Lawrence Livermore National Laboratory
University of California
Livermore, California 94550

UCRL-AR-145818

Water Quality Testing after the Detonation of Primacord Detonation Cord in Water from Lake Davis

Authors

Tina Carlsen[1]
Ned Borglin[1]
Mark Hoffman[2]
Raul Garza[2]

October 2001

[1]Environmental Restoration Division
[2]Chemistry and Materials Sciences Division

Environmental Restoration Division
Chemistry and Materials Sciences Division

\This work was performed under the auspices of the U.S. Department of Energy by the University of California, Lawrence Livermore National Laboratory under Contract W-7405-Eng-48.

UCRL-AR-145818

Water Quality Testing after the Detonation of Primacord Detonation Cord in Water from Lake Davis

Authors

Tina Carlsen[1]
Ned Borglin[1]
Mark Hoffman[2]
Raul Garza[2]

October 2001

[1]Environmental Restoration Division
[2]Chemistry and Materials Sciences Division

Table of Contents

List of Photos

List of Figures

List of Tables

Appendices

Executive Summary

The California Department of Fish and Game (CDFG) is considering the use of detonation cord as a means of pike management at Lake Davis. CDFG contracted with Lawrence Livermore National Laboratory (LLNL) to conduct experimental detonations of Primacord in water and conduct water quality sampling and analysis of the water used in the detonations. These data will be used by CDFG to evaluate the impact the detonation of Primacord may have on the water quality at Lake Davis.

LLNL detonated approx. 4 in (10 cm) of Reinforced Primacord (50 grain/ft or 0.107 g of PETN/cm) in approx. 600 ml of Lake Davis water in duplicate, in a one-kilogram detonation tank at its High Explosives Application Facility (HEAF). Between 580 and 590 ml of water was recovered from each detonation, and each replicate was diluted to approx. 16 L with Lake Davis water. Water from each replicate was sampled and analyzed at 12 m, 120 m and 1200 m from the time of dilution for volatile organic compounds (VOCs), semi-VOCs, nitrogen compounds (nitrate, nitrite, ammonia and total kjeldahl nitrogen), physical parameters (total suspended solids and turbidity), formaldehyde, cyanide, and PETN (the explosive comprising the detonation cord). Lake Davis water that had been placed into the experimental vessels prior to detonation was also sampled and analyzed for these constituents, and served as background or blank samples.

Nitrate, nitrite and formaldehyde were not detected in either the blank or detonation samples above the detection limit (0.5 mg/L, 0.02 mg/L, and 15 µg/L, respectively). All of the detonation samples contained cyanide, averaging around 0.08 mg/L for all times sampled, which was not detected in the blank samples (detection limit 0.02 mg/L). Ammonia increased 100% compared to the blank samples, up to an average of around 0.42 mg/L at all times sampled. TKN increased by approx. 50% up to an average of 2.0 mg/L after 120 m. TSS increased by over 100% by 120 m (18.5 mg/L average), declining slightly to 12.9 mg/L average after 1200 m. Turbidity was only slightly elevated, probably not significantly, after 1200 m (average of 10.0 NTU). PETN was detected in the final 1200 m samples (only the blank and 1200 m samples were analyzed for PETN), at an average concentration of 155 µg/L. PETN was not detected in the blank sample (detection limit of 5 µg/L).

The blank samples did not contain any semi-VOCs or VOCs above the detection limit (between 2 and 20 µg/L). The four VOC trip blanks were also free of VOCs. One semi-volatile VOC, naphthalene, was detected in all detonation samples, averaging 3.7 µg/L for the 12 and 120 m samples, and declining slightly to 2.3 µg/L after 1200 m. Bis(2-eylhexyl)phthalate was consistently detected in one of the detonation samples at around 30 µg/L at 12 and 120 m, declining to 17 µg/L after 1200 m. However, this compound was not detected in the second sample. Benzoic acid was also detected at 120 m in this detonation sample.

The aromatic VOCs benzene, ethylbenzene, styrene, toluene, and total xylenes were detected in all detonation samples regardless of time sampled. Concentrations were between 10.4 and 8.0 µg/L for benzene (12 and 1200 m respectively), 0.9 and 0.6 µg/L for ethylbenzene (12 and 1200 m respectively), 2.3 and 1.5 µg/L for styrene (120 and 1200 m respectively), 5.7 and 4.4 µg/L for toluene (12 and 1200 m respectively), and 1.8 and 1.2 µg/L for total xylene (12 and 1200 m respectively). Chloromethane was only detected in the first replicate of the 12 m

sampling event, but not in the other three samples. VOC concentrations declined slightly over time.

Similar detonation tests were conducted by the Denver Research Institute (DRI) in 1983 and the University of Rhode Island (URI) in 2000. DRI analyzed the resulting water for nitrogen compounds, TSS and cyanide. URI analyzed the resulting water for semi-VOCs and VOCs. After taking into account differences in the amount of detonation cord and volume of water used, the results found in this test are consistent with these previous tests.

Thus, under the conditions similar to those found in these tests, the detonation of Primacord detonation cord in water will be expected to produce low concentrations of semi-VOCs and VOCs, slight increases in the nitrogenous compounds ammonia and TKN, slight increases in the physical parameters TSS and turbidity, and detectable concentrations of PETN and cyanide.

1. Introduction

This report describes a detonation test conducted by Lawrence Livermore National Laboratory (LLNL) to evaluate the impact the detonation of Primacord detonation cord in water may have on subsequent water quality. The California Department of Fish and Game (CDFG) is considering the use of detonation cord as a means of pike management at Lake Davis. CDFG contracted with LLNL to conduct experimental detonations of Primacord in water and conduct water quality sampling and analysis of the water used in the detonations. These data will be used by CDFG to evaluate the impact the detonation of Primacord may have on the water quality at Lake Davis.

2. Collection of Lake Davis Water

LLNL received approximately 60 L of Lake Davis water from the CDFG on August 28, 2001 under chain of custody (Appendix A). The water was contained in three 20 L high-density polyethylene (HDPE) Nalgene carboys (catalog number 16338-039) with molded graduations, Teflon bottom spigot, stainless handle and molded-in handgrips. The carboys were filled to capacity with no headspace. An unused carboy was also provided to LLNL for possible use in the detonation cord testing. These carboys had originally been provided to LLNL on August 21, 2001 containing water from Lake Davis. However, the first detonation test revealed problems with the test vessels, and thus the Lake Davis water and carboys were not used. The three carboys were subsequently emptied and returned to CDFG via Federal Express for refilling. The carboys refilled with Lake Davis water were transported to LLNL by CDFG staff by vehicle in an oversized ice chest and cooled with blue ice. The filled carboys were transferred into a similar oversized ice chest with blue ice at LLNL. The chain of custody indicated the carboys were filled at the mouth of Mosquito slough on August 27, 2001. The water was stored overnight in the oversized ice chest in the Environmental Restoration Division's chemistry laboratory (Photo 1).

3. Detonation Cord and Detonator

The detonation cord tested was 50 grain PETN/ft (which is equivalent to 0.107 g/cm or 10.7 mg/mm) of reinforced Primacord from Ensign-Bickford. The Primacord was provided to LLNL by Brian Oliver of W. Murphy Company in Jamestown, CA. The detonation cord was received at Site 300, and subsequently transferred to the High Explosives Application Facility (HEAF) in Livermore. Approximately 16 inches (40 cm) of Primacord was provided to LLNL. The detonator used was an RP-2 detonator (Figure 1). This is a small slapper-initiating device containing 32 mg of PETN and 18 mg RDX with binders, which lights the PETN in the Primacord. A stainless steel sleeve was constructed to connect the RP-2 detonator to the Primacord. The Primacord was attached to the detonator by sliding the stainless steel sleeve over the Primacord and detonator and crimping the sleeve (Photo 5). An end cap was used on the free end of the Primacord to retain the PETN. This end cap was removed prior to immersion in water and detonation.

4. Vessel Construction

Vessels available at LLNL for possible use in the experiment were tested on August 22, 2001 and found to be inadequate for use with water and detonation cord. Therefore, vessels specifically designed for use with detonation cord in water test were constructed (Figure 2, Photo 2). The design consisted of a smaller cylindrical stainless steel open-top vessel (~3 in diameter by 6 in long, nominal volume of 600 ml) suspended by three stainless steel wires from the top cap of a larger cylindrical vessel (Figure 2). The larger vessel was constructed of 3/4 in stainless steel and had an interior diameter of 6.5 in and a height of 15 in for vessel 1 or 12.25 in for vessel 2. Nominal interior volume was 6 L. The top cap of the vessels consisted of 0.25 in stainless steel with 3 side holes for bolting the cap to the outer vessel, and two small holes (~1/8 in diameter), one in the center used for the wires holding the interior vessel, and one to the side used for the detonation wires. This vessel assembly was designed to isolate the hydrodynamic shock propagating through the water from the larger outer vessel. The Primacord and detonator are suspended from the top cap into the inner vessel filled with water. Upon detonation, the wires of the inner vessel shear from the wires holding it to the top cap, with the water collecting in the larger vessel. Detonation of the detonator and approx. 100 mm (about 4 in) length of Primacord was estimated to generate about 1 L of product gases, thus the outer vessel would experience a pressure increase of about 2 PSI.

5. Experimental Test Shots

The test was assigned experiment number 3X056. Logbook ZJ Site300 was used to record all test data. This logbook is a bound, numbered logbook tracked within the Environmental Restoration Division's data management system.

5.1. Blank Collection

Preparation of blank, or baseline, water quality samples was conducted the morning of August 29, 2001 (Photo 3). A carboy filled with Lake Davis water was labeled for use in Detonation 1, a second carboy was labeled for Detonation 2. Similar labeling was done for each vessel. The vessels, all wires, and the stainless steel detonator connector sleeves were thoroughly cleaned with Alconox detergent and rinsed three times with de-ionized water. An additional rinse with Lake Davis water followed the DI water rinses. Water quality parameters were collected from carboy 1 and 2 and are listed in Table 1. All water quality parameters were collected using commercially available Chemetrics test kits, and calibrations were conducted according to the manufacturer's instructions. To prepare the baseline, or blank sample, the outer vessel was completely filled with Lake Davis water (approx. 6 L), and the entire vessel assembled. The vessel was then disassembled, and water from the larger vessel was collected into sample bottles (water quality samples collected for each sampling event are listed in Table 2). Samples were immediately placed into an ice chest with double-bagged ice.

5.2. Detonations

The detonations were carried out the afternoon of August 29, 2001. The north one-kilogram tank at HEAF was used for the detonations (Photo 4). Both vessels were assembled with the Primacord, the detonator and Lake Davis water and placed into the tank for simultaneous detonation (Photos 4–13). Vessel 1 was assembled with 5.2 mm X 95 mm of Primacord (1.8284 g, containing 1.0485 g of PETN), the RP-2 detonator (0.032 g PETN and 0.018 g RDX with binder) and 625 ml of Lake Davis water. Vessel 2 was assembled with 5.2 mm × 110 mm of Primacord (2.2780 g, containing 1.177 g PETN), the RP-2 detonator (0.032 g PETN and 0.018 g RDX with binder) and 650 ml of Lake Davis water (Photo 5). The small red plastic cap on the free end of the Primacord, which helps hold the PETN in place, was removed. The three wires holding the inner vessel were fed through the center hole in the top cap, and the two copper wires from the detonator were fed through the side hole in the top cap. The Primacord/detonator assembly was suspended into the inner vessel, and the inner vessel was filled with Lake Davis water (Photo 8). A small amount of particulate PETN could be observed on the sides of the inner vessel in test vessel 2. The prepared inner assembly was then placed into the outer vessel and bolted in place (Photos 9 and 10), with the wires holding the inner vessel secured around one of the bolts prior to tightening the top plate. Care was taken to ensure nothing that went inside the larger vessels became contaminated. The detonator wires were hooked to the firing assembly on the side of the tank (Photo 11) and the tank was closed (Photos 12 and 13).

Detonation occurred at 2:15 p.m. (Photo 14). A very faint sound was heard, like that of a door closing. The tank was reopened at 2:30 p.m. and the vessels retrieved. The outer vessels and all outer wires remained intact (Photo 15). A small amount of water was visible on the floor of the tank. This water most likely was forced out either through the small exit holes provided for the wires, or between the top cap and outer vessel. These escape areas are left unsealed to allow for pressure release.

6. Water Quality Sampling

Vessel 1 was retrieved, examined and diluted first. The wires holding the inner vessel had sheared from the top inside the vessel, but the outer portion of the wires remained bolted to the outer top plate (Photo 15). The inner vessel was at the bottom of the outer vessel along with the water and Primacord debris (Photo 16). The test water was poured into a clean, 1000 ml graduated cylinder pre-rinsed with Lake Davis water and measured. Vessel 1 had ~580 ml of remaining water. Primacord debris consisted of dark, plastic particulate matter floating on the surface of the water (Photos 17 and 18). Within the graduated cylinder, this debris occupied about 60 ml. The water had a very strong acrid smell, somewhat like burning plastic. The test water was poured into carboy 1, which was then well agitated. About 1.5 L of water from the carboy containing spare Lake Davis water was used to rinse the inner vessel and inside of the outer vessel. This rinse water was added to carboy 1, bringing the volume to approx. 16 L. The carboy was again well agitated. Final dilution was complete at 2:53 p.m. Vessel 2 was then retrieved, and was similarly examined, rinsed, and diluted. Vessel 2 had ~590 ml of remaining water, with about 50 ml of shot debris floating on the surface. Final volume in carboy 2 was also approx. 16 L. Final dilution of carboy 2 was complete at 3:00 p.m.

Water quality samples were collected at 12 m, 120 m (2 hr) and 1200 m (20 hr) after the final dilution (Photo 19). The carboys were agitated prior to sample collection, and periodically during sample collection. Water quality parameters were collected from each carboy just prior to each sampling event, and are listed in Table 1. The water quality samples collected for each sampling event are listed in Table 2. Table 3 lists the sample identifiers used. Water continued to have a detectable odor even at the 1200 m sampling event, although it was reduced. Because of its floating nature, the majority of the plastic Primacord debris went into the 1200 m TSS/Turbidity sample, which was the last sample collected from each carboy. All water was sampled. Carboy 1 was short about 100 ml, thus the final TDS/Turbidity sample was not quite 1000 ml. Carboy 2 had approximately 200 ml remaining after all samples were collected.

Samples were collected according to appropriate EPA protocols (USEPA 1997), stored in iced coolers, and sent to BC Laboratory of Bakersfield, a certified analytical laboratory, under full chain-of-custody. Five day turn around was officially requested based on the laboratory's current sample load, although we indicated our desire for a faster TAT if possible. All samples collected during sampling events 1 through 3 (blank, 12 m and 120 m) were picked up by the BC Laboratory courier the evening of August 29, 2001. Samples collected for sampling event 4 (1200 m) were picked up on August 30, 2001. Data were provided to CDFG and Blankinship and Associates upon receipt in a Portable Document Format (PDF) file.

7. Results

Results are summarized in Tables 4 and 5. The average concentration of each compound from the two replicates was determined, and plotted in Figures 3 through 12. When the compound was not detected, the detection limit was used to obtain the average. Results were plotted using a logarithmic scale for the x axis (time). Thus, the concentration in the blank (time 0) is plotted at 1 minute, as log scales cannot use a zero value.

Both blank samples were free of PETN, cyanide, nitrate, nitrite, semi-VOCs, and VOCs (Tables 4 and 5). A small amount of total kjeldahl nitrogen (TKN) was detected (1.3 mg/L as N) as well as a small amount of ammonia (0.2 mg/L as N). Total suspended solids (TSS) averaged 7.7 mg/L, and turbidity averaged 7.0 NTU. These values for TKN, ammonia, TSS and turbidity are considered the background value for the Lake Davis water.

PETN was detected in the final 1200 m samples, and at an average concentration of 155 µg/L (Table 4, Fig. 3). Formaldehyde was not detected in any of the samples (Table 4, Fig. 3). All of the detonation samples contained cyanide, averaging around 0.08 mg/L for all times sampled (Table 4, Fig. 4). Ammonia increased 100% up to an average of around 0.42 mg/L at all times sampled (Fig. 4). TKN increased by approx. 50% up to an average of 2.0 mg/L after 120 m, where as nitrate and nitrite remained undetectable (Fig. 5). TSS increased by over 100% by 120 m (18.5 mg/L average) but declined slightly after 1200 m (12.9 mg/L average, Fig. 6). Turbidity was only slightly elevated, probably not significantly, after 1200 m (average of 10.0 NTU, Fig. 6).

The semi-volatile VOC naphthalene was detected in all detonation samples, averaging 3.7 µg/L for the 12 and 120 m samples, and declining slightly to 2.3 µg/L after 1200 m (Table 5, Fig. 7). Bis(2-eylhexyl)phthalate was consistently detected in the first detonation samples (Det1) at around 30 µg/L at 12 and 120 m, declining to 17 µg/L after 1200 m. However, this compound

was not detected in the second (Det2) samples. Benzoic acid was also detected at 120 m in the first detonation sample.

The aromatic VOCs benzene, ethylbenzene, styrene, toluene, and total xylenes were detected in all detonation samples regardless of time sampled (Table 5, Fig. 8). Concentrations were between 10.4 and 8.0 µg/L for benzene (12 and 1200 m respectively), 0.9 and 0.6 µg/L for ethylbenzene (12 and 1200 m respectively), 2.3 and 1.5 µg/L for styrene (120 and 1200 m respectively), 5.7 and 4.4 µg/L for toluene (12 and 1200 m respectively), and 1.8 and 1.2 µg/L for total xylene (12 and 1200 m respectively). Chloromethane was only detected in the first replicate of the 12 m sampling event, but not in other three samples. VOC concentrations declined slightly over time. Duplicate samples were collected during the 12 m sampling event, and except for chloromethane, results from the duplicate sample closely match the original sample. Each sampling event was packed in separate ice chests for transport to the analytical laboratory, and each ice chest contained a trip blank. The four trip blanks were free of VOCs.

8. Discussion

Two other tests have been conducted on Primacord to evaluate the impacts of the detonation products of Primacord in water on water quality. Table 6 lists the pertinent experimental variable of the two tests plus the LLNL test. In our experiment (LLNL 2001), approx. 1.1 g of PETN was detonated in 600 ml of water in duplicate. Between 580 and 585 ml of recovered water was subsequently diluted to approx. 16,000 ml. Assuming minimal loss of detonation products in the evacuated water, this resulted in about 1.1 g PETN/16 L of water, or 0.069 g/L. In 2001, the CDFG contracted with the University of Rhode Island (URI) to evaluate Primacord detonation in Lake Davis water (URI 2000). In that experiment, 6 in of Primacord containing 1.62 g of PETN was detonated in 500 ml of Lake Davis water in duplicate. Between 350 and 430 ml of water was recovered from each detonation and diluted to approx. 1040 ml and analyzed for VOCs (EPA 8260) and semi-VOCs (EPA 8270). Again assuming minimal loss of the detonation cord products in the evacuated water, this resulted in 1.62 g PETN/1.04 L of water, or 1.55 g/L, or 22 times more concentrated than our test.

In 1983, Ensign-Bickford, the maker of Primacord, contracted with the Denver Research Institute (DRI) to conduct underwater detonations and water quality analysis for cyanide, TSS, ammonia, TKN and nitrate, along with total carbon and total organic carbon (DRI 1983). In this test, five successive detonations of Series 200 Primacord were conducted in 125 gallons of distilled water. The first detonation consisted of 12 in of Primacord (13 g PETN), with each successive detonation consisting of 24 in of Primacord (26 g PETN). Some water was lost with each detonation, resulting in a final volume of 84 gallons. Samples were collected prior to the first detonation (time 0), and after each subsequent detonation (1 through 5). The amount of PETN per volume of water was 0.027 g/L up to 0.37 g/L (or from 0.039 up to 5.36 times our test concentration). Detonation 2 was most similar to our test concentration (0.08 g PETN/L water, or 1.16 times our test concentration). A search of the open literature failed to identify other tests concerning the use of detonation cord in water, either as a fisheries management tool, or to evaluate the impact on water quality.

Our cyanide results are consistent with those detected by DRI (DRI 1983). DRI sampled for cyanide at time 0 and after detonation 3 (0.16 g PETN/L water, 2.32 times our test concentration)

and 5 (0.37 g PETN/L water, 5.36 times our test concentration), and found non-detection, 0.07 and 0.0119 mg/L of cyanide, respectively. Our results of around 0.08 g/L of cyanide are within this range.

In the DRI test, TSS increased from 4.5 mg/L at time 0, up to 14.0 mg/L at detonation 2 (most similar to our detonation). We experienced an increase from around 8 mg/L up to about 18 mg/L. This is a delta of around 10 mg/L, similar to that observed in the DRI test. DRI did not observe a significant increase in ammonia concentrations through the second detonation (concentrations remained around 0.5 mg/L), concentrations increased up to 1.0 mg/L by the fifth detonation, a delta of 0.5 mg/L. We observed ammonia concentrations increasing from about 0.2 mg/L to 0.4 mg/L, a delta of 0.2 mg/L. Like ammonia, TKN did not significantly increase in the DRI test until after the second detonation, where it increased from about 0.8 mg/L up to 1.7 mg/L, a delta of 0.9 mg/L. We observed an increase in TKN from 1.3 mg/L to 2.0 mg/L, a delta of 0.7 mg/L. Finally, DRI observed increases in nitrate after the second detonation, increasing from 0.56 mg/L up to 1.55 mg/L, for a delta of almost 1 mg/L. We did not detect nitrate in any of our test samples (<0.2 mg/L). In general, our results are consistent with those obtained by DRI.

Our VOC results are consistent with those obtained from by the University of Rhode Island (URI 2000). URI detected benzene at around 500 µg/L, toluene around 200 µg/L, styrene between 500 and 700 µg/L, and ethylbenzene and xylene in the 100 to 150 µg/L range. Our benzene results were around 10 µg/L, toluene around 4 µg/L, styrene around 2 µg/L, and total xylene and ethylbenzene around 1 µg/L. Our results are within an order of magnitude of the URI results once the difference in dilution is taken into account.

Also consistent with our results, URI detected the semi-VOC naphthalene at around 600 µg/L, where as we detected naphthalene at around 3 µg/L. However, URI also detected small amounts of isopropylbenzene, n-propylbenzene, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, and sec-butylbenzene at concentrations ranging from 1 to 12 µg/L. It is possible our differences in dilution accounts for these compounds not being detected in our test. We detected two compounds (benzoic acid and bis(2-ethylhexyl)phthalate) that were not detected by URI. However, we only detected these two compounds in one of the tests.

Neither of the above two tests (URI and DRI) analyzed samples for PETN. We detected significant concentrations of PETN in our final 1200 m samples (average of 155 µg/L PETN). This could have been the result of some of the PETN falling out of the Primacord as it was lowered into the water, and thus not available for detonation, or a result of incomplete combustion.

Thus, under the conditions similar to those found in the tests described above, the detonation of Primacord detonation cord in water will be expected to produce low concentrations of semi-VOCs and VOCs, slight increases in the nitrogenous compounds ammonia and TKN, slight increases in the physical parameters TSS and turbidity, and detectable concentrations of PETN and cyanide.

9. Acknowledgements

This test could not have been conducted without the assistance of many people. From the Environmental Restoration Division: Jim Doggett and Tom Dresser worked diligently to get the contract into place, and provide weekly cost data; Becky Goodrich and Paula Krauter allowed us use of their Chemetrics test kits; Mark Campbell provided additional sampling supplies; Harry

Beller provided bench space in ERD's chemistry laboratory, and allowed us use of his pre-cleaned glassware. From the Chemistry and Materials Sciences Division: Barry Levine and Ken Montgomery fabricated the test vessels under severe time constraints; Denise Grimsley and Don Burns were the tank operator and electronics technician, respectively, and Angie Niles assisted in test organization and logistics. Funding support for the test was provided by the California Department of Fish and Game under Agreement P0120003, Proposal # L9382.

10. References

US EPA (United State Environmental Protection Agency) (1997). *Test Methods for Evaluating Solid Waste* (SW-846). United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, DC (Revision: May).

University of Rhode Island (2000). Summary report on results of analyses performed in support of University of Rhode Island Project No. URI, SDG No. A. September 26, 2000. From Jimmie Oxley, Chemistry Dept., U. of Rhode Island, Kingston, RI 02881 to Ms. Susan Ellis, Dept. of Fish and Game, Central Valley, Bay Delta Branch, 1416 Ninth St, Sacramento, CA 95814.

Denver Research Institute (1983). *Testing and analysis of water soluble Primacord Detonation Products*. Final Report. DRI Project No. 5-32044. April 22, 1983. Submitted to Ensign-Bickford, P.O. Box 97, Louviers, Colorado 80131. Submitted by Michael Shaffron, Research Associate, Chemical and Materials Sciences Division, Denver Research Institute.

Photos

Photo 1. Lake Davis water as received from CDFG.

Photo 2. Vessels used in testing.

Vessel 1

Vessel 2

Photo 3. Preparation of blank samples.

Photo 4. North one kilogram detonation tank used at HEAF.

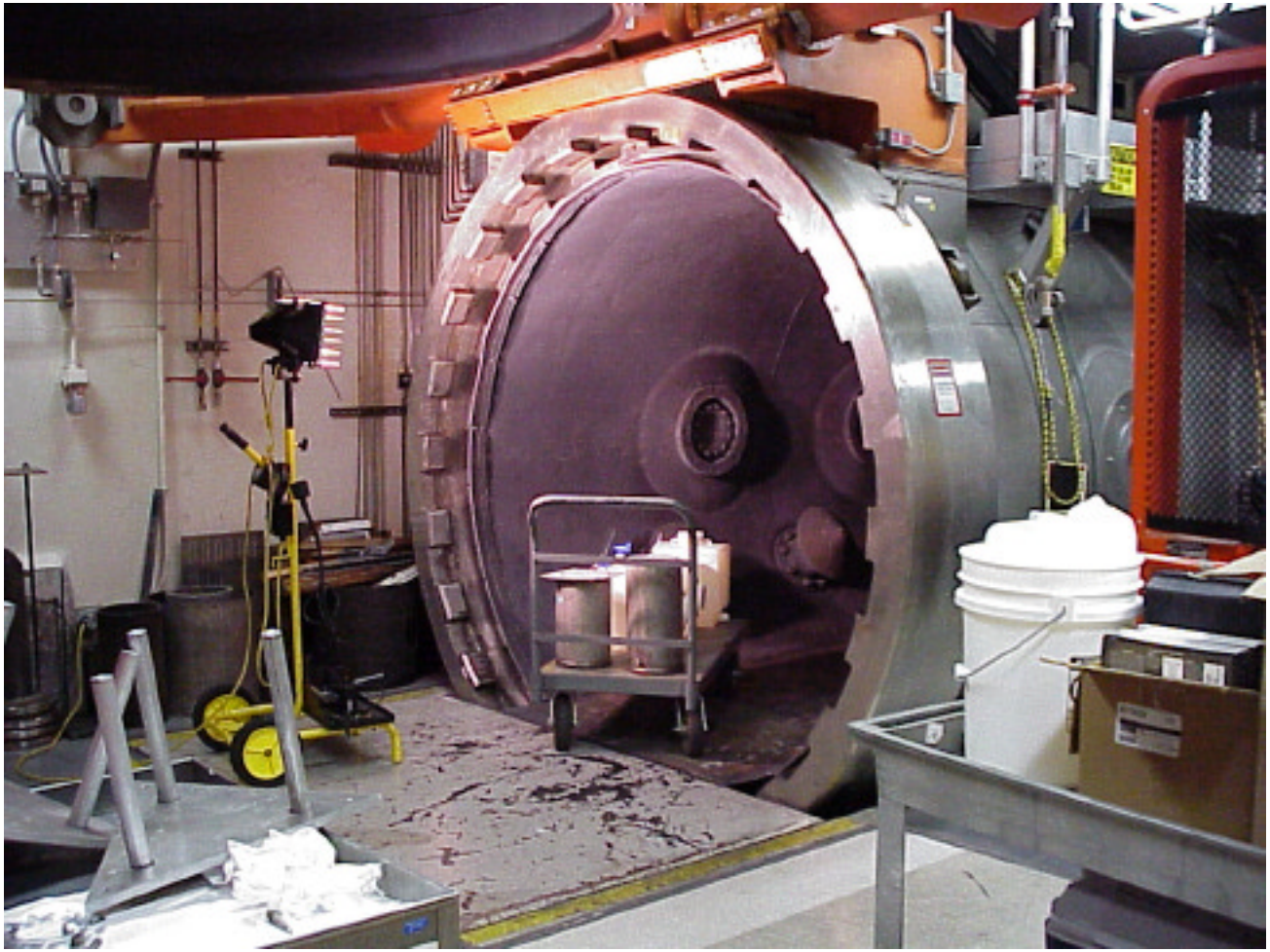


Photo 5. Primacord assembled with detonator.

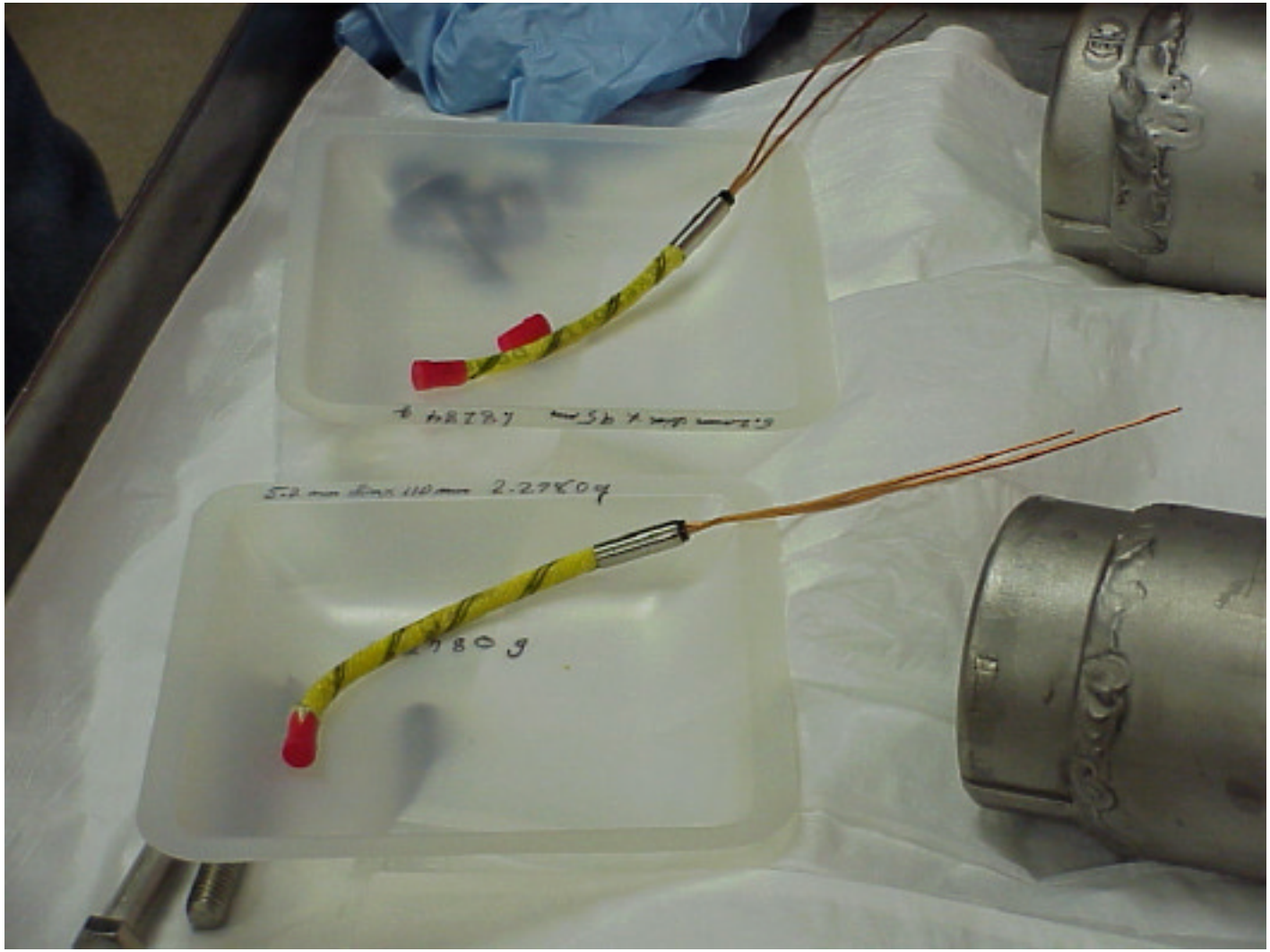


Photo 6. Primacord assembly, inner vessel and top cap.

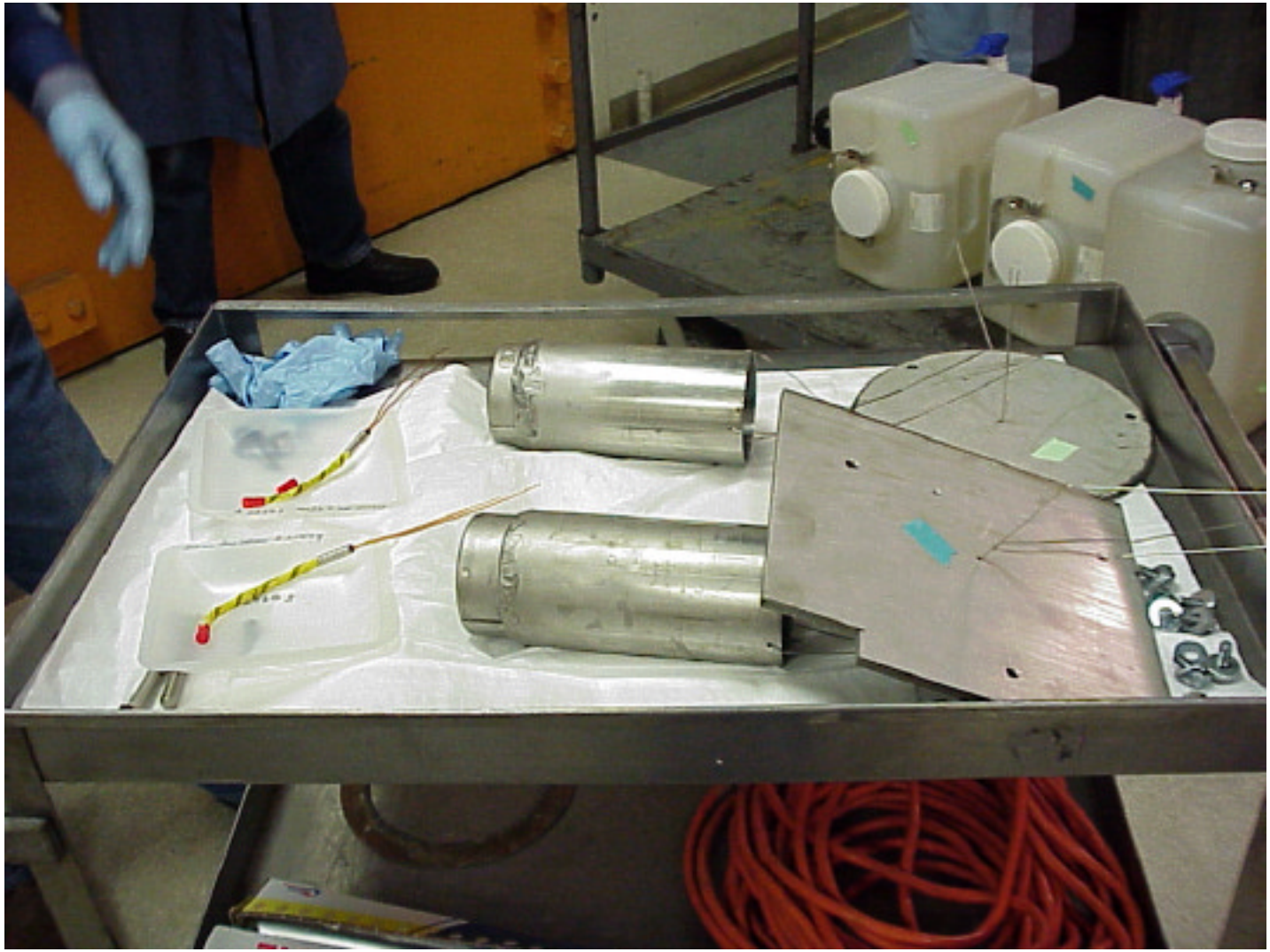
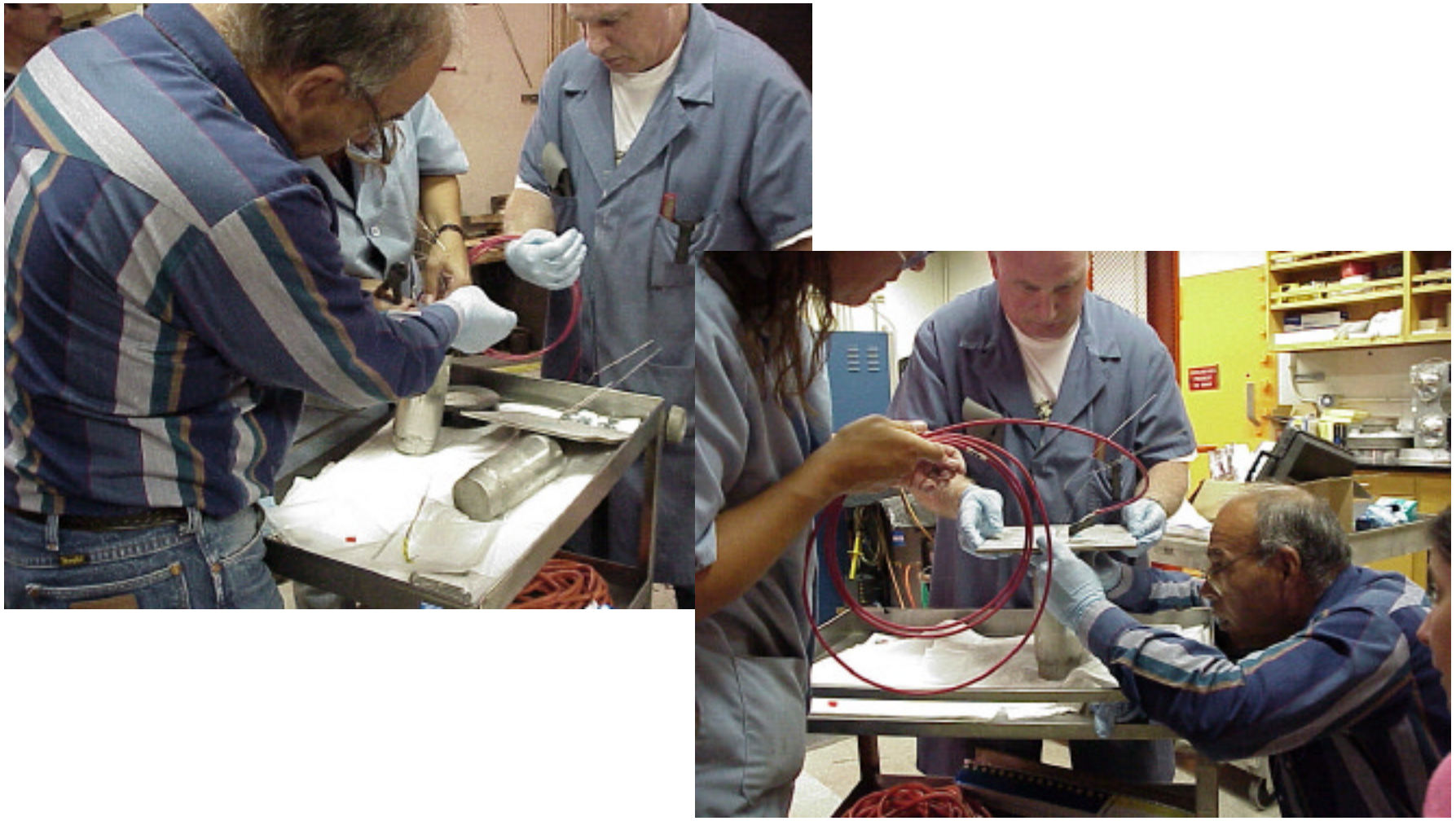


Photo 7. Assembling Primacord and inner vessel to top cap.



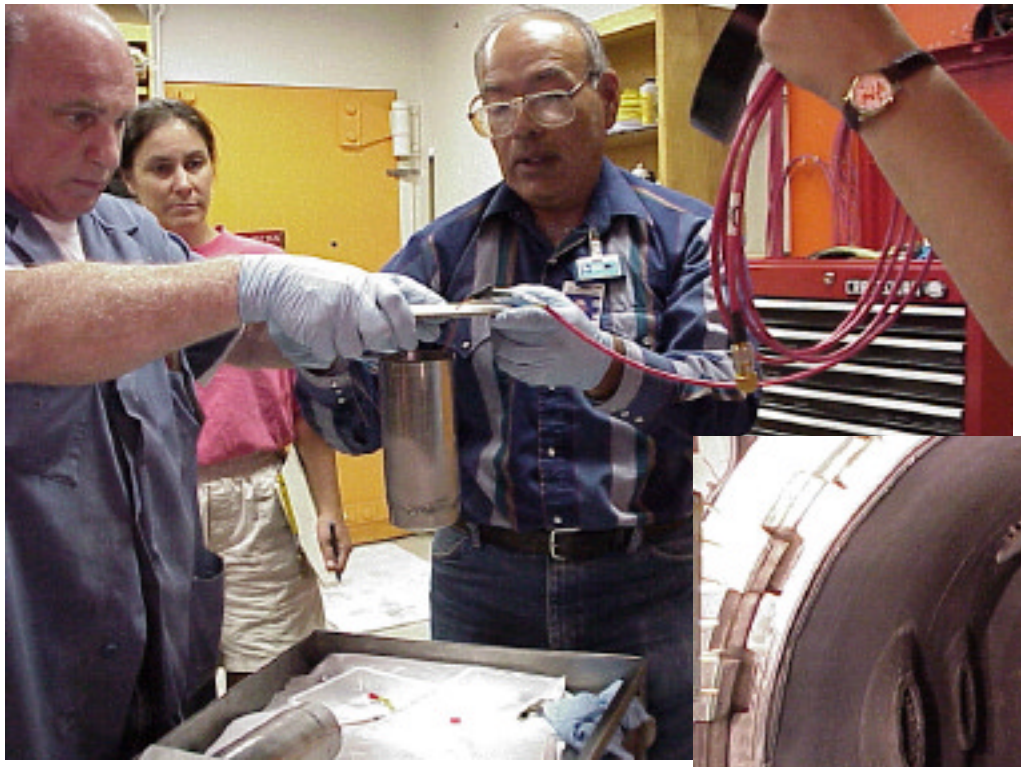


Photo 8. Lake Davis water was added to inner vessel using a 1000 ml graduated cylinder.

Photo 9. Filled inner assembly installed into outer vessel.

Photo 10. Installation of vessels into tank.

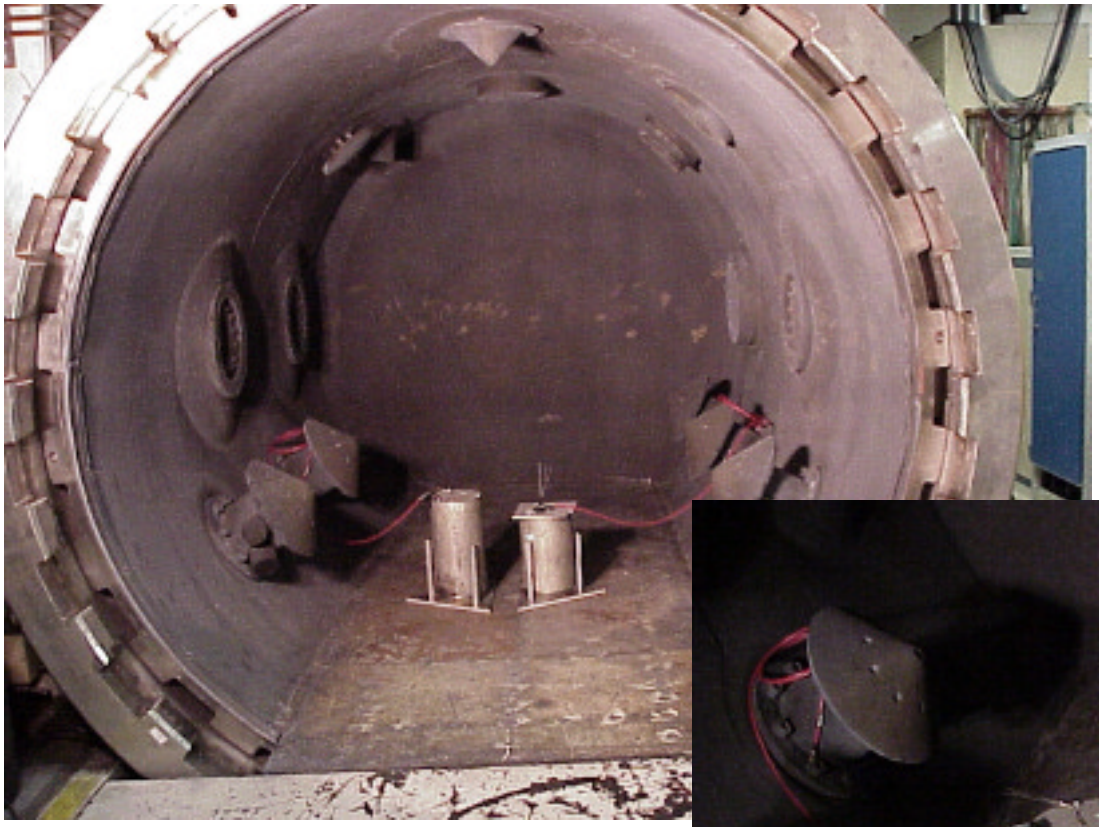
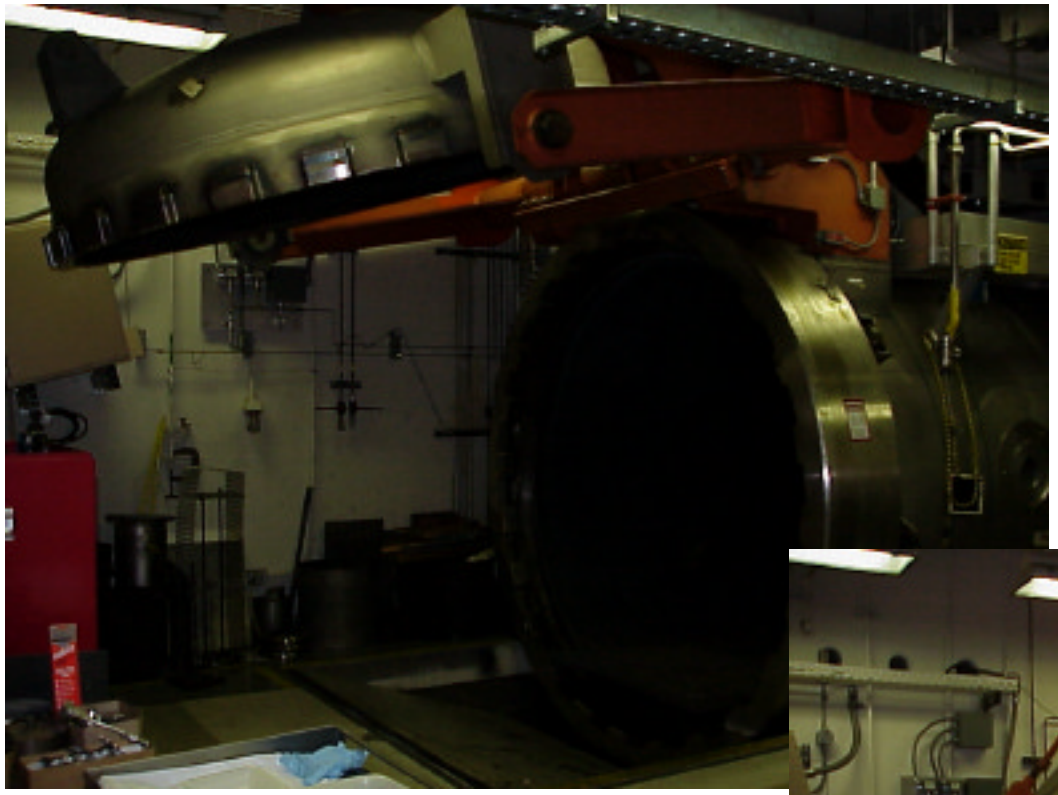


Photo 11. Detonator cords attached to firing assembly in tank.



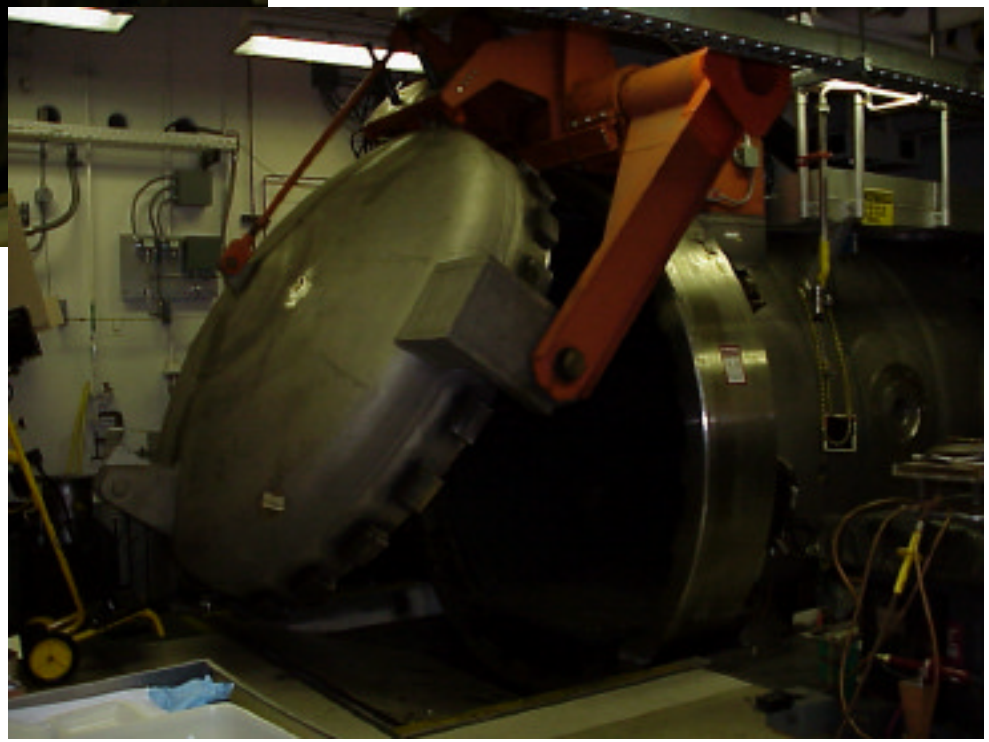


Photo 12. Closing the tank.

Photo 13. Closed Tank.

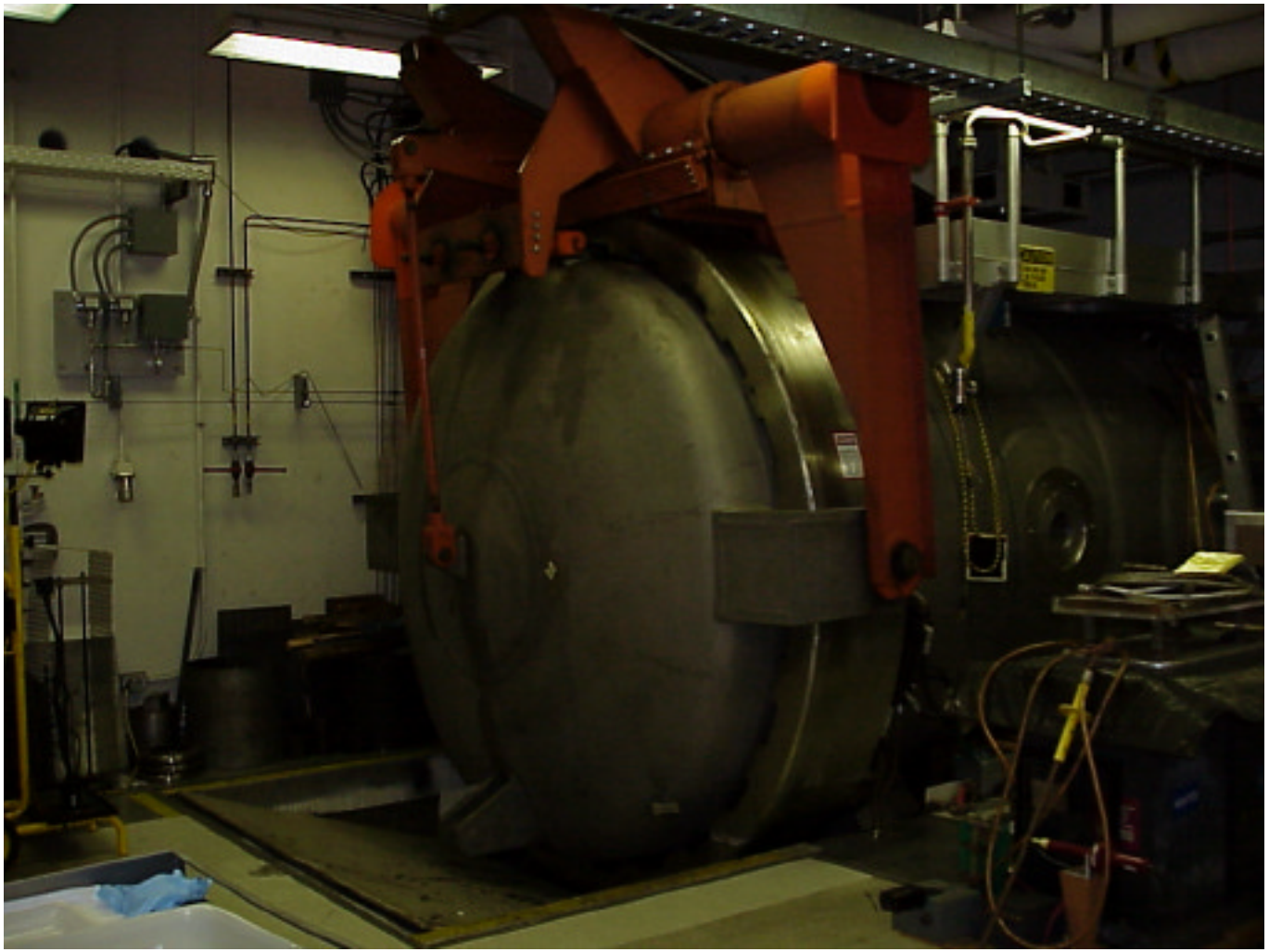
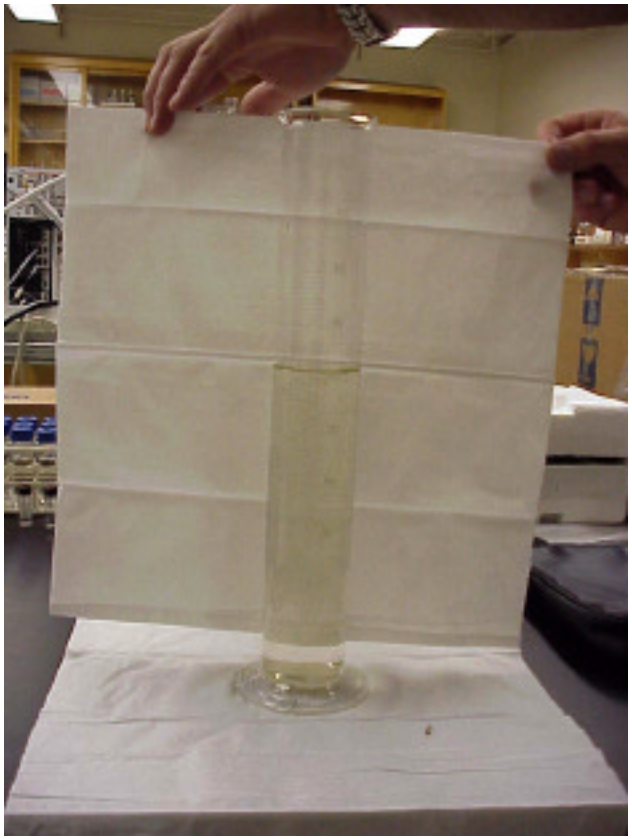


Photo 14. Firing the shot.

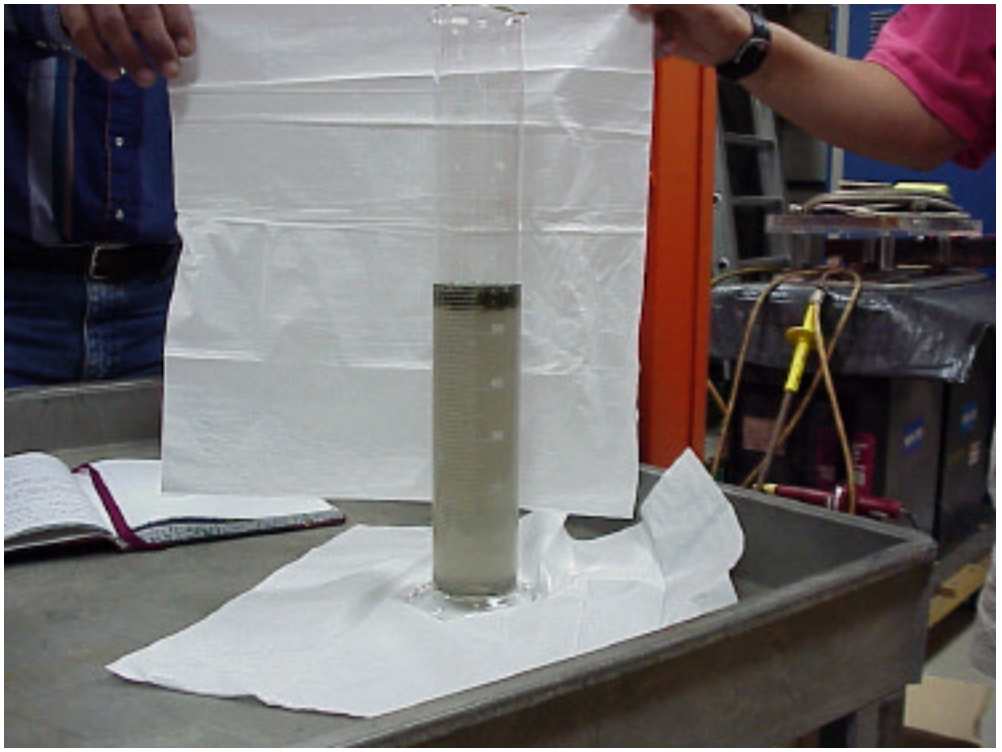
Photo 15. Immediately post-shot.

Photo 16. Interior of vessel 1.

Photo 17. Lake Davis water pre- and post-shot.



Pre-shot



Post-shot

Photo 18. Detail of water and shot debris.

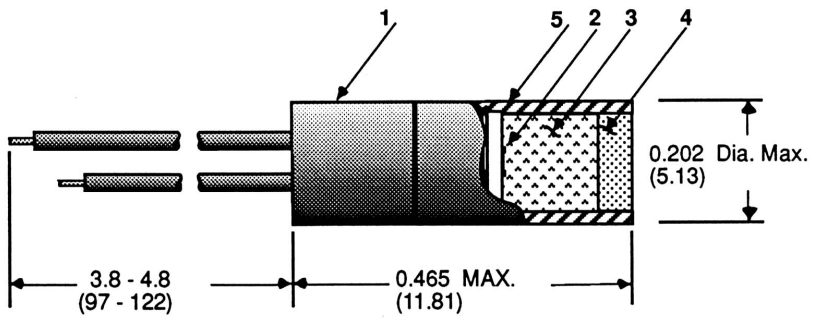
Photo 19. Preparing for final sample collection.

Figures

RP-2 EBW Detonator
P/N 167-4379

The RP-2 is a high precision exploding bridgewire detonator manufactured by RISI which features close tolerance electrode spacing, precise bridgewire attachment, high quality loading sleeves, and a rigidly controlled crystallization process of the PETN explosive and loading operation. Density is controlled through consistency of crystalline structure, precision weighing and Class A dies and tooling.

The result is a detonator with a transmission time simultaneity standard deviation of less than .035 microsecond. While some applications may not require this degree of timing, or safety, users may want to take advantage of the high degree of reliability present in this detonator.



PARTS DESCRIPTION

1. MOLDED HEAD: Diallyl phthalate per MIL-M-14 type SDG
2. BRIDGEWIRE: Gold 0.0015 inches in diameter, 0.030 inches long
3. INITIATING EXPLOSIVE: 32 mg of PETN
4. HIGH DENSITY EXPLOSIVE: 18 mg of RDX with binder
5. SLEEVE: Brass, 0.032 thick

PERFORMANCE

- Threshold Burst Current (I_{bth}).....220 amps
- Threshold Voltage .....Approx. 500 volts
- Threshold Voltage Std. Deviation.... 10 volts maximum
- Function Time.....1.65 µsec typical
- Function Time Simultaneity
  Standard Deviation.....0.035 µsec max

CAUTION: EBW detonators contain explosives and are classified as detonator class "C" and of course are designed to explode. They should be used in blasting operations only by or under the direction of a person experienced in the handling and use of explosives. Explosive users should bear in mind that every explosive can be detonated under certain critical conditions, and all existing explosive handling, storage, and usage regulations should be followed.

ERD-S3R-01-0191

Figure 1. Detail of RP-2 detonator. Taken from RISI Reynolds Industries Systems, Incorporated, Secondary Explosive Initiators and Accessories, San Ramon, California, 4/92.

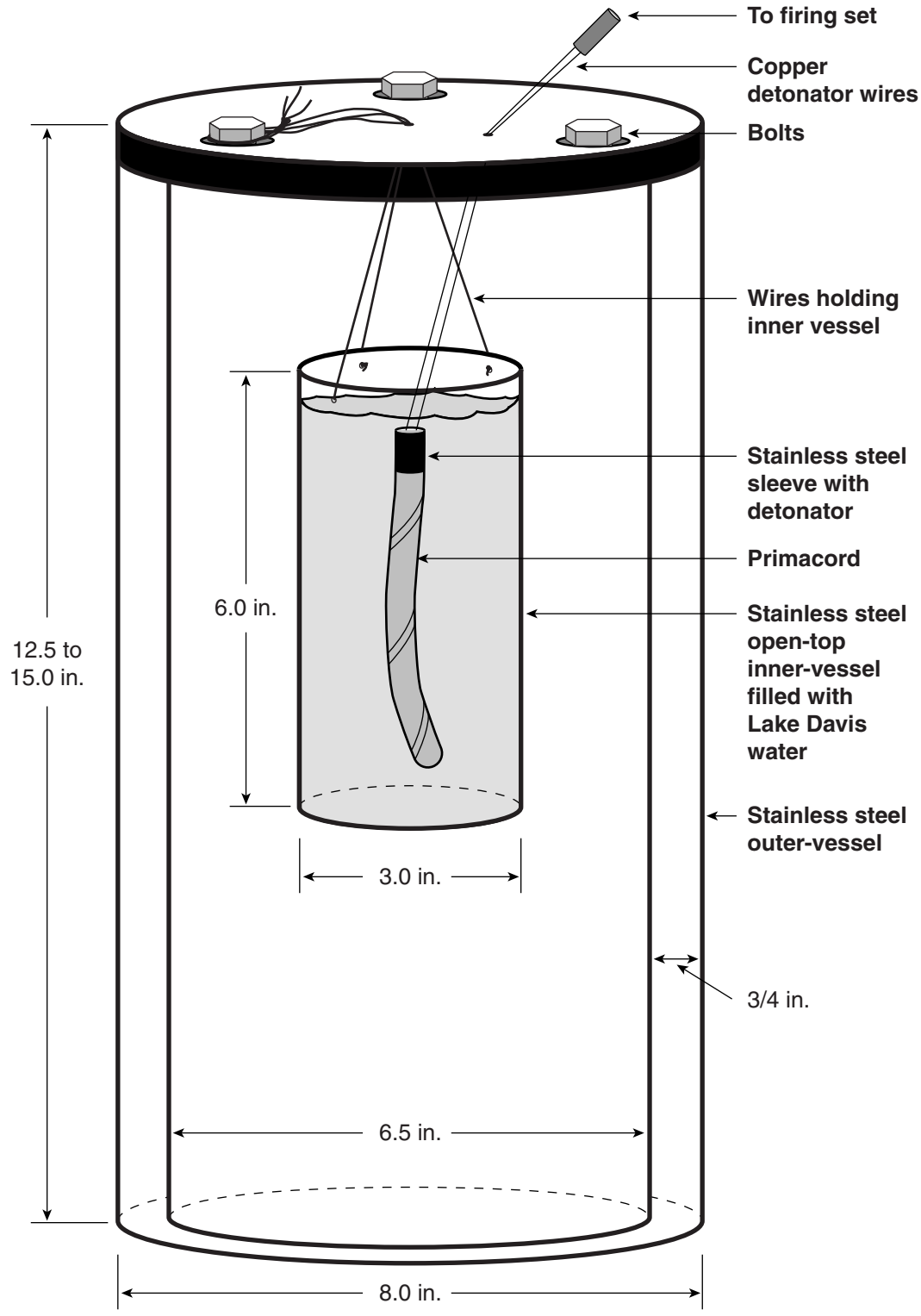


Figure 2. Schematic of detonation vessel.

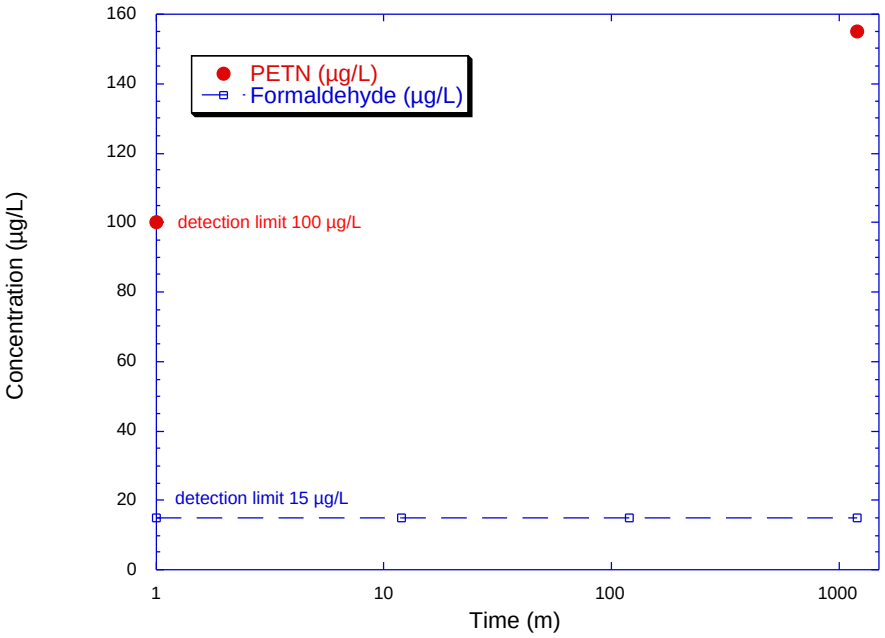


Figure 3. Average PETN and formaldehyde concentrations over time. The value at 1 minute represents the blank result.

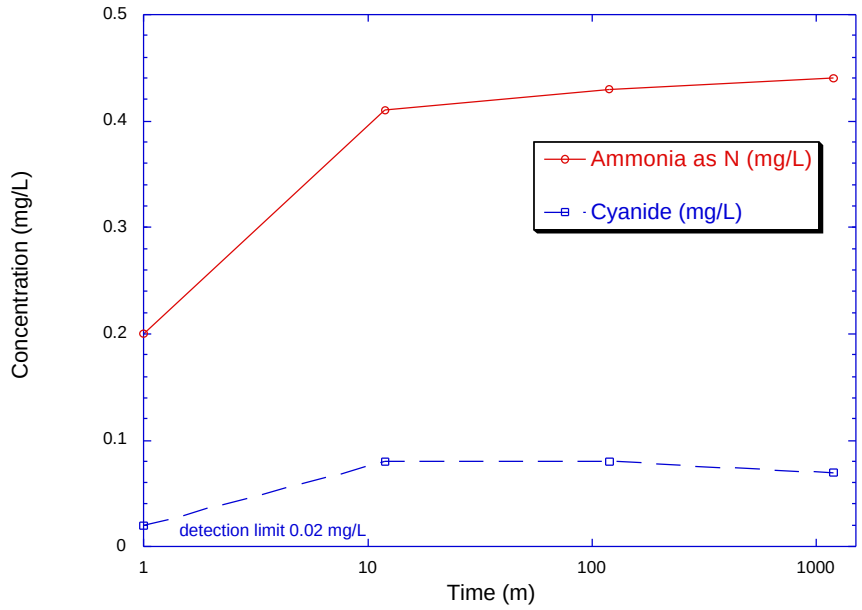


Figure 4. Average ammonia and cyanide concentrations over time. The value at 1 minute represents the blank result.

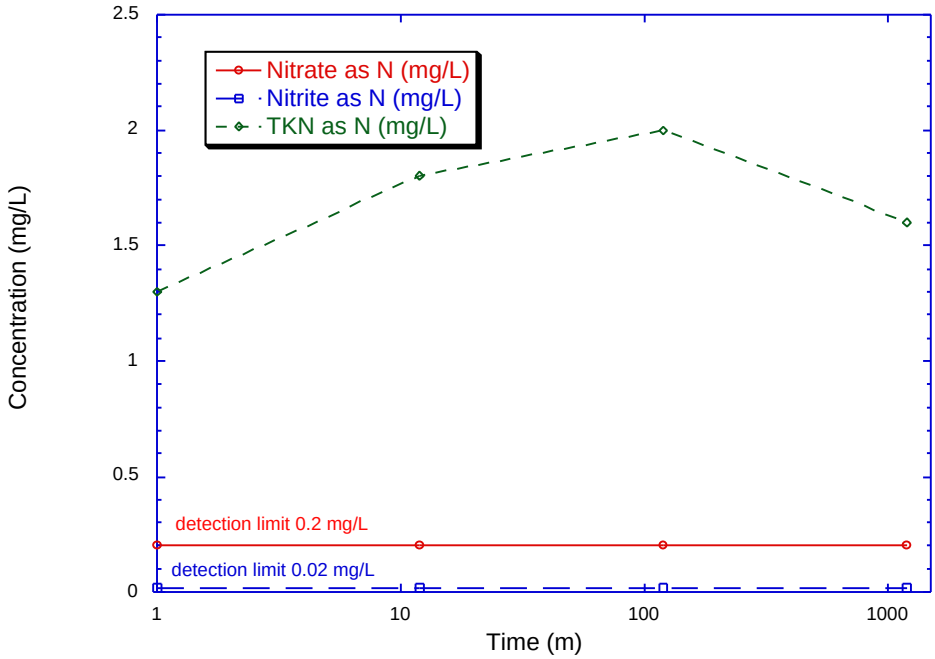


Figure 5. Average nitrate, nitrite, and total kjeldahl nitrogen (TKN) concentrations over time. The value at 1 minute represents the blank result.

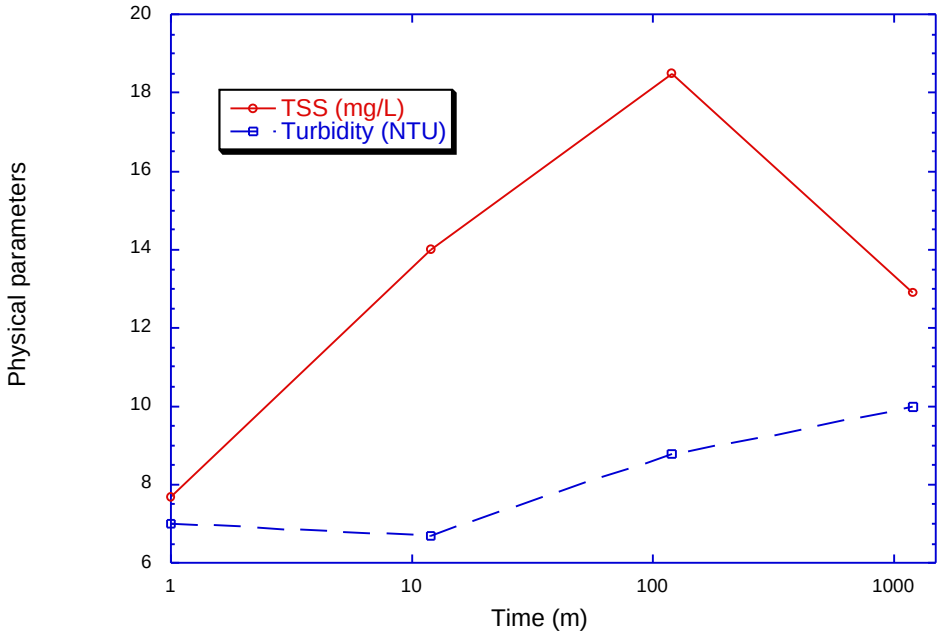


Figure 6. Average total suspended solids (TSS) and turbidity concentrations over time. The value at 1 minute represents the blank result.

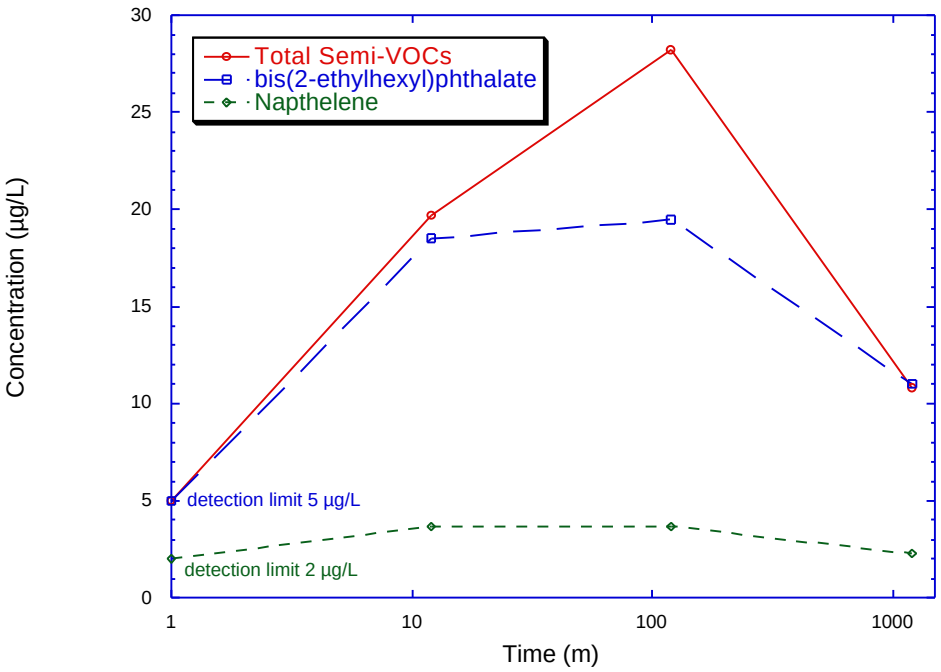


Figure 7. Average semi-volatile organic compound concentrations over time. The value at 1 minute represents the blank result.

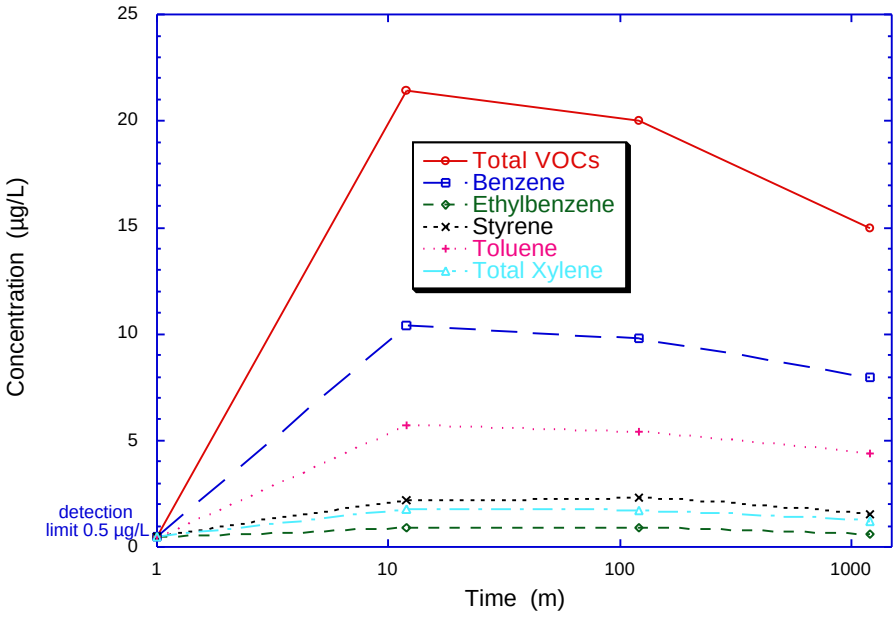


Figure 8. Average volatile organic compound (VOC) concentrations over time. The value at 1 minute represents the blank result.

Tables

Table 1. Water quality parameters obtained from carboys used in Lake Davis Test.

Sample event	Carboy	Time	DO (ppm)	pH	ORP (mV)	TDS (ppm)	SC (μS)	Temp C
1 (Blank)	1	9:00 am	5.9	7.37	195	58.55	91.35	18.5
8/29/01	2	9:15 am	5.2	8.40	194	57.25	88.80	17.5
2 (12 m)	1	2:53 pm	7.8	5.9	150	59.20	92.38	21.5
8/29/01	2	3:00 pm	6.9	6.68	128	59.22	92.30	21.5
3 (120 m)	1	4:53 pm	7.8	7.18	129	59.00	92.25	21.8
8/29/01	2	5:00 pm	7.6	7.20	122	59.40	92.82	21.4
4 (1200 m)	1	10:53 am	7.5	7.06	161	59.69	93.20	21.4
8/30/01	2	11:00 am	8.7	6.94	146	59.68	93.07	21.2

Notes:

DO = Dissolved oxygen.

ORP = Oxidation reduction potential.

TDS = Total dissolved solids.

SC = Specific conductance.

Temp = Temperature.

Table 2. Water quality samples collected.

Analysis	Method	Volume (ml)	Container	Preservation	Holding time	TAT	Nominal DL	Sample event
Semi-VOCs	EPA 8270	1000	1 L amber glass	4 C	7 d	5 d	2–20 µg/L	all
VOCs	EPA 8260	120	VOA vials	HCL, 4 C[a]	7 d	5 d	0.5 µg/L	all
Nutrients		1000	1 L plastic	4 C	2 d	5 d		all
Ammonia as N	EPA 350.2	–	–	–	–	–	0.025 mg/L	–
Nitrate as N	EPA 353.2	–	–	–	–	–	0.2 mg/L as N	–
Nitrate as NO_3	EPA 353.2	–	–	–	–	–	0.5 mg/L as NO_3	–
Nitrite as N	EPA 353.2	–	–	–	–	–	0.02 mg/L Nitrite as N	–
Total Kjeldahl N	EPA 351.3	–	–	–	–	–	0.2 mg/L	–
Formaldehyde	EPA 8315	1000	1 L amber glass	4 C	3 d	5 d	15 µg/L	all
Cyanide	EPA 335.2	500	0.5 L plastic	4 C[b]	14 d	5 d	0.02 mg/L	all
TSS	EPA 160.2	1000	1 L plastic	4 C	7 d	5 d	2 mg/L	all
Turbidity	EPA 180.1	–	–	4 C	48 hr	5 d	0.1 NTU	–
PETN	EPA 8330	1000	1 L glass	4 C		5 d	100 µg/L	1 (Blank) and 2 (1200 m)

Notes:

All samples sent to BC Laboratories of Bakersfield, CA for analyses.

TAT = Turnaround time.

TSS = Total suspended solids.

– = Inclusive in sample bottle collected for nutrients or TSS, as subsumed.

[a] **No preservative required if analyzed within 7 d. All samples were preserved with HCL except trip blanks 2, 3, and 4 and detonation samples collected at 1200 m (sample event 4). All were analyzed within 7 d.**

[b] **Bottles used for sample events 1 and 3 were pre-preserved with NaOH. Samples from events 2 and 4 were preserved upon receipt by the laboratory.**

Table 3. Sample identifiers used.

Sample identifier	Description
3X056-BLK1-BLE	**Blank for vessel used in first detonation**
3X056-BLK2-BLE	**Blank for vessel used in second detonation**
3X056-DET1-12M	**First detonation at 12 minutes**
3X056-DET1-12MD	**Sample duplicate (EPA Method 8260 only)**
3X056-DET1-120M	**First detonation at 120 minutes**
3X056-DET1-1200M	**First detonation at 1200 minutes**
3X056-DET2-12M	**Second detonation at 12 minutes**
3X056-DET2-12MD	**Sample duplicate (EPA Method 8260 only)**
3X056-DET2-120M	**Second detonation at 120 minutes**
3X056-DET2-1200M	**Second detonation at 1200 minutes**

Table 4. Summary of PETN, formaldehyde, and inorganic analytical results.

	Blanks			12 m			120 m			1200 m		
Analyte	BLK 1	BLK 2	AVG[a]	Det 1	Det 2	AVG[a]	Det 1	Det 2	AVG[a]	Det 1	Det 2	AVG[a]
PETN (μg/L)	<5.0	<5.0	<5.0	–	–	–	–	–	–	180.0	130.0	155.0
Formaldehyde (μg/L)	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15
Cyanide (mg/L)	<0.02	<0.02	<0.02	0.070	0.089	0.080	0.067	0.092	0.080	0.061	0.081	0.071
Nitrate as N (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrite as N (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total kjeldahl N (mg/)	1.3	1.3	1.3	1.9	1.6	1.8	2.2	1.8	2.0	1.5	1.6	1.6
Ammonia as N (mg/L)	0.2	0.2	0.2	0.39	0.43	0.41	0.39	0.47	0.43[b]	0.43	0.44[b]	0.44
TSS (mg/L)	8.3	7.0	7.7	16.0	12.0	14.0	21.0	16.0	18.5	8.8	17.0	12.9
Turbidity (NTU)	10.0	4.0	7.0	7.2	6.2	6.7	7.5	10.0	8.8	10.0	10.0	10.0

Note:

– = Not analyzed.

[a] **When averaging detection limit data, the detection limits used.**

[b] **Batch-specific matrix spike recovery(s) are not within QC limits. Accuracy verified through LCS.**

Table 5. Summary of semi-volatile and volatile organic analytical results.

Analyte	Blanks				12 m						120 m				1200 m			
	BLK 1	BLK 2	AVG[a]	Trp Blk 1	Det 1	Det 1 Dup	Det 2	Det 2 Dup	AVG[a]	Trp Blk 2	Det 1	Det 2	AVG[a]	Trp Blk 3	Det 1	Det 2	AVG[a]	Trp Blk 4
Total semi-VOCs (µg/L)	<2-20	<2-20	<2-20	–	35.4	–	3.9	–	19.7	–	52.5	3.8	28.2	–	19.1	2.5	10.8	–
Individual semi-VOCs (µg/L)																		
benzoic acid	<10.0	<10.0	<10.0	–	<10.0	–	<10.0	–	<10.0	–	15.0[b]	<10.0	12.5	–	<10.0	<10.0	<10.0	–
bis(2-ethylhexyl)phthalate	<5.0	<5.0	<5.0	–	32.0	–	<5.0	–	18.5	–	34.0[b,c]	<5.0	19.5	–	17.0	<5.0	<11.0	–
Naphthelene	<2.0	<2.0	<2.0	–	3.4	–	3.9	–	3.7	–	3.5[b]	3.8	3.7	–	2.1	2.5	2.3	–
Total VOCs (µg/L)	<0.5[d]	<0.5[d]	<0.5[d]	<0.5[d]	20.1	18.3	22.6	24.6	21.4	0.5[b]	17.1	22.9	20.0	86.0	12.7	17.4	15.0	55.0
Individual VOCs (µg/L)																		
Benzene	<0.5	<0.5	<0.5	<0.5	9.3	9.3	11.0	12.0	10.4	<0.5	8.5	11	9.8	<3.0	7.1	8.8	8.0	<0.5
Chloromethane	<0.5	<0.5	<0.5	<0.5	1.8	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	0<.5	<3.0	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	0.76	0.75	0.98	1.0	0.9	<0.5	0.72	0.98	0.9	<3.0	0.51	0.68	0.6	<0.5
Styrene	<0.5	<0.5	<0.5	<0.5	1.7	1.8	2.5	2.8	2.2	<0.5	1.8	2.8	2.3	<3.0	1.3	1.7	1.5	<0.5
Toluene	<0.5	<0.5	<0.5	<0.5	5.0	4.9	6.2	6.7	5.7	<0.5	4.6	6.2	5.4	<3.0	3.8	4.9	4.4	<0.5
Total xylene	<0.5	<0.5	<0.5	<0.5	1.5	1.5	1.9	2.1	1.8	<0.5	1.5	1.9	1.7	<5.0	<1.0	1.3	1.2	<0.5

Note:

– = Not analyzed.

[a] When averaging detection limit data, the detection limit is used.

[b] Surrogate recovery not within established limits. Results are affected due to low internal standard response.

[c] Associated surrogate recoverys low. Results are affected due to low internal standard response.

[d] Nominal detection limit, some analytes have higher detection limits, ranging from 1 µg/L for methylene chloride to 1000 µg/L for ethanol.

Table 6. Comparison of tests conducted to evaluate detonation cord impacts on water quality.`

	LLNL 2001	URI 2000	DRI 1983
Detonation cord	**Reinforced Primacord**	**Reinforced Primacord**	**Series 200 Primacord**
PETN amount/length cord	**50 grains/ft**	**50 grains/ft**	
	0.272 grams/inch	**0.272 grams/in**	**1.08 grams/in**
	0.106 grams/cm	**0.106 grams/cm**	**0.425 grams/cm**
Length of cord/volume of water	**10.16 cm/16 L**	**15.25 cm/1.04 L**	**274 cm/318 L**
	4 in/4.2 gal	**6 in/0.27 gal**	**9 ft/84 gal**
PETN/volume of test water	**0.069 g PETN/L test water**	**1.55 g PETN/L test water**	**0.027–0.37 g PETN/L test water (test 2 0.08 g/L)**
Dilution or concentration factor (relative to LLNL)	**1**	**22**	**0.039–5.38 (test 2 1.16)**
Analyses performed	**PETN, formaldehyde, cyanide, TSS, turbidity, nitrogen compounds, VOCs, semi-vocs**	**VOCs, semi-VOCs**	**cyanide, TSS, nitrogen compounds**

Appendix A

Copies of CDFG Chain of Custodies for Lake Davis Water

DFG REQUEST FOR ANALYSIS AND CHAIN OF CUSTODY RECORD

Page 1 of 1

SAMPLER: Jim McCall PHONE #	SEND RESULTS TO (916) 358-2858	FOR LABORATORY USE ONLY
ADDRESS: 2005 Nimbus Road	ADDRESS	LAB NUMBER
CITY: Rancho Cordova CA ZIP: 95670	CITY CA ZIP	FIELD NUMBER
DATE REQUIRED/REASON	COPIES TO	LAB STORAGE
SHIPPED VIA	ADDRESS	SPILL TITLE: LAKE DAVIS
	CITY STATE ZIP	SUSPECT
		INDEX-PCA

- ☐ Fish & Wildlife Loss Date:_____ Region: _____
- ☐ DFG Code Violation _____
- ☐ Suspected or Potential Problem
- ☐ Routine Analysis

Water Temp: °F or °C pH: DO: mg/L Conductivity: umhos/cm

ANALYSIS REQUESTED

Sample Identification/Location (Draw Map on Separate Sheet if Necessary)	Collection Date	Collection Time	PETROLEUM FINGERPRINT	TRACE ELEMENTS (SPECIFY BELOW)	PESTICIDES (SPECIFY BELOW)	Sample Type: WATER	FILTERED WATER	SOIL	TISSUE		Number of Containers: PLASTIC	GLASS	VOA VIAL		Preservation: TEMP	ACID
LAKE DAVIS - MOUTH OF MOSQUITO CR	8/20	1215				X								3 CARBOY		
BLANK CARBOY														1		

Problem Description

Suspect/Incident Location

Comments/Special Instructions WATER SAMPLES TO GO TO LAWRENCE LIVERMORE

POLLUTION ACTION KIT REQUESTED: YES ☐ NO ☐

GLOVE SIZE: LARGE ☐ MEDIUM ☐

HAZMAT SHIPPER REQUESTED: YES ☐ NO ☐

SAMPLE(S) RELINQUISHED BY (SIGNATURE)	PRINT NAME	DATE	RECEIVED BY (SIGNATURE)	PRINT NAME
Jim McCall	Jim McCall	08/20/01	C.R. Todd	C.R. TODD
C.R. Todd	C.R. Todd	8/21/01	Gary Forkner	GARY FORKNER
Gary Forkner	GARY FORKNER	8-21-01	Tina M. Carlson	TINA M. CARLSON

WHITE, CANARY, PINK -- LAB COPIES
GOLDENROD - SUBMITTER

☐ **Pesticide Investigations Lab**
1701 Nimbus Road
Rancho Cordova, CA 95670

☐ **Petroleum Chemistry Lab**
1995 Nimbus Road
Rancho Cordova, CA 95670

☒ **Water Pollution Control Lab**
2005 Nimbus Road
Rancho Cordova, CA 95670

FG 1000 (Rev. 11/94)

DFG REQUEST FOR ANALYSIS AND CHAIN OF CUSTODY RECORD

Page 1 of 1

SAMPLER: JIM MCCALL — PHONE #:	SEND RESULTS TO: (916) 358-2858	FOR LABORATORY USE ONLY — LAB NUMBER: L-389-01
ADDRESS: 2005 NIMBUS Rd.	ADDRESS: (SAME)	FIELD NUMBER:
CITY: RANCHO CORDOVA CA ZIP: 95670	CITY: CA ZIP:	LAB STORAGE:
DATE REQUIRED/REASON:	COPIES TO:	SPILL TITLE: LAKE DAVIS
SHIPPED VIA:	ADDRESS:	SUSPECT:
	CITY STATE ZIP:	INDEX-PCA:

- ☐ Fish & Wildlife Loss Date: _____ Region: II
- ☐ DFG Code Violation _____
- ☐ Suspected or Potential Problem
- ☐ Routine Analysis

Water Temp: °F or °C pH: DO: mg/L Conductivity: umhos/cm

ANALYSIS REQUESTED

Sample Identification/Location (Draw Map on Separate Sheet if Necessary)	Collection Date	Collection Time	PETROLEUM FINGERPRINT	TRACE ELEMENTS (SPECIFY BELOW)	PESTICIDES (SPECIFY BELOW)	Sample Type: WATER	FILTERED WATER	SOIL	TISSUE	Number of Containers: PLASTIC	GLASS	VOA VIAL	CARBOY	Preservation: TEMP	ACID
LAKE DAVIS - MOUTH OF MOSQUITO	8/27					X							3	X	
SLOUGH (3) BLANK CARBOY SENT FROM															
LLL.															

Problem Description

Suspect/Incident Location

Comments/Special Instructions WATER SAMPLES SENT TO LAWRENCE LIVERMORE

POLLUTION ACTION KIT REQUESTED: YES ☐ NO ☐

GLOVE SIZE: LARGE ☐ MEDIUM ☐

HAZMAT SHIPPER REQUESTED: YES ☐ NO ☐

SAMPLE(S) RELINQUISHED BY (SIGNATURE)	PRINT NAME	DATE	RECEIVED BY (SIGNATURE)	PRINT NAME
	JIM MCCALL	8/28/01		GARY FORKNER
	GARY FORKNER	8/28/01	TINA M. CARLSON	TINA M. CARLSON

WHITE, CANARY, PINK – LAB COPIES
GOLDENROD - SUBMITTER

☐ **Pesticide Investigations Lab**
1701 Nimbus Road
Rancho Cordova, CA 95670

☐ **Petroleum Chemistry Lab**
1995 Nimbus Road
Rancho Cordova, CA 95670

☒ **Water Pollution Control Lab**
2005 Nimbus Road
Rancho Cordova, CA 95670

FG 1000 (Rev. 11/94)

Appendix B

Copies of Analytical Reports and Corresponding Chain of Custodies

BC Laboratories, Inc

CASE NARRATIVE

COC A28000 to A28003
Requestor: Livermore

Date: 10/09/01

Laboratory Number: 01-09890
Field Log Book # ZJ014

Table of Qualified Data Revised

BC Laboratory Number	LLNL Sample Identification	Sampling Date	Analyses	Flags
01-09890-1	3X056-BLK1-BLE	08/29/01 @ 1100	E160.2 E180.1 E335.2 Nutrients E8260 E8270 E8315 PETN	 *03 – CCV recovery not within method limits. * - Sample was analyzed by Truesdail (602795-1). * - Sample was analyzed by CLS (T1225-1A).
01-09890-2	3X056-BLK2-BLE	08/29/01 @ 1115	E160.2 E180.1 E335.2 Nutrients E8260 E8270 E8315 PETN	 *03 – CCV recovery not within method limits. * - Sample was analyzed by Truesdail (602795-2). * - Sample was analyzed by CLS (T1225-2A).
01-09890-3	3X056-DET1-12M	08/29/01 @ 1505	E160.2 E180.1 E335.2 Nutrients E8260 E8270 E8315 PETN	 *03 – CCV recovery not within method limits. * - Sample was analyzed by Truesdail (602795-3). * - Sample was analyzed by CLS (T1225-3A).
01-09890-4	3X056-DET1-12MD	08/29/01 @ 1505	E8260	

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

CASE NARRATIVE CONTINUED

01-09890-5	3X056-DET2-12M	08/29/01 @ 1512	E160.2 E180.1 E335.2 Nutrients E8260 E8270 E8315 PETN	* - Sample was analyzed by Truesdail (602795-4). * - Sample was analyzed by CLS (T1225-4A).
01-09890-6	3X056-DET2-12MD	08/29/01 @ 1512	E8260	

I. Sample Receipt
Samples received refrigerated to 5.9° and 6.8°C.

II. Holding Times.
All holding time requirements met.

III. Method Blanks
Method blanks were prepared and analyzed at the required requirements.

IV. Calibration
Initial calibration criteria for respective analyses were met. Frequency criteria for initial and continuing calibrations were met. Accuracy criteria for initial and continuing calibrations were met except for the CCV's for EPA 8260 compounds 1,4-Dichloro-2-butene and Vinyl acetate affecting samples 01-09890-1, 01-09890-1TB, 01-09890-2, and 01-09890-2TB, and 1,4-Dichloro-2-butene affecting sample 01-09890-3. The sample reports are flagged accordingly.

V. Matrix Spikes
Precision and Accuracy requirements were within QC limits.

VI. LCS
The LCS recoveries are within QC limits.

VII. Discussion
No other significant issues to be discussed.

Sincerely

Kim Halbrook,
Project Manager

Todays Date: 10-01-01

DATA QUALIFIER FLAG FORM

Circle the appropriate qualifier flags and fill out information below.

Flag	Definition
B	Analyte found in method blank
F	Analyte found in field blank, trip blank, or equipment blank
G	Quantitated using fuel calibration, but does not match typical fuel fingerprint.
I	Surrogate recoveries were outside of QC limits.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
(L)	Spike accuracy not within control limits.
O	Duplicate spike or sample precision not within control limits.
R	Sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet QC criteria. The presence or absence of the analyte cannot be verified.
S	The analytical results from this sample are suspect.
T	Analyte is tentatively identified compound; result is approximate.

Laboratory Code: (circle one) (BB) CN, TN, GE, QR or other:_____

QC Chemist Initials: NB Requested Analysis: E8315

Analyte(s)/Code: Formaldehyde (4840)

Explanation (check one or fill in):

[X] Insufficient sample for spike. [ ] _____ in method blank.

[ ] Matrix interference. [X] LCS validates methodology. LCS/LCSD

[ ] High concentration of _____ in spiked sample.

[ ] Other/comments: No matrix spk performed

Log Number of Affected Samples: 01-09890-1,-2,-3,-5

For Data Management Use Only:

Entered: Initials_____ Date:_____

Elect. Confirmed: Initials:_____ Date:_____

Last Revised: April 13, 1999 by VRD

BC Laboratories, Inc

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/07/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-1

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-BLK1-BLE
Sample Depth:
Sampling Date/Time: 08/29/2001 @ 11:00
Sample Matrix: BW - Blank water
Sample Collected By: TINA CARLSON/NED BORGLIN

THIS IS REALLY:
300-EXP-056

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Nitrate as NO3	None Detected	mg/L	0.5	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5945
Nitrate as N	None Detected	mg/L	0.20	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5895
Nitrate/Nitrite as N	None Detected	mg/L	0.2	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5950
Total Suspended Solids using glass fiber Type A/E	8.3	mg/L	2.	EPA-160.2	08/31/01	SAS	3.33	MANUAL	n.a.	08/31/01	E160.2	7450
Turbidity	10.	NT Units	0.1	EPA-180.1	08/30/01	PDL	1.	T2100	n.a.	08/30/01	E180.1	8850
Total Cyanide	None Detected	mg/L	0.02	EPA-335.3	08/31/01	TDC	1.	AAII-1	EPA-335.3	08/30/01	E335.2	2850
Total Kjeldahl Nitrogen	1.3	mg/L	0.20	EPA-351.2	09/07/01	NJC	1.	RFA-1	EPA-351.2	09/06/01	NUTRIENTSA	5980
Ammonia as N	0.2	mg/L	0.025	EPA-350.1	09/04/01	NJC	1.	AAII-5	n.a.	09/04/01	NUTRIENTSA	0325
Nitrite as N	None Detected	mg/L	0.02	EPA-353.2	08/31/01	NJC	1.	RFA-2	n.a.	08/31/01	NUTRIENTSA	5960
Nitrite as NO2	None Detected	mg/L	0.50	EPA-353.2	08/31/01	NJC	1.	RFA-2	n.a.	08/31/01	NUTRIENTSA	5975

P.Q.L. = Practical Quantitation Limit (refers to the least amount of analyte quantifiable based on sample size used and analytical technique employed).

California D.O.H.S. Cert. #1186

M. Atencio

Marna Atencio
Department Supervisor

BC Laboratories, Inc

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/07/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-2

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-BLK2-BLE
Sample Depth:
Sampling Date/Time: 08/29/2001 @ 11:15
Sample Matrix: BW - Blank water
Sample Collected By: NED BORGLIN/TINA CARLSON

THIS IS REALLY:
300-EXP-056

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Nitrate as NO3	None Detected	mg/L	0.5	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5945
Nitrate as N	None Detected	mg/L	0.20	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5895
Nitrate/Nitrite as N	None Detected	mg/L	0.2	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5950
Total Suspended Solids using glass fiber Type A/E	7.0	mg/L	2.	EPA-160.2	08/31/01	SAS	3.33	MANUAL	n.a.	08/31/01	E160.2	7450
Turbidity	4.8	NT Units	0.1	EPA-180.1	08/30/01	PDL	1.	T2100	n.a.	08/30/01	E180.1	8850
Total Cyanide	None Detected	mg/L	0.02	EPA-335.3	08/31/01	TDC	1.	AAII-1	EPA-335.3	08/30/01	E335.2	2850
Total Kjeldahl Nitrogen	1.3	mg/L	0.20	EPA-351.2	09/07/01	NJC	1.	RFA-1	EPA-351.2	09/06/01	NUTRIENTSA	5980
Ammonia as N	0.2	mg/L	0.025	EPA-350.1	09/04/01	NJC	1.	AAII-5	n.a.	09/04/01	NUTRIENTSA	0325
Nitrite as N	None Detected	mg/L	0.02	EPA-353.2	08/31/01	NJC	1.	RFA-2	n.a.	08/31/01	NUTRIENTSA	5960
Nitrite as NO2	None Detected	mg/L	0.50	EPA-353.2	08/31/01	NJC	1.	RFA-2	n.a.	08/31/01	NUTRIENTSA	5975

P.Q.L. = Practical Quantitation Limit (refers to the least amount of analyte quantifiable based on sample size used and analytical technique employed).

California D.O.H.S. Cert. #1186

M. Atencio

Marna Atencio
Department Supervisor

BC Laboratories, Inc

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/07/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-3

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET1-12M
Sample Depth:
Sampling Date/Time: 08/29/2001 @ 15:05
Sample Matrix: AQ - Aqueous
Sample Collected By: NED BORGLIN/TINA CARLSON

THIS IS REALLY:
300-EXP-056

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Nitrate as NO3	None Detected	mg/L	0.5	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5945
Nitrate as N	None Detected	mg/L	0.20	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5895
Nitrate/Nitrite as N	None Detected	mg/L	0.2	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5950
Total Suspended Solids using glass fiber Type A/E	16.	mg/L	2.	EPA-160.2	08/31/01	SAS	3.33	MANUAL	n.a.	08/31/01	E160.2	7450
Turbidity	7.2	NT Units	0.1	EPA-180.1	08/30/01	PDL	1.	T2100	n.a.	08/30/01	E180.1	8850
Total Cyanide	0.070	mg/L	0.02	EPA-335.3	08/31/01	TDC	1.	AAII-1	EPA-335.3	08/30/01	E335.2	2850
Total Kjeldahl Nitrogen	1.9	mg/L	0.20	EPA-351.2	09/07/01	NJC	1.	RFA-1	EPA-351.2	09/06/01	NUTRIENTSA	5980
Ammonia as N	0.39	mg/L	0.025	EPA-350.1	09/04/01	NJC	1.	AAII-5	n.a.	09/04/01	NUTRIENTSA	0325
Nitrite as N	None Detected	mg/L	0.02	EPA-353.2	08/31/01	NJC	1.	RFA-2	n.a.	08/31/01	NUTRIENTSA	5960
Nitrite as NO2	None Detected	mg/L	0.50	EPA-353.2	08/31/01	NJC	1.	RFA-2	n.a.	08/31/01	NUTRIENTSA	5975

P.Q.L. = Practical Quantitation Limit (refers to the least amount of analyte quantifiable based on sample size used and analytical technique employed).

California D.O.H.S. Cert. #1186

Marna Atencio
Department Supervisor

BC Laboratories, Inc

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/07/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-5

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET2-12M
Sample Depth:
Sampling Date/Time: 08/29/2001 @ 15:12
Sample Matrix: AQ - Aqueous
Sample Collected By: NED BORGLIN/TINA CARLSON

THIS IS REALLY:
300-EXP-056

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Nitrate as NO3	None Detected	mg/L	0.5	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5945
Nitrate as N	None Detected	mg/L	0.20	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5895
Nitrate/Nitrite as N	None Detected	mg/L	0.2	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5950
Total Suspended Solids using glass fiber Type A/E	12.	mg/L	2.	EPA-160.2	08/31/01	SAS	3.33	MANUAL	n.a.	08/31/01	E160.2	7450
Turbidity	6.2	NT Units	0.1	EPA-180.1	08/30/01	PDL	1.	T2100	n.a.	08/30/01	E180.1	8850
Total Cyanide	0.089	mg/L	0.02	EPA-335.3	08/31/01	TDC	1.	AAII-1	EPA-335.3	08/30/01	E335.2	2850
Total Kjeldahl Nitrogen	1.6	mg/L	0.20	EPA-351.2	09/07/01	NJC	1.	RFA-1	EPA-351.2	09/06/01	NUTRIENTSA	5980
Ammonia as N	0.43	mg/L	0.025	EPA-350.1	09/04/01	NJC	1.	AAII-5	n.a.	09/04/01	NUTRIENTSA	0325
Nitrite as N	None Detected	mg/L	0.02	EPA-353.2	08/31/01	NJC	1.	RFA-2	n.a.	08/31/01	NUTRIENTSA	5960
Nitrite as NO2	None Detected	mg/L	0.50	EPA-353.2	08/31/01	NJC	1.	RFA-2	n.a.	08/31/01	NUTRIENTSA	5975

P.Q.L. = Practical Quantitation Limit (refers to the least amount of analyte quantifiable based on sample size used and analytical technique employed).

California D.O.H.S. Cert. #1186

M. Atencio

Marna Atencio
Department Supervisor

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-1
(Revised)

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-BLK1-BLE
Sample Matrix: BW - Blank water
Sample Collected By: TINA CARLSON/NED BORGLIN

Date Collected: 08/29/2001 @ 11:00

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Benzene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0500
Bromodichloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1450
Bromoform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1500
Bromomethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1550
Carbon tetrachloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1800
Chlorobenzene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2000
Chloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2050
2-Chloroethylvinyl ether	None Detected	µg/L	10.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2100
Chloroform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2150
Chloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2200
Dibromochloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3200
1,2-Dibromo-3-Chloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3185
Dichlorodifluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3500
1,1-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3550
1,2-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3600
1,1-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3650
cis-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3695
trans-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3700
Total 1,2-Dichloroethene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3705
1,2-Dichloropropane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3850
cis-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3900
trans-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3950
Total 1,3-Dichloropropene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3975
Ethyl Benzene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4700
Methylene Chloride	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5750

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-1
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-BLK1-BLE, 08/29/2001 @ 11:00, TINA CARLSON/NED BORGLIN

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code	
Styrene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	7968	
1,1,1,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8185	
1,1,2,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8200	
Tetrachloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8250	
Toluene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8350	
1,1,1-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8550	
1,1,2-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8600	
Trichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8650	
Trichlorofluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8700	
1,2,3-Trichloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8753	
1,1,2-Trichloro-1,2,2-trifluoroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4850	
Vinyl Chloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8900	
Total Xylenes	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8975	
Total Trihalomethanes	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8760	
Acetone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0125	
Acetonitrile	None Detected	µg/L	100.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0110	
Acrolein	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0150	
Acrylonitrile	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0200	
2-Butanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5815	
Carbon Disulfide	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1775	
Chloroprene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2025	
1,4-Dichloro-2-butene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3285	*03
1,4-Dioxane	None Detected	µg/L	300.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4360	
Ethanol	None Detected	µg/L	1000.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4675	
2-Hexanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5735	
4-Methyl-2-pentanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5720	
Methyl-t-butylether	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5728	
Vinyl acetate	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8885	*03

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-1
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-BLK1-BLE, 08/29/2001 @ 11:00, TINA CARLSON/NED BORGLIN

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code

Quality Control Data

Surrogates	% Recovery	Control Limits
1,2-Dichloroethane-d4	104.	76-114
Toluene-d8	99.	88-110
4-Bromofluorobenzene	107.	86-115

Note: Sample received at pH = 4.

Flag Explanations:
*03 = CCV recovery not within method limits.
California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-2
(Revised)

Date Collected: 08/29/2001 @ 11:15

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-BLK2-BLE
Sample Matrix: BW - Blank water
Sample Collected By: NED BORGLIN/TINA CARLSON

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Benzene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0500
Bromodichloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1450
Bromoform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1500
Bromomethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1550
Carbon tetrachloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1800
Chlorobenzene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2000
Chloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2050
2-Chloroethylvinyl ether	None Detected	µg/L	10.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2100
Chloroform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2150
Chloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2200
Dibromochloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3200
1,2-Dibromo-3-Chloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3185
Dichlorodifluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3500
1,1-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3550
1,2-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3600
1,1-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3650
cis-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3695
trans-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3700
Total 1,2-Dichloroethene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3705
1,2-Dichloropropane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3850
cis-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3900
trans-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3950
Total 1,3-Dichloropropene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3975
Ethyl Benzene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4700
Methylene Chloride	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5750

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-2
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-BLK2-BLE, 08/29/2001 @ 11:15, NED BORGLIN/TINA CARLSON

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code	
Styrene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	7968	
1,1,1,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8185	
1,1,2,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8200	
Tetrachloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8250	
Toluene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8350	
1,1,1-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8550	
1,1,2-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8600	
Trichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8650	
Trichlorofluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8700	
1,2,3-Trichloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8753	
1,1,2-Trichloro-1,2,2-trifluoroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4850	
Vinyl Chloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8900	
Total Xylenes	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8975	
Total Trihalomethanes	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8760	
Acetone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0125	
Acetonitrile	None Detected	µg/L	100.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0110	
Acrolein	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0150	
Acrylonitrile	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0200	
2-Butanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5815	
Carbon Disulfide	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1775	
Chloroprene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2025	
1,4-Dichloro-2-butene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3285	*03
1,4-Dioxane	None Detected	µg/L	300.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4360	
Ethanol	None Detected	µg/L	1000.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4675	
2-Hexanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5735	
4-Methyl-2-pentanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5720	
Methyl-t-butylether	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5728	
Vinyl acetate	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8885	*03

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-2
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-BLK2-BLE, 08/29/2001 @ 11:15, NED BORGLIN/TINA CARLSON

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code

Quality Control Data

Surrogates	% Recovery	Control Limits
1,2-Dichloroethane-d4	98.	76-114
Toluene-d8	101.	88-110
4-Bromofluorobenzene	100.	86-115

Note: Sample received at pH = 4.

Flag Explanations:
*03 = CCV recovery not within method limits.
California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-1TB
(Revised)

Date Collected: 08/29/2001

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: TRIP BLANK
Sample Matrix: BW - Blank water
Sample Collected By: TINA CARLSON/NED BORGLIN

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Benzene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0500
Bromodichloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1450
Bromoform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1500
Bromomethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1550
Carbon tetrachloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1800
Chlorobenzene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2000
Chloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2050
2-Chloroethylvinyl ether	None Detected	µg/L	10.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2100
Chloroform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2150
Chloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2200
Dibromochloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3200
1,2-Dibromo-3-Chloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3185
Dichlorodifluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3500
1,1-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3550
1,2-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3600
1,1-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3650
cis-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3695
trans-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3700
Total 1,2-Dichloroethene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3705
1,2-Dichloropropane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3850
cis-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3900
trans-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3950
Total 1,3-Dichloropropene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3975
Ethyl Benzene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4700
Methylene Chloride	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5750

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-1TB
(Revised)

Sample Description: UNICARD, LAKE DAVIS, TRIP BLANK, 08/29/2001, TINA CARLSON/NED BORGLIN

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code	
Styrene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	7968	
1,1,1,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8185	
1,1,2,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8200	
Tetrachloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8250	
Toluene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8350	
1,1,1-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8550	
1,1,2-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8600	
Trichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8650	
Trichlorofluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8700	
1,2,3-Trichloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8753	
1,1,2-Trichloro-1,2,2-trifluoroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4850	
Vinyl Chloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8900	
Total Xylenes	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8975	
Total Trihalomethanes	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8760	
Acetone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0125	
Acetonitrile	None Detected	µg/L	100.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0110	
Acrolein	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0150	
Acrylonitrile	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0200	
2-Butanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5815	
Carbon Disulfide	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1775	
Chloroprene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2025	
1,4-Dichloro-2-butene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3285	*03
1,4-Dioxane	None Detected	µg/L	300.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4360	
Ethanol	None Detected	µg/L	1000.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4675	
2-Hexanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5735	
4-Methyl-2-pentanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5720	
Methyl-t-butylether	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5728	
Vinyl acetate	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8885	*03

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-1TB
(Revised)

Sample Description: UNICARD, LAKE DAVIS, TRIP BLANK, 08/29/2001, TINA CARLSON/NED BORGLIN

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code

Quality Control Data

Surrogates	% Recovery	Control Limits
1,2-Dichloroethane-d4	101.	76-114
Toluene-d8	98.	88-110
4-Bromofluorobenzene	104.	86-115

Note: Sample received at pH = 4.

Flag Explanations:
*03 = CCV recovery not within method limits.
California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-3
(Revised)

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET1-12M
Sample Matrix: AQ - Aqueous
Sample Collected By: NED BORGLIN/TINA CARLSON

Date Collected: 08/29/2001 @ 15:05

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Benzene	9.3	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0500
Bromodichloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1450
Bromoform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1500
Bromomethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1550
Carbon tetrachloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1800
Chlorobenzene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2000
Chloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2050
2-Chloroethylvinyl ether	None Detected	µg/L	10.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2100
Chloroform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2150
Chloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2200
Dibromochloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3200
1,2-Dibromo-3-Chloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3185
Dichlorodifluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3500
1,1-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3550
1,2-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3600
1,1-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3650
cis-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3695
trans-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3700
Total 1,2-Dichloroethene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3705
1,2-Dichloropropane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3850
cis-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3900
trans-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3950
Total 1,3-Dichloropropene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3975
Ethyl Benzene	0.75	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4700
Methylene Chloride	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5750

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-3
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET1-12M, 08/29/2001 @ 15:05, NED BORGLIN/TINA CARLSON

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code	
Styrene	1.8	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	7968	
1,1,1,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8185	
1,1,2,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8200	
Tetrachloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8250	
Toluene	4.9	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8350	
1,1,1-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8550	
1,1,2-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8600	
Trichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8650	
Trichlorofluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8700	
1,2,3-Trichloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8753	
1,1,2-Trichloro-1,2,2-trifluoroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4850	
Vinyl Chloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8900	
Total Xylenes	1.5	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8975	
Total Trihalomethanes	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8760	
Acetone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0125	
Acetonitrile	None Detected	µg/L	100.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0110	
Acrolein	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0150	
Acrylonitrile	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0200	
2-Butanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5815	
Carbon Disulfide	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1775	
Chloroprene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2025	
1,4-Dichloro-2-butene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3285	*03
1,4-Dioxane	None Detected	µg/L	300.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4360	
Ethanol	None Detected	µg/L	1000.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4675	
2-Hexanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5735	
4-Methyl-2-pentanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5720	
Methyl-t-butylether	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5728	
Vinyl acetate	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8885	

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-3
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET1-12M, 08/29/2001 @ 15:05, NED BORGLIN/TINA CARLSON

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code

Quality Control Data

Surrogates	% Recovery	Control Limits
1,2-Dichloroethane-d4	102.	76-114
Toluene-d8	103.	88-110
4-Bromofluorobenzene	98.	86-115

Note: Sample received at pH = 4.

Flag Explanations:
*03 = CCV recovery not within method limits.
California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-4
(Revised)

Date Collected: 08/29/2001 @ 15:05

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET1-12MD
Sample Matrix: AQ - Aqueous
Sample Collected By: NED BORGLIN/TINA CARLSON

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Benzene	9.3	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0500
Bromodichloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1450
Bromoform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1500
Bromomethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1550
Carbon tetrachloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1800
Chlorobenzene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2000
Chloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2050
2-Chloroethylvinyl ether	None Detected	µg/L	10.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2100
Chloroform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2150
Chloromethane	1.8	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2200
Dibromochloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3200
1,2-Dibromo-3-Chloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3185
Dichlorodifluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3500
1,1-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3550
1,2-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3600
1,1-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3650
cis-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3695
trans-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3700
Total 1,2-Dichloroethene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3705
1,2-Dichloropropane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3850
cis-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3900
trans-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3950
Total 1,3-Dichloropropene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3975
Ethyl Benzene	0.76	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4700
Methylene Chloride	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5750

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-4
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET1-12MD, 08/29/2001 @ 15:05, NED BORGLIN/TINA CARLSON

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Styrene	1.7	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	7968
1,1,1,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8185
1,1,2,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8200
Tetrachloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8250
Toluene	5.0	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8350
1,1,1-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8550
1,1,2-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8600
Trichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8650
Trichlorofluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8700
1,2,3-Trichloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8753
1,1,2-Trichloro-1,2,2-trifluoroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4850
Vinyl Chloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8900
Total Xylenes	1.5	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8975
Total Trihalomethanes	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8760
Acetone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0125
Acetonitrile	None Detected	µg/L	100.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0110
Acrolein	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0150
Acrylonitrile	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0200
2-Butanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5815
Carbon Disulfide	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1775
Chloroprene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2025
1,4-Dichloro-2-butene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3285
1,4-Dioxane	None Detected	µg/L	300.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4360
Ethanol	None Detected	µg/L	1000.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4675
2-Hexanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5735
4-Methyl-2-pentanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5720
Methyl-t-butylether	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5728
Vinyl acetate	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8885

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-4
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET1-12MD, 08/29/2001 @ 15:05, NED BORGLIN/TINA CARLSON

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code

Quality Control Data

Surrogates	% Recovery	Control Limits
1,2-Dichloroethane-d4	102.	76-114
Toluene-d8	104.	88-110
4-Bromofluorobenzene	102.	86-115

Note: Sample received at pH = 4.

California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-5
(Revised)

Date Collected: 08/29/2001 @ 15:12

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET2-12M
Sample Matrix: AQ - Aqueous
Sample Collected By: NED BORGLIN/TINA CARLSON

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Benzene	11.	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0500
Bromodichloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1450
Bromoform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1500
Bromomethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1550
Carbon tetrachloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1800
Chlorobenzene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2000
Chloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2050
2-Chloroethylvinyl ether	None Detected	µg/L	10.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2100
Chloroform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2150
Chloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2200
Dibromochloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3200
1,2-Dibromo-3-Chloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3185
Dichlorodifluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3500
1,1-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3550
1,2-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3600
1,1-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3650
cis-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3695
trans-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3700
Total 1,2-Dichloroethene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3705
1,2-Dichloropropane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3850
cis-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3900
trans-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3950
Total 1,3-Dichloropropene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3975
Ethyl Benzene	0.98	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4700
Methylene Chloride	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5750

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-5
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET2-12M, 08/29/2001 @ 15:12, NED BORGLIN/TINA CARLSON

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Styrene	2.5	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	7968
1,1,1,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8185
1,1,2,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8200
Tetrachloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8250
Toluene	6.2	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8350
1,1,1-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8550
1,1,2-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8600
Trichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8650
Trichlorofluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8700
1,2,3-Trichloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8753
1,1,2-Trichloro-1,2,2-trifluoroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4850
Vinyl Chloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8900
Total Xylenes	1.9	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8975
Total Trihalomethanes	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8760
Acetone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0125
Acetonitrile	None Detected	µg/L	100.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0110
Acrolein	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0150
Acrylonitrile	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0200
2-Butanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5815
Carbon Disulfide	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1775
Chloroprene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2025
1,4-Dichloro-2-butene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3285
1,4-Dioxane	None Detected	µg/L	300.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4360
Ethanol	None Detected	µg/L	1000.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4675
2-Hexanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5735
4-Methyl-2-pentanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5720
Methyl-t-butylether	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5728
Vinyl acetate	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8885

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-5
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET2-12M, 08/29/2001 @ 15:12, NED BORGLIN/TINA CARLSON

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code

Quality Control Data

Surrogates	% Recovery	Control Limits
1,2-Dichloroethane-d4	103.	76-114
Toluene-d8	99.	88-110
4-Bromofluorobenzene	103.	86-115

Note: Sample received at pH = 4.

California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-6
(Revised)

Date Collected: 08/29/2001 @ 15:12

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET2-12MD
Sample Matrix: AQ - Aqueous
Sample Collected By: NED BORGLIN/TINA CARLSON

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Benzene	12.	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0500
Bromodichloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1450
Bromoform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1500
Bromomethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1550
Carbon tetrachloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1800
Chlorobenzene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2000
Chloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2050
2-Chloroethylvinyl ether	None Detected	µg/L	10.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2100
Chloroform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2150
Chloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2200
Dibromochloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3200
1,2-Dibromo-3-Chloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3185
Dichlorodifluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3500
1,1-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3550
1,2-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3600
1,1-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3650
cis-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3695
trans-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3700
Total 1,2-Dichloroethene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3705
1,2-Dichloropropane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3850
cis-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3900
trans-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3950
Total 1,3-Dichloropropene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3975
Ethyl Benzene	1.0	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4700
Methylene Chloride	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5750

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-6
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET2-12MD, 08/29/2001 @ 15:12, NED BORGLIN/TINA CARLSON

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Styrene	2.8	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	7968
1,1,1,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8185
1,1,2,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8200
Tetrachloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8250
Toluene	6.7	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8350
1,1,1-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8550
1,1,2-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8600
Trichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8650
Trichlorofluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8700
1,2,3-Trichloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8753
1,1,2-Trichloro-1,2,2-trifluoroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4850
Vinyl Chloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8900
Total Xylenes	2.1	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8975
Total Trihalomethanes	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8760
Acetone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0125
Acetonitrile	None Detected	µg/L	100.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0110
Acrolein	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0150
Acrylonitrile	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0200
2-Butanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5815
Carbon Disulfide	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1775
Chloroprene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2025
1,4-Dichloro-2-butene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3285
1,4-Dioxane	None Detected	µg/L	300.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4360
Ethanol	None Detected	µg/L	1000.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4675
2-Hexanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5735
4-Methyl-2-pentanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5720
Methyl-t-butylether	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5728
Vinyl acetate	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8885

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-6
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET2-12MD, 08/29/2001 @ 15:12, NED BORGLIN/TINA CARLSON

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code

Quality Control Data

Surrogates	% Recovery	Control Limits
1,2-Dichloroethane-d4	104.	76-114
Toluene-d8	98.	88-110
4-Bromofluorobenzene	99.	86-115

Note: Sample received at pH = 4.

California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-2TB
(Revised)

Date Collected: 08/29/2001

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: TRIP BLANK
Sample Matrix: BW - Blank water
Sample Collected By: TINA CARLSON/NED BORGLIN

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Benzene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0500
Bromodichloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1450
Bromoform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1500
Bromomethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1550
Carbon tetrachloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1800
Chlorobenzene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2000
Chloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2050
2-Chloroethylvinyl ether	None Detected	µg/L	10.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2100
Chloroform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2150
Chloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2200
Dibromochloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3200
1,2-Dibromo-3-Chloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3185
Dichlorodifluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3500
1,1-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3550
1,2-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3600
1,1-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3650
cis-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3695
trans-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3700
Total 1,2-Dichloroethene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3705
1,2-Dichloropropane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3850
cis-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3900
trans-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3950
Total 1,3-Dichloropropene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3975
Ethyl Benzene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4700
Methylene Chloride	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5750

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-2TB
(Revised)

Sample Description: UNICARD, LAKE DAVIS, TRIP BLANK, 08/29/2001, TINA CARLSON/NED BORGLIN

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code	
Styrene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	7968	
1,1,1,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8185	
1,1,2,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8200	
Tetrachloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8250	
Toluene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8350	
1,1,1-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8550	
1,1,2-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8600	
Trichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8650	
Trichlorofluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8700	
1,2,3-Trichloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8753	
1,1,2-Trichloro-1,2,2-trifluoroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4850	
Vinyl Chloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8900	
Total Xylenes	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8975	
Total Trihalomethanes	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8760	
Acetone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0125	
Acetonitrile	None Detected	µg/L	100.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0110	
Acrolein	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0150	
Acrylonitrile	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0200	
2-Butanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5815	
Carbon Disulfide	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1775	
Chloroprene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2025	
1,4-Dichloro-2-butene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3285	*03
1,4-Dioxane	None Detected	µg/L	300.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4360	
Ethanol	None Detected	µg/L	1000.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4675	
2-Hexanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5735	
4-Methyl-2-pentanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5720	
Methyl-t-butylether	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5728	
Vinyl acetate	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8885	*03

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-2TB
(Revised)

Sample Description: UNICARD, LAKE DAVIS, TRIP BLANK, 08/29/2001, TINA CARLSON/NED BORGLIN

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code

Quality Control Data

Surrogates	% Recovery	Control Limits
1,2-Dichloroethane-d4	105.	76-114
Toluene-d8	96.	88-110
4-Bromofluorobenzene	99.	86-115

Flag Explanations:
*03 = CCV recovery not within method limits.
California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000 THIS IS REALLY: 300-EXP-056

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-BLK1-BLE
Sample Matrix: BW - Blank water
Sample Collected By: TINA CARLSON/NED BORGLIN

Date Reported: 09/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-1

Date Collected: 08/29/2001 @ 11:00
Date Extracted: 08/30/2001
Date Analyzed: 09/05/2001
Extract Method: 3510
Method: 8270
Analyst: SKC
Dilution Used: 1
Instrument ID: MS-B2

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
Acenaphthene	None Detected	µg/L	2.	E8270	0050
Acenaphthylene	None Detected	µg/L	2.	E8270	0100
Aldrin	None Detected	µg/L	2.	E8270	0250
Aniline	None Detected	µg/L	5.	E8270	0335
Anthracene	None Detected	µg/L	2.	E8270	0350
Benzidine	None Detected	µg/L	20.	E8270	0600
Benzo (a) anthracene	None Detected	µg/L	2.	E8270	0650
Benzo (b) fluoranthene	None Detected	µg/L	2.	E8270	0700
Benzo (k) fluoranthene	None Detected	µg/L	2.	E8270	0750
Benzo (a) pyrene	None Detected	µg/L	2.	E8270	0850
Benzo (ghi) perylene	None Detected	µg/L	2.	E8270	0800
Benzoic Acid	None Detected	µg/L	10.	E8270	0875
Benzyl alcohol	None Detected	µg/L	2.	E8270	0880
Butyl Benzyl phthalate	None Detected	µg/L	2.	E8270	1625
alpha-BHC	None Detected	µg/L	2.	E8270	0950
beta-BHC	None Detected	µg/L	2.	E8270	1000
delta-BHC	None Detected	µg/L	2.	E8270	1050
gamma-BHC	None Detected	µg/L	2.	E8270	1100
bis(2-chloroethyl)ether	None Detected	µg/L	2.	E8270	1250
bis(2-chloroethoxy)methane	None Detected	µg/L	2.	E8270	1200
bis(2-chloro-1-methylethyl)	None Detected	µg/L	2.	E8270	1300
bis(2-ethylhexyl)phthalate	None Detected	µg/L	5.	E8270	1350
4-Bromophenyl phenyl ether	None Detected	µg/L	2.	E8270	1613
4-Chloroaniline	None Detected	µg/L	2.	E8270	1975
2-Chloronaphthalene	None Detected	µg/L	2.	E8270	2300
4-Chlorophenyl phenyl ether	None Detected	µg/L	2.	E8270	2425
Chrysene	None Detected	µg/L	2.	E8270	2600
4,4-DDD'	None Detected	µg/L	2.	E8270	2900
4,4-DDE'	None Detected	µg/L	3.	E8270	2950
4,4-DDT'	None Detected	µg/L	2.	E8270	3000
Dibenzo (a,h) anthracene	None Detected	µg/L	3.	E8270	3150
Dibenzofuran	None Detected	µg/L	2.	E8270	3175
Di-n-butyl phthalate	None Detected	µg/L	2.	E8270	3250
1,2-Dichlorobenzene	None Detected	µg/L	2.	E8270	3300
1,3-Dichlorobenzene	None Detected	µg/L	2.	E8270	3350
1,4-Dichlorobenzene	None Detected	µg/L	2.	E8270	3400
3,3-Dichlorobenzidine	None Detected	µg/L	10.	E8270	3450
Dieldrin	None Detected	µg/L	3.	E8270	4000

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

THIS IS REALLY: 300-EXP-056

Date Reported: 09/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-1

Sample Description: UNICARD, LAKE DAVIS, 3X056-BLK1-BLE, 08/29/2001 @ 11:00, TINA CARLSON/NED BORGLIN

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
Diethyl phthalate	None Detected	µg/L	2.	E8270	4050
Dimethyl phthalate	None Detected	µg/L	2.	E8270	4150
2,4-Dinitrotoluene	None Detected	µg/L	2.	E8270	4250
2,6-Dinitrotoluene	None Detected	µg/L	2.	E8270	4300
Di-n-octylphthalate	None Detected	µg/L	2.	E8270	4350
1,2-Diphenylhydrazine	None Detected	µg/L	2.	E8270	4400
Endosulfan I	None Detected	µg/L	10.	E8270	4450
Endosulfan II	None Detected	µg/L	10.	E8270	4500
Endosulfan sulfate	None Detected	µg/L	3.	E8270	4550
Endrin	None Detected	µg/L	2.	E8270	4600
Endrin aldehyde	None Detected	µg/L	10.	E8270	4650
Fluoranthene	None Detected	µg/L	2.	E8270	4750
Fluorene	None Detected	µg/L	2.	E8270	4800
Heptachlor	None Detected	µg/L	2.	E8270	4950
Heptachlor epoxide	None Detected	µg/L	2.	E8270	5000
Hexachlorobenzene	None Detected	µg/L	2.	E8270	5050
Hexachlorobutadiene	None Detected	µg/L	2.	E8270	5100
Hexachlorocyclopentadiene	None Detected	µg/L	2.	E8270	5150
Hexachloroethane	None Detected	µg/L	2.	E8270	5200
Indeno (1,2,3-cd) pyrene	None Detected	µg/L	2.	E8270	5300
Isophorone	None Detected	µg/L	2.	E8270	5400
2-Methylnaphthalene	None Detected	µg/L	2.	E8270	5740
Naphthalene	None Detected	µg/L	2.	E8270	5800
2-Naphthylamine	None Detected	µg/L	20.	E8270	5805
2-Nitroaniline	None Detected	µg/L	2.	E8270	5990
3-Nitroaniline	None Detected	µg/L	2.	E8270	5992
4-Nitroaniline	None Detected	µg/L	5.	E8270	5994
Nitrobenzene	None Detected	µg/L	2.	E8270	6000
n-Nitrosodimethylamine	None Detected	µg/L	2.	E8270	6150
n-Nitrosodiphenylamine	None Detected	µg/L	2.	E8270	6200
N-Nitrosodi-n-propylamine	None Detected	µg/L	2.	E8270	6250
Phenanthrene	None Detected	µg/L	2.	E8270	6850
Pyrene	None Detected	µg/L	2.	E8270	7100
1,2,4-Trichlorobenzene	None Detected	µg/L	2.	E8270	8500
4-Chloro-3-methylphenol	None Detected	µg/L	5.	E8270	2250
2-Chlorophenol	None Detected	µg/L	2.	E8270	2350
2,4-Dichlorophenol	None Detected	µg/L	2.	E8270	3750
2,4-Dimethylphenol	None Detected	µg/L	2.	E8270	4100
2,4-Dinitrophenol	None Detected	µg/L	10.	E8270	4200
2-Methyl-4,6-dinitrophenol	None Detected	µg/L	10.	E8270	5700
2-Methylphenol	None Detected	µg/L	2.	E8270	5730
3- & 4-Methylphenol	None Detected	µg/L	2.	E8270	5734

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

THIS IS REALLY 300-EXP-056

Date Reported: 09/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-1

Sample Description: UNICARD, LAKE DAVIS, 3X056-BLK1-BLE, 08/29/2001 @ 11:00, TINA CARLSON/NED BORGLIN

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
2-Nitrophenol	None Detected	µg/L	2.	E8270	6050
4-Nitrophenol	None Detected	µg/L	2.	E8270	6100
Pentachlorophenol	None Detected	µg/L	10.	E8270	6400
Phenol	None Detected	µg/L	2.	E8270	6900
2,4,5-Trichlorophenol	None Detected	µg/L	5.	E8270	8745
2,4,6-Trichlorophenol	None Detected	µg/L	5.	E8270	8750
2-Picoline	None Detected	µg/L	10.	E8270	7120

Quality Control Data

Surrogates	% Recovery	Control Limits
2-Fluorophenol	53.	21-100
Phenol-d5	39.	10-94
Nitrobenzene-d5	97.	35-114
2-Fluorobiphenyl	89.	43-116
2,4,6-Tribromophenol	101.	10-123
d14-Terphenyl	81.	33-141

California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc.

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-2

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-BLK2-BLE
Sample Matrix: BW - Blank water
Sample Collected By: NED BORGLIN/TINA CARLSON

THIS IS REALLY: 300-EXP-056

Date Collected: 08/29/2001 @ 11:15
Date Extracted: 08/30/2001
Date Analyzed: 09/05/2001
Extract Method: 3510
Method: 8270
Analyst: SKC
Dilution Used: 1
Instrument ID: MS-B2

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
Acenaphthene	None Detected	µg/L	2.	E8270	0050
Acenaphthylene	None Detected	µg/L	2.	E8270	0100
Aldrin	None Detected	µg/L	2.	E8270	0250
Aniline	None Detected	µg/L	5.	E8270	0335
Anthracene	None Detected	µg/L	2.	E8270	0350
Benzidine	None Detected	µg/L	20.	E8270	0600
Benzo (a) anthracene	None Detected	µg/L	2.	E8270	0650
Benzo (b) fluoranthene	None Detected	µg/L	2.	E8270	0700
Benzo (k) fluoranthene	None Detected	µg/L	2.	E8270	0750
Benzo (a) pyrene	None Detected	µg/L	2.	E8270	0850
Benzo (ghi) perylene	None Detected	µg/L	2.	E8270	0800
Benzoic Acid	None Detected	µg/L	10.	E8270	0875
Benzyl alcohol	None Detected	µg/L	2.	E8270	0880
Butyl Benzyl phthalate	None Detected	µg/L	2.	E8270	1625
alpha-BHC	None Detected	µg/L	2.	E8270	0950
beta-BHC	None Detected	µg/L	2.	E8270	1000
delta-BHC	None Detected	µg/L	2.	E8270	1050
gamma-BHC	None Detected	µg/L	2.	E8270	1100
bis(2-chloroethyl)ether	None Detected	µg/L	2.	E8270	1250
bis(2-chloroethoxy)methane	None Detected	µg/L	2.	E8270	1200
bis(2-chloro-1-methylethyl)	None Detected	µg/L	2.	E8270	1300
bis(2-ethylhexyl)phthalate	None Detected	µg/L	5.	E8270	1350
4-Bromophenyl phenyl ether	None Detected	µg/L	2.	E8270	1613
4-Chloroaniline	None Detected	µg/L	2.	E8270	1975
2-Chloronaphthalene	None Detected	µg/L	2.	E8270	2300
4-Chlorophenyl phenyl ether	None Detected	µg/L	2.	E8270	2425
Chrysene	None Detected	µg/L	2.	E8270	2600
4,4-DDD'	None Detected	µg/L	2.	E8270	2900
4,4-DDE'	None Detected	µg/L	3.	E8270	2950
4,4-DDT'	None Detected	µg/L	2.	E8270	3000
Dibenzo (a,h) anthracene	None Detected	µg/L	3.	E8270	3150
Dibenzofuran	None Detected	µg/L	2.	E8270	3175
Di-n-butyl phthalate	None Detected	µg/L	2.	E8270	3250
1,2-Dichlorobenzene	None Detected	µg/L	2.	E8270	3300
1,3-Dichlorobenzene	None Detected	µg/L	2.	E8270	3350
1,4-Dichlorobenzene	None Detected	µg/L	2.	E8270	3400
3,3-Dichlorobenzidine	None Detected	µg/L	10.	E8270	3450
Dieldrin	None Detected	µg/L	3.	E8270	4000

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY THIS IS REALLY 300-EXP-056
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-2

Sample Description: UNICARD, LAKE DAVIS, 3X056-BLK2-BLE, 08/29/2001 @ 11:15, NED BORGLIN/TINA CARLSON

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
Diethyl phthalate	None Detected	µg/L	2.	E8270	4050
Dimethyl phthalate	None Detected	µg/L	2.	E8270	4150
2,4-Dinitrotoluene	None Detected	µg/L	2.	E8270	4250
2,6-Dinitrotoluene	None Detected	µg/L	2.	E8270	4300
Di-n-octylphthalate	None Detected	µg/L	2.	E8270	4350
1,2-Diphenylhydrazine	None Detected	µg/L	2.	E8270	4400
Endosulfan I	None Detected	µg/L	10.	E8270	4450
Endosulfan II	None Detected	µg/L	10.	E8270	4500
Endosulfan sulfate	None Detected	µg/L	3.	E8270	4550
Endrin	None Detected	µg/L	2.	E8270	4600
Endrin aldehyde	None Detected	µg/L	10.	E8270	4650
Fluoranthene	None Detected	µg/L	2.	E8270	4750
Fluorene	None Detected	µg/L	2.	E8270	4800
Heptachlor	None Detected	µg/L	2.	E8270	4950
Heptachlor epoxide	None Detected	µg/L	2.	E8270	5000
Hexachlorobenzene	None Detected	µg/L	2.	E8270	5050
Hexachlorobutadiene	None Detected	µg/L	2.	E8270	5100
Hexachlorocyclopentadiene	None Detected	µg/L	2.	E8270	5150
Hexachloroethane	None Detected	µg/L	2.	E8270	5200
Indeno (1,2,3-cd) pyrene	None Detected	µg/L	2.	E8270	5300
Isophorone	None Detected	µg/L	2.	E8270	5400
2-Methylnaphthalene	None Detected	µg/L	2.	E8270	5740
Naphthalene	None Detected	µg/L	2.	E8270	5800
2-Naphthylamine	None Detected	µg/L	20.	E8270	5805
2-Nitroaniline	None Detected	µg/L	2.	E8270	5990
3-Nitroaniline	None Detected	µg/L	2.	E8270	5992
4-Nitroaniline	None Detected	µg/L	5.	E8270	5994
Nitrobenzene	None Detected	µg/L	2.	E8270	6000
n-Nitrosodimethylamine	None Detected	µg/L	2.	E8270	6150
n-Nitrosodiphenylamine	None Detected	µg/L	2.	E8270	6200
N-Nitrosodi-n-propylamine	None Detected	µg/L	2.	E8270	6250
Phenanthrene	None Detected	µg/L	2.	E8270	6850
Pyrene	None Detected	µg/L	2.	E8270	7100
1,2,4-Trichlorobenzene	None Detected	µg/L	2.	E8270	8500
4-Chloro-3-methylphenol	None Detected	µg/L	5.	E8270	2250
2-Chlorophenol	None Detected	µg/L	2.	E8270	2350
2,4-Dichlorophenol	None Detected	µg/L	2.	E8270	3750
2,4-Dimethylphenol	None Detected	µg/L	2.	E8270	4100
2,4-Dinitrophenol	None Detected	µg/L	10.	E8270	4200
2-Methyl-4,6-dinitrophenol	None Detected	µg/L	10.	E8270	5700
2-Methylphenol	None Detected	µg/L	2.	E8270	5730
3- & 4-Methylphenol	None Detected	µg/L	2.	E8270	5734

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

THIS IS REALLY: 300-EXP-056

Date Reported: 09/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-2

Sample Description: UNICARD, LAKE DAVIS, 3X056-BLK2-BLE, 08/29/2001 @ 11:15, NED BORGLIN/TINA CARLSON

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
2-Nitrophenol	None Detected	µg/L	2.	E8270	6050
4-Nitrophenol	None Detected	µg/L	2.	E8270	6100
Pentachlorophenol	None Detected	µg/L	10.	E8270	6400
Phenol	None Detected	µg/L	2.	E8270	6900
2,4,5-Trichlorophenol	None Detected	µg/L	5.	E8270	8745
2,4,6-Trichlorophenol	None Detected	µg/L	5.	E8270	8750
2-Picoline	None Detected	µg/L	10.	E8270	7120

Quality Control Data

Surrogates	% Recovery	Control Limits
2-Fluorophenol	52.	21-100
Phenol-d5	38.	10-94
Nitrobenzene-d5	100.	35-114
2-Fluorobiphenyl	92.	43-116
2,4,6-Tribromophenol	101.	10-123
d14-Terphenyl	81.	33-141

California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc.

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-3

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET1-12M THIS IS REALLY 300-EXP-056
Sample Matrix: AQ - Aqueous
Sample Collected By: NED BORGLIN/TINA CARLSON

Date Collected: 08/29/2001 @ 15:05
Date Extracted: 08/30/2001
Date Analyzed: 09/05/2001
Extract Method: 3510
Method: 8270
Analyst: SKC
Dilution Used: 1
Instrument ID: MS-B2

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
Acenaphthene	None Detected	µg/L	2.	E8270	0050
Acenaphthylene	None Detected	µg/L	2.	E8270	0100
Aldrin	None Detected	µg/L	2.	E8270	0250
Aniline	None Detected	µg/L	5.	E8270	0335
Anthracene	None Detected	µg/L	2.	E8270	0350
Benzidine	None Detected	µg/L	20.	E8270	0600
Benzo (a) anthracene	None Detected	µg/L	2.	E8270	0650
Benzo (b) fluoranthene	None Detected	µg/L	2.	E8270	0700
Benzo (k) fluoranthene	None Detected	µg/L	2.	E8270	0750
Benzo (a) pyrene	None Detected	µg/L	2.	E8270	0850
Benzo (ghi) perylene	None Detected	µg/L	2.	E8270	0800
Benzoic Acid	None Detected	µg/L	10.	E8270	0875
Benzyl alcohol	None Detected	µg/L	2.	E8270	0880
Butyl Benzyl phthalate	None Detected	µg/L	2.	E8270	1625
alpha-BHC	None Detected	µg/L	2.	E8270	0950
beta-BHC	None Detected	µg/L	2.	E8270	1000
delta-BHC	None Detected	µg/L	2.	E8270	1050
gamma-BHC	None Detected	µg/L	2.	E8270	1100
bis(2-chloroethyl)ether	None Detected	µg/L	2.	E8270	1250
bis(2-chloroethoxy)methane	None Detected	µg/L	2.	E8270	1200
bis(2-chloro-1-methylethyl)	None Detected	µg/L	2.	E8270	1300
bis(2-ethylhexyl)phthalate	32.	µg/L	5.	E8270	1350
4-Bromophenyl phenyl ether	None Detected	µg/L	2.	E8270	1613
4-Chloroaniline	None Detected	µg/L	2.	E8270	1975
2-Chloronaphthalene	None Detected	µg/L	2.	E8270	2300
4-Chlorophenyl phenyl ether	None Detected	µg/L	2.	E8270	2425
Chrysene	None Detected	µg/L	2.	E8270	2600
4,4-DDD'	None Detected	µg/L	2.	E8270	2900
4,4-DDE'	None Detected	µg/L	3.	E8270	2950
4,4-DDT'	None Detected	µg/L	2.	E8270	3000
Dibenzo (a,h) anthracene	None Detected	µg/L	3.	E8270	3150
Dibenzofuran	None Detected	µg/L	2.	E8270	3175
Di-n-butyl phthalate	None Detected	µg/L	2.	E8270	3250
1,2-Dichlorobenzene	None Detected	µg/L	2.	E8270	3300
1,3-Dichlorobenzene	None Detected	µg/L	2.	E8270	3350
1,4-Dichlorobenzene	None Detected	µg/L	2.	E8270	3400
3,3-Dichlorobenzidine	None Detected	µg/L	10.	E8270	3450
Dieldrin	None Detected	µg/L	3.	E8270	4000

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

THIS IS REALLY: 300-EXP-056

Date Reported: 09/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-3

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET1-12M, 08/29/2001 @ 15:05, NED BORGLIN/TINA CARLSON

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
Diethyl phthalate	None Detected	µg/L	2.	E8270	4050
Dimethyl phthalate	None Detected	µg/L	2.	E8270	4150
2,4-Dinitrotoluene	None Detected	µg/L	2.	E8270	4250
2,6-Dinitrotoluene	None Detected	µg/L	2.	E8270	4300
Di-n-octylphthalate	None Detected	µg/L	2.	E8270	4350
1,2-Diphenylhydrazine	None Detected	µg/L	2.	E8270	4400
Endosulfan I	None Detected	µg/L	10.	E8270	4450
Endosulfan II	None Detected	µg/L	10.	E8270	4500
Endosulfan sulfate	None Detected	µg/L	3.	E8270	4550
Endrin	None Detected	µg/L	2.	E8270	4600
Endrin aldehyde	None Detected	µg/L	10.	E8270	4650
Fluoranthene	None Detected	µg/L	2.	E8270	4750
Fluorene	None Detected	µg/L	2.	E8270	4800
Heptachlor	None Detected	µg/L	2.	E8270	4950
Heptachlor epoxide	None Detected	µg/L	2.	E8270	5000
Hexachlorobenzene	None Detected	µg/L	2.	E8270	5050
Hexachlorobutadiene	None Detected	µg/L	2.	E8270	5100
Hexachlorocyclopentadiene	None Detected	µg/L	2.	E8270	5150
Hexachloroethane	None Detected	µg/L	2.	E8270	5200
Indeno (1,2,3-cd) pyrene	None Detected	µg/L	2.	E8270	5300
Isophorone	None Detected	µg/L	2.	E8270	5400
2-Methylnaphthalene	None Detected	µg/L	2.	E8270	5740
Naphthalene	3.4	µg/L	2.	E8270	5800
2-Naphthylamine	None Detected	µg/L	20.	E8270	5805
2-Nitroaniline	None Detected	µg/L	2.	E8270	5990
3-Nitroaniline	None Detected	µg/L	2.	E8270	5992
4-Nitroaniline	None Detected	µg/L	5.	E8270	5994
Nitrobenzene	None Detected	µg/L	2.	E8270	6000
n-Nitrosodimethylamine	None Detected	µg/L	2.	E8270	6150
n-Nitrosodiphenylamine	None Detected	µg/L	2.	E8270	6200
N-Nitrosodi-n-propylamine	None Detected	µg/L	2.	E8270	6250
Phenanthrene	None Detected	µg/L	2.	E8270	6850
Pyrene	None Detected	µg/L	2.	E8270	7100
1,2,4-Trichlorobenzene	None Detected	µg/L	2.	E8270	8500
4-Chloro-3-methylphenol	None Detected	µg/L	5.	E8270	2250
2-Chlorophenol	None Detected	µg/L	2.	E8270	2350
2,4-Dichlorophenol	None Detected	µg/L	2.	E8270	3750
2,4-Dimethylphenol	None Detected	µg/L	2.	E8270	4100
2,4-Dinitrophenol	None Detected	µg/L	10.	E8270	4200
2-Methyl-4,6-dinitrophenol	None Detected	µg/L	10.	E8270	5700
2-Methylphenol	None Detected	µg/L	2.	E8270	5730
3- & 4-Methylphenol	None Detected	µg/L	2.	E8270	5734

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

THIS IS REALLY: 300-EXP.056

Date Reported: 09/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-3

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET1-12M, 08/29/2001 @ 15:05, NED BORGLIN/TINA CARLSON

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
2-Nitrophenol	None Detected	µg/L	2.	E8270	6050
4-Nitrophenol	None Detected	µg/L	2.	E8270	6100
Pentachlorophenol	None Detected	µg/L	10.	E8270	6400
Phenol	None Detected	µg/L	2.	E8270	6900
2,4,5-Trichlorophenol	None Detected	µg/L	5.	E8270	8745
2,4,6-Trichlorophenol	None Detected	µg/L	5.	E8270	8750
2-Picoline	None Detected	µg/L	10.	E8270	7120

Quality Control Data

Surrogates	% Recovery	Control Limits
2-Fluorophenol	46.	21-100
Phenol-d5	34.	10-94
Nitrobenzene-d5	92.	35-114
2-Fluorobiphenyl	85.	43-116
2,4,6-Tribromophenol	78.	10-123
d14-Terphenyl	80.	33-141

California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-5

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET2-12M
Sample Matrix: AQ - Aqueous
Sample Collected By: NED BORGLIN/TINA CARLSON

THIS IS REALLY 300-EXP-056

Date Collected: 08/29/2001 @ 15:12
Date Extracted: 08/30/2001
Date Analyzed: 09/06/2001
Extract Method: 3510
Method: 8270
Analyst: SKC
Dilution Used: 1
Instrument ID: MS-B2

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
Acenaphthene	None Detected	µg/L	2.	E8270	0050
Acenaphthylene	None Detected	µg/L	2.	E8270	0100
Aldrin	None Detected	µg/L	2.	E8270	0250
Aniline	None Detected	µg/L	5.	E8270	0335
Anthracene	None Detected	µg/L	2.	E8270	0350
Benzidine	None Detected	µg/L	20.	E8270	0600
Benzo (a) anthracene	None Detected	µg/L	2.	E8270	0650
Benzo (b) fluoranthene	None Detected	µg/L	2.	E8270	0700
Benzo (k) fluoranthene	None Detected	µg/L	2.	E8270	0750
Benzo (a) pyrene	None Detected	µg/L	2.	E8270	0850
Benzo (ghi) perylene	None Detected	µg/L	2.	E8270	0800
Benzoic Acid	None Detected	µg/L	10.	E8270	0875
Benzyl alcohol	None Detected	µg/L	2.	E8270	0880
Butyl Benzyl phthalate	None Detected	µg/L	2.	E8270	1625
alpha-BHC	None Detected	µg/L	2.	E8270	0950
beta-BHC	None Detected	µg/L	2.	E8270	1000
delta-BHC	None Detected	µg/L	2.	E8270	1050
gamma-BHC	None Detected	µg/L	2.	E8270	1100
bis(2-chloroethyl)ether	None Detected	µg/L	2.	E8270	1250
bis(2-chloroethoxy)methane	None Detected	µg/L	2.	E8270	1200
bis(2-chloro-1-methylethyl)	None Detected	µg/L	2.	E8270	1300
bis(2-ethylhexyl)phthalate	None Detected	µg/L	5.	E8270	1350
4-Bromophenyl phenyl ether	None Detected	µg/L	2.	E8270	1613
4-Chloroaniline	None Detected	µg/L	2.	E8270	1975
2-Chloronaphthalene	None Detected	µg/L	2.	E8270	2300
4-Chlorophenyl phenyl ether	None Detected	µg/L	2.	E8270	2425
Chrysene	None Detected	µg/L	2.	E8270	2600
4,4-DDD'	None Detected	µg/L	2.	E8270	2900
4,4-DDE'	None Detected	µg/L	3.	E8270	2950
4,4-DDT'	None Detected	µg/L	2.	E8270	3000
Dibenzo (a,h) anthracene	None Detected	µg/L	3.	E8270	3150
Dibenzofuran	None Detected	µg/L	2.	E8270	3175
Di-n-butyl phthalate	None Detected	µg/L	2.	E8270	3250
1,2-Dichlorobenzene	None Detected	µg/L	2.	E8270	3300
1,3-Dichlorobenzene	None Detected	µg/L	2.	E8270	3350
1,4-Dichlorobenzene	None Detected	µg/L	2.	E8270	3400
3,3-Dichlorobenzidine	None Detected	µg/L	10.	E8270	3450
Dieldrin	None Detected	µg/L	3.	E8270	4000

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

THIS IS REALLY 300-EXP-056

Date Reported: 09/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-5

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET2-12M, 08/29/2001 @ 15:12, NED BORGLIN/TINA CARLSON

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
Diethyl phthalate	None Detected	µg/L	2.	E8270	4050
Dimethyl phthalate	None Detected	µg/L	2.	E8270	4150
2,4-Dinitrotoluene	None Detected	µg/L	2.	E8270	4250
2,6-Dinitrotoluene	None Detected	µg/L	2.	E8270	4300
Di-n-octylphthalate	None Detected	µg/L	2.	E8270	4350
1,2-Diphenylhydrazine	None Detected	µg/L	2.	E8270	4400
Endosulfan I	None Detected	µg/L	10.	E8270	4450
Endosulfan II	None Detected	µg/L	10.	E8270	4500
Endosulfan sulfate	None Detected	µg/L	3.	E8270	4550
Endrin	None Detected	µg/L	2.	E8270	4600
Endrin aldehyde	None Detected	µg/L	10.	E8270	4650
Fluoranthene	None Detected	µg/L	2.	E8270	4750
Fluorene	None Detected	µg/L	2.	E8270	4800
Heptachlor	None Detected	µg/L	2.	E8270	4950
Heptachlor epoxide	None Detected	µg/L	2.	E8270	5000
Hexachlorobenzene	None Detected	µg/L	2.	E8270	5050
Hexachlorobutadiene	None Detected	µg/L	2.	E8270	5100
Hexachlorocyclopentadiene	None Detected	µg/L	2.	E8270	5150
Hexachloroethane	None Detected	µg/L	2.	E8270	5200
Indeno (1,2,3-cd) pyrene	None Detected	µg/L	2.	E8270	5300
Isophorone	None Detected	µg/L	2.	E8270	5400
2-Methylnaphthalene	None Detected	µg/L	2.	E8270	5740
Naphthalene	3.9	µg/L	2.	E8270	5800
2-Naphthylamine	None Detected	µg/L	20.	E8270	5805
2-Nitroaniline	None Detected	µg/L	2.	E8270	5990
3-Nitroaniline	None Detected	µg/L	2.	E8270	5992
4-Nitroaniline	None Detected	µg/L	5.	E8270	5994
Nitrobenzene	None Detected	µg/L	2.	E8270	6000
n-Nitrosodimethylamine	None Detected	µg/L	2.	E8270	6150
n-Nitrosodiphenylamine	None Detected	µg/L	2.	E8270	6200
N-Nitrosodi-n-propylamine	None Detected	µg/L	2.	E8270	6250
Phenanthrene	None Detected	µg/L	2.	E8270	6850
Pyrene	None Detected	µg/L	2.	E8270	7100
1,2,4-Trichlorobenzene	None Detected	µg/L	2.	E8270	8500
4-Chloro-3-methylphenol	None Detected	µg/L	5.	E8270	2250
2-Chlorophenol	None Detected	µg/L	2.	E8270	2350
2,4-Dichlorophenol	None Detected	µg/L	2.	E8270	3750
2,4-Dimethylphenol	None Detected	µg/L	2.	E8270	4100
2,4-Dinitrophenol	None Detected	µg/L	10.	E8270	4200
2-Methyl-4,6-dinitrophenol	None Detected	µg/L	10.	E8270	5700
2-Methylphenol	None Detected	µg/L	2.	E8270	5730
3- & 4-Methylphenol	None Detected	µg/L	2.	E8270	5734

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

THIS IS REALLY 300-EXP-056

Date Reported: 09/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-5

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET2-12M, 08/29/2001 @ 15:12, NED BORGLIN/TINA CARLSON

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
2-Nitrophenol	None Detected	µg/L	2.	E8270	6050
4-Nitrophenol	None Detected	µg/L	2.	E8270	6100
Pentachlorophenol	None Detected	µg/L	10.	E8270	6400
Phenol	None Detected	µg/L	2.	E8270	6900
2,4,5-Trichlorophenol	None Detected	µg/L	5.	E8270	8745
2,4,6-Trichlorophenol	None Detected	µg/L	5.	E8270	8750
2-Picoline	None Detected	µg/L	10.	E8270	7120

Quality Control Data

Surrogates	% Recovery	Control Limits
2-Fluorophenol	48.	21-100
Phenol-d5	36.	10-94
Nitrobenzene-d5	88.	35-114
2-Fluorobiphenyl	82.	43-116
2,4,6-Tribromophenol	95.	10-123
d14-Terphenyl	97.	33-141

California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/14/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-1

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-BLK1-BLE
Sample Depth:
Sampling Date/Time: 08/29/2001 @ 11:00
Sample Matrix: BW - Blank water
Sample Collected By: TINA CARLSON/NED BORGLIN

THIS IS REALLY:
300-EXP-056

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Formaldehyde	None Detected	µg/L	15.	JAPC-1181-	09/04/01	DWW	1.	HPLC-A	8315	08/31/01	E8315	4840

P.Q.L. = Practical Quantitation Limit (refers to the least amount of analyte quantifiable based on sample size used and analytical technique employed).

California D.O.H.S. Cert. #1186

M. Atencio

Marna Atencio
Department Supervisor

BC Laboratories, Inc

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/14/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-2

THIS IS REALLY:
300-EXP-056

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-BLK2-BLE
Sample Depth:
Sampling Date/Time: 08/29/2001 @ 11:15
Sample Matrix: BW - Blank water
Sample Collected By: NED BORGLIN/TINA CARLSON

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Formaldehyde	None Detected	µg/L	15.	JAPC-1181-	09/04/01	DWW	1.	HPLC-A	8315	08/31/01	E8315	4840

P.Q.L. = Practical Quantitation Limit (refers to the least amount of analyte quantifiable based on sample size used and analytical technique employed).

California D.O.H.S. Cert. #1186

M. Atencio

Marna Atencio
Department Supervisor

BC Laboratories, Inc

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/14/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-3

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET1-12M
Sample Depth:
Sampling Date/Time: 08/29/2001 @ 15:05
Sample Matrix: AQ - Aqueous
Sample Collected By: NED BORGLIN/TINA CARLSON

THIS IS REALLY:
300-EXP-056

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Formaldehyde	None Detected	µg/L	15.	JAPC-1181-	09/04/01	DWW	1.	HPLC-A	8315	08/31/01	E8315	4840

P.Q.L. = Practical Quantitation Limit (refers to the least amount of analyte quantifiable based on sample size used and analytical technique employed).

California D.O.H.S. Cert. #1186

Marna Atencio
Department Supervisor

BC Laboratories, Inc

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/14/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-5

THIS IS REALLY:
300-EXP-056

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET2-12M
Sample Depth:
Sampling Date/Time: 08/29/2001 @ 15:12
Sample Matrix: AQ - Aqueous
Sample Collected By: NED BORGLIN/TINA CARLSON

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Formaldehyde	None Detected	µg/L	15.	JAPC-1181-	09/04/01	DWW	1.	HPLC-A	8315	08/31/01	E8315	4840

P.Q.L. = Practical Quantitation Limit (refers to the least amount of analyte quantifiable based on sample size used and analytical technique employed).

California D.O.H.S. Cert./ #1186

M. Atencio

Marna Atencio
Department Supervisor

BC Laboratories, Inc.

Explosive Residues
(EPA Method 8330)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000 THIS IS REALLY: 300-EXP-056

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-BLK1-BLE
Sample Depth:
Sample Matrix: BW - Blank water
Sample Collected By: TINA CARLSON/NED BORGLIN

Date Reported: 09/07/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-1

Date Collected: 08/29/2001 @ 11:00
Date Extracted: 09/05/2001
Date Analyzed: 09/06/2001
Extract Method: 8330
Method: 8330
Analyst: LAW
Dilution Used: 1.0
Instrument ID: LC002

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code	
PETN	None Detected	µg/L	5.0	E8330:PETN	6410	*

Flag Explanations:
* = Note: Sample analyzed by CLS Labs.
California D.O.H.S. Cert. #1186

Steven Bennett for
Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc.

Explosive Residues
(EPA Method 8330)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/07/2001
Date Received: 08/29/2001
Laboratory No.: 01-09890-2

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-BLK2-BLE THIS IS REALLY 300-EXP-056
Sample Depth:
Sample Matrix: BW - Blank water
Sample Collected By: NED BORGLIN/TINA CARLSON

Date Collected: 08/29/2001 @ 11:15
Date Extracted: 09/05/2001
Date Analyzed: 09/06/2001
Extract Method: 8330
Method: 8330
Analyst: LAW
Dilution Used: 1.0
Instrument ID: LC002

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code	
PETN	None Detected	µg/L	5.0	E8330:PETN	6410	*

Flag Explanations:
* = Note: Sample analyzed by CLS Labs.
California D.O.H.S. Cert. #1186

Steven Bennett Jr

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/27/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*WATER

Samples Affected: 01-09890-1 - 01-09890-3, 01-09890-5

Constituents	Method Blank Readings	Units
Nitrate as NO3	< 0.5	mg/L
Nitrate as N	< 0.20	mg/L
Nitrate/Nitrite as N	< 0.2	mg/L
Total Suspended Solids using glass fiber Type A/E	< 0.5	mg/L
Total Cyanide	< 0.02	mg/L
Total Kjeldahl Nitrogen	< 0.2	mg/L
Ammonia as N	< 0.025	mg/L
Nitrite Nitrogen	< 0.02	mg/L
Nitrite as NO2	< 0.50	mg/L

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Precision & Accuracy)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/27/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*WATER

Samples Affected: 01-09890-1 - 01-09890-3, 01-09890-5

Constituents	QC Sample ID	Sample Result	Sample Duplicate	MS Result	MSD Result	MS Spike Level	MSD Spike Level	Units	Sample R.P.D.	Spike R.P.D.	Precision Control Limits	MS % Rec	MSD % Rec	Accuracy Control Limits
Nitrate/Nitrite as N	9889-1-X2	< 0.2	< 0.2	4.464	4.464	4.211	4.211	mg/L	<PQL	0.	10	106.	106.	90 - 110
Total Suspended Solids using glass fiber Type A/E	9906-1	10.00	10.50					mg/L	<PQL		10			
Turbidity	9938-8	0.3000	0.2800					NT Units	<PQL		10			
Total Cyanide	TOTAL-09738-2	< 0.02	< 0.02	0.2454	0.2454	0.2500	0.2500	mg/L	<PQL	0.	10	98.	98.	90 - 110
Total Kjeldahl Nitrogen	WATER-09890-1	1.284	1.550	3.380	3.114	2.000	2.000	mg/L	19.-	8.	20	105.	92.	80 - 120
Ammonia as N	9727-2	0.04078	0.04882	0.5336	0.5336	0.5263	0.5263	mg/L	<PQL	0.	10	94.	94.	90 - 110
Nitrite Nitrogen	9889-1	< 0.02	< 0.02	0.5374	0.5374	0.5263	0.5263	mg/L	<PQL	0.	10	101.	101.	90 - 110
Nitrite as NO2	9889-1	< 0.065	< 0.065	1.765	1.765	1.729	1.729	mg/L	<PQL	0.	10	101.	101.	90 - 110

MS = Matrix Spike; MSD = Matrix Spike Duplicate; RPD = Relative Percent Difference

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Laboratory Control Sample)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/27/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*WATER

Samples Affected: 01-09890-1 - 01-09890-3, 01-09890-5

Constituents	QC Sample ID	Sample Result	Spike Level	Units	% Rec	Accuracy Control Limits
Nitrate/Nitrite as N	LCSW1-09-0	2.1205	2.00	mg/L	106.	90 - 110
Total Cyanide	TOTAL-LCSW	10.514	10.0	mg/L	105.	90 - 110
Total Kjeldahl Nitrogen	WATER-LCSW	47.064	50.0	mg/L	94.	85 - 115
Ammonia as N	LCSW1-09-0	0.47480	0.500	mg/L	95.	90 - 110
Nitrite Nitrogen	LCSW1-08-3	0.49660	0.500	mg/L	99.	90 - 110
Nitrite as NO2	LCSW1-08-3	1.6311	1.6422	mg/L	99.	90 - 110

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/18/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*8260

Samples Affected: 01-09890-1 - 01-09890-6, 01-09890-1TB, 01-09890-2TB

Constituents	Method Blank Readings	Units
Benzene	< 0.5	µg/L
Bromodichloromethane	< 0.5	µg/L
Bromoform	< 0.5	µg/L
Bromomethane	< 0.5	µg/L
Carbon tetrachloride	< 0.5	µg/L
Chlorobenzene	< 0.5	µg/L
Chloroethane	< 0.5	µg/L
2-Chloroethylvinyl ether	<10.	µg/L
Chloroform	< 0.5	µg/L
Chloromethane	< 0.5	µg/L
Dibromochloromethane	< 0.5	µg/L
1,2-Dibromo-3-Chloropropane	< 0.5	µg/L
Dichlorodifluoromethane	< 0.5	µg/L
1,1-Dichloroethane	< 0.5	µg/L
1,2-Dichloroethane	< 0.5	µg/L
1,1-Dichloroethene	< 0.5	µg/L
cis-1,2-Dichloroethene	< 0.5	µg/L
trans-1,2-Dichloroethene	< 0.5	µg/L
Total 1,2-Dichloroethene	< 2.	µg/L
1,2-Dichloropropane	< 0.5	µg/L
cis-1,3-Dichloropropene	< 0.5	µg/L
trans-1,3-Dichloropropene	< 0.5	µg/L
Total 1,3-Dichloropropene	< 2.	µg/L
Ethyl Benzene	< 0.5	µg/L
Methylene Chloride	< 1.	µg/L
Styrene	< 0.5	µg/L
1,1,1,2-Tetrachloroethane	< 0.5	µg/L
1,1,2,2-Tetrachloroethane	< 0.5	µg/L
Tetrachloroethene	< 0.5	µg/L
Toluene	< 0.5	µg/L

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/18/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*8260

Samples Affected: 01-09890-1 - 01-09890-6, 01-09890-1TB, 01-09890-2TB

Constituents	Method Blank Readings	Units
Benzene	< 0.5	µg/L
Bromodichloromethane	< 0.5	µg/L
Bromoform	< 0.5	µg/L
Bromomethane	< 0.5	µg/L
Carbon tetrachloride	< 0.5	µg/L
Chlorobenzene	< 0.5	µg/L
Chloroethane	< 0.5	µg/L
2-Chloroethylvinyl ether	<10.	µg/L
Chloroform	< 0.5	µg/L
Chloromethane	< 0.5	µg/L
Dibromochloromethane	< 0.5	µg/L
1,2-Dibromo-3-Chloropropane	< 0.5	µg/L
Dichlorodifluoromethane	< 0.5	µg/L
1,1-Dichloroethane	< 0.5	µg/L
1,2-Dichloroethane	< 0.5	µg/L
1,1-Dichloroethene	< 0.5	µg/L
cis-1,2-Dichloroethene	< 0.5	µg/L
trans-1,2-Dichloroethene	< 0.5	µg/L
Total 1,2-Dichloroethene	< 2.	µg/L
1,2-Dichloropropane	< 0.5	µg/L
cis-1,3-Dichloropropene	< 0.5	µg/L
trans-1,3-Dichloropropene	< 0.5	µg/L
Total 1,3-Dichloropropene	< 2.	µg/L
Ethyl Benzene	< 0.5	µg/L
Methylene Chloride	< 1.	µg/L
Styrene	< 0.5	µg/L
1,1,1,2-Tetrachloroethane	< 0.5	µg/L
1,1,2,2-Tetrachloroethane	< 0.5	µg/L
Tetrachloroethene	< 0.5	µg/L
Toluene	< 0.5	µg/L

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/18/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*8260

Samples Affected: 01-09890-1 - 01-09890-6, 01-09890-1TB, 01-09890-2TB

Constituents	Method Blank Readings	Units
1,1,1-Trichloroethane	< 0.5	µg/L
1,1,2-Trichloroethane	< 0.5	µg/L
Trichloroethene	< 0.5	µg/L
Trichlorofluoromethane	< 0.5	µg/L
1,2,3-Trichloropropane	< 1.	µg/L
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.5	µg/L
Vinyl Chloride	< 0.5	µg/L
Total Xylenes	< 1.	µg/L
Total Trihalomethanes	< 2.	µg/L
Acetone	<10.	µg/L
Acetonitrile	<100.	µg/L
Acrolein	<50.	µg/L
Acrylonitrile	<50.	µg/L
2-Butanone	<20.	µg/L
Carbon Disulfide	< 5.	µg/L
Chloroprene	< 5.	µg/L
1,4-Dichloro-2-butene	< 5.	µg/L
1,4-Dioxane	<300.	µg/L
Ethanol	<1000.	µg/L
2-Hexanone	<20.	µg/L
4-Methyl-2-pentanone	<20.	µg/L
Methyl-t-butylether	< 0.5	µg/L
Vinyl acetate	<20.	µg/L
1,2-Dichloroethane-d4	104.	%
Toluene-d8	99.	%
4-Bromofluorobenzene	104.	%

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/18/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*8260

Samples Affected: 01-09890-1 - 01-09890-6, 01-09890-1TB, 01-09890-2TB

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Precision & Accuracy)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/12/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*8260

Samples Affected: 01-09890-1 - 01-09890-6, 01-09890-1TB, 01-09890-2TB

Constituents	QC Sample ID	Sample Result	MS Result	MSD Result	MS Spike Level	MSD Spike Level	Units	Spike R.P.D.	Precision Control Limits	MS % Rec	MSD % Rec	Accuracy Control Limits
Benzene	OFW	< 0.5	26.	27.	25.	25.	µg/L	4.	20	105.	109.	70 - 130
Bromodichloromethane	OFW	< 0.5	27.	27.	25.	25.	µg/L	3.	20	106.	110.	70 - 130
Chlorobenzene	OFW	< 0.5	26.	25.	25.	25.	µg/L	2.	20	103.	101.	70 - 130
Chloroethane	OFW	< 0.5	26.	28.	25.	25.	µg/L	7.	20	104.	111.	70 - 130
1,1-Dichloroethane	OFW	< 0.5	26.	27.	25.	25.	µg/L	4.	20	102.	107.	70 - 130
1,1-Dichloroethene	OFW	< 0.5	27.	30.	25.	25.	µg/L	9.	20	109.	119.	70 - 130
Toluene	OFW	< 0.5	26.	27.	25.	25.	µg/L	2.	20	104.	106.	70 - 130
Trichloroethene	OFW	< 0.5	27.	28.	25.	25.	µg/L	4.	20	107.	111.	70 - 130
1,2-Dichloroethane-d4	MS/MSD									104.	109.	76 - 114
Toluene-d8	MS/MSD									99.	105.	88 - 110
4-Bromofluorobenzene	MS/MSD									103.	98.	86 - 115

MS = Matrix Spike; MSD = Matrix Spike Duplicate; RPD = Relative Percent Difference

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Laboratory Control Sample)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/12/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*8260

Samples Affected: 01-09890-1 - 01-09890-6, 01-09890-1TB, 01-09890-2TB

Constituents	QC Sample ID	Sample Result	Spike Level	Units	% Rec	Accuracy Control Limits
Benzene	LCS	25.	25.	µg/L	102.	70 - 130
Bromodichloromethane	LCS	24.	25.	µg/L	97.	70 - 130
Chlorobenzene	LCS	25.	25.	µg/L	101.	70 - 130
Chloroethane	LCS	23.	25.	µg/L	93.	70 - 130
1,1-Dichloroethane	LCS	24.	25.	µg/L	97.	70 - 130
1,1-Dichloroethene	LCS	26.	25.	µg/L	102.	70 - 130
Toluene	LCS	23.	25.	µg/L	94.	70 - 130
Trichloroethene	LCS	24.	25.	µg/L	96.	70 - 130
1,2-Dichloroethane-d4	LCS				104.	76 - 114
Toluene-d8	LCS				97.	88 - 110
4-Bromofluorobenzene	LCS				101.	86 - 115

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*8270

Samples Affected: 01-09890-1 - 01-09890-3, 01-09890-5

Constituents	Method Blank Readings	Units
Acenaphthene	< 2.	µg/L
Acenaphthylene	< 2.	µg/L
Aldrin	< 2.	µg/L
Aniline	< 5.	µg/L
Anthracene	< 2.	µg/L
Benzidine	<20.	µg/L
Benzo (a) anthracene	< 2.	µg/L
Benzo (b) fluoranthene	< 2.	µg/L
Benzo (k) fluoranthene	< 2.	µg/L
Benzo (a) pyrene	< 2.	µg/L
Benzo (ghi) perylene	< 2.	µg/L
Benzoic Acid	<10.	µg/L
Benzyl alcohol	< 2.	µg/L
Butyl Benzyl phthalate	< 2.	µg/L
alpha-BHC	< 2.	µg/L
beta-BHC	< 2.	µg/L
delta-BHC	< 2.	µg/L
gamma-BHC	< 2.	µg/L
bis(2-chloroethyl)ether	< 2.	µg/L
bis(2-chloroethoxy)methane	< 2.	µg/L
bis(2-chloro-1-methylethyl) et	< 2.	µg/L
bis(2-ethylhexyl)phthalate	< 5.	µg/L
4-Bromophenyl phenyl ether	< 2.	µg/L
4-Chloroaniline	< 2.	µg/L
2-Chloronaphthalene	< 2.	µg/L
4-Chlorophenyl phenyl ether	< 2.	µg/L
Chrysene	< 2.	µg/L
4,4-DDD'	< 2.	µg/L
4,4-DDE'	< 3.	µg/L
4,4-DDT'	< 2.	µg/L

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*8270

Samples Affected: 01-09890-1 - 01-09890-3, 01-09890-5

Constituents	Method Blank Readings	Units
Dibenzo (a,h) anthracene	< 3.	µg/L
Dibenzofuran	< 2.	µg/L
Di-n-butyl phthalate	< 2.	µg/L
1,2-Dichlorobenzene	< 2.	µg/L
1,3-Dichlorobenzene	< 2.	µg/L
1,4-Dichlorobenzene	< 2.	µg/L
3,3-Dichlorobenzidine	<10.	µg/L
Dieldrin	< 3.	µg/L
Diethyl phthalate	< 2.	µg/L
Dimethyl phthalate	< 2.	µg/L
2,4-Dinitrotoluene	< 2.	µg/L
2,6-Dinitrotoluene	< 2.	µg/L
Di-n-octylphthalate	< 2.	µg/L
1,2-Diphenylhydrazine	< 2.	µg/L
Endosulfan I	<10.	µg/L
Endosulfan II	<10.	µg/L
Endosulfan sulfate	< 3.	µg/L
Endrin	< 2.	µg/L
Endrin aldehyde	<10.	µg/L
Fluoranthene	< 2.	µg/L
Fluorene	< 2.	µg/L
Heptachlor	< 2.	µg/L
Heptachlor epoxide	< 2.	µg/L
Hexachlorobenzene	< 2.	µg/L
Hexachlorobutadiene	< 2.	µg/L
Hexachlorocyclopentadiene	< 2.	µg/L
Hexachloroethane	< 2.	µg/L
Indeno (1,2,3-cd) pyrene	< 2.	µg/L
Isophorone	< 2.	µg/L
2-Methylnaphthalene	< 2.	µg/L

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*8270

Samples Affected: 01-09890-1 - 01-09890-3, 01-09890-5

Constituents	Method Blank Readings	Units
Naphthalene	< 2.	µg/L
2-Naphthylamine	<20.	µg/L
2-Nitroaniline	< 2.	µg/L
3-Nitroaniline	< 2.	µg/L
4-Nitroaniline	< 5.	µg/L
Nitrobenzene	< 2.	µg/L
n-Nitrosodimethylamine	< 2.	µg/L
n-Nitrosodiphenylamine	< 2.	µg/L
N-Nitrosodi-n-propylamine	< 2.	µg/L
Phenanthrene	< 2.	µg/L
Pyrene	< 2.	µg/L
1,2,4-Trichlorobenzene	< 2.	µg/L
4-Chloro-3-methylphenol	< 5.	µg/L
2-Chlorophenol	< 2.	µg/L
2,4-Dichlorophenol	< 2.	µg/L
2,4-Dimethylphenol	< 2.	µg/L
2,4-Dinitrophenol	<10.	µg/L
2-Methyl-4,6-dinitrophenol	<10.	µg/L
2-Methylphenol	< 2.	µg/L
3- & 4-Methylphenol	< 2.	µg/L
2-Nitrophenol	< 2.	µg/L
4-Nitrophenol	< 2.	µg/L
Pentachlorophenol	<10.	µg/L
Phenol	< 2.	µg/L
2,4,5-Trichlorophenol	< 5.	µg/L
2,4,6-Trichlorophenol	< 5.	µg/L
2-Picoline	<10.	µg/L
2-Fluorophenol	74.	%
Phenol-d5	53.	%
Nitrobenzene-d5	110.	%

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*8270

Samples Affected: 01-09890-1 - 01-09890-3, 01-09890-5

Constituents	Method Blank Readings	Units
2-Fluorobiphenyl	98.	%
2,4,6-Tribromophenol	113.	%
d14-Terphenyl	85.	%

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Precision & Accuracy)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*8270

Samples Affected: 01-09890-1 - 01-09890-3, 01-09890-5

Constituents	QC Sample ID	Sample Result	MS Result	MSD Result	MS Spike Level	MSD Spike Level	Units	Spike R.P.D.	Precision Control Limits	MS % Rec	MSD % Rec	Accuracy Control Limits
Acenaphthene	SDI1-MS1-08-30	< 2.	67.49	67.58	80.00	80.00	µg/L	0.	16	84.	84.	46 - 113
1,4-Dichlorobenzene	SDI1-MS1-08-30	< 2.	64.52	66.59	80.00	80.00	µg/L	3.	30	81.	83.	33 - 111
2,4-Dinitrotoluene	SDI1-MS1-08-30	< 2.	74.38	72.49	80.00	80.00	µg/L	3.	27	93.	91.	21 - 157
Hexachlorobenzene	SDI1-MS1-08-30	< 2.	71.52	69.97	80.00	80.00	µg/L	2.	14	89.	87.	38 - 117
Hexachlorobutadiene	SDI1-MS1-08-30	< 2.	55.03	58.14	80.00	80.00	µg/L	6.	30	69.	73.	23 - 96
Hexachloroethane	SDI1-MS1-08-30	< 2.	62.41	65.46	80.00	80.00	µg/L	5.	30	78.	82.	27 - 117
Nitrobenzene	SDI1-MS1-08-30	< 2.	82.21	84.66	80.00	80.00	µg/L	3.	24	103.	106.	52 - 127
N-Nitrosodi-n-propylamine	SDI1-MS1-08-30	< 2.	71.24	70.41	80.00	80.00	µg/L	1.	30	89.	88.	50 - 122
Pyrene	SDI1-MS1-08-30	< 2.	59.49	58.65	80.00	80.00	µg/L	1.	30	74.	73.	19 - 162
1,2,4-Trichlorobenzene	SDI1-MS1-08-30	< 2.	65.82	67.88	80.00	80.00	µg/L	3.	30	82.	85.	35 - 109
4-Chloro-3-methylphenol	SDI1-MS1-08-30	< 5.	77.41	75.48	80.00	80.00	µg/L	3.	16	97.	94.	49 - 129
2-Chlorophenol	SDI1-MS1-08-30	< 2.	78.52	78.54	80.00	80.00	µg/L	0.	16	98.	98.	53 - 126
2-Methylphenol	SDI1-MS1-08-30	< 2.	73.68	72.53	80.00	80.00	µg/L	2.	23	92.	91.	45 - 117
3- & 4-Methylphenol	SDI1-MS1-08-30	< 2.	59.64	57.99	80.00	80.00	µg/L	3.	24	75.	72.	29 - 106
4-Nitrophenol	SDI1-MS1-08-30	< 2.	29.52	29.67	80.00	80.00	µg/L	1.	30	37.	37.	3 - 66
Pentachlorophenol	SDI1-MS1-08-30	< 10.	79.72	78.88	80.00	80.00	µg/L	1.	26	100.	99.	10 - 154
Phenol	SDI1-MS1-08-30	< 2.	35.89	35.77	80.00	80.00	µg/L	0.	28	45.	45.	23 - 61
2,4,6-Trichlorophenol	SDI1-MS1-08-30	< 5.	75.35	75.21	80.00	80.00	µg/L	0.	16	94.	94.	25 - 140
2-Fluorophenol	MS/MSD									70.	73.	21 - 100
Phenol-d5	MS/MSD									51.	52.	10 - 94
Nitrobenzene-d5	MS/MSD									106.	110.	35 - 114
2-Fluorobiphenyl	MS/MSD									94.	97.	43 - 116
2,4,6-Tribromophenol	MS/MSD									114.	114.	10 - 123
d14-Terphenyl	MS/MSD									83.	84.	33 - 141

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Precision & Accuracy)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*8270

Samples Affected: 01-09890-1 - 01-09890-3, 01-09890-5

MS = Matrix Spike; MSD = Matrix Spike Duplicate; RPD = Relative Percent Difference

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Laboratory Control Sample)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*8270

Samples Affected: 01-09890-1 - 01-09890-3, 01-09890-5

Constituents	QC Sample ID	Sample Result	Spike Level	Units	% Rec	Accuracy Control Limits
Acenaphthene	SDI1-LCSW1	68.03	80.00	µg/L	85.	46 - 113
1,4-Dichlorobenzene	SDI1-LCSW1	68.09	80.00	µg/L	85.	33 - 111
2,4-Dinitrotoluene	SDI1-LCSW1	74.32	80.00	µg/L	93.	21 - 157
Hexachlorobenzene	SDI1-LCSW1	69.53	80.00	µg/L	87.	38 - 117
Hexachlorobutadiene	SDI1-LCSW1	59.67	80.00	µg/L	75.	23 - 96
Hexachloroethane	SDI1-LCSW1	66.39	80.00	µg/L	83.	27 - 117
Nitrobenzene	SDI1-LCSW1	85.55	80.00	µg/L	107.	52 - 127
N-Nitrosodi-n-propylamine	SDI1-LCSW1	70.43	80.00	µg/L	88.	50 - 122
Pyrene	SDI1-LCSW1	57.66	80.00	µg/L	72.	19 - 162
1,2,4-Trichlorobenzene	SDI1-LCSW1	69.56	80.00	µg/L	87.	35 - 109
4-Chloro-3-methylphenol	SDI1-LCSW1	76.78	80.00	µg/L	96.	49 - 129
2-Chlorophenol	SDI1-LCSW1	80.50	80.00	µg/L	101.	53 - 126
2-Methylphenol	SDI1-LCSW1	74.17	80.00	µg/L	93.	45 - 117
3- & 4-Methylphenol	SDI1-LCSW1	58.13	80.00	µg/L	73.	29 - 106
4-Nitrophenol	SDI1-LCSW1	29.72	80.00	µg/L	37.	3 - 66
Pentachlorophenol	SDI1-LCSW1	83.94	80.00	µg/L	105.	10 - 154
Phenol	SDI1-LCSW1	36.35	80.00	µg/L	45.	23 - 61
2,4,6-Trichlorophenol	SDI1-LCSW1	76.55	80.00	µg/L	96.	25 - 140
2-Fluorophenol	SDI1-LCSW1				73.	21 - 100
Phenol-d5	SDI1-LCSW1				52.	10 - 94
Nitrobenzene-d5	SDI1-LCSW1				106.	35 - 114
2-Fluorobiphenyl	SDI1-LCSW1				95.	43 - 116
2,4,6-Tribromophenol	SDI1-LCSW1				113.	10 - 123
d14-Terphenyl	SDI1-LCSW1				82.	33 - 141

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Laboratory Control Sample)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*8270

Samples Affected: 01-09890-1 - 01-09890-3, 01-09890-5

Quality Control Officer

Danette Bohm

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*FORM

Samples Affected: 01-09890-1 - 01-09890-3, 01-09890-5

Constituents	Method Blank Readings	Units
Formaldehyde	<15.	µg/L

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Laboratory Control Sample)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*FORM

Samples Affected: 01-09890-1 - 01-09890-3, 01-09890-5

Constituents	QC Sample ID	Sample Result	Duplicate Result	Spike Level	Units	% Rec	LCSD % Rec	RPD	Accuracy Control Limits	Precision Control Limits
Formaldehyde	LCS	49.2	49.4	50.0	µg/L	98.	99.	0.	75 - 125	20

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8330

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/11/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*8330

Samples Affected: 01-09890-1, 01-09890-2

Constituents	Method Blank Readings	Units
PETN	< 5.0	µg/L

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Precision & Accuracy)
Method 8330

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/19/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*8330

Samples Affected: 01-09890-1, 01-09890-2

Constituents	QC Sample ID	Sample Result	MS Result	MSD Result	MS Spike Level	MSD Spike Level	Units	Spike R.P.D.	Precision Control Limits	MS % Rec	MSD % Rec	Accuracy Control Limits
PETN	T1225	< 5.0	21.8	22.3	20.0	20.0	µg/L	3.	30	109.	112.	60 - 140

MS = Matrix Spike; MSD = Matrix Spike Duplicate; RPD = Relative Percent Difference

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Laboratory Control Sample)
Method 8330

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/11/2001
Sample Matrix: BW - Blank water
QC Batch ID: 200109890-1*8330

Samples Affected: 01-09890-1, 01-09890-2

Constituents	QC Sample ID	Sample Result	Spike Level	Units	% Rec	Accuracy Control Limits
PETN	LCS	21.9	20.0	µg/L	110.	60 - 140

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

TRUESDAIL LABORATORIES, INC.
INDEPENDENT TESTING, FORENSIC SCIENCE, AND ENVIRONMENTAL ANALYSES
Established 1931
14201 FRANKLIN AVENUE
TUSTIN, CALIFORNIA 92780-7008
(714) 730-6239 · FAX (714) 730-6462
www.truesdail.com

REPORT

CLIENT: **BC Laboratories**
4100 Atlas Court
Bakersfield, CA 93308
ATTN: Kim Halbrook
SAMPLE DESCRIPTION: See below
INVESTIGATION: Formaldehyde by EPA Method 8315F
INSTRUMENT ID: Shimadzu HPLC A

LAB. NO.: **602795**
REPORT DATE: 9/13/01
DATE(S) SAMPLED: 8/29/01
DATE RECEIVED: 8/30/01
DATE(S) EXTRACTED: 8/31/01
DATE(S) ANALYZED: 9/4/01
ANALYST(S): DW/RP

RESULTS SUMMARY

Lab Number	COC #10524 Sample ID / Desc	Time	Formaldyhyde ug/L	Initial Vol(ml)	Final Vol(ml)	Dilution Factor
602795 -1	01-09890-1	11:00	ND	100	10	1
602795 -2	01-09890-2	11:15	ND	100	10	1
602795 -3	01-09890-3	15:05	ND	100	10	1
602795 -4	01-09890-5	15:12	ND	100	10	1
602795 -MB			ND	100	10	1

Detection Limits for Reporting (DLR): **15**
Method Detection Limits (MDL): **10**

ug/L = Micrograms per Liter (ppb)

Respectfully Submitted,
TRUESDAIL LABORATORIES, INC.
Michael Whyte
Project Manager, Environmental Sciences

SEP 2 1 2001

T1225

SUBCONTRACT CHAIN OF CUSTODY

Subcontract Lab: CLS (CLSZZ)
3249 FITZGERALD ROAD
RANCHO CORDOVA, CA 95742
Attn: Mark Smith
Phone: 916-638-7301
FAX: 916-638-4510

Report To: BC Laboratories
4100 Atlas Court
Bakersfield, CA 93308
Attn: Kim Halbrook
Phone: 661-327-4911

Bill To: BC Laboratories
4100 Atlas Court
Bakersfield, CA 93308
Attn: Accounts Payable

TAT: ASAP

Sample ID	Sample Matrix	Sample Date	Sample Time	Requested Tests 01
01-09890-1	Blank Wate	08/29/2001	11:00	X
01-09890-2	BW - Blank	08/29/2001	11:15	X

Requested Tests Legend

01 GC-8330W-PETN

32 oz jar

Note: Please do not subcontract any test without obtaining approval from an authorized representative of BC laboratories.

Comments: [redacted]
PLEASE NOTIFY KIM HALBROOK IF TURN AROUND TIME CANNOT BE MET.
Please fax rush samples' results ASAP to Kim HaLbrook!!!.
REPORT DILUTION FACTOR, INSTRUMENT I.D., DATE EXTRACTED & ANALYZED
ANALYSTS (3) INITIALS, MB, MS/MSD, AND LCS REPORTS ON FINAL REPORT

		Date/Time
Relinquished By:	Deborah Renear	KP 8/30/01 14:00
Received By:		8/31/01 0950
Relinquished By:		
Received By:		
Relinquished By:		
Received By:		
Relinquished By:		
Received By:		

CAL. OVERNI
850 465 512

CALIFORNIA LABORATORY SERVICES

Environmental Chemistry

09/07/2001

BC Laboratories
4100 Atlas Court
Bakersfield, Ca 93308

Attention: **Kim Halbrook**

Reference: **Analytical Results**

Project Name:
Project No.: **01-09890**
Date Received: **08/31/2001**
Chain Of Custody: **NO NUMBER**

CLS ID No.: **T1225**
CLS Job No.: **841225**

The following analyses were performed on the above referenced project:

No. of Samples	*Turnaround Time*	*Analysis Description*
2	5 Days	Expanded QC
2	5 Days	8330PETN

Sample Receiving Exception Report: COC shows TAT as ASAP. Per Kim Holbrook, TAT should be 5 day or sooner. Logged as 5 day.

Hold Times-Acceptable.
Method Blank/Trip Blank Results-Acceptable.
Laboratory Control Samples-Acceptable.
Matrix Spike/Matrix Spike Duplicate-Acceptable.
Calibrations-Acceptable.

These samples were received by CLS Labs in a chilled, intact state and accompanied by a valid chain of custody document.

Calibrations for analytical testing have been performed in accordance to and pass the EPA's criteria for acceptability.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

Analysis Report: **PETN**

Client: **BC Laboratories**
4100 Atlas Court
Bakersfield, Ca 93308

Project:

Date Sampled: **08/29/2001**
Date Received: **08/31/2001**
Date Extracted: **09/05/2001**
Date Analyzed: **09/06/2001**
Date Reported: **09/07/2001**
Client ID No.: **01-09890-1**

Project No.: **01-09890**
Contact: **Kim Halbrook**
Phone: **(661)327-4911**

Lab Contact: **James LIang**
Lab ID No.: **T1225-1A**
Job No.: **841225**
COC Log No.: **NO NUMBER**
Batch No.: **E01094**
Instrument ID: **LC002**
Analyst ID: **LAURAW**
Matrix: **BW**

01-09890-1

Analyte	Code	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
PETN	6410	ND	5.0	1.0

ND = Not detected at or above indicated Reporting Limit

SEP 1 2 2001

CALIFORNIA LABORATORY SERVICES

Environmental Chemistry

Analysis Report: **PETN**

Client: **BC Laboratories**
4100 Atlas Court
Bakersfield, Ca 93308

Project:

Date Sampled: **08/29/2001**
Date Received: **08/31/2001**
Date Extracted: **09/05/2001**
Date Analyzed: **09/06/2001**
Date Reported: **09/07/2001**
Client ID No.: **01-09890-2**

Project No.: **01-09890**
Contact: **Kim Halbrook**
Phone: **(661)327-4911**

Lab Contact: **James LIang**
Lab ID No.: **T1225-2A**
Job No.: **841225**
COC Log No.: **NO NUMBER**
Batch No.: **E01094**
Instrument ID: **LC002**
Analyst ID: **LAURAW**
Matrix: **BW**

01-09890-2

Analyte	Code	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
PETN	6410	ND	5.0	1.0

ND = Not detected at or above indicated Reporting Limit

Analysis Report: **PETN**

Client: **BC Laboratories**
4100 Atlas Court
Bakersfield, Ca 93308

Project:

Date Extracted: **09/05/2001**
Date Analyzed: **09/06/2001**
Date Reported: **09/07/2001**

Project No.: **01-09890**
Contact: **Kim Halbrook**
Phone: **(661)327-4911**

Lab Contact: **James LIang**
Lab ID No.: **T1225**
Job No.: **841225**
COC Log No.: **NO NUMBER**
Batch No.: **E01094**
Instrument ID: **LC002**
Analyst ID: **LAURAW**
Matrix: **BW**

METHOD BLANK

Analyte	Code	Results (ug/L)	Reporting Limit (ug/L)
PETN	6410	ND	5.0

ND = Not detected at or above indicated Reporting Limit

CALIFORNIA LABORATORY SERVICES

Environmental Chemistry

Analysis Report: **PETN**

Client: **BC Laboratories**
4100 Atlas Court
Bakersfield, Ca 93308

Project:

Date Extracted: **09/05/2001**
Date Analyzed: **09/06/2001**
Date Reported: **09/07/2001**

Project No.: **01-09890**
Contact: **Kim Halbrook**
Phone: **(661)327-4911**

Lab Contact: **James LIang**
Lab ID No.: **T1225**
Job No.: **841225**
COC Log No.: **NO NUMBER**
Batch No.: **E01094**
Instrument ID: **LC002**
Analyst ID: **LAURAW**
Matrix: **BW**

***Matrix Spike:* 01-09890-2**

Analyte	Code	Observed Conc. (ug/L)	MS Conc. (ug/L)	MS Recovery (percent)	Lower Spec (Limit)	Upper Spec (Limit)
PETN	6410	21.8	20.0	109	60	140

***Matrix Spike Duplicate:* 01-09890-2**

Analyte	Code	Observed Conc. (ug/L)	MSD Conc. (ug/L)	MSD Recovery (percent)	Lower Spec (Limit)	Upper Spec (Limit)
PETN	6410	22.3	20.0	112	60	140

RELATIVE % DIFFERENCE

Analyte	Code	Relative Percent Difference (percent)	Lower Spec (Limit)	Upper Spec (Limit)
PETN	6410	3	0	30

Analysis Report: **PETN**

Client: **BC Laboratories**
4100 Atlas Court
Bakersfield, Ca 93308

Project:

Date Extracted: **09/05/2001**
Date Analyzed: **09/06/2001**
Date Reported: **09/07/2001**

Project No.: **01-09890**
Contact: **Kim Halbrook**
Phone: **(661)327-4911**

Lab Contact: **James LIang**
Lab ID No.: **T1225**
Job No.: **841225**
COC Log No.: **NO NUMBER**
Batch No.: **E01094**
Instrument ID: **LC002**
Analyst ID: **LAURAW**
Matrix: **BW**

LAB CONTROL SAMPLE

Analyte	Code	Observed Value (ug/L)	LCS Conc. (ug/L)	LCS Recovery (percent)	Lower Spec (Limit)	Upper Spec (Limit)
PETN	6410	21.9	20.0	110	60	140

BC LABORATORIES INC. 01-09590 **SAMPLE RECEIPT FORM** Rev. No.7 10/03/00 Page 1 Of 2

Submission #: 01-09884 | Project Code: | TB Batch #

SHIPPING INFORMATION

Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____

SHIPPING CONTAINER

Ice Chest ☒ None ☐
Box ☐ Other ☐ (Specify)_____

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals: Ice Chest ☐ Intact? Yes ☐ No ☐ | Containers ☐ Intact? Yes ☐ No ☐ | None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☐ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received

☒ YES ☐ NO

Ice Chest ID _____ Date/Time 8/29/01
Temperature: 5.9 °C
Thermometer ID: 80 Analyst Init SDD
Emissivity 98
Container 2YA

Ice Chest ID _____ Date/Time _____
Temperature: _____ °C
Thermometer ID: _____ Analyst Init _____
Emissivity _____
Container

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
0T GENERAL MINERAL/ GENERAL PHYSICAL			2	2	2																			
PT PE UNPRESERVED																								
0T INORGANIC CHEMICAL METALS																								
PT INORGANIC CHEMICAL METALS																								
PT CYANIDE			1		1																			
PT NITROGEN FORMS																								
PT TOTAL SULFIDE																								
2oz. NITRATE / NITRITE																								
100ml TOTAL ORGANIC CARBON																								
0T TOX																								
PT CHEMICAL OXYGEN DEMAND																								
100ml PHENOLICS																								
40ml VOA VIAL TRAVEL BLANK			3	3	3	3																		
40ml VOA VIAL																								
0T EPA 413.1, 413.2, 418.1																								
PT ODOR																								
RADIOLOGICAL																								
BACTERIOLOGICAL																								
PT EPA 504																								
0T EPA 508/608/8080																								
0T EPA 515.1/8150																								
0T EPA 525																								
0T EPA 525 TRAVEL BLANK																								
100ml EPA 547																								
100ml EPA 531.1																								
0T EPA 548																								
0T EPA 549																								
0T EPA 632																								
0T EPA 8015M																								
0T OA/OC																								
0T AMBER			2		2																			
8 OZ. JAR																								
32 OZ. JAR																								
SOIL SLEEVE																								
PCB VIAL																								
PLASTIC BAG																								

CHK BY ☑ DISTRIBUTION MK MT SUB-OUT ☐

SHORT HOLDING TIME
Cr^{+3} NO_2 NO_3 OP SS
DO BOD MBAS C O

Comments: travel blank received labeled travel blank)

Sample Numbering Completed By: SDD Date/Time: 8/29/01 [F:\WP80\LAB_DOCS\FORMS\SAMREC2.WPD]

samples for -4 have 2 times. ~~1230~~ 0830

BC LABORATORIES INC. **SAMPLE RECEIPT FORM** Rev. No.7 10/03/00 Page 1 of 2

Submission #: 01-09890 | Project Code: | TB Batch #

SHIPPING INFORMATION

Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____

SHIPPING CONTAINER

Ice Chest ☒ None ☐
Box ☐ Other ☐ (Specify)_____

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals: Ice Chest ☐ Intact? Yes ☐ No ☐ | Containers ☐ Intact? Yes ☐ No ☐ | None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received

☒ YES ☐ NO

Ice Chest ID _____ Date/Time 8/29/01 0930
Temperature: 16.8 °C
Thermometer ID: 850 Analyst Init SDW
Emissivity .98
Container QT

Ice Chest ID _____ Date/Time _____
Temperature: _____ °C
Thermometer ID: _____ Analyst Init _____
Emissivity _____
Container

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
QT GENERAL MINERAL/ GENERAL PHYSICAL	2	2																						
PT PE UNPRESERVED																								
QT INORGANIC CHEMICAL METALS																								
PT INORGANIC CHEMICAL METALS																								
PT CYANIDE	1	1																						
PT NITROGEN FORMS																								
PT TOTAL SULFIDE																								
2oz. NITRATE / NITRITE																								
100ml TOTAL ORGANIC CARBON																								
QT TOX																								
PT CHEMICAL OXYGEN DEMAND																								
100ml PHENOLICS																								
40ml VOA VIAL TRAVEL BLANK																								
40ml VOA VIAL	3	3																						
QT EPA 413.1, 413.2, 418.1																								
PT ODOR																								
RADIOLOGICAL																								
BACTERIOLOGICAL																								
PT EPA 504																								
QT EPA 508/608/8080																								
QT EPA 515.1/8150																								
QT EPA 525																								
QT EPA 525 TRAVEL BLANK																								
100ml EPA 547																								
100ml EPA 531.1																								
QT EPA 548																								
QT EPA 549																								
QT EPA 632																								
QT EPA 8015M																								
QT OA/OC																								
QT AMBER	2	2																						
8 OZ. JAR																								
32 OZ. JAR	1	1																						
SOIL SLEEVE																								
PCB VIAL																								
PLASTIC BAG																								

Comments: travel blank received labeled tb 2

Sample Numbering Completed By: _____ Date/Time: 8/29/01 0930

[F:\WP80\LAB_DOCS\FORMS\SAMREC2.WPD]

ERD Chain-of-Custody Record and Analytic Instructions

A 28000

Sampled By: Ned Beglin / Tina Carlson
Sampler's Employer: LLNL
Project Name: LAKE DAVIS

Requester, (circle one): S300 / WGMG / **Livermore** (per NB KA)

Send all results to:
Attn: ERD DMG L-528
Lawrence Livermore National Laboratory
7000 East Ave.
Livermore, CA 94550

Field Log Book# ZJ014 Page 1 of 4
LLNL Acct. # 0876-43 Release #
Analytical Laboratory Name BC
Analytical Laboratory Log # 0169890

Analytical Lab Please Fax or Email copies to:

name Tina Carlson Fax# 925-422-6950 / (circle one) Email (circled)
name Ned Beglin Fax# 925-422-6950 / Email (circled)

* Analytical Lab, when [illegible] requested [illegible] Email ERD DMG

Analysis & Turnaround Required [1]

Additional Instructions to Lab

	Sample Identification	Sample Date/Time	Matrix [2] / Container [3]	# of Cont.	Study Area	E8260	PETN	NUTRIENTS A	E160.2	E180.1	E8270	E335.2			* Remarks *
-1	3X056-BLK1-BLE 1	8/29/01 1100AM	BW / V	3		5d									
	2		BW / G	1			5d								
	3		BW / P	1				5d							
	4		BW / P	1					5d	5d					
	5		BW / G	1							5d				
	6		BW / P	1								5d			
-2	3X056-BLK2-BLE 7	8/29/01 11:15AM	BW / G	1			5d								
	8		BW / V	3		5d									
	9		BW / P	1				5d							

	Signature	Company	Time	Date
Relinquished by	[signature]	LLNL-ERD	04:40p	8/29/01
Received by	[signature]	BC LABS	1745	8/29/01
Relinquished by	[signature]	BC LABS	1826	8/29/01
Received by	[signature]	BC LABS	1827	8-29-01
Relinquished by	[signature]	BC LABS	2246	8-29-01
Received by	[signature]	BC Labs	2246	8/29/01

[1] Enter the number of days or hours for TAT of the official printed report. See Requested Analysis code list for available TAT's for each type of analysis. Example: 24h = 24 hours / 20d = 20 day

[2] Sample Matrix Codes: **See list on back of pink copy**

[3] Container type codes: **V** = VOA Bottle, **P** = Polyethylene Bottle, **G** = Glass Bottle, **T** = Brass Tube, **B** = Bag, **S** = Stainless Steel Tube, **O** = Other (specify under remarks)

To receive copies of this data from DMG
CC:

Revision 4.6
21-jul-99 ERD

White : Laboratory return to ERD Attn. ERD Data Management Team L-528 **Yellow : Analytical Lab.** **Pink: Sampler leave with ERD Attn. ERD Data Management Team L-528** **Gold: Sampler Leave with TRR**

ERD Chain-of-Custody Record and Analytic Instructions

A 28001

Sampled By : Ned Borglin / Tina Carlsen
Sampler's Employer: LLNL
Project Name : LAKE DAVIS

Requester, (circle one): S300 · WGMG · Livermore

Send all results to:
Attn: ERD DMG L-528
Lawrence Livermore
National Laboratory
7000 East Ave.
Livermore, CA 94550

Field Log Book# ZJ014 Page 2 of 4
LLNL Acct. # 0876 43 **Release #**
Analytical Laboratory Name BC
Analytical Laboratory Log # 01-09840

Analytical Lab Please Fax or Email copies to:

name Tina Carlsen Fax# 925-422-6950 / Email (circle one)
name Ned Borglin Fax# 925-422-6950 / Email

* Analytical Lab: [illegible]

	Sample Identification		Sample Date/Time	Matrix [2] / Container [3]	# of Cont.	Study Area	E160.2	E180.1	E335.2	E8270	E8315	E8260				* Remarks *
2	3X056-BLK2-BLE	1	8/29/01 11:15A	BW / P	1		5d	5d								
	↓	2	↓	BW / P	1				5d							
	↓	3	↓	BW / G	1					5d						
1	3X056-BLK1-BLE	4	8/29/01 11:00Am	BW / G	1						5d					
2	3X056-BLK2-BLE	5	8/29/01 11:15Am	BW / G	1						5d					
3	3X056-DET1-12M	6	8/29/01 03:05 ~~03:12pm~~	AQ / V	3							5d				
	↓	7	↓	AQ / G	1						5d					
	↓	8	↓	AQ / P	1		5d	5d								
	↓	9	↓	AQ / P	1				5d							

Analysis & Turnaround Required [1]

Additional Instructions to Lab

	Signature	Company	Time	Date
Relinquished by	Ned Borglin	LLNL-ERD	04:40	8/29/01
Received by	[signature]	BC LABS	1745	8/29/01
Relinquished by	[signature]	BC LABS	1826	8/29/01
Received by	[signature]	BC LABS	1826	8-29-01
Relinquished by	[signature]	BC LABS	2246	8-29-01
Received by	Sarah Wells	BC Labs	2246	8/29/01

[1] Enter the number of days or hours for TAT of the official printed report. See Requested Analysis code list for available TAT's for each type of analysis. Example: 24h = 24 hours / 20d = 20 day

[2] Sample Matrix Codes: **See list on back of pink copy**

[3] Container type codes: **V** = VOA Bottle, **P** = Polyethylene Bottle, **G** = Glass Bottle, **T** = Brass Tube, **B** = Bag, **S** = Stainless Steel Tube, **O** = Other (specify under remarks)

To receive copies of this data from DMG
CC:

Revision 4.6
21-jul-99 ERD

White : Laboratory return to ERD Attn. ERD Data Management Team L-528 **Yellow : Analytical Lab** **Pink: Sampler leave with ERD Attn. ERD Data Management Team L-528** **Gold: Sampler Leave with TRR**

ERD Chain-of-Custody Record and Analytic Instructions

A 28002

Sampled By : Ned Borglin / Tina Carlson
Sampler's Employer: LLNL
Project Name : LAKE DAVIS

Requester, (circle one): S300 / WGMG / Livermore

Send all results to:
Attn: ERD DMG L-528
Lawrence Livermore
National Laboratory
7000 East Ave.
Livermore, CA 94550

Field Log Book# ZJ014 Page 3 of 4
LLNL Acct. # 087643 **Release #**
Analytical Laboratory Name BC
Analytical Laboratory Log # 01-09896

Analytical Lab Please
Fax or Email copies to:

name Tina Carlson Fax# 925-422-6950 (circle one) / Email (circled)
name Ned Borglin Fax# 925-422-6950 / Email (circled)

* Analytical Lab, when [illegible]

Analysis & Turnaround Required [1]

Additional Instructions to Lab

	Sample Identification	Sample Date/Time	Matrix [2] / Container [3]	# of Cont.	Study Area	E8270	NUTRIENTSA	E8260	E160.2	E180.1	E335.2	E8315			* Remarks *
-3	3X056-DET1-12M	8/29/01 03:05 ~~03:13pm~~	AQ / G	1		5d									
	"	" "	AQ / P	1			5d								
-4	3X056-DET1-12MD	" "	AQ / V	3		NB ~~5d~~		5d							
5	3X056-DET2-12M	8/29/01 03:12p	AQ / P	1			5d								
			AQ / V	3				5d							
			AQ / P	1					5d	5d					
			AQ / P	1							5d				
			AQ / G	1		5d									
			AQ / B	1								5d			

	Signature	Company	Time	Date
Relinquished by	Ned Borglin	LLNL-ERD	04:40	8/29/01
Received by	[signature]	BC LABS	1745	8/29/01
Relinquished by	[signature]	BC LABS	1826	8/29/01
Received by	[signature]	BC LABS	1827	8-29-01
Relinquished by	[signature]	BC LABS	2246	8-29-01
Received by	[signature]	BC Labs	2246	8/29/01

[1] Enter the number of days or hours for TAT of the official printed report. See Requested Analysis code list for available TAT's for each type of analysis. Example: 24h = 24 hours / 20d = 20 day

[2] Sample Matrix Codes: **See list on back of pink copy**

[3] Container type codes: **V** = VOA Bottle, **P** = Polyethylene Bottle, **G** = Glass Bottle, **T** = Brass Tube, **B** = Bag, **S** = Stainless Steel Tube, **O** = Other (specify under remarks)

To receive copies of this data from DMG
CC:

Revision 4.6
21-jul-99 ERD

White : Laboratory return to ERD Attn. ERD Data Management Team L-528 **Yellow : Analytical Lab** **Pink: Sampler leave with ERD** Attn. ERD Data Management Team L-528 **Gold: Sampler Leave with TRR**

ERD Chain-of-Custody Record and Analytic Instructions

A 28003

Sampled By: Tina Carlson / Ned B.
Sampler's Employer: LLNL
Project Name: LAKE DAVIS

Requester, (circle one): S300 / WGMG / Livermore

Send all results to:
Attn: ERD DMG L-528
Lawrence Livermore
National Laboratory
7000 East Ave.
Livermore, CA 94550

Field Log Book# ZJ014 Page 4 of 4
LLNL Acct. # 087643 **Release #**
Analytical Laboratory Name BC
Analytical Laboratory Log # 01-09890

Analytical Lab Please
Fax or Email copies to:

name Tina Carlson Fax# 925-422-6950 (circle one) Email
name Ned Boglin Fax# 925-422-6950 (circle one) Email
* [redacted] DMG

	Sample Identification	Sample Date/Time	Matrix[2] Container[3]	# of Cont.	Study Area	E8260	Analysis & Turnaround Required[1]	* Remarks *
1	3X056-DET2-12MD	8/24/01 03:12p	AQ V	3		5d		
2								
3								
4	NOTE: Rec'd 2- Ice chest			1		X		
5	each w/ a Trip blank labeled			1		X		
6	-1TB + -2TB							
7	Lab. NB (See sample Rec'd Form)							
8								
9								

Additional Instructions to Lab

	Signature	Company	Time	Date
Relinquished by	[signature]	LLNL - ERD	04:40	8/29/01
Received by	[signature]	BC LABS	1745	8/29/01
Relinquished by	[signature]	BC LABS	1826	8/29/01
Received by	[signature]	BC LABS	1827	8-29-01
Relinquished by	[signature]	BC LABS	2246	8-29-01
Received by	[signature]	BC Labs	2246	8/29/01

[1] Enter the number of days or hours for TAT of the official printed report. See Requested Analysis code list for available TAT's for each type of analysis. Example: 24h = 24 hours / 20d = 20 day

[2] Sample Matrix Codes: **See list on back of pink copy**

[3] Container type codes: **V** = VOA Bottle, **P** = Polyethylene Bottle, **G** = Glass Bottle, **T** = Brass Tube, **B** = Bag, **S** = Stainless Steel Tube, **O** = Other (specify under remarks)

To receive copies of this data from DMG
CC:

Revision 4.6
21-jul-99 ERD

White : Laboratory return to ERD Attn. ERD Data Management Team L-528 | Yellow : Analytical Lab | Pink : Sampler leave with ERD Attn. ERD Data Management Team L-528 | Gold: Sampler Leave with TRR

BC Laboratories, Inc

DATA QUALIFIER FLAG ATTACHED

CASE NARRATIVE

COC A28024 & A28025
Requestor: Livermore

Date: 09/28/01

THIS IS REALLY:
300-EXP-056

Laboratory Number: 01-09889
Field Log Book # ZJ014

Table of Qualified Data

BC Laboratory Number	LLNL Sample Identification	Sampling Date	Analyses	Flags
01-09889-1	3X056-DET1-120M	08/29/01 @ 1653	E160.2 E180.1 E335.2 NutrientsA E8260 E8270 E8315	 *10 – PQL's were raised due to matrix interference (NO3). *03 – CCV recovery not within method limits. *2 – Associated surrogate recovery is low. Results are affected due to low internal standard response. *22 – Associated surrogate recovery is low. *3 – Surrogate recovery not within established limits. Results affected due to low internal standard response. * - Sample was analyzed by Truesdail (602796-1).
01-09889-2	3X056-DET2-120M	08/29/01 @ 1700	E160.2 E180.1 E335.2 NutrientsA E8260 E8270 E8315	 *03 – CCV recovery not within method limits. * - Sample was analyzed by Truesdail (602796-2).
01-09889-3TB	TRIP BLANK		E8260	*03 – CCV recovery not within method limits.

I. Sample Receipt
Samples received refrigerated to 9.6°C.

II. Holding Times.
All holding time requirements met.

CASE NARRATIVE CONTINUED

III. Method Blanks
Method blanks were prepared and analyzed at the required requirements.

IV. Calibration
Initial calibration criteria for respective analyses were met. Frequency criteria for initial and continuing calibrations were met. Accuracy criteria for initial and continuing calibrations were met except for the CCV's for EPA 8260 compounds 1,4-Dichloro-2-butene and Vinyl acetate affecting samples 01-09889-1 and 01-09889-2 and 2-Chloroethylvinyl ether and Acrolein affecting sample 01-09889-3TB. The sample reports are flagged accordingly.

V. Matrix Spikes
Precision and Accuracy requirements were within QC limits.

VI. LCS
The LCS recoveries are within QC limits.

VII. Discussion
Various compounds for EPA 8270 for sample 01-09889-1 are flagged due to results being affected due to low internal standard response. The surrogate recoveries for the same sample are high for 2-Fluorobiphenyl, 2,4,6-Tribromphenol, and d14-Terphenyl. These are also affected by the low internal standard response. The surrogates and the associated compounds are flagged.

Sincerely

Kim Halbrook,
Project Manager

Todays Date: 10-01-01

DATA QUALIFIER FLAG FORM

Circle the appropriate qualifier flags and fill out information below.

Flag	Definition
B	Analyte found in method blank
F	Analyte found in field blank, trip blank, or equipment blank
G	Quantitated using fuel calibration, but does not match typical fuel fingerprint.
I	Surrogate recoveries were outside of QC limits.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
L	Spike accuracy not within control limits.
O	Duplicate spike or sample precision not within control limits.
R	Sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet QC criteria. The presence or absence of the analyte cannot be verified.
S	The analytical results from this sample are suspect.
T	Analyte is tentatively identified compound; result is approximate.

Laboratory Code: (circle one) BB, CN, TN, GE, QR or other: _____

QC Chemist Initials: NB Requested Analysis: E8270

Analyte(s)/Code: bis(2-ethyhexyl) phthalate (1350)

Explanation (check one or fill in):

[ ] Insufficient sample for spike. [ ] _____ in method blank.

[ ] Matrix interference. [ ] LCS validates methodology.

[ ] High concentration of _____ in spiked sample.

[X] Other/comments: associated surrogate %R >UCL

Log Number of Affected Samples: 01-09889-1

For Data Management Use Only:

Entered: Initials _____ Date: _____

Elect. Confirmed: Initials: _____ Date: _____

Last Revised: April 13, 1999 by VRD

Todays Date: 10/01/01

DATA QUALIFIER FLAG FORM

Circle the appropriate qualifier flags and fill out information below.

Flag	Definition
B	Analyte found in method blank
F	Analyte found in field blank, trip blank, or equipment blank
G	Quantitated using fuel calibration, but does not match typical fuel fingerprint.
I	Surrogate recoveries were outside of QC limits.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
(L)	Spike accuracy not within control limits.
O	Duplicate spike or sample precision not within control limits.
R	Sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet QC criteria. The presence or absence of the analyte cannot be verified.
S	The analytical results from this sample are suspect.
T	Analyte is tentatively identified compound; result is approximate.

Laboratory Code: (circle one) (BB), CN, TN, GE, QR or other: _____

QC Chemist Initials: NB Requested Analysis: E 8315

Analyte(s)/Code: formaldehyde (4840)

Explanation (check one or fill in):

[X] Insufficient sample for spike. [ ] _____ in method blank.

[ ] Matrix interference. [X] LCS validates methodology. LCS/LCSD

[ ] High concentration of _____ in spiked sample.

[X] Other/comments: NO matrix spk performed

Log Number of Affected Samples: 01-09889-1, -2

For Data Management Use Only:

Entered: Initials _____ Date: _____

Elect. Confirmed: Initials: _____ Date: _____

Last Revised: April 13, 1999 by VRD

BC Laboratories, Inc

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/07/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-1

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET1-120M
Sample Depth:
Sampling Date/Time: 08/29/2001 @ 16:53
Sample Matrix: Aqueous
Sample Collected By: TINA CARLSON/NB

THIS IS REALLY:
300-EXP-056

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code	
Nitrate as NO3	None Detected	mg/L	0.88	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5945	
Nitrate as N	None Detected	mg/L	0.20	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5895	
Nitrate/Nitrite as N	None Detected	mg/L	0.2	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5950	*10
Total Suspended Solids using glass fiber Type A/E	21.	mg/L	2.	EPA-160.2	08/30/01	SAS	3.33	MANUAL	n.a.	08/30/01	E160.2	7450	
Turbidity	7.5	NT Units	0.1	EPA-180.1	08/30/01	PDL	1.	T2100	n.a.	08/30/01	E180.1	8850	
Total Cyanide	0.067	mg/L	0.02	EPA-335.3	08/31/01	TDC	1.	AAII-1	EPA-335.3	08/30/01	E335.2	2850	
Total Kjeldahl Nitrogen	2.2	mg/L	0.20	EPA-351.2	09/07/01	NJC	1.	RFA-1	EPA-351.2	09/06/01	NUTRIENTSA	5980	
Ammonia as N	0.39	mg/L	0.025	EPA-350.1	09/04/01	NJC	1.	AAII-5	n.a.	09/04/01	NUTRIENTSA	0325	
Nitrite as N	None Detected	mg/L	0.02	EPA-353.2	08/31/01	NJC	1.	RFA-2	n.a.	08/31/01	NUTRIENTSA	5960	
Nitrite as NO2	None Detected	mg/L	0.50	EPA-353.2	08/31/01	NJC	1.	RFA-2	n.a.	08/31/01	NUTRIENTSA	5975	

BC Laboratories, Inc

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

THIS IS REALLY:
300-EXP-056

Date Reported: 09/07/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-1

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET1-120M, 08/29/2001 @ 16:53, TINA CARLSON/NB

P.Q.L. = Practical Quantitation Limit (refers to the least amount of analyte quantifiable based on sample size used and analytical technique employed).

Flag Explanations:
*10 = Note: PQL's were raised due to matrix interference.

California D.O.H.S. Cert. #1186

M. Atencio

Marna Atencio
Department Supervisor

BC Laboratories, Inc

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/07/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-2

THIS IS REALLY:
300-EXP-056

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET2-120M
Sample Depth:
Sampling Date/Time: 08/29/2001 @ 17:00
Sample Matrix: Aqueous
Sample Collected By: TINA CARLSON/NB

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Nitrate as NO3	None Detected	mg/L	0.88	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5945
Nitrate as N	None Detected	mg/L	0.20	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5895
Nitrate/Nitrite as N	None Detected	mg/L	0.1	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5950
Total Suspended Solids using glass fiber Type A/E	16.	mg/L	2.	EPA-160.2	08/30/01	SAS	3.33	MANUAL	n.a.	08/30/01	E160.2	7450
Turbidity	10.	NT Units	0.1	EPA-180.1	08/30/01	PDL	1.	T2100	n.a.	08/30/01	E180.1	8850
Total Cyanide	0.092	mg/L	0.02	EPA-335.3	08/31/01	TDC	1.	AAII-1	EPA-335.3	08/30/01	E335.2	2850
Total Kjeldahl Nitrogen	1.8	mg/L	0.20	EPA-351.2	09/07/01	NJC	1.	RFA-1	EPA-351.2	09/06/01	NUTRIENTSA	5980
Ammonia as N	0.47	mg/L	0.025	EPA-350.1	09/04/01	NJC	1.	AAII-5	n.a.	09/04/01	NUTRIENTSA	0325
Nitrite as N	None Detected	mg/L	0.02	EPA-353.2	08/31/01	NJC	1.	RFA-2	n.a.	08/31/01	NUTRIENTSA	5960
Nitrite as NO2	None Detected	mg/L	0.50	EPA-353.2	08/31/01	NJC	1.	RFA-2	n.a.	08/31/01	NUTRIENTSA	5975

P.Q.L. = Practical Quantitation Limit (refers to the least amount of analyte quantifiable based on sample size used and analytical technique employed).

California D.O.H.S. Cert. #1186

M. Atencio

Marna Atencio
Department Supervisor

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-1
(Revised)

Date Collected: 08/29/2001 @ 16:53

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET1-120M
Sample Matrix: Aqueous
Sample Collected By: TINA CARLSON/NB

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Benzene	8.5	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0500
Bromodichloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1450
Bromoform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1500
Bromomethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1550
Carbon tetrachloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1800
Chlorobenzene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2000
Chloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2050
2-Chloroethylvinyl ether	None Detected	µg/L	10.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2100
Chloroform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2150
Chloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2200
Dibromochloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3200
1,2-Dibromo-3-Chloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3185
Dichlorodifluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3500
1,1-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3550
1,2-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3600
1,1-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3650
cis-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3695
trans-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3700
Total 1,2-Dichloroethene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3705
1,2-Dichloropropane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3850
cis-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3900
trans-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3950
Total 1,3-Dichloropropene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3975
Ethyl Benzene	0.72	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4700
Methylene Chloride	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5750

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-1
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET1-120M, 08/29/2001 @ 16:53, TINA CARLSON/NB

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code	
Styrene	1.8	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	7968	
1,1,1,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8185	
1,1,2,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8200	
Tetrachloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8250	
Toluene	4.6	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8350	
1,1,1-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8550	
1,1,2-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8600	
Trichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8650	
Trichlorofluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8700	
1,2,3-Trichloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8753	
1,1,2-Trichloro-1,2,2-trifluoroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4850	
Vinyl Chloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8900	
Total Xylenes	1.5	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8975	
Total Trihalomethanes	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8760	
Acetone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0125	
Acetonitrile	None Detected	µg/L	100.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0110	
Acrolein	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0150	
Acrylonitrile	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0200	
2-Butanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5815	
Carbon Disulfide	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1775	
Chloroprene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2025	
1,4-Dichloro-2-butene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3285	*03
1,4-Dioxane	None Detected	µg/L	300.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4360	
Ethanol	None Detected	µg/L	1000.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4675	
2-Hexanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5735	
4-Methyl-2-pentanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5720	
Methyl-t-butylether	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5728	
Vinyl acetate	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8885	*03

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-1
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET1-120M, 08/29/2001 @ 16:53, TINA CARLSON/NB

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code

Quality Control Data

Surrogates	% Recovery	Control Limits
1,2-Dichloroethane-d4	100.	76-114
Toluene-d8	105.	88-110
4-Bromofluorobenzene	102.	86-115

Note: Sample received at pH = 4.

Flag Explanations:
*03 = CCV recovery not within method limits.
California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-2
(Revised)

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET2-120M
Sample Matrix: Aqueous
Sample Collected By: TINA CARLSON/NB

Date Collected: 08/29/2001 @ 17:00

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Benzene	11.	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0500
Bromodichloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1450
Bromoform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1500
Bromomethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1550
Carbon tetrachloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1800
Chlorobenzene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2000
Chloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2050
2-Chloroethylvinyl ether	None Detected	µg/L	10.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2100
Chloroform	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2150
Chloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2200
Dibromochloromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3200
1,2-Dibromo-3-Chloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3185
Dichlorodifluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3500
1,1-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3550
1,2-Dichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3600
1,1-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3650
cis-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3695
trans-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3700
Total 1,2-Dichloroethene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3705
1,2-Dichloropropane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3850
cis-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3900
trans-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3950
Total 1,3-Dichloropropene	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3975
Ethyl Benzene	0.98	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4700
Methylene Chloride	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5750

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-2
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET2-120M, 08/29/2001 @ 17:00, TINA CARLSON/NB

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code	
Styrene	2.8	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	7968	
1,1,1,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8185	
1,1,2,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8200	
Tetrachloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8250	
Toluene	6.2	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8350	
1,1,1-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8550	
1,1,2-Trichloroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8600	
Trichloroethene	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8650	
Trichlorofluoromethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8700	
1,2,3-Trichloropropane	None Detected	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8753	
1,1,2-Trichloro-1,2,2-trifluoroethane	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4850	
Vinyl Chloride	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8900	
Total Xylenes	1.9	µg/L	1.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8975	
Total Trihalomethanes	None Detected	µg/L	2.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8760	
Acetone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0125	
Acetonitrile	None Detected	µg/L	100.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0110	
Acrolein	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0150	
Acrylonitrile	None Detected	µg/L	50.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	0200	
2-Butanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5815	
Carbon Disulfide	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	1775	
Chloroprene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	2025	
1,4-Dichloro-2-butene	None Detected	µg/L	5.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	3285	*03
1,4-Dioxane	None Detected	µg/L	300.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4360	
Ethanol	None Detected	µg/L	1000.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	4675	
2-Hexanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5735	
4-Methyl-2-pentanone	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5720	
Methyl-t-butylether	None Detected	µg/L	0.5	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	5728	
Vinyl acetate	None Detected	µg/L	20.	8260	09/06/01	SNM	1.	MS-V8	5030	09/06/01	E8260	8885	*03

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-2
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET2-120M, 08/29/2001 @ 17:00, TINA CARLSON/NB

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code

Quality Control Data

Surrogates	% Recovery	Control Limits
1,2-Dichloroethane-d4	101.	76-114
Toluene-d8	101.	88-110
4-Bromofluorobenzene	100.	86-115

Note: Sample received at pH = 4.

Flag Explanations:
*03 = CCV recovery not within method limits.
California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-3TB
(Revised)

Date Collected: 08/29/2001

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: TRIP BLANK
Sample Matrix: BW - Blank water
Sample Collected By: TINA CARLSON/NB

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code	
Benzene	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	0500	
Bromodichloromethane	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	1450	
Bromoform	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	1500	
Bromomethane	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	1550	
Carbon tetrachloride	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	1800	
Chlorobenzene	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	2000	
Chloroethane	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	2050	
2-Chloroethylvinyl ether	None Detected	µg/L	50.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	2100	*03
Chloroform	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	2150	
Chloromethane	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	2200	
Dibromochloromethane	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	3200	
1,2-Dibromo-3-Chloropropane	None Detected	µg/L	6.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	3185	
Dichlorodifluoromethane	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	3500	
1,1-Dichloroethane	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	3550	
1,2-Dichloroethane	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	3600	
1,1-Dichloroethene	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	3650	
cis-1,2-Dichloroethene	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	3695	
trans-1,2-Dichloroethene	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	3700	
Total 1,2-Dichloroethene	None Detected	µg/L	10.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	3705	
1,2-Dichloropropane	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	3850	
cis-1,3-Dichloropropene	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	3900	
trans-1,3-Dichloropropene	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	3950	
Total 1,3-Dichloropropene	None Detected	µg/L	10.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	3975	
Ethyl Benzene	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	4700	
Methylene Chloride	None Detected	µg/L	5.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	5750	

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-3TB
(Revised)

Sample Description: UNICARD, LAKE DAVIS, TRIP BLANK, 08/29/2001, TINA CARLSON/NB

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code	
Styrene	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	7968	
1,1,1,2-Tetrachloroethane	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	8185	
1,1,2,2-Tetrachloroethane	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	8200	
Tetrachloroethene	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	8250	
Toluene	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	8350	
1,1,1-Trichloroethane	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	8550	
1,1,2-Trichloroethane	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	8600	
Trichloroethene	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	8650	
Trichlorofluoromethane	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	8700	
1,2,3-Trichloropropane	None Detected	µg/L	5.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	8753	
1,1,2-Trichloro-1,2,2-trifluoroethane	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	4850	
Vinyl Chloride	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	8900	
Total Xylenes	None Detected	µg/L	5.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	8975	
Total Trihalomethanes	None Detected	µg/L	10.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	8760	
Acetone	None Detected	µg/L	100.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	0125	
Acetonitrile	None Detected	µg/L	500.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	0110	
Acrolein	None Detected	µg/L	300.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	0150	*03
Acrylonitrile	None Detected	µg/L	300.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	0200	
2-Butanone	None Detected	µg/L	100.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	5815	
Carbon Disulfide	None Detected	µg/L	30.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	1775	
Chloroprene	None Detected	µg/L	30.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	2025	
1,4-Dichloro-2-butene	None Detected	µg/L	30.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	3285	
1,4-Dioxane	None Detected	µg/L	2000.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	4360	
Ethanol	None Detected	µg/L	5000.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	4675	
2-Hexanone	None Detected	µg/L	100.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	5735	
4-Methyl-2-pentanone	None Detected	µg/L	100.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	5720	
Methyl-t-butylether	None Detected	µg/L	3.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	5728	
Vinyl acetate	None Detected	µg/L	100.	8260	09/07/01	SNM	5.	MS-V8	5030	09/07/01	E8260	8885	

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-3TB
(Revised)

Sample Description: UNICARD, LAKE DAVIS, TRIP BLANK, 08/29/2001, TINA CARLSON/NB

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code

Quality Control Data

Surrogates	% Recovery	Control Limits
1,2-Dichloroethane-d4	102.	76-114
Toluene-d8	97.	88-110
4-Bromofluorobenzene	99.	86-115

Note: PQL's were raised due to high concentration of target analytes requiring sample dilution.

Flag Explanations:
*03 = CCV recovery not within method limits.
California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-1

Project Number: UNICARD THIS IS REALLY: 300-EXP-056
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET1-120M
Sample Matrix: Aqueous
Sample Collected By: TINA CARLSON/NB

Date Collected: 08/29/2001 @ 16:53
Date Extracted: 08/30/2001
Date Analyzed: 09/06/2001 @ 01:20
Extract Method: 3510
Method: 8270
Analyst: SKC
Dilution Used: 1
Instrument ID: MS-B2

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code	
Acenaphthene	None Detected	µg/L	2.	E8270	0050	*2
Acenaphthylene	None Detected	µg/L	2.	E8270	0100	*2
Aldrin	None Detected	µg/L	2.	E8270	0250	*2
Aniline	None Detected	µg/L	5.	E8270	0335	
Anthracene	None Detected	µg/L	2.	E8270	0350	*2
Benzidine	None Detected	µg/L	20.	E8270	0600	*2
Benzo (a) anthracene	None Detected	µg/L	2.	E8270	0650	*2
Benzo (b) fluoranthene	None Detected	µg/L	2.	E8270	0700	*2
Benzo (k) fluoranthene	None Detected	µg/L	2.	E8270	0750	*2
Benzo (a) pyrene	None Detected	µg/L	2.	E8270	0850	*2
Benzo (ghi) perylene	None Detected	µg/L	2.	E8270	0800	*2
Benzoic Acid	15.	µg/L	10.	E8270	0875	
Benzyl alcohol	None Detected	µg/L	2.	E8270	0880	
Butyl Benzyl phthalate	None Detected	µg/L	2.	E8270	1625	*2
alpha-BHC	None Detected	µg/L	2.	E8270	0950	*2
beta-BHC	None Detected	µg/L	2.	E8270	1000	*2
delta-BHC	None Detected	µg/L	2.	E8270	1050	*2
gamma-BHC	None Detected	µg/L	2.	E8270	1100	*2
bis(2-chloroethyl)ether	None Detected	µg/L	2.	E8270	1250	
bis(2-chloroethoxy)methane	None Detected	µg/L	2.	E8270	1200	
bis(2-chloro-1-methylethyl)	None Detected	µg/L	2.	E8270	1300	*2
bis(2-ethylhexyl)phthalate	34.	µg/L	5.	E8270	1350	*2
4-Bromophenyl phenyl ether	None Detected	µg/L	2.	E8270	1613	*2
4-Chloroaniline	None Detected	µg/L	2.	E8270	1975	
2-Chloronaphthalene	None Detected	µg/L	2.	E8270	2300	*2
4-Chlorophenyl phenyl ether	None Detected	µg/L	2.	E8270	2425	*2
Chrysene	None Detected	µg/L	2.	E8270	2600	*2
4,4-DDD'	None Detected	µg/L	2.	E8270	2900	*2
4,4-DDE'	None Detected	µg/L	3.	E8270	2950	*2
4,4-DDT'	None Detected	µg/L	2.	E8270	3000	*2
Dibenzo (a,h) anthracene	None Detected	µg/L	3.	E8270	3150	*2
Dibenzofuran	None Detected	µg/L	2.	E8270	3175	*2
Di-n-butyl phthalate	None Detected	µg/L	2.	E8270	3250	*2
1,2-Dichlorobenzene	None Detected	µg/L	2.	E8270	3300	
1,3-Dichlorobenzene	None Detected	µg/L	2.	E8270	3350	
1,4-Dichlorobenzene	None Detected	µg/L	2.	E8270	3400	
3,3-Dichlorobenzidine	None Detected	µg/L	10.	E8270	3450	*2
Dieldrin	None Detected	µg/L	3.	E8270	4000	*2

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

300-EXP-056

Date Reported: 09/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-1

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET1-120M, 08/29/2001 @ 16:53, TINA CARLSON/NB

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code	
Diethyl phthalate	None Detected	µg/L	2.	E8270	4050	*2
Dimethyl phthalate	None Detected	µg/L	2.	E8270	4150	*2
2,4-Dinitrotoluene	None Detected	µg/L	2.	E8270	4250	*2
2,6-Dinitrotoluene	None Detected	µg/L	2.	E8270	4300	*2
Di-n-octylphthalate	None Detected	µg/L	2.	E8270	4350	*2
1,2-Diphenylhydrazine	None Detected	µg/L	2.	E8270	4400	
Endosulfan I	None Detected	µg/L	10.	E8270	4450	*2
Endosulfan II	None Detected	µg/L	10.	E8270	4500	*2
Endosulfan sulfate	None Detected	µg/L	3.	E8270	4550	*2
Endrin	None Detected	µg/L	2.	E8270	4600	*2
Endrin aldehyde	None Detected	µg/L	10.	E8270	4650	*2
Fluoranthene	None Detected	µg/L	2.	E8270	4750	*2
Fluorene	None Detected	µg/L	2.	E8270	4800	*2
Heptachlor	None Detected	µg/L	2.	E8270	4950	*2
Heptachlor epoxide	None Detected	µg/L	2.	E8270	5000	*2
Hexachlorobenzene	None Detected	µg/L	2.	E8270	5050	*2
Hexachlorobutadiene	None Detected	µg/L	2.	E8270	5100	*2
Hexachlorocyclopentadiene	None Detected	µg/L	2.	E8270	5150	*2
Hexachloroethane	None Detected	µg/L	2.	E8270	5200	
Indeno (1,2,3-cd) pyrene	None Detected	µg/L	2.	E8270	5300	*2
Isophorone	None Detected	µg/L	2.	E8270	5400	
2-Methylnaphthalene	None Detected	µg/L	2.	E8270	5740	*2
Naphthalene	3.5	µg/L	2.	E8270	5800	
2-Naphthylamine	None Detected	µg/L	20.	E8270	5805	*2
2-Nitroaniline	None Detected	µg/L	2.	E8270	5990	*2
3-Nitroaniline	None Detected	µg/L	2.	E8270	5992	*2
4-Nitroaniline	None Detected	µg/L	5.	E8270	5994	*2
Nitrobenzene	None Detected	µg/L	2.	E8270	6000	
n-Nitrosodimethylamine	None Detected	µg/L	2.	E8270	6150	
n-Nitrosodiphenylamine	None Detected	µg/L	2.	E8270	6200	*2
N-Nitrosodi-n-propylamine	None Detected	µg/L	2.	E8270	6250	*2
Phenanthrene	None Detected	µg/L	2.	E8270	6850	*2
Pyrene	None Detected	µg/L	2.	E8270	7100	*2
1,2,4-Trichlorobenzene	None Detected	µg/L	2.	E8270	8500	
4-Chloro-3-methylphenol	None Detected	µg/L	5.	E8270	2250	*22
2-Chlorophenol	None Detected	µg/L	2.	E8270	2350	
2,4-Dichlorophenol	None Detected	µg/L	2.	E8270	3750	
2,4-Dimethylphenol	None Detected	µg/L	2.	E8270	4100	
2,4-Dinitrophenol	None Detected	µg/L	10.	E8270	4200	*2
2-Methyl-4,6-dinitrophenol	None Detected	µg/L	10.	E8270	5700	*2
2-Methylphenol	None Detected	µg/L	2.	E8270	5730	
3- & 4-Methylphenol	None Detected	µg/L	2.	E8270	5734	

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000 300-EXR-056

Date Reported: 09/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-1

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET1-120M, 08/29/2001 @ 16:53, TINA CARLSON/NB

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code	
2-Nitrophenol	None Detected	µg/L	2.	E8270	6050	
4-Nitrophenol	None Detected	µg/L	2.	E8270	6100	*2
Pentachlorophenol	None Detected	µg/L	10.	E8270	6400	*2
Phenol	None Detected	µg/L	2.	E8270	6900	
2,4,5-Trichlorophenol	None Detected	µg/L	5.	E8270	8745	*2
2,4,6-Trichlorophenol	None Detected	µg/L	5.	E8270	8750	*2
2-Picoline	None Detected	µg/L	10.	E8270	7120	

Quality Control Data

Surrogates	% Recovery	Control Limits	
2-Fluorophenol	42.	21-100	
Phenol-d5	11.	10-94	
Nitrobenzene-d5	94.	35-114	
2-Fluorobiphenyl	407.	43-116	*3
2,4,6-Tribromophenol	290.	10-123	*3
d14-Terphenyl	219.	33-141	*3

Flag Explanations:
*2 = Associated surrogate recovery is low.
Results are affected due to low internal standard response.
*22 = Associated surrogate recovery is low.
*3 = Surrogate recovery not within established limits.
Results are affected due to low internal standard response.
California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-2

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET2-120M
Sample Matrix: Aqueous
Sample Collected By: TINA CARLSON/NB

THIS IS REALLY 300-EXP-056

Date Collected: 08/29/2001 @ 17:00
Date Extracted: 08/30/2001
Date Analyzed: 09/06/2001 @ 02:03
Extract Method: 3510
Method: 8270
Analyst: SKC
Dilution Used: 1
Instrument ID: MS-B2

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
Acenaphthene	None Detected	µg/L	2.	E8270	0050
Acenaphthylene	None Detected	µg/L	2.	E8270	0100
Aldrin	None Detected	µg/L	2.	E8270	0250
Aniline	None Detected	µg/L	5.	E8270	0335
Anthracene	None Detected	µg/L	2.	E8270	0350
Benzidine	None Detected	µg/L	20.	E8270	0600
Benzo (a) anthracene	None Detected	µg/L	2.	E8270	0650
Benzo (b) fluoranthene	None Detected	µg/L	2.	E8270	0700
Benzo (k) fluoranthene	None Detected	µg/L	2.	E8270	0750
Benzo (a) pyrene	None Detected	µg/L	2.	E8270	0850
Benzo (ghi) perylene	None Detected	µg/L	2.	E8270	0800
Benzoic Acid	None Detected	µg/L	10.	E8270	0875
Benzyl alcohol	None Detected	µg/L	2.	E8270	0880
Butyl Benzyl phthalate	None Detected	µg/L	2.	E8270	1625
alpha-BHC	None Detected	µg/L	2.	E8270	0950
beta-BHC	None Detected	µg/L	2.	E8270	1000
delta-BHC	None Detected	µg/L	2.	E8270	1050
gamma-BHC	None Detected	µg/L	2.	E8270	1100
bis(2-chloroethyl)ether	None Detected	µg/L	2.	E8270	1250
bis(2-chloroethoxy)methane	None Detected	µg/L	2.	E8270	1200
bis(2-chloro-1-methylethyl)	None Detected	µg/L	2.	E8270	1300
bis(2-ethylhexyl)phthalate	None Detected	µg/L	5.	E8270	1350
4-Bromophenyl phenyl ether	None Detected	µg/L	2.	E8270	1613
4-Chloroaniline	None Detected	µg/L	2.	E8270	1975
2-Chloronaphthalene	None Detected	µg/L	2.	E8270	2300
4-Chlorophenyl phenyl ether	None Detected	µg/L	2.	E8270	2425
Chrysene	None Detected	µg/L	2.	E8270	2600
4,4-DDD'	None Detected	µg/L	2.	E8270	2900
4,4-DDE'	None Detected	µg/L	3.	E8270	2950
4,4-DDT'	None Detected	µg/L	2.	E8270	3000
Dibenzo (a,h) anthracene	None Detected	µg/L	3.	E8270	3150
Dibenzofuran	None Detected	µg/L	2.	E8270	3175
Di-n-butyl phthalate	None Detected	µg/L	2.	E8270	3250
1,2-Dichlorobenzene	None Detected	µg/L	2.	E8270	3300
1,3-Dichlorobenzene	None Detected	µg/L	2.	E8270	3350
1,4-Dichlorobenzene	None Detected	µg/L	2.	E8270	3400
3,3-Dichlorobenzidine	None Detected	µg/L	10.	E8270	3450
Dieldrin	None Detected	µg/L	3.	E8270	4000

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

THIS IS REALLY: 300-EXP-056

Date Reported: 09/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-2

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET2-120M, 08/29/2001 @ 17:00, TINA CARLSON/NB

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
Diethyl phthalate	None Detected	µg/L	2.	E8270	4050
Dimethyl phthalate	None Detected	µg/L	2.	E8270	4150
2,4-Dinitrotoluene	None Detected	µg/L	2.	E8270	4250
2,6-Dinitrotoluene	None Detected	µg/L	2.	E8270	4300
Di-n-octylphthalate	None Detected	µg/L	2.	E8270	4350
1,2-Diphenylhydrazine	None Detected	µg/L	2.	E8270	4400
Endosulfan I	None Detected	µg/L	10.	E8270	4450
Endosulfan II	None Detected	µg/L	10.	E8270	4500
Endosulfan sulfate	None Detected	µg/L	3.	E8270	4550
Endrin	None Detected	µg/L	2.	E8270	4600
Endrin aldehyde	None Detected	µg/L	10.	E8270	4650
Fluoranthene	None Detected	µg/L	2.	E8270	4750
Fluorene	None Detected	µg/L	2.	E8270	4800
Heptachlor	None Detected	µg/L	2.	E8270	4950
Heptachlor epoxide	None Detected	µg/L	2.	E8270	5000
Hexachlorobenzene	None Detected	µg/L	2.	E8270	5050
Hexachlorobutadiene	None Detected	µg/L	2.	E8270	5100
Hexachlorocyclopentadiene	None Detected	µg/L	2.	E8270	5150
Hexachloroethane	None Detected	µg/L	2.	E8270	5200
Indeno (1,2,3-cd) pyrene	None Detected	µg/L	2.	E8270	5300
Isophorone	None Detected	µg/L	2.	E8270	5400
2-Methylnaphthalene	None Detected	µg/L	2.	E8270	5740
Naphthalene	3.8	µg/L	2.	E8270	5800
2-Naphthylamine	None Detected	µg/L	20.	E8270	5805
2-Nitroaniline	None Detected	µg/L	2.	E8270	5990
3-Nitroaniline	None Detected	µg/L	2.	E8270	5992
4-Nitroaniline	None Detected	µg/L	5.	E8270	5994
Nitrobenzene	None Detected	µg/L	2.	E8270	6000
n-Nitrosodimethylamine	None Detected	µg/L	2.	E8270	6150
n-Nitrosodiphenylamine	None Detected	µg/L	2.	E8270	6200
N-Nitrosodi-n-propylamine	None Detected	µg/L	2.	E8270	6250
Phenanthrene	None Detected	µg/L	2.	E8270	6850
Pyrene	None Detected	µg/L	2.	E8270	7100
1,2,4-Trichlorobenzene	None Detected	µg/L	2.	E8270	8500
4-Chloro-3-methylphenol	None Detected	µg/L	5.	E8270	2250
2-Chlorophenol	None Detected	µg/L	2.	E8270	2350
2,4-Dichlorophenol	None Detected	µg/L	2.	E8270	3750
2,4-Dimethylphenol	None Detected	µg/L	2.	E8270	4100
2,4-Dinitrophenol	None Detected	µg/L	10.	E8270	4200
2-Methyl-4,6-dinitrophenol	None Detected	µg/L	10.	E8270	5700
2-Methylphenol	None Detected	µg/L	2.	E8270	5730
3- & 4-Methylphenol	None Detected	µg/L	2.	E8270	5734

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000 300-EXP-056

Date Reported: 09/10/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-2

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET2-120M, 08/29/2001 @ 17:00, TINA CARLSON/NB

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
2-Nitrophenol	None Detected	µg/L	2.	E8270	6050
4-Nitrophenol	None Detected	µg/L	2.	E8270	6100
Pentachlorophenol	None Detected	µg/L	10.	E8270	6400
Phenol	None Detected	µg/L	2.	E8270	6900
2,4,5-Trichlorophenol	None Detected	µg/L	5.	E8270	8745
2,4,6-Trichlorophenol	None Detected	µg/L	5.	E8270	8750
2-Picoline	None Detected	µg/L	10.	E8270	7120

Quality Control Data

Surrogates	% Recovery	Control Limits
2-Fluorophenol	47.	21-100
Phenol-d5	34.	10-94
Nitrobenzene-d5	88.	35-114
2-Fluorobiphenyl	84.	43-116
2,4,6-Tribromophenol	93.	10-123
d14-Terphenyl	95.	33-141

California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/14/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-1

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET1-120M
Sample Depth:
Sampling Date/Time: 08/29/2001 @ 16:53
Sample Matrix: Aqueous
Sample Collected By: TINA CARLSON/NB

THIS IS REALLY:
300-EXP-056

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Formaldehyde	None Detected	µg/L	15.	JAPC-1181-	09/04/01	DWW	1.	HPLC-A	8315	08/31/01	E8315	4840

P.Q.L. = Practical Quantitation Limit (refers to the least amount of analyte quantifiable based on sample size used and analytical technique employed).

California D.O.H.S. Cert. #1186

M. Atencio

Marna Atencio
Department Supervisor

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/14/2001
Date Received: 08/29/2001
Laboratory No.: 01-09889-2

Project Number: UNICARD
COC Number: ZJ014
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET2-120M
Sample Depth:
Sampling Date/Time: 08/29/2001 @ 17:00
Sample Matrix: Aqueous
Sample Collected By: TINA CARLSON/NB

THIS IS REALLY:
300-EXP-056

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Formaldehyde	None Detected	µg/L	15.	JAPC-1181-	09/04/01	DWW	1.	HPLC-A	8315	08/31/01	E8315	4840

P.Q.L. = Practical Quantitation Limit (refers to the least amount of analyte quantifiable based on sample size used and analytical technique employed).

California D.O.H.S. Cert. #1186

M. Atencio

Marna Atencio
Department Supervisor

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/27/2001
Sample Matrix: Aqueous
QC Batch ID: 200109889-1*WATER

Samples Affected: 01-09889-1, 01-09889-2

Constituents	Method Blank Readings	Units
Nitrate as NO3	< 0.5	mg/L
Nitrate as N	< 0.20	mg/L
Nitrate/Nitrite as N	< 0.2	mg/L
Total Suspended Solids using glass fiber Type A/E	< 0.5	mg/L
Total Cyanide	< 0.02	mg/L
Total Kjeldahl Nitrogen	< 0.2	mg/L
Ammonia as N	< 0.025	mg/L
Nitrite Nitrogen	< 0.02	mg/L
Nitrite as NO2	< 0.50	mg/L

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Precision & Accuracy)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/27/2001
Sample Matrix: Aqueous
QC Batch ID: 200109889-1*WATER

Samples Affected: 01-09889-1, 01-09889-2

Constituents	QC Sample ID	Sample Result	Sample Duplicate	MS Result	MSD Result	MS Spike Level	MSD Spike Level	Units	Sample R.P.D.	Spike R.P.D.	Precision Control Limits	MS % Rec	MSD % Rec	Accuracy Control Limits
Nitrate/Nitrite as N	9889-1-X2	< 0.2	< 0.2	4.464	4.464	4.211	4.211	mg/L	<PQL	0.	10	106.	106.	90 - 110
Total Suspended Solids using glass fiber Type A/E	9906-1	10.00	10.50					mg/L	<PQL		10			
Turbidity	9938-8	0.3000	0.2800					NT Units	<PQL		10			
Total Cyanide	TOTAL-09738-2	< 0.02	< 0.02	0.2454	0.2454	0.2500	0.2500	mg/L	<PQL	0.	10	98.	98.	90 - 110
Total Kjeldahl Nitrogen	WATER-09890-1	1.284	1.550	3.380	3.114	2.000	2.000	mg/L	19.	8.	20	105.	92.	80 - 120
Ammonia as N	9727-2	0.04078	0.04882	0.5336	0.5336	0.5263	0.5263	mg/L	<PQL	0.	10	94.	94.	90 - 110
Nitrite Nitrogen	9889-1	< 0.02	< 0.02	0.5374	0.5374	0.5263	0.5263	mg/L	<PQL	0.	10	101.	101.	90 - 110
Nitrite as NO2	9889-1	< 0.065	< 0.065	1.765	1.765	1.729	1.729	mg/L	<PQL	0.	10	101.	101.	90 - 110

MS = Matrix Spike; MSD = Matrix Spike Duplicate; RPD = Relative Percent Difference

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Laboratory Control Sample)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/27/2001
Sample Matrix: Aqueous
QC Batch ID: 200109889-1*WATER

Samples Affected: 01-09889-1, 01-09889-2

Constituents	QC Sample ID	Sample Result	Spike Level	Units	% Rec	Accuracy Control Limits
Nitrate/Nitrite as N	LCSW1-09-0	2.1205	2.00	mg/L	106.	90 - 110
Total Cyanide	TOTAL-LCSW	10.514	10.0	mg/L	105.	90 - 110
Total Kjeldahl Nitrogen	WATER-LCSW	47.064	50.0	mg/L	94.	85 - 115
Ammonia as N	LCSW1-09-0	0.47480	0.500	mg/L	95.	90 - 110
Nitrite Nitrogen	LCSW1-08-3	0.49660	0.500	mg/L	99.	90 - 110
Nitrite as NO2	LCSW1-08-3	1.6311	1.6422	mg/L	99.	90 - 110

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/18/2001
Sample Matrix: Aqueous
QC Batch ID: 200109889-1*8260

Samples Affected: 01-09889-1 through 01-09889-3TB

Constituents	Method Blank Readings	Units
Benzene	< 0.5	µg/L
Bromodichloromethane	< 0.5	µg/L
Bromoform	< 0.5	µg/L
Bromomethane	< 0.5	µg/L
Carbon tetrachloride	< 0.5	µg/L
Chlorobenzene	< 0.5	µg/L
Chloroethane	< 0.5	µg/L
2-Chloroethylvinyl ether	<10.	µg/L
Chloroform	< 0.5	µg/L
Chloromethane	< 0.5	µg/L
Dibromochloromethane	< 0.5	µg/L
1,2-Dibromo-3-Chloropropane	< 0.5	µg/L
Dichlorodifluoromethane	< 0.5	µg/L
1,1-Dichloroethane	< 0.5	µg/L
1,2-Dichloroethane	< 0.5	µg/L
1,1-Dichloroethene	< 0.5	µg/L
cis-1,2-Dichloroethene	< 0.5	µg/L
trans-1,2-Dichloroethene	< 0.5	µg/L
Total 1,2-Dichloroethene	< 2.	µg/L
1,2-Dichloropropane	< 0.5	µg/L
cis-1,3-Dichloropropene	< 0.5	µg/L
trans-1,3-Dichloropropene	< 0.5	µg/L
Total 1,3-Dichloropropene	< 2.	µg/L
Ethyl Benzene	< 0.5	µg/L
Methylene Chloride	< 1.	µg/L
Styrene	< 0.5	µg/L
1,1,1,2-Tetrachloroethane	< 0.5	µg/L
1,1,2,2-Tetrachloroethane	< 0.5	µg/L
Tetrachloroethene	< 0.5	µg/L
Toluene	< 0.5	µg/L

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/18/2001
Sample Matrix: Aqueous
QC Batch ID: 200109889-1*8260

Samples Affected: 01-09889-1 through 01-09889-3TB

Constituents	Method Blank Readings	Units
1,1,1-Trichloroethane	< 0.5	µg/L
1,1,2-Trichloroethane	< 0.5	µg/L
Trichloroethene	< 0.5	µg/L
Trichlorofluoromethane	< 0.5	µg/L
1,2,3-Trichloropropane	< 1.	µg/L
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.5	µg/L
Vinyl Chloride	< 0.5	µg/L
Total Xylenes	< 1.	µg/L
Total Trihalomethanes	< 2.	µg/L
Acetone	<10.	µg/L
Acetonitrile	<100.	µg/L
Acrolein	<50.	µg/L
Acrylonitrile	<50.	µg/L
2-Butanone	<20.	µg/L
Carbon Disulfide	< 5.	µg/L
Chloroprene	< 5.	µg/L
1,4-Dichloro-2-butene	< 5.	µg/L
1,4-Dioxane	<300.	µg/L
Ethanol	<1000.	µg/L
2-Hexanone	<20.	µg/L
4-Methyl-2-pentanone	<20.	µg/L
Methyl-t-butylether	< 0.5	µg/L
Vinyl acetate	<20.	µg/L
1,2-Dichloroethane-d4	104.	%
Toluene-d8	99.	%
4-Bromofluorobenzene	104.	%

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/18/2001
Sample Matrix: Aqueous
QC Batch ID: 200109889-1*8260

Samples Affected: 01-09889-1 through 01-09889-3TB

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Precision & Accuracy)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/12/2001
Sample Matrix: Aqueous
QC Batch ID: 200109889-1*8260

Samples Affected: 01-09889-1 through 01-09889-3TB

Constituents	QC Sample ID	Sample Result	MS Result	MSD Result	MS Spike Level	MSD Spike Level	Units	Spike R.P.D.	Precision Control Limits	MS % Rec	MSD % Rec	Accuracy Control Limits
Benzene	OFW	< 0.5	26.	27.	25.	25.	µg/L	4.	20	105.	109.	80 - 120
Bromodichloromethane	OFW	< 0.5	27.	27.	25.	25.	µg/L	3.	20	106.	110.	80 - 120
Chlorobenzene	OFW	< 0.5	26.	25.	25.	25.	µg/L	2.	20	103.	101.	80 - 120
Chloroethane	OFW	< 0.5	26.	28.	25.	25.	µg/L	7.	20	104.	111.	80 - 120
1,1-Dichloroethane	OFW	< 0.5	26.	27.	25.	25.	µg/L	4.	20	102.	107.	80 - 120
1,1-Dichloroethene	OFW	< 0.5	27.	30.	25.	25.	µg/L	9.	20	109.	119.	80 - 120
Toluene	OFW	< 0.5	26.	27.	25.	25.	µg/L	2.	20	104.	106.	80 - 120
Trichloroethene	OFW	< 0.5	27.	28.	25.	25.	µg/L	4.	20	107.	111.	80 - 120
1,2-Dichloroethane-d4	MS/MSD									104.	109.	76 - 114
Toluene-d8	MS/MSD									99.	105.	88 - 110
4-Bromofluorobenzene	MS/MSD									103.	98.	86 - 115

MS = Matrix Spike; MSD = Matrix Spike Duplicate; RPD = Relative Percent Difference

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Laboratory Control Sample)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/12/2001
Sample Matrix: Aqueous
QC Batch ID: 200109889-1*8260

Samples Affected: 01-09889-1 through 01-09889-3TB

Constituents	QC Sample ID	Sample Result	Spike Level	Units	% Rec	Accuracy Control Limits
Benzene	LCSW1	25.	25.	µg/L	102.	70 - 130
Bromodichloromethane	LCSW1	24.	25.	µg/L	97.	70 - 130
Chlorobenzene	LCSW1	25.	25.	µg/L	101.	70 - 130
Chloroethane	LCSW1	23.	25.	µg/L	93.	70 - 130
1,1-Dichloroethane	LCSW1	24.	25.	µg/L	97.	70 - 130
1,1-Dichloroethene	LCSW1	26.	25.	µg/L	102.	70 - 130
Toluene	LCSW1	23.	25.	µg/L	94.	70 - 130
Trichloroethene	LCSW1	24.	25.	µg/L	96.	70 - 130
1,2-Dichloroethane-d4	LCSW1				104.	76 - 114
Toluene-d8	LCSW1				97.	88 - 110
4-Bromofluorobenzene	LCSW1				101.	86 - 115

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: Aqueous
QC Batch ID: 200109889-1*8270

Samples Affected: 01-09889-1, 01-09889-2

Constituents	Method Blank Readings	Units
Acenaphthene	< 2.	µg/L
Acenaphthylene	< 2.	µg/L
Aldrin	< 2.	µg/L
Aniline	< 5.	µg/L
Anthracene	< 2.	µg/L
Benzidine	<20.	µg/L
Benzo (a) anthracene	< 2.	µg/L
Benzo (b) fluoranthene	< 2.	µg/L
Benzo (k) fluoranthene	< 2.	µg/L
Benzo (a) pyrene	< 2.	µg/L
Benzo (ghi) perylene	< 2.	µg/L
Benzoic Acid	<10.	µg/L
Benzyl alcohol	< 2.	µg/L
Butyl Benzyl phthalate	< 2.	µg/L
alpha-BHC	< 2.	µg/L
beta-BHC	< 2.	µg/L
delta-BHC	< 2.	µg/L
gamma-BHC	< 2.	µg/L
bis(2-chloroethyl)ether	< 2.	µg/L
bis(2-chloroethoxy)methane	< 2.	µg/L
bis(2-chloro-1-methylethyl) et	< 2.	µg/L
bis(2-ethylhexyl)phthalate	< 5.	µg/L
4-Bromophenyl phenyl ether	< 2.	µg/L
4-Chloroaniline	< 2.	µg/L
2-Chloronaphthalene	< 2.	µg/L
4-Chlorophenyl phenyl ether	< 2.	µg/L
Chrysene	< 2.	µg/L
4,4-DDD'	< 2.	µg/L
4,4-DDE'	< 3.	µg/L
4,4-DDT'	< 2.	µg/L

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: Aqueous
QC Batch ID: 200109889-1*8270

Samples Affected: 01-09889-1, 01-09889-2

Constituents	Method Blank Readings	Units
Dibenzo (a,h) anthracene	< 3.	µg/L
Dibenzofuran	< 2.	µg/L
Di-n-butyl phthalate	< 2.	µg/L
1,2-Dichlorobenzene	< 2.	µg/L
1,3-Dichlorobenzene	< 2.	µg/L
1,4-Dichlorobenzene	< 2.	µg/L
3,3-Dichlorobenzidine	<10.	µg/L
Dieldrin	< 3.	µg/L
Diethyl phthalate	< 2.	µg/L
Dimethyl phthalate	< 2.	µg/L
2,4-Dinitrotoluene	< 2.	µg/L
2,6-Dinitrotoluene	< 2.	µg/L
Di-n-octylphthalate	< 2.	µg/L
1,2-Diphenylhydrazine	< 2.	µg/L
Endosulfan I	<10.	µg/L
Endosulfan II	<10.	µg/L
Endosulfan sulfate	< 3.	µg/L
Endrin	< 2.	µg/L
Endrin aldehyde	<10.	µg/L
Fluoranthene	< 2.	µg/L
Fluorene	< 2.	µg/L
Heptachlor	< 2.	µg/L
Heptachlor epoxide	< 2.	µg/L
Hexachlorobenzene	< 2.	µg/L
Hexachlorobutadiene	< 2.	µg/L
Hexachlorocyclopentadiene	< 2.	µg/L
Hexachloroethane	< 2.	µg/L
Indeno (1,2,3-cd) pyrene	< 2.	µg/L
Isophorone	< 2.	µg/L
2-Methylnaphthalene	< 2.	µg/L

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: Aqueous
QC Batch ID: 200109889-1*8270

Samples Affected: 01-09889-1, 01-09889-2

Constituents	Method Blank Readings	Units
Naphthalene	< 2.	µg/L
2-Naphthylamine	<20.	µg/L
2-Nitroaniline	< 2.	µg/L
3-Nitroaniline	< 2.	µg/L
4-Nitroaniline	< 5.	µg/L
Nitrobenzene	< 2.	µg/L
n-Nitrosodimethylamine	< 2.	µg/L
n-Nitrosodiphenylamine	< 2.	µg/L
N-Nitrosodi-n-propylamine	< 2.	µg/L
Phenanthrene	< 2.	µg/L
Pyrene	< 2.	µg/L
1,2,4-Trichlorobenzene	< 2.	µg/L
4-Chloro-3-methylphenol	< 5.	µg/L
2-Chlorophenol	< 2.	µg/L
2,4-Dichlorophenol	< 2.	µg/L
2,4-Dimethylphenol	< 2.	µg/L
2,4-Dinitrophenol	<10.	µg/L
2-Methyl-4,6-dinitrophenol	<10.	µg/L
2-Methylphenol	< 2.	µg/L
3- & 4-Methylphenol	< 2.	µg/L
2-Nitrophenol	< 2.	µg/L
4-Nitrophenol	< 2.	µg/L
Pentachlorophenol	<10.	µg/L
Phenol	< 2.	µg/L
2,4,5-Trichlorophenol	< 5.	µg/L
2,4,6-Trichlorophenol	< 5.	µg/L
2-Picoline	<10.	µg/L
2-Fluorophenol	74.	%
Phenol-d5	53.	%
Nitrobenzene-d5	110.	%

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: Aqueous
QC Batch ID: 200109889-1*8270

Samples Affected: 01-09889-1, 01-09889-2

Constituents	Method Blank Readings	Units
2-Fluorobiphenyl	98.	%
2,4,6-Tribromophenol	113.	%
d14-Terphenyl	85.	%

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Precision & Accuracy)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: Aqueous
QC Batch ID: 200109889-1*8270

Samples Affected: 01-09889-1, 01-09889-2

Constituents	QC Sample ID	Sample Result	MS Result	MSD Result	MS Spike Level	MSD Spike Level	Units	Spike R.P.D.	Precision Control Limits	MS % Rec	MSD % Rec	Accuracy Control Limits
Acenaphthene	SDI1-MS1-08-30	< 2.	67.49	67.58	80.00	80.00	µg/L	0.	16	84.	84.	46 - 113
1,4-Dichlorobenzene	SDI1-MS1-08-30	< 2.	64.52	66.59	80.00	80.00	µg/L	3.	30	81.	83.	33 - 111
2,4-Dinitrotoluene	SDI1-MS1-08-30	< 2.	74.38	72.49	80.00	80.00	µg/L	3.	27	93.	91.	21 - 157
Hexachlorobenzene	SDI1-MS1-08-30	< 2.	71.52	69.97	80.00	80.00	µg/L	2.	14	89.	87.	38 - 117
Hexachlorobutadiene	SDI1-MS1-08-30	< 2.	55.03	58.14	80.00	80.00	µg/L	6.	30	69.	73.	23 - 96
Hexachloroethane	SDI1-MS1-08-30	< 2.	62.41	65.46	80.00	80.00	µg/L	5.	30	78.	82.	27 - 117
Nitrobenzene	SDI1-MS1-08-30	< 2.	82.21	84.66	80.00	80.00	µg/L	3.	24	103.	106.	52 - 127
N-Nitrosodi-n-propylamine	SDI1-MS1-08-30	< 2.	71.24	70.41	80.00	80.00	µg/L	1.	30	89.	88.	50 - 122
Pyrene	SDI1-MS1-08-30	< 2.	59.49	58.65	80.00	80.00	µg/L	1.	30	74.	73.	19 - 162
1,2,4-Trichlorobenzene	SDI1-MS1-08-30	< 2.	65.82	67.88	80.00	80.00	µg/L	3.	30	82.	85.	35 - 109
4-Chloro-3-methylphenol	SDI1-MS1-08-30	< 5.	77.41	75.48	80.00	80.00	µg/L	3.	16	97.	94.	49 - 129
2-Chlorophenol	SDI1-MS1-08-30	< 2.	78.52	78.54	80.00	80.00	µg/L	0.	16	98.	98.	53 - 126
2-Methylphenol	SDI1-MS1-08-30	< 2.	73.68	72.53	80.00	80.00	µg/L	2.	23	92.	91.	45 - 117
3- & 4-Methylphenol	SDI1-MS1-08-30	< 2.	59.64	57.99	80.00	80.00	µg/L	3.	24	75.	72.	29 - 106
4-Nitrophenol	SDI1-MS1-08-30	< 2.	29.52	29.67	80.00	80.00	µg/L	1.	30	37.	37.	3 - 66
Pentachlorophenol	SDI1-MS1-08-30	< 10.	79.72	78.88	80.00	80.00	µg/L	1.	26	100.	99.	10 - 154
Phenol	SDI1-MS1-08-30	< 2.	35.89	35.77	80.00	80.00	µg/L	0.	28	45.	45.	23 - 61
2,4,6-Trichlorophenol	SDI1-MS1-08-30	< 5.	75.35	75.21	80.00	80.00	µg/L	0.	16	94.	94.	25 - 140
2-Fluorophenol	MS/MSD									70.	73.	21 - 100
Phenol-d5	MS/MSD									51.	52.	10 - 94
Nitrobenzene-d5	MS/MSD									106.	110.	35 - 114
2-Fluorobiphenyl	MS/MSD									94.	97.	43 - 116
2,4,6-Tribromophenol	MS/MSD									114.	114.	10 - 123
d14-Terphenyl	MS/MSD									83.	84.	33 - 141

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Precision & Accuracy)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: Aqueous
QC Batch ID: 200109889-1*8270

Samples Affected: 01-09889-1, 01-09889-2

MS = Matrix Spike; MSD = Matrix Spike Duplicate; RPD = Relative Percent Difference

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Laboratory Control Sample)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: Aqueous
QC Batch ID: 200109889-1*8270

Samples Affected: 01-09889-1, 01-09889-2

Constituents	QC Sample ID	Sample Result	Spike Level	Units	% Rec	Accuracy Control Limits
Acenaphthene	SDI1-LCSW1	68.03	80.00	µg/L	85.	46 - 113
1,4-Dichlorobenzene	SDI1-LCSW1	68.09	80.00	µg/L	85.	33 - 111
2,4-Dinitrotoluene	SDI1-LCSW1	74.32	80.00	µg/L	93.	21 - 157
Hexachlorobenzene	SDI1-LCSW1	69.53	80.00	µg/L	87.	38 - 117
Hexachlorobutadiene	SDI1-LCSW1	59.67	80.00	µg/L	75.	23 - 96
Hexachloroethane	SDI1-LCSW1	66.39	80.00	µg/L	83.	27 - 117
Nitrobenzene	SDI1-LCSW1	85.55	80.00	µg/L	107.	52 - 127
N-Nitrosodi-n-propylamine	SDI1-LCSW1	70.43	80.00	µg/L	88.	50 - 122
Pyrene	SDI1-LCSW1	57.66	80.00	µg/L	72.	19 - 162
1,2,4-Trichlorobenzene	SDI1-LCSW1	69.56	80.00	µg/L	87.	35 - 109
4-Chloro-3-methylphenol	SDI1-LCSW1	76.78	80.00	µg/L	96.	49 - 129
2-Chlorophenol	SDI1-LCSW1	80.50	80.00	µg/L	101.	53 - 126
2-Methylphenol	SDI1-LCSW1	74.17	80.00	µg/L	93.	45 - 117
3- & 4-Methylphenol	SDI1-LCSW1	58.13	80.00	µg/L	73.	29 - 106
4-Nitrophenol	SDI1-LCSW1	29.72	80.00	µg/L	37.	3 - 66
Pentachlorophenol	SDI1-LCSW1	83.94	80.00	µg/L	105.	10 - 154
Phenol	SDI1-LCSW1	36.35	80.00	µg/L	45.	23 - 61
2,4,6-Trichlorophenol	SDI1-LCSW1	76.55	80.00	µg/L	96.	25 - 140
2-Fluorophenol	SDI1-LCSW1				73.	21 - 100
Phenol-d5	SDI1-LCSW1				52.	10 - 94
Nitrobenzene-d5	SDI1-LCSW1				106.	35 - 114
2-Fluorobiphenyl	SDI1-LCSW1				95.	43 - 116
2,4,6-Tribromophenol	SDI1-LCSW1				113.	10 - 123
d14-Terphenyl	SDI1-LCSW1				82.	33 - 141

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Laboratory Control Sample)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: Aqueous
QC Batch ID: 200109889-1*8270

Samples Affected: 01-09889-1, 01-09889-2

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/20/2001
Sample Matrix: Aqueous
QC Batch ID: 200109889-1*WATER

Samples Affected: 01-09889-1, 01-09889-2

Constituents	Method Blank Readings	Units
Formaldehyde	<15.	µg/L

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Laboratory Control Sample)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/20/2001
Sample Matrix: Aqueous
QC Batch ID: 200109889-1*WATER

Samples Affected: 01-09889-1, 01-09889-2

Constituents	QC Sample ID	Sample Result	Duplicate Result	Spike Level	Units	% Rec	LCSD % Rec	RPD	Accuracy Control Limits	Precision Control Limits
Formaldehyde	LCS	49.2	49.4	50.	µg/L	98.	99.	0.	75 - 125	20

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

TRUESDAIL LABORATORIES, INC.
INDEPENDENT TESTING, FORENSIC SCIENCE, AND ENVIRONMENTAL ANALYSES
Established 1931
14201 FRANKLIN AVENUE
TUSTIN, CALIFORNIA 92780-7008
(714) 730-6239 · FAX (714) 730-6462
www.truesdail.com

REPORT

CLIENT: BC Laboratories
4100 Atlas Court
Bakersfield, CA 93308
ATTN: Kim Halbrook
SAMPLE DESCRIPTION: See below
INVESTIGATION: Formaldehyde by EPA Method 8315F
INSTRUMENT ID: Shimadzu HPLC A

LAB. NO.: 602796
REPORT DATE: 9/13/01
DATE(S) SAMPLED: 8/29/01
DATE RECEIVED: 8/30/01
DATE(S) EXTRACTED: 8/31/01
DATE(S) ANALYZED: 9/4/01
ANALYST(S): DW/RP

RESULTS SUMMARY

Lab Number	COC #10525 Sample ID / Desc	Time	Formaldyhyde ug/L	Initial Vol(ml)	Final Vol(ml)	Dilution Factor
602796 -1	01-09889-1	16:53	ND	100	10	1
602796 -2	01-09889-2	17:00	ND	100	10	1
602795 -MB			ND	100	10	1

Detection Limits for Reporting (DLR): 15
Method Detection Limits (MDL): 10

ug/L = Micrograms per Liter (ppb)

Respectfully Submitted,
TRUESDAIL LABORATORIES, INC.
Michael Whyte
Project Manager, Environmental Sciences

SEP 2 1 2001

BC LABORATORIES INC. **SAMPLE RECEIPT FORM** Rev. No.7 10/03/00 Page __ Of __

Submission #: 01-09889. Project Code: TB Batch #

SHIPPING INFORMATION

Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____

SHIPPING CONTAINER

Ice Chest ☒ None ☐
Box ☐ Other ☐ (Specify)_____

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals: Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☐ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received

☒ YES ☐ NO

Ice Chest ID _____ Date/Time 8/29/09 0955
Temperature: 9.6 °C
Thermometer ID: 82 Analyst Init SDW
Emissivity 98
Container Ampobank

Ice Chest ID _____ Date/Time _____
Temperature: _____ °C
Thermometer ID: _____ Analyst Init _____
Emissivity _____
Container

SAMPLE CONTAINERS	SAMPLE NUMBERS																							
	1	2	TB	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
QT GENERAL MINERAL/ GENERAL PHYSICAL	2	2																						
PT PE UNPRESERVED																								
QT INORGANIC CHEMICAL METALS																								
PT INORGANIC CHEMICAL METALS																								
PT CYANIDE	1	1																						
PT NITROGEN FORMS																								
PT TOTAL SULFIDE																								
2oz. NITRATE / NITRITE																								
100ml TOTAL ORGANIC CARBON																								
QT TOX																								
PT CHEMICAL OXYGEN DEMAND																								
100ml PHENOLICS																								
40ml VOA VIAL TRAVEL BLANK			1																					
40ml VOA VIAL	3	3																						
QT EPA 413.1, 413.2, 418.1																								
PT ODOR																								
RADIOLOGICAL																								
BACTERIOLOGICAL																								
PT EPA 504																								
QT EPA 508/608/8080																								
QT EPA 515.1/8150																								
QT EPA 525																								
QT EPA 525 TRAVEL BLANK																								
100ml EPA 547																								
100ml EPA 531.1																								
QT EPA 548																								
QT EPA 549																								
QT EPA 632																								
QT EPA 8015M																								
QT OA/OC																								
QT AMBER	2	2																						
8 OZ. JAR																								
32 OZ. JAR																								
SOIL SLEEVE																								
PCB VIAL																								
PLASTIC BAG																								

CHK BY DISTRIBUTION WHITE LAB SUB-OUT ☐

SHORT HOLDING TIME

Cl_2	NO_2	NO_3	OP	SS	
DO	BOD	MBAS	C	O	T

Comments:_____

Sample Numbering Completed By: SDW. Date/Time: 8/29/09. 0955.

[H:\DOCS\WP80\LAB_DOCS\FORMS\SAMREC2.WPD]

ERD Chain-of-Custody Record and Analytic Instructions

A 28025

Sampled By: Tina Carlson / NB
Sampler's Employer: LLNL
Project Name: LAKE DAVIS

Requester, (circle one): S300 / WGMG / Livermore

Send all results to:
Attn: ERD DMG L-528
Lawrence Livermore
National Laboratory
7000 East Ave.
Livermore, CA 94550

Field Log Book# ZJ014 Page 1 of 2
LLNL Acct. # 087643 Release #
Analytical Laboratory Name BC
Analytical Laboratory Log # 0109889

Analytical Lab Please Fax or Email copies to:

name Tina Carlson Fax# 925-422-6950 (circle one) Email
name Ned Boglin Fax# 925-422-6950 (circle one) Email

* [illegible] *

Sample Identification	Sample Date/Time	Matrix[2] Container[3]	# of Cont.	Study Area	E8260	E8270	E8315	E610.2	E180.1	E335.2	NUTRIENTSA			Additional Instructions to Lab / * Remarks *
1 3X056-DET1-120M	8/29/01 4:53pm	AQ V	3		5d									
2		AQ G	1			5d								
3		AQ G	1				5d							
4		AQ P	1					5d	5d					
5		AQ P	1							5d				
6		AQ P	1								5d			
7 3X056-DET2-120M	8/29/01 5:00pm	AQ V	3		5d									
8		AG G	1			5d								
9		AQ G	1				5d							

Signature	Company	Time	Date
Relinquished by Ned Boglin	LLNL - ERD	05:30p	8/29/01
Received by [illegible]	BC LABS	1745	8/29/01
Relinquished by [illegible]	BC LABS	1826	8/29/01
Received by [illegible]	BC LABS	1827	8-29-01
Relinquished by [illegible]	BC LABS	2246	8-29-01
Received by [illegible]	BC Labs	2246	8/29/01

[1] Enter the number of days or hours for TAT of the official printed report. See Requested Analysis code list for available TAT's for each type of analysis. Example: 24h = 24 hours / 20d = 20 day

[2] Sample Matrix Codes: **See list on back of pink copy**

[3] Container type codes: **V** = VOA Bottle, **P** = Polyethylene Bottle, **G** = Glass Bottle, **T** = Brass Tube, **B** = Bag, **S** = Stainless Steel Tube, **O** = Other (specify under remarks)

To receive copies of this data from DMG
CC:

4.6 ERD

White : Laboratory return to ERD Attn, ERD Data Management Team L-528 **Yellow : Analytical Lab** **Pink: Sampler leave with ERD** Attn, ERD Data Management Team L-528 **Gold: Sampler Leave with TRR**

ERD Chain-of-Custody Record and Analytic Instructions

A 28024

Sampled By: Tina Carlson
Sampler's Employer: LLNL
Project Name: LAKE DAVIS

Requester, (circle one): S300 / WGMG / Livermore

Send all results to:
Attn: ERD DMG L-528
Lawrence Livermore
National Laboratory
7000 East Ave.
Livermore, CA 94550

Field Log Book# ZJ014 Page 2 of 2
LLNL Acct. # 0876 43 Release #
Analytical Laboratory Name BC
Analytical Laboratory Log # 0109889

Analytical Lab Please Fax or Email copies to:

name Tina Carlson Fax# 925-422-6950 (circle one) Email
name Ned Boylin Fax# 925-422-6950 (circle one) Email
* [redacted]

Sample Identification	Sample Date/Time	Matrix[2] Container[3]	# of Cont.	Study Area	Analysis & Turnaround Required[1]: E335.2	NUTRIENTS A	E160.2	E180.1	Additional Instructions to Lab: * Remarks *
1 3X056-DET2-120M	8/29/01 5:00 pm	AQ P	1		5d				
2 "	" "	AQ P	1			5d			
3 "	" "	AQ P	1				5d	5d	
4									
5 Trip Blank									
6									
7									
8									
9									

Signature	Company	Time	Date
Relinquished by Ned Boylin	LLNL-ERD	05:30pm	8/29/01
Received by [illegible]	BC Labs	1845	8/29/01
Relinquished by [illegible]	BC Labs	1846	8/29/01
Received by [illegible]	BC Labs	1827	8-29-01
Relinquished by [illegible]	BC Labs	2246	8-29-01
Received by Gerard D Wells	BC Labs	2246	8/29/01

[1] Enter the number of days or hours for TAT of the official printed report. See Requested Analysis code list for available TAT's for each type of analysis. Example: 24h = 24 hours / 20d = 20 day

[2] Sample Matrix Codes: **See list on back of pink copy**

[3] Container type codes: **V** = VOA Bottle, **P** = Polyethylene Bottle, **G** = Glass Bottle, **T** = Brass Tube, **B** = Bag, **S** = Stainless Steel Tube, **O** = Other (specify under remarks)

To receive copies of this data from DMG
CC:

Revision 4.6
21-jul-99 ERD

White : Laboratory return to ERD Attn. ERD Data Management Team L-528 — Yellow : Analytical Lab — Pink: Sampler leave with ERD Attn. ERD Data Management Team L-528 — Gold: Sampler Leave with TRR

BC Laboratories, Inc

DATA QUALIFIER FLAG ATTACHED

CASE NARRATIVE

COC A28017
Requestor: Livermore

Date: 09/28/01

Laboratory Number: 01-09948
Field Log Book # ZJ016

THIS IS REALLY 300-EXP-056

Table of Qualified Data

BC Laboratory Number	LLNL Sample Identification	Sampling Date	Analyses	Flags
01-09948-1	3X056-DET1-1200M	08/30/01 @ 1053	E160.2 E180.1 E335.2 NutrientsA E8260 E8270 E8315 PETN	 *16 – Batch specific matrix spike recovery(s) are not within QC limits. Accuracy verified through LCS. *16 – Batch specific matrix spike recovery(s) are not within QC limits. Accuracy verified through LCS. * - Formaldehyde was analyzed by Truesdail Labs(602799-1). * - Sample was analyzed by CLS (T1298-1A).
01-09948-2	3X056-DET2-1200M	08/30/01 @ 1100	E160.2 E180.1 E335.2 NutrientsA E8260 E8270 E8315 PETN	 *16 – Batch specific matrix spike recovery(s) are not within QC limits. Accuracy verified through LCS. *16 – Batch specific matrix spike recovery(s) are not within QC limits. Accuracy verified through LCS. * - Formaldehyde was analyzed by Truesdail Labs(602799-1). * - Sample was analyzecd by CLS (T1298-2A).
01-09948-3TB	TRIP BLANK 08/06/01		E8260	*16 – Batch specific matrix spike recovery(s) are not within QC limits. Accuracy verified through LCS.

I. Sample Receipt
Samples received refrigerated to 4.1°C.

BC Laboratories, Inc

CASE NARRATIVE CONTINUED

II. Holding Times.
All holding time requirements met.

III. Method Blanks
Method blanks were prepared and analyzed at the required requirements.

IV. Calibration
Initial calibration criteria for respective analyses were met. Frequency criteria for initial and continuing calibrations were met. Accuracy criteria for initial and continuing calibrations were met.

V. Matrix Spikes
Precision and Accuracy requirements were within QC limits except for the matrix spike recoveries for Ammonia and EPA 8260 compounds 1,1-Dichloroethene and 1,1-Dichloroethane. The sample reports are flagged accordingly.

VI. LCS
The LCS recoveries are within QC limits.

VII. Discussion
No other significant issues to be discussed.

Sincerely

Kim Halbrook,
Project Manager

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

Todays Date: 10-01-01

DATA QUALIFIER FLAG FORM

Circle the appropriate qualifier flags and fill out information below.

Flag	Definition
B	Analyte found in method blank
F	Analyte found in field blank, trip blank, or equipment blank
G	Quantitated using fuel calibration, but does not match typical fuel fingerprint.
I	Surrogate recoveries were outside of QC limits.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
(L)	Spike accuracy not within control limits.
O	Duplicate spike or sample precision not within control limits.
R	Sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet QC criteria. The presence or absence of the analyte cannot be verified.
S	The analytical results from this sample are suspect.
T	Analyte is tentatively identified compound; result is approximate.

Laboratory Code: (circle one) (BB), CN, TN, GE, QR or other: _____

QC Chemist Initials: NB Requested Analysis: E8315

Analyte(s)/Code: Formaldehyde (4840)

Explanation (check one or fill in):

[X] Insufficient sample for spike. [ ] _____ in method blank.

[ ] Matrix interference. [X] LCS validates methodology. LCS/LCSD

[ ] High concentration of _____ in spiked sample.

[X] Other/comments: no matrix spk performed

Log Number of Affected Samples: 01-09948-1, -2

For Data Management Use Only:

Entered: Initials _____ Date: _____

Elect. Confirmed: Initials: _____ Date: _____

Last Revised: April 13, 1999 by VRD

Todays Date: 10-01-01

DATA QUALIFIER FLAG FORM

Circle the appropriate qualifier flags and fill out information below.

Flag	Definition
B	Analyte found in method blank
F	Analyte found in field blank, trip blank, or equipment blank
G	Quantitated using fuel calibration, but does not match typical fuel fingerprint.
I	Surrogate recoveries were outside of QC limits.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
(L)	Spike accuracy not within control limits.
O	Duplicate spike or sample precision not within control limits.
R	Sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet QC criteria. The presence or absence of the analyte cannot be verified.
S	The analytical results from this sample are suspect.
T	Analyte is tentatively identified compound; result is approximate.

Laboratory Code: (circle one) (BB), CN, TN, GE, QR or other: _____

QC Chemist Initials: NB Requested Analysis: NUTRIENTS A

Analyte(s)/Code: Ammonia as N (0325)

Explanation (check one or fill in):

[ ] Insufficient sample for spike. [ ] _____ in method blank.

[ ] Matrix interference. [X] LCS validates methodology.

[ ] High concentration of _____ in spiked sample.

[X] Other/comments: ms/msd %R < LCL

Log Number of Affected Samples: 01 - 09948 -1, -2

For Data Management Use Only:

Entered: Initials _____ Date: _____

Elect. Confirmed: Initials: _____ Date: _____

Last Revised: April 13, 1999 by VRD

Todays Date: 10-01-01

DATA QUALIFIER FLAG FORM

Circle the appropriate qualifier flags and fill out information below.

Flag	Definition
B	Analyte found in method blank
F	Analyte found in field blank, trip blank, or equipment blank
G	Quantitated using fuel calibration, but does not match typical fuel fingerprint.
I	Surrogate recoveries were outside of QC limits.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
(L)	Spike accuracy not within control limits.
O	Duplicate spike or sample precision not within control limits.
R	Sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet QC criteria. The presence or absence of the analyte cannot be verified.
S	The analytical results from this sample are suspect.
T	Analyte is tentatively identified compound; result is approximate.

Laboratory Code: (circle one) (BB) CN, TN, GE, QR or other: _____

QC Chemist Initials: NB Requested Analysis: E 8260

Analyte(s)/Code: 1,1-DCE (8260)

Explanation (check one or fill in):

[ ] Insufficient sample for spike. [ ] _____ in method blank.

[ ] Matrix interference. [X] LCS validates methodology.

[ ] High concentration of 1 in spiked sample.

[X] Other/comments: MS/MSD % R >UCL

Log Number of Affected Samples: 01-09948-1 TO -3TB

For Data Management Use Only:

Entered: Initials _____ Date: _____

Elect. Confirmed: Initials: _____ Date: _____

Last Revised: April 13, 1999 by VRD

BC Laboratories, Inc

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/07/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-1

Project Number: UNICARD
COC Number: ZJ016
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET1-1200M
Sample Depth:
Sampling Date/Time: 08/30/2001 @ 10:53
Sample Matrix: AQ - Aqueous
Sample Collected By: TINA CARLSEN

THIS IS REALLY:
300-EXP-056

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code	
Nitrate as NO3	None Detected	mg/L	0.5	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5945	
Nitrate as N	None Detected	mg/L	0.20	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5895	
Nitrate/Nitrite as N	None Detected	mg/L	0.1	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5950	
Total Suspended Solids													
using glass fiber Type A/E	8.8	mg/L	2.	EPA-160.2	08/31/01	SAS	2.5	MANUAL	n.a.	08/31/01	E160.2	7450	
Turbidity	10.	NT Units	0.1	EPA-180.1	08/31/01	PDL	1.	T2100	n.a.	08/31/01	E180.1	8850	
Total Cyanide	0.061	mg/L	0.02	EPA-335.3	09/05/01	TDC	1.	AAII-1	EPA-335.3	09/05/01	E335.2	2850	
Total Kjeldahl Nitrogen	1.5	mg/L	0.20	EPA-351.2	09/05/01	NJC	1.	RFA-1	EPA-351.2	09/04/01	NUTRIENTSA	5980	
Ammonia as N	0.43	mg/L	0.025	EPA-350.1	09/05/01	NJC	1.	AAII-5	n.a.	09/05/01	NUTRIENTSA	0325	*16
Nitrite as N	None Detected	mg/L	0.02	EPA-353.2	08/31/01	NJC	1.	RFA-2	n.a.	08/31/01	NUTRIENTSA	5960	
Nitrite as NO2	None Detected	mg/L	0.50	EPA-353.2	08/31/01	NJC	1.	RFA-2	n.a.	08/31/01	NUTRIENTSA	5975	

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

300-EXP-056

Date Reported: 09/07/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-1

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET1-1200M, 08/30/2001 @ 10:53, TINA CARLSEN

P.Q.L. = Practical Quantitation Limit (refers to the least amount of analyte quantifiable based on sample size used and analytical technique employed).

Flag Explanations:
*16 = Batch specific matrix spike recovery(s) are not within QC limits. Accuracy verified through LCS.

California D.O.H.S. Cert. #1186

M. Atencio

Marna Atencio
Department Supervisor

BC Laboratories, Inc

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/07/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-2

Project Number: UNICARD
COC Number: ZJ016
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET2-1200M
Sample Depth:
Sampling Date/Time: 08/30/2001 @ 11:00
Sample Matrix: AQ - Aqueous
Sample Collected By: TINA CARLSEN

THIS IS REALLY:
300-EXP-056

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code	
Nitrate as NO3	None Detected	mg/L	0.5	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5945	
Nitrate as N	None Detected	mg/L	0.20	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5895	
Nitrate/Nitrite as N	None Detected	mg/L	0.1	EPA-353.2	09/05/01	NJC	1.	RFA-2	n.a.	09/05/01	NUTRIENTSA	5950	
Total Suspended Solids using glass fiber Type A/E	17.	mg/L	1.	EPA-160.2	08/31/01	SAS	2.	MANUAL	n.a.	08/31/01	E160.2	7450	
Turbidity	10.	NT Units	0.1	EPA-180.1	08/31/01	PDL	1.	T2100	n.a.	08/31/01	E180.1	8850	
Total Cyanide	0.081	mg/L	0.02	EPA-335.3	09/05/01	TDC	1.	AAII-1	EPA-335.3	09/05/01	E335.2	2850	
Total Kjeldahl Nitrogen	1.6	mg/L	0.20	EPA-351.2	09/05/01	NJC	1.	RFA-1	EPA-351.2	09/04/01	NUTRIENTSA	5980	
Ammonia as N	0.44	mg/L	0.025	EPA-350.1	09/05/01	NJC	1.	AAII-5	n.a.	09/05/01	NUTRIENTSA	0325	*16
Nitrite as N	None Detected	mg/L	0.02	EPA-353.2	08/31/01	NJC	1.	RFA-2	n.a.	08/31/01	NUTRIENTSA	5960	
Nitrite as NO2	None Detected	mg/L	0.50	EPA-353.2	08/31/01	NJC	1.	RFA-2	n.a.	08/31/01	NUTRIENTSA	5975	

BC Laboratories, Inc

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

THIS IS REALLY
300-EXP-056

Date Reported: 09/07/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-2

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET2-1200M, 08/30/2001 @ 11:00, TINA CARLSEN

P.Q.L. = Practical Quantitation Limit (refers to the least amount of analyte quantifiable based on sample size used and analytical technique employed).

Flag Explanations:
*16 = Batch specific matrix spike recovery(s) are not within QC limits. Accuracy verified through LCS.

California D.O.H.S. Cert #1186

M. Atencio

Marna Atencio
Department Supervisor

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-1
(Revised)

Date Collected: 08/30/2001 @ 10:53

Project Number: UNICARD
COC Number: ZJ016
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET1-1200M
Sample Matrix: AQ - Aqueous
Sample Collected By: TINA CARLSEN

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code	
Benzene	7.1	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	0500	
Bromodichloromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1450	
Bromoform	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1500	
Bromomethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1550	
Carbon tetrachloride	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1800	
Chlorobenzene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2000	
Chloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2050	
2-Chloroethylvinyl ether	None Detected	µg/L	10.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2100	
Chloroform	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2150	
Chloromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2200	
Dibromochloromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3200	
1,2-Dibromo-3-Chloropropane	None Detected	µg/L	1.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3185	
Dichlorodifluoromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3500	
1,1-Dichloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3550	*16
1,2-Dichloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3600	
1,1-Dichloroethene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3650	*16
cis-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3695	
trans-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3700	
Total 1,2-Dichloroethene	None Detected	µg/L	2.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3705	
1,2-Dichloropropane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3850	
cis-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3900	
trans-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3950	
Total 1,3-Dichloropropene	None Detected	µg/L	2.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3975	
Ethyl Benzene	0.51	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	4700	
Methylene Chloride	None Detected	µg/L	1.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	5750	

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-1
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET1-1200M, 08/30/2001 @ 10:53, TINA CARLSEN

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Styrene	1.3	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	7968
1,1,1,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8185
1,1,2,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8200
Tetrachloroethene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8250
Toluene	3.8	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8350
1,1,1-Trichloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8550
1,1,2-Trichloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8600
Trichloroethene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8650
Trichlorofluoromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8700
1,2,3-Trichloropropane	None Detected	µg/L	1.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8753
1,1,2-Trichloro-1,2,2-trifluoroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	4850
Vinyl Chloride	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8900
Total Xylenes	None Detected	µg/L	1.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8975
Total Trihalomethanes	None Detected	µg/L	2.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8760
Acetone	None Detected	µg/L	20.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	0125
Acetonitrile	None Detected	µg/L	100.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	0110
Acrolein	None Detected	µg/L	50.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	0150
Acrylonitrile	None Detected	µg/L	50.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	0200
2-Butanone	None Detected	µg/L	20.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	5815
Carbon Disulfide	None Detected	µg/L	5.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1775
Chloroprene	None Detected	µg/L	5.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2025
1,4-Dichloro-2-butene	None Detected	µg/L	5.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3285
1,4-Dioxane	None Detected	µg/L	300.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	4360
Ethanol	None Detected	µg/L	1000.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	4675
2-Hexanone	None Detected	µg/L	20.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	5735
4-Methyl-2-pentanone	None Detected	µg/L	20.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	5720
Methyl-t-butylether	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	5728
Vinyl acetate	None Detected	µg/L	20.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8885

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-1
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET1-1200M, 08/30/2001 @ 10:53, TINA CARLSEN

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code

Quality Control Data

Surrogates	% Recovery	Control Limits
1,2-Dichloroethane-d4	102.	76-114
Toluene-d8	107.	88-110
4-Bromofluorobenzene	103.	86-115

Note: Sample received at neutral pH.

Flag Explanations:
*16 = Batch specific matrix spike recovery(s) are not within QC limits.
Accuracy verified through LCS.
California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-2
(Revised)

Date Collected: 08/30/2001 @ 11:00

Project Number: UNICARD
COC Number: ZJ016
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET2-1200M
Sample Matrix: AQ - Aqueous
Sample Collected By: TINA CARLSEN

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code	
Benzene	8.8	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	0500	
Bromodichloromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1450	
Bromoform	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1500	
Bromomethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1550	
Carbon tetrachloride	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1800	
Chlorobenzene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2000	
Chloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2050	
2-Chloroethylvinyl ether	None Detected	µg/L	10.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2100	
Chloroform	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2150	
Chloromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2200	
Dibromochloromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3200	
1,2-Dibromo-3-Chloropropane	None Detected	µg/L	1.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3185	
Dichlorodifluoromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3500	
1,1-Dichloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3550	*16
1,2-Dichloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3600	
1,1-Dichloroethene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3650	*16
cis-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3695	
trans-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3700	
Total 1,2-Dichloroethene	None Detected	µg/L	2.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3705	
1,2-Dichloropropane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3850	
cis-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3900	
trans-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3950	
Total 1,3-Dichloropropene	None Detected	µg/L	2.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3975	
Ethyl Benzene	0.68	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	4700	
Methylene Chloride	None Detected	µg/L	1.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	5750	

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-2
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET2-1200M, 08/30/2001 @ 11:00, TINA CARLSEN

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Styrene	1.7	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	7968
1,1,1,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8185
1,1,2,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8200
Tetrachloroethene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8250
Toluene	4.9	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8350
1,1,1-Trichloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8550
1,1,2-Trichloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8600
Trichloroethene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8650
Trichlorofluoromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8700
1,2,3-Trichloropropane	None Detected	µg/L	1.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8753
1,1,2-Trichloro-1,2,2-trifluoroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	4850
Vinyl Chloride	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8900
Total Xylenes	1.3	µg/L	1.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8975
Total Trihalomethanes	None Detected	µg/L	2.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8760
Acetone	None Detected	µg/L	20.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	0125
Acetonitrile	None Detected	µg/L	100.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	0110
Acrolein	None Detected	µg/L	50.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	0150
Acrylonitrile	None Detected	µg/L	50.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	0200
2-Butanone	None Detected	µg/L	20.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	5815
Carbon Disulfide	None Detected	µg/L	5.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1775
Chloroprene	None Detected	µg/L	5.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2025
1,4-Dichloro-2-butene	None Detected	µg/L	5.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3285
1,4-Dioxane	None Detected	µg/L	300.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	4360
Ethanol	None Detected	µg/L	1000.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	4675
2-Hexanone	None Detected	µg/L	20.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	5735
4-Methyl-2-pentanone	None Detected	µg/L	20.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	5720
Methyl-t-butylether	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	5728
Vinyl acetate	None Detected	µg/L	20.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8885

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-2
(Revised)

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET2-1200M, 08/30/2001 @ 11:00, TINA CARLSEN

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code

Quality Control Data

Surrogates	% Recovery	Control Limits
1,2-Dichloroethane-d4	102.	76-114
Toluene-d8	108.	88-110
4-Bromofluorobenzene	103.	86-115

Note: Sample received at neutral pH.

Flag Explanations:
*16 = Batch specific matrix spike recovery(s) are not within QC limits.
Accuracy verified through LCS.
California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-3TB
(Revised)

Date Collected: 08/06/2001

Project Number: UNICARD
COC Number: ZJ016
Sampling Location: LAKE DAVIS
Sample ID: TRIPBLANK 08/06/01
Sample Matrix: BW - Blank water
Sample Collected By: TINA CARLSEN

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code	
Benzene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	0500	
Bromodichloromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1450	
Bromoform	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1500	
Bromomethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1550	
Carbon tetrachloride	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1800	
Chlorobenzene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2000	
Chloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2050	
2-Chloroethylvinyl ether	None Detected	µg/L	10.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2100	
Chloroform	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2150	
Chloromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2200	
Dibromochloromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3200	
1,2-Dibromo-3-Chloropropane	None Detected	µg/L	1.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3185	
Dichlorodifluoromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3500	
1,1-Dichloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3550	*16
1,2-Dichloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3600	
1,1-Dichloroethene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3650	*16
cis-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3695	
trans-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3700	
Total 1,2-Dichloroethene	None Detected	µg/L	2.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3705	
1,2-Dichloropropane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3850	
cis-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3900	
trans-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3950	
Total 1,3-Dichloropropene	None Detected	µg/L	2.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3975	
Ethyl Benzene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	4700	
Methylene Chloride	None Detected	µg/L	1.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	5750	

BC Laboratories, Inc

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-3TB
(Revised)

Date Collected: 08/06/2001

Project Number: UNICARD
COC Number: ZJ016
Sampling Location: LAKE DAVIS
Sample ID: TRIPBLANK 08/06/01
Sample Matrix: BW - Blank water
Sample Collected By: TINA CARLSEN

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code	
Benzene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	0500	
Bromodichloromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1450	
Bromoform	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1500	
Bromomethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1550	
Carbon tetrachloride	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1800	
Chlorobenzene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2000	
Chloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2050	
2-Chloroethylvinyl ether	None Detected	µg/L	10.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2100	
Chloroform	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2150	
Chloromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2200	
Dibromochloromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3200	
1,2-Dibromo-3-Chloropropane	None Detected	µg/L	1.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3185	
Dichlorodifluoromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3500	
1,1-Dichloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3550	*16
1,2-Dichloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3600	
1,1-Dichloroethene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3650	*16
cis-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3695	
trans-1,2-Dichloroethene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3700	
Total 1,2-Dichloroethene	None Detected	µg/L	2.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3705	
1,2-Dichloropropane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3850	
cis-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3900	
trans-1,3-Dichloropropene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3950	
Total 1,3-Dichloropropene	None Detected	µg/L	2.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3975	
Ethyl Benzene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	4700	
Methylene Chloride	None Detected	µg/L	1.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	5750	

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-3TB
(Revised)

Sample Description: UNICARD, LAKE DAVIS, TRIPBLANK 08/06/01, 08/06/2001, TINA CARLSEN

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Styrene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	7968
1,1,1,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8185
1,1,2,2-Tetrachloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8200
Tetrachloroethene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8250
Toluene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8350
1,1,1-Trichloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8550
1,1,2-Trichloroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8600
Trichloroethene	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8650
Trichlorofluoromethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8700
1,2,3-Trichloropropane	None Detected	µg/L	1.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8753
1,1,2-Trichloro-1,2,2-trifluoroethane	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	4850
Vinyl Chloride	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8900
Total Xylenes	None Detected	µg/L	1.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8975
Total Trihalomethanes	None Detected	µg/L	2.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8760
Acetone	55.	µg/L	20.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	0125
Acetonitrile	None Detected	µg/L	100.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	0110
Acrolein	None Detected	µg/L	50.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	0150
Acrylonitrile	None Detected	µg/L	50.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	0200
2-Butanone	None Detected	µg/L	20.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	5815
Carbon Disulfide	None Detected	µg/L	5.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	1775
Chloroprene	None Detected	µg/L	5.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	2025
1,4-Dichloro-2-butene	None Detected	µg/L	5.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	3285
1,4-Dioxane	None Detected	µg/L	300.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	4360
Ethanol	None Detected	µg/L	1000.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	4675
2-Hexanone	None Detected	µg/L	20.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	5735
4-Methyl-2-pentanone	None Detected	µg/L	20.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	5720
Methyl-t-butylether	None Detected	µg/L	0.5	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	5728
Vinyl acetate	None Detected	µg/L	20.	8260	09/05/01	SNM	1.	MS-V4	5030	09/05/01	E8260	8885

Volatile Organic Analysis
(EPA Method 8260)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 10/10/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-3TB
(Revised)

Sample Description: UNICARD, LAKE DAVIS, TRIPBLANK 08/06/01, 08/06/2001, TINA CARLSEN

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code

Quality Control Data

Surrogates	% Recovery	Control Limits
1,2-Dichloroethane-d4	109.	76-114
Toluene-d8	105.	88-110
4-Bromofluorobenzene	99.	86-115

Note: Sample received at neutral pH.

Flag Explanations:
*16 = Batch specific matrix spike recovery(s) are not within QC limits.
Accuracy verified through LCS.
California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 10/10/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8260

Samples Affected: 01-09948-1 through 01-09948-3TB

Constituents	Method Blank Readings	Units
Benzene	< 0.5	µg/L
Bromodichloromethane	< 0.5	µg/L
Bromoform	< 0.5	µg/L
Bromomethane	< 0.5	µg/L
Carbon tetrachloride	< 0.5	µg/L
Chlorobenzene	< 0.5	µg/L
Chloroethane	< 0.5	µg/L
2-Chloroethylvinyl ether	<10.	µg/L
Chloroform	< 0.5	µg/L
Chloromethane	< 0.5	µg/L
Dibromochloromethane	< 0.5	µg/L
1,2-Dibromo-3-Chloropropane	< 0.5	µg/L
Dichlorodifluoromethane	< 0.5	µg/L
1,1-Dichloroethane	< 0.5	µg/L
1,2-Dichloroethane	< 0.5	µg/L
1,1-Dichloroethene	< 0.5	µg/L
cis-1,2-Dichloroethene	< 0.5	µg/L
trans-1,2-Dichloroethene	< 0.5	µg/L
Total 1,2-Dichloroethene	< 2.	µg/L
1,2-Dichloropropane	< 0.5	µg/L
cis-1,3-Dichloropropene	< 0.5	µg/L
trans-1,3-Dichloropropene	< 0.5	µg/L
Total 1,3-Dichloropropene	< 2.	µg/L
Ethyl Benzene	< 0.5	µg/L
Methylene Chloride	< 1.	µg/L
Styrene	< 0.5	µg/L
1,1,1,2-Tetrachloroethane	< 0.5	µg/L
1,1,2,2-Tetrachloroethane	< 0.5	µg/L
Tetrachloroethene	< 0.5	µg/L
Toluene	< 0.5	µg/L

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 10/10/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8260

Samples Affected: 01-09948-1 through 01-09948-3TB

Constituents	Method Blank Readings	Units
1,1,1-Trichloroethane	< 0.5	µg/L
1,1,2-Trichloroethane	< 0.5	µg/L
Trichloroethene	< 0.5	µg/L
Trichlorofluoromethane	< 0.5	µg/L
1,2,3-Trichloropropane	< 1.	µg/L
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.5	µg/L
Vinyl Chloride	< 0.5	µg/L
Total Xylenes	< 1.	µg/L
Total Trihalomethanes	< 2.	µg/L
Acetone	<10.	µg/L
Acetonitrile	<100.	µg/L
Acrolein	<50.	µg/L
Acrylonitrile	<50.	µg/L
2-Butanone	<20.	µg/L
Carbon Disulfide	< 5.	µg/L
Chloroprene	< 5.	µg/L
1,4-Dichloro-2-butene	< 5.	µg/L
1,4-Dioxane	<300.	µg/L
Ethanol	<1000.	µg/L
2-Hexanone	<20.	µg/L
4-Methyl-2-pentanone	<20.	µg/L
Methyl-t-butylether	< 0.5	µg/L
Vinyl acetate	<20.	µg/L
1,2-Dichloroethane-d4	100.	%
Toluene-d8	105.	%
4-Bromofluorobenzene	101.	%

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 10/10/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8260

Samples Affected: 01-09948-1 through 01-09948-3TB

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc.

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

THIS IS REALLY 300-EXP-05-6

Project Number: UNICARD
COC Number: ZJ016
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET1-1200M
Sample Matrix: AQ - Aqueous
Sample Collected By: TINA CARLSEN

Date Reported: 09/10/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-1

Date Collected: 08/30/2001 @ 10:53
Date Extracted: 08/31/2001
Date Analyzed: 09/06/2001 @ 03:30
Extract Method: 3510
Method: 8270
Analyst: SKC
Dilution Used: 1
Instrument ID: MS-B2

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
Acenaphthene	None Detected	µg/L	2.	E8270	0050
Acenaphthylene	None Detected	µg/L	2.	E8270	0100
Aldrin	None Detected	µg/L	2.	E8270	0250
Aniline	None Detected	µg/L	5.	E8270	0335
Anthracene	None Detected	µg/L	2.	E8270	0350
Benzidine	None Detected	µg/L	20.	E8270	0600
Benzo (a) anthracene	None Detected	µg/L	2.	E8270	0650
Benzo (b) fluoranthene	None Detected	µg/L	2.	E8270	0700
Benzo (k) fluoranthene	None Detected	µg/L	2.	E8270	0750
Benzo (a) pyrene	None Detected	µg/L	2.	E8270	0850
Benzo (ghi) perylene	None Detected	µg/L	2.	E8270	0800
Benzoic Acid	None Detected	µg/L	10.	E8270	0875
Benzyl alcohol	None Detected	µg/L	2.	E8270	0880
Butyl Benzyl phthalate	None Detected	µg/L	2.	E8270	1625
alpha-BHC	None Detected	µg/L	2.	E8270	0950
beta-BHC	None Detected	µg/L	2.	E8270	1000
delta-BHC	None Detected	µg/L	2.	E8270	1050
gamma-BHC	None Detected	µg/L	2.	E8270	1100
bis(2-chloroethyl)ether	None Detected	µg/L	2.	E8270	1250
bis(2-chloroethoxy)methane	None Detected	µg/L	2.	E8270	1200
bis(2-chloro-1-methylethyl)	None Detected	µg/L	2.	E8270	1300
bis(2-ethylhexyl)phthalate	17.	µg/L	5.	E8270	1350
4-Bromophenyl phenyl ether	None Detected	µg/L	2.	E8270	1613
4-Chloroaniline	None Detected	µg/L	2.	E8270	1975
2-Chloronaphthalene	None Detected	µg/L	2.	E8270	2300
4-Chlorophenyl phenyl ether	None Detected	µg/L	2.	E8270	2425
Chrysene	None Detected	µg/L	2.	E8270	2600
4,4-DDD'	None Detected	µg/L	2.	E8270	2900
4,4-DDE'	None Detected	µg/L	3.	E8270	2950
4,4-DDT'	None Detected	µg/L	2.	E8270	3000
Dibenzo (a,h) anthracene	None Detected	µg/L	3.	E8270	3150
Dibenzofuran	None Detected	µg/L	2.	E8270	3175
Di-n-butyl phthalate	None Detected	µg/L	2.	E8270	3250
1,2-Dichlorobenzene	None Detected	µg/L	2.	E8270	3300
1,3-Dichlorobenzene	None Detected	µg/L	2.	E8270	3350
1,4-Dichlorobenzene	None Detected	µg/L	2.	E8270	3400
3,3-Dichlorobenzidine	None Detected	µg/L	10.	E8270	3450
Dieldrin	None Detected	µg/L	3.	E8270	4000

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY THIS IS REALLY
P.O. BOX 808, L528 300-EXP-056
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/10/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-1

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET1-1200M, 08/30/2001 @ 10:53, TINA CARLSEN

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
Diethyl phthalate	None Detected	µg/L	2.	E8270	4050
Dimethyl phthalate	None Detected	µg/L	2.	E8270	4150
2,4-Dinitrotoluene	None Detected	µg/L	2.	E8270	4250
2,6-Dinitrotoluene	None Detected	µg/L	2.	E8270	4300
Di-n-octylphthalate	None Detected	µg/L	2.	E8270	4350
1,2-Diphenylhydrazine	None Detected	µg/L	2.	E8270	4400
Endosulfan I	None Detected	µg/L	10.	E8270	4450
Endosulfan II	None Detected	µg/L	10.	E8270	4500
Endosulfan sulfate	None Detected	µg/L	3.	E8270	4550
Endrin	None Detected	µg/L	2.	E8270	4600
Endrin aldehyde	None Detected	µg/L	10.	E8270	4650
Fluoranthene	None Detected	µg/L	2.	E8270	4750
Fluorene	None Detected	µg/L	2.	E8270	4800
Heptachlor	None Detected	µg/L	2.	E8270	4950
Heptachlor epoxide	None Detected	µg/L	2.	E8270	5000
Hexachlorobenzene	None Detected	µg/L	2.	E8270	5050
Hexachlorobutadiene	None Detected	µg/L	2.	E8270	5100
Hexachlorocyclopentadiene	None Detected	µg/L	2.	E8270	5150
Hexachloroethane	None Detected	µg/L	2.	E8270	5200
Indeno (1,2,3-cd) pyrene	None Detected	µg/L	2.	E8270	5300
Isophorone	None Detected	µg/L	2.	E8270	5400
2-Methylnaphthalene	None Detected	µg/L	2.	E8270	5740
Naphthalene	2.1	µg/L	2.	E8270	5800
2-Naphthylamine	None Detected	µg/L	20.	E8270	5805
2-Nitroaniline	None Detected	µg/L	2.	E8270	5990
3-Nitroaniline	None Detected	µg/L	2.	E8270	5992
4-Nitroaniline	None Detected	µg/L	5.	E8270	5994
Nitrobenzene	None Detected	µg/L	2.	E8270	6000
n-Nitrosodimethylamine	None Detected	µg/L	2.	E8270	6150
n-Nitrosodiphenylamine	None Detected	µg/L	2.	E8270	6200
N-Nitrosodi-n-propylamine	None Detected	µg/L	2.	E8270	6250
Phenanthrene	None Detected	µg/L	2.	E8270	6850
Pyrene	None Detected	µg/L	2.	E8270	7100
1,2,4-Trichlorobenzene	None Detected	µg/L	2.	E8270	8500
4-Chloro-3-methylphenol	None Detected	µg/L	5.	E8270	2250
2-Chlorophenol	None Detected	µg/L	2.	E8270	2350
2,4-Dichlorophenol	None Detected	µg/L	2.	E8270	3750
2,4-Dimethylphenol	None Detected	µg/L	2.	E8270	4100
2,4-Dinitrophenol	None Detected	µg/L	10.	E8270	4200
2-Methyl-4,6-dinitrophenol	None Detected	µg/L	10.	E8270	5700
2-Methylphenol	None Detected	µg/L	2.	E8270	5730
3- & 4-Methylphenol	None Detected	µg/L	2.	E8270	5734

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

THIS IS REALLY 300-EXP-056

Date Reported: 09/10/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-1

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET1-1200M, 08/30/2001 @ 10:53, TINA CARLSEN

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
2-Nitrophenol	None Detected	µg/L	2.	E8270	6050
4-Nitrophenol	None Detected	µg/L	2.	E8270	6100
Pentachlorophenol	None Detected	µg/L	10.	E8270	6400
Phenol	None Detected	µg/L	2.	E8270	6900
2,4,5-Trichlorophenol	None Detected	µg/L	5.	E8270	8745
2,4,6-Trichlorophenol	None Detected	µg/L	5.	E8270	8750
2-Picoline	None Detected	µg/L	10.	E8270	7120

Quality Control Data

Surrogates	% Recovery	Control Limits
2-Fluorophenol	52.	21-100
Phenol-d5	37.	10-94
Nitrobenzene-d5	90.	35-114
2-Fluorobiphenyl	85.	43-116
2,4,6-Tribromophenol	76.	10-123
d14-Terphenyl	82.	33-141

California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc.

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/10/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-2

THIS IS REALLY: 300-EXP-056

Project Number: UNICARD
COC Number: ZJ016
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET2-1200M
Sample Matrix: AQ - Aqueous
Sample Collected By: TINA CARLSEN

Date Collected: 08/30/2001 @ 11:00
Date Extracted: 08/31/2001
Date Analyzed: 09/06/2001 @ 04:14
Extract Method: 3510
Method: 8270
Analyst: SKC
Dilution Used: 1
Instrument ID: MS-B2

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
Acenaphthene	None Detected	µg/L	2.	E8270	0050
Acenaphthylene	None Detected	µg/L	2.	E8270	0100
Aldrin	None Detected	µg/L	2.	E8270	0250
Aniline	None Detected	µg/L	5.	E8270	0335
Anthracene	None Detected	µg/L	2.	E8270	0350
Benzidine	None Detected	µg/L	20.	E8270	0600
Benzo (a) anthracene	None Detected	µg/L	2.	E8270	0650
Benzo (b) fluoranthene	None Detected	µg/L	2.	E8270	0700
Benzo (k) fluoranthene	None Detected	µg/L	2.	E8270	0750
Benzo (a) pyrene	None Detected	µg/L	2.	E8270	0850
Benzo (ghi) perylene	None Detected	µg/L	2.	E8270	0800
Benzoic Acid	None Detected	µg/L	10.	E8270	0875
Benzyl alcohol	None Detected	µg/L	2.	E8270	0880
Butyl Benzyl phthalate	None Detected	µg/L	2.	E8270	1625
alpha-BHC	None Detected	µg/L	2.	E8270	0950
beta-BHC	None Detected	µg/L	2.	E8270	1000
delta-BHC	None Detected	µg/L	2.	E8270	1050
gamma-BHC	None Detected	µg/L	2.	E8270	1100
bis(2-chloroethyl)ether	None Detected	µg/L	2.	E8270	1250
bis(2-chloroethoxy)methane	None Detected	µg/L	2.	E8270	1200
bis(2-chloro-1-methylethyl)	None Detected	µg/L	2.	E8270	1300
bis(2-ethylhexyl)phthalate	None Detected	µg/L	5.	E8270	1350
4-Bromophenyl phenyl ether	None Detected	µg/L	2.	E8270	1613
4-Chloroaniline	None Detected	µg/L	2.	E8270	1975
2-Chloronaphthalene	None Detected	µg/L	2.	E8270	2300
4-Chlorophenyl phenyl ether	None Detected	µg/L	2.	E8270	2425
Chrysene	None Detected	µg/L	2.	E8270	2600
4,4-DDD'	None Detected	µg/L	2.	E8270	2900
4,4-DDE'	None Detected	µg/L	3.	E8270	2950
4,4-DDT'	None Detected	µg/L	2.	E8270	3000
Dibenzo (a,h) anthracene	None Detected	µg/L	3.	E8270	3150
Dibenzofuran	None Detected	µg/L	2.	E8270	3175
Di-n-butyl phthalate	None Detected	µg/L	2.	E8270	3250
1,2-Dichlorobenzene	None Detected	µg/L	2.	E8270	3300
1,3-Dichlorobenzene	None Detected	µg/L	2.	E8270	3350
1,4-Dichlorobenzene	None Detected	µg/L	2.	E8270	3400
3,3-Dichlorobenzidine	None Detected	µg/L	10.	E8270	3450
Dieldrin	None Detected	µg/L	3.	E8270	4000

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

THIS IS REALLY: 300-EXP056

Date Reported: 09/10/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-2

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET2-1200M, 08/30/2001 @ 11:00, TINA CARLSEN

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
Diethyl phthalate	None Detected	µg/L	2.	E8270	4050
Dimethyl phthalate	None Detected	µg/L	2.	E8270	4150
2,4-Dinitrotoluene	None Detected	µg/L	2.	E8270	4250
2,6-Dinitrotoluene	None Detected	µg/L	2.	E8270	4300
Di-n-octylphthalate	None Detected	µg/L	2.	E8270	4350
1,2-Diphenylhydrazine	None Detected	µg/L	2.	E8270	4400
Endosulfan I	None Detected	µg/L	10.	E8270	4450
Endosulfan II	None Detected	µg/L	10.	E8270	4500
Endosulfan sulfate	None Detected	µg/L	3.	E8270	4550
Endrin	None Detected	µg/L	2.	E8270	4600
Endrin aldehyde	None Detected	µg/L	10.	E8270	4650
Fluoranthene	None Detected	µg/L	2.	E8270	4750
Fluorene	None Detected	µg/L	2.	E8270	4800
Heptachlor	None Detected	µg/L	2.	E8270	4950
Heptachlor epoxide	None Detected	µg/L	2.	E8270	5000
Hexachlorobenzene	None Detected	µg/L	2.	E8270	5050
Hexachlorobutadiene	None Detected	µg/L	2.	E8270	5100
Hexachlorocyclopentadiene	None Detected	µg/L	2.	E8270	5150
Hexachloroethane	None Detected	µg/L	2.	E8270	5200
Indeno (1,2,3-cd) pyrene	None Detected	µg/L	2.	E8270	5300
Isophorone	None Detected	µg/L	2.	E8270	5400
2-Methylnaphthalene	None Detected	µg/L	2.	E8270	5740
Naphthalene	2.5	µg/L	2.	E8270	5800
2-Naphthylamine	None Detected	µg/L	20.	E8270	5805
2-Nitroaniline	None Detected	µg/L	2.	E8270	5990
3-Nitroaniline	None Detected	µg/L	2.	E8270	5992
4-Nitroaniline	None Detected	µg/L	5.	E8270	5994
Nitrobenzene	None Detected	µg/L	2.	E8270	6000
n-Nitrosodimethylamine	None Detected	µg/L	2.	E8270	6150
n-Nitrosodiphenylamine	None Detected	µg/L	2.	E8270	6200
N-Nitrosodi-n-propylamine	None Detected	µg/L	2.	E8270	6250
Phenanthrene	None Detected	µg/L	2.	E8270	6850
Pyrene	None Detected	µg/L	2.	E8270	7100
1,2,4-Trichlorobenzene	None Detected	µg/L	2.	E8270	8500
4-Chloro-3-methylphenol	None Detected	µg/L	5.	E8270	2250
2-Chlorophenol	None Detected	µg/L	2.	E8270	2350
2,4-Dichlorophenol	None Detected	µg/L	2.	E8270	3750
2,4-Dimethylphenol	None Detected	µg/L	2.	E8270	4100
2,4-Dinitrophenol	None Detected	µg/L	10.	E8270	4200
2-Methyl-4,6-dinitrophenol	None Detected	µg/L	10.	E8270	5700
2-Methylphenol	None Detected	µg/L	2.	E8270	5730
3- & 4-Methylphenol	None Detected	µg/L	2.	E8270	5734

Base Neutral and Acid Extractables
Organic Analysis
(EPA Method 8270)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

THIS IS REALLY 300-EXP-056

Date Reported: 09/10/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-2

Sample Description: UNICARD, LAKE DAVIS, 3X056-DET2-1200M, 08/30/2001 @ 11:00, TINA CARLSEN

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code
2-Nitrophenol	None Detected	µg/L	2.	E8270	6050
4-Nitrophenol	None Detected	µg/L	2.	E8270	6100
Pentachlorophenol	None Detected	µg/L	10.	E8270	6400
Phenol	None Detected	µg/L	2.	E8270	6900
2,4,5-Trichlorophenol	None Detected	µg/L	5.	E8270	8745
2,4,6-Trichlorophenol	None Detected	µg/L	5.	E8270	8750
2-Picoline	None Detected	µg/L	10.	E8270	7120

Quality Control Data

Surrogates	% Recovery	Control Limits
2-Fluorophenol	51.	21-100
Phenol-d5	38.	10-94
Nitrobenzene-d5	88.	35-114
2-Fluorobiphenyl	80.	43-116
2,4,6-Tribromophenol	83.	10-123
d14-Terphenyl	100.	33-141

California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/14/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-1

Project Number: UNICARD
COC Number: ZJ016
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET1-1200M
Sample Depth:
Sampling Date/Time: 08/30/2001 @ 10:53
Sample Matrix: AQ - Aqueous
Sample Collected By: TINA CARLSEN

THIS IS REALLY:
300-EXP-056

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Formaldehyde	None Detected	µg/L	15.	JAPC-1181-	09/04/01	DWW	1.	HPLC-A	8315	08/31/01	E8315	4840

P.Q.L. = Practical Quantitation Limit (refers to the least amount of analyte quantifiable based on sample size used and analytical technique employed).

California D.O.H.S. Cert. #1186

M. Atencio

Marna Atencio
Department Supervisor

BC Laboratories, Inc

WATER ANALYSIS
(GENERAL CHEMISTRY)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/14/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-2

Project Number: UNICARD
COC Number: ZJ016
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET2-1200M
Sample Depth:
Sampling Date/Time: 08/30/2001 @ 11:00
Sample Matrix: AQ - Aqueous
Sample Collected By: TINA CARLSEN

THIS IS REALLY:
300-EXP-056

Constituents	Results	Units	P.Q.L.	Method	Run Date	Analyst	Dilution	Instrument	Prep Method	Prep Date	LLNL Method	LLNL Code
Formaldehyde	None Detected	µg/L	15.	JAPC-1181-	09/04/01	DWW	1.	HPLC-A	8315	08/31/01	E8315	4840

P.Q.L. = Practical Quantitation Limit (refers to the least amount of analyte quantifiable based on sample size used and analytical technique employed).

California D.O.H.S. Cert. #1186

Marna Atencio
Department Supervisor

BC Laboratories, Inc.

Explosive Residues
(EPA Method 8330)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

THIS IS REALLY: 300-EXP-05C

Project Number: UNICARD
COC Number: ZJ016
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET1-1200M
Sample Depth:
Sample Matrix: AQ - Aqueous
Sample Collected By: TINA CARLSEN

Date Reported: 09/12/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-1

Date Collected: 08/30/2001 @ 10:53
Date Extracted: 09/05/2001
Date Analyzed: 09/11/2001
Extract Method: 8330
Method: 8330
Analyst: LAW
Dilution Used: 20
Instrument ID: LC002

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code	
PETN	180.	µg/L	100.	E8330:PETN	6410	*

Flag Explanations:
* = Note: Sample analyzed by CLS Labs.
California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc.

Explosive Residues
(EPA Method 8330)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
Attn: ERD DMG, L-528 000-0000

Date Reported: 09/13/2001
Date Received: 08/30/2001
Laboratory No.: 01-09948-2

Project Number: UNICARD
COC Number: ZJ016
Sampling Location: LAKE DAVIS
Sample ID: 3X056-DET2-1200M
Sample Depth:
Sample Matrix: AQ - Aqueous
Sample Collected By: TINA CARLSEN

THIS IS REALLY: 300-EXP-056

Date Collected: 08/30/2001 @ 11:00
Date Extracted: 09/05/2001
Date Analyzed: 09/11/2001
Extract Method: 8330
Method: 8330
Analyst: LAW
Dilution Used: 20
Instrument ID: LC002

Constituents	Analysis Results	Reporting Units	Practical Quantitation Limit	LLNL Method	LLNL Code	
PETN	130.	µg/L	100.	E8330:PETN	6410	*

Flag Explanations:
* = Note: Sample analyzed by CLS Labs.
California D.O.H.S. Cert. #1186

Stuart G. Buttram
Department Supervisor

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/27/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*WATER

Samples Affected: 01-09948-1, 01-09948-2

Constituents	Method Blank Readings	Units
Nitrate as NO3	< 0.50	mg/L
Nitrate as N	< 0.20	mg/L
Nitrate/Nitrite as N	< 0.1	mg/L
Total Suspended Solids using glass fiber Type A/E	< 0.5	mg/L
Total Cyanide	< 0.02	mg/L
Total Kjeldahl Nitrogen	< 0.2	mg/L
Ammonia as N	< 0.025	mg/L
Nitrite Nitrogen	< 0.02	mg/L
Nitrite as NO2	< 0.05	mg/L

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Precision & Accuracy)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/27/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*WATER

Samples Affected: 01-09948-1, 01-09948-2

Constituents	QC Sample ID	Sample Result	Sample Duplicate	MS Result	MSD Result	MS Spike Level	MSD Spike Level	Units	Sample R.P.D.	Spike R.P.D.	Precision Control Limits	MS % Rec	MSD % Rec	Accuracy Control Limits
Nitrate/Nitrite as N	9889-1-X2	< 0.2	< 0.2	4.464	4.464	4.211	4.211	mg/L	<PQL	0.	10	106.	106.	90 - 110
Total Suspended Solids using glass fiber Type A/E	9906-1	10.00	10.50					mg/L	<PQL		10			
Turbidity	9938-8	0.3000	0.2800					NT Units	<PQL		10			
Total Cyanide	TOTAL-09947-5	< 0.02	< 0.02	0.2455	0.2512	0.2500	0.2500	mg/L	<PQL	2.	10	98.	100.	90 - 110
Total Kjeldahl Nitrogen	WATER-09938-1	1.616	1.616	3.705	3.605	2.000	2.000	mg/L	0.	3.	20	104.	99.	80 - 120
Ammonia as N	9796-1	0.04882	0.04882	0.5167	0.5167	0.5263	0.5263	mg/L	<PQL	0.	10	89.	89.	90 - 110
Nitrite Nitrogen	9893-1	0.09257	0.09257	0.6327	0.6327	0.5263	0.5263	mg/L	<PQL	0.	10	103.	103.	90 - 110
Nitrite as NO2	9893-1	0.3040	0.3040	2.078	2.078	1.729	1.729	mg/L	<PQL	0.	10	103.	103.	90 - 110

MS = Matrix Spike; MSD = Matrix Spike Duplicate; RPD = Relative Percent Difference

The matrix spike recoveries for Ammonia are outside QC limits.

Quality Control Officer

Danette Bohm

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Laboratory Control Sample)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/27/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*WATER

Samples Affected: 01-09948-1, 01-09948-2

Constituents	QC Sample ID	Sample Result	Spike Level	Units	% Rec	Accuracy Control Limits
Nitrate/Nitrite as N	LCSW1-09-0	2.1205	2.00	mg/L	106.	90 - 110
Total Cyanide	TOTAL-LCSW	10.023	10.0	mg/L	100.	90 - 110
Total Kjeldahl Nitrogen	WATER-LCSW	48.683	50.0	mg/L	97.	85 - 115
Ammonia as N	LCSW1-09-0	0.47480	0.500	mg/L	95.	90 - 110
Nitrite Nitrogen	LCSW1-08-3	0.49660	0.500	mg/L	99.	90 - 110
Nitrite as NO2	LCSW1-08-3	1.6311	1.6422	mg/L	99.	90 - 110

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/18/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8260

Samples Affected: 01-09948-1 through 01-09948-3TB

Constituents	Method Blank Readings	Units
Benzene	< 0.5	µg/L
Bromodichloromethane	< 0.5	µg/L
Bromoform	< 0.5	µg/L
Bromomethane	< 0.5	µg/L
Carbon tetrachloride	< 0.5	µg/L
Chlorobenzene	< 0.5	µg/L
Chloroethane	< 0.5	µg/L
2-Chloroethylvinyl ether	<10.	µg/L
Chloroform	< 0.5	µg/L
Chloromethane	< 0.5	µg/L
Dibromochloromethane	< 0.5	µg/L
1,2-Dibromo-3-Chloropropane	< 0.5	µg/L
Dichlorodifluoromethane	< 0.5	µg/L
1,1-Dichloroethane	< 0.5	µg/L
1,2-Dichloroethane	< 0.5	µg/L
1,1-Dichloroethene	< 0.5	µg/L
cis-1,2-Dichloroethene	< 0.5	µg/L
trans-1,2-Dichloroethene	< 0.5	µg/L
Total 1,2-Dichloroethene	< 2.	µg/L
1,2-Dichloropropane	< 0.5	µg/L
cis-1,3-Dichloropropene	< 0.5	µg/L
trans-1,3-Dichloropropene	< 0.5	µg/L
Total 1,3-Dichloropropene	< 2.	µg/L
Ethyl Benzene	< 0.5	µg/L
Methylene Chloride	< 1.	µg/L
Styrene	< 0.5	µg/L
1,1,1,2-Tetrachloroethane	< 0.5	µg/L
1,1,2,2-Tetrachloroethane	< 0.5	µg/L
Tetrachloroethene	< 0.5	µg/L
Toluene	< 0.5	µg/L

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/18/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8260

Samples Affected: 01-09948-1 through 01-09948-3TB

Constituents	Method Blank Readings	Units
1,1,1-Trichloroethane	< 0.5	µg/L
1,1,2-Trichloroethane	< 0.5	µg/L
Trichloroethene	< 0.5	µg/L
Trichlorofluoromethane	< 0.5	µg/L
1,2,3-Trichloropropane	< 1.	µg/L
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.5	µg/L
Vinyl Chloride	< 0.5	µg/L
Total Xylenes	< 1.	µg/L
Total Trihalomethanes	< 2.	µg/L
Acetone	<10.	µg/L
Acetonitrile	<100.	µg/L
Acrolein	<50.	µg/L
Acrylonitrile	<50.	µg/L
2-Butanone	<20.	µg/L
Carbon Disulfide	< 5.	µg/L
Chloroprene	< 5.	µg/L
1,4-Dichloro-2-butene	< 5.	µg/L
1,4-Dioxane	<300.	µg/L
Ethanol	<1000.	µg/L
2-Hexanone	<20.	µg/L
4-Methyl-2-pentanone	<20.	µg/L
Methyl-t-butylether	< 0.5	µg/L
2-Picoline	< 0.5	µg/L
Vinyl acetate	<20.	µg/L
1,2-Dichloroethane-d4	100.	%
Toluene-d8	105.	%
4-Bromofluorobenzene	101.	%

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/18/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8260

Samples Affected: 01-09948-1 through 01-09948-3TB

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Precision & Accuracy)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/18/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8260

Samples Affected: 01-09948-1 through 01-09948-3TB

Constituents	QC Sample ID	Sample Result	MS Result	MSD Result	MS Spike Level	MSD Spike Level	Units	Spike R.P.D.	Precision Control Limits	MS % Rec	MSD % Rec	Accuracy Control Limits	
Benzene	9950-1	< 0.5	30.410	31.558	25.000	25.000	µg/L	4.	20	122.	126.	70 - 130	
Bromodichloromethane	9950-1	< 0.5	32.402	31.882	25.000	25.000	µg/L	2.	20	130.	128.	70 - 130	
Chlorobenzene	9950-1	< 0.5	28.884	28.043	25.000	25.000	µg/L	3.	20	116.	112.	70 - 130	
Chloroethane	9950-1	< 0.5	30.794	31.651	25.000	25.000	µg/L	3.	20	123.	127.	70 - 130	
1,1-Dichloroethane	9950-1	< 0.5	31.036	33.596	25.000	25.000	µg/L	8.	20	124.	134.	70 - 130	+
1,1-Dichloroethene	9950-1	< 0.5	32.817	35.100	25.000	25.000	µg/L	7.	20	131.	140.	70 - 130	+
Toluene	9950-1	< 0.5	30.310	28.632	25.000	25.000	µg/L	6.	20	121.	115.	70 - 130	
Trichloroethene	9950-1	< 0.5	31.038	30.652	25.000	25.000	µg/L	1.	20	124.	123.	70 - 130	
1,2-Dichloroethane-d4	MS/MSD									102.	109.	76 - 114	
Toluene-d8	MS/MSD									104.	99.	88 - 110	
4-Bromofluorobenzene	MS/MSD									104.	102.	86 - 115	

MS = Matrix Spike; MSD = Matrix Spike Duplicate; RPD = Relative Percent Difference

The matrix spike recoveries for 1,1-Dichloroethene and 1,1-Dichloroethane are outside QC limits.

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Laboratory Control Sample)
Method 8260

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/18/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8260

Samples Affected: 01-09948-1 through 01-09948-3TB

Constituents	QC Sample ID	Sample Result	Spike Level	Units	% Rec	Accuracy Control Limits
Benzene	LCSW1	26.180	25.000	µg/L	105.	70 - 130
Bromodichloromethane	LCSW1	27.005	25.000	µg/L	108.	70 - 130
Chlorobenzene	LCSW1	25.529	25.000	µg/L	102.	70 - 130
Chloroethane	LCSW1	26.693	25.000	µg/L	107.	70 - 130
1,1-Dichloroethane	LCSW1	26.542	25.000	µg/L	106.	70 - 130
1,1-Dichloroethene	LCSW1	27.636	25.000	µg/L	111.	70 - 130
Toluene	LCSW1	26.120	25.000	µg/L	104.	70 - 130
Trichloroethene	LCSW1	25.858	25.000	µg/L	103.	70 - 130
1,2-Dichloroethane-d4	LCSW1				103.	76 - 114
Toluene-d8	LCSW1				103.	88 - 110
4-Bromofluorobenzene	LCSW1				109.	86 - 115

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8270

Samples Affected: 01-09948-1 - 01-09948-2

Constituents	Method Blank Readings	Units
Acenaphthene	< 2.	µg/L
Acenaphthylene	< 2.	µg/L
Aldrin	< 2.	µg/L
Aniline	< 5.	µg/L
Anthracene	< 2.	µg/L
Benzidine	<20.	µg/L
Benzo (a) anthracene	< 2.	µg/L
Benzo (b) fluoranthene	< 2.	µg/L
Benzo (k) fluoranthene	< 2.	µg/L
Benzo (a) pyrene	< 2.	µg/L
Benzo (ghi) perylene	< 2.	µg/L
Benzoic Acid	<10.	µg/L
Benzyl alcohol	< 2.	µg/L
Butyl Benzyl phthalate	< 2.	µg/L
alpha-BHC	< 2.	µg/L
beta-BHC	< 2.	µg/L
delta-BHC	< 2.	µg/L
gamma-BHC	< 2.	µg/L
bis(2-chloroethyl)ether	< 2.	µg/L
bis(2-chloroethoxy)methane	< 2.	µg/L
bis(2-chloro-1-methylethyl) et	< 2.	µg/L
bis(2-ethylhexyl)phthalate	< 5.	µg/L
4-Bromophenyl phenyl ether	< 2.	µg/L
4-Chloroaniline	< 2.	µg/L
2-Chloronaphthalene	< 2.	µg/L
4-Chlorophenyl phenyl ether	< 2.	µg/L
Chrysene	< 2.	µg/L
4,4-DDD'	< 2.	µg/L
4,4-DDE'	< 3.	µg/L
4,4-DDT'	< 2.	µg/L

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8270

Samples Affected: 01-09948-1 - 01-09948-2

Constituents	Method Blank Readings	Units
Dibenzo (a,h) anthracene	< 3.	µg/L
Dibenzofuran	< 2.	µg/L
Di-n-butyl phthalate	< 2.	µg/L
1,2-Dichlorobenzene	< 2.	µg/L
1,3-Dichlorobenzene	< 2.	µg/L
1,4-Dichlorobenzene	< 2.	µg/L
3,3-Dichlorobenzidine	<10.	µg/L
Dieldrin	< 3.	µg/L
Diethyl phthalate	< 2.	µg/L
Dimethyl phthalate	< 2.	µg/L
2,4-Dinitrotoluene	< 2.	µg/L
2,6-Dinitrotoluene	< 2.	µg/L
Di-n-octylphthalate	< 2.	µg/L
1,2-Diphenylhydrazine	< 2.	µg/L
Endosulfan I	<10.	µg/L
Endosulfan II	<10.	µg/L
Endosulfan sulfate	< 3.	µg/L
Endrin	< 2.	µg/L
Endrin aldehyde	<10.	µg/L
Fluoranthene	< 2.	µg/L
Fluorene	< 2.	µg/L
Heptachlor	< 2.	µg/L
Heptachlor epoxide	< 2.	µg/L
Hexachlorobenzene	< 2.	µg/L
Hexachlorobutadiene	< 2.	µg/L
Hexachlorocyclopentadiene	< 2.	µg/L
Hexachloroethane	< 2.	µg/L
Indeno (1,2,3-cd) pyrene	< 2.	µg/L
Isophorone	< 2.	µg/L
2-Methylnaphthalene	< 2.	µg/L

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8270

Samples Affected: 01-09948-1 - 01-09948-2

Constituents	Method Blank Readings	Units
Naphthalene	< 2.	µg/L
2-Naphthylamine	<20.	µg/L
2-Nitroaniline	< 2.	µg/L
3-Nitroaniline	< 2.	µg/L
4-Nitroaniline	< 5.	µg/L
Nitrobenzene	< 2.	µg/L
n-Nitrosodimethylamine	< 2.	µg/L
n-Nitrosodiphenylamine	< 2.	µg/L
N-Nitrosodi-n-propylamine	< 2.	µg/L
Phenanthrene	< 2.	µg/L
Pyrene	< 2.	µg/L
1,2,4-Trichlorobenzene	< 2.	µg/L
4-Chloro-3-methylphenol	< 2.	µg/L
2-Chlorophenol	< 2.	µg/L
2,4-Dichlorophenol	< 2.	µg/L
2,4-Dimethylphenol	< 2.	µg/L
2,4-Dinitrophenol	<10.	µg/L
2-Methyl-4,6-dinitrophenol	<10.	µg/L
2-Methylphenol	< 2.	µg/L
3- & 4-Methylphenol	< 2.	µg/L
2-Nitrophenol	< 2.	µg/L
4-Nitrophenol	< 2.	µg/L
Pentachlorophenol	<10.	µg/L
Phenol	< 2.	µg/L
2,4,5-Trichlorophenol	< 5.	µg/L
2,4,6-Trichlorophenol	< 5.	µg/L
2-Picoline	<10.	µg/L
2-Fluorophenol	71.	%
Phenol-d5	52.	%
Nitrobenzene-d5	105.	%

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8270

Samples Affected: 01-09948-1 - 01-09948-2

Constituents	Method Blank Readings	Units
2-Fluorobiphenyl	92.	%
2,4,6-Tribromophenol	109.	%
d14-Terphenyl	83.	%

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Precision & Accuracy)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8270

Samples Affected: 01-09948-1 - 01-09948-2

Constituents	QC Sample ID	Sample Result	MS Result	MSD Result	MS Spike Level	MSD Spike Level	Units	Spike R.P.D.	Precision Control Limits	MS % Rec	MSD % Rec	Accuracy Control Limits
Acenaphthene	SD12-MS1-08-31	< 2.	66.19	70.42	80.00	80.00	µg/L	6.	16	83.	88.	46 - 113
1,4-Dichlorobenzene	SD12-MS1-08-31	< 2.	66.53	70.30	80.00	80.00	µg/L	6.	30	83.	88.	33 - 111
2,4-Dinitrotoluene	SD12-MS1-08-31	< 2.	72.15	73.54	80.00	80.00	µg/L	2.	27	90.	92.	21 - 157
Hexachlorobenzene	SD12-MS1-08-31	< 2.	69.07	72.06	80.00	80.00	µg/L	4.	14	86.	90.	38 - 117
Hexachlorobutadiene	SD12-MS1-08-31	< 2.	58.32	60.30	80.00	80.00	µg/L	3.	30	73.	75.	23 - 96
Hexachloroethane	SD12-MS1-08-31	< 2.	65.43	68.92	80.00	80.00	µg/L	5.	30	82.	86.	27 - 117
Nitrobenzene	SD12-MS1-08-31	< 2.	85.65	87.76	80.00	80.00	µg/L	2.	24	107.	110.	52 - 127
N-Nitrosodi-n-propylamine	SD12-MS1-08-31	< 2.	68.97	73.88	80.00	80.00	µg/L	7.	30	86.	92.	50 - 122
Pyrene	SD12-MS1-08-31	< 2.	57.31	60.82	80.00	80.00	µg/L	6.	30	72.	76.	19 - 162
1,2,4-Trichlorobenzene	SD12-MS1-08-31	< 2.	68.89	70.97	80.00	80.00	µg/L	3.	30	86.	89.	35 - 109
4-Chloro-3-methylphenol	SD12-MS1-08-31	< 5.	75.73	77.90	80.00	80.00	µg/L	3.	16	95.	97.	49 - 129
2-Chlorophenol	SD12-MS1-08-31	< 2.	78.49	82.10	80.00	80.00	µg/L	5.	16	98.	103.	53 - 126
2-Methylphenol	SD12-MS1-08-31	< 2.	73.21	76.98	80.00	80.00	µg/L	5.	23	92.	96.	45 - 117
3- & 4-Methylphenol	SD12-MS1-08-31	< 2.	58.26	61.55	80.00	80.00	µg/L	5.	24	73.	77.	29 - 106
4-Nitrophenol	SD12-MS1-08-31	< 2.	32.11	30.41	80.00	80.00	µg/L	5.	30	40.	38.	3 - 66
Pentachlorophenol	SD12-MS1-08-31	< 10.	80.69	80.23	80.00	80.00	µg/L	1.	26	101.	100.	10 - 154
Phenol	SD12-MS1-08-31	< 2.	37.79	38.99	80.00	80.00	µg/L	3.	28	47.	49.	23 - 61
2,4,6-Trichlorophenol	SD12-MS1-08-31	< 5.	74.74	77.41	80.00	80.00	µg/L	4.	16	93.	97.	25 - 140
2-Fluorophenol	MS/MSD									75.	77.	21 - 100
Phenol-d5	MS/MSD									54.	56.	10 - 94
Nitrobenzene-d5	MS/MSD									107.	111.	35 - 114
2-Fluorobiphenyl	MS/MSD									96.	99.	43 - 116
2,4,6-Tribromophenol	MS/MSD									112.	117.	10 - 123
d14-Terphenyl	MS/MSD									81.	85.	33 - 141

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Precision & Accuracy)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8270

Samples Affected: 01-09948-1 - 01-09948-2

MS = Matrix Spike; MSD = Matrix Spike Duplicate; RPD = Relative Percent Difference

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Laboratory Control Sample)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8270

Samples Affected: 01-09948-1 - 01-09948-2

Constituents	QC Sample ID	Sample Result	Spike Level	Units	% Rec	Accuracy Control Limits
Acenaphthene	SDI2-LCSW1	70.09	80.00	µg/L	88.	46 - 113
1,4-Dichlorobenzene	SDI2-LCSW1	68.95	80.00	µg/L	86.	33 - 111
2,4-Dinitrotoluene	SDI2-LCSW1	77.52	80.00	µg/L	97.	21 - 157
Hexachlorobenzene	SDI2-LCSW1	71.04	80.00	µg/L	89.	38 - 117
Hexachlorobutadiene	SDI2-LCSW1	60.57	80.00	µg/L	76.	23 - 96
Hexachloroethane	SDI2-LCSW1	67.67	80.00	µg/L	85.	27 - 117
Nitrobenzene	SDI2-LCSW1	88.52	80.00	µg/L	111.	52 - 127
N-Nitrosodi-n-propylamine	SDI2-LCSW1	74.40	80.00	µg/L	93.	50 - 122
Pyrene	SDI2-LCSW1	61.72	80.00	µg/L	77.	19 - 162
1,2,4-Trichlorobenzene	SDI2-LCSW1	70.34	80.00	µg/L	88.	35 - 109
4-Chloro-3-methylphenol	SDI2-LCSW1	79.20	80.00	µg/L	99.	49 - 129
2-Chlorophenol	SDI2-LCSW1	80.04	80.00	µg/L	100.	53 - 126
2-Methylphenol	SDI2-LCSW1	76.18	80.00	µg/L	95.	45 - 117
3- & 4-Methylphenol	SDI2-LCSW1	61.42	80.00	µg/L	77.	29 - 106
4-Nitrophenol	SDI2-LCSW1	31.52	80.00	µg/L	39.	3 - 66
Pentachlorophenol	SDI2-LCSW1	81.98	80.00	µg/L	102.	10 - 154
Phenol	SDI2-LCSW1	38.20	80.00	µg/L	48.	23 - 61
2,4,6-Trichlorophenol	SDI2-LCSW1	76.77	80.00	µg/L	96.	25 - 140
2-Fluorophenol					74.	21 - 100
Phenol-d5					55.	10 - 94
Nitrobenzene-d5					112.	35 - 114
2-Fluorobiphenyl					99.	43 - 116
2,4,6-Tribromophenol					116.	10 - 123
d14-Terphenyl					87.	33 - 141

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Laboratory Control Sample)
Method 8270

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/28/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8270

Samples Affected: 01-09948-1 - 01-09948-2

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/20/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*WATER

Samples Affected: 01-09948-1, 01-09948-2

Constituents	Method Blank Readings	Units
Formaldehyde	<15.	µg/L

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Laboratory Control Sample)

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/20/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*WATER

Samples Affected: 01-09948-1, 01-09948-2

Constituents	QC Sample ID	Sample Result	Duplicate Result	Spike Level	Units	% Rec	LCSD % Rec	RPD	Accuracy Control Limits	Precision Control Limits
Formaldehyde	LCS	49.2	49.4	50.	µg/L	98.	99.	0.	78 - 125	20

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 8330

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/18/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8330

Samples Affected: 01-09948-1, 01-09948-2

Constituents	Method Blank Readings	Units
PETN	< 5.0	µg/L

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Precision & Accuracy)
Method 8330

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/18/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8330

Samples Affected: 01-09948-1, 01-09948-2

Constituents	QC Sample ID	Sample Result	MS Result	MSD Result	MS Spike Level	MSD Spike Level	Units	Spike R.P.D.	Precision Control Limits	MS % Rec	MSD % Rec	Accuracy Control Limits
PETN	T1298	< 5.0	20.0	20.0	27.6	27.6	µg/L	3.	30	138.	138.	60 - 140

MS = Matrix Spike; MSD = Matrix Spike Duplicate; RPD = Relative Percent Difference

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Laboratory Control Sample)
Method 8330

LAWRENCE LIVERMORE NATIONAL LABORATORY
P.O. BOX 808, L528
LIVERMORE, CA 94551
ERD DMG, L-528

Date of Report: 09/18/2001
Sample Matrix: AQ - Aqueous
QC Batch ID: 200109948-1*8330

Samples Affected: 01-09948-1, 01-09948-2

Constituents	QC Sample ID	Sample Result	Spike Level	Units	% Rec	Accuracy Control Limits
PETN	LCS	19.7	20.0	µg/L	99.	60 - 140

Quality Control Officer

Danette Bohm

4100 Atlas Court * Bakersfield, CA 93308 * (661) 327-4911 * Fax (661) 327-1918 * www.bclabs.com

TRUESDAIL LABORATORIES, INC.
INDEPENDENT TESTING, FORENSIC SCIENCE, AND ENVIRONMENTAL ANALYSES
Established 1931
14201 FRANKLIN AVENUE
TUSTIN, CALIFORNIA 92780-7008
(714) 730-6239 · FAX (714) 730-6462
www.truesdail.com

REPORT

CLIENT: **BC Laboratories**
4100 Atlas Court
Bakersfield, CA 93308
ATTN: Kim Halbrook
SAMPLE DESCRIPTION: See below
INVESTIGATION: Formaldehyde by EPA Method 8315F
INSTRUMENT ID: Shimadzu HPLC A

LAB. NO.: **602799**
REPORT DATE: 9/13/01
DATE(S) SAMPLED: 8/30/01
DATE RECEIVED: 8/31/01
DATE(S) EXTRACTED: 8/31/01
DATE(S) ANALYZED: 9/4/01
ANALYST(S): DW/RP

RESULTS SUMMARY

Lab Number	COC # (not given) Sample ID / Desc	Time	Formaldyhyde ug/L	Initial Vol(ml)	Final Vol(ml)	Dilution Factor
602799 -1	01-09948-1	10:53	ND	100	10	1
602799 -2	01-09948-2	11:00	ND	100	10	1
602795 -MB			ND	100	10	1

Detection Limits for Reporting (DLR): **15**
Method Detection Limits (MDL): **10**

ug/L = Micrograms per Liter (ppb)

Respectfully Submitted,
TRUESDAIL LABORATORIES, INC.
Michael Whyte
Michael Whyte
Project Manager, Environmental Sciences

SEP 2 1 2001

TRUESDAIL LABORATORIES, INC.
INDEPENDENT TESTING, FORENSIC SCIENCE, AND ENVIRONMENTAL ANALYSES
Established 1931
14201 FRANKLIN AVENUE
TUSTIN, CALIFORNIA 92780-7008
(714) 730-6239 · FAX (714) 730-6462
www.truesdail.com

REPORT

LCS / LCSD
QA / QC SUMMARY REPORT

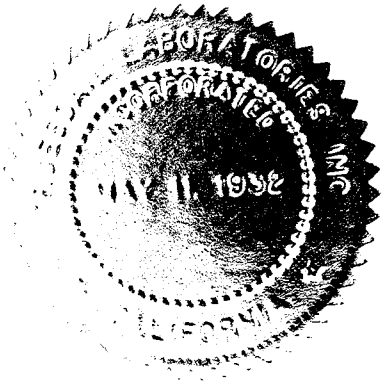
LCS / LCSD

ANALYTE	Amount Spiked (ug/L)	Amount Recovered (ug/L)		Method Blank	Sample Amount (ug/L)	Percent Recovery (%)		RPD (%)	RPD Limit (%)	Recovery Limit (%)
		LCS	LCSD			LCS	LCSD			
Formaldehyde	50	49.2	49.4	ND	NA	**98.4**	**98.8**	0.4	20	75-125
Acetaldehyde	50	43.2	46.6	ND	NA	**86.4**	**93.2**	7.6	20	70-125

Detection Limits for Reporting (DLR): 15 ug/L

Method Detection Limits (MDL): 10 ug/L

LCS = Laboratory Control Spike	NA = Not analyzed
LCSD = Laboratory Control Spike Duplicate	ND = Not detected
All QC run on same batch as corresponding samples	RPD = Relative Percent Difference



Respectfully Submitted,
TRUESDAIL LABORATORIES, INC.

Michael Whyte
Project Manager, Environmental Sciences

8°
T1298

SUBCONTRACT CHAIN OF CUSTODY

Subcontract Lab: CLS (CLSZZ)
3249 FITZGERALD ROAD
RANCHO CORDOVA, CA 95742
Attn: Mark Smith
Phone: 916-638-7301
FAX: 916-638-4510

Report To: BC Laboratories
4100 Atlas Court
Bakersfield, CA 93308
Attn: K Halbrook
Phone: 661-327-4911

Bill To: BC Laboratories
4100 Atlas Court
Bakersfield, CA 93308
Attn: Accounts Payable

TAT: ASAP!

Sample ID	Sample Matrix	Sample Date	Sample Time	Requested Tests 01
01-09948-1	AQ - Aqueo	08/30/2001	10:53	X ~~X~~ KB 32 oz jar
01-09948-2	AQ - Aqueo	08/30/2001	11:00	X

Requested Tests Legend

01 GC-8330W-PETN

Note: Please do not subcontract any test without obtaining approval from an authorized representative of BC laboratories.

Comments: ~~8315(FORMALDEHYDE)~~
PLEASE NOTIFY KIM HALBROOK IF TURN AROUND TIME CANNOT BE MET.
Please fax rush samples' results ASAP to Kim HaLbrook!!!.
REPORT DILUTION FACTOR, INSTRUMENT I.D., DATE EXTRACTED & ANALYZED
ANALYSTS (3) INITIALS, MB, MS/MSD, AND LCS REPORTS ON FINAL REPORT

		Date/Time
Relinquished By:	K Brown	RP ~~8/31/01~~ 13:30 EXP 9/4/01 13:15
Received By:		090501 1000
Relinquished By:		
Received By:		
Relinquished By:		
Received By:		
Relinquished By:		
Received By:		

CALIFORNIA LABORATORY SERVICES

Environmental Chemistry

BC Laboratories
4100 Atlas Court
Bakersfield, Ca 93308

09/19/2001

Attention: **K. Halbrook**

Reference: **Analytical Results**

Project Name:
Project No.: **01-09948**
Date Received: **09/05/2001**
Chain Of Custody: **NO NUMBER**

CLS ID No.: **T1298**
CLS Job No.: **841298**

The following analyses were performed on the above referenced project:

No. of Samples	*Turnaround Time*	*Analysis Description*
2	5 Days	**Expanded QC**
2	5 Days	**PETN, EPA 8330**

A BC Lab sample from Lab Job T1225 was used for the MS/MSD.

Hold Times-Acceptable.
Method Blank/Trip Blank Results-Acceptable.
Laboratory Control Samples-Acceptable.
Matrix Spike/Matrix Spike Duplicate-Acceptable.
Calibrations-Acceptable.

These samples were received by CLS Labs in a chilled, intact state and accompanied by a valid chain of custody document.

Calibrations for analytical testing have been performed in accordance to and pass the EPA's criteria for acceptability.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

CALIFORNIA LABORATORY SERVICES

Environmental Chemistry

Analysis Report: **PETN**

Client: **BC Laboratories**
4100 Atlas Court
Bakersfield, Ca 93308

Project:

Date Sampled: **08/30/2001**
Date Received: **09/05/2001**
Date Extracted: **09/05/2001**
Date Analyzed: **09/11/2001**
Date Reported: **09/13/2001**
Client ID No.: **01-09948-1**

Project No.: **01-09948**
Contact: **K. Halbrook**
Phone: **(661)327-4911**

Lab Contact: **James LIang**
Lab ID No.: **T1298-1A**
Job No.: **841298**
COC Log No.: **NO NUMBER**
Batch No.: **E01094**
Instrument ID: **LC002**
Analyst ID: **LAURAW**
Matrix: **AQ**

01-09948-1

Analyte	Code	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
PETN	6410	180	100	20

ND = Not detected at or above indicated Reporting Limit

SEP 9 4 2001

CALIFORNIA LABORATORY SERVICES

Environmental Chemistry

Analysis Report: **PETN**

Client: **BC Laboratories**
4100 Atlas Court
Bakersfield, Ca 93308

Project:

Date Sampled: **08/30/2001**
Date Received: **09/05/2001**
Date Extracted: **09/05/2001**
Date Analyzed: **09/11/2001**
Date Reported: **09/13/2001**
Client ID No.: **01-09948-2**

Project No.: **01-09948**
Contact: **K. Halbrook**
Phone: **(661)327-4911**

Lab Contact: **James LIang**
Lab ID No.: **T1298-2A**
Job No.: **841298**
COC Log No.: **NO NUMBER**
Batch No.: **E01094**
Instrument ID: **LC002**
Analyst ID: **LAURAW**
Matrix: **AQ**

01-09948-2

Analyte	Code	Results (ug/L)	Rep. Limit (ug/L)	Dilution (factor)
PETN	6410	130	100	20

ND = Not detected at or above indicated Reporting Limit

CALIFORNIA LABORATORY SERVICES

Environmental Chemistry

Analysis Report: **PETN**

Client: **BC Laboratories**
4100 Atlas Court
Bakersfield, Ca 93308

Project:

Date Extracted: **09/05/2001**
Date Analyzed: **09/11/2001**
Date Reported: **09/13/2001**

Project No.: **01-09948**
Contact: **K. Halbrook**
Phone: **(661)327-4911**

Lab Contact: **James LIang**
Lab ID No.: **T1298**
Job No.: **841298**
COC Log No.: **NO NUMBER**
Batch No.: **E01094**
Instrument ID: **LC002**
Analyst ID: **LAURAW**
Matrix: **AQ**

METHOD BLANK

Analyte	Code	Results (ug/L)	Reporting Limit (ug/L)
PETN	6410	ND	5.0

ND = Not detected at or above indicated Reporting Limit

Analysis Report: **PETN**

Client: **BC Laboratories**
4100 Atlas Court
Bakersfield, Ca 93308

Project:

Date Extracted: **09/05/2001**
Date Analyzed: **09/11/2001**
Date Reported: **09/13/2001**

Project No.: **01-09948**
Contact: **K. Halbrook**
Phone: **(661)327-4911**

Lab Contact: **James LIang**
Lab ID No.: **T1298**
Job No.: **841298**
COC Log No.: **NO NUMBER**
Batch No.: **E01094**
Instrument ID: **LC002**
Analyst ID: **LAURAW**
Matrix: **AQ**

MATRIX SPIKE

Analyte	Code	Observed Conc. (ug/L)	MS Conc. (ug/L)	MS Recovery (percent)	Lower Spec (Limit)	Upper Spec (Limit)
PETN	6410	27.6	20.0	138	60	140

MATRIX SPIKE DUPLICATE

Analyte	Code	Observed Conc. (ug/L)	MSD Conc. (ug/L)	MSD Recovery (percent)	Lower Spec (Limit)	Upper Spec (Limit)
PETN	6410	27.6	20.0	138	60	140

RELATIVE % DIFFERENCE

Analyte	Code	Relative Percent Difference (percent)	Lower Spec (Limit)	Upper Spec (Limit)
PETN	6410	0	0	30

Analysis Report: **PETN**

Client: **BC Laboratories**
4100 Atlas Court
Bakersfield, Ca 93308

Project:

Date Extracted: **09/05/2001**
Date Analyzed: **09/11/2001**
Date Reported: **09/13/2001**

Project No.: **01-09948**
Contact: **K. Halbrook**
Phone: **(661)327-4911**

Lab Contact: **James LIang**
Lab ID No.: **T1298**
Job No.: **841298**
COC Log No.: **NO NUMBER**
Batch No.: **E01094**
Instrument ID: **LC002**
Analyst ID: **LAURAW**
Matrix: **AQ**

LAB CONTROL SAMPLE

Analyte	Code	Observed Value (ug/L)	LCS Conc. (ug/L)	LCS Recovery (percent)	Lower Spec (Limit)	Upper Spec (Limit)
PETN	6410	19.7	20.0	99	60	140

LAB CONTROL SAMPLE DUPLICATE

Analyte	Code	Observed Value (ug/L)	LCS Conc. (ug/L)	LCSD Recovery (percent)	Lower Spec (Limit)	Upper Spec (Limit)
PETN	6410	20.5	20.0	103	60	140

LCS RPD

Analyte	Code	LCS Relative Percent Difference (percent)	Lower Spec (Limit)	Upper Spec (Limit)
PETN	6410	4	0	30

BC LABORATORIES INC. **SAMPLE RECEIPT FORM** Rev. No.7 10/03/00 Page 1 Of 1

Submission #: 01-09948 **Project Code:** **TB Batch #**

SHIPPING INFORMATION

Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☑ Other ☐ (Specify)________

SHIPPING CONTAINER

Ice Chest ☑ None ☐
Box ☐ Other ☐ (Specify)________

Refrigerant: Ice ☑ Blue Ice ☐ None ☐ Other ☐ **Comments:**

Custody Seals: Ice Chest ☐ Intact? Yes ☐ No ☐ | Containers ☐ Intact? Yes ☐ No ☐ | None ☑ **Comments:**

All samples received? Yes ☑ No ☐ All samples containers intact? Yes ☑ No ☐ Description(s) match COC? Yes ☑ No ☐

COC Received

☑ YES ☐ NO

Ice Chest ID ____ Date/Time 8/30/01 2150
Temperature: 4.1 °C
Thermometer ID: 80 Analyst Init SDW
Emissivity 1.00
Container Other

Ice Chest ID ____ Date/Time ____
Temperature: ____ °C
Thermometer ID: ____ Analyst Init ____
Emissivity ____
Container ____

SAMPLE CONTAINERS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
QT GENERAL MINERAL/ GENERAL PHYSICAL	2	2																						
PT PE UNPRESERVED																								
QT INORGANIC CHEMICAL METALS																								
PT INORGANIC CHEMICAL METALS																								
PT CYANIDE																								
PT NITROGEN FORMS																								
PT TOTAL SULFIDE																								
2oz. NITRATE / NITRITE																								
100ml TOTAL ORGANIC CARBON																								
QT TOX																								
PT CHEMICAL OXYGEN DEMAND																								
100ml PHENOLICS																								
40ml VOA VIAL TRAVEL BLANK																								
40ml VOA VIAL	3	3																						
QT EPA 413.1, 413.2, 418.1																								
PT ODOR																								
RADIOLOGICAL																								
BACTERIOLOGICAL																								
PT EPA 504																								
QT EPA 508/608/8080																								
QT EPA 515.1/8150																								
QT EPA 525																								
QT EPA 525 TRAVEL BLANK																								
100ml EPA 547																								
100ml EPA 531.1																								
QT EPA 548																								
QT EPA 549																								
QT EPA 632																								
QT EPA 8015M																								
QT QA/QC																								
QT AMBER	2	2																						
8 OZ. JAR	[illegible] 8/30																							
32 OZ. JAR	1	1																						
SOIL SLEEVE																								
PCB VIAL																								
PLASTIC BAG																								

CHK BY DISTRIBUTION
SUB-OUT ☐

SHORT HOLDING TIME
Cr^{+6} NO_2 NO_3 OP SS
DO BOD MBAS C O T

Comments:________

Sample Numbering Completed By: SDW Date/Time: 8/30/01 0040

[H:\DOCS\WP80\LAB_DOCS\FORMS\SAMREC2.WPD]

ERD Chain-of-Custody Record and Analytic Instructions

A 28017

Sampled By: Tina Carlsen
Sampler's Employer: LLNL
Project Name: LAKE DAVIS

Requester, (circle one): S300 / WGMG / **Livermore**

Send all results to:
Attn: ERD DMG L-528
Lawrence Livermore
National Laboratory
7000 East Ave.
Livermore, CA 94550

Field Log Book# ZJ016 Page 1 of 1
LLNL Acct. # 0876 43 **Release #**
Analytical Laboratory Name BC
Analytical Laboratory Log # 01-09948

Analytical Lab Please Fax or Email copies to:

name Tina Carlsen Fax# 925-422-6950 (circle one) Email
name Ned Borglin Fax# 925-422-6950 (circle one) Email

* [redacted]

	Sample Identification	Sample Date/Time	Matrix[2] Container[3]	# of Cont.	Study Area	Analysis & Turnaround Required[1]: E8260	E8270	Nutrients A	E8315	E335.2	E160.2	E180.1	PETN		Additional Instructions to Lab / * Remarks *
1	3X056-DET1-1200M	8/30/01 10:53A	AQ / P,G,V	9		5d	5d	5d	5d	5d	5d	5d	5d		
2	3X056-DET2-1200M	1 11:00A	AQ / P,G,V	9		5d	5d	5d	5d	5d	5d	5d	5d		
3	TRIP-BLANK	08/06/01*		1		*									* - contains 1-BB size bubble
	Temp BLK Included			1											* Analyze if VOCs detected in sample
5															
6															
7															
8															
9															

TAT - ASAP if possible
please preserve upon receipt

Signature	Company	Time	Date
Relinquished by: Ned Borglin	LLNL - ERD	12:00 pm	8/30/01
Received by: Colleen Hess	BC LABS	1630	8/30/01
Relinquished by: Colleen Hess	BC LABS	1729	8/30/01
Received by: [illegible]	BC Labs	1730	8-30-01
Relinquished by: [illegible]	BC Labs	2145	8.30.01
Received by: Brandi Wells	BC Labs	2145	8/30/01

[1] Enter the number of days or hours for TAT of the official printed report. See Requested Analysis code list for available TAT's for each type of analysis. Example: 24h = 24 hours / 20d = 20 day

[2] Sample Matrix Codes: **See list on back of pink copy**

[3] Container type codes: **V** = VOA Bottle, **P** = Polyethylene Bottle, **G** = Glass Bottle, **T** = Brass Tube, **B** = Bag, **S** = Stainless Steel Tube, **O** = Other (specify under remarks)

To receive copies of this data from DMG
CC:

Revision 4.6
21-jul-99 ERD

White : Laboratory return to ERD Attn. ERD Data Management Team L-528 **Yellow : Analytical Lab** [illegible] **Leave with ERD** Attn. ERD Data Management Team L-528 **Gold: Sampler Leave with TRR**