

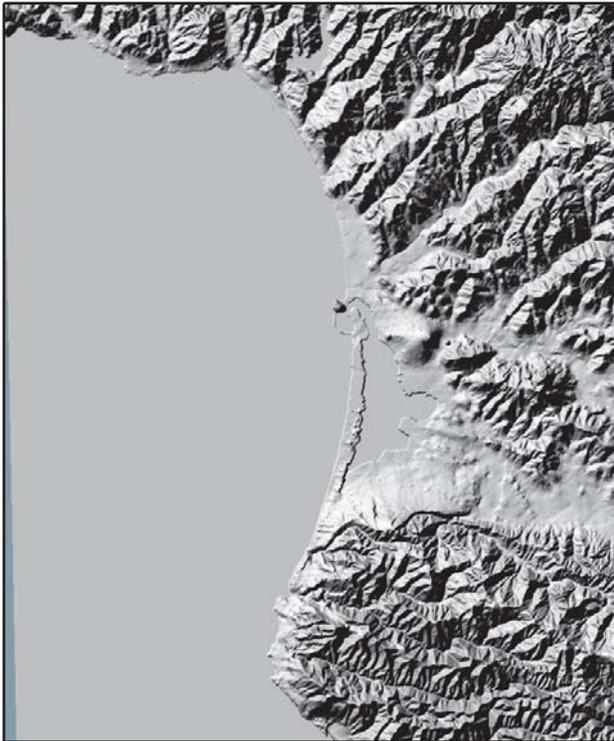
**City of Morro Bay and  
Cayucos Sanitary District**

**OFFSHORE MONITORING  
AND REPORTING PROGRAM**

**SEMIANNUAL EFFLUENT SAMPLING**

**CHEMICAL AND BIOASSAY  
ANALYSIS RESULTS**

**JANUARY 2005**



**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 2005**

**Prepared by**

**Douglas A. Coats and Bonnie Luke**

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**February 2005**

# 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

22 February 2005

## **Reference: Chemical and Bioassay Analysis Results for Effluent Samples Collected in January 2005**

Dear Mr. Keogh:

Enclosed are the results of chemical analyses conducted on grab and composite effluent samples collected on 12 January 2005, a chronic bioassay on one composite effluent sample collected on 10 January, and an acute bioassay conducted on four effluent samples collected daily from 10 January through 13 January 2005. All analyses were conducted in accordance with the requirements of Monitoring and Reporting Program Number 98-15<sup>1</sup> to assess compliance with effluent limitations specified in the Waste Discharge Requirements of the NPDES Discharge Permit.<sup>2</sup> Bioassay protocols conformed to the revised requirements specified by RWQCB<sup>3</sup> staff that eliminated techniques previously used to mitigate interference from ammonia toxicity.<sup>4</sup> Nevertheless, all of the measured chemical concentrations and toxicity endpoints complied with the limitations promulgated by the current discharge permit. This includes outdated acute-toxicity limitations that are no longer promulgated by the current version of the California Ocean Plan<sup>5</sup> because they were determined to be unnecessarily stringent. This cover letter summarizes the bioassay results and discusses the chemical compounds that were 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 to this letter report.

### **Chronic Bioassay**

As summarized in Table 1, the chronic bioassay tests demonstrated that effluent toxicity was an order of magnitude lower than the limitations specified in the NPDES permit. Results were comparable to the low toxicities determined in tests conducted over the last 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, as is described below. As with past bioassays, the chronic toxicity tests conducted in January 2005 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<sup>6</sup>

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<sup>1</sup> 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

<sup>2</sup> 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

<sup>3</sup> California Regional Water Quality Control Board, Central Coast Division

<sup>4</sup> 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

<sup>5</sup> 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

<sup>6</sup> 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 ( <i>Macrocystis pyrifera</i> ) Chronic Germination	18 <sup>8</sup>	5.6			134
Chronic Growth	18 <sup>8</sup>	5.6			134
Acute: Fathead Minnow ( <i>Pimephales promelas</i> )	>100 <sup>9</sup>	0.76	1.5	2.0	2.5

established that giant kelp (*M. pyrifera*) is substantially more sensitive to MBCSD<sup>7</sup> effluent than other species, such as the larvae of the inland silverside (*Menidia beryllina*) and bay mussel (*Mytilus edulis*).

The chronic bioassay results presented in Table 1 demonstrate the effluent's continuing low toxicity to this most-sensitive marine species. Both chronic-toxicity concentrations (5.6 TUc) were more than 20 times lower than the applicable permit limitation (134 TUc). The reported chronic toxic units (TUc) 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 18%, 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 that the kelp specimens were susceptible to toxic exposure because they experienced 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 of 18 µg/L was comparable to toxic concentrations found in reference tests conducted over the last several years.<sup>10</sup> This suggests that this particular batch of kelp spores was highly susceptible to toxic materials. Nevertheless, they were only minimally affected by exposure to treatment plant effluent.

### Acute Bioassay

In contrast to the chronic toxicity tests, the acute bioassay was confounded by toxic interference caused by the presence of ammonia in the test sample. Current bioassay protocols<sup>11</sup> limit the use of techniques that, in the past, have been widely used 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, these widely applied tests have reliably evaluated a broad range of freshwater, marine, and effluent samples. However, they are problematic when test samples contain ammonia, a constituent that 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

<sup>7</sup> City of Morro Bay and the Cayucos Sanitary District, joint owners of the wastewater treatment and disposal facility

<sup>8</sup> NOEC or the No Observed Effects Concentration, which is the highest concentration of effluent that did not produce an adverse effect statistically different from the control experiment

<sup>9</sup> LC<sub>50</sub> or the effluent concentration that produces death of 50% of the test organisms exposed to the toxicants for 96 hours

<sup>10</sup> cf. The Giant Kelp Germ Tube Growth Laboratory Control Chart attached to this report

<sup>11</sup> 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

limit for ammonia concentrations that is specified in the NPDES discharge permit (804 mg/L)<sup>12</sup> as compared to typical effluent ammonia concentrations ( $\leq 36$  mg/L).<sup>13</sup> This is because ammonia remains in a relatively benign, ionic ammonium<sup>14</sup> form in seawater and wastewater. However, in an acute bioassay, effluent remains static in the test chambers for an extended period of time, during which complex interactions among the organic constituents cause pH to increase. As pH increases, ammonium is converted into a deionized ammonia form<sup>15</sup> that is highly toxic to the test organisms. In contrast, 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, report artificially elevated toxic concentrations.

Various methods have been developed over the years to reduce the artifactual toxicity that results from changes in wastewater ammonia during bioassay tests.<sup>16</sup> Ammonia interference in the acute bioassays conducted on MBCSD effluent samples has previously been successfully reduced through the use of zeolite pretreatment. As a result, in the 21 acute tests conducted since 1997, and prior to 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.<sup>17</sup> Among other changes, the new protocols use much younger, smaller test specimens, and encourage the use of sample-renewal techniques to reduce moderate levels of ammonia interference, rather than chemical techniques. Based on this, the RWQCB staff further required that the acute toxicity tests no longer implement any form of chemical sample manipulation to reduce toxic ammonia interference.

However, 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, and fall far short of eliminating significant artifactual toxicity arising from ammonia deionization. As a result, the acute toxicity reported here is somewhat 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 no commensurate increase in the accompanying chronic-toxicity measurements.

Because static renewal is only marginally effective in accommodating the artifactual toxicity resulting from pH-induced ammonia interference in MBCSD effluent samples, extraordinary measures were instituted in an attempt to reduce impacts from ammonia toxicity to the maximum extent possible. The current bioassay protocols were implemented using daily grab effluent samples that 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 sample containers and to maintain a uniform sample temperature during transit to the bioassay laboratory. Finally, care was also taken during renewal in the laboratory to avoid physical impact to the extremely small larval-fish specimens.

The January 2005 acute bioassay also benefited from lower-than-normal ammonia concentrations in the effluent test samples. To some extent, this tempered the toxic interference from ammonia and resulted in a

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<sup>12</sup> Instantaneous maximum ammonia concentration specified in the NPDES waste-discharge requirements for the MBCSD effluent

<sup>13</sup> Marine Research Specialists (MRS). 2005. City of Morro Bay and Cayucos Sanitary District, Offshore Monitoring and Reporting Program, 2004 Annual Report. Submitted February 2005 to the City of Morro Bay and Cayucos Sanitary District, Morro Bay, CA

<sup>14</sup>  $\text{NH}_4^+$

<sup>15</sup>  $\text{NH}_3$

<sup>16</sup> 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.

<sup>17</sup> RWQCB. 2003 (Footnote 4) *op. cit.*

reported toxicity level (0.76 TUa) that was somewhat lower than in quarterly bioassays conducted last year, when all reported toxicities exceeded 1.4 TUa. The effluent samples described in this report were collected during a rainy period when effluent was diluted by rainwater inflow into the collection system. Consequently, the measured concentrations of some wastewater constituents were found to be slightly lower than normal in the samples analyzed for this report. For example, the ammonia concentration in the effluent sample collected on 12 January was 20 mg/L. This concentration was 10 mg/L lower than the average ammonia concentration reported for 2004, and was lower than any of the monthly ammonia concentrations reported that year.

As part of the quality control procedures, acute bioassay tests were also conducted using a reference toxic chemical<sup>18</sup> in order to determine the relative sensitivity of the test organisms. Results demonstrated that the batch of Fathead Minnows (*P. promelas*) used in the January 2005 bioassay were highly susceptible to toxic exposure. They experienced 100% mortality in concentrations as low as 8 mg/L of the reference toxicant.<sup>19</sup> The concomitant LC<sub>50</sub> for the reference toxicant was 4.9 mg/L, which was comparable to the average toxicant concentrations found in reference tests conducted in previous years.

### Chemical Constituents

The nontoxic character of the MBCSD effluent was confirmed by the general absence of chemical contaminants within grab and composite samples collected on 12 January. The samples were tested for the presence of 145 chemical compounds. Table 2 shows that only six compounds were detected in the January-2005 effluent samples. Compounds with detectable concentrations were ammonia, arsenic, lead, selenium, cyanide, and a commonly occurring phthalate compound (bis 2-ethylhexyl phthalate). Table 2 also shows that the concentrations measured for these six compounds were all well below the discharge limitations promulgated by the NPDES discharger permit. The permit limits were derived from the receiving-water objectives stated in Table B of the California Ocean Plan,<sup>20</sup> and a critical initial dilution ratio of 133:1 computed from a conservative oceanic dispersion model applied to the MBCSD outfall.<sup>21</sup> Because the PQL's<sup>22</sup> 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.

All six of the compounds found in the January-2005 effluent samples have been routinely detected at similarly low concentrations within effluent<sup>23</sup> and biosolid<sup>24</sup> samples collected over the past two decades. Ammonia as nitrogen<sup>25</sup> is measured in grab effluent samples that are collected on a monthly basis. It has always been present in detectable concentrations that are well below the most-stringent permit limit of 80.4 mg/L, which applies to a 6-month median.

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<sup>18</sup> Sodium dodecyl sulfate

<sup>19</sup> *cf.* The Larval Fathead Minnow Juvenile Acute Laboratory Control Chart attached to this report

<sup>20</sup> 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.

<sup>21</sup> 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.

<sup>22</sup> The Practical Quantification Limit is the smallest quantifiable concentration based on the sample size and analytical technique.

<sup>23</sup> 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.

<sup>24</sup> Table 22 (Page III-77) *op. cit.*

<sup>25</sup> NH<sub>3</sub>-N

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

Constituent	Units	Concentration	
		Measured	Limitation <sup>26</sup>
Cyanide, Total	mg/L	<b>0.022</b>	0.13
Antimony	mg/L	<0.1 <sup>27</sup>	160.8
Arsenic	µg/L	<b>2.8</b>	670.
Beryllium	µg/L	<10.	4.42 <sup>28</sup>
Cadmium	µg/L	<10.	130.
Chromium	µg/L	<10.	270.
Copper	µg/L	<10.	140.
Lead	µg/L	<b>1.6</b>	270.
Mercury	µg/L	<0.2	5.
Nickel	µg/L	<10.	670.
Selenium	µg/L	<b>3.0</b>	2010.
Silver	µg/L	<10	70.
Thallium	µg/L	<1.	1880. <sup>28</sup>
Zinc	µg/L	<50.	1620.
Bis (2-ethylhexyl) phthalate	µg/L	<b>6.6</b>	470. <sup>28</sup>
Ammonia (as N)	mg/L	<b>20.</b>	80.4

### *Metals*

Similarly, the presence of arsenic and lead in the January effluent sample is not indicative of a significant new contaminant source within the influent stream. Unlike synthetic organic compounds, arsenic and lead occur naturally within the mineralogy of sediments along the central California coast. Arsenic commonly enters the water system through the weathering of arsenic-bearing rocks and forest fires. The anthropogenic sources of arsenic include mining activities, agricultural pesticides, and insecticides. Lead enters the wastewater system most frequently through household plumbing systems, lead-based paints, and gasoline- or fuel-contaminated dusts. The measured concentrations of 2.8 µg/L for arsenic and 1.6 µg/L for lead were low and only slightly above their respective PQLs of 2 µg/L and 1 µg/L.

Additionally, the detection of lead was probably an artifact of the lower PQL attained in the analysis of the January sample. Previous analyses usually only attained a PQL of 2 µg/L, and would not have detected the presence of lead at the measured concentration of 1.6 µg/L. Regardless, the measured concentration of arsenic was over 230 times lower, and the concentration of lead was over 160 times lower than the limits specified in the NPDES discharge permit.

Selenium was the only other metal detected in the January 2005 effluent sample. At 3 µg/L, the measured concentration of selenium was only slightly above its PQL of 2 µg/L, and was 670 times lower than the limit specified in the NPDES discharge permit. Although, like arsenic and lead, it is a naturally occurring component of the mineralogy of the central California coast, it has not been detected in effluent samples since July 1998. However, as with lead, the absence of detectable levels of selenium in previous samples may have been related to their higher detection limits, where PQLs often exceeded 4 µg/L.

Anthropogenic sources of selenium include glass manufacturing, the combustion of fossil fuels (coal burning), and metal refining by-products. None of these are the likely source of the low concentrations of selenium in the January-2005 effluent sample. Instead, its presence is probably linked to the mobilization of

<sup>26</sup> 6-month median limitation unless otherwise indicated.

<sup>27</sup> Not detected at levels above the indicated practical quantification (detection) limit

<sup>28</sup> 30-Day Average

naturally occurring selenium in surficial soils following the heavy rainfall event that occurred just prior to the January 2005 effluent sampling. Studies in the San Joaquin Valley watershed have shown that selenium is released from naturally occurring rocks by oxidation during weathering, and that it accumulates in soils in water-soluble salts.<sup>29</sup> In addition, areas in which selenium has accumulated to high levels within soils are generally those where the mean annual precipitation is less than 12 inches. During 2002 and 2003, the annual rainfall totals noted at the Morro Bay treatment plant were 12.0 and 11.5 inches, respectively.<sup>30,31</sup> In comparison, over two inches of precipitation fell in Morro Bay in the five days prior to the January 2005 effluent sampling. This isolated intense rainfall event may have mobilized selenium that had accumulated in surficial sediments over the past several years. The increased proportion of rainwater inflow into the collection system probably accounted for its presence in the effluent sample.

### ***Organic Compounds***

The phthalate compound, bis 2-ethylhexyl phthalate, is an ubiquitous compound that has also been consistently detected at low levels in effluent and biosolid samples collected over the past decade.<sup>32</sup> Phthalates are components of synthetic dyes, resins, plasticizers, insecticides, and, pharmaceuticals. Although this phthalate compound can negatively affect human health, concentrations would have to be more than 70-times higher than those measured in January 2005 to be of a human-health concern.

### ***Cyanide***

Cyanide was the only additional compound detected in the January-2005 effluent sample. However, at 0.022 mg/L, its concentration was only slightly above its PQL of 0.02 mg/L. Also, the measured concentration was almost 6-times lower than the permitted 6-month median concentration and, therefore, was not of ecological concern. Although cyanide is not normally detected in effluent samples, it is commonly found in low concentrations in biosolids.<sup>24</sup> Consequently, the detection of low concentrations in effluent is not unexpected and does not imply the presence of a new source of cyanide within the collection system. Although there are many natural sources of cyanide, it is frequently used in pigments and can be introduced into the collection system during photo processing and newspaper printing. Cyanide is also a component in many insecticides. At the low measured concentration and flow rates comparable to 2004, the mass emission of cyanide will remain well below the stringent mass-loading goal of 57 kg/yr identified in the NPDES permit.

### **Conclusions**

The comprehensive chemical and bioassay analyses conducted on effluent samples collected in January 2005 augment data collected over the last two decades. Together, these measurements demonstrate the consistently benign nature of the discharge from the MBSCD 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-2005 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.

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<sup>29</sup> Anderson, David W. 1998. Natural Levels of Nickel, Selenium, and Arsenic in the Southern San Francisco Bay Area. Prepared for City of San Jose Environmental Services Department.

<sup>30</sup> Marine Research Specialists (MRS). 2003. City of Morro Bay and Cayucos Sanitary District, Offshore Monitoring and Reporting Program, 2002 Annual Report. Submitted February 2003 to the City of Morro Bay and Cayucos

<sup>31</sup> Marine Research Specialists (MRS). 2004. City of Morro Bay and Cayucos Sanitary District, Offshore Monitoring and Reporting Program, 2003 Annual Report. Submitted February 2004 to the City of Morro Bay and Cayucos Sanitary District, Morro Bay, CA.

<sup>32</sup> 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.

*Mr. B. Keogh*  
*22 February 2005*

*Page 7*

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

Sincerely,

Douglas A. Coats, Ph.D.  
Program Manager

Enclosure (Four Report Copies)

***CHEMICAL ANALYSIS RESULTS***



MARINE RESEARCH SPECIALISTS  
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Attn: DOUG COATS

### Water Analysis (General Chemistry)

<b>COC Number</b>	---	<b>Receive Date/Time</b>	01/12/2005 @ 18:15
<b>Project Number</b>	---	<b>Sampling Date/Time</b>	01/12/2005 @ 10:30
<b>Sampling Location</b>	---	<b>Sample Depth</b>	---
<b>Sampling Point</b>	GRAB	<b>Sample Matrix</b>	Water
<b>Sampled By</b>	---	<b>BCL Sample ID</b>	05-00396-1

Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date	Run Time	Analyst	Instrument ID	Dilution	QC Batch ID	MB Bias	Lab Quals
Ammonia as N (Distilled)	20	mg/L	5	2	EPA-350.1	01/18/05	01/18/05	14:30	TDC	AAII-5	100	218-101469	5	A01, Q03, M01

Flag	Explanations
A01	PQL's and MDL's are raised due to sample dilution.
M01	Analyte detected in the Method Blank at a level above the PQL.
Q03	Matrix spike recovery is not within the control limits.

California DOHS Certification #1186

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### Water Analysis (General Chemistry)

<b>COC Number</b>	---							<b>Receive Date/Time</b>	01/12/2005 @ 18:15					
<b>Project Number</b>	---							<b>Sampling Date/Time</b>	01/12/2005 @ 10:30					
<b>Sampling Location</b>	---							<b>Sample Depth</b>	---					
<b>Sampling Point</b>	COMPOSITE							<b>Sample Matrix</b>	Water					
<b>Sampled By</b>	---							<b>BCL Sample ID</b>	05-00396-2					
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date	Run Time	Analyst	Instrument ID	Dilution	QC Batch ID	MB Bias	Lab Quale
Total Cyanide	0.022	mg/L	0.02	0.0063	EPA-335.3	01/17/05	01/18/05	05:00	MRM2	AAII-1	1	216-101002	ND	

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05-00396-2



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### Water Analysis (Metals)

<b>COC Number</b>	---	<b>Receive Date/Time</b>	01/12/2005 @ 18:15
<b>Project Number</b>	---	<b>Sampling Date/Time</b>	01/12/2005 @ 10:30
<b>Sampling Location</b>	---	<b>Sample Depth</b>	---
<b>Sampling Point</b>	COMPOSITE	<b>Sample Matrix</b>	Water
<b>Sampled By</b>	---	<b>BCL Sample ID</b>	05-00396-2

Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date	Run Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quale
Total Antimony	< PQL	ug/L	100	5.1	EPA-6010	01/20/05	01/21/05	20:11	ARD	PE-OP2	1	385-101755	ND	
Total Beryllium	< PQL	ug/L	10	0.24	EPA-6010	01/20/05	01/21/05	20:11	ARD	PE-OP2	1	385-101755	ND	
Total Cadmium	< PQL	ug/L	10	0.50	EPA-6010	01/20/05	01/21/05	20:11	ARD	PE-OP2	1	385-101755	ND	
Total Chromium	< PQL	ug/L	10	0.17	EPA-6010	01/20/05	01/21/05	20:11	ARD	PE-OP2	1	385-101755	ND	
Total Copper	< PQL	ug/L	10	0.83	EPA-6010	01/20/05	01/21/05	20:11	ARD	PE-OP2	1	385-101755	ND	
Total Mercury	< PQL	ug/L	0.2	0.050	EPA-7470	01/17/05	01/18/05	12:13	JEE2	CETAC1	1	215-101489	ND	
Total Nickel	< PQL	ug/L	10	0.37	EPA-6010	01/20/05	01/21/05	20:11	ARD	PE-OP2	1	385-101755	ND	
Total Silver	< PQL	ug/L	10	1.0	EPA-6010	01/20/05	01/21/05	20:11	ARD	PE-OP2	1	385-101755	ND	
Total Zinc	< PQL	ug/L	50	0.32	EPA-6010	01/20/05	01/21/05	20:11	ARD	PE-OP2	1	385-101755	ND	
Total Recoverable Arsenic	2.8	ug/L	2	0.90	EPA-200.8	01/17/05	01/27/05	22:05	MJP	PE-EL1	1	352-101735	ND	
Total Recoverable Lead	1.6	ug/L	1	0.020	EPA-200.8	01/17/05	01/27/05	22:05	MJP	PE-EL1	1	352-101735	ND	
Total Recoverable Selenium	3.0	ug/L	2	0.28	EPA-200.8	01/17/05	01/27/05	22:05	MJP	PE-EL1	1	352-101735	ND	
Total Recoverable Thallium	< PQL	ug/L	1	0.095	EPA-200.8	01/17/05	01/27/05	22:05	MJP	PE-EL1	1	352-101735	ND	



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Organochlorine Pesticides and PCB's (EPA Method 608)

Table with 2 columns: Left column contains COC Number, Project Number, Sampling Location, Sampling Point (COMPOSITE), and Sampled By. Right column contains Receive Date/Time (01/12/2005 @ 18:15), Sampling Date/Time (01/12/2005 @ 10:30), Sample Depth, Sample Matrix (Water), and BCL Sample ID (05-00396-2).

Main data table with 15 columns: Constituent, Result, Units, PQL, MDL, Method, Prep Date, Run Date, Run Time, Analyst, Instrument ID, Dilution, GC Batch ID, MB Bias, Lab Quats. Lists various pesticides and PCBs with their respective results and detection limits.

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# Organochlorine Pesticides and PCB's (EPA Method 608)

Sample Description		COMPOSITE, 01/12/2005 @ 10:30												
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date	Run Time	Analyst	Instrument ID	Dilution	QC Batch ID	MB Bias	Lab Quale
PCB-1242	< PQL	ug/L	0.2	0.094	EPA-608	01/17/05	01/22/05	01:28	SAM	GC-1	1			
PCB-1248	< PQL	ug/L	0.2	0.025	EPA-608	01/17/05	01/22/05	01:28	SAM	GC-1	1			
PCB-1254	< PQL	ug/L	0.2	0.042	EPA-608	01/17/05	01/22/05	01:28	SAM	GC-1	1			
PCB-1260	< PQL	ug/L	0.2	0.079	EPA-608	01/17/05	01/22/05	01:28	SAM	GC-1	1			
Total PCB's (Summation)	< PQL	ug/L	0.2	0.002	EPA-608	01/17/05	01/22/05	01:28	SAM	GC-1	1			
Surrogate Compounds	Result	Units	Control Limits		Method	Prep Date	Run Date	Run Time	Analyst	Instrument ID	Dilution	QC Batch ID	MB Bias	Lab Quale
TCMX	77	%	50-124		EPA-608	01/17/05	01/22/05	01:28	SAM	GC-1	1			
Dibutyl chlorendate	38	%	34-174		EPA-608	01/17/05	01/22/05	01:28	SAM	GC-1	1			

Flag	Explanations
V01	The Initial Calibration Verification (ICV) recovery is not within established control limits.

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05-00396-2



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VENTURA, CA 93003-3238
Attn: DOUG COATS

Volatile Organic Analysis (EPA Method 624)

Table with 4 columns: COC Number, Project Number, Sampling Location, Sampling Point, Sampled By, Receive Date/Time, Sampling Date/Time, Sample Depth, Sample Matrix, BCL Sample ID.

Main data table with 15 columns: Constituent, Result, Units, PQL, MDL, Method, Prep Date, Run Date, Run Time, Analyst, Instrument ID, Dilution, QC Batch ID, MB Bias, Lab Quale.

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# Volatile Organic Analysis (EPA Method 624)

Sample Description		COMPOSITE, 01/12/2005 @ 10:30												
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date	Run Time	Analyst	Instrument ID	Dilution	QC Batch ID	MB Bias	Lab Quals
1,1,2,2-Tetrachloroethane	< PQL	ug/L	0.5	0.14	EPA-624	01/19/05	01/19/05	15:12	MGC	MS-V7	1	358-101296	ND	
Tetrachloroethane	< PQL	ug/L	0.5	0.089	EPA-624	01/19/05	01/19/05	15:12	MGC	MS-V7	1	358-101296	ND	
Toluene	< PQL	ug/L	0.5	0.15	EPA-624	01/19/05	01/19/05	15:12	MGC	MS-V7	1	358-101296	ND	
1,1,1-Trichloroethane	< PQL	ug/L	0.5	0.13	EPA-624	01/19/05	01/19/05	15:12	MGC	MS-V7	1	358-101296	ND	
1,1,2-Trichloroethane	< PQL	ug/L	0.5	0.16	EPA-624	01/19/05	01/19/05	15:12	MGC	MS-V7	1	358-101296	ND	V11
Trichloroethene	< PQL	ug/L	0.5	0.15	EPA-624	01/19/05	01/19/05	15:12	MGC	MS-V7	1	358-101296	ND	
Trichlorofluoromethane	< PQL	ug/L	0.5	0.15	EPA-624	01/19/05	01/19/05	15:12	MGC	MS-V7	1	358-101296	ND	
1,1,2-Trichloro-1,2,2-trifluoroethane	< PQL	ug/L	0.5	0.078	EPA-624	01/19/05	01/19/05	15:12	MGC	MS-V7	1	358-101296	ND	
Vinyl chloride	< PQL	ug/L	0.5	0.17	EPA-624	01/19/05	01/19/05	15:12	MGC	MS-V7	1	358-101296	ND	
Total Xylenes	< PQL	ug/L	1	0.26	EPA-624	01/19/05	01/19/05	15:12	MGC	MS-V7	1	358-101296	ND	
Acrolein	< PQL	ug/L	50	3.3	EPA-624	01/19/05	01/19/05	15:12	MGC	MS-V7	1	351-100438	ND	V11
Acrylonitrile	< PQL	ug/L	20	0.63	EPA-624	01/19/05	01/19/05	15:12	MGC	MS-V7	1	351-100438	ND	
Methyl t-butyl ether	< PQL	ug/L	0.5	0.11	EPA-624	01/19/05	01/19/05	15:12	MGC	MS-V7	1	358-101296	ND	
Surrogate Compounds	Result	Units	Control Limits		Method	Prep Date	Run Date	Run Time	Analyst	Instrument ID	Dilution	QC Batch ID	MB Bias	Lab Quals
1,2-Dichloroethane-d4	111	%	76-114		EPA-624	01/19/05	01/19/05	15:12	MGC	MS-V7	1	358-101296		
Toluene-d8	102	%	88-110		EPA-624	01/19/05	01/19/05	15:12	MGC	MS-V7	1	358-101296		
4-Bromofluorobenzene	107	%	86-115		EPA-624	01/19/05	01/19/05	15:12	MGC	MS-V7	1	358-101296		

Flag	Explanations
V11	The Continuing Calibration Verification (CCV) recovery is not within established control limits.



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

Table with 2 columns: Left column contains COC Number, Project Number, Sampling Location, Sampling Point, Sampled By; Right column contains Receive Date/Time, Sampling Date/Time, Sample Depth, Sample Matrix, BCL Sample ID.

Main data table with 15 columns: Constituent, Result, Units, PQL, MDL, Method, Prep Date, Run Date, Run Time, Analyst, Instrument ID, Dilution, QC Batch ID, MB Bias, Lab Quats. Lists various phenols and chlorophenols.

Table with 15 columns: Surrogate Compounds, Result, Units, Control Limits, Method, Prep Date, Run Date, Run Time, Analyst, Instrument ID, Dilution, QC Batch ID, MB Bias, Lab Quats. Lists surrogate compounds like 2-Fluorophenol and Phenol-d5.

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

Sample Description		GRAB, 01/12/2005 @ 10:30											
Surrogate Compounds	Result	Units	Control Limits	Method	Prep Date	Run Date	Run Time	Analyst	Instrument ID	Dilution	QC Batch ID	MB Bias	Lab Quale
2,4,6-Tribromophenol	91	%	61-131	EPA-625	01/14/05	01/25/05	00:57	SKC	MS-B1	1.01	305-100578		
p-Terphenyl-d14	92	%	47-119	EPA-625	01/14/05	01/25/05	00:57	SKC	MS-B1	1.01	305-100578		
Perylene-d12	< PQL	%		EPA-625									

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05-00396-1



**BC Laboratories, Inc**

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

COC Number	---	Receive Date/Time	01/12/2005 @ 18:15
Project Number	---	Sampling Date/Time	01/12/2005 @ 10:30
Sampling Location	---	Sample Depth	---
Sampling Point	COMPOSITE	Sample Matrix	Water
Sampled By	---	BCL Sample ID	05-00396-2

Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date	Run Time	Analyst	Instru-ment ID	Dilution	QC Batch ID	MB Bias	Lab Quale
Acenaphthene	< PQL	ug/L	2	0.20	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Acenaphthylene	< PQL	ug/L	2	0.19	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Aldrin	< PQL	ug/L	2	0.31	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Aniline	< PQL	ug/L	5	0.61	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	v11
Anthracene	< PQL	ug/L	2	0.27	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Benzidine	< PQL	ug/L	20	0.95	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	c02
Benzo[a]anthracene	< PQL	ug/L	2	0.19	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Benzo[b]fluoranthene	< PQL	ug/L	2	0.38	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Benzo[k]fluoranthene	< PQL	ug/L	2	0.21	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Benzo[a]pyrene	< PQL	ug/L	2	0.21	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Benzo[g,h,i]perylene	< PQL	ug/L	2	0.19	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Benzoic acid	< PQL	ug/L	10	1.3	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Benzyl alcohol	< PQL	ug/L	2	0.24	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Benzyl butyl phthalate	< PQL	ug/L	2	0.25	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
alpha-BHC	< PQL	ug/L	2	0.42	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
beta-BHC	< PQL	ug/L	2	0.26	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
delta-BHC	< PQL	ug/L	2	0.24	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
gamma-BHC (Lindane)	< PQL	ug/L	2	0.24	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
bis(2-Chloroethyl) ether	< PQL	ug/L	2	0.36	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
bis(2-Chloroethoxy)methane	< PQL	ug/L	2	0.25	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
bis(2-Chloro-1-methylethyl) ether	< PQL	ug/L	2	0.19	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	v11
bis(2-Ethylhexyl)phthalate	6.6	ug/L	5	0.29	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	

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

Sample Description		COMPOSITE, 01/12/2005 @ 10:30												
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date	Run Time	Analyst	Instrument ID	Dilution	QC Batch ID	MB Bias	Lab Code
4-Bromophenyl phenyl ether	< PQL	ug/L	2	0.28	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
4-Chloroaniline	< PQL	ug/L	2	0.58	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
2-Chloronaphthalene	< PQL	ug/L	2	0.23	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
4-Chlorophenyl phenyl ether	< PQL	ug/L	2	0.24	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Chrysene	< PQL	ug/L	2	0.39	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
4,4'-DDD	< PQL	ug/L	2	0.23	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
4,4'-DDE	< PQL	ug/L	3	0.26	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
4,4'-DDT	< PQL	ug/L	2	0.22	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Dibenzo[a,h]anthracene	< PQL	ug/L	3	0.19	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Dibenzofuran	< PQL	ug/L	2	0.23	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Di-n-butyl phthalate	< PQL	ug/L	2	0.31	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
1,2-Dichlorobenzene	< PQL	ug/L	2	0.31	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
1,3-Dichlorobenzene	< PQL	ug/L	2	0.33	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
1,4-Dichlorobenzene	< PQL	ug/L	2	0.39	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
3,3-Dichlorobenzidine	< PQL	ug/L	10	0.25	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Dieldrin	< PQL	ug/L	3	0.19	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Diethyl phthalate	< PQL	ug/L	2	0.26	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Dimethyl phthalate	< PQL	ug/L	2	0.21	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
2,4-Dinitrotoluene	< PQL	ug/L	2	0.21	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
2,6-Dinitrotoluene	< PQL	ug/L	2	0.22	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Di-n-octyl phthalate	< PQL	ug/L	2	0.22	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
1,2-Diphenylhydrazine	< PQL	ug/L	2	0.22	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Endosulfan I	< PQL	ug/L	10	1.7	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Endosulfan II	< PQL	ug/L	10	0.84	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Endosulfan sulfate	< PQL	ug/L	3	0.37	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Endrin	< PQL	ug/L	2	0.34	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	V11
Endrin aldehyde	< PQL	ug/L	10	0.18	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Fluoranthene	< PQL	ug/L	2	0.28	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Fluorene	< PQL	ug/L	2	0.27	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Heptachlor	< PQL	ug/L	2	0.35	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Heptachlor epoxide	< PQL	ug/L	2	0.51	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	V11
Hexachlorobenzene	< PQL	ug/L	2	0.35	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Hexachlorobutadiene	< PQL	ug/L	2	0.35	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Hexachlorocyclopentadiene	< PQL	ug/L	2	0.30	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	

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

Sample Description		COMPOSITE, 01/12/2005 @ 10:30												
Constituent	Result	Units	PQL	MDL	Method	Prep Date	Run Date	Run Time	Analyst	Instrument ID	Dilution	QC Batch ID	MB Bias	Lab Quota
Hexachloroethane	< PQL	ug/L	2	0.43	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Indeno[1,2,3-cd]pyrene	< PQL	ug/L	2	0.24	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Isophorone	< PQL	ug/L	2	0.24	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
2-Methylnaphthalene	< PQL	ug/L	2	0.39	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Naphthalene	< PQL	ug/L	2	0.29	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
2-Naphthylamine	< PQL	ug/L	20	0.81	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	C02, V11
2-Nitroaniline	< PQL	ug/L	2	0.22	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
3-Nitroaniline	< PQL	ug/L	2	0.35	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
4-Nitroaniline	< PQL	ug/L	5	0.21	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	V11
Nitrobenzene	< PQL	ug/L	2	0.25	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
N-Nitrosodimethylamine	< PQL	ug/L	2	0.14	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	V11
N-Nitrosodiphenylamine	< PQL	ug/L	2	0.24	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
N-Nitrosodi-N-propylamine	< PQL	ug/L	2	0.20	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	V11
Phenanthrene	< PQL	ug/L	2	0.30	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Pyrene	< PQL	ug/L	2	0.20	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
1,2,4-Trichlorobenzene	< PQL	ug/L	2	0.32	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
4-Chloro-3-methylphenol	< PQL	ug/L	5	0.25	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
2-Chlorophenol	< PQL	ug/L	2	0.22	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
2,4-Dichlorophenol	< PQL	ug/L	2	0.25	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
2,4-Dimethylphenol	< PQL	ug/L	2	0.50	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
2,4-Dinitrophenol	< PQL	ug/L	10	0.18	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
2-Methyl-4,6-dinitrophenol	< PQL	ug/L	10	0.18	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
2-Methylphenol	< PQL	ug/L	2	0.20	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
3- & 4-Methylphenol	< PQL	ug/L	2	0.44	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
2-Nitrophenol	< PQL	ug/L	2	0.24	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
4-Nitrophenol	< PQL	ug/L	2	0.074	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Pentachlorophenol	< PQL	ug/L	10	0.30	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
Phenol	< PQL	ug/L	2	0.16	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
2,4,5-Trichlorophenol	< PQL	ug/L	5	0.20	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	
2,4,6-Trichlorophenol	< PQL	ug/L	5	0.24	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578	ND	

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



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

Sample Description		COMPOSITE, 01/12/2005 @ 10:30											
Surrogate Compounds	Result	Units	Control Limits	Method	Prep Date	Run Date	Run Time	Analyst	Instrument ID	Dilution	QC Batch ID	MB Bias	Lab Quats
2-Fluorophenol	59	%	34-84	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578		
Phenol-d5	59	%	22-70	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578		
Nitrobenzene-d5	100	%	63-111	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578		
2-Fluorobiphenyl	78	%	55-104	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578		
2,4,6-Tribromophenol	99	%	61-131	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578		
p-Terphenyl-d14	93	%	47-119	EPA-625	01/14/05	01/25/05	01:27	SKC	MS-B1	0.98	305-100578		

Flag	Explanations
C02	The relative standard deviation of the calibration curve response factors exceeds the control limit.
V11	The Continuing Calibration Verification (CCV) recovery is not within established control limits.

California DOHS Certification #1186

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

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05-00396-2

**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 15, 2005

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

**Laboratory No.:** A-05011105-001  
**Sample I.D.:** Morro Bay Effluent

**Sample Control:** The samples were received by ATL in a chilled state, with the chain of custody record attached.

Date Sampled: 01/10, 01/11, 01/12, 01/13/05  
Date Received: 01/11, 01/12, 01/13, 01/14/05  
Dates Tested: 01/11/05 to 01/15/05

**Sample Analysis:** The following analyses were performed on your sample:  
  
Fathead Minnow 96hr Acute Static-Renewal Toxicity Test (EPA-821-R-02-012).  
  
Attached are the test data generated from the analysis of your sample.

## Result Summary:

<u>Sample ID.</u>	<u>Results</u>
Grab Effluent	LC50 > 100% TUa = 0.76

**Quality Control:** Reviewed and approved by:

Joseph A. LeMay  
Laboratory Director

# FATHEAD MINNOW ACUTE NPDES TEST



Lab No.: A-05011105

Client/ID: MRS - Morro Bay

Start Date: 01/11/05

## RAW TEST DATA

		DAY 1		DAY 2		DAY 3		DAY 4		
		0 hr	24hr							
<b>Analyst Initials:</b>		<i>Rm</i>								
<b>Time of Readings:</b>		1130	1130	1130	1300	1300	1400	1400	1100	
Control	DO	9.2	8.1	8.9	8.2	9.3	8.2	9.4	8.3	
	pH	7.9	7.9	8.1	7.7	7.9	7.6	8.0	7.7	
	Temp	20.9	19.9	20.0	19.8	19.3	20.0	19.9	19.4	
	# Alive	Rep A	—	10	—	10	—	10	—	10
		Rep B	—	10	—	10	—	10	—	10
6.25%	DO	9.2	8.0	9.0	8.1	9.3	8.3	9.4	8.4	
	pH	7.9	7.8	8.0	7.6	7.9	7.7	7.9	7.8	
	Temp	20.9	19.8	20.0	20.0	19.3	20.0	19.9	19.3	
	# Alive	Rep A	—	10	—	10	—	10	—	10
		Rep B	—	10	—	10	—	10	—	10
12.5%	DO	9.2	8.0	9.1	8.2	9.4	8.3	9.4	8.1	
	pH	7.8	7.9	8.0	7.7	7.8	7.8	7.9	7.8	
	Temp	20.8	19.8	19.9	19.9	19.3	19.9	19.9	19.3	
	# Alive	Rep A	—	10	—	10	—	10	—	10
		Rep B	—	10	—	10	—	10	—	10
25%	DO	9.2	7.7	9.2	7.9	9.4	8.1	9.5	8.1	
	pH	7.7	8.0	7.9	7.8	7.7	7.9	7.9	7.9	
	Temp	20.6	19.8	19.9	19.9	19.4	19.9	19.9	19.3	
	# Alive	Rep A	—	10	—	10	—	10	—	10
		Rep B	—	10	—	10	—	10	—	10
50%	DO	9.2	7.5	9.2	7.9	9.4	7.7	9.5	7.4	
	pH	7.6	8.2	7.8	7.9	7.7	8.0	7.8	8.0	
	Temp	20.2	19.8	19.8	19.8	19.5	19.9	19.8	19.3	
	# Alive	Rep A	—	10	—	10	—	10	—	10
		Rep B	—	10	—	10	—	10	—	10
100%	DO	9.3	7.1	9.2	6.8	9.5	6.5	9.6	6.1	
	pH	7.5	8.3	7.7	8.0	7.6	8.1	7.7	8.1	
	Temp	19.5	19.8	19.7	19.8	19.7	19.9	20.1	19.3	
	# Alive	Rep A	—	9	—	9	—	8	—	8
		Rep B	—	10	—	10	—	10	—	8

# FATHEAD MINNOW ACUTE NPDES TEST



Lab No.: A-05011105  
 Client/ID: MRS - Morro Bay

Start Date: 01/11/05

## TEST SUMMARY

Species: *Pimephales promelas*.  
 Age: 12 (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-050104.

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)	20.9	4	2	2	2
DO (mg/l)	9.2	9.3	9.2	9.5	9.6
pH	7.9	7.5	7.7	7.6	7.7
Total Res. Chlorine (mg/l)	0	0	0.1*	0	0
Ammonia (mg/l NH <sub>3</sub> -N)	0.2	32	20	32	40
Alkalinity (mg/l CaCO <sub>3</sub> )	60	266	209	276	298
Hardness (mg/l CaCO <sub>3</sub> )	100	257	233	300	313
Conductivity (umhos)	315	1090	925	1325	1505

**Comments:**

\* Chlorine neutralized with sodium thiosulfate (one drop per liter of 10% solution).

**Acute Fish Test-96 Hr Survival**

Start Date: 11 Jan-05 11:30 Test ID: 5011105f Sample ID: CA0047881-Morro Bay SD  
 End Date: 15 Jan-05 11:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: EFF1-POTW  
 Sample Date: 10 Jan-05 00:00 Protocol: EPAA 91-EPA Acute 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	0.8000	0.8000

**Transform: Arcsin Square Root**

Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N		
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	0.8000	0.8000	1.1071	1.1071	1.1071	0.000	2	4	20

**Auxiliary Tests**

Normality of the data set cannot be confirmed  
 Equality of variance cannot be confirmed

Statistic

Critical

Skew

Kurt

$$TU_a = 0.76$$

# LABORATORY REPORT

**Date:** January 14, 2005  
**Client:** Marine Research Specialists  
3140 Telegraph Road, Suite A  
Ventura, CA 93003  
Attn: Doug Coats



*"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

**Laboratory No.:** A-05011106-001  
**Sample I.D.:** Morro Bay Effluent

**Sample Control:** The samples were received by ATL in a chilled state, with the chain of custody record attached.

Date Sampled: 01/10/05  
Date Received: 01/11/05  
Dates Tested: 01/11/05 to 01/13/05

**Sample Analysis:** The following analyses were performed on your sample:  
  
Giant Kelp Germination and Growth Short-Term Toxicity Test.  
  
Attached are the test data generated from the analysis of your sample.

## Result Summary:

<u>Sample ID.</u>	<u>Results</u>	<u>NOEC</u>	<u>TUc</u>
Comp Effluent	Kelp Germination:	18%	5.6
	Kelp Growth:	18%	5.6

**Quality Control:** Reviewed and approved by:

  
Joseph A. LeMay  
Laboratory Director

# GIANT KELP GERMINATION AND GROWTH SHORT-TERM TOXICITY TEST



Lab No.: A-05011106-001  
Client/ID: MRS Morro Bay Comp. Effluent

Date Tested: 01/11/05 - 01/13/05

## TEST SUMMARY

Species: *Macrocystis pyrifera*.

Protocol: CSWRCB.

Test type: Static.

Test chamber: 100 ml plastic petri dishes.

Temperature: 15 +/- 1°C.

Number of spores per ml: 7,500 (approx.).

QA/QC Batch No.: RT-050111 (ran concurrently).

Source: Field collected.

Dilution water: Lab seawater.

Endpoints: NOEC, IC25 at 48 hrs.

Test volume: 50 ml.

Aeration: None.

Number of replicates: 5.

## RESULTS SUMMARY

Sample Concentration	Percent Germination		Mean Germ Tube Length ( $\mu\text{m}$ )	
Control (Brine)	90.8%		14.75	
5.6%	90.8%		14.80	
10%	90.7%		14.90	
18%	91.1%		14.40	
32%	63.7%	*	10.80	*
56%	23.2%	*	7.60	*

\* Statistically significantly less than control at P = 0.05 level

## CHRONIC TOXICITY

END POINT	GERMINATION	GERM TUBE LENGTH
NOEC	18%	18%
TUc (100/NOEC)	5.56	5.56

## QA/QC TEST ACCEPTABILITY

Parameter	Result
Mean control germination $\geq 70\%$	Yes (90.8%)
Mean control germination tube length $> 10 \mu\text{m}$	Yes (14.75 $\mu\text{m}$ )
Please see RT-050111 report for additional test acceptability criteria.	

**Macrocyctis Germination and Growth Test-Proportion Germinated**

Start Date: 11 Jan-05 16:00 Test ID: 5011106k Sample ID: CA0047881-Momo Bay SD  
 End Date: 13 Jan-05 16:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: EFF1-POTW  
 Sample Date: 10 Jan-05 00:00 Protocol: MBP 90 Test Species: MP-Macrocyctis pyrifera  
 Comments:

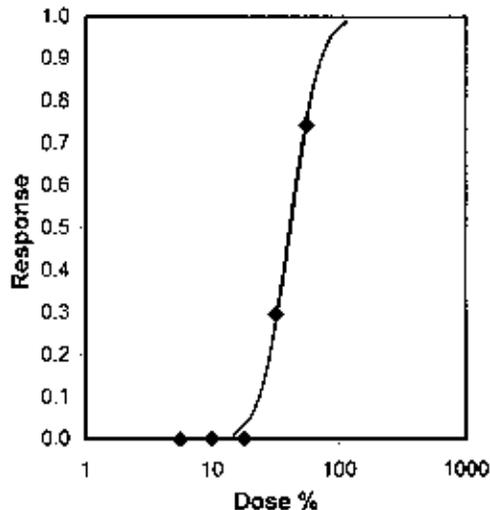
Conc-%	1	2	3	4	5
B-Control	0.9245	0.9307	0.8835	0.9109	0.8911
D-Control	0.9065	0.8529	0.9307	0.8929	0.9065
5.6	0.9223	0.8911	0.9307	0.8932	0.9029
10	0.9020	0.9223	0.9115	0.8783	0.9216
18	0.9029	0.9307	0.8911	0.9216	0.9109
32	0.5098	0.7264	0.7736	0.7037	0.4717
56	0.2453	0.1802	0.3364	0.2661	0.1346

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					Rank Sum	1-Tailed Critical	Number Resp	Total Number
			Mean	Min	Max	CV%	N				
B-Control	0.9081	1.0114	1.2543	1.2225	1.3044	2.811	5			47	512
D-Control	0.8979	1.0000	1.2478	1.1772	1.3044	3.715	5				
5.6	0.9080	1.0113	1.2638	1.2345	1.3044	2.464	5	28.00	16.00	47	511
10	0.9071	1.0103	1.2622	1.2144	1.2884	2.417	5	26.00	16.00	50	535
18	0.9114	1.0151	1.2695	1.2345	1.3044	2.155	5	28.50	16.00	45	508
*32	0.6370	0.7095	0.9285	0.7571	1.0749	15.370	5	15.00	16.00	191	528
*56	0.2325	0.2590	0.4986	0.3757	0.6188	18.879	5	15.00	16.00	412	537

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution ( $p > 0.01$ )	0.95701	0.9	-0.4193	1.13768
Bartlett's Test indicates unequal variances ( $p = 1.91E-03$ )	19.0169	15.0863		
The control means are not significantly different ( $p = 0.55$ )	0.63023	2.30601		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	18	32	24	5.55556

Parameter	Value	SE	95% Fiducial Limits		Maximum Likelihood-Probit						
			Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter		
Slope	5.25629	0.34201	4.58595	5.92663	0.0918	4.7035	11.3449	0.19	1.61731	0.19025	5
Intercept	-3.501	0.55666	-4.5921	-2.41							
TSCR	0.08745	0.00688	0.07398	0.10093							
Point	Probits	%	95% Fiducial Limits								
EC01	2.674	14.9529	12.731	16.9577							
EC05	3.355	20.1548	17.8866	22.146							
EC10	3.718	23.6318	21.4247	25.5522							
EC15	3.964	26.3105	24.1857	28.1574							
EC20	4.158	28.6545	26.618	30.4318							
EC25	4.326	30.8311	28.8831	32.5464							
EC40	4.747	37.0775	35.347	38.698							
EC50	5.000	41.4295	39.7333	43.1397							
EC60	5.253	46.2922	44.4493	48.3235							
EC75	5.674	55.6711	53.0484	58.9174							
EC80	5.842	59.8999	58.7805	63.8793							
EC85	6.036	65.2362	61.4071	70.2575							
EC90	6.282	72.631	67.7043	79.2689							
EC95	6.645	85.1608	78.1543	94.9046							
EC99	7.326	114.787	102.109	133.282							



**Macrocyctis Germination and Growth Test-Growth-Length**

Start Date: 11 Jan-05 16:00 Test ID: 5011106k Sample ID: CA0047881-Morro Bay SD  
 End Date: 13 Jan-05 16:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: EFF1-POTW  
 Sample Date: 10 Jan-05 00:00 Protocol: MBP 90 Test Species: MP-Macrocyctis pyrifera  
 Comments:

Conc-%	1	2	3	4	5
B-Control	14.500	14.500	15.000	14.500	15.250
D-Control	15.250	14.500	14.750	14.750	14.500
5.6	14.750	15.000	15.500	14.750	14.000
10	14.750	15.250	14.750	14.500	15.250
18	14.250	14.250	14.250	14.750	14.500
32	12.500	11.250	11.000	10.250	9.000
56	8.000	7.250	9.000	7.500	6.250

Conc-%	Mean	N-Mean	Transform: Untransformed					Rank Sum	1-Tailed Critical	Isotonic	
			Mean	Min	Max	CV%	N			Mean	N-Mean
B-Control	14.750	1.0000	14.750	14.500	15.250	2.397	5			14.817	1.0000
D-Control	14.750	1.0000	14.750	14.500	15.250	2.076	5				
5.6	14.800	1.0034	14.800	14.000	15.500	3.662	5	29.50	16.00	14.817	1.0000
10	14.900	1.0102	14.900	14.500	15.250	2.251	5	31.50	16.00	14.817	1.0000
18	14.400	0.9763	14.400	14.250	14.750	1.553	5	19.50	16.00	14.400	0.9719
*32	10.800	0.7322	10.800	9.000	12.500	11.961	5	15.00	16.00	10.800	0.7289
*56	7.600	0.5153	7.600	6.250	9.000	13.281	5	15.00	16.00	7.600	0.5129

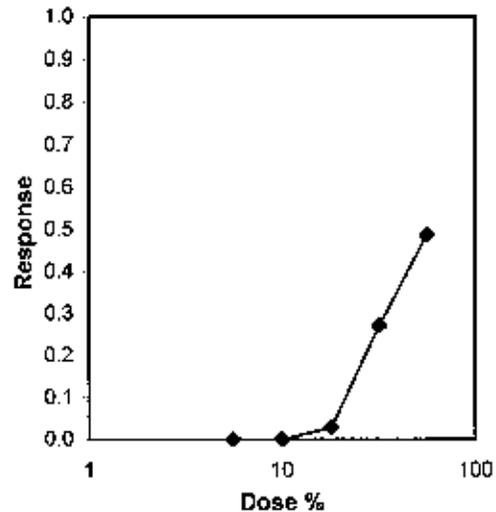
**Auxiliary Tests**

	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution ( $p > 0.01$ )	0.93067	0.9	-0.0856	2.29497
Bartlett's Test indicates unequal variances ( $p = 7.71E-03$ )	15.7133	15.0863		
The control means are not significantly different ( $p = 1.00$ )	0	2.30601		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	18	32	24	5.55556

**Linear Interpolation (80 Resamples)**

Point	%	SE	95% CL(Exp)		Skew
IC05	19.261	0.583	17.851	20.874	0.3369
IC10	22.142	0.823	20.614	24.867	0.8840
IC15	25.023	1.161	22.998	29.234	1.0588
IC20	27.904	1.524	25.186	33.525	1.0623
IC25	30.785	1.963	27.125	37.524	0.9170
IC40	46.325	2.211	40.959	51.642	0.2961
IC50	>56				



SHORT-TERM TOXICITY TEST



Lab No.: A-05011106

TEST DATA

Petri Dish No.	Test Sample Conc.	Total Number Counted	Number of Germin.	Number Non-Germin.	Germ Tube Lengths (micrometer units)									
					1	2	3	4	5	6	7	8	9	10
1	A	102	92	10	6	5	7	7	6	6	4	7	6	5
2	B	106	98	8	6	7	4	5	7	6	5	5	7	6
3	C-6	101	90	11	6	6	5	7	6	5	7	5	6	7
4	32	102	52	50	5	4	4	7	6	5	4	4	5	6
5	18	101	90	11	7	6	6	5	7	6	5	4	4	7
6	56	107	36	71	4	3	3	5	4	3	5	4	3	2
7	B	101	94	7	5	6	7	7	6	6	5	4	6	6
8	10	103	95	8	7	6	5	6	6	7	6	5	7	6
9	C-6	101	94	7	6	7	5	7	7	6	5	7	6	6
10	18	102	94	8	6	7	7	6	6	6	5	4	6	6
11	32	106	77	29	4	4	7	7	4	3	3	4	5	4
12	56	109	29	80	2	3	2	2	5	3	4	4	3	2
13	10	113	103	10	6	5	6	7	6	6	7	5	4	7
14	18	101	92	9	7	6	6	5	5	7	6	6	4	6
15	C-6	103	92	11	7	6	5	7	6	5	5	6	6	4
16	32	106	82	24	4	5	4	6	6	4	4	3	3	5
17	B	103	91	12	6	7	6	5	5	6	7	5	6	7
18	56	104	14	90	3	2	2	2	4	2	3	3	2	2
19	10	115	101	14	6	7	6	6	6	5	7	4	4	7
20	C-6	103	93	10	4	7	7	4	6	5	6	6	5	6

Comments:

Micrometer conversion factor: 1 unit = 2.5  $\mu$ m at 400X power.

Analyst: [Signature]

Date: 1-13-05

GIANT KELP GERMINATION AND GROWTH  
SHORT-TERM TOXICITY TEST



Lab No.: A0501106

TEST DATA

Petri Dish No.	Test Sample Conc.	Total Number Counted	Number of Germin.	Number Non-Germin.	Germ Tube Lengths (micrometer units)									
					1	2	3	4	5	6	7	8	9	10
21	32	108	76	32	7	4	4	4	3	4	6	4	3	2
22	18	103	93	10	6	5	5	7	6	6	6	5	4	7
23	13	101	92	9	5	6	6	5	6	6	7	7	4	6
24	56	106	26	80	1	3	2	4	5	2	4	3	3	2
25	B	101	90	11	7	6	6	7	7	5	6	4	7	6
26	56	103	95	8	6	6	7	7	7	4	5	4	7	6
27	32	106	50	56	4	3	4	5	5	3	3	4	2	3
28	10	102	94	8	6	7	7	5	6	6	6	7	5	4
29	18	101	94	7	5	6	5	5	6	6	5	7	6	6
30	56	111	20	91	3	3	3	2	4	3	3	2	4	2
31														
32														
33														
34														
35														
36														
37														
38														
39														
40														

Comments:

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

Analyst: [Signature]

Date: 1-13-05

**GIANT KELP GERMINATION AND GROWTH  
SHORT-TERM TOXICITY TEST**



Lab No.: A-05/1106

**PHYSICAL/CHEMICAL MEASUREMENTS**

Nominal Concentration	Initial				Final			
	Temp. (°C)	DO (mg/l)	pH	Salinity (o/oo)	Temp. (°C)	DO (mg/l)	pH	Salinity (o/oo)
Control	15.7	7.6	8.1	34	15.0	7.5	8.1	34
Brine Control	15.0	7.6	8.1	3.1	15.8	7.4	8.1	3.1
5.6%	15.4	7.7	8.1	34	15.6	7.4	8.1	34
10%	14.9	7.5	8.1	34	15.5	7.5	8.1	34
18%	15.5	7.5	8.1	34	15.7	7.5	8.1	3.1
32%	15.4	7.4	8.0	34	15.7	7.4	8.1	3.1
56%	15.0	7.1	8.0	34	15.8	7.2	8.1	3.4

**COMMENTS:**

Brine control contains equivalent amount of brine as highest effluent conc.

Test initiation:

Analyst: [Signature]

Date/Time: 1-11-05 1600

Final test readings:

Analyst: [Signature]

Date/Time: 1-13-05 1600

**QA/QC REPORTS & CHAINS OF CUSTODY**



**BC Laboratories, Inc**

B C LABORATORIES  
QUALITY CONTROL REPORT  
(Precision & Accuracy)

MARINE RESEARCH SPECIALISTS  
3140 TELEGRAPH ROAD  
SUITE A  
VENTURA, CA 93003-3238  
DOUG COATS

Date of Report: 01/31/2005  
Sample Matrix: Water  
QC Batch ID: 200500396-1\*WATER

Samples Affected: 05-00396-1

Constituents	QC Sample ID	Sample Result	Sample Duplicate	MS Result	MSD Result	MS Spike Level	MSD Spike Level	Units	Sample R.P.D.	Spike R.P.D.	Precision Control Limits	MS % Rec	MSD % Rec	Accuracy Control Limits
Ammonia as N (Distilled)	DIST-00396-1-X	15.53	14.89	17.45	18.73	4.000	4.000	mg/L	4.	7.	20	40.	80.	80 - 120

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

The matrix spike recovery for Ammonia as N (Distilled) is outside QC limits.

Quality Control Officer

Authorized Signature



**BC Laboratories, Inc**

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

MARINE RESEARCH SPECIALISTS  
3140 TELEGRAPH ROAD  
SUITE A  
VENTURA, CA 93003-3238  
DOUG COATS

Date of Report: 01/31/2005  
Sample Matrix: Water  
QC Batch ID: 200500396-1\*WATER

Samples Affected: 05-00396-1

Constituents	ICV	ICV % Found	CCV	CCV % Found	CCB	CCB Readings	Units	CCB	CCB Readings	Units	Method	Units
	% Found	Control Limits	% Found	Control Before	% Found	Control After		% Found	Control Before		% Found	
Ammonia as N (Distilled)	104.	80 - 120	101.	106.	85 - 115	< 0.02	mg/L	< 0.02	mg/L	< 5.	mg/L	

ICV = Initial Calibration Verification; CCV = Continuing Calibration Verification; CCB = Continuing Calibration Blank

Quality Control Officer

Authorized Signature



BC Laboratories, Inc

B C LABORATORIES  
QUALITY CONTROL REPORT  
(Precision & Accuracy)

MARINE RESEARCH SPECIALISTS  
3140 TELEGRAPH ROAD  
SUITE A  
VENTURA, CA 93003-3238  
DOUG COATS

Date of Report: 01/31/2005  
Sample Matrix: Water  
QC Batch ID: 200500396-2\*WATER

Samples Affected: 05-00396-2

Constituents	QC Sample ID	Sample Result	Sample Duplicate	MS Result	MSD Result	MS Spike Level	MSD Spike Level	Units	Sample R.P.D.	Spike R.P.D.	Precision Control Limits	MS % Rec	MSD % Rec	Accuracy Control Limits
Total Cyanide	W-TOTAL-00396-	0.02166	0.02166	0.2643	0.2676	0.2500	0.2500	mg/L	<PQL	1.	20	97.	98.	90 - 110

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

Quality Control Officer

Authorized Signature



BC Laboratories, Inc

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

MARINE RESEARCH SPECIALISTS  
3140 TELEGRAPH ROAD  
SUITE A  
VENTURA, CA 93003-3238  
DOUG COATS

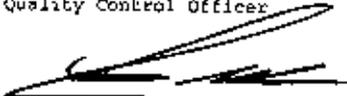
Date of Report: 01/31/2005  
Sample Matrix: Water  
QC Batch ID: 200500396.2\*WATER

Samples Affected: 05-00396-2

Constituents	ICV	ICV % Found	CCV	CCV % Found	CCB	CCB		Method			
	% Found	Control Limits	% Found Before	% Found After	Readings Before	Readings After	Units	Blank Readings	Units		
Total Cyanide	99.	90 - 110	99.	102.	< 0.005		mg/L	< 0.005	mg/L	< 0.02	mg/L

ICV = Initial Calibration Verification; CCV = Continuing Calibration Verification; CCB = Continuing Calibration Blank

Quality Control Officer

  
Authorized Signature



BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Precision & Accuracy)

MARINE RESEARCH SPECIALISTS
3140 TELEGRAPH ROAD
SUITE A
VENTURA, CA 93003-3238
DOUG COATS

Date of Report: 02/04/2005
Sample Matrix: Water
QC Batch ID: 200500396-2\*METALS

Sample Affected: 05-00396-2

Table with 15 columns: Constituent, QC Sample ID, Sample Result, Sample Duplicate, MS Result, MSD Result, MS Spike Level, MSD Spike Level, Units, Sample R.P.D., Spike R.P.D., Precision Control Limits, MS % Rec, MSD % Rec, Accuracy Control Limits. Rows include Total Antimony, Beryllium, Cadmium, Chromium, Copper, Mercury, Nickel, Silver, Zinc, Recoverable Arsenic, Lead, Selenium, and Thallium.

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

Quality Control Officer

Authorized Signature



BC Laboratories, Inc

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

MARINE RESEARCH SPECIALISTS
3140 TELEGRAPH ROAD
SUITE A
VENTURA, CA 93003-3236
DOUG COATS

Date of Report: 02/04/2005
Sample Matrix: Water
QC Batch ID: 200500396-2\*METALS

Samples Affected: 05-00396-2

Table with 12 columns: Constituents, ICV % Found, ICV Control Limits, CCV % Found Before, CCV % Found After, % Found Control Limits, CCB Readings Before, CCB Readings After, Units, Method Blank Readings, Units. Rows include Total Antimony, Beryllium, Cadmium, Chromium, Copper, Mercury, Nickel, Silver, Zinc, Recoverable Arsenic, Recoverable Lead, Recoverable Selenium, and Recoverable Thallium.

ICV = Initial Calibration Verification; CCV = Continuing Calibration Verification; CCB = Continuing Calibration Blank

Quality Control Officer

Authorized Signature



BC Laboratories, Inc

B C LABORATORIES  
QUALITY CONTROL REPORT  
(Precision & Accuracy)  
Method 608

MARINE RESEARCH SPECIALISTS  
3140 TELEGRAPH ROAD  
SUITE A  
VENTURA, CA 93003-3238  
DOUG COATS

Date of Report: 01/31/2005  
Sample Matrix: Water  
QC Batch ID: 200500396-2\*608

Samples Affected: 05-00396-2

Constituents	QC Sample ID	Sample Result	MS Result	MSD Result	MS Spike Level	MSD Spike Level	Units	Spike R.P.D.	Precision		Accuracy	
									Control Limits	% Rec	MSD % Rec	Control Limits
Aldrin	OPW	< 0.005	0.195	0.178	0.250	0.250	µg/L	9.	26	78.	71.	44 - 155
gamma-BHC	OPW	< 0.005	0.215	0.199	0.250	0.250	µg/L	8.	23	86.	79.	22 - 152
4,4'-DDT	OPW	< 0.005	0.241	0.211	0.250	0.250	µg/L	13.	26	96.	84.	30 - 170
Dieldrin	OPW	< 0.005	0.250	0.231	0.250	0.250	µg/L	8.	25	100.	92.	47 - 167
Endrin	OPW	< 0.005	0.271	0.244	0.250	0.250	µg/L	11.	26	109.	98.	46 - 175
Heptachlor	OPW	< 0.005	0.253	0.243	0.250	0.250	µg/L	4.	25	101.	97.	28 - 156

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

Quality Control Officer

Authorized Signature



**BC Laboratories, Inc**

**B C LABORATORIES  
QUALITY CONTROL REPORT  
(Instrumental & Blank Parameters)  
Method 608**

MARINE RESEARCH SPECIALISTS  
3140 TELEGRAPH ROAD  
SUITE A  
VENTURA, CA 93003-3238  
DOUG COATS

Date of Report: 01/31/2005  
Sample Matrix: Water  
QC Batch ID: 200500396-2\*608

Samples Affected: 05-00396-2

Constituents	Method Blank Readings	Units
Aldrin	< 0.005	µg/L
alpha-BHC	< 0.005	µg/L
beta-BHC	< 0.005	µg/L
delta-BHC	< 0.005	µg/L
gamma-BHC	< 0.005	µg/L
Chlordane	< 1.	µg/L
4,4'-DDD	< 0.005	µg/L
4,4'-DDE	< 0.005	µg/L
4,4'-DDT	< 0.005	µg/L
Dieldrin	< 0.005	µg/L
Endosulfan I	< 0.005	µg/L
Endosulfan II	< 0.005	µg/L
Endosulfan Sulfate	< 0.005	µg/L
Endrin	< 0.005	µg/L
Endrin Aldehyde	< 0.005	µg/L
Heptachlor	< 0.005	µg/L
Heptachlor Epoxide	< 0.005	µg/L
Methoxychlor	< 0.01	µg/L
Toxaphene	< 2.	µg/L
PCB-1016	< 0.2	µg/L
PCB-1221	< 0.2	µg/L
PCB-1232	< 0.2	µg/L
PCB-1242	< 0.2	µg/L
PCB-1248	< 0.2	µg/L
PCB-1254	< 0.2	µg/L
PCB-1260	< 0.2	µg/L
Total PCB's (Summation)	< 0.2	µg/L



B C LABORATORIES  
QUALITY CONTROL REPORT  
(Instrumental & Blank Parameters)  
Method 608

MARINE RESEARCH SPECIALISTS  
3140 TELEGRAPH ROAD  
SUITE A  
VENTURA, CA 93003-3238  
DOUG COATS

Date of Report: 01/31/2005  
Sample Matrix: Water  
QC Batch ID: 200500396-2\*608

Samples Affected: 05-00396-2

Quality Control Officer

Authorized Signature



BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 624

MARINE RESEARCH SPECIALISTS
3140 TELEGRAPH ROAD
SUITE A
VENTURA, CA 93003-3238
DOUG COATS

Date of Report: 01/30/2005
Sample Matrix: Water
QC Batch ID: 200500396-2\*624

Sample Affected: 05-00396-2

Table with 12 columns: Constituent, ICV % Found, ICV Control Limits, CCV % Found Before, CCV % Found After, % Found Control Limits, CCB Readings Before, CCB Readings After, Units, Method Blank Readings, Units. Rows include Benzene, Bromodichloromethane, Bromoform, Bromomethane, Carbon tetrachloride, Chlorobenzene, Chloroethane, Chloroform, Chloromethane, Dibromochloromethane, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,1-Dichloroethane, 1,2-Dichloroethane, 1,1-Dichloroethene, trans-1,2-Dichloroethene, 1,2-Dichloropropane, cis-1,3-Dichloropropene, trans-1,3-Dichloropropene, Ethyl benzene, Methylene Chloride, 1,1,2,2-Tetrachloroethane, Tetrachloroethene, Toluene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethene, Trichlorofluoromethane.



BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Instrumental & Blank Parameters)
Method 624

MARINE RESEARCH SPECIALISTS
3140 TELEGRAPH ROAD
SUITE A
VENTURA, CA 93003-3238
DOUG COATS

Date of Report: 01/30/2005
Sample Matrix: Water
QC Batch ID: 200500396-2\*624

Samples Affected: 05-00396-2

Table with 12 columns: Constituents, ICV Found, ICV Control Limits, CCV % Found Before, CCV % Found After, CCV Control Limits, CCB Readings Before, CCB Readings After, CCB Units, Method Blank Readings, Method Blank Units. Rows include 1,1,2-Trichloro-1,2,2-trifluoroethane, Vinyl Chloride, Xylenes, Acrolein, Acrylonitrile, and Methyl-t-butylether.

ICV = Initial Calibration Verification; CCV = Continuing Calibration Verification; CCB = Continuing Calibration Blank

The CCV's recoveries for Bromodichloromethane, Chloromethane and Acrolein are outside QC limits.

Quality Control Officer

Handwritten signature
Authorized Signature



BC Laboratories, Inc

B C LABORATORIES
QUALITY CONTROL REPORT
(Precision & Accuracy)
Method 624

MARINE RESEARCH SPECIALISTS
3140 TELEGRAPH ROAD
SUITE A
VENTURA, CA 93003-3238
DOUG COATS

Date of Report: 01/30/2005
Sample Matrix: Water
QC Batch ID: 200500396-2\*624

Samples Affected: 05-00396-2

Table with 13 columns: Constituent, QC Sample ID, Sample Result, MS Result, MSD Result, MS Spike Level, MSD Spike Level, Units, Spike R.P.D., Precision Control Limits, MS Rec, MSD Rec, Accuracy Control Limits. Rows list various chemical compounds like Benzene, Bromodichloromethane, etc.



BC Laboratories, Inc

B C LABORATORIES  
QUALITY CONTROL REPORT  
(Precision & Accuracy)  
Method 624

MARINE RESEARCH SPECIALISTS  
3140 TELEGRAPH ROAD  
SUITE A  
VENTURA, CA 93003-3238  
DOUG COATS

Date of Report: 01/30/2005  
Sample Matrix: Water  
QC Batch ID: 200500396-2\*624

Samples Affected: 05-00396-2

Constituents	QC Sample ID	Sample Result	MS Result	MSD Result	MS Spike Level	MSD Spike Level	Units	Spike R.P.D.	Precision Control Limits	MS % Rec	MSD % Rec	Accuracy Control Limits
1,1,2-Trichloro- 1,2,2-trifluoroethane	00396-2-B1	< 0.5	26.52	25.20	25.00	25.00	µg/L	5.	20	106.	101.	70 - 130
Vinyl Chloride	00396-2-B1	< 0.5	21.28	22.43	25.00	25.00	µg/L	5.	20	85.	90.	70 - 130
Xylenes	00396-2-B1	< 1.	85.75	75.75	75.00	75.00	µg/L	12.	20	114.	101.	70 - 130
Methyl-t-butylether	00396-2-B1	< 0.5	26.44	24.55	25.00	25.00	µg/L	7.	20	105.	90.	70 - 130

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

Quality Control Officer

Authorized Signature



BC Laboratories, Inc

B C LABORATORIES  
QUALITY CONTROL REPORT  
(Precision & Accuracy)  
Method 625

MARINE RESEARCH SPECIALISTS  
3140 TELEGRAPH ROAD  
SUITE A  
VENTURA, CA 93003-3238  
DOUG COATS

Date of Report: 01/30/2005  
Sample Matrix: Water  
QC Batch ID: 200500396-1+625

Samples Affected: 05-DD396-1, 05-00396-2

Constituents	QC Sample ID	Sample Result	MS Result	MSD Result	MS Spike Level	MSD Spike Level	Units	Spike R.P.D.	Precision		Accuracy	
									Control Limits	% Rec	MSD % Rec	Control Limits
4-Chloro-3-methylphenol	SD11-PB1-01-14	< 5.	67.06	65.63	80.00	80.00	µg/L	2.	20	84.	82.	51 - 129
2-Chlorophenol	SD11-PB1-01-14	< 2.	58.91	57.76	80.00	80.00	µg/L	2.	22	74.	72.	45 - 116
2-Methylphenol	SD11-PB1-01-14	< 2.	59.11	58.34	80.00	80.00	µg/L	1.	20	74.	73.	47 - 118
3,4-Methylphenol	SD11-PB1-01-14	< 2.	62.05	61.39	80.00	80.00	µg/L	1.	24	76.	77.	44 - 106
4-Nitrophenol	SD11-PB1-01-14	< 2.	39.51	41.21	80.00	80.00	µg/L	4.	23	49.	52.	14 - 81
Pentachlorophenol	SD11-PB1-01-14	< 10.	75.60	75.57	80.00	80.00	µg/L	0.	26	95.	94.	37 - 161
Phenol	SD11-PB1-01-14	< 2.	33.82	33.07	80.00	80.00	µg/L	2.	24	42.	41.	20 - 70
2,4,6-Trichlorophenol	SD11-PB1-01-14	< 5.	60.45	60.62	80.00	80.00	µg/L	0.	23	76.	76.	48 - 139

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

Quality Control Officer

Authorized Signature



BC Laboratories, Inc

B C LABORATORIES  
QUALITY CONTROL REPORT  
(Instrumental & Blank Parameters)  
Method 625

MARINE RESEARCH SPECIALISTS  
3140 TELEGRAPH ROAD  
SUITE A  
VENTURA, CA 93003-3238  
DOUG COATS

Date of Report: 01/30/2005  
Sample Matrix: Water  
QC Batch ID: 200500396-1\*625

Samples Affected: 05-00396-1, 05-00396-2

Constituents	Method Blank Readings	Units
4-Chloro-3-methylphenol	< 5.	µg/L
2-Chlorophenol	< 2.	µg/L
2,4-Dichlorophenol	< 2.	µg/L
2,4-Dimethylphenol	< 2.	µg/L
2,4-Dinitrophenol	<10.	µg/L
2-Methyl-4,6-dinitrophenol	<10.	µg/L
2-Methylphenol	< 2.	µg/L
4-Methylphenol	< 2.	µg/L
2-Nitrophenol	< 2.	µg/L
4-Nitrophenol	< 2.	µg/L
Pentachlorophenol	<10.	µg/L
Phenol	< 2.	µg/L
2,4,5-Trichlorophenol	< 5.	µg/L
2,4,6-Trichlorophenol	< 5.	µg/L

Quality Control Officer

Authorized Signature



***CHAIN  
OF  
CUSTODY***

BC

Laboratories, Inc

**Cover Report**

MARINE RESEARCH SPECIALISTS

3140 TELEGRAPH ROAD

SUITE A

VENTURA, CA 93003-3238

Attn: DOUG COATS

Project Number:

COC Number:

BCL Number: 05-00396

Dear Mr. Coats:

This report contains the analytical results for the samples received under chain of custody by BC Laboratories, Inc. The samples were logged into the Laboratory Information Management System (LIMS) and BC Lab numbers were assigned to each sample. The result of the temperature check, condition of the samples and any other discrepancies were recorded on the cooler receipt form.

All applicable quality control procedures met method-specific acceptance criteria, except as noted on the following analytical and quality control reports.

This report shall not be reproduced except in full, without written approval of the laboratory.

California DOHS Certification #1186



Authorized Signature

4100 Atlas Court  
 Bakersfield, CA 93308  
 (881) 327-4811 · FAX  
 (881) 327-1918

# BC LABORATORIES, INC.

# CHAIN OF CUSTODY

Bill To: **Report To:** **05-00398**

<b>MARINE RESEARCH SPEC.</b>		<b>Consultant Firm: MARINE RESEARCH SPEC.</b>		<b>ANALYSIS REQUESTED</b>					Turn Around Time Requested	Number and Container Type
ADDRESS: 3839 E. HARBOR #208 CITY: VENTURA		3839 E. HARBOR #208, VENTURA, CA 93001-4277 Attn: DOUG COATS								
STATE: CA ZIP: 93001-4277		Site #: MBWWTP-SEMI-ANNUAL-EFF.								
PROG. MGR: DOUG COATS		SAMPLER NAME:								

Seq#	Sample Description	Date Sampled	Time Sampled	Matrix	AMMONIA	TOTAL NH <sub>3</sub> -CALCULATED (625)	TOTAL CHLORIDE (625)	AS, AS <sub>2</sub> O <sub>3</sub> , SO <sub>2</sub> , SO <sub>3</sub> , CO, CR, ZN, BS	M, ME, TL, ZN	CYANIDE	EPA 909 & EPA 825	624+ AGRICULTURAL CONTAMINANTS
1	-1 GRAB	1-12-05	1030	WATER	X	X	X					
2	-2 COMPOSITE	1-12-05	1030	WATER				X	X	X	X	X
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

CHK BY	DISTRIBUTION
SIC	<input checked="" type="checkbox"/> COMPLETE
	SUB-OUT <input type="checkbox"/>

Comments: FAX RESULTS TO DOUG COATS @ (805) 644-1189

Relinquished by: (Signature) <i>Steven R. Archibald</i>	Received by: <i>Jayman</i> Date & Time 1-12-05 1830
Relinquished by: (Signature) <i>Jayman</i>	Received by: <i>Christina Vold</i> Date & Time 1-12-05 1815
Relinquished by: (Signature)	Received by: Date & Time

Submission #: 05-0039A Project Code:                     

TB Batch #                     

SHIPPING INFORMATION

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

SHIPPING CONTAINER

Ice Chest  None   
 Box  Other  (Specify)                     

Refrigerant: Ice  Blue Ice  None  Other  Comments:                     

Custody Seals: Ice Chest  Containers  None  Comments:                     

Intact? Yes  No  Intact? Yes  No

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

COC Received  
 YES  NO

Ice Chest ID                       
 Temperature: 2.6 °C  
 Thermometer ID: TH100

Emissivity 0.95  
 Container PTPE

Date/Time 1-12-05  
 1812  
 Analyst Init CV

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		E								
PT CYANIDE		D								
PT NITROGEN FORMS	C									
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
100ml TOTAL ORGANIC CARBON										
QT TOX										
PT CHEMICAL OXYGEN DEMAND										
PIA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK			A							
40ml VOA VIAL		F13								
QT EPA 413.1, 413.2, 413.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL, 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
100ml EPA 547										
100ml EPA 531.1										
QT EPA 548										
QT EPA 609 608		C								
QT EPA 609 625	A, B	A, B								
QT EPA 8015M										
QT QA/QC										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										

Comments:                       
 Sample Numbering Completed By: OTO

Date/Time: 1/13/05 1100

05-00396

**Analyses of Effluent Samples to be collected from the Morro Bay  
Wastewater Treatment Plant in January 2005**

<b>Analysis</b>	<b>Sample</b>	<b>Method</b>
Level IIA QC		
Ammonia as N w/ distillation	Grab	EPA-350.1
Total Chlorinated and Total Non-Chlorinated Phenolic Compounds (totals only)	Grab	EPA-625
<b>13 Metals:</b>		
Ag Silver	Composite	EPA 6010
As Arsenic	Composite	EPA 7060
Be Berilium	Composite	EPA 6010
Cd Cadmium	Composite	EPA 6010
Cr Chromium	Composite	EPA 6010
Cu Copper	Composite	EPA 6010
Hg Mercury	Composite	EPA 7470
Ni Nickel	Composite	EPA 6010
Pb Lead	Composite	EPA 7421
Sb Antimony	Composite	EPA 6010
Se Selenium	Composite	EPA 7740
Tl Thalium	Composite	EPA 7841
Zn Zinc	Composite	EPA 6010
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

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

# 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



**Aquatic  
Testing  
Laboratories**

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

Purchase Order No:

Sample ID	Sample Date	Sample Time	Sample Type *	Number of Containers	Testing Requested
Grab Eff. ARS	1-10-05	0815	E	1 (one gallon)	FHM Acute daily renewal

Special Instructions:

\* 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)
<i>Bruce Keogh</i>	<i>Paula E...</i>	1-10-05	1445	—	—
<i>Paula E...</i>	<i>J...</i>	1-11-05	1000	NA	4°C

# CHAIN OF CUSTODY

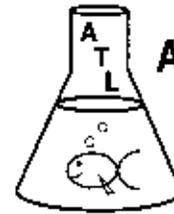
Client: City of Morro Bay  
 Address: Wastewater Treatment Plant  
160 Atascadero Road  
Morro Bay, CA 93442

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 *	Number of Containers	Testing Requested
Grab Eff. ARS	1-11-05	0820	E	1 (one gallon)	FHM Acute daily renewal
Special Instructions:					

\* 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)
<i>Bruce Keogh</i>	<i>Fel Ex</i>	1/11/05	1615	—	—
<i>Fel Ex</i>	<i>JLM</i>	1/12/05	0950	NA	20

# CHAIN OF CUSTODY

Client: City of Morro Bay

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



**Aquatic  
Testing  
Laboratories**

Project Manager: Doug Coats - MRS

Phone: (805) 644-1180

Fax: (805) 289-3935

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

Purchase Order No:

Sample ID	Sample Date	Sample Time	Sample Type *	Number of Containers	Testing Requested
Grab Eff. ARS	1-12-05	0830	E	1 (one gallon)	FHM Acute daily renewal

Special Instructions:

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

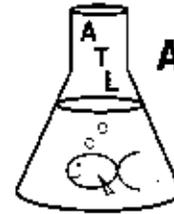
## CUSTODY TRANSFERS

Relinquished by (signature)	Received by (signature)	Date (mm/dd/yy)	Time (hh:mm)	Seals Intact? (Yes, No, NA)	Temperature Received (°C)
<i>Bruce Keogh</i>	<i>[Signature]</i>	1-12-05	1845	—	—
<i>EA #2</i>	<i>[Signature]</i>	1-13-05	0945	NA	2°C

# CHAIN OF CUSTODY

Client: City of Morro Bay

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



**Aquatic  
Testing  
Laboratories**

Project Manager: Doug Coats - MRS

Phone: (805) 644-1180

Fax: (805) 289-3935

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

Purchase Order No:

Sample ID	Sample Date	Sample Time	Sample Type *	Number of Containers	Testing Requested
Grab Eff. ARS	1/13/05	8:15	E	1 (one gallon)	FHM Acute daily renewal

Special Instructions:

\* 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)
<i>Bruce Keefe</i>	<i>Fel Ber</i>	1/13/05	14:30	—	—
<i>Fel Ber</i>	<i>[Signature]</i>	1-14-05	10:10	NA	29

# CHAIN OF CUSTODY

Client: City of Morro Bay

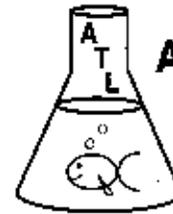
Address: 160 Atascadero rd.  
Morro Bay, Ca. 93442

Project Manager: Doug Coats

Phone: 772-6273

Fax: \_\_\_\_\_

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 *	Number of Containers	Testing Requested	Remarks
COMP Eff P <sub>12</sub>	10 Jan 05	10:30	L	1	Chronic Toxicity	

Special Instructions: \_\_\_\_\_

\* 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. Aschenberg	-	10 Jan 05	-	-	-
Bruce Keogh	Fred B...	1-10-05	1045	-	-
Fred B...	[Signature]	1-11-05	1000	ML	4°C



***REFERENCE  
TOXICANT  
DATA***

FATHEAD MINNOW ACUTE REFERENCE TOXICANT TEST

QA/QC Batch No.: RT050104

TEST SUMMARY

Species: Pimephales promelas.  
 Test type: Static, renewal at 48hr.  
 Test chamber volume: 250 ml.  
 Test chamber: 600 ml beakers.  
 Number of replicates: 2.  
 Photoperiod: 16/8 hrs light/dark.

Source: In-Lab Culture.  
 Regulations: NEDES.  
 Endpoints: LC50 at 96 hrs.  
 Temperature: 20 +/- 1°C.  
 Number of fish per chamber: 10.  
 Ref. toxicant: Sodium dodecyl sulfate (SDS).

Age: 14 days (1-14).  
 Test Protocol: EPA/600/4-90/027F.  
 Feeding: Prior to renewal at 48hr.  
 Aeration: None, unless DO drops below 4.0 mg/l.  
 Dilution water: Mod. hard reconstituted water.

TEST DATA

DATE/TIME:	INITIAL			24 Hr				48 Hr				RENEWAL			72 Hr				96 Hr				
	°C	DO	pH	°C	DO	pH	# Dead	°C	DO	pH	# Dead	°C	DO	pH	°C	DO	pH	# Dead	°C	DO	pH	# Dead	
1-4-05 1000	20.2	9.0	8.0	19.9	8.1	7.7	0	20.0	8.3	7.7	0	19.9	9.1	7.9	20.3	7.5	7.8	0	20.8	7.8	7.7	0	0
1-5-05 1100	20.2	9.1	8.0	19.9	7.9	7.7	0	20.0	8.2	7.6	0	19.5	9.2	7.9	20.3	7.5	7.8	0	20.8	7.5	7.6	0	0
1-6-05 1030	20.3	9.1	7.9	19.8	7.8	7.6	0	19.9	8.2	7.6	0	19.5	9.1	7.8	20.2	7.5	7.7	0	20.7	7.5	7.5	0	0
1-7-05 1130	20.3	9.2	7.9	19.7	8.1	7.6	3	19.9	7.7	7.5	0	19.5	9.0	7.8	20.7	7.6	7.6	0	20.8	7.6	7.5	0	0
1-8-05 1100	20.3	9.2	7.9	19.9	6.4	7.3	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANALYST:	<u>[Signature]</u>			<u>[Signature]</u>				<u>[Signature]</u>				<u>[Signature]</u>			<u>[Signature]</u>				<u>[Signature]</u>				
Comments:	Control: Alkalinity: <u>58</u> mg/l; Hardness: <u>96</u> mg/l; Conductivity: <u>300</u> umho. SDS: Alkalinity: <u>57</u> mg/l; Hardness: <u>97</u> mg/l; Conductivity: <u>305</u> umho.																						

RESULTS

LC50: 4.9 mg/l 95% Confidence Limits: 4.4 ≤ u ≤ 5.6 mg/l

Method: Graphical - Trimmed Spearman-Kärber X Probit -

**Acute Fish Test-96 Hr Survival**

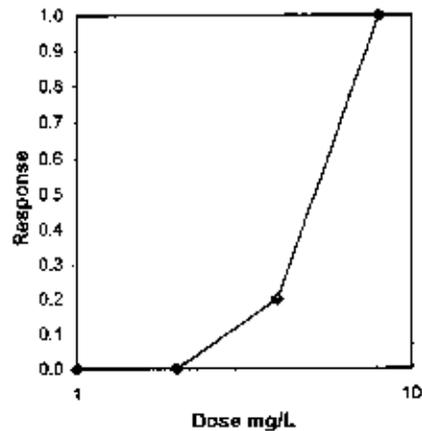
Start Date: 04 Jan-05 12:00 Test ID: RT-050104f Sample ID: REF-Ref Toxicant  
 End Date: 08 Jan-05 11:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: SDS-Sodium dodecyl sulfate  
 Sample Date: 04 Jan-05 00:00 Protocol: EPAA 91-EPA Acute Test Species: PP-Pimephales promelas  
 Comments:

Conc-mg/L	1	2
D-Control	1.0000	1.0000
1	1.0000	1.0000
2	1.0000	1.0000
4	0.7000	0.9000
8	0.0000	0.0000

Conc-mg/L	Transform: Arcsin Square Root							Number Resp	Total Number
	Mean	N-Mean	Mean	Min	Max	CV%	N		
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	1.1201	0.9912	1.2490	16.280	2	4	20
8	0.0000	0.0000	0.1588	0.1588	0.1588	0.000	2	20	20

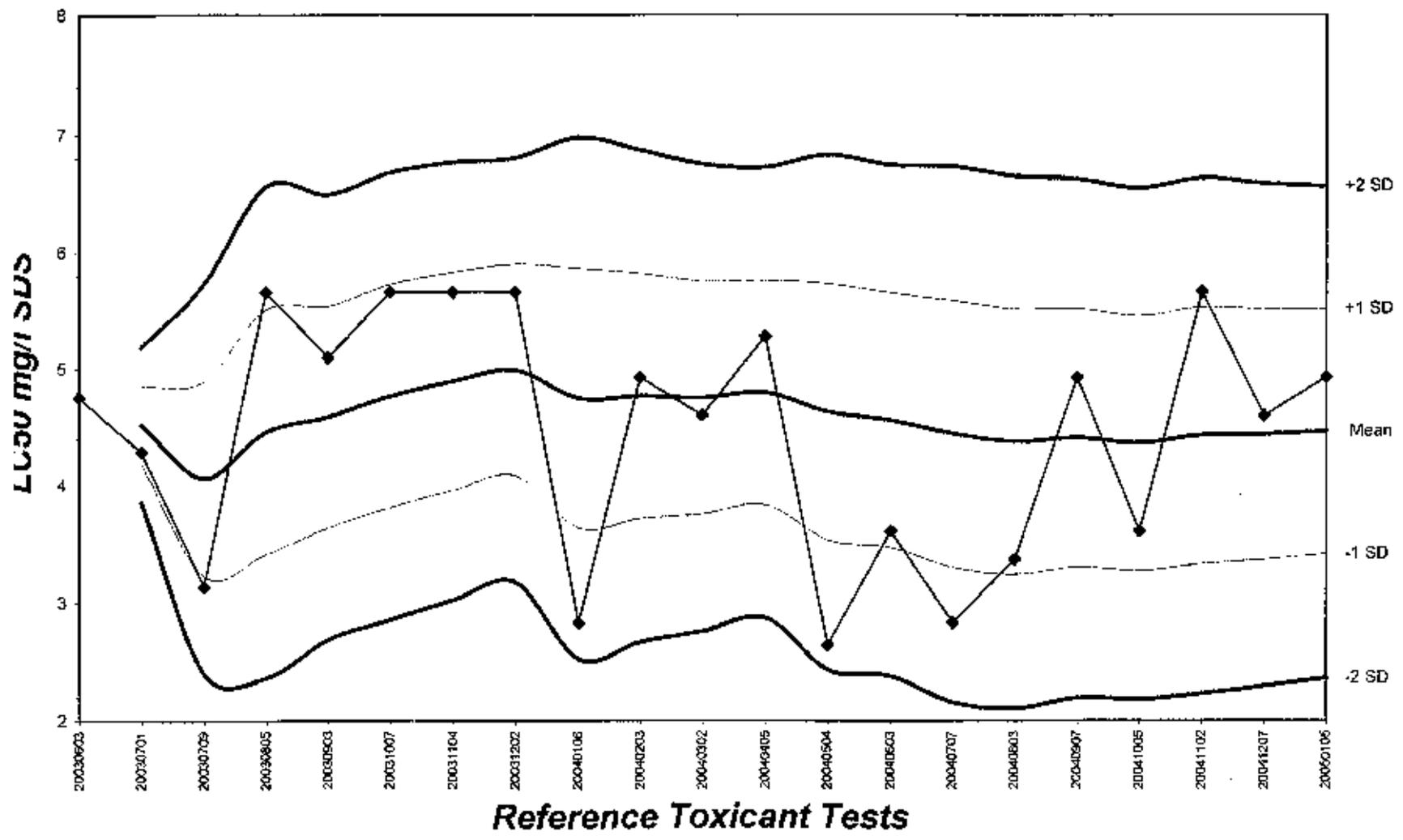
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Normality of the data set cannot be confirmed				
Equality of variance cannot be confirmed				

Trim Level	Trimmed Spearman-Kärber		
	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

CV% = 23.6



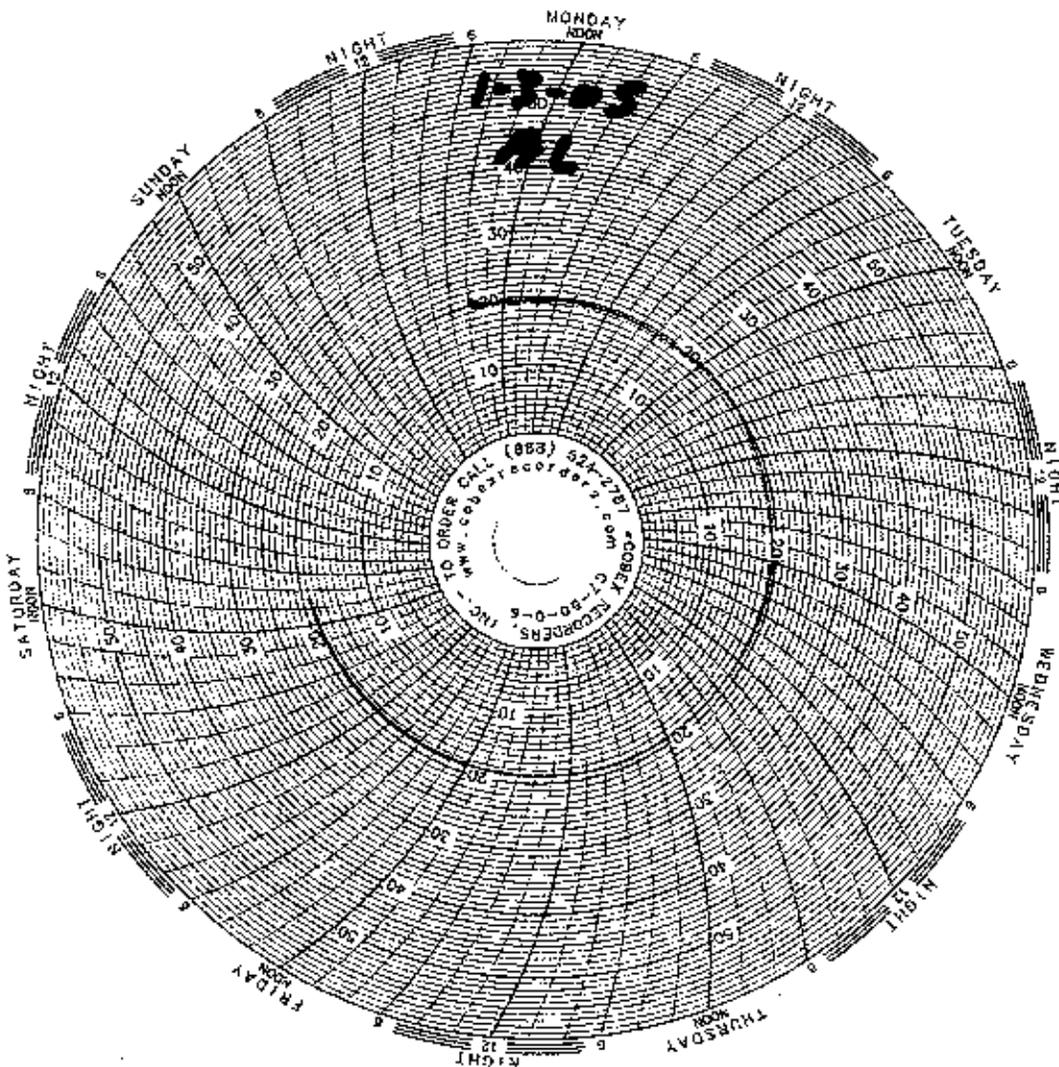


# Laboratory Temperature Chart

QA/QC Batch No: RT-050104

Date Tested: 01/04/05 to 01/08/05

Acceptable Range: 20 +/- 1°C





***REFERENCE  
TOXICANT  
DATA***

# GIANT KELP GERMINATION AND GROWTH TEST REFERENCE TOXICANT - COPPER



QA/QC Batch No.: RT-050111

Date Tested: 01/11/05 - 01/13/05

## TEST SUMMARY

Species: *Macrocystis pyrifera*.

Protocol: CSWRCB.

Test type: Static.

Test chamber: 100 ml plastic petri dishes.

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: 50 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	89.8%		14.75	
10 µg/l	90.5%		14.95	
18 µg/l	92.0%		14.80	
32 µg/l	81.1%	*	12.20	*
56 µg/l	53.0%	*	9.70	*
100 µg/l	18.4%	*	7.20	*
180 µg/l	7.7%	*	5.60	*

\* Statistically significantly less than control at P = 0.05 level

## CHRONIC TOXICITY

Germination NOEC	18 µg/l
Germination EC25	42.3 µg/l
Germ Tube Growth NOEC	18 µg/l
Germ Tube Growth IC25	42.2 µg/l

## QA/QC TEST ACCEPTABILITY

Parameter	Result
Mean control germination ≥ 70%	Yes (89.8%)
Mean control germination tube length > 10 µm	Yes (14.75 µm)
Germination tube growth NOEC < 35 µg/l Copper	Yes (18 µg/l)
%MSD < 20% relative to control (germination & growth)	Yes (germ = 7.9%, growth = 4.4%)

**Macrocyctis Germination and Growth Test-Proportion Germinated**

Start Date: 11 Jan-05 16:00 Test ID: RT-050111k Sample ID: REF-Ref Toxicant  
 End Date: 13 Jan-05 16:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: CUCL-Copper chloride  
 Sample Date: 11 Jan-05 00:00 Protocol: MBP 90 Test Species: MP-Macrocyctis pyrifera  
 Comments:

Conc-ug/L	1	2	3	4	5
D-Control	0.9065	0.8529	0.9307	0.8929	0.9065
10	0.9314	0.8932	0.8835	0.9074	0.9099
18	0.8824	0.9519	0.9231	0.9245	0.9167
32	0.8627	0.8077	0.7524	0.8519	0.7810
56	0.5644	0.5098	0.5701	0.6078	0.3966
100	0.1667	0.1078	0.0952	0.3091	0.2430
180	0.0741	0.0980	0.0577	0.1165	0.0385

Conc-ug/L	Transform: Arcsin Square Root							t-Stat	1-Tailed Critical	MSD	Number Resp	Total Number
	Mean	N-Mean	Mean	Min	Max	CV%	N					
D-Control	0.8979	1.0000	1.2478	1.1772	1.3044	3.715	5				54	529
10	0.9051	1.0080	1.2587	1.2225	1.3057	2.518	5	-0.250	2.409	0.1048	50	527
18	0.9197	1.0243	1.2861	1.2207	1.3497	3.573	5	-0.880	2.409	0.1048	42	524
*32	0.8111	0.9033	1.1235	1.0500	1.1913	5.332	5	2.858	2.409	0.1048	99	524
*56	0.5297	0.5900	0.8152	0.6812	0.8941	10.158	5	9.943	2.409	0.1048	250	528
*100	0.1844	0.2053	0.4348	0.3137	0.5895	27.055	5	18.887	2.409	0.1048	433	532
*180	0.0770	0.0857	0.2765	0.1974	0.3483	21.649	5	22.325	2.409	0.1048	481	521

**Auxiliary Tests**

	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.98184	0.91	-0.0779	0.19029
Bartlett's Test indicates equal variances (p = 0.22)	8.24642	16.8119		

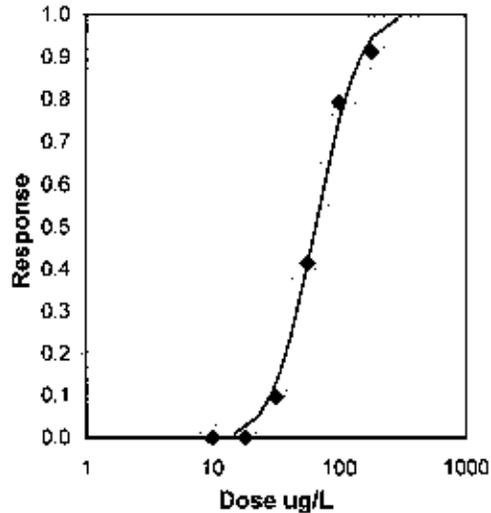
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F-Stat	F-Prob	df
Dunnett's Test	18	32	24		0.07136	0.88185	0.00473	186.322	3.1E-21	6, 28

**Maximum Likelihood-Probit**

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	3.62052	0.34752	2.65565	4.58539	0.10208	18.7321	13.2767	8.9E-04	1.8129	0.2762	6
Intercept	-1.5636	0.65151	-3.3725	0.24525							
TSCR	0.08606	0.01718	0.03836	0.13377							

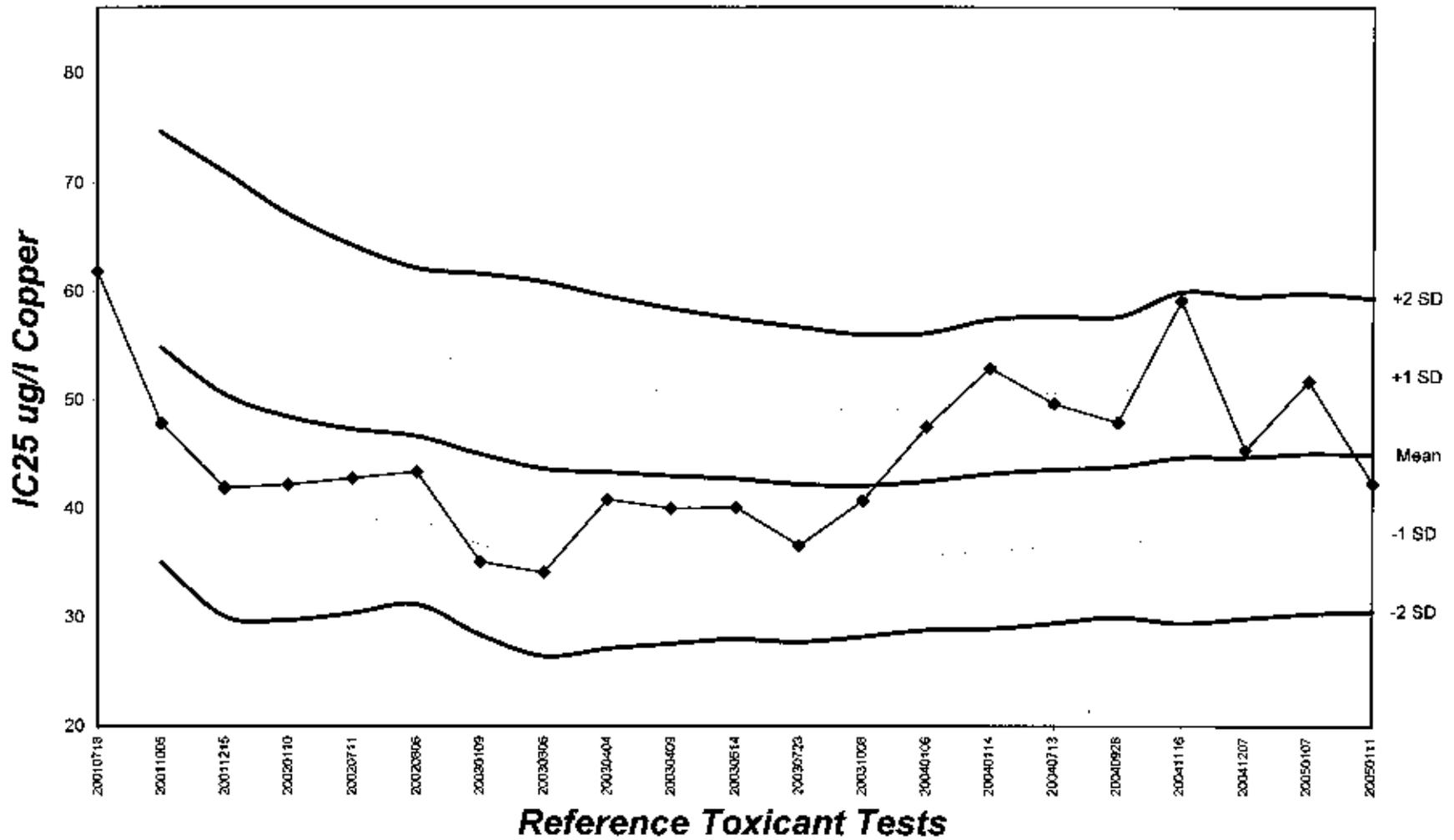
  

Point	Probits	ug/L	95% Fiducial Limits	
EC01	2.674	14.803	7.85958	21.5781
EC05	3.355	22.834	14.0806	30.622
EC10	3.718	28.7692	19.1687	36.9911
EC15	3.964	33.6225	23.566	42.0883
EC20	4.158	38.0573	27.7314	46.7001
EC25	4.326	42.3253	31.8442	51.1261
EC40	4.747	55.325	44.7233	64.7988
EC50	5.000	64.9975	54.3224	75.4698
EC60	5.253	76.3611	65.2354	88.9034
EC75	5.674	99.8144	85.8718	120.221
EC80	5.842	111.008	94.9188	136.729
EC85	6.036	125.65	106.189	159.579
EC90	6.282	146.847	121.684	194.797
EC95	6.645	185.017	147.945	263.479
EC99	7.326	285.392	211.195	469.255



# Giant Kelp Germination Laboratory Control Chart

CV% = 16.1



**Macrocystis Germination and Growth Test-Growth-Length**

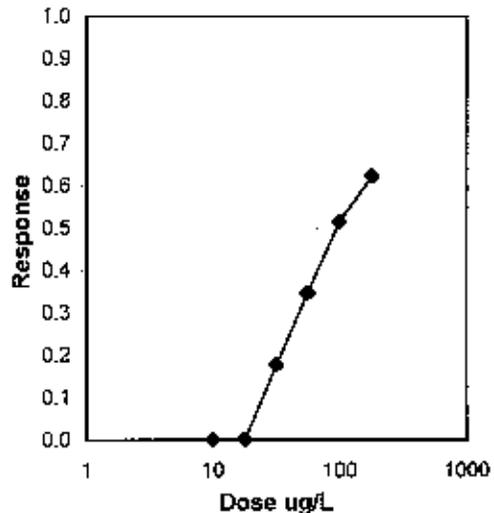
Start Date: 11 Jan-05 16:00 Test ID: RT-050111k Sample ID: REF-Ref Toxicant  
 End Date: 13 Jan-05 16:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: CUCL-Copper chloride  
 Sample Date: 11 Jan-05 00:00 Protocol: MBP 90 Test Species: MP-Macrocystis pyrifera  
 Comments:

Conc-ug/L	1	2	3	4	5
D-Control	15.250	14.500	14.750	14.750	14.500
10	15.250	14.250	14.250	15.500	15.500
18	14.000	15.250	15.000	14.750	15.000
32	12.500	12.000	12.000	12.000	12.500
56	10.750	9.500	9.500	9.250	9.500
100	7.250	7.500	7.000	7.250	7.000
180	5.500	5.750	5.750	5.750	5.250

Conc-ug/L	Transform: Untransformed							t-Stat	1-Tailed Critical	MSD	Isotonic	
	Mean	N-Mean	Mean	Min	Max	CV%	N				Mean	N-Mean
D-Control	14.750	1.0000	14.750	14.500	15.250	2.076	5				14.850	1.0000
10	14.950	1.0136	14.950	14.250	15.500	4.328	5	-0.743	2.409	0.649	14.850	1.0000
18	14.800	1.0034	14.800	14.000	15.250	3.249	5	-0.186	2.409	0.649	14.800	0.9966
*32	12.200	0.8271	12.200	12.000	12.500	2.245	5	9.470	2.409	0.649	12.200	0.8215
*56	9.700	0.6576	9.700	9.250	10.750	6.153	5	18.755	2.409	0.649	9.700	0.6532
*100	7.200	0.4881	7.200	7.000	7.500	2.905	5	28.040	2.409	0.649	7.200	0.4848
*180	5.600	0.3797	5.600	5.250	5.750	3.993	5	33.982	2.409	0.649	5.600	0.3771

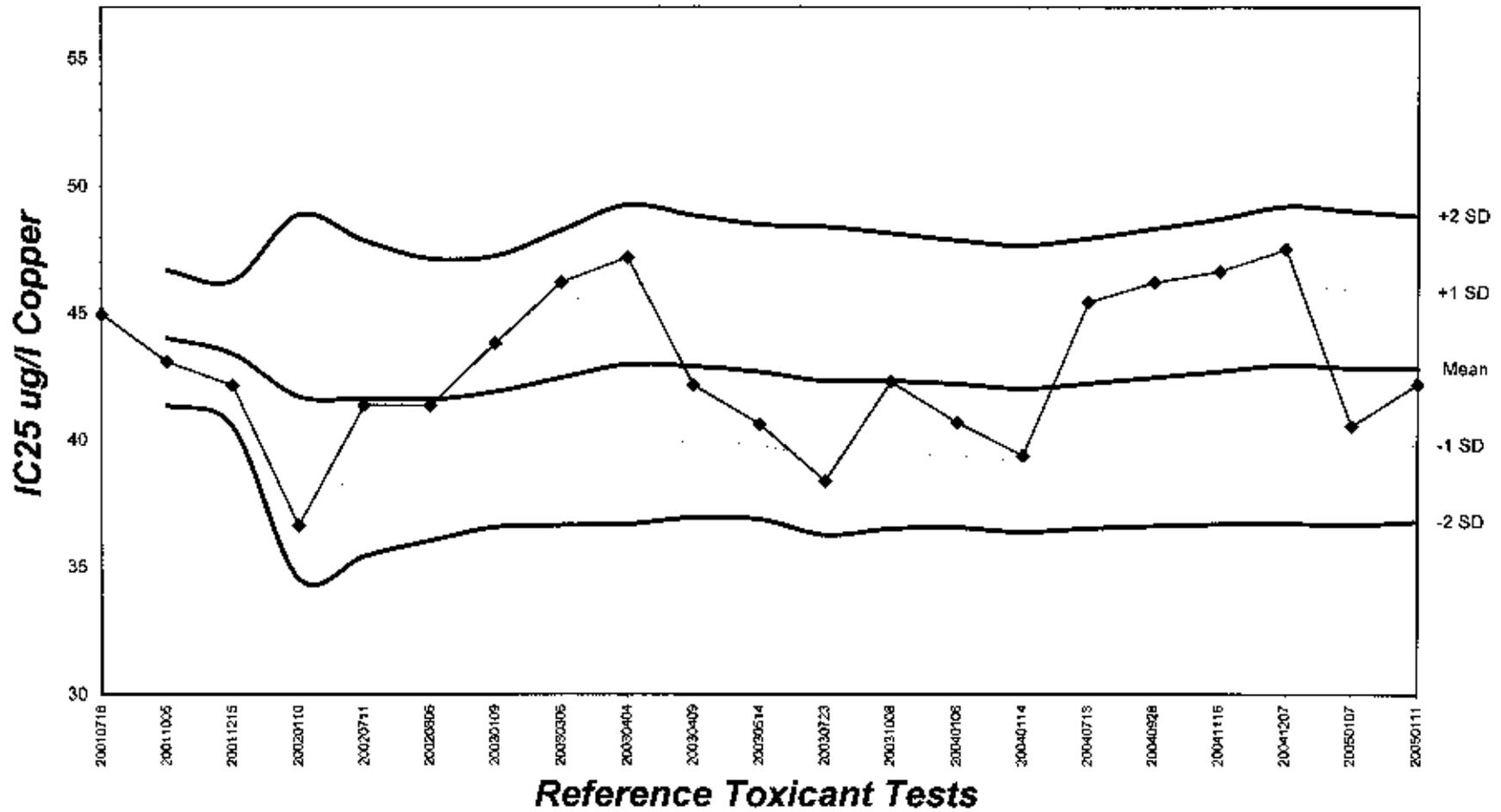
Auxiliary Tests	Statistic	Critical	Skew	Kurt						
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96984	0.91	0.22313	0.66267						
Bartlett's Test indicates equal variances (p = 0.17)	9.10889	16.8119								
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F-Stat	F-Prob	df
Dunnett's Test	18	32	24		0.64853	75.1196	0.18125	414.453	5.3E-26	6, 28

Linear Interpolation (80 Resamples)					
Point	ug/L	SE	95% CL(Exp)		Skew
IC05	21.729	0.622	19.153	22.811	-1.0388
IC10	25.727	0.658	23.452	27.488	-0.4423
IC15	29.725	0.780	27.533	32.165	0.0854
IC20	35.072	1.386	31.069	38.810	0.0428
IC25	42.200	1.549	38.352	45.663	1.1654
IC40	69.904	2.977	61.117	75.350	0.3753
IC50	96.040	1.665	90.496	100.199	-0.0046



# Giant Kelp Germ Tube Growth Laboratory Control Chart

CV% = 7.0



SHORT-TERM TOXICITY TEST



Lab No.: RT-0501 11

TEST DATA

Petri Dish No.	Test Sample Conc.	Total Number Counted	Number of Germin.	Number Non-Germin.	Germ Tube Lengths (micrometer units)									
					1	2	3	4	5	6	7	8	9	10
1	10	111	101	10	6	7	6	6	5	7	6	6	7	6
2	32	105	79	26	4	5	6	6	4	4	5	4	6	4
3	C	107	97	10	6	5	7	6	6	6	7	7	5	6
4	18	102	90	12	5	6	5	5	6	7	4	7	6	5
5	56	101	57	44	5	5	4	3	3	4	5	5	4	5
6	10	103	91	12	6	6	5	5	7	6	6	4	6	5
7	180	108	8	100	3	2	2	2	2	3	2	2	2	2
8	100	110	34	76	4	3	2	2	3	4	3	3	2	3
9	C	102	87	15	6	5	6	7	7	6	6	5	4	6
10	32	108	42	16	4	6	4	5	6	4	5	4	6	4
11	180	102	10	92	2	2	2	2	2	3	3	3	2	2
12	10	108	98	10	6	7	5	7	7	6	6	4	7	5
13	18	104	99	5	6	6	5	7	6	6	7	5	7	6
14	180	104	6	98	2	2	2	2	3	2	2	2	4	2
15	56	102	52	50	4	3	4	5	5	4	4	3	3	3
16	100	107	26	81	3	2	4	2	3	3	2	4	2	3
17	C	101	94	7	4	4	6	4	7	5	7	7	7	6
18	56	107	61	46	4	3	3	4	5	4	3	3	4	5
19	32	105	82	23	4	6	4	6	5	5	4	6	6	4
20	18	104	94	8	6	7	5	5	7	7	6	6	6	5

Comments:

Micrometer conversion factor: 1 unit = 2.5  $\mu$ m at 400X power.

Analyst: *[Signature]*

Date: 1-13-05

GIANT KELP GERMINATION AND GROWTH  
SHORT-TERM TOXICITY TEST



Lab No.: RT-05011

TEST DATA

Petri Dish No.	Test Sample Conc.	Total Number Counted	Number of Germin.	Number Non-Germin.	Germ Tube Lengths (micrometer units)									
					1	2	3	4	5	6	7	8	9	10
21	100	108	18	90	3	2	2	3	4	4	3	3	2	3
22	56	102	62	40	4	3	5	4	3	4	6	5	3	2
23	18	106	98	8	6	7	7	6	5	7	4	6	6	5
24	6	112	100	12	5	6	7	7	4	5	6	6	7	6
25	10	102	95	7	7	6	6	7	6	5	5	6	7	6
26	180	103	12	91	2	3	2	2	2	2	3	3	2	2
27	32	102	88	14	4	5	5	6	5	5	6	4	3	4
28	100	102	11	91	3	4	2	2	3	3	3	4	3	3
29	180	104	4	100	2	2	2	2	2	2	2	2	3	2
30	10	103	92	11	6	7	5	7	6	5	5	4	6	6
31	100	105	10	94	3	2	4	2	2	3	4	2	3	3
32	18	108	99	9	7	6	5	5	7	6	6	6	5	7
33	6	107	97	10	7	7	4	4	7	5	5	6	7	6
34	32	104	84	20	4	4	5	4	5	5	5	6	6	4
35	56	116	46	70	4	3	4	5	5	4	2	4	3	4
36														
37														
38														
39														
40														

Comments:

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

Analyst: [Signature]

Date: 1-13-05

GIANT KELP GERMINATION AND GROWTH  
SHORT-TERM TOXICITY TEST

REFERENCE TOXICANT - COPPER SULFATE



QA/QC No.: PT-050111

PHYSICAL/CHEMICAL MEASUREMENTS

Nominal Concentration	Initial				Final			
	Temp. (°C)	DO (mg/l)	pH	Salinity (o/oo)	Temp. (°C)	DO (mg/l)	pH	Salinity (o/oo)
Control	15.7	7.6	8.1	34	15.0	7.5	8.1	34
10 ug/l Cu	15.1	7.6	8.1	34	15.5	7.4	8.1	34
18 ug/l Cu	15.2	7.6	8.1	34	15.4	7.5	8.1	34
32 ug/l Cu	15.4	7.6	8.1	34	15.2	7.4	8.1	34
56 ug/l Cu	15.0	7.7	8.1	34	14.8	7.4	8.1	34
100 ug/l Cu	15.6	7.6	8.1	34	15.6	7.5	8.1	34
180 ug/l Cu	14.9	7.7	8.1	34	15.0	7.5	8.1	34
Brine Control								

COMMENTS:

All dilutions made with reference lab seawater

Illumination at top of test chambers ( $50 \pm 10 \mu\text{E}/\text{m}^2/\text{s}$ ) at 5 locations  
(four corners and center): 56, 55, 52, 53, 54  $\mu\text{E}/\text{m}^2/\text{s}$ .

Initial test readings:

Analyst: [Signature]

Date/Time: 1-11-05 1600

Final test readings:

Analyst: [Signature]

Date/Time: 1-13-05 1600



# *Laboratory Temperature Chart*

*QA/QC Batch No: RT-050111*

*Date Tested: 01/11/05 to 01/13/05*

*Acceptable Range: 15 $\pm$ 1 $^{\circ}$ C*

