Atlantic Richfield Company
(a BP affiliated company)

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7 August 2009

Re: Vapor Intrusion Assessment and Dual-Phase Extraction Pilot Test Report
Former BP Station # 11132
3201 35th Avenue
Oakland, California
ACEH Case #RO0000014

"I declare, that to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached document are true and correct."

Submitted by:

Paul Supple
Environmental Business Manger

VAPOR INTRUSION ASSESSMENT & DUAL-PHASE EXTRACTION PILOT TEST REPORT

Former BP Service Station No. 11132
3201 35th Avenue, Oakland, California
ACEH Fuel Leak Case No. RO0000014

Prepared for:

Mr. Paul Supple
Environmental Business Manager
Atlantic Richfield Company
P.O. Box 1257
San Ramon, California 94583

Prepared by:

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

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7 August 2009

Project No. 06-88-655

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BROADBENT & ASSOCIATES, INC
ENVIRONMENTAL, WATER RESOURCES & ENGINEERING

7 August 2009

Project No. 06-88-655

Atlantic Richfield Company
P.O. Box 1257
San Ramon, CA 94583
Submitted via ENFOS

Attn.: Mr. Paul Supple

Re: Vapor Intrusion Assessment and Dual-Phase Extraction Pilot Test Report, Former BP Service Station No.11132, 3201 35th Avenue, Oakland, California;
ACEH Case No.RO0000014

Dear Mr. Supple:

Broadbent & Associates, Inc. (BAI) is pleased to submit this *Vapor Intrusion Assessment and Dual-Phase Extraction Pilot Test Report* for Former BP Service Station No.11132 (herein referred to as Station No.11132) located at 3201 35th Avenue, Oakland, California (Site). This report contains the results of an on-site vapor intrusion assessment and dual-phase extraction (DPE) pilot test. These activities were conducted in accordance to the *Dual-Phase Extraction Pilot Testing and Soil and Ground-Water Investigation Work Plan* (BAI, 9 January 2009) as approved with technical comments by ACEH in their letter dated 17 February 2009 and the *Addendum to Dual-Phase Extraction Pilot Testing and Soil & Ground-Water Investigation Work Plan* (BAI, 24 March 2009) as approved by ACEH in their letter dated 16 April 2009.

Should you have questions or require additional information, please do not hesitate to contact us at (530) 566-1400.

Sincerely,
BROADBENT & ASSOCIATES, INC.

Thomas A. Venus
Senior Engineer, P.E.

Robert H. Miller, P.G., C.HG.
Principal Hydrogeologist

PROFESSIONAL GEOLOGIST
ROBERT H. MILLER
No. 561
CERTIFIED HYDROGEOLOGIST
exp. 4-30-10
STATE OF CALIFORNIA

Enclosures

cc: Mr. Paresh Khatri, Alameda County Environmental Health (Submitted via ACEH ftp site)
Ms. Shelby Lathrop, ConocoPhillips, 76 Broadway, Sacramento, California 95818
Electronic copy uploaded to GeoTracker

VAPOR INTRUSION ASSESSMENT AND
DUAL-PHASE EXTRACTION PILOT TEST REPORT
Former BP Service Station No. 11132
3201 35th Avenue, Oakland, California

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VAPOR INTRUSION ASSESSMENT AND
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Former BP Service Station No. 11132
3201 35th Avenue, Oakland, California

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Appendix B	Stratus Soil Gas Well Installation and Sampling Data Package (Includes Field Notes, Well Construction Logs, Well Completion Reports, Well Permits, Site Layout Plan, and Laboratory Analytical Reports with Chain-of-Custody Documentation)
Appendix C	GeoTracker Upload Confirmation Receipts
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VAPOR INTRUSION ASSESSMENT AND
DUAL-PHASE EXTRACTION PILOT TEST REPORT
Former BP Service Station No. 11132
3201 35th Avenue, Oakland, California

1.0 INTRODUCTION

On behalf of the Atlantic Richfield Company, RM - a BP affiliated company, Broadbent & Associates, Inc. (BAI) has prepared this Vapor Intrusion Assessment and Dual-Phase Extraction Report for the Former BP Service Station No. 11132, located at 3201 35th Avenue, Oakland, Alameda County, California (Site). The vapor intrusion assessment and dual-phase extraction (DPE) pilot testing activities were conducted in accordance to the *Dual-Phase Extraction Pilot Testing and Soil and Ground-Water Investigation Work Plan* (BAI, 9 January 2009) as approved with technical comments by ACEH in their letter dated 17 February 2009 and the *Addendum to Dual-Phase Extraction Pilot Testing and Soil & Ground-Water Investigation Work Plan* (BAI, 24 March 2009) as approved by ACEH in their letter dated 16 April 2009. Copies of recent regulatory correspondence are provided within Appendix A. This document includes a brief discussion on the Site background, vapor intrusion assessment activities including analytical results, DPE pilot testing activities including analytical results, conclusions and recommendations. Tables, drawings, and appendices referenced within this document are provided following the conclusion of the document's text.

2.0 SITE BACKGROUND

The Site is currently an active 76-branded gasoline retail outlet located on the northeast corner of 35th Avenue and Sutter Street, southwest of Interstate 580, in Oakland. A Site Location Map is provided as Drawing 1. A Site Layout Plan is provided as Drawing 2. The Site has operated as a gasoline service station since at least the early 1970's. It was acquired in 1989 from Mobil Oil Company by BP and operated under the BP brand. BP sold the station in 1994 to Tosco, which was acquired by Conoco Phillips who now operates the 76-branded station. The original underground storage tank (UST) system release was reported on 15 April 1986, following a failed UST integrity test on 5 March 1986. The ACEH-assigned Fuel Leak Case No. is RO0000014 / GeoTracker Global ID No. T0600100213.

The Site is located in a mixed commercial and residential area. A Quik-Stop convenience/ gasoline station is located at 3130 35th Avenue across the street approximately 150 feet to the southwest of the Site. Two former gasoline service stations are located slightly further west of the Site along 35th Avenue: a former Texaco-branded gasoline service station on the northeast corner of 35th Avenue and School Street, now operated as Tito's Car Washing & Detail Shop at 3101 35th Avenue; and a former Exxon-branded gasoline service station on the northwest corner of 35th Avenue and School Street, which is presently a vacant lot. The former Exxon station is an active leaking UST case, ACEH Fuel Leak Case No. RO0000271 / GeoTracker Global ID No. T0600100538.

A substantial summary of previous environmental investigations with Site characterization, local and area geology and hydrogeology, remediation status, and preliminary Site conceptual exposure model was recently submitted in the *Site Conceptual Model with Feasibility Study Report* (BAI, 21 July 2008).

3.0 VAPOR INTRUSION ASSESSMENT

Vapor intrusion assessment activities were originally proposed in the *Dual-Phase Extraction Pilot Testing and Soil & Ground-Water Investigation Work Plan* (BAI, 9 January 2009). An *Addendum to Dual-Phase Extraction Pilot Testing and Soil & Ground-Water Investigation Work Plan* (BAI, 24 March 2009) was later submitted in response to technical comments within the ACEH letter dated 17 February 2009. Vapor intrusion assessment activities were approved by ACEH in their letter dated 16 April 2009.

3.1 Preliminary Field Activities

Prior to initiating field activities, Stratus Environmental Inc. (Stratus) obtained the necessary well drilling permits from the Alameda County Public Works Agency (See Appendix B). Stratus also prepared a site health and safety plan specific to the work scope and cleared the Site for subsurface utilities. The utility clearance included notifying Underground Service Alert of the work a minimum of 48 hours prior to initiating the field investigation, and additionally securing the services of Cruz Brothers, a private utility locating company to confirm the absence of underground utilities at the boring locations.

3.2 Soil Borings

Soil borings for soil vapor sampling locations SG-1 and SG-2 (See Drawing 2) were advanced on 26 May 2009 by RSI Drilling using a hand auger. Each boring was advanced to a total depth of approximately 3.5 ft bgs. Due to the shallow nature of the borings, soils were not classified during boring installation activities. Field notes and well construction logs are provided in Appendix B. A GEO_MAP depicting the boring locations was uploaded to the GeoTracker AB2886 database. A copy of the upload confirmation receipt is provided in Appendix C.

3.3 Soil Vapor Well Construction

The soil vapor sampling wells were constructed by placing a 6-inch long soil vapor probe at the bottom of each boring attached to a 0.25-inch diameter nylon tubing extending to the surface. The probes were constructed of double-woven stainless steel wire screen with a pore diameter of 0.057 inch, equipped with stainless steel end fittings. The annulus of the soil vapor sampling wells were constructed with No.2/12 sand filter packs from 3.5 ft bgs to 2.5 ft bgs, overlain with a bentonite annular seal from 2.5 ft bgs to 1.0 ft bgs. The remainder of the annulus was filled with neat cement grout to the surface. The wells were completed with flush, traffic-rated well boxes, with a concrete surface seal to match the existing grade. The cement grout was allowed to cure for 13 days prior to sampling. Residual solids and liquids generated during well construction activities were stored temporarily onsite in a Department of Transportation-approved 55-gallon drums pending analytical results and profiling. Following characterization and profiling, Belshire Environmental Services was scheduled to transport the investigation-derived residuals to an Atlantic Richfield Company-approved facility for treatment or disposal.

3.4 Soil Gas Sampling Procedures

Soil gas sampling activities were completed by Stratus on 8 June 2009. One-liter Summa® canisters were used to collect the samples for analysis. The Summa® canisters were shipped by the laboratory under high vacuum, leak checked, and batch certified to be free of contaminants. The initial canister vacuum was measured before use and verified to be approximately 30 inches of Mercury (in.Hg). A purge canister was used to purge the sampling train (sampling point and tubing) a minimum of three volumes prior to sample collection. Swagelok fittings were used to connect the canisters to the tubing. Once the purge canister was connected to the tubing, the sampling train was checked for leaks by applying a vacuum for approximately 16-17 minutes. The vacuum in the canisters did not decrease, indicating that the sample train was properly sealed and not leaking.

Once the leak test was complete, the in-line valve was closed and the sample canister connected to the tubing. The in-line valve was then opened and the sample collected. The sampling flow rate did not exceed 200 milliliters per minute (mL/min) as measured by a flow regulator. Samples were collected until the vacuum in the canister(s) reached approximately 10 in.Hg.

A leak test was performed as a further check to make sure significant ambient air was not leaking into the sample train. Prior to and during sample collection, a tracer/leak test compound (Isopropanol) was applied around the probe at the ground surface and at connections in the sampling system. The tracer/leak test compound was emplaced by wetting a paper towel with the compound and wrapping it around the test locations. Isopropanol was included in the laboratory analysis. An ambient air sample was not collected outside the Station Building as proposed within the work plan due to a misunderstanding by Stratus.

3.5 Laboratory Analysis of Soil Gas Samples

Collected samples were submitted promptly under chain-of-custody protocol to Calscience Environmental Laboratories, Inc. in Garden Grove, California (CA-ELAP #1230, NELAP #03220CA). Soil gas samples were analyzed for Gasoline Range Organics (GRO), Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX), Methyl Tertiary Butyl Ether (MTBE), Ethanol, Tertiary Butyl Alcohol (TBA), Di-Isopropyl Ether (DIPE), Ethyl Tertiary Butyl Ether (ETBE), Tertiary Amyl Methyl Ether (TAME), and Isopropanol (the leak check compound) by EPA Method TO-15. Soil gas samples were also analyzed for Oxygen (O_2), Carbon Dioxide (CO_2), and Methane (CH_4) by Modified Method ASTM D-1946. Laboratory analyses for soil gas samples were performed in accordance with the EPA standard holding times for Summa® canisters. The laboratory analytical report for the soil gas samples, including chain-of-custody documentation, is provided in Appendix B. Soil vapor laboratory analytical results along with Environmental Screening Levels (ESLs) for shallow soil gas (residential land use) established by the California Regional Water Quality Control Board, San Francisco Bay Region (SFRWQCB) are also summarized in tabular format on the following page.

Soil Gas Samples - Laboratory Analytical Results

Sample Identification	Benzene (mg/m^3)	Toluene (mg/m^3)	Ethyl-benzene (mg/m^3)	Total Xylenes (mg/m^3)	Oxygen (%)	Carbon Dioxide (%)
SG-1	0.0090	0.22	0.150	0.82	15.4	7.80
SG-2	0.0073	0.08	0.059	0.37	14.1	9.39
ESLs	0.084	63	0.98	21	NA	NA

mg/m^3 = milligrams per cubic meter
NA = not applicable

Concentrations of GRO, MTBE, TBA, DIPE, ETBE, TAME, and Isopropanol are not included in the above table as the results for these constituents were below their respective laboratory reporting limits. No significant irregularities were reported during laboratory analysis of the soil gas samples. The laboratory results for soil gas sample analyses were uploaded to the GeoTracker AB2886 database. Copies of the GeoTracker upload confirmation receipts (EDF) are provided within Appendix C.

3.6 Discussion of Vapor Intrusion Results

The results obtained during the vapor intrusion assessment activities conducted on-site at Station #11132 indicate that minor concentrations of BTEX are present within shallow subsurface soils adjacent to the station building. However, the soil gas concentrations observed are significantly below the residential land use ESLs for shallow soil gas established by the SFRWQCB. The residential land use ESLs were used for comparison in an effort to utilize the most conservative approach. The leak test compound, Isopropanol, was not detected above laboratory reporting limits, which suggests that the sampling train and fittings was securely sealed. The analytical results also indicated the presence of oxygen and carbon dioxide within the shallow subsurface soils at the Site. The presence of oxygen and carbon dioxide in the soil suggests that biodegradation of petroleum hydrocarbons is potentially occurring within the soil pore space. Based on the minor concentrations of BTEX and the presence of oxygen and carbon dioxide within the shallow subsurface soil, the vapor intrusion to indoor air migration pathway into the station building does not appear to be a valid and complete pathway.

4.0 DUAL-PHASE EXTRACTION PILOT TEST

Stratus performed the field activities associated with the DPE pilot test conducted during the period between 11 May and 19 May 2009 as approved by ACEH in their letter dated 16 April 2009. Prior to initiation of DPE pilot testing activities, Stratus submitted a notification letter to the Bay Area Air Quality Management District outlining the proposed scope of work. A copy of this letter is provided in Appendix A.

Existing wells MW-1, MW-2, MW-8, MW-9, MW-10, and RW-1 were used as individual and combined extraction wells for this DPE pilot test. Selection of these extraction wells was based

on well construction, laboratory analytical results, and locations on the Site. The remaining onsite wells within close proximity to the extraction wells were used as observation points to monitor any observed influence. Drawing 2 depicts the Site with associated well locations. Details of DPE pilot test event activities and results are provided below.

4.1 DPE Pilot Testing Equipment and Procedures

A trailer-mounted DPE unit with an approximate 250 standard cubic feet per minute (scfm) liquid-ring blower was mobilized to the Site to conduct the DPE pilot test. The DPE unit was used to simultaneously extract ground water and air from wells MW-1, MW-2, MW-8, MW-9, MW-10, and RW-1 on an individual basis and wells MW-1, MW-2, and RW-1 on a combined basis, by using a "stinger" pipe which was placed down the center of each well. The stinger end was placed below the static ground-water surface table to draw down a cone of depression to the inlet of the stinger, at which point, both soil vapor and ground water were extracted/drawn into the system. The combined process stream was then directed into a water knockout system which separated the liquid and air streams. The process air was then driven through the liquid ring blower and a thermal oxidizer which destroyed hydrocarbon vapors before they were discharged to the atmosphere. Extracted water was accumulated on-site until receipt of laboratory analytical results allowed for offsite transportation and treatment.

Prior to initiating the DPE pilot test, background depth-to-water level measurements were recorded for the applicable wells associated with the Site and the initial hour meter on the DPE equipment was recorded. Field personnel then recorded on an hourly basis during each DPE episode the hour meter reading, applied vacuum in inches of mercury (in.Hg) using magnehelic gauges, air flow (scfm), liquid flow totalizer reading (gallons), and a photo-ionization detector (PID) reading of recovered vapors. Recorded field observations for the extraction wells are provided in Table 1 with observation well data provided in Table 2. Copies of recorded field data are provided in Appendix D.

During the testing periods, air and water was extracted from each extraction well with the stinger tip set approximately one to 15 ft above the well bottom. Extracted air and ground-water samples were collected after the first hour and at two-to-three hour intervals. Not all collected samples were submitted for laboratory analysis. Representative samples collected at one hour, the approximate mid-point, and the approximate end-point of each DPE event were submitted for certified laboratory analyses. The duration of each extraction event was approximately four to ten hours.

4.2 Discussion of the DPE Pilot Test

The DPE pilot test began at 7:00 am on 11 May 2009. Each extraction event continued for approximately four to ten hours. The overall DPE pilot test ran for a combined total of 58.75 hours. The pilot test was terminated at approximately 16:30 pm on 19 May 2009.

The DPE stinger tips were set at approximately one foot above the bottom of wells MW-1, MW-2, MW-9, and MW-10 at approximately 26 to 42 ft bgs. The DPE stinger tips were set at

approximately 11 ft above the bottom of well RW-1 at approximately 27 ft bgs, and approximately 15 ft above the bottom of well MW-8 at approximately 22 ft bgs. The extraction rate during each DPE event averaged approximately 26.12 scfm with an average observed vacuum of 25.9 in. Hg. The induced vacuum remained fairly consistent throughout each extraction event.

Influent air and liquid samples were collected during testing activities to monitor mass removal. Collected samples were delivered to Calscience Environmental Laboratories, Inc. (Garden Grove, California). Samples were analyzed for GRO using EPA Method 8015B for liquids and EPA Method TO-3M for air, and BTEX and MTBE using EPA Method 8260B for liquids and EPA Method TO-15M for air. Liquid samples were also analyzed for TBA, DIPE, ETBE, and TAME using EPA Method 8260B. Analytical results are provided in Table 3 for vapor samples and Table 4 for water samples. Estimated mass removal from ground-water extraction is provided in Table 5. Residual liquids generated during the DPE activities were stored temporarily onsite in a tank pending analytical results and profiling. Following characterization and profiling, Belshire Environmental Services was scheduled to transport the residuals to an Atlantic Richfield Company-approved facility for treatment or disposal. Laboratory analytical reports with chain-of-custody documentation are provided in Appendix D.

4.3 DPE Pilot Test Observations

Observations recorded during each extraction event are described below including date and duration of extraction, approximate stinger depth, vapor and ground water recovery, and observed extraction influences. Field data recorded for the extraction and observation wells are provided in Tables 1 and 2. Laboratory analytical results of collected samples are provided in Tables 3 and 4.

4.3.1 RW-1 Extraction Event

The RW-1 extraction event was conducted on 11 May 2009 for approximately 10 hours. The bottom of the stinger was set at approximately 27 ft bgs (approximately 11 feet above the bottom of this well). The initial depth-to-water measurement prior to commencement of extraction was 16.18 feet below the top of casing measuring point. Wells MW-1, MW-2, MW-3, and MW-9 were used as observation wells during this event. Results of the RW-1 DPE event are summarized below:

- The influent soil vapor flow rate ranged between 17.90 and 40.3 scfm (averaging approximately 25.48 scfm) with an applied vacuum that ranged between 25.0 and 26.0 in.Hg (averaging approximately 25.4 in.Hg).

- Approximately 710 gallons of water were extracted from RW-1 during the DPE event at an average flow rate of approximately 1.18 gallons per minute (gpm).

- No induced vacuum was observed in the observation wells during the DPE event. It must be noted that the screen interval for well MW-9 (15-35 ft bgs) was submerged during the first half of this test event.

- Decreases in ground-water elevations (ranging from 0.76 to 1.64 feet) were observed in each of the observation wells, with the highest decrease in ground-water elevation observed at well MW-2, located approximately 26 feet from test well RW-1.

- PID readings in the influent vapor stream ranged from 29 to 155 parts per million volume (ppmv).

- Maximum concentrations from laboratory analysis of influent vapor-stream samples collected during this event were 170 ppmv GRO, 0.27 ppmv Benzene, and 0.23 ppmv MTBE (Table 3).

- Maximum concentrations from laboratory analysis of influent water samples collected during this event were 2,100 micrograms per liter (µg/l) GRO, 7.5 µg/l Benzene, and 86 µg/l MTBE (Table 4).

- Based on influent concentrations in the vapor stream and average flow rates, approximately 0.452 pounds (lbs) of GRO, 0.0008 lbs of Benzene, and 0.0008 lbs of MTBE were extracted in soil vapor during this test event (Table 3).

- Based on the volume of ground water extracted during this event and petroleum hydrocarbon concentrations in the influent water samples, approximately 0.0028 lbs of GRO, 0.00004 lbs of Benzene, and 0.0005 lbs of MTBE were extracted from the ground water during this test event (Table 5).

4.3.2 MW-9 Extraction Event

The MW-9 extraction was conducted on 12 May 2009 for approximately four hours. The bottom of the stinger was set at approximately 26 ft bgs (approximately one foot above the bottom of this well). Initial depth to water on 11 May 2009 was measured at 14.42 feet below the top of casing measuring point. Wells MW-1, MW-2, MW-3, MW-8, and RW-1 were used as observation points during the event. Results of the MW-9 DPE event are summarized below:

- The influent soil vapor flow rate ranged between 11.2 and 13.4 scfm (averaging approximately 12.52 scfm) with an applied vacuum of 26.5 in.Hg.

- Approximately 390 gallons of water were extracted from MW-9 during the DPE event at a flow rate of approximately 1.30 gpm.

- No induced vacuum was observed in the observation wells during the DPE event. It must be noted that the screen intervals for wells MW-8 (20-40 ft bgs) and RW-1 (20-40 ft bgs) were submerged during this test event.

- Decreases in ground-water elevations (ranging from 0.69 to 1.90 feet) were observed in each of the observation wells with the highest decrease observed at well MW-3, located approximately 53 feet from well MW-9.

- PID readings in the influent vapor stream ranged from 40 to 43 ppmv.

- Maximum concentrations from laboratory analysis of influent vapor-stream samples collected during this event were 65 ppmv GRO and 0.074 ppmv Benzene (Table 3). MTBE was not detected above the laboratory reporting limit in the influent vapor-stream samples analyzed.

- Maximum concentrations from laboratory analysis of influent water samples collected during this event were 880 µg/l GRO, 1.9 µg/l Benzene, and 12 µg/l MTBE (Table 4).

- Based on influent concentrations in the vapor stream and average flow rates, approximately 0.048 lbs of GRO and 0.00004 lbs of Benzene were extracted in soil vapor (Table 3).

- Based on the volume of ground water extracted during this event and petroleum hydrocarbon concentrations in the influent water samples, approximately 0.0016 lbs of GRO, 0.000003 lbs of Benzene and 0.00002 lbs MTBE were extracted from the ground water (Table 5).

4.3.3 MW-8 Extraction Event

The MW-8 extraction event was conducted on 12 May 2009 for approximately five hours. The bottom of the stinger was set at approximately 23 ft bgs (approximately 15 feet above the bottom of this well). Initial depth to water on 11 May 2009 was measured at 14.65 feet below the top of casing measuring point. Wells MW-2, MW-10, and RW-1 were used as observation points during the event. Results of the MW-8 DPE event are summarized below:

- The influent soil vapor flow rate was approximately 11.20 scfm throughout the event with an applied vacuum ranging between 26.5 and 27.0 in.Hg (averaging approximately 26.9 in.Hg).

- Approximately 530 gallons of water were extracted from MW-8 during the DPE event at a flow rate of approximately 1.47 gpm.

- No induced vacuum was observed in the observation wells during the DPE event. It must be noted that the screen intervals for wells MW-10 (20-36 ft bgs) and RW-1 (20-40 ft bgs) were submerged during this test event.

- Decreases in ground-water elevations (ranging from 0.96 to 1.51 feet) were observed in each of the observation wells, with the largest decrease observed at well MW-2, located approximately 103 feet from test well MW-8.

- PID readings in the influent vapor stream ranged from 15 to 30 ppmv.

- Maximum concentrations from laboratory analysis of influent vapor-stream samples collected during this event were 31 ppmv GRO, 0.49 ppmv Benzene, and 0.34 ppmv MTBE (Table 3).

- Maximum concentrations from laboratory analysis of influent water samples collected during this event were 520 µg/l GRO, 13 µg/l Benzene, and 49 µg/l MTBE (Table 4).

- Based on influent concentrations in the vapor stream and average flow rates, approximately 0.26 lbs of GRO, 0.0002 lbs of Benzene, and 0.0002 lbs of MTBE were extracted in soil vapor (Table 3).

- Based on the volume of ground water extracted during this event and petroleum hydrocarbon concentrations in the influent water samples, approximately 0.0015 lbs of GRO, 0.00002 lbs of Benzene, and 0.0002 lbs of MTBE were extracted from the ground water (Table 5).

4.3.4 MW-10 Extraction Event

The MW-10 extraction event was conducted on 13 May 2009 for approximately 4.25 hours. The bottom of the stinger was set at approximately 32 ft bgs (approximately one foot above the bottom of this well). Initial depth to water on 11 May 2009 was measured at 16.05 feet below the top of casing measuring point. Wells MW-2 and MW-7 were used as observation points during the event. Results of the MW-10 DPE event are summarized below:

- The influent soil vapor flow rate ranged between 4.5 and 26.8 scfm (averaging approximately 15.2 scfm) with an applied vacuum ranging between 26.0 and 27.0 in.Hg (averaging approximately 26.2 in.Hg).

- Approximately 560 gallons of water were extracted from MW-10 during the DPE event at a flow rate of approximately 2.67 gpm.

- No induced vacuum was observed in the observation wells during the DPE event.

- Decreases in ground-water elevations (ranging from 0.40 to 0.66 feet) were observed in each observation well, with the largest decrease observed at well MW-2, located approximately 59 feet from test well MW-10.

- PID readings in the influent vapor stream ranged from 35 to 53 ppmv.

- Maximum concentrations from laboratory analysis of influent vapor-stream samples collected during this event were 79 ppmv GRO, 0.47 ppmv Benzene, and 0.66 ppmv MTBE (Table 3).

- Maximum concentrations from laboratory analysis of influent water samples collected during this event were 990 µg/l GRO, 25 µg/l Benzene and 340 µg/l MTBE (Table 4).

- Based on influent concentrations in the vapor stream and average flow rates, approximately 0.105 lbs of GRO, 0.0005 lbs of Benzene, and 0.0008 lbs MTBE were extracted in soil vapor (Table 3).

- Based on the volume of ground water extracted during this event and petroleum hydrocarbon concentrations in the influent water samples, approximately 0.004 lbs of GRO, 0.0001 lbs of Benzene, and 0.0014 lbs of MTBE were extracted from the ground water (Table 5).

4.3.5 MW-1 Extraction Event

The MW-1 extraction event was conducted on 14 May 2009 for approximately 10 hours. The bottom of the stinger was set at approximately 40 ft bgs (approximately one foot above the bottom of this well). Initial depth to water on 11 May 2009 was measured at 17.94 feet below the top of casing measuring point. Wells MW-2, MW-3, MW-4, MW-9 and RW-1 were used as observation points during the event. Results of the MW-1 DPE event are summarized below:

- The influent soil vapor flow rate was approximately 15.70 scfm throughout the event with an applied vacuum of approximately 26.0 in.Hg.

- Approximately 1,120 gallons of water were extracted from MW-1 during the DPE event at a flow rate of approximately 1.87 gpm.

- Induced vacuum was observed in observation wells MW-4 and MW-9 during the DPE event. The maximum induced vacuum was recorded in well MW-4 at -0.23 in.Hg. It must be noted that the screen interval for well RW-1 (20-40 ft bgs) was submerged during this test event.

- Decreases in ground-water elevations (ranging from 1.24 to 2.37 feet) were observed in each observation well, with the largest decrease observed at well RW-1, located approximately 59 feet from test well MW-1.

- PID readings in the influent vapor stream ranged from 67 to 114 ppmv.

- Maximum concentrations from laboratory analysis of influent vapor-stream samples collected during this event were 200 ppmv GRO, 1.5 ppmv Benzene, and 0.38 ppmv MTBE (Table 3).

- Maximum concentrations from laboratory analysis of influent water samples collected during this event were 2,600 µg/l GRO, 56 µg/l Benzene and 120 µg/l MTBE (Table 4).

- Based on influent concentrations in the vapor stream and average flow rates, approximately 0.425 lbs of GRO, 0.0027 lbs of Benzene, and 0.0008 lbs MTBE were extracted in soil vapor (Table 3).

- Based on the volume of ground water extracted during this event and petroleum hydrocarbon concentrations in the influent water samples, approximately 0.01 lbs of GRO, 0.0005 lbs of Benzene, and 0.001 lbs of MTBE were extracted from the ground water (Table 5).

4.3.6 MW-2 Extraction Event

The MW-2 extraction event was conducted on 15 May 2009 for approximately six hours. The bottom of the stinger was set at approximately 30 ft bgs (approximately one foot above the bottom of this well). Initial depth to water on 11 May 2009 was measured at 16.70 feet below the top of casing measuring point. Wells MW-1, MW-9, MW-10 and RW-1 were used as observation points during the event. Results of the MW-2 DPE event are summarized below:

- The influent soil vapor flow rate ranged between 15.7 and 20.10 scfm (averaging approximately 19.47 scfm) with an applied vacuum of 26.0 in.Hg.

- Approximately 580 gallons of water were extracted from MW-2 during the DPE event at a flow rate of approximately 1.61 gpm.

- Induced vacuum was observed in observation well MW-9 at a maximum value of -0.01 in.Hg during the DPE event. No induced vacuum was recorded for the remaining observation wells. It must be noted that the screen intervals for wells MW-10 (20-36 ft bgs) and RW-1 (20-40 ft bgs) were submerged during this test event.

- Decreases in ground-water elevations (ranging from 0.90 to 1.93 feet) were observed in each observation well, with the largest decrease observed at well RW-1, located approximately 26 feet from test well MW-2.

- PID readings in the influent vapor stream ranged from 184 to 539 ppmv.

- Maximum concentrations from laboratory analysis of influent vapor-stream samples collected during this event were 1,700 ppmv GRO, 6.7 ppmv Benzene, and 0.43 ppmv MTBE (Table 3).

- Maximum concentrations from laboratory analysis of influent water samples collected during this event were 1,400 µg/l GRO, 190 µg/l Benzene and 100 µg/l MTBE (Table 4).

- Based on influent concentrations in the vapor stream and average flow rates, approximately 1.9 lbs of GRO, 0.0067 lbs of Benzene, and 0.0003 lbs MTBE were extracted in soil vapor (Table 3).

- Based on the volume of ground water extracted during this event and petroleum hydrocarbon concentrations in the influent water samples, approximately 0.0039 lbs of GRO, 0.0005 lbs of Benzene, and 0.0004 lbs of MTBE were extracted from the ground water (Table 5).

4.3.7 Multi-Well Extraction Event #1

The first multi-well extraction event was conducted on 18 May 2009 for approximately 10 hours and utilized wells MW-1, MW-2, and RW-1. The bottom of the stinger was set at approximately 40 ft bgs in well MW-1 and 30 ft bgs in wells MW-2 and RW-1. Initial depths to water measured on 11 May 2009 were at 17.94 feet below top of casing in well MW-1, 16.70 feet below top of casing in well MW-2, and 16.18 feet below top of casing in well RW-1. Wells MW-3, MW-4, MW-9, and MW-10 were used as observation points during the event. Results of the first multi-well DPE event are summarized below:

- The influent soil vapor flow rate ranged between 35.8 and 49.2 scfm (averaging approximately 47.37 scfm) with an applied vacuum of 25.0 in.Hg.

- Approximately 2,370 gallons of water were extracted during the multi-well DPE event at a flow rate of approximately 3.95 gpm.

- Induced vacuum was observed in observation wells MW-4 and MW-9 during the DPE event at a maximum value of -0.29 in.Hg in well MW-4. No induced vacuum was recorded for the remaining observation wells. It must be noted that the screen interval for well MW-10 (20-36 ft bgs) was submerged during this test event.

- Decreases in ground-water elevations (ranging from 2.54 to 3.01 feet) were observed in each of the observation wells, with the largest decrease observed at well MW-9.

- PID readings in the influent vapor stream ranged from 261 to 418 ppmv.

- Maximum concentrations from laboratory analysis of influent vapor-stream samples collected during this event were 1,800 ppmv GRO, 5.4 ppmv Benzene, and 1.1 ppmv MTBE (Table 3).

- Maximum concentrations from laboratory analysis of influent water samples collected during this event were 660 µg/l GRO, 35 µg/l Benzene, and 67 µg/l MTBE (Table 4).

- Based on influent concentrations in the vapor stream and average flow rates, approximately 8.9 lbs of GRO, 0.27 lbs of Benzene, and 0.0029 lbs of MTBE were extracted in soil vapor (Table 3).

- Based on the volume of ground water extracted during this event and petroleum hydrocarbon concentrations in the influent water samples, approximately 0.01 lbs of GRO, 0.0006 lbs of Benzene, and 0.0013 lbs of MTBE were extracted from the ground water (Table 5).

4.3.8 Multi-Well Extraction Event #2

The second multi-well extraction event was conducted on 19 May 2009 for approximately 9.5 hours and utilized wells MW-1, MW-2, and RW-1. The bottom of the stinger was set at approximately 40 ft bgs in well MW-1 and 30 ft bgs in wells MW-2 and RW-1. Initial depths to water measured on 11 May 2009 were at 17.94 feet below top of casing in well MW-1, 16.70 feet below top of casing in well MW-2, and 16.18 feet below top of casing in well RW-1. Wells MW-3, MW-4, MW-9, and MW-10 were used as observation points during the event. Results of the second multi-well DPE event are summarized below:

- The influent soil vapor flow rate was 47.0 scfm throughout the event with an applied vacuum of 26.0 in.Hg.

- Approximately 2,310 gallons of water were extracted during the multi-well DPE event at a flow rate of approximately 3.98 gpm.

- Induced vacuum was observed in observation wells MW-4 and MW-9 during the DPE event at a maximum value of -0.57 in.Hg in well MW-4. No induced vacuum was recorded for the remaining observation wells. It must be noted that the screen interval for well MW-10 (20-36 ft bgs) was submerged during this test event.

- Decreases in ground-water elevations (ranging from 2.35 to 2.73 feet) were observed in each of the observation wells, with the largest decrease observed at well MW-9.

- PID readings in the influent vapor stream ranged from 237 to 411 ppmv.

- Maximum concentrations from laboratory analysis of influent vapor-stream samples collected during this event were 1,300 ppmv GRO, 5.0 ppmv Benzene, and 11 ppmv MTBE (Table 3).

- Maximum concentrations from laboratory analysis of influent water samples collected during this event were 1,100 µg/l GRO, 32 µg/l Benzene, and 64 µg/l MTBE (Table 4).

- Based on influent concentrations in the vapor stream and average flow rates, approximately 6.29 lbs of GRO, 0.026 lbs of Benzene, and 0.04 lbs of MTBE were extracted in soil vapor (Table 3).

- Based on the volume of ground water extracted during this event and petroleum hydrocarbon concentrations in the influent water samples, approximately 0.0092 lbs of GRO, 0.0005 lbs of Benzene, and 0.0012 lbs of MTBE were extracted from the ground water (Table 5).

4.4 DPE Pilot Test Results

Stratus conducted six individual DPE events utilizing wells MW-1, MW-2, MW-8, MW-9, MW-10, and RW-1 and two multi-well DPE events utilizing wells MW-1, MW-2, and RW-1. The extraction events varied in duration from approximately four to ten hours. During the DPE events, the average soil vapor extraction rate was approximately 26.12 scfm and the average applied system vacuum was approximately 25.9 in.Hg. Laboratory analytical results reported relatively high GRO concentrations in soil vapor extracted from well MW-2 (maximum of 1,700 ppmv GRO) and also during the multi-well DPE events (maximum of 1,800 ppmv GRO). Concentrations of hydrocarbons in the extracted ground water during the events were relatively high for samples collected from wells MW-1, RW-1, MW-2 and during the multi-well DPE event (maximum of 2,600 µg/l GRO). The concentration of hydrocarbons in soil vapor generally decreased over time during extraction from wells MW-1, MW-2, RW-1, and during the multi-well DPE events, while concentrations remained relatively constant over time during extraction from wells MW-8, MW-9, and MW-10. GRO concentrations in ground water generally decreased over time during extraction from each of the individual wells and during the multi-well event. The other hydrocarbon concentrations in ground water fluctuated but generally remained constant over time during each of the extraction events including the multi-well tests. The laboratory results for DPE sample analyses were uploaded to the GeoTracker AB2886 database. Copies of the GeoTracker upload confirmation receipts (EDF) are provided within Appendix C.

Approximately 8,570 gallons of ground water was extracted as a result of this DPE pilot test. Approximately 0.043 lbs of GRO, 0.0023 lbs of Benzene and 0.006 lbs of MTBE in ground water, and 18.2 lbs of GRO, 0.064 lbs of Benzene and 0.046 lbs of MTBE in soil vapor were removed from the subsurface during extraction activities.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

BAI prepared this *Vapor Intrusion Assessment and Dual-Phase Extraction Pilot Test Report* for Station No.11132 following implementation of the scope of work proposed in the *Dual-Phase Extraction Pilot Testing and Soil and Ground-Water Investigation Work Plan* (BAI, 9 January 2009). BAI makes the following conclusions:

- **Vapor Intrusion Assessment** – Minor concentrations of BTEX were detected in the soil gas samples collected from approximately 3.5 feet bgs adjacent to the station building. GRO and the other petroleum constituents and additives were not detected above the

reporting limits. The BTEX concentrations were below the established Environmental Screening Levels established by the San Francisco Regional Water Quality Control Board. Significant Oxygen and Carbon Dioxide were also detected in the soil gas samples, suggesting at least indirectly that biodegradation of petroleum hydrocarbons may potentially be occurring within the subsurface soils. The vapor intrusion to indoor air migration pathway into the station building does not appear to be a valid and complete pathway.

- **Dual-Phase Extraction Pilot Test** – A minimal amount of GRO (18.2 lbs), Benzene (0.064 lbs) and MTBE (0.046 lbs) was removed as soil vapor during the DPE pilot testing activities. Approximately 8,570 gallons of ground water was extracted during this DPE pilot test, containing insignificant amounts of GRO (0.043 lbs), Benzene (0.0023 lbs) and MTBE (0.006 lbs). Ground-water drawdown was observed in each of the observation wells throughout the extraction events. Vacuum influence was observed in wells MW-4 and MW-9 during the DPE pilot test.

5.2 Recommendations

Based on the information obtained and presented in this report, BAI makes the following recommendations:

- No further investigation or remedial actions regarding vapor intrusion assessment are warranted at this time.
- Due to the limited vacuum influence and minimal contaminant removal rates, DPE does not appear to be an optimal remedial technology for this Site. As discussed in the previously-submitted *Site Conceptual Model with Feasibility Study Report* (BAI, 7/21/2008), a pilot test utilizing enhanced biodegradation should be researched and implemented for potential use at the Site. Furthermore, source area excavation should be retained as a potential remediation option involving current property owner/station operator Conoco-Phillips.

6.0 CLOSURE

The findings presented in this document are based upon: observation of field personnel from previous consultants, the points investigated, and results of laboratory tests performed by various laboratories. Our services were performed in accordance with the generally accepted standard of practice at the time this document was written. No other warranty, expressed on implied was made. This report has been prepared for the exclusive use of Atlantic Richfield Company. It is possible that variations in soil or ground-water conditions could exist beyond points explored in this investigation. Also changes in site conditions could occur in the future due to variations in rainfall, temperature, regional water usage, or other factors.

7.0 REFERENCES

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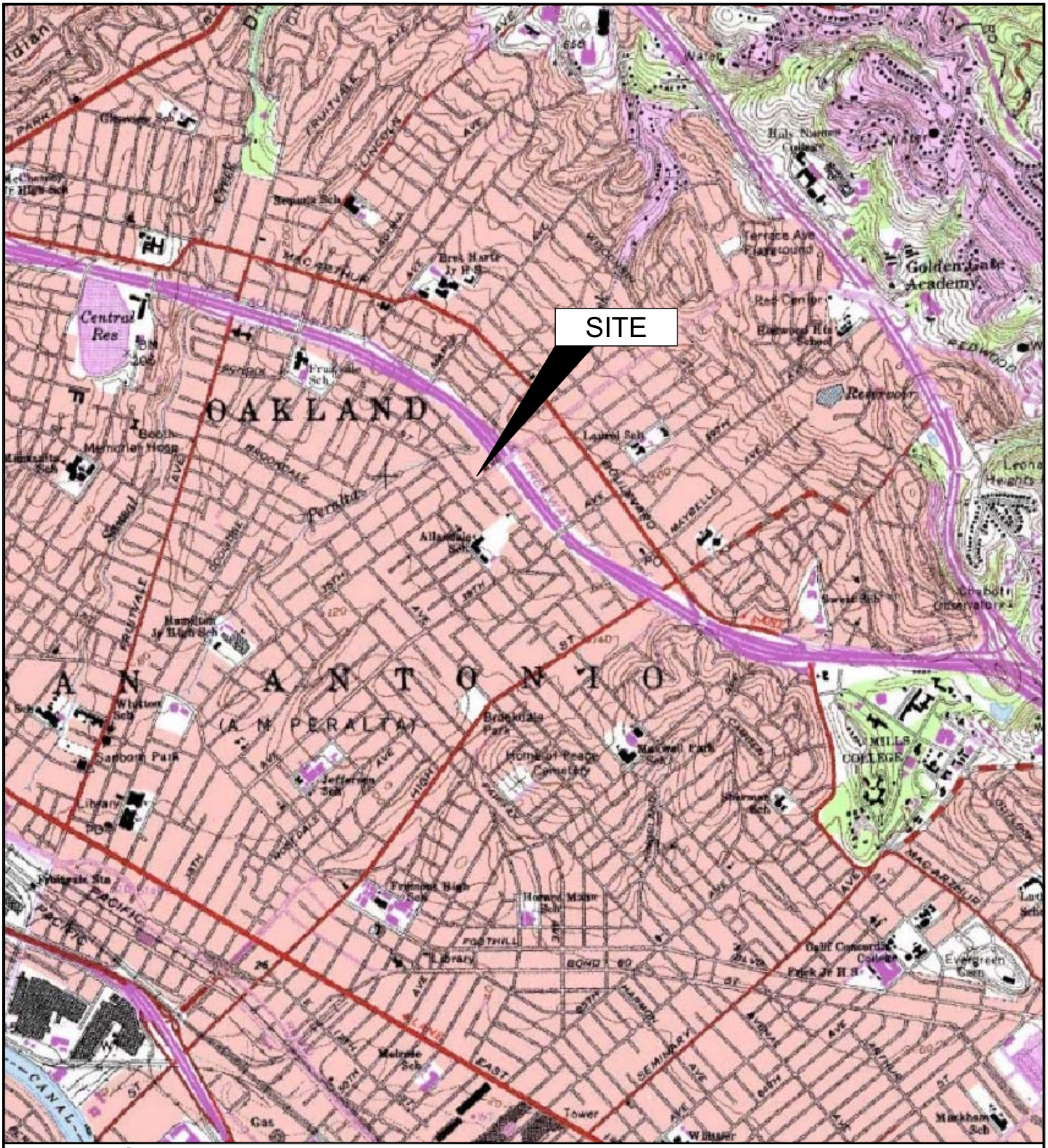

IMAGE SOURCE: USGS

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
1324 Mangrove Ave. Suite 212, Chico, CA 95926

Project No.: 06-88-655 Date: 07/24/09

Former BP Service Station #11132
3201 35th Avenue
Oakland, California

Site Location Map

Drawing
1

0 50 100

SCALE (ft)

BROADBENT & ASSOCIATES, INC.

ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

1324 Mangrove Ave. Suite 212, Chico, California 95926

Project No.: 06-08-655 Date: 7/13/09

Former BP Service Station #11132

3201 35th Avenue

Oakland, California

Site Layout Plan

Drawing

2

Table 1. DPE Pilot Test Extraction Well Data
Former BP Service Station #11132, 3201 35th Avenue, Oakland, California

Extraction Event	Cumulative Testing Time (hours)	Depth to Water (feet)	Drawdown (feet)	Applied System Vacuum (inches Hg)	Air Flow Rate (SCFM)	Volume of Water Pumped		PID Readings	
						(cumulative gal)	(gpm)*	Influent (ppm)	Effluent (ppm)
RW-1	0	16.18	---	---	---	0.00	0.00	---	---
(5/11/2009)	Startup	22.00	-5.82	---	---	0.00	0.00	---	---
Stinger tip set approximately	1	22.00	-5.82	26.0	17.90	0.00	0.00	155	5.0
eleven feet above well bottom, or	2	25.00	-8.82	26.0	17.90	90.00	1.50	73	5.0
approx. 11 ft below water surface	3	25.00	-8.82	26.0	17.90	170.00	1.33	88	4.0
	4	27.00	-10.82	26.0	40.30	270.00	1.67	44	3.0
	5	27.00	-10.82	25.0	26.80	300.00	0.50	48	3.0
	6	27.00	-10.82	25.0	26.80	370.00	1.17	36	3.0
	7	27.00	-10.82	25.0	26.80	470.00	1.67	35	3.0
	8	27.00	-10.82	25.0	26.80	550.00	1.33	32	2.0
	9	27.00	-10.82	25.0	26.80	630.00	1.33	29	2.0
Test terminated	**10**	**27.00**	**-10.82**	**25.0**	**26.80**	**710.00**	**1.33**	**37**	**2.0**
MW-9	0	14.42[1]	---	---	---	0.00	0.00	---	---
(5/12/2009)	Startup	26.00	-11.58	---	---	0.00	0.00	---	---
Stinger tip set approximately	0.5	26.00	-11.58	26.5	13.40	0.00	0.00	42	2.0
one foot above well bottom, or	1	26.00	-11.58	26.5	13.40	50.00	0.83	43	2.0
approx. 11.5 ft below water surface	2	26.00	-11.58	26.5	13.40	140.00	1.50	40	1.0
	3	26.00	-11.58	26.5	11.20	320.00	3.00	41	2.0
Test terminated	**4**	**26.00**	**-11.58**	**26.5**	**11.20**	**390.00**	**1.17**	**41**	**2.0**
MW-8	0	14.65[2]	---	---	---	0.00	0.00	---	---
(5/12/2009)	Startup	21.00	-6.35	---	---	0.00	0.00	---	---
Stinger tip set approximately	0.5	21.00	-6.35	26.5	11.20	0.00	0.00	30	3.0
15 feet above well bottom, or	1	21.00	-6.35	27.0	11.20	90.00	1.50	23	2.0
approx. 8 ft below water surface	2	21.00	-6.35	27.0	11.20	190.00	1.67	15	2.0
	3	23.00	-8.35	27.0	11.20	270.00	1.33	22	1.0
	4	23.00	-8.35	27.0	11.20	460.00	3.17	24	1.0
Test terminated	**5**	**23.00**	**-8.35**	**27.0**	**11.20**	**530.00**	**1.17**	**23**	**1.0**
MW-10	0	16.05[1]	---	---	---	0.00	0.00	---	---
(5/13/2009)	Startup	32.00	-15.95	27.0	8.90	0.00	0.00	49	5.0
Stinger tip set approximately	1	32.00	-15.95	26.0	4.50	100.00	1.67	53	7.0
one foot above well bottom, or	2	32.00	-15.95	26.0	17.90	200.00	1.67	40	2.0
approx. 16 ft below water surface	3	32.00	-15.95	26.0	17.90	380.00	3.00	35	2.0
	4	32.00	-15.95	26.0	26.80	480.00	1.67	38	3.2
Test terminated	**4.25**	**32.00**	**-15.95**	**---**	**---**	**560.00**	**5.33**	**---**	**---**
MW-1	0	17.94[1]	---	---	---	0.00	0.00	---	---
(5/14/2009)	Startup	40.00	-23.95	26.0	15.70	0.00	0.00	100	5.0
Stinger tip set approximately	1	40.00	-23.95	26.0	15.70	100.00	1.67	114	4.0
one foot above well bottom, or	2	40.00	-23.95	26.0	15.70	190.00	1.50	100	3.0
approx. 24 ft below water surface	3	40.00	-23.95	26.0	15.70	280.00	1.50	100	3.0
	4	40.00	-23.95	26.0	15.70	370.00	1.50	99	2.0
	5	40.00	-23.95	26.0	15.70	530.00	2.67	82	2.0
	6	40.00	-23.95	26.0	15.70	640.00	1.83	75	2.0
	7	40.00	-23.95	26.0	15.70	750.00	1.83	81	1.0
	8	40.00	-23.95	26.0	15.70	840.00	1.50	71	0.0
	9	40.00	-23.95	26.0	15.70	930.00	1.50	67	0.0
Test terminated	**10**	**40.00**	**-23.95**	**26.0**	**15.70**	**1120.00**	**3.17**	**72**	**0.0**
MW-2	0	16.70[1]	---	---	---	0.00	0.00	---	---
(5/15/2009)	Startup	30.00	-13.95	26.0	15.70	0.00	0.00	184	6.0
Stinger tip set approximately	1	30.00	-13.95	26.0	20.10	100.00	1.67	539	5.0
one foot above well bottom, or	2	30.00	-13.95	26.0	20.10	170.00	1.17	425	5.0
approx. 14 ft below water surface	3	30.00	-13.95	26.0	20.10	270.00	1.67	386	4.0
	4	30.00	-13.95	26.0	20.10	390.00	2.00	275	3.0
	5	30.00	-13.95	26.0	20.10	480.00	1.50	256	3.0
Test terminated	**6**	**30.00**	**-13.95**	**26.0**	**20.10**	**580.00**	**1.67**	**251**	**2.0**
MW-1, MW-2 & RW-1	0	---	---	---	---	0.00	0.00	---	---
(5/18/2009)	Startup	---	---	25.0	49.20	0.00	0.00	380	7.0
Stinger tips set at various depths	1	---	---	25.0	49.20	350.00	5.83	418	6.0
within each well	2	---	---	25.0	49.20	470.00	2.00	359	6.0
	3	---	---	25.0	49.20	690.00	3.67	382	5.0
	4	---	---	25.0	35.80	920.00	3.83	290	4.0
	5	---	---	25.0	42.50	1160.00	4.00	261	3.0
	6	---	---	25.0	49.20	1480.00	5.33	313	2.0
	7	---	---	25.0	49.20	1700.00	3.67	297	2.0
	8	---	---	25.0	49.20	1930.00	3.83	285	2.0
	9	---	---	25.0	49.20	2190.00	4.33	301	2.0
Test terminated	**10**	**---**	**---**	**25.0**	**49.20**	**2370.00**	**3.00**	**296**	**2.0**
MW-1, MW-2 & RW-1	0	---	---	---	---	0.00	0.00	---	---
(5/19/2009)	Startup	---	---	26.0	47.00	0.00	0.00	347	7.0
Stinger tips set at various depths	1	---	---	26.0	47.00	190.00	3.17	411	7.0
within each well	2	---	---	26.0	47.00	440.00	4.17	350	5.0
	3	---	---	26.0	47.00	660.00	3.67	333	4.0
	5	---	---	26.0	47.00	1100.00	3.67	258	3.0
	7	---	---	26.0	47.00	1590.00	4.08	237	3.0
Test terminated	**9.5**	**---**	**---**	**26.0**	**47.00**	**2310.00**	**5.14**	**252**	**3.0**

Notes:
Depth to water values are calculated based on the estimated depth of the stinger
--- - Not Applicable
* - Estimated
1 - Depth to water value from 5/11/2009 prior to initiation of DPE activities
2 - Depth to water value for MW-8 from 5/12/2009 due to a car restricting access on 5/11/2009

Table 2. DPE Pilot Test Observation Well Data
Former BP Service Station #11132, 3201 35th Avenue, Oakland, California

RW-1 Extraction (5/11/2009)

	Observation Wells							
	MW-1		MW-2		MW-3		MW-9	
Hours	VAC	DTW[1]	VAC	DTW[1]	VAC	DTW[1]	VAC	DTW[1]
0	---	17.94	----	16.70	---	15.07	---	14.42
1	0.00	18.51	0.00	17.59	0.00	15.33	0.00	14.74
2	0.00	18.75	0.00	17.77	0.00	15.41	0.00	14.83
3	0.00	18.90	0.00	17.95	0.00	15.50	0.00	14.94
4	0.00	18.96	0.00	17.90	0.00	15.55	0.00	14.95
5	0.00	19.04	0.00	18.02	0.00	15.60	0.00	15.02
6	0.00	19.11	0.00	18.16	0.00	15.67	0.00	15.11
7	0.00	19.25	0.00	18.24	0.00	15.73	0.00	15.17
8	0.00	19.30	0.00	18.28	0.00	15.78	0.00	15.20
9	0.00	19.35	0.00	18.32	0.00	15.82	0.00	15.25
10	0.00	19.38	0.00	18.34	0.00	15.83	0.00	15.27
	Final DD:	-1.44	Final DD:	-1.64	Final DD:	-0.76	Final DD:	-0.85
	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	0.00

MW-9 Extraction (5/12/2009)

	Observation Wells									
	MW-1		MW-2		MW-3		MW-8		RW-1	
Hours	VAC	DTW[1]	VAC	DTW[1]	VAC	DTW[1]	VAC	DTW	VAC	DTW[1]
0	---	17.94	---	16.70	---	15.07	---	---	---	16.18
0.5	0.00	18.26	0.00	17.01	0.00	15.64	0.00	14.65	0.00	16.53
1	0.00	18.52	0.00	17.32	0.00	16.40	0.00	14.97	0.00	16.75
2	0.00	18.65	0.00	17.44	0.00	16.60	0.00	15.10	0.00	16.89
3	0.00	18.81	0.00	17.60	0.00	16.82	0.00	15.22	0.00	17.06
4	0.00	18.96	0.00	17.74	0.00	16.97	0.00	15.34	0.00	17.21
	Final DD:	-1.02	Final DD:	-1.04	Final DD:	-1.90	Final DD:	-0.69	Final DD:	-1.03
	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	0.00

MW-8 Extraction (5/12/2009)

	Observation Wells					
	MW-2		MW-10		RW-1	
Hours	VAC	DTW[1]	VAC	DTW[1]	VAC	DTW[1]
0	---	16.70	---	16.05	---	16.18
1	0.00	17.96	0.00	16.42	0.00	17.30
2	0.00	18.13	0.00	16.93	0.00	17.40
3	0.00	18.12	0.00	16.90	0.00	17.44
4	0.00	18.18	0.00	16.97	0.00	17.49
5	0.00	18.21	0.00	17.01	0.00	17.53
	Final DD:	-1.51	Final DD:	-0.96	Final DD:	-1.35
	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	0.00

Table 2. DPE Pilot Test Observation Well Data
Former BP Service Station #11132, 3201 35th Avenue, Oakland, California

MW-10 Extraction (5/13/2009)

	Observation Wells			
	MW-2		MW-7	
Hours	VAC	DTW	VAC	DTW
0	---	---	0.00	17.52
1	0.00	18.08	0.03	17.67
2	0.00	18.39	0.04	17.74
3	0.00	18.60	0.00	17.85
4	0.00	18.74	0.01	17.92
	Final DD:	-0.66	Final DD:	-0.40
	Max. Vac:	0.00	Max. Vac:	0.04

MW-1 Extraction (5/14/2009)

	Observation Wells									
	MW-2		MW-3		MW-4		MW-9		RW-1	
Hours	VAC	DTW	VAC	DTW	VAC	DTW	VAC	DTW	VAC[2]	DTW
0	0.00	17.30	0.00	15.80	0.00	19.51	0.00	15.08	0.00	16.75
1	0.00	17.71	0.00	16.24	-0.23	19.85	-0.01	15.39	---	17.31
2	0.00	18.03	0.00	16.55	-0.18	20.18	-0.01	15.60	---	17.84
3	0.00	18.25	0.00	16.80	-0.07	20.49	-0.01	15.80	---	18.30
4	0.00	18.40	0.00	16.97	-0.01	20.70	-0.01	15.95	---	18.56
5	0.00	18.50	0.00	17.10	0.00	20.80	-0.01	16.05	---	18.75
6	0.00	18.57	0.00	17.20	0.00	20.90	-0.01	16.13	---	18.87
7	0.00	18.62	0.00	17.27	0.00	20.96	-0.02	16.20	---	18.97
8	0.00	18.66	0.00	17.34	0.00	21.00	-0.01	16.24	---	19.04
9	0.00	18.69	0.00	17.39	0.00	21.02	-0.01	16.30	---	19.10
10	0.00	18.72	0.00	17.42	0.00	21.05	0.00	16.32	---	19.12
	Final DD:	-1.42	Final DD:	-1.62	Final DD:	-1.54	Final DD:	-1.24	Final DD:	-2.37
	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	-0.23	Max. Vac:	-0.02	Max. Vac:	0.00

MW-2 Extraction (5/15/2009)

	Observation Wells							
	MW-1		MW-9		MW-10		RW-1	
Hours	VAC	DTW	VAC	DTW	VAC	DTW	VAC[2]	DTW
0	0.00	18.80	0.00	15.23	0.00	16.29	---	16.90
1	0.00	19.13	0.00	15.53	0.00	16.93	---	17.42
2	0.00	19.48	-0.01	15.77	0.00	17.18	---	18.00
3	0.00	19.65	-0.01	15.88	0.00	17.33	---	18.40
4	0.00	19.76	0.00	16.00	0.00	17.42	---	18.64
5	0.00	19.85	0.00	16.09	0.00	17.50	---	18.78
6	0.00	19.90	0.00	16.13	0.00	17.56	---	18.83
	Final DD:	-1.10	Final DD:	-0.90	Final DD:	-1.27	Final DD:	-1.93
	Max. Vac:	0.00	Max. Vac:	-0.01	Max. Vac:	0.00	Max. Vac:	0.00

Table 2. DPE Pilot Test Observation Well Data
Former BP Service Station #11132, 3201 35th Avenue, Oakland, California

MW-1, MW-2, & RW-1 Extraction (5/18/2009)

	Observation Wells							
	MW-3		MW-4		MW-9		MW-10	
Hours	VAC	DTW	VAC	DTW	VAC	DTW	VAC	DTW
0	0.00	15.97	0.00	19.58	0.00	15.25	0.00	16.37
1	0.00	17.04	-0.28	20.70	-0.09	16.44	0.00	17.80
2	0.00	17.28	-0.26	20.97	-0.06	16.69	0.00	17.97
3	0.00	17.69	-0.29	21.32	-0.06	17.05	0.00	18.27
4	0.00	18.00	-0.15	21.75	-0.01	17.37	0.00	18.50
5	0.00	18.23	-0.09	21.97	-0.01	17.58	0.00	18.65
6	0.00	18.44	0.00	22.20	-0.01	17.78	0.00	18.18
7	0.00	18.60	0.00	22.33	-0.01	17.93	0.00	18.91
8	0.00	18.73	0.00	22.41	0.00	18.07	---	---
9	0.00	18.86	0.00	22.50	0.00	18.19	---	---
10	0.00	18.94	0.00	22.57	0.00	18.26	---	---
	Final DD:	-2.97	Final DD:	-2.99	Final DD:	-3.01	Final DD:	-2.54
	Max. Vac:	0.00	Max. Vac:	-0.29	Max. Vac:	-0.09	Max. Vac:	0.00

MW-1, MW-2, & RW-1 Extraction (5/19/2009)

	Observation Wells							
	MW-3		MW-4		MW-9		MW-10	
Hours	VAC	DTW	VAC	DTW	VAC	DTW	VAC	DTW
0	0.00	16.77	0.00	20.15	0.00	16.00	0.00	16.97
1	0.00	17.17	-0.28	20.53	-0.07	16.66	---	---
2	0.00	17.95	-0.57	21.12	-0.03	17.37	---	---
3	0.00	18.34	-0.19	21.84	-0.06	17.71	0.00	18.81
5	0.00	18.78	-0.21	22.20	-0.03	18.13	0.00	19.10
7	0.00	19.13	0.00	22.62	-0.05	18.45	0.00	19.32
9	0.00	19.39	0.00	22.82	-0.03	18.73	---	---
	Final DD:	-2.62	Final DD:	-2.67	Final DD:	-2.73	Final DD:	-2.35
	Max. Vac:	0.00	Max. Vac:	-0.57	Max. Vac:	-0.07	Max. Vac:	0.00

Notes:

1 - Initial Depth to Water value from 5/11/2009 prior to initiation of DPE activities

2 - Not able to seal well

--- - Not recorded

VAC - Vacuum (in.Hg)

DTW - Depth to Water (feet)

Final DD - Final observed drawdown at end of test (feet).

Max Vac - Maximum recorded vacuum during test (in.Hg).

Table 3. Summary of DPE Vapor Data: Laboratory Analyses and Estimated Removal
Former BP Station #11132, 3201 35th Avenue, Oakland, California

Extraction Event	Influent Air Sample		Air (average)		Influent Air Concentrations in ppmv							Removal Rate (lbs/hr)			Net removal		
	Date	Time	Flow Rate SCFM	Vacuum in.Hg	PID Readings	Benzene	Toluene	Ethyl-benzene	Xylenes	GRO	MTBE	GRO	Benzene	MTBE	GRO (lbs)	Benzene (lbs)	MTBE (lbs)
RW-1	5/11/2009	7:00	**DPE Test Initiated on RW-1**		---	---	---	---	---	---	---	---	---	---	---	---	---
RW-1	5/11/2009	8:05	17.90	26.00	155	0.16	0.31	0.63	5.40	170	0.20	0.048	0.000035	0.000050	0.052	0.0000	0.000054
RW-1	5/11/2009	13:05	26.80	25.00	36	0.25	0.03	0.18	0.27	120	0.20	0.051	0.000082	0.000075	0.254	0.0004	0.000373
RW-1	5/11/2009	16:30	26.80	25.00	29	0.27	0.016	0.19	0.20	88	0.23	0.037	0.000089	0.000086	0.127	0.0003	0.000293
RW-1	5/11/2009	17:00*	26.80	25.00	37	0.27	0.016	0.19	0.20	88	0.23	0.037	0.000089	0.000086	0.019	0.0000	0.000043
MW-9	5/12/2009	7:00	**DPE Test Initiated on MW-9**		---	---	---	---	---	---	---	---	---	---	---	---	---
MW-9	5/12/2009	8:10	13.40	26.50	43	0.074	0.032	0.32	0.70	64	<0.05	0.014	0.0000	0.000000	0.016	0.0000	0.000000
MW-9	5/12/2009	10:05	11.20	26.50	41	0.061	0.024	0.49	1.1	65	<0.05	0.012	0.0000	0.000000	0.022	0.0000	0.000000
MW-9	5/12/2009	11:00*	11.20	26.50	41	0.061	0.024	0.49	1.1	65	<0.05	0.012	0.0000	0.000000	0.011	0.0000	0.000000
MW-8	5/12/2009	11:00	**DPE Test Initiated on MW-8**		---	---	---	---	---	---	---	---	---	---	---	---	---
MW-8	5/12/2009	12:00	11.20	27.00	23	0.49	0.096	0.46	1.1	23	0.23	0.004	0.0001	0.000036	0.004	0.0001	0.000036
MW-8	5/12/2009	15:05	11.20	27.00	24	0.26	0.059	0.33	0.83	31	0.34	0.005	0.0000	0.000053	0.017	0.0001	0.000163
MW-8	5/12/2009	16:00*	11.20	27.00	23	0.26	0.059	0.33	0.83	31	0.34	0.005	0.0000	0.000053	0.005	0.0000	0.000049
MW-10	5/13/2009	7:30	**DPE Test Initiated on MW-10**		---	---	---	---	---	---	---	---	---	---	---	---	---
MW-10	5/13/2009	8:30	4.50	26.00	53	0.35	0.10	0.35	0.81	79	0.38	0.006	0.0000	0.000024	0.006	0.0000	0.000024
MW-10	5/13/2009	11:35	26.80	26.00	38	0.47	0.24	0.49	1.3	76	0.66	0.032	0.0002	0.000246	0.099	0.0005	0.000758
MW-1	5/14/2009	7:00	**DPE Test Initiated on MW-1**		---	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	5/14/2009	8:00	15.70	26.00	114	0.82	0.078	0.79	0.68	200	0.25	0.050	0.0002	0.000055	0.050	0.0002	0.000055
MW-1	5/14/2009	14:00	15.70	26.00	81	1.5	0.12	1.1	0.90	170	0.38	0.042	0.0003	0.000083	0.253	0.0017	0.000498
MW-1	5/14/2009	17:05	15.70	26.00	72	1.3	0.11	1.0	0.91	160	0.34	0.040	0.0003	0.000074	0.122	0.0008	0.000229
MW-2	5/15/2009	7:00	**DPE Test Initiated on MW-2**		---	---	---	---	---	---	---	---	---	---	---	---	---
MW-2	5/15/2009	8:05	20.10	26.00	539	6.7	0.68	0.94	2.3	1,700	<1.0	0.540	0.0017	0.000000	0.585	0.0018	0.000000
MW-2	5/15/2009	10:05	20.10	26.00	386	4.5	0.48	0.6	1.6	1,100	<0.80	0.349	0.0011	0.000000	0.699	0.0022	0.000000
MW-2	5/15/2009	12:50	20.10	26.00	251	4.0	0.52	0.72	1.7	750	0.43	0.238	0.0010	0.000120	0.655	0.0027	0.000330
MW-1, MW-2, & RW-1	5/18/2009	7:00	**DPE Test Initiated on MW-1, MW-2, & RW-1**		---	---	---	---	---	---	---	---	---	---	---	---	---
MW-1, MW-2, & RW-1	5/18/2009	8:20	49.20	25.00	418	5.4	0.73	2.0	2.8	1,800	<1.0	1.399	0.0033	0.000000	1.866	0.0044	0.000000
MW-1, MW-2, & RW-1	5/18/2009	13:05	49.20	25.00	313	3.8	0.51	1.3	1.9	1,000	<0.8	0.777	0.0023	0.000000	3.692	0.0109	0.000000
MW-1, MW-2, & RW-1	5/18/2009	16:20	49.20	25.00	301	4.8	0.66	1.6	2.4	1,100	1.1	0.855	0.0029	0.000752	2.779	0.0094	0.002445
MW-1, MW-2, & RW-1	5/18/2009	17:00*	49.20	25.00	296	4.8	0.66	1.6	2.4	1,100	1.1	0.855	0.0029	0.000752	0.570	0.0019	0.000502
MW-1, MW-2, & RW-1	5/19/2009	7:00	**DPE Test Initiated on MW-1, MW-2, & RW-1**		---	---	---	---	---	---	---	---	---	---	---	---	---
MW-1, MW-2, & RW-1	5/19/2009	8:05	47.00	26.00	411	4.8	0.87	2.3	3.7	1,300	1.2	0.965	0.0028	0.000784	1.046	0.0030	0.000849
MW-1, MW-2, & RW-1	5/19/2009	13:05	47.00	26.00	237	4.8	0.76	2.1	3.8	860	11	0.639	0.0028	0.007186	3.193	0.0139	0.035932
MW-1, MW-2, & RW-1	5/19/2009	16:20	47.00	26.00	252	5.0	0.77	2.4	4.1	850	1.6	0.631	0.0029	0.001045	2.051	0.0094	0.003397
Totals and Averages for 2009 DPE Pilot Test			26	25.9	169	2.2	0.32	0.92	1.7	520	1.1	0.306	0.0010	0.000462	18.2	0.0639	0.046027
													Total Gallons Removed:		2.93	0.0088	0.0074

Table 3. Summary of DPE Vapor Data: Laboratory Analyses and Estimated Removal
Former BP Station #11132, 3201 35th Avenue, Oakland, California

Sample calculations:

Removal rate calculation:

lbs/hour = ("x" ppm/1,000,000) * ("Q" ft^3/min)*("M.W." lb/lb-mol)*(60 min/hr)*(lb-mol/379.5 ft^3)

where: "x" is influent concentration in ppmv
"Q" is the average flow rate in ft^3/min
"M.W." is the molecular weight in lb/lb-mol (100.2 for GRO, 78.1 for benzene, 88.15 for MTBE)

gallons removed = lbs / density (density for GRO and MTBE is 6.2 lbs/gallon, density for benzene is 7.3 lbs/gallon)

Notes:

SCFM - Standard cubic feet per minute.
in.Hg - Inches of mercury.
ppmv - Parts per million by volume.
GRO - Total Petroleum Hydrocarbons - Gasoline Range Organics.
MTBE - Methyl-tert-butyl ether
--- - Not sampled and/or Not applicable
* - Time recorded at end of DPE event with no samples collected. Influent constituent concentrations are estimated from previous collected sample.

Table 4. Summary of DPE Ground-Water Laboratory Analytical Data
Former BP Service Station #11132, 3201 35th Avenue, Oakland, California

Laboratory Analytical Results (µg/l)

Extraction Event	Collection Date and Time	GRO	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	DIPE	ETBE	TBA	TAME	Ethanol
RW-1	**5/11/09, 8:00**	2,100	2.4	<2.0	5.8	37	29	<2.0	<2.0	490	<2.0	<1,200
RW-1	**5/11/09, 13:05**	470	5.8	<2.5	6.3	12	70	<2.5	<2.5	800	<2.5	<1,500
RW-1	**5/11/09, 16:15**	490	7.5	<2.0	7.9	12	86	<2.0	<2.0	870	2.5	<1,200
MW-9	**5/12/09, 8:00**	880	1.9	1.0	17	52	12	<0.5	<0.5	120	<0.5	<300
MW-9	**5/12/09, 10:00**	430	0.78	<0.5	9.5	29	5.7	<0.5	<0.5	<10	<0.5	<300
MW-8	**5/12/09, 11:45**	520	13	1.9	15	45	14	<0.5	<0.5	11	<0.5	<300
MW-8	**5/12/09, 15:00**	290	3.8	0.9	7.1	25	49	<0.5	<0.5	<10	0.7	<300
MW-10	**5/13/09, 8:15**	990	25	7.3	30	94	150	<0.5	<0.5	85	1.9	<300
MW-10	**5/13/09, 11:30**	830	24	16	38	140	340	<0.5	<0.5	30	4.9	<300
MW-1	**5/14/09, 7:45**	2,600	31	2.6	71	54	120	<2.5	<2.5	350	3.6	<1,500
MW-1	**5/14/09, 13:55**	1,000	56	4.1	54	52	100	<0.5	<0.5	370	2.6	<300
MW-1	**5/14/09, 17:00**	830	53	4.1	50	51	110	<0.5	<0.5	350	2.7	<300
MW-2	**5/15/09, 8:00**	1,400	190	18	28	110	79	<2.0	<2.0	710	<2.0	<1,200
MW-2	**5/15/09, 10:00**	730	94	13	19	74	85	<2.0	<2.0	410	<2.0	<1,200
MW-2	**5/15/09, 12:45**	650	82	15	20	72	100	<2.0	<2.0	360	<2.0	<1,200
MW-1, MW-2, & RW-1	**5/18/09, 8:15**	660	35	5.9	20	40	54	<2.0	<2.0	500	<2.0	<1,200
MW-1, MW-2, & RW-1	**5/18/09, 13:00**	510	34	5.6	19	37	67	<2.0	<2.0	430	<2.0	<1,200
MW-1, MW-2, & RW-1	**5/18/09, 16:15**	440	30	5.2	17	33	65	<2.0	<2.0	390	<2.0	<1,200
MW-1, MW-2, & RW-1	**5/19/09, 8:10**	1,100	32	6.6	28	49	64	<2.0	<2.0	450	<2.0	<1,200
MW-1, MW-2, & RW-1	**5/19/09, 13:00**	430	26	4.8	16	34	62	<2.0	<2.0	410	<2.0	<1,200
MW-1, MW-2, & RW-1	**5/19/09, 16:15**	400	25	4.4	15	32	62	<2.0	<2.0	400	<2.0	<1,200

Notes:

GRO - Total Petroleum Hydrocarbons - Gasoline Range Organics.
MTBE - Methyl-tert-butyl ether
DIPE - Di-isopropyl ether
ETBE - Ethyl ter-butyl ether
TBA - Tert-Butyl alcohol
TAME - Tert-Amyl methyl ether

Table 5. DPE Ground-Water Extraction Data and Estimated Recovery
Former BP Service Station #11132, 3201 35th Avenue, Oakland, California

Date Sampled	Extraction Event	Period		Estimated Volume Processed			Influent Concentration, µg/L			Net Removal		
		Start Time	Sample Time	Initial Totalizer	Final Totalizer	Gallons Pumped	GRO	Benzene	MTBE	GRO	Benzene	MTBE
5/11/2009	RW-1	7:00	8:00	7,580	7,580	0	2,100	2.4	29	0.0000 lbs	0.0000000 lbs	0.00000000 lbs
5/11/2009	RW-1	8:00	13:05	7,580	7,950	370	470	5.8	70	0.0014 lbs	0.0000179 lbs	0.00021564 lbs
5/11/2009	RW-1	13:05	16:15	7,950	8,210	260	490	7.5	86	0.0011 lbs	0.0000162 lbs	0.00018617 lbs
5/11/2009	RW-1	16:15	17:00*	8,210	8,290	80	490	7.5	86	0.0003 lbs	0.0000050 lbs	0.00005728 lbs
5/12/2009	MW-9	7:00	8:00	8,290	8,340	50	880	1.9	12	0.0004 lbs	0.0000008 lbs	0.00000500 lbs
5/12/2009	MW-9	8:00	10:00	8,340	8,610	270	430	0.78	5.7	0.0010 lbs	0.0000018 lbs	0.00001281 lbs
5/12/2009	MW-9	10:00	11:00*	8,610	8,680	70	430	0.78	5.7	0.0003 lbs	0.0000005 lbs	0.00000332 lbs
5/12/2009	MW-8	11:00	11:45	8,680	8,770	90	520	13	14	0.0004 lbs	0.0000097 lbs	0.00001049 lbs
5/12/2009	MW-8	11:45	15:00	8,770	9,140	370	290	3.8	49	0.0009 lbs	0.0000117 lbs	0.00015095 lbs
5/12/2009	MW-8	15:00	16:00*	9,140	9,210	70	290	3.8	49	0.0002 lbs	0.0000022 lbs	0.00002856 lbs
5/13/2009	MW-10	7:30	8:15	9,210	9,310	100	990	25	150	0.0008 lbs	0.0000208 lbs	0.00012489 lbs
5/13/2009	MW-10	8:15	11:30	9,310	9,690	380	830	24	340	0.0026 lbs	0.0000759 lbs	0.00107572 lbs
5/13/2009	MW-10	11:30	11:45*	9,690	9,770	80	830	24	340	0.0006 lbs	0.0000160 lbs	0.00022647 lbs
5/14/2009	MW-1	7:00	7:45	9,770	9,870	100	2,600	31	120	0.0022 lbs	0.0000258 lbs	0.00009991 lbs
5/14/2009	MW-1	7:45	13:55	9,870	10,520	650	1,000	56	100	0.0054 lbs	0.0003031 lbs	0.00054119 lbs
5/14/2009	MW-1	13:55	17:00	10,520	10,890	370	830	53	110	0.0026 lbs	0.0001633 lbs	0.00033887 lbs
5/15/2009	MW-2	7:00	8:00	10,890	10,990	100	1,400	190	79	0.0012 lbs	0.0001582 lbs	0.00006578 lbs
5/15/2009	MW-2	8:00	10:00	10,990	11,160	170	730	94	85	0.0010 lbs	0.0001330 lbs	0.00012031 lbs
5/15/2009	MW-2	10:00	12:45	11,160	11,470	310	650	82	100	0.0017 lbs	0.0002116 lbs	0.00025811 lbs
5/18/2009	MW-1, MW-2, & RW-1	7:00	8:15	11,470	11,820	350	660	35	54	0.0019 lbs	0.0001020 lbs	0.00015736 lbs
5/18/2009	MW-1, MW-2, & RW-1	8:15	13:00	11,820	12,950	1,130	510	34	67	0.0048 lbs	0.0003199 lbs	0.00063036 lbs
5/18/2009	MW-1, MW-2, & RW-1	13:00	16:15	12,950	13,660	710	440	30	65	0.0026 lbs	0.0001773 lbs	0.00038424 lbs
5/18/2009	MW-1, MW-2, & RW-1	16:15	17:00*	13,660	13,840	180	440	30	65	0.0007 lbs	0.0000450 lbs	0.00009741 lbs
5/19/2009	MW-1, MW-2, & RW-1	7:00	8:10	13,840	14,030	190	1,100	32	64	0.0017 lbs	0.0000506 lbs	0.00010124 lbs
5/19/2009	MW-1, MW-2, & RW-1	8:10	13:00	14,030	15,430	1,400	430	26	62	0.0050 lbs	0.0003031 lbs	0.00072270 lbs
5/19/2009	MW-1, MW-2, & RW-1	13:00	16:15	15,430	16,150	720	400	25	62	0.0024 lbs	0.0001499 lbs	0.00037167 lbs
Totals						8,570				0.0430 lbs 0.0069 gals	0.0023213 lbs 0.0003180 gals	0.005986 lbs 0.000966 gals

Sample calculations:

Removal rate calculation:

lbs removed = ("x" µg/L)*(gram/1,000,000 µg)*(lb/454 grams)*(3.78 L/gal)*(gallons pumped)
where "x" is influent concentration

Gallons removal calculation (for GRO):

gallons removed = lbs * gallon/6.2 lbs (density for GRO and MTBE is 6.2; density for benzene is 7.3)

Notes:

* - Time recorded at end of DPE event with no samples collected. Influent concentrations are estimated from previous collected sample.
µg/L - micrograms per liter
GRO - total petroleum hydrocarbons - gasoline range organics
MTBE - methyl tertiary butyl ether

APPENDIX A

RECENT REGULATORY CORRESPONDENCE

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

February 17, 2009

Paul Supple
Atlantic Richfield Company
(A BP Affiliated Company)
P.O. Box 1257
San Ramon, CA 94583

Terry L. Grayson
Conoco Phillips
76 Broadway
Sacramento, CA 95818

Rajinder S & Sukhvinder Sull
2004 Hartnell Street
Union City, CA 94587

Subject: Fuel Leak Case No. RO0000014 and Geotracker Global ID T0600100213, BP #11132, 3201 35th Avenue, Oakland, CA 94619

Dear Messrs. Supple, Grayson, & Sull:

Alameda County Environmental Health (ACEH) staff has reviewed the case file for the above-referenced site including the recently submitted document entitled, "Dual-Phase Extraction Pilot Testing and Soil & Ground-Water Investigation Work Plan," dated January 9, 2009, which was prepared by Broadbent & Associates, Inc. (BAI) for the subject site. BAI proposes to install two borings to collect soil vapor samples at depths of 7 ft, 10 ft, 15 ft, and 20 ft bgs in the vicinity of the station building. BAI also proposes to conduct a dual-phase extraction pilot test utilizing groundwater monitoring wells RW-1, MW-1, MW-2, MW-8, MW-9, and MW-10.

ACEH generally concurs with the proposed scope of work and the proposed scope of work may be implemented provided that the modifications requested in the technical comments below are addressed and incorporated during the field implementation. Submittal of a revised Work Plan is not required unless an alternate scope of work outside that described in the Work Plan and technical comments below is proposed.

We request that you address the following technical comments, perform the proposed work, and send us the technical reports requested below.

TECHNICAL COMMENTS

1. **Soil Vapor Sampling** – Prior to sample collection BAI proposes to use helium as a leak test compound. BAI states that helium "will be applied and temporarily secured at locations where ambient air could enter the sampling system including sample system connections, the surface bentonite seal, and the top of the drill rod." It is not clear how the leak check compound will be applied or whether the leak check compound will be present throughout the duration of the sample collection. Therefore, it is recommended that soil vapor probes are constructed with the sampling device and all fittings placed under a shroud with pliable weather-stripping along its base to maintain a tracer gas atmosphere. The shroud should

ensure that there is tracer gas around all sampling connections. The shroud should have a port for inserting a monitoring and sampling device (e.g. Photo Ionization Detector) to ensure that tracer gas atmosphere is maintained.

NOTIFICATION OF FIELDWORK ACTIVITIES

Please schedule and complete the fieldwork activities by the date specified below and provide ACEH with at least three (3) business days notification prior to conducting the fieldwork.

TECHNICAL REPORT REQUEST

Please submit technical reports to ACEH (Attention: Paresh Khatri), according to the following schedule:

- **April 30, 2009** – Quarterly Monitoring Report (1st Quarter 2009)
- **June 17, 2009** – Soil and Water Investigation Report (DPE Pilot Testing)
- **July 30, 2009** – Quarterly Monitoring Report (2nd Quarter 2009)
- **October 30, 2009** – Quarterly Monitoring Report (3rd Quarter 2009)
- **January 30, 2010** – Quarterly Monitoring Report (4th Quarter 2008)

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (LOP and SLIC) require submission of reports in electronic form. The electronic copy replaces paper copies and is expected to be used for all public information requests, regulatory review, and compliance/enforcement activities. Instructions for submission of electronic documents to the Alameda County Environmental Cleanup Oversight Program FTP site are provided on the attached "Electronic Report Upload Instructions." Submission of reports to the Alameda County FTP site is an addition to existing requirements for electronic submittal of information to the State Water Resources Control Board (SWRCB) GeoTracker website. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for all groundwater cleanup programs. For several years, responsible parties for cleanup of leaks from underground storage tanks (USTs) have been required to submit groundwater analytical data, surveyed locations of monitoring wells, and other data to the GeoTracker database over the Internet. Beginning July 1, 2005, these same reporting requirements were added to Spills, Leaks, Investigations, and Cleanup (SLIC) sites. Beginning July 1, 2005, electronic submittal of a complete copy of all reports for all sites is

required in GeoTracker (in PDF format). Please visit the SWRCB website for more information on these requirements (http://www.swrcb.ca.gov/ust/electronic_submittal/report_rqmts.shtml.

PERJURY STATEMENT

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 6835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

Please note that delays in investigation, later reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to $10,000 per day for each day of violation.

If you have any questions, please call me at (510) 777-2478 or send me an electronic mail message at paresh.khatri@acgov.org.

Sincerely,

Paresh C. Khatri
Hazardous Materials Specialist

Donna L. Drogos, PE
Supervising Hazardous Materials Specialist

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: Tom Venus, Broadbent & Associates, 1324 Mangrove Avenue, Suite 212, Chico, CA 95926
Leroy Griffin, Oakland Fire Department, 250 Frank H. Ogawa Plaza, Ste. 3341, Oakland, CA 94612-2032
Donna Drogos, ACEH
Paresh Khatri, ACEH
GeoTracker
File

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
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ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
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(510) 567-6700
FAX (510) 337-9335

April 16, 2009

Paul Supple
Atlantic Richfield Company
(A BP Affiliated Company)
P.O. Box 1257
San Ramon, CA 94583

Terry L. Grayson
Conoco Phillips
76 Broadway
Sacramento, CA 95818

Rajinder S & Sukhvinder Sull
2004 Hartnell Street
Union City, CA 94587

Subject: Fuel Leak Case No. RO0000014 and GeoTracker Global ID T0600100213, BP #11132, 3201 35th Avenue, Oakland, CA 94619

Dear Messrs. Supple, Grayson, & Sull:

Alameda County Environmental Health (ACEH) staff has reviewed the case file for the above-referenced site including the recently submitted document entitled, "Addendum to Dual-Phase Extraction Pilot Testing and Soil & Groundwater Investigation Work Plan," dated March 24, 2009, which was prepared by Broadbent & Associates, Inc. for the subject site. BAI has provided clarification in their soil vapor sampling protocols in response to comments in ACEH's February 17, 2009 correspondence. Instead of helium as a leak tracer, BAI proposes to use iso-propanol or butane, which will be applied to paper towels and wrapped around connections in the sampling system as well as applied around the sampling probe at the ground surface.

ACEH generally concurs with the proposed scope of work and requests that you perform the proposed work, and send us the technical reports described below.

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TECHNICAL REPORT REQUEST

Please submit technical reports to ACEH (Attention: Paresh Khatri), according to the following schedule:

- **June 17, 2009** – Soil and Water Investigation Report (DPE Pilot Testing)
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- **Due within 30 Days of Sampling** – Quarterly Monitoring Report (3rd Quarter 2009)

- **Due within 30 Days of Sampling** – Quarterly Monitoring Report (4th Quarter 2009)
- **Due within 30 Days of Sampling** – Quarterly Monitoring Report (1st Quarter 2010)

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The California Business and Professions Code (Sections 6735, 6835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

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Please note that delays in investigation, later reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

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If you have any questions, please call me at (510) 777-2478 or send me an electronic mail message at paresh.khatri@acgov.org.

Sincerely,

Paresh C. Khatri
Hazardous Materials Specialist

Donna L. Drogos, PE
Supervising Hazardous Materials Specialist

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: Tom Venus, Broadbent & Associates, 1324 Mangrove Avenue, Suite 212, Chico, CA 95926
Leroy Griffin, Oakland Fire Department, 250 Frank H. Ogawa Plaza, Ste. 3341, Oakland, CA 94612-2032
Donna Drogos, ACEH
Paresh Khatri,
GeoTracker
File

STRATUS
ENVIRONMENTAL, INC.

3330 Cameron Park Drive, Ste 550
Cameron Park, California 95682
(530) 676-6004 ~ Fax: (530) 676-6005

April 29, 2009
Project No. E11132-01

Ms. Flora Chan
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, California 94109

Re: **Notification of Proposed DPE Test**
Application No. 17880 and Plant No. 17101
Former BP Service Station No. 11132
3201 35th Avenue
Oakland, California

Dear Ms. Chan:

Stratus Environmental, Inc. (Stratus) on behalf of Atlantic Richfield Company (ARCO – a BP-affiliated company), has prepared this letter to notify Bay Area Air Quality Management District (BAAQMD) regarding a proposed 7-day dual phase extraction (DPE) test at the former ARCO Facility No. 11132, located at 3201 35th Avenue, Oakland, California (see Figure 1). The test is currently scheduled to begin on **May 11, 2009**. Stratus proposes to conduct the individual well DPE tests between May 11 and 15, 2009, and the combined well DPE test on May 18 and 19, 2009.

Stratus proposes to use a CBA Equipment, LLC (CBA), 350 cubic feet per minute (cfm) trailer-mounted DPE system. The system incorporates a 20-horsepower (hp) liquid ring pump and a thermal oxidizer rated at a maximum flow rate of 430 cfm. Petroleum hydrocarbon laden soil vapors and groundwater will be extracted using existing wells RW-1, MW-1, MW-2, MW-8, MW-9, and MW-10 using the liquid ring pump. Soil vapors will be separated from groundwater in a 100-gallon air-water separator, in-built on the DPE system, and abated using the thermal oxidizer before discharging to the atmosphere. Groundwater from the knock-out tank will be transferred to a 4,000 gallon poly-tank, pending transportation and disposal at a waste acceptance facility. A 49-hp rated propane generator, or similar, will be used to energize the DPE system. The location of the extraction wells and other pertinent site features are presented in Figure 2. A process flow diagram for the system is illustrated in Figure 3.

Stratus conducted a web search (www.yahoo.com and www.google.com) to identify any K-12 schools in the vicinity of the site. No K-12 schools were found within a 1,500-foot radius of the subject site.

The following parameters will be monitored during the test:

- Hour meter reading,
- Vapor extraction flow rate,
- Influent, operating, and effluent temperatures,
- Applied vacuum at the extraction well using standard pressure gauges,
- Depth to water and induced vacuum measurements in wells located in the immediate vicinity of test-wells,
- Totalizer reading to calculate groundwater extraction rates, and
- Photo-ionization detector (PID) measurements for system-influent and effluent air samples.

A minimum of one influent air sample will be collected during each day of the DPE event, and one effluent air sample will be collected on the start-up day. The effluent sample will be forwarded to a state certified analytical laboratory for chemical analysis on a 24-hour turnaround time, and the remainder of the samples will be analyzed on a standard turnaround time. The air samples submitted to the laboratory will be analyzed for gasoline range organics (GRO) using United States Environmental Protection Agency (USEPA) Method TO3, and for benzene, toluene, ethylbenzene, and total xylenes (BTEX compounds) and methyl tertiary butyl ether (MTBE) using USEPA Method TO15. The analytical results of the effluent air samples will be forwarded to BAAQMD via facsimile or e-mail. Additional air and water samples will be collected during the test to evaluate system performance and to monitor petroleum hydrocarbon concentrations in soil vapors.

Upon completion of the test and receipt of all analytical results, Broadbent and Associates, Inc. (Broadbent), will prepare and submit a report that documents the findings of the 7-day DPE test.

April 29, 2009

If you have any questions regarding this project, please contact Kiran Nagaraju at (530) 676-6007.

Sincerely,

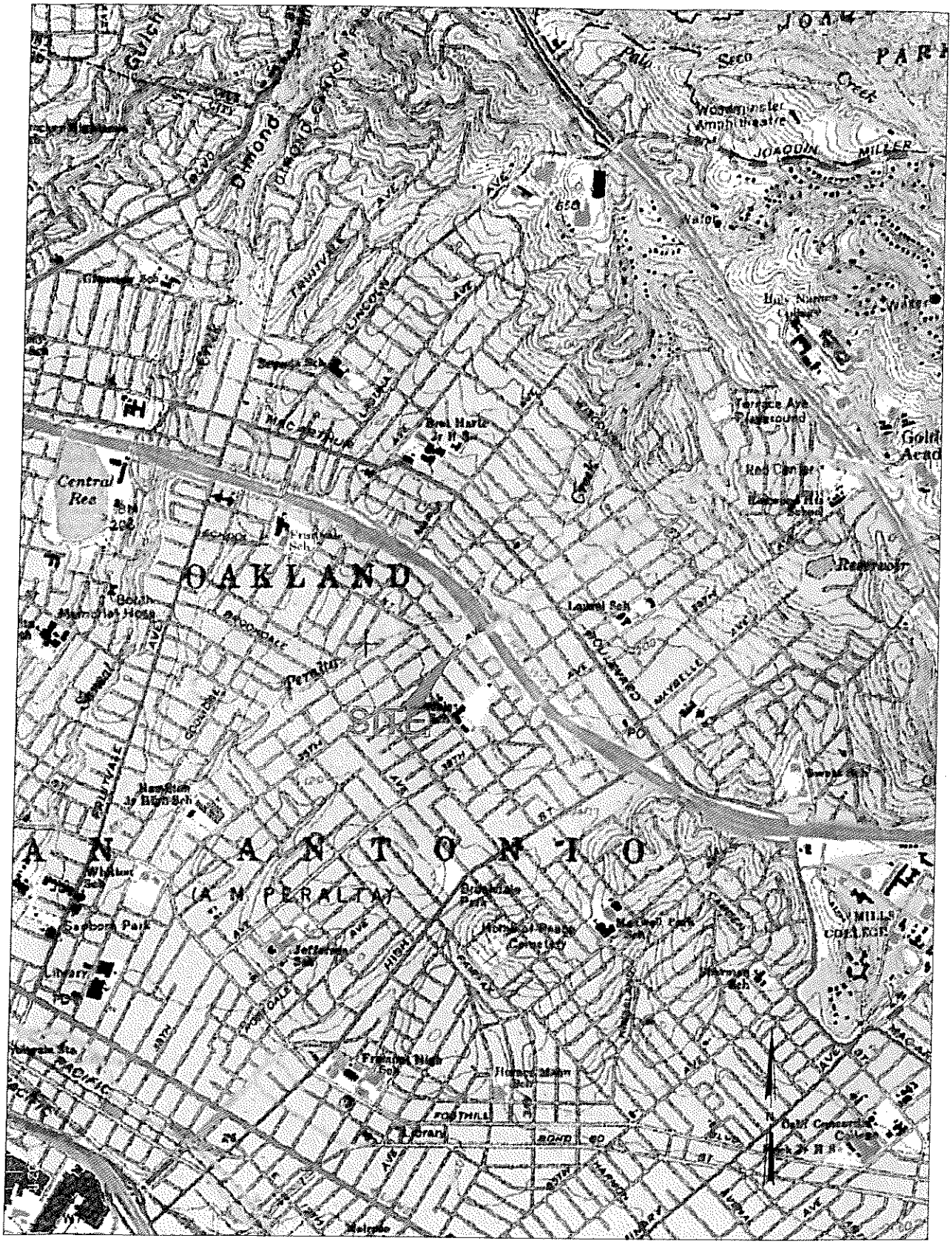
STRATUS ENVIRONMENTAL, INC.

Kiran Nagaraju
Project Engineer

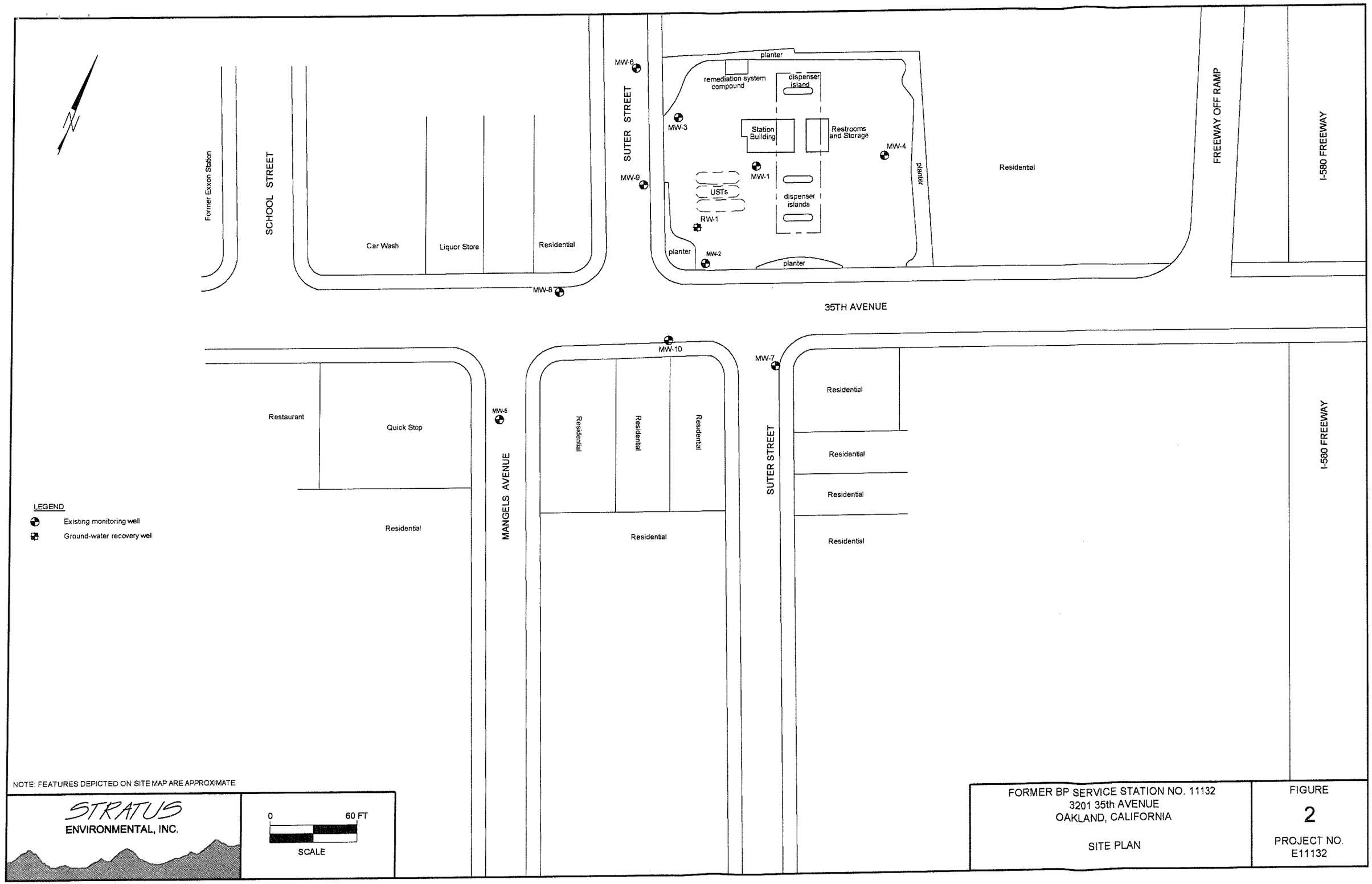
Jay R. Johnson, P.G.
Project Manager

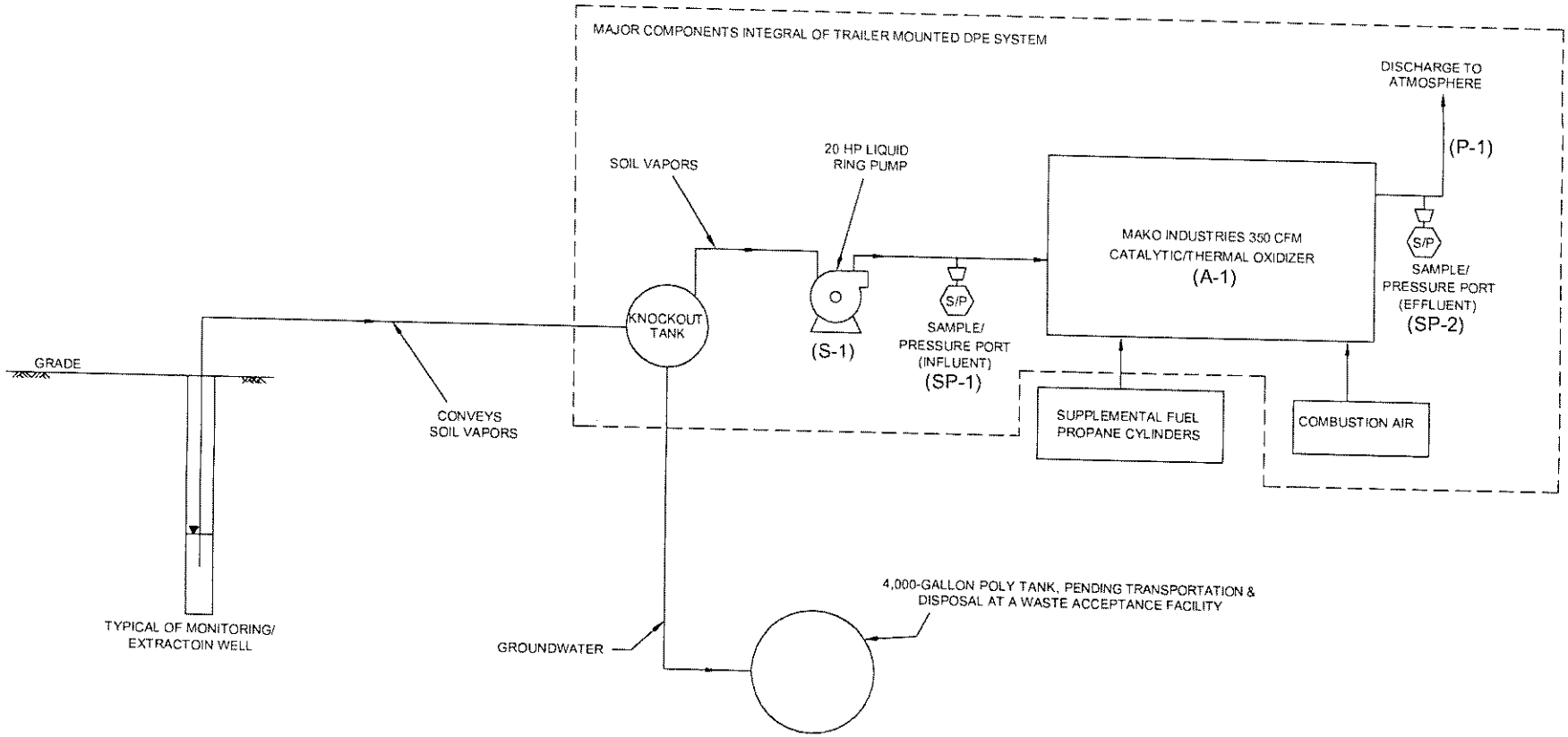
Attachments
Figure1 Site Location Map (Source: Broadbent & Associates, Inc.)
Figure 2 Site Plan
Figure 3 Process Flow Diagram

cc: Mr. Paul Supple, Atlantic Richfield Company
Mr. Rob Miller, Broadbent & Associates, Inc.



BROADBENT & ASSOCIATES, INC. ENGINEERING, WATER RESOURCES & ENVIRONMENTAL 1324 Mangrove Ave. Suite 212, Chico, California Project No.: 06-08-655 Date: 01/07/09	Former BP Service Station #11132 3201 35th Avenue Oakland, California	Site Location Map	Drawing 1


Former Exxon Station
SCHOOL STREET
Car Wash
Liquor Store
Residential
MW-8
MW-6
SUTER STREET
MW-3
MW-9
planter
remediation system compound
dispenser island
Station Building
Restrooms and Storage
MW-4
MW-1
USTs
dispenser islands
RW-1
MW-2
planter
planter
Residential
FREEWAY OFF RAMP
I-580 FREEWAY
35TH AVENUE
MW-10
MW-7
Restaurant
Quick Stop
MW-5
Residential
Residential
Residential
Residential
Residential
Residential
Residential
MANGELS AVENUE
SUTER STREET
I-580 FREEWAY
LEGEND
Existing monitoring well
Ground-water recovery well
NOTE: FEATURES DEPICTED ON SITE MAP ARE APPROXIMATE
STRATUS ENVIRONMENTAL, INC.
0
60 FT
SCALE
FORMER BP SERVICE STATION NO. 11132
3201 35th AVENUE
OAKLAND, CALIFORNIA
SITE PLAN
FIGURE
2
PROJECT NO.
E11132



DUAL PHASE EXTRACTION SYSTEM
NOT TO SCALE

THIS IS A PROCESS FLOW DIAGRAM, THEREFORE INSTRUMENTATION AND CONTROL EQUIPMENT DETAILS ARE NOT SHOWN. INSTRUMENT FUNCTIONS AND INTERACTIONS ARE ALSO NOT SHOWN. EQUIPMENT SIZES ARE NOT PROPORTIONAL AND ARE NOT INDICATIVE OF FINAL SIZES.

STRATUS ENVIRONMENTAL, INC.

FORMER BP SERVICE STATION NO. 11132
3201 35th AVENUE
OAKLAND, CALIFORNIA

PROCESS FLOW DIAGRAM

FIGURE
3

PROJECT NO.
E 11132

APPENDIX B

STRATUS SOIL GAS WELL INSTALLATION AND SAMPLING DATA PACKAGE
(Includes Field Notes, Well Construction Logs, Well Completion Reports, Well Permits, Site Layout Plan, and Laboratory Analytical Reports with Chain-of-Custody Documentation)

STRATUS
ENVIRONMENTAL INC.

3330 Cameron Park Drive, Ste 550
Cameron Park, California 95682
(530) 676-6004 ~ Fax: (530) 676-6005

July 1, 2009

Mr. Tom Venus
Broadbent & Associates, Inc.
1324 Mangrove Avenue
Chico, California 95926

Re: Soil Gas Well Installation and Sampling Data Package, Former BP Service Station No. 11132, located at 3201 35th Avenue, Oakland, California (field activities performed betewen March 12th and June 8th , 2009)

General Information

Data Submittal Prepared / Reviewed by: Collin Fischer and Scott Bittinger / Jay Johnson
Phone Number: (530) 676-2062 / (530) 676-6000

Date: March 12, 2009
On-Site Supplier Representative: Collin Fischer
Scope of Work Performed: Health and Safety meeting with utility locating subcontractor (Cruz Brothers Locators). Clear 2 boring/soil gas well locations and locate all utilities onsite. Sketch a uility map and mark site for Underground Service Alert (USA) notification.
Variations from Work Scope: The locations of the two proposed soil gas wells were adjusted due to the locations of underground utilities near one of the locations proposed by the scoping contractor in the project's work plan.

Date: May 22, 2009
On-Site Supplier Representative: Collin Fischer
Scope of Work Performed: Fill out Health and Safety forms. Check USA markings and update site utility location map per ground disturbance procedures.
Variations from Work Scope: None noted

Date: May 26, 2009
On-Site Supplier Representative: Collin Fischer
Scope of Work Performed: Health and Safety meeting with soil gas well installation subcontractor (RSI Drilling). Install 2 Soil Gas Wells (SG-1 and SG-2) by hand augering.
Variations from Work Scope: None noted.

July 1, 2009

Date: June 8, 2009
On-Site Supplier Representative: Collin Fischer
Scope of Work Performed: Fill out Health and Safety forms. Set up and sample 2 Soil Gas Wells (SG-1 and SG-2).
Variations from Work Scope: None noted

This submittal presents the tabulation of data collected in association with the installation and sampling of two soil gas wells. The attachments include field data sheets, well construction detail diagrams, a drilling permit issued by Alameda County Public Works Department, Department of Water Resources (DWR) well completion forms, an underground utility location sketch, a site plan, certified analytical results, and chain-of-custody documentation. The information is being provided to BP-ARCO's Scoping Supplier for use in preparing a report for regulatory submittal. This submittal is limited to presentation of collected data and does not include data interpretation or conclusions or recommendations.

Any questions concerning this submittal should be addressed to the Preparer/Reviewer identified above.

Sincerely,

STRATUS ENVIRONMENTAL, INC.

Scott G. Bittinger, P.G.
Project Geologist

Jay R. Johnson, P.G.
Project Manager

Attachments:

- Field Data Sheets
- Well Construction Detail Diagrams
- Drilling Permit
- DWR Well Completion Forms
- Underground Utility Location Sketch
- Site Plan
- Certified Analytical Report
- Chain-of-Custody Documentation

cc: Mr. Paul Supple, BP/ARCO

Sunny
Clear
3/12/09

AREA 11932

0800 → ONSITE, SAFETY MEETING.

0815 → START UTILITY LOCATING, CLEAR 2 BORINGS, LOCATE UTILITIES
ALL UTILITIES COMING OUT OF BUILDING, MARK
ON SITE MAP. (IE) H2O, ELECTRIC, COMM & GAS

0945 → ALL UTILITIES LOCATED, SKETCHED ON MAP,
SG-1 WILL NEED TO BE MOVED 15'-20' WEST
IN ORDER TO ASSURE SAFE BORING.

1000 → OFFSITE.

Collin Fair

STRATUS ENV., INC

Field Data Sheet

Site: ARCO 11132 Date: 5/22/09

Personnel on site: Collin Fischer

Weather Conditions: Partly Cloudy

Notes:

1600 -> ONSITE, Fill out SAFETY PAPERWORK, SITE WALK

1620 -> SKETCH & UPDATE Utility MAP & UPDATE USA TRACKING SHEET PER BP/ARCO'S GROUND DISTURBANCE PROCEDURES

-> OFFSITE

STRATUS ENV., INC.

Field Data Sheet

Site: ARCO 11132 Date: 8/26/09

Personnel on site: Collin Fisher, RSI Dallas

Weather Conditions: Sunny, Clear

Notes:

0830 → ONSITE, SAFETY MEETING SITE WALK

0900 → SET UP ON (SG-2) & START CONCRETE CORING.

1030 → DIFFICULT TO CORE THROUGH CONCRETE, FINISHED @ SG-2 LOCATION, ~~[illegible]~~

START HAND AUGER, UPON CLEARING OUT CONCRETE CORE NOTICED & PARTIALLY SEVERED COPPER PIPE, UPON INVESTIGATION & TALKING W/ STATION MANAGER, IT WAS DETERMINED TO BE A HISTORICAL ELECTRICAL LINE. MADE PHONE CALL TO OFFICE & DOCUMENT NEAR MISS.

1115 → PATCH HOLE & MOVE OVER & BEGIN CORING ANOTHER HOLE FOR (SG-2).

1215 → AUGERED TO 3.5' BGS & SET (SG-2).

SCREEN - 3.67 3.0'
SAND - 3.5 - 2.5
BENT - 2.5 - 1
GROUT - 0 - 1

1240 → DONE SETTING WELL, MOVE TO (SG-1), BREAK SURFACE W/ CORING MACHINE.

1300 → START AUGERING.

1320 → AUGER TO 3.5' BGS & SET WELL SET (SG-1)

SCREEN - 3.67 3.0
SAND - 3.5 - 2.5
BENT - 2.5 - 1
GROUT - 0 - 1

1325 → SET BOTH BOXES & CLEAN UP.

1430 → SECURE AREA

1500 → OFFSITE

Collin Fisher

STRATUS ENV., INC.

ARCO 1132 - Collin Fischer

Clear
060808

0330 -> ONSITE, fill out SHIFTS PAPERWORK, SET UP

Well #	FlowCont	Summa #	Leak Start	Leak Stop	Purge Start	Purge Stop	Sample Start	Sample Stop
SG-1	#61	D375	0350 (-30)	0400 (-30)	0400 (-30)	0417 (-15)	0417 (-30)	0440 (-10)
SG-2	A202	D369	0445 (-30)	0505 (-30)	0505 (-30)	0521 (-15)	0521 (-30)	0543 (-10)

0550 -> Cleaned

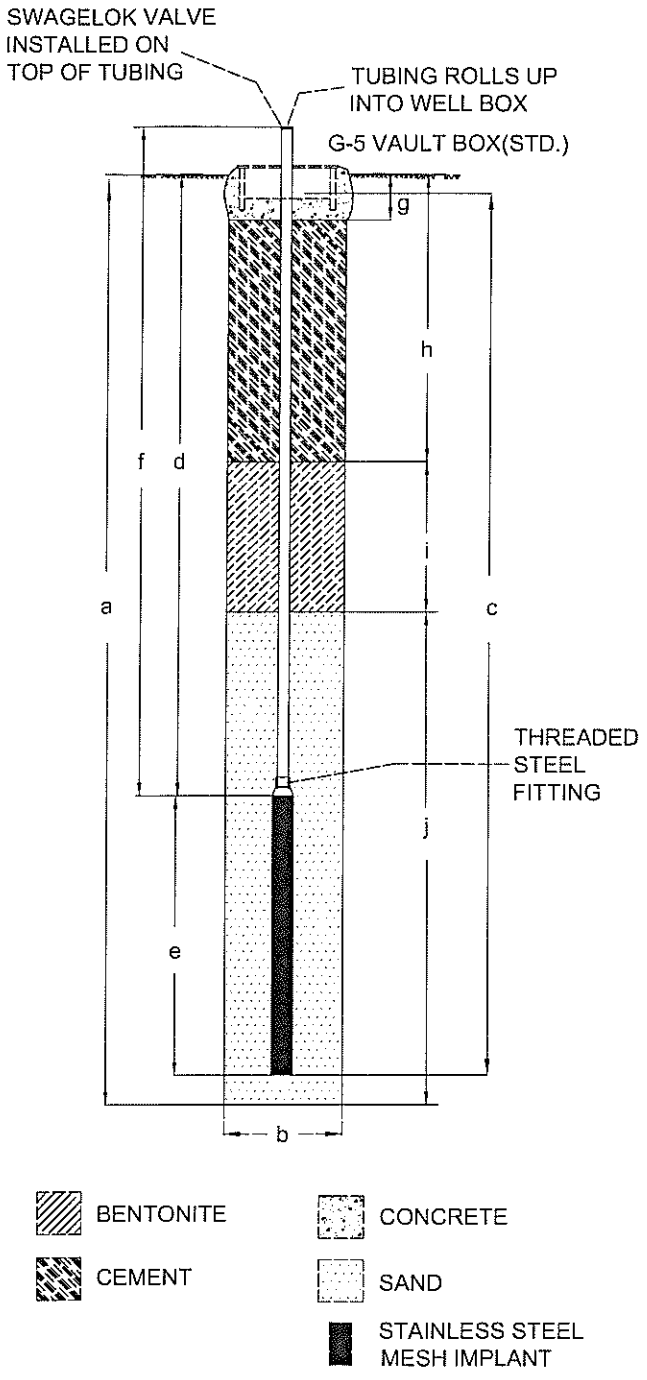
0600 -> OFFSITE

Collin Fischer

SOIL GAS WELL DETAILS

PROJECT NUMBER E11132
PROJECT NAME Former BP Service Station No. 11132
LOCATION 3201 35th Avenue, Oakland, California

BORING/WELL NO. SG-1
WELL PERMIT NO. W2009-0405
INSTALLATION DATE May 26, 2009



NOT TO SCALE

EXPLORATORY BORING

a. TOTAL DEPTH 3.5 ft.
b. DIAMETER 6 in.
DRILLING METHOD Hand Augering

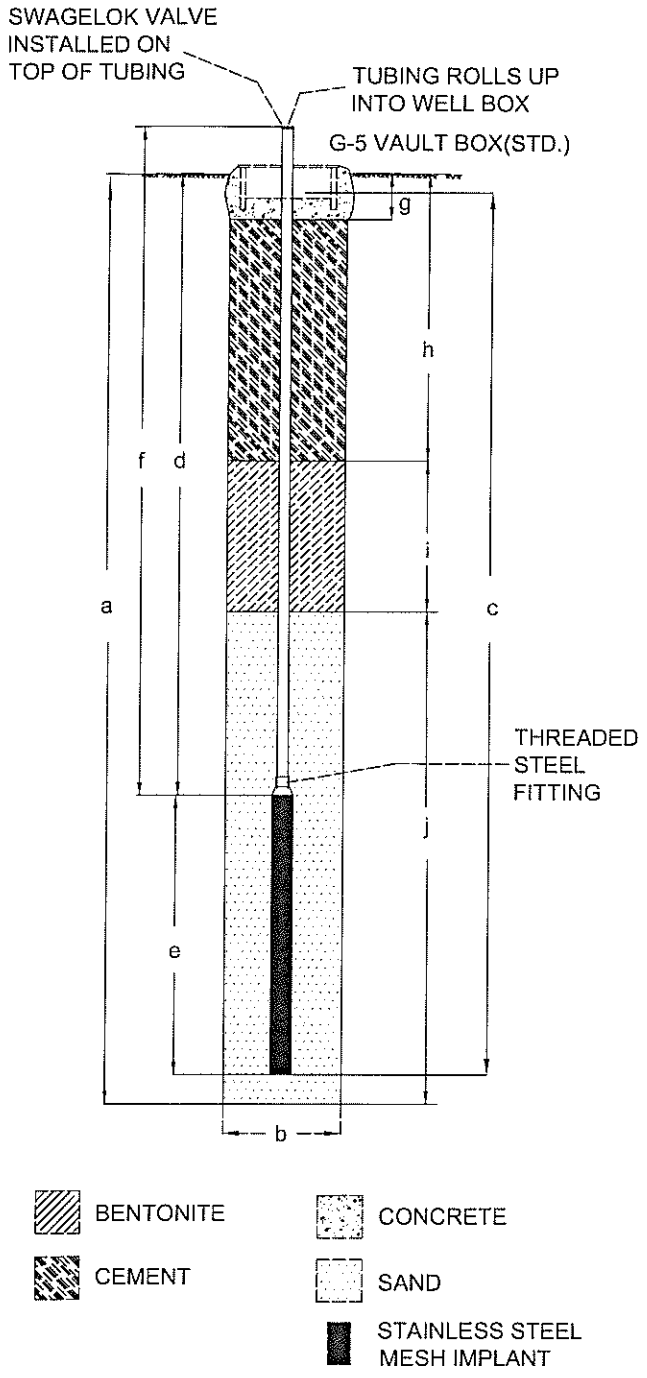
WELL CONSTRUCTION

c. TOTAL WELL DEPTH 3.5 ft.
WELL SCREEN MATERIAL 3/8" dia. Stainless steel mesh implant
d. DEPTH TO TOP PERFORATIONS 3.0 ft.
e. PERFORATED
INTERVAL FROM 3.0 TO 3.5 ft.
f. LENGTH OF TUBING 7 ft.
TUBING CONNECTED TO WELL SCREEN AT 3.0 ft.
TUBING DIAMETER 0.25 in.
TUBING MATERIAL Nyaflow
g. SURFACE SEAL 0 to 0.5 ft.
SEAL MATERIAL Concrete
h. BACKFILL 0.5 to 1.0 ft.
BACKFILL MATERIAL Neat Cement
i. SEAL 1.0 to 2.5 ft.
SEAL MATERIAL Bentonite
j. FILTER PACK 2.5 to 3.5 ft.
FILTER PACK MATERIAL #2/12 Sand

SOIL GAS WELL DETAILS

PROJECT NUMBER E11132
PROJECT NAME Former BP Service Station No. 11132
LOCATION 3201 35th Avenue, Oakland, California

BORING/WELL NO. SG-2
WELL PERMIT NO. W2009-0405
INSTALLATION DATE May 26, 2009



NOT TO SCALE

EXPLORATORY BORING

a. TOTAL DEPTH 3.5 ft.
b. DIAMETER 6 in.
DRILLING METHOD Hand Augering

WELL CONSTRUCTION

c. TOTAL WELL DEPTH 3.5 ft.
WELL SCREEN MATERIAL 3/8" dia. Stainless steel mesh implant
d. DEPTH TO TOP PERFORATIONS 3.0 ft.
e. PERFORATED
INTERVAL FROM 3.0 TO 3.5 ft.
f. LENGTH OF TUBING 7 ft.
TUBING CONNECTED TO WELL SCREEN AT 3.0 ft.
TUBING DIAMETER 0.25 in.
TUBING MATERIAL Nyaflow
g. SURFACE SEAL 0 to 0.5 ft.
SEAL MATERIAL Concrete
h. BACKFILL 0.5 to 1.0 ft.
BACKFILL MATERIAL Neat Cement
i. SEAL 1.0 to 2.5 ft.
SEAL MATERIAL Bentonite
j. FILTER PACK 2.5 to 3.5 ft.
FILTER PACK MATERIAL #2/12 Sand

Alameda County Public Works Agency - Water Resources Well Permit

399 Elmhurst Street
Hayward, CA 94544-1395
Telephone: (510)670-6633 Fax:(510)782-1939

Application Approved on: 05/07/2009 By jamesy

Permit Numbers: W2009-0405
Permits Valid from 05/26/2009 to 05/26/2009

Application Id: 1241732820270 **City of Project Site:** Oakland
Site Location: 3201 35th Avenue, Oakland, CA 94612
Project Start Date: 05/26/2009 **Completion Date:** 05/26/2009
Assigned Inspector: Contact Vicky Hamlin at (510) 670-5443 or vickyh@acpwa.org

Applicant: Stratus Environmental - Scott Bittinger **Phone:** 530-676-2062
3330 Cameron Park Dr #550, Cameron Park, CA 95682
Property Owner: Conoco Phillips **Phone:** 925-277-2335
PO Box 1539, Paso Robles, CA 93447
Client: ** same as Property Owner **

	Total Due:	$230.00
Receipt Number: WR2009-0174	**Total Amount Paid:**	$230.00
Payer Name : Stratus Environmental	Paid By: CHECK	**PAID IN FULL**

Works Requesting Permits:

Remediation Well Construction-Vapor Remediation Well - 2 Wells
Driller: RSi Drilling - Lic #: 802334 - Method: Hand **Work Total: $230.00**

Specifications

Permit #	Issued Date	Expire Date	Owner Well Id	Hole Diam.	Casing Diam.	Seal Depth	Max. Depth
W2009-0405	05/07/2009	08/24/2009	SG-1	6.00 in.	0.50 in.	2.00 ft	4.00 ft
W2009-0405	05/07/2009	08/24/2009	SG-2	6.00 in.	0.50 in.	2.00 ft	4.00 ft

Specific Work Permit Conditions

1. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.

2. Permitte, permittee's contractors, consultants or agents shall be responsible to assure that all material or waters generated during drilling, boring destruction, and/or other activities associated with this Permit will be safely handled, properly managed, and disposed of according to all applicable federal, state, and local statutes regulating such. In no case shall these materials and/or waters be allowed to enter, or potentially enter, on or off-site storm sewers, dry wells, or waterways or be allowed to move off the property where work is being completed.

3. Compliance with the well-sealing specifications shall not exempt the well-sealing contractor from complying with appropriate State reporting-requirements related to well construction or destruction (Sections 13750 through 13755 (Division 7, Chapter 10, Article 3) of the California Water Code). Contractor must complete State DWR Form 188 and mail original to the Alameda County Public Works Agency, Water Resources Section, within 60 days. Including permit number and site map.

4. Applicant shall submit the copies of the approved encroachment permit to this office within 60 days.

5. Applicant shall contact Vicky Hamlin for an inspection time at 510-670-5443 or email to vickyh@acpwa.org at least five (5) working days prior to starting, once the permit has been approved. Confirm the scheduled date(s) at least 24 hours

prior to drilling.

6. Minimum seal depth (Neat Cement Seal) is 2 feet below ground surface (BGS).

7. Minimum surface seal thickness is two inches of cement grout placed by tremie

8. Copy of approved drilling permit must be on site at all times. Failure to present or show proof of the approved permit application on site shall result in a fine of $500.00.

9. Prior to any drilling activities onto any public right-of-ways, it shall be the applicants responsibilities to contact and coordinate a Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits required for that City or to the County and follow all City or County Ordinances. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County a Traffic Safety Plan for any lane closures or detours planned. No work shall begin until all the permits and requirements have been approved or obtained.

CONFIDENTIAL

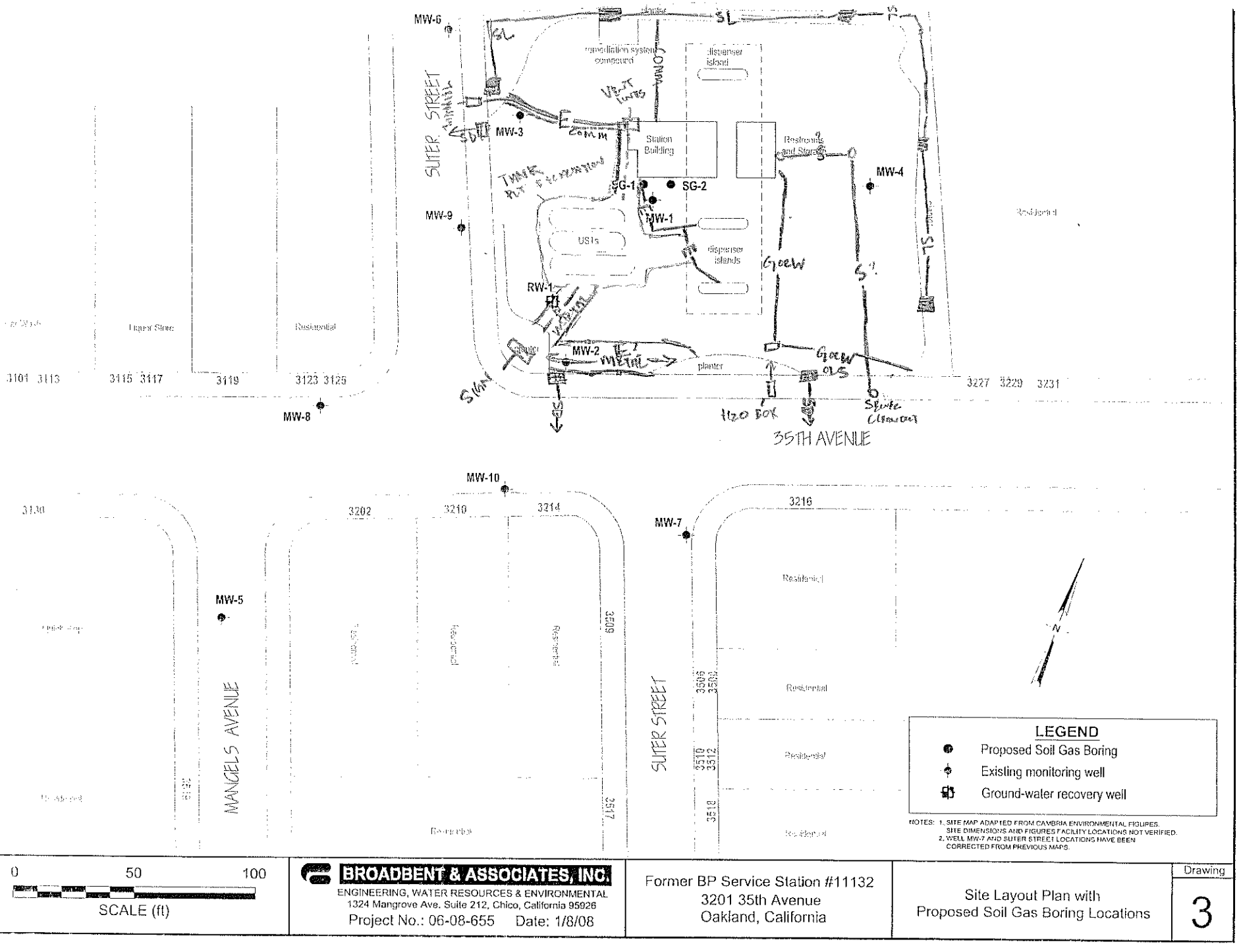
STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

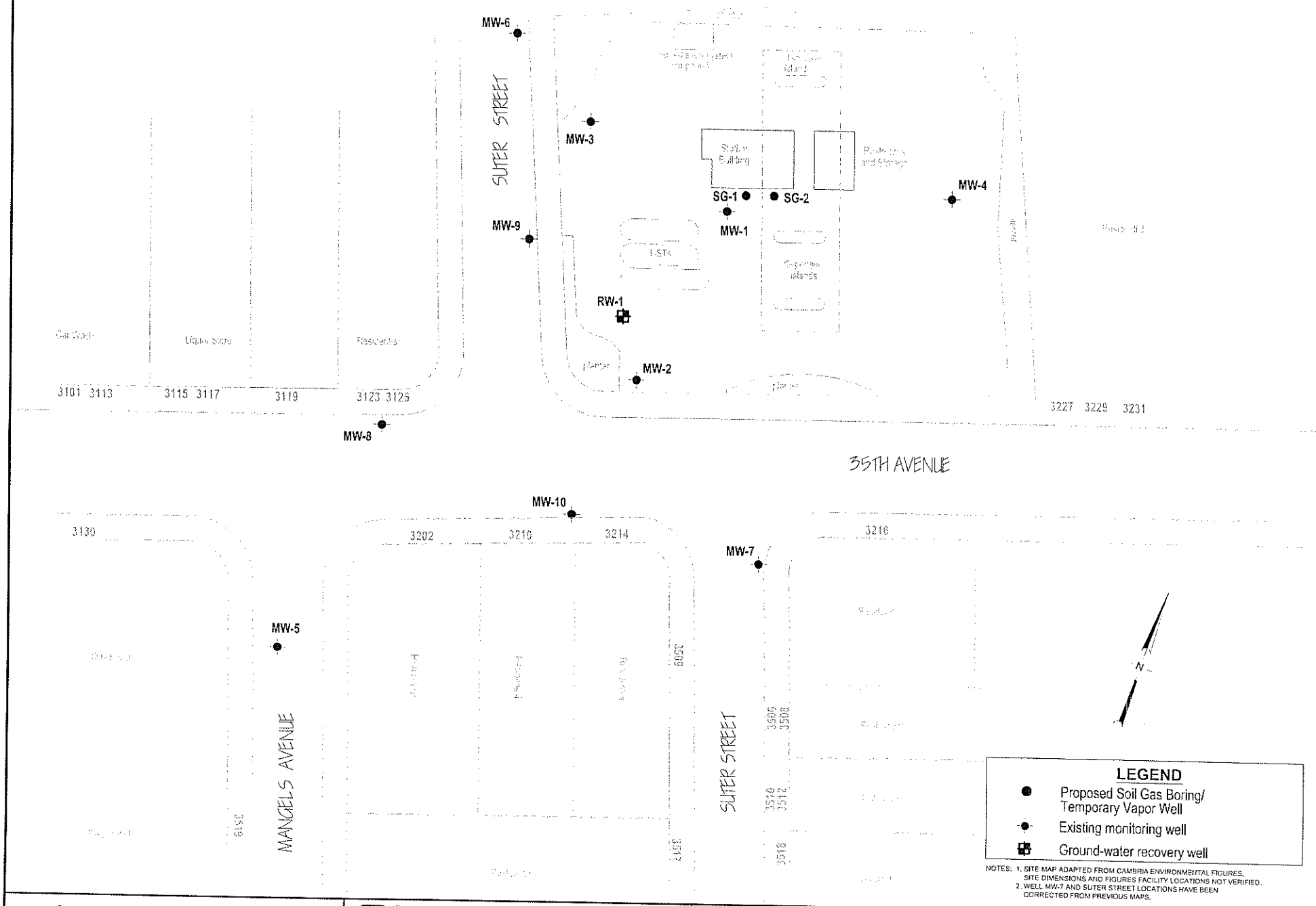


BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
1324 Mangrove Ave. Suite 212, Chico, California 95926
Project No.: 06-08-655 Date: 1/8/08

Former BP Service Station #11132
3201 35th Avenue
Oakland, California

Site Layout Plan with
Proposed Soil Gas Boring Locations

Drawing
3



0 50 100
SCALE (ft)

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
1324 Mangrove Ave. Suite 212, Chico, California 95926
Project No.: 06-08-655 Date: 3/20/09

Former BP Service Station #11132
3201 35th Avenue
Oakland, California

Revised Site Layout Plan with
Proposed Soil Gas Sampling Locations

Drawing
1

Calscience
Environmental
Laboratories, Inc.

June 18, 2009

Jay Johnson
Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Subject: **Calscience Work Order No.:** **09-06-0906**
Client Reference: **ARCO 11132**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 6/10/2009 and analyzed in accordance with the attached chain-of-custody.

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

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

Sincerely,

Calscience Environmental
Laboratories, Inc.
Richard Villafania
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Date Received: 06/10/09
Work Order No: 09-06-0906
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: ARCO 11132

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SG-1	**09-06-0906-1-A**	**06/08/09 04:40**	**Air**	**GC 36**	**N/A**	**06/10/09 00:00**	**090610L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Methane	ND	1.06	2.12		Oxygen + Argon	15.4	1.06	2.12	
Carbon Dioxide	7.80	1.06	2.12						

SG-2	**09-06-0906-2-A**	**06/08/09 05:43**	**Air**	**GC 36**	**N/A**	**06/10/09 00:00**	**090610L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Methane	ND	1.02	2.04		Oxygen + Argon	14.1	1.02	2.04	
Carbon Dioxide	9.39	1.02	2.04						

Method Blank	**099-03-002-811**	**N/A**	**Air**	**GC 36**	**N/A**	**06/10/09 00:00**	**090610L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Methane	ND	0.500	1		Oxygen + Argon	ND	0.500	1	
Carbon Dioxide	ND	0.500	1						

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Date Received: 06/10/09
Work Order No: 09-06-0906
Preparation: N/A
Method: EPA TO-15
Units: mg/m3

Project: ARCO 11132

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SG-1	**09-06-0906-1-A**	**06/08/09 04:40**	**Air**	**GC/MS ZZ**	**N/A**	**06/12/09 20:34**	**090612L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	0.0090	0.0034	2.12		Xylenes (total)	0.82	0.018	8.48	
Diisopropyl Ether (DIPE)	ND	0.018	2.12		Tert-Amyl-Methyl Ether (TAME)	ND	0.018	2.12	
Ethyl-t-Butyl Ether (ETBE)	ND	0.018	2.12		Tert-Butyl Alcohol (TBA)	ND	0.013	2.12	
Ethylbenzene	0.15	0.0046	2.12		Toluene	0.22	0.0040	2.12	
Methyl-t-Butyl Ether (MTBE)	ND	0.015	2.12		Isopropanol	ND	0.026	2.12	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	102	57-129			1,2-Dichloroethane-d4	104	47-137		
Toluene-d8	98	78-156							

SG-2	**09-06-0906-2-A**	**06/08/09 05:43**	**Air**	**GC/MS ZZ**	**N/A**	**06/12/09 21:19**	**090612L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	0.0073	0.0033	2.04		Xylenes (total)	0.37	0.018	2.04	
Diisopropyl Ether (DIPE)	ND	0.017	2.04		Tert-Amyl-Methyl Ether (TAME)	ND	0.017	2.04	
Ethyl-t-Butyl Ether (ETBE)	ND	0.017	2.04		Tert-Butyl Alcohol (TBA)	ND	0.012	2.04	
Ethylbenzene	0.059	0.0044	2.04		Toluene	0.080	0.0038	2.04	
Methyl-t-Butyl Ether (MTBE)	ND	0.015	2.04		Isopropanol	ND	0.025	2.04	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	98	57-129			1,2-Dichloroethane-d4	102	47-137		
Toluene-d8	100	78-156							

Method Blank	**095-01-021-7,765**	**N/A**	**Air**	**GC/MS ZZ**	**N/A**	**06/12/09 15:28**	**090612L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.0016	1		Xylenes (total)	ND	0.0087	1	
Diisopropyl Ether (DIPE)	ND	0.0084	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.0084	1	
Ethyl-t-Butyl Ether (ETBE)	ND	0.0084	1		Tert-Butyl Alcohol (TBA)	ND	0.0061	1	
Ethylbenzene	ND	0.0022	1		Toluene	ND	0.0019	1	
Methyl-t-Butyl Ether (MTBE)	ND	0.0072	1		Isopropanol	ND	0.012	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	102	57-129			1,2-Dichloroethane-d4	110	47-137		
Toluene-d8	96	78-156							

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	06/10/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-06-0906
Cameron Park, CA 95682-8861	Preparation:	N/A
	Method:	EPA TO-15
	Units:	mg/m3
Project: ARCO 11132		Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**095-01-021-7,775**	**N/A**	**Air**	**GC/MS ZZ**	**N/A**	**06/13/09 12:36**	**090613L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.0016	1		Xylenes (total)	ND	0.0087	1	
Diisopropyl Ether (DIPE)	ND	0.0084	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.0084	1	
Ethyl-t-Butyl Ether (ETBE)	ND	0.0084	1		Tert-Butyl Alcohol (TBA)	ND	0.0061	1	
Ethylbenzene	ND	0.0022	1		Toluene	ND	0.0019	1	
Methyl-t-Butyl Ether (MTBE)	ND	0.0072	1		Isopropanol	ND	0.012	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	102	57-129			1,2-Dichloroethane-d4	108	47-137		
Toluene-d8	96	78-156							

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	06/10/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-06-0906
Cameron Park, CA 95682-8861	Preparation:	N/A
	Method:	EPA TO-3M

Project: ARCO 11132

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SG-1	**09-06-0906-1-A**	**06/08/09 04:40**	**Air**	**GC 38**	**N/A**	**06/10/09 15:19**	**090610L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	81	2.12		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SG-2	**09-06-0906-2-A**	**06/08/09 05:43**	**Air**	**GC 38**	**N/A**	**06/10/09 15:58**	**090610L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	78	2.04		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-685-161**	**N/A**	**Air**	**GC 38**	**N/A**	**06/10/09 08:45**	**090610L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	38	1		mg/m3

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

Calscience Environmental Laboratories, Inc.

Quality Control - Duplicate

Stratus Environmental, inc.	Date Received:	06/10/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-06-0906
Cameron Park, CA 95682-8861	Preparation:	N/A
	Method:	EPA TO-3M

Project: ARCO 11132

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
SG-2	**Air**	**GC 38**	**N/A**	**06/10/09**	**090610D01**

Parameter	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	ND	ND	NA	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.		Date Received:	N/A
3330 Cameron Park Drive, Suite 550		Work Order No:	09-06-0906
Cameron Park, CA 95682-8861		Preparation:	N/A
		Method:	ASTM D-1946

Project: ARCO 11132

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-03-002-811	**Air**	**GC 36**	**N/A**	**06/10/09**	**090610L01**

Parameter	LCS Conc	LCSD Conc	RPD	RPD CL	Qualifiers
Carbon Dioxide	4.984	5.057	1	0-30	
Oxygen + Argon	18.58	18.62	0	0-30	
Nitrogen	63.63	63.66	0	0-30	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.		Date Received:	N/A
3330 Cameron Park Drive, Suite 550		Work Order No:	09-06-0906
Cameron Park, CA 95682-8861		Preparation:	N/A
		Method:	EPA TO-15

Project: ARCO 11132

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
095-01-021-7,765	**Air**	**GC/MS ZZ**	**N/A**	**06/12/09**	**090612L01**

Parameter	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
Benzene	103	109	60-156	44-172	5	0-40	
Carbon Tetrachloride	128	138	64-154	49-169	8	0-32	
1,2-Dibromoethane	103	109	54-144	39-159	5	0-36	
1,2-Dichlorobenzene	105	113	34-160	13-181	7	0-47	
1,2-Dichloroethane	111	114	69-153	55-167	3	0-30	
1,2-Dichloropropane	104	110	67-157	52-172	6	0-35	
1,4-Dichlorobenzene	105	114	36-156	16-176	8	0-47	
c-1,3-Dichloropropene	119	127	61-157	45-173	6	0-35	
Ethylbenzene	106	112	52-154	35-171	6	0-38	
o-Xylene	107	115	52-148	36-164	6	0-38	
p/m-Xylene	101	107	42-156	23-175	6	0-41	
Tetrachloroethene	107	114	56-152	40-168	6	0-40	
Toluene	99	103	56-146	41-161	4	0-43	
Trichloroethene	108	117	63-159	47-175	8	0-34	
1,1,2-Trichloroethane	106	114	65-149	51-163	8	0-37	
Vinyl Chloride	103	106	45-177	23-199	3	0-36	

Total number of LCS compounds : 16
Total number of ME compounds : 0
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Date Received: N/A
Work Order No: 09-06-0906
Preparation: N/A
Method: EPA TO-15

Project: ARCO 11132

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
095-01-021-7,775	**Air**	**GC/MS ZZ**	**N/A**	**06/13/09**	**090613L01**

Parameter	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
Benzene	106	110	60-156	44-172	4	0-40	
Carbon Tetrachloride	132	139	64-154	49-169	5	0-32	
1,2-Dibromoethane	110	113	54-144	39-159	2	0-36	
1,2-Dichlorobenzene	109	110	34-160	13-181	1	0-47	
1,2-Dichloroethane	117	117	69-153	55-167	0	0-30	
1,2-Dichloropropane	108	111	67-157	52-172	3	0-35	
1,4-Dichlorobenzene	110	113	36-156	16-176	3	0-47	
c-1,3-Dichloropropene	122	127	61-157	45-173	3	0-35	
Ethylbenzene	112	115	52-154	35-171	3	0-38	
o-Xylene	112	116	52-148	36-164	3	0-38	
p/m-Xylene	105	108	42-156	23-175	3	0-41	
Tetrachloroethene	115	120	56-152	40-168	4	0-40	
Toluene	106	107	56-146	41-161	1	0-43	
Trichloroethene	112	118	63-159	47-175	5	0-34	
1,1,2-Trichloroethane	110	114	65-149	51-163	3	0-37	
Vinyl Chloride	109	112	45-177	23-199	3	0-36	

Total number of LCS compounds : 16
Total number of ME compounds : 0
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 09-06-0906

Qualifier	Definition
AX	Sample too dilute to quantify surrogate.
BA	Relative percent difference out of control.
BA,AY	BA = Relative percent difference out of control. AY = Matrix interference suspected.
BB	Sample > 4x spike concentration.
BF	Reporting limits raised due to high hydrocarbon background.
BH	Reporting limits raised due to high level of non-target analytes.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
BY	Sample received at improper temperature.
BZ	Sample preserved improperly.
CL	Initial analysis within holding time but required dilution.
CQ	Analyte concentration greater than 10 times the blank concentration.
CU	Surrogate concentration diluted to not detectable during analysis.
DF	Reporting limits elevated due to matrix interferences.
DU	Insufficient sample quantity for matrix spike/dup matrix spike.
ET	Sample was extracted past end of recommended max. holding time.
EY	Result exceeds normal dynamic range; reported as a min est.
GR	Internal standard recovery is outside method recovery limit.
IB	CCV recovery abovelimit; analyte not detected.
IH	Calibrtn. verif. recov. below method CL for this analyte.
IJ	Calibrtn. verif. recov. above method CL for this analyte.
J,DX	J=EPA Flag -Estimated value; DX= Value < lowest standard (MQL), but > than MDL.
LA	Confirmatory analysis was past holding time.
LG,AY	LG= Surrogate recovery below the acceptance limit. AY= Matrix interference suspected.
LH,AY	LH= Surrogate recovery above the acceptance limit. AY= Matrix interference suspected.
LM,AY	LM= MS and/or MSD above acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LN,AY	LN= MS and/or MSD below acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LQ	LCS recovery above method control limits.

Work Order Number: 09-06-0906

Qualifier	Definition
LR	LCS recovery below method control limits.
LW	Quantitation of unknown hydrocarbon(s) in sample based on gasoline.
LX	Quantitation of unknown hydrocarbon(s) in sample based on diesel.
MB	Analyte present in the method blank.
PC	Sample taken from VOA vial with air bubble > 6mm diameter.
PI	Primary and confirm results varied by > than 40% RPD.
RB	RPD exceeded method control limit; % recoveries within limits.
SG	A silica gel cleanup procedure was performed.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture.

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name:
BP/ARC Facility No:
Req Due Date (mm/dd/yy): 0906
Lab Work Order Number:
Rush TAT: Yes ___ No X
Page 1 of 1

Lab Name: CALSCIENCE	BP/ARC Facility Address: 3201 35TH AVE, OAKLAND	Consultant/Contractor: STANTEC BAU - UNC.
Lab Address: 7440 LINCOLN WAY, GARDEN GROVE	City, State, ZIP Code: OAKLAND, CA.	Consultant/Contractor Project No:
Lab PM: RICHARD V.	Lead Regulatory Agency: ACPWA	Address: 3330 CAMINO DEL RIO N #550
Lab Phone: (714) 895 5494	California Global ID No.: T0600100213	Consultant/Contractor PM: JAY JOHNSON
Lab Shipping Acct: 9255	Enfos Proposal No:	Phone: (530) 676 6000
Lab Bottle Order No:	Accounting Mode: Provision X OOC-BU ___ OOC-RM ___	Email EDD To: CHARP@STANTEC.NET
Other Info:	Stage: Activity:	Invoice To: BP/ARC X Contractor ___
BP/ARC EBM: PAUL SUPPLE		
EBM Phone:		
EBM Email:		

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol	Requested Analyses: 8260 (TO-15)	DBE (TO-15)	* SOIG (TO-15)	O_2 (ASTM D-1946)	CO_2 (ASTM D-1946)	CH_4 (ASTM D-1946)	ISOBUTYL ALCOHOL (TO-15)
1	SG-1	06 APR 09	0440		X		1						X	X	X	X	X	X	X
2	SG-2	↓	0543		X		1						X	X	X	X	X	X	X

Report Type & QC Level
Standard ___
Full Data Package ___

Comments
Note: If sample not collected, indicate "No Sample" In comments and single-strike out and initial any preprinted sample description.

ISOBUTYL ALCOHOL by TRACER GRAM

* SOIG = MTBE, ETBE, DIPE, TAME, TBA

Sampler's Name: CA	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: STANTEC		06APR09	1800			
Shipment Method: FEDEX Ship Date: 06APR09						
Shipment Tracking No: #106160208						
Special Instructions:						

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: ___ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

BP/ARC LaMP COC Rev. 6, 01/01/2009

0906

Clear
060808

ARCO UB32 - Collin Fischer

0330 -> ONSITE, fill out shipping paperwork, set up

Well #	Flowcnt	Summa #	Leak start	Leak stop	Purge start	Purge stop	Sample start	Sample stop
SG-1	#61	D375	0350 (-30)	0400 (-30)	0400 (-30)	0417 (-15)	0417 (-30)	0440 (-10)
SG-2	A202	D369	0445 (-30)	0505 (-30)	0505 (-30)	0521 (-15)	0521 (-30)	0543 (-10)

0550 -> Clear

0600 -> OFFSITE

Collin Fischer

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 09-06- 0 9 0 6

SAMPLE RECEIPT FORM

Cooler 0 of 0

CLIENT: STRATUS

DATE: 06 / 10 / 09

TEMPERATURE: (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature ____.____ °C - 0.2 °C (CF) = ____.____ °C ☐ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☑ Air ☐ Filter ☐ Metals Only ☐ PCBs Only **Initial:** PS

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☑ N/A **Initial:** PS 6/10/09

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present **Initial:** D.L

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☐	☑	☐
☑ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Correct containers and volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
Proper preservation noted on COC or sample container	☐	☐	☑
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve ☐EnCores® ☐TerraCores® ☐_____

Water: ☐VOA ☐VOA**h** ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☐1AGB ☐1AGB**na$_2$** ☐1AGB**s** ☐500AGB ☐500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐500PB ☐500PB**na** ☐250PB ☐250PB**n** ☐125PB ☐125PB**znna** ☐100PB ☐100PB**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☑Summa® * ☐_____ **Other:** ☐_____ **Checked/Labeled by:** D.L

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar (Wide-mouth) B: Bottle (Narrow-mouth) **Reviewed by:** PS

Preservative: h: HCL n: HNO_3 na$_2$: $Na_2S_2O_3$ Na: NaOH p: H_3PO_4 s: H_2SO_4 znna: $ZnAc_2$+NaOH f: Field-filtered **Scanned by:** D.L

* 1 container per sample

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 09-06-0906

SAMPLE ANOMALY FORM

SAMPLES - CONTAINERS & LABELS:

- ☐ **Samples NOT RECEIVED but listed on COC**
- ☐ **Samples received but NOT LISTED on COC**
- ☐ **Holding time expired** – list sample ID(s) and test
- ☐ **Insufficient quantities for analysis** – list test
- ☐ **Improper container(s)/preservative used** – list test
- ☐ **No preservative noted on COC or label** – list test & notify lab
- ☐ **Sample labels illegible** – note test/container type
- ☐ **Sample labels do not match COC** – Note in comments
  - ☐ **Sample ID**
  - ☐ **Date and/or Time Collected**
  - ☐ **Project Information**
  - ☐ **# of containers**
- ☐ **Sample containers compromised** – Note in comments
  - ☐ **Leaking**
  - ☐ **Broken**
  - ☐ **Without Labels**
- ☐ **Air sample containers compromised** – Note in comments
  - ☐ **Flat**
  - ☐ **Very low in volume**
  - ☐ **Leaking (transferred into Calscience Tedlar® Bag*)**
  - ☐ **Leaking (transferred into Client's Tedlar® Bag*)**
- ☑ **Other:** See comments.

Comments:

(-1) & (-2) analysis not mark on COC

HEADSPACE – Containers with Bubble > 6mm or ¼ inch:

Sample #	Container ID(s)	# of Vials Received	Sample #	Container ID(s)	# of Vials Received	Sample #	Container ID(s)	# of RSK or CO_2 or DO Received

Comments:

*Transferred at Client's request.

Initial / Date D.L 6/10/09

Richard Villafania

From: Kiran Nagaraju [knagaraju@stratusinc.net]
Sent: Wednesday, June 10, 2009 2:09 PM
To: Richard Villafania
Cc: Terri Nguyen; chuff@stratusinc.net; mmorgan@stratusinc.net; 'Scott Bittinger'
Subject: RE: COC for Arco 11132 / CEL 09-06-0906
Attachments: Scan1928.pdf

Richard,

Here is the updated COC for 11132.

Thanks,
Kiran

From: Richard Villafania [mailto:RVillafania@calscience.com]
Sent: Wednesday, June 10, 2009 1:44 PM
To: Kiran Nagaraju
Cc: Terri Nguyen
Subject: RE: COC for Arco 11132 / CEL 09-06-0906

Hello Kiran,
It would be great if you can get back to me today, these are air samples and the tests may have short holding times. I also emailed another COC for BP 2030 which has the same issues. Thanks.

Richard

From: Kiran Nagaraju [mailto:knagaraju@stratusinc.net]
Sent: Wednesday, June 10, 2009 1:32 PM
To: Richard Villafania; chuff@stratusinc.net; mmorgan@stratusinc.net; 'Scott Bittinger'
Subject: RE: COC for Arco 11132 / CEL 09-06-0906

Richard,

Scott, project manager for this site, is not in the office today. Can this wait until tomorrow? Otherwise please let me know, I will research and get back to you.

Thanks,
Kiran

From: Richard Villafania [mailto:RVillafania@calscience.com]
Sent: Wednesday, June 10, 2009 12:12 PM
To: chuff@stratusinc.net; knagaraju@stratusinc.net; mmorgan@stratusinc.net
Subject: COC for Arco 11132 / CEL 09-06-0906

<<09-06-0906_coc.pdf>>

FYI - Please see the attached COC, assuming this is Arco 11132. Air samples received in Summa canisters, no tests checked off and numerous entries are blank. Please confirm reporting limits for GRO if needed, will report 10 ppm v/v unless otherwise instructed. Please fill out missing info on COC and email back. Thanks.

Richard Villafania

Calscience Environmental
Laboratories, Inc.
7440 Lincoln Way
Garden Grove, CA 92841-1427
Tel.: 714-895-5494
Fax : 714-894-7501
rvillafania@calscience.com

The difference is service

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: ARCO 11132 Soil Gas
BP/ARC Facility No: ARCO 11132, 3201 35th Ave Oakland
Req Due Date (mm/dd/yy): 0906
Rush TAT: Yes ___ No X
Page 1 of 1
Lab Work Order Number:

Lab Name: CalScience	BP/ARC Facility Address: 3201 35TH AVE, OAKLAND
Lab Address: 7440 Lincoln Way, Garden Grove	City, State, ZIP Code: OAKLAND, CA.
Lab PM: Hermo V.	Lead Regulatory Agency: ACPWA
Lab Phone: (714) 895 5494	California Global ID No.: T0600100213
Lab Shipping Accnt: 9255	Enfos Proposal No: 000MT-0005
Lab Bottle Order No:	Accounting Mode: Provision A OOC-BU ___ OOC-RM ___
Other Info:	Stage: SELECT Activity: FC
BP/ARC EBM: Paul Supple	
EBM Phone:	
EBM Email:	

Consultant/Contractor: Stantec Env. Inc.	
Consultant/Contractor Project No: E11	
Address: 3338 Cameron Park Dr. #550	
Consultant/Contractor PM: Jay Johnson	
Phone: (530) 676 6000	
Email EDD To: CHeath@stantec.com	
Invoice To: BP/ARC X Contractor ___	

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol
1	Sg-1	06/24/09	0440			X	1					
2	Sg-2	↓	0543			X	1					

Requested Analyses: GRO (TO-15); BTEX (TO-15); *Soil Gas (TO-15); O_2 (ASTM D-1946); CO_2 (ASTM D-1946); CH4 (ASTM D-1946); Isopropyl Alcohol (TO-15)

Report Type & QC Level: Standard X; Full Data Package ___

Comments:
Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

Isopropyl Alcohol
Tracer Gas

* Soil Gas ⇒ MTBE, ETBE, DIPE, TAME, TBA

Sampler's Name: CH	
Sampler's Company: Stantec	
Shipment Method: GSO	Ship Date: 06/24/09
Shipment Tracking No: #106160208	
Special Instructions:	

Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
[signature]	6/24/09	1800	Stacy A. CCL	6/10/09	10:30

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: ___ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

APPENDIX C

GEOTRACKER UPLOAD CONFIRMATION RECEIPTS

STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A EDF FILE

SUCCESS

Processing is complete. No errors were found!
Your file has been successfully submitted!

Submittal Type:	**EDF - Site Investigation**
Submittal Title:	**Vapor Intrusion Assessment Sampling 0609**
Facility Global ID:	**T0600100213**
Facility Name:	**BP #11132**
File Name:	**09060906.zip**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**67.118.40.90**
Submittal Date/Time:	**7/13/2009 4:50:22 PM**
Confirmation Number:	**3975516080**

VIEW QC REPORT

VIEW DETECTIONS REPORT

STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A GEO_MAP FILE

SUCCESS

Your GEO_MAP file has been successfully submitted!

Submittal Type:	**GEO_MAP**
Facility Global ID:	**T0600100213**
Facility Name:	**BP #11132**
File Name:	**11132 GEO_MAP.pdf**
Username:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**67.118.40.90**
Submittal Date/Time:	**7/14/2009 9:50:56 AM**
Confirmation Number:	**6232857823**

STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A EDF FILE

SUCCESS

Processing is complete. No errors were found!
Your file has been successfully submitted!

Submittal Type:	**EDF - Other Report / Document**
Submittal Title:	**DPE Test - AIR 5-11-2009 - Baseline EFF, RW-1 INF**
Facility Global ID:	**T0600100213**
Facility Name:	**BP #11132**
File Name:	**09051008.zip**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**67.118.40.90**
Submittal Date/Time:	**7/8/2009 11:01:22 AM**
Confirmation Number:	**9697359383**

VIEW QC REPORT

VIEW DETECTIONS REPORT

STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A EDF FILE

SUCCESS

Processing is complete. No errors were found!
Your file has been successfully submitted!

Submittal Type:	**EDF - Other Report / Document**
Submittal Title:	**DPE TEST - AIR 5-12-2009 - MW-8, MW-9 INF**
Facility Global ID:	**T0600100213**
Facility Name:	**BP #11132**
File Name:	**09051126.zip**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**67.118.40.90**
Submittal Date/Time:	**7/8/2009 11:01:42 AM**
Confirmation Number:	**1298860847**

VIEW QC REPORT

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STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A EDF FILE

SUCCESS

Processing is complete. No errors were found!
Your file has been successfully submitted!

Submittal Type:	**EDF - Other Report / Document**
Submittal Title:	**DPE TEST - AIR 5-13 to 5-14-2009 - MW-1, MW-10 INF**
Facility Global ID:	**T0600100213**
Facility Name:	**BP #11132**
File Name:	**09051392.zip**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**67.118.40.90**
Submittal Date/Time:	**7/8/2009 11:02:03 AM**
Confirmation Number:	**3299333870**

VIEW QC REPORT

VIEW DETECTIONS REPORT

STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A EDF FILE

SUCCESS

Processing is complete. No errors were found!
Your file has been successfully submitted!

Submittal Type:	**EDF - Other Report / Document**
Submittal Title:	**DPE TEST - AIR 5-15-2009 - MW-2 INF**
Facility Global ID:	**T0600100213**
Facility Name:	**BP #11132**
File Name:	**09051509.zip**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**67.118.40.90**
Submittal Date/Time:	**7/8/2009 11:03:08 AM**
Confirmation Number:	**6261300504**

VIEW QC REPORT

VIEW DETECTIONS REPORT

STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A EDF FILE

SUCCESS

Processing is complete. No errors were found!
Your file has been successfully submitted!

Submittal Type:	**EDF - Other Report / Document**
Submittal Title:	**DPE TEST - AIR 5-18-2009 - MW-1, MW-2, RW-1 INF**
Facility Global ID:	**T0600100213**
Facility Name:	**BP #11132**
File Name:	**09051648.zip**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**67.118.40.90**
Submittal Date/Time:	**7/8/2009 11:03:27 AM**
Confirmation Number:	**9805337071**

VIEW QC REPORT

VIEW DETECTIONS REPORT

STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A EDF FILE

SUCCESS

Processing is complete. No errors were found!
Your file has been successfully submitted!

Submittal Type:	**EDF - Other Report / Document**
Submittal Title:	**DPE TEST - AIR 5-19-2009 - MW-1, MW-2, RW-1 INF**
Facility Global ID:	**T0600100213**
Facility Name:	**BP #11132**
File Name:	**09051765.zip**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**67.118.40.90**
Submittal Date/Time:	**7/8/2009 11:03:44 AM**
Confirmation Number:	**5844290494**

VIEW QC REPORT

VIEW DETECTIONS REPORT

STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A EDF FILE

SUCCESS

Processing is complete. No errors were found!
Your file has been successfully submitted!

Submittal Type:	EDF - Other Report / Document
Submittal Title:	DPE TEST - WATER 5-11 to 5-14-2009 - MW-1, MW-8, MW-9, MW-10, RW-1 INF
Facility Global ID:	T0600100213
Facility Name:	BP #11132
File Name:	09051393.zip
Organization Name:	Broadbent & Associates, Inc.
Username:	BROADBENT-C
IP Address:	67.118.40.90
Submittal Date/Time:	7/8/2009 11:02:24 AM
Confirmation Number:	7835039436

VIEW QC REPORT

VIEW DETECTIONS REPORT

STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A EDF FILE

SUCCESS

Processing is complete. No errors were found!
Your file has been successfully submitted!

Submittal Type:	**EDF - Other Report / Document**
Submittal Title:	**DPE TEST - WATER 5-15-2009 - MW-2 INF**
Facility Global ID:	**T0600100213**
Facility Name:	**BP #11132**
File Name:	**09051508.zip**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**67.118.40.90**
Submittal Date/Time:	**7/8/2009 11:02:50 AM**
Confirmation Number:	**1404192268**

VIEW QC REPORT

VIEW DETECTIONS REPORT

STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A EDF FILE

SUCCESS

Processing is complete. No errors were found!
Your file has been successfully submitted!

Submittal Type:	**EDF - Other Report / Document**
Submittal Title:	**DPE TEST - WATER 5-18 to 5-19-2009 - MW-1, MW-2, RW-1 INF**
Facility Global ID:	**T0600100213**
Facility Name:	**BP #11132**
File Name:	**09051766.zip**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**67.118.40.90**
Submittal Date/Time:	**7/8/2009 11:04:01 AM**
Confirmation Number:	**4793786168**

VIEW QC REPORT

VIEW DETECTIONS REPORT

APPENDIX D

STRATUS DUAL-PHASE EXTRACTION TEST DATA PACKAGE
(Includes Field Data Sheets and Laboratory Analytical Reports with Chain-of-Custody Documentation)

STRATUS
ENVIRONMENTAL, INC.

3330 Cameron Park Drive, Ste 550
Cameron Park, California 95682
(530) 676-6004 ~ Fax: (530) 676-6005

June 5, 2009

Mr. Rob Miller
Broadbent & Associates, Inc.
2000 Kirman Avenue
Reno, Nevada 89502

Re: Dual Phase Extraction Test Data Package, Former ARCO Service Station No. 11132, located at 3201 35th Avenue, Oakland, California.

General Information

Data Submittal Prepared / Reviewed by: Kiran Nagaraju /Jay Johnson

Phone Number: (530) 676-6007 / (530) 676-6000

On-Site Supplier Representative: Chris Hill, Doug Foland, Kiran Nagaraju and Marty Morgan.

Scope of Work Performed: Conducted a DPE test between May 11, 2009 and May 19, 2009, in accordance with the *Dual-Phase Extraction Pilot Testing and Soil & Ground-Water Investigation Work Plan* (dated January 9, 2009).

Prior to the field activities, an application and traffic control plans were submitted (on March 16, 2009) to the City of Oakland requesting traffic and obstruction permits to utilize wells MW-8, M-9, and MW-10 for the pilot testing. The traffic and obstruction permits were issued by the City of Oakland on April 15, 2009.

In accordance with the Bay Area Air Quality Management District (BAAQMD) permit requirements, a notification letter regarding the DPE event was submitted to BAAQMD on April 29, 2009.

In accordance with the City of Oakland traffic permit requirements, Oakland Police, Oakland Fire, Alameda County Regional Transit, and the businesses and residences (in the vicinity of the intersection of 35th Avenue and Sutter Street) were given advance notice of the test and its duration.

Prior to the commencement of the pilot tests, the wellheads of the test wells were temporarily modified to facilitate the installation of a stinger. In addition, the observation wellheads were also temporarily modified to measure induced vacuum levels.

During the DPE event, air and water samples were collected in accordance with the frequency identified in the work plan. The following table summarizes the samples that were submitted to the laboratory for chemical analyses:

Test Well ID (Test Date)	System Influent Air	Influent Water
RW-1 (5/11/09)	1st hour, 5th hour, and 8th hour	1st hour, 5th hour, and 8th hour
MW-9 (5/12/09)	1st hour and 3rd hour	1st hour and 3rd hour
MW-8 (5/12/09)	1st hour and 4th hour	1st hour and 4th hour
MW-10 (5/13/09)	1st hour and 5th hour	1st hour and 5th hour
MW-1 (5/14/09)	1st hour, 7th hour, and 10th hour	1st hour, 7th hour, and 10th hour
MW-2 (5/1/509)	2nd hour, 3rd hour, and 5th hour	2nd hour, 3rd hour, and 5th hour
MW-1, MW-2, and RW-1 (5/18/09)	2nd hour, 6th hour, and 9th hour	2nd hour, 6th hour, and 9th hour
MW-1, MW-2, and RW-1 (5/19/09)	2nd hour, 6th hour, and 9th hour	2nd hour, 6th hour, and 9th hour

In addition, an effluent air sample was also collected on the first day of the test.

Variations from Work Scope: Upon discussion with Broadbent and Associates, Inc., the DPE test duration for wells MW-8 and MW-9 were shortened to approximately 4.5 hours and 3.5 hours, respectively, (instead of 12 hours/test) due to low influent vapor concentrations (measured using a PID). The combined well test (using wells MW-1, MW-2, and RW-1) was conducted for approximately 19.5 hours (instead of 12-hours) due to relatively high influent vapor concentrations.

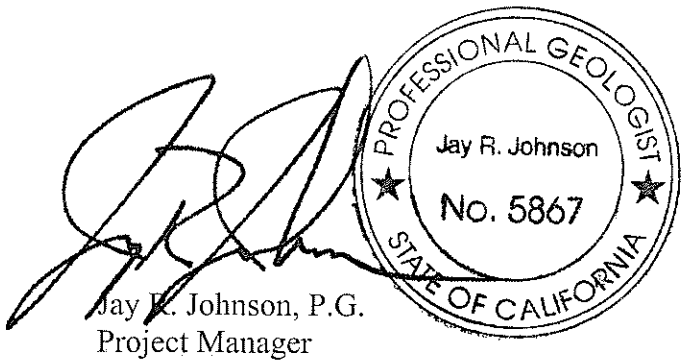
The attachments include field data sheets, certified analytical results with chain-of-custody documentation, and non-hazardous waste manifests. The information is being provided to BP-ARCO's Scoping Supplier for use in preparing a report for regulatory submittal. This submittal is limited to presentation of collected data and does not include data interpretation or conclusions or recommendations.

Any questions concerning this submittal should be addressed to the Preparer/Reviewer identified above.

Sincerely,

STRATUS ENVIRONMENTAL, INC.

Kiran Nagaraju
Project Engineer



Jay R. Johnson, P.G.
Project Manager

Attachments:

- Field Data Sheets
- Certfied Analytical Results with Chain of Custody Documentation
- Non-Hazardous Waste Manifest

cc: Mr. Paul Supple, BP/ARCO

Site Name & Address: Former ARCO No. 11132
3201 35th Avenue, Oakland

Test Well ID: Baseline

Date: 5-11-09

Operators: CHW

TWNSND

Date & Time	Induced Vacuum ("WC)												
	MW-1	MW-2	MW-3	MW-4	MW-7	MW-8	MW-9	MW-10	RW-1				
0500	0	0	0	0	0	—	0	0	0				

Date & Time	Depth to Water, feet bgs												
	MW-1	MW-2	MW-3	MW-4	MW-7	MW-8	MW-9	MW-10	RW-1				
0500	17.94	16.70	15.07	18.95	17.20	CAR	14.42	16.05	16.18				
DTB	41'	31'				38'	27'	33'	38'				

Site Name & Address: Former ARCO No. 11132 / 3201 35th Avenue, Oakland

Test Well ID: RW-1

ORIGINAL

Date: 5/11/09

Test Operators: CHILL

Equipment Model and Serial Nos.: 250T CHT LR MMM 126

PID Model: MINI RAE

Date & Time 5-11-09 (0700 start)	Hour Meter Reading hrs	Applied Vacuum "Hg	Sys Inf Air Flow Rate[1] (fpm)/cfm	Dilution Air Flow Rate[2] (fpm)/cfm	Dilution Air Temp deg F	Flow totalizer (DPE unit) gallons	Sys Inf Air Temp deg F	Control Temp deg F	Effluent Air Temp deg F	System Influent ppmv	Effluent PID ppmv	Comments/Notes
0800	1487	26	1500	1100	55	7580	90	1460	1440	155	5	11132 A SYS INF 0800 11132 W INF 0800
0900	1489	26	1500	1100	60	7670	90	1460	1389	73	5	11132 A EFF 0900
1000	1490	26	1500	1100	60	7750	90	1484	1443	88	4	11132 A SYS INF 1000 11132 W INF 1000
1100	1491	26	1800	900	70	7850	95	1464	1439	44	3	
1200	1492	25	1800	1200	70	7880	100	1474	1442	48	3	
1300	1493	25	1800	1200	72	7950	100	1459	1430	36	3	11132 A SYS INF 1300 11132 W INF 1300
1400	1494	25	1800	1200	72	8050	105	1456	1427	35	3	
1500	1495	25	1800	1200	70	8130	105	1461	1428	32	2	
1600	1496	25	1800	1200	68	8210	105	1459	1435	29	2	11132 A SYS INF 1630 11132 W INF 1615
1700	1497	25	1800	1200	68	8290	105	1460	1430	37	2	

[1] Diameter of the system influent air flow pipe is 3 inches

[2] Diameter of the dilution air flow pipe is 2 inches

710 GALS

NO Thermocouple on EFF VSL Dilution controller

* Very little Air Added AT well

Site Name & Address: Former ARCO No. 11132, 3201 35th Avenue, Oakland

Test Well ID: RW-5

Date: 5/1/09

Operators: CM/LC

ORIGINAL

Date & Time	RW-1		MW-1		MW-2		MW-3		MW-9	
	Stinger Depth	Wellhead Vacuum	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water
	feet bgs	"Hg	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs
0800	22'	13"	0	18.51	0	17.59	0	15.33	0	14.74
0900	25	16"	0	18.75	0	17.77	0	15.41	0	14.83
1000	25	16"	0	18.90	0	17.95	0	15.50	0	14.94
1100	27'	10"	0	18.96	0	17.90	0	15.55	0	14.95
1200	27'	13"	0	19.24	0	18.02	0	15.60	0	15.02
1300	27'	13"	0	19.11	0	18.16	0	15.67	0	15.11
1400	27'	13"	0	19.25	0	18.24	0	15.73	0	15.17
1500	27'	13"	0	19.30	0	18.28	0	15.78	0	15.20
1600	27'	13"	0	19.35	0	18.32	0	15.82	0	15.25
1700	27'	13"	0	19.38	0	18.34	0	15.83	0	15.27

Site Name & Address: Former ARCO No. 11132, 3201 35th Avenue, Oakland

Test Well ID: MW-9

ORIGINAL

Date: 5-12-09

Test Operators: CHILL

Equipment Model and Serial Nos.: 250 T CAT LR

PID Model: MINI RAE

Date & Time 5/12/09 07[illegible]	Hour Meter Reading hrs	Applied Vacuum "Hg	Sys Inf Air Flow Rate[1] (rpm/cfm)	Dilution Air Flow Rate[2] (rpm/cfm)	Dilution Air Temp deg F	Flow totalizer (DPE unit) gallons	Sys Inf Air Temp deg F	Control Temp deg F	Effluent Air Temp deg F	System Influent ppmv	Effluent PID ppmv	Comments/Notes
0750	1498	26.5	1000	700	50	8290	75	1488	1417	42	2	
0800	1499	26.5	1000	700	55	8340	80	1490	1444	43	2	11132A SYS INF 0810 11132W INF 0800
0900	1500	26.5	1000	700	55	8430	80	1460	1430	40	1	
1000	1501	26.5	1500	1250	60	8610	90	1477	1442	41	2	11132A SYS INF 1005 11132W INF 1000
1100	1502	26.5	1500	1250	60	8680	90	1469	1434	41	2	
						390 Total						

[1] Diameter of the system influent air flow pipe is 3 inches

[2] Diameter of the dilution air flow pipe is 2 inches

* Not much Air Added to 1PT well

Site Name & Address: Former ARCO No. 11132, 3201 35th Avenue, Oakland

Date: 5/2/09

Operators: CM/LL

Test Well ID: MW-9

ORIGINAL

Date & Time	MW-9		MW-1		MW-2		MW-3		MW-8		RW-1				
	Stinger Depth	Wellhead Vacuum	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water			
5/2/09	feet bgs	"Hg	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs			
0730	26'	7	0	18.26	0	17.01	0	15.64	0	14.65	0	16.53			
0800	26'	5	0	18.52	0	17.32	0	16.40	0	14.97		16.75			
0900	26'	5	0	18.65	0	17.44	0	16.60	0	15.10		16.89			
1000	26'	5	0	18.81	0	17.60	0	16.82	0	15.22		17.06			
1100	26'	5	0	18.96	0	17.74	0	16.97	0	15.34		17.21			

Not Able To Seal Off

Site Name & Address: Former ARCO No. 11132, 3201 35th Avenue, Oakland

Test Well ID: MW-8

ORIGINAL

Date: 5/20/09

Test Operators: CM/LC

Equipment Model and Serial Nos.: 2507 CAT LR min 120 min RATE

PID Model:

Date & Time 5/20/09	Hour Meter Reading hrs	Applied Vacuum "Hg	Sys Inf Air Flow Rate[1] (fpm)/cfm	Dilution Air Flow Rate[2] (fpm)/cfm	Dilution Air Temp deg F	Flow totalizer (DPE unit) gallons	Sys Inf Air Temp deg F	Control Temp deg F	Effluent Air Temp deg F	System Influent ppmv	Effluent PID ppmv	Comments/Notes
1130	1502.4	26.5	1000	1000	62	8680	90	1475	1447	30	3	
1200	1503	27	1000	750	65	8770	90	1472	1433	23	2	11132 A SYS INF 1200 11132 W INF 1145
1300	1504	27	1000	750	70	8870	100	1457	1427	15	2	
1400	1505	27	1000	750	72	8950	100	1469	1439	22	1	
1500	1506	27	1000	750	72	9140	100	1477	1437	24	1	11132 A SYS INF 1505 11132 W INF 1500
1600	1507	27	1000	750	72	9210	100	1470	1436	23	1	
						530 GALS						

[1] Diameter of the system influent air flow pipe is 3 inches * Air Added AT well

[2] Diameter of the dilution air flow pipe is 2 inches

Site Name & Address: Former ARCO No. 11132, 3201 35th Avenue, Oakland

Test Well ID: MW-8

ORIGINAL

Date: 5-12-09

Operators: CHIL

Date & Time	MW-8		MW-2		MW-5		MW-10		RW-1							
	Stinger Depth	Wellhead Vacuum	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water						
5/12/09	feet bgs	"Hg	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs						
1200	21'	3	0	17.96	CH	2	0	16.42	0	17.30						
1300	21'	2	0	18.13			0	16.93	0	17.40						
1400	23'	1	0	18.12			0	16.90	0	17.44						
1500	23'	1	0	18.18			0	16.97	0	17.49						
1600	23'	1	0	18.21			0	17.01	0	17.53						

Site Name & Address: Former ARCO No. 11132, 3201 35th Avenue, Oakland

Test Well ID: MW-10

Date: 51309

Test Operators: Kwong, Chinn

Equipment Model and Serial Nos.: 250 Cmt LR

PID Model: Mini RAE

Date & Time 51309	Hour Meter Reading hrs	Applied Vacuum "Hg	Sys Inf Air Flow Rate[1] fpm/cfm	Dilution Air Flow Rate[2] fpm/cfm	Dilution Air Temp deg F	Flow totalizer (DPE unit) gallons	Sys Inf Air Temp deg F	Control Temp deg F	Effluent Air Temp deg F	System Influent ppmv	Effluent PID ppmv	Comments/Notes
0730	1507	27	1000	800	55	9210	75	1498	1412	49	5	
0830	1508	26	1200	1100	56	9310	75	1459	1416	53	7	11132 A SYS INF 0830 11132 W INF 0815
0930	1509	26	1500	1100	70	9410	105	1460	1422	40	2	
1030	1510	26	1500	1100	70	9590	110	1474	1443	35	2	
1130	1511	26	1500	900	70	9690	110	1469	1440	38	3.2	11132 A SYS INF 1130 11132 W INF 1130
1145		CHG DOWN				9770						
						560	Total					

[1] Diameter of the system influent air flow pipe is 3 inches

[2] Diameter of the dilution air flow pipe is 2 inches

Site Name & Address: Former ARCO No. 11132, 3201 35th Avenue, Oakland

Test Well ID: MW-10

Date: 5/3/09

Operators: KMM, CHILL

TWNSND 19

Date & Time	MW-10		MW-2		MW-7		MW-8									
5/3/09 0730	Stinger Depth	Wellhead Vacuum	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water								
	feet bgs	"Hg	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs								
0730	32'	7	Traffic		0	17.92	CAR									
0830	32'	6.5	0	18.08	0.4	17.67	@ CAR									
0930	32'	5	0	18.39	0.5	17.74	—	—								
1030	32'	5	0	18.60	0	17.85	—	—								
1130	32'	5	0	18.74	0.1	17.92										
1145	←	SHUT DOWN						→								

Site Name & Address: Former ARCO No. 11132, 3201 35th Avenue, Oakland

Test Well ID: MW-1

Date: 5 14 09

Test Operators: CHILL

Equipment Model and Serial Nos.: Z50TCAT LR

PID Model: ORIGINAL MINI RAE

Date & Time 5 14 09	Hour Meter Reading hrs	Applied Vacuum "Hg	Sys Inf Air Flow Rate[1] fpm/cfm	Dilution Air Flow Rate[2] fpm/cfm	Dilution Air Temp deg F	Flow totalizer (DPE unit) gallons	Sys Inf Air Temp deg F	Control Temp deg F	Effluent Air Temp deg F	System Influent ppmv	Effluent PID ppmv	Comments/Notes
0700	1511	26	1100	750	52	9770	75	1483	1395	100	5	
0800	1512	26	1100	750	55	9870	75	1461	1411	114	4	11132A SYS INF 0800 11132W INF 0745
0900	1513	26	1100	750	58	9960	80	1464	1434	100	3	
1000	1514	26	1100	750	60	10050	85	1482	1442	100	3	
1100	1515	26	1100	750	62	10140	85	1458	1424	99	2	11132A SYS INF 1100 11132W INF 1105 HOLE
1200	1516	26	1100	750	65	10300	90	1457	1426	82	2	
1300	1517	26	1100	750	70	10410	100	1477	1437	75	2	
1400	1518	26	1100	750	75	10520	100	1465	1430	81	1	11132A SYS INF 1400 11132W INF 1355
1500	1519	26	1100	750	75	10610	100	1450	1441	71	0	
1600	1520	26	1100	750	77	10700	105	1477	1434	67	0	
1700	1521	26	1100	750	77	10890	105	1458	1426	72	0	11132A SYS INF 1705 11132W INF 1700
						10890						

* Very little Air at well Added

1120 Total GALS

[1] Diameter of the system influent air flow pipe is 3 inches

[2] Diameter of the dilution air flow pipe is 2 inches

Site Name & Address: Former ARCO No. 11132, 3201 35th Avenue, Oakland

Test Well ID: MW-1

Date: 51409

Operators: CHILL

ORIGINAL

Date & Time	MW-1		MW-2		MW-3		MW-4		MW-9		RW-1				
51409	Stinger Depth	Wellhead Vacuum	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water			
	feet bgs	"Hg	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs			
0700	40'	8	0	17.30	0	15.80	0	19.51	0	15.08	0	16.75			
0800	40'	[illegible]	0	17.71	0	16.24	-3.1	19.85	-.1	15.39	NOT	17.31			
0900	40'	11"	0	18.03	0	16.55	-2.4	20.18	-.2	15.60	ABLE	17.84			
1000	40'	11"	0	18.25	0	16.80	-1.0	20.49	-.1	15.80	TO	18.30			
1100	40'	11"	0	18.40	0	16.97	-.2	20.70	-.2	15.95	SEAL	18.56			
1200	40'	11"	0	18.50	0	17.10	0	20.80	-.1	16.05	WELL	18.75			
1300	40'	11"	0	18.57	0	17.20	0	20.90	-.1	16.13		18.87			
1400	40'	11"	0	18.62	0	17.27	0	20.96	-.3	16.20		18.97			
1500	40'	12"	0	18.66	0	17.34	0	21.00	-.2	16.24		19.04			
1600	40'	12"	0	18.69	0	17.39	0	21.02	-.1	16.30		19.10			
1700	40'	12"	0	18.72	0	17.42	0	21.05	0	16.32		19.12			

Site Name & Address: Former ARCO No. 11132, 3201 35th Avenue, Oakland

Test Well ID: MW-2

Date: 5/5/09

Test Operators: CH/LL

Equipment Model and Serial Nos.: 250TCAT LIR min 126

PID Model: Mini RAE

ORIGINAL

Date & Time 5/5/09	Hour Meter Reading hrs	Applied Vacuum "Hg	Sys Inf Air Flow Rate[1] fpm/cfm	Dilution Air Flow Rate[2] fpm/cfm	Dilution Air Temp deg F	Flow totalizer (DPE unit) gallons	Sys Inf Air Temp deg F	Control Temp deg F	Effluent Air Temp deg F	System Influent ppmv	Effluent PID ppmv	Comments/Notes
0700	1522	26	1100	750	52	10890	70	1475	1396	184	6	
0800	1523	26	1200	750	56	10990	85	1474	1433	539	5	11132A SYS INF 0805 11132W INF 0800
0900	1524	26	1200	750	60	11060	85	1463	1433	429	5	
1000	1525	26	1200	750	66	11160	85	1479	1445	386	4	11132A SYS INF 1005 11132W INF 1000
1100	1526	26	1200	750	70	11280	85	1479	1446	275	3	
1200	1527	26	1200	750	70	11370	90	1482	1447	256	3	
1300	1528	26	1200	750	72	11470	100	1459	1432	251	2	11132A SYS INF 1250 11132W INF 1245

* No Air Added At Well

[1] Diameter of the system influent air flow pipe is 3 inches

[2] Diameter of the dilution air flow pipe is 2 inches

Site Name & Address: Former ARCO No. 11132
3201 35th Avenue, Oakland

Test Well ID: MW-2

Date: 5-15-09

Operators: CHILL

ORIGINAL

Date & Time	MW-2		MW-1		MW-8		MW-9		MW-10		RW-1				
	Stinger Depth	Wellhead Vacuum	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water			
51509	feet bgs	"Hg	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs			
0700	30'	5	0	18.80	CAR		0	15.23	0	16.29	—	16.90			
0800	30'	7	0	19.13			0	15.53	0	16.93	Not	17.42			
0900	30'	7	0	19.48			-.1	15.77	0	17.16	ABle	18.10			
1000	30'	7	0	19.65			-.2	15.88	0	~~17.80~~ 17.33	To	18.40			
1100	30'	7	0	19.76			0	16.0	0	17.33 / 17.42	Seal	18.64			
1200	30'	7	0	19.85			0	16.09	0	17.50	well	18.78			
1300	30'	7	0	19.90			0	16.13	0	17.56		18.83			

Site Name & Address: Former ARCO No. 11132 — 3201 35th Avenue, Oakland

Test Well ID: MW-1, MW-2, & RW-1

Date: 5-18-09

Test Operators: CHILL

Equipment Model and Serial Nos.: ORIGINAL 2587 C4T LR MW4126

PID Model: MIN. RAE

Date & Time 5 18 09	Hour Meter Reading hrs	Applied Vacuum "Hg	Sys Inf Air Flow Rate[1] fpm/cfm	Dilution Air Flow Rate[2] fpm/cfm	Dilution Air Temp deg F	Flow totalizer (DPE unit) gallons	Sys Inf Air Temp deg F	Control Temp deg F	Effluent Air Temp deg F	System Influent ppmv	Effluent PID ppmv	Comments/Notes
0760	1528	25	1100	0	—	11470	110	1480	1429	380	7	
0800	1529	25	1100	2	—	11820	115	1481	1437	418	6	11132 A SYS INF 0820 11132 W INF 0815
0900	1530	25	1100	0	—	11940	115	1471	1429	359	6	
1000	1531	25	1100	0	—	12160	115	1473	1434	382	5	11132 A SYS INF 1000 11132 W INF 1005
1100	1532	25	1100	300	68	12390	115	1478	1439	290	4	
1200	1533	25	1100	150	70	12630	115	1460	1428	261	3	
1300	1534	25	1100	0	70	12950	115	1458	1430	313	2	11132 A SYS INF 1305 11132 W INF 1300
1400	1535	25	1100	0	80	13170	125	1467	1430	297	2	
1500	1536	25	1100	0	82	13400	125	1457	1430	285	2	
1600	1537	25	1100	0	80	13660	125	1475	1445	301	2	11132 A SYS INF 1620 11132 W INF 1605
1700	1538	25	1100	0	80	13840	125	1463	1432	296	2	

2370 GALS

[1] Diameter of the system influent air flow pipe is 3 inches

[2] Diameter of the dilution air flow pipe is 2 inches

Site Name & Address: Former ARCO No. 11132, 3201 35th Avenue, Oakland

Test Well ID: MW-1, MW-2, & RW-1

Date: 5 18 09

Operators: CHILL

ORIGINAL

Date & Time	MW-1		MW-2		RW-1		MW-3		MW-4		MW-8		MW-9		MW-10	
	Stinger Depth	Wellhead Vacuum	Stinger Depth	Wellhead Vacuum	Stinger Depth	Wellhead Vacuum	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water
5-18-09	feet bgs	"Hg		feet bgs	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs
0700	40'	9	30'		27'		0	15.97	0	19.58	CAR		0	15.25	0	16.37
0800	40'	12" H2O	30'	7" H2O	29'	90" H2O	0	17.04	-3.8	20.70			-1.2	16.44	0	17.80
0900	40'	10" H2O	30'	7" H2O	30'	90" H2O	0	17.25	-3.6	20.97			-.8	16.69	0	17.97
1000	40'	10"	30'	7	30'	92"	0	17.69	-4.0	21.32			-.8	17.05	0	18.27
1100	40'	10"	30'	7	30'	92"	0	18.0	-2.0	21.75			-.2	17.37	0	18.52
1200	40'	10" H2O	30'	7" H2O	30'	92" H2O	0	18.23	-1.2	21.97			-.2	17.58	0	18.65
1300	40'	10	30'	7"	30'	92" H2O	0	18.44	0	22.20			-.2	17.78	0	18.80
1400	40'	11"	30'	7"	30'	92"	0	18.60	0	22.33			-.2	17.93	0	18.91
1500	40'	11"	30'	7"	30'	92"	0	18.73	0	22.41			0	18.07	Trouble	
1600	40'	11"	30'	7	30'	92"	0	18.86	0	22.50			0	18.19	Trouble	
1700	40'	11"	30'	7"	30'	92"	0	18.94	0	22.57			0	18.26	Trouble	

* Air Added At well MW-1, RW-1

Site Name & Address: Former ARCO No. 11132, 3201 35th Avenue, Oakland

Test Well ID: MW-1, MW-2, & RW-1

Date: 5 19 09

Test Operators: CHUC

Equipment Model and Serial Nos.: 250TCAT LR MW 126 Mw RW2

PID Model:

ORIGINAL

Date & Time 5 19 09	Hour Meter Reading hrs	Applied Vacuum "Hg	Sys Inf Air Flow Rate[1] fpm/cfm	Dilution Air Flow Rate[2] fpm/cfm	Dilution Air Temp deg F	Flow totalizer (DPE unit) gallons	Sys Inf Air Temp deg F	Control Temp deg F	Effluent Air Temp deg F	System Influent ppmv	Effluent PID ppmv	Comments/Notes
0700	1538	26	1200	150	55	13840	105	1483	1422	347	7	
0800	1539	26	1200	150	58	14030	110	1475	1427	411	7	11132 A SYS INF 0805 11132W INF 0810
0900	1540	26	1200	150	60	14280	110	1484	1444	350	5	
1000	1541	26	1200	150	62	14500	115	1466	1431	333	4	11132A SYS INF 1000 11132W INF 1005
1200	1543	26	1200	150	62	14940	125	1471	1435	258	3	
1400	1545	26	1200	150	75	15430	125	1472	1437	237	3	11132A SYS INF 1305 11132W INF 1300
1630	1547	26	1200	150	70	16150	125	1460	1429	252	3	
	1548											11132A SYS INF 1620 11132W INF 1615

[1] Diameter of the system influent air flow pipe is 3 inches

[2] Diameter of the dilution air flow pipe is 2 inches

* 40 GALS IN Drum onsite Put in Tank with All water

Site Name & Address: Former ARCO No. 11132
3201 35th Avenue, Oakland

Test Well ID: MW-1, MW-2, & RW-1

Date: 5-19-09

Operators: CHILL

ORIGINAL

Date & Time	MW-1		MW-2		RW-1		MW-3		MW-4		MW-8		MW-9		MW-10	
	Stinger Depth	Wellhead Vacuum	Stinger Depth	Wellhead Vacuum	Stinger Depth	Wellhead Vacuum	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water	Induced Vacuum	Depth to water
51904	feet bgs	"Hg	~~"WC~~	~~feet bgs~~	~~"WC~~	~~feet bgs~~	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs	"WC	feet bgs
0700	40'	9	30'	7	30'	80" H2O	0	16.77	0	20.15	CHILL		0	16.0	0	16.97
0800	40'	9	30'	7	30'	82"	0	17.17	-3.8	20.53			-.9	16.66	—	—
0900	40'	9	30'	7	30'	84"	0	17.95	-7.8	21.12			-.4	17.37	—	—
1000	40'	9	30'	7	30'	85" H2O	0	18.34	-2.6	21.84			-.8	17.71	0	18.51
1200	40'	10	30'	7	30'	90"	0	18.78	-2.9	22.20			-.4	18.13	0	19.10
1400	40'	10	30'	7	30'	92"	0	19.13	0	22.62			-.7	18.45	0	19.32
1600	40'	10.5	30'	7.5	30'	92"	0	19.39	0	22.82			-.4	18.73		

STRATUS

Calscience
Environmental
Laboratories, Inc.

May 13, 2009

Jay Johnson
Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Subject: **Calscience Work Order No.:** **09-05-1008**
Client Reference: **ARCO 11132 - Assessment**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 5/12/2009 and analyzed in accordance with the attached chain-of-custody.

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

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

Sincerely,

Calscience Environmental
Laboratories, Inc.
Richard Villafania
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.		Date Received:	05/12/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1008
Cameron Park, CA 95682-8861		Preparation:	N/A
		Method:	EPA TO-15M
		Units:	mg/m3
Project: ARCO 11132 - Assessment			Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1008-1-A**	**05/11/09 08:05**	**Air**	**GC/MS V**	**N/A**	**05/12/09 16:05**	**090512L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	0.52	0.080	50		Xylenes (total)	24	0.43	50	
Toluene	1.2	0.094	50		Methyl-t-Butyl Ether (MTBE)	0.73	0.36	50	
Ethylbenzene	2.7	0.11	50						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	103	57-129			1,2-Dichloroethane-d4	107	47-137		
Toluene-d8	107	78-156							

11132AEFF	**09-05-1008-2-A**	**05/11/09 08:10**	**Air**	**GC/MS V**	**N/A**	**05/12/09 15:18**	**090512L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.0016	1		Xylenes (total)	ND	0.0087	1	
Toluene	0.0092	0.0019	1		Methyl-t-Butyl Ether (MTBE)	ND	0.0072	1	
Ethylbenzene	ND	0.0022	1						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	100	57-129			1,2-Dichloroethane-d4	103	47-137		
Toluene-d8	81	78-156							

11132ASYSINF	**09-05-1008-4-B**	**05/11/09 13:05**	**Air**	**GC/MS V**	**N/A**	**05/12/09 14:29**	**090512L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	0.79	0.064	40		Xylenes (total)	1.2	0.35	40	
Toluene	0.11	0.075	40		Methyl-t-Butyl Ether (MTBE)	0.73	0.29	40	
Ethylbenzene	0.77	0.087	40						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	89	57-129			1,2-Dichloroethane-d4	101	47-137		
Toluene-d8	105	78-156							

11132ASYSINF	**09-05-1008-5-B**	**05/11/09 16:30**	**Air**	**GC/MS V**	**N/A**	**05/12/09 13:41**	**090512L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	0.86	0.032	20		Xylenes (total)	0.86	0.17	20	
Toluene	0.059	0.038	20		Methyl-t-Butyl Ether (MTBE)	0.84	0.14	20	
Ethylbenzene	0.82	0.043	20						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	103	57-129			1,2-Dichloroethane-d4	109	47-137		
Toluene-d8	106	78-156							

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.		Date Received:	05/12/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1008
Cameron Park, CA 95682-8861		Preparation:	N/A
		Method:	EPA TO-15M
		Units:	mg/m3
Project: ARCO 11132 - Assessment			Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**097-09-002-8,541**	**N/A**	**Air**	**GC/MS V**	**N/A**	**05/12/09 12:54**	**090512L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.0016	1		Xylenes (total)	ND	0.0087	1	
Toluene	ND	0.0019	1		Methyl-t-Butyl Ether (MTBE)	ND	0.0072	1	
Ethylbenzene	ND	0.0022	1						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	106	57-129			1,2-Dichloroethane-d4	105	47-137		
Toluene-d8	107	78-156							

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	05/12/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1008
Cameron Park, CA 95682-8861	Preparation:	N/A
	Method:	EPA TO-3M

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1008-1-A**	**05/11/09 08:05**	**Air**	**GC 19**	**N/A**	**05/12/09 11:57**	**090512L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	660	38	1		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132AEFF	**09-05-1008-2-A**	**05/11/09 08:10**	**Air**	**GC 19**	**N/A**	**05/12/09 11:22**	**090512L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	38	1		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1008-4-A**	**05/11/09 13:05**	**Air**	**GC 19**	**N/A**	**05/12/09 12:31**	**090512L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	450	38	1		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1008-5-A**	**05/11/09 16:30**	**Air**	**GC 19**	**N/A**	**05/12/09 13:46**	**090512L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	340	38	1		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-685-139**	**N/A**	**Air**	**GC 19**	**N/A**	**05/12/09 08:58**	**090512L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	38	1		mg/m3

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

Calscience Environmental Laboratories, Inc.

Quality Control - Duplicate

Stratus Environmental, inc.		Date Received:	05/12/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1008
Cameron Park, CA 95682-8861		Preparation:	N/A
		Method:	EPA TO-3M

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
11132ASYSINF	**Air**	**GC 19**	**N/A**	**05/12/09**	**090512D01**

Parameter	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	450	460	2	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.	Date Received: N/A
3330 Cameron Park Drive, Suite 550	Work Order No: 09-05-1008
Cameron Park, CA 95682-8861	Preparation: N/A
	Method: EPA TO-15M

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
097-09-002-8,541	Air	GC/MS V	N/A	05/12/09	090512L01

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	105	84	60-156	22	0-40	
Toluene	106	86	56-146	21	0-43	
Ethylbenzene	114	91	52-154	22	0-38	
p/m-Xylene	118	95	42-156	21	0-41	
o-Xylene	119	97	52-148	20	0-38	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 09-05-1008

Qualifier	Definition
AX	Sample too dilute to quantify surrogate.
AZ	Surrogate recovery outside of acceptance limits due to matrix interference.
BA	Relative percent difference out of control.
BA,AY	BA = Relative percent difference out of control. AY = Matrix interference suspected.
BB	Sample > 4x spike concentration.
BF	Reporting limits raised due to high hydrocarbon background.
BH	Reporting limits raised due to high level of non-target analytes.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
BY	Sample received at improper temperature.
CL	Initial analysis within holding time but required dilution.
CQ	Analyte concentration greater than 10 times the blank concentration.
CU	Surrogate concentration diluted to not detectable during analysis.
DF	Reporting limits elevated due to matrix interferences.
DU	Insufficient sample quantity for matrix spike/dup matrix spike.
ET	Sample was extracted past end of recommended max. holding time.
EY	Result exceeds normal dynamic range; reported as a min est.
GR	Internal standard recovery is outside method recovery limit.
IB	CCV recovery abovelimit; analyte not detected.
IH	Calibrtn. verif. recov. below method CL for this analyte.
IJ	Calibrtn. verif. recov. above method CL for this analyte.
J,DX	J=EPA Flag -Estimated value; DX= Value < lowest standard (MQL), but > than MDL.
LA	Confirmatory analysis was past holding time.
LG,AY	LG= Surrogate recovery below the acceptance limit. AY= Matrix interference suspected.
LH,AY	LH= Surrogate recovery above the acceptance limit. AY= Matrix interference suspected.
LM,AY	LM= MS and/or MSD above acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LN,AY	LN= MS and/or MSD below acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LQ	LCS recovery above method control limits.

Work Order Number: 09-05-1008

Qualifier	Definition
LR	LCS recovery below method control limits.
LW	Quantitation of unknown hydrocarbon(s) in sample based on gasoline.
LX	Quantitation of unknown hydrocarbon(s) in sample based on diesel.
MB	Analyte present in the method blank.
PC	Sample taken from VOA vial with air bubble > 6mm diameter.
PI	Primary and confirm results varied by > than 40% RPD.
RB	RPD exceeded method control limit; % recoveries within limits.
SG	A silica gel cleanup procedure was performed.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture.

Air

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: ARCO 11132 - Assessment
BP/ARC Facility No: 11132
Req Due Date (mm/dd/yy): Eff 24hrs&othersSTD Rush TAT: Yes x No
Lab Work Order Number: 09-05-1008

Lab Name: Calscience Environmental Laboratories, Inc.	BP/ARC Facility Address: 3201 35th Avenue	Consultant/Contractor: Stratus Environmental, Inc.
Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841	City, State, ZIP Code: Oakland, California	Consultant/Contractor Project No: E11132-01
Lab PM: Richard Villafania	Lead Regulatory Agency: Alameda County Environmental Health	Address: 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682
Lab Phone: 714-895-5494	California Global ID No.: T0600100213	Consultant/Contractor PM: Jay Johnson
Lab Shipping Accnt: 9255	Enfos Proposal No: 000MT-0004	Phone: 530-676-6000
Lab Bottle Order No:	Accounting Mode: Provision x OOC-BU ___ OOC-RM ___	Email EDD To: chuff@stratusinc.net
Other Info:	Stage: Select Activity: Feasibility Study	Invoice To: BP/ARC x Contractor ___
BP/ARC EBM: Paul Supple		
EBM Phone: 925-275-3801		
EBM Email: paul.supple@bp.com		

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Water / Liquid	Air / Vapor	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol	Requested Analyses: GRO	BTEX	MTBE	6-oxys	Turnaround Time: 24-hours	Standard
1	11132 A SVS INF	51109	0905			X	2						X	X	X			X
2	11132 A EFF	51109	0810			X	2						X	X	X		X	
3	11132 A SVS INF	51109	1005			X	2										Hold	
4	11132 A SVS INF	51109	1305			X	2						X	X	X			X
5	11132 A SVS INF	51109	1630			X	2						X	X	X			X
6																		
7																		
8																		
9																		
10																		

Report Type & QC Level: Standard x; Full Data Package ___

Comments
Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

6-oxys include MTBE, TBA, TAME, DIPE, ETBE, and Ethanol.

Sampler's Name: Chris Hill	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Stratus Environmental, Inc.	Stratus	17/09	51109	Gregg A. Lee	5/11/09	10:00
Shipment Method: GSO Ship Date: 5/11/09						
Shipment Tracking No: # 106280037						

Special Instructions: [illegible]@broadbentinc.com

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: ____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 09-05- 1 0 0 8

SAMPLE RECEIPT FORM

Box ~~Cooler~~ 1 of 1

CLIENT: STRATUS DATE: 05 / 12 / 09

TEMPERATURE: (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature ____.____ °C - 0.2 °C (CF) = ____.____ °C ☐ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☑ Air ☐ Filter ☐ Metals Only ☐ PCBs Only **Initial:** PS

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A **Initial:** PS

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present **Initial:** PS

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Correct containers and volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
Proper preservation noted on COC or sample container	☐	☐	☑
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☑	☐	☐

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve ☐EnCores® ☐TerraCores® ☐_____

Water: ☐VOA ☐VOA**h** ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☐1AGB ☐1AGB**na$_2$** ☐1AGB**s** ☐500AGB ☐500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐500PB ☐500PB**na** ☐250PB ☐250PB**n** ☐125PB ☐125PB**znna** ☐100PB ☐100PB**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☑Tedlar® ☐Summa® ☐_____ **Other:** ☐_____ **Checked/Labeled by:** PS

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar (Wide-mouth) B: Bottle (Narrow-mouth) **Reviewed by:** WB

Preservative: h: HCL n: HNO3 na$_2$: $Na_2S_2O_3$ Na: NaOH p: H_3PO_4 s: H_2SO_4 znna: $ZnAc_2$+NaOH f: Field-filtered **Scanned by:** PS

Calscience
Environmental
Laboratories, Inc.

May 15, 2009

Jay Johnson
Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Subject: **Calscience Work Order No.:** **09-05-1126**
Client Reference: **ARCO 11132 - Assessment**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 5/13/2009 and analyzed in accordance with the attached chain-of-custody.

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

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

Sincerely,

Calscience Environmental
Laboratories, Inc.
Richard Villafania
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.		Date Received:	05/13/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1126
Cameron Park, CA 95682-8861		Preparation:	N/A
		Method:	EPA TO-15M
		Units:	mg/m3
Project: ARCO 11132 - Assessment			Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1126-1-A**	**05/12/09 08:10**	**Air**	**GC/MS DD**	**N/A**	**05/13/09 16:53**	**090513L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	0.24	0.040	25		Xylenes (total)	3.1	0.22	25	
Toluene	0.12	0.047	25		Methyl-t-Butyl Ether (MTBE)	ND	0.18	25	
Ethylbenzene	1.4	0.054	25						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	98	57-129			1,2-Dichloroethane-d4	105	47-137		
Toluene-d8	89	78-156							

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1126-2-A**	**05/12/09 10:05**	**Air**	**GC/MS DD**	**N/A**	**05/13/09 17:44**	**090513L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	0.20	0.040	25		Xylenes (total)	4.9	0.22	25	
Toluene	0.090	0.047	25		Methyl-t-Butyl Ether (MTBE)	ND	0.18	25	
Ethylbenzene	2.1	0.054	25						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	103	57-129			1,2-Dichloroethane-d4	102	47-137		
Toluene-d8	86	78-156							

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1126-3-A**	**05/12/09 12:00**	**Air**	**GC/MS DD**	**N/A**	**05/13/09 18:33**	**090513L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	1.6	0.016	10		Xylenes (total)	4.8	0.087	10	
Toluene	0.36	0.019	10		Methyl-t-Butyl Ether (MTBE)	0.84	0.072	10	
Ethylbenzene	2.0	0.022	10						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	106	57-129			1,2-Dichloroethane-d4	101	47-137		
Toluene-d8	92	78-156							

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1126-4-A**	**05/12/09 15:05**	**Air**	**GC/MS DD**	**N/A**	**05/13/09 19:22**	**090513L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	0.84	0.026	16		Xylenes (total)	3.6	0.14	16	
Toluene	0.22	0.030	16		Methyl-t-Butyl Ether (MTBE)	1.2	0.12	16	
Ethylbenzene	1.4	0.035	16						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	98	57-129			1,2-Dichloroethane-d4	100	47-137		
Toluene-d8	93	78-156							

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	05/13/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1126
Cameron Park, CA 95682-8861	Preparation:	N/A
	Method:	EPA TO-15M
	Units:	mg/m3

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**097-09-002-8,545**	**N/A**	**Air**	**GC/MS DD**	**N/A**	**05/13/09 14:25**	**090513L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.0016	1		Xylenes (total)	ND	0.0087	1	
Toluene	ND	0.0019	1		Methyl-t-Butyl Ether (MTBE)	ND	0.0072	1	
Ethylbenzene	ND	0.0022	1						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	90	57-129			1,2-Dichloroethane-d4	105	47-137		
Toluene-d8	97	78-156							

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	05/13/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1126
Cameron Park, CA 95682-8861	Preparation:	N/A
	Method:	EPA TO-3M

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1126-1-A**	**05/12/09 08:10**	**Air**	**GC 38**	**N/A**	**05/13/09 13:03**	**090513L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	240	38	1		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1126-2-A**	**05/12/09 10:05**	**Air**	**GC 38**	**N/A**	**05/13/09 12:24**	**090513L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	250	38	1		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1126-3-A**	**05/12/09 12:00**	**Air**	**GC 38**	**N/A**	**05/13/09 11:08**	**090513L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	87	38	1		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1126-4-A**	**05/12/09 15:05**	**Air**	**GC 38**	**N/A**	**05/13/09 11:46**	**090513L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	120	38	1		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-685-141**	**N/A**	**Air**	**GC 38**	**N/A**	**05/13/09 08:42**	**090513L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	38	1		mg/m3

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

Calscience Environmental Laboratories, Inc.

Quality Control - Duplicate

Stratus Environmental, inc.	Date Received:	05/13/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1126
Cameron Park, CA 95682-8861	Preparation:	N/A
	Method:	EPA TO-3M

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
11132ASYSINF	**Air**	**GC 38**	**N/A**	**05/13/09**	**090513D01**

Parameter	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	240	250	2	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.	Date Received: N/A
3330 Cameron Park Drive, Suite 550	Work Order No: 09-05-1126
Cameron Park, CA 95682-8861	Preparation: N/A
	Method: EPA TO-15M

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
097-09-002-8,545	Air	GC/MS DD	N/A	05/13/09	090513L01

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	124	116	60-156	7	0-40	
Toluene	122	115	56-146	6	0-43	
Ethylbenzene	125	117	52-154	6	0-38	
p/m-Xylene	121	114	42-156	6	0-41	
o-Xylene	125	118	52-148	6	0-38	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 09-05-1126

Qualifier	Definition
AX	Sample too dilute to quantify surrogate.
AZ	Surrogate recovery outside of acceptance limits due to matrix interference.
BA	Relative percent difference out of control.
BA,AY	BA = Relative percent difference out of control. AY = Matrix interference suspected.
BB	Sample > 4x spike concentration.
BF	Reporting limits raised due to high hydrocarbon background.
BH	Reporting limits raised due to high level of non-target analytes.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
BY	Sample received at improper temperature.
CL	Initial analysis within holding time but required dilution.
CQ	Analyte concentration greater than 10 times the blank concentration.
CU	Surrogate concentration diluted to not detectable during analysis.
DF	Reporting limits elevated due to matrix interferences.
DU	Insufficient sample quantity for matrix spike/dup matrix spike.
ET	Sample was extracted past end of recommended max. holding time.
EY	Result exceeds normal dynamic range; reported as a min est.
GR	Internal standard recovery is outside method recovery limit.
IB	CCV recovery abovelimit; analyte not detected.
IH	Calibrtn. verif. recov. below method CL for this analyte.
IJ	Calibrtn. verif. recov. above method CL for this analyte.
J,DX	J=EPA Flag -Estimated value; DX= Value < lowest standard (MQL), but > than MDL.
LA	Confirmatory analysis was past holding time.
LG,AY	LG= Surrogate recovery below the acceptance limit. AY= Matrix interference suspected.
LH,AY	LH= Surrogate recovery above the acceptance limit. AY= Matrix interference suspected.
LM,AY	LM= MS and/or MSD above acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LN,AY	LN= MS and/or MSD below acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LQ	LCS recovery above method control limits.

Work Order Number: 09-05-1126

Qualifier	Definition
LR	LCS recovery below method control limits.
LW	Quantitation of unknown hydrocarbon(s) in sample based on gasoline.
LX	Quantitation of unknown hydrocarbon(s) in sample based on diesel.
MB	Analyte present in the method blank.
PC	Sample taken from VOA vial with air bubble > 6mm diameter.
PI	Primary and confirm results varied by > than 40% RPD.
RB	RPD exceeded method control limit; % recoveries within limits.
SG	A silica gel cleanup procedure was performed.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture.

A

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: ARCO 11132 - Assessment
BP/ARC Facility No: 11132
Req Due Date (mm/dd/yy): Eff 24hrs&othersSTD Rush TAT: Yes x No
Lab Work Order Number: 09-05-1126

Lab Name: Calscience Environmental Laboratories, Inc.	BP/ARC Facility Address: 3201 35th Avenue	Consultant/Contractor: Stratus Environmental, Inc.
Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841	City, State, ZIP Code: Oakland, California	Consultant/Contractor Project No: E11132-01
Lab PM: Richard Villafania	Lead Regulatory Agency: Alameda County Environmental Health	Address: 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682
Lab Phone: 714-895-5494	California Global ID No.: T0600100213	Consultant/Contractor PM: Jay Johnson
Lab Shipping Accnt: 9255	Enfos Proposal No: 000MT-0004	Phone: 530-676-6000
Lab Bottle Order No:	Accounting Mode: Provision x OOC-BU ___ OOC-RM ___	Email EDD To: chuff@stratusinc.net
Other Info:	Stage: Select Activity: Feasibility Study	Invoice To: BP/ARC x Contractor ___
BP/ARC EBM: Paul Supple		
EBM Phone: 925-275-3801		
EBM Email: paul.supple@bp.com		

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol	Requested Analyses: GRO	BTEX	MTBE	6-oxys			Turnaround Time: 24-hours	Standard		
1	11132 A SYS INF	51209	0810			X	2						X	X	X					X		
2	11132 A SYS INF	51209	1005			X	2						X	X	X					X		
3	11132 A SYS INF	51209	1200			X	2						X	X	X					X		
4	11132 A SYS INF	51209	1505			X	2						X	X	X					X		
5																						
6																						
7																						
8																						
9																						
10																						

Report Type & QC Level: Standard x; Full Data Package ___

Comments
Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

6-oxys include MTBE, TBA, TAME, DIPE, ETBE, and Ethanol.

Sampler's Name: Chris Hill	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Stratus Environmental, Inc.	Chris Hill / Stratus	51209	1700	[illegible] COL	051309	1000
Shipment Method: GSO Ship Date: 51209						
Shipment Tracking No: 105748991						

Special Instructions: Please cc results to bpedf@broadbentinc.com

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: _____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 09-05- 1 1 2 6

SAMPLE RECEIPT FORM

Box Cooler 1 of 1

CLIENT: Stratus DATE: 05/13/09

TEMPERATURE: (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature ____.____ °C - 0.2 °C (CF) = ____.____ °C ☐ **Blank** ☐ **Sample**

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☑ Air ☐ Filter ☐ Metals Only ☐ PCBs Only **Initial:** NC

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A **Initial:** NC

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present **Initial:** NC

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Correct containers and volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
Proper preservation noted on COC or sample container	☐	☐	☑
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☑	☐	☐

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve ☐EnCores® ☐TerraCores® ☐_____

Water: ☐VOA ☐VOA**h** ☐VOA**na_2** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☐1AGB ☐1AGB**na_2** ☐1AGB**s** ☐500AGB ☐500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐500PB ☐500PB**na** ☐250PB ☐250PB**n** ☐125PB ☐125PB**znna** ☐100PB ☐100PB**na_2** ☐_____ ☐_____ ☐_____

Air: ☑ Tedlar® ☐Summa® ☐_____ **Other:** ☐_____ **Checked/Labeled by:** NC

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar (Wide-mouth) B: Bottle (Narrow-mouth) **Reviewed by:** [illegible]

Preservative: h: HCL n: HNO3 na_2:$Na_2S_2O_3$ Na: NaOH p: H_3PO_4 s: H_2SO_4 znna: $ZnAc_2$+NaOH f: Field-filtered **Scanned by:** [illegible]

Calscience
Environmental
Laboratories, Inc.

May 28, 2009

Jay Johnson
Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Subject: **Calscience Work Order No.:** **09-05-1509**
Client Reference: **ARCO 11132 - Assessment**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 5/16/2009 and analyzed in accordance with the attached chain-of-custody.

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

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

Sincerely,

Calscience Environmental
Laboratories, Inc.
Richard Villafania
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Date Received: 05/16/09
Work Order No: 09-05-1509
Preparation: N/A
Method: EPA TO-15M
Units: mg/m3

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF (08:05)	**09-05-1509-1-A**	**05/15/09 08:05**	**Air**	**GC/MS II**	**N/A**	**05/16/09 18:11**	**090516L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	21	0.80	500		Xylenes (total)	10	4.3	500	
Toluene	2.6	0.94	500		Methyl-t-Butyl Ether (MTBE)	ND	3.6	500	
Ethylbenzene	4.1	1.1	500						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	101	57-129			1,2-Dichloroethane-d4	94	47-137		
Toluene-d8	83	78-156							

11132ASYSINF (10:05)	**09-05-1509-2-A**	**05/15/09 10:05**	**Air**	**GC/MS II**	**N/A**	**05/16/09 16:39**	**090516L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	14	0.64	400		Xylenes (total)	6.8	3.5	400	
Toluene	1.8	0.75	400		Methyl-t-Butyl Ether (MTBE)	ND	2.9	400	
Ethylbenzene	2.6	0.87	400						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	102	57-129			1,2-Dichloroethane-d4	95	47-137		
Toluene-d8	85	78-156							

11132ASYSINF (12:50)	**09-05-1509-3-A**	**05/15/09 12:50**	**Air**	**GC/MS II**	**N/A**	**05/16/09 17:25**	**090516L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	13	0.32	200		Xylenes (total)	7.6	1.7	200	
Toluene	2.0	0.38	200		Methyl-t-Butyl Ether (MTBE)	1.6	1.4	200	
Ethylbenzene	3.1	0.43	200						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	101	57-129			1,2-Dichloroethane-d4	98	47-137		
Toluene-d8	85	78-156							

Method Blank	**097-09-002-8,562**	**N/A**	**Air**	**GC/MS II**	**N/A**	**05/16/09 12:02**	**090516L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.0016	1		Xylenes (total)	ND	0.0087	1	
Toluene	ND	0.0019	1		Methyl-t-Butyl Ether (MTBE)	ND	0.0072	1	
Ethylbenzene	ND	0.0022	1						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	101	57-129			1,2-Dichloroethane-d4	101	47-137		
Toluene-d8	98	78-156							

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	05/16/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1509
Cameron Park, CA 95682-8861	Preparation:	N/A
	Method:	EPA TO-3M

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF (08:05)	**09-05-1509-1-A**	**05/15/09 08:05**	**Air**	**GC 38**	**N/A**	**05/16/09 13:08**	**090516L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	6600	190	5		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF (10:05)	**09-05-1509-2-A**	**05/15/09 10:05**	**Air**	**GC 38**	**N/A**	**05/16/09 12:27**	**090516L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	4300	190	5		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF (12:50)	**09-05-1509-3-A**	**05/15/09 12:50**	**Air**	**GC 38**	**N/A**	**05/16/09 11:49**	**090516L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	2800	190	5		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-685-143**	**N/A**	**Air**	**GC 38**	**N/A**	**05/16/09 08:47**	**090516L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	38	1		mg/m3

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

Calscience Environmental Laboratories, Inc.

Quality Control - Duplicate

Stratus Environmental, inc.		Date Received:	05/16/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1509
Cameron Park, CA 95682-8861		Preparation:	N/A
		Method:	EPA TO-3M

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
11132ASYSINF (08:05)	**Air**	**GC 38**	**N/A**	**05/16/09**	**090516D01**

Parameter	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	6600	7100	7	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.		Date Received:	N/A
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1509
Cameron Park, CA 95682-8861		Preparation:	N/A
		Method:	EPA TO-15M

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
097-09-002-8,562	Air	GC/MS II	N/A	05/16/09	090516L01

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	105	110	60-156	5	0-40	
Toluene	102	105	56-146	3	0-43	
Ethylbenzene	111	114	52-154	3	0-38	
p/m-Xylene	115	119	42-156	3	0-41	
o-Xylene	115	119	52-148	3	0-38	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 09-05-1509

Qualifier	Definition
AX	Sample too dilute to quantify surrogate.
AZ	Surrogate recovery outside of acceptance limits due to matrix interference.
BA	Relative percent difference out of control.
BA,AY	BA = Relative percent difference out of control. AY = Matrix interference suspected.
BB	Sample > 4x spike concentration.
BF	Reporting limits raised due to high hydrocarbon background.
BH	Reporting limits raised due to high level of non-target analytes.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
BY	Sample received at improper temperature.
CL	Initial analysis within holding time but required dilution.
CQ	Analyte concentration greater than 10 times the blank concentration.
CU	Surrogate concentration diluted to not detectable during analysis.
DF	Reporting limits elevated due to matrix interferences.
DU	Insufficient sample quantity for matrix spike/dup matrix spike.
ET	Sample was extracted past end of recommended max. holding time.
EY	Result exceeds normal dynamic range; reported as a min est.
GR	Internal standard recovery is outside method recovery limit.
IB	CCV recovery abovelimit; analyte not detected.
IH	Calibrtn. verif. recov. below method CL for this analyte.
IJ	Calibrtn. verif. recov. above method CL for this analyte.
J,DX	J=EPA Flag -Estimated value; DX= Value < lowest standard (MQL), but > than MDL.
LA	Confirmatory analysis was past holding time.
LG,AY	LG= Surrogate recovery below the acceptance limit. AY= Matrix interference suspected.
LH,AY	LH= Surrogate recovery above the acceptance limit. AY= Matrix interference suspected.
LM,AY	LM= MS and/or MSD above acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LN,AY	LN= MS and/or MSD below acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LQ	LCS recovery above method control limits.

Work Order Number: 09-05-1509

Qualifier	Definition
LR	LCS recovery below method control limits.
LW	Quantitation of unknown hydrocarbon(s) in sample based on gasoline.
LX	Quantitation of unknown hydrocarbon(s) in sample based on diesel.
MB	Analyte present in the method blank.
PC	Sample taken from VOA vial with air bubble > 6mm diameter.
PI	Primary and confirm results varied by > than 40% RPD.
RB	RPD exceeded method control limit; % recoveries within limits.
SG	A silica gel cleanup procedure was performed.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture.

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Laboratory Management Program LaMP Chain of Custody Record

Page 1 of 1

BP/ARC Project Name: ARCO 11132 - Assessment
BP/ARC Facility No: 11132
Req Due Date (mm/dd/yy): Eff 24hrs&othersSTD Rush TAT: Yes x No
Lab Work Order Number: 09-05-1509

Lab Name: Calscience Environmental Laboratories, Inc.	BP/ARC Facility Address: 3201 35th Avenue	Consultant/Contractor: Stratus Environmental, Inc.
Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841	City, State, ZIP Code: Oakland, California	Consultant/Contractor Project No: E11132-01
Lab PM: Richard Villafania	Lead Regulatory Agency: Alameda County Environmental Health	Address: 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682
Lab Phone: 714-895-5494	California Global ID No.: T0600100213	Consultant/Contractor PM: Jay Johnson
Lab Shipping Accnt: 9255	Enfos Proposal No: 000MT-0004	Phone: 530-676-6000
Lab Bottle Order No:	Accounting Mode: Provision x OOC-BU ___ OOC-RM ___	Email EDD To: chuff@stratusinc.net
Other Info:	Stage: Select Activity: Feasibility Study	Invoice To: BP/ARC x Contractor ___
BP/ARC EBM: Paul Supple		
EBM Phone: 925-275-3801		
EBM Email: paul.supple@bp.com		

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol	Requested Analyses: GRO	BTEX	MTBE	6-oxys			Turnaround Time: 24-hours	Standard		
1	11132 A S45 INF	51509	0805			X	2						X	X	X					X		
2	11132 A S45 INF	51509	1005			X	2						X	X	X					X		
3	11132 A S45 INF	51509	1250			X	2						X	X	X					X		
4																						
5																						
6																						
7																						
8																						
9																						
10																						

Turnaround Time: 24-hours ___ Standard x

Report Type & QC Level: Standard x; Full Data Package ___

Comments

Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

6-oxys include MTBE, TBA, TAME, DIPE, ETBE, and Ethanol.

Sampler's Name: Chris Hill	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Stratus Environmental, Inc.		51509	1600			
Shipment Method: GSO Ship Date: 51509				CEL	5.16.09	9:40
Shipment Tracking No: 925552822442						

Special Instructions: Please cc results to bpedf@broadbentinc.com

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: _____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 09-05-1 1 5 0 9

SAMPLE RECEIPT FORM

Box Cooler 1 of 1

CLIENT: stratus DATE: 5 / 16 / 09

TEMPERATURE: (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature ____.____ °C - 0.2 °C (CF) = ____.____ °C ☐ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☑ Air ☐ Filter ☐ Metals Only ☐ PCBs Only **Initial:** JD

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☐ Not Present ☑ N/A **Initial:** JD

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present **Initial:** MH

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Correct containers and volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
Proper preservation noted on COC or sample container	☐	☐	☑
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☑	☐	☐

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve ☐EnCores® ☐TerraCores® ☐_____

Water: ☐VOA ☐VOAh ☐VOAna_2 ☐125AGB ☐125AGBh ☐125AGBp ☐1AGB ☐1AGBna_2 ☐1AGBs ☐500AGB ☐500AGJ ☐500AGJs ☐250AGB ☐250CGB ☐250CGBs ☐1PB ☐500PB ☐500PBna ☐250PB ☐250PBn ☐125PB ☐125PBznna ☐100PB ☐100PBna_2 ☐_____ ☐_____ ☐_____

Air: ☑ Tedlar® ☐Summa® ☐_____ **Other:** ☐_____ **Checked/Labeled by:** MH

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar (Wide-mouth) B: Bottle (Narrow-mouth) **Reviewed by:** YL

Preservative: h: HCL n: HNO3 na_2: $Na_2S_2O_3$ Na: NaOH p: H_3PO_4 s: H_2SO_4 znna: $ZnAc_2$+NaOH f: Field-filtered **Scanned by:** MH

Calscience
Environmental
Laboratories, Inc.

May 28, 2009

Jay Johnson
Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Subject: **Calscience Work Order No.:** **09-05-1648**
Client Reference: **ARCO 11132 - Assessment**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 5/19/2009 and analyzed in accordance with the attached chain-of-custody.

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

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

Sincerely,

Calscience Environmental
Laboratories, Inc.
Richard Villafania
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.		Date Received:	05/19/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1648
Cameron Park, CA 95682-8861		Preparation:	N/A
		Method:	EPA TO-15M
		Units:	mg/m3
Project: ARCO 11132 - Assessment			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1648-1-A**	**05/18/09 08:20**	**Air**	**GC/MS II**	**N/A**	**05/19/09 14:07**	**090519L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	17	0.80	500		Xylenes (total)	12	4.3	500	
Toluene	2.8	0.94	500		Methyl-t-Butyl Ether (MTBE)	ND	3.6	500	
Ethylbenzene	8.6	1.1	500						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	104	57-129			1,2-Dichloroethane-d4	119	47-137		
Toluene-d8	105	78-156							

11132ASYSINF	**09-05-1648-3-A**	**05/18/09 13:05**	**Air**	**GC/MS II**	**N/A**	**05/19/09 17:11**	**090519L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	12	0.64	400		Xylenes (total)	8.2	3.5	400	
Toluene	1.9	0.75	400		Methyl-t-Butyl Ether (MTBE)	ND	2.9	400	
Ethylbenzene	5.4	0.87	400						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	109	57-129			1,2-Dichloroethane-d4	110	47-137		
Toluene-d8	103	78-156							

11132ASYSINF	**09-05-1648-4-A**	**05/18/09 16:20**	**Air**	**GC/MS II**	**N/A**	**05/19/09 16:25**	**090519L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	15	0.64	400		Xylenes (total)	11	3.5	400	
Toluene	2.5	0.75	400		Methyl-t-Butyl Ether (MTBE)	4.1	2.9	400	
Ethylbenzene	7.1	0.87	400						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	105	57-129			1,2-Dichloroethane-d4	118	47-137		
Toluene-d8	111	78-156							

Method Blank	**097-09-002-8,569**	**N/A**	**Air**	**GC/MS II**	**N/A**	**05/19/09 13:21**	**090519L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.0016	1		Xylenes (total)	ND	0.0087	1	
Toluene	ND	0.0019	1		Methyl-t-Butyl Ether (MTBE)	ND	0.0072	1	
Ethylbenzene	ND	0.0022	1						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	98	57-129			1,2-Dichloroethane-d4	114	47-137		
Toluene-d8	98	78-156							

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.		Date Received:	05/19/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1648
Cameron Park, CA 95682-8861		Preparation:	N/A
		Method:	EPA TO-3M

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1648-1-A**	**05/18/09 08:20**	**Air**	**GC 38**	**N/A**	**05/19/09 13:11**	**090519L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	6900	190	5		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1648-3-A**	**05/18/09 13:05**	**Air**	**GC 38**	**N/A**	**05/19/09 12:33**	**090519L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	3900	190	5		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1648-4-A**	**05/18/09 16:20**	**Air**	**GC 38**	**N/A**	**05/19/09 11:55**	**090519L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	4100	190	5		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-685-144**	**N/A**	**Air**	**GC 38**	**N/A**	**05/19/09 08:40**	**090519L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	38	1		mg/m3

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

Calscience Environmental Laboratories, Inc.

Quality Control - Duplicate

Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Date Received: 05/19/09
Work Order No: 09-05-1648
Preparation: N/A
Method: EPA TO-3M

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
11132ASYSINF	**Air**	**GC 38**	**N/A**	**05/19/09**	**090519D01**

Parameter	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	6900	7000	1	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.	Date Received: N/A
3330 Cameron Park Drive, Suite 550	Work Order No: 09-05-1648
Cameron Park, CA 95682-8861	Preparation: N/A
	Method: EPA TO-15M

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
097-09-002-8,569	Air	GC/MS II	N/A	05/19/09	090519L01

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	116	121	60-156	4	0-40	
Toluene	116	118	56-146	1	0-43	
Ethylbenzene	132	134	52-154	2	0-38	
p/m-Xylene	144	147	42-156	2	0-41	
o-Xylene	142	145	52-148	2	0-38	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 09-05-1648

Qualifier	Definition
AX	Sample too dilute to quantify surrogate.
AZ	Surrogate recovery outside of acceptance limits due to matrix interference.
BA	Relative percent difference out of control.
BA,AY	BA = Relative percent difference out of control. AY = Matrix interference suspected.
BB	Sample > 4x spike concentration.
BF	Reporting limits raised due to high hydrocarbon background.
BH	Reporting limits raised due to high level of non-target analytes.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
BY	Sample received at improper temperature.
CL	Initial analysis within holding time but required dilution.
CQ	Analyte concentration greater than 10 times the blank concentration.
CU	Surrogate concentration diluted to not detectable during analysis.
DF	Reporting limits elevated due to matrix interferences.
DU	Insufficient sample quantity for matrix spike/dup matrix spike.
ET	Sample was extracted past end of recommended max. holding time.
EY	Result exceeds normal dynamic range; reported as a min est.
GR	Internal standard recovery is outside method recovery limit.
IB	CCV recovery abovelimit; analyte not detected.
IH	Calibrtn. verif. recov. below method CL for this analyte.
IJ	Calibrtn. verif. recov. above method CL for this analyte.
J,DX	J=EPA Flag -Estimated value; DX= Value < lowest standard (MQL), but > than MDL.
LA	Confirmatory analysis was past holding time.
LG,AY	LG= Surrogate recovery below the acceptance limit. AY= Matrix interference suspected.
LH,AY	LH= Surrogate recovery above the acceptance limit. AY= Matrix interference suspected.
LM,AY	LM= MS and/or MSD above acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LN,AY	LN= MS and/or MSD below acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LQ	LCS recovery above method control limits.

Work Order Number: 09-05-1648

Qualifier	Definition
LR	LCS recovery below method control limits.
LW	Quantitation of unknown hydrocarbon(s) in sample based on gasoline.
LX	Quantitation of unknown hydrocarbon(s) in sample based on diesel.
MB	Analyte present in the method blank.
PC	Sample taken from VOA vial with air bubble > 6mm diameter.
PI	Primary and confirm results varied by > than 40% RPD.
RB	RPD exceeded method control limit; % recoveries within limits.
SG	A silica gel cleanup procedure was performed.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture.

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

Page 1 of 1

BP/ARC Project Name: ARCO 11132 - Assessment
BP/ARC Facility No: 11132
Req Due Date (mm/dd/yy): Eff 24hrs&othersSTD Rush TAT: Yes x No
Lab Work Order Number: 09-05-1648

Lab Name: Calscience Environmental Laboratories, Inc.	BP/ARC Facility Address: 3201 35th Avenue	Consultant/Contractor: Stratus Environmental, Inc.
Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841	City, State, ZIP Code: Oakland, California	Consultant/Contractor Project No: E11132-01
Lab PM: Richard Villafania	Lead Regulatory Agency: Alameda County Environmental Health	Address: 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682
Lab Phone: 714-895-5494	California Global ID No.: T0600100213	Consultant/Contractor PM: Jay Johnson
Lab Shipping Accnt: 9255	Enfos Proposal No: 000MT-0004	Phone: 530-676-6000
Lab Bottle Order No:	Accounting Mode: Provision x OOC-BU ___ OOC-RM ___	Email EDD To: chuff@stratusinc.net
Other Info:	Stage: Select Activity: Feasibility Study	Invoice To: BP/ARC x Contractor ___
BP/ARC EBM: Paul Supple		
EBM Phone: 925-275-3801		
EBM Email: paul.supple@bp.com		

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Water / Liquid	Air / Vapor	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol	Requested Analyses: GRO	BTEX	MTBE	6-oxys	Turnaround Time: 24-hours	Standard
1	11132 A SVS INF	51809	0820			X	2						X	X	X			X
2	11132 A SVS INF	51809	1000			X	2						X	X	X			Hold
3	11132 A SVS INF	51809	1305			X	2						X	X	X			X
4	11132 A SVS INF	51809	1620			X	2						X	X	X			X
5																		
6																		
7																		
8																		
9																		
10																		

Report Type & QC Level: Standard x; Full Data Package ___

Comments
Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

6-oxys include MTBE, TBA, TAME, DIPE, ETBE, and Ethanol.

Sampler's Name: Chris Hill	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Stratus Environmental, Inc.						
Shipment Method: GSO Ship Date: 51809		51809	1700		051909	1030
Shipment Tracking No: 105749016						

Special Instructions: Please cc results to bpedf@broadbentinc.com

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: _____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 09-05-1648

SAMPLE RECEIPT FORM

Box ~~Cooler~~ 1 of 1

CLIENT: Stratus DATE: 05/19/09

TEMPERATURE: (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature ____.____ °C - 0.2 °C (CF) = ____.____ °C ☐ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☑ Air ☐ Filter ☐ Metals Only ☐ PCBs Only **Initial:** NC

CUSTODY SEALS INTACT:

☐ Cooler ☑ Box ☐ No (Not Intact) ☐ Not Present ☐ N/A **Initial:** NC

☐ Sample ☐ _____ ☐ No (Not Intact) ☑ Not Present **Initial:** NC

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Correct containers and volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
Proper preservation noted on COC or sample container	☐	☐	☑
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☑	☐	☐

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve ☐EnCores® ☐TerraCores® ☐_____

Water: ☐VOA ☐VOA**h** ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☐1AGB ☐1AGB**na$_2$** ☐1AGB**s** ☐500AGB ☐500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐500PB ☐500PB**na** ☐250PB ☐250PB**n** ☐125PB ☐125PB**znna** ☐100PB ☐100PB**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☑Tedlar® ☐Summa® ☐_____ **Other:** ☐_____ **Checked/Labeled by:** NC

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar (Wide-mouth) B: Bottle (Narrow-mouth) **Reviewed by:** _____

Preservative: h: HCL n: HNO3 na$_2$: $Na_2S_2O_3$ Na: NaOH p: H_3PO_4 s: H_2SO_4 znna: $ZnAc_2$+NaOH f: Field-filtered **Scanned by:** _____

Calscience
Environmental
Laboratories, Inc.

May 28, 2009

Jay Johnson
Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Subject: **Calscience Work Order No.:** **09-05-1765**
Client Reference: **ARCO 11132 - Assessment**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 5/20/2009 and analyzed in accordance with the attached chain-of-custody.

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

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

Sincerely,

Calscience Environmental
Laboratories, Inc.
Richard Villafania
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Date Received: 05/20/09
Work Order No: 09-05-1765
Preparation: N/A
Method: EPA TO-15M
Units: mg/m3

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1765-1-A**	**05/19/09 08:05**	**Air**	**GC/MS AA**	**N/A**	**05/20/09 15:09**	**090520L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	15	0.64	400		Xylenes (total)	16	3.5	400	
Toluene	3.3	0.75	400		Methyl-t-Butyl Ether (MTBE)	4.4	2.9	400	
Ethylbenzene	10	0.87	400						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	97	57-129			1,2-Dichloroethane-d4	97	47-137		
Toluene-d8	87	78-156							

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1765-3-A**	**05/19/09 13:05**	**Air**	**GC/MS AA**	**N/A**	**05/20/09 15:56**	**090520L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	15	0.40	250		Xylenes (total)	16	2.2	250	
Toluene	2.8	0.47	250		Methyl-t-Butyl Ether (MTBE)	39	1.8	250	
Ethylbenzene	9.1	0.54	250						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	99	57-129			1,2-Dichloroethane-d4	97	47-137		
Toluene-d8	85	78-156							

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1765-4-A**	**05/19/09 16:20**	**Air**	**GC/MS AA**	**N/A**	**05/20/09 16:43**	**090520L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	16	0.40	250		Xylenes (total)	18	2.2	250	
Toluene	2.9	0.47	250		Methyl-t-Butyl Ether (MTBE)	5.6	1.8	250	
Ethylbenzene	10	0.54	250						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	98	57-129			1,2-Dichloroethane-d4	96	47-137		
Toluene-d8	83	78-156							

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**097-09-002-8,573**	**N/A**	**Air**	**GC/MS AA**	**N/A**	**05/20/09 12:34**	**090520L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.0016	1		Xylenes (total)	ND	0.0087	1	
Toluene	ND	0.0019	1		Methyl-t-Butyl Ether (MTBE)	ND	0.0072	1	
Ethylbenzene	ND	0.0022	1						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	93	57-129			1,2-Dichloroethane-d4	95	47-137		
Toluene-d8	92	78-156							

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	05/20/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1765
Cameron Park, CA 95682-8861	Preparation:	N/A
	Method:	EPA TO-3M

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1765-1-A**	**05/19/09 08:05**	**Air**	**GC 38**	**N/A**	**05/20/09 12:44**	**090520L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	4900	190	5		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1765-3-A**	**05/19/09 13:05**	**Air**	**GC 38**	**N/A**	**05/20/09 14:03**	**090520L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	3300	190	5		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1765-4-A**	**05/19/09 16:20**	**Air**	**GC 38**	**N/A**	**05/20/09 14:43**	**090520L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	3300	190	5		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-685-145**	**N/A**	**Air**	**GC 38**	**N/A**	**05/20/09 08:40**	**090520L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	38	1		mg/m3

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

Calscience Environmental Laboratories, Inc.

Quality Control - Duplicate

Stratus Environmental, inc.		Date Received:	05/20/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1765
Cameron Park, CA 95682-8861		Preparation:	N/A
		Method:	EPA TO-3M

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
11132ASYSINF	**Air**	**GC 38**	**N/A**	**05/20/09**	**090520D01**

Parameter	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	4900	5000	2	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.	Date Received: N/A
3330 Cameron Park Drive, Suite 550	Work Order No: 09-05-1765
Cameron Park, CA 95682-8861	Preparation: N/A
	Method: EPA TO-15M

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
097-09-002-8,573	Air	GC/MS AA	N/A	05/20/09	090520L01

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	103	110	60-156	7	0-40	
Toluene	107	115	56-146	7	0-43	
Ethylbenzene	108	117	52-154	8	0-38	
p/m-Xylene	102	111	42-156	8	0-41	
o-Xylene	108	118	52-148	9	0-38	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 09-05-1765

Qualifier	Definition
AX	Sample too dilute to quantify surrogate.
AZ	Surrogate recovery outside of acceptance limits due to matrix interference.
BA	Relative percent difference out of control.
BA,AY	BA = Relative percent difference out of control. AY = Matrix interference suspected.
BB	Sample > 4x spike concentration.
BF	Reporting limits raised due to high hydrocarbon background.
BH	Reporting limits raised due to high level of non-target analytes.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
BY	Sample received at improper temperature.
CL	Initial analysis within holding time but required dilution.
CQ	Analyte concentration greater than 10 times the blank concentration.
CU	Surrogate concentration diluted to not detectable during analysis.
DF	Reporting limits elevated due to matrix interferences.
DU	Insufficient sample quantity for matrix spike/dup matrix spike.
ET	Sample was extracted past end of recommended max. holding time.
EY	Result exceeds normal dynamic range; reported as a min est.
GR	Internal standard recovery is outside method recovery limit.
IB	CCV recovery abovelimit; analyte not detected.
IH	Calibrtn. verif. recov. below method CL for this analyte.
IJ	Calibrtn. verif. recov. above method CL for this analyte.
J,DX	J=EPA Flag -Estimated value; DX= Value < lowest standard (MQL), but > than MDL.
LA	Confirmatory analysis was past holding time.
LG,AY	LG= Surrogate recovery below the acceptance limit. AY= Matrix interference suspected.
LH,AY	LH= Surrogate recovery above the acceptance limit. AY= Matrix interference suspected.
LM,AY	LM= MS and/or MSD above acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LN,AY	LN= MS and/or MSD below acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LQ	LCS recovery above method control limits.

Work Order Number: 09-05-1765

Qualifier	Definition
LR	LCS recovery below method control limits.
LW	Quantitation of unknown hydrocarbon(s) in sample based on gasoline.
LX	Quantitation of unknown hydrocarbon(s) in sample based on diesel.
MB	Analyte present in the method blank.
PC	Sample taken from VOA vial with air bubble > 6mm diameter.
PI	Primary and confirm results varied by > than 40% RPD.
RB	RPD exceeded method control limit; % recoveries within limits.
SG	A silica gel cleanup procedure was performed.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture.

A

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: ARCO 11132 - Assessment
BP/ARC Facility No: 11132
Req Due Date (mm/dd/yy): Eff 24hrs&othersSTD Rush TAT: Yes x No
Lab Work Order Number: 09-05-1765

Lab Name: Calscience Environmental Laboratories, Inc.	BP/ARC Facility Address: 3201 35th Avenue	Consultant/Contractor: Stratus Environmental, Inc.
Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841	City, State, ZIP Code: Oakland, California	Consultant/Contractor Project No: E11132-01
Lab PM: Richard Villafania	Lead Regulatory Agency: Alameda County Environmental Health	Address: 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682
Lab Phone: 714-895-5494	California Global ID No.: T0600100213	Consultant/Contractor PM: Jay Johnson
Lab Shipping Accnt: 9255	Enfos Proposal No: 000MT-0004	Phone: 530-676-6000
Lab Bottle Order No:	Accounting Mode: Provision x OOC-BU ___ OOC-RM ___	Email EDD To: chuff@stratusinc.net
Other Info:	Stage: Select Activity: Feasibility Study	Invoice To: BP/ARC x Contractor ___
BP/ARC EBM: Paul Supple		
EBM Phone: 925-275-3801		
EBM Email: paul.supple@bp.com		

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Water / Liquid	Air / Vapor	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol	Requested Analyses: GRO	BTEX	MTBE	6-oxys	Turnaround Time: 24-hours	Standard
1	11132 A SVS INF	51909	0805			X	2						X	X	X			X
2	11132 A SVS INF	51909	1000			X	2											Hold
3	11132 A SVS INF	51909	1305			X	2						X	X	X			X
4	11132 A SVS INF	51909	1620			X	2						X	X	X			X
5																		
6																		
7																		
8																		
9																		
10																		

Report Type & QC Level: Standard x; Full Data Package ___

Comments
Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

6-oxys include MTBE, TBA, TAME, DIPE, ETBE, and Ethanol.

Sampler's Name: Chris Hill	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Stratus Environmental, Inc.	Chris Hill Stratus	51909	1700	Stacy R. Cea	5/10/09	10:15
Shipment Method: GSO Ship Date: 51909						
Shipment Tracking No: 105749017						

Special Instructions: Please ... adbentinc.com

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: _____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 09-05- 1 7 6 5

SAMPLE RECEIPT FORM

BOX ~~Cooler~~ 1 of 1

CLIENT: STRATUS DATE: 05 / 20 / 09

TEMPERATURE: (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature ____.____ °C - 0.2 °C (CF) = ____.____ °C ☐ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☑ Air ☐ Filter ☐ Metals Only ☐ PCBs Only **Initial:** PS

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A **Initial:** PS

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present **Initial:** PS

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Correct containers and volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
Proper preservation noted on COC or sample container	☐	☐	☑
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☑	☐	☐

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve ☐EnCores® ☐TerraCores® ☐_____

Water: ☐VOA ☐VOA**h** ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☐1AGB ☐1AGB**na$_2$** ☐1AGB**s** ☐500AGB ☐500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐500PB ☐500PB**na** ☐250PB ☐250PB**n** ☐125PB ☐125PB**znna** ☐100PB ☐100PB**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☑ Tedlar® ☐ Summa® ☐_____ **Other:** ☐_____ **Checked/Labeled by:** PS

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar (Wide-mouth) B: Bottle (Narrow-mouth) **Reviewed by:** DL

Preservative: h: HCL n: HNO_3 na$_2$: $Na_2S_2O_3$ Na: NaOH p: H_3PO_4 s: H_2SO_4 znna: $ZnAc_2$+NaOH f: Field-filtered **Scanned by:** PS

Calscience
Environmental
Laboratories, Inc.

May 29, 2009

Jay Johnson
Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Subject: **Calscience Work Order No.:** **09-05-1392**
Client Reference: **ARCO 11132 - Assessment**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 5/15/2009 and analyzed in accordance with the attached chain-of-custody.

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

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

Sincerely,

Calscience Environmental
Laboratories, Inc.
Richard Villafania
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Date Received: 05/15/09
Work Order No: 09-05-1392
Preparation: N/A
Method: EPA TO-15M
Units: mg/m3

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1392-1-A**	**05/13/09 08:30**	**Air**	**GC/MS AA**	**N/A**	**05/15/09 17:07**	**090515L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	1.1	0.040	25		Xylenes (total)	3.5	0.22	25	
Toluene	0.39	0.047	25		Methyl-t-Butyl Ether (MTBE)	1.4	0.18	25	
Ethylbenzene	1.5	0.054	25						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	101	57-129			1,2-Dichloroethane-d4	102	47-137		
Toluene-d8	85	78-156							

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1392-2-A**	**05/13/09 11:35**	**Air**	**GC/MS AA**	**N/A**	**05/15/09 17:52**	**090515L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	1.5	0.040	25		Xylenes (total)	5.8	0.22	25	
Toluene	0.90	0.047	25		Methyl-t-Butyl Ether (MTBE)	2.4	0.18	25	
Ethylbenzene	2.1	0.054	25						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	100	57-129			1,2-Dichloroethane-d4	99	47-137		
Toluene-d8	84	78-156							

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1392-3-A**	**05/14/09 08:00**	**Air**	**GC/MS AA**	**N/A**	**05/15/09 18:39**	**090515L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	2.6	0.16	100		Xylenes (total)	3.0	0.87	100	
Toluene	0.29	0.19	100		Methyl-t-Butyl Ether (MTBE)	0.89	0.72	100	
Ethylbenzene	3.4	0.22	100						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	99	57-129			1,2-Dichloroethane-d4	98	47-137		
Toluene-d8	87	78-156							

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1392-5-A**	**05/14/09 14:00**	**Air**	**GC/MS AA**	**N/A**	**05/15/09 19:26**	**090515L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	4.7	0.11	70		Xylenes (total)	3.9	0.61	70	
Toluene	0.43	0.13	70		Methyl-t-Butyl Ether (MTBE)	1.4	0.50	70	
Ethylbenzene	4.7	0.15	70						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	99	57-129			1,2-Dichloroethane-d4	99	47-137		
Toluene-d8	88	78-156							

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.		Date Received:	05/15/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1392
Cameron Park, CA 95682-8861		Preparation:	N/A
		Method:	EPA TO-15M
		Units:	mg/m3
Project: ARCO 11132 - Assessment			Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1392-6-A**	**05/14/09 17:05**	**Air**	**GC/MS AA**	**N/A**	**05/15/09 20:13**	**090515L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	4.2	0.080	50		Xylenes (total)	3.9	0.43	50	
Toluene	0.40	0.094	50		Methyl-t-Butyl Ether (MTBE)	1.2	0.36	50	
Ethylbenzene	4.5	0.11	50						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	100	57-129			1,2-Dichloroethane-d4	98	47-137		
Toluene-d8	86	78-156							

Method Blank	**097-09-002-8,556**	**N/A**	**Air**	**GC/MS AA**	**N/A**	**05/15/09 16:20**	**090515L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.0016	1		Xylenes (total)	ND	0.0087	1	
Toluene	ND	0.0019	1		Methyl-t-Butyl Ether (MTBE)	ND	0.0072	1	
Ethylbenzene	ND	0.0022	1						
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	98	57-129			1,2-Dichloroethane-d4	100	47-137		
Toluene-d8	96	78-156							

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.		Date Received:	05/15/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1392
Cameron Park, CA 95682-8861		Preparation:	N/A
		Method:	EPA TO-3M

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1392-1-A**	**05/13/09 08:30**	**Air**	**GC 38**	**N/A**	**05/15/09 11:30**	**090515L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	300	38	1		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1392-2-A**	**05/13/09 11:35**	**Air**	**GC 38**	**N/A**	**05/15/09 12:06**	**090515L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	290	38	1		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1392-3-A**	**05/14/09 08:00**	**Air**	**GC 38**	**N/A**	**05/15/09 12:49**	**090515L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	760	38	1		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1392-5-A**	**05/14/09 14:00**	**Air**	**GC 38**	**N/A**	**05/15/09 14:02**	**090515L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	650	38	1		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132ASYSINF	**09-05-1392-6-A**	**05/14/09 17:05**	**Air**	**GC 38**	**N/A**	**05/15/09 14:41**	**090515L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	610	38	1		mg/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-685-142**	**N/A**	**Air**	**GC 38**	**N/A**	**05/15/09 08:45**	**090515L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	38	1		mg/m3

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

Calscience Environmental Laboratories, Inc.

Quality Control - Duplicate

Stratus Environmental, inc.		Date Received:	05/15/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1392
Cameron Park, CA 95682-8861		Preparation:	N/A
		Method:	EPA TO-3M

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
11132ASYSINF	**Air**	**GC 38**	**N/A**	**05/15/09**	**090515D01**

Parameter	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	760	790	3	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.		Date Received:	N/A
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1392
Cameron Park, CA 95682-8861		Preparation:	N/A
		Method:	EPA TO-15M

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
097-09-002-8,556	Air	GC/MS AA	N/A	05/15/09	090515L01

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	101	104	60-156	3	0-40	
Toluene	98	105	56-146	7	0-43	
Ethylbenzene	99	107	52-154	7	0-38	
p/m-Xylene	94	101	42-156	7	0-41	
o-Xylene	100	107	52-148	7	0-38	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 09-05-1392

Qualifier	Definition
AX	Sample too dilute to quantify surrogate.
AZ	Surrogate recovery outside of acceptance limits due to matrix interference.
BA	Relative percent difference out of control.
BA,AY	BA = Relative percent difference out of control. AY = Matrix interference suspected.
BB	Sample > 4x spike concentration.
BF	Reporting limits raised due to high hydrocarbon background.
BH	Reporting limits raised due to high level of non-target analytes.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
BY	Sample received at improper temperature.
CL	Initial analysis within holding time but required dilution.
CQ	Analyte concentration greater than 10 times the blank concentration.
CU	Surrogate concentration diluted to not detectable during analysis.
DF	Reporting limits elevated due to matrix interferences.
DU	Insufficient sample quantity for matrix spike/dup matrix spike.
ET	Sample was extracted past end of recommended max. holding time.
EY	Result exceeds normal dynamic range; reported as a min est.
GR	Internal standard recovery is outside method recovery limit.
IB	CCV recovery abovelimit; analyte not detected.
IH	Calibrtn. verif. recov. below method CL for this analyte.
IJ	Calibrtn. verif. recov. above method CL for this analyte.
J,DX	J=EPA Flag -Estimated value; DX= Value < lowest standard (MQL), but > than MDL.
LA	Confirmatory analysis was past holding time.
LG,AY	LG= Surrogate recovery below the acceptance limit. AY= Matrix interference suspected.
LH,AY	LH= Surrogate recovery above the acceptance limit. AY= Matrix interference suspected.
LM,AY	LM= MS and/or MSD above acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LN,AY	LN= MS and/or MSD below acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LQ	LCS recovery above method control limits.

Work Order Number: 09-05-1392

Qualifier	Definition
LR	LCS recovery below method control limits.
LW	Quantitation of unknown hydrocarbon(s) in sample based on gasoline.
LX	Quantitation of unknown hydrocarbon(s) in sample based on diesel.
MB	Analyte present in the method blank.
PC	Sample taken from VOA vial with air bubble > 6mm diameter.
PI	Primary and confirm results varied by > than 40% RPD.
RB	RPD exceeded method control limit; % recoveries within limits.
SG	A silica gel cleanup procedure was performed.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture.

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

Page 1 of 1

BP/ARC Project Name: ARCO 11132 - Assessment
Req Due Date (mm/dd/yy): Eff 24hrs&othersSTD Rush TAT: Yes x No
BP/ARC Facility No: 11132
Lab Work Order Number: 09-05-1392

Lab Name: Calscience Environmental Laboratories, Inc.	BP/ARC Facility Address: 3201 35th Avenue	Consultant/Contractor: Stratus Environmental, Inc.
Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841	City, State, ZIP Code: Oakland, California	Consultant/Contractor Project No: E11132-01
Lab PM: Richard Villafania	Lead Regulatory Agency: Alameda County Environmental Health	Address: 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682
Lab Phone: 714-895-5494	California Global ID No.: T0600100213	Consultant/Contractor PM: Jay Johnson
Lab Shipping Accnt: 9255	Enfos Proposal No: 000MT-0004	Phone: 530-676-6000
Lab Bottle Order No:	Accounting Mode: Provision x OOC-BU ___ OOC-RM ___	Email EDD To: chuff@stratusinc.net
Other Info:	Stage: Select Activity: Feasibility Study	Invoice To: BP/ARC x Contractor ___
BP/ARC EBM: Paul Supple		
EBM Phone: 925-275-3801		
EBM Email: paul.supple@bp.com		

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol	Requested Analyses: GRO	BTEX	MTBE	6-oxys	Turnaround Time: 24-hours	Standard
1	11132 A SYS INF	51309	0933			X	2						X	X	X			X
2	11132 A SYS INF	51309	1135			X	2						X	X	X			X
3	11132 A SYS INF	51409	0800			X	2						X	X	X			X
4	11132 A SYS INF	51409	1100			X	2										HOLD	
5	11132 A SYS INF	51409	1400			X	2						X	X	X			X
6	11132 A SYS INF	51409	1705			X	2						X	X	X			X
7																		
8																		
9																		
10																		

Report Type & QC Level: Standard x; Full Data Package ___

Comments: Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

6-oxys include MTBE, TBA, TAME, DIPE, ETBE, and Ethanol.

Sampler's Name: Chris Hill	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Stratus Environmental, Inc.						
Shipment Method: GSO Shipped Date: 51409		51409	1700		5/15/09	0930
Shipment Tracking No: #4 105749015						

Special Instructions: Please cc results to bpedf@broadbentinc.com

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: _____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 09-05- 1 1 3 9 2

SAMPLE RECEIPT FORM

BOX ~~Cooler~~ 1 of 1

CLIENT: STRATUS DATE: 05 / 15 / 09

TEMPERATURE: (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature ____.____ °C - 0.2 °C (CF) = ____.____ °C ☐ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☑ Air ☐ Filter ☐ Metals Only ☐ PCBs Only **Initial:** RS

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A **Initial:** RS

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present **Initial:** WB

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Correct containers and volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
Proper preservation noted on COC or sample container	☐	☐	☑
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☑	☐	☐ WB 5/15/09

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve ☐EnCores® ☐TerraCores® ☐_____

Water: ☐VOA ☐VOA**h** ☐VOA**na_2** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☐1AGB ☐1AGB**na_2** ☐1AGB**s** ☐500AGB ☐500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐500PB ☐500PB**na** ☐250PB ☐250PB**n** ☐125PB ☐125PB**znna** ☐100PB ☐100PB**na_2** ☐_____ ☐_____ ☐_____

Air: ☑Tedlar® ☐Summa® ☐_____ **Other:** ☐_____ **Checked/Labeled by:** WB

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar (Wide-mouth) B: Bottle (Narrow-mouth) **Reviewed by:** DS

Preservative: h: HCL n: HNO3 **na_2**:$Na_2S_2O_3$ Na: NaOH p: H_3PO_4 s: H_2SO_4 znna: $ZnAc_2$+NaOH f: Field-filtered **Scanned by:** WB

Calscience
Environmental
Laboratories, Inc.

May 29, 2009

Jay Johnson
Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Subject: **Calscience Work Order No.:** **09-05-1508**
Client Reference: **ARCO 11132 - Assessment**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 5/16/2009 and analyzed in accordance with the attached chain-of-custody.

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

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

Sincerely,

Calscience Environmental
Laboratories, Inc.
Richard Villafania
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	05/16/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1508
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8015B (M)

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF	**09-05-1508-1-D**	**05/15/09 08:00**	**Aqueous**	**GC 4**	**05/26/09**	**05/26/09 23:37**	**090526B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	1400	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	96	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF	**09-05-1508-2-D**	**05/15/09 10:00**	**Aqueous**	**GC 4**	**05/26/09**	**05/27/09 00:10**	**090526B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	730	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	97	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF	**09-05-1508-3-D**	**05/15/09 12:45**	**Aqueous**	**GC 4**	**05/26/09**	**05/27/09 00:43**	**090526B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	650	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	105	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-695-550**	**N/A**	**Aqueous**	**GC 4**	**05/26/09**	**05/26/09 11:03**	**090526B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	107	38-134			

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Date Received: 05/16/09
Work Order No: 09-05-1508
Preparation: EPA 5030B
Method: EPA 8260B
Units: ug/L

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF	**09-05-1508-1-A**	**05/15/09 08:00**	**Aqueous**	**GC/MS BB**	**05/27/09**	**05/27/09 14:59**	**090527L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	190	5.0	10		Tert-Butyl Alcohol (TBA)	710	40	4	
Ethylbenzene	28	2.0	4		Diisopropyl Ether (DIPE)	ND	2.0	4	
Toluene	18	2.0	4		Ethyl-t-Butyl Ether (ETBE)	ND	2.0	4	
Xylenes (total)	110	2.0	4		Tert-Amyl-Methyl Ether (TAME)	ND	2.0	4	
Methyl-t-Butyl Ether (MTBE)	79	2.0	4		Ethanol	ND	1200	4	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	105	73-145			Dibromofluoromethane	98	81-135		
Toluene-d8	100	83-119			1,4-Bromofluorobenzene	99	74-110		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF	**09-05-1508-2-A**	**05/15/09 10:00**	**Aqueous**	**GC/MS BB**	**05/27/09**	**05/27/09 15:31**	**090527L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	94	2.0	4		Tert-Butyl Alcohol (TBA)	410	40	4	
Ethylbenzene	19	2.0	4		Diisopropyl Ether (DIPE)	ND	2.0	4	
Toluene	13	2.0	4		Ethyl-t-Butyl Ether (ETBE)	ND	2.0	4	
Xylenes (total)	74	2.0	4		Tert-Amyl-Methyl Ether (TAME)	ND	2.0	4	
Methyl-t-Butyl Ether (MTBE)	85	2.0	4		Ethanol	ND	1200	4	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	102	73-145			Dibromofluoromethane	97	81-135		
Toluene-d8	100	83-119			1,4-Bromofluorobenzene	102	74-110		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF	**09-05-1508-3-A**	**05/15/09 12:45**	**Aqueous**	**GC/MS BB**	**05/27/09**	**05/27/09 16:03**	**090527L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	82	2.0	4		Tert-Butyl Alcohol (TBA)	360	40	4	
Ethylbenzene	20	2.0	4		Diisopropyl Ether (DIPE)	ND	2.0	4	
Toluene	15	2.0	4		Ethyl-t-Butyl Ether (ETBE)	ND	2.0	4	
Xylenes (total)	72	2.0	4		Tert-Amyl-Methyl Ether (TAME)	ND	2.0	4	
Methyl-t-Butyl Ether (MTBE)	100	2.0	4		Ethanol	ND	1200	4	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	110	73-145			Dibromofluoromethane	99	81-135		
Toluene-d8	102	83-119			1,4-Bromofluorobenzene	102	74-110		

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	05/16/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1508
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8260B
	Units:	ug/L

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-703-897**	**N/A**	**Aqueous**	**GC/MS BB**	**05/27/09**	**05/27/09 13:22**	**090527L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
Ethylbenzene	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Toluene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	105	73-145			Dibromofluoromethane	99	81-135		
Toluene-d8	100	83-119			1,4-Bromofluorobenzene	95	74-110		

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

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Stratus Environmental, inc.		Date Received:	05/16/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1508
Cameron Park, CA 95682-8861		Preparation:	EPA 5030B
		Method:	EPA 8015B (M)

Project ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-05-1246-6	**Aqueous**	**GC 4**	**05/26/09**	**05/26/09**	**090526S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	105	98	38-134	7	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Stratus Environmental, inc.	Date Received:	05/16/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1508
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8260B

Project ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-05-1849-15	**Aqueous**	**GC/MS BB**	**05/27/09**	**05/27/09**	**090527S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	104	108	86-122	4	0-8	
Carbon Tetrachloride	105	108	78-138	3	0-9	
Chlorobenzene	103	106	90-120	3	0-9	
1,2-Dibromoethane	104	102	70-130	1	0-30	
1,2-Dichlorobenzene	105	108	89-119	3	0-10	
1,1-Dichloroethene	110	113	52-142	3	0-23	
Ethylbenzene	103	106	70-130	3	0-30	
Toluene	105	107	85-127	2	0-12	
Trichloroethene	103	105	78-126	2	0-10	
Vinyl Chloride	82	82	56-140	0	0-21	
Methyl-t-Butyl Ether (MTBE)	139	163	64-136	4	0-28	LM,AY
Tert-Butyl Alcohol (TBA)	114	137	27-183	6	0-60	
Diisopropyl Ether (DIPE)	107	109	78-126	2	0-16	
Ethyl-t-Butyl Ether (ETBE)	109	108	67-133	1	0-21	
Tert-Amyl-Methyl Ether (TAME)	104	104	63-141	0	0-21	
Ethanol	97	111	11-167	14	0-64	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.		Date Received:	N/A
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1508
Cameron Park, CA 95682-8861		Preparation:	EPA 5030B
		Method:	EPA 8015B (M)

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-695-550	Aqueous	GC 4	05/26/09	05/26/09	090526B01

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	105	108	78-120	3	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Date Received: N/A
Work Order No: 09-05-1508
Preparation: EPA 5030B
Method: EPA 8260B

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-703-897	Aqueous	GC/MS BB	05/27/09	05/27/09	090527L01

Parameter	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Benzene	102	104	87-117	82-122	2	0-7	
Carbon Tetrachloride	105	109	78-132	69-141	3	0-8	
Chlorobenzene	103	105	88-118	83-123	2	0-8	
1,2-Dibromoethane	97	106	80-120	73-127	8	0-20	
1,2-Dichlorobenzene	104	107	88-118	83-123	3	0-8	
1,1-Dichloroethene	106	110	71-131	61-141	3	0-14	
Ethylbenzene	102	103	80-120	73-127	1	0-20	
Toluene	104	107	85-127	78-134	4	0-7	
Trichloroethene	103	107	85-121	79-127	3	0-11	
Vinyl Chloride	84	83	64-136	52-148	1	0-10	
Methyl-t-Butyl Ether (MTBE)	100	112	67-133	56-144	12	0-16	
Tert-Butyl Alcohol (TBA)	104	101	34-154	14-174	3	0-19	
Diisopropyl Ether (DIPE)	103	108	80-122	73-129	4	0-8	
Ethyl-t-Butyl Ether (ETBE)	101	110	73-127	64-136	8	0-11	
Tert-Amyl-Methyl Ether (TAME)	98	109	69-135	58-146	11	0-12	
Ethanol	101	101	34-124	19-139	0	0-44	

Total number of LCS compounds : 16
Total number of ME compounds : 0
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 09-05-1508

Qualifier	Definition
AX	Sample too dilute to quantify surrogate.
AZ	Surrogate recovery outside of acceptance limits due to matrix interference.
BA	Relative percent difference out of control.
BA,AY	BA = Relative percent difference out of control. AY = Matrix interference suspected.
BB	Sample > 4x spike concentration.
BF	Reporting limits raised due to high hydrocarbon background.
BH	Reporting limits raised due to high level of non-target analytes.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
BY	Sample received at improper temperature.
CL	Initial analysis within holding time but required dilution.
CQ	Analyte concentration greater than 10 times the blank concentration.
CU	Surrogate concentration diluted to not detectable during analysis.
DF	Reporting limits elevated due to matrix interferences.
DU	Insufficient sample quantity for matrix spike/dup matrix spike.
ET	Sample was extracted past end of recommended max. holding time.
EY	Result exceeds normal dynamic range; reported as a min est.
GR	Internal standard recovery is outside method recovery limit.
IB	CCV recovery abovelimit; analyte not detected.
IH	Calibrtn. verif. recov. below method CL for this analyte.
IJ	Calibrtn. verif. recov. above method CL for this analyte.
J,DX	J=EPA Flag -Estimated value; DX= Value < lowest standard (MQL), but > than MDL.
LA	Confirmatory analysis was past holding time.
LG,AY	LG= Surrogate recovery below the acceptance limit. AY= Matrix interference suspected.
LH,AY	LH= Surrogate recovery above the acceptance limit. AY= Matrix interference suspected.
LM,AY	LM= MS and/or MSD above acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LN,AY	LN= MS and/or MSD below acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LQ	LCS recovery above method control limits.

Work Order Number: 09-05-1508

Qualifier	Definition
LR	LCS recovery below method control limits.
LW	Quantitation of unknown hydrocarbon(s) in sample based on gasoline.
LX	Quantitation of unknown hydrocarbon(s) in sample based on diesel.
MB	Analyte present in the method blank.
PC	Sample taken from VOA vial with air bubble > 6mm diameter.
PI	Primary and confirm results varied by > than 40% RPD.
RB	RPD exceeded method control limit; % recoveries within limits.
SG	A silica gel cleanup procedure was performed.
	Solid - unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for moisture.

W

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: ARCO 11132 - Assessment
BP/ARC Facility No: 11132
Req Due Date (mm/dd/yy): Eff 24hrs&othersSTD Rush TAT: Yes x No ____
Lab Work Order Number: 09-05-1508

Lab Name: Calscience Environmental Laboratories, Inc.	BP/ARC Facility Address: 3201 35th Avenue	Consultant/Contractor: Stratus Environmental, Inc.
Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841	City, State, ZIP Code: Oakland, California	Consultant/Contractor Project No: E11132-01
Lab PM: Richard Villafania	Lead Regulatory Agency: Alameda County Environmental Health	Address: 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682
Lab Phone: 714-895-5494	California Global ID No.: T0600100213	Consultant/Contractor PM: Jay Johnson
Lab Shipping Accnt: 9255	Enfos Proposal No: 000MT-0004	Phone: 530-676-6000
Lab Bottle Order No:	Accounting Mode: Provision x OOC-BU ____ OOC-RM ____	Email EDD To: chuff@stratusinc.net
Other Info:	Stage: Select Activity: Feasibility Study	Invoice To: BP/ARC x Contractor ____
BP/ARC EBM: Paul Supple		
EBM Phone: 925-275-3801		
EBM Email: paul.supple@bp.com		

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol	Requested Analyses: GRO	BTEX	MTBE	6-oxys	Turnaround Time: 24-hours	Standard
1	11132 W INF	51509	0800		X		6				X		X	X	X	X		X
2	11132 W INF	51509	1000		X		6				X		X	X	X	X		X
3	11132 W INF	51509	1245		X		6				X		X	X	X	X		X
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Report Type & QC Level
Standard x
Full Data Package ____

Comments
Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

6-oxys include MTBE, TBA, TAME, DIPE, ETBE, and Ethanol.

Sampler's Name: Chris Hill	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation / Date / Time
Sampler's Company: Stratus Environmental, Inc.		51509	1100	
Shipment Method: GSO Ship Date:				CEL 5.16.09 9:40
Shipment Tracking No: 9255 2822 42				

Special Instructions: Please cc results to bpedf@broadbentinc.com

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: ____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

9255522241

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 09-05-1508

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Stratus

DATE: 5/16/09

TEMPERATURE: (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature 3.6 °C - 0.2 °C (CF) = 3.4 °C ☑ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter ☐ Metals Only ☐ PCBs Only Initial: HD

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A Initial: HD

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present Initial: YL

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Correct containers and volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
Proper preservation noted on COC or sample container	☑	☐	☐
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☑	☐	☐
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve ☐EnCores® ☐TerraCores® ☐_____

Water: ☐VOA ☑VOAh ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☐1AGB ☐1AGB**na$_2$** ☐1AGB**s**

☐500AGB ☐500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐500PB ☐500PB**na**

☐250PB ☐250PB**n** ☐125PB ☐125PB**znna** ☐100PB ☐100PB**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Summa® ☐_____ **Other:** ☐_____ **Checked/Labeled by:** YL

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar (Wide-mouth) B: Bottle (Narrow-mouth) **Reviewed by:**

Preservative: h: HCL n: HNO3 na$_2$: $Na_2S_2O_3$ Na: NaOH p: H_3PO_4 s: H_2SO_4 znna: $ZnAc_2$+NaOH f: Field-filtered **Scanned by:** YL

Calscience
Environmental
Laboratories, Inc.

May 29, 2009

Jay Johnson
Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Subject: **Calscience Work Order No.:** **09-05-1393**
Client Reference: **ARCO 11132 - Assessment**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 5/15/2009 and analyzed in accordance with the attached chain-of-custody.

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

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

Sincerely,

Calscience Environmental
Laboratories, Inc.
Richard Villafania
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	05/15/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1393
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8015B (M)

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/11/09 08:00)	**09-05-1393-1-D**	**05/11/09 08:00**	**Aqueous**	**GC 4**	**05/23/09**	**05/23/09 17:30**	**090523B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	2100	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	134	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/11/09 13:05)	**09-05-1393-3-D**	**05/11/09 13:05**	**Aqueous**	**GC 4**	**05/23/09**	**05/23/09 15:19**	**090523B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	470	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	106	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/11/09 16:15)	**09-05-1393-4-D**	**05/11/09 16:15**	**Aqueous**	**GC 4**	**05/23/09**	**05/23/09 18:03**	**090523B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	490	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	104	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/12/09 08:00)	**09-05-1393-5-D**	**05/12/09 08:00**	**Aqueous**	**GC 4**	**05/23/09**	**05/23/09 18:36**	**090523B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	880	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	110	38-134			

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.		Date Received:	05/15/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1393
Cameron Park, CA 95682-8861		Preparation:	EPA 5030B
		Method:	EPA 8015B (M)

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/12/09 10:00)	**09-05-1393-6-D**	**05/12/09 10:00**	**Aqueous**	**GC 4**	**05/23/09**	**05/23/09 19:08**	**090523B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	430	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	102	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/12/09 11:45)	**09-05-1393-7-D**	**05/12/09 11:45**	**Aqueous**	**GC 4**	**05/23/09**	**05/23/09 19:41**	**090523B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	520	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	102	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/12/09 15:00)	**09-05-1393-8-D**	**05/12/09 15:00**	**Aqueous**	**GC 4**	**05/23/09**	**05/23/09 20:14**	**090523B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	290	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	91	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/13/09 08:15)	**09-05-1393-9-D**	**05/13/09 08:15**	**Aqueous**	**GC 4**	**05/23/09**	**05/23/09 20:47**	**090523B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	990	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	100	38-134			

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	05/15/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1393
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8015B (M)

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/13/09 11:30)	**09-05-1393-10-D**	**05/13/09 11:30**	**Aqueous**	**GC 4**	**05/23/09**	**05/23/09 21:20**	**090523B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	830	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	95	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/14/09 07:45)	**09-05-1393-11-D**	**05/14/09 07:45**	**Aqueous**	**GC 4**	**05/23/09**	**05/23/09 21:53**	**090523B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	2600	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	108	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/14/09 13:55)	**09-05-1393-13-D**	**05/14/09 13:55**	**Aqueous**	**GC 4**	**05/23/09**	**05/23/09 22:58**	**090523B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	1000	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	108	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/14/09 17:00)	**09-05-1393-14-D**	**05/14/09 17:00**	**Aqueous**	**GC 4**	**05/23/09**	**05/23/09 23:31**	**090523B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	830	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	96	38-134			

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	05/15/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1393
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8015B (M)

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-695-547**	**N/A**	**Aqueous**	**GC 4**	**05/23/09**	**05/23/09 13:41**	**090523B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	108	38-134			

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	05/15/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1393
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8260B
	Units:	ug/L

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/11/09 08:00)	**09-05-1393-1-B**	**05/11/09 08:00**	**Aqueous**	**GC/MS BB**	**05/22/09**	**05/22/09 21:24**	**090522L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	2.4	2.0	4		Tert-Butyl Alcohol (TBA)	490	40	4	
Ethylbenzene	5.8	2.0	4		Diisopropyl Ether (DIPE)	ND	2.0	4	
Toluene	ND	2.0	4		Ethyl-t-Butyl Ether (ETBE)	ND	2.0	4	
Xylenes (total)	37	2.0	4		Tert-Amyl-Methyl Ether (TAME)	ND	2.0	4	
Methyl-t-Butyl Ether (MTBE)	29	2.0	4		Ethanol	ND	1200	4	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	106	73-145			Dibromofluoromethane	108	81-135		
Toluene-d8	98	83-119			1,4-Bromofluorobenzene	108	74-110		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/11/09 13:05)	**09-05-1393-3-B**	**05/11/09 13:05**	**Aqueous**	**GC/MS BB**	**05/22/09**	**05/22/09 21:56**	**090522L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	5.8	2.5	5		Tert-Butyl Alcohol (TBA)	800	50	5	
Ethylbenzene	6.3	2.5	5		Diisopropyl Ether (DIPE)	ND	2.5	5	
Toluene	ND	2.5	5		Ethyl-t-Butyl Ether (ETBE)	ND	2.5	5	
Xylenes (total)	12	2.5	5		Tert-Amyl-Methyl Ether (TAME)	ND	2.5	5	
Methyl-t-Butyl Ether (MTBE)	70	2.5	5		Ethanol	ND	1500	5	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	97	73-145			Dibromofluoromethane	101	81-135		
Toluene-d8	98	83-119			1,4-Bromofluorobenzene	102	74-110		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/11/09 16:15)	**09-05-1393-4-C**	**05/11/09 16:15**	**Aqueous**	**GC/MS BB**	**05/23/09**	**05/23/09 20:40**	**090523L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	7.5	2.0	4		Tert-Butyl Alcohol (TBA)	870	100	10	
Ethylbenzene	7.9	2.0	4		Diisopropyl Ether (DIPE)	ND	2.0	4	
Toluene	ND	2.0	4		Ethyl-t-Butyl Ether (ETBE)	ND	2.0	4	
Xylenes (total)	12	2.0	4		Tert-Amyl-Methyl Ether (TAME)	2.5	2.0	4	
Methyl-t-Butyl Ether (MTBE)	86	2.0	4		Ethanol	ND	1200	4	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	97	73-145			Dibromofluoromethane	97	81-135		
Toluene-d8	99	83-119			1,4-Bromofluorobenzene	100	74-110		

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.		Date Received:	05/15/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1393
Cameron Park, CA 95682-8861		Preparation:	EPA 5030B
		Method:	EPA 8260B
		Units:	ug/L
Project: ARCO 11132 - Assessment			Page 2 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/12/09 08:00)	**09-05-1393-5-A**	**05/12/09 08:00**	**Aqueous**	**GC/MS BB**	**05/22/09**	**05/23/09 08:03**	**090522L02**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	1.9	0.50	1		Tert-Butyl Alcohol (TBA)	120	10	1	
Ethylbenzene	17	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Toluene	1.0	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Xylenes (total)	52	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Methyl-t-Butyl Ether (MTBE)	12	0.50	1		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	93	73-145			Dibromofluoromethane	102	81-135		
Toluene-d8	96	83-119			1,4-Bromofluorobenzene	108	74-110		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/12/09 10:00)	**09-05-1393-6-A**	**05/12/09 10:00**	**Aqueous**	**GC/MS BB**	**05/22/09**	**05/23/09 08:35**	**090522L02**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	0.78	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
Ethylbenzene	9.5	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Toluene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Xylenes (total)	29	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Methyl-t-Butyl Ether (MTBE)	5.7	0.50	1		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	97	73-145			Dibromofluoromethane	101	81-135		
Toluene-d8	98	83-119			1,4-Bromofluorobenzene	100	74-110		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/12/09 11:45)	**09-05-1393-7-A**	**05/12/09 11:45**	**Aqueous**	**GC/MS BB**	**05/23/09**	**05/23/09 16:25**	**090523L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	13	0.50	1		Tert-Butyl Alcohol (TBA)	11	10	1	
Ethylbenzene	15	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Toluene	1.9	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Xylenes (total)	45	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Methyl-t-Butyl Ether (MTBE)	14	0.50	1		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	97	73-145			Dibromofluoromethane	101	81-135		
Toluene-d8	99	83-119			1,4-Bromofluorobenzene	102	74-110		

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	05/15/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1393
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8260B
	Units:	ug/L

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/12/09 15:00)	**09-05-1393-8-A**	**05/12/09 15:00**	**Aqueous**	**GC/MS BB**	**05/23/09**	**05/23/09 16:57**	**090523L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	3.8	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
Ethylbenzene	7.1	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Toluene	0.90	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Xylenes (total)	25	0.50	1		Tert-Amyl-Methyl Ether (TAME)	0.70	0.50	1	
Methyl-t-Butyl Ether (MTBE)	49	2.5	5		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	98	73-145			Dibromofluoromethane	99	81-135		
Toluene-d8	98	83-119			1,4-Bromofluorobenzene	103	74-110		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/13/09 08:15)	**09-05-1393-9-A**	**05/13/09 08:15**	**Aqueous**	**GC/MS BB**	**05/23/09**	**05/23/09 17:29**	**090523L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	25	0.50	1		Tert-Butyl Alcohol (TBA)	85	10	1	
Ethylbenzene	30	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Toluene	7.3	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Xylenes (total)	94	0.50	1		Tert-Amyl-Methyl Ether (TAME)	1.9	0.50	1	
Methyl-t-Butyl Ether (MTBE)	150	5.0	10		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	99	73-145			Dibromofluoromethane	100	81-135		
Toluene-d8	98	83-119			1,4-Bromofluorobenzene	105	74-110		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/13/09 11:30)	**09-05-1393-10-A**	**05/13/09 11:30**	**Aqueous**	**GC/MS BB**	**05/23/09**	**05/23/09 18:01**	**090523L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	24	0.50	1		Tert-Butyl Alcohol (TBA)	30	10	1	
Ethylbenzene	38	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Toluene	16	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Xylenes (total)	140	10	1		Tert-Amyl-Methyl Ether (TAME)	4.9	0.50	1	
Methyl-t-Butyl Ether (MTBE)	340	10	20		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	96	73-145			Dibromofluoromethane	99	81-135		
Toluene-d8	99	83-119			1,4-Bromofluorobenzene	103	74-110		

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	05/15/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1393
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8260B
	Units:	ug/L
Project: ARCO 11132 - Assessment		Page 4 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/14/09 07:45)	**09-05-1393-11-B**	**05/14/09 07:45**	**Aqueous**	**GC/MS BB**	**05/26/09**	**05/26/09 21:20**	**090526L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	31	2.5	5		Tert-Butyl Alcohol (TBA)	350	50	5	
Ethylbenzene	71	2.5	5		Diisopropyl Ether (DIPE)	ND	2.5	5	
Toluene	2.6	2.5	5		Ethyl-t-Butyl Ether (ETBE)	ND	2.5	5	
Xylenes (total)	54	2.5	5		Tert-Amyl-Methyl Ether (TAME)	3.6	2.5	5	
Methyl-t-Butyl Ether (MTBE)	120	2.5	5		Ethanol	ND	1500	5	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	96	73-145			Dibromofluoromethane	97	81-135		
Toluene-d8	100	83-119			1,4-Bromofluorobenzene	102	74-110		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/14/09 13:55)	**09-05-1393-13-A**	**05/14/09 13:55**	**Aqueous**	**GC/MS BB**	**05/23/09**	**05/23/09 19:04**	**090523L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	56	2.5	5		Tert-Butyl Alcohol (TBA)	370	50	5	
Ethylbenzene	54	2.5	5		Diisopropyl Ether (DIPE)	ND	0.50	1	
Toluene	4.1	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Xylenes (total)	52	0.50	1		Tert-Amyl-Methyl Ether (TAME)	2.6	0.50	1	
Methyl-t-Butyl Ether (MTBE)	100	2.5	5		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	98	73-145			Dibromofluoromethane	99	81-135		
Toluene-d8	99	83-119			1,4-Bromofluorobenzene	107	74-110		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF (5/14/09 17:00)	**09-05-1393-14-A**	**05/14/09 17:00**	**Aqueous**	**GC/MS BB**	**05/23/09**	**05/23/09 19:36**	**090523L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	53	2.5	5		Tert-Butyl Alcohol (TBA)	350	50	5	
Ethylbenzene	50	2.5	5		Diisopropyl Ether (DIPE)	ND	0.50	1	
Toluene	4.1	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Xylenes (total)	51	0.50	1		Tert-Amyl-Methyl Ether (TAME)	2.7	0.50	1	
Methyl-t-Butyl Ether (MTBE)	110	2.5	5		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	96	73-145			Dibromofluoromethane	98	81-135		
Toluene-d8	99	83-119			1,4-Bromofluorobenzene	105	74-110		

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	05/15/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1393
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8260B
	Units:	ug/L
Project: ARCO 11132 - Assessment		Page 5 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-703-891**	**N/A**	**Aqueous**	**GC/MS BB**	**05/22/09**	**05/22/09 16:36**	**090522L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
Ethylbenzene	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Toluene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	103	73-145			Dibromofluoromethane	102	81-135		
Toluene-d8	100	83-119			1,4-Bromofluorobenzene	78	74-110		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-703-892**	**N/A**	**Aqueous**	**GC/MS BB**	**05/22/09**	**05/23/09 03:16**	**090522L02**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
Ethylbenzene	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Toluene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	105	73-145			Dibromofluoromethane	98	81-135		
Toluene-d8	99	83-119			1,4-Bromofluorobenzene	98	74-110		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-703-893**	**N/A**	**Aqueous**	**GC/MS BB**	**05/23/09**	**05/23/09 12:36**	**090523L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
Ethylbenzene	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Toluene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	99	73-145			Dibromofluoromethane	103	81-135		
Toluene-d8	100	83-119			1,4-Bromofluorobenzene	101	74-110		

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.		Date Received:	05/15/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1393
Cameron Park, CA 95682-8861		Preparation:	EPA 5030B
		Method:	EPA 8260B
		Units:	ug/L
Project: ARCO 11132 - Assessment			Page 6 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-703-894**	**N/A**	**Aqueous**	**GC/MS BB**	**05/26/09**	**05/26/09 12:41**	**090526L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
Ethylbenzene	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Toluene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	97	73-145			Dibromofluoromethane	98	81-135		
Toluene-d8	100	83-119			1,4-Bromofluorobenzene	99	74-110		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-703-896**	**N/A**	**Aqueous**	**GC/MS BB**	**05/26/09**	**05/27/09 01:04**	**090526L02**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
Ethylbenzene	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Toluene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	102	73-145			Dibromofluoromethane	101	81-135		
Toluene-d8	100	83-119			1,4-Bromofluorobenzene	99	74-110		

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

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Stratus Environmental, inc.	Date Received:	05/15/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1393
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8015B (M)

Project ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
11132WINF (5/11/09 13:05)	**Aqueous**	**GC 4**	**05/23/09**	**05/23/09**	**090523S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	103	101	38-134	1	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Stratus Environmental, inc.		Date Received:	05/15/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1393
Cameron Park, CA 95682-8861		Preparation:	EPA 5030B
		Method:	EPA 8260B

Project ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-05-1278-4	**Aqueous**	**GC/MS BB**	**05/22/09**	**05/22/09**	**090522S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	90	89	86-122	0	0-8	
Carbon Tetrachloride	101	101	78-138	1	0-9	
Chlorobenzene	100	99	90-120	1	0-9	
1,2-Dibromoethane	100	101	70-130	1	0-30	
1,2-Dichlorobenzene	100	103	89-119	2	0-10	
1,1-Dichloroethene	104	106	52-142	2	0-23	
Ethylbenzene	103	104	70-130	0	0-30	
Toluene	102	102	85-127	0	0-12	
Trichloroethene	98	98	78-126	0	0-10	
Vinyl Chloride	77	74	56-140	4	0-21	
Methyl-t-Butyl Ether (MTBE)	99	103	64-136	3	0-28	
Tert-Butyl Alcohol (TBA)	94	96	27-183	2	0-60	
Diisopropyl Ether (DIPE)	101	104	78-126	3	0-16	
Ethyl-t-Butyl Ether (ETBE)	99	103	67-133	4	0-21	
Tert-Amyl-Methyl Ether (TAME)	96	100	63-141	5	0-21	
Ethanol	93	93	11-167	0	0-64	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Stratus Environmental, inc.	Date Received:	05/15/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1393
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8260B

Project ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-05-1246-6	**Aqueous**	**GC/MS BB**	**05/23/09**	**05/23/09**	**090523S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	102	100	86-122	2	0-8	
Carbon Tetrachloride	104	101	78-138	3	0-9	
Chlorobenzene	101	100	90-120	2	0-9	
1,2-Dibromoethane	96	99	70-130	3	0-30	
1,2-Dichlorobenzene	101	103	89-119	2	0-10	
1,1-Dichloroethene	103	105	52-142	2	0-23	
Ethylbenzene	100	99	70-130	1	0-30	
Toluene	103	101	85-127	2	0-12	
Trichloroethene	100	98	78-126	2	0-10	
Vinyl Chloride	77	78	56-140	1	0-21	
Methyl-t-Butyl Ether (MTBE)	102	102	64-136	1	0-28	
Tert-Butyl Alcohol (TBA)	99	110	27-183	11	0-60	
Diisopropyl Ether (DIPE)	104	104	78-126	0	0-16	
Ethyl-t-Butyl Ether (ETBE)	104	104	67-133	1	0-21	
Tert-Amyl-Methyl Ether (TAME)	100	101	63-141	0	0-21	
Ethanol	98	102	11-167	4	0-64	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Stratus Environmental, inc.		Date Received:	05/15/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1393
Cameron Park, CA 95682-8861		Preparation:	EPA 5030B
		Method:	EPA 8260B

Project ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-05-1550-2	**Aqueous**	**GC/MS BB**	**05/26/09**	**05/26/09**	**090526S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	100	99	86-122	1	0-8	
Carbon Tetrachloride	100	98	78-138	2	0-9	
Chlorobenzene	100	101	90-120	1	0-9	
1,2-Dibromoethane	93	101	70-130	8	0-30	
1,2-Dichlorobenzene	100	104	89-119	4	0-10	
1,1-Dichloroethene	101	99	52-142	1	0-23	
Ethylbenzene	100	98	70-130	2	0-30	
Toluene	99	99	85-127	0	0-12	
Trichloroethene	98	97	78-126	1	0-10	
Vinyl Chloride	79	76	56-140	4	0-21	
Methyl-t-Butyl Ether (MTBE)	94	104	64-136	8	0-28	
Tert-Butyl Alcohol (TBA)	107	104	27-183	4	0-60	
Diisopropyl Ether (DIPE)	99	103	78-126	3	0-16	
Ethyl-t-Butyl Ether (ETBE)	99	104	67-133	5	0-21	
Tert-Amyl-Methyl Ether (TAME)	96	103	63-141	7	0-21	
Ethanol	100	96	11-167	4	0-64	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Stratus Environmental, inc.		Date Received:	05/15/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1393
Cameron Park, CA 95682-8861		Preparation:	EPA 5030B
		Method:	EPA 8260B

Project ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-05-1664-2	**Aqueous**	**GC/MS BB**	**05/26/09**	**05/27/09**	**090526S02**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	101	100	86-122	1	0-8	
Carbon Tetrachloride	97	98	78-138	1	0-9	
Chlorobenzene	100	101	90-120	1	0-9	
1,2-Dibromoethane	97	100	70-130	3	0-30	
1,2-Dichlorobenzene	101	104	89-119	3	0-10	
1,1-Dichloroethene	107	105	52-142	3	0-23	
Ethylbenzene	101	100	70-130	1	0-30	
Toluene	100	99	85-127	1	0-12	
Trichloroethene	98	98	78-126	0	0-10	
Vinyl Chloride	81	77	56-140	5	0-21	
Methyl-t-Butyl Ether (MTBE)	111	111	64-136	1	0-28	
Tert-Butyl Alcohol (TBA)	104	107	27-183	3	0-60	
Diisopropyl Ether (DIPE)	113	110	78-126	3	0-16	
Ethyl-t-Butyl Ether (ETBE)	112	111	67-133	1	0-21	
Tert-Amyl-Methyl Ether (TAME)	103	105	63-141	2	0-21	
Ethanol	105	95	11-167	10	0-64	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.		Date Received:	N/A
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1393
Cameron Park, CA 95682-8861		Preparation:	EPA 5030B
		Method:	EPA 8015B (M)

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-695-547	Aqueous	GC 4	05/23/09	05/23/09	090523B01

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	109	109	78-120	0	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.	Date Received: N/A
3330 Cameron Park Drive, Suite 550	Work Order No: 09-05-1393
Cameron Park, CA 95682-8861	Preparation: EPA 5030B
	Method: EPA 8260B

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-703-891	Aqueous	GC/MS BB	05/22/09	05/22/09	090522L01

Parameter	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Benzene	104	107	87-117	82-122	3	0-7	
Carbon Tetrachloride	105	110	78-132	69-141	4	0-8	
Chlorobenzene	106	105	88-118	83-123	1	0-8	
1,2-Dibromoethane	108	107	80-120	73-127	1	0-20	
1,2-Dichlorobenzene	109	107	88-118	83-123	2	0-8	
1,1-Dichloroethene	114	115	71-131	61-141	1	0-14	
Ethylbenzene	107	107	80-120	73-127	0	0-20	
Toluene	105	108	85-127	78-134	3	0-7	
Trichloroethene	114	115	85-121	79-127	1	0-11	
Vinyl Chloride	87	87	64-136	52-148	0	0-10	
Methyl-t-Butyl Ether (MTBE)	113	114	67-133	56-144	0	0-16	
Tert-Butyl Alcohol (TBA)	103	106	34-154	14-174	3	0-19	
Diisopropyl Ether (DIPE)	110	112	80-122	73-129	2	0-8	
Ethyl-t-Butyl Ether (ETBE)	112	113	73-127	64-136	1	0-11	
Tert-Amyl-Methyl Ether (TAME)	107	109	69-135	58-146	1	0-12	
Ethanol	105	107	34-124	19-139	2	0-44	

Total number of LCS compounds : 16
Total number of ME compounds : 0
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.		Date Received:	N/A
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1393
Cameron Park, CA 95682-8861		Preparation:	EPA 5030B
		Method:	EPA 8260B

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-703-892	Aqueous	GC/MS BB	05/22/09	05/23/09	090522L02

Parameter	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
Benzene	100	102	87-117	82-122	1	0-7	
Carbon Tetrachloride	101	104	78-132	69-141	3	0-8	
Chlorobenzene	101	101	88-118	83-123	0	0-8	
1,2-Dibromoethane	101	102	80-120	73-127	1	0-20	
1,2-Dichlorobenzene	102	101	88-118	83-123	1	0-8	
1,1-Dichloroethene	108	108	71-131	61-141	1	0-14	
Ethylbenzene	100	101	80-120	73-127	1	0-20	
Toluene	102	103	85-127	78-134	1	0-7	
Trichloroethene	117	122	85-121	79-127	4	0-11	LQ
Vinyl Chloride	82	84	64-136	52-148	3	0-10	
Methyl-t-Butyl Ether (MTBE)	102	106	67-133	56-144	3	0-16	
Tert-Butyl Alcohol (TBA)	97	99	34-154	14-174	2	0-19	
Diisopropyl Ether (DIPE)	103	105	80-122	73-129	2	0-8	
Ethyl-t-Butyl Ether (ETBE)	103	106	73-127	64-136	2	0-11	
Tert-Amyl-Methyl Ether (TAME)	100	102	69-135	58-146	2	0-12	
Ethanol	105	100	34-124	19-139	5	0-44	

Total number of LCS compounds : 16
Total number of ME compounds : 1
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.		Date Received:	N/A
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1393
Cameron Park, CA 95682-8861		Preparation:	EPA 5030B
		Method:	EPA 8260B

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-703-893	Aqueous	GC/MS BB	05/23/09	05/23/09	090523L01

Parameter	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Benzene	99	103	87-117	82-122	4	0-7	
Carbon Tetrachloride	100	101	78-132	69-141	1	0-8	
Chlorobenzene	100	103	88-118	83-123	2	0-8	
1,2-Dibromoethane	95	101	80-120	73-127	6	0-20	
1,2-Dichlorobenzene	101	103	88-118	83-123	2	0-8	
1,1-Dichloroethene	105	106	71-131	61-141	1	0-14	
Ethylbenzene	100	102	80-120	73-127	2	0-20	
Toluene	101	105	85-127	78-134	5	0-7	
Trichloroethene	98	104	85-121	79-127	6	0-11	
Vinyl Chloride	80	81	64-136	52-148	1	0-10	
Methyl-t-Butyl Ether (MTBE)	103	107	67-133	56-144	4	0-16	
Tert-Butyl Alcohol (TBA)	102	102	34-154	14-174	0	0-19	
Diisopropyl Ether (DIPE)	105	106	80-122	73-129	2	0-8	
Ethyl-t-Butyl Ether (ETBE)	106	109	73-127	64-136	3	0-11	
Tert-Amyl-Methyl Ether (TAME)	100	106	69-135	58-146	6	0-12	
Ethanol	91	100	34-124	19-139	9	0-44	

Total number of LCS compounds : 16
Total number of ME compounds : 0
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.		Date Received:	N/A
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1393
Cameron Park, CA 95682-8861		Preparation:	EPA 5030B
		Method:	EPA 8260B

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-703-894	Aqueous	GC/MS BB	05/26/09	05/26/09	090526L01

Parameter	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Benzene	99	100	87-117	82-122	1	0-7	
Carbon Tetrachloride	103	102	78-132	69-141	2	0-8	
Chlorobenzene	101	101	88-118	83-123	0	0-8	
1,2-Dibromoethane	100	99	80-120	73-127	1	0-20	
1,2-Dichlorobenzene	104	105	88-118	83-123	1	0-8	
1,1-Dichloroethene	103	101	71-131	61-141	2	0-14	
Ethylbenzene	100	99	80-120	73-127	1	0-20	
Toluene	102	101	85-127	78-134	0	0-7	
Trichloroethene	100	101	85-121	79-127	1	0-11	
Vinyl Chloride	79	81	64-136	52-148	2	0-10	
Methyl-t-Butyl Ether (MTBE)	98	102	67-133	56-144	3	0-16	
Tert-Butyl Alcohol (TBA)	100	98	34-154	14-174	2	0-19	
Diisopropyl Ether (DIPE)	97	99	80-122	73-129	2	0-8	
Ethyl-t-Butyl Ether (ETBE)	98	102	73-127	64-136	4	0-11	
Tert-Amyl-Methyl Ether (TAME)	98	101	69-135	58-146	3	0-12	
Ethanol	95	97	34-124	19-139	2	0-44	

Total number of LCS compounds : 16
Total number of ME compounds : 0
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.		Date Received:	N/A
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1393
Cameron Park, CA 95682-8861		Preparation:	EPA 5030B
		Method:	EPA 8260B

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-703-896	Aqueous	GC/MS BB	05/26/09	05/26/09	090526L02

Parameter	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
Benzene	103	104	87-117	82-122	1	0-7	
Carbon Tetrachloride	103	105	78-132	69-141	2	0-8	
Chlorobenzene	102	101	88-118	83-123	1	0-8	
1,2-Dibromoethane	101	101	80-120	73-127	0	0-20	
1,2-Dichlorobenzene	105	106	88-118	83-123	1	0-8	
1,1-Dichloroethene	108	108	71-131	61-141	0	0-14	
Ethylbenzene	101	101	80-120	73-127	0	0-20	
Toluene	103	105	85-127	78-134	1	0-7	
Trichloroethene	110	117	85-121	79-127	6	0-11	
Vinyl Chloride	80	83	64-136	52-148	4	0-10	
Methyl-t-Butyl Ether (MTBE)	108	110	67-133	56-144	2	0-16	
Tert-Butyl Alcohol (TBA)	100	99	34-154	14-174	1	0-19	
Diisopropyl Ether (DIPE)	107	109	80-122	73-129	2	0-8	
Ethyl-t-Butyl Ether (ETBE)	107	110	73-127	64-136	3	0-11	
Tert-Amyl-Methyl Ether (TAME)	105	107	69-135	58-146	1	0-12	
Ethanol	108	100	34-124	19-139	8	0-44	

Total number of LCS compounds : 16
Total number of ME compounds : 0
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 09-05-1393

Qualifier	Definition
AX	Sample too dilute to quantify surrogate.
AZ	Surrogate recovery outside of acceptance limits due to matrix interference.
BA	Relative percent difference out of control.
BA,AY	BA = Relative percent difference out of control. AY = Matrix interference suspected.
BB	Sample > 4x spike concentration.
BF	Reporting limits raised due to high hydrocarbon background.
BH	Reporting limits raised due to high level of non-target analytes.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
BY	Sample received at improper temperature.
CL	Initial analysis within holding time but required dilution.
CQ	Analyte concentration greater than 10 times the blank concentration.
CU	Surrogate concentration diluted to not detectable during analysis.
DF	Reporting limits elevated due to matrix interferences.
DU	Insufficient sample quantity for matrix spike/dup matrix spike.
ET	Sample was extracted past end of recommended max. holding time.
EY	Result exceeds normal dynamic range; reported as a min est.
GR	Internal standard recovery is outside method recovery limit.
IB	CCV recovery abovelimit; analyte not detected.
IH	Calibrtn. verif. recov. below method CL for this analyte.
IJ	Calibrtn. verif. recov. above method CL for this analyte.
J,DX	J=EPA Flag -Estimated value; DX= Value < lowest standard (MQL), but > than MDL.
LA	Confirmatory analysis was past holding time.
LG,AY	LG= Surrogate recovery below the acceptance limit. AY= Matrix interference suspected.
LH,AY	LH= Surrogate recovery above the acceptance limit. AY= Matrix interference suspected.
LM,AY	LM= MS and/or MSD above acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LN,AY	LN= MS and/or MSD below acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LQ	LCS recovery above method control limits.

Work Order Number: 09-05-1393

Qualifier	Definition
LR	LCS recovery below method control limits.
LW	Quantitation of unknown hydrocarbon(s) in sample based on gasoline.
LX	Quantitation of unknown hydrocarbon(s) in sample based on diesel.
MB	Analyte present in the method blank.
PC	Sample taken from VOA vial with air bubble > 6mm diameter.
PI	Primary and confirm results varied by > than 40% RPD.
RB	RPD exceeded method control limit; % recoveries within limits.
SG	A silica gel cleanup procedure was performed.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture.

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: ARCO 11132 - Assessment
BP/ARC Facility No: 11132
Req Due Date (mm/dd/yy): Eff 24hrs&othersSTD Rush TAT: Yes x No
Lab Work Order Number: 09-05-1393

Lab Name: Calscience Environmental Laboratories, Inc.	BP/ARC Facility Address: 3201 35th Avenue	Consultant/Contractor: Stratus Environmental, Inc.
Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841	City, State, ZIP Code: Oakland, California	Consultant/Contractor Project No: E11132-01
Lab PM: Richard Villafania	Lead Regulatory Agency: Alameda County Environmental Health	Address: 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682
Lab Phone: 714-895-5494	California Global ID No.: T0600100213	Consultant/Contractor PM: Jay Johnson
Lab Shipping Accnt: 9255	Enfos Proposal No: 000MT-0004	Phone: 530-676-6000
Lab Bottle Order No:	Accounting Mode: Provision x OOC-BU ___ OOC-RM ___	Email EDD To: chuff@stratusinc.net
Other Info:	Stage: Select Activity: Feasibility Study	Invoice To: BP/ARC x Contractor ___
BP/ARC EBM: Paul Supple		
EBM Phone: 925-275-3801		
EBM Email: paul.supple@bp.com		

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol	Requested Analyses: GRO	BTEX	MTBE	6-oxys	Turnaround Time: 24-hours	Standard	Report Type & QC Level: Standard x / Full Data Package ___
1	11132 W INF	51109	0800		X		6				X		X	X	X	X		X	6-oxys include MTBE, TBA, TAME,
2	11132 W INF	51109	1000		X		6				X							Hold	DIPE, ETBE, and Ethanol.
3	11132 W INF	51109	1305		X		6				X		X	X	X	X		X	
4	11132 W INF	51109	1615		X		6				X		X	X	X	X		X	
5	11132 W INF	51209	0800		X		6				X		X	X	X	X		X	
6	11132 W INF	51209	1000		X		6				X		X	X	X	X		X	
7	11132 W INF	51209	1145		X		6				X		X	X	X	X		X	
8	11132 W INF	51209	1500		X		6				X		X	X	X	X		X	
9	11132 W INF	51309	0815		X		6				X		X	X	X	X		X	
10	11132 W INF	51309	1130		X		6				X		X	X	X	X		X	

Comments: Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

Sampler's Name: Chris Hill	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Stratus Environmental, Inc.	Chris Hill Stratus	51409	1700	Jacqueline A. Cha	5/15/09	0:9
Shipment Method: GSO Ship Date: 51409						
Shipment Tracking No: #105748992						

Special Instructions: Please ... results to bpeon@broadbentinc.com

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: ____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

W

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: ARCO 11132 - Assessment
BP/ARC Facility No: 11132
Req Due Date (mm/dd/yy): Eff 24hrs&othersSTD Rush TAT: Yes x No
Lab Work Order Number: 09-05-1393

Lab Name: Calscience Environmental Laboratories, Inc.	BP/ARC Facility Address: 3201 35th Avenue	Consultant/Contractor: Stratus Environmental, Inc.
Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841	City, State, ZIP Code: Oakland, California	Consultant/Contractor Project No: E11132-01
Lab PM: Richard Villafania	Lead Regulatory Agency: Alameda County Environmental Health	Address: 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682
Lab Phone: 714-895-5494	California Global ID No.: T0600100213	Consultant/Contractor PM: Jay Johnson
Lab Shipping Accnt: 9255	Enfos Proposal No: 000MT-0004	Phone: 530-676-6000
Lab Bottle Order No:	Accounting Mode: Provision X OOC-BU ___ OOC-RM ___	Email EDD To: chuff@stratusinc.net
Other Info:	Stage: Select Activity: Feasibility Study	Invoice To: BP/ARC x Contractor ___
BP/ARC EBM: Paul Supple		
EBM Phone: 925-275-3801		
EBM Email: paul.supple@bp.com		

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol	Requested Analyses: GRO	BTEX	MTBE	6-oxys	Turnaround Time: 24-hours	Standard
1	11132 W INF	51409	0745		X		6				X		X	X	X	X		X
2	11132 W INF	51409	1115		X		6				X		X	X	X	X	Hold	
3	11132 W INF	51409	1355		X		6				X		X	X	X	X		X
4	11132 W INF	51409	1700		X		6				X		X	X	X	X		X
5																		
6																		
7																		
8																		
9																		
15 10	TB11152514O9	51409	1115		X		2										Hold	

Report Type & QC Level: Standard x; Full Data Package ___

Comments
Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

6-oxys include MTBE, TBA, TAME, DIPE, ETBE, and Ethanol.

Sampler's Name: Chris Hill	Relinquished By / Affiliation	Date	Time
Sampler's Company: Stratus Environmental, Inc.	Chris Hill Stratus	51409	1700
Shipment Method: GSO Ship Date: 51409			
Shipment Tracking No:			

Accepted By / Affiliation	Date	Time
Greg R. GSO	5/15/09	09:30

Special Instructions: Please cc results to bpedf@broadbentinc.com

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: _____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 09-05- 1 3 0 3

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: STRATUS

DATE: 05/15/09

TEMPERATURE: (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature 1.9 °C - 0.2 °C (CF) = 1.7 °C ☑ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter ☐ Metals Only ☐ PCBs Only **Initial:** PS

CUSTODY SEALS INTACT:

☑ Cooler ☐_____ ☐ No (Not Intact) ☐ Not Present ☐ N/A **Initial:** PS

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present **Initial:** RH

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☐	☑	☐
Sample container(s) intact and good condition	☑	☐	☐
Correct containers and volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
Proper preservation noted on COC or sample container	☑	☐	☐
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☑	☐	☐
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve ☐EnCores® ☐TerraCores® ☐_____

Water: ☐VOA ☑VOAh ☐VOAna_2 ☐125AGB ☐125AGBh ☐125AGBp ☐1AGB ☐1AGBna_2 ☐1AGBs ☐500AGB ☐500AGJ ☐500AGJs ☐250AGB ☐250CGB ☐250CGBs ☐1PB ☐500PB ☐500PBna ☐250PB ☐250PBn ☐125PB ☐125PBznna ☐100PB ☐100PBna_2 ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Summa® ☐_____ **Other:** ☐_____ **Checked/Labeled by:** RH

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar (Wide-mouth) B: Bottle (Narrow-mouth) **Reviewed by:** D.C

Preservative: h: HCL n: HNO3 na_2:$Na_2S_2O_3$ Na: NaOH p: H_3PO_4 s: H_2SO_4 znna: $ZnAc_2$+NaOH f: Field-filtered **Scanned by:** RH

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 09-05-1 2 9 3

SAMPLE ANOMALY FORM

SAMPLES - CONTAINERS & LABELS:

- ☐ **Samples NOT RECEIVED but listed on COC**
- ☐ **Samples received but NOT LISTED on COC**
- ☐ **Holding time expired** – list sample ID(s) and test
- ☐ **Insufficient quantities for analysis** – list test
- ☐ **Improper container(s)/preservative used** – list test
- ☐ **No preservative noted on COC or label** – list test & notify lab
- ☐ **Sample labels illegible** – note test/container type
- ☑ **Sample labels do not match COC** – Note in comments
  - ☐ **Sample ID**
  - ☑ **Date and/or Time Collected**
  - ☐ **Project Information**
  - ☐ **# of containers**
- ☐ **Sample containers compromised** – Note in comments
  - ☐ **Leaking**
  - ☐ **Broken**
  - ☐ **Without Labels**
- ☐ **Air sample containers compromised** – Note in comments
  - ☐ **Flat**
  - ☐ **Very low in volume**
  - ☐ **Leaking (transferred into Calscience Tedlar® Bag*)**
  - ☐ **Leaking (transferred into Client's Tedlar® Bag*)**
- ☐ **Other:** _____

Comments:

(-3) 11132 WINF
COLLECTION DATE AND TIME
PER LABEL 5/11/09 @ 1300

(-12) 11132 WINF
COLLECTION DATE AND TIME
PER LABEL 5/14/09 @ 1105

HEADSPACE – Containers with Bubble > 6mm or ¼ inch:

Sample #	Container ID(s)	# of Vials Received	Sample #	Container ID(s)	# of Vials Received	Sample #	Container ID(s)	# of RSK or CO_2 or DO Received

Comments: _____

*Transferred at Client's request.

Initial / Date RM 5/15/09

Calscience
Environmental
Laboratories, Inc.

June 02, 2009

Jay Johnson
Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Subject: **Calscience Work Order No.:** **09-05-1766**
Client Reference: **ARCO 11132 - Assessment**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 5/20/2009 and analyzed in accordance with the attached chain-of-custody.

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

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

Sincerely,

Calscience Environmental
Laboratories, Inc.
Richard Villafania
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	05/20/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1766
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8015B (M)

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF	**09-05-1766-1-D**	**05/18/09 08:15**	**Aqueous**	**GC 4**	**05/27/09**	**05/27/09 22:21**	**090527B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	660	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	113	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF	**09-05-1766-3-D**	**05/18/09 13:00**	**Aqueous**	**GC 4**	**05/27/09**	**05/27/09 22:54**	**090527B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	510	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	110	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF	**09-05-1766-4-D**	**05/18/09 16:15**	**Aqueous**	**GC 4**	**05/27/09**	**05/27/09 23:27**	**090527B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	440	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	105	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF	**09-05-1766-5-D**	**05/19/09 08:10**	**Aqueous**	**GC 4**	**05/27/09**	**05/27/09 00:00**	**090527B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	1100	50	1		ug/L
Surrogates:	**REC (%)**	**Control Limits**		**Qual**	
1,4-Bromofluorobenzene	105	38-134			

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	05/20/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1766
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8015B (M)

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF	**09-05-1766-7-D**	**05/19/09 13:00**	**Aqueous**	**GC 4**	**05/27/09**	**05/28/09 01:06**	**090527B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	430	50	1		ug/L
Surrogates:	REC (%)	Control Limits		Qual	
1,4-Bromofluorobenzene	107	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF	**09-05-1766-8-D**	**05/19/09 16:15**	**Aqueous**	**GC 4**	**05/27/09**	**05/28/09 01:39**	**090527B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	400	50	1		ug/L
Surrogates:	REC (%)	Control Limits		Qual	
1,4-Bromofluorobenzene	107	38-134			

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-695-552**	**N/A**	**Aqueous**	**GC 4**	**05/27/09**	**05/27/09 13:02**	**090527B01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	50	1		ug/L
Surrogates:	REC (%)	Control Limits		Qual	
1,4-Bromofluorobenzene	91	38-134			

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	05/20/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1766
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8260B
	Units:	ug/L

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF	**09-05-1766-1-A**	**05/18/09 08:15**	**Aqueous**	**GC/MS BB**	**05/28/09**	**05/28/09 17:33**	**090528L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	35	2.0	4		Tert-Butyl Alcohol (TBA)	500	40	4	
Ethylbenzene	20	2.0	4		Diisopropyl Ether (DIPE)	ND	2.0	4	
Toluene	5.9	2.0	4		Ethyl-t-Butyl Ether (ETBE)	ND	2.0	4	
Xylenes (total)	40	2.0	4		Tert-Amyl-Methyl Ether (TAME)	ND	2.0	4	
Methyl-t-Butyl Ether (MTBE)	54	2.0	4		Ethanol	ND	1200	4	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	113	73-145			Dibromofluoromethane	102	81-135		
Toluene-d8	100	83-119			1,4-Bromofluorobenzene	101	74-110		

11132WINF	**09-05-1766-3-A**	**05/18/09 13:00**	**Aqueous**	**GC/MS BB**	**05/28/09**	**05/28/09 18:05**	**090528L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	34	2.0	4		Tert-Butyl Alcohol (TBA)	430	40	4	
Ethylbenzene	19	2.0	4		Diisopropyl Ether (DIPE)	ND	2.0	4	
Toluene	5.6	2.0	4		Ethyl-t-Butyl Ether (ETBE)	ND	2.0	4	
Xylenes (total)	37	2.0	4		Tert-Amyl-Methyl Ether (TAME)	ND	2.0	4	
Methyl-t-Butyl Ether (MTBE)	67	2.0	4		Ethanol	ND	1200	4	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	113	73-145			Dibromofluoromethane	102	81-135		
Toluene-d8	99	83-119			1,4-Bromofluorobenzene	99	74-110		

11132WINF	**09-05-1766-4-A**	**05/18/09 16:15**	**Aqueous**	**GC/MS BB**	**05/28/09**	**05/28/09 18:37**	**090528L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	30	2.0	4		Tert-Butyl Alcohol (TBA)	390	40	4	
Ethylbenzene	17	2.0	4		Diisopropyl Ether (DIPE)	ND	2.0	4	
Toluene	5.2	2.0	4		Ethyl-t-Butyl Ether (ETBE)	ND	2.0	4	
Xylenes (total)	33	2.0	4		Tert-Amyl-Methyl Ether (TAME)	ND	2.0	4	
Methyl-t-Butyl Ether (MTBE)	65	2.0	4		Ethanol	ND	1200	4	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	113	73-145			Dibromofluoromethane	104	81-135		
Toluene-d8	100	83-119			1,4-Bromofluorobenzene	76	74-110		

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.	Date Received:	05/20/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-1766
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8260B
	Units:	ug/L

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF	**09-05-1766-5-A**	**05/19/09 08:10**	**Aqueous**	**GC/MS BB**	**05/28/09**	**05/28/09 19:09**	**090528L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	32	2.0	4		Tert-Butyl Alcohol (TBA)	450	40	4	
Ethylbenzene	28	2.0	4		Diisopropyl Ether (DIPE)	ND	2.0	4	
Toluene	6.6	2.0	4		Ethyl-t-Butyl Ether (ETBE)	ND	2.0	4	
Xylenes (total)	49	2.0	4		Tert-Amyl-Methyl Ether (TAME)	ND	2.0	4	
Methyl-t-Butyl Ether (MTBE)	64	2.0	4		Ethanol	ND	1200	4	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	108	73-145			Dibromofluoromethane	99	81-135		
Toluene-d8	101	83-119			1,4-Bromofluorobenzene	84	74-110		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF	**09-05-1766-7-A**	**05/19/09 13:00**	**Aqueous**	**GC/MS BB**	**05/28/09**	**05/28/09 19:41**	**090528L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	26	2.0	4		Tert-Butyl Alcohol (TBA)	410	40	4	
Ethylbenzene	16	2.0	4		Diisopropyl Ether (DIPE)	ND	2.0	4	
Toluene	4.8	2.0	4		Ethyl-t-Butyl Ether (ETBE)	ND	2.0	4	
Xylenes (total)	34	2.0	4		Tert-Amyl-Methyl Ether (TAME)	ND	2.0	4	
Methyl-t-Butyl Ether (MTBE)	62	2.0	4		Ethanol	ND	1200	4	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	108	73-145			Dibromofluoromethane	99	81-135		
Toluene-d8	99	83-119			1,4-Bromofluorobenzene	97	74-110		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11132WINF	**09-05-1766-8-A**	**05/19/09 16:15**	**Aqueous**	**GC/MS BB**	**05/28/09**	**05/28/09 20:13**	**090528L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	25	2.0	4		Tert-Butyl Alcohol (TBA)	400	40	4	
Ethylbenzene	15	2.0	4		Diisopropyl Ether (DIPE)	ND	2.0	4	
Toluene	4.4	2.0	4		Ethyl-t-Butyl Ether (ETBE)	ND	2.0	4	
Xylenes (total)	32	2.0	4		Tert-Amyl-Methyl Ether (TAME)	ND	2.0	4	
Methyl-t-Butyl Ether (MTBE)	62	2.0	4		Ethanol	ND	1200	4	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	106	73-145			Dibromofluoromethane	98	81-135		
Toluene-d8	100	83-119			1,4-Bromofluorobenzene	102	74-110		

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

Calscience Environmental Laboratories, Inc.

Analytical Report

Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Date Received: 05/20/09
Work Order No: 09-05-1766
Preparation: EPA 5030B
Method: EPA 8260B
Units: ug/L

Project: ARCO 11132 - Assessment

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-703-899**	**N/A**	**Aqueous**	**GC/MS BB**	**05/28/09**	**05/28/09 13:17**	**090528L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	0.50	1		Tert-Butyl Alcohol (TBA)	ND	10	1	
Ethylbenzene	ND	0.50	1		Diisopropyl Ether (DIPE)	ND	0.50	1	
Toluene	ND	0.50	1		Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1	
Xylenes (total)	ND	0.50	1		Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1		Ethanol	ND	300	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	103	73-145			Dibromofluoromethane	99	81-135		
Toluene-d8	100	83-119			1,4-Bromofluorobenzene	99	74-110		

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

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Stratus Environmental, inc.		Date Received:	05/20/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1766
Cameron Park, CA 95682-8861		Preparation:	EPA 5030B
		Method:	EPA 8015B (M)

Project ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-05-1664-2	**Aqueous**	**GC 4**	**05/27/09**	**05/27/09**	**090527S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	102	97	38-134	6	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Stratus Environmental, inc.		Date Received:	05/20/09
3330 Cameron Park Drive, Suite 550		Work Order No:	09-05-1766
Cameron Park, CA 95682-8861		Preparation:	EPA 5030B
		Method:	EPA 8260B

Project ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-05-1849-9	**Aqueous**	**GC/MS BB**	**05/28/09**	**05/28/09**	**090528S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	109	108	86-122	1	0-8	
Carbon Tetrachloride	112	109	78-138	3	0-9	
Chlorobenzene	106	105	90-120	1	0-9	
1,2-Dibromoethane	100	101	70-130	0	0-30	
1,2-Dichlorobenzene	106	108	89-119	2	0-10	
1,1-Dichloroethene	97	99	52-142	2	0-23	
Ethylbenzene	102	102	70-130	0	0-30	
Toluene	108	107	85-127	1	0-12	
Trichloroethene	105	106	78-126	1	0-10	
Vinyl Chloride	96	97	56-140	1	0-21	
Methyl-t-Butyl Ether (MTBE)	104	107	64-136	3	0-28	
Tert-Butyl Alcohol (TBA)	105	103	27-183	1	0-60	
Diisopropyl Ether (DIPE)	105	108	78-126	3	0-16	
Ethyl-t-Butyl Ether (ETBE)	104	105	67-133	1	0-21	
Tert-Amyl-Methyl Ether (TAME)	104	103	63-141	1	0-21	
Ethanol	113	127	11-167	11	0-64	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.	Date Received: N/A
3330 Cameron Park Drive, Suite 550	Work Order No: 09-05-1766
Cameron Park, CA 95682-8861	Preparation: EPA 5030B
	Method: EPA 8015B (M)

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-695-552	Aqueous	GC 4	05/27/09	05/27/09	090527B01

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	105	106	78-120	0	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.	Date Received: N/A
3330 Cameron Park Drive, Suite 550	Work Order No: 09-05-1766
Cameron Park, CA 95682-8861	Preparation: EPA 5030B
	Method: EPA 8260B

Project: ARCO 11132 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-703-899	Aqueous	GC/MS BB	05/28/09	05/28/09	090528L01

Parameter	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
Benzene	105	104	87-117	82-122	0	0-7	
Carbon Tetrachloride	112	108	78-132	69-141	4	0-8	
Chlorobenzene	105	103	88-118	83-123	2	0-8	
1,2-Dibromoethane	99	103	80-120	73-127	4	0-20	
1,2-Dichlorobenzene	107	106	88-118	83-123	1	0-8	
1,1-Dichloroethene	112	107	71-131	61-141	4	0-14	
Ethylbenzene	104	101	80-120	73-127	3	0-20	
Toluene	105	106	85-127	78-134	1	0-7	
Trichloroethene	104	106	85-121	79-127	2	0-11	
Vinyl Chloride	106	100	64-136	52-148	5	0-10	
Methyl-t-Butyl Ether (MTBE)	105	112	67-133	56-144	6	0-16	
Tert-Butyl Alcohol (TBA)	103	102	34-154	14-174	1	0-19	
Diisopropyl Ether (DIPE)	109	108	80-122	73-129	0	0-8	
Ethyl-t-Butyl Ether (ETBE)	106	109	73-127	64-136	3	0-11	
Tert-Amyl-Methyl Ether (TAME)	99	107	69-135	58-146	7	0-12	
Ethanol	122	95	34-124	19-139	24	0-44	

Total number of LCS compounds : 16
Total number of ME compounds : 0
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 09-05-1766

Qualifier	Definition
AX	Sample too dilute to quantify surrogate.
AZ	Surrogate recovery outside of acceptance limits due to matrix interference.
BA	Relative percent difference out of control.
BA,AY	BA = Relative percent difference out of control. AY = Matrix interference suspected.
BB	Sample > 4x spike concentration.
BF	Reporting limits raised due to high hydrocarbon background.
BH	Reporting limits raised due to high level of non-target analytes.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
BY	Sample received at improper temperature.
CL	Initial analysis within holding time but required dilution.
CQ	Analyte concentration greater than 10 times the blank concentration.
CU	Surrogate concentration diluted to not detectable during analysis.
DF	Reporting limits elevated due to matrix interferences.
DU	Insufficient sample quantity for matrix spike/dup matrix spike.
ET	Sample was extracted past end of recommended max. holding time.
EY	Result exceeds normal dynamic range; reported as a min est.
GR	Internal standard recovery is outside method recovery limit.
IB	CCV recovery abovelimit; analyte not detected.
IH	Calibrtn. verif. recov. below method CL for this analyte.
IJ	Calibrtn. verif. recov. above method CL for this analyte.
J,DX	J=EPA Flag -Estimated value; DX= Value < lowest standard (MQL), but > than MDL.
LA	Confirmatory analysis was past holding time.
LG,AY	LG= Surrogate recovery below the acceptance limit. AY= Matrix interference suspected.
LH,AY	LH= Surrogate recovery above the acceptance limit. AY= Matrix interference suspected.
LM,AY	LM= MS and/or MSD above acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LN,AY	LN= MS and/or MSD below acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LQ	LCS recovery above method control limits.

Work Order Number: 09-05-1766

Qualifier	Definition
LR	LCS recovery below method control limits.
LW	Quantitation of unknown hydrocarbon(s) in sample based on gasoline.
LX	Quantitation of unknown hydrocarbon(s) in sample based on diesel.
MB	Analyte present in the method blank.
PC	Sample taken from VOA vial with air bubble > 6mm diameter.
PI	Primary and confirm results varied by > than 40% RPD.
RB	RPD exceeded method control limit; % recoveries within limits.
SG	A silica gel cleanup procedure was performed.
	Solid - unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for moisture.

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: ARCO 11132 - Assessment
BP/ARC Facility No: 11132
Req Due Date (mm/dd/yy): Eff 24hrs&othersSTD Rush TAT: Yes x No
Lab Work Order Number: 09-05-1766

Lab Name: Calscience Environmental Laboratories, Inc.	BP/ARC Facility Address: 3201 35th Avenue	Consultant/Contractor: Stratus Environmental, Inc.
Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841	City, State, ZIP Code: Oakland, California	Consultant/Contractor Project No: E11132-01
Lab PM: Richard Villafania	Lead Regulatory Agency: Alameda County Environmental Health	Address: 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682
Lab Phone: 714-895-5494	California Global ID No.: T0600100213	Consultant/Contractor PM: Jay Johnson
Lab Shipping Accnt: 9255	Enfos Proposal No: 000MT-0004	Phone: 530-676-6000
Lab Bottle Order No:	Accounting Mode: Provision x OOC-BU ___ OOC-RM ___	Email EDD To: chuff@stratusinc.net
Other Info:	Stage: Select Activity: Feasibility Study	Invoice To: BP/ARC x Contractor ___
BP/ARC EBM: Paul Supple		
EBM Phone: 925-275-3801		
EBM Email: paul.supple@bp.com		

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol	Requested Analyses: GRO	BTEX	MTBE	6-oxys	Turnaround Time: 24-hours	Standard
1	11132 W INF	51809	0815		X		6				X		X	X	X	X		X
2	11132 W INF	51809	1005		X		6				X		X	X	X	X		Hold
3	11132 W INF	51809	1300		X		6				X		X	X	X	X		X
4	11132 W INF	51809	1615		X		6				X		X	X	X	X		X
5	11132 W INF	51909	0810		X		6				X		X	X	X	X		X
6	11132 W INF	51904	1005		X		6				X							Hold
7	11132 W INF	51904	1300		X		6				X		X	X	X	X		X
8	11132 W INF	51904	1615		X		6				X		X	X	X	X		X
9																		
FB	FB11132 51904	51904	1050		X		2											Hold

Comments	Report Type & QC Level
Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.	Standard x Full Data Package ___
6-oxys include MTBE, TBA, TAME, DIPE, ETBE, and Ethanol.	

Sampler's Name: Chris Hill	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Stratus Environmental, Inc.		51904	1700		5/10/09	1230
Shipment Method: GSO Ship Date:						1610 PS 5/10/09
Shipment Tracking No: 106280001						

Special Instructions: Please cc results to bpedf@broadbentinc.com

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: ____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 09-05- 1 7 6 6

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: STRATUS

DATE: 05 / 20 / 09

TEMPERATURE: (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature 2.1 °C - 0.2 °C (CF) = 2.5 °C ☑ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter ☐ Metals Only ☐ PCBs Only Initial: PS

CUSTODY SEALS INTACT:

☑ Cooler ☐_____ ☐ No (Not Intact) ☐ Not Present ☐ N/A Initial: PS

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present Initial: PS

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Correct containers and volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
Proper preservation noted on COC or sample container	☑	☐	☐
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☑	☐	☐
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve ☐EnCores® ☐TerraCores® ☐_____

Water: ☐VOA ☑VOAh ☐VOAna_2 ☐125AGB ☐125AGBh ☐125AGBp ☐1AGB ☐1AGBna_2 ☐1AGBs ☐500AGB ☐500AGJ ☐500AGJs ☐250AGB ☐250CGB ☐250CGBs ☐1PB ☐500PB ☐500PBna ☐250PB ☐250PBn ☐125PB ☐125PBznna ☐100PB ☐100PBna_2 ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Summa® ☐_____ **Other:** ☐_____ **Checked/Labeled by:** PS

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar (Wide-mouth) B: Bottle (Narrow-mouth) **Reviewed by:** TN

Preservative: h: HCL n: HNO_3 na_2: $Na_2S_2O_3$ Na: NaOH p: H_3PO_4 s: H_2SO_4 znna: $ZnAc_2$+NaOH f: Field-filtered **Scanned by:** PS

NO. 667116

NON-HAZARDOUS WASTE DATA FORM

TO BE COMPLETED BY GENERATOR

GENERATOR: SITE:

EPA I.D NO: NOT REQUIRED

NAME: BP WEST COAST PRODUCTS LLC. FORMER ARCO 11132

ADDRESS: PO BOX 90249 3201 35TH AVENUE

PROFILE NO:

CITY STATE ZIP: RANCHO SANTA MARGARITA,CA 92688 OAKLAND,CA 94619

PHONE NO: ( )

CONTAINERS: No TT VOLUME 3400 Gal WEIGHT

TYPE: [X] TANK TRUCK [ ] DUMP TRUCK [ ] DRUMS [ ] CARTONS [ ] OTHER

WASTE DESCRIPTION: NON-HAZARDOUS WATER

GENERATING PROCESS

	COMPONENTS OF WASTE	PPM	%		COMPONENTS OF WASTE	PPM	%
1	WATER	99-100%		5			
2	TPH	<1%		6			
3				7	BESI# 168657		
4				8			

PROPERTIES: 7-10 [ ] SOLID [X] LIQUID [ ] SLUDGE [ ] SLURRY [ ] OTHER

HANDLING INSTRUCTIONS: WEAR ALL APPROPRIATE PROTECTIVE CLOTHING

THE GENERATOR CERTIFIES THAT THE WASTE AS DESCRIBED IS 100% NON-HAZARDOUS.

Larry Meathart BESI for GENERATOR — TYPED OR PRINTED FULL NAME & SIGNATURE — DATE

TRANSPORTER

NAME: W GOMES EXCAVATTION

EPA I.D NO:

ADDRESS: 551 AIRPORT RD

SERVICE ORDER NO: BESI 168657

CITY STATE ZIP: RIO VISTA, CA 94571

PICK UP DATE: 5-15-09

PHONE NO: 707-374-2691

TRUCK, UNIT, I.D. NO.

RICHARD SPANGLER Richard Spangler 5-15-09

TYPED OR PRINTED FULL NAME & SIGNATURE — DATE

TSD FACILITY

NAME: INSTRAT, INC

EPA I.D NO:

DISPOSAL METHOD

ADDRESS: 1105 AIRPORT RD #C

[ ] LANDFILL [ ] OTHER

CITY STATE ZIP: RIO VISTA, CA 94571

3400 gals.

PHONE NO. 530-753-1809

11132

506672

Mark Roberts 5-15-09

TYPED OR PRINTED FULL NAME & SIGNATURE — DATE

GEN	OLD/NEW	L A	TONS
TRANS		S B	
C/O		RT/CO	H/WDF NONE

DISCREPANCY

NO. 667117

NON-HAZARDOUS WASTE DATA FORM

TO BE COMPLETED BY GENERATOR

GENERATOR: | SITE:

EPA I.D NO: NOT REQUIRED

NAME: BP WEST COAST PRODUCTS LLC. | FORMER ARCO 11132

ADDRESS: PO BOX 90249 | 3201 35TH AVENUE

PROFILE NO:

CITY STATE ZIP: RANCHO SANTA MARGARITA, CA 92688 OAKALNAD, CA 94619 PHONE NO ( )

CONTAINERS: No TT VOLUME 5400 Gal WEIGHT

TYPE: [X] TANK TRUCK [ ] DUMP TRUCK [ ] DRUMS [ ] CARTONS [ ] OTHER

WASTE DESCRIPTION: NON-HAZARDOUS WATER GENERATING PROCESS

COMPONENTS OF WASTE	PPM	%	COMPONENTS OF WASTE	PPM	%
1 WATER	99-100%		5		
2 TPH	<1%		6		
3			7 BEST# 168657		
4			8		

PROPERTIES: 7-10 [ ] SOLID [X] LIQUID [ ] SLUDGE [ ] SLURRY [ ] OTHER

HANDLING INSTRUCTIONS: WEAR ALL APPROPRIATE PROTECTIVE CLOTHING

THE GENERATOR CERTIFIES THAT THE WASTE AS DESCRIBED IS 100% NON-HAZARDOUS.

Larry Moothart BEST for GENERATOR — TYPED OR PRINTED FULL NAME & SIGNATURE — DATE

TRANSPORTER

NAME: W GOMES EXCAVATION EPA I.D NO:

ADDRESS: 551 AIRPORT RD SERVICE ORDER NO: BEST #168657

CITY STATE ZIP: RIO VISTA, CA 94571 PICK UP DATE: 5-19-09

PHONE NO: 707-374-2881

TRUCK, UNIT, I.D. NO.

RICHARD SPANGLER Richard Spangler 5-20-09 — TYPED OR PRINTED FULL NAME & SIGNATURE — DATE 5-19-09

TSD FACILITY

NAME: INSTRAT, INC EPA I.D NO:

ADDRESS: 1105 AIRPORT RD #C DISPOSAL METHOD: [ ] LANDFILL [ ] OTHER

CITY STATE ZIP: RIO VISTA, CA 94571 5,400 gals.

PHONE NO: 530-753-1829

11132

506636

Albert Robles 5-20-09 — TYPED OR PRINTED FULL NAME & SIGNATURE — DATE

GEN	OLD/NEW	L A	TONS
TRANS		S B	
C/Q		RT/CD	HWDF: NONE

DISCREPANCY