Golder Associates Inc.
2580 Wyandotte Street, Suite G
Mountain View, CA USA 94043
Telephone: (6506) 386-3828
Fax: (650) 386-3815

PILOT TEST REPORT

FORMER DESERT PETROLEUM (B&C GAS MINI MART)
2008 1ST STREET
LIVERMORE, CALIFORNIA
FUEL LEAK CASE NO. RO0000278

Submitted to:

Alameda County Environmental Health Services
Environmental Protection

Prepared by:

Golder Associates Inc.
2580 Wyandotte Street, Suite G
Mountain View, California 94043

Distribution:

(1) Copy – Mr. Balaji Angle (hardcopy))
(1) Copy – Ms. Donna Drogos, ACEHS (electronic upload)
(1) Copy – GeoTracker Database (submitted electronically)
(1) Copy – Mr. Michael Veiluva (electronic)
(1) Copy – Ms. Chris Davidson, City of Livermore (electronic)
(1) Copy – Golder Associates Inc.

December 7, 2007 053-7020

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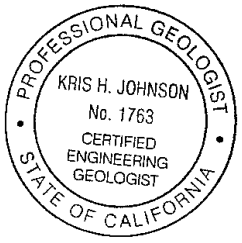
Mark H. Naugle, PE
Senior Engineer



Kris H. Johnson, CEG 1763
Senior Consultant

December 7, 2007

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1.0 INTRODUCTION

On behalf of the former Desert Petroleum (B&C Gas Mini Mart), Golder Associates, Inc. (Golder) has prepared this pilot test report to provide an update regarding the ongoing remedial action at the former B&C site at 2008 1st Street, Livermore, California (Figure 1). Golder is conducting a pilot test consistent with a remediation plan[1] and subsequent addendum[2] submitted to the Alameda County Environmental Health Services (ACEHS). The remedial action was approved by ACEHS on July 13, 2007 and their letter is included in Appendix A.

The remedial action activities included the following:

- Install seven dual-completion ozone sparging wells ("A" and "B" screens), two deeper sparging wells ("C" screen), and one soil vapor extraction (SVE) well;
- Perform an ozone bench-scale test;
- Perform a one month pilot test by injecting air and ozone into the upper and lower screens of one of the dual-completion wells and monitoring the surrounding sparge wells; and,
- Evaluate the pilot test data and prepare a report including the design basis and remedial implementation plan for ozone/air sparging in the source zone.

Golder installed the sparge and SVE wells on August 20 through 24, 2007 and performed baseline groundwater monitoring on September 10, 2007. Following delays attributed to negotiating the equipment lease and contractor availability, the ozone sparging system was installed on November 6 through 13, 2007 and the pilot test commenced on November 14, 2007.

Golder estimated that the source zone extends from the tank pit to the northwest under the Groth Brothers showroom (Figure 2) and is approximately 250 feet long, 30 to 120 feet wide and generally confined to the lower coarse grained unit with the majority of the impacted sediments located at depths of 36 to 48 feet below ground surface (bgs).[3] Golder designed the sparge well screen intervals to coincide with the depth range of the source zone and consistent with comments and directives from the ACEHS, to provide down gradient (off site) vertical migration monitoring.

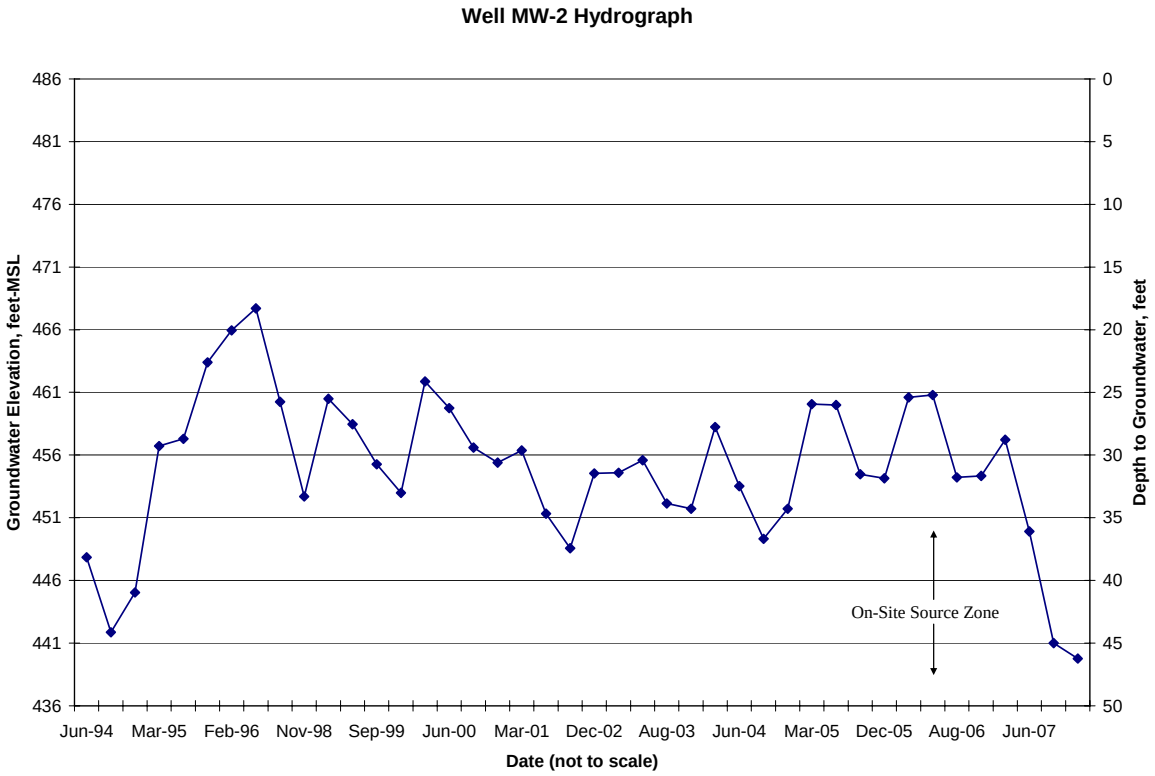
Since June of 2007, depths to groundwater have dropped more than 10 feet and groundwater is currently deeper than it's been in the last 15 years. Over the last 10 years (February 1997 to June 2007) depths to groundwater in the on site groundwater monitoring wells MW-1, MW-2, and MW-3 have ranged from 16.97 to 37.64 feet below ground surface (bgs), however, during the baseline monitoring, depths to groundwater ranged from 42.50 to 43.55 feet bgs. The most recent depth to groundwater was greater than 46 feet on November 26, 2007. The ozone sparging system was designed to address the source zone present at depths between 36 and 48 feet bgs. This depth range has been saturated over more than the last 10 years; however, the majority of this depth range is currently unsaturated. (see well MW-2 hydrograph below). Due to the large drop in the water table most of the "A" sparge well screens are above the water table and there is less than 1.5 feet of

[1] Golder Associates, Inc., *Source Zone Remediation Plan*, August 11, 2006.

[2] Golder Associates, Inc., Revised Source Zone Remediation Plan Addendum, June 28, 2007.

[3] Golder Associates Inc., Field Investigation for Source Zone Remediation, June 6, 2006.

groundwater above the "B" sparge well screens. The shallow groundwater table limits the potential zone of influence of sparging and much of the pilot test monitoring is not possible because the inactive sparge point screens planned as monitoring points are dry or lack sufficient water for sample collection.



Golder has prepared this report to document activities performed to date and to propose alternative remedial approaches considering the current conditions. Primarily, Golder recommends adjusting our approach to include soil vapor extraction to take advantage of the opportunity to extract vapors through the now-unsaturated source zone. The following sections include descriptions of the sparge and SVE well installations, pilot test activities, and conclusions and recommendations.

2.0 SPARGE AND SVE WELL INSTALLATION

On August 20 through 24, 2007 Golder drilled and installed six dual-completion sparge wells, two deeper screened sparge wells, and a soil vapor extraction (SVE) well. The locations of the sparge and SVE wells are shown on Figure 2. Golder subcontracted with WDC Exploration and Wells (WDC) to drill and install the wells using hollow-stem auger drilling methods. The following sections include descriptions of the well installation activities.

Golder's remediation plan addendum included installing five on- or near-site, dual-completion sparge wells; one onsite, one in the sidewalk, and three at the edge of L Street between the water line and the gutter (Figure 2). Due to access constraints Golder eliminated one of the three wells in the street and relocated the wells onto the sidewalk. Before drilling began on August 20, 2007, the City of Livermore (City) notified Golder that there was a 4-inch diameter polyvinyl chloride (PVC) irrigation line buried immediately below the edge of the concrete gutter at the asphalt/concrete joint. This irrigation water line does not appear on the utility map previously provided by the City.[4] Due to the risk of drilling between the irrigation line and the water line, Golder adjusted the sparge well locations approximately 5 to 7 feet to the east and onto the sidewalk (Figure 2). One of the three sparge wells planned to be installed in the street would then be approximately only 5 feet from SP-1 (A, B) and was therefore not installed because it would be too close to SP-1.

2.1 Prefield Activities

Before well installation, Golder acquired approval for this work from the ACEHS (Appendix A), an access agreement for the Groth Brother's Property, well permits from Zone 7 (Appendix B), and an encroachment permit from the City (Appendix B). Golder reviewed the City's utility map, called Underground Service Alert (USA), and hired a utility locator to assess for the presence of subsurface utilities at the drilling locations. Golder also prepared a site-specific health and safety plan for the well installation and pilot study.

2.2 Sparge Well Installation

On August 20 through 24, 2007, Golder's subcontracted driller, WDC installed six, dual-completion sparge wells, SP-1 (A, B) through SP-6 (A, B) and two deeper sparge wells, SP-5C and SP-6C, as shown on Figure 2. A summary of the sparge well construction details is included in Table 1a. For reference, the groundwater monitoring well construction details are included in Table 1b. In general, the A and B sparge well screens were installed across the source zone at depths between 36 and 48 feet bgs to sparge into or monitor the source zone and the C screens were installed at approximately 54 feet to assess vertical migration.

WDC constructed the sparge wells in borings drilled with nominal 8-inch diameter hollow-stem augers. Due to equipment problems, WDC was not able to continuous-core the lower parts of the borings as planned. WDC collected samples at about 5-foot intervals and these soil samples were logged by a Golder field geologist under the supervision of a register professional geologist. Soil samples were collected for chemical analysis as discussed in Section 2.4 and for a bench-scale ozone oxidation test as described in Section 3.0.

Boring logs and well construction details are included in Appendix C. Typically, in the onsite drilling locations, Golder observed finer-grained materials from about 15 to 45 feet bgs followed by

[4] Golder Associates, Inc., Revised Source Zone Remediation Plan Addendum, June 28, 2007.

gravelly sand to the total depths explored (49 feet bgs). In the offsite drilling locations, Golder logged silty sand and sand from 15 to 47 feet bgs following by sandy gravel to the total depths explored (54 feet bgs).

The sparge wells were constructed with 1.5-foot long, 25-micron, porous polyvinylidene fluoride (PVDF) sparge points connected to schedule 80 PVC well casing. The "B" screens were placed at approximately 46.5 to 48 feet bgs and the "A" screens were placed at approximately 40.5 to 42 feet bgs. WDC installed filter packs to approximately 1-foot above the screens followed by a continuous bentonite seal from 3 to 3.5 feet thick. The sparge points were installed using stainless steel centralizers to maintain the sparge points and casing materials in positions away from the boring sidewalls to improve the seal between the two sparge points in the dual completion wells. Approximately one to two gallons of clean potable water were placed on top of the well seals to hydrate the bentonite. The bentonite was then allowed to hydrate a minimum of 30 minutes before constructing the upper sparge point or grouting the remaining well annulus. The remaining well annulus was sealed with bentonite grout and capped at grade with concrete. The sparge wells were completed in 18-inch traffic-rated well boxes installed in concrete.

2.3 SVE Well Installation

SVE well SVE-1 was installed near the southern end of the former USTs near the soil sample (T1S) collected during the UST removal in 1996 that contained 8,500 milligrams per kilogram (mg/kg) of TPHg. Additional assessment and remediation, if warranted at this location, was requested by ACEHS.[5] Golder could not confirm the routing of the fuel conveyance lines from the existing USTs and therefore moved this SVE well approximately 17 feet to the west to avoid potentially breaking a fuel line and causing a fuel release. The location of SVE-1 is shown on Figure 2. The lithology logged by Golder included gravel to approximately 7 feet bgs, gravelly sand from approximately 7 to 17 feet, followed by silt to the total depth explored. Golder collected soil samples at 5-foot intervals, beginning at 10 feet bgs, for chemical analysis as described in the following section. The SVE well was constructed with 0.040-inch factory slotted PVC well screen from 25 to 15 feet, a 6x16 medium aquarium sand filter to 13 feet bgs, a 2-foot thick bentonite seal, and finished with cement grout. The boring log and well construction detail are included in Appendix C. This SVE well was completed in an 8-inch traffic-rated vault box.

2.4 Soil Sampling and Analysis

Consistent with the remediation plan and addendum, Golder selected one soil sample from each sparge well boring and samples at 5-foot increments from the SVE well at depths from 10 to 25 feet bgs for chemical analysis. Golder selected the sparge well boring soil samples on the basis of field observations and head space volatile organic compound (VOC) measurements with a photoionization detector (PID) (see boring logs in Appendix C). Soil samples were collected using a modified California split-spoon sampler in 6-inch stainless steel sleeves. Golder covered the ends of the sleeves with teflon tape and plastic end caps and immediately labeled and placed the samples in a chilled ice chest. Golder submitted the samples to Kiff Analytical, LLC of Davis, California (Kiff) for analysis accompanied by completed chain of custody documentation. Kiff analyzed the soil samples for total petroleum hydrocarbons as gasoline (TPHg); benzene, toluene, ethylbenzene, and total xylenes (BTEX); and methyl-tert-butyl ether (MTBE) by US EPA Method 8260B.

[5] Letter from ACEHS to B&C Gas Mini Mart and Desert Petroleum, March 26, 2007.

Sample results are summarized in Table 2 and the certified analytical reports are included in Appendix D. In the sparge wells, the highest TPHg concentrations in soil were detected in SP-1 at 40 feet bgs (260 milligrams per kilogram (mg/kg)) and SP-5 at 45 feet bgs (290 mg/kg). The remaining sparge well soil samples contained from 2.8 to 71 mg/kg TPHg. The SVE well soil samples were non-detect at 10 through 20 feet and contained only 6.6 mg/kg TPHg at 25 feet bgs.

3.0 BENCH-SCALE TREATABILITY TESTING

Golder collected representative soil samples for bench-scale treatability testing during the sparge well installation. Golder collected soil from SP-1 at depths of 15 to 25 feet bgs (un-impacted soil) and 30 to 45 feet (impacted soil) on August 22, 2007. Golder collected 5 gallons of groundwater from MW-1 on August 21, 2007 also for the treatability testing. Golder delivered the soil and groundwater samples to Prima Environmental, Inc. of Sacramento, California (PRIMA).

PRIMA performed bench-scale treatability testing to evaluate the ability of ozone (O_3) to destroy petroleum hydrocarbons. PRIMA's bench testing report is included in Appendix E. The petroleum hydrocarbons assessed during the testing included gasoline range organics (GRO; analogous to TPHg), BTEX (benzene, toluene, ethylbenzene, and xylenes), and fuel oxygenates (MTBE, TBA, TAME, ETBE and DIPE). PRIMA performed batch tests to assess hydrocarbon removal, estimate the ozone demand of soil and groundwater, evaluate potential secondary groundwater effects of treatment, and assess attenuation of hexavalent chromium and bromate formed during treatment.

The bench testing demonstrated that GRO, benzene, ethylbenzene, xylenes and MTBE were destroyed by ozone. Greater than 98% of most petroleum hydrocarbons were removed through the application of 420 milligrams (mg) of ozone (an amount approximately equal to the measured ozone demand). Complete removal was achieved with 2,200 mg of ozone. Some petroleum hydrocarbons were volatilized, but in general the amount was less than 3% of the initial mass present.

Treatment with ozone did not affect most water quality parameters except for bromate and Cr(VI). Up to 0.16 mg/L bromate and up to 0.45 mg/L Cr(VI) was formed. In both cases, the amount generated was proportional to the amount of ozone applied, with higher concentrations seen with higher amount of ozone. Both bromate and Cr(VI) readily attenuated (typically within 7 days) in tests simulating the treatment zone and downgradient conditions.

The ozone demand of soil was 990 to 1,110 mg O_3/kg soil while the demand of groundwater was 182 to 207 mg O_3/L groundwater.

Based on the results of bench testing, PRIMA recommends that ozone be considered for use at this site. Ozone effectively destroyed COCs, and although Cr(VI) and bromate were formed, they readily attenuated once ozonation ceased.

4.0 PILOT TEST

Golder performed baseline groundwater sampling, installed the ozone sparging system, and implemented the ozone sparging pilot test. These activities are described in the following sections.

4.1 Baseline Groundwater Sampling

Golder performed the baseline groundwater sampling event on September 10 through 12, 2007 beginning with depth to water (DTW) measurements. DTW measurements are summarized in Table 3 and the field sheets from this monitoring event are included in Appendix F. The DTWs in the "B" screens ranged from 42.50 to 43.55 feet bgs. As shown in Table 1, the bottom of the screen intervals for the "A" screens ranged from 41 to 42.5; therefore, the DTWs measured in the "A" screens (38.36 feet bgs in SP-4A to 40.60 feet bgs in SP-2A) may have been stagnant water remaining in the sparge wells and filter packs after the groundwater table dropped. Golder's field geologist was only able to sample one of the "A" screens (SP-4A).

Golder performed the groundwater monitoring consistent with the procedures included in the remediation plan and submitted the samples accompanied by completed chain-of-custody forms to Kiff. Kiff analyzed the samples for the following analyses:

- VOCs by US EPA Method 8260B;
- Total petroleum hydrocarbons as gasoline (TPHg) by US EPA Method 8015 or 8260B
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by US EPA Method 8260B; and,
- MTBE by US EPA Method 8260B.

To assess baseline concentrations of potential oxidation by-products one sample from SP-4B was also submitted to McCampbell Analytical, Inc. of Pittsburg, California (McCampbell) for the following analyses:

- Bromide, bromate, chromium, and hexachrome by US EPA Methods 300.1, 200.8 and E218.6;
- Mono-, di-, and tri-chloroacetic acid isomers by EPA Method 552.2; and,
- Formaldehyde by EPA Method 8315A.

The petroleum hydrocarbons and VOC results are summarized in Table 3 and the oxidation by-products analytical results are summarized in Table 4. The certified analytical results are included in Appendix D.

4.2 Shallow Soil Vapor Probe Sampling

Golder collected soil vapor samples from shallow (5 feet bgs) soil vapor probes SV-MW-2 and SV-MIP-8 (Figure 2) on November 19, 2007. Golder collected these samples to assess whether or not the declining water table impacted the soil vapor concentrations of petroleum hydrocarbons in comparison to the sampling and analysis performed during the source zone investigation.[6] Field notes

[6] Field Investigation for Source Zone Remediation, Golder Associates Inc., June 6, 2006.

and soil vapor sampling procedures are included in Appendix G. Golder submitted the soil vapor samples to Air Toxics, Ltd of Folsom, California (ATL) for analysis. ATL analyzed the vapor samples for the following parameters:

- TPH-g by US EPA method TO-3;
- BTEX, MTBE, and the leak detection compound isopropanol (at a reporting limit of less than 10 µg/L) by modified US EPA Method TO-15; and,
- Oxygen, carbon dioxide, and methane by modified ASTM D-1946.

The locations of these shallow soil vapor probes are shown on Figure 2. The sample results are summarized in Tables 5 and 6 and the analytical reports are included in Appendix D. Golder has compiled the latest residential soil vapor ESLs[7] at the bottom of the table. In general the results are consistent with the sampling event performed in April 2006 during the source zone investigation with the exception of TPHg in SV-MW-2. In April 2006 the sample from SV-MW-2 contained 930 micrograms per cubic meter (ug/m3) and in November 2007 the sample from SV-MW-2 contained 15,000 ug/m3 TPHg. The TPHg concentration detected in SV-MW-2 in November 2007 exceeds the revised 2007 TPHg ESL of 10,000 ug/m3. The 2005 ESL for TPHg was 26,000 ug/m3. None of the other soil vapor results exceed the 2007 ESLs.

4.3 Ozone Sparging System Installation

On November 6 through November 13, 2007, Golder's subcontractor, Sequoia Construction and Development, Inc. (Sequoia) installed the ozone sparging system. Sequoia excavated trenches and installed 2-inch diameter electrical conduits from the equipment enclosure to each of the onsite dual-completion sparge wells as shown on Figure 2. Sequoia then pulled two sections of ½-inch outside diameter by 3/8-inch inside diameter Teflon tubing through each conduit to connect each of the sparge wells to the ozone sparge system. Each section of conveyance tubing was installed as a continuous piece without any connector fitting between the enclosure and the well vaults. At the well vault for SP-1A and SP-1B, the Teflon tubing was connected to a well head assembly with a Kynar compression fitting. Each well head assembly includes a union and a silicon-filled stainless steel pressure gauge.

On November 13, 2007, Calcon Environmental (Calcon) delivered a HiPro 2500 ozone sparging system to the site and it was placed behind the service station building as shown on Figure 2. Sequoia then connected 240-volt, single-phase, 60 amp electrical service to the system.

4.4 Startup and Pilot Testing

On November 14, 2007, Calcon trained Golder personnel in the operation of the ozone sparging system and Golder began the pilot test by sparging air into SP-1B. Golder operated the ozone sparging system with air only to assess the breakout pressure and performed variable pressure/flow rate testing to assess flow characteristics. Pilot test monitoring data is included in Appendix H. As described above, due to the falling water table, there was approximately 1.5 feet of water above the

[7] *Screening For Environmental Concerns at Sites with Contaminated Soil and Groundwater*, California Regional Water Quality Control Board, San Francisco Bay Region, INTERIM FINAL – November 2007.

SP-1B sparge well screen. Upon changing the sparge pressure, the flow rate would stabilize very quickly. In addition, Golder noted that after sparging continued for approximately 10 minutes, the flow rate would increase indicating that the water had been pushed away from the sparge well or a preferential pathway with little resistance to flow had developed. Pressure and flow rate readings were taken from the instrumentation included with the ozone sparging system; air pressure transducer transmitted to the programmable logic controller (PLC) and a mass flow meter also transmitted to the PLC.

Golder was not able to collect groundwater samples to perform the planned field monitoring due to the lack of water in the sparge wells surrounding SP-1 (A, B). Golder periodically collected soil vapor samples from the surrounding sparge wells in tedlar bags and measured VOCs with a photoionization detector (PID) and oxygen with a GasTech multigas meter. During the pilot testing on November 14, Golder measured a slight increase in VOCs in SP-2B following the initiation of sparging and a slight increase in oxygen; however, the baseline oxygen reading was higher than that measured at the beginning of the test (Appendix H). Golder did not collect soil vapor samples for field monitoring from SVE-1 due to its distance from SP-1 (A, B); the low concentration of petroleum hydrocarbons in soil samples from SVE-1, and the apparently low permeability soils encountered below 17 feet bgs at SVE-1.

Golder returned to the site on November 19, 2007 and performed additional pilot testing and incorporated groundwater monitoring wells near SP-1B to collect groundwater field measurements. Vapor monitoring data was collected in MW-1, MW-2, and the sparge wells surrounding SP-1B (Appendix H). Golder also collected field groundwater quality data at MW-2. Golder programmed the ozone sparging system to provide ozone at 25% of maximum production to SP-1B at a pressure of 3 pounds per square inch (psi) and a resulting flow rate of 1.3 standard cubic feet per minute (scfm). This was the minimum turn-down of the ozone sparge system to continue to produce flow to the sparge well.

On November 19, 2007 an increase in the groundwater elevation was measured in SP-2B, which is approximately 10 feet away from SP-1B. In addition, VOC concentrations measured with the PID appeared to decrease in the head space above the groundwater in MW-1 and MW-2 during sparging and the oxygen levels also increased. MW-1 and MW-2 are approximately 15 feet away from SP-1B. Golder shut off the ozone sparging system and measured the groundwater recharge rate in SP-1B. Within approximately 1 hour, the DTW in SP-1B returned to its pre-test measurement.

Based upon the data collected during the pilot testing, Golder programmed the ozone sparging system to operate for 10 minutes with 100% ozone generation and rest for one hour to allow the groundwater at SP-1B to recharge. Golder returned to the site on November 26, 2007 to perform vapor monitoring in the sparge wells surrounding SP-1B (Appendix H). The PID readings were consistent with baseline readings. Most notably, however, the oxygen concentration in SP-4A was 30.7% indicating potential influence from the ozone sparging resulting in increased oxygen levels in the subsurface since ozone degrades to oxygen (typical atmospheric air contains 20.9% oxygen).

5.0 CONCLUSIONS AND RECOMMENDATIONS

Golder installed ozone sparge wells and an SVE well; collected soil samples, baseline groundwater samples, and shallow soil vapor samples; and performed pilot testing with an ozone sparging system. Based on this work as described above, Golder concludes the following:

- Soil sample results from boring SVE-1 (Table 2) indicate that the petroleum hydrocarbon impact at the south end of the USTs is not extensive or has attenuated and no further assessment in this area is warranted.
- Soil vapor sampling at the Groth Property indicates that even with the decline in the water table, the soil vapor concentrations do not exceed residential ESLs.
- The decline in the water table is limiting the ability to monitor the ozone sparging test since groundwater samples cannot be collected from the sparge wells surrounding the test well (SP-1B).
- The decline in the water table is limiting the effectiveness of sparging because the amount of air flow that can be applied to the saturated zone must be minimized because the thin layer of groundwater located above the sparge screen is easily pushed aside creating preferential pathways. Minimizing the air flow reduces the radius of influence and potential mass transfer rates.
- The decline in the water table is limiting the ability of ozone sparging to provide ozone to the source zone since this technology was chosen for implementation/pilot testing on the basis of treating a saturated source zone. There may be other technologies such as SVE or multi-phase extraction (MPE) that will be more effective when the source zone is unsaturated.

Golder recommends discontinuing the ozone sparging pilot test until water levels are above the source zone (36 feet bgs). The timing of the water table fluctuations is unknown; however, over the history of site monitoring there has been 10-foot water level fluctuations within a quarter (fourth quarter 1994 to first quarter 1995). Golder recommends performing SVE and MPE pilot testing at the onsite wells MW-2 and MW-3 to assess the implementation of these technologies while the water table is below the source zone. Both of these wells are 4-inch diameter and screened from 30 to 60 feet bgs. Golder does not recommend installing new wells at this time because of the uncertainties associated with future groundwater table fluctuations. SVE may provide more rapid mass removal while the source zone is unsaturated. A work plan and implementation schedule will be provided to ACEHS. Because of the potentially rapid changes in water levels at the site, we anticipate initiating SVE and MPE pilot testing within the next 1 to 2 months.

6.0 LIMITATIONS

No investigation is thorough enough to exclude the presence of unidentified hazardous materials at a given site. Therefore, Golder's results and conclusions should not be construed as a guarantee of the absence of such materials, but merely as the result of services performed within the scope, limitations, and cost of the work done.

Any opinions and/or recommendations presented apply to site conditions existing at the time of performance of the services. Golder is unable to report on or accurately predict events that may affect the site following performance of our services, whether occurring naturally or caused by external forces. Golder assumes no responsibility for conditions that we have not assessed, or conditions not generally recognized as environmentally unacceptable at the time our services were performed. Where the scope of services was limited to observations made during site reconnaissance, interviews, and/or review of readily available reports and literature, any conclusions and /or recommendations are necessarily based largely on information supplied by others, the accuracy or sufficiency of which may not have been independently reviewed by Golder.

Golder's professional opinions are based in part on the interpretation of data from discrete sampling locations that may not represent actual conditions between such sampling locations.

Naturally occurring toxic substances, toxicity of substances common in current habitable environments, or contaminant concentrations which are not of current environmental concern may not be reflected in this document if such was not an express concern of our client or previously reported by others.

Golder is not responsible for the impact of changes in applicable environmental standards, practices, or regulations following performance of services.

Services were performed in accordance with our agreement and understanding with our client, which may not be fully disclosed in this document. Opinions and/or recommendations are intended for the client, purpose, site, location, time frame, and project parameters indicated.

This report was prepared solely for the use of the client, and should be reviewed in its entirety; Golder is not responsible for subsequent separation, detachment, or partial use of this document. Any reliance on this report by a third party shall be at such party's sole risk.

TABLES

Table 1a
Sparge Well Construction Details
2008 1st Street, Livermore, California

Well No.	Drilling Method	Date Completed	T.D. Boring (ft.-bgs)	T.D. Well (ft.-bgs)	Borehole Diameter (inches)	Casing Material (PVC)	Casing Diameter (inches)	Screen Size and Type	Sand Pack Material	Seal Material	Seal Interval (ft-bgs)	Screened Interval (ft.-bgs)	Sand Pack Interval (ft.-bgs)
SP-1A	HSA	8/22/2007	48.5	42.0	8.25	SCH 80	1	1.5 in.x 18 in., 25 micron porous PVDF	#0/30	Bentonite Chips	36.5-39.5	40.5-42.0	39.5-42.0
SP-1B	HSA	8/22/2007	48.5	48.5	8.25	SCH 80	1	1.5 in.x 18 in., 25 micron porous PVDF	#0/30	Bentonite Chips	42.0-45.5	47-48.5	45.5-48.5
SP-2A	HSA	8/21/2007	48.5	42.5	8.25	SCH 80	1	1.5 in.x 18 in., 25 micron porous PVDF	#0/30	Bentonite Chips	37.0-40.0	41.0 - 42.5	40.0-42.5
SP-2B	HSA	8/21/2007	48.5	48.5	8.25	SCH 80	1	1.5 in.x 18 in., 25 micron porous PVDF	#0/30	Bentonite Chips	42.5-46.0	47.0-48.5	46.0-48.5
SP-3A	HSA	8/24/2007	49.0	42.0	8.25	SCH 80	1	1.5 in.x 18 in., 25 micron porous PVDF	#0/30	Bentonite Chips	36.5 - 39.5	40.5-42.0	39.5-42.0
SP-3B	HSA	8/24/2007	49.0	48.0	8.25	SCH 80	1	1.5 in.x 18 in., 25 micron porous PVDF	#0/30	Bentonite Chips	42.0-45.5	46.5-48.0	45.5-48.0
SP-4A	HSA	8/22/2007	49.0	42.0	8.25	SCH 80	1	1.5 in.x 18 in., 25 micron porous PVDF	#0/30	Bentonite Chips	36.5-39.5	40.5-42.0	39.5-42.0
SP-4B	HSA	8/22/2007	49.0	49.0	8.25	SCH 80	1	1.5 in.x 18 in., 25 micron porous PVDF	#0/30	Bentonite Chips	42.0-45.5	47.5-49.0	45.5-49.0
SP-5A	HSA	8/21/2007	51.0	41.0	8.25	SCH 80	1	1.5 in.x 18 in., 25 micron porous PVDF	#0/30	Bentonite Chips	35.5-38.5	39.5-41.0	38.5-41.0
SP-5B	HSA	8/21/2007	51.0	48.0	8.25	SCH 80	1	1.5 in.x 18 in., 25 micron porous PVDF	#0/30	Bentonite Chips	41.0-45.5	46.5-48.0	45.5-48.0
SP-5C	HSA	8/21/2007	54.0	54.0	8.25	SCH 80	1	1.5 in.x 18 in., 25 micron porous PVDF	#0/30	Bentonite Chips	48.5-51.5	52.5-54.0	51.5-54.0
SP-6A	HSA	8/23/2007	54.0	42.0	8.25	SCH 80	1	1.5 in.x 18 in., 25 micron porous PVDF	#0/30	Bentonite Chips	36.5-39.5	40.5-42.0	39.5-42.0
SP-6B	HSA	8/23/2007	54.0	49.0	8.25	SCH 80	1	1.5 in.x 18 in., 25 micron porous PVDF	#0/30	Bentonite Chips	42.0-44.0	47.5-49.0	44.0-49.0
SP-6C	HSA	8/24/2007	56.0	54.0	8.25	SCH 80	1	1.5 in.x 18 in., 25 micron porous PVDF	#0/30	Bentonite Chips	48.5-51.5	52.5-54.0	51.5-54.0

Notes:

HAS = Hollow-Stem Auger

T.D. = total depth

ft.-bgs = feet below ground surface

PVDF = polyvinylidene fluoride (Kynar)

Table 1b
Single-Screen Monitoring Well Construction Details
2008 1st Street, Livermore, California

Well No.	Drilling Method	Date Installed	T.D. Boring (ft.-bgs)	T.D. Well (ft.-bgs)	Borehole Diameter (inches)	Casing Material (PVC)	Casing Diameter (inches)	Screen Size (inches)	Sand Pack Material	Screened Interval (ft.-bgs)	Sand Pack Interval (ft.-bgs)
MW-1	HSA	Sep-88	77	77	8	PVC	2	0.020	#3 sand	27 - 77	25 - 77
MW-2	HSA	Jun-94	60	60	10	PVC	4	0.020	#2/20 sand	30 - 60	27 - 60
MW-3	HSA	Jun-94	60	60	10	PVC	4	0.020	#2/20 sand	30 - 60	27 - 60
MW-4	HSA	Jun-94	60	60	10	PVC	4	0.020	#2/20 sand	30 - 60	27 - 60
MW-5	HSA	Oct-95	42	40	10	PVC	4	0.020	#2 sand	15 - 40	12 - 40
MW-6	HSA	Oct-95	42	40	10	PVC	4	0.020	#2 sand	15 - 40	12 - 40
MW-7	HSA	Jun-99	62	49	8	PVC	2	0.020	#3 sand	29-49	27-51
MW-8	HSA	Jun-99	62	54	8	PVC	2	0.020	#3 sand	34-54	32-54
MW-9	HSA	Jun-99	45	45	8	PVC	2	0.020	#3 sand	25-45	23-45
MW-10	HSA	Jun-99	55	53.5	8	PVC	2	0.020	#3 sand	33.5-53.5	23-55
MW-11	HSA	Jun-99	50	49	8	PVC	2	0.020	#3 sand	29-49	27-49
MW-12	HSA	Jun-99	45	43.5	8	PVC	2	0.020	#3 sand	23.5-43.5	21-45
MW-13	HSA	Jul-99	55	55	8	PVC	2	0.020	#3 sand	35-55	32-55
D-1	HSA	Jun-99	125	125	8	PVC	2	0.020	#3 sand	110-125	104-125
D-2	HSA	Jun-99	115	114	8	PVC	2	0.020	#3 sand	99-114	94-114
(MS)MW-1	HSA	Apr-89	62	60	NA	PVC	2	NA	NA	30-60	NA

Notes:
HSA = Hollow-Stem Auger
T.D. = total depth
ft.-bgs = feet below ground surface
NA = not available
Well construction information for wells MW-2 through MW-6 collected from Remediation Service Int'l boring logs.

Table 2
Summary of Petroleum Hydrocarbons in Soil
2008 1st Street, Livermore, California

Units: micrograms per liter (mg/kg)

Sample ID	Sample Depth (ft bgs)	Sample Date	USEPA Method 8260B					
			TPH Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE
SP-1	40	8/22/2007	260	<0.050	0.056	4.7	18	<0.050
SP-2	43	8/20/2007	71	<0.025	<0.025	0.72	2.0	<0.025
SP-3	35	8/24/2007	4.4	<0.0050	<0.0050	0.019	<0.0050	<0.0050
SP-5	45	8/20/2007	290	0.070	0.059	4.5	3.5	<0.040
SP-6	35	8/24/2007	2.8	0.058	<0.0050	0.070	0.015	0.052
SVE-1	10	8/24/2007	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	0.0083
SVE-1	15	8/24/2007	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
SVE-1	20	8/24/2007	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
SVE-1	25	8/24/2007	6.6	0.028	<0.0050	0.16	0.099	1.6

NOTES:

Laboratory analyses performed according to USEPA method 8260B

TPH - Total Petroleum Hydrocarbons

MTBE - Methyl *tertiary* -butyl ether

NA - Not Analyzed

ND - Not detected at specified detection limits; for raised detection limits, higher value is given in table.

ft bgs - Feet below ground surface

Table 3
Summary of Petroleum Hydrocarbons and VOCs in Groundwater
2008 1st Street, Livermore, California

Units: micrograms per liter (ug/l)

Sample	Sample Date	DTW (ft bgs)	TPH Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	VOCs			
									Vinyl Chloride	cis-1,2 DCE	PCE	Other VOCs
SP-1A	9/11/2007	40.47	NA	NA	NA	NA	NA	NA	NA	NA	NA	
SP-1B	9/12/2007	43.37	1,200	62	6.2	54	100	37	<0.50	7.9	<0.50	
SP-2A	9/11/2007	40.60	NA	NA	NA	NA	NA	NA	NA	NA	NA	
SP-2B	9/12/2007	43.55	1,500	130	6.3	57	77	8.8	1.3	20	<0.50	
SP-3A	9/11/2007	39.72	NA	NA	NA	NA	NA	NA	NA	NA	NA	
SP-3B	9/12/2007	42.57	140	5.6	0.68	<0.50	<0.50	25	<0.50	3.1	<0.50	
SP-4A	9/11/2007	38.36	340	14	1.3	4.3	16	27	<0.50	5.1	<0.50	
SP-4B	9/11/2007	42.92	700	24	3.1	22	55	17	NA	12	0.81	
SP-5A	9/11/2007	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
SP-5B	9/11/2007	42.88	3,000	97	5.6	78	51	250	4.3	8.9	<0.50	
SP-5C	9/11/2007	43.37	530	8.3	1.6	9.4	11	21	0.53	3.7	<0.50	
SP-6A	9/11/2007	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
SP-6B	9/12/2007	42.50	930	23	2.2	53	72	26	<0.50	2.2	<0.50	
SP-6C	9/12/2007	42.61	390	9.2	1.5	16	28	7.6	<0.50	7.9	1.3	trans-1,2-DCE = 0.62 TCE = 0.65

NOTES:

Laboratory analyses performed according to USEPA method 8260B

DTW - Depth to water

ft bgs - Feet below ground surface

TPH - Total Petroleum Hydrocarbons

MTBE - Methyl *tertiary* -butyl ether

NA - Not Analyzed - well dry

ND - Not detected at specified detection limits; for raised detection limits, higher value is given in table.

DCE - Dichloroethene

TCE - Trichloroethene

PCE - Tetrachloroethene

VOC - Volatile Organic Compounds

Table 4
Summary of Potential Oxidation By Products
2008 1st Street, Livermore, California

Units: micrograms per liter (ug/l)

Sample ID	Sample Date	Cr^{6+}	Bromide	Bromate	Haloacetic Acids						Formald-ehyde	Chromium
					DBAA	DCAA	MBAA	MCAA	TCAA	Total HAAs		
SP-4B	9/12/2007	<0.2	810	<5	<0.5	<0.5	<0.5	<1.0	<0.5	<3.0	<5.0	2.4

NOTES:

DBAA - Dibromoacetic acid
DCAA - Dichloroacetic acid
MBAA - Monobromoacetic acid
MCAA - Monochloroacetic acid
TCAA - Trichloroacetic acid
HAAs - Haloacetic acids

Table 5
Summary of Petroleum Hydrocarbons in Soil Vapor
2008 1st Street, Livermore, California

Units: micrograms per cubic meter (µg/m^3)

Sample ID	Sample Date	TPHg	Benzene	Toluene	Ethyl-benzene	m,p-Xylene	o-Xylene	MtBE	2-Propanol
SV-MW-2	4/25/2006	930	5.1	11	<5.0	9.6	<5.0	<4.0	<11
SV-MW-2	11/19/2007	15,000	13	6.5	64	71	12	<4.0	<11
SV-MIP-8	4/25/2006	2,200	8.6	210	9.1	30	11	<4.4	26
SV-MIP-8	11/19/2007	1,800	<3.4	12	7.0	12	<4.6	<3.8	97
ESL (Residential)*		10,000	84	63,000	210000		21000	9400	NA

NOTES:

TPHg - Total Petroleum Hydrocarbons as gasoline

MtBE - Methyl tert-butyl ether

* - California Regional Water Quality Control Board, *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater* , Interim-Final November 2007.

NA - Not Available, 2-Propanol is used for leak detection and does not have an ESL

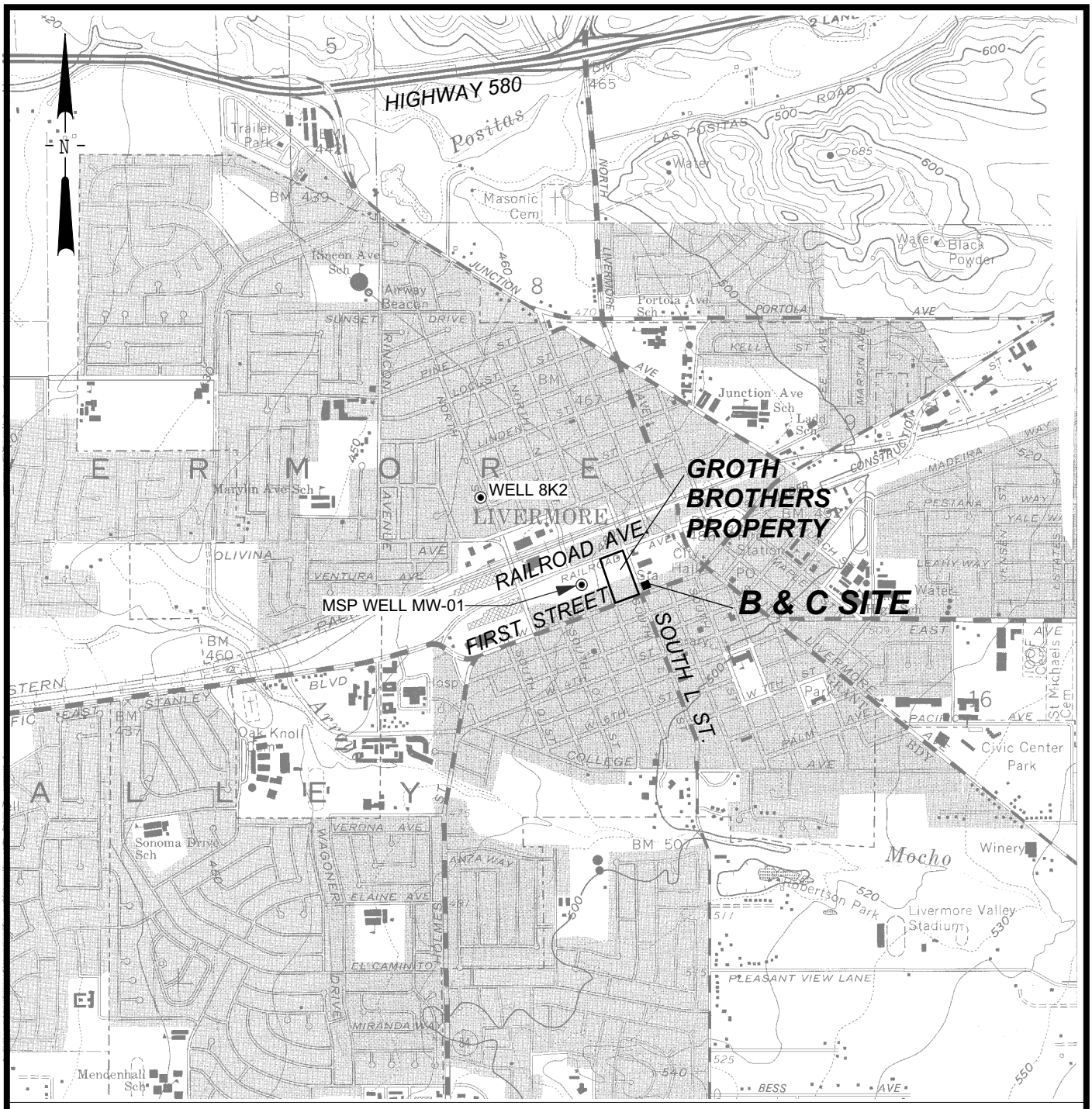
Table 6
Summary of Atmospheric Gases in Soil Vapor
2008 1st Street, Livermore, California

Units: percent (%)

Sample ID	Sample Date	Oxygen	Methane	Carbon Dioxide
SV-MW-2	4/25/2006	18	0.001	2.4
SV-MW-2	11/19/2007	19	<0.00022	1.9
SV-MIP-8	4/25/2006	17	0.004	3
SV-MIP-8	11/19/2007	21	<0.00021	0.83

NOTES:
% is percent by volume

FIGURES

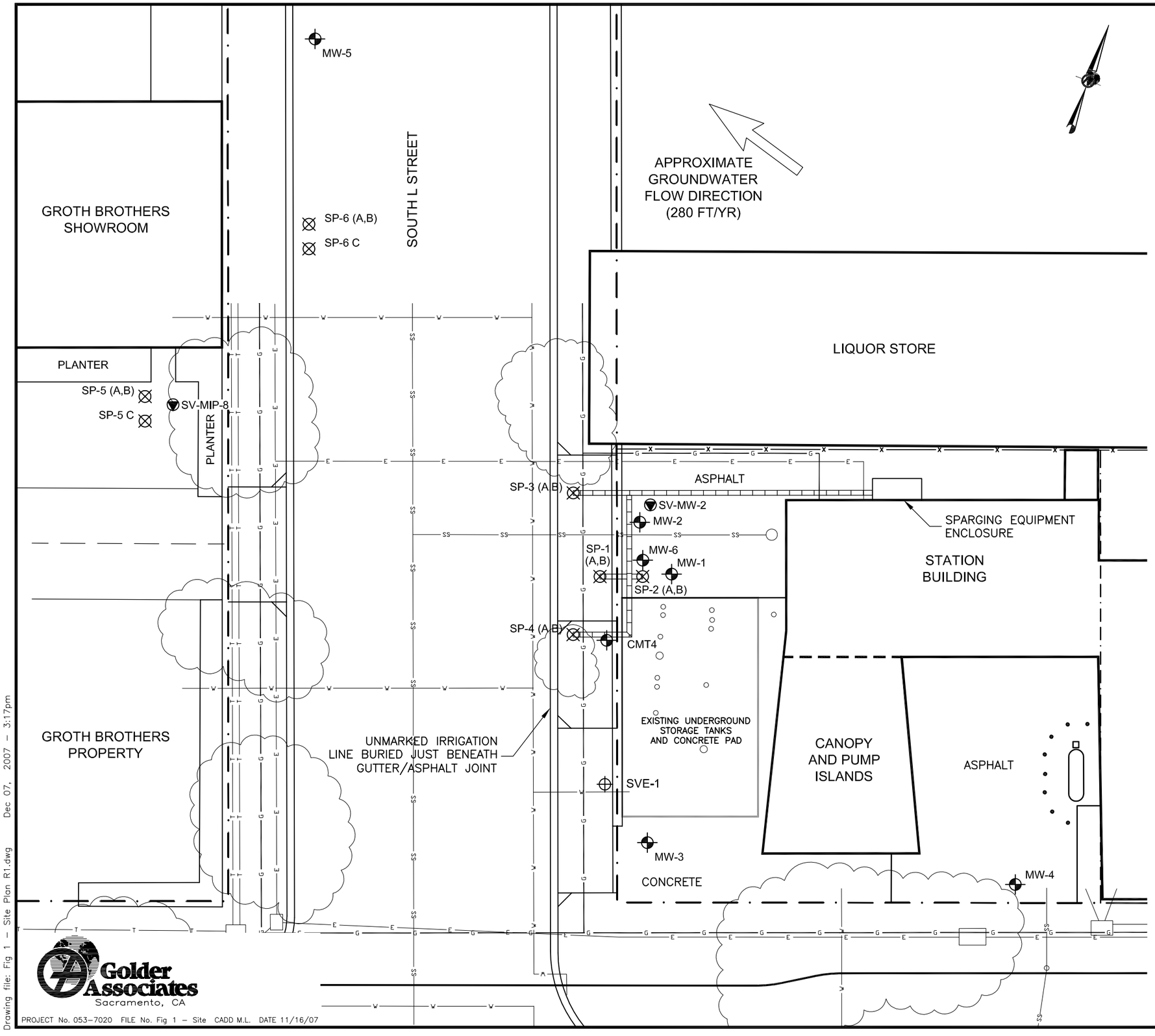


Base map: USGS 7.5' topography, Livermore, California (1961; photorevised 1980)

SCALE: 0 2,000 4,000 FEET

G:\053-7020\FIGURES\SITELOC-Pilot Test Report-mn.DSF 12/7/07

Golder Associates	PILOT TEST REPORT FORMER DESERT PETROLEUM (B&C GAS MINI MART) LIVERMORE, CALIFORNIA	FIGURE 1
	SITE LOCATION MAP	PROJECT NO. 053-7020



LEGEND

- RIGHT–OF–WAY LIMIT
- GAS LINE
- SANITARY SEWER LINE
- WATER LINE
- ELECTRIC LINE
- TELEPHONE LINE
- PROPOSED OZONE SPARGE/ MONITORING WELL
- PROPOSED SOIL VAPOR EXTRACTION/ MONITORING WELL
- GROUNDWATER MONITORING WELL
- SOIL VAPOR EXTRACTION WELL
- SPARGE CONVEYANCE LINES (UNDERGROUND)
- TREE (TYP.)

NOTES

1. APPROXIMATE LOCATIONS OF UTILITY LINES AND SURFACE FEATURES BASED FROM CITY OF LIVERMORE DRAWING TITILED FIRST STREET STREETSCAPE IMPROVEMENTS. DATE OF DRAWING: FEBRUARY 9, 2005.

20 0 20
SCALE FEET

Golder Associates
Sacramento, CA

PROJECT No. 053–7020 FILE No. Fig 1 – Site CADD M.L. DATE 11/16/07

Drawing file: Fig 1 – Site Plan R1.dwg Dec 07, 2007 – 3:17pm

SITE PLAN

FIGURE 2

APPENDIX A
ACEHS Letter

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

July 13, 2007

Mr. Balaji Angle
B&C Gas Mini Mart
2008 1ST Street
Livermore, CA 94550

Mr. John Rutherford
Desert Petroleum
3781 Telegraph Rd
Ventura, CA 93003-3420

Dear Messrs. Angle and Rutherford:

Subject: Fuel Leak Case No. RO0000278, Desert Petroleum, 2008 1ST Street, Livermore, CA

ACEH staff has reviewed the "Revised Source Zone Remediation Plan Addendum", dated June 28, 2007, and the proposed project schedule dated May, 30, 2007, both prepared by Golder Associates (Golder). Thank you for revising your plan and submitting the details requested by ACEH. We generally concur with the work proposed in the workplan. The proposed scope of work may be implemented provided that the technical comment below is addressed and incorporated during the proposed field work. Submittal of a revised workplan is not required unless an alternative proposal outside that described in the workplan and technical comment below is proposed. We request that you incorporate the following technical comment in your proposed work, perform the work, and send us the reports requested below.

We have reviewed the schedule for permitting and operation of the pilot test program and concur with the proposed schedule of work. ACEH has revised the schedule for submittal of technical reports accordingly as specified below.

Additionally, we have received the "Response to ACEH Comments and SCM Rev. 2.0 Transmittal," dated June 22, 2007. ACEH review of these reports is pending.

TECHNICAL COMMENT

1. **Monitoring Well Network for Pilot Test** – We concur with your proposal to install SP-3 through SP-6 to monitor the effectiveness of the remediation system. We are concerned that data from one monitoring location downgradient will not yield sufficient information to evaluate the effectiveness of your system over time. We request that you install an additional well pair between SP-6 and MW-5 and incorporate it into your pilot test monitoring network.

TECHNICAL REPORT REQUEST

Please submit technical reports electronically to ACEH (Attention: Ms. Donna L. Drogos), according to the schedule below and as established for the project under the Polanco Act.

- **July 30, 2007** – Quarterly Report for the Second Quarter 2007
- **October 30, 2007** – Quarterly Report for the Third Quarter 2007

- **December 7, 2007** – Pilot Test Report
- **January 30, 2008** - Quarterly Report for the Third Quarter 2007
- **February 1, 2008** - CAP and Public Participation Plan
- **April 30, 2008** - Quarterly Report for the First Quarter 2007

These reports are being requested pursuant to Section 25296.10 of the California Health and Safety Code. 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

The Alameda County Environmental Cleanup Oversight Programs (LOP and SLIC) require submission of all reports in electronic form to the county's ftp site. Paper copies of reports will no longer be accepted. The electronic copy replaces the paper copy and will 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 (ftp) Instructions." Please do not submit reports as attachments to electronic mail.

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. Submission of reports to the Geotracker website does not fulfill the requirement to submit documents to the Alameda County ftp site. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for 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, electronic submittal of a complete copy of all necessary reports was required in Geotracker (in PDF format). Please visit the SWRCB website for more information on these requirements (http://www.swrcb.ca.gov/ust/cleanup/electronic_reporting).

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 further delays in investigation and reporting, late reports, or enforcement actions will result in ACEH recommending to the State that you be made 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) 567-6721.

Sincerely,

Donna L. Drogos, P.E.
LOP Program Manager

cc:	Mr. Bill Fowler (w/Enc) Golder Associates 2580 Wyandotte Street, Suite G Mountain View, CA 94043 bfowler@golder.com	Ms. Mary Rose Cassa Regional Water Quality Control Board San Francisco Bay Region 1515 Clay Street, Suite 1400 Oakland, CA 94612 MCassa@waterboards.ca.gov	Ms. Colleen Winey Zone 7 Water Agency 100 North Canyons Parkway Livermore, CA 94551 cwiney@zone7water.com
	Ms. Danielle Stefani Livermore – Pleasanton Fire Department 3560 Nevada Street Pleasanton, CA 94566 dstefani@lpfire.org	Mr. Sunil Ramdass State Water Resources Control Board UST Cleanup Fund P.O. Box 944212 Sacramento, CA 94244-2120 sramdas@waterboards.ca.gov	Ms, Chris Davidson City of Livermore 1052 S Livermore Ave Livermore, CA 94550 cedavidson@ci.livermore.ca.us

	Mr. John Freeman, Jr. California Water Service 195 South N Street Livermore, CA 94550 jfreeman@calwater.com	Michael J. Veiluva Esq Alborg, Veiluva & Epstein LLP 200 Pringle Avenue, Suite 410 Walnut Creek, CA 94596 mveiluva@avelaw.com	Mr. Glenn Young Fugro West, Inc 1000 Broadway, Suite 200 Oakland, CA, 94607 GYoung@Fugro.com
	Mr. Balaji Angle gasman6020@yahoo.com		
	D. Drogos , files		

APPENDIX B

Encroachment and Well Permits

CUST 1

City of Livermore

Community Development Department
1052 S. Livermore Avenue
Livermore, CA 94550
(925) 960-4500

Encroachment
Permit No. EN070284
DevFrtlm

PERMIT TO DO WORK IN ACCORDANCE WITH CHAPTER 12.08 OF THE LIVERMORE MUNICIPAL CODE AND SPECIFICATIONS AS ADOPTED BY THE CITY OF LIVERMORE AND ANY SPECIAL REQUIREMENTS SHOWN OR LISTED HEREIN.

Permit Fee:	$53.00
Inspection Fee:	$630.00
Bond:	$0.00
Total:	***$683.00***

Applicant/Permittee:
Name: Golder Associates (Mark Naugle)
Address: 1009 Enterprise Way, Ste. 350
Roseville, CA, 95678
Phone: 916-786-2424

Contractor:
Name:
Address:

Phone:

PLEASE READ THIS PERMIT CAREFULLY. KEEP IT AT THE WORK SITE. TO ARRANGE FOR AN INSPECTION, PHONE (925) 960-4500 AT LEAST 24 HOURS BEFORE YOU START WORK.

JOB LOCATION: ***2008 First Street *******
DESCRIPTION OF WORK: ***Installation of remediation wells. Please see attached plans.***

Length of Excavation: _ L.F. **Width:** _ L.F. **Depth:** _ L.F.

Attention is directed to the General Provisions printed on the reverse side of this permit and to the attached special requirements (to be determined as needed by the Engineering Division).

Prosecution of Work: All work authorized by the permit shall be performed in a workmanlike, diligent, and expeditious manner, and must be completed to the satisfaction of the City Engineer.

Liability and Damages: The permittee shall be responsible for all liability imposed by law for personal injury or property damage which may arise out of the work permitted and done by permittee under this permit, or which may arise out of the failure on the part of the permittee to perform his obligations under said permit in respect to maintenance and encroachment. The permittee shall protect and indemnify the City of Livermore, its officers and employees, and save them harmless in every way from all action at law for damage or injury to persons or property that may arise out of or be occasioned in any way because of his operations as provided in this permit.

Signature of Permittee:
By: _____
Date: 8/8/07

City Engineer
By: _____
Date of Issue: 7/31/07

Work Completed:

Date: _____

Inspector: _____

CITY OF LIVERMORE GENERAL PROVISIONS

1. The permittee shall begin work as authorized under this permit within 45 days from the date of issuance, unless a different date is stated in the permit. If the work is not begun within 45 days or the time stated in the permit, the permit shall become void. The permit shall be valid for a term of 6 months from the date of issuance, or as otherwise stated on the permit, unless discontinued by the use or removal of the encroachment for which the permit was issued.

2. This permit is issued only for that portion of work in the City of Livermore public right-of-way.

3. All construction shall be in accordance with City Standard Details and Specifications.

4. Permittee shall notify Underground Service Alert (U.S.A.) at 800-227-2600 prior to excavation. All underground contractors must have U.S.A. inquiry identification number.

5. Permittee is hereby cautioned that unless otherwise noted herein, traffic signal detector loops, wiring, etc., shall not be disturbed. Request marking from the City of Livermore Street Maintenance Dept. at 960-8020.

6. All excavations shall conform to the requirement of the State of California Division of Occupational Safety and Health.

7. Permittee shall furnish all safeguards and post warning signs in advance of work area for vehicular traffic and shall clear the roadway of any obstructions or debris at the end of each work day. All safety devices shall conform to the latest edition of the State of California "Manual of Warning Signs, Lights, and Devices for Use in Performance of Work Upon Highways".

8. No public road under the jurisdiction of the City Engineer shall be closed to travel by the general public without special permission, in writing, from the City Engineer (Sec. 12.08.180 Livermore Municipal Code). No lane closures will be allowed between 6:00 a.m. and 9:00 a.m. or between 3:30 p.m. and 6:30 p.m. At other times, at least one lane of traffic shall be kept open to the general public.

9. No more than 300 linear feet of continuous excavation shall be opened at one time. Excavate only that length of trench which can be backfilled and compacted to specified requirements the same day. Temporary pavement must be placed the same day.

10. Backfill shall be placed in accordance with the current City Standard Detail S-1.

11. Metal plates of sufficient thickness for legal load traffic or temporary paving, 1½" ,minimum thickness, shall be placed over any unpaved areas at the end of each work day. Temporary pavement must be placed around all edges of said plates. Sidewalk construction areas shall be left in a safe condition.

12. Material excavated from within the City road right-of-way under this permit shall be removed from within the right-of-way and disposed of in a legal manner. (Sec. 12.08.170 Livermore Municipal Code)

13. The right-of-way shall be left clean and orderly daily to the satisfaction of the City Engineer or his representative. The permittee shall give particular attention to maintaining the project in a dust-free condition while performing the various items of work and during non-working periods, including weekends.

14. Job sites left in an unsafe condition will be secured by City personnel and the permittee will be billed for all expenses incurred by the City.

15. Final asphalt concrete surfacing shall be placed within 14 days of completion of each 300 linear feet of excavation. If the edges of the trench have been ravelled prior to final surfacing, the edges shall be re-sawn.

16. Where concrete is placed in a planter strip, score lines, construction joints and expansion joints shall be continued across entire sidewalk area. Where curb, gutter and sidewalk are placed monolithically, the "back edge" of the curb shall be scored.

17. No culverts or storm drains are to be cut or disturbed. Direction of flow and capacity of existing surface water drainage facilities shall not be materially changed.

18. Access to public and private properties adjacent to the public road in which work is authorized shall not be denied by reason of such work. Special measures shall be taken to insure passage for emergency vehicles over and at the site of work at all times.

19. In the event that any future improvement of the road right-of-way necessitates the relocation of the encroachment for which this permit is issued, the permittee shall relocate same at his sole expense.

20. Priority shall be given to operations performed under this contract let by the City of Livermore for certain work at this location. Coordination shall be effected through said Contractor and the Project Representative for the City.

21. Any existing facilities damaged or removed in the course of the work shall be replaced in kind or better, including ground and pavement surfaces, signs, striping, markers, curb, gutter, survey monuments, trees and other vegetation, etc., to the satisfaction of the owner of said facility.

22. In accordance with the Livermore Municipal Code, a cash deposit or surety bond may be required. The deposit placed for this work will be held for 90 days after the final inspection.

PERMITTEE SHALL NOTIFY CITY INSPECTOR AT 960-4500
WITHIN THREE (3) DAYS AFTER WORK IS COMPLETED.

FAILURE TO COMPLY WITH THESE PROVISIONS WILL RESULT IN
THE CITY'S TAKING WHATEVER MEASURES NECESSARY
TO CONFORM TO PERMIT CONDITIONS AND
THE PERMITTEE WILL BE BILLED FOR ALL EXPENSES INCURRED.

City of Livermore

Community Development Department
1052 S. Livermore Avenue
Livermore, CA 94550
(925) 960-4500

Encroachment Permit No. EN070284

SPECIAL REQUIREMENTS APPLICABLE TO WORK ASSOCIATED WITH

JOB LOCATION: 2008 First Street ****

DESCRIPTION OF WORK: Installation of remediation wells. Please see attached plans.

1: See Attached Drawing/Plans

2: All work shall be completed between the hours of 9 a.m. and 3 p.m.

3: Remove wells after 2 years monitoring period and restore street and sidewalk per City Std G-1 and ST-31.

4: Traffic control shall be completed per Cal Trans Standards and any additional requirements deemed necessary by the City Engineer.

5: Pedestrian access must be maintained at all times, including if necessary, escorting pedestrians through the work area.

6: Contractor shall repair/replace all damaged curb, gutter and sidewalk damaged as a result of current work being completed per the City Livermore Standard Details.

7: Contractor shall provide a traffic control plan and meet with Inspector at site to verify traffic control measures are adequate prior to starting work in the street.

CITY OF LIVERMORE GENERAL PROVISIONS

1. The permittee shall begin work as authorized under this permit within 45 days from the date of issuance, unless a different date is stated in the permit. If the work is not begun within 45 days or the time stated in the permit, the permit shall become void. The permit shall be valid for a term of 6 months from the date of issuance, or as otherwise stated on the permit, unless discontinued by the use or removal of the encroachment for which the permit was issued.

2. This permit is issued only for that portion of work in the City of Livermore public right-of-way.

3. All construction shall be in accordance with City Standard Details and Specifications.

4. Permittee shall notify Underground Service Alert (U.S.A.) at 800-227-2600 prior to excavation. All underground contractors must have U.S.A. inquiry identification number.

5. Permittee is hereby cautioned that unless otherwise noted herein, traffic signal detector loops, wiring, etc., shall not be disturbed. Request marking from the City of Livermore Street Maintenance Dept. at 960-8020.

6. All excavations shall conform to the requirement of the State of California Division of Occupational Safety and Health.

7. Permittee shall furnish all safeguards and post warning signs in advance of work area for vehicular traffic and shall clear the roadway of any obstructions or debris at the end of each work day. All safety devices shall conform to the latest edition of the State of California "Manual of Warning Signs, Lights, and Devices for Use in Performance of Work Upon Highways".

8. No public road under the jurisdiction of the City Engineer shall be closed to travel by the general public without special permission, in writing, from the City Engineer (Sec. 12.08.180 Livermore Municipal Code). No lane closures will be allowed between 6:00 a.m. and 9:00 a.m. or between 3:30 p.m. and 6:30 p.m. At other times, at least one lane of traffic shall be kept open to the general public.

9. No more than 300 linear feet of continuous excavation shall be opened at one time. Excavate only that length of trench which can be backfilled and compacted to specified requirements the same day. Temporary pavement must be placed the same day.

10. Backfill shall be placed in accordance with the current City Standard Detail S-1.

11. Metal plates of sufficient thickness for legal load traffic or temporary paving, 1½" ,minimum thickness, shall be placed over any unpaved areas at the end of each work day. Temporary pavement must be placed around all edges of said plates. Sidewalk construction areas shall be left in a safe condition.

12. Material excavated from within the City road right-of-way under this permit shall be removed from within the right-of-way and disposed of in a legal manner. (Sec. 12.08.170 Livermore Municipal Code)

13. The right-of-way shall be left clean and orderly daily to the satisfaction of the City Engineer or his representative. The permittee shall give particular attention to maintaining the project in a dust-free condition while performing the various items of work and during non-working periods, including weekends.

14. Job sites left in an unsafe condition will be secured by City personnel and the permittee will be billed for all expenses incurred by the City.

15. Final asphalt concrete surfacing shall be placed within 14 days of completion of each 300 linear feet of excavation. If the edges of the trench have been ravelled prior to final surfacing, the edges shall be re-sawn.

16. Where concrete is placed in a planter strip, score lines, construction joints and expansion joints shall be continued across entire sidewalk area. Where curb, gutter and sidewalk are placed monolithically, the "back edge" of the curb shall be scored.

17. No culverts or storm drains are to be cut or disturbed. Direction of flow and capacity of existing surface water drainage facilities shall not be materially changed.

18. Access to public and private properties adjacent to the public road in which work is authorized shall not be denied by reason of such work. Special measures shall be taken to insure passage for emergency vehicles over and at the site of work at all times.

19. In the event that any future improvement of the road right-of-way necessitates the relocation of the encroachment for which this permit is issued, the permittee shall relocate same at his sole expense.

20. Priority shall be given to operations performed under this contract let by the City of Livermore for certain work at this location. Coordination shall be effected through said Contractor and the Project Representative for the City.

21. Any existing facilities damaged or removed in the course of the work shall be replaced in kind or better, including ground and pavement surfaces, signs, striping, markers, curb, gutter, survey monuments, trees and other vegetation, etc., to the satisfaction of the owner of said facility.

22. In accordance with the Livermore Municipal Code, a cash deposit or surety bond may be required. The deposit placed for this work will be held for 90 days after the final inspection.

PERMITTEE SHALL NOTIFY CITY INSPECTOR AT 960-4500
WITHIN THREE (3) DAYS AFTER WORK IS COMPLETED.

FAILURE TO COMPLY WITH THESE PROVISIONS WILL RESULT IN
THE CITY'S TAKING WHATEVER MEASURES NECESSARY
TO CONFORM TO PERMIT CONDITIONS AND
THE PERMITTEE WILL BE BILLED FOR ALL EXPENSES INCURRED.

CITY OF LIVERMORE
-ENCROACHMENT PERMIT-
APPLICATION/WORKSHEET

City of Livermore
1052 S. Livermore Avenue
Livermore, CA 94550

Public Works Inspection
925-960-4500
925-960-4503 *fax*

-For Office Use Only-

Date Received: _____ Project Number: ENO702841

Ready to Issue: _____ Total Fees Required: _____

Notified Applicant By: Telephone/Mail Date Contacted: _____

Project address: 2008 1st Street Tract# _____ Lot# _____ APN# 97-1-24-1

Applicant's Name: Mark Naugle Telephone number: (916) 786-2424

Applicant's Address: 1009 EnterprisE Way, Ste 350 City Roseville State CA Zip 95678

PROPERTY OWNER:

Name: Balaji Angle

Address: 35584 Connovan Lane

City/Zip: Fremont, CA 94536

Telephone Number: (510)742-5924

CONTRACTOR:

Name: Golder Associates, Inc.

Address: 1009 Enterprise Way, Suite 350

City/Zip: Roseville, CA 95678

Telephone Number: (916) 786-2424

State License Number: 754659 Type General Engineering Contractor Class A

Description of work: Installation of ~~three~~ remediation wells. Please see attached Description of Work.

In sidewalk - SP-1AB

In street - SP-3AB, SP-4AB, SP-5AB, SP-7AB, SP-7C

SKETCH

Please see attached figure.

Lung, Pam

From: Lung, Pam
Sent: Tuesday, July 31, 2007 9:01 PM
To: 'Naugle, Mark'
Cc: Moreira, Xochitl; Purcell, Lorraine; Duffus, Kevin
Subject: RE: Encroachment Permit, 2008 1st Street, Livermore, CA

Mark,
Your encroachment permit will be ready for you to pick up tommarrow. I have signed it and placed it on Xochitl's desk so she can assist you with it when you come in to pick it up. Please call her to let her know when you plan to come in. You can reach her at 925-960-4500. You will need to come into the office to pay the fee, sign and pick-up your permit. At that time you can arrange for an inspector to meet you on site prior to starting work. Please provide a minimum of 48 hours notice. One of the conditions of the permit is to provide a traffic control plan per Caltrans standards and meet with the construction inspector in the field to review your traffic control prior to starting work. Please call 925-960-4500 to arrange for an inspector to meet you on site to do this. This phone number is also on your encroachment permit. Based upon the information you provided below your permit fee is $683. Please call Xochitl if you have any questions. Lorraine Purcell will also be available at the same number to assist you if you have any questions while I am out of the office the next few days. Have a good evening!- Pam

---

From: Naugle, Mark [mailto:mnaugle@golder.com]
Sent: Friday, July 27, 2007 4:44 PM
To: Lung, Pam
Cc: Purcell, Lorraine; Thrailkill, Mark; Duffus, Kevin; Pournia, Mohammad; Davidson, Chris; Johnson, Kris
Subject: RE: Encroachment Permit, 2008 1st Street, Livermore, CA

Thank you,

Your well listing is correct.

I estimate the drilling of those wells to be $18,000 and I'm estimating $3,000 for sidewalk repair, but I'm guessing for the sidewalk repair – I'm unsure exactly how much will need to be repaired

Mark Naugle
Golder Associates Inc.
1009 Enterprise Way, Suite 350
Roseville, CA 95678
Tel: (916) 786-2424
Cell: (916) 257-3670
Fax: (916) 786-2434
Web: www.Golder.com

From: Lung, Pam [mailto:pgjones@ci.livermore.ca.us]
Sent: Friday, July 27, 2007 3:55 PM
To: Naugle, Mark
Cc: Purcell, Lorraine; Thrailkill, Mark; Duffus, Kevin; Pournia, Mohammad; Davidson, Chris
Subject: RE: Encroachment Permit, 2008 1st Street, Livermore, CA

Mark,
Thank you. I will be processing the encroachment permit for you in Mark's absence. I did get the paperwork you previously submitted. Please confirm the monitoring well locations are the same as listed in your July 17th email below:

In sidewalk - SP-1AB
In street - SP-3AB
SP-4AB
SP-5AB
SP-7AB
SP-7C

Please provide an estimate of the cost for initial drilling of the holes and restoring the pavement and sidewalk.

The base encroachment permit is $53 and the encroachment permit inspection fee will be based upon the cost of work within the City right-f-way. The total permit fee will be the combination of the permit and inspection fee and be due when the permit is ready to be picked up. I am checking to see if I need to request a deposit or bond to assure the City the street will be restored after the 2 year monitoring period and if there are any working restrictions due to traffic on L street.

Thanks! Let me know if you have any questions. - Pam

From: Thrailkill, Mark
Sent: Friday, July 27, 2007 1:28 PM
To: Lung, Pam
Cc: Purcell, Lorraine; mnaugle@golder.com
Subject: FW: Encroachment Permit, 2008 1st Street, Livermore, CA

From: Naugle, Mark [mailto:mnaugle@golder.com]
Sent: Monday, July 23, 2007 5:22 PM
To: Thrailkill, Mark
Cc: Lofholm, Steve; Johnson, Kris
Subject: FW: Encroachment Permit, 2008 1st Street, Livermore, CA

Hi Mark,

Did you get a chance to look at this information? Is there anything else you need?

Thank you,

Mark Naugle
Golder Associates Inc.
1009 Enterprise Way, Suite 350
Roseville, CA 95678
Tel: (916) 786-2424
Cell: (916) 257-3670
Fax: (916) 786-2434
Web: www.Golder.com

From: Naugle, Mark
Sent: Tuesday, July 17, 2007 11:11 AM

To: Mark Thrailkill (mjthrailkill@ci.livermore.ca.us)
Cc: Lofholm, Steve; Johnson, Kris
Subject: Encroachment Permit, 2008 1st Street, Livermore, CA

Mark,

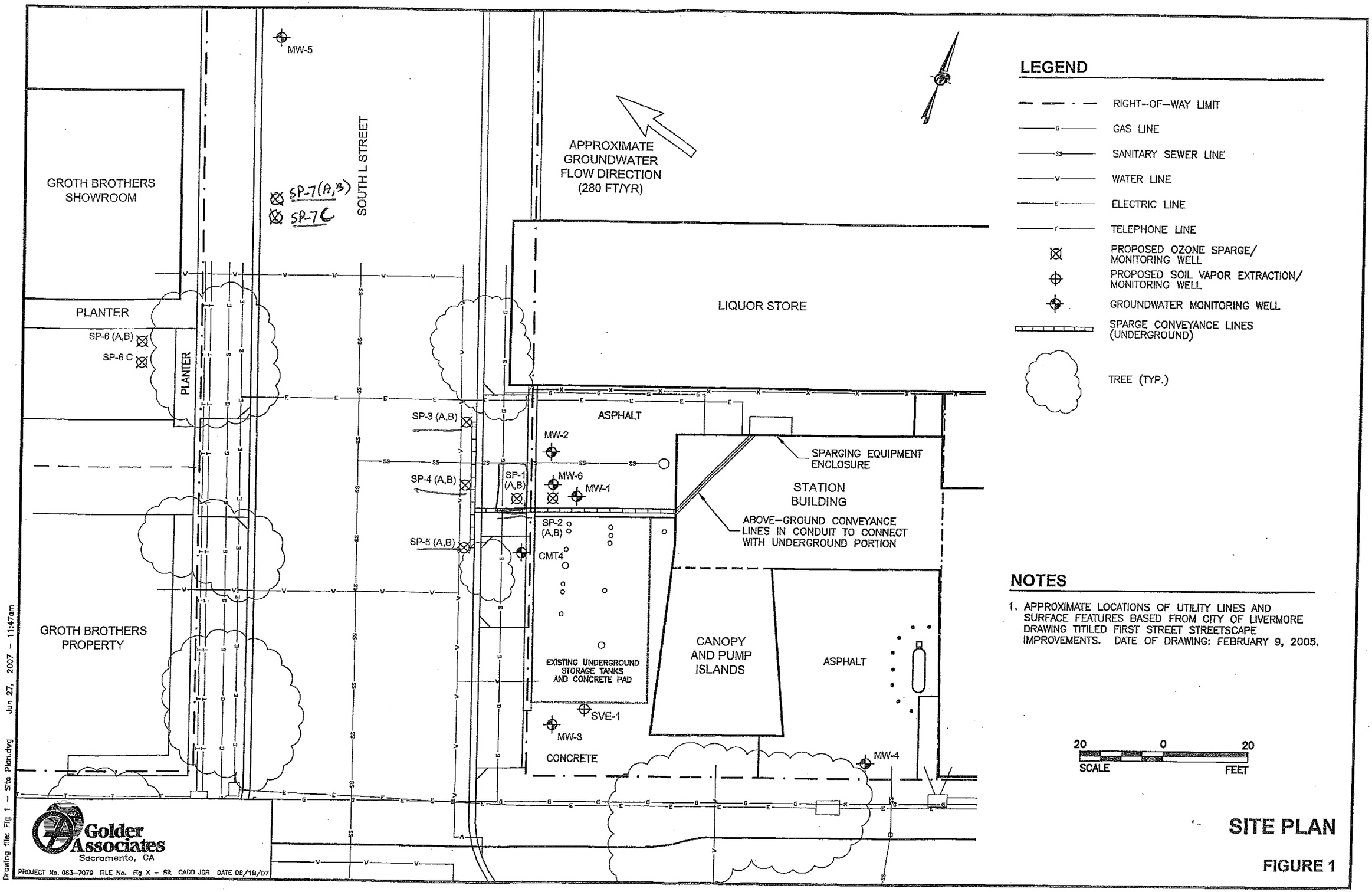
As we discussed this morning, here is the Figure showing the proposed well locations planned for 1st Street near Valley Gas. I've also included a schematic of the well construction for the dual-completion wells (i.e. SP-7(A, B)) and the deeper well screen (i.e. SP-7C). Well SP-7 (A, B) and SP-7 C have been added as required by Alameda County Environmental Health.

As shown in Figure 1, the wells that need to go in the street are SP-3 (A,B), SP-4 (A,B), SP-5 (A,B), SP-7 (A,B), and SP-7 C. The "(A,B)" wells are dual completion as shown on Figure 2 and the "C" well is a single completion, deeper well, as shown on Figure 3. The other well shown in the street, MW-5, is an existing well.

Please let me know if you need any additional information. We would like to install these wells in the next few weeks to comply with the deadline given to us by Alameda County.

Thank you,

Mark Naugle
Golder Associates Inc.
1009 Enterprise Way, Suite 350
Roseville, CA 95678
Tel: (916) 786-2424
Cell: (916) 257-3670
Fax: (916) 786-2434
Web: www.Golder.com



SITE PLAN

FIGURE 1

Golder Associates Inc.
1009 Enterprise Way, Suite 350
Roseville, CA USA 95678
Telephone: (916) 786-2424
Fax: (916) 786-2434

June 15, 2007

Our Ref.: 053-7020

Engineering Department
City of Livermore
1052 S. Livermore Avenue
Livermore, CA 94550

Attention: Mark Thrailkill

RE: ENCROACHMENT PERMIT APPLICATION FOR 2008 1ST STREET, LIVERMORE, CALIFORNIA

Dear Mr. Thrailkill:

Golder Associates, Inc. (Golder) has prepared the attached Encroachment Permit Application on behalf of B&C Gas Station. The Encroachment Permit Application is for the installation of three remediation wells (SP-1, SP-2, and SP-3) in L Street adjacent to our site. The wells will be installed using a drill rig and 8.5-inch augers. The wells will be completed inside approximately 18-inch round utility vaults. Tunneling under the sidewalk and trenching in the street immediately adjacent to the sidewalk/gutter to connect conveyance piping to the wells is also required. The approximate location of the wells is shown on the attached figure. The estimated duration of remediation is 2 years.

The placement of the wells in the street adjacent to the site is necessary in order to meet the remediation goals for this site. The source of the contamination is from the tank pit located adjacent to the sidewalk on the subject property. Placement of the wells must be to the west, northwest of the contaminant source (the down-gradient direction). Well placement in the sidewalk is not preferred due to a public gas utility running beneath the sidewalk.

In addition to the permit application and site plan, portions of the work plan describing the sparge points and the City of Livermore trenching details to be used for boring and trench completions are also attached.

Please feel free to contact me at (916) 786-2424 with any questions or concerns.

Sincerely,

GOLDER ASSOCIATES INC.

Mark Naugle
Senior Project Engineer

Attachments: Encroachment Permit Application;
Site Plan figure
Relevant portions of the work plan

5.0 REMEDIAL IMPLEMENTATION

In order to design a full-scale system to meet the remedial objectives for the source zone, Golder recommends performing a bench scale test and an extended pilot study while performing interim remediation. These activities are summarized in the following sections.

5.1 Ozone Bench Scale Test

The bench scale test will include analyses to assess the ozone dose requirements and the natural buffering capacity of the soil. To confirm the effectiveness of ozone as an oxidant and to assess whether ozone sparging will generate chemical species that are deleterious to groundwater quality, bench-scale testing will be performed using representative aquifer materials and groundwater. The aquifer materials and groundwater for the bench-scale testing will be collected during the installation of the sparge wells described in Section 5.2. The bench test apparatus will provide a continuous source of ozone to representative soil and groundwater from the site by sparging in a manner consistent the sparging that will be performed on site. The bench scale testing will assess the following:

- The effectiveness of ozonation and the extent to which removal is due to destruction or volatilization;
- The ozone demand of soil and water;
- The effect of ozonation on secondary groundwater quality parameters; and
- The potential for the formation of hexavalent chromium and/or bromate and the attenuation of these species, if formed.

Details regarding the proposed bench-scale testing are included in **Appendix B.** The results of the bench study will be used to develop the sampling and analysis plan for the ozone sparging pilot test and allow modification of the pilot test approach if necessary (such as a larger ozone generator if necessary).

5.2 Ozone/Air Sparge Well Installation

Three double-nested ozone/air sparge wells (SP-1 through SP-3) will be installed at the approximate locations shown on Figure 3. A schematic of the sparge well construction is shown on Figure 4. The sparge wells will be installed using hollow-stem auger drilling methods. Continuous soil samples will be collected from 36 to 48 feet bgs. Soil samples will be logged by a geologist or engineer working under the direct supervision of a California-registered geologist. Soil and groundwater

samples will be collected during the installation of the SPs for the bench scale testing. One soil sample will also be collected for chemical analysis as discussed in Section 5.3.3.

The sparge wells will be constructed from 1.5-foot long, 25-micron, porous, polyvinylidene fluoride (PVDF) sparge points connected to schedule 80 polyvinyl chloride or PVDF well casing (Figure 4). The sparge points will be set within higher permeability zones at approximately 40.5 to 42 feet and 46.5 to 48 feet below surface grade (bgs). A filter pack consisting of No. 8/30 sand (or equivalent) will be installed to one foot above each sparge point, and the sparge points will be separated by a continuous bentonite seal approximately 3.0 to 3.5 feet thick. Approximately one to two gallons of clean potable water will be placed on top of the well seals to hydrate the bentonite. The bentonite will be allowed to hydrate a minimum of 30 minutes prior to constructing the upper sparge point or grouting the remaining well annulus. The remaining well bore will be sealed to within eight inches of surface grade with bentonite grout and capped at grade with concrete. The sparge wells will be completed in an 18-inch traffic-rated well boxes installed in concrete. A four-inch diameter sweep elbow will be installed beneath the skirt of the vault boxes to allow future routing of conveyance tubing or flexible piping.

5.3 Ozone Pilot Test/Interim Remediation

The primary goal of the pilot test is to confirm the effectiveness of ozone sparging and provide data to formulate the design basis for the full scale implementation. The pilot test will be performed to evaluate the following:

- The gas entry pressure of the course-grained unit within the source zone;
- The potential radius of influence;
- The relationship between pressure and flow rate during sparging;
- If petroleum hydrocarbons are off-gasing to the vadose zone;
- The contaminant removal rates from groundwater;
- If oxidation by-products accumulate (in conjunction with the bench study); and,
- The potential effects on the water table and the capillary fringe induced by gas injection.

5.3.1 System Components

The primary components anticipated for the sparging pilot test include:

- Power supply;
- Dual completion ozone/air sparge well (SP-1)
- Ozone sparging equipment package to include:
    - oxygen enriched inlet air,
    - programmable operation with actuated valves and manifold;
    - capability to produce up to 2 pounds per day ozone;
    - capablility of 2 standard cubic feet per minute (SCFM);
    - capability of up to 20 pounds per square inch (psi).
- Pressure gauges on injection and monitoring wells
- Helium delivery system with flow meter, pressure gauge/regulator.
- Helium detector;
- Ozone detector (optional);
- Miscellaneous soil vapor and groundwater sampling equipment; and
- Photo-ionization detector (PID).

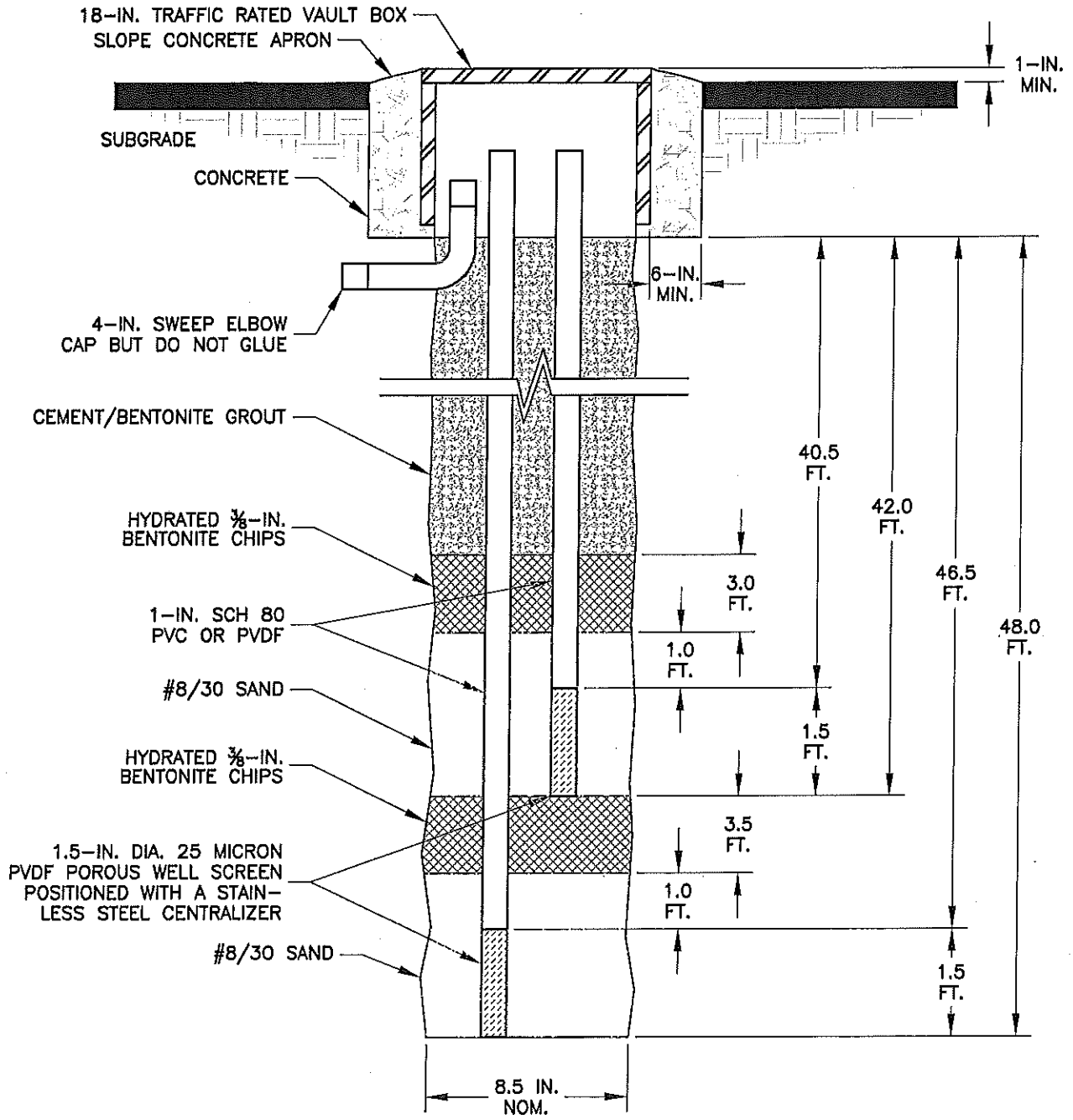
5.3.2 Testing Procedures

Golder proposes to conduct two types of performance tests including:

- Variable pressure/flow rate tests for estimating sparge cycle durations and gas injection system equipment requirements.
- Constant-rate tests for evaluating sparge areas of influence and contaminant removal effectiveness.

The variable pressure/flow rate tests will be conducted first to evaluate the gas entry pressure and determine the time required to generate the maximum effective zone of sparging. These results will also be used to plan the injection configuration and flow rates for the constant-rate test. The constant-

(NOT TO SCALE)



LEGEND

IN.	INCH
FT	FEET
MIN.	MINMUM
NOM.	NOMINAL
PVDF	POLYVINYLIDENE FLUORIDE (KYNAR ®)

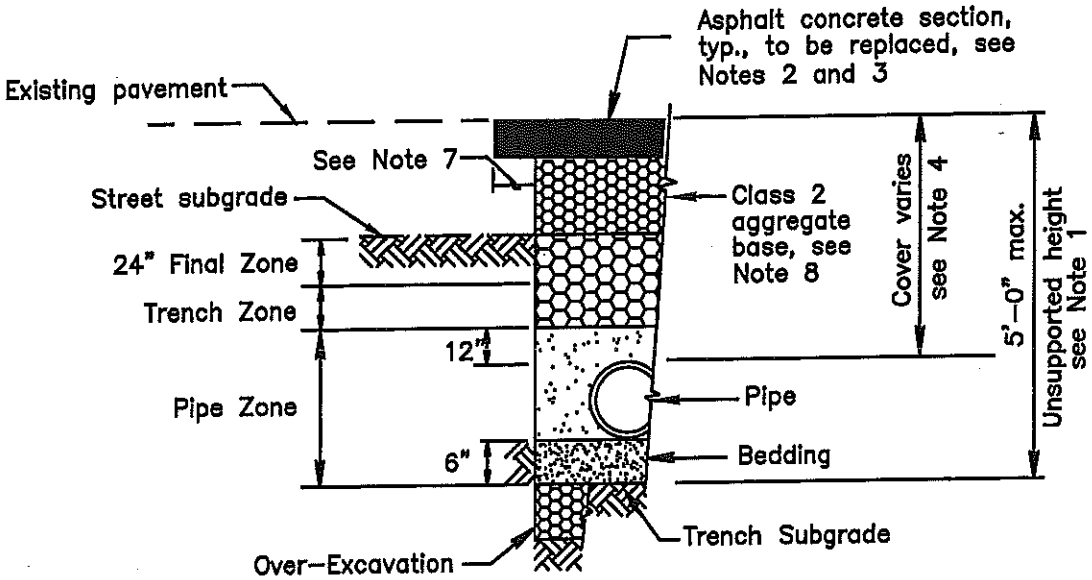
OZONE/AIR SPARGE WELL SCHEMATIC

FIGURE 4

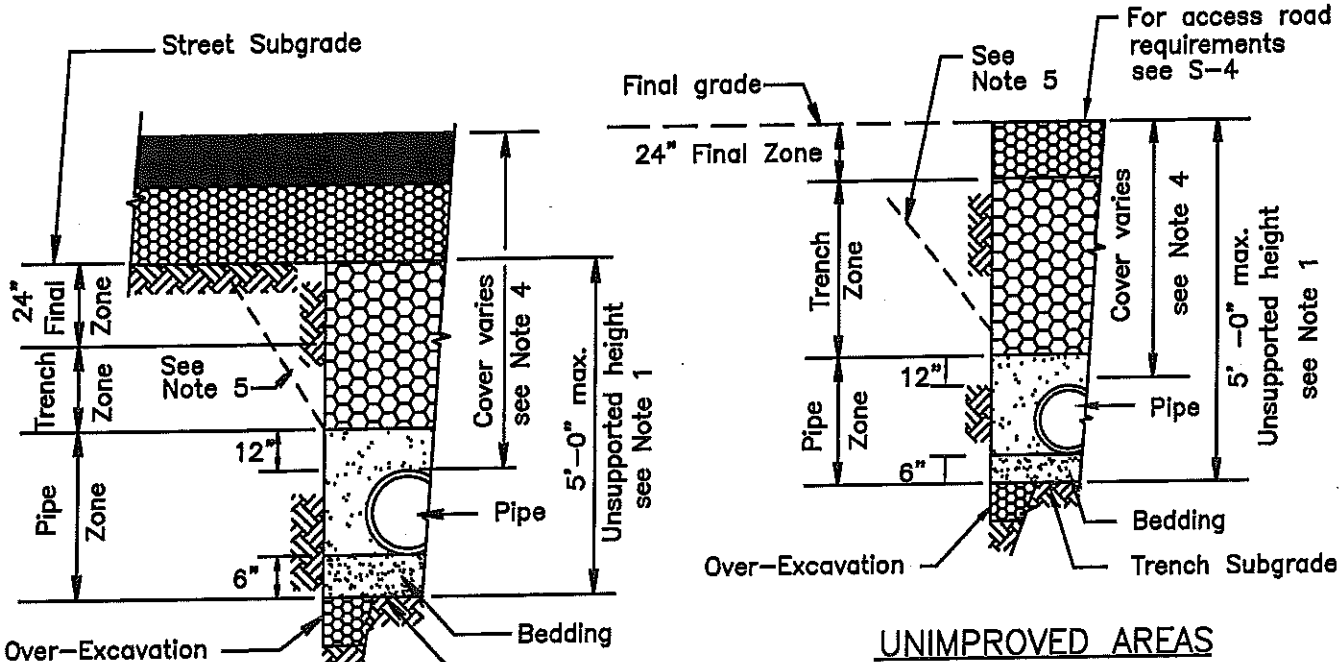
Golder Associates
Sacramento, CA

PROJECT No. 053–7020 FILE No. Fig 4 – Air CADD JDR DATE 08/10/06

Drawing file: Fig 4 – Air Sparge Well.dwg Aug 10, 2006 – 4:58pm



EXISTING STREET



NEW STREET

UNIMPROVED AREAS

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

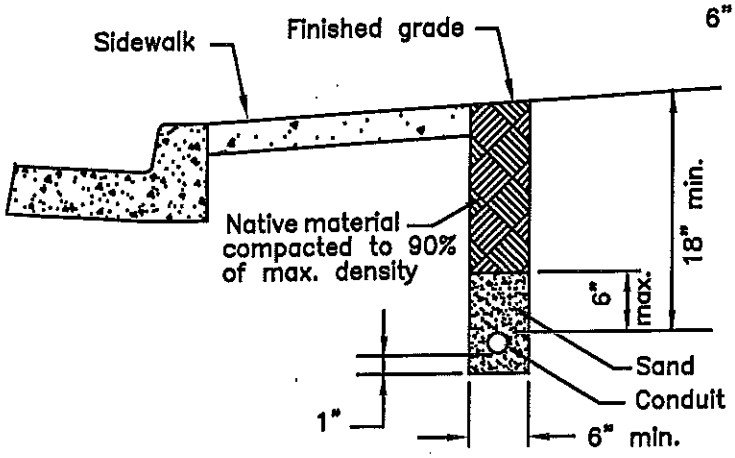
Date:	By:	Rev:

TRENCH SECTION

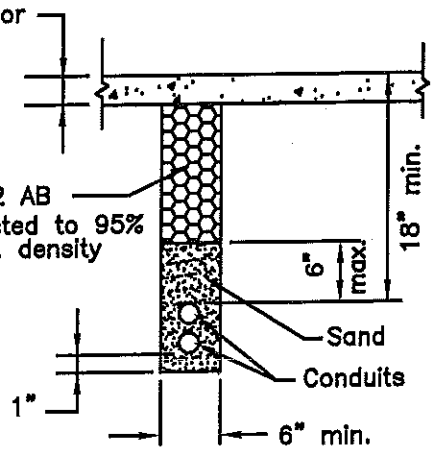
CITY OF LIVERMORE
STANDARD DETAIL

Dwn: M-W/KY	Date: May-05	No.
Ckd: Spec. Committee	Scale: None	G-1A

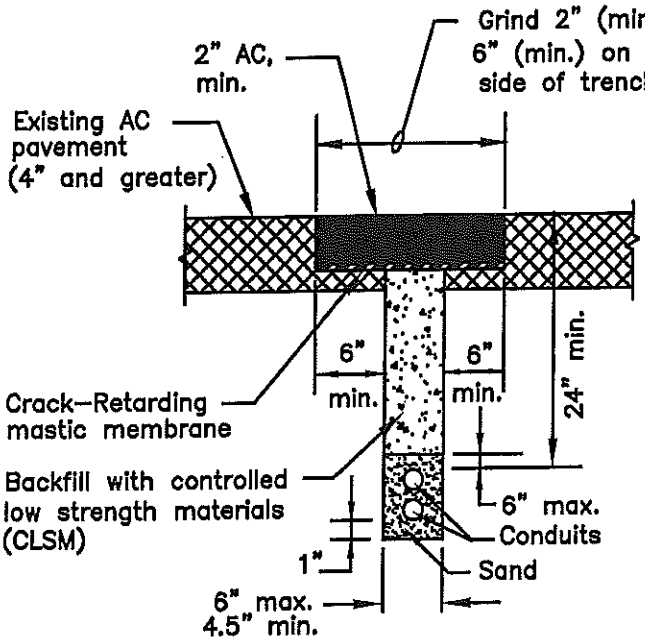
City Engineer



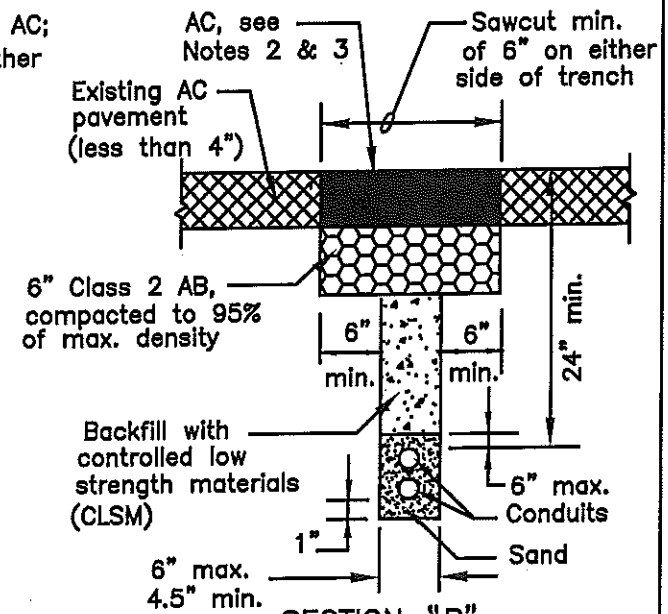
STREET LIGHT CONDUIT TRENCH SECTION (WHEN NOT IN JOINT TRENCH)



TRAFFIC SIGNAL CONDUIT TRENCH SECTION UNDER SIDEWALKS/DRIVEWAYS



SECTION "A"
FOR EXISTING ASPHALT CONCRETE SECTIONS 4" AND GREATER



SECTION "B"
FOR EXISTING ASPHALT CONCRETE SECTIONS LESS THAN 4"

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

TELECOMMUNICATIONS CONDUIT TRENCH SECTIONS

(ELECTRICAL, TRAFFIC SIGNAL CONDUITS, STREET LIGHT CONDUIT CROSSINGS, TELEPHONE, CABLE TV / COMMUNICATION CONDUITS)

Date	By	Rev.

TRENCH SECTION

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: KY	Date: May-05	No.
Ckd: Spec. Committee	Scale: None	G-1B

City Engineer

G01B.DWG

NOTES:

1. Trenching shall conform to the "Construction Safety Orders of the State of California" and Section 6705 of the California Labor Code.
2. In existing streets, the total asphalt concrete thickness replaced shall not be less than 6" (4" in residential streets), or match the existing asphalt concrete section, whichever is greater.
3. In existing streets the asphalt concrete bottom lift(s) shall not be less than 4" (2" in residential streets), and the asphalt concrete top lift shall not be less than 2".
4. Where adequate compaction cannot be achieved due to obstruction or other conditions, replace pipe zone and/or trench zone fill with Controlled Low Strength Material (CLSM) as directed by the ENGINEER.
5. Sloping trench sections, above pipe zone, can only be used where stable compact soil conditions exist, where approved by the ENGINEER, or where shown on the drawing or specifications. Sloping trench sections will not be allowed in existing streets.
6. Prior to trenching, contact USA 1–800–227–2600
7. Before pavement section is replaced, the existing pavement shall be sawcut at least 12 inches back from trench excavation along neat, straight, parallel lines. Where the existing asphalt concrete is 6" or more in thickness or where the repaving is less that 15 square feet in area, sawcut may be the edge of the trench excavation. Where wall of trench excavation is within 18" of the lip of gutter replace AC from trench wall to lip of gutter.
8. In existing streets the total aggregate base shall be the greater of the existing street aggregate base section or the following minimum aggregate base:

   a) Local, loops, cul–de–sac, and private residential streets: 12" AB (min.)

   b) Collector, frontage, major, and industrial/commercial streets: 18" AB (min.)

9. See the "Utility Earthwork" section of the City standard specifications for additional information.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date	By	Rev.

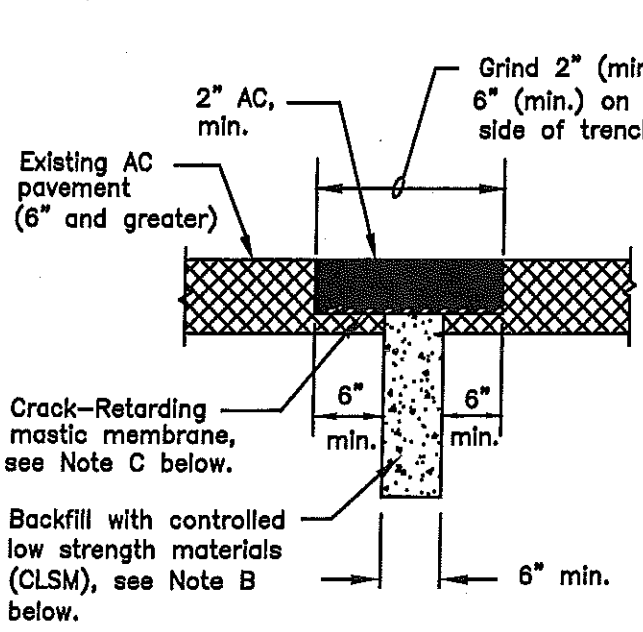
TRENCH SECTION

CITY OF LIVERMORE
STANDARD DETAIL

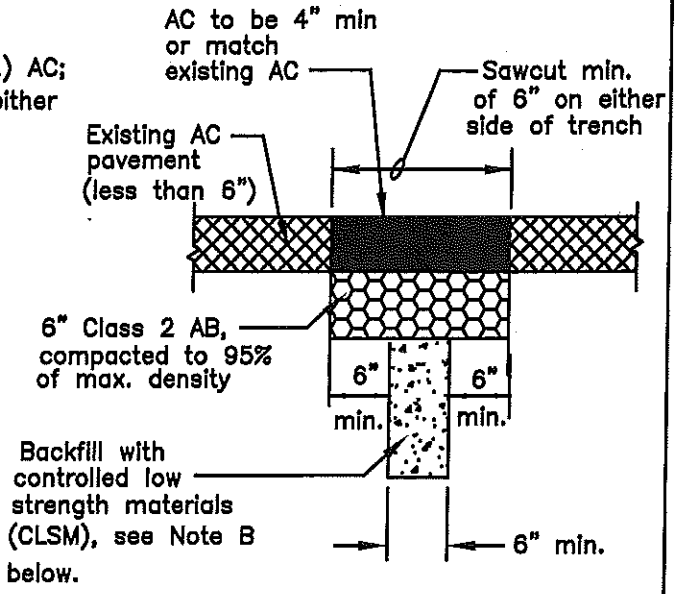
Dwn: M–W/KY	Date: May–05	No.
Ckd: Spec. Committee	Scale: None	G–1C

City Engineer

GUTC.DWG



SECTION "A"
FOR EXISTING ASPHALT CONCRETE
SECTIONS 6" AND GREATER



SECTION "B"
FOR EXISTING ASPHALT CONCRETE
SECTIONS LESS THAN 6"

NOTES

A. PRIOR TO TRENCHING, CONTACT USA 1-800-227-2600

B. CONTROLLED LOW STRENGTH MATERIALS (CLSM) SHALL BE A FLOWABLE, HAND-EXCAVATABLE MIXTURE OF CEMENT, POZZOLAN, COARSE AND FINE AGGREGATE, ADMIXTURES AND WATER WHICH HAS BEEN MIXED IN ACCORDANCE WITH ASTM C 94. ALL PROPERTIES, COMPOSITIONS AND INSTALLATION REQUIREMENTS SHALL BE PER SPECIFICATION SECTION 312323. (CLSM) SHALL NOT COME IN CONTACT WITH UTILITIES. MAINTAIN A CLEARANCE OF 6" MINIMUM BETWEEN CLSM AND UTILITIES FOR BACKFILL.

C. CRACKED-RETARDING MASTIC MEMBRANE SHALL BE AS MANUFACTURED BY CONTECH CONSTRUCTION PRODUCTS INC. – PAVEPREP, AMOCO FABRICS FIBERS COMPANY – PETROTAC OR EQUAL.

D. ANY EXCAVATIONS LARGER THAN 3'x3' SHALL COMPLY WITH CITY STD DETAIL G-1B.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

WD1D.DWG

SOIL BORING AND SMALL EXCAVATION IN STREET SECTION

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: MAP	Date: May-05	No.
Ckd: Spec. Committee	Scale: None	G-1D

City Engineer

CITY OF LIVERMORE, CA

RECVD BY: C ARCHER E1000007556
PAYOR: GOLDER & ASSOC. INC
TODAY'S DATE: 08/08/07
REGISTER DATE: 08/08/07 TIME: 14:32

DESCRIPTION	AMOUNT
ENCRCHMENT/TRANSPO PER	$53.00
CUST ID: ENO70284	
ENCRO ENCRCHMENT/TRANSPO PERMIT	
001-31300	
PUB WORKS-INSPECTION F	$630.00
CUST ID: ENO70284	
2016 PUB WORKS-INSPECTION FEES	
001-35350	
TOTAL DUE:	$683.00

CHECK PAID: $683.00
CHECK NO: 1472
TENDERED: $683.00
CHANGE: $.00

ZONE 7 WATER AGENCY

100 NORTH CANYONS PARKWAY, LIVERMORE, CALIFORNIA 94551 VOICE (925) 454-5000 FAX (925) 454-5728

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT 2008 First Street
Livermore, CA 94550

California Coordinates Source _____ ft .Accuracy _____ ft.
CCN _____ ft. CCE _____ ft.
APN 97-1-24-1

CLIENT
Name Balaji Angle - B&C Gas
Address 35584 Connovan Lane Phone (510) 742-5924
City Fremont, CA 94536 Zip 94536

APPLICANT
Name Heather Kuoppamaki
Golder Associates Fax (916)786-2434
Address 1009 Enterprise Way, Ste 350 Phone (916)786-2424
City Roseville, CA Zip 95678

TYPE OF PROJECT

Well Construction	Geotechnical Investigation
Cathodic Protection	General
Water Supply	Contamination
[Monitoring]	Well Destruction

PROPOSED WELL USE

New Domestic	Irrigation
Municipal	[Remediation]
Industrial	Groundwater Monitoring
Dewatering	Other _____

DRILLING METHOD:

Mud Rotary	Air Rotary	[Hollow Stem Auger]
Cable Tool	Direct Push	Other _____

DRILLING COMPANY WDC Exploration & Wells
DRILLER'S LICENSE NO. 283326

WELL PROJECTS
Drill Hole Diameter 8.5 in. Maximum
Casing Diameter 1 in. Depth 48 ft.
Surface Seal Depth 3.0-3.5 ft. Number 10

SOIL BORINGS
Number of Borings _____ Maximum
Hole Diameter _____ in. Depth _____ ft.

ESTIMATED STARTING DATE August 20th, 2007
ESTIMATED COMPLETION DATE August 24th, 2007

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE _____ Date 8/8/07

ATTACH SITE PLAN OR SKETCH

PERMIT NUMBER 27135
WELL NUMBER 3S/2E-8R34 to 8R43
APN 097-0001-024-01

PERMIT CONDITIONS

(Circled Permit Requirements Apply)

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

B. WATER SUPPLY WELLS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.
3. An access port at least 0.5 inches in diameter is required on the wellhead for water level measurements.
4. A sample port is required on the discharge pipe near the wellhead.

(C.) GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

E. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

F. WELL DESTRUCTION. See attached.

(G.) SPECIAL CONDITIONS. Submit to Zone 7 within 60 days after the completion of permitted work the well installation report including all soil and water laboratory analysis results.

Approved Wyman Hong Date 8/14/07
Wyman Hong

Revised: April 27, 2005

APPENDIX C

Boring Logs and Well Construction Details

Golder Associates
2580 Wyandotte St., Ste G
Mountain View, CA 94043
Telephone: 650-386-3828
Fax: 650-386-3815

WELL NUMBER SP-1 (A-B)

PROJECT NUMBER 053-7020 **DATE STARTED** 8/22/07

PROJECT NAME B&C Gas Mini Mart Sparge Well Installation **DATE COMPLETED** 8/22/07

Continued from Previous Page

PID (ppm)	DEPTH TO WATER	RECOVERY (inches)	BLOW COUNTS	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
340	▼ ▽	12	50		45	CL		SANDY CLAY (CL), dark yellowish brown (10YR 3/4), 60% fines, 20% fine sand, 10% medium to coarse sand, 10% gravel to 2" diameter, moist, strong odor @40': Sample SP-1 (40') 40' to 48': Impacted soil sample taken for bench test from extracted cores. *(continued)*	42.0	Two centralizers @ 40.5' #0/30 Sand Porous PVDF, 25 Micron Pore Size, 1.5"ODx18"L w/ 3/8" FNPT tapped hole, w/ viton o-ring Bentonite Chips Centralizer @46.5' #0/30 Sand Screen (Typ.)
						SP		GRAVELLY SAND (SP), yellowish brown (10YR 5/4), 5% fines, 70% fine to coarse sand, 25% gravel to 3" diameter, dense, wet, moderate to strong odor		
								Bottom of borehole at 48.0 feet.	48.0	

Golder Associates
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Mountain View, CA 94043
Telephone: 650-386-3828
Fax: 650-386-3815

WELL NUMBER SP-2 (A-B)

PROJECT NUMBER 053-7020
PROJECT NAME B&C Gas Mini Mart Sparge Well Installation
LOCATION Livermore, CA
DRILLING METHOD 8.25" Hollow Stem Auger
SAMPLING METHOD Continuous Core
GROUND ELEVATION (ft) ~487
TOP OF CASING (ft) 486
LOGGED BY DSF

DATE STARTED 8/20/07
DATE COMPLETED 8/21/07
CASING TYPE/DIAMETER SCH 80 PVC / 1"
SCREEN TYPE/SLOT Porous PVDF / 25 Micron Pore Size
GRAVEL PACK TYPE #0/30 Sand
GROUT TYPE/QUANTITY Type I/II Portland Cement
DEPTH TO WATER (ft-bgs) 43.6
GROUND WATER ELEVATION (ft) 442.5

REMARKS Drilled to 48' bgs using hollow stem auger. Split spoon sample every 5' from 5 to 40' bgs. Continuous core: 40 to 45' bgs. Flush 18" box.

PID (ppm)	DEPTH TO WATER	RECOVERY (inches)	BLOW COUNTS	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
								Punch through 4" concrete, hand auger to 3'	0.5
						GP		Logged from cuttings: GRAVEL (GP), yellowish brown (10 YR 5/4), gravel to 3" diameter, loose, dry	3.0
0.0		6	12 30 30		5	GP		SANDY GRAVEL (GP), dark yellowish brown (10YR 3/4), <5% fines, 30% fine sand, 10% medium to coarse sand, 60% gravel to 0.75" diameter, medium dense, damp, no odor	7.0
0.0		6	15 4 6		10	SP		GRAVELLY SAND (SP), yellowish brown (10YR 5/4), <5% fines, 70% fine sand, 10% medium to coarse sand, 20% gravel to 1" diameter, loose, dry to damp	12.0
0.0		12	22 50 50		15	GC		CLAYEY GRAVEL (GC), dark yellowish brown (10YR 3/4), 20% medium plasticity fines, 15% fine sand, 10% medium to coarse sand, 55% gravel to 1" diameter, dense, dry to damp	17.0
0.1		12	20 50 50		20	CL		GRAVELLY CLAY (CL), dark yellowish brown (10YR 3/4), 65% medium plasticity fines, 15% fine to coarse sand, 20% gravel to 1.5" diameter, firm, damp to moist	24.0
0.0		18	8 30 45		25	SP		GRAVELLY SAND (SP), mottled (green, red, orange, brown), 5% fines, 45% fine sand, 20% medium to coarse sand, 30% gravel to 1.5" diameter, medium dense, moist	27.0
25.2		18	10 10 15		30	ML		SILT (ML), very dark grayish brown (10YR 3/2), mottled green, 95% medium to high plasticity fines, 5% fine sand, trace gravel to 0.5", stiff, moist, moderate odor, slight sheen	37.0
41.7		6	8 10 13		35				
1046		12				CL		SANDY CLAY (CL), dark yellowish brown (10YR 3/4), 60% fines, 20% fine sand, 10% medium to coarse sand, 10% gravel to 2" diameter, medium dense, moist, moderate odor	

WELL DIAGRAM: Type I/II Portland Cement; 1" SCH 80 PVC; Bentonite Chips

LOG A EWNNO1 MODIFIED WATER 3 SPARGE WELL BORING LOGS.GPJ LOG A EWNN01.GDT 9/11/07

Golder Associates
2580 Wyandotte St., Ste G
Mountain View, CA 94043
Telephone: 650-386-3828
Fax: 650-386-3815

WELL NUMBER SP-2 (A-B)

PROJECT NUMBER 053-7020 **DATE STARTED** 8/20/07

PROJECT NAME B&C Gas Mini Mart Sparge Well Installation **DATE COMPLETED** 8/21/07

Continued from Previous Page

PID (ppm)	DEPTH TO WATER	RECOVERY (inches)	BLOW COUNTS	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
563 1211	▽	36				CL		SANDY CLAY (CL), dark yellowish brown (10YR 3/4), 60% fines, 20% fine sand, 10% medium to coarse sand, 10% gravel to 2" diameter, medium dense, moist, moderate odor *(continued)* @43': Sample SP-2 (43')		
17 826 161		36			45	SP		GRAVELLY SAND (SP), mottled (green, blue, orange, brown), 5% fines, 75% fine to coarse sand, 20% gravel to 2.5" diameter, dense, moist to wet, strong odor	45.0	
								Bottom of borehole at 48.0 feet.	48.0	

Two centralizers @ 41'
#0/30 Sand
Porous PVDF, 25 Micron Pore Size, 1.5"ODx18"L w/ 3/8" FNPT tapped hole, w/ viton o-ring
Bentonite Chips
Centralizer @ 47'
#0/30 Sand Screen (Typ.)

Golder Associates
2580 Wyandotte St., Ste G
Mountain View, CA 94043
Telephone: 650-386-3828
Fax: 650-386-3815

WELL NUMBER SP-3 (A-B)

PROJECT NUMBER 053-7020
PROJECT NAME B&C Gas Mini Mart Sparge Well Installation
LOCATION Livermore, CA
DRILLING METHOD 8.25" Hollow Stem Auger
SAMPLING METHOD Split Spoon
GROUND ELEVATION (ft) ~487
TOP OF CASING (ft) 486
LOGGED BY DSF

DATE STARTED 8/24/07
DATE COMPLETED 8/24/07
CASING TYPE/DIAMETER SCH 80 PVC / 1"
SCREEN TYPE/SLOT Porous PVDF / 25 Micron Pore Size
GRAVEL PACK TYPE #0/30 Sand
GROUT TYPE/QUANTITY Type I/II Portland Cement
DEPTH TO WATER (ft-bgs) 42.6
GROUND WATER ELEVATION (ft) 443.4

REMARKS Drilled to 49' using hollow stem auger. Split spoon sample every 5' from 35 to 45' bgs. Flush 18" traffic vault box completion.

PID (ppm)	DEPTH TO WATER	RECOVERY (inches)	BLOW COUNTS	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
						GP		Air knife/vacuum to 4' Logged from cuttings: GRAVEL (GP), yellowish brown (10 YR 5/4), gravel to 3" diameter, loose, dry	4.0
					5			No samples extracted. See SP-1(A-B) boring log for lithology.	
					10				
					15				
					20				
					25				
					30				31.0
30.7		18	50		35	ML		SANDY SILT (ML), very dark grayish brown (10YR 3/2) with some black mottling, 90% high plasticity fines, 10% fine sand, stiff, moist, moderate to strong odor @35': Sample SP-3 (35')	37.0
		12	50			CL		SANDY CLAY (CL), dark yellowish brown (10YR 3/4), 60% fines, 20% fine sand, 10% medium to coarse sand, 10% gravel to 2" diameter, moist, moderate odor	

WELL DIAGRAM: Type I/II Portland Cement; 1" SCH 80 PVC; Bentonite Chips

LOG A EWNNO1 MODIFIED WATER 3 SPARGE WELL BORING LOGS.GPJ LOG A EWNN01.GDT 9/11/07

Golder Associates
2580 Wyandotte St., Ste G
Mountain View, CA 94043
Telephone: 650-386-3828
Fax: 650-386-3815

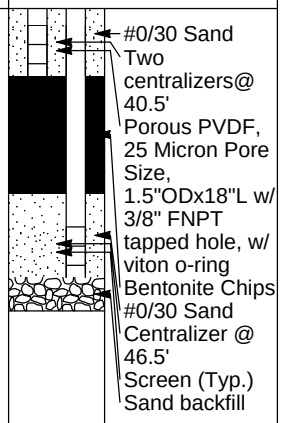
WELL NUMBER SP-3 (A-B)

PROJECT NUMBER 053-7020 **DATE STARTED** 8/24/07

PROJECT NAME B&C Gas Mini Mart Sparge Well Installation **DATE COMPLETED** 8/24/07

Continued from Previous Page

PID (ppm)	DEPTH TO WATER	RECOVERY (inches)	BLOW COUNTS	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
	▼ ▽	12	50		45	CL		SANDY CLAY (CL), dark yellowish brown (10YR 3/4), 60% fines, 20% fine sand, 10% medium to coarse sand, 10% gravel to 2" diameter, moist, moderate odor *(continued)*		
						SP		GRAVELLY SAND (SP), yellowish brown (10YR 5/4), 5% fines, 70% fine to coarse sand, 25% gravel to 3" diameter, dense, wet, moderate odor	43.0	
								Bottom of borehole at 49.0 feet.	49.0	



Golder Associates
2580 Wyandotte St., Ste G
Mountain View, CA 94043
Telephone: 650-386-3828
Fax: 650-386-3815

WELL NUMBER SP-4 (A-B)

PROJECT NUMBER 053-7020
PROJECT NAME B&C Gas Mini Mart Sparge Well Installation
LOCATION Livermore, CA
DRILLING METHOD 8.25" Hollow Stem Auger
SAMPLING METHOD Split Spoon
GROUND ELEVATION (ft) ~487
TOP OF CASING (ft) 486
LOGGED BY DSF

DATE STARTED 8/22/07
DATE COMPLETED 8/22/07
CASING TYPE/DIAMETER SCH 80 PVC / 1"
SCREEN TYPE/SLOT Porous PVDF / 25 Micron Pore Size
GRAVEL PACK TYPE #0/30 Sand
GROUT TYPE/QUANTITY Type I/II Portland Cement
DEPTH TO WATER (ft-bgs) 42.9
GROUND WATER ELEVATION (ft) 443.1

REMARKS Drilled to total depth of 49 ft using hollow stem auger. No samples taken (see below). Flush 18" traffic vault box completion

PID (ppm)	DEPTH TO WATER	RECOVERY (inches)	BLOW COUNTS	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								Punch through 4" of concrete, hand auger to 4' Logged from cuttings: GRAVEL (GP), yellowish brown (10 YR 5/4), gravel to 3" diameter, loose, dry	4.0	
					5			No samples extracted due to equipment malfunction on the drill rig and City of Livermore traffic control laws. For lithology, see SP-1(A-B) boring log.		
					10					
					15					
					20					Type I/II Portland Cement
					25					
					30					
					35					1" SCH 80 PVC Bentonite Chips

Golder Associates
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Mountain View, CA 94043
Telephone: 650-386-3828
Fax: 650-386-3815

WELL NUMBER SP-4 (A-B)

PROJECT NUMBER 053-7020 **DATE STARTED** 8/22/07

PROJECT NAME B&C Gas Mini Mart Sparge Well Installation **DATE COMPLETED** 8/22/07

Continued from Previous Page

PID (ppm)	DEPTH TO WATER	RECOVERY (inches)	BLOW COUNTS	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
	▽ ▼				45			No samples extracted due to equipment malfunction on the drill rig and City of Livermore traffic control laws. For lithology, see SP-1(A-B) boring log. *(continued)*		#0/30 Sand Two centralizers @ 40.5' Porous PVDF, 25 Micron Pore Size, 1.5"ODx18"L w/ 3/8" FNPT tapped hole, w/ viton o-ring Bentonite Chips Centralizer @ 47.5' #0/30 Sand Screen (Typ.)
								Bottom of borehole at 49.0 feet.	49.0	

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WELL NUMBER SP-5 (A-B)

PROJECT NUMBER 053-7020
PROJECT NAME B&C Gas Mini Mart Sparge Well Installation
LOCATION Livermore, CA
DRILLING METHOD 8.25" Hollow Stem Auger
SAMPLING METHOD Split Spoon
GROUND ELEVATION (ft) ~486
TOP OF CASING (ft) 485
LOGGED BY DSF

DATE STARTED 8/21/07
DATE COMPLETED 8/21/07
CASING TYPE/DIAMETER SCH 80 PVC / 1"
SCREEN TYPE/SLOT Porous PVDF / 25 Micron Pore Size
GRAVEL PACK TYPE #0/30 Sand
GROUT TYPE/QUANTITY Type I/II Portland Cement
DEPTH TO WATER (ft-bgs) 42.9
GROUND WATER ELEVATION (ft) 442.1

REMARKS Drilled to 51 ft bgs using hollow stem auger. Split spoon sample every 5' from 5 to 50 ft bgs. Flush 18" traffic vault box completion.

PID (ppm)	DEPTH TO WATER	RECOVERY (inches)	BLOW COUNTS	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
						GP		Punch through asphalt (~4"), hand auger to 3' Logged from cuttings: Heaving SANDY GRAVEL (GP)	0.5
		0	50		5	GP		No recovery, logged from cuttings: SANDY GRAVEL (GP), yellowish brown (10YR 5/4), 5% fines, 35% fine sand, 60% gravel to 2.5" diameter, dense, dry, no odor	3.5
0.0		6	50		10	GC		CLAYEY GRAVEL (GC), dark brown (10YR 3/3), 20% high plasticity fines, 15% fine sand, 10% medium to coarse sand, 55% gravel to 2" diameter, dense, dry to damp, no odor	7.0
0.0		18	6 8 10		15			SILTY SAND (SM), yellowish brown (10YR 5/4), some mottling (orange, red, brown), 30% fines, 70% fine sand, loose, damp, no odor	12.0
0.0		18	10 10 20		20	SM		@20': Trace gravel to 0.5" diameter, no odor	
0.0		18	9 16 20		25			@25': Moist, no odor	
98.7		18	13 13 18		30			@30': Dark greenish gray (Gley 4/10G), some mottling (orange, green, brown), moderate odor	32.0
515		18	20 50		35	SP		SAND (SP), mottled (green, orange, brown), 60% fine sand, 40% medium to coarse sand, trace gravel to 0.5" diameter, dense, wet, moderate to strong odor	
1630		12	10 20						

WELL DIAGRAM: Type I/II Portland Cement; 1" SCH 80 PVC; Bentonite Chips; Two centralizers @

Golder Associates
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Mountain View, CA 94043
Telephone: 650-386-3828
Fax: 650-386-3815

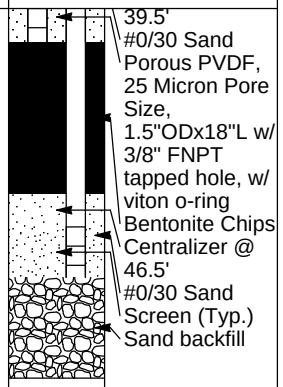
WELL NUMBER SP-5 (A-B)

PROJECT NUMBER 053-7020 **DATE STARTED** 8/21/07

PROJECT NAME B&C Gas Mini Mart Sparge Well Installation **DATE COMPLETED** 8/21/07

Continued from Previous Page

PID (ppm)	DEPTH TO WATER	RECOVERY (inches)	BLOW COUNTS	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
			45					SAND (SP), mottled (green, orange, brown), 60% fine sand, 40% medium to coarse sand, trace gravel to 0.5" diameter, dense, wet, moderate to strong odor *(continued)*		
	▼							@40': 10% gravel, very strong odor from cuttings		
3078	▽	18	19 50		45	SP		@45': Sample SP-5 (45')		
									47.0	
793		18	16 50		50	GP		SANDY GRAVEL (GP), mottled (green, orange, brown), 40% fine to coarse sand, 60% gravel to 2" diameter, dense, wet, strong odor		
									51.0	
								Bottom of borehole at 51.0 feet.		



Golder Associates
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Telephone: 650-386-3828
Fax: 650-386-3815

WELL NUMBER SP-5 (C)

PROJECT NUMBER 053-7020
PROJECT NAME B&C Gas Mini Mart Sparge Well Installation
LOCATION Livermore, CA
DRILLING METHOD 8.25" Hollow Stem Auger
SAMPLING METHOD Split Spoon
GROUND ELEVATION (ft) ~486
TOP OF CASING (ft) 485
LOGGED BY DSF

DATE STARTED 8/21/07
DATE COMPLETED 8/21/07
CASING TYPE/DIAMETER SCH 80 PVC / 1"
SCREEN TYPE/SLOT Porous PVDF / 25 Micron Pore Size
GRAVEL PACK TYPE #0/30 Sand
GROUT TYPE/QUANTITY Type I/II Portland Cement
DEPTH TO WATER (ft-bgs) 43.4
GROUND WATER ELEVATION (ft) 441.6

REMARKS No samples between 15 and 35' bgs. Split spoon sample every 5' from 5 to 15' and 35 to 54' bgs. Flush 18" traffic vault box.

PID (ppm)	DEPTH TO WATER	RECOVERY (inches)	BLOW COUNTS	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								Punch through asphalt (4"), hand auger to 3'	0.5	
0.0		6	15 22 10		5	GP		SANDY GRAVEL (GP), yellowish brown (10YR 5/4), 5% fines, 35% fine sand, 60% gravel to 2.5", dense, dry		
								No samples extracted. See SP-5(A-B) boring log for lithology	7.0	
					10					
					15					
					20					
					25					Type I/II Portland Cement
					30					
								SAND (SP), mottled (green, orange, brown), 60% fine sand, 40% medium to coarse sand, trace gravel, dense, moist to wet, moderate to strong odor	32.0	
168		18	10 17 45		35	SP				1" SCH 80 PVC
316		12	50							

Golder Associates
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Telephone: 650-386-3828
Fax: 650-386-3815

WELL NUMBER SP-5 (C)

PROJECT NUMBER 053-7020 **DATE STARTED** 8/21/07

PROJECT NAME B&C Gas Mini Mart Sparge Well Installation **DATE COMPLETED** 8/21/07

Continued from Previous Page

PID (ppm)	DEPTH TO WATER	RECOVERY (inches)	BLOW COUNTS	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
445	▼ ▽	12	12 50		45	SP		SAND (SP), mottled (green, orange, brown), 60% fine sand, 40% medium to coarse sand, trace gravel, dense, moist to wet, moderate to strong odor *(continued)* @40': Increasing gravel, very strong odor		
									47.0	
112		18	50		50	GP		SANDY GRAVEL (GP), mottled (green, orange, brown), 40% fine to coarse sand, 60% gravel to 2" diameter, dense, wet, strong odor		Bentonite Chips
71.3		6	50							Centralizer @ 52.5' #0/30 Sand Porous PVDF, 25 Micron Pore Size, 1.5"ODx18"L w/ 3/8" FNPT tapped hole, w/ viton o-ring
									54.0	
								Bottom of borehole at 54.0 feet.		

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Fax: 650-386-3815

WELL NUMBER SP-6 (A-B)

PROJECT NUMBER 053-7020
PROJECT NAME B&C Gas Mini Mart Sparge Well Installation
LOCATION Livermore, CA
DRILLING METHOD 8.25" Hollow Stem Auger
SAMPLING METHOD Split Spoon
GROUND ELEVATION (ft) ~485
TOP OF CASING (ft) 484
LOGGED BY DSF

DATE STARTED 8/23/07
DATE COMPLETED 8/23/07
CASING TYPE/DIAMETER SCH 80 PVC / 1"
SCREEN TYPE/SLOT Porous PVDF / 25 Micron Pore Size
GRAVEL PACK TYPE #0/30 Sand
GROUT TYPE/QUANTITY Type I/II Portland Cement
DEPTH TO WATER (ft-bgs) 42.5
GROUND WATER ELEVATION (ft) 441.5

REMARKS Borehole drilled to 54' bgs with hollow stem auger. Hole collapsed to 46' bgs. Re-drill hole to 49' bgs. No samples taken. Flush 18" box.

PID (ppm)	DEPTH TO WATER	RECOVERY (inches)	BLOW COUNTS	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					5, 10, 15, 20, 25, 30, 35			No samples extracted due to malfunction in drill rig equipment. See SP-6(C) boring log for lithology.		Type I/II Portland Cement; 1" SCH 80 PVC; Bentonite Chips

Golder Associates
2580 Wyandotte St., Ste G
Mountain View, CA 94043
Telephone: 650-386-3828
Fax: 650-386-3815

WELL NUMBER SP-6 (A-B)

PROJECT NUMBER 053-7020 **DATE STARTED** 8/23/07

PROJECT NAME B&C Gas Mini Mart Sparge Well Installation **DATE COMPLETED** 8/23/07

Continued from Previous Page

PID (ppm)	DEPTH TO WATER	RECOVERY (inches)	BLOW COUNTS	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
	▼ ▽				45 50			No samples extracted due to malfunction in drill rig equipment. See SP-6(C) boring log for lithology. *(continued)*		#0/30 Sand Two centralizers @ 40.5' Porous PVDF, 25 Micron Pore Size, 1.5"ODx18"L w/ 3/8" FNPT tapped hole, w/ viton o-ring Bentonite Chips #0/30 Sand Centralizer @47.5' Screen (Typ.) Original borehole drilled to 54'. Hole collapsed to 46' and was re-drilled to 49'.
								Borehole collapsed to 46' bgs. Hole was re-drilled to 49' bgs. Bottom of borehole at 54.0 feet.	54.0	

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2580 Wyandotte St., Ste G
Mountain View, CA 94043
Telephone: 650-386-3828
Fax: 650-386-3815

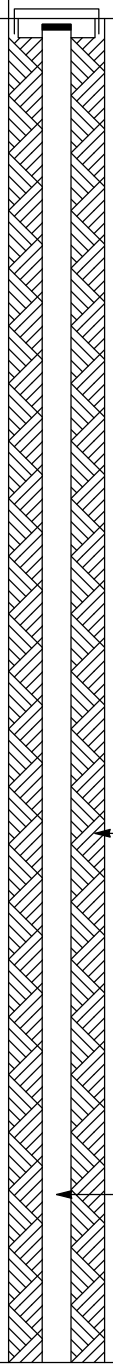
WELL NUMBER SP-6 (C)

PROJECT NUMBER 053-7020
PROJECT NAME B&C Gas Mini Mart Sparge Well Installation
LOCATION Livermore, CA
DRILLING METHOD 8.25" Hollow Stem Auger
SAMPLING METHOD Split Spoon
GROUND ELEVATION (ft) ~485
TOP OF CASING (ft) 484
LOGGED BY DSF

DATE STARTED 8/24/07
DATE COMPLETED 8/24/07
CASING TYPE/DIAMETER SCH 80 PVC / 1"
SCREEN TYPE/SLOT Porous PVDF / 25 Micron Pore Size
GRAVEL PACK TYPE #0/30 Sand
GROUT TYPE/QUANTITY Type I/II Portland Cement
DEPTH TO WATER (ft-bgs) 42.6
GROUND WATER ELEVATION (ft) 441.4

REMARKS Drilled to 56' bgs with hollow stem auger. Split spoon sample every 5' from 33.5 to 56' bgs. Flush 18" traffic vault box.

PID (ppm)	DEPTH TO WATER	RECOVERY (inches)	BLOW COUNTS	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
								Air knife/vacuum to 5', 4" of asphalt, 6" of concrete	0.3
								Logged from cuttings: Heaving SANDY GRAVEL (GP), yellowish brown, trace fines, some fine sand, gravel to 2" diameter, dense dry	0.8
						GP			
					5				
									7.0
								Logged from cuttings: CLAYEY GRAVEL (GC), dark brown, some fines, gravel to 2" diameter, dense, dry	
					10	GC			
									13.0
								Logged from cuttings: SILTY SAND (SM), yellowish brown, mottled (red, orange, brown), some fiines, mostly fine sand, loose, damp	
					15				
					20				
						SM			
					25				
					30				
									31.0
								SILTY SAND (SM), yellowish brown (10YR 5/4), 30% fines, 70% fine sand, loose, damp, moderate odor	
						SM			
372		12	50						34.5
					35			SAND (SP), mottled (green, orange, brown), 60% fine sand, 40% medium to coarse, sand, trace gravel to 0.5" diameter, dense, wet, moderate odor	
								@35': Sample SP-6 (35')	
						SP			
147		6	50						



LOG A EWNNO1 MODIFIED WATER 3 SPARGE WELL BORING LOGS.GPJ LOG A EWNN01.GDT 9/11/07

Golder Associates
2580 Wyandotte St., Ste G
Mountain View, CA 94043
Telephone: 650-386-3828
Fax: 650-386-3815

WELL NUMBER SP-6 (C)

PROJECT NUMBER 053-7020 **DATE STARTED** 8/24/07

PROJECT NAME B&C Gas Mini Mart Sparge Well Installation **DATE COMPLETED** 8/24/07

Continued from Previous Page

PID (ppm)	DEPTH TO WATER	RECOVERY (inches)	BLOW COUNTS	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
	▼					SP		SAND (SP), mottled (green, orange, brown), 60% fine sand, 40% medium to coarse, sand, trace gravel to 0.5" diameter, dense, wet, moderate odor *(continued)*	43.0	
64.7	▽	12	41 50		45			SANDY GRAVEL (GP), mottled (green, orange, brown), 40% fine to coarse sand, 60% gravel to 2" diameter, dense, wet, moderate odor		Bentonite Chips
10.0		12	50		50	GP				Centralizer@ 52.5' #0/30 Sand Porous PVDF, 25 Micron Pore Size, 1.5"ODx18"L w/ 3/8" FNPT tapped hole, w/ viton o-ring Sand backfill
					55				56.0	
								Bottom of borehole at 56.0 feet.		

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2580 Wyandotte St., Ste G
Mountain View, CA 94043
Telephone: 650-386-3828
Fax: 650-386-3815

WELL NUMBER SVE-1

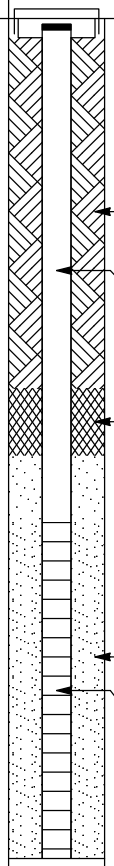
PROJECT NUMBER 053-7020
PROJECT NAME B&C Gas Mini Mart Sparge Well Installation
LOCATION Livermore, CA
DRILLING METHOD 8.25" Hollow Stem Auger
SAMPLING METHOD Split Spoon
GROUND ELEVATION (ft) ~487
TOP OF CASING (ft) 486
LOGGED BY DSF

DATE STARTED 8/24/07
DATE COMPLETED 8/24/07
CASING TYPE/DIAMETER SCH 40 PVC / 2"
SCREEN TYPE/SLOT 2" diameter factory slotted PVC / 0.040
GRAVEL PACK TYPE 6X16 Medium Aquarium Sand
GROUT TYPE/QUANTITY Type I/II Portland Cement
DEPTH TO WATER (ft-bgs)
GROUND WATER ELEVATION (ft)

REMARKS Drilled to 25 ft bgs with hollow stem auger. Split spoon sample every 5' from 10 to 25 ft bgs. Flush 8" traffic vault box completion.

PID (ppm)	DEPTH TO WATER	RECOVERY (inches)	BLOW COUNTS	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
								Punch through 4" of concrete	0.5
						GP		Logged from cuttings: GRAVEL (GP), yellowish brown (10 YR 5/4), gravel to 3" diameter, loose, dry	
					5				7.0
0.0		6	16 15 4		10	SP		GRAVELLY SAND (SP), dark yellowish brown (10YR 3/4), 5% fines, 55% fine sand, 10% medium to coarse sand, 30% gravel to 1" diameter, pieces of red brick fill, loose, dry @10': Sample SVE-1 (10')	
0.0		6	12 15 13		15			@15': Sample SVE-1 (15')	17.0
0.0		6	50		20	ML		SANDY SILT (ML), very dark grayish brown (10YR 3/2), 90% high plasticity fines, 10% fine sand, stiff, damp, slight odor @20': Sample SVE-1 (20') @25': Sample SVE-1 (25')	
41.3		18	10 17 6		25			Bottom of borehole at 25.0 feet.	25.0

WELL DIAGRAM



LOG A EWNNO1 MODIFIED WATER 3 SPARGE WELL BORING LOGS.GPJ LOG A EWNN01.GDT 9/11/07

Golder Associates
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Telephone: 650-386-3828
Fax: 650-386-3815

WELL NUMBER SP-1 (A-B)

PROJECT NUMBER 053-7020
PROJECT NAME B&C Gas Mini Mart Sparge Well Installation
LOCATION Livermore, CA
DRILLING METHOD 8.25" Hollow Stem Auger
SAMPLING METHOD Split Spoon
GROUND ELEVATION (ft) ~487
TOP OF CASING (ft) 486
LOGGED BY DSF

DATE STARTED 8/22/07
DATE COMPLETED 8/22/07
CASING TYPE/DIAMETER SCH 80 PVC / 1"
SCREEN TYPE/SLOT Porous PVDF / 25 Micron Pore Size
GRAVEL PACK TYPE #0/30 Sand
GROUT TYPE/QUANTITY Type I/II Portland Cement
DEPTH TO WATER (ft-bgs) 43.4
GROUND WATER ELEVATION (ft) 442.6

REMARKS Drilled to 48 ft bgs using hollow stem auger. Split spoon sample every 5' from 5 to 45 ft bgs. Flush 18" traffic vault box completion.

PID (ppm)	DEPTH TO WATER	RECOVERY (inches)	BLOW COUNTS	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
						GP		Punch through 3" of concrete. Hand auger to 3' due to heaving pea gravel	0.5
						GP		Logged from cuttings: GRAVEL (GP), yellowish brown (10 YR 5/4), gravel to 3" diameter, loose, dry	3.0
0.0		6	50		5	GP		SANDY GRAVEL (GP), dark yellowish brown (10YR 3/4), <5% fines, 35% fine sand, 10% medium to coarse sand, 55% gravel to 0.75" diameter, medium dense, no odor	
0.0		6	50		10	GP			
						GP			13.0
0.0		6	50		15	SP		GRAVELLY SAND (SP), yellowish brown (10YR 5/4), <5% fines, 55% fine sand, 10% medium to coarse sand, 35% gravel to 1" diameter, medium dense, dry 15' to 25': Clean soil sample taken for bench test from extracted cores.	17.0
0.0		12	28 50		20	GC		CLAYEY GRAVEL (GC), dark yellowish brown (10YR 3/4), 20% medium plasticity fines, 15% fine sand, 10% medium to coarse sand, 55% gravel to 1" diameter, dense, dry to damp	22.0
0.0		12	50		25	CL		GRAVELLY CLAY (CL), dark yellowish brown (10YR 3/4), 65% medium plasticity fines, 15% fine to coarse sand, 20% gravel to 1.5" diameter, stiff, damp to moist	
1012		18	6 7 8		30	ML		SANDY SILT(ML), very dark grayish brown (10YR 3/2), some mottling (green, orange, brown), 90% high plasticity fines, 10% fine sand, stiff, moist, moderate odor	29.0
2012		18	50		35	ML		Strong odor	
						CL			37.0
3187		6	50			CL			

WELL DIAGRAM: Type I/II Portland Cement; 1" SCH 80 PVC; Bentonite Chips

LOG A EWNNO1 MODIFIED WATER 3 SPARGE WELL BORING LOGS.GPJ LOG A EWNN01.GDT 9/11/07

APPENDIX D

Certified Analytical Reports

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Air Toxics Ltd. Introduces the Electronic Report

Thank you for choosing Air Toxics Ltd. To better serve our customers, we are providing your report by e-mail. This document is provided in Portable Document Format which can be viewed with Acrobat Reader by Adobe.

This electronic report includes the following:

- Work order Summary;
- Laboratory Narrative;
- Results; and
- Chain of Custody (copy).

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(916) 985-1000 .FAX (916) 985-1020
Hours 8:00 A.M to 6:00 P.M. Pacific

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0711410A

Work Order Summary

CLIENT:	Ms. Cheryl Hayhurst Golder Associates, Inc. 1009 Enterprise Way Suite 350 Roseville, CA 95661	**BILL TO:**	Ms. Cheryl Hayhurst Golder Associates, Inc. 1009 Enterprise Way Suite 350 Roseville, CA 95661
PHONE:	916-786-2424	**P.O. #**	
FAX:	916-786-2434	**PROJECT #**	053-7466-100 BNC Gas Mini Mart
DATE RECEIVED:	11/20/2007	**CONTACT:**	Kyle Vagadori
DATE COMPLETED:	12/05/2007		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.
01A	SV-MW-2	Modified TO-15	3.0 "Hg
02A	SV-MIP-8	Modified TO-15	1.5 "Hg
03A	Lab Blank	Modified TO-15	NA
04A	CCV	Modified TO-15	NA
05A	LCS	Modified TO-15	NA

CERTIFIED BY: Linda D. Fruman DATE: 12/05/07

Laboratory Director

Certfication numbers: CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/07, Expiration date: 06/30/08
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified TO-15
Golder Associates, Inc.
Workorder# 0711410A

Two 1 Liter Summa Canister samples were received on November 20, 2007. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode. The method involves concentrating up to 0.2 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***TO-15***	***ATL Modifications***
Daily CCV	+- 30% Difference	</= 30% Difference with two allowed out up to </=40%.; flag and narrate outliers
Sample collection media	Summa canister	ATL recommends use of summa canisters to insure data defensibility, but will report results from Tedlar bags at client request
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.
UJ- Non-detected compound associated with low bias in the CCV
N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: SV-MW-2

Lab ID#: 0711410A-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Benzene	1.1	4.0	3.6	13
Toluene	1.1	1.7	4.2	6.5
Ethyl Benzene	1.1	15	4.9	64
m,p-Xylene	1.1	16	4.9	71
o-Xylene	1.1	2.9	4.9	12

Client Sample ID: SV-MIP-8

Lab ID#: 0711410A-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
2-Propanol	4.3	40	10	97
Toluene	1.1	3.2	4.0	12
Ethyl Benzene	1.1	1.6	4.6	7.0
m,p-Xylene	1.1	2.9	4.6	12

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: SV-MW-2

Lab ID#: 0711410A-01A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1120316**	**Date of Collection: 11/19/07**	
Dil. Factor:	**2.24**	**Date of Analysis: 12/3/07 07:05 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
2-Propanol	4.5	Not Detected	11	Not Detected
Methyl tert-butyl ether	1.1	Not Detected	4.0	Not Detected
Benzene	1.1	4.0	3.6	13
Toluene	1.1	1.7	4.2	6.5
Ethyl Benzene	1.1	15	4.9	64
m,p-Xylene	1.1	16	4.9	71
o-Xylene	1.1	2.9	4.9	12

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	114	70-130
4-Bromofluorobenzene	108	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: SV-MIP-8

Lab ID#: 0711410A-02A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1120317**	**Date of Collection: 11/19/07**	
Dil. Factor:	**2.13**	**Date of Analysis: 12/3/07 07:55 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
2-Propanol	4.3	40	10	97
Methyl tert-butyl ether	1.1	Not Detected	3.8	Not Detected
Benzene	1.1	Not Detected	3.4	Not Detected
Toluene	1.1	3.2	4.0	12
Ethyl Benzene	1.1	1.6	4.6	7.0
m,p-Xylene	1.1	2.9	4.6	12
o-Xylene	1.1	Not Detected	4.6	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	108	70-130
4-Bromofluorobenzene	108	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: Lab Blank

Lab ID#: 0711410A-03A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1120305**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/3/07 11:43 AM**	

Compound	**Rpt. Limit (ppbv)**	**Amount (ppbv)**	**Rpt. Limit (uG/m3)**	**Amount (uG/m3)**
2-Propanol	2.0	Not Detected	4.9	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected

Container Type: NA - Not Applicable

Surrogates	**%Recovery**	**Method Limits**
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	110	70-130
4-Bromofluorobenzene	109	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: CCV

Lab ID#: 0711410A-04A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1120302**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/3/07 09:22 AM**	

Compound	%Recovery
2-Propanol	117
Methyl tert-butyl ether	88
Benzene	97
Toluene	98
Ethyl Benzene	96
m,p-Xylene	98
o-Xylene	100

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	104	70-130
4-Bromofluorobenzene	110	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: LCS

Lab ID#: 0711410A-05A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1120303**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/3/07 10:04 AM**	

Compound	**%Recovery**
2-Propanol	80
Methyl tert-butyl ether	104
Benzene	106
Toluene	110
Ethyl Benzene	106
m,p-Xylene	107
o-Xylene	109

Container Type: NA - Not Applicable

Surrogates	**%Recovery**	**Method Limits**
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	108	70-130
4-Bromofluorobenzene	93	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

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Thank you for choosing Air Toxics Ltd. To better serve our customers, we are providing your report by e-mail. This document is provided in Portable Document Format which can be viewed with Acrobat Reader by Adobe.

This electronic report includes the following:

- Work order Summary;
- Laboratory Narrative;
- Results; and
- Chain of Custody (copy).

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AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0711410B

Work Order Summary

CLIENT:	Ms. Cheryl Hayhurst Golder Associates, Inc. 1009 Enterprise Way Suite 350 Roseville, CA 95661	**BILL TO:**	Ms. Cheryl Hayhurst Golder Associates, Inc. 1009 Enterprise Way Suite 350 Roseville, CA 95661
PHONE:	916-786-2424	**P.O. #**	
FAX:	916-786-2434	**PROJECT #**	053-7466-100 BNC Gas Mini Mart
DATE RECEIVED:	11/20/2007	**CONTACT:**	Kyle Vagadori
DATE COMPLETED:	12/05/2007		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.
01A	SV-MW-2	Modified TO-3	3.0 "Hg
02A	SV-MIP-8	Modified TO-3	1.5 "Hg
03A	Lab Blank	Modified TO-3	NA
04A	LCS	Modified TO-3	NA

CERTIFIED BY: Linda D. Fruman DATE: 12/05/07

Laboratory Director

Certfication numbers: CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/07, Expiration date: 06/30/08
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

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LABORATORY NARRATIVE
Modified TO-3
Golder Associates, Inc.
Workorder# 0711410B

Two 1 Liter Summa Canister samples were received on November 20, 2007. The laboratory performed analysis for volatile organic compounds in air via modified EPA Method TO-3 using gas chromatography with flame ionization detection. The method involves concentrating up to 200 mL of sample. The concentrated aliquot is then dry purged to remove water vapor prior to entering the chromatographic system. The TPH (Gasoline Range) results are calculated using the response factor of Gasoline. A molecular weight of 100 is used to convert the TPH (Gasoline Range) ppmv result to ug/L. See the data sheets for the reporting limits for each compound.

Method modifications taken to run these samples include:

Requirement	***TO-3***	***ATL Modifications***
Daily Calibration Standard Frequency	Prior to sample analysis and every 4 - 6 hrs	Prior to sample analysis and after the analytical batch </= 20 samples
Initial Calibration Calculation	4-point calibration using a linear regression model	5-point calibration using average Response Factor
Initial Calibration Frequency	Weekly	When daily calibration standard recovery is outside 75 - 125 %, or upon significant changes to procedure or instrumentation
Moisture Control	Nafion system	Sorbent system
Minimum Detection Limit (MDL)	Calculated using the equation DL = A+3.3S, where A is intercept of calibration line and S is the standard deviation of at least 3 reps of low level standard	40 CFR Pt. 136 App. B
Preparation of Standards	Levels achieved through dilution of gas mixture	Levels achieved through loading various volumes of the gas mixture

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:
B - Compound present in laboratory blank greater than reporting limit.

J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the detection limit.
M - Reported value may be biased due to apparent matrix interferences.

File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Summary of Detected Compounds
MODIFIED EPA METHOD TO-3 GC/FID

Client Sample ID: SV-MW-2

Lab ID#: 0711410B-01A

Compound	Rpt. Limit (ppmv)	Rpt. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH (Gasoline Range)	0.056	0.23	3.6	15

Client Sample ID: SV-MIP-8

Lab ID#: 0711410B-02A

Compound	Rpt. Limit (ppmv)	Rpt. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH (Gasoline Range)	0.053	0.22	0.44	1.8

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: SV-MW-2

Lab ID#: 0711410B-01A

MODIFIED EPA METHOD TO-3 GC/FID

File Name:	**6112116**	**Date of Collection: 11/19/07**	
Dil. Factor:	**2.24**	**Date of Analysis: 11/21/07 02:21 PM**	

Compound	Rpt. Limit (ppmv)	Rpt. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH (Gasoline Range)	0.056	0.23	3.6	15

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Fluorobenzene (FID)	104	75-150

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: SV-MIP-8

Lab ID#: 0711410B-02A

MODIFIED EPA METHOD TO-3 GC/FID

File Name:	**6112115**	**Date of Collection: 11/19/07**	
Dil. Factor:	**2.13**	**Date of Analysis: 11/21/07 01:54 PM**	

Compound	**Rpt. Limit (ppmv)**	**Rpt. Limit (uG/L)**	**Amount (ppmv)**	**Amount (uG/L)**
TPH (Gasoline Range)	0.053	0.22	0.44	1.8

Container Type: 1 Liter Summa Canister

Surrogates	**%Recovery**	**Method Limits**
Fluorobenzene (FID)	89	75-150

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: Lab Blank

Lab ID#: 0711410B-03A

MODIFIED EPA METHOD TO-3 GC/FID

File Name:	**6112104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/21/07 02:01 AM**	

Compound	Rpt. Limit (ppmv)	Rpt. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH (Gasoline Range)	0.025	0.10	Not Detected	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Fluorobenzene (FID)	96	75-150

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: LCS

Lab ID#: 0711410B-04A

MODIFIED EPA METHOD TO-3 GC/FID

File Name:	**6112117**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/21/07 02:58 PM**	

Compound	**%Recovery**
TPH (Gasoline Range)	86

Container Type: NA - Not Applicable

Surrogates	**%Recovery**	**Method Limits**
Fluorobenzene (FID)	100	75-150

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Air Toxics Ltd. Introduces the Electronic Report

Thank you for choosing Air Toxics Ltd. To better serve our customers, we are providing your report by e-mail. This document is provided in Portable Document Format which can be viewed with Acrobat Reader by Adobe.

This electronic report includes the following:

- Work order Summary;
- Laboratory Narrative;
- Results; and
- Chain of Custody (copy).

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 .FAX (916) 985-1020
Hours 8:00 A.M to 6:00 P.M. Pacific

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0711410C

Work Order Summary

CLIENT:	Ms. Cheryl Hayhurst Golder Associates, Inc. 1009 Enterprise Way Suite 350 Roseville, CA 95661	**BILL TO:**	Ms. Cheryl Hayhurst Golder Associates, Inc. 1009 Enterprise Way Suite 350 Roseville, CA 95661
PHONE:	916-786-2424	**P.O. #**	
FAX:	916-786-2434	**PROJECT #**	053-7466-100 BNC Gas Mini Mart
DATE RECEIVED:	11/20/2007	**CONTACT:**	Kyle Vagadori
DATE COMPLETED:	12/05/2007		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.
01A	SV-MW-2	Modified ASTM D-1946	3.0 "Hg
02A	SV-MIP-8	Modified ASTM D-1946	1.5 "Hg
03A	Lab Blank	Modified ASTM D-1946	NA
04A	LCS	Modified ASTM D-1946	NA
04B	LCS	Modified ASTM D-1946	NA

CERTIFIED BY: Linda D. Fruman DATE: 12/05/07

Laboratory Director

Certfication numbers: CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/07, Expiration date: 06/30/08
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified ASTM D-1946
Golder Associates, Inc.
Workorder# 0711410C

Two 1 Liter Summa Canister samples were received on November 20, 2007. The laboratory performed analysis via Modified ASTM Method D-1946 for Methane and fixed gases in air using GC/FID or GC/TCD. The method involves direct injection of 1.0 mL of sample.

On the analytical column employed for this analysis, Oxygen coelutes with Argon. The corresponding peak is quantitated as Oxygen.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***ASTM D-1946***	***ATL Modifications***
Calibration	A single point calibration is performed using a reference standard closely matching the composition of the unknown.	A 3-point calibration curve is performed. Quantitation is based on a daily calibration standard which may or may not resemble the composition of the associated samples.
Reference Standard	The composition of any reference standard must be known to within 0.01 mol % for any component.	The standards used by ATL are blended to a >/= 95% accuracy.
Sample Injection Volume	Components whose concentrations are in excess of 5 % should not be analyzed by using sample volumes greater than 0.5 mL.	The sample container is connected directly to a fixed volume sample loop of 1.0 mL on the GC. Linear range is defined by the calibration curve. Bags are loaded by vacuum.
Normalization	Normalize the mole percent values by multiplying each value by 100 and dividing by the sum of the original values. The sum of the original values should not differ from 100% by more than 1.0%.	Results are not normalized. The sum of the reported values can differ from 100% by as much as 15%, either due to analytical variability or an unusual sample matrix.
Precision	Precision requirements established at each concentration level.	Duplicates should agree within 25% RPD for detections > 5 X's the RL.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:
B - Compound present in laboratory blank greater than reporting limit.
J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the detection limit.
M - Reported value may be biased due to apparent matrix interferences.
File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Summary of Detected Compounds
MODIFIED NATURAL GAS ANALYSIS BY ASTM D-1946

Client Sample ID: SV-MW-2

Lab ID#: 0711410C-01A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.22	19
Carbon Dioxide	0.022	1.9

Client Sample ID: SV-MIP-8

Lab ID#: 0711410C-02A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.21	21
Carbon Dioxide	0.021	0.83

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: SV-MW-2

Lab ID#: 0711410C-01A

MODIFIED NATURAL GAS ANALYSIS BY ASTM D-1946

File Name:	**9112408**	**Date of Collection: 11/19/07**	
Dil. Factor:	**2.24**	**Date of Analysis: 11/24/07 12:22 PM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Oxygen	0.22	19
Methane	0.00022	Not Detected
Carbon Dioxide	0.022	1.9

Container Type: 1 Liter Summa Canister

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: SV-MIP-8

Lab ID#: 0711410C-02A

MODIFIED NATURAL GAS ANALYSIS BY ASTM D-1946

File Name:	**9112409**	**Date of Collection: 11/19/07**	
Dil. Factor:	**2.13**	**Date of Analysis: 11/24/07 12:49 PM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Oxygen	0.21	21
Methane	0.00021	Not Detected
Carbon Dioxide	0.021	0.83

Container Type: 1 Liter Summa Canister

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: Lab Blank

Lab ID#: 0711410C-03A

MODIFIED NATURAL GAS ANALYSIS BY ASTM D-1946

File Name:	**9112405**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/24/07 10:48 AM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Oxygen	0.10	Not Detected
Methane	0.00010	Not Detected
Carbon Dioxide	0.010	Not Detected

Container Type: NA - Not Applicable

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: LCS

Lab ID#: 0711410C-04A

MODIFIED NATURAL GAS ANALYSIS BY ASTM D-1946

File Name:	**9112414b**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/24/07 03:39 PM**	

Compound	**%Recovery**
Oxygen	104
Carbon Dioxide	87

Container Type: NA - Not Applicable

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: LCS

Lab ID#: 0711410C-04B

MODIFIED NATURAL GAS ANALYSIS BY ASTM D-1946

File Name:	**9112415**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/24/07 04:01 PM**	

Compound	**%Recovery**
Methane	100

Container Type: NA - Not Applicable

KIFF Analytical LLC

Report Number : 58478
Date : 9/19/2007

Mark Naugle
Golder Associates, Inc.
1009 Enterprise Way Suite 350
Roseville, CA 95678

Subject : 9 Water Samples
Project Name : B&C
Project Number : 053-7020.45

Dear Mr. Naugle,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

KIFF Analytical LLC

Report Number : 58478
Date : 9/19/2007

Subject : 9 Water Samples
Project Name : B&C
Project Number : 053-7020.45

Case Narrative

The Method Reporting Limit for Chloromethane has been increased due to the presence of an interfering compound for samples SP-4A, SP-5B, SP-1B, SP-2B, SP-6B and SP-6C.

Approved By: Joel Kiff

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

KIFF Analytical LLC

Report Number : 58478

Date : 9/19/2007

Sample : **SP-4A**

Project Name : **B&C**

Project Number : **053-7020.45** Lab Number : 58478-01 Date Analyzed : 9/15/2007

Matrix : Water Sample Date : 9/11/2007 Analysis Method: EPA 8260B

Parameter	Measured Value	MRL [1]	Units
Benzene	**14**	0.50	ug/L
Toluene	**1.3**	0.50	ug/L
Ethylbenzene	**4.3**	0.50	ug/L
Total Xylenes	**16**	0.50	ug/L
Methyl-t-butyl ether (MTBE)	**27**	0.50	ug/L
TPH as Gasoline	**340**	50	ug/L
Chloromethane	< 0.80	0.80 (2)	ug/L
Vinyl Chloride	< 0.50	0.50	ug/L
Bromomethane	< 20	20	ug/L
Chloroethane	< 0.50	0.50	ug/L
Trichlorofluoromethane	< 0.50	0.50	ug/L
1,1-Dichloroethene	< 0.50	0.50	ug/L
Methylene Chloride	< 5.0	5.0	ug/L
trans-1,2-Dichloroethene	< 0.50	0.50	ug/L
1,1-Dichloroethane	< 0.50	0.50	ug/L
cis-1,2-Dichloroethene	**5.1**	0.50	ug/L
Chloroform	< 0.50	0.50	ug/L
1,1,1-Trichloroethane	< 0.50	0.50	ug/L
1,2-Dichloroethane	< 0.50	0.50	ug/L
Carbon Tetrachloride	< 0.50	0.50	ug/L
Trichloroethene	< 0.50	0.50	ug/L
1,2-Dichloropropane	< 0.50	0.50	ug/L
Bromodichloromethane	< 0.50	0.50	ug/L
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L
1,1,2-Trichloroethane	< 0.50	0.50	ug/L
Tetrachloroethene	< 0.50	0.50	ug/L
Dibromochloromethane	< 0.50	0.50	ug/L
Chlorobenzene	< 0.50	0.50	ug/L
Bromoform	< 0.50	0.50	ug/L
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L
1,3-Dichlorobenzene	< 0.50	0.50	ug/L
1,4-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dibromoethane	< 0.50	0.50	ug/L

Parameter	Measured Value	MRL [1]	Units
Toluene - d8 (Surr)	100		% Recovery
4-Bromofluorobenzene (Surr)	105		% Recovery
1,2-Dichloroethane-d4 (Surr)	97.2		% Recovery

1) MRL = Method reporting limit
2) MRL raised due to interference

Approved By:

Joel Kiff

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

KIFF Analytical LLC

Report Number : 58478

Date : 9/19/2007

Sample : **SP-4B**

Project Name : **B&C**

Project Number : **053-7020.45** Lab Number : 58478-02 Date Analyzed : 9/15/2007

Matrix : Water Sample Date : 9/11/2007 Analysis Method: EPA 8260B

Parameter	Measured Value	MRL [1]	Units
Benzene	**24**	0.50	ug/L
Toluene	**3.1**	0.50	ug/L
Ethylbenzene	**22**	0.50	ug/L
Total Xylenes	**55**	0.50	ug/L
Methyl-t-butyl ether (MTBE)	**17**	0.50	ug/L
TPH as Gasoline	**700**	50	ug/L
Chloromethane	< 0.50	0.50	ug/L
Vinyl Chloride	< 0.50	0.50	ug/L
Bromomethane	< 20	20	ug/L
Chloroethane	< 0.50	0.50	ug/L
Trichlorofluoromethane	< 0.50	0.50	ug/L
1,1-Dichloroethene	< 0.50	0.50	ug/L
Methylene Chloride	< 5.0	5.0	ug/L
trans-1,2-Dichloroethene	< 0.50	0.50	ug/L
1,1-Dichloroethane	< 0.50	0.50	ug/L
cis-1,2-Dichloroethene	**12**	0.50	ug/L
Chloroform	< 0.50	0.50	ug/L
1,1,1-Trichloroethane	< 0.50	0.50	ug/L
1,2-Dichloroethane	< 0.50	0.50	ug/L
Carbon Tetrachloride	< 0.50	0.50	ug/L
Trichloroethene	< 0.50	0.50	ug/L
1,2-Dichloropropane	< 0.50	0.50	ug/L
Bromodichloromethane	< 0.50	0.50	ug/L
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L
1,1,2-Trichloroethane	< 0.50	0.50	ug/L
Tetrachloroethene	**0.81**	0.50	ug/L
Dibromochloromethane	< 0.50	0.50	ug/L
Chlorobenzene	< 0.50	0.50	ug/L
Bromoform	< 0.50	0.50	ug/L
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L
1,3-Dichlorobenzene	< 0.50	0.50	ug/L
1,4-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dibromoethane	< 0.50	0.50	ug/L

Parameter	Measured Value	MRL [1]	Units
Toluene - d8 (Surr)	100		% Recovery
4-Bromofluorobenzene (Surr)	104		% Recovery
1,2-Dichloroethane-d4 (Surr)	101		% Recovery

1) MRL = Method reporting limit
2) MRL raised due to interference

Approved By:

Joel Kiff

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

KIFF Analytical LLC

Report Number : 58478

Date : 9/19/2007

Sample : **SP-5B**

Project Name : **B&C**

Project Number : **053-7020.45** Lab Number : 58478-03 Date Analyzed : 9/15/2007

Matrix : Water Sample Date : 9/11/2007 Analysis Method: EPA 8260B

Parameter	Measured Value	MRL [1]	Units
Benzene	**97**	0.50	ug/L
Toluene	**5.6**	0.50	ug/L
Ethylbenzene	**78**	0.50	ug/L
Total Xylenes	**51**	0.50	ug/L
Methyl-t-butyl ether (MTBE)	**250**	0.50	ug/L
TPH as Gasoline	**3000**	50	ug/L
Chloromethane	< 2.0	2.0 (2)	ug/L
Vinyl Chloride	**4.3**	0.50	ug/L
Bromomethane	< 20	20	ug/L
Chloroethane	< 0.50	0.50	ug/L
Trichlorofluoromethane	< 0.50	0.50	ug/L
1,1-Dichloroethene	< 0.50	0.50	ug/L
Methylene Chloride	< 5.0	5.0	ug/L
trans-1,2-Dichloroethene	< 0.50	0.50	ug/L
1,1-Dichloroethane	< 0.50	0.50	ug/L
cis-1,2-Dichloroethene	**8.9**	0.50	ug/L
Chloroform	< 0.50	0.50	ug/L
1,1,1-Trichloroethane	< 0.50	0.50	ug/L
1,2-Dichloroethane	< 0.50	0.50	ug/L
Carbon Tetrachloride	< 0.50	0.50	ug/L
Trichloroethene	< 0.50	0.50	ug/L
1,2-Dichloropropane	< 0.50	0.50	ug/L
Bromodichloromethane	< 0.50	0.50	ug/L
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L
1,1,2-Trichloroethane	< 0.50	0.50	ug/L
Tetrachloroethene	< 0.50	0.50	ug/L
Dibromochloromethane	< 0.50	0.50	ug/L
Chlorobenzene	< 0.50	0.50	ug/L
Bromoform	< 0.50	0.50	ug/L
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L
1,3-Dichlorobenzene	< 0.50	0.50	ug/L
1,4-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dibromoethane	< 0.50	0.50	ug/L

Parameter	Measured Value	MRL [1]	Units
Toluene - d8 (Surr)	97.9		% Recovery
4-Bromofluorobenzene (Surr)	105		% Recovery
1,2-Dichloroethane-d4 (Surr)	96.6		% Recovery

1) MRL = Method reporting limit
2) MRL raised due to interference

Approved By:

Joel Kiff

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

KIFF Analytical LLC

Report Number : 58478

Date : 9/19/2007

Sample : **SP-5C**

Project Name : **B&C**

Project Number : **053-7020.45** Lab Number : 58478-04 Date Analyzed : 9/17/2007

Matrix : Water Sample Date : 9/11/2007 Analysis Method: EPA 8260B

Parameter	Measured Value	MRL [1]	Units
Benzene	**8.3**	0.50	ug/L
Toluene	**1.6**	0.50	ug/L
Ethylbenzene	**9.4**	0.50	ug/L
Total Xylenes	**11**	0.50	ug/L
Methyl-t-butyl ether (MTBE)	**21**	0.50	ug/L
TPH as Gasoline	**530**	50	ug/L
Chloromethane	< 0.50	0.50	ug/L
Vinyl Chloride	**0.53**	0.50	ug/L
Bromomethane	< 20	20	ug/L
Chloroethane	< 0.50	0.50	ug/L
Trichlorofluoromethane	< 0.50	0.50	ug/L
1,1-Dichloroethene	< 0.50	0.50	ug/L
Methylene Chloride	< 5.0	5.0	ug/L
trans-1,2-Dichloroethene	< 0.50	0.50	ug/L
1,1-Dichloroethane	< 0.50	0.50	ug/L
cis-1,2-Dichloroethene	**3.7**	0.50	ug/L
Chloroform	< 0.50	0.50	ug/L
1,1,1-Trichloroethane	< 0.50	0.50	ug/L
1,2-Dichloroethane	< 0.50	0.50	ug/L
Carbon Tetrachloride	< 0.50	0.50	ug/L
Trichloroethene	< 0.50	0.50	ug/L
1,2-Dichloropropane	< 0.50	0.50	ug/L
Bromodichloromethane	< 0.50	0.50	ug/L
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L
1,1,2-Trichloroethane	< 0.50	0.50	ug/L
Tetrachloroethene	< 0.50	0.50	ug/L
Dibromochloromethane	< 0.50	0.50	ug/L
Chlorobenzene	< 0.50	0.50	ug/L
Bromoform	< 0.50	0.50	ug/L
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L
1,3-Dichlorobenzene	< 0.50	0.50	ug/L
1,4-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dibromoethane	< 0.50	0.50	ug/L

Parameter	Measured Value	MRL [1]	Units
Toluene - d8 (Surr)	99.0		% Recovery
4-Bromofluorobenzene (Surr)	102		% Recovery
1,2-Dichloroethane-d4 (Surr)	99.8		% Recovery

1) MRL = Method reporting limit
2) MRL raised due to interference

Approved By:

Joel Kiff

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

KIFF Analytical LLC

Report Number : 58478

Date : 9/19/2007

Sample : **SP-1B**

Project Name : **B&C**

Project Number : **053-7020.45** Lab Number : 58478-05 Date Analyzed : 9/17/2007

Matrix : Water Sample Date : 9/12/2007 Analysis Method: EPA 8260B

Parameter	Measured Value	MRL [1]	Units
Benzene	**62**	0.50	ug/L
Toluene	**6.2**	0.50	ug/L
Ethylbenzene	**54**	0.50	ug/L
Total Xylenes	**100**	0.50	ug/L
Methyl-t-butyl ether (MTBE)	**37**	0.50	ug/L
TPH as Gasoline	**1200**	50	ug/L
Chloromethane	< 0.80	0.80 (2)	ug/L
Vinyl Chloride	< 0.50	0.50	ug/L
Bromomethane	< 20	20	ug/L
Chloroethane	< 0.50	0.50	ug/L
Trichlorofluoromethane	< 0.50	0.50	ug/L
1,1-Dichloroethene	< 0.50	0.50	ug/L
Methylene Chloride	< 5.0	5.0	ug/L
trans-1,2-Dichloroethene	< 0.50	0.50	ug/L
1,1-Dichloroethane	< 0.50	0.50	ug/L
cis-1,2-Dichloroethene	**7.9**	0.50	ug/L
Chloroform	< 0.50	0.50	ug/L
1,1,1-Trichloroethane	< 0.50	0.50	ug/L
1,2-Dichloroethane	< 0.50	0.50	ug/L
Carbon Tetrachloride	< 0.50	0.50	ug/L
Trichloroethene	< 0.50	0.50	ug/L
1,2-Dichloropropane	< 0.50	0.50	ug/L
Bromodichloromethane	< 0.50	0.50	ug/L
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L
1,1,2-Trichloroethane	< 0.50	0.50	ug/L
Tetrachloroethene	< 0.50	0.50	ug/L
Dibromochloromethane	< 0.50	0.50	ug/L
Chlorobenzene	< 0.50	0.50	ug/L
Bromoform	< 0.50	0.50	ug/L
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L
1,3-Dichlorobenzene	< 0.50	0.50	ug/L
1,4-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dibromoethane	< 0.50	0.50	ug/L

Parameter	Measured Value	MRL [1]	Units
Toluene - d8 (Surr)	98.4		% Recovery
4-Bromofluorobenzene (Surr)	103		% Recovery
1,2-Dichloroethane-d4 (Surr)	98.4		% Recovery

1) MRL = Method reporting limit
2) MRL raised due to interference

Approved By:

Joel Kiff

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

KIFF Analytical LLC

Report Number : 58478

Date : 9/19/2007

Sample : **SP-2B**

Project Name : **B&C**

Project Number : **053-7020.45** Lab Number : 58478-06 Date Analyzed : 9/18/2007

Matrix : Water Sample Date : 9/12/2007 Analysis Method: EPA 8260B

Parameter	Measured Value	MRL [1]	Units
Benzene	**130**	0.50	ug/L
Toluene	**6.3**	0.50	ug/L
Ethylbenzene	**57**	0.50	ug/L
Total Xylenes	**77**	0.50	ug/L
Methyl-t-butyl ether (MTBE)	**8.8**	0.50	ug/L
TPH as Gasoline	**1500**	50	ug/L
Chloromethane	< 0.80	0.80 (2)	ug/L
Vinyl Chloride	**1.3**	0.50	ug/L
Bromomethane	< 20	20	ug/L
Chloroethane	< 0.50	0.50	ug/L
Trichlorofluoromethane	< 0.50	0.50	ug/L
1,1-Dichloroethene	< 0.50	0.50	ug/L
Methylene Chloride	< 5.0	5.0	ug/L
trans-1,2-Dichloroethene	< 0.50	0.50	ug/L
1,1-Dichloroethane	< 0.50	0.50	ug/L
cis-1,2-Dichloroethene	**20**	0.50	ug/L
Chloroform	< 0.50	0.50	ug/L
1,1,1-Trichloroethane	< 0.50	0.50	ug/L
1,2-Dichloroethane	< 0.50	0.50	ug/L
Carbon Tetrachloride	< 0.50	0.50	ug/L
Trichloroethene	< 0.50	0.50	ug/L
1,2-Dichloropropane	< 0.50	0.50	ug/L
Bromodichloromethane	< 0.50	0.50	ug/L
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L
1,1,2-Trichloroethane	< 0.50	0.50	ug/L
Tetrachloroethene	< 0.50	0.50	ug/L
Dibromochloromethane	< 0.50	0.50	ug/L
Chlorobenzene	< 0.50	0.50	ug/L
Bromoform	< 0.50	0.50	ug/L
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L
1,3-Dichlorobenzene	< 0.50	0.50	ug/L
1,4-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dibromoethane	< 0.50	0.50	ug/L

Parameter	Measured Value	MRL [1]	Units
Toluene - d8 (Surr)	97.4		% Recovery
4-Bromofluorobenzene (Surr)	103		% Recovery
1,2-Dichloroethane-d4 (Surr)	98.7		% Recovery

1) MRL = Method reporting limit
2) MRL raised due to interference

Approved By:

Joel Kiff

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

KIFF Analytical LLC

Report Number : 58478

Date : 9/19/2007

Sample : **SP-3B**

Project Name : **B&C**

Project Number : **053-7020.45** Lab Number : 58478-07 Date Analyzed : 9/17/2007

Matrix : Water Sample Date : 9/12/2007 Analysis Method: EPA 8260B

Parameter	Measured Value	MRL [1]	Units
Benzene	**5.6**	0.50	ug/L
Toluene	**0.68**	0.50	ug/L
Ethylbenzene	< 0.50	0.50	ug/L
Total Xylenes	< 0.50	0.50	ug/L
Methyl-t-butyl ether (MTBE)	**25**	0.50	ug/L
TPH as Gasoline	**140**	50	ug/L
Chloromethane	< 0.50	0.50	ug/L
Vinyl Chloride	< 0.50	0.50	ug/L
Bromomethane	< 20	20	ug/L
Chloroethane	< 0.50	0.50	ug/L
Trichlorofluoromethane	< 0.50	0.50	ug/L
1,1-Dichloroethene	< 0.50	0.50	ug/L
Methylene Chloride	< 5.0	5.0	ug/L
trans-1,2-Dichloroethene	< 0.50	0.50	ug/L
1,1-Dichloroethane	< 0.50	0.50	ug/L
cis-1,2-Dichloroethene	**3.1**	0.50	ug/L
Chloroform	< 0.50	0.50	ug/L
1,1,1-Trichloroethane	< 0.50	0.50	ug/L
1,2-Dichloroethane	< 0.50	0.50	ug/L
Carbon Tetrachloride	< 0.50	0.50	ug/L
Trichloroethene	< 0.50	0.50	ug/L
1,2-Dichloropropane	< 0.50	0.50	ug/L
Bromodichloromethane	< 0.50	0.50	ug/L
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L
1,1,2-Trichloroethane	< 0.50	0.50	ug/L
Tetrachloroethene	< 0.50	0.50	ug/L
Dibromochloromethane	< 0.50	0.50	ug/L
Chlorobenzene	< 0.50	0.50	ug/L
Bromoform	< 0.50	0.50	ug/L
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L
1,3-Dichlorobenzene	< 0.50	0.50	ug/L
1,4-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dibromoethane	< 0.50	0.50	ug/L

Parameter	Measured Value	MRL [1]	Units
Toluene - d8 (Surr)	98.6		% Recovery
4-Bromofluorobenzene (Surr)	103		% Recovery
1,2-Dichloroethane-d4 (Surr)	100		% Recovery

1) MRL = Method reporting limit
2) MRL raised due to interference

Approved By:

Joel Kiff

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

KIFF Analytical LLC

Report Number : 58478

Date : 9/19/2007

Sample : **SP-6B**

Project Name : **B&C**

Project Number : **053-7020.45** Lab Number : 58478-08 Date Analyzed : 9/18/2007

Matrix : Water Sample Date : 9/12/2007 Analysis Method: EPA 8260B

Parameter	Measured Value	MRL [1]	Units
Benzene	**23**	0.50	ug/L
Toluene	**2.2**	0.50	ug/L
Ethylbenzene	**53**	0.50	ug/L
Total Xylenes	**72**	0.50	ug/L
Methyl-t-butyl ether (MTBE)	**26**	0.50	ug/L
TPH as Gasoline	**930**	50	ug/L
Chloromethane	< 1.0	1.0 (2)	ug/L
Vinyl Chloride	< 0.50	0.50	ug/L
Bromomethane	< 20	20	ug/L
Chloroethane	< 0.50	0.50	ug/L
Trichlorofluoromethane	< 0.50	0.50	ug/L
1,1-Dichloroethene	< 0.50	0.50	ug/L
Methylene Chloride	< 5.0	5.0	ug/L
trans-1,2-Dichloroethene	< 0.50	0.50	ug/L
1,1-Dichloroethane	< 0.50	0.50	ug/L
cis-1,2-Dichloroethene	**2.2**	0.50	ug/L
Chloroform	< 0.50	0.50	ug/L
1,1,1-Trichloroethane	< 0.50	0.50	ug/L
1,2-Dichloroethane	< 0.50	0.50	ug/L
Carbon Tetrachloride	< 0.50	0.50	ug/L
Trichloroethene	< 0.50	0.50	ug/L
1,2-Dichloropropane	< 0.50	0.50	ug/L
Bromodichloromethane	< 0.50	0.50	ug/L
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L
1,1,2-Trichloroethane	< 0.50	0.50	ug/L
Tetrachloroethene	< 0.50	0.50	ug/L
Dibromochloromethane	< 0.50	0.50	ug/L
Chlorobenzene	< 0.50	0.50	ug/L
Bromoform	< 0.50	0.50	ug/L
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L
1,3-Dichlorobenzene	< 0.50	0.50	ug/L
1,4-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dibromoethane	< 0.50	0.50	ug/L

Parameter	Measured Value	MRL [1]	Units
Toluene - d8 (Surr)	98.3		% Recovery
4-Bromofluorobenzene (Surr)	103		% Recovery
1,2-Dichloroethane-d4 (Surr)	99.3		% Recovery

1) MRL = Method reporting limit
2) MRL raised due to interference

Approved By:

Joel Kiff

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

KIFF Analytical LLC

Report Number : 58478

Date : 9/19/2007

Sample : **SP-6C**

Project Name : **B&C**

Project Number : **053-7020.45** Lab Number : 58478-09 Date Analyzed : 9/18/2007

Matrix : Water Sample Date : 9/12/2007 Analysis Method: EPA 8260B

Parameter	Measured Value	MRL [1]	Units
Benzene	**9.2**	0.50	ug/L
Toluene	**1.5**	0.50	ug/L
Ethylbenzene	**16**	0.50	ug/L
Total Xylenes	**28**	0.50	ug/L
Methyl-t-butyl ether (MTBE)	**7.6**	0.50	ug/L
TPH as Gasoline	**390**	50	ug/L
Chloromethane	< 0.80	0.80 (2)	ug/L
Vinyl Chloride	< 0.50	0.50	ug/L
Bromomethane	< 20	20	ug/L
Chloroethane	< 0.50	0.50	ug/L
Trichlorofluoromethane	< 0.50	0.50	ug/L
1,1-Dichloroethene	< 0.50	0.50	ug/L
Methylene Chloride	< 5.0	5.0	ug/L
trans-1,2-Dichloroethene	**0.62**	0.50	ug/L
1,1-Dichloroethane	< 0.50	0.50	ug/L
cis-1,2-Dichloroethene	**7.9**	0.50	ug/L
Chloroform	< 0.50	0.50	ug/L
1,1,1-Trichloroethane	< 0.50	0.50	ug/L
1,2-Dichloroethane	< 0.50	0.50	ug/L
Carbon Tetrachloride	< 0.50	0.50	ug/L
Trichloroethene	**0.65**	0.50	ug/L
1,2-Dichloropropane	< 0.50	0.50	ug/L
Bromodichloromethane	< 0.50	0.50	ug/L
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L
1,1,2-Trichloroethane	< 0.50	0.50	ug/L
Tetrachloroethene	**1.3**	0.50	ug/L
Dibromochloromethane	< 0.50	0.50	ug/L
Chlorobenzene	< 0.50	0.50	ug/L
Bromoform	< 0.50	0.50	ug/L
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L
1,3-Dichlorobenzene	< 0.50	0.50	ug/L
1,4-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dichlorobenzene	< 0.50	0.50	ug/L
1,2-Dibromoethane	< 0.50	0.50	ug/L

Parameter	Measured Value	MRL [1]	Units
Toluene - d8 (Surr)	98.9		% Recovery
4-Bromofluorobenzene (Surr)	102		% Recovery
1,2-Dichloroethane-d4 (Surr)	101		% Recovery

1) MRL = Method reporting limit
2) MRL raised due to interference

Approved By:

Joel Kiff

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

Report Number : 58478

Date : 9/19/2007

QC Report : Method Blank Data

Project Name : **B&C**

Project Number : **053-7020.45**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
Toluene	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	9/15/2007
Chloromethane	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
Vinyl Chloride	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
Bromomethane	< 20	20	ug/L	EPA 8260B	9/15/2007
Chloroethane	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
Trichlorofluoromethane	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
1,1-Dichloroethene	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
Methylene Chloride	< 5.0	5.0	ug/L	EPA 8260B	9/15/2007
trans-1,2-Dichloroethene	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
1,1-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
cis-1,2-Dichloroethene	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
Chloroform	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
1,1,1-Trichloroethane	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
Carbon Tetrachloride	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
Trichloroethene	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
1,2-Dichloropropane	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
Bromodichloromethane	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
1,1,2-Trichloroethane	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
Tetrachloroethene	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
Dibromochloromethane	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
Chlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
Bromoform	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
1,3-Dichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
1,4-Dichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
1,2-Dichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	9/15/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Toluene - d8 (Surr)	99.3		%	EPA 8260B	9/15/2007
4-Bromofluorobenzene (Surr)	102		%	EPA 8260B	9/15/2007
1,2-Dichloroethane-d4 (Surr)	99.4		%	EPA 8260B	9/15/2007
Benzene	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
Toluene	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	9/17/2007
Chloromethane	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
Vinyl Chloride	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
Bromomethane	< 20	20	ug/L	EPA 8260B	9/17/2007
Chloroethane	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
Trichlorofluoromethane	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
1,1-Dichloroethene	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
Methylene Chloride	< 5.0	5.0	ug/L	EPA 8260B	9/17/2007
trans-1,2-Dichloroethene	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
1,1-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
cis-1,2-Dichloroethene	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
Chloroform	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
1,1,1-Trichloroethane	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
Carbon Tetrachloride	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
Trichloroethene	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
1,2-Dichloropropane	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
Bromodichloromethane	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
cis-1,3-Dichloropropene	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
trans-1,3-Dichloropropene	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
1,1,2-Trichloroethane	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
Tetrachloroethene	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
Dibromochloromethane	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
Chlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
Bromoform	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
1,1,2,2-Tetrachloroethane	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

Report Number : 58478

Date : 9/19/2007

QC Report : Method Blank Data

Project Name : **B&C**

Project Number : **053-7020.45**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
1,3-Dichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
1,4-Dichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
1,2-Dichlorobenzene	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	9/17/2007
Toluene - d8 (Surr)	98.8		%	EPA 8260B	9/17/2007
4-Bromofluorobenzene (Surr)	102		%	EPA 8260B	9/17/2007
1,2-Dichloroethane-d4 (Surr)	100		%	EPA 8260B	9/17/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

Report Number : 58478

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 9/19/2007

Project Name : **B&C**

Project Number : **053-7020.45**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	58501-04	<0.50	40.0	40.0	36.3	35.2	ug/L	EPA 8260B	9/15/07	90.7	87.9	3.11	70-130	25
Toluene	58501-04	<0.50	40.0	40.0	31.8	31.6	ug/L	EPA 8260B	9/15/07	79.5	78.9	0.730	70-130	25
Tert-Butanol	58501-04	<5.0	200	200	182	186	ug/L	EPA 8260B	9/15/07	91.1	92.9	1.96	70-130	25
Methyl-t-Butyl Ether	58501-04	<0.50	40.0	40.0	37.6	37.6	ug/L	EPA 8260B	9/15/07	94.1	93.9	0.178	70-130	25
Benzene	58494-03	<0.50	40.0	40.0	41.6	40.3	ug/L	EPA 8260B	9/17/07	104	101	3.13	70-130	25
Toluene	58494-03	<0.50	40.0	40.0	41.3	40.2	ug/L	EPA 8260B	9/17/07	103	100	2.76	70-130	25
Tert-Butanol	58494-03	<5.0	200	200	206	205	ug/L	EPA 8260B	9/17/07	103	103	0.299	70-130	25
Methyl-t-Butyl Ether	58494-03	<0.50	40.0	40.0	41.7	41.0	ug/L	EPA 8260B	9/17/07	104	102	1.62	70-130	25

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

Report Number : 58478

QC Report : Laboratory Control Sample (LCS)

Date : 9/19/2007

Project Name : **B&C**

Project Number : **053-7020.45**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	40.0	ug/L	EPA 8260B	9/15/07	96.8	70-130
Toluene	40.0	ug/L	EPA 8260B	9/15/07	101	70-130
Tert-Butanol	200	ug/L	EPA 8260B	9/15/07	104	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	9/15/07	99.4	70-130
Benzene	40.0	ug/L	EPA 8260B	9/17/07	99.8	70-130
Toluene	40.0	ug/L	EPA 8260B	9/17/07	102	70-130
Tert-Butanol	200	ug/L	EPA 8260B	9/17/07	99.6	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	9/17/07	99.2	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

58478

Golder Associates Inc.
CHAIN OF CUSTODY

Quotation No.

PROJECT AND PHASE NO.:	SITE NAME:
053-7020.45	B&C

SAMPLER(S): Amy Hill (printed) Amy Hill (signature)

CONTRACT LABORATORY: Kiff

TURN-AROUND TIME: Std. 5 day

EDD required? [X] Yes [ ] No

EDF required? [X] Yes [ ] No

Sample I.D.	Lab I.D.	Collection Date	Collection Time	Matrix	Depth	Container Info Type/Vol.	Container Info Filter	Container Info Preserv.	ANALYSES: 8260B (8010 LIST) TPH-g, BTEX, MTBE	ANALYSES: 8260B (8010 LIST) WITH TPH-g, BTEX, MTBE	Cont. Qty.	Remarks
SP-4A		9/11/07	1345	W		40m VOA	N	HCl	5		5	send results to
SP-4B			1330	W						5	5	Mark Naugle
SP-5B			1245	W					5		5	mnaugle@golder.com
SP-5C			1230	W					5		5	
SP-1B		9/12/07	1000	W					5		5	
SP-2B			0935	W					5		5	
SP-3B			1030	W					5		5	
SP-6B			0740	W					5		5	
SP-6C			0750	W					5		5	

SAMPLE RECEIPT
Temp °C 2.0 Therm. ID# IR-5
Initial Rm Date 091307
Time 1530 Coolant present: (Yes) No

Relinquished by: (signature)	Received by: (signature)	Date/Time:
Amy Hill		
Relinquished by: (signature)	Received by: (signature)	Date/Time:
Relinquished by: (signature)	Received by: (signature)	Date/Time:
	Kiff Analytical	091307 1126

SEND RESULTS TO:
Attn: Mark Naugle
Golder Associates Inc.
2580 Wyandotte St., Suite G
Mountain View, CA 94043
Phone (650) 386-3828
Fax (650) 386-3815

white: lab copy yellow: project file

KIFF Analytical LLC

Report Number : 58259
Date : 9/5/2007

Mark Naugle
Golder Associates, Inc.
1009 Enterprise Way Suite 350
Roseville, CA 95678

Subject : 9 Soil Samples
Project Name : BNC
Project Number : 053-7020.43

Dear Mr. Naugle,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

KIFF Analytical LLC

Report Number : 58259

Date : 9/5/2007

Project Name : **BNC**

Project Number : **053-7020.43**

Sample : **SP-2 (43')** Matrix : Soil Lab Number : 58259-01

Sample Date :8/20/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.025**	0.025	mg/Kg	EPA 8260B	9/1/2007
Toluene	**< 0.025**	0.025	mg/Kg	EPA 8260B	9/1/2007
Ethylbenzene	**0.72**	0.025	mg/Kg	EPA 8260B	9/1/2007
Total Xylenes	**2.0**	0.025	mg/Kg	EPA 8260B	9/1/2007
Methyl-t-butyl ether (MTBE)	**< 0.025**	0.025	mg/Kg	EPA 8260B	9/1/2007
TPH as Gasoline	**71**	2.5	mg/Kg	EPA 8260B	9/1/2007
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	9/1/2007
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	9/1/2007

Sample : **SP-5 (45')** Matrix : Soil Lab Number : 58259-02

Sample Date :8/21/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.070**	0.040	mg/Kg	EPA 8260B	9/1/2007
Toluene	**0.059**	0.040	mg/Kg	EPA 8260B	9/1/2007
Ethylbenzene	**4.5**	0.040	mg/Kg	EPA 8260B	9/1/2007
Total Xylenes	**3.5**	0.040	mg/Kg	EPA 8260B	9/1/2007
Methyl-t-butyl ether (MTBE)	**< 0.040**	0.040	mg/Kg	EPA 8260B	9/1/2007
TPH as Gasoline	**290**	4.0	mg/Kg	EPA 8260B	9/1/2007
Toluene - d8 (Surr)	93.9		% Recovery	EPA 8260B	9/1/2007
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	9/1/2007

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF Analytical LLC

Report Number : 58259
Date : 9/5/2007

Project Name : **BNC**
Project Number : **053-7020.43**

Sample : **SP-1 (40')** Matrix : Soil Lab Number : 58259-03
Sample Date :8/22/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.050**	0.050	mg/Kg	EPA 8260B	9/1/2007
Toluene	**0.056**	0.050	mg/Kg	EPA 8260B	9/1/2007
Ethylbenzene	**4.7**	0.050	mg/Kg	EPA 8260B	9/1/2007
Total Xylenes	**18**	0.050	mg/Kg	EPA 8260B	9/1/2007
Methyl-t-butyl ether (MTBE)	**< 0.050**	0.050	mg/Kg	EPA 8260B	9/1/2007
TPH as Gasoline	**260**	5.0	mg/Kg	EPA 8260B	9/1/2007
Toluene - d8 (Surr)	98.0		% Recovery	EPA 8260B	9/1/2007
4-Bromofluorobenzene (Surr)	87.2		% Recovery	EPA 8260B	9/1/2007

Sample : **SVE-1 (10')** Matrix : Soil Lab Number : 58259-04
Sample Date :8/24/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	8/31/2007
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	8/31/2007
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	8/31/2007
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	8/31/2007
Methyl-t-butyl ether (MTBE)	**0.0083**	0.0050	mg/Kg	EPA 8260B	8/31/2007
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	8/31/2007
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	8/31/2007
4-Bromofluorobenzene (Surr)	97.6		% Recovery	EPA 8260B	8/31/2007

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF Analytical LLC

Report Number : 58259
Date : 9/5/2007

Project Name : **BNC**
Project Number : **053-7020.43**

Sample : **SVE-1 (15')** Matrix : Soil Lab Number : 58259-05
Sample Date :8/24/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/1/2007
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	9/1/2007
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	9/1/2007
4-Bromofluorobenzene (Surr)	96.8		% Recovery	EPA 8260B	9/1/2007

Sample : **SVE-1 (20')** Matrix : Soil Lab Number : 58259-06
Sample Date :8/24/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/1/2007
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	9/1/2007
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	9/1/2007
4-Bromofluorobenzene (Surr)	94.7		% Recovery	EPA 8260B	9/1/2007

Approved By: Joel Kiff

KIFF Analytical LLC

Report Number : 58259
Date : 9/5/2007

Project Name : **BNC**
Project Number : **053-7020.43**

Sample : **SVE-1 (25')** Matrix : Soil Lab Number : 58259-07
Sample Date :8/24/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.028**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Ethylbenzene	**0.16**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Total Xylenes	**0.099**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Methyl-t-butyl ether (MTBE)	**1.6**	0.0050	mg/Kg	EPA 8260B	9/1/2007
TPH as Gasoline	**6.6**	1.0	mg/Kg	EPA 8260B	9/1/2007
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	9/1/2007
4-Bromofluorobenzene (Surr)	95.4		% Recovery	EPA 8260B	9/1/2007

Sample : **SP-6 (35')** Matrix : Soil Lab Number : 58259-08
Sample Date :8/24/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.058**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Ethylbenzene	**0.070**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Total Xylenes	**0.015**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Methyl-t-butyl ether (MTBE)	**0.052**	0.0050	mg/Kg	EPA 8260B	9/1/2007
TPH as Gasoline	**2.8**	1.0	mg/Kg	EPA 8260B	9/1/2007
Toluene - d8 (Surr)	99.7		% Recovery	EPA 8260B	9/1/2007
4-Bromofluorobenzene (Surr)	94.1		% Recovery	EPA 8260B	9/1/2007

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF Analytical LLC

Report Number : 58259

Date : 9/5/2007

Project Name : **BNC**

Project Number : **053-7020.43**

Sample : **SP-3 (35')** Matrix : Soil Lab Number : 58259-09

Sample Date :8/24/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Ethylbenzene	**0.019**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/1/2007
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	9/1/2007
TPH as Gasoline	**4.4**	1.0	mg/Kg	EPA 8260B	9/1/2007
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	9/1/2007
4-Bromofluorobenzene (Surr)	94.7		% Recovery	EPA 8260B	9/1/2007

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

Report Number : 58259

Date : 9/5/2007

QC Report : Method Blank Data

Project Name : **BNC**

Project Number : **053-7020.43**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	8/31/2007
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	8/31/2007
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	8/31/2007
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	8/31/2007
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	8/31/2007
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	8/31/2007
Toluene - d8 (Surr)	101		%	EPA 8260B	8/31/2007
4-Bromofluorobenzene (Surr)	99.7		%	EPA 8260B	8/31/2007
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	9/1/2007
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	9/1/2007
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	9/1/2007
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	9/1/2007
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	9/1/2007
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	9/1/2007
Toluene - d8 (Surr)	99.8		%	EPA 8260B	9/1/2007
4-Bromofluorobenzene (Surr)	97.9		%	EPA 8260B	9/1/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

Report Number : 58259

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 9/5/2007

Project Name : **BNC**

Project Number : **053-7020.43**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	58259-04	<0.0050	0.0399	0.0399	0.0416	0.0407	mg/Kg	EPA 8260B	9/1/07	104	102	2.17	70-130	25
Toluene	58259-04	<0.0050	0.0399	0.0399	0.0401	0.0389	mg/Kg	EPA 8260B	9/1/07	100	97.4	3.01	70-130	25
Tert-Butanol	58259-04	0.016	0.200	0.200	0.218	0.211	mg/Kg	EPA 8260B	9/1/07	101	97.7	3.66	70-130	25
Methyl-t-Butyl Ether	58259-04	0.0083	0.0399	0.0399	0.0416	0.0395	mg/Kg	EPA 8260B	9/1/07	83.3	78.2	6.30	70-130	25
Benzene	58249-05	<0.0050	0.0399	0.0399	0.0414	0.0425	mg/Kg	EPA 8260B	9/1/07	104	106	2.69	70-130	25
Toluene	58249-05	<0.0050	0.0399	0.0399	0.0408	0.0422	mg/Kg	EPA 8260B	9/1/07	102	106	3.54	70-130	25
Tert-Butanol	58249-05	<0.0050	0.200	0.200	0.183	0.182	mg/Kg	EPA 8260B	9/1/07	91.6	91.4	0.241	70-130	25
Methyl-t-Butyl Ether	58249-05	<0.0050	0.0399	0.0399	0.0392	0.0405	mg/Kg	EPA 8260B	9/1/07	98.2	102	3.28	70-130	25

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

Report Number : 58259

QC Report : Laboratory Control Sample (LCS)

Date : 9/5/2007

Project Name : **BNC**

Project Number : **053-7020.43**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	0.0394	mg/Kg	EPA 8260B	8/31/07	112	70-130
Toluene	0.0394	mg/Kg	EPA 8260B	8/31/07	111	70-130
Tert-Butanol	0.197	mg/Kg	EPA 8260B	8/31/07	96.6	70-130
Methyl-t-Butyl Ether	0.0394	mg/Kg	EPA 8260B	8/31/07	106	70-130
Benzene	0.0398	mg/Kg	EPA 8260B	9/1/07	110	70-130
Toluene	0.0398	mg/Kg	EPA 8260B	9/1/07	108	70-130
Tert-Butanol	0.199	mg/Kg	EPA 8260B	9/1/07	94.9	70-130
Methyl-t-Butyl Ether	0.0398	mg/Kg	EPA 8260B	9/1/07	101	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

Golder Associates Inc.
CHAIN OF CUSTODY

58259

Quotation No.

PROJECT AND PHASE NO.:	SITE NAME:
053-7020.413	BNC

SAMPLER(S): Dianna Ferrand (printed) (signature)

CONTRACT LABORATORY: Kiff

TURN-AROUND TIME: Standard

ANALYSES: TPH-G; BTEX; NITRATE

EDD required? [X] Yes [ ] No

EDF required? [X] Yes [ ] No

Sample I.D.	Lab I.D.	Collection Date	Collection Time	Matrix	Depth	Container Info: Type/Vol.	Filter	Preserv.	TPH-G	BTEX	NITRATE	Cont. Qty.	Remarks
SP-2(A,B)		8/20/07	1440	Soil		8oz	—	—	X	X	X	1	01
SP-5(A,B)		8/21/07	0815			8oz Jar	—	—	X	X	X	1	02
SP-1(A,B)		8/22/07	0755			8oz Jar	—	—	X	X	X	1	03
SVE-1(10')		8/24/07	0740			8oz Jar	—	—	X	X	X	1	04
SVE-1(15')		8/24/07	0745			8oz Jar	—	—	X	X	X	1	05
SVE-1(20')		8/24/07	0750			8oz Jar	—	—	X	X	X	1	06
SVE-1(25')		8/24/07	0755			8oz Jar	—	—	X	X	X	1	07
SP-6(A,B)		8/24/07	1000			8oz Jar	—	—	X	X	X	1	08
SP-3(A,B)		8/24/07	1355			8oz Jar	—	—	X	X	X	1	09

SAMPLE RECEIPT
Temp° 2.2 Therm. ID# IR5
Initial LH Date 083007
Time 1500 Coolant present: (Yes) No

Relinquished by: (signature)	Received by: (signature)	Date/Time:
Relinquished by: (signature)	Received by: (signature)	Date/Time:
Relinquished by: (signature)	Received by: (signature) Kiff Analytical	Date/Time: 083007 1450

SEND RESULTS TO:
Attn: Mark Nangle mnangle@golder.com
Golder Associates Inc.
2580 Wyandotte St., Suite G Roswell
Mountain View, CA 94043
Phone (650) 386-3828
Fax (650) 386-3815

white: lab copy yellow: project file

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Web: www.mccampbell.com E-mail: main@mccampbell.com
Telephone: 877-252-9262 Fax: 925-252-9269

Golder Associates Inc. 2580 Wayndotte Street, Suite G Mountain View, CA 94043	Client Project ID: #053-7020/45; B&C	Date Sampled: 09/12/07
		Date Received: 09/12/07
	Client Contact: Mark Naugle	Date Reported: 09/18/07
	Client P.O.:	Date Completed: 09/18/07

WorkOrder: 0709259

September 18, 2007

Dear Mark:

Enclosed are:

1). the results of **1** analyzed sample from your **#053-7020/45; B&C project,**

2). a QC report for the above sample

3). a copy of the chain of custody, and

4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Best regards,

Angela Rydelius, Lab Manager

070959 GAMV

Golder Associates Inc.

Page 1 of 1

CHAIN OF CUSTODY

Quotation No.

PROJECT AND PHASE NO.:	SITE NAME:
053-7020/45	B&C

SAMPLER SIGNATURE(S): Amy Hill / Amy Hill

CONTRACT LABORATORY: McCampbell

TURN-AROUND TIME: std 5 day

ANALYSES

EDD Required? Yes GeoTracker

EDF Required? Yes/No

Call lab for Bottles!

Sample ID	Lab ID	Collection Date	Collection Time	Matrix	Depth	Container Info	Mono-, di-, and tri-chloroacetic acid isomers EPA Method 552.2	Formaldehyde, 8315A**	Chromium, Dissolved**	Hexa chromium, Dissolved**	Bromate, Dissolved**	Bromide, Dissolved**	Cont. Qty.	Remarks
						Type	VOA	A	PE	PE	A	PE		
						Volume	40mL	1L	250mL	125mL	500mL	125mL		
						Filter	N	N	Y	Y	Y	Y		
						Preserv.	NH_4Cl	N	N	N	N	N	Cont.	
SP-~~34~~4B 4th		09/12/07	0730	W			X	X	X	X	X	X	7	Metals filtered in field

Send results to Mark Naugle mnaugle@golder.com

ICE / t° 11.8°C
GOOD CONDITION ✓ APPROPRIATE ✓
HEAD SPACE ABSENT ___ CONTAINERS ___
DECHLORINATED IN LAB ___ PRESERVED IN LAB ___
PRESERVATION* VOAS | O & G | METALS | OTHER

Relinquished by (signature):	Received by (signature):	Date/Time:
Amy Hill		9/12/07 12:44
Relinquished by (signature):	Received by (signature):	Date/Time:
		9/12/07
Relinquished by (signature):	Received by (signature):	Date/Time:

SEND RESULTS TO:

Attention: Mark Naugle
Golder Associates Inc.
2580 Wyandotte Street, Suite G
Mountain View, CA 94043
Phone (650) 386-3828
Fax (650) 386-3815

C:\Documents and Settings\ahill\Local Settings\Temporary Internet Files\OLK4\COC Form Baseline McCampbell.xls

11.8°C

McCampbell Analytical, Inc.
1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0709259 **ClientID: GAMV**

☑ EDF ☑ Excel ☐ Fax ☑ Email ☐ HardCopy ☐ ThirdParty

Report to:
Mark Naugle
Golder Associates Inc.
2580 Wayndotte Street, Suite G
Mountain View, CA 94043
Email: mnaugle@golder.com
TEL: (650)386-382 FAX: (650) 386-381
ProjectNo: #053-7020/45; B&C
PO:

Bill t
Accounts Payable
Golder Associates Inc.
2580 Wyandotte Street, Suite G
Mountain View, CA 94043

Requested TAT: 5 days

Date Received **09/12/2007**
Date Printed: **09/18/2007**

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					1	2	3	4	5	6	7	8	9	10	11	12
0709259-001	SP-4B	Water	9/12/2007 7:30:00	☐	D	E	F	A	B	C	A					

Test Legend:

1	218_6_W	2	300_1_W	3	300_1SPE_W	4	552_2_W	5	8315A_W
6	METALSMS_DISS	7	PREDF REPORT	8		9		10	
11		12							

Prepared by: Chloe Lam

Comments:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

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Sample Receipt Checklist

Client Name: **Golder Associates Inc.**
Date and Time Received: **9/12/2007 4:31:10 PM**

Project Name: **#053-7020/45; B&C**
Checklist completed and reviewed by: Chloe Lam

WorkOrder N°: **0709259** Matrix Water
Carrier: Client Drop-In

Chain of Custody (COC) Information

Chain of custody present?	Yes ☑	No ☐
Chain of custody signed when relinquished and received?	Yes ☑	No ☐
Chain of custody agrees with sample labels?	Yes ☑	No ☐
Sample IDs noted by Client on COC?	Yes ☑	No ☐
Date and Time of collection noted by Client on COC?	Yes ☑	No ☐
Sampler's name noted on COC?	Yes ☑	No ☐

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	NA ☑
Shipping container/cooler in good condition?	Yes ☑	No ☐	
Samples in proper containers/bottles?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature	Cooler Temp: 11.8°C		NA ☐
Water - VOA vials have zero headspace / no bubbles?	Yes ☑	No ☐	No VOA vials submitted ☐
Sample labels checked for correct preservation?	Yes ☑	No ☐	
TTLC Metal - pH acceptable upon receipt (pH<2)?	Yes ☐	No ☐	NA ☑

Client contacted: Date contacted: Contacted by:

Comments:

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Telephone: 877-252-9262 Fax: 925-252-9269

Golder Associates Inc.	Client Project ID: #053-7020/45; B&C	Date Sampled: 09/12/07
2580 Wayndotte Street, Suite G		Date Received: 09/12/07
Mountain View, CA 94043	Client Contact: Mark Naugle	Date Extracted: 09/12/07
	Client P.O.:	Date Analyzed 09/12/07

Hexachrome by IC*

Analytical Method: E218.6 Work Order: 0709259

Lab ID	Client ID	Matrix	Hexachrome	DF
0709259-001D	SP-4B	W	ND	1

Reporting Limit for DF = 1; ND means not detected at or above the reporting limit	W	0.2 µg/L	
	S	NA	

* water samples are reported in µg/L.

N/A means surrogate not applicable to this analysis; # surrogate diluted out of range or surrogate coelutes with another peak.

h) a lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) sample diluted due to matrix interference; p) see attached narrative.

DHS ELAP Certification N° 1644

Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Web: www.mccampbell.com E-mail: main@mccampbell.com
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Golder Associates Inc.	Client Project ID: #053-7020/45; B&C	Date Sampled: 09/12/07
2580 Wayndotte Street, Suite G		Date Received: 09/12/07
Mountain View, CA 94043	Client Contact: Mark Naugle	Date Extracted: 09/12/07
	Client P.O.:	Date Analyzed 09/14/07

Inorganic Anions by IC*

Analytical methods: E300.1 Work Order: 0709259

Lab ID	Client ID	Matrix	Bromide	DF	% SS
0709259-001E	SP-4B	W	0.81	1	108

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	0.1	mg/L
	S	NA	NA

* water samples are reported in mg/L, soil/sludge/solid samples in mg/kg, wipe samples in mg/wipe, product/oil/non-aqueous liquid samples in mg/L.

* [Nitrate as $NO3^{-}$] = 4.4286 x [Nitrate as N]

surrogate diluted out of range or surrogate coelutes with another peak; N/A means surrogate not applicable to this analysis.

h) a lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) sample diluted/reporting limit raised due to high inorganic content/matrix interference; k) sample arrived with head space.

DHS ELAP Certification N° 1644

Angela Rydelius, Lab Manager

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Golder Associates Inc.	Client Project ID: #053-7020/45; B&C	Date Sampled: 09/12/07
2580 Wayndotte Street, Suite G		Date Received: 09/12/07
Mountain View, CA 94043	Client Contact: Mark Naugle	Date Extracted: 09/12/07
	Client P.O.:	Date Analyzed 09/13/07

Disinfection Byproduct*

Analytical methods: E300.1 Work Order: 0709259

Lab ID	Client ID	Matrix	Bromate	DF	% SS
0709259-001F	SP-4B	W	ND	1	N/A

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	0.005	mg/L
	S	NA	NA

* water samples are reported in mg/L, soil/sludge/solid samples in mg/kg, wipe samples in mg/wipe, product/oil/non-aqueous liquid samples in mg/L.

surrogate diluted out of range or surrogate coelutes with another peak; N/A means surrogate not applicable to this analysis.

h) a lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) sample diluted/reporting limit raised due to high inorganic content/matrix interference; k) sample arrived with head space.

DHS ELAP Certification N° 1644

Angela Rydelius, Lab Manager

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Golder Associates Inc.	Client Project ID: #053-7020/45; B&C	Date Sampled: 09/12/07
2580 Wayndotte Street, Suite G		Date Received: 09/12/07
Mountain View, CA 94043	Client Contact: Mark Naugle	Date Extracted: 09/12/07
	Client P.O.:	Date Analyzed 09/13/07

Haloacetic Acids by GC-ECD*

Extraction Method: E552.2 Analytical Method: E552.2 Work Order: 0709259

Lab ID	0709259-001A				Reporting Limit for DF =1		
Client ID	SP-4B						
Matrix	W						
DF	1					S	W
Compound	**Concentration**					ug/kg	µg/L
Dibromoacetic acid (DBAA)	ND					NA	0.5
Dichloroacetic acid (DCAA)	ND					NA	0.5
Monobromoacetic acid (MBAA)	ND					NA	0.5
Monochloroacetic acid (MCAA)	ND					NA	1.0
Trichloroacetic acid (TCAA)	ND					NA	0.5
Total HAAs	ND					NA	3.0
Surrogate Recoveries (%)							
%SS:	95						
Comments							

* water samples are reported in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

surrogate peak coelutes with a non-target peak, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

h) a lighter than water immiscible sheen/product is present; i) liquid sample that contains >~1 vol. % sediment; j) sample diluted due to high organic content/matrix interference/cluttered chromatogram; k) results reported on a dry weight basis; m) low surrogate recovery due to matrix interference; p) see attached narrative.

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Web: www.mccampbell.com E-mail: main@mccampbell.com
Telephone: 877-252-9262 Fax: 925-252-9269

Golder Associates Inc.	Client Project ID: #053-7020/45; B&C	Date Sampled: 09/12/07
2580 Wayndotte Street, Suite G		Date Received: 09/12/07
Mountain View, CA 94043	Client Contact: Mark Naugle	Date Extracted: 09/12/07
	Client P.O.:	Date Analyzed 09/13/07

Carbonyls by HPLC*

Extraction method SW8315A Analytical methods SW8315A Work Order: 0709259

Lab ID	Client ID	Matrix	Formaldehyde	DF	% SS
0709259-001B	SP-4B	W	ND	1	N/A

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	5.0	µg/L
	S	NA	NA

* water samples in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts are reported in mg/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

surrogate diluted out of range or surrogate coelutes with another peak.

h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) sample diluted due to high organic content; p) see attached narrative.

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Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Web: www.mccampbell.com E-mail: main@mccampbell.com
Telephone: 877-252-9262 Fax: 925-252-9269

Golder Associates Inc.	Client Project ID: #053-7020/45; B&C	Date Sampled: 09/12/07
2580 Wayndotte Street, Suite G		Date Received: 09/12/07
Mountain View, CA 94043	Client Contact: Mark Naugle	Date Extracted: 09/12/07
	Client P.O.:	Date Analyzed 09/13/07

Metals*

Extraction method E200.8 Analytical methods E200.8 Work Order: 0709259

Lab ID	Client ID	Matrix	Extraction Type	Chromium	DF	% SS
0709259-001C	SP-4B	W	DISS.	2.4	1	N/A

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	DISS.	0.5	µg/L
	S	TOTAL^	NA	mg/Kg

*water samples are reported in µg/L, product/oil/non-aqueous liquid samples and all TCLP / STLC / DISTLC / SPLP extracts are reported in mg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter.

means surrogate diluted out of range; ND means not detected above the reporting limit; N/A means not applicable to this sample or instrument.

TOTAL = acid digestion.

WET = Waste Extraction Test (STLC).

DI WET = Waste Extraction Test using de-ionized water.

i) aqueous sample containing greater than ~1 vol. % sediment; for DISSOLVED metals, this sample has been preserved prior to filtration; for TOTAL^ metals, a representative sediment-water mixture was digested; j) reporting limit raised due to insufficient sample amount; k) reporting limit raised due to matrix interference; m) estimated value due to low/high surrrogate recovery; n) results are reported on a dry weight basis; p) see attached narrative.

DHS ELAP Certification N° 1644

Angela Rydelius, Lab Manager

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1534 Willow Pass Road, Pittsburg, CA 94565-1701
Web: www.mccampbell.com E-mail: main@mccampbell.com
Telephone: 877-252-9262 Fax: 925-252-9269

QC SUMMARY REPORT FOR E300.1

W.O. Sample Matrix: Water QC Matrix: Water WorkOrder 0709259

EPA Method E300.1 **Extraction E300.1** **BatchID: 30511** **Spiked Sample ID: N/A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	mg/L	mg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
Bromate	N/A	0.040	N/A	N/A	N/A	96.1	92.4	3.98	N/A	N/A	90 - 115	10

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 30511 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0709259-001F	09/12/07 7:30 AM	09/12/07	09/13/07 7:12 AM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not applicable to this method.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS ELAP Certification N° 1644

QA/QC Officer

McCampbell Analytical, Inc.
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1534 Willow Pass Road, Pittsburg, CA 94565-1701
Web: www.mccampbell.com E-mail: main@mccampbell.com
Telephone: 877-252-9262 Fax: 925-252-9269

QC SUMMARY REPORT FOR E218.6

W.O. Sample Matrix: Water QC Matrix: Water WorkOrder 0709259

EPA Method E218.6	Extraction E218.6				BatchID: 30557			Spiked Sample ID: 0709248-001c			
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
Hexachrome	ND	25	92.3	94.3	2.19	93.8	93.2	0.642	90 - 110	10	90 - 110	10

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 30557 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0709259-001D	09/12/07 7:30 AM	09/12/07	09/12/07 6:56 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

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"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Web: www.mccampbell.com E-mail: main@mccampbell.com
Telephone: 877-252-9262 Fax: 925-252-9269

QC SUMMARY REPORT FOR SW8315A

W.O. Sample Matrix: Water QC Matrix: Water WorkOrder 0709259

EPA Method SW8315A	Extraction SW8315A	BatchID: 30572	Spiked Sample ID: 0709259-001b

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
Formaldehyde	ND	100	113	112	0.198	111	110	0.518	80 - 120	20	80 - 120	20

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 30572 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0709259-001B	09/12/07 7:30 AM	09/12/07	09/13/07 3:48 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

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"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Web: www.mccampbell.com E-mail: main@mccampbell.com
Telephone: 877-252-9262 Fax: 925-252-9269

QC SUMMARY REPORT FOR E300.1

W.O. Sample Matrix: Water QC Matrix: Water WorkOrder 0709259

EPA Method E300.1 **Extraction E300.1** **BatchID: 30562** **Spiked Sample ID: N/A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	mg/L	mg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
Bromide	N/A	1	N/A	N/A	N/A	109	102	7.06	N/A	N/A	85 - 115	15
%SS:	N/A	0.10	N/A	N/A	N/A	106	107	0.658	N/A	N/A	90 - 115	10

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 30562 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0709259-001E	09/12/07 7:30 AM	09/12/07	09/14/07 12:01 AM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not applicable to this method.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

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"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Web: www.mccampbell.com E-mail: main@mccampbell.com
Telephone: 877-252-9262 Fax: 925-252-9269

QC SUMMARY REPORT FOR E552.2

W.O. Sample Matrix: Water QC Matrix: Water WorkOrder: 0709259

EPA Method E552.2 **Extraction E552.2** **BatchID: 30561** **Spiked Sample ID: N/A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
Dibromoacetic acid (DBAA)	N/A	4	N/A	N/A	N/A	97.8	91.3	6.91	N/A	N/A	70 - 130	30
Dichloroacetic acid (DCAA)	N/A	12	N/A	N/A	N/A	99.4	92.6	7.06	N/A	N/A	70 - 130	30
Monobromoacetic acid (MBAA)	N/A	8	N/A	N/A	N/A	98.3	91.9	6.68	N/A	N/A	70 - 130	30
Monochloroacetic acid (MCAA)	N/A	12	N/A	N/A	N/A	109	105	3.51	N/A	N/A	70 - 130	30
Trichloroacetic acid (TCAA)	N/A	4	N/A	N/A	N/A	103	98	5.17	N/A	N/A	70 - 130	30
%SS:	N/A	13.3	N/A	N/A	N/A	91	99	8.09	N/A	N/A	70 - 130	30

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 30561 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0709259-001A	09/12/07 7:30 AM	09/12/07	09/13/07 4:58 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS ELAP Certification N° 1644 QA/QC Officer

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Web: www.mccampbell.com E-mail: main@mccampbell.com
Telephone: 877-252-9262 Fax: 925-252-9269

QC SUMMARY REPORT FOR E200.8

W.O. Sample Matrix: Water QC Matrix: Water WorkOrder: 0709259

EPA Method E200.8 **Extraction E200.8** **BatchID: 30535** **Spiked Sample ID: 0709214-001C**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
Chromium	130	10	112	138, F1	1.79	96.1	98.2	2.15	70 - 130	20	80 - 120	20

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

F1 = MS / MSD outside of acceptance criteria. LCS - LCSD validate prep batch.

BATCH 30535 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0709259-001C	09/12/07 7:30 AM	09/12/07	09/13/07 1:12 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not applicable to this method.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

APPENDIX E

Bench-Scale Testing Report

PRIMA ENVIRONMENTAL

December 6, 2007

Mark Naugle
Golder Associates
1009 Enterprise Way, Ste 350
Roseville, CA 95678

RE: Final report for bench scale evaluation of ozone for destruction of petroleum hydrocarbons, B&C Gas Mart, Livermore, California site

Dear Mark:

Enclosed is the final report of findings "Evaluation of Ozone for the Destruction of Petroleum Hydrocarbons" that describes bench testing conducted on soil and groundwater from the B&C Gas Mart site in Livermore, California. If you have any questions, please give me a call. Thank you for the opportunity to be of service.

Sincerely,
PRIMA Environmental, Inc.

Cindy G. Schreier, Ph.D.
President

10265 Old Placerville Road, Suite 15, Sacramento, CA 95827-3042 • Ph (916) 363-8798 • Fax (916) 363-8829
www.primaenvironmental.com

Report of Findings

Evaluation of Ozone for the Destruction of Petroleum Hydrocarbons

B&C Gas Mart
Livermore, California

December 6, 2007

Submitted to

Mark Naugle
Golder Associates
1009 Enterprise Way, Ste 350
Roseville, CA 95678

Submitted by
Cindy G. Schreier, Ph.D.
PRIMA Environmental
10265 Old Placerville Road, Suite 15
Sacramento, CA 95827

Cindy G. Schreier, Ph.D., Principal

Dec 7, 2007
Date

EXECUTIVE SUMMARY

Bench-scale treatability testing was conducted on soil (SP-1) and groundwater (MW-1) from the B&C Gas Mart site in Livermore, California to evaluate the ability of ozone to destroy petroleum hydrocarbons. Specific chemicals of concern (COCs) at this site were gasoline range organics (GRO), BTEX (benzene, toluene, ethylbenzene, and xylenes), and fuel oxygenates (MTBE, TBA, TAME, ETBE and DIPE). Batch tests were conducted to assess hydrocarbon removal, estimate the ozone demand of soil and groundwater, evaluate potential secondary effects of treatment, and assess attenuation of hexavalent chromium and bromate formed during treatment.

Laboratory testing clearly demonstrated that GRO, benzene, ethylbenzene, xylenes and MTBE were destroyed by ozone. Greater than 98% of most COCs were removed with application of 420 mg ozone (an amount approximately equal to the measured ozone demand). Complete removal was achieved using 2,200 mg ozone. Some COCs were volatilized, but in general the amount was less than 3% of the initial mass present.

Treatment with ozone did not affect most water quality parameters except for bromate and Cr(VI). Up to 0.16 mg/L bromate and up to 0.45 mg/L Cr(VI) was formed. In both cases, the amount generated was proportional to the amount of ozone applied, with higher concentrations seen with higher amount of ozone. Both bromate and Cr(VI) readily attenuated (typically within 7 days) in tests simulating the treatment zone and downgradient conditions.

The ozone demand of soil was 990-1,110 mg O_3/kg soil while the demand of groundwater was 182-207 mg O_3/L groundwater.

Based on the results of bench testing, PRIMA Environmental, Inc. recommends that ozone be considered for use at this site. Ozone effectively destroyed COCs, and although Cr(VI) and bromate were formed, they readily attenuated once ozonation ceased.

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1.0 INTRODUCTION

Bench-scale treatability testing was conducted on soil (SP-1) and groundwater (MW-1) from the B&C Gas Mart site in Livermore, California to evaluate the ability of ozone to destroy petroleum hydrocarbons. Specific chemicals of concern (COCs) at this site were gasoline range organics (GRO), BTEX (benzene, toluene, ethylbenzene, and xylenes), and fuel oxygenates (MTBE, TBA, TAME, ETBE and DIPE). Batch tests were conducted to assess hydrocarbon removal, estimate the ozone demand of soil and groundwater, evaluate potential secondary effects, and assess attenuation of hexavalent chromium and bromate formed during treatment.

1.1 Background

Ozone gas is a strong oxidant that can destroy a wide range of organic compounds. Dissolved iron and other metal ions in soil and groundwater can increase the effectiveness of ozone by reacting with ozone to form hydroxyl radicals. The hydroxyl radical is an even stronger oxidant than ozone and may react more quickly and produce fewer intermediates than ozone itself. Equations 1-6 show the reactions for conversion of BTEX compounds and the fuel oxygenates to carbon dioxide (CO_2) and water (H_2O). The stoichiometric ozone requirements for the complete mineralization of each contaminant are given in Table 1. Chemical reactions cannot be written for GRO (and stoichiometric requirements cannot be pre-determined) because GRO is a complex mixture of chemicals. However, if n-octane is used to represent GRO (Eqn. 7), then a first approximation of the stoichiometric ozone requirement can be calculated. In practice, a greater-than-stoichiometric dose of O_3 will usually be required because O_3 is a non-selective oxidant that will react with natural organic matter and other non-target compounds.

$$15O_3 + \underset{\textit{benzene}}{C_6H_6} \rightarrow 6CO_2 + 15O_2 + 3H_2O \qquad \text{Eqn. 1}$$

$$18O_3 + \underset{\textit{toluene}}{C_7H_8} \rightarrow 7CO_2 + 18O_2 + 4H_2O \qquad \text{Eqn. 2}$$

$$21O_3 + \underset{\textit{ethylbenzene or xylene}}{C_8H_{10}} \rightarrow 8CO_2 + 21O_2 + 5H_2O \qquad \text{Eqn. 3}$$

$$15O_3 + \underset{\textit{MTBE}}{C_5H_{12}O} \rightarrow 5CO_2 + 15O_2 + 6H_2O \qquad \text{Eqn. 4}$$

$$12O_3 + \underset{\textit{TBA}}{C_4H_{10}O} \rightarrow 4CO_2 + 12O_2 + 5H_2O \qquad \text{Eqn. 5}$$

$$18O_3 + \underset{\textit{ETBE/TAME/DIPE}}{C_6H_{14}O} \rightarrow 6CO_2 + 18O_2 + 7H_2O \qquad \text{Eqn. 6}$$

$$25O_3 + \underset{\textit{n-octane}}{C_8H_{18}} \rightarrow 8CO_2 + 25O_2 + 9H_2O \qquad \text{Eqn. 7}$$

Table 1. Ozone Stoichiometry

Compound	g Ozone / g contaminant
Benzene	9.2
Toluene	9.5
Ethylbenzene	9.5
Xylenes	9.5
MTBE	8.2
TBA	8.5
ETBE	8.5
TAME	8.5
DIPE	8.5
n-octane (representing GRO)	10.5

Because ozone is a gas, treatment of volatile compounds by sparging with ozone could result in removal of contaminants by stripping rather than oxidation. Lab testing, therefore, addressed contaminant destruction versus volatilization.

As with all strong oxidants, ozone is a non-selective oxidizing agent and may react with soil and water constituents other than the target compounds. The most likely potential effects of ozone include oxidation and precipitation of dissolved iron, oxidation and dissolution of manganese oxides, oxidation of naturally-occurring bromide to bromate, and oxidation of soil chromium to hexavalent chromium ([Cr(VI)]. The magnitude and duration of these changes is site specific and may or may not be of significance.

1.2 Study Objectives

Batch tests were conducted to evaluate each of the technologies. Specific goals were to:

- measure ozone soil and groundwater demand
- assess COC removal and assess destruction versus volatilization
- evaluate the effect of treatment on secondary water quality parameters
- assess the potential for natural attenuation of Cr(VI) and bromate formed during treatment

The batch tests conducted to achieve these goals are described in Section 2.0. The results and interpretation are presented in Section 3.0. PRIMA Environmental, Inc. evaluated ozone technology based on the laboratory results. However, it is the responsibility of Golder Associates to review this report and use its knowledge and expertise to determine whether ozone should be applied at the site.

2.0 MATERIALS AND METHODS

2.1 Materials

2.1.1 Ozone Generation

Ozone was generated using a corona discharge ozone generator with dry air feed. The concentration of ozone was approximately 30-40 mg O_3/L air (2-3% w/w).

2.1.2 Soil

Two soil samples [SP-1 (impacted) and SP-1 (clean)] were received on August 22, 2007. Impacted soil was used in all tests except attenuation tests, in which the clean soil served as the "untreated" soil (see Section 2.X.) Prior to testing, SP-1 (impacted) was composited and particles greater than about 4 mesh were removed. The composite was wet but crumbly with a gasoline odor. The composited soil was analyzed for

- GRO
- BTEX
- Fuel oxygenates (MTBE, TBA, TAME, ETBE and DIPE)
- Metals (arsenic, barium, cadmium, chromium, copper, iron, lead, selenium)

Sample SP-1 (clean) was homogenized before use, but was not analyzed for these chemical parameters.

2.1.3 Groundwater

One groundwater sample (MW-1) was received on August 22, 2007. The water was received in a single 5-gallon container, which was distributed into amber glass bottles upon receipt. The water was transferred into glass to prevent any losses due to sorption of COCs on to the plastic sample container. The groundwater was analyzed for

- GRO
- BTEX
- Fuel oxygenates (MTBE, TBA, TAME, ETBE and DIPE)
- Bromate
- Bromide
- Cr(VI)
- Metals (arsenic, barium, cadmium, chromium, copper, iron, lead, selenium)
- Oxidation reduction potential (ORP)
- pH

2.2 Ozone Demand

The ozone demand of soil and groundwater was estimated using methods based on the "Ozone Demand" tests described in *Standard Methods for the Examination of Water and Wastewater, 19th Ed.* Residual ozone was determined using the indigo method (SM 4500 O_3).

The ozone demand of the soil was estimated by adding 2.5 g of soil to 1L of ozone-saturated water, then measuring the concentration of ozone over time. The groundwater demand was estimated by adding 10 mL of groundwater to 990 mL of ozone-saturated DI water then measuring ozone over time. Controls in which no soil or groundwater was added were also performed. All tests were conducted in duplicate. The ozone demand (OD_{oz}) was taken to be the difference in ozone consumption in the presence and absence of site material. It was calculated according to the equation

$$OD = \{[O_3 \text{ Consumed}]_{\text{site material}} - [O_3 \text{ Consumed}]_{\text{control}}\} \times V/M \qquad \text{Eqn. 8}$$

where

OD = oxidant demand in mg O_3 consumed/kg soil or mg O_3 consumed/L groundwater

$[O_3 \text{ Consumed}]_{\text{control}}$ = change in O_3 concentration—in mg/L—in the absence of site material

$[O_3 \text{ Consumed}]_{\text{soil}}$ = change in O_3 concentration—in mg/L—in the presence of site material

V = total volume of water in L

M = amount of site material (kilograms of soil or L of groundwater)

2.3 COC Removal

Batch tests were conducted to assess COC removal, determine the amount of removal due to destruction versus volatilization, and estimate the appropriate ozone dose. Five reactors each containing 190 g soil and 0.95 L groundwater were prepared, then allowed to mix in a closed container. After 20 minutes, one of the reactors was destructively sampled and analyzed for GRO, BTEX, and fuel oxygenates. This reactor was the "time 0" reactor. Two of the remaining reactors were capped and mixed for the duration of the test. These reactors were the controls. The final two reactors were sparged with ozone (32 mg O_3/L air) at a flowrate of 50 mL/min for up to 23.1 hours. Off-gases were collected in Tedlar bags. Periodically, one control and one ozonated reactor were destructively sampled and the off-gases and aqueous phases analyzed for GRO, BTEX, and fuel oxygenates. Soil was not analyzed due to the difficulty of sampling soil without losing significant hydrocarbons to volatilization. The tests are summarized in Table 2.

Table 2. Test Conditions for COC Removal

Test	Mass Soil, g	Volume Ground-water, L	Sample Time, hours	Ozone Applied, mg
Time 0	190	0.95	0	0
Control-A	190	0.95	4.4	0
Control-B	190	0.95	23.1	0
Ozone-A	190	0.95	4.4	420
Ozone-B	190	0.94	23.1	2,200

2.4 Effect of Ozone on Water Quality

The effect of ozone on secondary water quality was assessed by analyzing the aqueous phases of the COC Removal test (Section 2.3) for

- Bromate
- Bromide
- Cr(VI)
- Metals (arsenic, barium, cadmium, chromium, copper, iron, lead, selenium)
- ORP
- pH.

2.5 Attenuation of Bromate and Cr(VI)

Because Cr(VI) and bromate were formed during treatment with ozone, additional tests were conducted to assess whether these parameters can naturally attenuate. Tests simulated attenuation in the treatment zone as well as downgradient of the treatment zone. Treatment zone tests used treated soil and treated groundwater, while downgradient tests used untreated soil and treated groundwater. Treated materials were obtained by repeating the COC removal tests. Cr(VI) was measured colorimetrically by PRIMA Environmental using a Hach DR 2800 Spectrophotometer and appropriate test reagents.

Cr(VI) Attenuation. The available Cr(VI) reducing capacity of soil, developed by Bartlett (Bartlett, R.J. **1991**. "Chromium Cycling in Soils and Water: Links, Gaps and Methods," *Environmental Health Perspectives*, **92**, 17-24.), was measured for treated soil and clean, untreated soil. In this method, 5 g soil is mixed with 25 mL of 10 mM phosphoric acid spiked with Cr(VI) for 18 hours, after which the residual Cr(VI) is measured. The available reducing capacity is defined as the amount of Cr(VI) removed per mass of soil.

Tests were also conducted to assess the ability of Cr(VI) to naturally attenuate in the presence of soil and groundwater within the treatment zone (once ozonation ceased) and downgradient of the treatment zone. Treatment zone tests comprised five replicates

containing 15 mL treated water and 15 g *treated* soil. Downgradient tests consisted of four replicates containing 15 mL treated water and 15 g *untreated* soil. Periodically, one replicate from each set was sacrificed and the aqueous phase analyzed for Cr(VI).

Bromate Attenuation. Tests were conducted to assess the ability of bromate to naturally attenuate within the treatment zone (once ozonation ceased) and downgradient of the treatment zone. Treatment zone tests comprised four replicates containing 50 mL treated water and 50 g *treated* soil. Downgradient tests consisted of four replicates containing 50 mL treated water and 50 g *untreated* soil. Periodically, one replicate from each set was sacrificed and the aqueous phase analyzed for bromate.

2.6 Analytical Methods

The method for each analysis and the laboratory to perform the analysis are given in Table 3.

Table 3. Analytical Methods.

Analyte	Method	Lab performing test*
GRO BTEX, MTBE, TBA, acetone	8015/8260B	Alpha Analytical
Bromate	EPA 317	BSK Analytical
Bromide	EPA 300	BSK Analytical
Cr(VI)	EPA7199/ Colorimetric**	Excelchem/PRIMA
Metals	EPA 6020	Alpha Analytical
ORP	Probe	PRIMA
pH	Probe	PRIMA

* Alpha Analytical (Sparks, NV), BSK Analytical (Fresno, CA)

** Hach DR 2800 Spectrophotometer and appropriate Hach kit reagents

3.0 RESULTS and DISCUSSION

The results of the bench tests are discussed in this section. Complete analytical reports for all analyses not conducted by PRIMA are provided in the Appendix.

3.1 Untreated Soil and Groundwater

The concentrations of COCs and secondary parameters are presented in Table 4. Soil was more heavily impacted than groundwater, with GRO present at 360 mg/kg and total BTEX at 12,000 µg/kg. In contrast, groundwater contained 6.0 mg/L GRO and 38 µg/L total BTEX, and 53 µg/L MTBE. Neither matrix contained Cr(VI) above the detection limit of 0.001 mg/kg or 0.001 mg/L, though soil contained 74 mg/kg total chromium. Bromate was not detected in groundwater.

Table 4. Analytical Results for Untreated Site Materials

Analyte	Units	Untreated Soil	Untreated Groundwater
GRO	mg/kg or mg/L	**360**	**6.0**
acetone	µg/kg or µg/L	< 4000	< 60
TBA	µg/kg or µg/L	< 10,000	< 30
MTBE	µg/kg or µg/L	< 100	**53**
DIPE	µg/kg or µg/L	< 200	< 3
ETBE	µg/kg or µg/L	< 200	< 3
TAME	µg/kg or µg/L	< 200	< 3
benzene	µg/kg or µg/L	< 100	**28**
toluene	µg/kg or µg/L	< 100	< 1.5
ethylbenzene	µg/kg or µg/L	**2,700**	< 1.5
m,p-xylene	µg/kg or µg/L	**8,300**	**8.4**
o-xylene	µg/kg or µg/L	**1,000**	**1.8**
Bromate	mg/L	n.m.	< 0.005
Bromide	mg/L	n.m.	**0.24**
Cr(VI)	mg/L or mg/kg	< 0.001	< 0.001
Metals			
chromium	mg/kg or mg/L	**74**	< 0.005
iron	mg/kg or mg/L	**24,000**	**0.50**
copper	mg/kg or mg/L	**30**	< 0.010
arsenic	mg/kg or mg/L	**4.7**	< 0.005
selenium	mg/kg or mg/L	< 1.0	< 0.005
cadmium	mg/kg or mg/L	< 1.0	< 0.005
barium	mg/kg or mg/L	**130**	**0.49**
lead	mg/kg or mg/L	**6.2**	< 0.005
ORP	mV	n.m.	**289**
pH	--	n.m.	**7.34**

3.2 COC Removal

The concentrations of COCs in the aqueous phase and off-gases are shown in Table 5. The degree of destruction versus volatilization is shown in Table 6. The percentages were calculated by comparing the mass of each hydrocarbon in the test to the mass of each hydrocarbon in the Time 0 sample according to Eqns. 9-11. The equations assume that COC concentrations in the soil are negligible.

$$\text{Percent Remaining in Aqueous} = 100 \times C/C_{T0} \quad \text{Eqn. 9}$$

$$\text{Percent Volatilized} = 100 \times C_{off\text{-}gas} V_{off\text{-}gas} / (C_{T0} V_{T0}) \quad \text{Eqn. 10}$$

$$\text{Percent Destroyed} = 100 - (\text{Percent Remaining} + \text{Percent volatilized}) \quad \text{Eqn. 11}$$

where

- C is the aqueous concentration (μg/L) in the control or ozone test,
- C_{T0} is the aqueous concentration (μg/L) in the Time 0 test,
- $C_{off\text{-}gas}$ is the off-gas concentration (μg/L) in the ozone test,
- $V_{off\text{-}gas}$ is the volume (L) of the off-gas, and
- V_{T0} is the volume (L) of the aqueous phase in the Time 0 test

Treatment of soil and groundwater with ozone effectively removed COCs from the aqueous phase. Application of 420 mg ozone (Ozone Rep A) dramatically decreased the concentration of most COCs—42% of MTBE, 5.3% of GRO and less than 2% each of ethylbenzene and xylenes remained in the aqueous phase after treatment, while benzene was completely removed. Complete removal of all COCs was achieved when 2,200 mg ozone (Ozone Rep B) was applied. TBA was detected in both tests, but the concentration was lower in the Ozone Rep B test, indicating that it can be destroyed. It is unknown whether the TBA was a by-product of oxidation of MTBE or whether it was initially present, but masked by the high concentrations of other COCs. Acetone, a common by-product of oxidation—was seen in both ozone tests.

Removal of COCs was due primarily to destruction, though some volatilization occurred. Benzene, toluene, and xylenes were detected in the off-gases, but the concentration of each was < 1.1 μg/L and in general, accounted for less than 2.8% of the mass initially present in the Time 0 reactor.

The concentrations of many COCs were higher in the controls than in the Time 0 reactor. This is due to dissolution of COCs from the soil into the aqueous phase and indicates that the Time 0 reactor was not mixed long enough before sampling. Incomplete dissolution does not affect the conclusions that ozone can destroy COCs, however.

Table 5. COC Removal Test—COC Concentrations

Analyte	Units	Test				
		Time 0	Control		Ozone	
			Rep A	Rep B	Rep A	Rep B
		Aqueous Phase Concentration				
GRO	mg/L	**10**	**14**	**22**	**0.53**	< 0.05
acetone	µg/L	< 200	< 200	< 400	**320**	**730**
TBA	µg/L	< 100	< 100	< 200	**28**	**10**
MTBE	µg/L	**48**	**52**	**51**	**20**	< 0.5
DIPE	µg/L	< 10	< 10	< 20	< 10	< 1.0
ETBE	µg/L	< 10	< 10	< 20	< 10	< 1.0
TAME	µg/L	< 10	< 10	< 20	< 10	< 1.0
benzene	µg/L	**14**	**24**	**15**	< 0.5	< 0.5
toluene	µg/L	< 5.0	< 5.0	< 10	**0.82**	< 0.5
ethylbenzene	µg/L	**190**	**280**	**91**	**2.5**	< 0.5
m,p-xylene	µg/L	**670**	**1100**	**1200**	**6.9**	< 0.5
o-xylene	µg/L	**94**	**150**	**160**	**1.6**	< 0.5
ozone applied	mg	0	0	0	420	2,200
volume	mg/L	0.95	0.95	0.95	0.95	0.95
			Off-Gas Concentration			
GRO	mg/L	n.a.	n.a.	n.a.	< 0.015	< 0.015
acetone	µg/L	n.a.	n.a.	n.a.	**7.6**	< 3.0
TBA	µg/L	n.a.	n.a.	n.a.	< 7.5	< 7.5
MTBE	µg/L	n.a.	n.a.	n.a.	< 0.15	< 0.15
DIPE	µg/L	n.a.	n.a.	n.a.	< 0.3	< 0.3
ETBE	µg/L	n.a.	n.a.	n.a.	< 0.3	< 0.3
TAME	µg/L	n.a.	n.a.	n.a.	< 0.3	< 0.3
benzene	µg/L	n.a.	n.a.	n.a.	**0.47**	< 0.15
toluene	µg/L	n.a.	n.a.	n.a.	**1.1**	**0.33**
ethylbenzene	µg/L	n.a.	n.a.	n.a.	< 0.15	< 0.15
m,p-xylene	µg/L	n.a.	n.a.	n.a.	**0.60**	**0.28**
o-xylene	µg/L	n.a.	n.a.	n.a.	**0.19**	< 0.15
volume off-gas	L	n.a.	n.a.	n.a.	**13**	**69**

n.a. = not applicable

Table 6. Destruction vs. Volatilization.

Analyte	Control		Ozone	
	Rep A	**Rep B**	**Rep A**	**Rep B**
	Percent Remaining in Aqueous Phase			
GRO	**140**	**220**	**5.3**	< 0.5
acetone	n.a.	n.a.	unknown	unknown
TBA	n.a.	n.a.	unknown	unknown
MTBE	**108**	**106**	**42**	< 1.0
DIPE	n.a.	n.a.	n.a.	n.a.
ETBE	n.a.	n.a.	n.a.	n.a.
TAME	n.a.	n.a.	n.a.	n.a.
benzene	**171**	**107**	< 4	< 4
toluene	n.a.	n.a.	unknown	n.a.
ethylbenzene	**147**	**48**	**1.3**	< 0.3
m,p-xylene	**164**	**179**	**1.0**	< 0.07
o-xylene	**160**	**170**	**1.7**	< 0.5
	Percent Volatilized			
GRO	n.a.	n.a.	< 2	< 11
acetone	n.a.	n.a.	unknown	n.a.
TBA	n.a.	n.a.	n.a.	n.a.
MTBE	n.a.	n.a.	< 4.4	< 22
DIPE	n.a.	n.a.	n.a.	n.a.
ETBE	n.a.	n.a.	n.a.	n.a.
TAME	n.a.	n.a.	n.a.	n.a.
benzene	n.a.	n.a.	**46**	< 75
toluene	n.a.	n.a.	unknown	unknown
ethylbenzene	n.a.	n.a.	< 1.1	< 5.6
m,p-xylene	n.a.	n.a.	**1.2**	**1.8**
o-xylene	n.a.	n.a.	**2.8**	< 11
	Percent Destroyed			
GRO	**-40**	**-120**	**93-95**	**> 89**
acetone	n.a.	n.a.	unknown	unknown
TBA	n.a.	n.a.	n.a.	n.a.
MTBE	**-8.3**	**-6.3**	**55-59**	**> 77**
DIPE	n.a.	n.a.	n.a.	n.a.
ETBE	n.a.	n.a.	n.a.	n.a.
TAME	n.a.	n.a.	n.a.	n.a.
benzene	**-71**	**-7**	**50-54**	**> 21**
toluene	n.a.	n.a.	unknown	n.a.
ethylbenzene	**-47**	**52**	**98-99**	**> 94**
m,p-xylene	**-64**	**-79**	**98**	**98**
o-xylene	**-60**	**-70**	**96**	**> 89**

Notes:
"n.a." = not applicable
"unknown" = unknown because analyte detected in sample, but not in Time 0

3.3 Effect of Ozone on Secondary Water Quality

The effect of ozone treatment on secondary water quality parameters is shown in Table 7. Most parameters were not affected treatment. Exceptions are bromate/bromide and Cr(VI)/total chromium. The concentration of bromate increased from < 0.005 mg/L in the Time 0 sample to 0.16 mg/L in the Ozone Rep B sample. A concomitant decrease in bromide was observed. Bromate was not detected in the Ozone Rep A test, indicating that its formation is dependent upon the amount of ozone applied. Similar results were seen for Cr(VI): the concentration of Cr(VI) increased from < 0.001 mg/L in the Time 0 test to 0.0405 mg/L in the Ozone Rep A test and 0.45 mg/L in the Ozone Rep B test, indicating that Cr(VI) formation is proportional to the amount of ozone applied. The formation of Cr(VI) was consistent with the increase in total Cr observed.

Table 7. Effect of Ozone on Secondary Water Quality

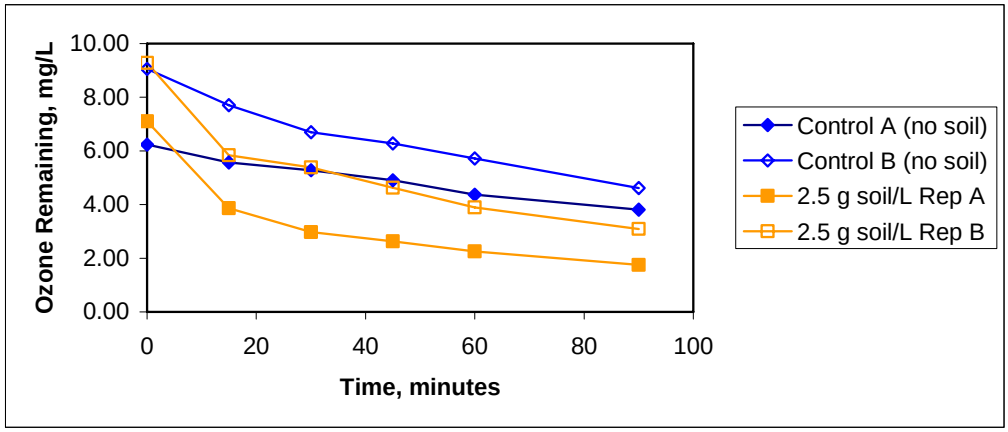
Analyte	Units	Test				
		Time 0	Control		Ozone	
			Rep A	Rep B	Rep A	Rep B
Bromate	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	**0.16**
Bromide	mg/L	**0.23**	**0.23**	**0.25**	**0.24**	**0.084**
Cr(VI)	mg/L	< 0.001	< 0.001	**0.0012**	**0.0405**	**0.45**
Metals						
chromium	mg/L	< 0.005	< 0.005	< 0.005	**0.035**	**0.32**
iron	mg/L	< 0.3	< 0.3	< 0.3	**0.37**	**0.49**
copper	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
arsenic	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
selenium	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
cadmium	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
barium	mg/L	**0.6**	**0.62**	**0.57**	**0.56**	**0.69**
lead	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
ORP	mg/L	**280**	**282**	**261**	**269**	**264**
pH	--	7.63	7.57	7.56	8.03	8.04

3.4 Ozone Demand

The ozone demand data for soil and groundwater are shown in Figures 1 and 2, respectively. The maximum ozone demand of soil, calculated using Eqn 8, was 990 mg O_3/kg soil for replicate A and 1,110 mg O_3/kg soil for replicate B. The maximum demand of the groundwater was 182-207 mg O_3/L of groundwater for the two replicates.

Based on these results and the amount of soil and groundwater used, the ozone demand in the COC Removal test (Section 3.2) was 384 mg ozone. Application of 420 mg destroyed up to 99% of COCs.

Time (min)	Ozone Remaining, mg/L soln.				Ozone Consumed, mg/kg soil	
	Control A (no soil)	Control B (no soil)	2.5 g soil/L Rep A	2.5 g soil/L Rep B	2.5 g soil/L Rep A	2.5 g soil/L Rep B
0	6.23	9.06	7.11	9.28		
15	5.57	7.71	3.87	5.83	893	974
30	5.28	6.69	2.97	5.39	990	893
45	4.90	6.27	2.63	4.62	968	1,040
60	4.37	5.71	2.25	3.89	902	1,110
90	3.81	4.61	1.75	3.09	769	1,100



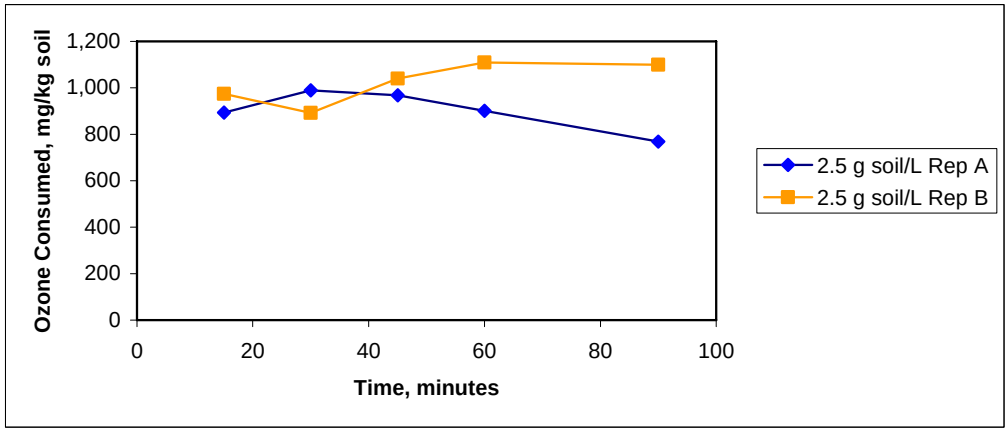
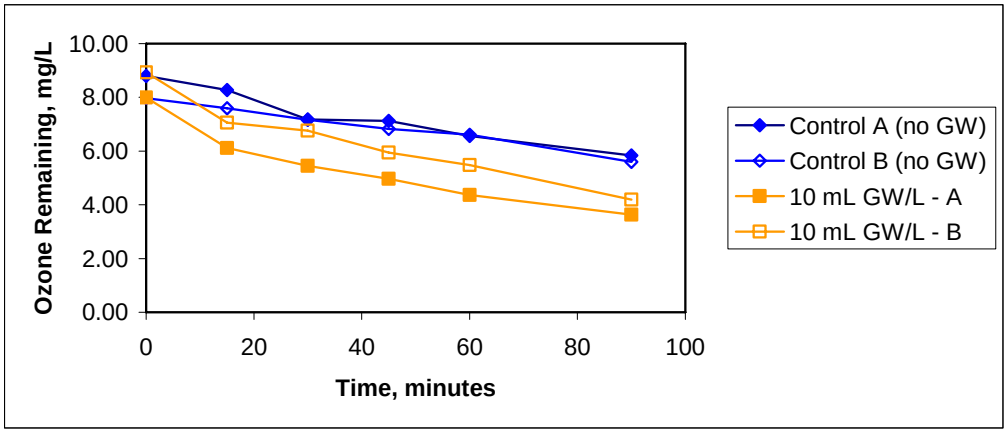


Figure 1. Soil Ozone Demand.

	Ozone Remaining, mg/L soln.				Ozone Consumed, mg/L groudnwater	
Time (min)	Control A (no GW)	Control B (no GW)	10 mL GW/L - A	10 mL GW/L - B	10 mL GW/L - A	10 mL GW/L - B
0	8.80	7.97	8.00	8.93		
15	8.27	7.60	6.12	7.06	142	141
30	7.18	7.17	5.45	6.75	133	96
45	7.12	6.83	4.97	5.94	161	157
60	6.56	6.61	4.37	5.49	182	164
90	5.84	5.60	3.63	4.20	170	207

* GW = groundwater



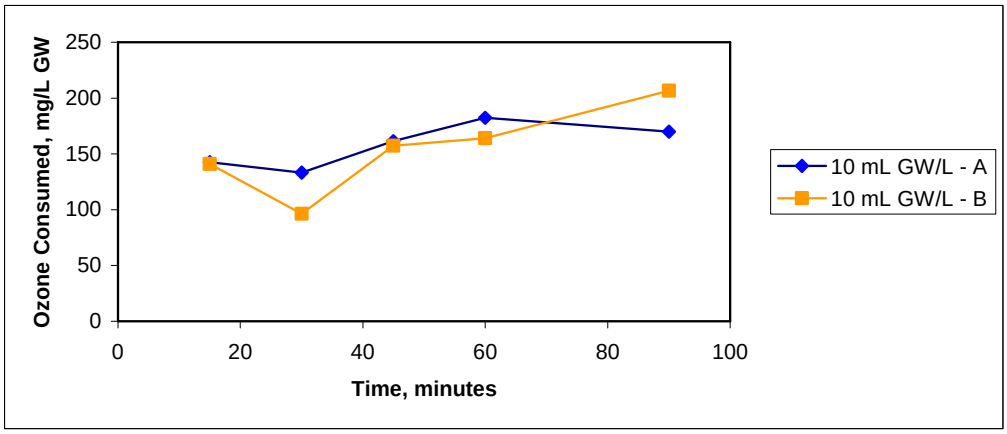


Figure 2. Groundwater Ozone Demand.

3.5 Bromate and Cr(VI) Attenuation

Because both bromate and Cr(VI) were generated by treatment with ozone, tests were conducted to determine whether these compounds could naturally attenuate.

3.5.1 Cr(VI) Attenuation

The results of the Bartlett's available reducing capacity test are shown in Table 8. Up to 12 mg Cr(VI)/kg soil were reduced by treated soil and 5.7 mg Cr(VI)/kg soil were reduced by untreated soil. The reason for the higher degree of removal for treated soil is uncertain—possibly COCs were not completely destroyed in the treated soil and reacted with the Cr(VI).

The results of the long-term Cr(VI) attenuation tests are shown in Table 9. Cr(VI) attenuated rapidly. Within 7 days, Cr(VI) decreased from 0.3 mg/L to < 0.01 mg/L in tests simulating downgradient conditions as well as in tests simulating the treatment zone.

Table 8. Available Cr(VI) Reducing Capacity.

Sample	Cr(VI) Concentration, µg/L		Available Cr(VI) Reducing
	Initial	Final	Capacity, mg Cr(VI)/kg soil
Untreated Soil	1.04	1.11	< 0.5
Untreated Soil	4.87	4.7	0.9
Untreated Soil	10.5	9.36	5.7
Treated Soil	1.06	0.825	1.2
Treated Soil	5.26	4.01	6.3
Treated Soil	10.82	8.42	12

Table 9. Long-Term Cr(VI) Attenuation.

Time, days	Cr(VI) Remaining, mg/L	
	Within Treatment Zone (Treated Soil/Treated GW)	Downgradient (Untreated Soil/Treated GW)
0	0.3	0.3
3	0.027	< 0.01
7	< 0.01	< 0.01
14	< 0.01	< 0.01

3.5.2 Bromate Attenuation

The results of the long-term bromate attenuation tests are shown in Table 10. Bromate attenuated rapidly. Within 7 days, bromate decreased from 0.19 mg/L to < 0.005 mg/L in test simulating the treatment zone. Complete removal was observed in the downgradient test by 29 days. The reason for the faster attenuation in the treatment zone test versus the downgradient tests in unknown, but the results are consistent with the Cr(VI) attenuation results.

Table 10. Long-term Bromate Attenuation

Time, days	Bromate Remaining, mg/L	
	Within Treatment Zone (Treated Soil/Treated GW)	Downgradient (Untreated Soil/Treated GW)
0	0.19	0.19
7	< 0.005	0.012
29	< 0.005	< 0.005

4.0 CONCLUSIONS

Laboratory testing clearly demonstrated that GRO, benzene, ethylbenzene, xylenes and MTBE were destroyed by ozone. Greater than 98% of most COCs were removed with application of 420 mg ozone (an amount approximately equal to the measured ozone demand). Complete removal was achieved using 2,200 mg ozone. Some COCs were volatilized, but in general the amount was less than 3% of the initial mass present.

Treatment with ozone did not affect most water quality parameters except for bromate and Cr(VI). Up to 0.16 mg/L bromate and up to 0.45 mg/L Cr(VI) was formed. In both cases, the amount generated was proportional to the amount of ozone applied, with higher concentrations seen with higher amount of ozone. Both bromate and Cr(VI) readily attenuated (typically within 7 days) in tests simulating the treatment zone and downgradient conditions.

The ozone demand of soil was 990-1,110 mg O_3/kg soil while the demand of groundwater was 182-207 mg O_3/L groundwater.

Based on the results of bench testing, PRIMA Environmental, Inc. recommends that ozone be considered for use at this site. Ozone effectively destroyed COCs, and although Cr(VI) and bromate were formed, they readily attenuated once ozonation ceased.

APPENDIX
(Analytical Reports)

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Prima Environmental
10265 Old Placerville Rd.
Sacramento, CA 958273042

Attn: Cindy Schreier
Phone: (916) 363-8798
Fax: (916) 363-8829
Date Received : 09/06/07

Job#: B&C Gas Mart

Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B
Volatile Organic Compounds (VOCs) EPA Method SW8260B

	Parameter	Concentration		Reporting Limit	Date Sampled	Date Analyzed
Client ID :	TPH-P (GRO)	360		20 mg/Kg	09/05/07	09/06/07
BC-LVMR-SO	Acetone	ND	V	4,000 µg/Kg	09/05/07	09/06/07
Lab ID :	Tertiary Butyl Alcohol (TBA)	ND	V	10,000 µg/Kg	09/05/07	09/06/07
PES07090603-01A	Methyl tert-butyl ether (MTBE)	ND	V	100 µg/Kg	09/05/07	09/06/07
	Di-isopropyl Ether (DIPE)	ND	V	200 µg/Kg	09/05/07	09/06/07
	Ethyl Tertiary Butyl Ether (ETBE)	ND	V	200 µg/Kg	09/05/07	09/06/07
	Benzene	ND	V	100 µg/Kg	09/05/07	09/06/07
	Tertiary Amyl Methyl Ether (TAME)	ND	V	200 µg/Kg	09/05/07	09/06/07
	Toluene	ND	V	100 µg/Kg	09/05/07	09/06/07
	Ethylbenzene	2,700		100 µg/Kg	09/05/07	09/06/07
	m,p-Xylene	8,300		100 µg/Kg	09/05/07	09/06/07
	o-Xylene	1,000		100 µg/Kg	09/05/07	09/06/07
Client ID :	TPH-P (GRO)	6.0		0.30 mg/L	09/05/07	09/06/07
BC-LVMR-GW	Acetone	ND	V	60 µg/L	09/05/07	09/06/07
Lab ID :	Tertiary Butyl Alcohol (TBA)	ND	V	30 µg/L	09/05/07	09/06/07
PES07090603-02A	Methyl tert-butyl ether (MTBE)	53		1.5 µg/L	09/05/07	09/06/07
	Di-isopropyl Ether (DIPE)	ND	V	3.0 µg/L	09/05/07	09/06/07
	Ethyl Tertiary Butyl Ether (ETBE)	ND	V	3.0 µg/L	09/05/07	09/06/07
	Benzene	28		1.5 µg/L	09/05/07	09/06/07
	Tertiary Amyl Methyl Ether (TAME)	ND	V	3.0 µg/L	09/05/07	09/06/07
	Toluene	ND	V	1.5 µg/L	09/05/07	09/06/07
	Ethylbenzene	ND	V	1.5 µg/L	09/05/07	09/06/07
	m,p-Xylene	8.4		1.5 µg/L	09/05/07	09/06/07
	o-Xylene	1.8		1.5 µg/L	09/05/07	09/06/07

Gasoline Range Organics (GRO) C4-C13
Note: Sample 01A extracted on 9/6/07.
V = Reporting Limits were increased due to high concentrations of target analytes.
ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

9/7/07
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

VOC Sample Preservation Report

Work Order: PES07090603 **Project:** B&C Gas Mart

Alpha's Sample ID	Client's Sample ID	Matrix	pH
07090603-02A	BC-LVMR-GW	Aqueous	6

9/7/07

Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *11-Sep-07*

QC Summary Report

Work Order: 07090603

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B**

File ID: **C:\HPCHEM\MS07\DATA\070906\07090607.D** Batch ID: **MS07W0906B** Analysis Date: **09/06/2007 11:55**

Sample ID: **MBLK MS07W0906B** Units : **mg/L** Run ID: **MSD_07_070906A** Prep Date: **09/06/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	ND	0.05								
Surr: 1,2-Dichloroethane-d4	0.00929		0.01		93	75	128			
Surr: Toluene-d8	0.0101		0.01		101	80	120			
Surr: 4-Bromofluorobenzene	0.00985		0.01		99	80	120			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B**

File ID: **C:\HPCHEM\MS07\DATA\070906\07090603.D** Batch ID: **MS07W0906B** Analysis Date: **09/06/2007 10:26**

Sample ID: **GLCS MS07W0906B** Units : **mg/L** Run ID: **MSD_07_070906A** Prep Date: **09/06/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	0.381	0.05	0.4		95	70	130			
Surr: 1,2-Dichloroethane-d4	0.00971		0.01		97	75	128			
Surr: Toluene-d8	0.0101		0.01		101	80	120			
Surr: 4-Bromofluorobenzene	0.00974		0.01		97	80	120			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B**

File ID: **C:\HPCHEM\MS07\DATA\070906\07090611.D** Batch ID: **MS07W0906B** Analysis Date: **09/06/2007 13:24**

Sample ID: **07083124-16AGS** Units : **mg/L** Run ID: **MSD_07_070906A** Prep Date: **09/06/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	1.71	0.25	2	0	85	60	131			
Surr: 1,2-Dichloroethane-d4	0.0449		0.05		90	75	128			
Surr: Toluene-d8	0.0513		0.05		103	80	120			
Surr: 4-Bromofluorobenzene	0.0504		0.05		101	80	120			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B**

File ID: **C:\HPCHEM\MS07\DATA\070906\07090612.D** Batch ID: **MS07W0906B** Analysis Date: **09/06/2007 13:47**

Sample ID: **07083124-16AGSD** Units : **mg/L** Run ID: **MSD_07_070906A** Prep Date: **09/06/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	1.73	0.25	2	0	86	60	131	1.706	1.2(20)	
Surr: 1,2-Dichloroethane-d4	0.0465		0.05		93	75	128			
Surr: Toluene-d8	0.0506		0.05		101	80	120			
Surr: 4-Bromofluorobenzene	0.0491		0.05		98	80	120			

Comments:

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Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *11-Sep-07*

QC Summary Report

Work Order: 07090603

Method Blank

Type **MBLK** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS07\DATA\070906\07090607.D** Batch ID: **MS07W0906A** Analysis Date: **09/06/2007 11:55**

Sample ID: **MBLK MS07W0906A** Units : **µg/L** Run ID: **MSD_07_070906A** Prep Date: **09/06/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Acetone	ND	10								
Tertiary Butyl Alcohol (TBA)	ND	10								
Methyl tert-butyl ether (MTBE)	ND	0.5								
Di-isopropyl Ether (DIPE)	ND	1								
Ethyl Tertiary Butyl Ether (ETBE)	ND	1								
Benzene	ND	0.5								
Tertiary Amyl Methyl Ether (TAME)	ND	1								
Toluene	ND	0.5								
Ethylbenzene	ND	0.5								
m,p-Xylene	ND	0.5								
o-Xylene	ND	0.5								
Surr: 1,2-Dichloroethane-d4	9.29		10		93	75	128			
Surr: Toluene-d8	10.1		10		101	80	120			
Surr: 4-Bromofluorobenzene	9.85		10		99	80	120			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS07\DATA\070906\07090604.D** Batch ID: **MS07W0906A** Analysis Date: **09/06/2007 10:48**

Sample ID: **LCS MS07W0906A** Units : **µg/L** Run ID: **MSD_07_070906A** Prep Date: **09/06/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	9.68	0.5	10		97	70	130			
Benzene	9.84	0.5	10		98	70	130			
Toluene	10	0.5	10		100	80	120			
Ethylbenzene	9.81	0.5	10		98	80	120			
m,p-Xylene	9.79	0.5	10		98	70	130			
o-Xylene	9.94	0.5	10		99	70	130			
Surr: 1,2-Dichloroethane-d4	9.34		10		93	75	128			
Surr: Toluene-d8	10.3		10		103	80	120			
Surr: 4-Bromofluorobenzene	10.1		10		101	80	120			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS07\DATA\070906\07090609.D** Batch ID: **MS07W0906A** Analysis Date: **09/06/2007 12:40**

Sample ID: **07083124-16AMS** Units : **µg/L** Run ID: **MSD_07_070906A** Prep Date: **09/06/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	48.3	1.3	50	0	97	62	139			
Benzene	43.9	1.3	50	0	88	70	130			
Toluene	44.4	1.3	50	0	89	67	130			
Ethylbenzene	41.8	1.3	50	0	84	70	130			
m,p-Xylene	43.1	1.3	50	0	86	69	130			
o-Xylene	45.4	1.3	50	0	91	70	130			
Surr: 1,2-Dichloroethane-d4	45.5		50		91	75	128			
Surr: Toluene-d8	51.9		50		104	80	120			
Surr: 4-Bromofluorobenzene	50.3		50		101	80	120			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS07\DATA\070906\07090610.D** Batch ID: **MS07W0906A** Analysis Date: **09/06/2007 13:02**

Sample ID: **07083124-16AMSD** Units : **µg/L** Run ID: **MSD_07_070906A** Prep Date: **09/06/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	47.8	1.3	50	0	96	62	139	48.26	0.9(20)	
Benzene	47	1.3	50	0	94	70	130	43.89	6.9(20)	
Toluene	48.2	1.3	50	0	96	67	130	44.37	8.3(20)	
Ethylbenzene	46.1	1.3	50	0	92	70	130	41.83	9.6(20)	
m,p-Xylene	46.6	1.3	50	0	93	69	130	43.05	8.0(20)	
o-Xylene	48.7	1.3	50	0	97	70	130	45.4	6.9(20)	
Surr: 1,2-Dichloroethane-d4	44.9		50		90	75	128			
Surr: Toluene-d8	52		50		104	80	120			
Surr: 4-Bromofluorobenzene	50.3		50		101	80	120			

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

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Date: *11-Sep-07*

QC Summary Report

Work Order: 07090603

Comments:

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Date: *11-Sep-07*

QC Summary Report

Work Order: 07090603

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B**

File ID: **07090707.D** Batch ID: **MS08S8285B** Analysis Date: **09/07/2007 10:51**

Sample ID: **MBLK MS08S8285B** Units : **mg/Kg** Run ID: **MSD_08_070907A** Prep Date: **09/07/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	ND	1								
Surr: 1,2-Dichloroethane-d4	0.185		0.2		93	69	126			
Surr: Toluene-d8	0.212		0.2		106	80	120			
Surr: 4-Bromofluorobenzene	0.194		0.2		97	80	120			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B**

File ID: **07090719.D** Batch ID: **MS08S8285B** Analysis Date: **09/07/2007 15:21**

Sample ID: **LCS MS08S8285B** Units : **mg/Kg** Run ID: **MSD_08_070907A** Prep Date: **09/07/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	18.5	2	16		116	58	141			
Surr: 1,2-Dichloroethane-d4	0.356		0.4		89	69	126			
Surr: Toluene-d8	0.401		0.4		100	80	120			
Surr: 4-Bromofluorobenzene	0.391		0.4		98	80	120			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B**

File ID: **07090720.D** Batch ID: **MS08S8285B** Analysis Date: **09/07/2007 15:43**

Sample ID: **07090658-02AGS** Units : **mg/Kg** Run ID: **MSD_08_070907A** Prep Date: **09/07/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	15.5	2	16	0	97	46	142			
Surr: 1,2-Dichloroethane-d4	0.348		0.4		87	69	126			
Surr: Toluene-d8	0.404		0.4		101	80	120			
Surr: 4-Bromofluorobenzene	0.38		0.4		95	80	120			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B**

File ID: **07090721.D** Batch ID: **MS08S8285B** Analysis Date: **09/07/2007 16:05**

Sample ID: **07090658-02AGSD** Units : **mg/Kg** Run ID: **MSD_08_070907A** Prep Date: **09/07/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	16	2	16	0	99.7	46	142	15.5	2.9(20)	
Surr: 1,2-Dichloroethane-d4	0.352		0.4		88	69	126			
Surr: Toluene-d8	0.401		0.4		100	80	120			
Surr: 4-Bromofluorobenzene	0.397		0.4		99	80	120			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *11-Sep-07*

QC Summary Report

Work Order: 07090603

Method Blank

Type **MBLK** Test Code: **EPA Method SW8260B**

File ID: **07090707.D** Batch ID: **MS08S8285A** Analysis Date: **09/07/2007 10:51**

Sample ID: **MBLK MS08S8285A** Units : **µg/Kg** Run ID: **MSD_08_070907A** Prep Date: **09/07/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Acetone	ND	200								
Tertiary Butyl Alcohol (TBA)	ND	500								
Methyl tert-butyl ether (MTBE)	ND	5								
Di-isopropyl Ether (DIPE)	ND	20								
Ethyl Tertiary Butyl Ether (ETBE)	ND	20								
Benzene	ND	5								
Tertiary Amyl Methyl Ether (TAME)	ND	20								
Toluene	ND	5								
Ethylbenzene	ND	5								
m,p-Xylene	ND	5								
o-Xylene	ND	5								
Surr: 1,2-Dichloroethane-d4	185		200		93	69	126			
Surr: Toluene-d8	212		200		106	80	120			
Surr: 4-Bromofluorobenzene	194		200		97	80	120			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8260B**

File ID: **07090716.D** Batch ID: **MS08S8285A** Analysis Date: **09/07/2007 14:17**

Sample ID: **LCS MS08S8285A** Units : **µg/Kg** Run ID: **MSD_08_070907A** Prep Date: **09/07/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	508	10	400		127	63	136			
Benzene	447	10	400		112	70	140			
Toluene	429	10	400		107	70	130			
Ethylbenzene	418	10	400		105	70	130			
m,p-Xylene	411	10	400		103	70	133			
o-Xylene	403	10	400		101	70	135			
Surr: 1,2-Dichloroethane-d4	393		400		98	69	126			
Surr: Toluene-d8	389		400		97	80	120			
Surr: 4-Bromofluorobenzene	377		400		94	80	120			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8260B**

File ID: **07090717.D** Batch ID: **MS08S8285A** Analysis Date: **09/07/2007 14:38**

Sample ID: **07090658-02AMS** Units : **µg/Kg** Run ID: **MSD_08_070907A** Prep Date: **09/07/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	440	10	400	0	110	42	146			
Benzene	393	10	400	0	98	57	140			
Toluene	394	10	400	0	98	60	130			
Ethylbenzene	379	10	400	0	95	63	134			
m,p-Xylene	376	10	400	0	94	64	136			
o-Xylene	368	10	400	0	92	62	138			
Surr: 1,2-Dichloroethane-d4	372		400		93	69	126			
Surr: Toluene-d8	399		400		99.7	80	120			
Surr: 4-Bromofluorobenzene	379		400		95	80	120			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8260B**

File ID: **07090718.D** Batch ID: **MS08S8285A** Analysis Date: **09/07/2007 15:00**

Sample ID: **07090658-02AMSD** Units : **µg/Kg** Run ID: **MSD_08_070907A** Prep Date: **09/07/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	424	10	400	0	106	42	146	440.4	3.8(20)	
Benzene	384	10	400	0	96	57	140	393.3	2.5(20)	
Toluene	378	10	400	0	95	60	130	393.9	4.0(20)	
Ethylbenzene	367	10	400	0	92	63	134	378.9	3.2(20)	
m,p-Xylene	362	10	400	0	90	64	136	375.7	3.7(20)	
o-Xylene	364	10	400	0	91	62	138	367.7	1.0(20)	
Surr: 1,2-Dichloroethane-d4	374		400		94	69	126			
Surr: Toluene-d8	398		400		99.6	80	120			
Surr: 4-Bromofluorobenzene	379		400		95	80	120			

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *11-Sep-07*

QC Summary Report

Work Order: 07090603

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA **RUSH!**

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : PES07090603

Report Due By : 5:00 PM On : 07-Sep-07

Client:
Prima Environmental
10265 Old Placerville Rd.
Suite 15
Sacramento, CA 95827-3042

Cindy Schreier
TEL : (916) 363-8798 x
FAX : (916) 363-8829
EMail data@primaenvironmental.com

EDD Required : **No**

Sampled by : KT

Report Attention : Cindy Schreier
CC Report :

Job : B&C Gas Mart
PO :

Client's COC # : 18047

Cooler Temp	Samples Received	Date Printed
4 °C	06-Sep-07	**06-Sep-07**

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles ORG	SUB	TAT	PWS #	Requested Tests TPH/P_S	TPH/P_W	VOC_S	VOC_W					Sample Remarks
PES07090603-01A	BC-LVMR-SO	SO	09/05/07 13:00	1	0	1		GAS-C		BTEX/OXY/ Acetone_C						
PES07090603-02A	BC-LVMR-GW	AQ	09/05/07 13:00	3	0	1			GAS-C		BTEX/OXY/ Acetone_C					

Comments: Security seals intact. Frozen ice. 24 Hour TAT. :

	Signature	Print Name	Company	Date/Time
Logged in by:	Elizabeth Sauvageau	Elizabeth Sauvageau	**Alpha Analytical, Inc.**	9-6-07 9:37

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information:
Name _____
Address _____
C _____
P _____

PRIMA ENVIRONMENTAL
10265 Old Placerville Rd, Ste 15
Sacramento, CA 95827-3042
PH: 916-363-8798
FAX: 916-363-8829
City, State, Zip

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431-5778
Phone (775) 355-1044
Fax (775) 355-0406

Samples Collected From Which State?
AZ ___ CA X NV ___ WA ___
ID ___ OR ___ OTHER ___

18047

Page # 1 of 1

P.O. # | Job # B&C - Gas Mart

EMail Ad data@primaenvironmental.com

Phone # | Fax #

Report Attention CINDY SCHREIER

Sampled by KT

Time Sampled	Date Sampled	Matrix* See Key Below	Lab ID Number (Office Use Only)	Sample Description	TAT	Field Filtered	Total and type of containers ** See below	Analyses Required: TPH-g	BTEX	Acetone	5 Oxy's *	Required QC Level? I II III IV	REMARKS
1300	9.5	SO	PES070905603-01	BC-LVMR-SD	48hr		1-SP	X	X	X	X		* MTBE
1300	9.50	AQ	-02	BC-LVMR-GW	48hr		3-V	X	X	X	X		TBA
													TAME
													ETBE
													DIPE

EDD / EDF? YES ___ NO ___

Global ID # _____

ADDITIONAL INSTRUCTIONS:

	Signature	Print Name	Company	Date	Time
Relinquished by	Kelly Trupp	Kelly Trupp	Prima	9-5-07	1415
Received by	Lisa de Silva	Lisa de Silva	ALPHA	9-5-07	1415
Relinquished by					
Received by	E. Sauvageau	E. Sauvageau	Alpha	9-6-07	9:37
Relinquished by					
Received by					

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air **: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this coc. The liability of the laboratory is limited to the amount paid for the report.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Prima Environmental
10265 Old Placerville Rd.
Sacramento, CA 958273042

Attn: Cindy Schreier
Phone: (916) 363-8798
Fax: (916) 363-8829
Date Received : 09/06/07

Job#: BC-Gas Mart

Metals by ICPMS
EPA Method SW6020/SW6020A

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**BC-Lvmr-So**					
Lab ID :	PES07090661-01A	Chromium (Cr)	74	1.0 mg/Kg	09/05/07	09/10/07
		Iron (Fe)	24,000	60 mg/Kg	09/05/07	09/10/07
		Copper (Cu)	30	2.0 mg/Kg	09/05/07	09/10/07
		Arsenic (As)	4.7	1.0 mg/Kg	09/05/07	09/10/07
		Selenium (Se)	ND	1.0 mg/Kg	09/05/07	09/10/07
		Cadmium (Cd)	ND	1.0 mg/Kg	09/05/07	09/10/07
		Barium (Ba)	130	1.0 mg/Kg	09/05/07	09/10/07
		Lead (Pb)	6.2	1.0 mg/Kg	09/05/07	09/10/07

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

9/19/07
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Prima Environmental
10265 Old Placerville Rd.
Sacramento, CA 958273042

Attn: Cindy Schreier
Phone: (916) 363-8798
Fax: (916) 363-8829
Date Received : 09/06/07

Job#: BC-Gas Mart

Metals by ICPMS
EPA Method SW6020

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**BC-LVMR-GW**					
Lab ID :	PES07090661-02A	Chromium (Cr)	ND	0.0050 mg/L	09/05/07	09/10/07
		Iron (Fe)	0.50	0.30 mg/L	09/05/07	09/10/07
		Copper (Cu)	ND	0.010 mg/L	09/05/07	09/10/07
		Arsenic (As)	ND	0.0050 mg/L	09/05/07	09/10/07
		Selenium (Se)	ND	0.0050 mg/L	09/05/07	09/10/07
		Cadmium (Cd)	ND	0.0050 mg/L	09/05/07	09/10/07
		Barium (Ba)	0.49	0.0050 mg/L	09/05/07	09/10/07
		Lead (Pb)	ND	0.0050 mg/L	09/05/07	09/10/07

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

9/19/07
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *14-Sep-07*

QC Summary Report

Work Order: 07090661

Method Blank

Type **MBLK** Test Code: **EPA Method SW6020**

File ID: **091007.B\048_ICB.D** Batch ID: **18290** Analysis Date: **09/10/2007 16:51**

Sample ID: **MB-18290** Units : **mg/Kg** Run ID: **ICP/MS_070910A** Prep Date: **09/06/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	ND	1								
Iron (Fe)	ND	500								
Copper (Cu)	ND	2								
Arsenic (As)	ND	1								
Selenium (Se)	ND	1								
Cadmium (Cd)	ND	1								
Barium (Ba)	ND	1								
Lead (Pb)	ND	1								

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW6020**

File ID: **091007.B\049_LCS.D** Batch ID: **18290** Analysis Date: **09/10/2007 16:56**

Sample ID: **LCS-18290** Units : **mg/Kg** Run ID: **ICP/MS_070910A** Prep Date: **09/06/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	25.8	1	25		103	75	120			
Iron (Fe)	5520	500	5000		110	80	120			
Copper (Cu)	27.2	2	25		109	80	125			
Arsenic (As)	25.9	1	25		103	80	120			
Selenium (Se)	25.5	1	25		102	80	120			
Cadmium (Cd)	25.6	1	25		103	80	120			
Barium (Ba)	245	1	250		98	78	123			
Lead (Pb)	26.6	1	25		106	80	122			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW6020**

File ID: **091007.B\052SMPL.D** Batch ID: **18290** Analysis Date: **09/10/2007 17:10**

Sample ID: **07090658-01AMS** Units : **mg/Kg** Run ID: **ICP/MS_070910A** Prep Date: **09/06/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	116	1	25	97.81	72	50	150			
Iron (Fe)	43700	500	5000	40070	72	50	150			
Copper (Cu)	64.5	2	25	41.46	92	54	143			
Arsenic (As)	26.9	1	25	3.035	96	60	130			
Selenium (Se)	24	1	25	0	96	69	130			
Cadmium (Cd)	24.9	1	25	0	99.8	70	130			
Barium (Ba)	358	1	250	112.9	98	58	150			
Lead (Pb)	30.2	1	25	4.725	102	68	141			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW6020**

File ID: **091007.B\053SMPL.D** Batch ID: **18290** Analysis Date: **09/10/2007 17:15**

Sample ID: **07090658-01AMSD** Units : **mg/Kg** Run ID: **ICP/MS_070910A** Prep Date: **09/06/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	91.6	1	25	97.81	-25	50	150	115.9	23.4(20)	M2 R5
Iron (Fe)	35200	500	5000	40070	-97	50	150	43680	21.4(20)	M3 R58
Copper (Cu)	51.5	2	25	41.46	40	54	143	64.46	22.3(20)	M2 R5
Arsenic (As)	20.9	1	25	3.035	72	60	130	26.93	25.2(20)	R5
Selenium (Se)	19.2	1	25	0	77	69	130	23.98	22.3(20)	R5
Cadmium (Cd)	23.9	1	25	0	96	70	130	24.94	4.1(20)	
Barium (Ba)	349	1	250	112.9	94	58	150	357.7	2.6(20)	
Lead (Pb)	28.8	1	25	4.725	96	68	141	30.17	4.7(20)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

M2 = Matrix spike recovery was low, the method control sample recovery was acceptable.

M3 = The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to the spike level. The method control sample recovery was acceptable.

R5 = MS/MSD RPD exceed the laboratory control limit. Recovery met acceptance criteria.

R58 = MS/MSD RPD exceeded the laboratory control limit.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *14-Sep-07*

QC Summary Report

Work Order: 07090661

Method Blank

Type **MBLK** Test Code: **EPA Method 200.8**

File ID: **091007.B\030_ICB.D** Batch ID: **18297** Analysis Date: **09/10/2007 15:19**

Sample ID: **MB-18297** Units : **mg/L** Run ID: **ICP/MS_070910B** Prep Date: **09/07/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	ND	0.005								
Iron (Fe)	ND	0.3								
Copper (Cu)	ND	0.01								
Arsenic (As)	ND	0.005								
Selenium (Se)	ND	0.005								
Cadmium (Cd)	ND	0.005								
Barium (Ba)	ND	0.005								
Lead (Pb)	ND	0.005								

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method 200.8**

File ID: **091007.B\031_LCS.D** Batch ID: **18297** Analysis Date: **09/10/2007 15:24**

Sample ID: **LCS-18297** Units : **mg/L** Run ID: **ICP/MS_070910B** Prep Date: **09/07/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.25	0.005	0.25		100	80	124			
Iron (Fe)	50.2	0.3	50		100	83	119			
Copper (Cu)	0.26	0.01	0.25		104	85	123			
Arsenic (As)	0.262	0.005	0.25		105	85	118			
Selenium (Se)	0.265	0.005	0.25		106	85	118			
Cadmium (Cd)	0.263	0.005	0.25		105	85	121			
Barium (Ba)	2.63	0.005	2.5		105	85	132			
Lead (Pb)	0.27	0.005	0.25		108	85	120			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method 200.8**

File ID: **091007.B\034SMPL.D** Batch ID: **18297** Analysis Date: **09/10/2007 15:43**

Sample ID: **07090602-01AMS** Units : **mg/L** Run ID: **ICP/MS_070910B** Prep Date: **09/07/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.285	0.005	0.25	0.02483	104	70	133			
Iron (Fe)	59.8	0.3	50	12.68	94	70	130			
Copper (Cu)	0.262	0.01	0.25	0.01379	99	70	131			
Arsenic (As)	0.353	0.005	0.25	0.07337	112	70	130			
Selenium (Se)	0.313	0.005	0.25	0.0144	119	70	131			
Cadmium (Cd)	0.261	0.005	0.25	0	104	70	130			
Barium (Ba)	2.75	0.005	2.5	0.1232	105	70	143			
Lead (Pb)	0.258	0.005	0.25	0	103	70	130			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method 200.8**

File ID: **091007.B\035SMPL.D** Batch ID: **18297** Analysis Date: **09/10/2007 15:47**

Sample ID: **07090602-01AMSD** Units : **mg/L** Run ID: **ICP/MS_070910B** Prep Date: **09/07/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.298	0.005	0.25	0.02483	109	70	133	0.2849	4.6(20)	
Iron (Fe)	65.8	0.3	50	12.68	106	70	130	59.83	9.4(20)	
Copper (Cu)	0.277	0.01	0.25	0.01379	105	70	131	0.2616	5.8(20)	
Arsenic (As)	0.365	0.005	0.25	0.07337	117	70	130	0.3532	3.2(20)	
Selenium (Se)	0.318	0.005	0.25	0.0144	121	70	131	0.3127	1.7(20)	
Cadmium (Cd)	0.264	0.005	0.25	0	105	70	130	0.261	1.0(20)	
Barium (Ba)	2.74	0.005	2.5	0.1232	105	70	143	2.746	0.1(20)	
Lead (Pb)	0.259	0.005	0.25	0	104	70	130	0.2576	0.6(20)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : PES07090661

Report Due By : 5:00 PM On : 20-Sep-07

Client:
Prima Environmental
10265 Old Placerville Rd.
Suite 15
Sacramento, CA 95827-3042

Cindy Schreier
TEL : (916) 363-8798 x
FAX : (916) 363-8829
EMail data@primaenvironmental.com

EDD Required : **No**

Sampled by : K.T.

Report Attention : Cindy Schreier
CC Report :

Job : BC-Gas Mart
PO :

Client's COC # : 18048

Cooler Temp	Samples Received	Date Printed
4 °C	06-Sep-07	06-Sep-07

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles ORG	SUB	TAT	PWS #	Requested Tests METALS_AQ	METALS_SO						Sample Remarks
PES07090661-01A	BC-Lvmr-So	SO	09/05/07 13:00	1	0	10			As, Ba, Cd, Cr, Cu, Fe, Pb, Se						
PES07090661-02A	BC-LVMR-GW	AQ	09/05/07 13:00	1	0	10		As, Ba, Cd, Cr, Cu, Fe, Pb, Se							Sample ID verified by poly.

Comments: Security seals intact. Frozen ice. :

	Signature	Print Name	Company	Date/Time
Logged in by:	Tara Dickinson	Tara Dickinson	**Alpha Analytical, Inc.**	9/6/07 1228

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information:
Name
Address
C
P

PRIMA ENVIRONMENTAL
10265 Old Placerville Rd, Ste 15
Sacramento, CA 95827-3042
PH: 916-363-8798
FAX: 916-363-8829
City, State, Zip

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431-5778
Phone (775) 355-1044
Fax (775) 355-0406

Samples Collected From Which State?
AZ ___ CA X NV ___ WA ___
ID ___ OR ___ OTHER ___

18048
Page # 1 of 1

P.O. # | Job # BC Gas Mart
Email: data@primaenvironmental.com
Phone # | Fax #

Report Attention CINDY SCHREIER

Sampled by KT

Time Sampled	Date Sampled	Matrix* See Key Below	Lab ID Number (Office Use Only)	Sample Description	TAT	Field Filtered	Total and type of containers ** See below	Analyses Required: Metals*	Required QC Level? I II III IV	REMARKS
1300	9.5	SO	PES07090661-01	BC.Lvmr.SO	STD		1-SO	X		* As, Ba, Cd, Cr, Cu, Fe, Pb, Se
1300	9.5	AQ	-02	BC.Lvmr.GW	STD	X	1-P	X		

EDD / EDF? YES ___ NO ___
Global ID # ___

ADDITIONAL INSTRUCTIONS:

	Signature	Print Name	Company	Date	Time
Relinquished by	Kelly Tripp	Kelly Tripp	Prima	9.5.07	1415
Received by	Lisa deSalvo	Lisa deSalvo	ALPHA	9-5-07	1415
Relinquished by					
Received by	Tara Dickinson	Tara Dickinson	Alpha	9/6/07	1228
Relinquished by					
Received by					

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air **: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this coc. The liability of the laboratory is limited to the amount paid for the report.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Prima Environmental
10265 Old Placerville Rd.
Sacramento, CA 958273042

Attn: Cindy Schreier
Phone: (916) 363-8798
Fax: (916) 363-8829
Date Received : 09/13/07

Job#: Golder-Livermore

Metals by ICPMS
EPA Method SW6020

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**Gold-Liv-03-TO**					
Lab ID :	PES07091352-01A	Chromium (Cr)	ND	0.0050 mg/L	09/12/07	09/17/07
		Iron (Fe)	ND	0.30 mg/L	09/12/07	09/17/07
		Copper (Cu)	ND	0.010 mg/L	09/12/07	09/17/07
		Arsenic (As)	ND	0.0050 mg/L	09/12/07	09/17/07
		Selenium (Se)	ND	0.0050 mg/L	09/12/07	09/17/07
		Cadmium (Cd)	ND	0.0050 mg/L	09/12/07	09/17/07
		Barium (Ba)	0.60	0.0050 mg/L	09/12/07	09/17/07
		Lead (Pb)	ND	0.0050 mg/L	09/12/07	09/17/07
Client ID :	**Gold-Liv-03-Con-A**					
Lab ID :	PES07091352-02A	Chromium (Cr)	ND	0.0050 mg/L	09/12/07	09/17/07
		Iron (Fe)	ND	0.30 mg/L	09/12/07	09/17/07
		Copper (Cu)	ND	0.010 mg/L	09/12/07	09/17/07
		Arsenic (As)	ND	0.0050 mg/L	09/12/07	09/17/07
		Selenium (Se)	ND	0.0050 mg/L	09/12/07	09/17/07
		Cadmium (Cd)	ND	0.0050 mg/L	09/12/07	09/17/07
		Barium (Ba)	0.62	0.0050 mg/L	09/12/07	09/17/07
		Lead (Pb)	ND	0.0050 mg/L	09/12/07	09/17/07
Client ID :	**Gold-Liv-03-Test-A**					
Lab ID :	PES07091352-03A	Chromium (Cr)	0.035	0.0050 mg/L	09/12/07	09/17/07
		Iron (Fe)	0.37	0.30 mg/L	09/12/07	09/17/07
		Copper (Cu)	ND	0.010 mg/L	09/12/07	09/17/07
		Arsenic (As)	ND	0.0050 mg/L	09/12/07	09/17/07
		Selenium (Se)	ND	0.0050 mg/L	09/12/07	09/17/07
		Cadmium (Cd)	ND	0.0050 mg/L	09/12/07	09/17/07
		Barium (Ba)	0.56	0.0050 mg/L	09/12/07	09/17/07
		Lead (Pb)	ND	0.0050 mg/L	09/12/07	09/17/07

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

9/26
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Prima Environmental
10265 Old Placerville Rd.
Sacramento, CA 958273042

Attn: Cindy Schreier
Phone: (916) 363-8798
Fax: (916) 363-8829
Date Received : 09/13/07

Job#: Golder-Livermore

Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B
Volatile Organic Compounds (VOCs) EPA Method SW8260B

	Parameter	Concentration		Reporting Limit	Date Sampled	Date Analyzed
Client ID :	TPH-P (GRO)	10		1.0 mg/L	09/12/07	09/20/07
Gold-Liv-03-TO	Acetone	ND	V	200 µg/L	09/12/07	09/20/07
Lab ID :	Tertiary Butyl Alcohol (TBA)	ND	V	100 µg/L	09/12/07	09/20/07
PES07091352-01A	Methyl tert-butyl ether (MTBE)	48		5.0 µg/L	09/12/07	09/20/07
	Di-isopropyl Ether (DIPE)	ND	V	10 µg/L	09/12/07	09/20/07
	Ethyl Tertiary Butyl Ether (ETBE)	ND	V	10 µg/L	09/12/07	09/20/07
	Benzene	14		5.0 µg/L	09/12/07	09/20/07
	Tertiary Amyl Methyl Ether (TAME)	ND	V	10 µg/L	09/12/07	09/20/07
	Toluene	ND	V	5.0 µg/L	09/12/07	09/20/07
	Ethylbenzene	190		5.0 µg/L	09/12/07	09/20/07
	m,p-Xylene	670		5.0 µg/L	09/12/07	09/20/07
	o-Xylene	94		5.0 µg/L	09/12/07	09/20/07
Client ID :	TPH-P (GRO)	14		1.0 mg/L	09/12/07	09/20/07
Gold-Liv-03-Con-A	Acetone	ND	V	200 µg/L	09/12/07	09/20/07
Lab ID :	Tertiary Butyl Alcohol (TBA)	ND	V	100 µg/L	09/12/07	09/20/07
PES07091352-02A	Methyl tert-butyl ether (MTBE)	52		5.0 µg/L	09/12/07	09/20/07
	Di-isopropyl Ether (DIPE)	ND	V	10 µg/L	09/12/07	09/20/07
	Ethyl Tertiary Butyl Ether (ETBE)	ND	V	10 µg/L	09/12/07	09/20/07
	Benzene	24		5.0 µg/L	09/12/07	09/20/07
	Tertiary Amyl Methyl Ether (TAME)	ND	V	10 µg/L	09/12/07	09/20/07
	Toluene	ND	V	5.0 µg/L	09/12/07	09/20/07
	Ethylbenzene	280		5.0 µg/L	09/12/07	09/20/07
	m,p-Xylene	1,100		5.0 µg/L	09/12/07	09/20/07
	o-Xylene	150		5.0 µg/L	09/12/07	09/20/07
Client ID :	TPH-P (GRO)	0.53		0.10 mg/L	09/12/07	09/20/07
Gold-Liv-03-Test-A	Acetone	320		20 µg/L	09/12/07	09/20/07
Lab ID :	Tertiary Butyl Alcohol (TBA)	28		10 µg/L	09/12/07	09/20/07
PES07091352-03A	Methyl tert-butyl ether (MTBE)	20		0.50 µg/L	09/12/07	09/20/07
	Di-isopropyl Ether (DIPE)	ND		1.0 µg/L	09/12/07	09/20/07
	Ethyl Tertiary Butyl Ether (ETBE)	ND		1.0 µg/L	09/12/07	09/20/07
	Benzene	ND		0.50 µg/L	09/12/07	09/20/07
	Tertiary Amyl Methyl Ether (TAME)	ND		1.0 µg/L	09/12/07	09/20/07
	Toluene	0.82		0.50 µg/L	09/12/07	09/20/07
	Ethylbenzene	2.5		0.50 µg/L	09/12/07	09/20/07
	m,p-Xylene	6.9		0.50 µg/L	09/12/07	09/20/07
	o-Xylene	1.6		0.50 µg/L	09/12/07	09/20/07

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Client ID :					
Gold-Liv-03-Test-A(T)	TPH-P (GRO)	ND	15 mg/m³	09/12/07	09/15/07
Lab ID :	Acetone	7.6	3.0 mg/m³	09/12/07	09/15/07
PES07091352-04A	Tertiary Butyl Alcohol (TBA)	ND	7.5 mg/m³	09/12/07	09/15/07
	Methyl tert-butyl ether (MTBE)	ND	0.15 mg/m³	09/12/07	09/15/07
	Di-isopropyl Ether (DIPE)	ND	0.30 mg/m³	09/12/07	09/15/07
	Ethyl Tertiary Butyl Ether (ETBE)	ND	0.30 mg/m³	09/12/07	09/15/07
	Benzene	0.47	0.15 mg/m³	09/12/07	09/15/07
	Tertiary Amyl Methyl Ether (TAME)	ND	0.30 mg/m³	09/12/07	09/15/07
	Toluene	1.1	0.15 mg/m³	09/12/07	09/15/07
	Ethylbenzene	ND	0.15 mg/m³	09/12/07	09/15/07
	m,p-Xylene	0.60	0.15 mg/m³	09/12/07	09/15/07
	o-Xylene	0.19	0.15 mg/m³	09/12/07	09/15/07

Gasoline Range Organics (GRO) C4-C13

Note: Concentrations of air in a Tedlar Bag are at 21 degrees Celsius and 25.36 inches of mercury.

V = Reporting Limits were increased due to high concentrations of target analytes.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

9/26/07

Report Date

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VOC Sample Preservation Report

Work Order: PES07091352 **Project:** Golder-Livermore

Alpha's Sample ID	Client's Sample ID	Matrix	pH
07091352-01A	Gold-Liv-03-TO	Aqueous	2
07091352-02A	Gold-Liv-03-Con-A	Aqueous	2
07091352-03A	Gold-Liv-03-Test-A	Aqueous	2

9/26/07

Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: 20-Sep-07

QC Summary Report

Work Order: 07091352

Method Blank

Type **MBLK** Test Code: **EPA Method 200.8**

File ID: **091707.B\A030_ICB.D** Batch ID: **18330** Analysis Date: **09/17/2007 20:30**

Sample ID: **MB-18330** Units : **mg/L** Run ID: **ICP/MS_070917A** Prep Date: **09/14/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	ND	0.005								
Iron (Fe)	ND	0.3								
Copper (Cu)	ND	0.01								
Arsenic (As)	ND	0.005								
Selenium (Se)	ND	0.005								
Cadmium (Cd)	ND	0.005								
Barium (Ba)	ND	0.005								
Lead (Pb)	ND	0.005								

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method 200.8**

File ID: **091707.B\A031_LCS.D** Batch ID: **18330** Analysis Date: **09/17/2007 20:35**

Sample ID: **LCS-18330** Units : **mg/L** Run ID: **ICP/MS_070917A** Prep Date: **09/14/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.291	0.005	0.25		116	80	124			
Iron (Fe)	56	0.3	50		112	83	119			
Copper (Cu)	0.294	0.01	0.25		118	85	123			
Arsenic (As)	0.291	0.005	0.25		117	85	118			
Selenium (Se)	0.286	0.005	0.25		115	85	118			
Cadmium (Cd)	0.29	0.005	0.25		116	85	121			
Barium (Ba)	3.13	0.005	2.5		125	85	132			
Lead (Pb)	0.283	0.005	0.25		113	85	120			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method 200.8**

File ID: **091707.B\A034SMPL.D** Batch ID: **18330** Analysis Date: **09/17/2007 20:49**

Sample ID: **07091403-01AMS** Units : **mg/L** Run ID: **ICP/MS_070917A** Prep Date: **09/14/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.293	0.005	0.25	0.03569	103	70	133			
Iron (Fe)	55.3	0.3	50	5.98	99	70	130			
Copper (Cu)	0.28	0.01	0.25	0.03876	96	70	131			
Arsenic (As)	0.269	0.005	0.25	0.01253	103	70	130			
Selenium (Se)	0.249	0.005	0.25	0	99.6	70	131			
Cadmium (Cd)	0.26	0.005	0.25	0	104	70	130			
Barium (Ba)	3.09	0.005	2.5	0.1758	117	70	143			
Lead (Pb)	0.255	0.005	0.25	0.01077	98	70	130			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method 200.8**

File ID: **091707.B\A035SMPL.D** Batch ID: **18330** Analysis Date: **09/17/2007 20:54**

Sample ID: **07091403-01AMSD** Units : **mg/L** Run ID: **ICP/MS_070917A** Prep Date: **09/14/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.28	0.005	0.25	0.03569	98	70	133	0.2932	4.8(20)	
Iron (Fe)	54.9	0.3	50	5.98	98	70	130	55.32	0.7(20)	
Copper (Cu)	0.276	0.01	0.25	0.03876	95	70	131	0.2795	1.1(20)	
Arsenic (As)	0.265	0.005	0.25	0.01253	101	70	130	0.2691	1.6(20)	
Selenium (Se)	0.246	0.005	0.25	0	99	70	131	0.249	1.1(20)	
Cadmium (Cd)	0.254	0.005	0.25	0	102	70	130	0.2598	2.2(20)	
Barium (Ba)	2.97	0.005	2.5	0.1758	112	70	143	3.091	4.1(20)	
Lead (Pb)	0.251	0.005	0.25	0.01077	96	70	130	0.2551	1.6(20)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha Analytical, Inc.

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Date: *24-Sep-07*

QC Summary Report

Work Order: 07091352

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B**

File ID: **07091438.D** Batch ID: **MS08A0914B** Analysis Date: **09/14/2007 23:43**

Sample ID: **MBLK MS08A0914B** Units : **mg/m³** Run ID: **MSD_08_070814B** Prep Date: **09/14/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	ND	10								
Surr: 1,2-Dichloroethane-d4	1.56		2		78	75	128			
Surr: Toluene-d8	2.16		2		108	80	120			
Surr: 4-Bromofluorobenzene	1.91		2		96	80	120			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B**

File ID: **07091436.D** Batch ID: **MS08A0914B** Analysis Date: **09/14/2007 22:52**

Sample ID: **GLCS MS08A0914B** Units : **mg/m³** Run ID: **MSD_08_070814B** Prep Date: **09/14/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	395	10	400		99	70	130			
Surr: 1,2-Dichloroethane-d4	8.24		10		82	75	128			
Surr: Toluene-d8	10		10		100	80	120			
Surr: 4-Bromofluorobenzene	9.31		10		93	80	120			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *24-Sep-07*

QC Summary Report

Work Order: 07091352

Method Blank

Type **MBLK** Test Code: **EPA Method SW8260B**

File ID: **07091438.D** Batch ID: **MS08A0914A** Analysis Date: **09/14/2007 23:43**

Sample ID: **MBLK MS08A0914A** Units : **mg/m³** Run ID: **MSD_08_070814B** Prep Date: **09/14/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Acetone	ND	2								
Tertiary Butyl Alcohol (TBA)	ND	5								
Methyl tert-butyl ether (MTBE)	ND	0.1								
Di-isopropyl Ether (DIPE)	ND	0.2								
Ethyl Tertiary Butyl Ether (ETBE)	ND	0.2								
Benzene	ND	0.1								
Tertiary Amyl Methyl Ether (TAME)	ND	0.2								
Toluene	ND	0.1								
Ethylbenzene	ND	0.1								
m,p-Xylene	ND	0.1								
o-Xylene	ND	0.1								
Surr: 1,2-Dichloroethane-d4	1.56		2		78	75	128			
Surr: Toluene-d8	2.16		2		108	80	120			
Surr: 4-Bromofluorobenzene	1.91		2		96	80	120			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8260B**

File ID: **07091434.D** Batch ID: **MS08A0914A** Analysis Date: **09/14/2007 22:02**

Sample ID: **LCS MS08A0914A** Units : **mg/m³** Run ID: **MSD_08_070814B** Prep Date: **09/14/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	10.9	0.1	10		109	70	130			
Benzene	10.8	0.1	10		108	70	130			
Toluene	10.6	0.1	10		106	80	120			
Ethylbenzene	10.1	0.1	10		101	80	120			
m,p-Xylene	10.1	0.1	10		101	70	130			
o-Xylene	10.1	0.1	10		101	70	130			
Surr: 1,2-Dichloroethane-d4	8.86		10		89	75	128			
Surr: Toluene-d8	9.88		10		99	80	120			
Surr: 4-Bromofluorobenzene	9.78		10		98	80	120			

Comments:

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *24-Sep-07*

QC Summary Report

Work Order: 07091352

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B**

File ID: **D:\MSDCHEM\MS12\DATA\070919\07091934.D** Batch ID: **MS12W0919D** Analysis Date: **09/19/2007 21:12**

Sample ID: **MBLK MS12W0919D** Units : **mg/L** Run ID: **MSD_12_070919B** Prep Date: **09/19/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	ND	0.05								
Surr: 1,2-Dichloroethane-d4	0.0107		0.01		107	75	128			
Surr: Toluene-d8	0.00974		0.01		97	80	120			
Surr: 4-Bromofluorobenzene	0.0104		0.01		104	80	120			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B**

File ID: **D:\MSDCHEM\MS12\DATA\070919\07091933.D** Batch ID: **MS12W0919D** Analysis Date: **09/19/2007 20:49**

Sample ID: **GLCS MS12W0919D** Units : **mg/L** Run ID: **MSD_12_070919B** Prep Date: **09/19/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	0.398	0.05	0.4		100	70	130			
Surr: 1,2-Dichloroethane-d4	0.0109		0.01		109	75	128			
Surr: Toluene-d8	0.00945		0.01		95	80	120			
Surr: 4-Bromofluorobenzene	0.0106		0.01		106	80	120			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B**

File ID: **D:\MSDCHEM\MS12\DATA\070919\07091937.D** Batch ID: **MS12W0919D** Analysis Date: **09/19/2007 22:19**

Sample ID: **07091823-07AGS** Units : **mg/L** Run ID: **MSD_12_070919B** Prep Date: **09/19/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	1.67	0.25	2	0	84	60	131			
Surr: 1,2-Dichloroethane-d4	0.0547		0.05		109	75	128			
Surr: Toluene-d8	0.0475		0.05		95	80	120			
Surr: 4-Bromofluorobenzene	0.0518		0.05		104	80	120			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B**

File ID: **D:\MSDCHEM\MS12\DATA\070919\07091938.D** Batch ID: **MS12W0919D** Analysis Date: **09/19/2007 22:41**

Sample ID: **07091823-07AGSD** Units : **mg/L** Run ID: **MSD_12_070919B** Prep Date: **09/19/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	1.72	0.25	2	0	86	60	131	1.673	2.6(20)	
Surr: 1,2-Dichloroethane-d4	0.0542		0.05		108	75	128			
Surr: Toluene-d8	0.048		0.05		96	80	120			
Surr: 4-Bromofluorobenzene	0.0517		0.05		103	80	120			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: 24-Sep-07

QC Summary Report

Work Order: 07091352

Method Blank

Type **MBLK** Test Code: **EPA Method SW8260B**

File ID: **D:\MSDCHEM\MS12\DATA\070919\07091934.D** Batch ID: **MS12W0919C** Analysis Date: **09/19/2007 21:12**

Sample ID: **MBLK MS12W0919C** Units : **µg/L** Run ID: **MSD_12_070919B** Prep Date: **09/19/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Acetone	ND	10								
Tertiary Butyl Alcohol (TBA)	ND	10								
Methyl tert-butyl ether (MTBE)	ND	0.5								
Di-isopropyl Ether (DIPE)	ND	1								
Ethyl Tertiary Butyl Ether (ETBE)	ND	1								
Benzene	ND	0.5								
Tertiary Amyl Methyl Ether (TAME)	ND	1								
Toluene	ND	0.5								
Ethylbenzene	ND	0.5								
m,p-Xylene	ND	0.5								
o-Xylene	ND	0.5								
Surr: 1,2-Dichloroethane-d4	10.7		10		107	75	128			
Surr: Toluene-d8	9.74		10		97	80	120			
Surr: 4-Bromofluorobenzene	10.4		10		104	80	120			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8260B**

File ID: **D:\MSDCHEM\MS12\DATA\070919\07091930.D** Batch ID: **MS12W0919C** Analysis Date: **09/19/2007 19:42**

Sample ID: **LCS MS12W0919C** Units : **µg/L** Run ID: **MSD_12_070919B** Prep Date: **09/19/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	9.52	0.5	10		95	70	130			
Benzene	9.68	0.5	10		97	70	130			
Toluene	9.24	0.5	10		92	80	120			
Ethylbenzene	9.48	0.5	10		95	80	120			
m,p-Xylene	9.64	0.5	10		96	70	130			
o-Xylene	9.81	0.5	10		98	70	130			
Surr: 1,2-Dichloroethane-d4	12.1		10		121	75	128			
Surr: Toluene-d8	9.21		10		92	80	120			
Surr: 4-Bromofluorobenzene	10.1		10		101	80	120			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8260B**

File ID: **D:\MSDCHEM\MS12\DATA\070919\07091935.D** Batch ID: **MS12W0919C** Analysis Date: **09/19/2007 21:34**

Sample ID: **07091823-07AMS** Units : **µg/L** Run ID: **MSD_12_070919B** Prep Date: **09/19/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	47.2	1.3	50	0	94	62	139			
Benzene	44	1.3	50	0	88	70	130			
Toluene	42.8	1.3	50	0	86	67	130			
Ethylbenzene	44.5	1.3	50	0	89	70	130			
m,p-Xylene	45.8	1.3	50	0	92	69	130			
o-Xylene	46.6	1.3	50	0	93	70	130			
Surr: 1,2-Dichloroethane-d4	56.9		50		114	75	128			
Surr: Toluene-d8	46.2		50		92	80	120			
Surr: 4-Bromofluorobenzene	50.5		50		101	80	120			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8260B**

File ID: **D:\MSDCHEM\MS12\DATA\070919\07091936.D** Batch ID: **MS12W0919C** Analysis Date: **09/19/2007 21:56**

Sample ID: **07091823-07AMSD** Units : **µg/L** Run ID: **MSD_12_070919B** Prep Date: **09/19/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	47.6	1.3	50	0	95	62	139	47.23	0.8(20)	
Benzene	45.6	1.3	50	0	91	70	130	43.97	3.6(20)	
Toluene	44.2	1.3	50	0	88	67	130	42.76	3.3(20)	
Ethylbenzene	45.6	1.3	50	0	91	70	130	44.53	2.5(20)	
m,p-Xylene	46.2	1.3	50	0	92	69	130	45.76	1.0(20)	
o-Xylene	47.2	1.3	50	0	94	70	130	46.56	1.4(20)	
Surr: 1,2-Dichloroethane-d4	56.1		50		112	75	128			
Surr: Toluene-d8	46.8		50		94	80	120			
Surr: 4-Bromofluorobenzene	51.3		50		103	80	120			

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *24-Sep-07*

QC Summary Report

Work Order: 07091352

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

AMENDED

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : PES07091352

Report Due By : 5:00 PM On : 27-Sep-07

Client:
Prima Environmental
10265 Old Placerville Rd.
Suite 15
Sacramento, CA 95827-3042

Cindy Schreier
TEL : (916) 363-8798 x
FAX : (916) 363-8829
EMail data@primaenvironmental.com

EDD Required : **No**

Sampled by : BB

Report Attention : Cindy Schreier
CC Report :

Job : Golder-Livermore
PO :

Client's COC # : 20816

Cooler Temp	Samples Received	Date Printed
4 °C	13-Sep-07	**13-Sep-07**

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles ORG	SUB	TAT	PWS #	Requested Tests METALS_A Q	TPH/P_A	TPH/P_W	VOC_A	VOC_W				Sample Remarks
PES07091352-01A	Gold-Liv-03-TO	AQ	09/12/07 13:00	4	0	10		As, Ba, Cd, Cr, Cu, Fe, Pb, Se		GAS-C		BTEX/OXY/ Acetone_C				
PES07091352-02A	Gold-Liv-03-Con-A	AQ	09/12/07 13:00	4	0	10		As, Ba, Cd, Cr, Cu, Fe, Pb, Se		GAS-C		BTEX/OXY/ Acetone_C				
PES07091352-03A	Gold-Liv-03-Test-A	AQ	09/12/07 13:00	4	0	10		As, Ba, Cd, Cr, Cu, Fe, Pb, Se		GAS-C		BTEX/OXY/ Acetone_C				
PES07091352-04A	Gold-Liv-03-Test-A(T)	AR	09/12/07 11:45	1	0	10			GAS-N/C		BTEX/OXY/ Acetone					Tedlar

Comments: Security seals intact. Frozen ice. Amended 9/13/07 to note that all voas will be rec'd 9/14/07, per Edana. TD. :

	Signature	Print Name	Company	Date/Time
Logged in by:	Tara Dickinson	Tara Dickinson	**Alpha Analytical, Inc.**	9/13/07 1107

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information :

CHAIN-OF-CUSTODY RECORD

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

CA

WorkOrder : PES07091352

Report Due By : 5:00 PM On : 27-Sep-07

Client:
Prima Environmental
10265 Old Placerville Rd.
Suite 15
Sacramento, CA 95827-3042

Cindy Schreier
TEL : (916) 363-8798 x
FAX : (916) 363-8829
EMail data@primaenvironmental.com

EDD Required : **No**

Sampled by : BB

Report Attention : Cindy Schreier
CC Report :

Job : Golder-Livermore
PO :

Client's COC # : 20816

Cooler Temp	Samples Received	Date Printed
4 °C	13-Sep-07	13-Sep-07

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles ORG	SUB	TAT	PWS #	Requested Tests METALS_AQ	TPH/P_A	TPH/P_W	VOC_A	VOC_W				Sample Remarks
PES07091352-01A	Gold-Liv-03-TO	AQ	09/12/07 13:00	4	0	10		As, Ba, Cd, Cr, Cu, Fe, Pb, Se		GAS-C		BTEX/OXY/ Acetone_C				
PES07091352-02A	Gold-Liv-03-Con-A	AQ	09/12/07 13:00	4	0	10		As, Ba, Cd, Cr, Cu, Fe, Pb, Se		GAS-C		BTEX/OXY/ Acetone_C				
PES07091352-03A	Gold-Liv-03-Test-A	AQ	09/12/07 13:00	4	0	10		As, Ba, Cd, Cr, Cu, Fe, Pb, Se		GAS-C		BTEX/OXY/ Acetone_C				
PES07091352-04A	Gold-Liv-03-Test-A(T)	AR	09/12/07 11:45	1	0	10			GAS-N/C		BTEX/OXY/ Acetone					Tedlar

Comments: Security seals intact. Frozen ice. :

	Signature	Print Name	Company	Date/Time
Logged in by:	Dana Dickinson	Dana Dickinson	Alpha Analytical, Inc.	9/13/07 1019

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

20816

Billing Information:

Name _____

Address _____

City, State, Zip _____

Ph _____

Cl _____

A _____

C _____

PRIMA ENVIRONMENTAL
10265 Old Placerville Rd, Ste 15
Sacramento, CA 95827-3042
PH: 916-363-8798
FAX: 916-363-8829

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431-5778
Phone (775) 355-1044
Fax (775) 355-0406

Samples Collected From Which State?
AZ ___ ***CA*** ___ ***NV*** ___ ***WA*** ___
ID ___ ***OR*** ___ ***OTHER*** ___ ***Page #*** ___ ***of*** ___

P.O. # | Job # Golder-Livermore

EMail Ad **data@primaenvironmental.com**

Phone # | Fax #

Required QC Level? I II III IV

EDD / EDF? YES ___ ***NO*** ___

Global ID # _____

Time Sampled	Date Sampled	Matrix* See Key Below	Sampled by BB / Lab ID Number (Office Use Only)	Report Attention Cindy Schreier / Sample Description	TAT	Field Filtered	Total and type of containers ** See below	Analyses Required: Oxy's *	GRO	BTXE	Acetone	8020 *			REMARKS
1300	9-12	AQ	PES0709135?-01	Gold. Liv. 03. TB	std		various	X	X	X	X	X			Oxys = MTBE, TBA, ETBE, TAME, DIPE
↓	↓	↓	-02	· 03. Con. A	↓		↓	X	X	X	X	X			
↓	↓	↓	-03	· 03. Test A	↓		↓	X	X	X	X	X			
1145	↓	AR	-04	Gold. Liv. 03. Test. A (T)	↓		1XT	X	X	X	X				metals = As, Ba, Cd, Cr, Cu, Fe, Pb, Se

ADDITIONAL INSTRUCTIONS:

	Signature	Print Name	Company	Date	Time
Relinquished by	Beth Brewer	Beth Brewer	PRIMA	9.12.07	1420
Received by	L. de Silva	Lisa de Silva	ALPHA	9-12-07	1420
Relinquished by					
Received by	Dale Dickinson	Dale Dickinson	Alpha	9/13/07	1021
Relinquished by					
Received by					

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air **: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this coc. The liability of the laboratory is limited to the amount paid for the report.

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Prima Environmental
10265 Old Placerville Rd.
Sacramento, CA 958273042

Attn: Cindy Schreier
Phone: (916) 363-8798
Fax: (916) 363-8829
Date Received : 09/14/07

Job#: Golder-Livermore

Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B
Volatile Organic Compounds (VOCs) EPA Method SW8260B

	Parameter	Concentration		Reporting Limit	Date Sampled	Date Analyzed
Client ID :	TPH-P (GRO)	ND		0.050 mg/L	09/13/07	09/20/07
Gold-Liv-03-Test B	Acetone	730		10 µg/L	09/13/07	09/20/07
Lab ID :	Tertiary Butyl Alcohol (TBA)	10		10 µg/L	09/13/07	09/20/07
PES07091454-01A	Methyl tert-butyl ether (MTBE)	ND		0.50 µg/L	09/13/07	09/20/07
	Di-isopropyl Ether (DIPE)	ND		1.0 µg/L	09/13/07	09/20/07
	Ethyl Tertiary Butyl Ether (ETBE)	ND		1.0 µg/L	09/13/07	09/20/07
	Benzene	ND		0.50 µg/L	09/13/07	09/20/07
	Tertiary Amyl Methyl Ether (TAME)	ND		1.0 µg/L	09/13/07	09/20/07
	Toluene	ND		0.50 µg/L	09/13/07	09/20/07
	Ethylbenzene	ND		0.50 µg/L	09/13/07	09/20/07
	m,p-Xylene	ND		0.50 µg/L	09/13/07	09/20/07
	o-Xylene	ND		0.50 µg/L	09/13/07	09/20/07
Client ID :	TPH-P (GRO)	22		2.0 mg/L	09/13/07	09/20/07
Gold-Liv-03-Con B	Acetone	ND	V	400 µg/L	09/13/07	09/20/07
Lab ID :	Tertiary Butyl Alcohol (TBA)	ND	V	200 µg/L	09/13/07	09/20/07
PES07091454-02A	Methyl tert-butyl ether (MTBE)	51		10 µg/L	09/13/07	09/20/07
	Di-isopropyl Ether (DIPE)	ND	V	20 µg/L	09/13/07	09/20/07
	Ethyl Tertiary Butyl Ether (ETBE)	ND	V	20 µg/L	09/13/07	09/20/07
	Benzene	15		10 µg/L	09/13/07	09/20/07
	Tertiary Amyl Methyl Ether (TAME)	ND	V	20 µg/L	09/13/07	09/20/07
	Toluene	ND	V	10 µg/L	09/13/07	09/20/07
	Ethylbenzene	91		10 µg/L	09/13/07	09/20/07
	m,p-Xylene	1,200		10 µg/L	09/13/07	09/20/07
	o-Xylene	160		10 µg/L	09/13/07	09/20/07
Client ID :	TPH-P (GRO)	ND		15 mg/m³	09/13/07	09/18/07
Gold-Liv-03-Test B(T)	Acetone	ND		3.0 mg/m³	09/13/07	09/18/07
Lab ID :	Tertiary Butyl Alcohol (TBA)	ND		7.5 mg/m³	09/13/07	09/18/07
PES07091454-03A	Methyl tert-butyl ether (MTBE)	ND		0.15 mg/m³	09/13/07	09/18/07
	Di-isopropyl Ether (DIPE)	ND		0.30 mg/m³	09/13/07	09/18/07
	Ethyl Tertiary Butyl Ether (ETBE)	ND		0.30 mg/m³	09/13/07	09/18/07
	Benzene	ND		0.15 mg/m³	09/13/07	09/18/07
	Tertiary Amyl Methyl Ether (TAME)	ND		0.30 mg/m³	09/13/07	09/18/07
	Toluene	0.33		0.15 mg/m³	09/13/07	09/18/07
	Ethylbenzene	ND		0.15 mg/m³	09/13/07	09/18/07
	m,p-Xylene	0.28		0.15 mg/m³	09/13/07	09/18/07
	o-Xylene	ND		0.15 mg/m³	09/13/07	09/18/07

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Gasoline Range Organics (GRO) C4-C13

Note: For sample 03A Concentrations of air in a Tedlar Bag are at 21 degrees Celsius and 25.58 inches of mercury.

V = Reporting Limits were increased due to high concentrations of target analytes.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

9/27/07

Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

VOC Sample Preservation Report

Work Order: PES07091454 **Project:** Golder-Livermore

Alpha's Sample ID	Client's Sample ID	Matrix	pH
07091454-01A	Gold-Liv-03-Test B	Aqueous	2
07091454-02A	Gold-Liv-03-Con B	Aqueous	2

9/27/07

Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Prima Environmental
10265 Old Placerville Rd.
Sacramento, CA 958273042

Attn: Cindy Schreier
Phone: (916) 363-8798
Fax: (916) 363-8829
Date Received : 09/14/07

Job#: Golder-Livermore

Metals by ICPMS
EPA Method SW6020

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**Gold-Liv-03-Test B**					
Lab ID :	PES07091454-01A	Chromium (Cr)	0.32	0.0050 mg/L	09/13/07	09/18/07
		Iron (Fe)	0.49	0.30 mg/L	09/13/07	09/18/07
		Copper (Cu)	ND	0.010 mg/L	09/13/07	09/18/07
		Arsenic (As)	ND	0.0050 mg/L	09/13/07	09/18/07
		Selenium (Se)	ND	0.0050 mg/L	09/13/07	09/18/07
		Cadmium (Cd)	ND	0.0050 mg/L	09/13/07	09/18/07
		Barium (Ba)	0.69	0.0050 mg/L	09/13/07	09/18/07
		Lead (Pb)	ND	0.0050 mg/L	09/13/07	09/18/07
Client ID :	**Gold-Liv-03-Con B**					
Lab ID :	PES07091454-02A	Chromium (Cr)	ND	0.0050 mg/L	09/13/07	09/18/07
		Iron (Fe)	ND	0.30 mg/L	09/13/07	09/18/07
		Copper (Cu)	ND	0.010 mg/L	09/13/07	09/18/07
		Arsenic (As)	ND	0.0050 mg/L	09/13/07	09/18/07
		Selenium (Se)	ND	0.0050 mg/L	09/13/07	09/18/07
		Cadmium (Cd)	ND	0.0050 mg/L	09/13/07	09/18/07
		Barium (Ba)	0.57	0.0050 mg/L	09/13/07	09/18/07
		Lead (Pb)	ND	0.0050 mg/L	09/13/07	09/18/07

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

9/27/07
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *25-Sep-07*

QC Summary Report

Work Order: 07091454

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B**

File ID: **07091737.D** Batch ID: **MS08A0917B** Analysis Date: **09/17/2007 22:14**

Sample ID: **MBLK MS08A0917B** Units : **mg/m³** Run ID: **MSD_08_070917B** Prep Date: **09/17/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	ND	10								
Surr: 1,2-Dichloroethane-d4	1.53		2		77	75	128			
Surr: Toluene-d8	2.17		2		109	80	120			
Surr: 4-Bromofluorobenzene	1.89		2		95	80	120			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B**

File ID: **07091735.D** Batch ID: **MS08A0917B** Analysis Date: **09/17/2007 21:31**

Sample ID: **GLCS MS08A0917B** Units : **mg/m³** Run ID: **MSD_08_070917B** Prep Date: **09/17/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	350	10	400		88	70	130			
Surr: 1,2-Dichloroethane-d4	8.03		10		80	75	128			
Surr: Toluene-d8	10.2		10		102	80	120			
Surr: 4-Bromofluorobenzene	9.44		10		94	80	120			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *25-Sep-07*

QC Summary Report

Work Order: 07091454

Method Blank

Type **MBLK** Test Code: **EPA Method SW8260B**

File ID: **07091737.D** Batch ID: **MS08A0917A** Analysis Date: **09/17/2007 22:14**

Sample ID: **MBLK MS08A0917A** Units : **mg/m³** Run ID: **MSD_08_070917B** Prep Date: **09/17/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Acetone	ND	2								
Tertiary Butyl Alcohol (TBA)	ND	5								
Methyl tert-butyl ether (MTBE)	ND	0.1								
Di-isopropyl Ether (DIPE)	ND	0.2								
Ethyl Tertiary Butyl Ether (ETBE)	ND	0.2								
Benzene	ND	0.1								
Tertiary Amyl Methyl Ether (TAME)	ND	0.2								
Toluene	ND	0.1								
Ethylbenzene	ND	0.1								
m,p-Xylene	ND	0.1								
o-Xylene	ND	0.1								
Surr: 1,2-Dichloroethane-d4	1.53		2		77	75	128			
Surr: Toluene-d8	2.17		2		109	80	120			
Surr: 4-Bromofluorobenzene	1.89		2		95	80	120			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8260B**

File ID: **07091734.D** Batch ID: **MS08A0917A** Analysis Date: **09/17/2007 21:09**

Sample ID: **LCS MS08A0917A** Units : **mg/m³** Run ID: **MSD_08_070917B** Prep Date: **09/17/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	10.6	0.1	10		106	70	130			
Benzene	10.4	0.1	10		104	70	130			
Toluene	10.1	0.1	10		101	80	120			
Ethylbenzene	9.68	0.1	10		97	80	120			
m,p-Xylene	9.82	0.1	10		98	70	130			
o-Xylene	9.74	0.1	10		97	70	130			
Surr: 1,2-Dichloroethane-d4	8.45		10		85	75	128			
Surr: Toluene-d8	9.86		10		99	80	120			
Surr: 4-Bromofluorobenzene	9.21		10		92	80	120			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *25-Sep-07*

QC Summary Report

Work Order: 07091454

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B**

File ID: **07092031.D** Batch ID: **MS08W0920B** Analysis Date: **09/20/2007 19:21**

Sample ID: **MBLK MS08W0920B** Units : **mg/L** Run ID: **MSD_08_070920B** Prep Date: **09/20/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	ND	0.05								
Surr: 1,2-Dichloroethane-d4	0.00747		0.01		75	75	128			
Surr: Toluene-d8	0.0107		0.01		107	80	120			
Surr: 4-Bromofluorobenzene	0.00912		0.01		91	80	120			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B**

File ID: **07092034.D** Batch ID: **MS08W0920B** Analysis Date: **09/20/2007 20:27**

Sample ID: **GLCS MS08W0920B** Units : **mg/L** Run ID: **MSD_08_070920B** Prep Date: **09/20/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	0.416	0.05	0.4		104	70	130			
Surr: 1,2-Dichloroethane-d4	0.00763		0.01		76	75	128			
Surr: Toluene-d8	0.0103		0.01		103	80	120			
Surr: 4-Bromofluorobenzene	0.00948		0.01		95	80	120			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B**

File ID: **07092038.D** Batch ID: **MS08W0920B** Analysis Date: **09/20/2007 21:53**

Sample ID: **07091457-03AGS** Units : **mg/L** Run ID: **MSD_08_070920B** Prep Date: **09/20/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	2.38	0.25	2	0.1619	111	60	131			
Surr: 1,2-Dichloroethane-d4	0.0381		0.05		76	75	128			
Surr: Toluene-d8	0.0504		0.05		101	80	120			
Surr: 4-Bromofluorobenzene	0.0459		0.05		92	80	120			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B**

File ID: **07092039.D** Batch ID: **MS08W0920B** Analysis Date: **09/20/2007 22:15**

Sample ID: **07091457-03AGSD** Units : **mg/L** Run ID: **MSD_08_070920B** Prep Date: **09/20/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	2.34	0.25	2	0.1619	109	60	131	2.384	2.0(20)	
Surr: 1,2-Dichloroethane-d4	0.038		0.05		76	75	128			
Surr: Toluene-d8	0.0508		0.05		102	80	120			
Surr: 4-Bromofluorobenzene	0.0459		0.05		92	80	120			

Comments:

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Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: 25-Sep-07

QC Summary Report

Work Order: 07091454

Method Blank

Type **MBLK** Test Code: **EPA Method SW8260B**

File ID: **07092031.D** Batch ID: **MS08W0920A** Analysis Date: **09/20/2007 19:21**

Sample ID: **MBLK MS08W0920A** Units : **µg/L** Run ID: **MSD_08_070920B** Prep Date: **09/20/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Acetone	ND	10								
Tertiary Butyl Alcohol (TBA)	ND	10								
Methyl tert-butyl ether (MTBE)	ND	0.5								
Di-isopropyl Ether (DIPE)	ND	1								
Ethyl Tertiary Butyl Ether (ETBE)	ND	1								
Benzene	ND	0.5								
Tertiary Amyl Methyl Ether (TAME)	ND	1								
Toluene	ND	0.5								
Ethylbenzene	ND	0.5								
m,p-Xylene	ND	0.5								
o-Xylene	ND	0.5								
Surr: 1,2-Dichloroethane-d4	7.47		10		75	75	128			
Surr: Toluene-d8	10.7		10		107	80	120			
Surr: 4-Bromofluorobenzene	9.12		10		91	80	120			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8260B**

File ID: **07092032.D** Batch ID: **MS08W0920A** Analysis Date: **09/20/2007 19:43**

Sample ID: **LCS MS08W0920A** Units : **µg/L** Run ID: **MSD_08_070920B** Prep Date: **09/20/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	10.7	0.5	10		107	70	130			
Benzene	10.8	0.5	10		108	70	130			
Toluene	10.6	0.5	10		106	80	120			
Ethylbenzene	10.1	0.5	10		101	80	120			
m,p-Xylene	10.3	0.5	10		103	70	130			
o-Xylene	10.3	0.5	10		103	70	130			
Surr: 1,2-Dichloroethane-d4	7.77		10		78	75	128			
Surr: Toluene-d8	10		10		100	80	120			
Surr: 4-Bromofluorobenzene	9.43		10		94	80	120			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8260B**

File ID: **07092036.D** Batch ID: **MS08W0920A** Analysis Date: **09/20/2007 21:10**

Sample ID: **07091457-03AMS** Units : **µg/L** Run ID: **MSD_08_070920B** Prep Date: **09/20/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	172	1.3	50	108.1	128	62	139			
Benzene	54.6	1.3	50	0.98	107	70	130			
Toluene	53.6	1.3	50	0	107	67	130			
Ethylbenzene	49.9	1.3	50	0	99.9	70	130			
m,p-Xylene	51.2	1.3	50	0	102	69	130			
o-Xylene	50.7	1.3	50	0	101	70	130			
Surr: 1,2-Dichloroethane-d4	38.8		50		78	75	128			
Surr: Toluene-d8	50.7		50		101	80	120			
Surr: 4-Bromofluorobenzene	49.2		50		98	80	120			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8260B**

File ID: **07092037.D** Batch ID: **MS08W0920A** Analysis Date: **09/20/2007 21:32**

Sample ID: **07091457-03AMSD** Units : **µg/L** Run ID: **MSD_08_070920B** Prep Date: **09/20/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Methyl tert-butyl ether (MTBE)	176	1.3	50	108.1	136	62	139	172.3	2.1(20)	
Benzene	52.7	1.3	50	0.98	104	70	130	54.58	3.5(20)	
Toluene	51.1	1.3	50	0	102	67	130	53.57	4.8(20)	
Ethylbenzene	48.7	1.3	50	0	97	70	130	49.94	2.6(20)	
m,p-Xylene	49.3	1.3	50	0	99	69	130	51.22	3.8(20)	
o-Xylene	50	1.3	50	0	100	70	130	50.74	1.4(20)	
Surr: 1,2-Dichloroethane-d4	38.3		50		77	75	128			
Surr: Toluene-d8	49.8		50		99.5	80	120			
Surr: 4-Bromofluorobenzene	48.2		50		96	80	120			

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *25-Sep-07*

QC Summary Report

Work Order: 07091454

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: 21-Sep-07

QC Summary Report

Work Order: 07091454

Method Blank

Type **MBLK** Test Code: **EPA Method 200.8**

File ID: **091707.B\019_ICB.D** Batch ID: **18356** Analysis Date: **09/18/2007 18:04**

Sample ID: **MB-18356** Units : **mg/L** Run ID: **ICP/MS_070918B** Prep Date: **09/18/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	ND	0.005								
Iron (Fe)	ND	0.3								
Copper (Cu)	ND	0.01								
Arsenic (As)	ND	0.005								
Selenium (Se)	ND	0.005								
Cadmium (Cd)	ND	0.005								
Barium (Ba)	ND	0.005								
Lead (Pb)	ND	0.005								

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method 200.8**

File ID: **091707.B\020_LCS.D** Batch ID: **18356** Analysis Date: **09/18/2007 18:09**

Sample ID: **LCS-18356** Units : **mg/L** Run ID: **ICP/MS_070918B** Prep Date: **09/18/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.291	0.005	0.25		116	80	124			
Iron (Fe)	53.7	0.3	50		107	83	119			
Copper (Cu)	0.289	0.01	0.25		116	85	123			
Arsenic (As)	0.272	0.005	0.25		109	85	118			
Selenium (Se)	0.272	0.005	0.25		109	85	118			
Cadmium (Cd)	0.276	0.005	0.25		110	85	121			
Barium (Ba)	2.93	0.005	2.5		117	85	132			
Lead (Pb)	0.268	0.005	0.25		107	85	120			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method 200.8**

File ID: **091707.B\023SMPL.D** Batch ID: **18356** Analysis Date: **09/18/2007 18:24**

Sample ID: **07091757-01AMS** Units : **mg/L** Run ID: **ICP/MS_070918B** Prep Date: **09/18/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.219	0.005	0.25	0	88	70	133			
Iron (Fe)	44.8	0.3	50	0.8243	88	70	130			
Copper (Cu)	0.234	0.01	0.25	0.02069	85	70	131			
Arsenic (As)	0.227	0.005	0.25	0	91	70	130			
Selenium (Se)	0.228	0.005	0.25	0	91	70	131			
Cadmium (Cd)	0.228	0.005	0.25	0.01452	86	70	130			
Barium (Ba)	2.65	0.005	2.5	0.1766	99	70	143			
Lead (Pb)	0.224	0.005	0.25	0	90	70	130			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method 200.8**

File ID: **091707.B\024SMPL.D** Batch ID: **18356** Analysis Date: **09/18/2007 18:29**

Sample ID: **07091757-01AMSD** Units : **mg/L** Run ID: **ICP/MS_070918B** Prep Date: **09/18/2007**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chromium (Cr)	0.252	0.005	0.25	0	101	70	133	0.2189	13.9(20)	
Iron (Fe)	49.2	0.3	50	0.8243	97	70	130	44.78	9.4(20)	
Copper (Cu)	0.25	0.01	0.25	0.02069	92	70	131	0.2341	6.6(20)	
Arsenic (As)	0.244	0.005	0.25	0	98	70	130	0.2271	7.1(20)	
Selenium (Se)	0.238	0.005	0.25	0	95	70	131	0.228	4.1(20)	
Cadmium (Cd)	0.247	0.005	0.25	0.01452	93	70	130	0.2283	7.7(20)	
Barium (Ba)	2.82	0.005	2.5	0.1766	106	70	143	2.647	6.2(20)	
Lead (Pb)	0.238	0.005	0.25	0	95	70	130	0.2244	5.9(20)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Billing Information :

CHAIN-OF-CUSTODY RECORD

CA

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : PES07091454

Report Due By : 5:00 PM On : 28-Sep-07

Client:
Prima Environmental
10265 Old Placerville Rd.
Suite 15
Sacramento, CA 95827-3042

Cindy Schreier
TEL : (916) 363-8798 x
FAX : (916) 363-8829
EMail data@primaenvironmental.com

EDD Required : **No**

Sampled by : BB

Report Attention : Cindy Schreier
CC Report :

Job : Golder-Livermore
PO :

Client's COC # : 20820

Cooler Temp	Samples Received	Date Printed
4 °C	14-Sep-07	**14-Sep-07**

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles ORG	SUB	TAT	PWS #	Requested Tests METALS_AQ	TPH/P_A	TPH/P_W	VOC_A	VOC_W				Sample Remarks
PES07091454-01A	Gold-Liv-03-Test B	AQ	09/13/07 13:00	4	0	10		As, Ba, Cd, Cr, Cu, Fe, Pb, Se		GAS-C		BTEX/OXY/Acetone_C				
PES07091454-02A	Gold-Liv-03-Con B	AQ	09/13/07 13:00	4	0	10		As, Ba, Cd, Cr, Cu, Fe, Pb, Se		GAS-C		BTEX/OXY/Acetone_C				
PES07091454-03A	Gold-Liv-03-Test B(T)	AR	09/13/07 11:00	1	0	10			GAS-N/C		BTEX/OXY/Acetone					Tedlar

Comments: Security seals intact. Frozen ice. :

	Signature	Print Name	Company	Date/Time
Logged in by:	Nana Dickinson	Nana Dickinson	**Alpha Analytical, Inc.**	9/14/07 1049

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

20820

Billing Information:

Name _____

Address _____

City State Zip _____

Phone _____

PRIMA ENVIRONMENTAL, INC.
10265 Old Placerville Rd., #15
Sacramento, CA 95827
PH: 916-363-8798
FAX: 916-363-8829

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431-5778
Phone (775) 355-1044
Fax (775) 355-0406

Samples Collected From Which State?
AZ ___ CA X NV ___ WA ___
ID ___ OR ___ OTHER ___

Page # 1 of 1

P.O. # _____ Job # GOLDER-Livermore

EMail Address data@primaenvironmental.com

Phone # _____ Fax # _____

Required QC Level? I II III IV

EDD / EDF? YES ___ NO ___

Global ID # _____

Time Sampled	Date Sampled	Matrix* See Key Below	Sampled by KT Lab ID Number (Office Use Only)	Report Attention Cindy SCHREIER Sample Description	TAT	Field Filtered	Total and type of containers ** See below	Analyses Required: Oxy's *	GRO	BTXE	ACETONE	6020 *			REMARKS
1300	9/13	AQ	RESO709145A-01	GOLD·LIV·03·TEST B	Std	X	various	X	X	X	X	X			Oxys = MTBE
↓	↓	↓	-02	CONB	Std	X		X	X	X	X	X			TBA ETBE
1100	9/13	AR	-03	Gold·Liv 03Test·B (T)	Std		1xT	X	X	X	X				TAME DIPE
															Metals =
															As, Ba, Cd, Cr
															Cu, Fe, Pb, Se

ADDITIONAL INSTRUCTIONS:

	Signature	Print Name	Company	Date	Time
Relinquished by	Kelly Tripp	Kelly Tripp	PRIMA	9.13.07	14.15
Received by	Lisa de Silva	Lisa de Silva	ALPHA	9-13-07	1415
Relinquished by					
Received by	Tara Dickinson	Tara Dickinson	Alpha	9/14/07	1011
Relinquished by					
Received by					

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other AR - Air **: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this coc. The liability of the laboratory is limited to the amount paid for the report.

EXCELCHEM
Environmental Labs

1135 W Sunset Boulevard
Suite A
Rocklin, CA 95765
Phone# 916-543-4445
Fax# 916-543-4449

ELAP Certificate No. : 2119

14 September 2007

Cindy Schreier

Prima Environmental

10265 Old Placerville Rd #15

Sacramento, CA 95827

RE: Golder-Livermore

Workorder number:0709052

Enclosed are the results of analyses for samples received by the laboratory on 09/12/07 15:35. All Quality Control results are within acceptable limits except where noted as a case narrative. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

_____

John Somers, Lab Director

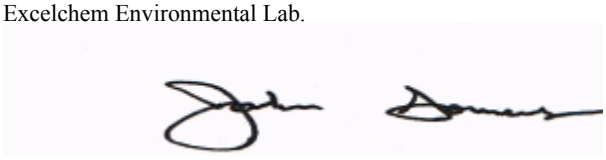
Excelchem Environmental Labs

Prima Environmental	Project:	Golder-Livermore	
10265 Old Placerville Rd #15	Project Number:	[none]	Date Reported:
Sacramento, CA 95827	Project Manager:	Cindy Schreier	09/14/07 08:26

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GOLD-LIV-GW	0709052-01	Water	09/12/07 13:00	09/12/07 15:35
GOLD-LIV-O3-CON-A	0709052-02	Water	09/12/07 13:00	09/12/07 15:35
GOLD-LIV-O3-TEST A	0709052-03	Water	09/12/07 13:00	09/12/07 15:35
GOLD-LIV-SOIL	0709052-04	Soil	09/12/07 13:00	09/12/07 15:35
GOLD-LIV-O3-O3-T0	0709052-05	Water	09/12/07 13:00	09/12/07 15:35

Excelchem Environmental Lab.



Laboratory Representative

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Excelchem Environmental Labs

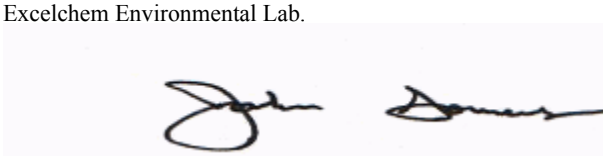
Prima Environmental	Project:	Golder-Livermore	
10265 Old Placerville Rd #15	Project Number:	[none]	Date Reported:
Sacramento, CA 95827	Project Manager:	Cindy Schreier	09/14/07 08:26

GOLD-LIV-GW

0709052-01 (Water)

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
Ion Chromatography								
Hexavalent Chromium	ND	1.0	ug/l	AQI0091	09/13/07	09/13/07	EPA 7199	

Excelchem Environmental Lab.



Laboratory Representative

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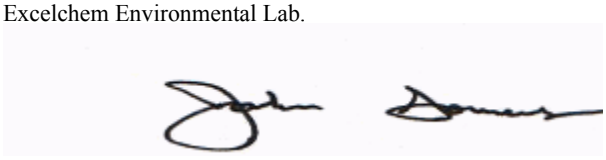
Excelchem Environmental Labs

Prima Environmental	Project:	Golder-Livermore	
10265 Old Placerville Rd #15	Project Number:	[none]	Date Reported:
Sacramento, CA 95827	Project Manager:	Cindy Schreier	09/14/07 08:26

GOLD-LIV-O3-CON-A
0709052-02 (Water)

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
Ion Chromatography								
Hexavalent Chromium	ND	1.0	ug/l	AQI0091	09/13/07	09/13/07	EPA 7199	

Excelchem Environmental Lab.



Laboratory Representative

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Excelchem Environmental Labs

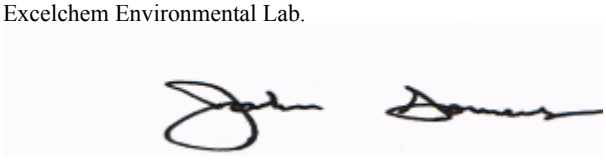
Prima Environmental	Project:	Golder-Livermore	
10265 Old Placerville Rd #15	Project Number:	[none]	Date Reported:
Sacramento, CA 95827	Project Manager:	Cindy Schreier	09/14/07 08:26

GOLD-LIV-O3-TEST A

0709052-03 (Water)

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
Ion Chromatography								
Hexavalent Chromium	**40.5**	1.0	ug/l	AQI0091	09/13/07	09/13/07	EPA 7199	

Excelchem Environmental Lab.



Laboratory Representative

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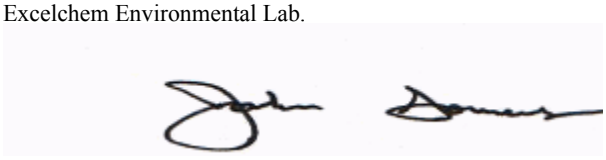
Excelchem Environmental Labs

Prima Environmental	Project:	Golder-Livermore	
10265 Old Placerville Rd #15	Project Number:	[none]	Date Reported:
Sacramento, CA 95827	Project Manager:	Cindy Schreier	09/14/07 08:26

GOLD-LIV-SOIL
0709052-04 (Soil)

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
Ion Chromatography								
Hexavalent Chromium	ND	0.001	mg/kg	AQI0081	09/13/07	09/13/07	EPA 7199	

Excelchem Environmental Lab.



Laboratory Representative

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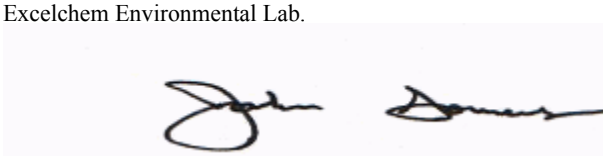
Excelchem Environmental Labs

Prima Environmental	Project:	Golder-Livermore	
10265 Old Placerville Rd #15	Project Number:	[none]	Date Reported:
Sacramento, CA 95827	Project Manager:	Cindy Schreier	09/14/07 08:26

GOLD-LIV-O3-O3-T0
0709052-05 (Water)

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
Ion Chromatography								
Hexavalent Chromium	ND	1.0	ug/l	AQI0091	09/13/07	09/13/07	EPA 7199	

Excelchem Environmental Lab.



Laboratory Representative

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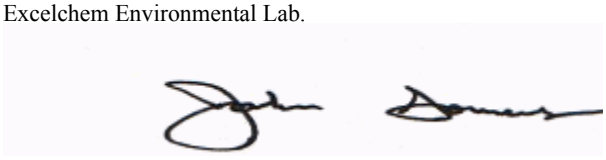
Excelchem Environmental Labs

Prima Environmental	Project:	Golder-Livermore	
10265 Old Placerville Rd #15	Project Number:	[none]	Date Reported:
Sacramento, CA 95827	Project Manager:	Cindy Schreier	09/14/07 08:26

Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch AQI0081 - EPA 7199										
Blank (AQI0081-BLK1)				Prepared & Analyzed: 09/13/07						
Hexavalent Chromium	ND	0.001	mg/kg							
LCS (AQI0081-BS1)				Prepared & Analyzed: 09/13/07						
Hexavalent Chromium	0.01	0.001	mg/kg	0.0100		100	80-120			
LCS Dup (AQI0081-BSD1)				Prepared & Analyzed: 09/13/07						
Hexavalent Chromium	0.01	0.001	mg/kg	0.0100		100	80-120	0.00	20	
Matrix Spike (AQI0081-MS1)		**Source: 0709016-01**		Prepared & Analyzed: 09/13/07						
Hexavalent Chromium	0.01	0.001	mg/kg	0.0100	0.00	100	75-125			
Matrix Spike Dup (AQI0081-MSD1)		**Source: 0709016-01**		Prepared & Analyzed: 09/13/07						
Hexavalent Chromium	0.01	0.001	mg/kg	0.0100	0.00	100	75-125	0.00	20	
Batch AQI0091 - EPA 7199										
Blank (AQI0091-BLK1)				Prepared & Analyzed: 09/13/07						
Hexavalent Chromium	ND	1.0	ug/l							
LCS (AQI0091-BS1)				Prepared & Analyzed: 09/13/07						
Hexavalent Chromium	11.9	1.0	ug/l	10.0		119	80-120			
LCS Dup (AQI0091-BSD1)				Prepared & Analyzed: 09/13/07						
Hexavalent Chromium	11.9	1.0	ug/l	10.0		119	80-120	0.00	20	
Matrix Spike (AQI0091-MS1)		**Source: 0709052-01**		Prepared & Analyzed: 09/13/07						
Hexavalent Chromium	10.3	1.0	ug/l	10.0	ND	103	75-125			

Excelchem Environmental Lab.



Laboratory Representative

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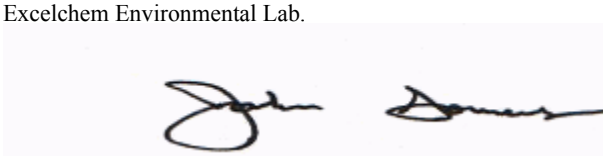
Excelchem Environmental Labs

Prima Environmental	Project:	Golder-Livermore	
10265 Old Placerville Rd #15	Project Number:	[none]	Date Reported:
Sacramento, CA 95827	Project Manager:	Cindy Schreier	09/14/07 08:26

Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch AQI0091 - EPA 7199										
Matrix Spike Dup (AQI0091-MSD1)		**Source: 0709052-01**		Prepared & Analyzed: 09/13/07						
Hexavalent Chromium	10.7	1.0	ug/l	10.0	ND	107	75-125	3.81	20	

Excelchem Environmental Lab.



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Excelchem Environmental Labs

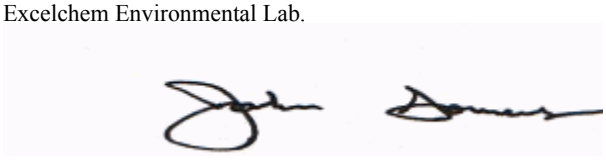
Prima Environmental	Project:	Golder-Livermore	
10265 Old Placerville Rd #15	Project Number:	[none]	Date Reported:
Sacramento, CA 95827	Project Manager:	Cindy Schreier	09/14/07 08:26

Notes and Definitions

ND - Analyte not detected at reporting limit.

NR - Not reported

Excelchem Environmental Lab.



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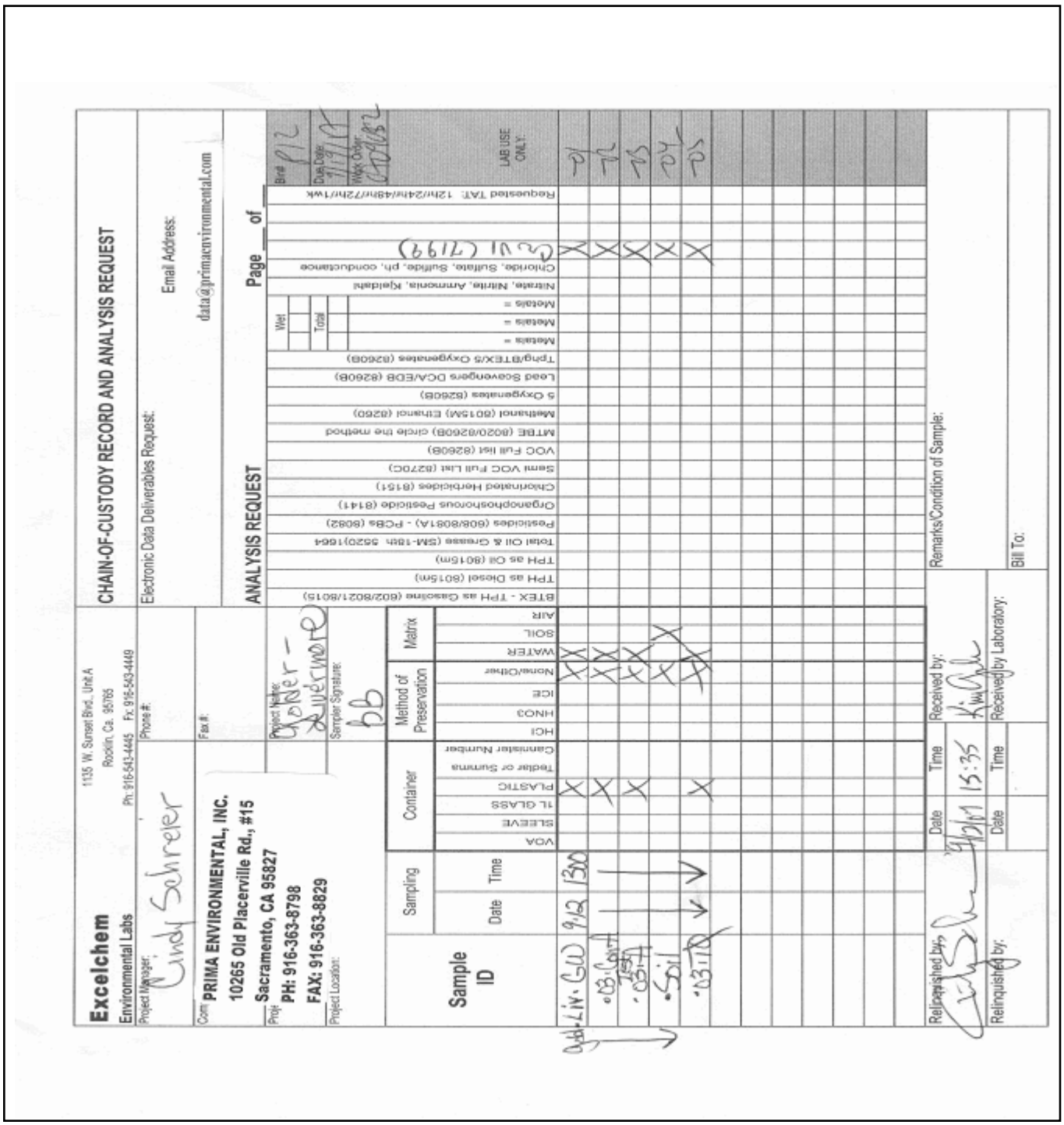
Prima Environmental	Project:	Golder-Livermore	
10265 Old Placerville Rd #15	Project Number:	[none]	Date Reported:
Sacramento, CA 95827	Project Manager:	Cindy Schreier	09/14/07 08:26



Excelchem Environmental Lab.

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Laboratory Representative

Excelchem Environmental Labs

Prima Environmental	Project:	Golder-Livermore	
10265 Old Placerville Rd #15	Project Number:	[none]	Date Reported:
Sacramento, CA 95827	Project Manager:	Cindy Schreier	09/14/07 08:26

EXCELCHEM
Environmental Labs

1135 W Sunset Boulevard
Suite A
Rocklin, CA 95765
Phone# 916-543-4445
Fax# 916-543-4449

ELAP Certificate No. : 2119

14 September 2007

Cindy Schreier

Prima Environmental

10265 Old Placerville Rd #15

Sacramento, CA 95827

RE: Golder-Livermore

Workorder number:0709061

Enclosed are the results of analyses for samples received by the laboratory on 09/13/07 14:10. All Quality Control results are within acceptable limits except where noted as a case narrative. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

_____

John Somers, Lab Director

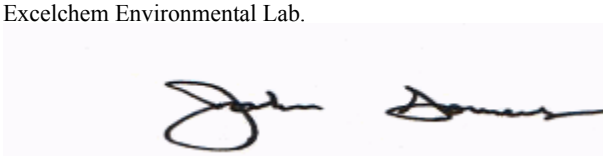
Excelchem Environmental Labs

Prima Environmental	Project:	Golder-Livermore	
10265 Old Placerville Rd #15	Project Number:	[none]	Date Reported:
Sacramento, CA 95827	Project Manager:	Cindy Schreier	09/14/07 08:31

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GOLD-Liv-03-Con-B	0709061-01	Water	09/13/07 13:00	09/13/07 14:10
GOLD-Liv-03-Test-B	0709061-02	Water	09/13/07 13:00	09/13/07 14:10

Excelchem Environmental Lab.



Laboratory Representative

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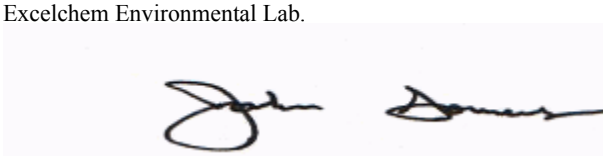
Excelchem Environmental Labs

Prima Environmental	Project:	Golder-Livermore	
10265 Old Placerville Rd #15	Project Number:	[none]	Date Reported:
Sacramento, CA 95827	Project Manager:	Cindy Schreier	09/14/07 08:31

GOLD-Liv-03-Con-B
0709061-01 (Water)

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
Ion Chromatography								
Hexavalent Chromium	**1.2**	1.0	ug/l	AQI0091	09/13/07	09/13/07	EPA 7199	

Excelchem Environmental Lab.



Laboratory Representative

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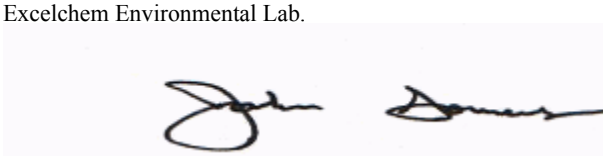
Excelchem Environmental Labs

Prima Environmental	Project:	Golder-Livermore	
10265 Old Placerville Rd #15	Project Number:	[none]	Date Reported:
Sacramento, CA 95827	Project Manager:	Cindy Schreier	09/14/07 08:31

GOLD-Liv-03-Test-B
0709061-02 (Water)

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
Ion Chromatography								
Hexavalent Chromium	**445**	10.0	ug/l	AQI0091	09/13/07	09/13/07	EPA 7199	

Excelchem Environmental Lab.



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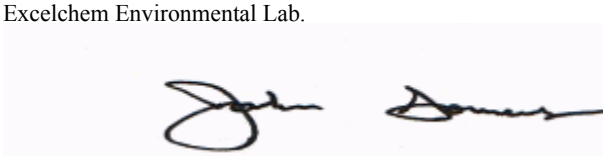
Excelchem Environmental Labs

Prima Environmental	Project:	Golder-Livermore	
10265 Old Placerville Rd #15	Project Number:	[none]	Date Reported:
Sacramento, CA 95827	Project Manager:	Cindy Schreier	09/14/07 08:31

Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch AQI0091 - EPA 7199										
Blank (AQI0091-BLK1)				Prepared & Analyzed: 09/13/07						
Hexavalent Chromium	ND	1.0	ug/l							
LCS (AQI0091-BS1)				Prepared & Analyzed: 09/13/07						
Hexavalent Chromium	11.9	1.0	ug/l	10.0		119	80-120			
LCS Dup (AQI0091-BSD1)				Prepared & Analyzed: 09/13/07						
Hexavalent Chromium	11.9	1.0	ug/l	10.0		119	80-120	0.00	20	
Matrix Spike (AQI0091-MS1)		**Source: 0709052-01**		Prepared & Analyzed: 09/13/07						
Hexavalent Chromium	10.3	1.0	ug/l	10.0	ND	103	75-125			
Matrix Spike Dup (AQI0091-MSD1)		**Source: 0709052-01**		Prepared & Analyzed: 09/13/07						
Hexavalent Chromium	10.7	1.0	ug/l	10.0	ND	107	75-125	3.81	20	

Excelchem Environmental Lab.



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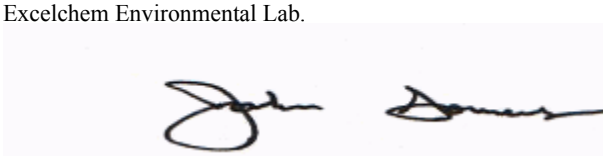
10265 Old Placerville Rd #15	Project Number:	[none]	Date Reported:
Sacramento, CA 95827	Project Manager:	Cindy Schreier	09/14/07 08:31

Notes and Definitions

ND - Analyte not detected at reporting limit.

NR - Not reported

Excelchem Environmental Lab.



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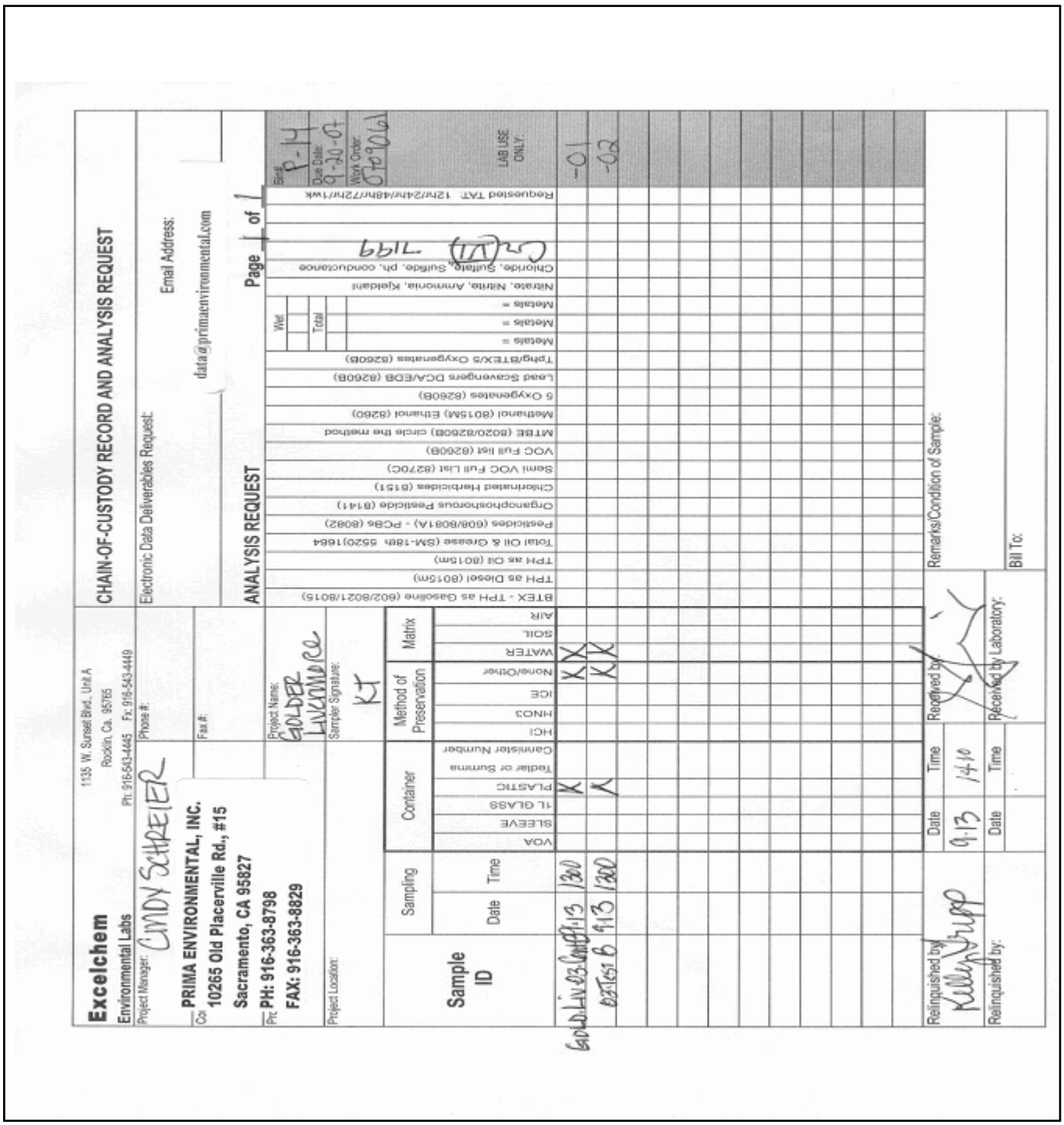
Prima Environmental	Project:	Golder-Livermore	
10265 Old Placerville Rd #15	Project Number:	[none]	Date Reported:
Sacramento, CA 95827	Project Manager:	Cindy Schreier	09/14/07 08:31



Excelchem Environmental Lab.

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Laboratory Representative

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Prima Environmental	Project:	Golder-Livermore	
10265 Old Placerville Rd #15	Project Number:	[none]	Date Reported:
Sacramento, CA 95827	Project Manager:	Cindy Schreier	09/14/07 08:31

BSK ANALYTICAL LABORATORIES

Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Cindy Schreier
Prima Environmental
10265 Old Placerville Road Suite 15
Sacramento, CA 95827

BSK Submission #: 2007091237

BSK Sample ID #: 894976

Report Issue Date: 09/21/2007

Project ID:

Project Desc:

Submission Comments:

Sample Type: Liquid

Sample Description: Gold-LIV 03 T0

Sample Comments:

Date Sampled: 09/12/2007

Time Sampled: 0900

Date Received: 09/17/2007

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Bromate (BrO3)	EPA 317.0	**ND**	mg/L	0.0050	1	0.0050	09/18/07	09/18/07
Bromide (Br)	EPA 300.1	**0.23**	mg/L	0.0050	1	0.0050	09/19/07	09/19/07

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
µg/L: Micrograms/Liter (ppb)
µg/Kg: Micrograms/Kilogram (ppb)
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit
DLR: Detection Limit for Reporting : PQL x Dilution
ND: None Detected at DLR
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time
P: Preliminary result
S: Suspect result. See Case Narrative for comments.
E: Analysis performed by External laboratory. See External Laboratory Report attachments.

Report Authentication Code: * 8 9 4 9 7 6 - 0 . 2 3 0 0 *

1414 Stanislaus Street Fresno, CA 93706-1623 Phone 559-497-2888, In CA 800-877-8310 Fax 559-485-6935

BSK ANALYTICAL LABORATORIES

Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Cindy Schreier
Prima Environmental
10265 Old Placerville Road Suite 15
Sacramento, CA 95827

BSK Submission #: 2007091237

BSK Sample ID #: 894977

Report Issue Date: 09/21/2007

Project ID:

Project Desc:

Submission Comments:

Sample Type: Liquid

Sample Description: Gold-LIV 03 Test B

Sample Comments:

Date Sampled: 09/12/2007
Time Sampled: 0900
Date Received: 09/17/2007

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Bromate (BrO3)	EPA 317.0	**0.16**	mg/L	0.0050	30	0.15	09/18/07	09/18/07
Bromide (Br)	EPA 300.1	**0.084**	mg/L	0.0050	2	0.010	09/20/07	09/20/07

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
µg/L: Micrograms/Liter (ppb)
µg/Kg: Micrograms/Kilogram (ppb)
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit
DLR: Detection Limit for Reporting : PQL x Dilution
ND: None Detected at DLR
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time
P: Preliminary result
S: Suspect result. See Case Narrative for comments.
E: Analysis performed by External laboratory. See External Laboratory Report attachments.

Report Authentication Code: * 8 9 4 9 7 7 - 0 . 2 4 4 0 *

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BSK ANALYTICAL LABORATORIES

Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Cindy Schreier
Prima Environmental
10265 Old Placerville Road Suite 15
Sacramento, CA 95827

BSK Submission #: 2007091237

BSK Sample ID #: 894978

Report Issue Date: 09/21/2007

Project ID:

Project Desc:

Submission Comments:

Sample Type: Liquid

Sample Description: Gold-LIV 03 Con B

Sample Comments:

Date Sampled: 09/12/2007

Time Sampled: 0900

Date Received: 09/17/2007

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Bromate (BrO3)	EPA 317.0	**ND**	mg/L	0.0050	1	0.0050	09/18/07	09/18/07
Bromide (Br)	EPA 300.1	**0.25**	mg/L	0.0050	1	0.0050	09/19/07	09/19/07

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
µg/L: Micrograms/Liter (ppb)
µg/Kg: Micrograms/Kilogram (ppb)
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit
DLR: Detection Limit for Reporting : PQL x Dilution
ND: None Detected at DLR
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time
P: Preliminary result
S: Suspect result. See Case Narrative for comments.
E: Analysis performed by External laboratory. See External Laboratory Report attachments.

Report Authentication Code: * 8 9 4 9 7 8 - 0 . 2 5 0 0 *

1414 Stanislaus Street Fresno, CA 93706-1623 Phone 559-497-2888, In CA 800-877-8310 Fax 559-485-6935

BSK ANALYTICAL LABORATORIES

Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Cindy Schreier
Prima Environmental
10265 Old Placerville Road Suite 15
Sacramento, CA 95827

BSK Submission #: 2007091237

BSK Sample ID #: 894979

Report Issue Date: 09/21/2007

Project ID:

Project Desc:

Submission Comments:

Sample Type: Liquid

Sample Description: Gold-LIV 03 Test A

Sample Comments:

Date Sampled: 09/12/2007

Time Sampled: 0900

Date Received: 09/17/2007

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Bromate (BrO3)	EPA 317.0	**ND**	mg/L	0.0050	1	0.0050	09/18/07	09/18/07
Bromide (Br)	EPA 300.1	**0.24**	mg/L	0.0050	1	0.0050	09/19/07	09/19/07

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
µg/L: Micrograms/Liter (ppb)
µg/Kg: Micrograms/Kilogram (ppb)
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit
DLR: Detection Limit for Reporting : PQL x Dilution
ND: None Detected at DLR
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time
P: Preliminary result
S: Suspect result. See Case Narrative for comments.
E: Analysis performed by External laboratory. See External Laboratory Report attachments.

Report Authentication Code: * 8 9 4 9 7 9 - 0 . 2 4 0 0 *

1414 Stanislaus Street Fresno, CA 93706-1623 Phone 559-497-2888, In CA 800-877-8310 Fax 559-485-6935

BSK ANALYTICAL LABORATORIES

Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Cindy Schreier
Prima Environmental
10265 Old Placerville Road Suite 15
Sacramento, CA 95827

BSK Submission #: 2007091237

BSK Sample ID #: 894980

Report Issue Date: 09/21/2007

Project ID:

Project Desc:

Submission Comments:

Sample Type: Liquid

Sample Description: Gold-LIV 03 Con A

Sample Comments:

Date Sampled: 09/12/2007

Time Sampled: 0900

Date Received: 09/17/2007

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Bromate (BrO3)	EPA 317.0	**ND**	mg/L	0.0050	1	0.0050	09/18/07	09/18/07
Bromide (Br)	EPA 300.1	**0.23**	mg/L	0.0050	1	0.0050	09/19/07	09/19/07

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
µg/L: Micrograms/Liter (ppb)
µg/Kg: Micrograms/Kilogram (ppb)
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit
DLR: Detection Limit for Reporting : PQL x Dilution
ND: None Detected at DLR
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time
P: Preliminary result
S: Suspect result. See Case Narrative for comments.
E: Analysis performed by External laboratory. See External Laboratory Report attachments.

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Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Cindy Schreier
Prima Environmental
10265 Old Placerville Road Suite 15
Sacramento, CA 95827

BSK Submission #: 2007091237

BSK Sample ID #: 894981

Report Issue Date: 09/21/2007

Project ID:

Project Desc:

Submission Comments:

Sample Type: Liquid

Sample Description: Gold-LIV 03 GW

Sample Comments:

Date Sampled: 09/12/2007

Time Sampled: 0900

Date Received: 09/17/2007

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Bromate (BrO3)	EPA 317.0	**ND**	mg/L	0.0050	1	0.0050	09/20/07	09/20/07
Bromide (Br)	EPA 300.1	**0.24**	mg/L	0.0050	1	0.0050	09/19/07	09/19/07

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
µg/L: Micrograms/Liter (ppb)
µg/Kg: Micrograms/Kilogram (ppb)
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit
DLR: Detection Limit for Reporting : PQL x Dilution
ND: None Detected at DLR
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time
P: Preliminary result
S: Suspect result. See Case Narrative for comments.
E: Analysis performed by External laboratory. See External Laboratory Report attachments.

Report Authentication Code: * 8 9 4 9 8 1 - 0 . 2 4 0 0 *

1414 Stanislaus Street Fresno, CA 93706-1623 Phone 559-497-2888, In CA 800-877-8310 Fax 559-485-6935

BSK ANALYTICAL LABORATORIES

Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Cindy Schreier
Prima Environmental
10265 Old Placerville Road Suite 15
Sacramento, CA 95827

BSK Submission #: 2007101583

BSK Sample ID #: 908214

Report Issue Date: 10/24/2007

Project ID:

Project Desc: Golder-Livermore

Submission Comments:

Sample Type: Liquid

Sample Description: Gold-Liv-03 / Bro3-Con

Sample Comments:

Date Sampled: 10/16/2007

Time Sampled: 1130

Date Received: 10/17/2007

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Bromate (BrO3)	EPA 317.0	**0.19**	mg/L	0.0050	30	0.15	10/18/07	10/18/07
Bromide (Br)	EPA 300.1	**0.056**	mg/L	0.0050	2	0.010	10/19/07	10/19/07

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
µg/L: Micrograms/Liter (ppb)
µg/Kg: Micrograms/Kilogram (ppb)
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit
DLR: Detection Limit for Reporting : PQL x Dilution
ND: None Detected at DLR
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time
P: Preliminary result
S: Suspect result. See Case Narrative for comments.
E: Analysis performed by External laboratory. See External Laboratory Report attachments.
MDC: Min Detectable Concentration

Report Authentication Code: * 9 0 8 2 1 4 - 0 . 2 4 6 0 *

1414 Stanislaus Street Fresno, CA 93706-1623 Phone 559-497-2888, In CA 800-877-8310 Fax 559-485-6935

BSK ANALYTICAL LABORATORIES

Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Cindy Schreier
Prima Environmental
10265 Old Placerville Road Suite 15
Sacramento, CA 95827

BSK Submission #: 2007101583

BSK Sample ID #: 908215

Report Issue Date: 10/24/2007

Project ID:

Project Desc: Golder-Livermore

Submission Comments:

Sample Type: Liquid

Sample Description: Gold-Liv-03 / Bro3-Test

Sample Comments:

Date Sampled: 10/16/2007

Time Sampled: 1130

Date Received: 10/17/2007

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Bromate (BrO3)	EPA 317.0	**ND**	mg/L	0.0050	1	0.0050	10/18/07	10/18/07
Bromide (Br)	EPA 300.1	**0.24**	mg/L	0.0050	2	0.010	10/22/07	10/22/07

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
µg/L: Micrograms/Liter (ppb)
µg/Kg: Micrograms/Kilogram (ppb)
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit
DLR: Detection Limit for Reporting : PQL x Dilution
ND: None Detected at DLR
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time
P: Preliminary result
S: Suspect result. See Case Narrative for comments.
E: Analysis performed by External laboratory. See External Laboratory Report attachments.
MDC: Min Detectable Concentration

Report Authentication Code: * 9 0 8 2 1 5 - 0 . 2 4 0 0 *

1414 Stanislaus Street Fresno, CA 93706-1623 Phone 559-497-2888, In CA 800-877-8310 Fax 559-485-6935

BSK ANALYTICAL LABORATORIES

Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Cindy Schreier
Prima Environmental
10265 Old Placerville Road Suite 15
Sacramento, CA 95827

BSK Submission #: 2007102159

BSK Sample ID #: 911325

Report Issue Date: 10/31/2007

Project ID:

Project Desc: Golder Livermore

Submission Comments:

Sample Type: Liquid

Sample Description: Gold Liv/03 BrO3 Attn. T\T- A

Sample Comments:

Date Sampled: 10/23/2007

Time Sampled: 1000

Date Received: 10/24/2007

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Bromate (BrO3)	EPA 317.0	**ND**	mg/L	0.0050	1	0.0050	10/29/07	10/29/07

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
µg/L: Micrograms/Liter (ppb)
µg/Kg: Micrograms/Kilogram (ppb)
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit
DLR: Detection Limit for Reporting : PQL x Dilution
ND: None Detected at DLR
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time
P: Preliminary result
S: Suspect result. See Case Narrative for comments.
E: Analysis performed by External laboratory. See External Laboratory Report attachments.
MDC: Min Detectable Concentration

Report Authentication Code: * 9 1 1 3 2 5 - 0 . 0 0 0 0 *

1414 Stanislaus Street Fresno, CA 93706-1623 Phone 559-497-2888, In CA 800-877-8310 Fax 559-485-6935

BSK ANALYTICAL LABORATORIES

Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Cindy Schreier
Prima Environmental
10265 Old Placerville Road Suite 15
Sacramento, CA 95827

BSK Submission #: 2007102159

BSK Sample ID #: 911326

Report Issue Date: 10/31/2007

Project ID:

Project Desc: Golder Livermore

Submission Comments:

Sample Type: Liquid

Sample Description: Gold Liv/03 BrO3 Attn. T\U- A

Sample Comments:

Date Sampled: 10/23/2007

Time Sampled: 1000

Date Received: 10/24/2007

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Bromate (BrO3)	EPA 317.0	**0.012**	mg/L	0.0050	1	0.0050	10/29/07	10/29/07

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
µg/L: Micrograms/Liter (ppb)
µg/Kg: Micrograms/Kilogram (ppb)
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit
DLR: Detection Limit for Reporting : PQL x Dilution
ND: None Detected at DLR
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time
P: Preliminary result
S: Suspect result. See Case Narrative for comments.
E: Analysis performed by External laboratory. See External Laboratory Report attachments.
MDC: Min Detectable Concentration

Report Authentication Code: * 9 1 1 3 2 6 - 0 . 0 1 2 0 *

1414 Stanislaus Street Fresno, CA 93706-1623 Phone 559-497-2888, In CA 800-877-8310 Fax 559-485-6935

CHAIN OF CUSTODY

PRIMA Environmental, Inc.
10265 Old Placerville Road, Suite 15, Sacramento, CA 95827-3042
(916) 363-8798 * (916) 363-8829 FAX

FAXED 8-24-07 to Cathy

Project Manager: Mark Naugle, Golder Assoc
Project Name: Livermore
Job Number: 053-7020
Date: 8-24-07
Phone: 916.786.2424 / F: 916.786.2431
Email:

Lab Name: PRIMA Environmental
Address: 10265 Old Placerville Rd #15
Sacramento, Ca 95827
Phone: 916.363.8795

Turnaround Time

SAMPLE ID	Date	Time	Matrix	# containers	Analysis	Comments
SP-1 (impacted	8/22/07		So	2E		1 Liter glass
SP-1 (clean)	8/22		So	1		1 Liter glass
Groundwater	8/22		GW	1		1 Plastic 3gal bucket

Special Instructions	Relinquished by:		Received by:
	Company: Golder & Assoc	Date: 8/22/07	Company: Prima Environmental
	Printed Name:	Time: 5:05pm	Printed Name: Kelly Trapp
	Signature:		Signature: Kelly Trapp
	Relinquished by:		**Received by:**
	Company:	Date:	Company:
	Printed Name:	Time:	Printed Name:
	Signature:		Signature:

APPENDIX F

Baseline Groundwater Monitoring Field Sheets

WATER SAMPLING AND ANALYSIS REQUEST

Project Name: B&C
Scheduled Date(s) : Week of 9/10/07
Site Contact/Phone: Balaji Angle 510-552-4822
Keys/Combos:

Monitoring Event: Ozone Pilot Study Baseline GW
Lab / Lab Contact: Kiff, Scott Forbes (530) 297-4800 ext 109
McCampbell, Elisa (877) 798-1620
EDD X **EDF**

Project No.: 053-7020
Phase: 45
Proj. Mngr.: Kris Johnson

Site Instructions:

Tag total depths and label A and B casings (B is deeper). Measure distance from concrete to top of casing and top of casing to vault lid.
Take digital camera photo showing inside of vault . Call lab for bottles and whether to for lab to filter metals for SP-3A.

Completed?	Well or Source	Casing Dia. (inches)	Total Depth (feet)	Previous Depth to Water (feet) (date)	Analyses: Water level	Field pH, EC, temp, turb, DO	Field ORP	VOCs, 8260B (8010 list)*	TPHg; BTEX; MTBE*	VOCs, 8260B (w/ TBF)*	See Note 1**	Formaldehyde, 8315A**	Chromium, Dissolved**	Hexa chromium, Dissolved**	Bromate, Dissolved**	Bromide, Dissolved**		Additional Information:
	SP-1A	1	42	~40	X	X	X	X	X									Lab filter metals analyses. Hexavalent Chromium has 24-hr hold time. Lab must pick up the same day sampled!
	SP-1B	1	48	~40	X	X	X	X	X									
	SP-2A	1	42	~40	X	X	X	X	X									
	SP-2B	1	48	~40	X	X	X	X	X									
	SP-3A	1	42	~40	X	X	X	NO	X	X	X	X	X	X	X	X		
	SP-3B	1	48	~40	X	X	X	X	X									
	SP-4A	1	42	~40	X	X	X	X	X									
	SP-4B	1	48	~40	X	X	X	X	X									
	SP-5A	1	42	~40	X	X	X	X	X									
	SP-5B	1	48	~40	X	X	X	X	X									
	SP-5C	1	54	~40	X	X	X	X	X									
	SP-6A	1	42	~40	X	X	X	X	X									
	SP-6B	1	48	~40	X	X	X	X	X									
	SP-6C	1	54	~40	X	X	X	X	X									

Note 1: Mono-, di-, and tri-chloroacetic acid isomers EPA Method 552.2
* Analysis by Kiff
** Analysis by McCampbell

Golder Associates Inc.

Page 1 of 1

CHAIN OF CUSTODY

Quotation No.

PROJECT AND PHASE NO.:	SITE NAME:
053-7020/45	B&C

SAMPLER SIGNATURE(S): Amy Hill
Amy Hill

CONTRACT LABORATORY: McCampbell

TURN-AROUND TIME: std 5 day

EDD Required? Yes/GeoTracker

EDF Required? Yes/No

Sample ID	Lab ID	Collection Date	Collection Time	Matrix	Depth	Container Info	Mono-, di-, and tri-chloroacetic acid isomers EPA Method 552.2	Formaldehyde, 8315A**	Chromium, Dissolved**	Hexa chromium, Dissolved**	Bromate, Dissolved**	Bromide, Dissolved**	Cont. Qty.	Remarks
						Type	VOA	A	PE	PE	A	PE		Call lab for Bottles!
						Volume	40mL	1L	250mL	125mL	500mL	125mL		
						Filter	N	N	Y	Y	Y	Y		
SP-~~3A~~ 4B Add		09/12/07		W		Preserv.	NH_4Cl	N	N	N	N	N	7	Metals filtered in field

Send results to Mark Naugle mnaugle@golder.com

Relinquished by (signature):	Received by (signature):	Date/Time:
Amy Hill		9/12/07 12:44
Relinquished by (signature):	Received by (signature):	Date/Time:
Relinquished by (signature):	Received by (signature):	Date/Time:

SEND RESULTS TO:

Attention: Mark Naugle
Golder Associates Inc.
2580 Wyandotte Street, Suite G
Mountain View, CA 94043
Phone (650) 386-3828
Fax (650) 386-3815

![Golder Associates]

Golder Associates Inc.
CHAIN OF CUSTODY

Quotation No. ______

PROJECT AND PHASE NO.:	SITE NAME:
053-7020.45	B&C

SAMPLER(S): Amy Hill (printed) Amy Hill (signature)

CONTRACT LABORATORY: Kiff

TURN-AROUND TIME: Std. 5 day

ANALYSES:
1. 8260B (8010 List) TPHg, BTEX, MTBE
2. 8260B (8010 List) ~~MTBE~~ TPHg, BTEX, MTBE

EDD required? [X] Yes [ ] No

EDF required? [X] Yes [ ] No

Sample I.D.	Lab I.D.	Collection Date	Collection Time	Matrix	Depth	Container Info	Analysis 1	Analysis 2	Cont. Qty.	Remarks	
						Type/Vol.	40ml VOA	40ml VOA			
						Filter	N	N			
						Preserv.	HCl	HCl			
SP-4A		9/11/07	1345	W			5		5	send results to	01
SP-4B		↓	1330	W				5	5	Mark Naugle	02
SP-5B		↓	1245	W			5		5	mnaugle@golder.com	03
SP-5C		↓	1230	W			5		5		04
SP-1B		9/12/07	1000	W			5		5		05
SP-2B		↓	0935	W			5		5		06
SP-3B		↓	1030	W			5		5		07
SP-6B		↓	0740	W			5		5		08
SP-6C		↓	0750	W			5		5		09

Relinquished by: (signature)	Received by: (signature)	Date/Time:
Amy Hill		
Relinquished by: (signature)	Received by: (signature)	Date/Time:
Relinquished by: (signature)	Received by: (signature) Kozma Lee Kiff Analytical	Date/Time: 091307 1126

SEND RESULTS TO:

Attn: Mark Naugle
Golder Associates Inc.
2580 Wyandotte St., Suite G
Mountain View, CA 94043
Phone (650) 386-3828
Fax (650) 386-3815

white: lab copy yellow: project file

Golder Associates

WATER SAMPLE FIELD DATA

LOCATION: BNC Gas Mini Mart
SAMPLE ID: SP-1A
PROJECT NO: 053-7020.45
SAMPLED BY: A. Hill
CLIENT: BNC Gas Mini Mart
REGULATORY AGENCY: ACEHS
SAMPLE TYPE: Groundwater X Surface Water ____ Leachate ____ Treatment System ____ Other ____
CASING DIAMETER (OD-inches): 3/4 ____ 1 X 2 ____ 4 ____ 4.5 ____ 6 ____ 8 ____ Other ____
GALLONS PER LINEAR FOOT : (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 41.49
Volume in Casing ~~(gal)~~: 154 mL
Depth to Water (ft): 40.47
Calculated Purge (volumes / ~~gal.~~ mL): 463
Height of Water Column (ft): 1.02
Actual Pre-Sampling Purge ~~(gal)~~ mL: ____

PURGE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____
Purge Water Containment: Drummed
Field QC Samples Collected at this Well (Equipment or Field Blank): EB-___ FB-___ Other ____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Elec. Conductivity (µmhos/cm)	pH (std. units)	Color (visual)	Turbidity (visual)	DO (mg/l)	ORP (mV)	Odor

Purge Date: ____

SAMPLE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____

Time (2400 Hr)	Temp. (°C)	Electrical Conductivity (µmhos/cm)	pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)	ORP (mV)

Sheen: ____ Odor: ____ Sample Date: ____

Field Measurement Devices: Horiba ____ Omega ____ QuickCheck ____ D.O. Test Kit ____ YSI X

REMARKS: 1.02 (0.04) (3785 ml/gal) = 154 mL
Well dry no samples

SIGNATURE: Amy Hill **DATE:** 09/11/07

Golder Associates

WATER SAMPLE FIELD DATA

LOCATION: BNC Gas Mini Mart
SAMPLE ID: SP-1B
PROJECT NO: 053-7020.45
SAMPLED BY: A. Hill
CLIENT: BNC Gas Mini Mart
REGULATORY AGENCY: ACEHS
SAMPLE TYPE: Groundwater X Surface Water ____ Leachate ____ Treatment System ____ Other ____
CASING DIAMETER (OD-inches): 3/4 ____ 1 X 2 ____ 4 ____ 4.5 ____ 6 ____ 8 ____ Other ____
GALLONS PER LINEAR FOOT : (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 48.47	Volume in Casing (~~gal~~): 772 mL
Depth to Water (ft): 43.37	Calculated Purge (volumes / ~~gal.~~ mL): 2316
Height of Water Column (ft): 5.10	Actual Pre-Sampling Purge (~~gal~~ mL): 350

PURGE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____
Purge Water Containment: Drummed
Field QC Samples Collected at this Well (Equipment or Field Blank): EB-___ FB-___ Other ____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Elec. Conductivity (µmhos/cm)	pH (std. units)	Color (visual)	Turbidity (visual)	DO (mg/l)	ORP (mV)	Odor
purged well dry									

Purge Date: ____

SAMPLE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____

Time (2400 Hr)	Temp. (°C)	Electrical Conductivity (µmhos/cm)	pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)	ORP (mV)

Sheen: ____ Odor: ____ Sample Date: ____

Field Measurement Devices: Horiba ____ Omega ____ QuickCheck ____ D.O. Test Kit ____ YSI X
REMARKS: (5.10)(0.04)(3.785 mL/gal) = 772 mL. 1015 purged well dry. Allowed to recharge - Sampled then insufficient water for field parameters

SIGNATURE: Amy Hill **DATE:** 12/12/07

Golder Associates

WATER SAMPLE FIELD DATA

LOCATION: BNC Gas Mini Mart
SAMPLE ID: SP-2A
PROJECT NO: 053-7020.45
SAMPLED BY: A. Hill
CLIENT: BNC Gas Mini Mart
REGULATORY AGENCY: ACEHS
SAMPLE TYPE: Groundwater X Surface Water ____ Leachate ____ Treatment System ____ Other ____
CASING DIAMETER (OD-inches): 3/4 ____ 1 X 2 ____ 4 ____ 4.5 ____ 6 ____ 8 ____ Other ____
GALLONS PER LINEAR FOOT : (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 41.80
Volume in Casing ~~(gal)~~: 181 mL
Depth to Water (ft): 40.60
Calculated Purge (volumes / ~~gal.~~ mL): 545
Height of Water Column (ft): 1.20
Actual Pre-Sampling Purge ~~(gal)~~ mL: ____

PURGE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____
Purge Water Containment: Drummed
Field QC Samples Collected at this Well (Equipment or Field Blank): EB-___ FB-___ Other ____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Elec. Conductivity (µmhos/cm)	pH (std. units)	Color (visual)	Turbidity (visual)	DO (mg/l)	ORP (mV)	Odor

Purge Date: ____

SAMPLE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____

Time (2400 Hr)	Temp. (°C)	Electrical Conductivity (µmhos/cm)	pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)	ORP (mV)

Sheen: ____ Odor: ____ Sample Date: ____

Field Measurement Devices: Horiba ____ Omega ____ QuickCheck ____ D.O. Test Kit ____ YSI X

REMARKS: (1.20 ft)(0.04)(3785 mL/gal) = 181 mL
Well dry, no samples

SIGNATURE: Amy Hill **DATE:** 09/11/07

Golder Associates

WATER SAMPLE FIELD DATA

LOCATION: BNC Gas Mini Mart
SAMPLE ID: SP-2B
PROJECT NO: 053-7020.45
SAMPLED BY: A. Hill
CLIENT: BNC Gas Mini Mart
REGULATORY AGENCY: ACEHS
SAMPLE TYPE: Groundwater X Surface Water ____ Leachate ____ Treatment System ____ Other ____
CASING DIAMETER (OD-inches): 3/4 ____ 1 X 2 ____ 4 ____ 4.5 ____ 6 ____ 8 ____ Other ____
GALLONS PER LINEAR FOOT : (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 48.26
Volume in Casing (~~gal~~): 713 mL
Depth to Water (ft): 43.55
Calculated Purge (volumes / ~~gal.~~): 3 x 713 mL = 2139
Height of Water Column (ft): 4.71
Actual Pre-Sampling Purge (~~gal~~): mL 490

PURGE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____
Purge Water Containment: Drummed
Field QC Samples Collected at this Well (Equipment or Field Blank): EB-___ FB-___ Other ____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Elec. Conductivity (µmhos/cm)	pH (std. units)	Color (visual)	Turbidity (visual)	DO (mg/l)	ORP (mV)	Odor
1040	purged well		dry						

Purge Date: ____

SAMPLE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____

Time (2400 Hr)	Temp. (°C)	Electrical Conductivity (µmhos/cm)	pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)	ORP (mV)

Sheen: ____ Odor: ____ Sample Date: ____

Field Measurement Devices: Horiba ____ Omega ____ QuickCheck ____ D.O. Test Kit ____ YSI X

REMARKS: (4.71)(0.04)(3785 mL/gal) = 713 mL · 1040 purged well dry · Allowed to recharge – sampled dry but sufficient liquid for field parameters

SIGNATURE: Amy Hill **DATE:** 04/12/07

Golder Associates

WATER SAMPLE FIELD DATA

LOCATION: BNC Gas Mini Mart
SAMPLE ID: SP-3A
PROJECT NO: 053-7020.45
SAMPLED BY: A. Hill
CLIENT: BNC Gas Mini Mart
REGULATORY AGENCY: ACEHS
SAMPLE TYPE: Groundwater X Surface Water ____ Leachate ____ Treatment System ____ Other ____
CASING DIAMETER (OD-inches): 3/4 ____ 1 X 2 ____ 4 ____ 4.5 ____ 6 ____ 8 ____ Other ____
GALLONS PER LINEAR FOOT : (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 40.37
Depth to Water (ft): 39.72
Height of Water Column (ft): 0.65
Volume in Casing ~~(gal)~~ mL: 98 mL
Calculated Purge (volumes / ~~gal~~ mL): 295 mL
Actual Pre-Sampling Purge ~~(gal)~~ mL: ____

PURGE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____
Purge Water Containment: Drummed
Field QC Samples Collected at this Well (Equipment or Field Blank): EB-___ FB-___ Other ____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Elec. Conductivity (µmhos/cm)	pH (std. units)	Color (visual)	Turbidity (visual)	DO (mg/l)	ORP (mV)	Odor

Purge Date: ____

SAMPLE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____

Time (2400 Hr)	Temp. (°C)	Electrical Conductivity (µmhos/cm)	pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)	ORP (mV)

Sheen: ____ Odor: ____ Sample Date: ____

Field Measurement Devices: Horiba ____ Omega ____ QuickCheck ____ D.O. Test Kit ____ YSI X

REMARKS: (0.65)(0.04)(3785 mL/gal) = 98 mL
Well dry, no samples

SIGNATURE: Amy Hill **DATE:** 9/11/07

Golder Associates

WATER SAMPLE FIELD DATA

LOCATION: BNC Gas Mini Mart
SAMPLE ID: SP-3B
PROJECT NO: 053-7020.45
SAMPLED BY: A. Hill
CLIENT: BNC Gas Mini Mart
REGULATORY AGENCY: ACEHS
SAMPLE TYPE: Groundwater X Surface Water ____ Leachate ____ Treatment System ____ Other ____
CASING DIAMETER (OD-inches): 3/4 ____ 1 X 2 ____ 4 ____ 4.5 ____ 6 ____ 8 ____ Other ____
GALLONS PER LINEAR FOOT : (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 47.40
Volume in Casing (gal): 731 mL
Depth to Water (ft): 42.57
Calculated Purge (volumes / gal.): 3 x 731 mL = 2194 mL
Height of Water Column (ft): 4.83
Actual Pre-Sampling Purge (gal): 320 mL

PURGE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____
Purge Water Containment: Drummed
Field QC Samples Collected at this Well (Equipment or Field Blank): EB-___ FB-___ Other ____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Elec. Conductivity (µmhos/cm)	pH (std. units)	Color (visual)	Turbidity (visual)	DO (mg/l)	ORP (mV)	Odor
1200	well	purged	dry						

Purge Date: ____

SAMPLE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____

Time (2400 Hr)	Temp. (°C)	Electrical Conductivity (µmhos/cm)	pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)	ORP (mV)

Sheen: ____ Odor: ____ Sample Date: ____

Field Measurement Devices: Horiba ____ Omega ____ QuickCheck ____ D.O. Test Kit ____ YSI X

REMARKS: (4.83)(0.04)(3785 mL/gal) = 731 . 1200 well purged dry - Allowed to recharge - sampled 1030 w/ turbid liquid for field parameters !

SIGNATURE: Amy Hill **DATE:** 8/12/07

Golder Associates

WATER SAMPLE FIELD DATA

LOCATION: BNC Gas Mini Mart
SAMPLE ID: SP-4A
PROJECT NO: 053-7020.45
SAMPLED BY: A. Hill
CLIENT: BNC Gas Mini Mart
REGULATORY AGENCY: ACEHS
SAMPLE TYPE: Groundwater X Surface Water ___ Leachate ___ Treatment System ___ Other ___
CASING DIAMETER (OD-inches): 3/4 ___ 1 X 2 ___ 4 ___ 4.5 ___ 6 ___ 8 ___ Other ___
GALLONS PER LINEAR FOOT : (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 41.55	Volume in Casing (~~gal~~): 483 mL
Depth to Water (ft): 38.36	Calculated Purge (volumes / ~~gal~~ mL): 1449 mL
Height of Water Column (ft): 3.19	Actual Pre-Sampling Purge (~~gal~~ mL): 250

PURGE:
Device (Depth of Intake from TOC): S.S. Bailer ___ Teflon Bailer ___ PVC Bailer ___ Disp. Bailer X
PVC Hand Pump ___ Peristaltic Pump ___ Centrifugal Pump ___ Bladder Pump ___
Pneumatic Displacement Pump ___ Electric Submersible Pump ___ Dedicated ___ Other ___
Purge Water Containment: Drummed
Field QC Samples Collected at this Well (Equipment or Field Blank): EB-___ FB-___ Other ___

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Elec. Conductivity (µmhos/cm)	pH (std. units)	Color (visual)	Turbidity (visual)	DO (mg/l)	ORP (mV)	Odor
1106	Well purged dry								

Purge Date: ___

SAMPLE:
Device (Depth of Intake from TOC): S.S. Bailer ___ Teflon Bailer ___ PVC Bailer ___ Disp. Bailer X
PVC Hand Pump ___ Peristaltic Pump ___ Centrifugal Pump ___ Bladder Pump ___
Pneumatic Displacement Pump ___ Electric Submersible Pump ___ Dedicated ___ Other ___

Time (2400 Hr)	Temp. (°C)	Electrical Conductivity (µmhos/cm)	pH (std. units)	Dissolved Oxygen (~~mg/l~~)	Color (visual)	Turbidity (NTU)	ORP (mV)

Sheen: ___ ~~Odor~~: ___ Sample Date: ___

Field Measurement Devices: Horiba ___ Omega ___ QuickCheck ___ D.O. Test Kit ___ YSI X

REMARKS: (3.19)(0.04)(3785 ml/gal) = 483 mL = well purged dry - allowed to recharge
Insufficient liquid for field parameters
Sampled @ 1345 h

SIGNATURE: Amy Hill **DATE:** 9/11/07

Golder Associates

WATER SAMPLE FIELD DATA

LOCATION: BNC Gas Mini Mart
SAMPLE ID: SP-4B
PROJECT NO: 053-7020.45
SAMPLED BY: A. Hill
CLIENT: BNC Gas Mini Mart
REGULATORY AGENCY: ACEHS
SAMPLE TYPE: Groundwater X Surface Water ____ Leachate ____ Treatment System ____ Other ____
CASING DIAMETER (OD-inches): 3/4 ____ 1 X 2 ____ 4 ____ 4.5 ____ 6 ____ 8 ____ Other ____
GALLONS PER LINEAR FOOT : (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 48.38
Depth to Water (ft): 42.92
Height of Water Column (ft): 5.46
Volume in Casing (gal): 826 mL
Calculated Purge (volumes / ~~gal.~~ mL): 2480 mL
Actual Pre-Sampling Purge (~~gal~~ mL): 500

PURGE:
Device (Depth of Intake from TOC): S.S. Bailer____ Teflon Bailer____ PVC Bailer____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump____ Electric Submersible Pump____ Dedicated____ Other____
Purge Water Containment: Drummed
Field QC Samples Collected at this Well (Equipment or Field Blank): EB-___ FB-___ Other ____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Elec. Conductivity (µmhos/cm)	pH (std. units)	Color (visual)	Turbidity (visual)	DO (mg/l)	ORP (mV)	Odor
1125	purged well dry								

Purge Date: ____

SAMPLE:
Device (Depth of Intake from TOC): S.S. Bailer____ Teflon Bailer____ PVC Bailer____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump____ Electric Submersible Pump____ Dedicated____ Other____

Time (2400 Hr)	Temp. (°C)	Electrical Conductivity (µmhos/cm)	pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)	ORP (mV)

Sheen: ____ Odor: ____ Sample Date: ____

Field Measurement Devices: Horiba ____ Omega ____ QuickCheck ____ D.O. Test Kit ____ YSI X

REMARKS: (5.46)(0.04)(3785 ml/gal) = 826 mL ; 1125 Purged well dry - allowed to recharge. Sampled 1230 - insufficient liquid for field parameters

SIGNATURE: Amy Hill **DATE:** 9/11/07

Golder Associates

WATER SAMPLE FIELD DATA

LOCATION: BNC Gas Mini Mart
SAMPLE ID: SP-5A
PROJECT NO: 053-7020.45
SAMPLED BY: A. Hill
CLIENT: BNC Gas Mini Mart
REGULATORY AGENCY: ACEHS
SAMPLE TYPE: Groundwater X Surface Water ____ Leachate ____ Treatment System ____ Other ____
CASING DIAMETER (OD-inches): 3/4 ____ 1 X 2 ____ 4 ____ 4.5 ____ 6 ____ 8 ____ Other ____
GALLONS PER LINEAR FOOT : (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 40.39
Volume in Casing (gal): —
Depth to Water (ft): Dry
Calculated Purge (volumes / gal.): —
Height of Water Column (ft): —
Actual Pre-Sampling Purge (gal): —

PURGE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____
Purge Water Containment: Drummed
Field QC Samples Collected at this Well (Equipment or Field Blank): EB-___ FB-___ Other ____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Elec. Conductivity (µmhos/cm)	pH (std. units)	Color (visual)	Turbidity (visual)	DO (mg/l)	ORP (mV)	Odor

Purge Date: ____

SAMPLE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____

Time (2400 Hr)	Temp. (°C)	Electrical Conductivity (µmhos/cm)	pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)	ORP (mV)

Sheen: ____ Odor: ____ Sample Date: ____

Field Measurement Devices: Horiba ____ Omega ____ QuickCheck ____ D.O. Test Kit ____ YSI X

REMARKS: Well dry no samples

SIGNATURE: Amy Hill **DATE:** 04/11/07

Golder Associates

WATER SAMPLE FIELD DATA

LOCATION: BNC Gas Mini Mart SAMPLE ID: SP-5B

PROJECT NO: 053-7020.45 SAMPLED BY: A. Hill

CLIENT: BNC Gas Mini Mart REGULATORY AGENCY: ACEHS

SAMPLE TYPE: Groundwater X Surface Water ____ Leachate ____ Treatment System ____ Other ____

CASING DIAMETER (OD-inches): 3/4 ____ 1 X 2 ____ 4 ____ 4.5 ____ 6 ____ 8 ____ Other ____

GALLONS PER LINEAR FOOT : (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 47.94 Volume in Casing (gal): 766 mL

Depth to Water (ft): 42.88 Calculated Purge (volumes / ~~gal.~~ mL): 2298

Height of Water Column (ft): 5.06 Actual Pre-Sampling Purge (~~gal~~ mL): 290

PURGE:

Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X

PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____

Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____

Purge Water Containment: Drummed

Field QC Samples Collected at this Well (Equipment or Field Blank): EB-___ FB-___ Other ____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Elec. Conductivity (µmhos/cm)	pH (std. units)	Color (visual)	Turbidity (visual)	DO (mg/l)	ORP (mV)	Odor
0915		purged well dry							

Purge Date: ____

SAMPLE:

Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X

PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____

Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____

Time (2400 Hr)	Temp. (°C)	Electrical Conductivity (µmhos/cm)	pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)	ORP (mV)

Sheen: ____ Odor: ____ Sample Date: ____

Field Measurement Devices: Horiba ____ Omega ____ QuickCheck ____ D.O. Test Kit ____ YSI X

REMARKS: 5.06(0.04)(3785 mL/gal) = 766 mL 0915 well purged dry
Allowed to recharge - insufficient volume for field parameters
sampled 1245

SIGNATURE: Amy Hill **DATE:** 08/16/07

Golder Associates

WATER SAMPLE FIELD DATA

LOCATION: BNC Gas Mini Mart
SAMPLE ID: SP-5C
PROJECT NO: 053-7020.45
SAMPLED BY: A. Hill
CLIENT: BNC Gas Mini Mart
REGULATORY AGENCY: ACEHS
SAMPLE TYPE: Groundwater X Surface Water ____ Leachate ____ Treatment System ____ Other ____
CASING DIAMETER (OD-inches): 3/4 ____ 1 X 2 ____ 4 ____ 4.5 ____ 6 ____ 8 ____ Other ____
GALLONS PER LINEAR FOOT : (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 53.55
Volume in Casing (~~gal~~): 1541 mL
Depth to Water (ft): 43.37
Calculated Purge (volumes / ~~gal~~ mL): 4623
Height of Water Column (ft): 10.18
Actual Pre-Sampling Purge (~~gal~~ mL): 1350

PURGE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____
Purge Water Containment: Drummed
Field QC Samples Collected at this Well (Equipment or Field Blank): EB-___ FB-___ Other ____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Elec. Conductivity (µmhos/cm)	pH (std. units)	Color (visual)	Turbidity (visual)	DO (mg/l)	ORP (mV)	Odor
0945		purged well dry							

Purge Date: ____

SAMPLE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____

Time (2400 Hr)	Temp. (°C)	Electrical Conductivity (µmhos/cm)	pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)	ORP (mV)

Sheen: ____ Odor: ____ Sample Date: ____

Field Measurement Devices: Horiba ____ Omega ____ QuickCheck ____ D.O. Test Kit ____ YSI X

REMARKS: (10.18)(0.04)(3785 mL/gal) = 1541 mL ; SP-5C well purged dry
Allowed to recharge → insufficient volume for field parameters ;
sampled @ 1230

SIGNATURE: Amy Fell **DATE:** 09/11/07

Golder Associates

WATER SAMPLE FIELD DATA

LOCATION: BNC Gas Mini Mart
SAMPLE ID: SP-6A
PROJECT NO: 053-7020.45
SAMPLED BY: A. Hill
CLIENT: BNC Gas Mini Mart
REGULATORY AGENCY: ACEHS
SAMPLE TYPE: Groundwater X Surface Water ____ Leachate ____ Treatment System ____ Other ____
CASING DIAMETER (OD-inches): 3/4 ____ 1 X 2 ____ 4 ____ 4.5 ____ 6 ____ 8 ____ Other ____
GALLONS PER LINEAR FOOT : (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 41.80
Depth to Water (ft): Dry
Height of Water Column (ft): ____
Volume in Casing (gal): ____
Calculated Purge (volumes / gal.): ____
Actual Pre-Sampling Purge (gal): ____

PURGE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____
Purge Water Containment: Drummed
Field QC Samples Collected at this Well (Equipment or Field Blank): EB-___ FB-___ Other ____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Elec. Conductivity (µmhos/cm)	pH (std. units)	Color (visual)	Turbidity (visual)	DO (mg/l)	ORP (mV)	Odor

Purge Date: ____

SAMPLE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____

Time (2400 Hr)	Temp. (°C)	Electrical Conductivity (µmhos/cm)	pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)	ORP (mV)

Sheen: ____ Odor: ____ Sample Date: ____

Field Measurement Devices: Horiba ____ Omega ____ QuickCheck ____ D.O. Test Kit ____ YSI X

REMARKS: Well dry - no samples

SIGNATURE: Amy Hill **DATE:** 9/11/07

Golder Associates

WATER SAMPLE FIELD DATA

LOCATION: BNC Gas Mini Mart
SAMPLE ID: SP-6B
PROJECT NO: 053-7020.45
SAMPLED BY: A. Hill
CLIENT: BNC Gas Mini Mart
REGULATORY AGENCY: ACEHS
SAMPLE TYPE: Groundwater X Surface Water ____ Leachate ____ Treatment System ____ Other ____
CASING DIAMETER (OD-inches): 3/4 ____ 1 X 2 ____ 4 ____ 4.5 ____ 6 ____ 8 ____ Other ____
GALLONS PER LINEAR FOOT : (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 48.28
Volume in Casing ~~(gal)~~: 875 mL
Depth to Water (ft): 42.50
Calculated Purge (volumes / ~~gal.~~ mL): 2625
Height of Water Column (ft): 5.78
Actual Pre-Sampling Purge (~~gal~~ mL): 450

PURGE:
Device (Depth of Intake from TOC): S.S. Bailer____ Teflon Bailer____ PVC Bailer____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump____ Electric Submersible Pump____ Dedicated____ Other____
Purge Water Containment: Drummed
Field QC Samples Collected at this Well (Equipment or Field Blank): EB-___ FB-___ Other ____

Time (2400 Hr)	Volume (gallons)	Temp. (°C)	Elec. Conductivity (µmhos/cm)	pH (std. units)	Color (visual)	Turbidity (visual)	DO (mg/l)	ORP (mV)	Odor
0755		purged dry							

Purge Date: ____

SAMPLE:
Device (Depth of Intake from TOC): S.S. Bailer____ Teflon Bailer____ PVC Bailer____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump____ Electric Submersible Pump____ Dedicated____ Other____

Time (2400 Hr)	Temp. (°C)	Electrical Conductivity (µmhos/cm)	pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)	ORP (mV)

Sheen: ____ Odor: ____ Sample Date: ____

Field Measurement Devices: Horiba ____ Omega ____ QuickCheck ____ D.O. Test Kit ____ YSI X
REMARKS: (5.78)(0.04)(3785 mL/gal) = 875 mL ; 0755 purged dry - Allowed to recharge - Sampled 0740 (insufficient liquid for pH parameters)

SIGNATURE: Amy Hill **DATE:** 09/12/07

Golder Associates

WATER SAMPLE FIELD DATA

LOCATION: BNC Gas Mini Mart
SAMPLE ID: SP-6C
PROJECT NO: 053-7020.45
SAMPLED BY: A. Hill
CLIENT: BNC Gas Mini Mart
REGULATORY AGENCY: ACEHS
SAMPLE TYPE: Groundwater X Surface Water ____ Leachate ____ Treatment System ____ Other ____
CASING DIAMETER (OD-inches): 3/4 ____ 1 X 2 ____ 4 ____ 4.5 ____ 6 ____ 8 ____ Other ____
GALLONS PER LINEAR FOOT : (0.02) (0.04) (0.17) (0.66) (0.83) (1.5) (2.6)

Well Total Depth (ft): 53.75
Volume in Casing (gal): 1686 mL
Depth to Water (ft): 42.61
Calculated Purge (volumes / gal.): 5060 mL
Height of Water Column (ft): 11.14
Actual Pre-Sampling Purge (gal): 1750 mL

PURGE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____
Purge Water Containment: Drummed
Field QC Samples Collected at this Well (Equipment or Field Blank): EB-___ FB-___ Other ____

Time (2400 Hr)	Volume (gallons) (mL)	Temp. (°C)	Elec. Conductivity (µmhos/cm)	pH (std. units)	Color (visual)	Turbidity (visual)	DO (mg/l)	ORP (mV)	Odor
0825	1600	19.58	1150	7.56	gray		11.3	-9	slight
0850		purged dry							

Purge Date: ____

SAMPLE:
Device (Depth of Intake from TOC): S.S. Bailer ____ Teflon Bailer ____ PVC Bailer ____ Disp. Bailer X
PVC Hand Pump ____ Peristaltic Pump ____ Centrifugal Pump ____ Bladder Pump ____
Pneumatic Displacement Pump ____ Electric Submersible Pump ____ Dedicated ____ Other ____

Time (2400 Hr)	Temp. (°C)	Electrical Conductivity (µmhos/cm)	pH (std. units)	Dissolved Oxygen (mg/l)	Color (visual)	Turbidity (NTU)	ORP (mV)
0750	19.83	1100	7.61	11.24			-47

Sheen: ____ Odor: ____ Sample Date: ____

Field Measurement Devices: Horiba ____ Omega ____ QuickCheck ____ D.O. Test Kit ____ YSI X

REMARKS: (11.14)(0.04)(3785 mL/gal) = 1686 mL ; 0850 purged dry - allowed to recharge & samples taken @ 0950

SIGNATURE: [signature] **DATE:** 9/12/07

12/5/07
HMK
B&C Gas Station
2008 1st St
Livermore, CA

Time	Well	DTW	DO	ORP	VAPOR				
					O2	CO2	PID	HELIUM	
9:40	SP-2B	45.73			20.9	0.00	13.8		
9:45	SP-2A	DRY			19.9	0.45	19.6		
10:15	SP-4B	45.31			20.8	0.05	0.8		
10:25	SP-4A	DRY			20.7	0.05	0.3		
10:32	SP-3B	44.88			19.6	0.60	1.9		
10:47	SP-3A	DRY			17.0	0.85	17.9		
12:00	SP-5A				10.7	1.20	895		

APPENDIX G

Field Notes and

Soil Vapor Sampling Procedures

SOIL VAPOR SAMPLE COLLECTION RECORD

Project Location: BNC
Sampler: D. Ferrand

Project No. 053-7406-100
Date 11/19/07

Sample ID	Canister Serial #	Depth (feet)	Canister Size (cc)	Target Purge Volume (cc)	Purging Data (Purge Can Serial #: 4319) Start Time	End Time	Purge Can Initial Vac (in. Hg)	Purge Can Final Vac (in. Hg)	Delta Vac (in. Hg)	Purged Volume (cc)	Estimated Flow Rate (cc/min)
SV-MW-2	9473	5	6L	18			29				175

Sample ID	Canister Serial #	Sample Train Serial #	Sample Depth (feet)	Canister Size (cc)	Sample Collection Start Time	End Time	Sample Can Initial Vac (in. Hg)	Sample Can Final Vac (in. Hg)	Delta Vac (in. Hg)	Sample Volume (cc)	Estimated Flow Rate (cc/min)
SV-MW-1	9473	000324	5	1L	1120	1126	29	4			175
SV-MIP-8	9331	000000 29005	5	1L	1150	1201	24	4			175

in. Hg Inches of Mercury
cc Cubic Centimeters, Equivalent to Milliliters
cc/min Cubic Centimeters per Minute
Delta Vac Initial Vacuum Minus Final Vacuum

The volume change is directly related to the vacuum change (Delta Vac) in the canister. Vol = (Delta Vac/Initial Vac) * Initial Volume

COMMENTS:

SUMMA CANISTER SOIL VAPOR SAMPLING PROCEDURES

Soil Vapor Sampling and Analytical Procedures

This procedure is based on the following: Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air, Department of Toxic Substances Control, California Environmental Protection Agency, (Interim Final), February 7, 2005.

This method is for collected soil vapor samples using Summa canisters and a sample train. The vapor point or probe will be purged using a purge canister that will be connected in series with the sampling canister and the vapor well using a sample train. A separate sampling train will be used for each sampling point. The sampling train and the Summa canisters are provided by the air laboratory and are certified clean. A schematic of the soil vapor well and sample train setup is shown on Figure 1. The proposed soil vapor sampling procedure is described below:

1. Connect the purge canister and sampling canister to the sample train. Connect the purge canister at the terminal end of the sample train as shown.
2. Connect the sampling train to the tubing extending from the boring using a compression fitting.
3. Leak-check the sampling train by closing the inlet valve (V_I) and opening (and then closing) the purge canister valve (V_p). Monitor the vacuum gauge to confirm that the sampling train holds the vacuum for 10 minutes.
4. Wrap gauze around each fitting from the vapor point or probe side of the inlet valve (V_I) to the vapor point or probe. There is no need to wrap gauze around the fittings that were vacuum leak checked in Step 3. During sample collection, saturate the gauze with rubbing alcohol (isopropyl alcohol). The detection of isopropyl alcohol in the sample will indicate there was a leak in the sample train upstream from V_I. Continue to wet the gauze with isopropyl alcohol approximately every 5 minutes during sample collection.

Before sampling each well, the purge volume will be converted to inches of mercury in the purge canister using the ideal gas law. For example, when the purge volume is 1545 milliliters (ml), the volume of the canister is 6000 ml, and the initial vacuum of the purge canister is 30 inches of mercury (in. Hg), then 1545 ml is equivalent to:

(1545 ml/6,000 ml) x 30 in. Hg = 7.7 in. Hg

Purging is completed when the purge canister vacuum goes from 30 to 22.3 in. Hg. The purge time is recorded in order to confirm the purging flow rate. The measurements are recorded on a Soil Vapor Sample Collection Record.

The sampling train incorporates a flow restrictor that maintains the air flow between 100 to 200 ml/min. As shown on Figure 3, the sampling train includes a filter (F), inlet valve (V_I), purging vacuum gauge (G_p), flow regulator (R), Summa canister vacuum gauge (G_s), and each of the Summa canisters is equipped with a valve (V_s and V_p; sampling canister and purge canister, respectively).

Soil Vapor Well Purging Procedure

The purging procedure is described below:

1. Initially all valves (V_I, V_s, and V_p) are closed.
2. Open V_p and record the initial purging canister pressure.
3. Open V_I to allow the purging canister to begin filling.
4. Observe G_s and stop the purging when G_s reaches the pre-determined post-purge vacuum (as described above) by shutting V_p and V_I.

Sample Vapor Sample Collection Procedure

The soil vapor sample will be collected at a flow rate of 100 to 200 milliliters/minute to inhibit partitioning or short circuiting (should take approximately 24 to 48 minutes for a 6-liter Summa canister assuming 20% of the vacuum will be left in the Summa canister. The sampling procedure is described below:

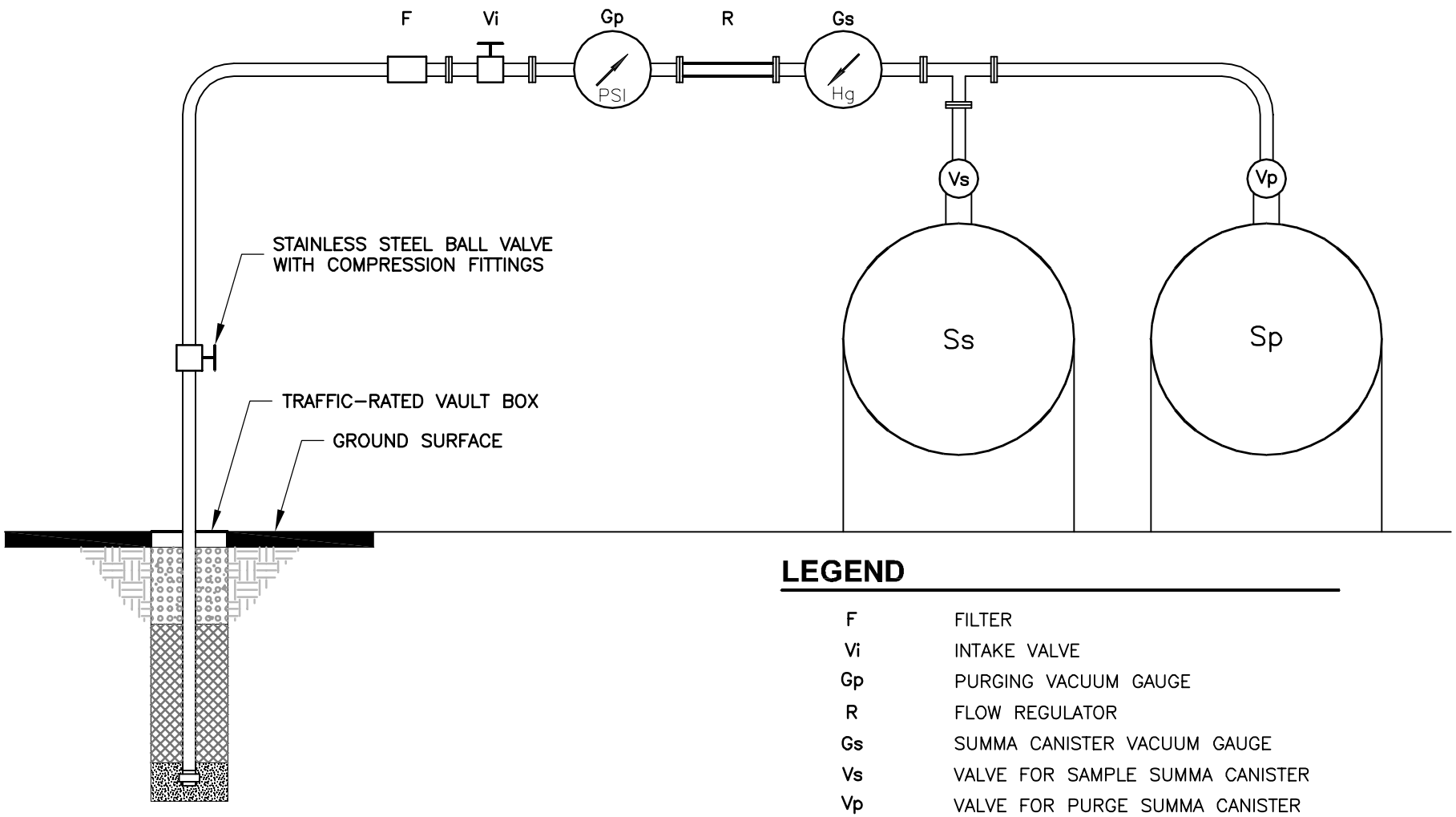
1. Initially all valves (V_I, V_s, and V_p) are closed.
2. Open V_s and record the initial sampling canister pressure.
3. Open V_I to allow the sampling canister to begin filling.
4. Observe G_s and stop the sampling when G_s is approximately 5 in. Hg by shutting V_s and V_I.
5. Disassemble the sampling train and complete the sample labeling and the chain of custody documentation

Soil Vapor Analytical Procedures

For additional leak check, analyze the soil vapor sample for the following atmospheric gases in addition to project specific analyses:

- Oxygen, carbon dioxide, and methane by modified ASTM D-1946.

Note: soil vapor samples will not be collected if measurable precipitation has occurred within the previous seven days.



LEGEND

F	FILTER
Vi	INTAKE VALVE
Gp	PURGING VACUUM GAUGE
R	FLOW REGULATOR
Gs	SUMMA CANISTER VACUUM GAUGE
Vs	VALVE FOR SAMPLE SUMMA CANISTER
Vp	VALVE FOR PURGE SUMMA CANISTER
Ss	SAMPLE SUMMA CANISTER
Sp	PURGE SUMMA CANISTER

NOT TO SCALE

IN-SITU SOIL-GAS SAMPLING SCHEMATIC

Golder Associates
Sacramento, CA

APPENDIX H

Pilot Test Monitoring Data

Table
Pilot Test Field Data November 14, 2007
2008 1st Street, Livermore, California

Date	Time	Pressure (psi)	Flow Rate (scfm)	Comment
Breakout Pressure Testing				
11/14/2007	8:45	7	>0	Flow started in 30 seconds
11/14/2007	8:47	5	1.6	Flow stabilized in 1 minute
Pressure Versus Flow Rate Testing				
11/14/2007	8:48	5	1.9	
11/14/2007	8:49	7	3.3	
11/14/2007	8:50	13	5.0	Wellhead @ 11.5 psi

Table
Pilot Test Field Data November 14, 2007
2008 1st Street, Livermore, California

Well ID.	Date	Time	DTW (ft.)	TD (ft.)	ORP (mV)	D.O. (mg/l)	P.I.D. (ppm)	O2 (%LEL)	CO2 (ppm)	Comments
Baseline										
SP-2A	11/14/2007	7 to 10	40.95	41.8	NA	NA	8.7	20.4	NA	
SP-2B	11/14/2007	7 to 10	45.35	48.2	NA	NA	6.6	20.9	NA	
SP-3A	11/14/2007	7 to 10	39.8	40.0	NA	NA	43.8	15.0	NA	
SP-3B	11/14/2007	7 to 10	44.6	46.6	NA	NA	12.4	19.9	NA	
SP-4A	11/14/2007	7 to 10	39.74	41.4	NA	NA	11.3	20.2	NA	
SP-4B	11/14/2007	7 to 10	44.94	48.2	NA	NA	81.7	20.0	NA	
MW-2	11/14/2007	7 to 10	45.70	55.9	NM	NM	NM	NM	NA	
Pilot Test										
SP-2A	11/14/2007	1313	41.8	--	227	2.64	--	--		Multiple bailer trips into well aerated sample
1420 begin air sparging at SP-1B, 9 psi, 4 scfm, wellhead at 5.5 psi										
1430 air sparging at SP-1B, 6 psi, 3.7 scfm										
SP-2A	11/14/2007	1445	Dry	--	NA	NA	10.5	NC	NA	
SP-2B	11/14/2007	1430	45.16	--	NA	NA	44.5	20.2	NA	
SP-2B	11/14/2007	1435	45.05	--	NA	NA	36.3	20.3	NA	
SP-2B	11/14/2007	1445	45.05	--	NA	NA	21.5	20.4	NA	
SP-2B	11/14/2007	1500	45.08	--	NA	NA	9.0	20.9	NA	
SP-2B	11/14/2007	1510	45.08	--	NA	NA	6.6	20.9	NA	
SP-4A	11/14/2007	1450	NM	--	NA	NA	10.0	20.0	NA	
SP-4B	11/14/2007	1455	44.80	--	NA	NA	54.5	20.1	NA	at 1510 SP-1B, 5 psi, 3.5 scfm
SP-4B	11/14/2007	1515	44.79	--	NA	NA	14.4	20.9	NA	at 1518 SP-1B, 4 psi, 3.5 scfm
1518 stop test and trac recharge into SP-1B										
SP-1B	11/14/2007	1519	Dry							
SP-1B	11/14/2007	1523	Dry							
SP-1B	11/14/2007	1526	Dry							
SP-1B	11/14/2007	1533	48.18							
SP-1B	11/14/2007	1540	48.07							
SP-1B	11/14/2007	1550	47.70							

Table
Pilot Test Field Data November 19, 2007
2008 1st Street, Livermore, California

Well ID.	Date	Time	DTW (ft.)	TD (ft.)	ORP (mV)	D.O. (mg/l)	P.I.D. (ppm)	O2 (%LEL)	CO2 (ppm)	Comments
Began sparging 1148, SP-1B, 3 psi, 1.3 scfm with ozone at 25% of maximum generation										
MW-1	11/19/2007	0745	45.93				800	<0	12.7	
MW-1	11/19/2007	1130					790.0	<0	>5	
MW-1	11/19/2007	1201					580.0	0.3	>5	
MW-1	11/19/2007	1300					450.0	7.9		
MW-2	11/19/2007	0739	46.01				820	<0	>5	
MW-2	11/19/2007	1100			-62.5	3.23				pH 7.35
MW-2	11/19/2007	1123					755	<0	>5	
MW-2	11/19/2007	1135			-44.6	3.72				sampling pump stopped working
MW-2	11/19/2007	1154					680	<0	>5	
MW-2	11/19/2007	1206	46.2							
MW-2	11/19/2007	1258					422	16.3	>5	
MW-2	11/19/2007	1330					500	16.0	>5	
SP-1B	11/19/2007	0734	45.19				3	20.4	0	
SP-2B	11/19/2007	810	45.42				3.6	20.8	0.05	
SP-2B	11/19/2007	1025					56	20.3	0.05	
SP-2B	11/19/2007	1123					95	20.4	0.10	
SP-2B	11/19/2007	1152					66	20.5	0.10	
SP-2B	11/19/2007	1158	45.10							
SP-2B	11/19/2007	1229	45.20				26	20.5	0.15	
SP-2B	11/19/2007	1253	45.20				13	20.7	0.15	
SP-2B	11/19/2007	1358	45.39							
SP-4B	11/19/2007	1134					40	20.5	0.10	
SP-4B	11/19/2007	1256					13	20.5	0.15	

Well ID.	Date	Time	DTW (ft.)	TD (ft.)	ORP (mV)	D.O. (mg/l)	P.I.D. (ppm)	O2 (%LEL)	CO2 (ppm)	Comments
1301 stop test and track recharge into SP-1B										
SP-1B	11/19/2007	1305	Dry							
	11/19/2007	1310	48.10							
	11/19/2007	1313	48.00							
	11/19/2007	1350	45.65							
	11/19/2007	1420	45.20							

NOTES:

Table
Pilot Test Field Data November 26, 2007
2008 1st Street, Livermore, California

Well ID.	Date	Time	DTW (ft.)	TD (ft.)	ORP (mV)	D.O. (mg/l)	P.I.D. (ppm)	O2 (%)	CO2 (ppm)	Comments
SP-2A	11/26/2007	1035	Dry				0.7	20.1	0.55	System resting
SP-2B	11/26/2007	1040	45.07				14.2	20.8	0.15	System resting
SP-4A	11/26/2007	1105	Dry				4.3	30.7	0.20	System resting
SP-4B	11/26/2007	1110	44.86				4.2	20.8	0.10	System resting
SP-3A	11/26/2007	1130	Dry				30.0	17.3	0.85	System on at 1114
SP-3B	11/26/2007	1135	44.71				4	19.8	0.60	System resting
SP-5A	11/26/2007	1205	Dry	40.4			697	10.7	1.95	Tubing at 38' bgs
MW-5	11/26/2007	1230	39.04	39.6			858	9.4	75	System resting, water in cap

Table
Pilot Test Field Data December 5, 2007
2008 1st Street, Livermore, California

Well ID.	Date	Time	DTW (ft.)	TD (ft.)	ORP (mV)	D.O. (mg/l)	P.I.D. (ppm)	O2 (%LEL)	CO2 (ppm)	Comments
SP-2A	12/5/2007	9:45	Dry				19.6	19.9	0.45	
SP-2B	12/5/2007	9:40	45.73	46.62			13.8	20.9	0.00	
SP-3A	12/5/2007	10:47	Dry				17.9	17.0	0.85	
SP-3B	12/5/2007	10:32	44.88	45.22			1.9	19.6	0.60	
SP-4A	12/5/2007	10:25	Dry				0.3	20.7	0.05	
SP-4B	12/5/2007	10:15	45.31	46.98	114	7.81	0.8	20.8	0.05	
SP-5A	12/5/2007	12:00					895	10.7	1.20	
MW-2	12/5/2007	16:30	46.32	60.69	-15	6.33				