

STELLAR ENVIRONMENTAL SOLUTIONS
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TRANSMITTAL MEMORANDUM	
TO: ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY DEPT. OF ENVIRONMENTAL HEALTH HAZARDOUS MATERIALS DIVISION 1131 HARBOR BAY PKWY, SUITE 250 ALAMEDA, CA 94502	DATE: OCTOBER 7, 2003
ATTENTION: MR. SCOTT SEERY	FILE: SES-2003-02
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: THIRD QUARTER 2003 SITE MONITORING REPORT FOR REDWOOD REGIONAL PARK SERVICE YARD SITE – OAKLAND, CALIFORNIA (OCTOBER 2003)	
<input type="checkbox"/> AS REQUESTED	<input type="checkbox"/> FOR YOUR APPROVAL
<input type="checkbox"/> FOR REVIEW	<input checked="" type="checkbox"/> FOR YOUR USE
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COPIES TO: N. FUJITA (EBRPD) M. RUGG (FISH & GAME) R. BREWER (REGIONAL BOARD)	BY: <u>Bruce Rucker</u>

October 3, 2003

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

Subject: Third Quarter 2003 Site Monitoring Report
Redwood Regional Park Service Yard Site – Oakland, California

Dear Mr. Seery:

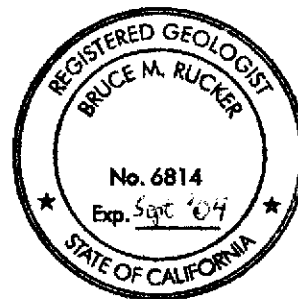
Attached is the referenced Stellar Environmental Solutions, Inc. (SES) report for the underground fuel storage tank site at the Redwood Regional Park Service Yard, located at 7867 Redwood Road, Oakland, California. This project is being conducted for the East Bay Regional Park District, and follows previous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

This report summarizes groundwater and surface monitoring and sampling activities conducted in September 2003 (Third Quarter 2003), and makes recommendations for future corrective action measures. If you have any questions regarding this report, please contact Mr. Neal Fujita of the East Bay Regional Park District, or contact us directly at (510) 644-3123.

Sincerely,

Bruce M. Rucker

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



Richard S. Makdissi

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

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

**THIRD QUARTER 2003
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
2198 SIXTH STREET
BERKELEY, CALIFORNIA 94710**

October 3, 2003

Project No. 2003-02

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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 Health Care Services Agency (ACHCSA) has provided regulatory oversight of the investigation since its inception. Other regulatory agencies with historical involvement in site review include the California Regional Water Quality Control Board (RWQCB) and the California Department of Fish and Game (CDFG).

OBJECTIVES AND SCOPE OF WORK

This report discusses the following activities conducted/coordinated by Stellar Environmental Solutions, Inc. (SES) between July 1 and September 30, 2003:

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

An exploratory borehole program was conducted in late September 2003 to address data gaps for evaluation of potential further corrective action. Because the results of that investigation are not yet available, these activities will be discussed and summarized in the next quarterly (Q4) progress report.

Previous SES reports (see References section) 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. An October 2000 Feasibility Study report for the site, submitted to ACHCSA, provided detailed analyses of the regulatory implications of the site contamination and an assessment of viable corrective actions (SES, 2000d). Additional monitoring well installations and corrective action by ORC™ injection proposed by SES were approved by the ACHCSA in its January 8, 2001 letter to the EBRPD. Two phases of ORC™ injection have been conducted: September 2001 and

July 2002. A total of 27 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.

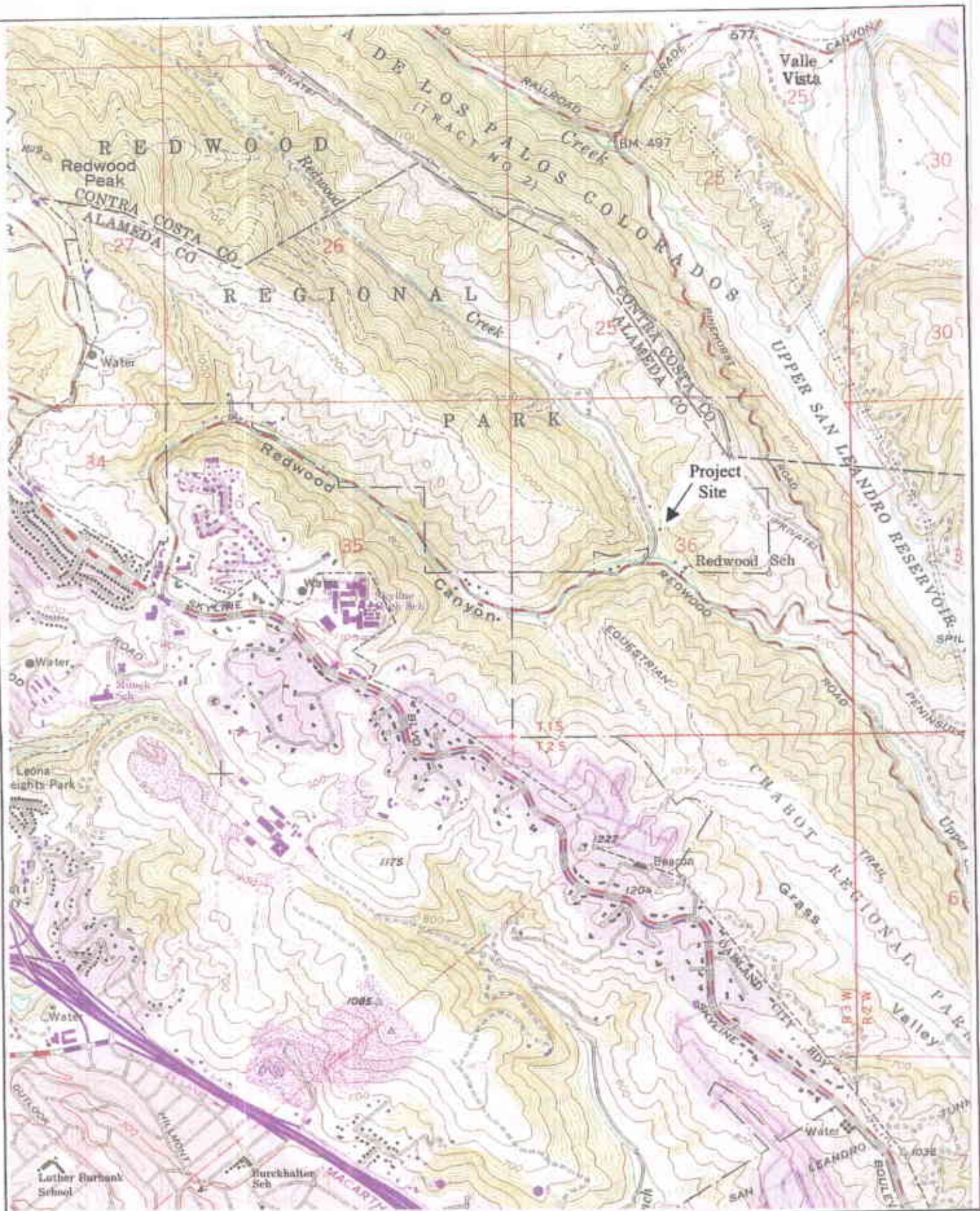
SITE DESCRIPTION

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 ACHCSA, with oversight provided by the RWQCB. The CDFG is also involved with regard to water quality impacts to Redwood Creek. All workplans and reports are submitted to these agencies. The most recent ACHCSA directive regarding the site (letter dated January 8, 2001) approved the ORC™ injection corrective action and requested continued quarterly groundwater monitoring and sampling. Historical ACHCSA-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 (ACHCSA, 1996). The latter recommendation has not yet been implemented due to continued concern over potential impacts to Redwood Creek.

Electronic Data Format (EDF) groundwater analytical results from the groundwater monitoring events beginning in the third quarter of 2001 have been successfully uploaded to the State of California Water Resources Control Board's GeoTracker database, in accordance with that agency's requirements for EDF submittals. Historical site groundwater and surface water analytical results are presented in Appendix C.



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



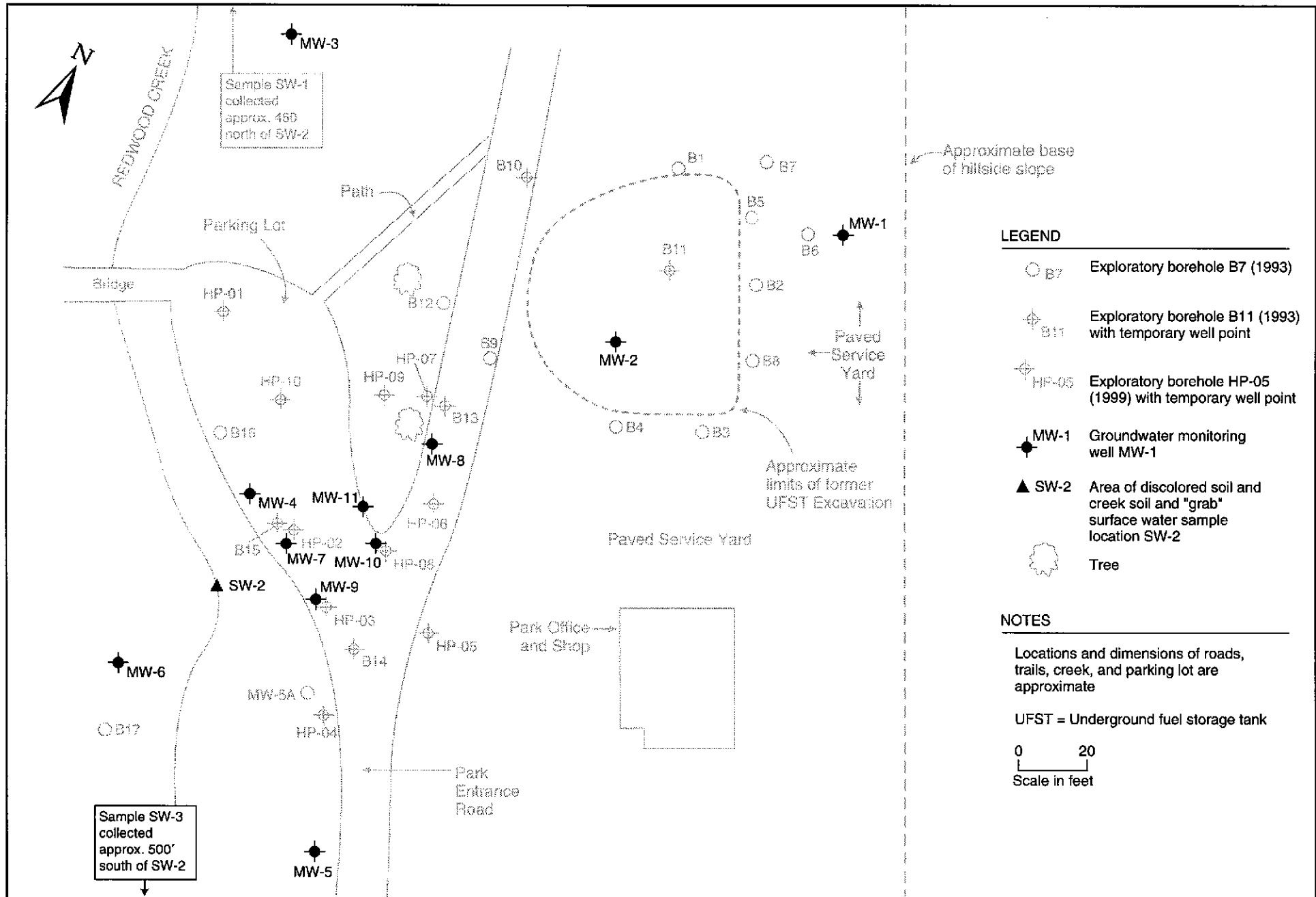
Redwood Regional Park Service Yard
Oakland, Alameda County, California

By: MJC

NOVEMBER 1997

★ Stellar Environmental Solutions
Geoscience & Engineering Consulting

Figure 1



LEGEND

- B7 Exploratory borehole B7 (1993)
- B11 Exploratory borehole B11 (1993) with temporary well point
- HP-05 Exploratory borehole HP-05 (1999) with temporary well point
- MW-1 Groundwater monitoring well MW-1
- SW-2 Area of discolored soil and creek soil and "grab" 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

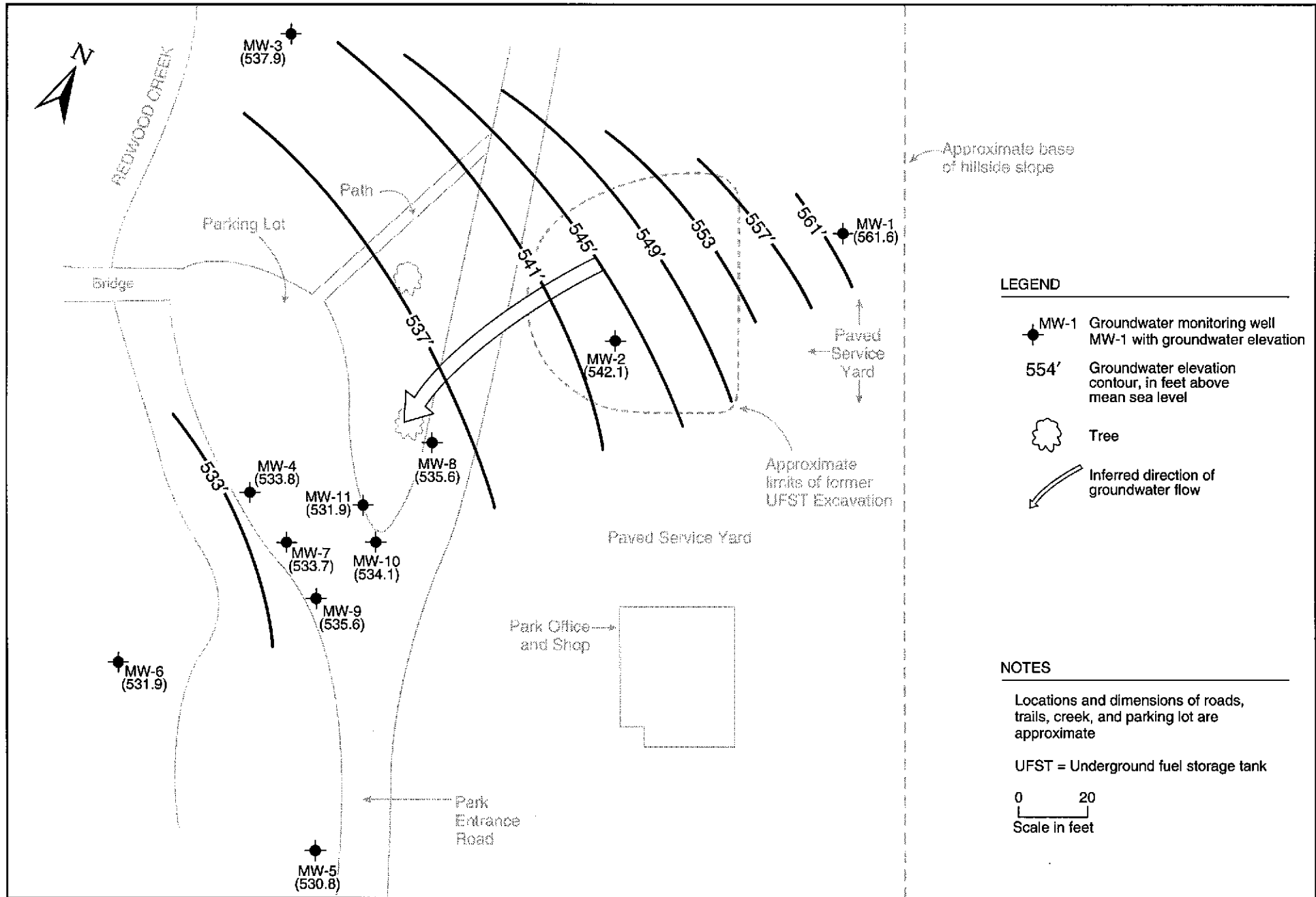
Following is a brief summary of the site hydrogeologic conditions based on geologic logging and water level measurements collected at the site since September 1993. A full discussion is presented in the SES June 1999 report.

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.

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 3 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. The groundwater gradient is relatively steep—approximately 2 feet per foot—between well MW-1 and the former UFST source area, resulting from the topography and the highly disturbed nature of sediments in the landslide debris. 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 from the UST installation and historical bores. 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 UST was 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 pump 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) in the vicinity of the site, and discharges into Upper San Leandro Reservoir located approximately 1 mile southeast of the site.

3.0 CURRENT GROUNDWATER AND SURFACE WATER MONITORING EVENT ACTIVITIES

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

- Measuring static water levels and field analyzing pre-purge groundwater samples for indicators of natural attenuation (dissolved oxygen, ferrous iron, and redox potential) in all 11 site wells;
- Collecting pre-purge groundwater samples for laboratory analysis of the natural attenuation indicators nitrate and sulfate from monitoring wells MW-3, MW-4, MW-7, MW-8, MW-9, MW-10, and MW-11;
- Collecting post-purge groundwater samples for laboratory analysis of site contaminants from wells located within 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 (a sample was not collected from location SW-3 as the creek was seasonally dry).

Creek sampling and groundwater monitoring/sampling was conducted on September 10, 2003. The locations of all site monitoring wells and creek water sampling locations are shown on Figure 2. Well construction information and water level data are summarized in Table 1. Appendix A contains the groundwater monitoring field records.

GROUNDWATER LEVEL MONITORING AND SAMPLING

Groundwater monitoring well water level measurements, purging, sampling, and field analyses were conducted by Blaine Tech Services under the direct supervision of SES personnel. Groundwater sampling 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 the ACHCSA in the SES 1998 workplan (SES, 1998a).

Table 1
Groundwater Monitoring Well Construction and Groundwater Elevation Data
Redwood Regional Park Corporation Yard, Oakland, California

Well	Well Depth	Screened Interval	TOC Elevation	Groundwater Elevation (9/10/03)
MW-1	18	7 to 17	565.9	561.6
MW-2	36	20 to 35	566.5	542.1
MW-3	42	7 to 41	560.9	537.9
MW-4	26	10 to 25	548.1	533.8
MW-5	26	10 to 25	547.5	530.8
MW-6	26	10 to 25	545.6	531.9
MW-7	24	9 to 24	547.7	533.7
MW-8	23	8 to 23	549.2	535.6
MW-9	26	11 to 26	549.4	535.6
MW-10	26	11 to 26	547.3	534.1
MW-11	26	11 to 26	547.9	531.9

Notes:

TOC = Top of casing.

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

All elevations are 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.

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.

The well development, purge water, and decontamination rinseate (approximately 90 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 it will be transported offsite for proper disposal.

CREEK SURFACE WATER SAMPLING

Surface water sampling was conducted by SES on September 10, 2003. 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). Consistent with

historical dry season conditions, Redwood Creek was dry; therefore, a sample was not available for collection at location SW-3 (approximately 500 feet downstream from SW-2). In accordance with a previous ACHCSA-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 not flowing at sampling location SW-2. Pooled water depth was less than 1 foot. At the SW-2 location, where contaminated groundwater discharge to the creek has historically been observed, a petroleum odor and sheen was noted, as was an orange algae growing on the saturated portion of the creek bank. It is likely that this algae is utilizing the petroleum as a carbon source, and is therefore a good indicator of the presence of petroleum contamination.

4.0 REGULATORY CONSIDERATIONS

The following is a summary of regulatory considerations regarding surface water and groundwater contamination. There are no ACHCSA 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 2 (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 risk-based screening levels (RBSLs) 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 RBSLs are composed of multiple components, including ceiling value, human toxicity, indoor air impacts, and aquatic life protection. Exceedance of RBSLs 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, the ACHCSA has indicated that impacts to nearby Redwood Creek are of primary importance, and that site target cleanup standards should primarily be evaluated in the context of surface water quality criteria.

SURFACE WATER CONTAMINATION

As summarized in Table 2 (Section 5.0), site surface water contaminant levels are compared to the most stringent screening level criteria published by the State of California, U.S. Environmental Protection Agency, and U.S. Department of Energy. These screening criteria address chronic and acute exposures to aquatic life. As discussed in the RWQCB's ESL document, benthic communities

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

Historical surface water sampling in the immediate vicinity of contaminated groundwater discharge (SW-2) has sporadically documented petroleum contamination, usually in periods of low stream flow, and generally at concentrations several orders of magnitude less than adjacent (within 20 feet) groundwater monitoring well concentrations. It is likely that mixing/dilution between groundwater and surface water precludes obtaining an "instantaneous discharge" surface water sample that is wholly representative of groundwater contamination at the discharge location. Therefore, the most conservative assumption is that surface water contamination at the groundwater/surface water interface is equivalent to the upgradient groundwater contamination (e.g., site downgradient wells MW-4, MW-7, and MW-9).

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

5.0 MONITORING EVENT ANALYTICAL RESULTS AND HYDROCHEMICAL TRENDS

This section presents the field and laboratory analytical results of the most recent monitoring event, followed by a summary of hydrochemical trends. Table 2 summarizes the contaminant analytical results of the current monitoring event, and Table 3 summarizes natural attenuation indicator results from the current event. Figure 4 shows the current event contaminant analytical results and the inferred limits of the total petroleum hydrocarbons as gasoline (TPHg) groundwater plume. Appendix B contains the certified analytical laboratory report and chain-of-custody records for the current event.

CURRENT EVENT GROUNDWATER AND SURFACE WATER RESULTS

Current quarter site groundwater contaminant concentrations exceed their respective groundwater ESLs (for both cases in which the drinking water resource is and is not threatened)—with the exception of toluene, which does not exceed either set of criteria. Site groundwater contaminant concentrations also exceed all surface water screening levels, with the exception of toluene and MTBE.

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

The surface water sample collected from location SW-2 had detectable concentrations of TPHg (190 $\mu\text{g/L}$), TPHd (92 $\mu\text{g/L}$), benzene (2.1 $\mu\text{g/L}$), and ethylbenzene (4.2 $\mu\text{g/L}$). None of the detected contaminant concentrations are above the established regulatory surface water screening levels.

CURRENT EVENT NATURAL ATTENUATION PARAMETERS RESULTS

Pre-purge groundwater samples from selected wells were collected and analyzed for indicators of the natural biodegradation of the hydrocarbon contamination or “natural attenuation.” Petroleum hydrocarbons require molecular oxygen to efficiently break down the ring structure of specific

Table 2
Groundwater and Surface Water Sample
Analytical Results – September 10, 2003
Redwood Regional Park Corporation Yard, Oakland, California

Compound	Concentrations in µg/L						
	TPHg	TPHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
GROUNDWATER SAMPLES							
MW-2	120	<50	8.6	0.51	0.53	<0.5	23
MW-4	<50	<50	<0.5	<0.5	<0.5	<0.5	<2.0
MW-7	10,000	3,300	150	11	300	136	<2.0
MW-8	3,600	400	120	3.3	300	221	<2.0
MW-9	8,300	2,900	420	14	870	200	<10
MW-10	<50	<50	1.1	<0.5	1.5	<0.5	7.0
MW-11	10,000	3,000	250	9.9	700	527	<4.0
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	190	92	2.1	<0.5	4.2	<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, 2000).

^(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 = Methyltertiary-butyl ether.

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

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

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

constituents. Although biodegradation of hydrocarbons can occur under anaerobic conditions, 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, replacing 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 3
Groundwater Sample Analytical Results
Natural Attenuation Indicators – September 10, 2003
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	3.7	0.0	126
MW-2	NA	NA	0.6	0.0	75
MW-3	<0.05	37	0.7	0.0	57
MW-4	0.26	54	11.5	0.0	-8
MW-5	NA	NA	0.7	0.0	86
MW-6	NA	NA	1.1	0.3	64
MW-7	<0.05	1.2	0.7	3.6	-89
MW-8	<0.05	92	0.1	1.4	-76
MW-9	<0.05	74	1.5	0.0	-71
MW-10	0.06	63	7.7	0.0	20
MW-11	<0.05	6.8	0.6	4.0	-94

Notes:

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

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. 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



NS
MW-3

MW-2	
TPHg	120
TPHd	ND
B	8.6
T	0.51
E	0.53
X	ND
MTBE	23

NS

MW-1

LEGEND & NOTES

◆ MW-1 Groundwater monitoring well MW-1

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

— 1,000 — TPHg isoconcentration in µg/L

Tree

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

All concentrations in µg/L (micrograms per liter)

UFST = Underground fuel storage tank

NS = Not sampled

ND = Not detected

MTBE = Methyl tertiary butyl ether

TPHg = Total petroleum hydrocarbons – gasoline range

TPHd = Total petroleum hydrocarbons – diesel range

BTEX = Benzene, toluene, ethylbenzene and total xylenes

0 20
Scale in feet

SW-2	
TPHg	190
TPHd	92
B	2.1
T	ND
E	4.2
X	ND
MTBE	ND

MW-7	
TPHg	10,000
TPHd	3,300
B	150
T	11
E	300
X	136
MTBE	ND

MW-4	
TPHg	ND
TPHd	ND
BTEX	ND
MTBE	ND

MW-8	
TPHg	3,600
TPHd	400
B	120
T	3.3
E	300
X	221
MTBE	ND

MW-11	
TPHg	10,000
TPHd	3,000
B	250
T	9.9
E	700
X	527
MTBE	ND

MW-9	
TPHg	8,300
TPHd	2,900
B	420
T	14
E	870
X	200
MTBE	ND

MW-10	
TPHg	ND
TPHd	ND
B	1.1
T	ND
E	1.5
X	ND
MTBE	7

MW-6
NS

SW-3
NS

MW-5
NS

★ **Stellar Environmental Solutions**
Geoscience & Engineering Consulting

ANALYTICAL RESULTS AND TPH-GAS PLUME—SEPTEMBER, 2003
Redwood Regional Park Service Yard, Oakland, CA

Figure 4

by: MJC

SEPTEMBER 2003

2003-02-12

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 0.1 mg/L to 3.7 mg/L, with one well (MW-10) at 7.7 mg/L and one well (MW-4) at 11.5 mg/L. The elevated DO concentration in these wells 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- μ g/L TPHg contour (MW-7, MW-8, MW-9, and MW-11) (see Figure 4), ORP values ranged from -71 mV to -94 mV. Other monitoring wells showed positive ORP values ranging from +20 mV to +126 mV. Thus, the ORP values showed the expected general inverse correlation with hydrocarbon concentrations.

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- μ g/L TPHg contour, nitrate concentrations were generally lower and ferrous iron concentrations were generally higher than for other monitoring wells. These results indicate that some degree of anaerobic degradation is likely occurring within the plume. 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.

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 B).

GENERAL HYDROCHEMICAL TRENDS

Appendix C contains a summary of historical groundwater analytical results. A detailed discussion of hydrochemical trends (focused on the efficacy of the ORC™ injection corrective action program) was provided in the SES Year 2002 Annual Summary report (SES, 2003a) and will be addressed again in the Year 2003 Annual Summary report. The following summary is presented because the active life of the previously-injected ORC™ product has been exceeded and is not expected to provide significant further benefit.

Following both ORC™ injection events (September 2001 and July 2002), contaminant concentrations in all wells showed contaminant reductions. Some wells on the plume fringes (northern and southern limits) were brought to trace or non-detectable concentrations. Natural attenuation indicators (especially dissolved oxygen) have also demonstrated some positive effects from the injection program. However, wells along the centerline of the plume concentrations generally rebounded following initial reductions. Overall, the groundwater plume appears to have stabilized; maximum groundwater concentrations have not increased in recent events.

The ORC™ model output for each ORC™ injection anticipated full and permanent reduction of groundwater contamination, which was predicated on numerous variables, the most important being the absence of a continued source of contaminant mass input to the system. The rebound in concentrations along the centerline of the plume and in the most upgradient well (MW-8) suggest the presence of a continued mass input from two sources: 1) the capillary fringe soils within the plume; and 2) capillary fringe soils and groundwater upgradient of the ORC™ treatment grid (i.e., upgradient of MW-8).

CORRECTIVE ACTION EVALUATION

The corrective action program has shown an overall reduction in contaminant mass in groundwater, and the downgradient ORC™ injection barrier (just upgradient of Redwood Creek) has likely significantly reduced contaminant discharge into Redwood Creek. However, residual groundwater concentrations still exceed groundwater and surface water screening-level criteria. Since the active life of the previously-injected ORC™ product has been exceeded, continued contaminant input to the

system and migration toward Redwood Creek is likely. Additional investigation and corrective action are needed to address the issue of continuing contaminant mass input.

While further injection of ORC™ may be appropriate for additional corrective action, limited additional site characterization is needed to identify specific areas and depths of residual contaminant mass upgradient of MW-8 and in the unsaturated zone overlying the contaminant plume. If additional ORC™ injection is warranted, any future injection design (and location) would require alteration from the previous design in order to optimize the remedy and focus on the remaining sources of contaminant mass input. Some of the potential residual contamination may be located in drilling-inaccessible areas (steep topography immediately downgradient of the former source area and upgradient of the ORC™ injection area).

An exploratory borehole program was conducted in late September 2003 to address these issues. Because the analytical results for that program are not yet available, the findings of the borehole program will be discussed in the next site report (Year 2003 Annual Summary Report).

6.0 SUMMARY, CONCLUSIONS AND PROPOSED ACTIONS

The following conclusions and proposed actions are focused 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 (27 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, which does not exceed either set of criteria. Site groundwater contaminant concentrations also exceed all surface water screening levels, with the exception of toluene and MTBE.
- Historical 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 100 feet long by 40 feet wide, significantly less than the area of contamination that existed prior to the ORC™ injections. Maximum groundwater concentrations for the majority of the contaminants have reached the most downgradient wells (just upgradient of the creek), and the plume appears to have stabilized (maximum site contaminant concentrations have not increased in recent sampling events).
- Contaminants were detected in the current event site surface water (creek sample); however, all detected contaminant concentrations are 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 have not been wholly effective in permanently reducing the contaminant concentrations within the

centerline of the plume. Residual groundwater concentrations exceed groundwater and surface water screening-level criteria, and the active life of the ORC™ product has likely 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. An exploratory borehole program was conducted in September 2003 to address these issues. Those findings will be discussed in the Year 2003 Annual Summary Report.

PROPOSED ACTIONS

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

- Continue the quarterly program of creek and groundwater sampling and reporting; and
- Complete the Year 2003 Annual Summary Report following the Q4 2003 monitoring event, including discussion of the September 2003 exploratory borehole program to further evaluate the efficacy of the ORC™ remedy program. If the investigation findings indicate that additional ORC™ injection is warranted, any future injection design (and location) would be altered from the previous design in order to optimize the remedy and focus on the remaining sources of contaminant mass input.

7.0 REFERENCES AND BIBLIOGRAPHY

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8.0 LIMITATIONS

This report has been prepared for the exclusive use of the East Bay Regional Park District, its authorized representatives, and the regulatory agencies. No reliance on this report shall be made by anyone other than those for whom it was prepared.

The findings and conclusions presented in this report are based on the review of previous investigators' findings at the site, as well as onsite activities conducted by SES since September 1998. This report 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.

WELLHEAD INSPECTION CHECKLIST

Client Stellar Env. Sol. Date 9/10/03

Site Address RRPS Yard, Oakland

Job Number 030910-B41 Technician BRIAN ALMON

Well ID	Well Inspected - No Corrective Action Required	Water Bailed From Wellbox	Wellbox Components Cleaned	Cap Replaced	Lock Replaced	Other Action Taken (explain below)	Well Not Inspected (explain below)	Repair Order Submitted
MW-1	✓							
MW-2	✓							
MW-3	✓							
MW-4	✓							
MW-5	✓							
MW-6	✓							
MW-7	✓							
MW-8						①		
MW-9	✓							
MW-10						②		
MW-11	✓							

NOTES: ① Missing one bolt ② Annular Seal needs to be replaced

WELL GAUGING DATA

Project # 030910-BA1 Date 9/10/03 Client Stellar Env Sol.

Site RRPS Yard, 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					4.35	19.21	ToC	
MW-2	4					24.40	38.89		
MW-3	4					23.24	45.09		
MW-4	4					14.32	26.39		
MW-5	4					16.68	26.98		
MW-6	4					13.65	27.54		
MW-7	2					13.96	25.32		
MW-8	2					13.58	22.29		
MW-9	2					13.80	26.35		
MW-10	2					13.23	28.34		
MW-11	2					16.02	30.27		↳

WELL MONITORING DATA SHEET

Project #: <u>030910-BA1</u>	Client: <u>Stellar Env. Sol.</u>
Sampler: <u>Brian Alcorn</u>	Start Date: <u>9/10/03</u>
Well I.D.: <u>MW-1</u>	Well Diameter: 2 3 <u>(4)</u> 6 8 <u> </u>
Total Well Depth: <u>19.21</u>	Depth to Water: <u>4.35</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:

- Bailer
- Disposable Bailer
- Positive Air Displacement
- Electric Submersible
- Waterra
- Peristaltic
- Extraction Pump
- Other _____

Sampling Method:

- Bailer
- Disposable Bailer
- Extraction Port
- Dedicated Tubing
- Other: _____

Gauge Only

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

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

Time	Temp. (°F or °C)	pH	Conductivity (mS or µS)	Turbidity (NTU)	Gals. Removed	Observations
<u>0320</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>Fe²⁺ ✓</u>

Did well dewater? Yes No Gallons actually evacuated:

Sampling Time: Sampling Date:

Sample I.D.: Laboratory: STL

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): Pre-purge: 3.7 mg/L Post-purge: mg/L

ORP (if req'd): Pre-purge: 126 mV Post-purge: mV

WELL MONITORING DATA SHEET

Project #: 030910-BA1	Client: Stellar Env. Sol.
Sampler: Brian Allen	Start Date: 9/10/03
Well I.D.: MW-2	Well Diameter: 3 3 (4) 6 8
Total Well Depth: 38.89	Depth to Water: 24.40
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
- Waterra
- Peristaltic
- Extraction Pump
- Other _____

Sampling Method:

- Bailer
- Disposable Bailer
- Extraction Port
- Dedicated Tubing
- Other: _____

9.5	(Gals.) X	3	=	28.5	Gals.
1 Case Volume		Specified Volumes		Calculated Volume	

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

Time	Temp. (°F or °C)	pH	Conductivity (mS or µS)	Turbidity (NTU)	Gals. Removed	Observations
0955	-	-	-	-	-	Fe 2+ φ
1150	63.8	7.1	875	358	9.5	clouds gray
1151	Well dewatered @			15 gallons		DW 36.90
1355	64.4	7.7	851	137	15.0	DW 26.07

Did well dewater? Yes No Gallons actually evacuated: 15

Sampling Time: ~~1355~~ ^{Post} 1355 Sampling Date: 9/10/03

Sample I.D.: MW-2 Laboratory: (STL)

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

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

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

D.O. (if req'd): (Pre-purge: 0.6 mg/L) Post-purge: mg/L

ORP (if req'd): (Pre-purge: 75 mV) Post-purge: mV

WELL MONITORING DATA SHEET

Project #: <u>030910-BA1</u>	Client: <u>Stellar</u>
Sampler: <u>Brian Alcorn</u>	Start Date: <u>9/10/03</u>
Well I.D.: <u>MW-3</u>	Well Diameter: 2 3 <u>4</u> 6 8 <u> </u>
Total Well Depth: <u>45.09</u>	Depth to Water: <u>23.04</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:

- | | |
|--|--|
| <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Bailer <input checked="" type="checkbox"/> Disposable Bailer <input checked="" type="checkbox"/> Positive Air Displacement <input checked="" type="checkbox"/> Electric Submersible | <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Waterra <input checked="" type="checkbox"/> Peristaltic <input checked="" type="checkbox"/> Extraction Pump <input checked="" type="checkbox"/> Other _____ |
|--|--|

Sampling Method:

- Bailer
- Disposable Bailer
- Extraction Port
- Dedicated Tubing
- Other: _____

No Purge Sample

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

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

Time	Temp. (°F or °C)	pH	Conductivity (mS or μS)	Turbidity (NTU)	Gals. Removed	Observations
0905	59.1	7.1	611	146	—	cloudy brown Fe ²⁺ & δ
1150	65.2	7.1	825	378	9.5	

Did well dewater? Yes No Gallons actually evacuated: —

Sampling Time: 0905 Sampling Date: 9/10/03

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

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

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

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

D.O. (if req'd):	<u>Pre-purge:</u>	0.7	mg/L	Post-purge:	mg/L
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ORP (if req'd):	<u>Pre-purge:</u>	57	mV	Post-purge:	mV
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WELL MONITORING DATA SHEET

Project #: 030910-3A1	Client: Steller
Sampler: Brian Allen	Start Date: 9/10/03
Well I.D.: MW-4	Well Diameter: 2 3 (4) 6 8
Total Well Depth: 24.39	Depth to Water: 14.32
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:

- Bailer
- Disposable Bailer
- Positive Air Displacement
- Electric Submersible
- Waterra
- Peristaltic
- Extraction Pump
- Other _____

Sampling Method:

- Bailer
- Disposable Bailer
- Extraction Port
- Dedicated Tubing
- Other: _____

8.0 (Gals.) X	3	= 24.0 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. (°F or °C)	pH	Conductivity (mS or µS)	Turbidity (NTU)	Gals. Removed	Observations
0935	60.5	8.4	781	20	—	clear Fe ²⁺ ⚪
1204	62.4	8.4	776	40	8.0	clear
1205	Well dewatered @ 12 gallons					DTW 24.40
1340	62.6	8.9	738	69	12.0	clear DTW 22.12

Did well dewater? Yes No Gallons actually evacuated: 12

Sampling Time: ^{Pre} 0935 / ^{Post} 1340 Sampling Date: 9/10/03

Sample I.D.: MW-4 Laboratory: (STL)

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: 11.5 mg/L Post-purge: _____ mg/L

ORP (if req'd): Pre-purge: -8 mV Post-purge: _____ mV

WELL MONITORING DATA SHEET

Project #:	Client:
Sampler: <u>Brian Alcorn</u>	Start Date: <u>9/10/03</u>
Well I.D.: <u>MW-5</u>	Well Diameter: 2 3 <u>4</u> 6 8
Total Well Depth: <u>26.98</u>	Depth to Water: <u>10.08</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:

- | | |
|--|--|
| <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Bailer <input checked="" type="checkbox"/> Disposable Bailer <input checked="" type="checkbox"/> Positive Air Displacement <input checked="" type="checkbox"/> Electric Submersible | <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Waterra <input checked="" type="checkbox"/> Peristaltic <input checked="" type="checkbox"/> Extraction Pump <input checked="" type="checkbox"/> Other _____ |
|--|--|

Sampling Method:

- Bailer
- Disposable Bailer
- Extraction Port
- Dedicated Tubing
- Other: _____

Groundwater

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

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

Time	Temp. (°F or °C)	pH	Conductivity (mS or µS)	Turbidity (NTU)	Gals. Removed	Observations
<u>0835</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>Fe²⁺ Ⓟ</u>

Did well dewater? Yes No Gallons actually evacuated: _____

Sampling Time: _____ Sampling Date: _____

Sample I.D.: _____ Laboratory: STL

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>	<u>0.7</u> mg/L	<u>Post-purge:</u>		mg/L
ORP (if req'd):	<u>Pre-purge:</u>	<u>86</u> mV	<u>Post-purge:</u>		mV

WELL MONITORING DATA SHEET

Project #: <u>030910-BA1</u>	Client: <u>Stellar</u>
Sampler: <u>Brian Anderson</u>	Start Date: <u>9/10/03</u>
Well I.D.: <u>MW-6</u>	Well Diameter: 2 3 <u>(4)</u> 6 8
Total Well Depth: <u>27.54</u>	Depth to Water: <u>13.69</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:

- ~~Bailer~~
- ~~Disposable Bailer~~
- ~~Positive Air Displacement~~
- ~~Electric Submersible~~

- ~~Waterra~~
- ~~Peristaltic~~
- ~~Extraction Pump~~
- ~~Other _____~~

Sampling Method:

- ~~Bailer~~
- ~~Disposable Bailer~~
- ~~Extraction Port~~
- ~~Dedicated Tubing~~
- ~~Other: _____~~

Garage Only

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

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

Time	Temp. (°F or °C)	pH	Conductivity (mS or µS)	Turbidity (NTU)	Gals. Removed	Observations
<u>0850</u>	—	—	—	—	—	<u>Fe²⁺ 0.3</u>

Did well dewater? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Gallons actually evacuated: _____
Sampling Time: _____	Sampling Date: _____
Sample I.D.: _____	Laboratory: <u>STL</u>
Analyzed for: <u>TPH-G BTEX MTBE TPH-D</u> Other: _____	
Equipment Blank I.D.: _____ @ _____ Time	Duplicate I.D.: _____
Analyzed for: <u>TPH-G BTEX MTBE TPH-D</u> Other: _____	
D.O. (if req'd): _____	Pre-purge: <u>(.1)</u> mg/L Post-purge: _____ mg/L
ORP (if req'd): _____	Pre-purge: <u>(-1)</u> mV Post-purge: _____ mV

WELL MONITORING DATA SHEET

Project #: 030910-BA1	Client: <u>Stellar</u>
Sampler: <u>BRIAN ALCOCK</u>	Start Date: <u>9/10/03</u>
Well I.D.: <u>MW-7</u>	Well Diameter: <u>2</u> 3 4 6 8
Total Well Depth: <u>25.32</u>	Depth to Water: <u>13.96</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 _____	

$$2.0 \text{ (Gals.)} \times 3 = 6.0 \text{ Gals.}$$
 1 Case Volume Specified Volumes Calculated Volume

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

Time	Temp. (°F or °C)	pH	Conductivity (mS or μS)	Turbidity (NTU)	Gals. Removed	Observations
1040	60.4	7.0	746	52	-	clear, odor Fe ²⁺ 3.6
1301	62.9	7.0	777	>1,000	2.0	cloudy gray, odor
1305	61.7	7.1	795	>1,000	4.0	"
1309	60.4	7.0	793	>1,000	6.0	"

Did well dewater? Yes No Gallons actually evacuated: 6

Sampling Time: Pre 1040 Post 1300 Sampling Date: 9/10/03

Sample I.D.: MW-7 Laboratory: (STL)

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: 0.7 mg/L Post-purge: _____ mg/L

ORP (if req'd): Pre-purge: -89 mV Post-purge: _____ mV

WELL MONITORING DATA SHEET

Project #: 030910-3A1	Client: Stellar
Sampler: <u>Beitav Alcoran</u>	Start Date: 9/10/03
Well I.D.: MW-8	Well Diameter: 2 3 4 6 8
Total Well Depth: 22.29	Depth to Water: 13.58
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: _____	

1.5	(Gals.) X	3	=	4.5	Gals.
1 Case Volume		Specified Volumes		Calculated Volume	

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

Time	Temp. (°F or °C)	pH	Conductivity (mS or <u>µS</u>)	Turbidity (NTU)	Gals. Removed	Observations
1110	61.4	7.2	814	351	-	cloudy gray, vch Fe ²⁺ 1.4
1122	59.4	7.1	823	>1,000	1.5	"
1124	58.5	7.1	845	>1,000	3.0	"
1126	58.1	7.1	824	>1,000	4.5	"

Did well dewater? Yes No Gallons actually evacuated: 4.5

Sampling Time: Pre 1110 Post 1130 Sampling Date: 9/10/03

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

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: 0.1 mg/L Post-purge: mg/L

ORP (if req'd): Pre-purge: -76 mV Post-purge: mV

WELL MONITORING DATA SHEET

Project #: <u>030910-BA1</u>	Client: <u>Stellar</u>
Sampler: <u>Brian Anderson</u>	Start Date: <u>9/10/03</u>
Well I.D.: <u>MW-9</u>	Well Diameter: <u>(2)</u> 3 4 6 8 <u> </u>
Total Well Depth: <u>26.35</u>	Depth to Water: <u>13.30</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: _____	

$2.0 \text{ (Gals.)} \times 3 = 6.0 \text{ Gals.}$
 1 Case Volume Specified Volumes Calculated Volume

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

Time	Temp. (°F or °C)	pH	Conductivity (mS or µS)	Turbidity (NTU)	Gals. Removed	Observations
1055	60.8	7.4	688	248	—	cloudy brown Fe ²⁺ &
1320	63.8	7.0	794	>1,000	2.0	cloudy gray-brown odor
1324	61.4	6.9	836	>1,000	4.0	"
1328	60.4	6.9	845	>1,000	6.0	"

Did well dewater? Yes No Gallons actually evacuated: 6

Sampling Time: Pre 1055 Post 1330 Sampling Date: 9/10/03

Sample I.D.: MW-9 Laboratory: (STL)

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) 1.5 mg/L Post-purge: _____ mg/L

ORP (if req'd): (Pre-purge) -71 mV Post-purge: _____ mV

WELL MONITORING DATA SHEET

Project #: <u>050910-BA1</u>	Client: <u>Stellar</u>
Sampler: <u>Brian Alcorn</u>	Start Date: <u>9/10/03</u>
Well I.D.: <u>MW-10</u>	Well Diameter: <u>2</u> 3 4 6 8 <u> </u>
Total Well Depth: <u>28.34</u>	Depth to Water: <u>13.23</u>
Before: <u> </u> After: <u> </u>	Before: <u> </u> After: <u> </u>
Depth to Free Product: <u> </u>	Thickness of Free Product (feet): <u> </u>
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): <u>YSI</u> HACH

Purge Method:

- Bailer
- Disposable Bailer
- Positive Air Displacement
- Electric Submersible

Sampling Method:

- Waterra
- Peristaltic
- Extraction Pump
- Other

Bailer

- Disposable Bailer
- Extraction Port
- Dedicated Tubing
- Other:

<u>2.5</u> (Gals.) X	<u>3</u>	<u>=</u>	<u>7.5</u> 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. (°F or °C)	pH	Conductivity (mS or μ S)	Turbidity (NTU)	Gals. Removed	Observations
10:15	61.1	8.8	686	34	—	clear Feet ϕ
12:15	62.6	8.7	740	405	2.5	cloudy brown
12:19	61.0	7.7	759	584	5.0	"
12:23	59.2	7.6	718	341	7.5	"

Did well dewater? Yes No Gallons actually evacuated: 7.5

Sampling Time: Pre 10:15 Post 12:25 Sampling Date: 9/10/03

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

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: 7.7 mg/L Post-purge: mg/L

ORP (if req'd): Pre-purge: 20 mV Post-purge: mV

WELL MONITORING DATA SHEET

Project #: 030910-BA1	Client: Stellar
Sampler: Brian Alcorn	Start Date: 9/10/03
Well I.D.: MW-11	Well Diameter: (2) 3 4 6 8
Total Well Depth: 30.27	Depth to Water: 16.02
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	Bailer
<u>Disposable Bailer</u>	<u>Disposable Bailer</u>
Positive Air Displacement	Extraction Port
Electric Submersible	Dedicated Tubing
Watertra	Other: _____
Peristaltic	
Extraction Pump	
Other: _____	

$2.25 \text{ (Gals.)} \times 3 = 6.75 \text{ Gals.}$
 1 Case Volume Specified Volumes Calculated Volume

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

Time	Temp. (°F or °C)	pH	Conductivity (mS of (µS))	Turbidity (NTU)	Gals. Removed	Observations
1025	60.2	6.8	1,027	25	—	clear, odor Fe ²⁺ 4.c
1239	61.2	6.8	1,053	586	2.25	cloudy gray, odor
1243	60.2	6.9	1,009	>1,000	4.5	"
1247	60.1	6.9	985	>1,000	6.75	"

Did well dewater? Yes No Gallons actually evacuated: 6.75

Sampling Time: Pre 1025 Post 1250 Sampling Date: 9/10/03

Sample I.D.: MW-11 Laboratory: STL

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: 0.6 mg/L Post-purge: _____ mg/L

ORP (if req'd): Pre-purge: -94 mV Post-purge: _____ mV



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

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

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

Prepared for:

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

Date: 17-SEP-03
Lab Job Number: 167477
Project ID: 030910-BA1
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 Bobra
Project Manager

Reviewed by: [Signature]
Operations Manager

This package may be reproduced only in its entirety.



Laboratory Numbers: **167477**
Client: **Stellar Environmental Solutions**
Location: **Redwood Regional Park**
Project #: **030910-BA1**

Sampled Date: **09/10/03**
Received Date: **09/10/03**

CASE NARRATIVE

This hardcopy data package contains sample and QC results for eight water samples, which were received from the site referenced above on September 10, 2003. The samples were received cold and intact.

TVH/BTXE:

High trifluorotoluene surrogate recovery was observed for sample MW-7 (CT# 167477-004) as a result of hydrocarbons coeluting with the surrogate. No other analytical problems were encountered.

TEH (EPA 8015M):

No analytical problems were encountered.

General Chemistry:

No analytical problems were encountered.

Laboratory CURTIS & TOMPKINS Method of Shipment _____
 Address 2323 FIFTH ST. Shipment No. _____
BERKELEY, CA Airbill No. _____
 Client STELLAR ENV. Cooler No. _____
 Address 219B SIXTH ST. Project Manager BRUCE RUCKER
BERKELEY, CA Telephone No. 50-644-3123
 Project Name REDWOOD REGIONAL PARK Fax No. _____
 Project Number 030910-BA1 Sampler: (Signature) _____

Filled ✓
 No. of Containers
TPH-6, BTEX, MTBE
TPH-D
NITRATE, SULFATE
 Analyte Required
 Remarks

Field Sample Number	Location/Depth	Date	Time	Sample Type	Type/Size of Container	Preservation		Temp.	Chemical											
						Temp.	Chemical													
1 MW-2		9/10	1355							X	X									
2 MW-3			0905							X	X	X								
3 MW-4 ()			0935							X	X	X								
4 MW-7 ()			1040							X	X	X								
5 MW-8 ()			1110							X	X	X								
6 MW-9 ()			1059							X	X	X								
7 MW-10 ()			1015							X	X	X								
8 MW-11 ()			1025							X	X	X								

Preservation Correct?
 Yes No N/A

Received On ice
 Cold Ambient Intact

Relinquished by: Signature _____ Printed <u>BRIAN ALCOCK</u> Company <u>BLAINE TECH SERVICES</u> Reason _____	Date <u>9/10</u> Time <u>1530</u>	Received by: Signature _____ Printed _____ Company <u>CTI</u>	Date <u>9/10</u> Time <u>3:35 PM</u>	Relinquished by: Signature _____ Printed _____ Company _____ Reason _____	Date _____ Time _____	Received by: Signature _____ Printed _____ Company _____	Date _____ Time _____
Comments: <u>SHORT HOLD TIMES</u>				Relinquished by: Signature _____ Printed _____ Company _____ Reason _____			

Curtis & Tompkins Laboratories Analytical Report

Lab #: 167477	Location: Redwood Regional Park
Client: Stellar Environmental Solutions	Prep: EPA 5030B
Project#: 030910-BA1	
Matrix: Water	Sampled: 09/10/03
Units: ug/L	Received: 09/10/03

Field ID: MW-2	Diln Fac: 1.000
Type: SAMPLE	Batch#: 84408
Lab ID: 167477-001	Analyzed: 09/11/03

Analyte	Result	RL	Analysis
Gasoline C7-C12	120 L Y	50	8015B
MTBE	23	2.0	EPA 8021B
Benzene	8.6	0.50	EPA 8021B
Toluene	0.51	0.50	EPA 8021B
Ethylbenzene	0.53	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)	115	57-150	8015B
Bromofluorobenzene (FID)	110	65-144	8015B
Trifluorotoluene (PID)	84	54-149	EPA 8021B
Bromofluorobenzene (PID)	87	58-143	EPA 8021B

Field ID: MW-4	Diln Fac: 1.000
Type: SAMPLE	Batch#: 84408
Lab ID: 167477-003	Analyzed: 09/11/03

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	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	57-150	8015B
Bromofluorobenzene (FID)	111	65-144	8015B
Trifluorotoluene (PID)	78	54-149	EPA 8021B
Bromofluorobenzene (PID)	88	58-143	EPA 8021B

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

Chromatogram

Sample Name : 167477-001,84408

Sample # : c1.3

Page 1 of 1

File Name : G:\GC05\DATA\253G016.raw

Date : 9/11/03 01:11 PM

Method : TVHBTXE

Time of Injection: 9/11/03 02:00 AM

Start Time : 0.00 min

End Time : 25.00 min

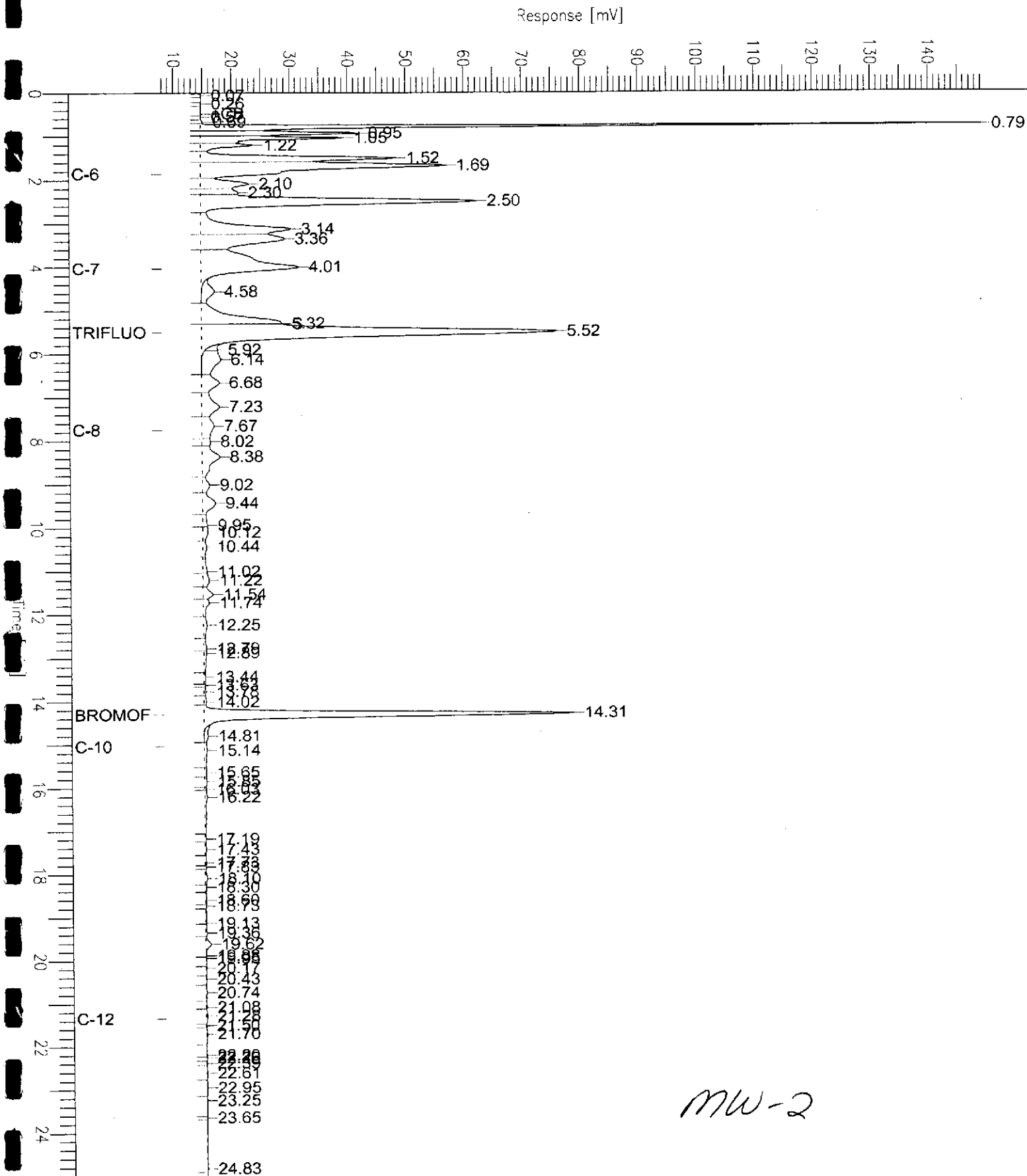
Low Point : 7.99 mV

High Point : 149.28 mV

Scale Factor : 1.0

Plot Offset : 8 mV

Plot Scale : 141.3 mV



MW-2

Curtis & Tompkins Laboratories Analytical Report

Lab #: 167477	Location: Redwood Regional Park
Client: Stellar Environmental Solutions	Prep: EPA 5030B
Project#: 030910-BA1	
Matrix: Water	Sampled: 09/10/03
Units: ug/L	Received: 09/10/03

Field ID: MW-7	Lab ID: 167477-004
Type: SAMPLE	

Analyte	Result	RL	Diln Fac	Batch#	Analyzed	Analysis
Gasoline C7-C12	10,000 H	100	2.000	84474	09/13/03	8015B
MTBE	ND	2.0	1.000	84408	09/10/03	EPA 8021B
Benzene	150	0.50	1.000	84408	09/10/03	EPA 8021B
Toluene	11 C	0.50	1.000	84408	09/10/03	EPA 8021B
Ethylbenzene	300	0.50	1.000	84408	09/10/03	EPA 8021B
m,p-Xylenes	130	0.50	1.000	84408	09/10/03	EPA 8021B
o-Xylene	5.9	0.50	1.000	84408	09/10/03	EPA 8021B

Surrogate	%REC	Limits	Diln Fac	Batch#	Analyzed	Analysis
Trifluorotoluene (FID)	224 *	>LR b 57-150	2.000	84474	09/13/03	8015B
Bromofluorobenzene (FID)	120	65-144	2.000	84474	09/13/03	8015B
Trifluorotoluene (PID)	121	54-149	1.000	84408	09/10/03	EPA 8021B
Bromofluorobenzene (PID)	98	58-143	1.000	84408	09/10/03	EPA 8021B

Field ID: MW-8	Diln Fac: 1.000
Type: SAMPLE	Batch#: 84408
Lab ID: 167477-005	Analyzed: 09/11/03

Analyte	Result	RL	Analysis
Gasoline C7-C12	3,600 H	50	8015B
MTBE	ND	2.0	EPA 8021B
Benzene	120	0.50	EPA 8021B
Toluene	3.3	0.50	EPA 8021B
Ethylbenzene	300	0.50	EPA 8021B
m,p-Xylenes	210	0.50	EPA 8021B
o-Xylene	11	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	141	57-150	8015B
Bromofluorobenzene (FID)	131	65-144	8015B
Trifluorotoluene (PID)	93	54-149	EPA 8021B
Bromofluorobenzene (PID)	98	58-143	EPA 8021B

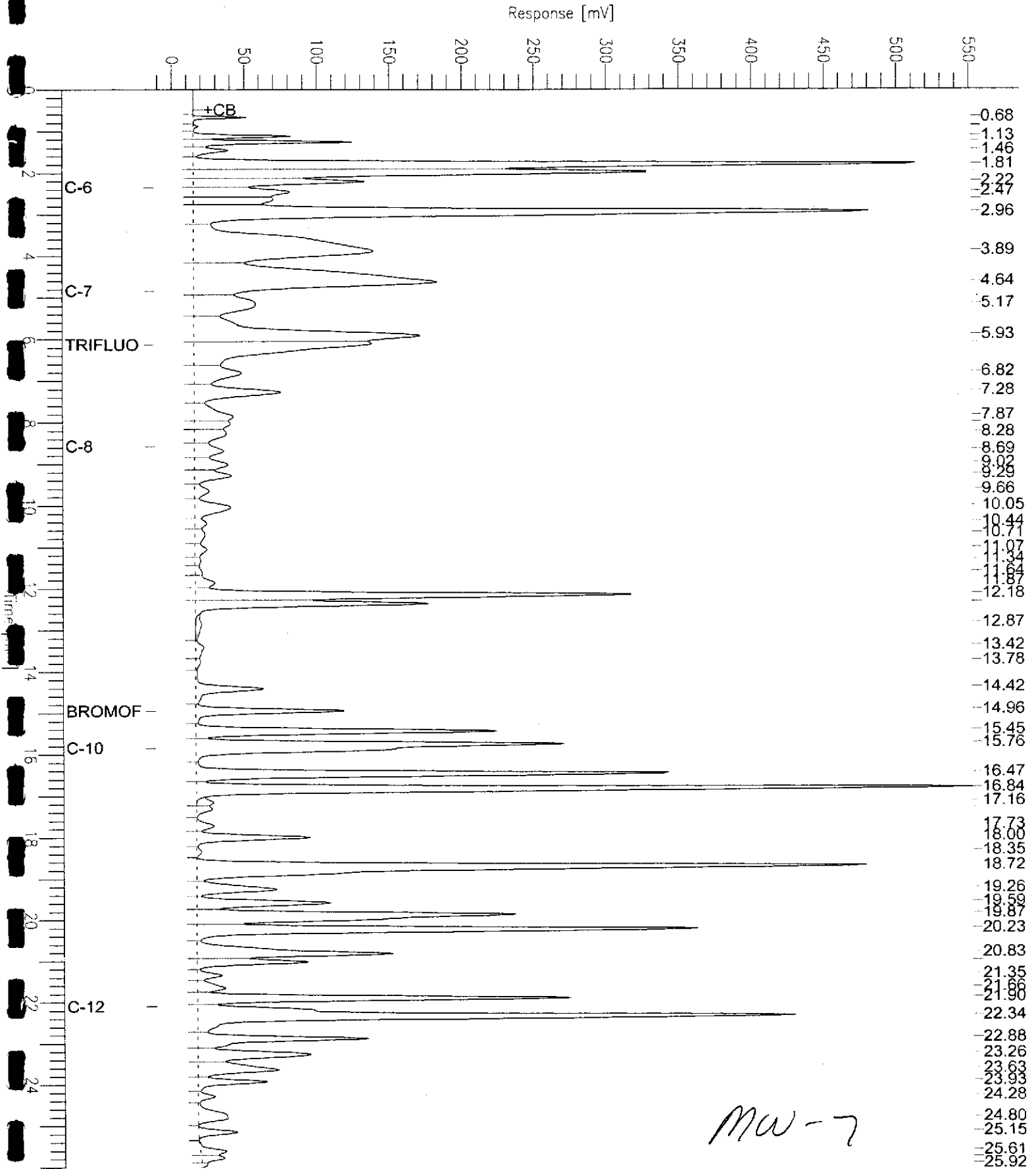
*= Value outside of QC limits; see narrative
 C= Presence confirmed, but RPD between columns exceeds 40%
 H= Heavier hydrocarbons contributed to the quantitation
 L= Lighter hydrocarbons contributed to the quantitation
 Y= Sample exhibits chromatographic pattern which does not resemble standard
 b= See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

GC07 TVH 'A' Data File RTX 502

Sample Name : 167477-004,84474
 File Name : G:\GC07\DATA\256A010.raw
 Method : TVHBTXE
 Start Time : 0.00 min
 Scale Factor : 1.0

End Time : 26.00 min
 Plot Offset : -12 mV

Sample #: e1.3
 Date : 9/13/03 05:21 PM
 Time of Injection: 9/13/03 04:55 PM
 Low Point : -12.06 mV
 High Point : 551.58 mV
 Plot Scale: 563.6 mV

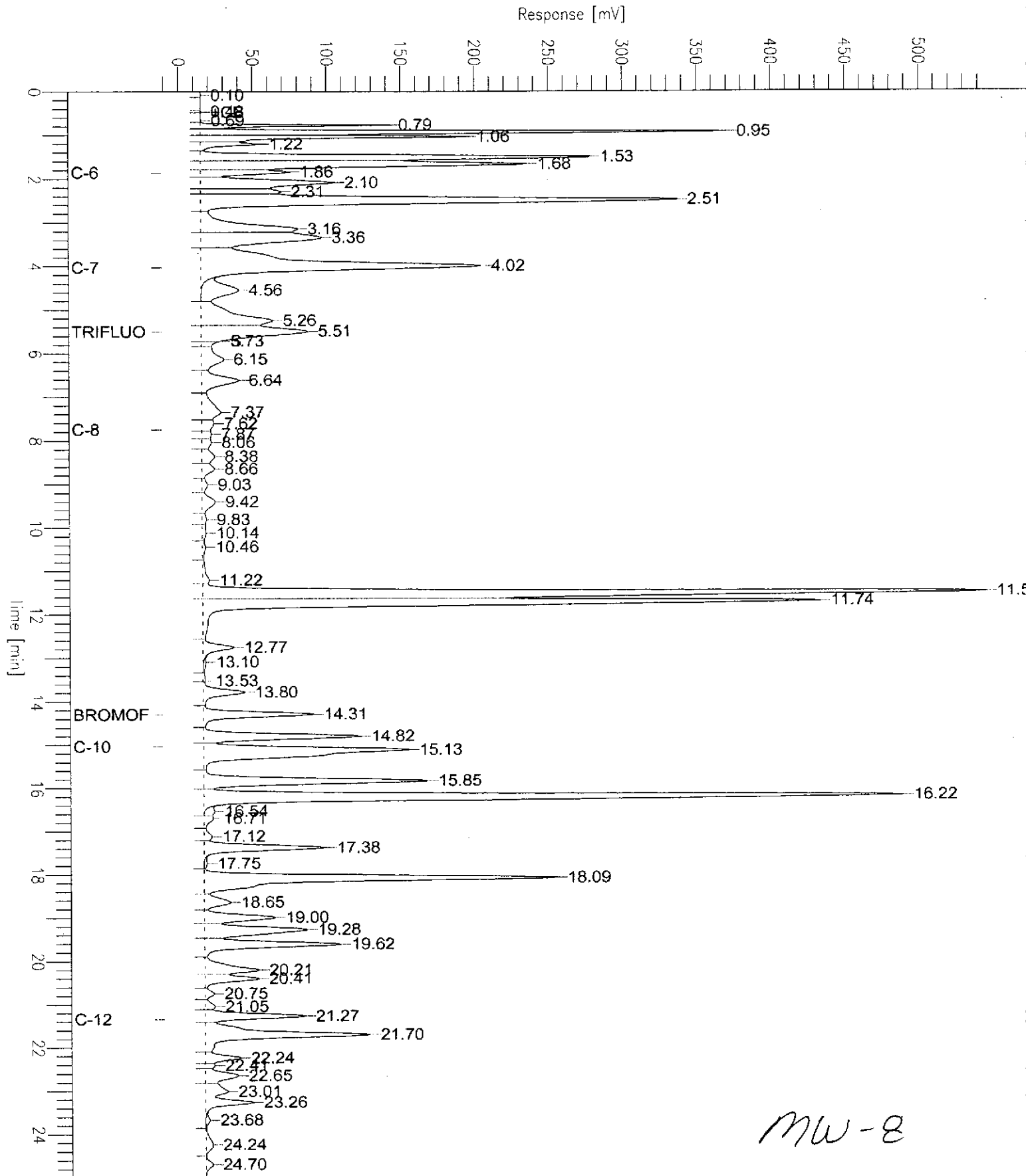


Chromatogram

Sample Name : 167477-005,84408
FileName : G:\GC05\DATA\253G018.raw
Method : TVHBTXE
Start Time : 0.00 min
Scale Factor : 1.0

End Time : 25.00 min
Plot Offset : -12 mV

Sample #: d1.3
Date : 9/11/03 01:11 PM
Time of Injection: 9/11/03 03:06 AM
Low Point : -11.52 mV
Plot Scale: 556.5 mV
High Point : 544.95 mV





Curtis & Tompkins Laboratories Analytical Report

Lab #:	167477	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	030910-BA1		
Matrix:	Water	Sampled:	09/10/03
Units:	ug/L	Received:	09/10/03

Field ID:	MW-9	Diln Fac:	5.000
Type:	SAMPLE	Batch#:	84408
Lab ID:	167477-006	Analyzed:	09/11/03

Analyte	Result	RL	Analysis
Gasoline C7-C12	8,300 H	250	8015B
MTBE	ND	10	EPA 8021B
Benzene	420	2.5	EPA 8021B
Toluene	14	2.5	EPA 8021B
Ethylbenzene	870	2.5	EPA 8021B
m,p-Xylenes	190	2.5	EPA 8021B
o-Xylene	10	2.5	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	136	57-150	8015B
Bromofluorobenzene (FID)	123	65-144	8015B
Trifluorotoluene (PID)	97	54-149	EPA 8021B
Bromofluorobenzene (PID)	99	58-143	EPA 8021B

Field ID:	MW-10	Diln Fac:	1.000
Type:	SAMPLE	Batch#:	84408
Lab ID:	167477-007	Analyzed:	09/11/03

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	8015B
MTBE	7.0	2.0	EPA 8021B
Benzene	1.1	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	1.5	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)	104	57-150	8015B
Bromofluorobenzene (FID)	112	65-144	8015B
Trifluorotoluene (PID)	77	54-149	EPA 8021B
Bromofluorobenzene (PID)	89	58-143	EPA 8021B

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

Chromatogram

Sample Name : 167477-006,84408

Sample #: d1.3

Page 1 of 1

FileName : G:\GC05\DATA\253G033.raw

Date : 9/11/03 11:52 AM

Method : TVHBTXE

Time of Injection: 9/11/03 11:27 AM

Start Time : 0.00 min

End Time : 25.00 min

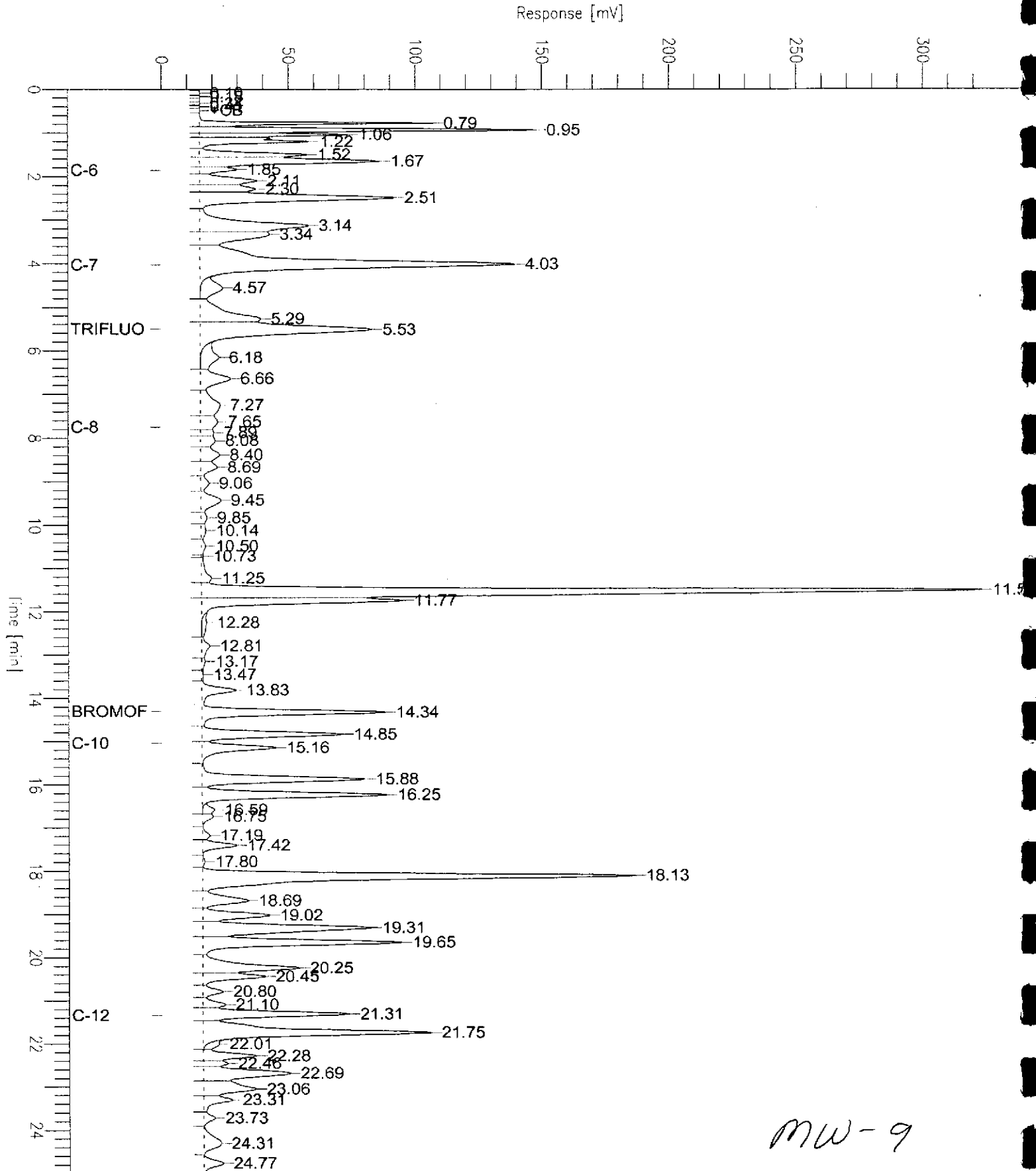
Low Point : -0.31 mV

High Point : 323.18 mV

Scale Factor: 1.0

Plot Offset: -0 mV

Plot Scale: 323.5 mV



MW-9



Curtis & Tompkins Laboratories Analytical Report

Lab #:	167477	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	030910-BA1		
Matrix:	Water	Sampled:	09/10/03
Units:	ug/L	Received:	09/10/03

Field ID:	MW-11	Diln Fac:	2.000
Type:	SAMPLE	Batch#:	84408
Lab ID:	167477-008	Analyzed:	09/11/03

Analyte	Result	RL	Analysis
Gasoline C7-C12	10,000 H	100	8015B
MTBE	ND	4.0	EPA 8021B
Benzene	250	1.0	EPA 8021B
Toluene	9.9 C	1.0	EPA 8021B
Ethylbenzene	700	1.0	EPA 8021B
m,p-Xylenes	510	1.0	EPA 8021B
o-Xylene	17	1.0	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	148	57-150	8015B
Bromofluorobenzene (FID)	129	65-144	8015B
Trifluorotoluene (PID)	99	54-149	EPA 8021B
Bromofluorobenzene (PID)	98	58-143	EPA 8021B

Type:	BLANK	Batch#:	84408
Lab ID:	QC225276	Analyzed:	09/10/03
Diln Fac:	1.000		

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	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	57-150	8015B
Bromofluorobenzene (FID)	105	65-144	8015B
Trifluorotoluene (PID)	78	54-149	EPA 8021B
Bromofluorobenzene (PID)	85	58-143	EPA 8021B

*= Value outside of QC limits; see narrative

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

H= Heavier hydrocarbons contributed to the quantitation

L= Lighter hydrocarbons contributed to the quantitation

Y= Sample exhibits chromatographic pattern which does not resemble standard

b= See narrative

NA= Not Analyzed

ND= Not Detected

RL= Reporting Limit

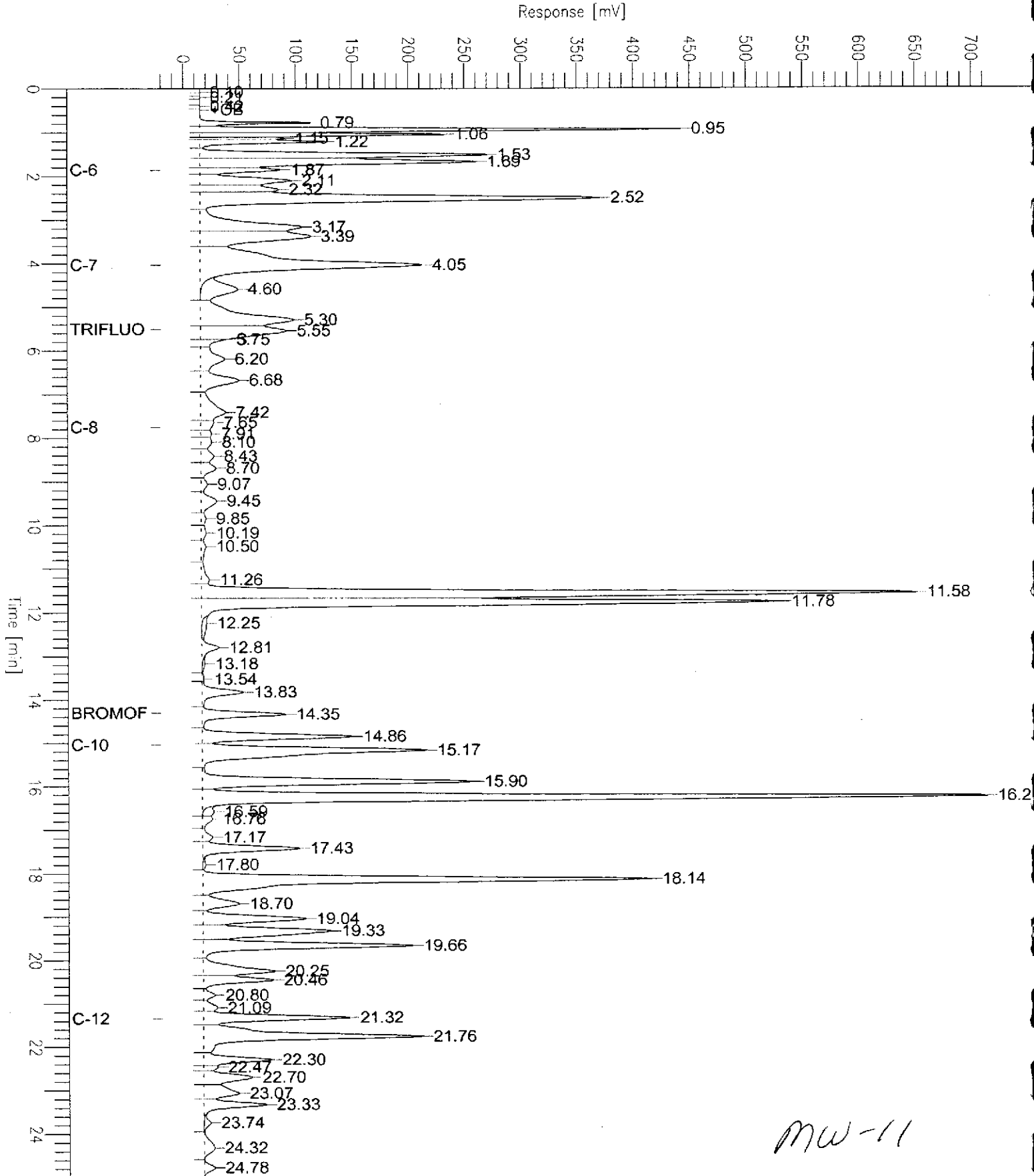
LR= Response exceeds instrument's linear range

Chromatogram

Sample Name : 167477-008,84408
FileName : G:\GC05\DATA\253G034.raw
Method : TVHBTXE
Start Time : 0.00 min
Scale Factor : 1.0

End Time : 25.00 min
Plot Offset : -20 mV

Sample #: d1.3
Date : 9/11/03 02:36 PM
Time of Injection: 9/11/03 12:01 PM
Low Point : -20.04 mV
High Point : 713.78 mV
Plot Scale: 733.8 mV



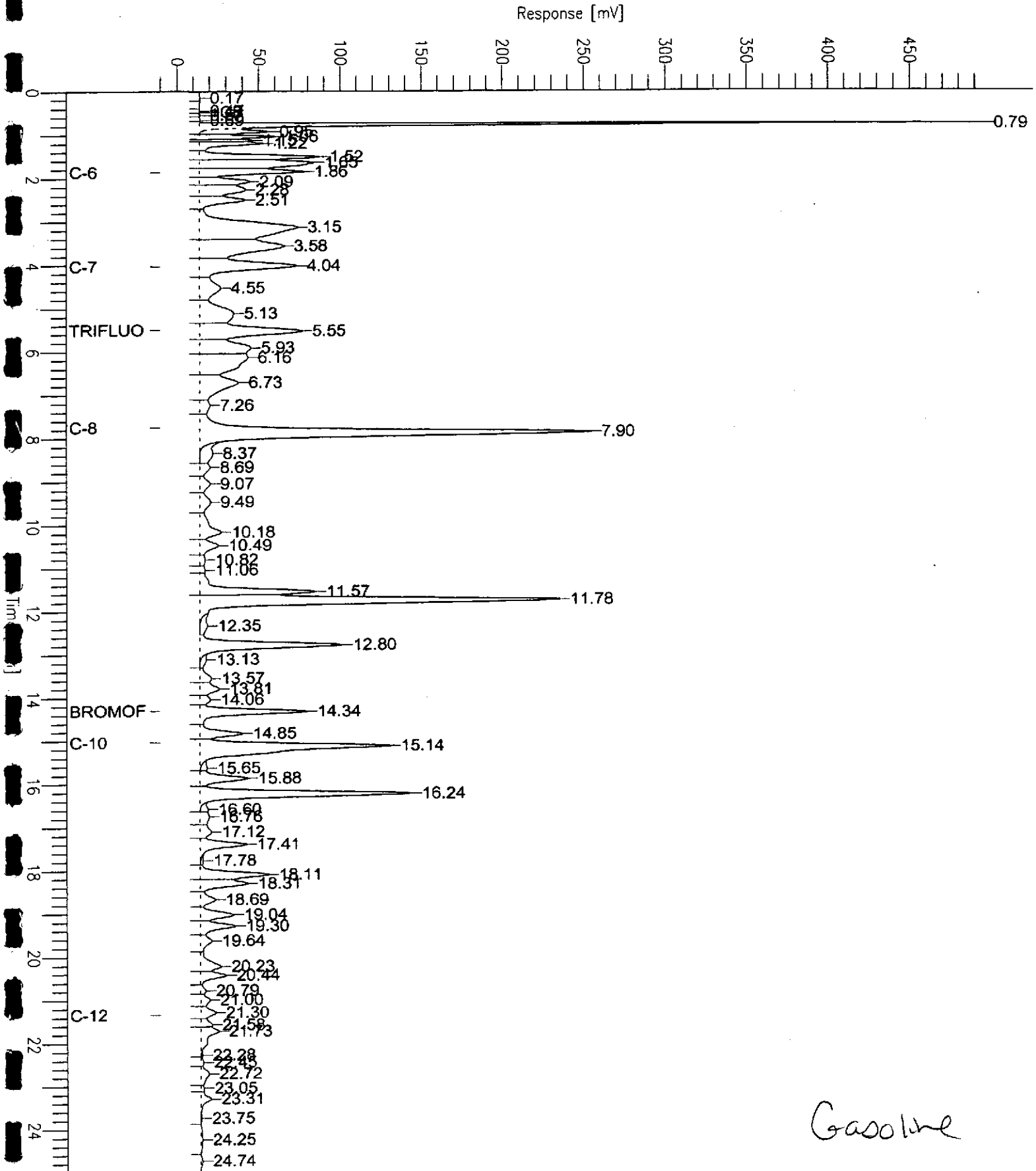
MW-11

Chromatogram

Sample Name : ccv/lcs,qc225277,84408,03ws1335,5/5000
Sample Name : G:\GC05\DATA\2530002.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 25.00 min
Scale Factor: 1.0 Plot Offset: -10 mV

Sample #:
Date : 9/10/03 05:52 PM
Time of Injection: 9/10/03 05:26 PM
Low Point : -10.07 mV High Point : 495.42 mV
Plot Scale: 505.5 mV

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Gasoline

Curtis & Tompkins Laboratories Analytical Report

Lab #:	167477	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	030910-BA1		
Matrix:	Water	Sampled:	09/10/03
Units:	ug/L	Received:	09/10/03

Type:	BLANK	Batch#:	84474
Lab ID:	QC225552	Analyzed:	09/13/03
Diln Fac:	1.000	Analysis:	8015B

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	Result	%REC	Limits
Trifluorotoluene (FID)		97	57-150
Bromofluorobenzene (FID)		108	65-144
Trifluorotoluene (PID)	NA		
Bromofluorobenzene (PID)	NA		

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

Curtis & Tompkins Laboratories Analytical Report

Lab #:	167477	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	030910-BA1		
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC225277	Batch#:	84408
Matrix:	Water	Analyzed:	09/10/03
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits	Analysis
Gasoline C7-C12	2,000	2,065	103	80-120	8015B
MTBE		NA			
Benzene		NA			
Toluene		NA			
Ethylbenzene		NA			
m,p-Xylenes		NA			
o-Xylene		NA			

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	119	57-150	8015B
Bromofluorobenzene (FID)	118	65-144	8015B
Trifluorotoluene (PID)	119	54-149	EPA 8021B
Bromofluorobenzene (PID)	89	58-143	EPA 8021B

Curtis & Tompkins Laboratories Analytical Report

Lab #: 167477	Location: Redwood Regional Park
Client: Stellar Environmental Solutions	Prep: EPA 5030B
Project#: 030910-BA1	
Type: LCS	Diln Fac: 1.000
Lab ID: QC225278	Batch#: 84408
Matrix: Water	Analyzed: 09/10/03
Units: ug/L	

Analyte	Spiked	Result	%REC	Limits	Analysis
Gasoline C7-C12		NA			
MTBE	20.00	16.96	85	51-125	EPA 8021B
Benzene	20.00	19.30	97	78-123	EPA 8021B
Toluene	20.00	18.23	91	79-120	EPA 8021B
Ethylbenzene	20.00	18.58	93	80-120	EPA 8021B
m,p-Xylenes	40.00	39.04	98	76-120	EPA 8021B
o-Xylene	20.00	18.95	95	80-121	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	90	57-150	8015B
Bromofluorobenzene (FID)	97	65-144	8015B
Trifluorotoluene (PID)	73	54-149	EPA 8021B
Bromofluorobenzene (PID)	78	58-143	EPA 8021B

Curtis & Tompkins Laboratories Analytical Report

Lab #: 167477	Location: Redwood Regional Park
Client: Stellar Environmental Solutions	Prep: EPA 5030B
Project#: 030910-BA1	Analysis: 8015B
Type: LCS	Diln Fac: 1.000
Lab ID: QC225553	Batch#: 84474
Matrix: Water	Analyzed: 09/13/03
Units: ug/L	

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	2,000	2,146	107	80-120

Surrogate	Result	%REC	Limits
Trifluorotoluene (FID)		114	57-150
Bromofluorobenzene (FID)		109	65-144
Trifluorotoluene (PID)	NA		
Bromofluorobenzene (PID)	NA		

Curtis & Tompkins Laboratories Analytical Report

Lab #: 167477	Location: Redwood Regional Park
Client: Stellar Environmental Solutions	Prep: EPA 5030B
Project#: 030910-BA1	
Field ID: ZZZZZZZZZZ	Batch#: 84408
MSS Lab ID: 167440-001	Sampled: 09/09/03
Matrix: Water	Received: 09/09/03
Units: ug/L	Analyzed: 09/11/03
Diln Fac: 1.000	

Type: MS Lab ID: QC225292

Analyte	MSS Result	Spiked	Result	%REC	Limits	Analysis
Gasoline C7-C12	19.43	2,000	2,023	100	76-120	8015B
MTBE			NA			
Benzene			NA			
Toluene			NA			
Ethylbenzene			NA			
m,p-Xylenes			NA			
o-Xylene			NA			

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	123	57-150	8015B
Bromofluorobenzene (FID)	127	65-144	8015B
Trifluorotoluene (PID)	113	54-149	EPA 8021B
Bromofluorobenzene (PID)	91	58-143	EPA 8021B

Type: MSD Lab ID: QC225293

Analyte	Spiked	Result	%REC	Limits	RPD	Lim	Analysis
Gasoline C7-C12	2,000	2,026	100	76-120	0	20	8015B
MTBE		NA					
Benzene		NA					
Toluene		NA					
Ethylbenzene		NA					
m,p-Xylenes		NA					
o-Xylene		NA					

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	128	57-150	8015B
Bromofluorobenzene (FID)	135	65-144	8015B
Trifluorotoluene (PID)	118	54-149	EPA 8021B
Bromofluorobenzene (PID)	98	58-143	EPA 8021B

 NA= Not Analyzed
 RPD= Relative Percent Difference
 Page 1 of 1

Curtis & Tompkins Laboratories Analytical Report

Lab #:	167477	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	030910-BA1	Analysis:	8015B
Field ID:	ZZZZZZZZZZ	Batch#:	84474
MSS Lab ID:	167519-001	Sampled:	09/10/03
Matrix:	Water	Received:	09/12/03
Units:	ug/L	Analyzed:	09/13/03
Diln Fac:	1.000		

Type: MS Lab ID: QC225558

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	612.2	2,000	2,778	108	76-120

Surrogate	Result	%REC	Limits
Trifluorotoluene (FID)		110	57-150
Bromofluorobenzene (FID)		122	65-144
Trifluorotoluene (PID)	NA		
Bromofluorobenzene (PID)	NA		

Type: MSD Lab ID: QC225559

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	2,757	107	76-120	1	20

Surrogate	Result	%REC	Limits
Trifluorotoluene (FID)		109	57-150
Bromofluorobenzene (FID)		123	65-144
Trifluorotoluene (PID)	NA		
Bromofluorobenzene (PID)	NA		

**Total Extractable Hydrocarbons**

Lab #:	167477	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	030910-BA1	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	09/10/03
Units:	ug/L	Received:	09/10/03
Diln Fac:	1.000	Prepared:	09/12/03
Batch#:	84465		

Field ID:	MW-2	Lab ID:	167477-001
Type:	SAMPLE	Analyzed:	09/15/03

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	74	44-146

Field ID:	MW-4	Lab ID:	167477-003
Type:	SAMPLE	Analyzed:	09/15/03

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	68	44-146

Field ID:	MW-7	Lab ID:	167477-004
Type:	SAMPLE	Analyzed:	09/15/03

Analyte	Result	RL
Diesel C10-C24	3,300 L Y	50

Surrogate	%REC	Limits
Hexacosane	79	44-146

Field ID:	MW-8	Lab ID:	167477-005
Type:	SAMPLE	Analyzed:	09/15/03

Analyte	Result	RL
Diesel C10-C24	400 L Y	50

Surrogate	%REC	Limits
Hexacosane	71	44-146

Field ID:	MW-9	Lab ID:	167477-006
Type:	SAMPLE	Analyzed:	09/15/03

Analyte	Result	RL
Diesel C10-C24	2,900 L Y	50

Surrogate	%REC	Limits
Hexacosane	78	44-146

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 2

Chromatogram

Sample Name : 167477-004,84465

Sample #: 84465

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FileName : G:\GC17\CHA\257A031.RAW

Date : 9/16/03 10:45 AM

Method : ATEH255.MTH

Time of Injection: 9/15/03 07:08 PM

Start Time : 0.00 min End Time : 31.90 min

Low Point : -26.47 mV

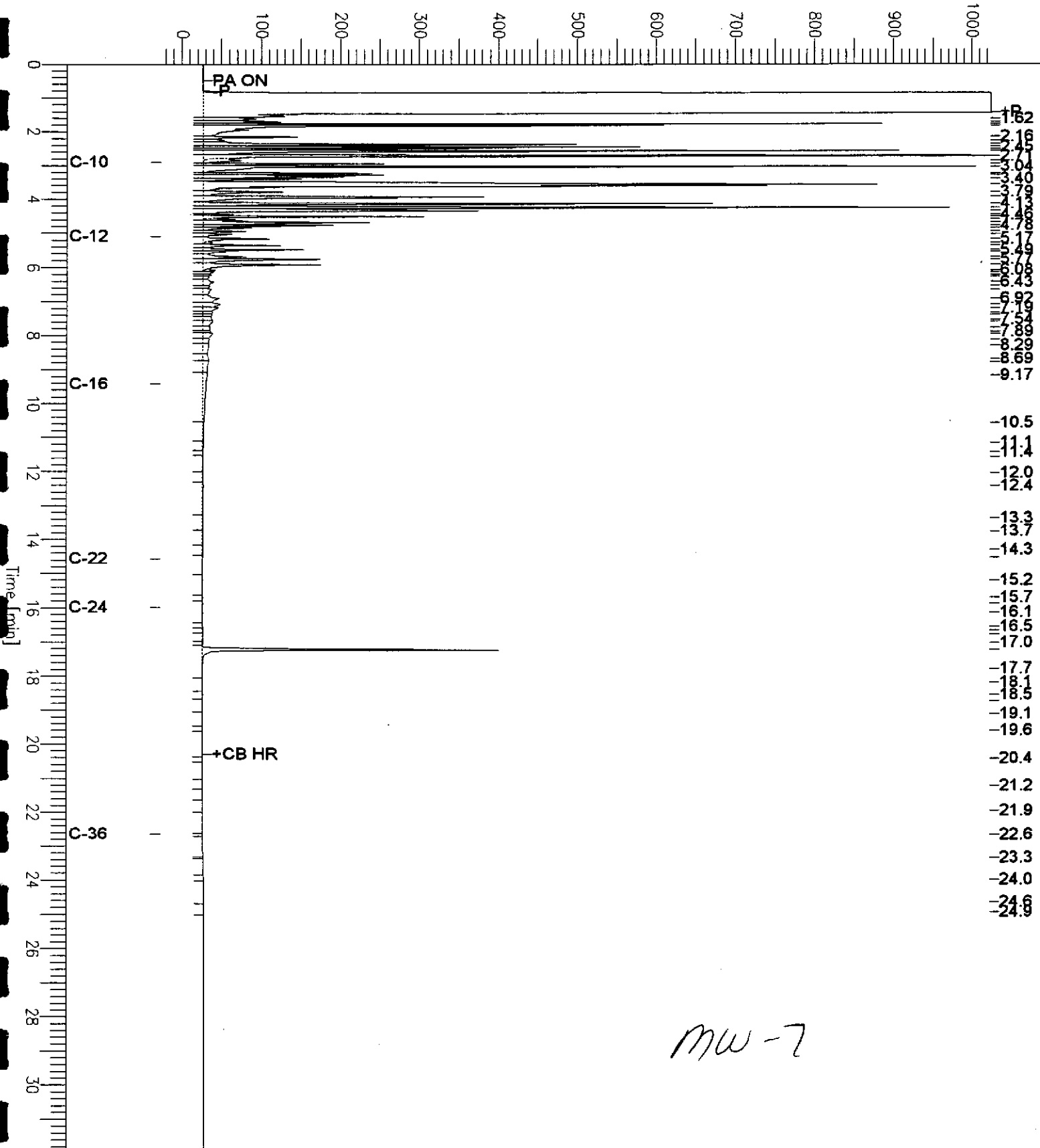
High Point : 1024.00 mV

Scale Factor: 0.0

Plot Offset: -26 mV

Plot Scale: 1050.5 mV

Response [mV]



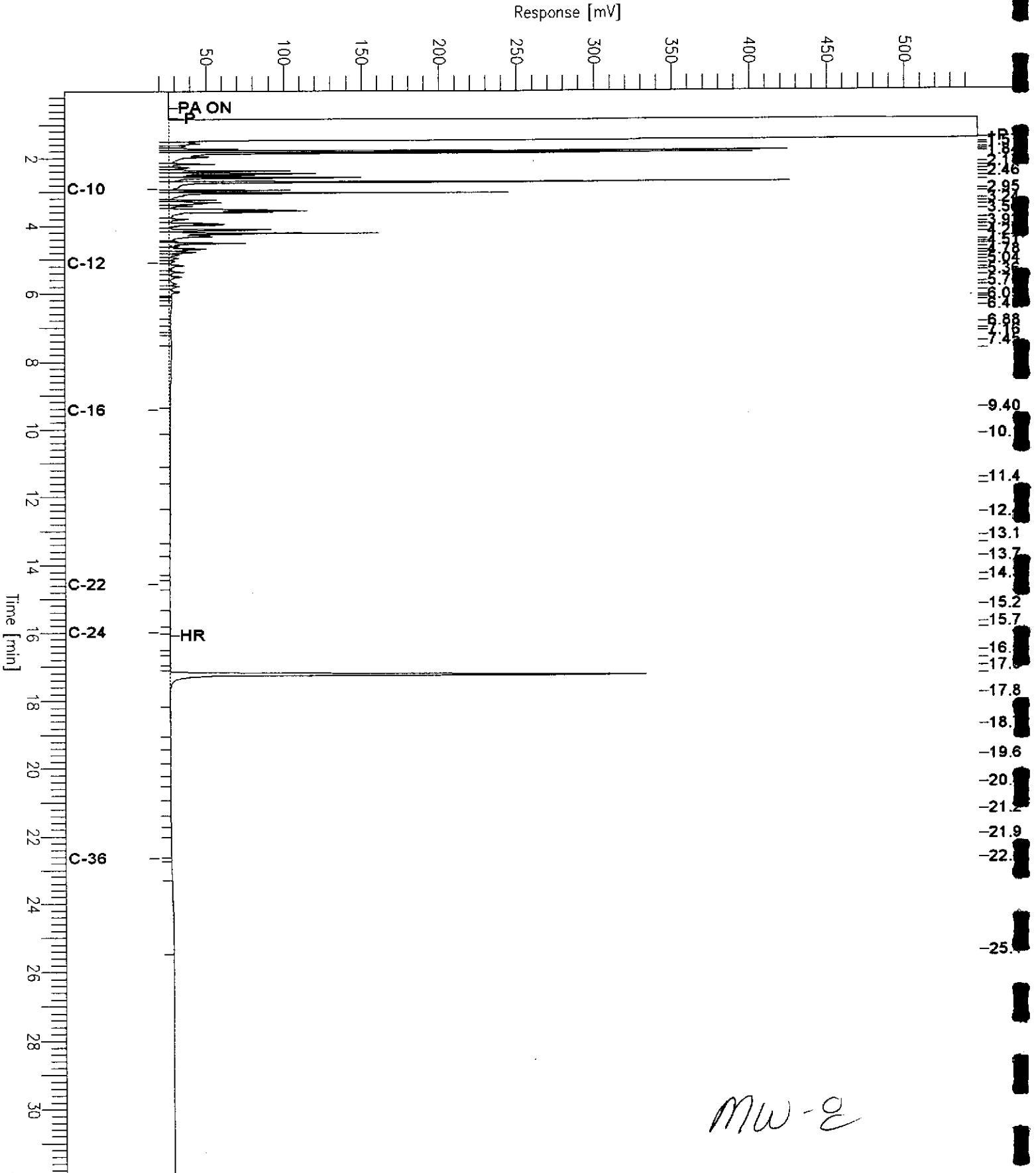
Chromatogram

Sample Name : 167477-005,84465
FileName : G:\GC17\CHA\257A032.RAW
Method : ATEH255.MTH
Start Time : 0.01 min
Scale Factor: 0.0

End Time : 31.91 min
Plot Offset: 19 mV

Sample #: 84465
Date : 9/16/03 10:46 AM
Time of Injection: 9/15/03 07:49 PM
Low Point : 18.89 mV
High Point : 547.81 mV
Plot Scale: 528.9 mV

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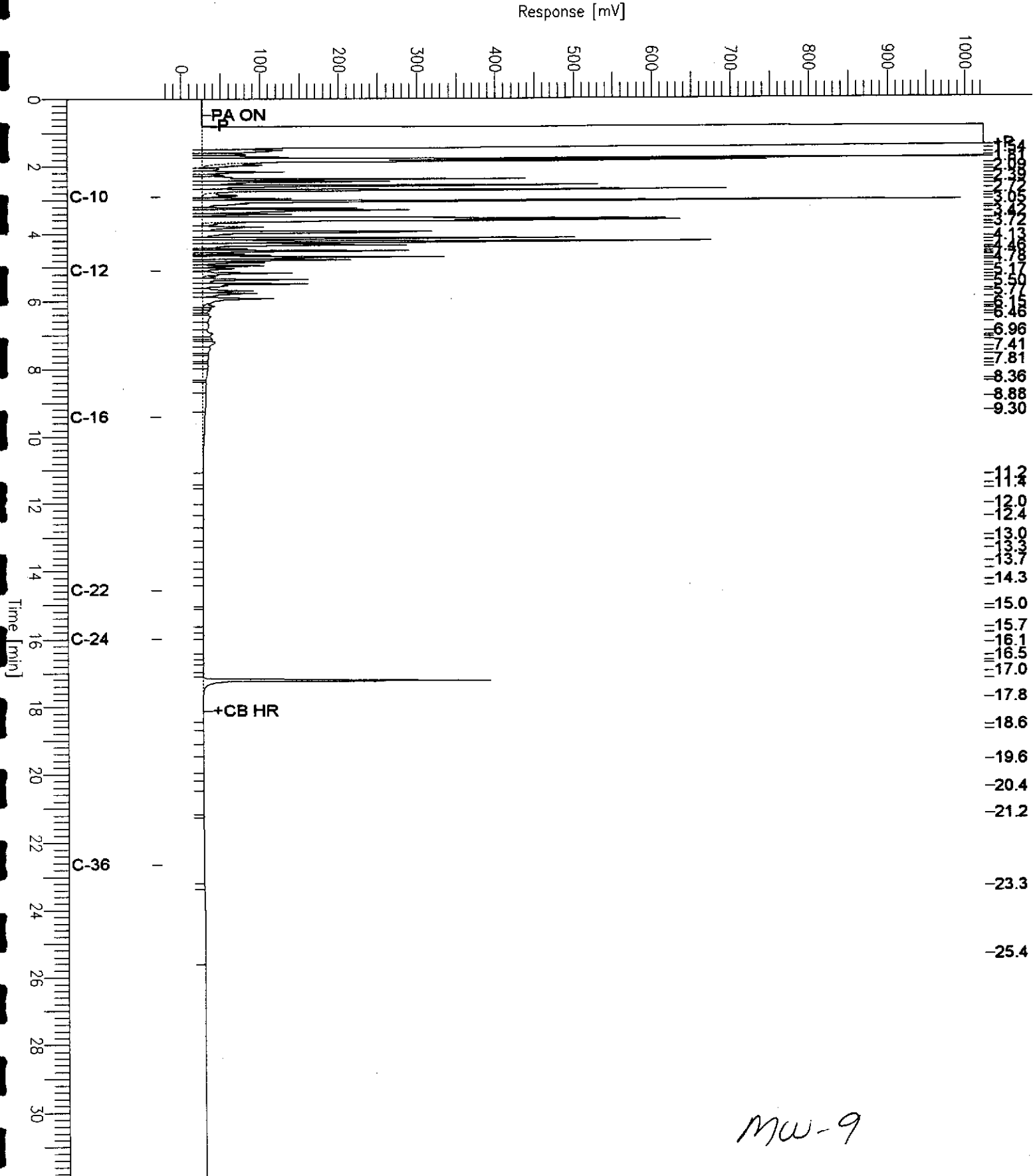
MW-2

Chromatogram

Sample Name : 167477-006,84465
FileName : G:\GC17\CHA\257A033.RAW
Method : ATEH255.MTH
Start Time : 0.00 min
Scale Factor: 0.0

End Time : 31.90 min
Plot Offset: -27 mV

Sample #: 84465
Date : 9/16/03 10:46 AM
Time of Injection: 9/15/03 08:29 PM
Low Point : -26.51 mV
Plot Scale: 1050.5 mV
High Point : 1024.00 mV



MW-9

**Total Extractable Hydrocarbons**

Lab #:	167477	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	030910-BA1	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	09/10/03
Units:	ug/L	Received:	09/10/03
Diln Fac:	1.000	Prepared:	09/12/03
Batch#:	84465		

Field ID:	MW-10	Lab ID:	167477-007
Type:	SAMPLE	Analyzed:	09/15/03

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	65	44-146

Field ID:	MW-11	Lab ID:	167477-008
Type:	SAMPLE	Analyzed:	09/15/03

Analyte	Result	RL
Diesel C10-C24	3,000 L Y	50

Surrogate	%REC	Limits
Hexacosane	80	44-146

Type:	BLANK	Analyzed:	09/16/03
Lab ID:	QC225512	Cleanup Method:	EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	84	44-146

L= Lighter hydrocarbons contributed to the quantitation
 Y= Sample exhibits chromatographic pattern which does not resemble standard
 ND= Not Detected
 RL= Reporting Limit
 Page 2 of 2

Chromatogram

Sample Name : 167477-008,84465

Sample #: 84465

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FileName : G:\GC17\CHA\257A035.RAW

Date : 9/16/03 10:48 AM

Method : ATEH255.MTH

Time of Injection: 9/15/03 09:50 PM

Start Time : 0.00 min

End Time : 31.90 min

Low Point : -26.45 mV

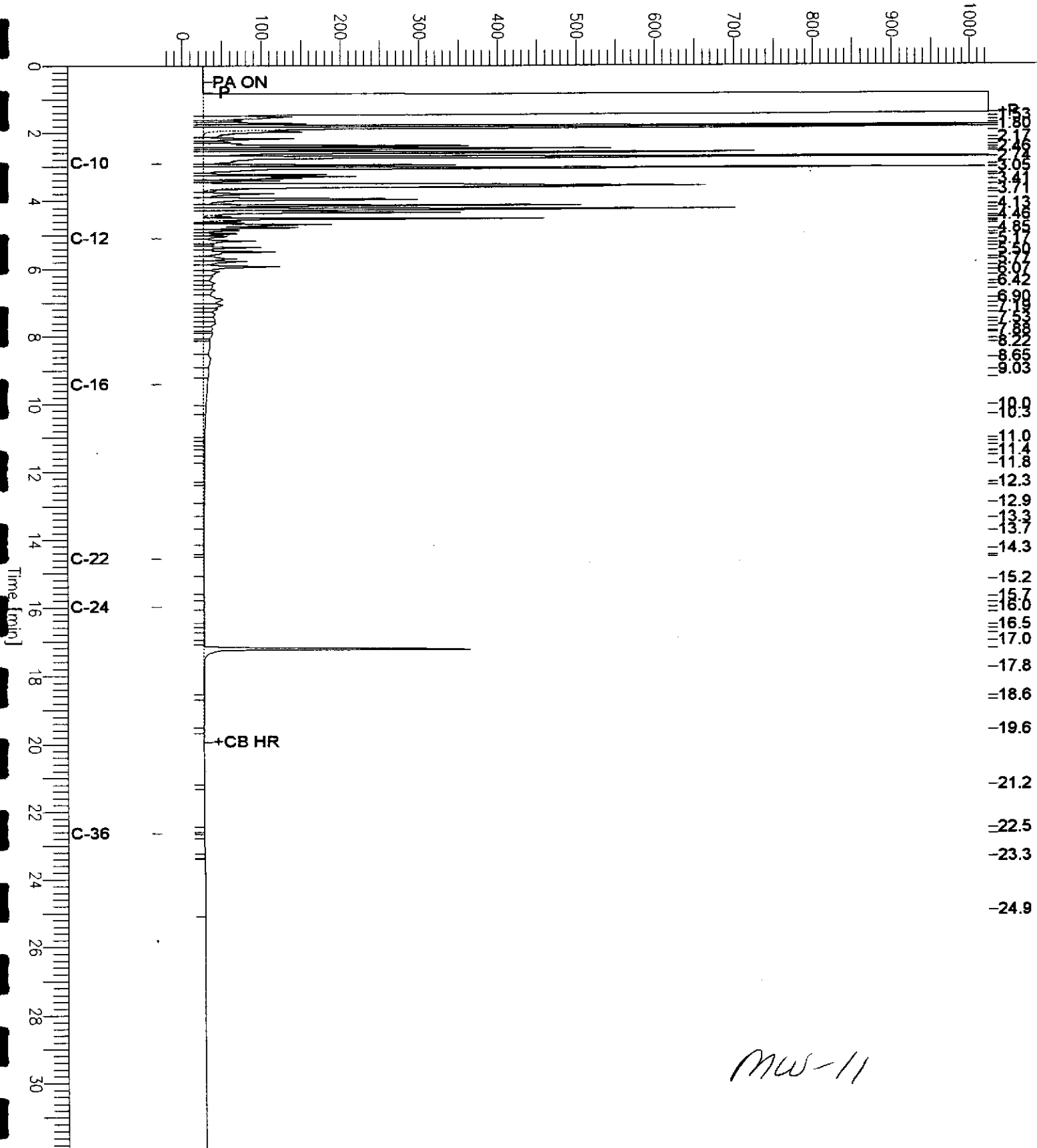
High Point : 1024.00 mV

Scale Factor: 0.0

Plot Offset: -26 mV

Plot Scale: 1050.5 mV

Response [mV]



MW-11

Chromatogram

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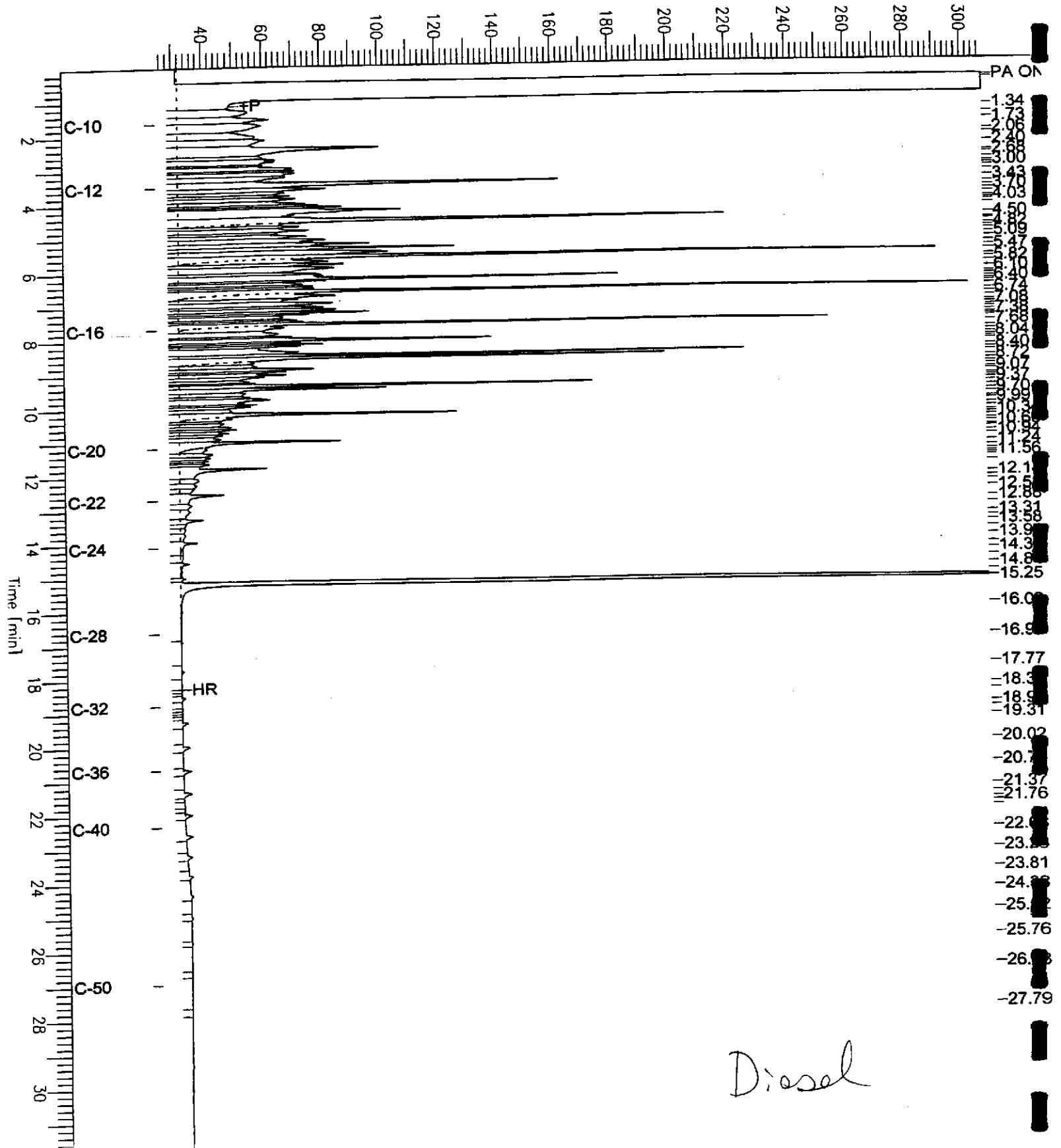
Sample Name : ccv_03ws1374.dsl
 File Name : G:\GC13\CHB\257B003.RAW
 Method : BTEH255.MTH
 Start Time : 0.01 min
 Scale Factor : 0.0

End Time : 31.91 min
 Plot Offset: 25 mV

Sample #: 500mg/L
 Date : 9/14/03 06:28 PM
 Time of Injection: 9/14/03 05:10 PM
 Low Point : 24.56 mV
 Plot Scale: 282.8 mV

High Point : 307.39 mV

Response [mV]



Diesel

Total Extractable Hydrocarbons

Lab #: 167477	Location: Redwood Regional Park
Client: Stellar Environmental Solutions	Prep: EPA 3520C
Project#: 030910-BA1	Analysis: EPA 8015B
Matrix: Water	Batch#: 84465
Units: ug/L	Prepared: 09/12/03
Filen Fac: 1.000	Analyzed: 09/14/03

Type: BS Cleanup Method: EPA 3630C
 Lab ID: QC225513

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	1,857	74	38-137

Surrogate	%REC	Limits
Hexacosane	67	44-146

Type: BSD Cleanup Method: EPA 3630C
 Lab ID: QC225514

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	1,965	79	38-137	6	35

Surrogate	%REC	Limits
Hexacosane	72	44-146

Nitrate Nitrogen

Lab #: 167477	Location: Redwood Regional Park	
Client: Stellar Environmental Solutions	Analysis: EPA 300.0	
Project#: 030910-BA1		
Analyte: Nitrogen, Nitrate	Diln Fac: 1.000	
Matrix: Water	Sampled: 09/10/03	
Units: mg/L	Received: 09/10/03	

Field ID	Type	Lab ID	Result	RL	Batch#	Analyzed
MW-3	SAMPLE	167477-002	ND	0.05	84435	09/11/03
MW-4	SAMPLE	167477-003	0.26	0.05	84463	09/11/03
MW-7	SAMPLE	167477-004	ND	0.05	84435	09/11/03
MW-8	SAMPLE	167477-005	ND	0.05	84435	09/11/03
MW-9	SAMPLE	167477-006	ND	0.05	84435	09/11/03
MW-10	SAMPLE	167477-007	0.06	0.05	84435	09/11/03
MW-11	SAMPLE	167477-008	ND	0.05	84435	09/11/03
	BLANK	QC225382	ND	0.05	84435	09/10/03
	BLANK	QC225503	ND	0.05	84463	09/11/03

Nitrate Nitrogen

Lab #:	167477	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Analysis:	EPA 300.0
Project#:	030910-BA1		
Analyte:	Nitrogen, Nitrate	Matrix:	Water
Field ID:	ZZZZZZZZZZ	Units:	mg/L

Type	MSS	Lab ID	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Diln	Fac	Batch#	Sampled	Received	Analyzed
BS			QC225383		1.000	0.9588	96	90-110			1.000		84435			09/10/03
BSD			QC225384		1.000	0.9665	97	90-110	1	20	1.000		84435			09/10/03
MS	167446-003		QC225385	<2.300	25.00	23.26	93	80-120			50.00		84435	09/09/03	09/09/03	09/10/03
MSD	167446-003		QC225386		25.00	23.90	96	80-120	3	20	50.00		84435	09/09/03	09/09/03	09/10/03
BS			QC225504		1.000	0.9364	94	90-110			1.000		84463			09/11/03
BSD			QC225505		1.000	0.9535	95	90-110	2	20	1.000		84463			09/11/03
MS	167511-012		QC225506	<2.300	25.00	23.96	96	80-120			50.00		84463	09/11/03	09/11/03	09/12/03
MSD	167511-012		QC225507		25.00	22.64	91	80-120	6	20	50.00		84463	09/11/03	09/11/03	09/12/03

RPD= Relative Percent Difference

Page 1 of 1



Sulfate

Lab #:	167477	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Analysis:	EPA 300.0
Project#:	030910-BA1		
Analyte:	Sulfate	Sampled:	09/10/03
Matrix:	Water	Received:	09/10/03
Units:	mg/L		

Field ID	Type	Lab ID	Result	RL	Diln	Fac	Batch#	Analyzed
MW-3	SAMPLE	167477-002	37	0.50	1.000		84435	09/11/03
MW-4	SAMPLE	167477-003	54	5.0	10.00		84463	09/12/03
MW-7	SAMPLE	167477-004	1.2	0.50	1.000		84435	09/11/03
MW-8	SAMPLE	167477-005	92	5.0	10.00		84435	09/11/03
MW-9	SAMPLE	167477-006	74	5.0	10.00		84435	09/11/03
MW-10	SAMPLE	167477-007	63	5.0	10.00		84435	09/11/03
MW-11	SAMPLE	167477-008	6.8	0.50	1.000		84435	09/11/03
	BLANK	QC225382	ND	0.50	1.000		84435	09/10/03
	BLANK	QC225503	ND	0.50	1.000		84463	09/11/03

ND= Not Detected

RL= Reporting Limit

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Sulfate

Lab #:	167477	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Analysis:	EPA 300.0
Project#:	030910-BA1		
Analyte:	Sulfate	Matrix:	Water
Field ID:	ZZZZZZZZZZ	Units:	mg/L

Type	MSS	Lab ID	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Diln	Fac	Batch#	Sampled	Received	Analyzed
BS			QC225383		9.960	9.863	99	90-110				1.000	84435			09/10/03
BSD			QC225384		9.960	9.867	99	90-110	0	20		1.000	84435			09/10/03
MS	167446-003		QC225385	<5.200	249.0	247.0	99	80-120				50.00	84435	09/09/03	09/09/03	09/10/03
MSD	167446-003		QC225386		249.0	251.0	101	80-120	2	20		50.00	84435	09/09/03	09/09/03	09/10/03
BS			QC225504		9.960	9.393	94	90-110				1.000	84463			09/11/03
BSD			QC225505		9.960	9.372	94	90-110	0	20		1.000	84463			09/11/03
MS	167511-012		QC225506	<5.200	249.0	237.1	95	80-120				50.00	84463	09/11/03	09/11/03	09/12/03
MSD	167511-012		QC225507		249.0	240.4	97	80-120	1	20		50.00	84463	09/11/03	09/11/03	09/12/03

RPD= Relative Percent Difference

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

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

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

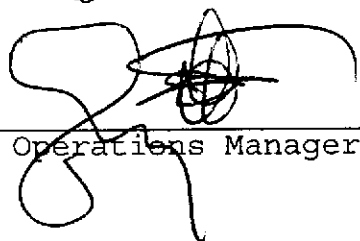
Prepared for:

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

Date: 18-SEP-03
Lab Job Number: 167456
Project ID: 2003-02
Location: Redwood Park Service Yard

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

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Chain of Custody Record

Lab Job no. _____
 Date 9/10/03
 Page 1 of 1

Laboratory Curtis & Tompkins Ltd. Method of Shipment hand delivery
 Address 2323 Fifth Street Shipment No. _____
Berkeley CA Airbill No. _____
510-486-0900 Cooler No. _____
 Project Owner East Bay Regional Park District Project Manager Bruce Rucker
 Site Address 7867 Redwood Road Telephone No. (510) 644-3123
Oakland CA Fax No. (510) 644-3859
 Project Name Redwood Park Service Yard Samplers: (Signature) [Signature]
 Project Number 2003-02

Field Sample Number	Location/Depth	Date	Time	Sample Type	Type/Size of Container	Preservation		Filtered	No. of Containers	Analysis Required										Remarks				
						Cooler	Chemical			TEH-diesel	TPH-gas	BTEX/HVBE	(8015/8021)											
SW-2		9/10/03	4:00	H ₂ O	1-L amber	✓	—	1	X															
"			7:00		40 ml VOA's	✓	HCl	2	X															
			7:00																					
SW-3					1-L amber	✓	—	1	X															
"					40 ml VOA's	✓	HCl	2	X															

Preservation Correct?
 Yes No N/A

Received On Ice
 Cold Ambient Intact

Relinquished by: Signature <u>[Signature]</u> Printed <u>Joe B. Diven</u> Company <u>Stellar Env. Solns</u>	Date <u>9/10/03</u> Time <u>10:06</u>	Received by: Signature <u>[Signature]</u> Printed <u>Steven Stanley</u> Company <u>C&T</u>	Date <u>9/10/03</u> Time <u>10:06</u>	Relinquished by: Signature _____ Printed _____ Company _____	Date _____ Time _____	Received by: Signature _____ Printed _____ Company _____	Date _____ Time _____
Turnaround Time: <u>1 week</u> Comments: _____ _____ _____				Relinquished by: Signature _____ Printed _____ Company _____		Received by: Signature _____ Printed _____ Company _____	

2000-00-01

Curtis & Tompkins Laboratories Analytical Report

Lab #:	167456	Location:	Redwood Park Service Yard
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2003-02		
Field ID:	SW-2	Batch#:	84408
Matrix:	Water	Sampled:	09/10/03
Units:	ug/L	Received:	09/10/03
Diln Fac:	1.000	Analyzed:	09/10/03

Type: SAMPLE Lab ID: 167456-001

Analyte	Result	RL	Analysis
Gasoline C7-C12	190	50	8015B
MTBE	ND	2.0	EPA 8021B
Benzene	2.1 C	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	4.2	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	57-150	8015B
Bromofluorobenzene (FID)	112	65-144	8015B
Trifluorotoluene (PID)	86	54-149	EPA 8021B
Bromofluorobenzene (PID)	90	58-143	EPA 8021B

Type: BLANK Lab ID: QC225276

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	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	57-150	8015B
Bromofluorobenzene (FID)	105	65-144	8015B
Trifluorotoluene (PID)	78	54-149	EPA 8021B
Bromofluorobenzene (PID)	85	58-143	EPA 8021B

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

ND= Not Detected

RL= Reporting Limit

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Chromatogram

Sample Name : 167456-001,84408

Sample #: b1.3

Page 1 of 1

FileName : G:\GC05\DATA\253G004.raw

Date : 9/11/03 01:11 PM

Method : TVHBTXE

Time of Injection: 9/10/03 07:01 PM

Start Time : 0.00 min

End Time : 25.00 min

Low Point : 7.48 mV

High Point : 141.48 mV

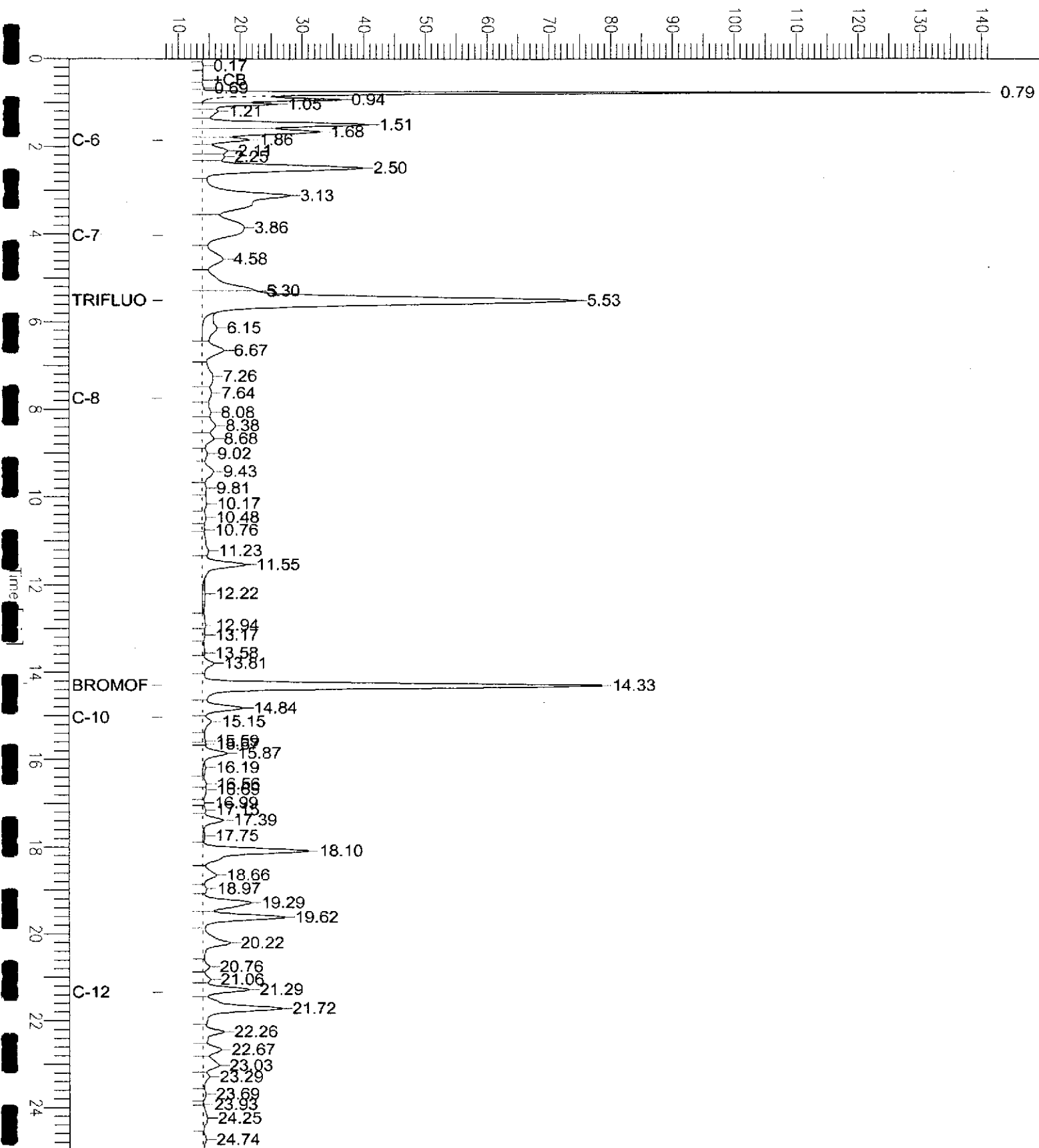
Scale Factor: 1.0

Plot Offset: 7 mV

Plot Scale: 134.0 mV

SW-2

Response [mV]



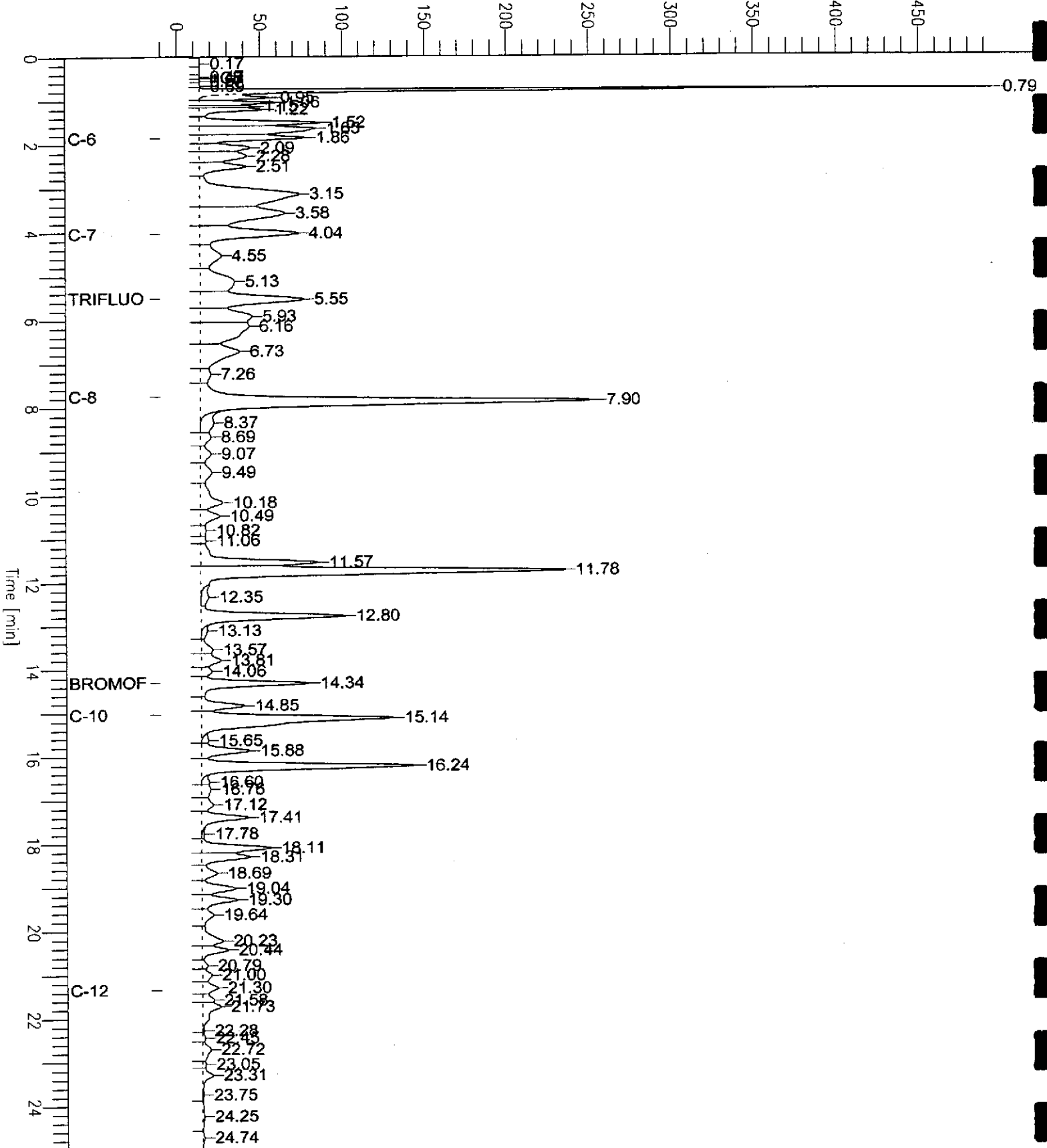
Chromatogram

Sample Name : ccv/lcs,qc225277,04408,03ws1335,5/5000
FileName : G:\GC05\DATA\253G002.raw
Method : TVHBTXE
Start Time : 0.00 min
Scale Factor : 1.0

Sample # :
Date : 9/10/03 05:52 PM
Time of Injection: 9/10/03 05:26 PM
Low Point : -10.07 mV
Plot Scale: 505.5 mV
End Time : 25.00 min
Plot Offset: -10 mV
High Point : 495.42 mV

Gasoline

Response [mV]



Total Volatile Hydrocarbons

Lab #: 167456	Location: Redwood Park Service Yard
Client: Stellar Environmental Solutions	Prep: EPA 5030B
Project#: 2003-02	Analysis: 8015B
Type: LCS	Diln Fac: 1.000
Lab ID: QC225277	Batch#: 84408
Matrix: Water	Analyzed: 09/10/03
Units: ug/L	

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	2,000	2,065	103	80-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	119	57-150
Bromofluorobenzene (FID)	118	65-144

**Benzene, Toluene, Ethylbenzene, Xylenes**

Lab #:	167456	Location:	Redwood Park Service Yard
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2003-02	Analysis:	EPA 8021B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC225278	Batch#:	84408
Matrix:	Water	Analyzed:	09/10/03
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
MTBE	20.00	16.96	85	51-125
Benzene	20.00	19.30	97	78-123
Toluene	20.00	18.23	91	79-120
Ethylbenzene	20.00	18.58	93	80-120
m,p-Xylenes	40.00	39.04	98	76-120
o-Xylene	20.00	18.95	95	80-121

Surrogate	%REC	Limits
Trifluorotoluene (PID)	73	54-149
Bromofluorobenzene (PID)	78	58-143

Total Volatile Hydrocarbons

Lab #: 167456	Location: Redwood Park Service Yard
Client: Stellar Environmental Solutions	Prep: EPA 5030B
Project#: 2003-02	Analysis: 8015B
Field ID: ZZZZZZZZZZ	Batch#: 84408
MSS Lab ID: 167440-001	Sampled: 09/09/03
Matrix: Water	Received: 09/09/03
Units: ug/L	Analyzed: 09/11/03
Diln Fac: 1.000	

Type: MS Lab ID: QC225292

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	19.43	2,000	2,023	100	76-120
Surrogate	%REC	Limits			
Trifluorotoluene (FID)	123	57-150			
Bromofluorobenzene (FID)	127	65-144			

Type: MSD Lab ID: QC225293

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	2,026	100	76-120	0	20
Surrogate	%REC	Limits				
Trifluorotoluene (FID)	128	57-150				
Bromofluorobenzene (FID)	135	65-144				

Total Extractable Hydrocarbons

Lab #:	167456	Location:	Redwood Park Service Yard
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2003-02	Analysis:	EPA 8015B
Field ID:	SW-2	Batch#:	84392
Matrix:	Water	Sampled:	09/10/03
Units:	ug/L	Received:	09/10/03
Diln Fac:	1.000	Prepared:	09/10/03

Type: SAMPLE Analyzed: 09/12/03
 Lab ID: 167456-001

Analyte	Result	RL
Diesel C10-C24	92 L Y	50

Surrogate	%REC	Limits
Hexacosane	110	44-146

Type: BLANK Analyzed: 09/14/03
 Lab ID: QC225212 Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	122	44-146

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 1

Chromatogram

Sample Name : 167456-001,84392

Sample #: 84392

Page 1 of 1

FileName : G:\GC13\CHB\254B043.RAW

Date : 9/12/03 08:01 PM

Method : BTEH255.MTH

Time of Injection: 9/12/03 06:45 PM

Start Time : 0.01 min

End Time : 31.91 min

Low Point : 24.11 mV

High Point : 234.70 mV

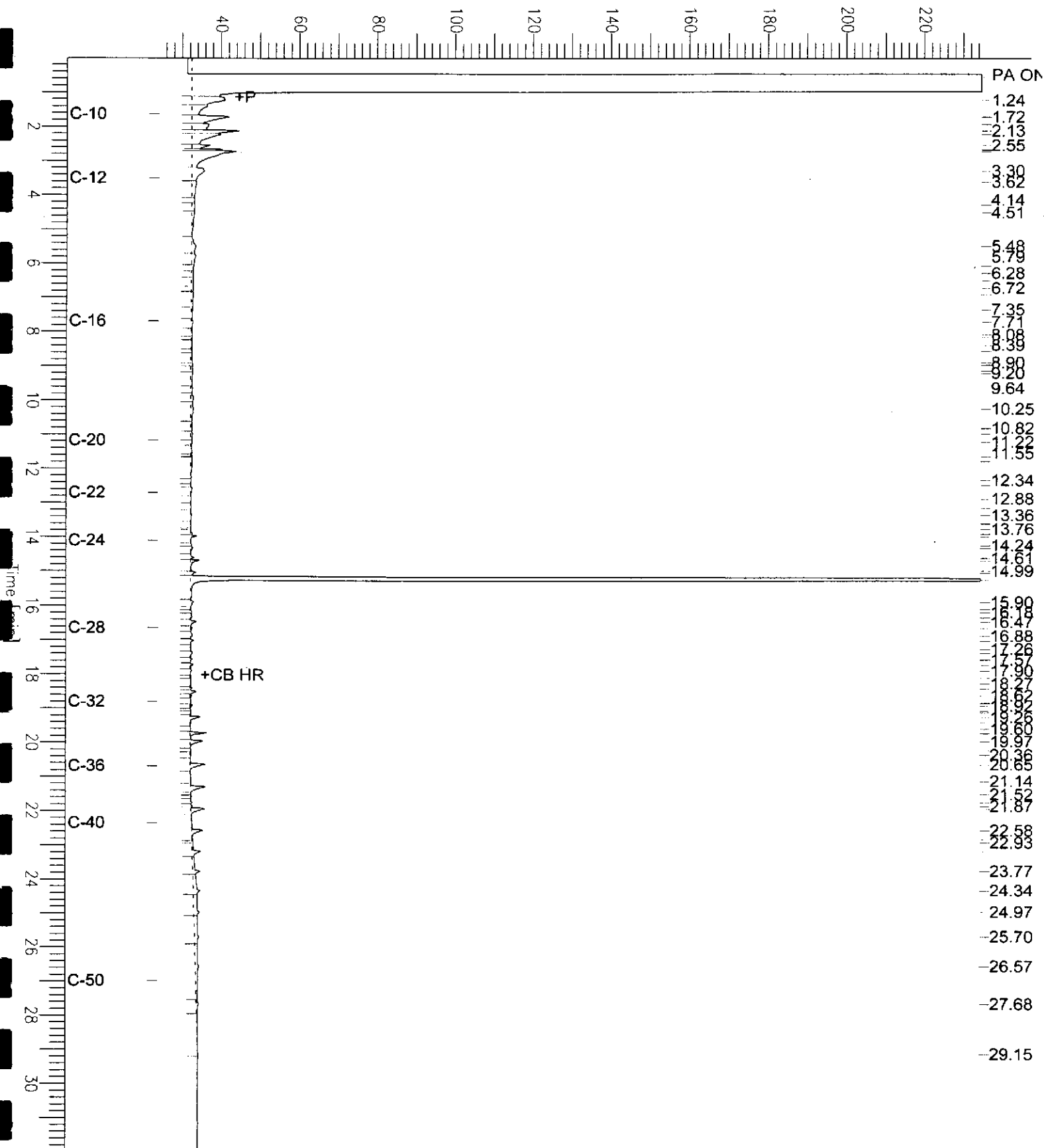
Scale Factor: 0.0

Plot Offset: 24 mV

Plot Scale: 210.6 mV

SW-2

Response [mV]



Chromatogram

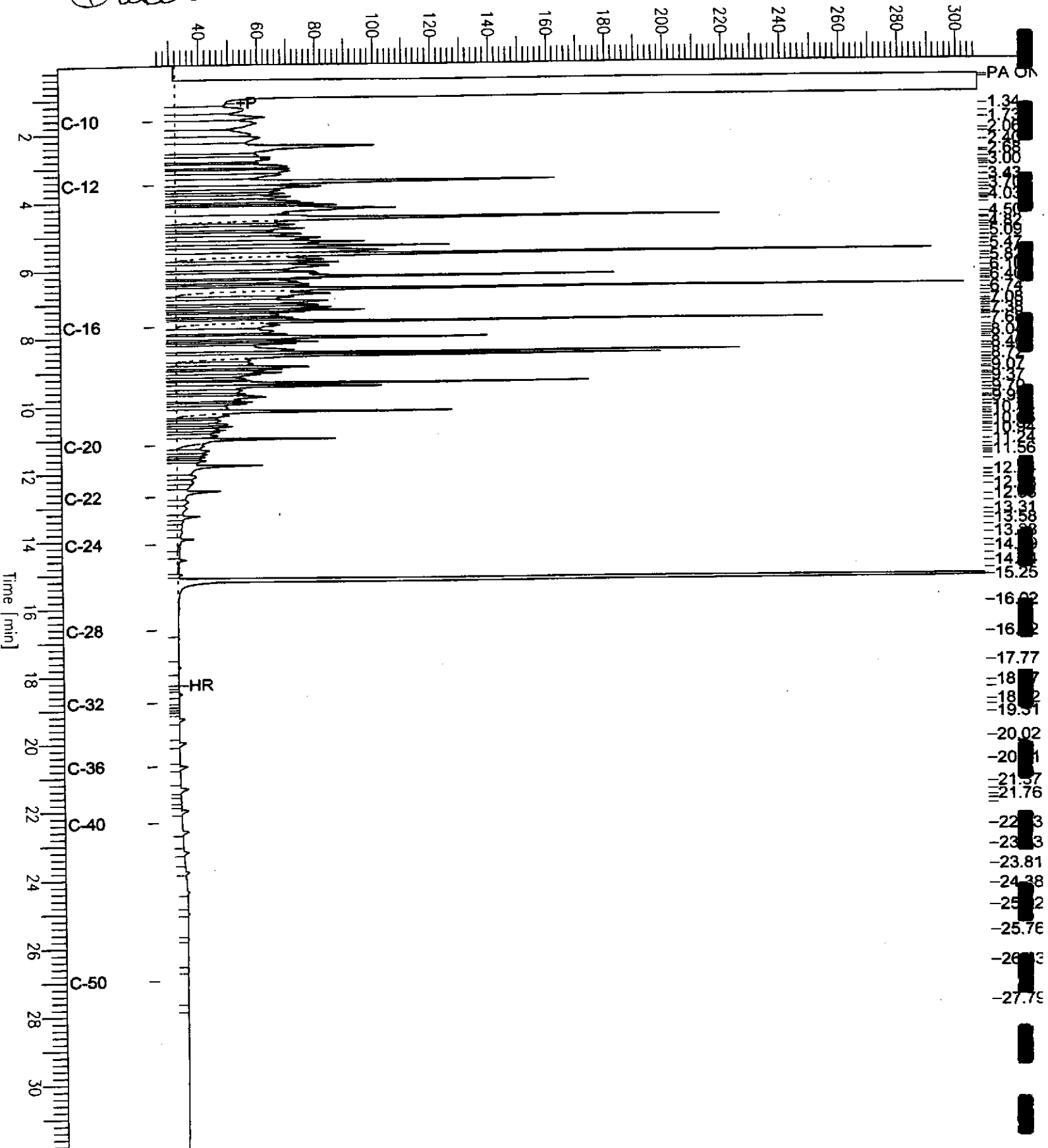
Sample Name : ccv_03ws1374.dsl
FileName : G:\GC13\CHB\257B003.RAW
Method : BTEH255.MTH
Start Time : 0.01 min
Scale Factor : 0.0

End Time : 31.91 min
Plot Offset : 25 mV

Sample #: 500mg/L
Date : 9/14/03 06:28 PM
Time of Injection: 9/14/03 05:10 PM
Low Point : 24.56 mV
Plot Scale: 282.8 mV
High Point : 307.39 mV

Diesel

Response [mV]





Total Extractable Hydrocarbons

Lab #:	167456	Location:	Redwood Park Service Yard
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2003-02	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC225213	Batch#:	84392
Matrix:	Water	Prepared:	09/10/03
Units:	ug/L	Analyzed:	09/14/03

Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,430	97	38-137

Surrogate	%REC	Limits
Hexacosane	95	44-146

Total Extractable Hydrocarbons

Lab #:	167456	Location:	Redwood Park Service Yard
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2003-02	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	84392
MSS Lab ID:	167453-002	Sampled:	09/09/03
Matrix:	Water	Received:	09/09/03
Units:	ug/L	Prepared:	09/10/03
Diln Fac:	1.000	Analyzed:	09/12/03

Type: MS Lab ID: QC225214

Analyte	MSS Result	Spiked	Result	%REC	Limits
Diesel C10-C24	<36.00	2,500	2,615	105	35-138
Surrogate	%REC	Limits			
Hexacosane	107	44-146			

Type: MSD Lab ID: QC225215

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	2,481	99	35-138	5	33
Surrogate	%REC	Limits				
Hexacosane	100	44-146				

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	TPHg	TPHd	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
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

NA = Not Analyzed for this constituent

Well MW-2 (continued)									
Event	Date	TPHg	TPHd	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

Well MW-4									
Event	Date	TPHg	TPHd	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	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	2	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	66.0	5.0

NA = Not Analyzed for this constituent

GW&SW-Analytical Summary.XLS

Well MW-4 (continued)									
Event	Date	TPHg	TPHd	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	< 0.5	< 2.0
22	Jun-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0
23	Sep-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0
24	Dec-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0
25	Mar-03	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0
26	Jun-03	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0
27	Sep-03	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0

Well MW-5									
Event	Date	TPHg	TPHd	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									

NA = Not Analyzed for this constituent

Well MW-7									
Event	Date	TPHg	TPHd	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

Well MW-8									
Event	Date	TPHg	TPHd	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

NA = Not Analyzed for this constituent

GW&SW-Analytical Summary.XLS

Well MW-9									
Event	Date	TPHg	TPHd	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

Well MW-10									
Event	Date	TPHg	TPHd	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	3	7.0

NA = Not Analyzed for this constituent

GW&SW-Analytical Summary.XLS

Well MW-11									
Event	Date	TPHg	TPHd	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	1100	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

NA = Not Analyzed for this constituent

GW&SW-Analytical Summary.XLS



**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	TPHg	TPHd	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	TPHg	TPHd	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

NA = Not Analyzed for this constituent

GW&SW-Analytical Summary.XLS

Sampling Location SW-3 (Downstream of Contaminated Groundwater Discharge Location SW-2)									
Event	Date	TPHg	TPHd	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	NA	NA	NA	NA	NA	NA	-	NA

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