City of Morro Bay and
Cayucos Sanitary District

OFFSHORE MONITORING AND REPORTING PROGRAM

SEMI-ANNUAL EFFLUENT SAMPLING

CHEMICAL AND BIOASSAY ANALYSIS RESULTS

JANUARY 2009

Marine Research Specialists

3140 Telegraph Rd., Suite A
Ventura, California 93003

Report to

City of Morro Bay and
Cayucos Sanitary District

955 Shasta Avenue
Morro Bay, California 93442
(805) 772-6272

MONITORING AND REPORTING PROGRAM

SEMI-ANNUAL EFFLUENT REPORT

CHEMICAL AND BIOASSAY ANALYSIS RESULTS

January 2009

Prepared by

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February 2009

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____

Mr. Bruce Ambo
City of Morro Bay

Date _____

marine research specialists

3140 Telegraph Road, Suite A • Ventura, CA 93003 • (805) 644-1180

Mr. Bruce Keogh
Wastewater Division Manager
City of Morro Bay
955 Shasta Avenue
Morro Bay, CA 93442

23 February 2009

Reference: Chemical and Bioassay Analysis Results for Effluent Samples Collected in January 2009

Dear Mr. Keogh:

Enclosed are the results of chemical analyses conducted on grab and composite effluent samples collected on 21 January 2009, a chronic bioassay on one composite effluent sample collected on 5 January 2009, and an acute bioassay conducted on four effluent samples collected daily from 19 January through 22 January 2009. All analyses were conducted in accordance with the requirements of Monitoring and Reporting Program Number 98-15[1] to assess compliance with effluent limitations specified in the Waste Discharge Requirements of the NPDES Discharge Permit.[2] Bioassay protocols conformed to the revised requirements specified by RWQCB[3] staff that eliminated techniques previously used to mitigate interference from ammonia toxicity.[4] All of the measured chemical concentrations and toxicity endpoints complied with the limitations promulgated by the current discharge permit. This includes acute-toxicity limitations that are no longer promulgated by the current version of the California Ocean Plan[5] because they were determined to be unnecessarily stringent. This cover letter summarizes the bioassay results and discusses the chemical compounds detected in the effluent samples. The full laboratory results as well as the pertinent QA/QC data and chains of custody are included as attachments.

Chronic Bioassay

As summarized in Table 1, the chronic bioassays demonstrated that effluent toxicity was one order of magnitude lower than the limitations specified in the NPDES permit. Results were comparable to the low toxicities determined in tests conducted for more than a decade. Chronic bioassays provide a far more sensitive and accurate measure of toxic effects to marine organisms than do acute toxicity tests, which are plagued with interference from ammonia, which is described below. As with past bioassays, the chronic toxicity tests conducted in January 2009 measured spore germination and growth response in giant kelp (*Macrocystis pyrifera*) after exposure to a range of effluent dilutions. Toxic screening studies conducted in 1993[6] established that giant kelp (*M. pyrifera*) is substantially more sensitive to MBCSD[7] effluent than other species, such as the larvae of the inland silverside (*Menidia beryllina*) and bay mussel (*Mytilus edulis*).

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[1] Monitoring and Reporting Program No. 98-15 for City of Morro Bay and Cayucos Sanitary District Wastewater Treatment Plant, San Luis Obispo County promulgated by the State of California Regional Water Quality Control Board Central Coast Region and the United States Environmental Protection Agency Region IX, San Francisco California. 11 December 1998.

[2] State of California Regional Water Quality Control Board Central Coast Region Waste Discharge Requirements Order No. 98-15 and United States Environmental Protection Agency Region IX, San Francisco California National Pollutant Discharge Elimination System Permit No. CA0047881 for City of Morro Bay and Cayucos Sanitary District Wastewater Treatment Plant, San Luis Obispo County.

[3] California Regional Water Quality Control Board, Central Coast Division.

[4] Letter from Roger W. Briggs, Executive Officer of the RWQCB to Mr. Bruce Keogh, City of Morro Bay WWTP, dated 14 March 2003: 2002 Annual Offshore monitoring Report, City of Morro Bay and Cayucos Sanitary District Wastewater Treatment Plant, San Luis Obispo County.

[5] State Water Resources Control Board (SWRCB). 2001. Water quality control plan, ocean waters of California, California Ocean Plan. California Environmental Protection Agency. Effective December 3, 2001.

[6] Table 2-4, Page 2-7 of the MBCSD 1993 *Annual Monitoring. Report to the City of Morro Bay and Cayucos Sanitary District*. Prepared by Marine Research Specialists, 1994.

Table 1. **Comparison of Measured Toxicity Levels with Permit Limitations**

Bioassay Test	End Point (%)	Toxicity Concentration (TU)	Permit Limitations (TU) 30-day Average	7-day Average	Instantaneous Maximum
Chronic: Giant Kelp (*Macrocystis pyrifera*)					
Chronic Germination	10[8]	10.0			134
Chronic Growth	10[8]	10.0			134
Acute: Fathead Minnow *(Pimephales promelas*)	70.7[9]	1.41	1.5	2.0	2.5

The chronic bioassay results in Table 1 demonstrate the effluent's continuing low toxicity to this most-sensitive marine species. Both chronic-toxicity concentrations (10.0 TUc) were more than 13 times lower than the applicable permit limitation (134 TUc). The reported chronic toxicity concentrations were based on a "*No Observable Effects Concentration*" (NOEC), which is the highest effluent concentration that does not cause an adverse effect statistically different from a control sample. Chronic bioassays did not reveal adverse effects in marine organisms with effluent concentrations at or below 10%, while the permit allows adverse effects in concentrations as low as 0.75%.

As part of quality control, chronic bioassays were also conducted using a reference toxic chemical (copper chloride) to determine the sensitivity of this particular set of giant kelp spores (*M. pyrifera*) to toxins. Results demonstrated susceptibility of the kelp specimens to toxic exposure because there was a significant reduction in germination and growth in concentrations as low as 32 µg/L of the reference toxicant. The concomitant NOEC for the reference toxicant, at 18 µg/L, was comparable to the toxic concentrations found in reference tests conducted over the last several years.[10]

Acute Bioassay

In contrast to the fidelity of the chronic toxicity test, the results of the acute bioassay were confounded by toxic interference by ammonia in the test sample. Current bioassay protocols[11] limit the use of techniques that, in the past, have been widely applied to reduce the confounding influence of ammonia during acute bioassay tests. The acute bioassay test examined the mortality of the fathead minnow (*Pimephales promelas*) exposed to various concentrations of effluent. Historically, fathead minnow tests have reliably evaluated the toxicity of a broad range of freshwater, marine, and effluent samples. However, the tests are problematic when samples contain ammonia, which is naturally elevated in sewage-derived wastewater. Under ambient ocean conditions, ammonia is not particularly toxic to marine organisms. This is reflected by the strikingly high limit for ammonia concentrations specified in the NPDES discharge permit (804 mg/L)[12] compared to typical effluent ammonia concentrations (≤41 mg/L),[13] because ammonia is in a relatively

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[7] City of Morro Bay and the Cayucos Sanitary District, joint owners of the wastewater treatment and disposal facility

[8] The *No Observed Effects Concentration* (NOEC) is the highest concentration of effluent that did not produce an adverse effect statistically different from the control experiment.

[9] The "*50% Lethal Concentration*" (LC_{50}) is the effluent concentration that produces death of 50% of the test organisms exposed to the toxicants for 96 hours.

[10] *cf.* The *Giant Kelp Germ Tube Growth Laboratory Control Chart* attached to this report

[11] *Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, Fifth Edition.* October 2002. U.S. Environmental Protection Agency, Office of Water (4303T), 1200 Pennsylvania Avenue, NW Washington, DC 20460. EPA-821-R-02-012.

[12] Instantaneous maximum ammonia concentration specified in the NPDES waste-discharge requirements for the MBCSD effluent.

[13] Marine Research Specialists (MRS). 2009. *City of Morro Bay and Cayucos Sanitary District, Offshore Monitoring and Reporting Program, 2008 Annual Report*. Submitted February 2009 to the City of Morro Bay and Cayucos Sanitary District, Morro Bay, CA.

benign, ionic ammonium[14] form in seawater and wastewater. However, in an acute bioassay, effluent remains static in the test chambers for an extended period, when complex interactions among the organic constituents cause pH to increase. As pH increases, ammonium is converted into a deionized ammonia form[15] that is highly toxic to the test organisms. In contrast to the static conditions in the test chambers, the pH of the marine receiving waters is stabilized by the highly buffered oceanic carbonate system. Thus, the acute bioassay tests are not representative of the alkalinity conditions in the ocean environment and, as a result, the tests report artificially elevated toxic concentrations.

Various methods have been developed over the years to reduce the well-recognized artifactual toxicity that results from changes in wastewater ammonia during bioassay tests.[16] Ammonia interference in the acute bioassays conducted on MBCSD effluent samples has been successfully reduced through the use of zeolite pretreatment. As a result, in the 21 acute tests conducted between 1997 and April 2003, the highest measured acute toxicity was 0.59 TUa. This practice was discontinued in April 2003 when the RWQCB staff specified the use of new EPA protocols in their comments on the 2002 Annual Monitoring Report for the MBCSD Wastewater Discharge.[17] Among other changes, the new protocols use much younger, smaller test specimens and encourage sample-renewal techniques to reduce moderate levels of ammonia interference, rather than chemical techniques. Consequently, the RWQCB staff further required that the acute toxicity tests no longer use any form of chemical sample manipulation to reduce toxic ammonia interference.

Unfortunately, renewal methods, in which test chambers are periodically refreshed with new sample solutions, are significantly more complex and costly to implement than previous bioassay procedures. More importantly, they fall far short of eliminating significant artifactual toxicity from ammonia deionization. As a result, the acute toxicity reported here is conspicuously elevated compared to past tests, although it remained below the permitted limit. The apparent increase is not attributable to an actual change in the characteristic toxicity of the effluent itself. Instead, it is an artifact of changes in the protocols used to assess acute toxicity. This is obvious because there was not a commensurate increase in the accompanying chronic-toxicity measurements.

Because static renewal is only marginally effective in accommodating pH-induced ammonia interference, extraordinary measures were instituted to reduce impacts from ammonia toxicity to the maximum extent possible. For example, the current bioassay protocols used daily grab effluent samples, which were hand delivered to the testing facility in Ventura, California shortly after collection at the MBCSD treatment plant. Extra care was also taken to remove all headspace in the sample containers and to maintain a uniform sample temperature during transit to the bioassay laboratory. Finally, care was also taken in the laboratory to avoid physical impact to the extremely small larval-fish specimens during renewal.

Despite these extraordinary measures, the presence of ammonia toxicity was unmistakable during the tests. The artificially elevated acute toxicity reported in Table 1 is a direct result of this test-related toxicity. The test results incorrectly imply that the effluent acute toxicity was only 0.09 TUa below the permitted limit, or 94% of the permitted toxicity. In reality, the effluent discharge does not cause pH-induced ammonia toxicity, DO depletion, or physical stress on marine organisms within receiving waters. Consequently, the reported results do not accurately reflect the toxicity that is experienced by marine organisms exposed to MBCSD effluent. Instead, ancillary measurements collected during the tests demonstrate that all of these confounding influences were present, and that they caused elevated measured toxicities that were close to the NPDES discharge permit limit.

The impact of unmitigated ammonia interference on the acute bioassay is evident in the water-quality measurements reported in the attached raw test data. The increase in the toxic deionized form of ammonia can be computed from the changes in pH measured in the test chambers. On the first day of the test (January

[14] NH_4^+
[15] NH_3
[16] Mercer, B.W., Ames, L.L, Touhill, C.J, Slyke, W.J, Dean, R.B. 1970. *Ammonia removal from secondary effluents by selective ion exchange*. Journal of the Water Pollution Control Federation 42 (2,Part 2), R95–R107.
[17] RWQCB. 2003 (Footnote 4) *op. cit*.

20), pH increased from 7.3 to 7.9 in the test chamber containing 100% effluent, causing toxic deionized ammonia concentrations to increase nearly four-fold from 0.4 mg/l to 1.5 mg/l. This, along with a precipitous drop in DO,[18] resulted in the mortality of all of the test specimens in the two test chambers containing 100% effluent on the first day of the test. In test chambers with lower effluent concentrations, daily static renewal was also only partially successful at ameliorating pH fluctuations. However, because the effluent was diluted, the concentrations of deionized ammonia were proportionally smaller, and despite the observed increases in pH, all the test organisms survived in the other test chambers. Nevertheless, the impacts apparent in the test chambers containing 100% effluent demonstrate that artifactual ammonia toxicity was not sufficiently accommodated by static renewal methods.

The foregoing discussion demonstrates that the apparent increase in acute toxicity, which was first measured in April 2003 and has continued into January 2009, is an artifact of the change in protocols rather than a true increase in marine toxicity. Additionally, chronic bioassays conducted over the past decade, including the one reported here, demonstrate that the MBCSD effluent has had a consistently low toxicity. Chronic bioassays are far more accurate and sensitive than the acute bioassays, particularly because toxic ammonia artifacts interfere with the acute bioassays.

As part of the quality control procedures, acute bioassay tests were also conducted using a reference toxic chemical[19] to determine the relative sensitivity of the test organisms. Results demonstrated that the batch of fathead minnows (*P. promelas*) used in the January 2009 bioassay were susceptible to toxic exposure. Their mortality was 100% in concentrations as low as 8 mg/L of the reference toxicant.[20] The concomitant LC_{50} for the reference toxicant was 4.9 mg/L, which was comparable to the average toxicant concentrations found in reference tests in previous years.

Quantifiable Chemical Constituents

The general absence of chemical contaminants within the grab and composite samples collected on 21 January 2009 confirmed the nontoxic character of the MBCSD effluent. The samples were tested for 145 chemical compounds. Table 2 shows that only four compounds were found in quantifiable amounts in the January 2009 effluent samples. These compounds were ammonia, copper, zinc, and chloroform. Table 2 also shows that the concentrations for these four compounds measured well below the discharge limitations in the NPDES permit. The permit limits were derived from the receiving-water objectives in Table B of the California Ocean Plan,[21] and a critical initial dilution ratio of 133:1 computed from a conservative oceanic dispersion model applied to the MBCSD outfall.[22] Because the PQLs[23] for nearly all undetected compounds were well below their respective permit limits, the chemical analyses were sensitive enough to detect potentially toxic levels of compounds in the effluent. All analyses were conducted in accordance with EPA protocols.

Ammonia

The compounds in Table 2 have been routinely detected at low but quantifiable concentrations within effluent[24] and biosolid[25] samples collected over the past decade. Ammonia as nitrogen[26] is measured in grab

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[18] DO concentrations in the test chamber with 100% effluent dropped from 7.5 mg/L to 4.2 mg/L on the first day of the test.

[19] Sodium dodecyl sulfate

[20] *cf.* The *Larval Fathead Minnow Juvenile Acute Laboratory Control Chart* attached to this report

[21] State Water Resources Control Board (SWRCB). 1997. *California Ocean Plan, Water Quality Control Plan Ocean Waters of California*. State Water Resources Control Board, California Environmental Protection Agency. Effective July 23, 1997.

[22] See the discussion beginning on Page III-1 in: *Supplement to the 2003 Renewal Application for Ocean Discharge under NPDES Permit No. CA0047881*. Prepared for the City of Morro Bay, Morro Bay, CA, July 2003.

[23] The *Practical Quantification Limit* is the smallest quantifiable concentration based on the sample size and analytical technique.

[24] Table 14 (Page III-20) in: Supplement to the 2003 Renewal Application for Ocean Discharge under NPDES Permit No. CA0047881. Prepared for the City of Morro Bay, Morro Bay, CA. July 2003.

Table 2. Comparison of Effluent Chemical Concentrations with NPDES Permit Limitations

		Concentration	
Constituent	**Units**	**Measured**	**Limitation**[27]
Copper	µg/L	13.	140.
Zinc	µg/L	53.	1,620.
Chloroform	µg/L	1.1	17,400.[28]
Ammonia (as N)	mg/L	23.	80.4

effluent samples collected on a monthly basis. Ammonia has always been present in detectable concentrations well below the most stringent permit limit of 80.4 mg/L, which applies to a 6-month median. The ammonia concentration of 23 mg/L measured in the January 2009 sample was comparable to the historical average concentration of 25 mg/L.

Metals

Similarly, the presence of copper and zinc at low but measureable concentrations in the January effluent sample is not indicative of any significant new contaminant sources within the collection system. Unlike synthetic organic compounds, these metals occur naturally within the mineralogy of sediments along the central California coast. They enter the wastewater collection system through erosion of natural mineral deposits. Both compounds also frequently enter the wastewater collection system through internal corrosion of household plumbing systems.

The measured concentrations were only 3 µg/L above their respective PQLs of 10 µg/L for copper and 50 µg/L for zinc. As such, the measured copper concentration was at least 10-times less than the limit specified in the NPDES discharge permit for 6-month median concentrations, while the measured concentration of zinc was 30-times less.

Chloroform

Chloroform was the only other compound detected in measurable concentrations within the January 2009 effluent sample. Chloroform is a common by-product of drinking water and wastewater chlorination programs and has been detected at low levels in about half of the effluent samples over the past decade. At 1.1 µg/L, the concentration in the January 2009 sample measured only slightly above its quantification limit of 0.5 µg/L, and it was over four orders of magnitude lower than levels considered harmful to human health. Additionally, because chloroform rapidly volatizes in seawater, low concentrations are not of ecological concern in the marine environment. At its low measured concentration, and at flow rates comparable to 2008, the mass emission of chloroform remains well below the mass-loading goal of 5 kg/yr identified in the NPDES permit.

Detected but Nonquantifiable Chemical Constituents

In addition to the four compounds detected in the effluent at quantifiable levels, ten other constituents were detected at levels too minute for accurate quantification by standard laboratory procedures. These compounds are listed in Table 3 with their estimated concentrations. They include four naturally occurring metals, two gasoline-related compounds, a cleaning agent, a solvent, and a chlorination by-product. All estimated concentrations are at least one order of magnitude less than their respective limiting concentrations. As such, the presence of these compounds in the effluent cannot be considered a threat to human health or the marine environment.

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[25] Table 22 (Page III-78) *op. cit.*
[26] NH_3-N
[27] 6-month median limitation unless otherwise indicated.
[28] 30-Day Average

Table 3. Effluent Constituents Detected at Nonquantifiable Concentrations

		Concentration			
Constituent	**Units**	**MDL**	**Estimated** [29]	**PQL**	**Limitation** [27]
Nickel	µg/L	2.3	3.4	10.	670.
Lead	µg/L	0.053	0.99	1.0	270.
Selenium	µg/L	0.5	1.4	2.0	2010.
Toluene	µg/L	0.054	0.26	0.5	11400000. [28]
Total Xylenes	µg/L	0.17	0.44	0.5	— [30]
Methylene chloride	mg/L	0.095	0.35	1.0	— [30]
1,4 Dichlorobenzene	µg/L	0.083	0.10	0.5	2410. [28]
Dibromochloromethane	µg/L	0.094	0.16	0.5	17400. [28]
Bis (2-ethylhexyl) phthalate	µg/L	11.	21.	50.	470. [28]
3&4 Methylphenol	µg/L	8.3	11.	20.	4020. [28]

Metals

Trace amounts of nickel, lead, and selenium in the January effluent sample does not indicate any significant new contaminant sources within the collection system. Like copper and zinc, these metals occur naturally within the mineralogy of sediments along the central California coast. They enter the wastewater collection system through erosion of natural mineral deposits and, in the case of lead, through internal corrosion of household plumbing systems.

BTEX

Toluene and xylene are aromatic hydrocarbon compounds part of what is collectively known as BTEX (benzene, toluene, ethyl benzene, and xylene). BTEX constituents generally indicate the presence of low-level gasoline concentrations. In addition to total xylenes detected at the estimated concentration of 0.17 µg/L listed in Table 3, the *p&m* and *o* isomers[31] of xylene were detected at the respective estimated concentrations of 0.30 µg/L and 0.14 µg/L.

Cleaning Agents and Solvents

Methylene chloride is commonly used as an industrial solvent and paint stripper, while the volatile organic chemical, 1,4-dichlorobenzene, is used to control moths, molds, and mildew and to deodorize restrooms and waste containers. Both have been occasionally detected at low concentrations in effluent samples.

Chlorination Byproducts

Dibromochloromethane is a halomethane. Halomethanes form during the chlorine disinfection process when organic substances are present. At the low concentration detected in the January 2009 effluent, it is not clear whether the presence of this compound is the result of wastewater disinfection within the treatment plant or the result of the chlorination of drinking water that is subsequently discharged into the collection system.

DEHP

The phthalate compound, bis (2-ethylhexyl) phthalate (DEHP), is a ubiquitous compound that has been consistently detected at low levels in effluent and biosolid samples collected over the past decade.[32]

[29] Concentration could only be estimated because amounts were too small to be quantified above the PQL.
[30] Limit not specified in the NPDES discharge permit.
[31] Constitutional isomers are molecules with the same molecular formula but have their atoms bonded together in different orders.
[32] Table 3 (Page II-9) in: Supplement to the 2003 Renewal Application for Ocean Discharge under NPDES Permit No. CA0047881. Prepared for the City of Morro Bay, Morro Bay, CA. July 2003.

Phthalate esters, such as DEHP, are components of synthetic dyes, resins, plasticizers, insecticides, and, pharmaceuticals. DEHP is a physical plasticizer added to plastic resins (primarily PVC) to soften them, increasing flexibility. It is not, however, covalently bound to the resin, which allows it to slowly leach out of the plastic and into the environment over time through evaporation or dissolution.

The annual production of DEHP is estimated at nearly 4 million tons worldwide. Plastics may contain from 1% to 40% DEHP by weight and are widely used in consumer products such as imitation leather, rainwear, footwear, upholstery, flooring, tablecloths, shower curtains, food packaging materials, and children's toys. Plastics containing DEHP are also used for tubing and containers for blood transfusions and blood products, as a hydraulic fluid, and as a dielectric fluid (a nonconductor of electric current) in electrical capacitors.

Because of their mobility, high vapor pressure, and the massive scale at which they are produced, phthalate esters, and DEHP in particular, have become pervasive in the environment. However, although this phthalate compound can negatively affect human health, concentrations would have to be 22 times higher than those measured in January 2009 to be of a human health concern.

Methylphenol

3&4 methylphenol (p-cresol) is a nonchlorinated phenolic compound that is a natural product present in many foods, as well as crude oil and coal tar. It is also detected in animal and human urine. In addition to its industrial uses, p-cresol is also an antiseptic and disinfectant because of its bactericidal and fungicidal properties. As a metabolite of toluene, p-cresol is a known toxin; however, the combined concentrations of all nonchlorinated phenolic compounds in the grab sample would have to be more than three orders of magnitude higher than those measured in the January 2009 effluent samples to be of a human health concern.

Conclusions

The comprehensive chemical and bioassay analyses conducted on effluent samples collected in January 2009 augment data collected over the last two decades. Together, these measurements demonstrate the consistently benign nature of the discharge from the MBCSD treatment plant. The absence of heavy industry within the collection area and the high performance of the treatment process are reflected in the general lack of toxicity and chemical contaminants within the effluent samples. The concentrations of the few chemical compounds that were detected in the January 2009 samples were typical of wastewater derived from domestic sources and all were far below limits specified in the NPDES discharge permit. All measurements fully complied with the requirements and limitations specified in the current NPDES discharge permit.

Please contact the undersigned if you have questions regarding these results.

Sincerely,

Douglas A. Coats, Ph.D.
Program Manager

Enclosures (4)

CHEMICAL ANALYSIS RESULTS

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Water Analysis (General Chemistry)

BCL Sample ID: 0900887-01 | **Client Sample Name:** Grab Eff A.R.S., 1/21/2009 9:10:00AM

Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals
Ammonia as N (Distilled)	23	mg/L	2.0	1.0	EPA-350.1	01/26/09	01/27/09 11:56	JSM	SC-1	20	BSA1402	1.1	A01

Marine Research Specialists
3140 Telegraph Road, Suite A
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Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Organochlorine Pesticides and PCB's (EPA Method 608)

BCL Sample ID: 0900887-02 | **Client Sample Name:** Comp Eff A.R.S., 1/21/2009 9:10:00AM

Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals
Aldrin	ND	ug/L	0.0050	0.0013	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
alpha-BHC	ND	ug/L	0.0050	0.0011	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
beta-BHC	ND	ug/L	0.0050	0.0021	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
delta-BHC	ND	ug/L	0.0050	0.0014	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
gamma-BHC (Lindane)	ND	ug/L	0.0050	0.00094	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
Chlordane (Technical)	ND	ug/L	0.50	0.38	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
4,4'-DDD	ND	ug/L	0.0050	0.0017	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
4,4'-DDE	ND	ug/L	0.0050	0.0019	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
4,4'-DDT	ND	ug/L	0.0050	0.00076	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
Dieldrin	ND	ug/L	0.0050	0.0012	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
Endosulfan I	ND	ug/L	0.0050	0.0016	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
Endosulfan II	ND	ug/L	0.0050	0.0014	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
Endosulfan sulfate	ND	ug/L	0.0050	0.0026	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
Endrin	ND	ug/L	0.0050	0.00082	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
Endrin aldehyde	ND	ug/L	0.010	0.0032	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
Heptachlor	ND	ug/L	0.0050	0.0012	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
Heptachlor epoxide	ND	ug/L	0.0050	0.00099	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
Methoxychlor	ND	ug/L	0.0050	0.0011	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
Toxaphene	ND	ug/L	2.0	0.42	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
PCB-1016	ND	ug/L	0.20	0.020	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
PCB-1221	ND	ug/L	0.20	0.089	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
PCB-1232	ND	ug/L	0.20	0.090	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	

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Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Organochlorine Pesticides and PCB's (EPA Method 608)

BCL Sample ID: 0900887-02 | **Client Sample Name:** Comp Eff A.R.S., 1/21/2009 9:10:00AM

Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals
PCB-1242	ND	ug/L	0.20	0.095	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
PCB-1248	ND	ug/L	0.20	0.025	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
PCB-1254	ND	ug/L	0.20	0.042	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
PCB-1260	ND	ug/L	0.20	0.020	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
Total PCB's (Summation)	ND	ug/L	0.20	0.10	EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567	ND	
TCMX (Surrogate)	132	%	72 - 129 (LCL - UCL)		EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567		S09
Dibutyl chlorendate (Surrogate)	49.1	%	82 - 177 (LCL - UCL)		EPA-608	01/26/09	02/04/09 11:00	JYT	GC-1	1	BSA1567		S09

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Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Volatile Organic Analysis (EPA Method 624)

BCL Sample ID: 0900887-02 **Client Sample Name:** Comp Eff A.R.S., 1/21/2009 9:10:00AM

Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals
Benzene	ND	ug/L	0.50	0.057	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
Bromodichloromethane	ND	ug/L	0.50	0.17	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
Bromoform	ND	ug/L	0.50	0.20	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
Bromomethane	ND	ug/L	1.0	0.19	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
Carbon tetrachloride	ND	ug/L	0.50	0.063	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
Chlorobenzene	ND	ug/L	0.50	0.050	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
Chloroethane	ND	ug/L	0.50	0.16	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
Chloroform	**1.1**	**ug/L**	**0.50**	**0.067**	**EPA-624**	**01/23/09**	**01/26/09 13:32**	**MGC**	**MS-V7**	**1**	**BSA1318**	**ND**	
Chloromethane	ND	ug/L	0.50	0.077	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
Dibromochloromethane	**0.16**	**ug/L**	**0.50**	**0.094**	**EPA-624**	**01/23/09**	**01/26/09 13:32**	**MGC**	**MS-V7**	**1**	**BSA1318**	**ND**	**J**
1,2-Dichlorobenzene	ND	ug/L	0.50	0.075	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
1,3-Dichlorobenzene	ND	ug/L	0.50	0.088	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
1,4-Dichlorobenzene	**0.10**	**ug/L**	**0.50**	**0.083**	**EPA-624**	**01/23/09**	**01/26/09 13:32**	**MGC**	**MS-V7**	**1**	**BSA1318**	**ND**	**J**
1,1-Dichloroethane	ND	ug/L	0.50	0.077	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
1,2-Dichloroethane	ND	ug/L	0.50	0.14	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
1,1-Dichloroethene	ND	ug/L	0.50	0.050	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
trans-1,2-Dichloroethene	ND	ug/L	0.50	0.14	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
1,2-Dichloropropane	ND	ug/L	0.50	0.087	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
cis-1,3-Dichloropropene	ND	ug/L	0.50	0.068	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
trans-1,3-Dichloropropene	ND	ug/L	0.50	0.091	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
Ethylbenzene	ND	ug/L	0.50	0.063	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
Methylene chloride	**0.35**	**ug/L**	**1.0**	**0.095**	**EPA-624**	**01/23/09**	**01/26/09 13:32**	**MGC**	**MS-V7**	**1**	**BSA1318**	**ND**	**J**

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Project: Semi-Annual Eff
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Reported: 02/12/2009 15:58

Volatile Organic Analysis (EPA Method 624)

BCL Sample ID: 0900887-02 **Client Sample Name:** Comp Eff A.R.S., 1/21/2009 9:10:00AM

Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals
Methyl t-butyl ether	ND	ug/L	0.50	0.079	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	0.13	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
Tetrachloroethene	ND	ug/L	0.50	0.072	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
Toluene	**0.26**	**ug/L**	**0.50**	**0.054**	**EPA-624**	**01/23/09**	**01/26/09 13:32**	**MGC**	**MS-V7**	**1**	**BSA1318**	**ND**	**J**
1,1,1-Trichloroethane	ND	ug/L	0.50	0.052	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
1,1,2-Trichloroethane	ND	ug/L	0.50	0.17	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
Trichloroethene	ND	ug/L	0.50	0.078	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
Trichlorofluoromethane	ND	ug/L	0.50	0.086	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ug/L	0.50	0.068	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
Vinyl chloride	ND	ug/L	0.50	0.089	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
Total Xylenes	**0.44**	**ug/L**	**0.50**	**0.17**	**EPA-624**	**01/23/09**	**01/26/09 13:32**	**MGC**	**MS-V7**	**1**	**BSA1318**	**ND**	**J**
Acrolein	ND	ug/L	20	3.7	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
Acrylonitrile	ND	ug/L	5.0	0.69	EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318	ND	
p- & m-Xylenes	**0.30**	**ug/L**	**0.50**	**0.14**	**EPA-624**	**01/23/09**	**01/26/09 13:32**	**MGC**	**MS-V7**	**1**	**BSA1318**	**ND**	**J**
o-Xylene	**0.14**	**ug/L**	**0.50**	**0.070**	**EPA-624**	**01/23/09**	**01/26/09 13:32**	**MGC**	**MS-V7**	**1**	**BSA1318**	**ND**	**J**
1,2-Dichloroethane-d4 (Surrogate)	98.1	%	76 - 114 (LCL - UCL)		EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318		
Toluene-d8 (Surrogate)	99.4	%	88 - 110 (LCL - UCL)		EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318		
4-Bromofluorobenzene (Surrogate)	102	%	86 - 115 (LCL - UCL)		EPA-624	01/23/09	01/26/09 13:32	MGC	MS-V7	1	BSA1318		

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Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

BCL Sample ID: 0900887-02 | **Client Sample Name:** Comp Eff A.R.S., 1/21/2009 9:10:00AM

Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals
Acenaphthene	ND	ug/L	20	4.8	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Acenaphthylene	ND	ug/L	20	6.4	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Aldrin	ND	ug/L	20	8.0	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Aniline	ND	ug/L	50	4.6	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Anthracene	ND	ug/L	20	7.9	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Benzidine	ND	ug/L	200	47	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Benzo[a]anthracene	ND	ug/L	20	5.2	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Benzo[b]fluoranthene	ND	ug/L	20	6.6	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Benzo[k]fluoranthene	ND	ug/L	20	8.0	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Benzo[a]pyrene	ND	ug/L	20	7.3	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Benzo[g,h,i]perylene	ND	ug/L	20	9.4	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Benzoic acid	ND	ug/L	100	61	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Benzyl alcohol	ND	ug/L	20	6.7	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Benzyl butyl phthalate	ND	ug/L	20	5.9	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
alpha-BHC	ND	ug/L	20	5.0	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
beta-BHC	ND	ug/L	20	4.8	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
delta-BHC	ND	ug/L	20	6.0	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
gamma-BHC (Lindane)	ND	ug/L	20	5.6	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
bis(2-Chloroethoxy)methane	ND	ug/L	20	5.8	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
bis(2-Chloroethyl) ether	ND	ug/L	20	5.2	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
bis(2-Chloroisopropyl)ether	ND	ug/L	20	7.3	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
bis(2-Ethylhexyl)phthalate	**21**	**ug/L**	**50**	**11**	**EPA-625**	**01/23/09**	**01/31/09 04:03**	**SKC**	**MS-B2**	**10**	**BSA1600**	**28**	**J,A10**

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Reported: 02/12/2009 15:58

Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

BCL Sample ID: 0900887-02 | **Client Sample Name:** Comp Eff A.R.S., 1/21/2009 9:10:00AM

Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals
4-Bromophenyl phenyl ether	ND	ug/L	20	6.9	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
4-Chloroaniline	ND	ug/L	20	8.7	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
2-Chloronaphthalene	ND	ug/L	20	5.0	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
4-Chlorophenyl phenyl ether	ND	ug/L	20	6.8	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Chrysene	ND	ug/L	20	7.3	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
4,4'-DDD	ND	ug/L	20	5.0	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
4,4'-DDE	ND	ug/L	30	5.8	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
4,4'-DDT	ND	ug/L	20	2.7	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Dibenzo[a,h]anthracene	ND	ug/L	30	9.2	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Dibenzofuran	ND	ug/L	20	8.1	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
1,2-Dichlorobenzene	ND	ug/L	20	5.8	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
1,3-Dichlorobenzene	ND	ug/L	20	6.6	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
1,4-Dichlorobenzene	ND	ug/L	20	5.3	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
3,3-Dichlorobenzidine	ND	ug/L	100	8.8	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Dieldrin	ND	ug/L	30	5.2	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Diethyl phthalate	ND	ug/L	20	8.5	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Dimethyl phthalate	ND	ug/L	20	5.5	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Di-n-butyl phthalate	ND	ug/L	20	7.4	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
2,4-Dinitrotoluene	ND	ug/L	20	9.9	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
2,6-Dinitrotoluene	ND	ug/L	20	7.4	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Di-n-octyl phthalate	ND	ug/L	20	8.5	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
1,2-Diphenylhydrazine	ND	ug/L	20	7.0	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10

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Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

BCL Sample ID: 0900887-02 | **Client Sample Name:** Comp Eff A.R.S., 1/21/2009 9:10:00AM

Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals
Endosulfan I	ND	ug/L	100	27	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Endosulfan II	ND	ug/L	100	24	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Endosulfan sulfate	ND	ug/L	30	5.8	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Endrin	ND	ug/L	20	5.4	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Endrin aldehyde	ND	ug/L	100	8.6	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Fluoranthene	ND	ug/L	20	7.0	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Fluorene	ND	ug/L	20	7.3	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Heptachlor	ND	ug/L	20	6.0	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Heptachlor epoxide	ND	ug/L	20	6.3	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Hexachlorobenzene	ND	ug/L	20	7.1	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Hexachlorobutadiene	ND	ug/L	20	5.9	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Hexachlorocyclopentadiene	ND	ug/L	20	2.6	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Hexachloroethane	ND	ug/L	20	5.2	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Indeno[1,2,3-cd]pyrene	ND	ug/L	20	9.2	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Isophorone	ND	ug/L	20	5.1	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
2-Methylnaphthalene	ND	ug/L	20	5.1	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Naphthalene	ND	ug/L	20	6.2	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
2-Naphthylamine	ND	ug/L	200	65	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
2-Nitroaniline	ND	ug/L	20	8.0	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
3-Nitroaniline	ND	ug/L	20	8.2	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
4-Nitroaniline	ND	ug/L	50	11	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Nitrobenzene	ND	ug/L	20	5.5	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10

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Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

BCL Sample ID: 0900887-02 | **Client Sample Name:** Comp Eff A.R.S., 1/21/2009 9:10:00AM

Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instrument ID	Dilution	QC Batch ID	MB Bias	Lab Quals
N-Nitrosodimethylamine	ND	ug/L	20	4.5	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
N-Nitrosodi-N-propylamine	ND	ug/L	20	5.9	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
N-Nitrosodiphenylamine	ND	ug/L	20	8.0	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Phenanthrene	ND	ug/L	20	6.0	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Pyrene	ND	ug/L	20	6.2	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
1,2,4-Trichlorobenzene	ND	ug/L	20	6.7	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
4-Chloro-3-methylphenol	ND	ug/L	50	6.7	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
2-Chlorophenol	ND	ug/L	20	6.5	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
2,4-Dichlorophenol	ND	ug/L	20	6.0	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
2,4-Dimethylphenol	ND	ug/L	20	5.2	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
4,6-Dinitro-2-methylphenol	ND	ug/L	100	22	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
2,4-Dinitrophenol	ND	ug/L	100	24	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
2-Methylphenol	ND	ug/L	20	5.7	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
3- & 4-Methylphenol	ND	ug/L	20	8.3	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
2-Nitrophenol	ND	ug/L	20	4.2	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
4-Nitrophenol	ND	ug/L	20	17	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Pentachlorophenol	ND	ug/L	100	4.5	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
Phenol	ND	ug/L	20	3.7	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
2,4,5-Trichlorophenol	ND	ug/L	50	9.3	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
2,4,6-Trichlorophenol	ND	ug/L	50	4.3	EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600	ND	A10
2-Fluorophenol (Surrogate)	0	%	28 - 93 (LCL - UCL)		EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600		A10,A17
Phenol-d5 (Surrogate)	0	%	0 - 82 (LCL - UCL)		EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600		A10,A17

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

BCL Sample ID: 0900887-02 | **Client Sample Name:** Comp Eff A.R.S., 1/21/2009 9:10:00AM

Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals
Nitrobenzene-d5 (Surrogate)	0	%	53 - 116 (LCL - UCL)		EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600		A10,A17
2-Fluorobiphenyl (Surrogate)	0	%	23 - 157 (LCL - UCL)		EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600		A10,A17
2,4,6-Tribromophenol (Surrogate)	0	%	38 - 142 (LCL - UCL)		EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600		A10,A17
p-Terphenyl-d14 (Surrogate)	0	%	48 - 148 (LCL - UCL)		EPA-625	01/23/09	01/31/09 04:03	SKC	MS-B2	10	BSA1600		A10,A17

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Water Analysis (General Chemistry)

BCL Sample ID: 0900887-02 | **Client Sample Name:** Comp Eff A.R.S., 1/21/2009 9:10:00AM

Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals
Total Cyanide	ND	mg/L	0.0050	0.0032	EPA-335.4	01/23/09	01/23/09 11:55	TDC	KONE-1	1	BSA1118	ND	

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Water Analysis (Metals)

BCL Sample ID: 0900887-02 | **Client Sample Name:** Comp Eff A.R.S., 1/21/2009 9:10:00AM

Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals
Total Antimony	ND	ug/L	100	14	EPA-200.7	01/26/09	01/29/09 11:38	ARD	PE-OP1	1	BSA1404	ND	
Total Beryllium	ND	ug/L	10	1.1	EPA-200.7	01/26/09	01/29/09 11:38	ARD	PE-OP1	1	BSA1404	ND	
Total Cadmium	ND	ug/L	10	1.4	EPA-200.7	01/26/09	01/29/09 11:38	ARD	PE-OP1	1	BSA1404	ND	
Total Chromium	ND	ug/L	10	2.3	EPA-200.7	01/26/09	01/29/09 11:38	ARD	PE-OP1	1	BSA1404	ND	
Total Copper	**13**	**ug/L**	**10**	**1.4**	**EPA-200.7**	**01/26/09**	**01/29/09 11:38**	**ARD**	**PE-OP1**	**1**	**BSA1404**	**ND**	
Total Mercury	ND	ug/L	0.20	0.016	EPA-245.1	01/26/09	01/27/09 10:20	MEV	CETAC1	1	BSA1462	ND	
Total Nickel	**3.4**	**ug/L**	**10**	**2.3**	**EPA-200.7**	**02/06/09**	**02/12/09 10:05**	**ARD**	**PE-OP1**	**1**	**BSB0490**	**ND**	**J**
Total Silver	ND	ug/L	10	2.5	EPA-200.7	01/26/09	01/29/09 11:38	ARD	PE-OP1	1	BSA1404	ND	
Total Zinc	**53**	**ug/L**	**50**	**8.9**	**EPA-200.7**	**01/26/09**	**01/29/09 11:38**	**ARD**	**PE-OP1**	**1**	**BSA1404**	**ND**	
Total Recoverable Arsenic	ND	ug/L	2.0	0.82	EPA-200.8	01/23/09	01/30/09 17:24	PRA	PE-EL1	1	BSA1344	ND	
Total Recoverable Lead	**0.99**	**ug/L**	**1.0**	**0.053**	**EPA-200.8**	**01/23/09**	**01/30/09 17:24**	**PRA**	**PE-EL1**	**1**	**BSA1344**	**0.14**	**J**
Total Recoverable Selenium	**1.4**	**ug/L**	**2.0**	**0.50**	**EPA-200.8**	**01/23/09**	**01/30/09 17:24**	**PRA**	**PE-EL1**	**1**	**BSA1344**	**ND**	**J**
Total Recoverable Thallium	ND	ug/L	1.0	0.054	EPA-200.8	01/23/09	01/30/09 17:24	PRA	PE-EL1	1	BSA1344	ND	

ACUTE AND CHRONIC BIOASSAY RESULTS

LABORATORY REPORT

Aquatic Testing Laboratories
"dedicated to providing quality aquatic toxicity testing"
4350 Transport Street, Unit 107
Ventura, CA 93003
(805) 650-0546 FAX (805) 650-0756
CA DOHS ELAP Cert. No.: 1775

Date: January 25, 2009

Client: Marine Research Specialists
3140 Telegraph Road, Suite A
Ventura, CA 93003
Attn: Doug Coats

Laboratory No.: A-09012001
Sample I.D.: Morro Bay Effluent

Sample Control: The samples were received by ATL within the recommended hold time, in a chilled state, and with the chain of custody records attached.

Date Sampled:	01/19/09	01/20/09	01/21/09	01/22/09
Date Received:	01/20/09	01/20/09	01/22/09	01/23/09
Temp. Received:	2°C	5°C	4°C	2°C
Chlorine (TRC):	0.0 mg/l	0.0 mg/l	0.0 mg/l	0.0 mg/l
Dates Tested:	01/20/09 to 01/24/09			

Sample Analysis: The following analyses were performed on your sample:

Fathead Minnow 96hr Acute Static-Renewal Toxicity Test (EPA Method 2000.0).

Attached are the test data generated from the analysis of your sample.

Result Summary:

Sample ID.	Test	LC50	TUa
Grab Effluent	Fathead Minnow	70.7%	1.41

Quality Control: Reviewed and approved by:

Joseph A. LeMay
Laboratory Director

FATHEAD MINNOW ACUTE NPDES TEST

Aquatic Testing Laboratories

Lab No.: A-09012001
Client/ID: MRS - Morro Bay **Start Date: 01/20/2009**

TEST SUMMARY

Species: *Pimephales promelas*.
Age: 13 (1-14) days.
Regulations: NPDES.
Test solution volume: 250 ml.
Feeding: prior to renewal at 48 hrs.
Aeration: None, unless DO drops below 4.0 mg/l.
Number of replicates: 2.
Dilution water: Moderately hard reconstituted water.
QA/QC Batch No.: RT-090107.

Source: In-laboratory Culture.
Test type: Static-Renewal.
Test Protocol: EPA-821-R-02-012.
Endpoints: Percent Survival at 96 hrs.
Test chamber: 500 ml beakers.
Temperature: 20 +/- 1°C.
Number of fish per chamber: 10.
Photoperiod: 16/8 hrs light/dark.

INITIAL WATER QUALITY PARAMETERS

Additional Parameters	Control	100% Sample			
		Day 1	Day 2	Day 3	Day 4
Temperature (°C)	20.8	20°	5°	4°	20°
DO (mg/l)	8.7	7.2	7.4	8.4	8.1
pH	7.7	7.3	7.3	7.4	7.4
Total Res. Chlorine (mg/l)	0	0	0	0	0
Ammonia (mg/l NH_3-N)**	<0.1	48	48	60	60
Alkalinity (mg/l $CaCO_3$)	68	336	340	380	380
Hardness (mg/l $CaCO_3$)	97	236	290	350	340
Conductivity (umhos)	320	1418	1680	2090	2070

Comments:
*** Chlorine neutralized with sodium thiosulfate (one drop per liter of 10% solution).**
**** Ammonia reading by Hach Kit - only approximate indication.**

Concentration-response relationship acceptable? (see attached computer analysis):
(Yes) (response curve normal)
No (dose interrupted indicated or non-normal)

Acute Fish Test-96 Hr Survival

Start Date:	1/20/2009 11:30	Test ID:	9012001	Sample ID:	CA0047881-Morro Bay SD
End Date:	1/24/2009 11:30	Lab ID:	CAATL-Aquatic Testing Labs	Sample Type:	EFF1-POTW
Sample Date:	1/19/2009 08:00	Protocol:	ACUTE-EPA-821-R-02-012	Test Species:	PP-Pimephales promelas

Comments:

Conc-%	1	2
D-Control	1.0000	1.0000
6.25	1.0000	1.0000
12.5	1.0000	1.0000
25	1.0000	1.0000
50	1.0000	1.0000
100	0.0000	0.0000

			Transform: Arcsin Square Root					Number	Total
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Resp	Number
D-Control	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20
6.25	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20
12.5	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20
25	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20
50	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20
100	0.0000	0.0000	0.1588	0.1588	0.1588	0.000	2	20	20

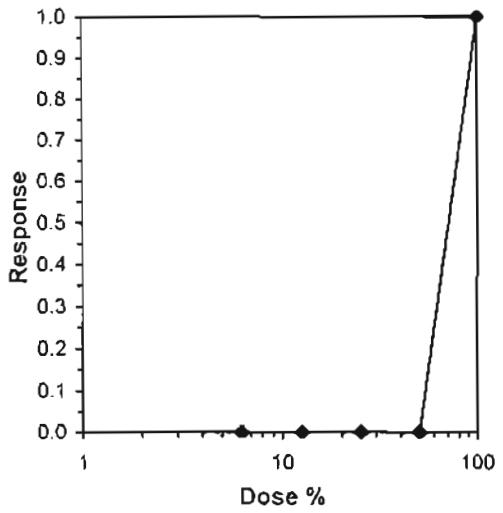
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Normality of the data set cannot be confirmed				
Equality of variance cannot be confirmed				

Graphical Method

Trim Level	EC50
0.0%	70.711

70.711

$TU_A = 1.41$



FATHEAD MINNOW ACUTE NPDES TEST

Aquatic Testing Laboratories

Lab No.: A-09012001
Client/ID: MRS - Morro Bay

Start Date: 01/20/2009

RAW TEST DATA

			DAY 1		DAY 2		DAY 3		DAY 4	
			0 hr	24hr	0 hr	24hr	0 hr	24hr	0 hr	24hr
Analyst Initials:			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Time of Readings:			1130	1230	1230	1100	1100	1230	1230	1130
Control	DO		8.7	7.6	8.8	7.5	8.8	7.3	8.6	6.7
	pH		7.7	7.3	7.8	7.5	7.8	7.4	7.7	7.4
	Temp		20.8	20.4	20.9	20.5	21.0	20.6	20.9	20.8
	# Alive	Rep A	---	10	---	10	---	10	---	10
		Rep B	---	10	---	10	---	10	---	10
6.25%	DO		8.8	7.4	8.7	7.3	8.7	7.3	8.6	7.3
	pH		7.6	7.4	7.7	7.5	7.7	7.5	7.6	7.5
	Temp		20.8	20.4	20.9	20.5	21.0	20.6	20.9	20.7
	# Alive	Rep A	---	10	---	10	---	10	---	10
		Rep B	---	10	---	10	---	10	---	10
12.5%	DO		8.7	7.3	8.6	7.2	8.7	7.1	8.6	7.3
	pH		7.4	7.5	7.6	7.6	7.7	7.6	7.6	7.6
	Temp		20.7	20.3	20.9	20.5	21.0	20.5	20.9	20.7
	# Alive	Rep A	---	10	---	10	---	10	---	10
		Rep B	---	10	---	10	---	10	---	10
25%	DO		8.5	6.9	8.4	6.9	8.7	6.7	8.6	7.2
	pH		7.3	7.6	7.4	7.7	7.6	7.7	7.5	7.7
	Temp		20.6	20.4	21.0	20.5	21.0	20.5	20.9	20.7
	# Alive	Rep A	---	10	---	10	---	10	---	10
		Rep B	---	10	---	10	---	10	---	10
50%	DO		8.3	6.7	8.2	6.1	8.6	5.7	8.5	5.6
	pH		7.3	7.8	7.3	7.8	7.4	7.8	7.5	7.8
	Temp		20.5	20.3	21.0	20.5	21.0	20.5	20.9	20.7
	# Alive	Rep A	---	10	---	10	---	10	---	10
		Rep B	---	10	---	10	---	10	---	10
100%	DO		7.5	4.2	—	—	—	—	—	—
	pH		7.3	7.9	—	—	—	—	—	—
	Temp		20.2	20.4	—	—	—	—	—	—
	# Alive	Rep A	---	0	---		---	—	---	—
		Rep B	---	0	---	—	---	—	---	—

LABORATORY REPORT

Aquatic Testing Laboratories
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4350 Transport Street, Unit 107
Ventura, CA 93003
(805) 650-0546 FAX (805) 650-0756
CA DOHS ELAP Cert. No.: 1775

Date: January 11, 2009

Client: Marine Research Specialists
3140 Telegraph Road, Suite A
Ventura, CA 93003
Attn: Doug Coats

Laboratory No.: A-09010601
Sample I.D.: Morro Bay Effluent

Sample Control: The samples were received by ATL within the recommended hold time, in a chilled state, and with the chain of custody records attached.

Date Sampled:	01/05/09 (composite)
Date Received:	01/06/09
Temp. Received:	1°C
Chlorine (TRC):	0.0 mg/l
Dates Tested:	01/06/09 to 01/08/09

Sample Analysis: The following analyses were performed on your sample:

Giant Kelp Germination and Growth Short-Term Toxicity Test (EPA Method 1009.0).

Attached are the test data generated from the analysis of your sample.

Result Summary:

Sample ID.	Test	NOEC	TUc
Comp Effluent	Kelp Germination:	10%	10.0
	Kelp Growth:	10%	10.0

Quality Control: Reviewed and approved by:

Joseph A. LeMay
Laboratory Director

GIANT KELP GERMINATION AND GROWTH SHORT-TERM TOXICITY TEST

Aquatic Testing Laboratories

Lab No.: A-09010601-002
Client/ID: MRS - Morro Bay Comp. Effluent

Date Tested: 01/06/09 - 01/08/09

TEST SUMMARY

Species: *Macrocystis pyrifera.*
Protocol: EPA Method 1009.0.
Test type: Static.
Test chamber: glass beaker.
Temperature: 15 +/- 1°C.
Number of spores per ml: 7,500 (approx.).
QA/QC Batch No.: RT-090106 (ran concurrently).

Source: Field collected.
Dilution water: Lab seawater.
Endpoints: NOEC, IC25 at 48 hrs.
Test volume: 200 ml.
Aeration: None.
Number of replicates: 5.

RESULTS SUMMARY

Sample Concentration	Percent Germination		Mean Germ Tube Length (μm)	
Control (Brine)	85.7%		15.55	
Control (Dilution)	82.8%		15.45	
5.6%	82.4%		15.85	
10%	82.5%		15.65	
18%	62.8%	*	12.70	*
32%	37.8%	*	8.25	*
56%	16.7%	*	7.35	*
* Statistically significantly less than control at P = 0.05 level				

CHRONIC TOXICITY

END POINT	GERMINATION	GERM TUBE LENGTH
NOEC	10%	10%
TUc (100/NOEC)	10.0	10.0

QA/QC TEST ACCEPTABILITY

Parameter	Result
Mean control germination ≥70%	Yes (82.8%)
Mean control germination tube length > 10 μm	Yes (15.45 μm)
Please see RT-090106 report for additional test acceptability criteria.	

Macrocystis Germination and Growth Test-Proportion Germinated

Start Date:	1/6/2009 15:00	Test ID:	9010601k	Sample ID:	CA0047881-Morro Bay SD
End Date:	1/8/2009 15:00	Lab ID:	CAATL-Aquatic Testing Labs	Sample Type:	EFF1-POTW
Sample Date:	1/5/2009 08:45	Protocol:	EPAWC-EPA/600/R-95/136	Test Species:	MP-Macrocystis pyrifera

Comments:

Conc-%	1	2	3	4	5
B-Control	0.8654	0.8515	0.8137	0.8218	0.9010
D-Control	0.7611	0.9010	0.8119	0.8431	0.8235
5.6	0.8519	0.8020	0.8173	0.8039	0.8431
10	0.8020	0.8641	0.8447	0.7864	0.8269
18	0.6731	0.7400	0.5865	0.5094	0.6296
32	0.4466	0.0926	0.3462	0.5941	0.4107
56	0.1481	0.2762	0.1509	0.1800	0.0818

			Transform: Arcsin Square Root					Rank	1-Tailed	Number	Total
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Resp	Number
B-Control	0.8507	1.0272	1.1761	1.1245	1.2507	4.310	5				
D-Control	0.8281	1.0000	1.1468	1.0601	1.2507	6.057	5	*		90	519
5.6	0.8236	0.9946	1.1380	1.1096	1.1757	2.647	5	26.50	16.00	91	517
10	0.8248	0.9960	1.1401	1.0904	1.1932	3.637	5	28.00	16.00	90	514
*18	0.6277	0.7580	0.9163	0.7948	1.0357	9.919	5	15.00	16.00	195	522
*32	0.3780	0.4565	0.6492	0.3092	0.8800	32.522	5	15.00	16.00	330	528
*56	0.1674	0.2022	0.4151	0.2901	0.5533	22.830	5	15.00	16.00	441	529

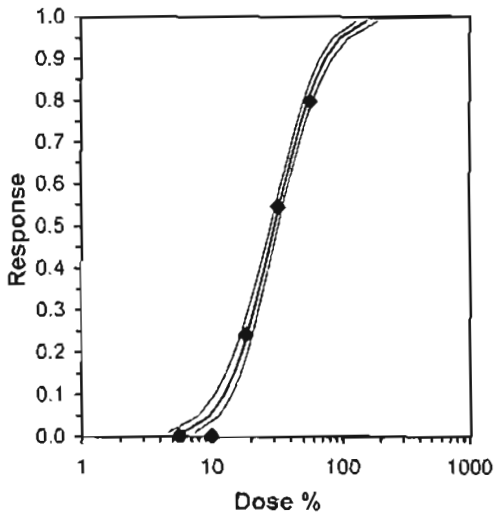
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.90125	0.927	-0.9976	4.78645
Bartlett's Test indicates unequal variances (p = 5.32E-03)	16.6029	15.0863		
The control means are not significantly different (p = 0.47)	0.76317	2.30601		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	10	18	13.4164	10
Treatments vs D-Control				

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	3.30592	0.2122	2.89001	3.72183	0.17341	5.59787	7.81472	0.13	1.47754	0.30249	7
Intercept	0.11536	0.32173	-0.5152	0.74595							
TSCR	0.16246	0.0118	0.13934	0.18559							

Point	Probits	%	95% Fiducial Limits	
EC01	2.674	5.94088	4.5458	7.32686
EC05	3.355	9.5498	7.8019	11.2007
EC10	3.718	12.2995	10.396	14.0573
EC15	3.964	14.5893	12.6095	16.3963
EC20	4.158	16.7094	14.6918	18.5405
EC25	4.326	18.7723	16.7403	20.6143
EC40	4.747	25.1714	23.1626	27.041
EC50	5.000	30.0291	28.0124	32.0032
EC60	5.253	35.8242	33.6538	38.1279
EC75	5.674	48.036	44.8861	51.8852
EC80	5.842	53.9662	50.0904	58.903
EC85	6.036	61.8088	56.8076	68.4285
EC90	6.282	73.3154	66.4185	82.7999
EC95	6.645	94.4255	83.5298	110.103
EC99	7.326	151.786	127.923	188.631



Reviewed by:

Macrocystis Germination and Growth Test-Growth-Length

Start Date:	1/6/2009 15:00	Test ID:	9010601k	Sample ID:	CA0047881-Morro Bay SD
End Date:	1/8/2009 15:00	Lab ID:	CAATL-Aquatic Testing Labs	Sample Type:	EFF1-POTW
Sample Date:	1/5/2009 08:45	Protocol:	EPAWC-EPA/600/R-95/136	Test Species:	MP-Macrocystis pyrifera

Comments:

Conc-%	1	2	3	4	5
B-Control	15.500	16.250	16.000	14.500	15.500
D-Control	16.000	15.500	16.000	14.750	15.000
5.6	17.000	15.750	15.250	15.500	15.750
10	16.250	16.500	15.250	15.000	15.250
18	14.250	14.250	11.500	13.250	10.250
32	8.000	6.750	8.000	9.250	9.250
56	7.000	6.750	7.250	8.250	7.500

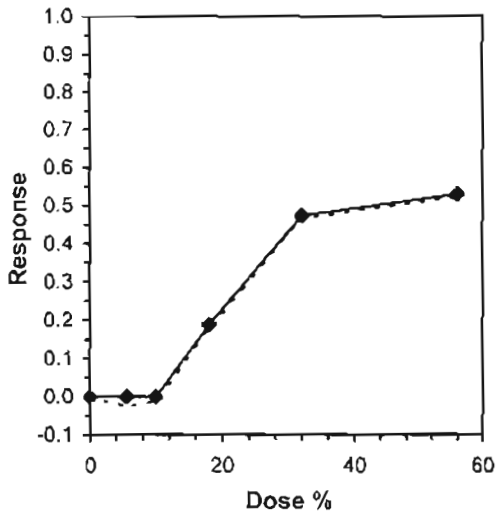
			Transform: Untransformed					1-Tailed			Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
B-Control	15.550	1.0065	15.550	14.500	16.250	4.314	5					
D-Control	15.450	1.0000	15.450	14.750	16.000	3.690	5	*			15.650	1.0000
5.6	15.850	1.0259	15.850	15.250	17.000	4.262	5	-0.643	2.360	1.468	15.650	1.0000
10	15.650	1.0129	15.650	15.000	16.500	4.316	5	-0.322	2.360	1.468	15.650	1.0000
*18	12.700	0.8220	12.700	10.250	14.250	13.947	5	4.422	2.360	1.468	12.700	0.8115
*32	8.250	0.5340	8.250	6.750	9.250	12.677	5	11.579	2.360	1.468	8.250	0.5272
*56	7.350	0.4757	7.350	6.750	8.250	7.831	5	13.026	2.360	1.468	7.350	0.4696

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.9603	0.927	-0.4217	0.69584
Bartlett's Test indicates equal variances (p = 0.13)	8.61008	15.0863		
The control means are not significantly different (p = 0.81)	0.254	2.30601		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs D-Control	10	18	13.4164	10	1.46751	0.09498	74.4621	0.96667	5.5E-14	5, 24

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05	12.122	0.862	10.050	14.170	0.4716
IC10	14.244	1.439	11.872	19.100	0.8406
IC15	16.366	1.675	13.373	21.013	0.2938
IC20	18.566	1.788	14.596	22.790	-0.0555
IC25	21.028	1.850	15.802	24.400	-0.5196
IC40	28.413	1.281	25.080	31.064	-0.6021
IC50	43.333				



GIANT KELP GERMINATION AND GROWTH SHORT-TERM TOXICITY TEST

Aquatic Testing Laboratories

Lab No.: A-09010601-002

Start Date: 01/06/2009

Dish No.	Sample Conc.	Total Number Counted	Number Germin.	Number Non-Germin.	Germ Tube Lengths (micrometer units)									
					A	B	C	D	E	F	G	H	I	J
1	10	101	81	20	8	7	6	7	6	7	7	5	6	6
2	13	104	90	14	6	7	7	5	7	6	6	5	7	6
3	32	103	46	57	4	3	2	4	4	3	3	2	4	3
4	5.6	108	92	16	7	8	6	5	7	7	8	7	7	6
5	C	113	86	27	7	5	7	7	6	5	7	5	8	7
6	56	108	16	92	3	4	2	4	2	2	2	3	4	2
7	18	104	70	34	6	7	5	5	7	6	4	4	7	6
8	13	101	86	25	8	6	6	7	5	6	7	7	6	7
9	10	103	89	14	6	7	8	7	7	6	5	7	7	6
10	18	100	74	26	5	6	4	7	5	6	6	5	7	6
11	C	101	91	10	7	6	5	7	6	6	5	7	7	6
12	32	108	10	98	2	3	3	4	2	2	2	3	4	2
13	56	105	29	76	3	2	5	2	2	2	2	4	3	2
14	5.6	101	81	20	7	6	7	5	5	7	6	5	8	7
15	32	104	36	68	4	3	7	2	2	3	4	2	3	2
16	C	101	82	19	8	7	6	5	7	7	6	5	7	6
17	10	103	87	16	6	7	5	5	7	6	5	7	7	6
18	13	102	83	19	7	8	7	6	5	6	7	7	6	5
19	18	104	61	43	4	7	7	3	4	2	2	4	7	6
20	56	106	16	90	2	3	2	2	4	5	2	3	2	4

Comments:

Micrometer conversion factor: 1 unit = 2.5 um at 400X power

GIANT KELP GERMINATION AND GROWTH SHORT-TERM TOXICITY TEST

Aquatic Testing Laboratories

Lab No.: A-09010601-002

Start Date: 01/06/2009

Dish No.	Sample Conc.	Total Number Counted	Number Germin.	Number Non-Germin.	Germ Tube Lengths (micrometer units)									
					A	B	C	D	E	F	G	H	I	J
21	56	100	18	82	3	4	3	4	5	4	3	3	2	2
22	18	106	54	52	5	6	4	4	7	6	6	4	5	6
23	C	102	86	16	6	5	6	6	7	7	5	4	7	6
24	5.6	104	85	19	7	6	5	7	6	7	7	5	4	7
25	32	101	60	41	2	4	6	4	3	5	4	3	4	2
26	10	103	81	22	5	6	7	7	6	4	5	7	7	6
27	56	110	9	101	2	3	2	4	4	3	4	3	3	2
28	18	101	83	18	5	7	6	7	5	4	6	6	7	5
29	18	108	68	40	5	4	3	3	4	5	6	4	3	4
30	C	102	84	18	6	7	7	5	6	4	7	6	5	7
31	5.6	102	82	20	5	7	7	6	5	8	7	7	4	6
32	32	112	46	66	4	3	4	5	6	4	2	2	3	4
33	10	104	86	18	6	5	7	7	6	5	7	6	5	7
34	18	101	91	10	7	4	7	7	6	6	5	7	7	6
35	5.6	102	86	16	7	6	5	5	6	7	8	7	7	5
36														
37														
38														
39														
40														

Comments:

Micrometer conversion factor: 1 unit = 2.5 um at 400X power

GIANT KELP GERMINATION AND GROWTH SHORT-TERM TOXICITY TEST

Aquatic Testing Laboratories

Lab No.: A-09010601-002
Client ID: MRS - Morro Bay Effluent

Start Date: 01/06/2009

WATER QUALITY READINGS

	Initial Readings				Final Readings			
Sample	Temp (°C)	DO (mg/l)	pH	Salinity (o/oo)	Temp (°C)	DO (mg/l)	pH	Salinity (o/oo)
Control	15.3	7.8	8.0	34	14.8	7.8	8.0	34
Brine Control	15.3	8.0	8.0	34	14.8	7.8	8.0	34
5.6%	15.1	8.1	8.0	34	14.9	7.8	8.0	34
10%	15.1	8.0	8.0	34	15.0	7.8	8.0	34
18%	15.0	7.8	8.1	34	14.8	7.7	8.0	34
32%	15.0	7.7	8.1	34	14.7	7.6	8.1	34
56%	14.9	7.4	8.1	34	14.8	7.7	8.1	34

Sample as received: Chlorine: 0.0 mg/l; pH: 7.4; Salinity: 0 ppt; Temp: 1°C; DO: 8.7 mg/l; NH_3-N: 44 mg/l..

Brine Control contains equivalent amount of artificial sea salts as highest effluent concentration.

Initial readings: Analyst: _____ Date: 1-6-09 Time: 1500

Final readings: Analyst: _____ Date: 1-8-09 Time: 1500

Aquatic Testing Laboratories

GIANT KELP GERMINATION AND GROWTH SHORT-TERM TOXICITY TEST

Lab No.: A-09010601-002
Client ID: MRS - Morro Bay Effluent

Start Date: 01/06/2009

RANDOMIZATION WORKSHEET

Beaker No.	Sample Conc.	Beaker No.	Sample Conc.	Beaker No.	Sample Conc.	Beaker No.	Sample Conc.	Notes
1	10	11	C	21	56	31	5.6	Need 7500/ml x 50 ml = 375,000 spores. Add 0.25 ml spore stock of 6 spores per 5x5 hemacytometer grid or Need 7500/ml x 200 ml = 1,500,000 spores. Add 1.0 ml spore stock of 6 spores per 5x5 hemacytometer grid
2	13	12	32	22	18	32	32	
3	32	13	56	23	C	33	10	
4	5.6	14	5.6	24	5.6	34	13	
5	C	15	32	25	32	35	5.6	
6	56	16	C	26	10	36		
7	18	17	10	27	56	37		
8	13	18	13	28	13	38		
9	10	19	18	29	18	39		
10	18	20	56	30	C	40		

Analyst: _____ Date: 1-6-9 Time: 1400

QA/QC REPORTS & CHAINS OF CUSTODY

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Date of Report: 02/12/2009

Doug Coats

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

RE: Semi-Annual Eff
BC Work Order: 0900887
Invoice ID: B057281

Enclosed are the results of analyses for samples received by the laboratory on 1/21/2009. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Tina Green
Client Services Manager

Authorized Signature

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
0900887-01	**COC Number:**	---	**Receive Date:**	01/21/2009 19:07
	Project Number:	---	**Sampling Date:**	01/21/2009 09:10
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	Grab Eff A.R.S.	**Sample Matrix:**	Water
	Sampled By:	---		
0900887-02	**COC Number:**	---	**Receive Date:**	01/21/2009 19:07
	Project Number:	---	**Sampling Date:**	01/21/2009 09:10
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	Comp Eff A.R.S.	**Sample Matrix:**	Water
	Sampled By:	---		

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

BCL Sample ID: 0900887-01 | **Client Sample Name:** Grab Eff A.R.S., 1/21/2009 9:10:00AM

Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date/Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quals
4-Chloro-3-methylphenol	ND	ug/L	50	6.7	EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10
2-Chlorophenol	ND	ug/L	20	6.5	EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10
2,4-Dichlorophenol	ND	ug/L	20	6.0	EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10
2,4-Dimethylphenol	ND	ug/L	20	5.2	EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10
4,6-Dinitro-2-methylphenol	ND	ug/L	100	22	EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10
2,4-Dinitrophenol	ND	ug/L	100	24	EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10
2-Methylphenol	ND	ug/L	20	5.7	EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10
3- & 4-Methylphenol	**11**	**ug/L**	**20**	**8.3**	**EPA-625**	**01/23/09**	**02/04/09 15:56**	**SKC**	**MS-B2**	**10**	**BSA1600**		**J,A10**
2-Nitrophenol	ND	ug/L	20	4.2	EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10
4-Nitrophenol	ND	ug/L	20	17	EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10
Pentachlorophenol	ND	ug/L	100	4.5	EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10
Phenol	ND	ug/L	20	3.7	EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10
2,4,5-Trichlorophenol	ND	ug/L	50	9.3	EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10
2,4,6-Trichlorophenol	ND	ug/L	50	4.3	EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10
2-Fluorophenol (Surrogate)	51.8	%	28 - 93 (LCL - UCL)		EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10
Phenol-d5 (Surrogate)	52.1	%	0 - 82 (LCL - UCL)		EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10
Nitrobenzene-d5 (Surrogate)	90.0	%	53 - 116 (LCL - UCL)		EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10
2-Fluorobiphenyl (Surrogate)	101	%	23 - 157 (LCL - UCL)		EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10
2,4,6-Tribromophenol (Surrogate)	91.6	%	38 - 142 (LCL - UCL)		EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10
p-Terphenyl-d14 (Surrogate)	69.5	%	48 - 148 (LCL - UCL)		EPA-625	01/23/09	02/04/09 15:56	SKC	MS-B2	10	BSA1600		A10

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Organochlorine Pesticides and PCB's (EPA Method 608)

Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
Aldrin	BSA1567	Matrix Spike	0814857-95	ND	0.20300	0.25000	ug/L		81.2		80 - 136	
		Matrix Spike Duplicate	0814857-95	ND	0.20360	0.25000	ug/L	0.2	81.4	20	80 - 136	
gamma-BHC (Lindane)	BSA1567	Matrix Spike	0814857-95	ND	0.21360	0.25000	ug/L		85.4		60 - 126	
		Matrix Spike Duplicate	0814857-95	ND	0.22632	0.25000	ug/L	5.8	90.5	24	60 - 126	
4,4'-DDT	BSA1567	Matrix Spike	0814857-95	ND	0.20777	0.25000	ug/L		83.1		61 - 128	
		Matrix Spike Duplicate	0814857-95	ND	0.21494	0.25000	ug/L	3.4	86.0	19	61 - 128	
Dieldrin	BSA1567	Matrix Spike	0814857-95	ND	0.23499	0.25000	ug/L		94.0		76 - 132	
		Matrix Spike Duplicate	0814857-95	ND	0.24550	0.25000	ug/L	4.4	98.2	18	76 - 132	
Endrin	BSA1567	Matrix Spike	0814857-95	ND	0.25322	0.25000	ug/L		101		76 - 143	
		Matrix Spike Duplicate	0814857-95	ND	0.26500	0.25000	ug/L	4.8	106	19	76 - 143	
Heptachlor	BSA1567	Matrix Spike	0814857-95	ND	0.21722	0.25000	ug/L		86.9		81 - 138	
		Matrix Spike Duplicate	0814857-95	ND	0.22162	0.25000	ug/L	1.9	88.6	18	81 - 138	
TCMX (Surrogate)	BSA1567	Matrix Spike	0814857-95	ND	0.28107	0.30000	ug/L		93.7		72 - 129	
		Matrix Spike Duplicate	0814857-95	ND	0.30004	0.30000	ug/L		100		72 - 129	
Dibutyl chlorendate (Surrogate)	BSA1567	Matrix Spike	0814857-95	ND	0.77030	0.75000	ug/L		103		82 - 177	
		Matrix Spike Duplicate	0814857-95	ND	0.80597	0.75000	ug/L		107		82 - 177	

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Volatile Organic Analysis (EPA Method 624)

Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
Benzene	BSA1318	Matrix Spike	0816914-63	ND	25.550	25.000	ug/L		102		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	26.520	25.000	ug/L	3.8	106	20	70 - 130	
Bromodichloromethane	BSA1318	Matrix Spike	0816914-63	ND	26.410	25.000	ug/L		106		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	25.340	25.000	ug/L	4.8	101	20	70 - 130	
Bromoform	BSA1318	Matrix Spike	0816914-63	ND	27.120	25.000	ug/L		108		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	25.850	25.000	ug/L	4.7	103	20	70 - 130	
Bromomethane	BSA1318	Matrix Spike	0816914-63	ND	23.380	25.000	ug/L		93.5		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	25.170	25.000	ug/L	7.7	101	20	70 - 130	
Carbon tetrachloride	BSA1318	Matrix Spike	0816914-63	ND	27.880	25.000	ug/L		112		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	26.620	25.000	ug/L	5.5	106	20	70 - 130	
Chlorobenzene	BSA1318	Matrix Spike	0816914-63	ND	26.640	25.000	ug/L		107		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	25.900	25.000	ug/L	2.8	104	20	70 - 130	
Chloroethane	BSA1318	Matrix Spike	0816914-63	ND	26.340	25.000	ug/L		105		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	27.240	25.000	ug/L	3.7	109	20	70 - 130	
Chloroform	BSA1318	Matrix Spike	0816914-63	ND	26.150	25.000	ug/L		105		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	26.290	25.000	ug/L	0	105	20	70 - 130	
Chloromethane	BSA1318	Matrix Spike	0816914-63	ND	24.630	25.000	ug/L		98.5		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	24.800	25.000	ug/L	0.7	99.2	20	70 - 130	
Dibromochloromethane	BSA1318	Matrix Spike	0816914-63	ND	25.070	25.000	ug/L		100		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	24.460	25.000	ug/L	2.2	97.8	20	70 - 130	
1,2-Dichlorobenzene	BSA1318	Matrix Spike	0816914-63	ND	27.220	25.000	ug/L		109		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	25.800	25.000	ug/L	5.7	103	20	70 - 130	
1,3-Dichlorobenzene	BSA1318	Matrix Spike	0816914-63	ND	26.350	25.000	ug/L		105		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	24.550	25.000	ug/L	6.7	98.2	20	70 - 130	
1,4-Dichlorobenzene	BSA1318	Matrix Spike	0816914-63	ND	26.900	25.000	ug/L		108		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	24.990	25.000	ug/L	7.7	100	20	70 - 130	

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Volatile Organic Analysis (EPA Method 624)

Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
1,1-Dichloroethane	BSA1318	Matrix Spike	0816914-63	ND	26.440	25.000	ug/L		106		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	26.920	25.000	ug/L	1.9	108	20	70 - 130	
1,2-Dichloroethane	BSA1318	Matrix Spike	0816914-63	ND	25.860	25.000	ug/L		103		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	25.410	25.000	ug/L	1.0	102	20	70 - 130	
1,1-Dichloroethene	BSA1318	Matrix Spike	0816914-63	ND	27.990	25.000	ug/L		112		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	28.940	25.000	ug/L	3.5	116	20	70 - 130	
trans-1,2-Dichloroethene	BSA1318	Matrix Spike	0816914-63	ND	25.520	25.000	ug/L		102		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	26.450	25.000	ug/L	3.8	106	20	70 - 130	
1,2-Dichloropropane	BSA1318	Matrix Spike	0816914-63	ND	26.100	25.000	ug/L		104		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	26.990	25.000	ug/L	3.8	108	20	70 - 130	
cis-1,3-Dichloropropene	BSA1318	Matrix Spike	0816914-63	ND	26.390	25.000	ug/L		106		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	26.230	25.000	ug/L	0.9	105	20	70 - 130	
trans-1,3-Dichloropropene	BSA1318	Matrix Spike	0816914-63	ND	26.730	25.000	ug/L		107		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	26.250	25.000	ug/L	1.9	105	20	70 - 130	
Ethylbenzene	BSA1318	Matrix Spike	0816914-63	ND	26.450	25.000	ug/L		106		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	24.850	25.000	ug/L	6.4	99.4	20	70 - 130	
Methylene chloride	BSA1318	Matrix Spike	0816914-63	ND	26.570	25.000	ug/L		106		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	27.380	25.000	ug/L	3.7	110	20	70 - 130	
Methyl t-butyl ether	BSA1318	Matrix Spike	0816914-63	ND	24.760	25.000	ug/L		99.0		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	25.720	25.000	ug/L	4.0	103	20	70 - 130	
1,1,2,2-Tetrachloroethane	BSA1318	Matrix Spike	0816914-63	ND	25.840	25.000	ug/L		103		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	24.850	25.000	ug/L	3.6	99.4	20	70 - 130	
Tetrachloroethene	BSA1318	Matrix Spike	0816914-63	ND	26.650	25.000	ug/L		107		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	25.070	25.000	ug/L	6.8	100	20	70 - 130	
Toluene	BSA1318	Matrix Spike	0816914-63	ND	27.350	25.000	ug/L		109		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	26.050	25.000	ug/L	4.7	104	20	70 - 130	

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Volatile Organic Analysis (EPA Method 624)

Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
1,1,1-Trichloroethane	BSA1318	Matrix Spike	0816914-63	ND	28.590	25.000	ug/L		114		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	26.700	25.000	ug/L	6.3	107	20	70 - 130	
1,1,2-Trichloroethane	BSA1318	Matrix Spike	0816914-63	ND	26.960	25.000	ug/L		108		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	27.450	25.000	ug/L	1.8	110	20	70 - 130	
Trichloroethene	BSA1318	Matrix Spike	0816914-63	ND	27.960	25.000	ug/L		112		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	26.530	25.000	ug/L	5.5	106	20	70 - 130	
Trichlorofluoromethane	BSA1318	Matrix Spike	0816914-63	ND	27.240	25.000	ug/L		109		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	25.940	25.000	ug/L	4.7	104	20	70 - 130	
1,1,2-Trichloro-1,2,2-trifluoroethane	BSA1318	Matrix Spike	0816914-63	ND	28.210	25.000	ug/L		113		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	28.370	25.000	ug/L	0	113	20	70 - 130	
Vinyl chloride	BSA1318	Matrix Spike	0816914-63	ND	25.580	25.000	ug/L		102		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	26.210	25.000	ug/L	2.9	105	20	70 - 130	
Total Xylenes	BSA1318	Matrix Spike	0816914-63	ND	77.740	75.000	ug/L		104		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	72.410	75.000	ug/L	7.5	96.5	20	70 - 130	
p- & m-Xylenes	BSA1318	Matrix Spike	0816914-63	ND	51.680	50.000	ug/L		103		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	48.140	50.000	ug/L	6.7	96.3	20	70 - 130	
o-Xylene	BSA1318	Matrix Spike	0816914-63	ND	26.060	25.000	ug/L		104		70 - 130	
		Matrix Spike Duplicate	0816914-63	ND	24.270	25.000	ug/L	6.9	97.1	20	70 - 130	
1,2-Dichloroethane-d4 (Surrogate)	BSA1318	Matrix Spike	0816914-63	ND	9.9900	10.000	ug/L		99.9		76 - 114	
		Matrix Spike Duplicate	0816914-63	ND	10.010	10.000	ug/L		100		76 - 114	
Toluene-d8 (Surrogate)	BSA1318	Matrix Spike	0816914-63	ND	10.150	10.000	ug/L		102		88 - 110	
		Matrix Spike Duplicate	0816914-63	ND	9.9100	10.000	ug/L		99.1		88 - 110	
4-Bromofluorobenzene (Surrogate)	BSA1318	Matrix Spike	0816914-63	ND	10.500	10.000	ug/L		105		86 - 115	
		Matrix Spike Duplicate	0816914-63	ND	10.050	10.000	ug/L		100		86 - 115	

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Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
Acenaphthene	BSA1600	Matrix Spike	0814857-88	ND	78.647	50.000	ug/L		157		10 - 201	
		Matrix Spike Duplicate	0814857-88	ND	71.941	50.000	ug/L	8.6	144	26	10 - 201	
1,4-Dichlorobenzene	BSA1600	Matrix Spike	0814857-88	ND	62.758	50.000	ug/L		126		52 - 115	Q03
		Matrix Spike Duplicate	0814857-88	ND	54.427	50.000	ug/L	14.5	109	26	52 - 115	
2,4-Dinitrotoluene	BSA1600	Matrix Spike	0814857-88	ND	61.894	50.000	ug/L		124		49 - 138	
		Matrix Spike Duplicate	0814857-88	ND	55.477	50.000	ug/L	11.1	111	22	49 - 138	
Hexachlorobenzene	BSA1600	Matrix Spike	0814857-88	ND	76.987	50.000	ug/L		154		47 - 138	Q03
		Matrix Spike Duplicate	0814857-88	ND	69.815	50.000	ug/L	9.5	140	30	47 - 138	Q03
Hexachlorobutadiene	BSA1600	Matrix Spike	0814857-88	ND	50.949	50.000	ug/L		102		29 - 119	
		Matrix Spike Duplicate	0814857-88	ND	45.018	50.000	ug/L	12.5	90.0	30	29 - 119	
Hexachloroethane	BSA1600	Matrix Spike	0814857-88	ND	55.777	50.000	ug/L		112		39 - 115	
		Matrix Spike Duplicate	0814857-88	ND	49.090	50.000	ug/L	13.1	98.2	29	39 - 115	
Nitrobenzene	BSA1600	Matrix Spike	0814857-88	ND	62.760	50.000	ug/L		126		56 - 114	Q03
		Matrix Spike Duplicate	0814857-88	ND	56.104	50.000	ug/L	11.8	112	26	56 - 114	
N-Nitrosodi-N-propylamine	BSA1600	Matrix Spike	0814857-88	ND	55.436	50.000	ug/L		111		45 - 108	Q03
		Matrix Spike Duplicate	0814857-88	ND	47.855	50.000	ug/L	14.8	95.7	26	45 - 108	
Pyrene	BSA1600	Matrix Spike	0814857-88	ND	65.752	50.000	ug/L		132		68 - 137	
		Matrix Spike Duplicate	0814857-88	ND	61.066	50.000	ug/L	7.9	122	28	68 - 137	
1,2,4-Trichlorobenzene	BSA1600	Matrix Spike	0814857-88	ND	57.634	50.000	ug/L		115		46 - 120	
		Matrix Spike Duplicate	0814857-88	ND	51.802	50.000	ug/L	10.0	104	22	46 - 120	
4-Chloro-3-methylphenol	BSA1600	Matrix Spike	0814857-88	ND	64.907	50.000	ug/L		130		10 - 180	
		Matrix Spike Duplicate	0814857-88	ND	60.231	50.000	ug/L	8.0	120	25	10 - 180	
2-Chlorophenol	BSA1600	Matrix Spike	0814857-88	ND	58.553	50.000	ug/L		117		52 - 122	
		Matrix Spike Duplicate	0814857-88	ND	51.640	50.000	ug/L	12.7	103	25	52 - 122	
2-Methylphenol	BSA1600	Matrix Spike	0814857-88	ND	59.518	50.000	ug/L		119		49 - 110	Q03
		Matrix Spike Duplicate	0814857-88	ND	50.538	50.000	ug/L	16.4	101	30	49 - 110	

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Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
3- & 4-Methylphenol	BSA1600	Matrix Spike	0814857-88	ND	86.843	50.000	ug/L		174		10 - 256	
		Matrix Spike Duplicate	0814857-88	ND	75.018	50.000	ug/L	14.8	150	30	10 - 256	
4-Nitrophenol	BSA1600	Matrix Spike	0814857-88	ND	28.390	50.000	ug/L		56.8		10 - 116	
		Matrix Spike Duplicate	0814857-88	ND	23.455	50.000	ug/L	19.1	46.9	30	10 - 116	
Pentachlorophenol	BSA1600	Matrix Spike	0814857-88	ND	78.724	50.000	ug/L		157		19 - 169	
		Matrix Spike Duplicate	0814857-88	ND	72.579	50.000	ug/L	7.9	145	30	19 - 169	
Phenol	BSA1600	Matrix Spike	0814857-88	ND	29.456	50.000	ug/L		58.9		10 - 77	
		Matrix Spike Duplicate	0814857-88	ND	25.923	50.000	ug/L	12.8	51.8	29	10 - 77	
2,4,6-Trichlorophenol	BSA1600	Matrix Spike	0814857-88	ND	67.874	50.000	ug/L		136		57 - 130	Q03
		Matrix Spike Duplicate	0814857-88	ND	60.989	50.000	ug/L	10.9	122	25	57 - 130	
2-Fluorophenol (Surrogate)	BSA1600	Matrix Spike	0814857-88	ND	58.270	80.000	ug/L		72.8		28 - 93	
		Matrix Spike Duplicate	0814857-88	ND	52.020	80.000	ug/L		65.0		28 - 93	
Phenol-d5 (Surrogate)	BSA1600	Matrix Spike	0814857-88	ND	40.740	80.000	ug/L		50.9		0 - 82	
		Matrix Spike Duplicate	0814857-88	ND	36.490	80.000	ug/L		45.6		0 - 82	
Nitrobenzene-d5 (Surrogate)	BSA1600	Matrix Spike	0814857-88	ND	82.380	80.000	ug/L		103		53 - 116	
		Matrix Spike Duplicate	0814857-88	ND	77.640	80.000	ug/L		97.0		53 - 116	
2-Fluorobiphenyl (Surrogate)	BSA1600	Matrix Spike	0814857-88	ND	84.150	80.000	ug/L		105		23 - 157	
		Matrix Spike Duplicate	0814857-88	ND	76.430	80.000	ug/L		95.5		23 - 157	
2,4,6-Tribromophenol (Surrogate)	BSA1600	Matrix Spike	0814857-88	ND	106.23	80.000	ug/L		133		38 - 142	
		Matrix Spike Duplicate	0814857-88	ND	95.750	80.000	ug/L		120		38 - 142	
p-Terphenyl-d14 (Surrogate)	BSA1600	Matrix Spike	0814857-88	ND	41.830	40.000	ug/L		105		48 - 148	
		Matrix Spike Duplicate	0814857-88	ND	37.550	40.000	ug/L		93.9		48 - 148	

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Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
Total Cyanide	BSA1118	Duplicate	0900928-01	ND	ND		mg/L			10		
		Matrix Spike	0900928-01	ND	0.094659	0.10000	mg/L		94.7		90 - 110	
		Matrix Spike Duplicate	0900928-01	ND	0.10457	0.10000	mg/L	10.3	105	20	90 - 110	
Ammonia as N (Distilled)	BSA1402	Duplicate	0900294-02	0.35520	0.33380		mg/L	6.2		20		
		Matrix Spike	0900294-02	0.35520	1.2323	1.0000	mg/L		87.7		80 - 120	
		Matrix Spike Duplicate	0900294-02	0.35520	1.2888	1.0000	mg/L	6.3	93.4	20	80 - 120	

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Water Analysis (Metals)

Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
Total Recoverable Arsenic	BSA1344	Duplicate	0900763-01	10.502	9.9210		ug/L	5.7		20		
		Matrix Spike	0900763-01	10.502	111.68	100.00	ug/L		101		70 - 130	
		Matrix Spike Duplicate	0900763-01	10.502	112.74	100.00	ug/L	1.0	102	20	70 - 130	
Total Recoverable Lead	BSA1344	Duplicate	0900763-01	0.62300	0.54600		ug/L	13.2		20		J
		Matrix Spike	0900763-01	0.62300	92.197	100.00	ug/L		91.6		70 - 130	
		Matrix Spike Duplicate	0900763-01	0.62300	95.587	100.00	ug/L	3.6	95.0	20	70 - 130	
Total Recoverable Selenium	BSA1344	Duplicate	0900763-01	81.715	80.798		ug/L	1.1		20		
		Matrix Spike	0900763-01	81.715	127.36	100.00	ug/L		45.6		70 - 130	Q03
		Matrix Spike Duplicate	0900763-01	81.715	123.51	100.00	ug/L	8.7	41.8	20	70 - 130	Q03
Total Recoverable Thallium	BSA1344	Duplicate	0900763-01	ND	ND		ug/L			20		
		Matrix Spike	0900763-01	ND	36.811	40.000	ug/L		92.0		70 - 130	
		Matrix Spike Duplicate	0900763-01	ND	38.304	40.000	ug/L	4.0	95.8	20	70 - 130	
Total Antimony	BSA1404	Duplicate	0900932-01	ND	ND		ug/L			20		
		Matrix Spike	0900932-01	ND	507.94	400.00	ug/L		127		75 - 125	Q03
		Matrix Spike Duplicate	0900932-01	ND	495.93	400.00	ug/L	2.4	124	20	75 - 125	
Total Beryllium	BSA1404	Duplicate	0900932-01	ND	ND		ug/L			20		
		Matrix Spike	0900932-01	ND	234.36	200.00	ug/L		117		75 - 125	
		Matrix Spike Duplicate	0900932-01	ND	230.71	200.00	ug/L	1.7	115	20	75 - 125	
Total Cadmium	BSA1404	Duplicate	0900932-01	ND	ND		ug/L			20		
		Matrix Spike	0900932-01	ND	234.95	200.00	ug/L		117		75 - 125	
		Matrix Spike Duplicate	0900932-01	ND	230.23	200.00	ug/L	1.7	115	20	75 - 125	
Total Chromium	BSA1404	Duplicate	0900932-01	ND	ND		ug/L			20		
		Matrix Spike	0900932-01	ND	229.96	200.00	ug/L		115		75 - 125	
		Matrix Spike Duplicate	0900932-01	ND	226.32	200.00	ug/L	1.8	113	20	75 - 125	
Total Copper	BSA1404	Duplicate	0900932-01	6.2716	6.3713		ug/L	1.6		20		J
		Matrix Spike	0900932-01	6.2716	481.15	400.00	ug/L		119		75 - 125	
		Matrix Spike Duplicate	0900932-01	6.2716	473.88	400.00	ug/L	1.7	117	20	75 - 125	

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Water Analysis (Metals)

Quality Control Report - Precision & Accuracy

Constituent	Batch ID	QC Sample Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
Total Silver	BSA1404	Duplicate	0900932-01	ND	ND		ug/L			20		
		Matrix Spike	0900932-01	ND	113.17	100.00	ug/L		113		75 - 125	
		Matrix Spike Duplicate	0900932-01	ND	111.51	100.00	ug/L	0.9	112	20	75 - 125	
Total Zinc	BSA1404	Duplicate	0900932-01	11.066	11.529		ug/L	4.1		20		J
		Matrix Spike	0900932-01	11.066	605.91	500.00	ug/L		119		75 - 125	
		Matrix Spike Duplicate	0900932-01	11.066	600.69	500.00	ug/L	0.8	118	20	75 - 125	
Total Mercury	BSA1462	Duplicate	0901022-01	ND	ND		ug/L			20		
		Matrix Spike	0901022-01	ND	1.0400	1.0000	ug/L		104		70 - 130	
		Matrix Spike Duplicate	0901022-01	ND	1.0900	1.0000	ug/L	4.7	109	20	70 - 130	
Total Nickel	BSB0490	Duplicate	0901601-01	2.8289	2.7757		ug/L	1.9		20		J
		Matrix Spike	0901601-01	2.8289	436.99	400.00	ug/L		109		75 - 125	
		Matrix Spike Duplicate	0901601-01	2.8289	437.37	400.00	ug/L	0	109	20	75 - 125	

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Organochlorine Pesticides and PCB's (EPA Method 608)

Quality Control Report - Laboratory Control Sample

Constituent	Batch ID	QC Sample ID	QC Type	Result	Spike Level	PQL	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
Aldrin	BSA1567	BSA1567-BS1	LCS	0.19800	0.25000	0.0050	ug/L	79.2		77 - 142		
gamma-BHC (Lindane)	BSA1567	BSA1567-BS1	LCS	0.20999	0.25000	0.0050	ug/L	84.0		62 - 125		
4,4'-DDT	BSA1567	BSA1567-BS1	LCS	0.19876	0.25000	0.0050	ug/L	79.5		64 - 130		
Dieldrin	BSA1567	BSA1567-BS1	LCS	0.22836	0.25000	0.0050	ug/L	91.3		79 - 133		
Endrin	BSA1567	BSA1567-BS1	LCS	0.24522	0.25000	0.0050	ug/L	98.1		82 - 139		
Heptachlor	BSA1567	BSA1567-BS1	LCS	0.21241	0.25000	0.0050	ug/L	85.0		76 - 143		
TCMX (Surrogate)	BSA1567	BSA1567-BS1	LCS	0.29669	0.30000		ug/L	98.9		72 - 129		
Dibutyl chlorendate (Surrogate)	BSA1567	BSA1567-BS1	LCS	0.78876	0.75000		ug/L	105		82 - 177		

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Volatile Organic Analysis (EPA Method 624)

Quality Control Report - Laboratory Control Sample

Constituent	Batch ID	QC Sample ID	QC Type	Result	Spike Level	PQL	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
Benzene	BSA1318	BSA1318-BS1	LCS	27.340	25.000	0.50	ug/L	109		70 - 130		
Bromodichloromethane	BSA1318	BSA1318-BS1	LCS	25.760	25.000	0.50	ug/L	103		70 - 130		
Bromoform	BSA1318	BSA1318-BS1	LCS	25.840	25.000	0.50	ug/L	103		70 - 130		
Bromomethane	BSA1318	BSA1318-BS1	LCS	26.860	25.000	1.0	ug/L	107		70 - 130		
Carbon tetrachloride	BSA1318	BSA1318-BS1	LCS	26.350	25.000	0.50	ug/L	105		70 - 130		
Chlorobenzene	BSA1318	BSA1318-BS1	LCS	26.700	25.000	0.50	ug/L	107		70 - 130		
Chloroethane	BSA1318	BSA1318-BS1	LCS	28.700	25.000	0.50	ug/L	115		70 - 130		
Chloroform	BSA1318	BSA1318-BS1	LCS	26.480	25.000	0.50	ug/L	106		70 - 130		
Chloromethane	BSA1318	BSA1318-BS1	LCS	26.250	25.000	0.50	ug/L	105		70 - 130		
Dibromochloromethane	BSA1318	BSA1318-BS1	LCS	24.900	25.000	0.50	ug/L	99.6		70 - 130		
1,2-Dichlorobenzene	BSA1318	BSA1318-BS1	LCS	26.240	25.000	0.50	ug/L	105		70 - 130		
1,3-Dichlorobenzene	BSA1318	BSA1318-BS1	LCS	25.410	25.000	0.50	ug/L	102		70 - 130		
1,4-Dichlorobenzene	BSA1318	BSA1318-BS1	LCS	25.650	25.000	0.50	ug/L	103		70 - 130		
1,1-Dichloroethane	BSA1318	BSA1318-BS1	LCS	28.320	25.000	0.50	ug/L	113		70 - 130		
1,2-Dichloroethane	BSA1318	BSA1318-BS1	LCS	25.330	25.000	0.50	ug/L	101		70 - 130		
1,1-Dichloroethene	BSA1318	BSA1318-BS1	LCS	29.830	25.000	0.50	ug/L	119		70 - 130		
trans-1,2-Dichloroethene	BSA1318	BSA1318-BS1	LCS	27.720	25.000	0.50	ug/L	111		70 - 130		
1,2-Dichloropropane	BSA1318	BSA1318-BS1	LCS	27.510	25.000	0.50	ug/L	110		70 - 130		
cis-1,3-Dichloropropene	BSA1318	BSA1318-BS1	LCS	26.570	25.000	0.50	ug/L	106		70 - 130		
trans-1,3-Dichloropropene	BSA1318	BSA1318-BS1	LCS	26.130	25.000	0.50	ug/L	105		70 - 130		
Ethylbenzene	BSA1318	BSA1318-BS1	LCS	25.820	25.000	0.50	ug/L	103		70 - 130		
Methylene chloride	BSA1318	BSA1318-BS1	LCS	28.340	25.000	1.0	ug/L	113		70 - 130		
Methyl t-butyl ether	BSA1318	BSA1318-BS1	LCS	25.700	25.000	0.50	ug/L	103		70 - 130		

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Volatile Organic Analysis (EPA Method 624)

Quality Control Report - Laboratory Control Sample

Constituent	Batch ID	QC Sample ID	QC Type	Result	Spike Level	PQL	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
1,1,2,2-Tetrachloroethane	BSA1318	BSA1318-BS1	LCS	24.940	25.000	0.50	ug/L	99.8		70 - 130		
Tetrachloroethene	BSA1318	BSA1318-BS1	LCS	25.840	25.000	0.50	ug/L	103		70 - 130		
Toluene	BSA1318	BSA1318-BS1	LCS	27.520	25.000	0.50	ug/L	110		70 - 130		
1,1,1-Trichloroethane	BSA1318	BSA1318-BS1	LCS	26.740	25.000	0.50	ug/L	107		70 - 130		
1,1,2-Trichloroethane	BSA1318	BSA1318-BS1	LCS	28.370	25.000	0.50	ug/L	113		70 - 130		
Trichloroethene	BSA1318	BSA1318-BS1	LCS	27.150	25.000	0.50	ug/L	109		70 - 130		
Trichlorofluoromethane	BSA1318	BSA1318-BS1	LCS	26.290	25.000	0.50	ug/L	105		70 - 130		
1,1,2-Trichloro-1,2,2-trifluoroethane	BSA1318	BSA1318-BS1	LCS	29.420	25.000	0.50	ug/L	118		70 - 130		
Vinyl chloride	BSA1318	BSA1318-BS1	LCS	27.510	25.000	0.50	ug/L	110		70 - 130		
Total Xylenes	BSA1318	BSA1318-BS1	LCS	75.980	75.000	0.50	ug/L	101		70 - 130		
p- & m-Xylenes	BSA1318	BSA1318-BS1	LCS	50.760	50.000	0.50	ug/L	102		70 - 130		
o-Xylene	BSA1318	BSA1318-BS1	LCS	25.220	25.000	0.50	ug/L	101		70 - 130		
1,2-Dichloroethane-d4 (Surrogate)	BSA1318	BSA1318-BS1	LCS	9.4200	10.000		ug/L	94.2		76 - 114		
Toluene-d8 (Surrogate)	BSA1318	BSA1318-BS1	LCS	10.430	10.000		ug/L	104		88 - 110		
4-Bromofluorobenzene (Surrogate)	BSA1318	BSA1318-BS1	LCS	10.050	10.000		ug/L	100		86 - 115		

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Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

Quality Control Report - Laboratory Control Sample

Constituent	Batch ID	QC Sample ID	QC Type	Result	Spike Level	PQL	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
Acenaphthene	BSA1600	BSA1600-BS1	LCS	76.731	50.000	2.0	ug/L	153		62 - 134		L01
1,4-Dichlorobenzene	BSA1600	BSA1600-BS1	LCS	60.208	50.000	2.0	ug/L	120		49 - 116		L01
2,4-Dinitrotoluene	BSA1600	BSA1600-BS1	LCS	61.100	50.000	2.0	ug/L	122		45 - 141		
Hexachlorobenzene	BSA1600	BSA1600-BS1	LCS	75.728	50.000	2.0	ug/L	151		46 - 135		L01
Hexachlorobutadiene	BSA1600	BSA1600-BS1	LCS	47.152	50.000	2.0	ug/L	94.3		30 - 116		
Hexachloroethane	BSA1600	BSA1600-BS1	LCS	52.682	50.000	2.0	ug/L	105		36 - 115		
Nitrobenzene	BSA1600	BSA1600-BS1	LCS	60.426	50.000	2.0	ug/L	121		51 - 118		L01
N-Nitrosodi-N-propylamine	BSA1600	BSA1600-BS1	LCS	55.919	50.000	2.0	ug/L	112		36 - 114		
Pyrene	BSA1600	BSA1600-BS1	LCS	64.853	50.000	2.0	ug/L	130		10 - 195		
1,2,4-Trichlorobenzene	BSA1600	BSA1600-BS1	LCS	55.689	50.000	2.0	ug/L	111		46 - 118		
4-Chloro-3-methylphenol	BSA1600	BSA1600-BS1	LCS	63.120	50.000	5.0	ug/L	126		10 - 180		
2-Chlorophenol	BSA1600	BSA1600-BS1	LCS	56.406	50.000	2.0	ug/L	113		43 - 128		
2-Methylphenol	BSA1600	BSA1600-BS1	LCS	58.991	50.000	2.0	ug/L	118		19 - 126		
3- & 4-Methylphenol	BSA1600	BSA1600-BS1	LCS	86.245	50.000	2.0	ug/L	172		17 - 216		
4-Nitrophenol	BSA1600	BSA1600-BS1	LCS	27.828	50.000	2.0	ug/L	55.7		10 - 113		
Pentachlorophenol	BSA1600	BSA1600-BS1	LCS	78.809	50.000	10	ug/L	158		14 - 167		
Phenol	BSA1600	BSA1600-BS1	LCS	29.890	50.000	2.0	ug/L	59.8		10 - 89		
2,4,6-Trichlorophenol	BSA1600	BSA1600-BS1	LCS	64.242	50.000	5.0	ug/L	128		50 - 137		
2-Fluorophenol (Surrogate)	BSA1600	BSA1600-BS1	LCS	57.340	80.000		ug/L	71.7		28 - 93		
Phenol-d5 (Surrogate)	BSA1600	BSA1600-BS1	LCS	40.750	80.000		ug/L	50.9		0 - 82		
Nitrobenzene-d5 (Surrogate)	BSA1600	BSA1600-BS1	LCS	79.880	80.000		ug/L	99.8		53 - 116		
2-Fluorobiphenyl (Surrogate)	BSA1600	BSA1600-BS1	LCS	81.280	80.000		ug/L	102		23 - 157		
2,4,6-Tribromophenol (Surrogate)	BSA1600	BSA1600-BS1	LCS	100.80	80.000		ug/L	126		38 - 142		

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Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

Quality Control Report - Laboratory Control Sample

Constituent	Batch ID	QC Sample ID	QC Type	Result	Spike Level	PQL	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
p-Terphenyl-d14 (Surrogate)	BSA1600	BSA1600-BS1	LCS	37.320	40.000		ug/L	93.3		48 - 148		

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Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	Batch ID	QC Sample ID	QC Type	Result	Spike Level	PQL	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
Total Cyanide	BSA1118	BSA1118-BS1	LCS	0.14405	0.15000	0.0050	mg/L	96.0		90 - 110		
Ammonia as N (Distilled)	BSA1402	BSA1402-BS1	LCS	0.92670	1.0000	0.10	mg/L	92.7		85 - 115		

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Water Analysis (Metals)

Quality Control Report - Laboratory Control Sample

Constituent	Batch ID	QC Sample ID	QC Type	Result	Spike Level	PQL	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
Total Recoverable Arsenic	BSA1344	BSA1344-BS1	LCS	103.85	100.00	2.0	ug/L	104		85 - 115		
Total Recoverable Lead	BSA1344	BSA1344-BS1	LCS	113.69	100.00	1.0	ug/L	114		85 - 115		
Total Recoverable Selenium	BSA1344	BSA1344-BS1	LCS	99.109	100.00	2.0	ug/L	99.1		85 - 115		
Total Recoverable Thallium	BSA1344	BSA1344-BS1	LCS	44.469	40.000	1.0	ug/L	111		85 - 115		
Total Antimony	BSA1404	BSA1404-BS1	LCS	397.10	400.00	100	ug/L	99.3		85 - 115		
Total Beryllium	BSA1404	BSA1404-BS1	LCS	210.65	200.00	10	ug/L	105		85 - 115		
Total Cadmium	BSA1404	BSA1404-BS1	LCS	215.26	200.00	10	ug/L	108		85 - 115		
Total Chromium	BSA1404	BSA1404-BS1	LCS	209.87	200.00	10	ug/L	105		85 - 115		
Total Copper	BSA1404	BSA1404-BS1	LCS	416.99	400.00	10	ug/L	104		85 - 115		
Total Silver	BSA1404	BSA1404-BS1	LCS	99.848	100.00	10	ug/L	99.8		85 - 115		
Total Zinc	BSA1404	BSA1404-BS1	LCS	560.76	500.00	50	ug/L	112		85 - 115		
Total Mercury	BSA1462	BSA1462-BS1	LCS	1.0225	1.0000	0.20	ug/L	102		85 - 115		
		BSA1462-BSD1	LCSD	1.0275	1.0000	0.20	ug/L	103	1.0	85 - 115	20	
Total Nickel	BSB0490	BSB0490-BS1	LCS	422.16	400.00	10	ug/L	106		85 - 115		

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Organochlorine Pesticides and PCB's (EPA Method 608)

Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
Aldrin	BSA1567	BSA1567-BLK1	ND	ug/L	0.0050	0.0013	
alpha-BHC	BSA1567	BSA1567-BLK1	ND	ug/L	0.0050	0.0011	
beta-BHC	BSA1567	BSA1567-BLK1	ND	ug/L	0.0050	0.0021	
delta-BHC	BSA1567	BSA1567-BLK1	ND	ug/L	0.0050	0.0014	
gamma-BHC (Lindane)	BSA1567	BSA1567-BLK1	ND	ug/L	0.0050	0.00094	
Chlordane (Technical)	BSA1567	BSA1567-BLK1	ND	ug/L	0.50	0.38	
4,4'-DDD	BSA1567	BSA1567-BLK1	ND	ug/L	0.0050	0.0017	
4,4'-DDE	BSA1567	BSA1567-BLK1	ND	ug/L	0.0050	0.0019	
4,4'-DDT	BSA1567	BSA1567-BLK1	ND	ug/L	0.0050	0.00076	
Dieldrin	BSA1567	BSA1567-BLK1	ND	ug/L	0.0050	0.0012	
Endosulfan I	BSA1567	BSA1567-BLK1	ND	ug/L	0.0050	0.0016	
Endosulfan II	BSA1567	BSA1567-BLK1	ND	ug/L	0.0050	0.0014	
Endosulfan sulfate	BSA1567	BSA1567-BLK1	ND	ug/L	0.0050	0.0026	
Endrin	BSA1567	BSA1567-BLK1	ND	ug/L	0.0050	0.00082	
Endrin aldehyde	BSA1567	BSA1567-BLK1	ND	ug/L	0.010	0.0032	
Heptachlor	BSA1567	BSA1567-BLK1	ND	ug/L	0.0050	0.0012	
Heptachlor epoxide	BSA1567	BSA1567-BLK1	ND	ug/L	0.0050	0.00099	
Methoxychlor	BSA1567	BSA1567-BLK1	ND	ug/L	0.0050	0.0011	
Toxaphene	BSA1567	BSA1567-BLK1	ND	ug/L	2.0	0.42	
PCB-1016	BSA1567	BSA1567-BLK1	ND	ug/L	0.20	0.020	
PCB-1221	BSA1567	BSA1567-BLK1	ND	ug/L	0.20	0.089	
PCB-1232	BSA1567	BSA1567-BLK1	ND	ug/L	0.20	0.090	
PCB-1242	BSA1567	BSA1567-BLK1	ND	ug/L	0.20	0.095	
PCB-1248	BSA1567	BSA1567-BLK1	ND	ug/L	0.20	0.025	

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Organochlorine Pesticides and PCB's (EPA Method 608)

Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
PCB-1254	BSA1567	BSA1567-BLK1	ND	ug/L	0.20	0.042	
PCB-1260	BSA1567	BSA1567-BLK1	ND	ug/L	0.20	0.020	
Total PCB's (Summation)	BSA1567	BSA1567-BLK1	ND	ug/L	0.20	0.10	
TCMX (Surrogate)	BSA1567	BSA1567-BLK1	95.7	%	72 - 129 (LCL - UCL)		
Dibutyl chlorendate (Surrogate)	BSA1567	BSA1567-BLK1	103	%	82 - 177 (LCL - UCL)		

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Volatile Organic Analysis (EPA Method 624)

Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
Benzene	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.057	
Bromodichloromethane	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.17	
Bromoform	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.20	
Bromomethane	BSA1318	BSA1318-BLK1	ND	ug/L	1.0	0.19	
Carbon tetrachloride	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.063	
Chlorobenzene	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.050	
Chloroethane	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.16	
Chloroform	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.067	
Chloromethane	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.077	
Dibromochloromethane	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.094	
1,2-Dichlorobenzene	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.075	
1,3-Dichlorobenzene	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.088	
1,4-Dichlorobenzene	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.083	
1,1-Dichloroethane	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.077	
1,2-Dichloroethane	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.14	
1,1-Dichloroethene	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.050	
trans-1,2-Dichloroethene	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.14	
1,2-Dichloropropane	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.087	
cis-1,3-Dichloropropene	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.068	
trans-1,3-Dichloropropene	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.091	
Ethylbenzene	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.063	
Methylene chloride	BSA1318	BSA1318-BLK1	ND	ug/L	1.0	0.095	
Methyl t-butyl ether	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.079	
1,1,2,2-Tetrachloroethane	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.13	

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Volatile Organic Analysis (EPA Method 624)

Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
Tetrachloroethene	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.072	
Toluene	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.054	
1,1,1-Trichloroethane	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.052	
1,1,2-Trichloroethane	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.17	
Trichloroethene	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.078	
Trichlorofluoromethane	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.086	
1,1,2-Trichloro-1,2,2-trifluoroethane	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.068	
Vinyl chloride	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.089	
Total Xylenes	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.17	
Acrolein	BSA1318	BSA1318-BLK1	ND	ug/L	20	3.7	
Acrylonitrile	BSA1318	BSA1318-BLK1	ND	ug/L	5.0	0.69	
p- & m-Xylenes	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.14	
o-Xylene	BSA1318	BSA1318-BLK1	ND	ug/L	0.50	0.070	
1,2-Dichloroethane-d4 (Surrogate)	BSA1318	BSA1318-BLK1	102	%	76 - 114 (LCL - UCL)		
Toluene-d8 (Surrogate)	BSA1318	BSA1318-BLK1	99.6	%	88 - 110 (LCL - UCL)		
4-Bromofluorobenzene (Surrogate)	BSA1318	BSA1318-BLK1	105	%	86 - 115 (LCL - UCL)		

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Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
Acenaphthene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.48	
Acenaphthylene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.64	
Aldrin	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.80	
Aniline	BSA1600	BSA1600-BLK1	ND	ug/L	5.0	0.46	
Anthracene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.79	
Benzidine	BSA1600	BSA1600-BLK1	ND	ug/L	20	4.7	
Benzo[a]anthracene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.52	
Benzo[b]fluoranthene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.66	
Benzo[k]fluoranthene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.80	
Benzo[a]pyrene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.73	
Benzo[g,h,i]perylene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.94	
Benzoic acid	BSA1600	BSA1600-BLK1	ND	ug/L	10	6.1	
Benzyl alcohol	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.67	
Benzyl butyl phthalate	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.59	
alpha-BHC	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.50	
beta-BHC	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.48	
delta-BHC	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.60	
gamma-BHC (Lindane)	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.56	
bis(2-Chloroethoxy)methane	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.58	
bis(2-Chloroethyl) ether	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.52	
bis(2-Chloroisopropyl)ether	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.73	
bis(2-Ethylhexyl)phthalate	BSA1600	BSA1600-BLK1	2.7759	ug/L	5.0	1.1	J
4-Bromophenyl phenyl ether	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.69	
4-Chloroaniline	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.87	

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
2-Chloronaphthalene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.50	
4-Chlorophenyl phenyl ether	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.68	
Chrysene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.73	
4,4'-DDD	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.50	
4,4'-DDE	BSA1600	BSA1600-BLK1	ND	ug/L	3.0	0.58	
4,4'-DDT	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.27	
Dibenzo[a,h]anthracene	BSA1600	BSA1600-BLK1	ND	ug/L	3.0	0.92	
Dibenzofuran	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.81	
1,2-Dichlorobenzene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.58	
1,3-Dichlorobenzene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.66	
1,4-Dichlorobenzene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.53	
3,3-Dichlorobenzidine	BSA1600	BSA1600-BLK1	ND	ug/L	10	0.88	
Dieldrin	BSA1600	BSA1600-BLK1	ND	ug/L	3.0	0.52	
Diethyl phthalate	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.85	
Dimethyl phthalate	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.55	
Di-n-butyl phthalate	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.74	
2,4-Dinitrotoluene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.99	
2,6-Dinitrotoluene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.74	
Di-n-octyl phthalate	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.85	
1,2-Diphenylhydrazine	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.70	
Endosulfan I	BSA1600	BSA1600-BLK1	ND	ug/L	10	2.7	
Endosulfan II	BSA1600	BSA1600-BLK1	ND	ug/L	10	2.4	
Endosulfan sulfate	BSA1600	BSA1600-BLK1	ND	ug/L	3.0	0.58	
Endrin	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.54	

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
Endrin aldehyde	BSA1600	BSA1600-BLK1	ND	ug/L	10	0.86	
Fluoranthene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.70	
Fluorene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.73	
Heptachlor	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.60	
Heptachlor epoxide	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.63	
Hexachlorobenzene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.71	
Hexachlorobutadiene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.59	
Hexachlorocyclopentadiene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.26	
Hexachloroethane	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.52	
Indeno[1,2,3-cd]pyrene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.92	
Isophorone	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.51	
2-Methylnaphthalene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.51	
Naphthalene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.62	
2-Naphthylamine	BSA1600	BSA1600-BLK1	ND	ug/L	20	6.5	
2-Nitroaniline	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.80	
3-Nitroaniline	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.82	
4-Nitroaniline	BSA1600	BSA1600-BLK1	ND	ug/L	5.0	1.1	
Nitrobenzene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.55	
N-Nitrosodimethylamine	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.45	
N-Nitrosodi-N-propylamine	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.59	
N-Nitrosodiphenylamine	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.80	
Phenanthrene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.60	
Pyrene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.62	
1,2,4-Trichlorobenzene	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.67	

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Base Neutral and Acid Extractables Organic Analysis (EPA Method 625)

Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
4-Chloro-3-methylphenol	BSA1600	BSA1600-BLK1	ND	ug/L	5.0	0.67	
2-Chlorophenol	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.65	
2,4-Dichlorophenol	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.60	
2,4-Dimethylphenol	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.52	
4,6-Dinitro-2-methylphenol	BSA1600	BSA1600-BLK1	ND	ug/L	10	2.2	
2,4-Dinitrophenol	BSA1600	BSA1600-BLK1	ND	ug/L	10	2.4	
2-Methylphenol	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.57	
3- & 4-Methylphenol	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.83	
2-Nitrophenol	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.42	
4-Nitrophenol	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	1.7	
Pentachlorophenol	BSA1600	BSA1600-BLK1	ND	ug/L	10	0.45	
Phenol	BSA1600	BSA1600-BLK1	ND	ug/L	2.0	0.37	
2,4,5-Trichlorophenol	BSA1600	BSA1600-BLK1	ND	ug/L	5.0	0.93	
2,4,6-Trichlorophenol	BSA1600	BSA1600-BLK1	ND	ug/L	5.0	0.43	
2-Fluorophenol (Surrogate)	BSA1600	BSA1600-BLK1	74.9	%	28 - 93 (LCL - UCL)		
Phenol-d5 (Surrogate)	BSA1600	BSA1600-BLK1	49.7	%	0 - 82 (LCL - UCL)		
Nitrobenzene-d5 (Surrogate)	BSA1600	BSA1600-BLK1	100	%	53 - 116 (LCL - UCL)		
2-Fluorobiphenyl (Surrogate)	BSA1600	BSA1600-BLK1	103	%	23 - 157 (LCL - UCL)		
2,4,6-Tribromophenol (Surrogate)	BSA1600	BSA1600-BLK1	126	%	38 - 142 (LCL - UCL)		
p-Terphenyl-d14 (Surrogate)	BSA1600	BSA1600-BLK1	111	%	48 - 148 (LCL - UCL)		

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
Total Cyanide	BSA1118	BSA1118-BLK1	ND	mg/L	0.0050	0.0032	
Ammonia as N (Distilled)	BSA1402	BSA1402-BLK1	0.054200	mg/L	0.10	0.050	J

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Reported: 02/12/2009 15:58

Water Analysis (Metals)

Quality Control Report - Method Blank Analysis

Constituent	Batch ID	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
Total Recoverable Arsenic	BSA1344	BSA1344-BLK1	ND	ug/L	2.0	0.82	
Total Recoverable Lead	BSA1344	BSA1344-BLK1	0.14500	ug/L	1.0	0.053	J
Total Recoverable Selenium	BSA1344	BSA1344-BLK1	ND	ug/L	2.0	0.50	
Total Recoverable Thallium	BSA1344	BSA1344-BLK1	ND	ug/L	1.0	0.054	
Total Antimony	BSA1404	BSA1404-BLK1	ND	ug/L	100	14	
Total Beryllium	BSA1404	BSA1404-BLK1	ND	ug/L	10	1.1	
Total Cadmium	BSA1404	BSA1404-BLK1	ND	ug/L	10	1.4	
Total Chromium	BSA1404	BSA1404-BLK1	ND	ug/L	10	2.3	
Total Copper	BSA1404	BSA1404-BLK1	ND	ug/L	10	1.4	
Total Silver	BSA1404	BSA1404-BLK1	ND	ug/L	10	2.5	
Total Zinc	BSA1404	BSA1404-BLK1	ND	ug/L	50	8.9	
Total Mercury	BSA1462	BSA1462-BLK1	ND	ug/L	0.20	0.016	
Total Nickel	BSB0490	BSB0490-BLK1	ND	ug/L	10	2.3	

Marine Research Specialists	Project: Semi-Annual Eff	**Reported:** 02/12/2009 15:58
3140 Telegraph Road, Suite A	Project Number: [none]	
Suite A	Project Manager: Doug Coats	
Ventura, CA 93003-3238		

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected at or above the reporting limit
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
A01	PQL's and MDL's are raised due to sample dilution.
A10	PQL's and MDL's were raised due to matrix interference.
A17	Surrogate not reportable due to sample dilution.
L01	The Laboratory Control Sample Water (LCSW) recovery is not within laboratory established control limits.
Q03	Matrix spike recovery(s) is(are) not within the control limits.
S09	The surrogate recovery on the sample for this compound was not within the control limits.

BC Laboratories, Inc.

Chain of Custody Form

Page ____ of ____

Report To:
Client: Marine Research Specialists
Attn:
Street Address: 3140 Telegraph Rd. Suite A
City, State, Zip: Ventura, CA 93003
Phone: 805 644.1180 Fax: 805 289.3935
Email Address: Doug.Coats@Mrsenv.com
Work Order #: 0900887

Project #:
Project Name:
Global ID #:
Sampler(s):

Analysis Requested

Please refer to the back of this page for completion instructions and method legend.

Comments:

Are there any tests with holding times less than or equal to 48 hours? ☐ Yes ☐ No

* Standard Turnaround = 10 work days

Sample #	Description	Date Sampled	Time Sampled	Ammonia	625 Phenolics	Ag, As, Cd, Se, Cr, Ni, Pb, Cu, Zn, Be, Hg	Cyanide	EPA 608/625	Volatile Organics 624			Soil	Sludge	Drinking Water	Ground Water	Waste Water	Other	Turnaround # of work days*	Notes
1	Grab eff. A.R.S.	1/21/09	0910	X	X											X			see attached sheet
2	Comp eff A.R.S.	1/21/09	0910			X	X	X	X	X						X			

CHK BY [signature] DISTRIBUTION [signature] SUB-OUT ☐

Billing ☐ Same as above
Client:
Address:
City: ______ State ____ Zip ____
Attn:
PO#:

EDF Required? ☐ Yes ☐ No

Send Copy to State of CA? (EDT) ☐ Yes ☐ No

Sample Disposal ☐ Return to Client ☐ Disposal by lab ☐ Archive: Months ____

Special Reporting ☐ QC ☐ EDF ☐ Raw Data

Relinquished By	Date	Time	Received By	Date	Time
1. [signature]	1/21/09	1430	1. [signature]	1-21-09	1430
2. [signature]	1-21-09	1850	2. [signature]	1-21-09	1907
3.			3.		

BC LABORATORIES INC. SAMPLE RECEIPT FORM Rev. No. 12 06/24/08 Page 1 Of 1

Submission #: 0900887

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

Emissivity: 0.98 Container: Other Thermometer ID: TH103

Temperature: A 3.8 °C / C 3.8 °C

Date/Time 1-21-09 1927

Analyst Init JDW

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL PHYSICAL										
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS		B C								
PT CYANIDE	A									
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL	( )	A 3	( )	( )	( )	( )	( )	( )	( )	( )
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA ~~508/608/8080~~ 608 048		F								
QT EPA 515.1/8150										
QT EPA ~~525~~ 1625 052	B	DE								
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 AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										

Comments:_____

Sample Numbering Completed By: AMB Date/Time: 1/22/09 940

A = Actual / C = Corrected

[H:\DOCS\WP80\LAB_DOCS\FORMS\SAMREC2.WPD]

#0900887

Analyses of Effluent Samples to be collected from the Morro Bay Wastewater Treatment Plant on January 7, 2009

Analysis	Sample	Method
Level IIA QC Report concentrations that are detected above the MDL, but are below the PQL		
Ammonia as N w/ distillation	Grab	EPA-350.1
Total Chlorinated and Total Non-Chlorinated Phenolic Compounds (Report only the phenolic compounds)	Grab	EPA-625
13 Metals:		
Ag Silver	Composite	EPA 200.7
As Arsenic	Composite	EPA 200.8
Be Beryllium	Composite	EPA 200.7
Cd Cadmium	Composite	EPA 200.7
Cr Chromium	Composite	EPA 200.7
Cu Copper	Composite	EPA 200.7
Hg Mercury	Composite	EPA 245.1
Ni Nickel	Composite	EPA 200.7
Pb Lead	Composite	EPA 200.8
Sb Antimony	Composite	EPA 200.7
Se Selenium	Composite	EPA 200.8
Tl Thallium	Composite	EPA 200.8
Zn Zinc	Composite	EPA 200.7
Volatile Organics - Low Level Including Acrolein, Acrylonitrile, MTBE	Composite	EPA 624/8240
Organochlorine Pesticides and PCBs	Composite	EPA 608/8080
Phenolic Compounds: Full list of base-neutral and acid-extractable congeners	Composite	EPA 625/8270
Cyanide	Composite	EPA 335.3

Invoice and Report to be sent to:

Dr. Douglas A. Coats (Doug.Coats@mrsenv.com)
Marine Research Specialists
3140 Telegraph Rd., Suite A
Ventura, CA 93003
Telephone: (805) 644-1180 Fax 289 3735

Samples to be collected from:

Morro Bay Wastewater Treatment Plant
160 Atascadero Rd.
Morro Bay, CA 93442
Telephone: (805) 772-6272

Morro Bay Wastewater Treatment Plant
160 Atascadero Road
Morro Bay, CA 93442

Bottle Order #49509

BC Laboratories
4100 Atlas Ct.
Bakersfield, CA 93308
(661) - 327-4911
(Sample Control)

Project Location: Semi-Annul
Bottle Order Requested By: on 12/30/2008
Bottle Order Needed By: 01/05/2008
Date Shipped: <No Entry>

#0910887

Quantity	Size	Type	Label	Analysis Constituents	Collection & Preservation	Holding Time	Notes
1	500 ml (1 pint)	Plastic	Cyanide (GREEN)	Cyanide	NaOH to pH > 12, 4 C	14 Days	Bottle contains preservative. DO NOT RINSE!
1	1000 ml (quart)	Plastic	BLANK (WHITE)	Asbestos	None	Immediate to 28 days	
1	500 ml (1 pint)	Plastic	Nitrogen Forms (YELLOW)	Ammonica	H2SO4 to pH < 2, 4 C	28 Days	Bottle contains preservative. DO NOT RINSE!
1	500 ml (1 pint)	Plastic	Inorganic Chemical Metals (RED)	Total Metals	PROJECT SPECIFIC	Hg-28 days Others-6 mo	Bottle contains preservative. DO NOT RINSE!
1	1000 ml (quart)	Glass Amber	EPA 608 (WHITE)	608	None	7 Days	Dechlorinate during collection for chlorinated sources.
2	1000 ml (quart)	Glass Amber	EPA 625 (WHITE)	625	None	7 Days	Two bottles are required for each sample. Dechlorinate during collection for chlorinated sources.
1	1000 ml (quart)	Glass Amber	EPA 8140/8141 (WHITE)	EPA 8140/8141	None	7 Days	Dechlorinate during collection for chlorinated sources.
3	40 ml	Glass Vial	Volatile Organics	624	200 uL HCl	14 Days	Fill completely Leave no headspace. Cool to 4 C. Bottle contains preservative. DO NOT RINSE!
1	40 ml	Glass Vial	Volatile Organics Travel Blank		200 uL HCl	14 Days	Bottle contains preservative and organic-free water. DO NOT OPEN!

Coolers: Y Blue Ice: Specific Packaging:

1 Chain of Custody Form

Ship
Label N-forms and 1 625 bottle - grab in right hand corner of label (see tina q/ questions)

Order Checked By:

Preserved containers: If not used within 6 months please return to BC Laboratories for proper disposal. Do not use for sampling.

Aquatic
Testing
Laboratories

CHAIN OF CUSTODY

CHAIN OF CUSTODY

Client: City of Morro Bay

Address: Wastewater Treatment Plant
160 Atascadero Road
Morro Bay, CA 93442

Project Manager: Doug Coats - MRS

Phone: (805) 644-1180

Fax: (805) 289-3935

Purchase Order No:

Aquatic Testing Laboratories

4350 Transport St., Unit 107
Ventura, CA 93003
(805) 650-0546 Fax (805) 650-0756

Sample ID	Sample Date	Sample Time	Sample Type *	Chlorine (TRC)**	Number of Containers	Testing Requested
Grab Eff. ARS	19 JAN 09	0800	E	<.05	1 (one gallon)	FHM Acute daily renewal

Special Instructions:

** Note: Total residual chlorine must be taken immediately after sample collection if sample is a chlorinated effluent.

* L - Liquid, S - Solid, SS - Semi-Solid/sludge, RW - Receiving Water, GW - Ground Water, E - Effluent

CUSTODY TRANSFERS

Relinquished by (signature)	Received by (signature)	Date (mm/dd/yy)	Time (hh:mm)	Seals Intact? (Yes, No, NA)	Temperature Received (°C)
Doug S. Helms	Fed Ex	19 JAN 09	14:30	—	—
Fed Ex		1-20-09	0950	NA	2°

CHAIN OF CUSTODY

Client: City of Morro Bay

Address: Wastewater Treatment Plant
160 Atascadero Road
Morro Bay, CA 93442

Project Manager: Doug Coats - MRS

Phone: (805) 644-1180

Fax: (805) 289-3935

Purchase Order No:

Aquatic Testing Laboratories

4350 Transport St., Unit 107
Ventura, CA 93003
(805) 650-0546 Fax (805) 650-0756

Sample ID	Sample Date	Sample Time	Sample Type *	Chlorine (TRC)**	Number of Containers	Testing Requested
Grab Eff. ARS	20 JAN 09	0805 AM	E	2.05	1 (one gallon)	FHM Acute daily renewal

Special Instructions:

**** Note: Total residual chlorine must be taken immediately after sample collection if sample is a chlorinated effluent.**

* L - Liquid, S - Solid, SS - Semi-Solid/sludge, RW - Receiving Water, GW - Ground Water, E - Effluent

CUSTODY TRANSFERS

Relinquished by (signature)	Received by (signature)	Date (mm/dd/yy)	Time (hh:mm)	Seals Intact? (Yes, No, NA)	Temperature Received (°C)
George S. Helms	Douglas A. Coats	20 JAN 09	1007	—	—
		1-20-09	1355	NA	5°
Douglas A. Coats					

CHAIN OF CUSTODY

Client: City of Morro Bay

Address: Wastewater Treatment Plant
160 Atascadero Road
Morro Bay, CA 93442

Project Manager: Doug Coats - MRS

Phone: (805) 644-1180

Fax: (805) 289-3935

Purchase Order No:

Aquatic Testing Laboratories

4350 Transport St., Unit 107
Ventura, CA 93003
(805) 650-0546 Fax (805) 650-0756

Sample ID	Sample Date	Sample Time	Sample Type *	Chlorine (TRC)**	Number of Containers	Testing Requested
Grab Eff. ARS	1/21/09	0820	E	<.05	1 (one gallon)	FHM Acute daily renewal

Special Instructions:

**** Note: Total residual chlorine must be taken immediately after sample collection if sample is a chlorinated effluent.**

* L - Liquid, S - Solid, SS - Semi-Solid/sludge, RW - Receiving Water, GW - Ground Water, E - Effluent

CUSTODY TRANSFERS

Relinquished by (signature)	Received by (signature)	Date (mm/dd/yy)	Time (hh:mm)	Seals Intact? (Yes, No, NA)	Temperature Received (°C)
George S. Stelma	Fed Ex	1/21/09	14:30	—	—
Fed Ex		1-22-09	0932	NA	4°

CHAIN OF CUSTODY

Client: City of Morro Bay

Address: Wastewater Treatment Plant
160 Atascadero Road
Morro Bay, CA 93442

Project Manager: Doug Coats - MRS

Phone: (805) 644-1180

Fax: (805) 289-3935

Purchase Order No:

Aquatic Testing Laboratories

4350 Transport St., Unit 107
Ventura, CA 93003
(805) 650-0546 Fax (805) 650-0756

Sample ID	Sample Date	Sample Time	Sample Type *	Chlorine (TRC)**	Number of Containers	Testing Requested
Grab Eff. ARS	22 Jan 09	0845	E	.03 mg/L	1 (one gallon)	FHM Acute daily renewal

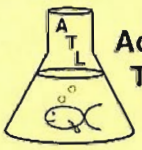
Special Instructions:

**** Note: Total residual chlorine must be taken immediately after sample collection if sample is a chlorinated effluent.**

* L - Liquid, S - Solid, SS - Semi-Solid/sludge, RW - Receiving Water, GW - Ground Water, E - Effluent

CUSTODY TRANSFERS

Relinquished by (signature)	Received by (signature)	Date (mm/dd/yy)	Time (hh:mm)	Seals Intact? (Yes, No, NA)	Temperature Received (°C)
Steven R. Rothenberger	FedEx	22Jan09	1430	YES	—
FedEx		1-23-09	0930	NA	2°



Aquatic
Testing
Laboratories

REFERENCE TOXICANT DATA

FATHEAD MINNOW ACUTE
Method 2000.0
Reference Toxicant - SDS

Aquatic Testing Laboratories

QA/QC Batch No.: RT-090107

TEST SUMMARY

Species: *Pimephales promelas*.
Age: 12 days old.
Regulations: NPDES.
Test chamber volume: 250 ml.
Feeding: Prior to renewal at 48 hrs.
Temperature: 20 +/- 1°C.
Number of replicates: 2.
Dilution water: MHSF.

Source: In-lab culture.
Test type: Static-Renewal.
Test Protocol: EPA-821-R-02-012.
Endpoints: LC50 at 96 hrs.
Test chamber: 600 ml beakers.
Aeration: None.
Number of organisms per chamber: 10.
Photoperiod: 16/8 hrs light/dark.

TEST DATA

	INITIAL			24 Hr					48 Hr				
Date/Time:	1-7-09 1300			1-8-09 1200					1-9-09 1200				
Analyst:													
	°C	DO	pH	°C	DO	pH	# Dead A	# Dead B	°C	DO	pH	# Dead A	# Dead B
Control	20.7	8.8	7.7	20.4	8.1	7.4	0	0	20.6	8.0	7.5	0	0
1.0 mg/l	20.7	8.8	7.7	20.3	8.0	7.3	0	0	20.5	8.0	7.5	0	0
2.0 mg/l	20.7	8.9	7.7	20.3	7.9	7.3	0	0	20.4	8.2	7.6	0	0
4.0 mg/l	20.8	8.9	7.7	20.2	7.3	7.2	2	2	20.4	8.3	7.6	0	0
8.0 mg/l	20.8	8.9	7.7	20.2	5.6	7.0	10	10	—	—	—	—	—

	RENEWAL			72 Hr					96 Hr				
Date/Time:	1-9-09 1200			1-10-09 1200					1-11-09 1200				
Analyst:													
	°C	DO	pH	°C	DO	pH	# Dead A	# Dead B	°C	DO	pH	# Dead A	# Dead B
Control	20.8	8.9	7.7	19.7	8.3	7.6	0	0	20.3	7.8	7.6	0	0
1.0 mg/l	20.8	9.0	7.7	19.7	8.2	7.6	0	0	20.4	7.9	7.6	0	0
2.0 mg/l	20.8	9.0	7.8	19.6	8.3	7.6	0	0	20.3	8.2	7.6	0	0
4.0 mg/l	20.8	8.9	7.8	19.6	8.3	7.6	0	0	20.2	8.1	7.6	0	0
8.0 mg/l	—	—	—	—	—	—	—	—	—	—	—	—	—

Comments: Control: Alkalinity: 63 mg/l; Hardness: 96 mg/l; Conductivity: 312 umho.
SDS: Alkalinity: 63 mg/l; Hardness: 96 mg/l; Conductivity: 317 umho.

Concentration-response relationship acceptable? (see attached computer analysis):
(Yes) (response curve normal)
No (dose interrupted indicated or non-normal)

Acute Fish Test-96 Hr Survival

Start Date:	1/7/2009 13:00	Test ID:	RT-090107f	Sample ID:	REF-Ref Toxicant
End Date:	1/11/2009 12:00	Lab ID:	CAATL-Aquatic Testing Labs	Sample Type:	SDS-Sodium dodecyl sulfate
Sample Date:	1/7/2009	Protocol:	ACUTE-EPA-821-R-02-012	Test Species:	PP-Pimephales promelas
Comments:					

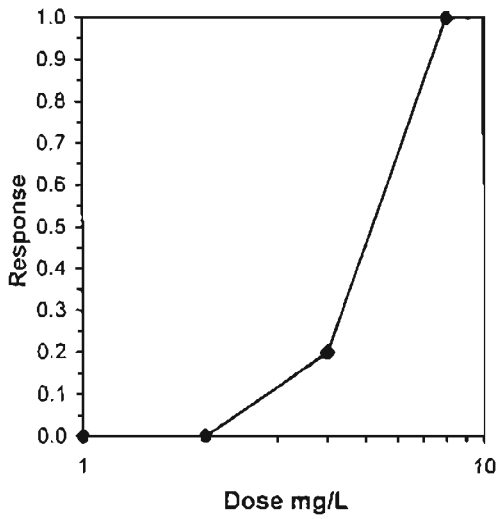
Conc-mg/L	1	2
D-Control	1.0000	1.0000
1	1.0000	1.0000
2	1.0000	1.0000
4	0.8000	0.8000
8	0.0000	0.0000

			Transform: Arcsin Square Root					Number	Total
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Resp	Number
D-Control	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20
1	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20
2	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	2	0	20
4	0.8000	0.8000	1.1071	1.1071	1.1071	0.000	2	4	20
8	0.0000	0.0000	0.1588	0.1588	0.1588	0.000	2	20	20

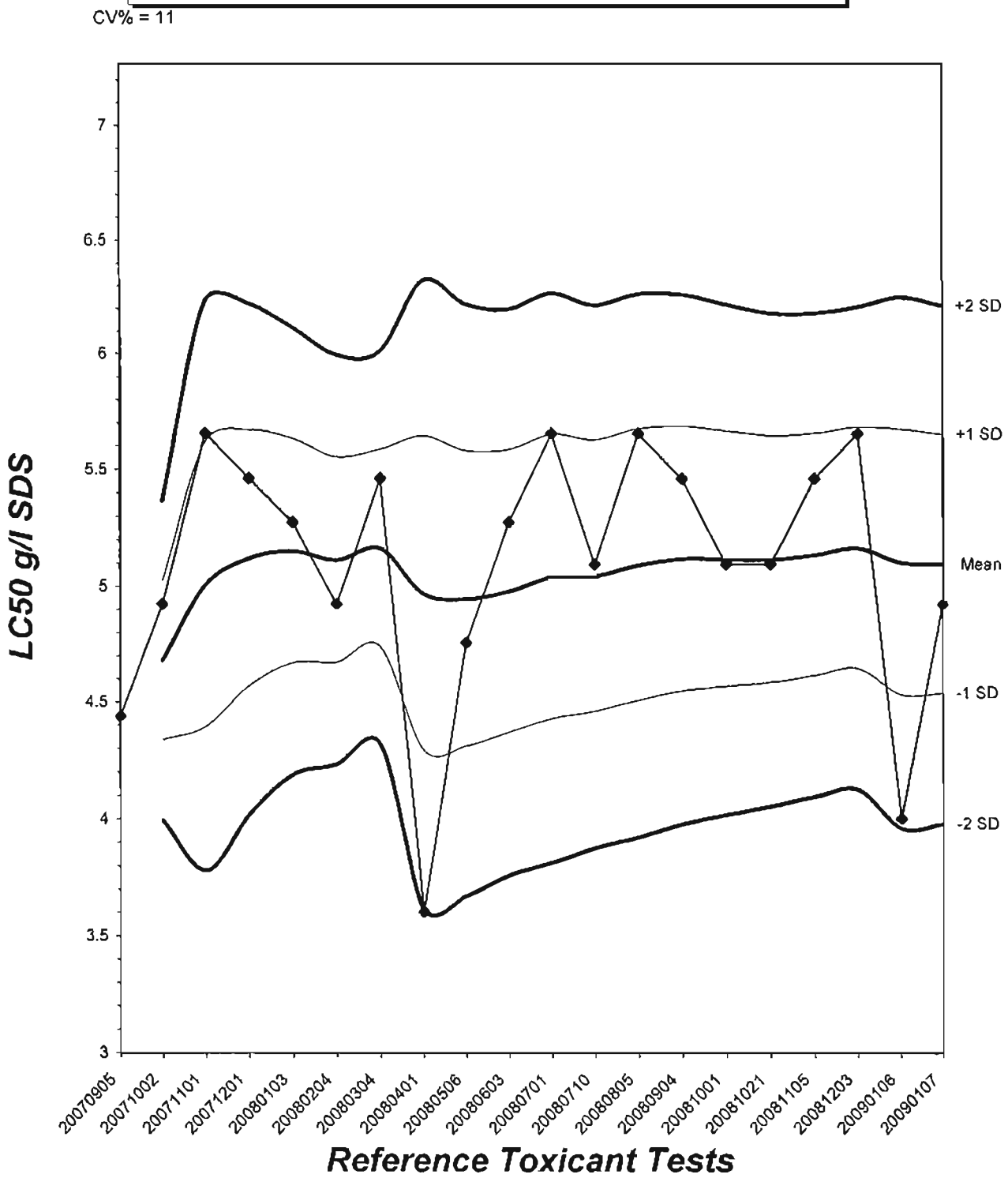
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Normality of the data set cannot be confirmed				
Equality of variance cannot be confirmed				

Trimmed Spearman-Karber

Trim Level	EC50	95% CL	
0.0%	4.9246	4.3503	5.5747
5.0%	5.0215	4.3576	5.7866
10.0%	5.1038	4.2923	6.0686
20.0%	5.1874	4.7084	5.7150
Auto-0.0%	4.9246	4.3503	5.5747



Fathead Minnow Acute Laboratory Control Chart



TEST ORGANISM LOG

Aquatic Testing Laboratories

FATHEAD MINNOW - LARVAL
(Pimephales promelas)

QA/QC BATCH NO.: RT-090107

SOURCE: In-Lab Culture

DATE HATCHED: 12-26-08

APPROXIMATE QUANTITY: 400

GENERAL APPEARANCE: good

 # MORTALITIES 48 HOURS PRIOR TO TO USE IN TESTING: 0

DATE USED IN LAB: 1/6/9

AVERAGE FISH WEIGHT: 0.006 gm

LOADING LIMITS: 0.65 gm/liter @ 20°C, 0.40 gm/liter @ 25°C

Approximately 1000 fish per 10 liters limit if held overnight for acclimation without filtration @ 20°C for fish with a mean weight of 0.006 gm.

Approximately 650 fish per 10 liters limit if held overnight for acclimation without filtration @ 25°C for fish with a mean weight of 0.006 gm.

200 ml test solution volume = 0.013 gm mean fish weight limit @ 20°C; 0.008 @ 25°C
250 ml test solution volume = 0.016 gm mean fish weight limit @ 20°C; 0.010 @ 25°C

ACCLIMATION WATER QUALITY:

Temp.: 20.2 °C **pH:** 7.7 **Ammonia:** <0.1 mg/l NH_3-N

DO: 8.8 mg/l **Alkalinity:** 63 mg/l **Hardness:** 96 mg/l

READINGS RECORDED BY: _____ **DATE:** 1-7-9

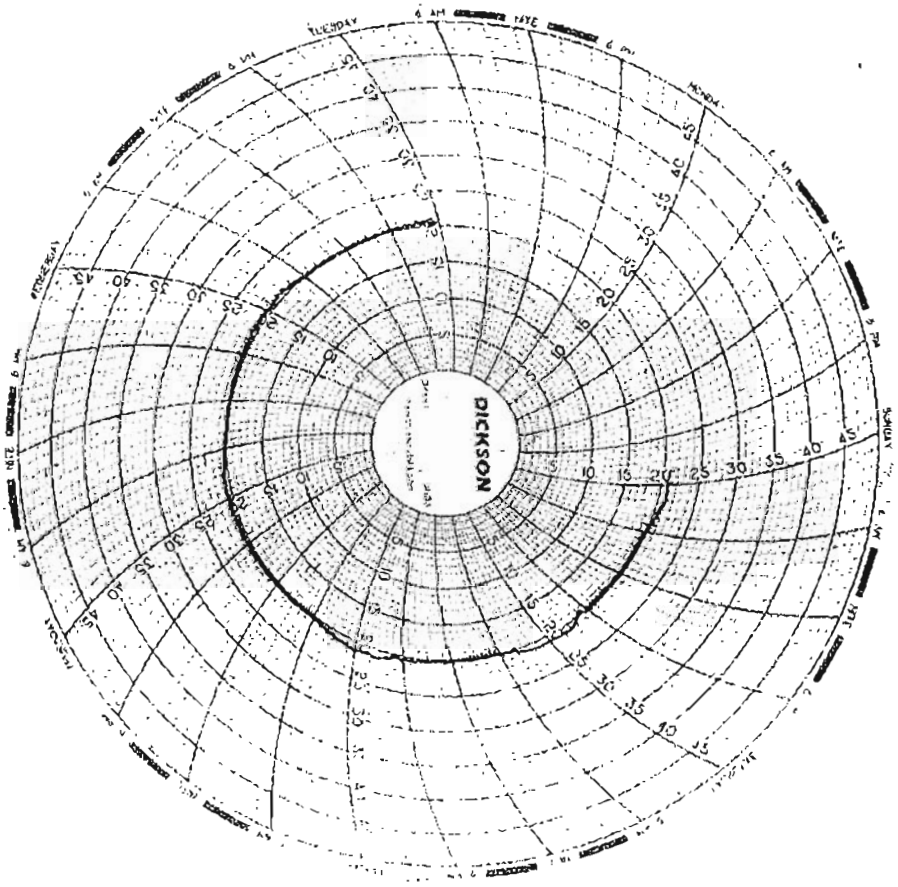
Aquatic Testing Laboratories

Test Temperature Chart

Test No: RT-090106

Date Tested: 01/07/09 to 01/11/09

Acceptable Range: 20+/- 1°C



Aquatic
Testing
Laboratories

CHAIN OF CUSTODY

CHAIN OF CUSTODY

Client: City of Morro Bay

Address: Wastewater Treatment Plant
160 Atascadero Road
Morro Bay, CA 93442

Project Manager: Doug Coats - MRS

Phone: (805) 644-1180

Fax: (805) 289-3935

Purchase Order No:

Aquatic Testing Laboratories

4350 Transport St., Unit 107
Ventura, CA 93003
(805) 650-0546 Fax (805) 650-0756

Sample ID	Sample Date	Sample Time	Sample Type *	Chlorine (TRC)**	Number of Containers	Testing Requested
Grab Eff. ARS	1/5/09	0845hrs.	E	<.05	1 (one gallon)	FHM Acute daily renewal
Comp. Eff.	1/5/09	0845hrs.	E	<.05	1 (one gallon)	Giant Kelp Chronic

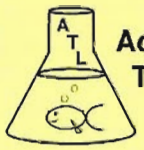
Special Instructions: Grab Ammonia = 34 mg/L

** Note: Total residual chlorine must be taken immediately after sample collection if sample is a chlorinated effluent.

* L - Liquid, S - Solid, SS - Semi-Solid/sludge, RW - Receiving Water, GW - Ground Water, E - Effluent

CUSTODY TRANSFERS

Relinquished by (signature)	Received by (signature)	Date (mm/dd/yy)	Time (hh:mm)	Seals Intact? (Yes, No, NA)	Temperature Received (°C)
	Fed Ex	1/5/09	1430	—	—
Fed Ex		1-6-09	1016	NA	10



Aquatic
Testing
Laboratories

REFERENCE TOXICANT DATA

GIANT KELP GERMINATION AND GROWTH TEST
REFERENCE TOXICANT - COPPER

Aquatic Testing Laboratories

QA/QC Batch No.: RT-090106

Date Tested: 01/06/09 - 01/08/09

TEST SUMMARY

Species: *Macrocystis pyrifera*.
Protocol: EPA/600/R-95/136.
Test type: Static.
Test chamber: Plastic beakers.
Temperature: 15 +/- 1°C.
Number of spores per ml: 7,500 (approx.).
Standard toxicant: Copper chloride.
Lab seawater: 0.2 um filtered seawater.

Source: Field collected.
Dilution water: Lab seawater.
Endpoints: NOEC, IC25 at 48 hrs.
Test volume: 200 ml.
Aeration: None.
Number of replicates: 5.
Ref. tox. source: Mallinckrodt.
Preservative: none.

RESULTS SUMMARY

Sample Concentration	Percent Germination		Mean Germ Tube Length (μm)	
Control	83.5%		15.35	
10 μg/l	84.4%		15.95	
18 μg/l	83.2%		15.80	
32 μg/l	74.0%	*	13.20	*
56 μg/l	50.7%	*	10.15	*
100 μg/l	23.7%	*	7.30	*
180 μg/l	6.3%	*	5.80	*
* Statistically significantly less than control at P = 0.05 level				

CHRONIC TOXICITY

Germination NOEC	18 μg/l
Germination IC25	43.3 μg/l
Germ Tube Growth NOEC	18 μg/l
Germ Tube Growth IC25	43.2 μg/l

QA/QC TEST ACCEPTABILITY

Parameter	Result
Mean control germination ≥ 70%	Yes (83.5%)
Mean control germination tube length > 10 μm	Yes (15.35 μm)
Germination tube growth NOEC < 35 μg/l Copper	Yes (18 μg/l)
%MSD < 20% relative to control (germination & growth)	Yes (germ = 11.4%, growth = 9.4%)

Macrocystis Germination and Growth Test-Proportion Germinated

Start Date:	1/6/2009 15:00	Test ID:	RT-090106k	Sample ID:	REF-Ref Toxicant
End Date:	1/8/2009 15:00	Lab ID:	CAATL-Aquatic Testing Labs	Sample Type:	CUCL-Copper chloride
Sample Date:	1/6/2009	Protocol:	EPAWC-EPA/600/R-95/136	Test Species:	MP-Macrocystis pyrifera
Comments:					

Conc-ug/L	1	2	3	4	5
D-Control	0.8000	0.8679	0.8317	0.8641	0.8113
10	0.9038	0.8416	0.8000	0.8667	0.8077
18	0.8667	0.8558	0.8039	0.8224	0.8113
32	0.7383	0.7525	0.6667	0.7642	0.7767
56	0.6040	0.3784	0.4815	0.4851	0.5849
100	0.1682	0.1963	0.3861	0.2816	0.1509
180	0.1636	0.0367	0.0196	0.0381	0.0561

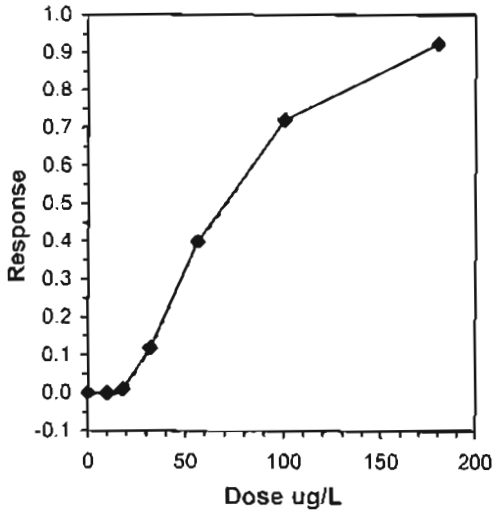
			Transform: Arcsin Square Root					1-Tailed			Isotonic	
Conc-ug/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
D-Control	0.8350	1.0000	1.1537	1.1071	1.1989	3.584	5				0.8394	1.0000
10	0.8440	1.0107	1.1676	1.1071	1.2555	5.221	5	-0.284	2.409	0.1172	0.8394	1.0000
18	0.8320	0.9964	1.1495	1.1121	1.1970	3.266	5	0.087	2.409	0.1172	0.8321	0.9912
*32	0.7397	0.8858	1.0363	0.9553	1.0786	4.652	5	2.413	2.409	0.1172	0.7399	0.8814
*56	0.5068	0.6069	0.7922	0.6625	0.8901	11.583	5	7.428	2.409	0.1172	0.5047	0.6013
*100	0.2366	0.2834	0.5021	0.3990	0.6705	22.367	5	13.386	2.409	0.1172	0.2347	0.2796
*180	0.0628	0.0752	0.2370	0.1405	0.4165	44.807	5	18.831	2.409	0.1172	0.0638	0.0760

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.96291	0.934	0.66204	0.64183
Bartlett's Test indicates equal variances (p = 0.20)	8.50881	16.8119		

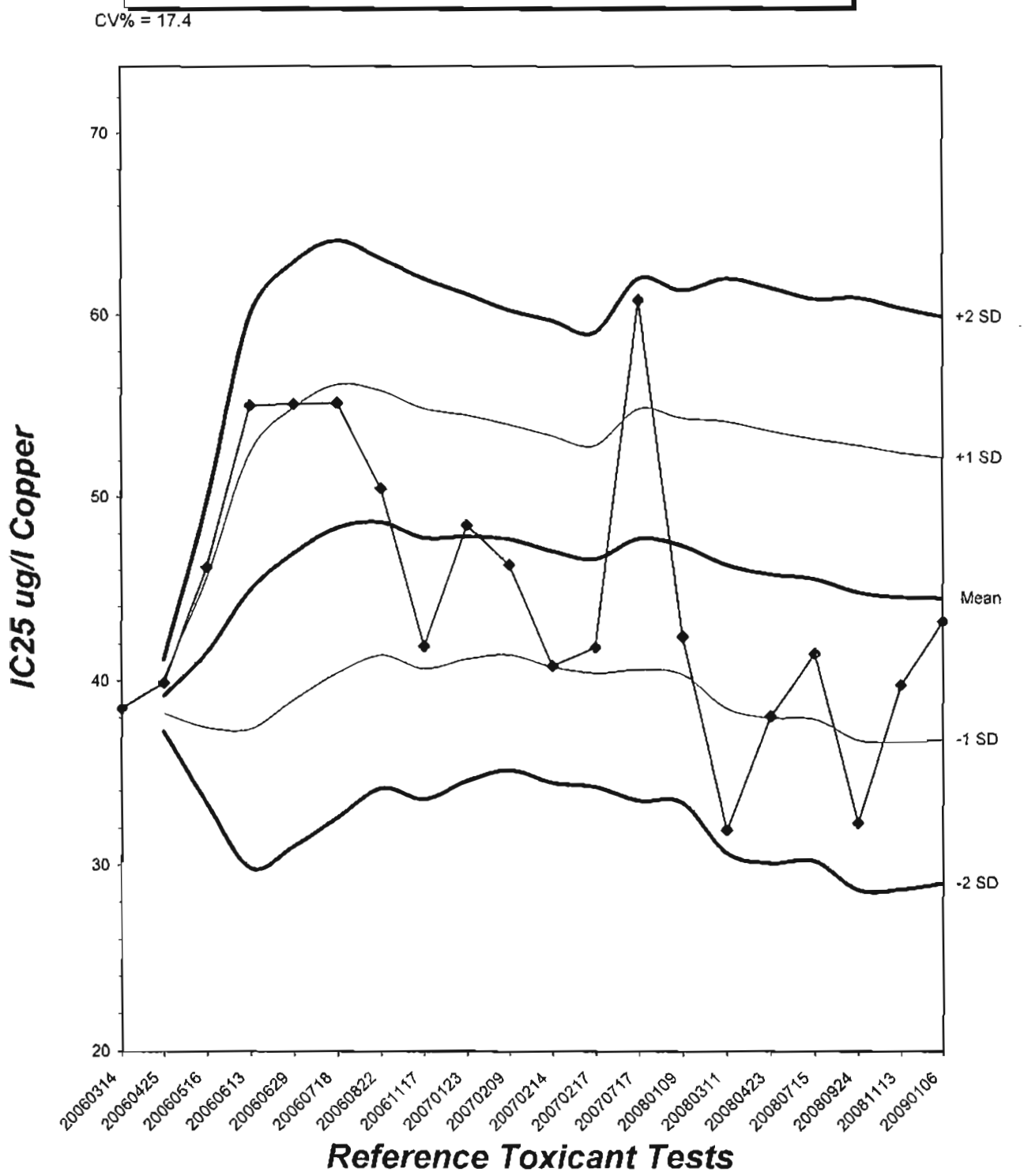
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs D-Control	18	32	24		0.09525	0.11394	0.68044	0.00592	2.1E-18	6, 28

Linear Interpolation (200 Resamples)

Point	ug/L	SD	95% CL(Exp)		Skew
IC05	23.255	1.704	17.284	26.808	0.0666
IC10	29.630	2.168	23.356	34.951	0.0401
IC15	34.691	1.872	27.638	39.114	-0.5356
IC20	38.975	1.890	33.368	44.408	-0.1231
IC25	43.259	2.140	38.308	50.356	0.4493
IC40	56.177	3.826	48.100	70.223	0.3171
IC50	69.856	4.326	54.390	80.987	-0.6811



Giant Kelp Germination Laboratory Control Chart



Macrocystis Germination and Growth Test-Growth-Length

Start Date:	1/6/2009 15:00	Test ID:	RT-090106k	Sample ID:	REF-Ref Toxicant
End Date:	1/8/2009 15:00	Lab ID:	CAATL-Aquatic Testing Labs	Sample Type:	CUCL-Copper chloride
Sample Date:	1/6/2009	Protocol:	EPAWC-EPA/600/R-95/136	Test Species:	MP-Macrocystis pyrifera
Comments:					

Conc-ug/L	1	2	3	4	5
D-Control	14.750	15.500	15.500	15.750	15.250
10	16.000	16.500	16.000	16.250	15.000
18	16.250	15.250	15.750	15.250	16.500
32	14.750	10.500	13.500	14.250	13.000
56	11.000	8.250	9.250	11.750	10.500
100	7.000	6.500	8.750	7.250	7.000
180	6.250	5.500	5.500	5.750	6.000

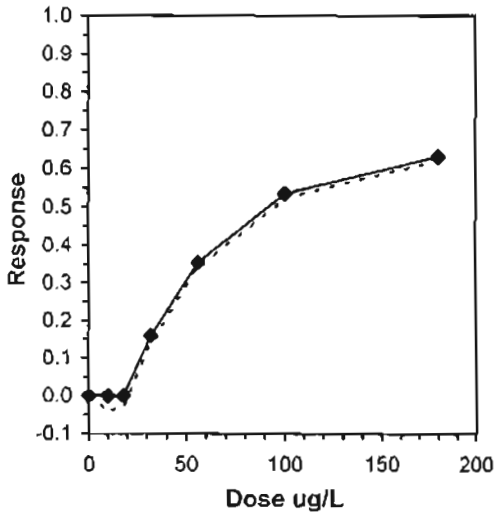
			Transform: Untransformed					1-Tailed			Isotonic	
Conc-ug/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
D-Control	15.350	1.0000	15.350	14.750	15.750	2.470	5				15.700	1.0000
10	15.950	1.0391	15.950	15.000	16.500	3.574	5	-0.999	2.409	1.447	15.700	1.0000
18	15.800	1.0293	15.800	15.250	16.500	3.608	5	-0.749	2.409	1.447	15.700	1.0000
*32	13.200	0.8599	13.200	10.500	14.750	12.520	5	3.578	2.409	1.447	13.200	0.8408
*56	10.150	0.6612	10.150	8.250	11.750	13.780	5	8.654	2.409	1.447	10.150	0.6465
*100	7.300	0.4756	7.300	6.500	8.750	11.714	5	13.397	2.409	1.447	7.300	0.4650
*180	5.800	0.3779	5.800	5.500	6.250	5.620	5	15.893	2.409	1.447	5.800	0.3694

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.94102	0.934	-0.7689	2.26363
Bartlett's Test indicates equal variances (p = 0.01)	15.8869	16.8119		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	18	32	24		1.44729	0.09429	88.8571	0.90268	1.7E-17	6, 28
Treatments vs D-Control										

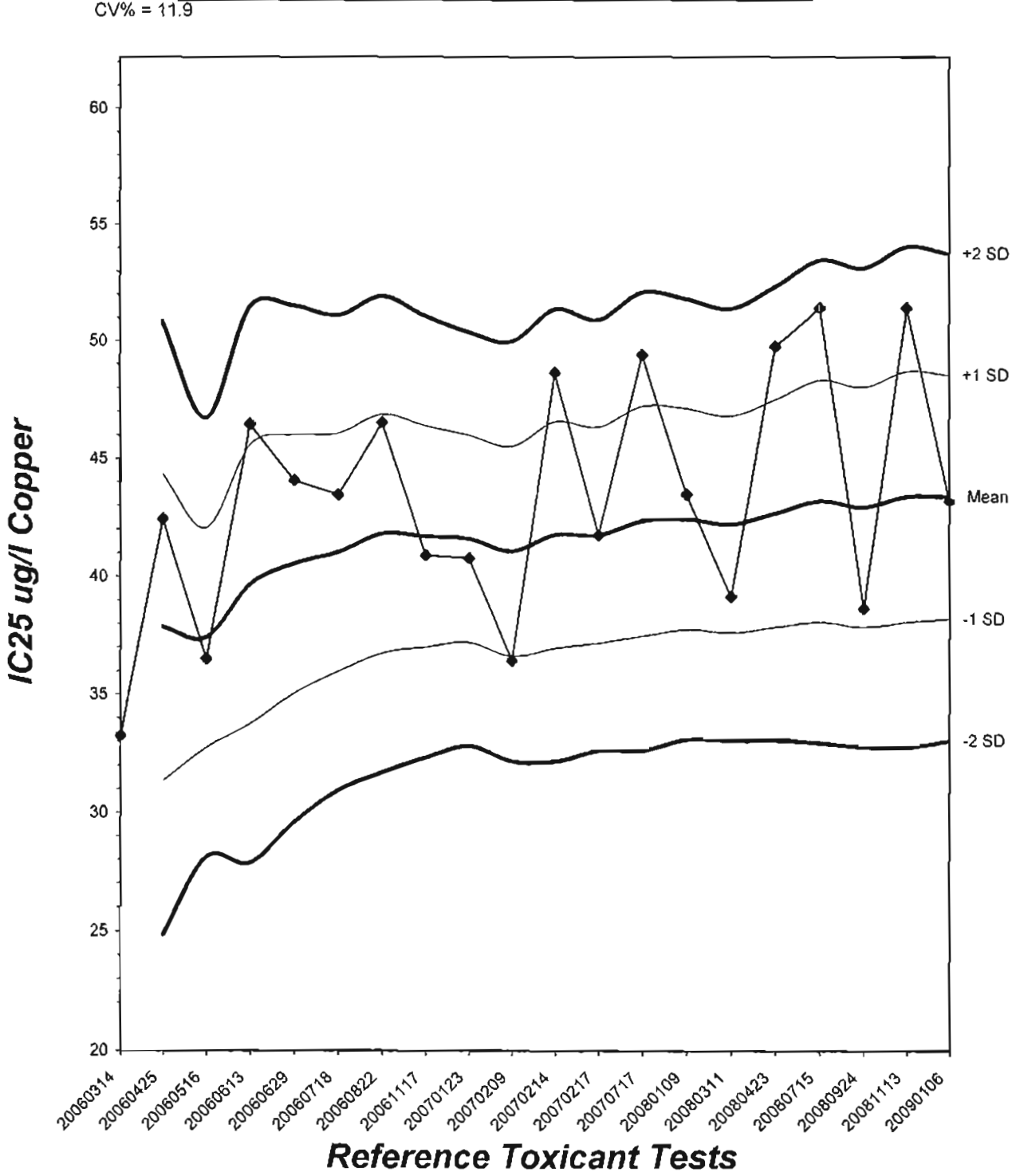
Linear Interpolation (200 Resamples)

Point	ug/L	SD	95% CL(Exp)		Skew
IC05	22.396	1.229	19.496	26.596	0.9578
IC10	26.792	2.381	21.538	35.454	0.7946
IC15	31.188	3.112	23.803	40.703	0.3248
IC20	37.036	3.831	25.016	45.737	-0.1408
IC25	43.213	4.080	26.065	52.644	-0.7183
IC40	67.270	6.774	46.817	82.558	-0.2982
IC50	91.509	5.842	77.766	112.874	1.0093



Reviewed by:

Giant Kelp Germ Tube Growth Laboratory Control Chart



GIANT KELP GERMINATION AND GROWTH SHORT-TERM TOXICITY TEST

Aquatic Testing Laboratories

QA/QC No.: RT-090106

Start Date: 01/06/2009

Dish No.	Sample Conc.	Total Number Counted	Number Germin.	Number Non-Germin.	Germ Tube Lengths (micrometer units)									
					A	B	C	D	E	F	G	H	I	J
1	100	107	18	89	5	3	2	2	4	2	2	2	3	3
2	10	104	94	10	7	6	8	5	6	6	7	7	6	6
3	56	101	61	40	5	5	4	6	5	3	3	4	5	4
4	32	107	79	28	6	7	5	6	6	5	6	6	5	7
5	C	105	84	21	5	6	4	7	7	6	5	7	6	6
6	18	105	91	14	7	6	7	5	4	8	8	7	6	7
7	180	110	18	92	2	3	3	2	2	3	3	3	2	2
8	C	106	92	14	5	7	6	6	7	5	7	6	6	7
9	32	101	76	25	4	3	4	4	3	5	4	5	6	4
10	100	107	21	86	3	2	4	3	3	2	2	2	2	3
11	18	104	89	15	7	5	7	6	6	5	7	6	7	5
12	180	109	4	105	2	3	2	2	2	2	3	2	2	2
13	56	111	42	69	4	3	2	4	3	3	4	2	3	5
14	10	101	85	16	6	6	7	5	7	7	6	7	8	7
15	180	102	2	100	2	2	3	2	2	2	2	2	3	2
16	10	105	84	21	7	5	6	7	7	6	5	7	6	8
17	100	101	39	62	4	2	3	4	3	3	5	3	4	4
18	32	102	68	34	5	6	7	5	4	4	6	7	5	5
19	56	108	52	56	4	5	4	3	3	2	4	5	4	3
20	18	102	82	20	6	7	5	7	6	6	7	5	7	7

Comments:

Micrometer conversion factor: 1 unit = 2.5 um at 400X power

GIANT KELP GERMINATION AND GROWTH SHORT-TERM TOXICITY TEST

Aquatic Testing Laboratories

QA/QC No.: RT-090106

Start Date: 01/06/2009

Dish No.	Sample Conc.	Total Number Counted	Number Germin.	Number Non-Germin.	Germ Tube Lengths (micrometer units)									
					A	B	C	D	E	F	G	H	I	J
21	C	101	84	17	7	7	5	6	7	6	6	5	7	6
22	56	101	49	52	4	6	5	4	3	3	5	6	6	5
23	180	105	4	101	3	2	2	3	2	2	2	2	2	3
24	C	103	89	14	6	7	5	7	7	6	5	7	6	7
25	32	106	81	25	7	6	5	7	6	5	5	5	6	5
26	10	105	91	14	7	5	6	7	7	8	5	7	6	7
27	100	103	29	74	3	2	4	4	3	2	2	2	3	4
28	18	107	88	19	8	7	5	4	7	7	6	5	6	6
29	100	106	16	90	2	4	3	3	2	2	2	4	4	2
30	C	106	86	20	6	7	5	5	7	7	6	5	7	6
31	32	103	80	23	5	7	4	4	6	5	5	6	4	6
32	180	107	6	101	2	3	4	2	2	2	3	2	2	2
33	10	104	84	20	6	5	6	7	7	6	5	7	4	7
34	56	106	62	46	4	5	5	4	3	5	4	3	4	5
35	18	106	86	20	7	6	7	5	8	7	6	6	7	7
36														
37														
38														
39														
40														

Comments:

Micrometer conversion factor: 1 unit = 2.5 um at 400X power

GIANT KELP GERMINATION AND GROWTH SHORT-TERM TOXICITY TEST

Aquatic Testing Laboratories

QA/QC No.: RT-090106

Start Date: 01/06/2009

WATER QUALITY READINGS

	Initial Readings				Final Readings			
Sample	Temp (°C)	DO (mg/l)	pH	Salinity (o/oo)	Temp (°C)	DO (mg/l)	pH	Salinity (o/oo)
Control	15.1	8.1	8.0	34	15.4	7.4	8.0	34
10 µg/l	15.0	8.1	8.0	34	15.3	7.4	8.0	34
18 µg/l	15.0	8.1	8.0	34	15.1	7.3	8.0	34
32µg/l	14.9	8.2	8.0	34	15.2	7.2	8.0	34
56 µg/l	14.9	8.1	8.0	34	14.9	7.3	8.0	34
100 µg/l	14.8	8.1	8.0	34	15.0	7.3	8.0	34
180 µg/l	14.8	8.1	8.0	34	14.9	7.3	8.0	34

Comments:

Reference toxicant: Copper chloride.

All dilutions made with reference lab seawater.

Illumination (16 hr light / 8 hr dark at 50 ± 10 uE/m²/s) at 5 locations in incubator: (four corners and center): 48, 52, 47, 53, 50 uE/m²/s.

Initial readings: Analyst: _____ Date: 1-6-9 Time: 1540

Final readings: Analyst: _____ Date: 1-8-09 Time: 1502

Aquatic Testing Laboratories

GIANT KELP GERMINATION AND GROWTH SHORT-TERM TOXICITY TEST

QA/QC No.: RT-090106

Start Date:01/06/2009

RANDOMIZATION WORKSHEET

Beaker No.	Sample Conc.	Beaker No.	Sample Conc.	Beaker No.	Sample Conc.	Beaker No.	Sample Conc.	Notes
1	100	11	18	21	C	31	32	Need 7500/ml x 200 ml = 1,500,000 spores. Add 1.0 ml spore stock of 6 spores per 5x5 hemacytometer grid
2	10	12	180	22	56	32	780	
3	56	13	56	23	180	33	10	
4	32	14	10	24	C	34	56	
5	C	15	180	25	32	35	18	
6	18	16	10	26	10	36		
7	180	17	100	27	100	37		
8	C	18	32	28	18	38		
9	32	19	56	29	100	39		
10	100	20	18	30	C	40		

Analyst: _____ Date: 1-6-9 Time: 1400

Aquatic Testing Laboratories

Test Temperature Chart

Test No: RT-090106

Date Tested: 01/06/09 to 01/08/09

Acceptable Range: 15+/- 1°C