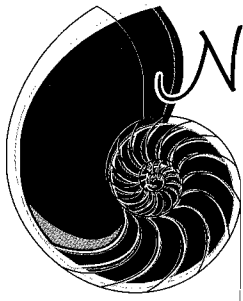


**APPENDIX 14-D  
BASELINE AND PILOT WATER TREATMENT PLANT  
TOXICITY TESTING**

---



Nautilus Environmental

**Toxicity Testing on the samples SC2, STE2, NTR2 and  
SCR- July 2009**

**Final Toxicity Test Report**

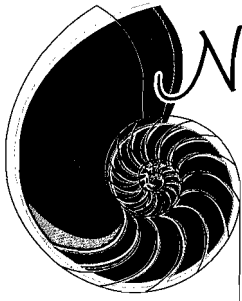
Report date: September 22, 2009

Submitted to:

**RESCAN ENVIRONMENTAL SERVICES LTD.**

Vancouver, BC

*Burnaby Laboratory*  
8664 Commerce  
Court  
Burnaby, BC  
V5A 4N7



# Nautilus Environmental

WO #: 09207-212

Ms. Judith Eigenbrod  
Rescan Environmental Services Ltd.  
6<sup>th</sup> Floor, 1111 W. Hastings Street  
Vancouver, BC  
V6E 2J3

September 22, 2009

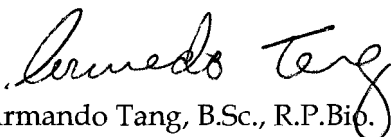
Ms. Eigenbrod:

**Re: Toxicity testing on samples SC2, STE2, NTR2, and SCR (all collected on July 5, 2009)**

Nautilus Environmental is pleased to provide you with the results of the toxicity tests conducted on samples SC2, STE2, NTR2 and SCR received on July 7, 2009. Testing was conducted following Environment Canada methods. All test acceptability criteria specified by Environment Canada protocols were met. A summary of the test methods and results are provided in the following report.

Please feel free to contact the undersigned at 604-420-8773 should you have any questions or require any additional information.

**Nautilus Environmental**

  
Armando Tang, B.Sc., R.P.Bio.  
Laboratory Manager

## TABLE OF CONTENTS

	Page
TABLE OF CONTENTS .....	i
1.0 INTRODUCTION .....	1
2.0 METHODS .....	1
2.1 <i>Ceriodaphnia dubia</i> survival and reproduction test.....	2
2.2 7-d <i>Oncorhynchus mykiss</i> embryo viability test.....	2
2.3 7-d <i>Lemna minor</i> growth inhibition test.....	3
2.4 72-h <i>Pseudokirchneriella subcapitata</i> growth inhibition test.....	4
2.5 96-h LC50 <i>Oncorhynchus mykiss</i> test.....	4
2.6 48-h LC50 <i>Daphnia magna</i> test.....	5
2.7 Quality Assurance/Quality Control (QA/QC) .....	5
3.0 RESULTS .....	13
3.1 <i>Ceriodaphnia dubia</i> survival and reproduction test.....	13
3.2 7-d <i>Oncorhynchus mykiss</i> embryo viability test.....	13
3.3 7-d <i>Lemna minor</i> growth inhibition test.....	13
3.4 72-h <i>Pseudokirchneriella subcapitata</i> growth inhibition test.....	14
3.5 96-h LC50 <i>Oncorhynchus mykiss</i> test .....	14
3.6 48-h LC50 <i>Daphnia magna</i> test.....	15
3.7 Quality Assurance/Quality Control .....	15
4.0 REFERENCES.....	23

## LIST OF TABLES

Table 1.	Summary of test conditions: <i>Ceriodaphnia dubia</i> survival and reproduction test. ....	7
Table 2.	Summary of test conditions for the rainbow trout embryo viability test.....	8
Table 3.	Summary of test conditions for the <i>Lemna minor</i> growth inhibition test.....	9
Table 4.	Summary of test conditions for the <i>Pseudokirchneriella subcapitata</i> growth inhibition test. ....	10
Table 5.	Summary of test conditions for the 96-h rainbow trout LC50 test. ....	11
Table 6.	Summary of test conditions for the 48-h <i>Daphnia magna</i> LC50 test.....	12
Table 7.	Toxicity test results for the <i>Ceriodaphnia dubia</i> survival and reproduction test.....	16
Table 8.	Toxicity test results for the <i>Oncorhynchus mykiss</i> embryo viability test.....	17
Table 9.	Toxicity test results for the <i>Lemna minor</i> growth inhibition test.....	18
Table 10.	Toxicity test results for the <i>Pseudokirchneriella subcapitata</i> growth inhibition test. ....	19

## TABLE OF CONTENTS

	<b>Page</b>
Table 11. Toxicity test results for the 96-h LC50 <i>Oncorhynchus mykiss</i> test.....	20
Table 12. Toxicity test results for the 48-h LC50 <i>Daphnia magna</i> test.....	21
Table 13. Reference toxicant test results.....	22

## LIST OF APPENDICES

- APPENDIX A - *Ceriodaphnia dubia* Toxicity Test Data
- APPENDIX B - *Oncorhynchus mykiss* embryo Toxicity Test Data
- APPENDIX C - *Lemna minor* Toxicity Test Data
- APPENDIX D- *Pseudokirchneriella subcapitata* Toxicity Test Data
- APPENDIX E - 96-h LC50 *Oncorhynchus mykiss* Toxicity Test Data
- APPENDIX F- 48-h LC50 *Daphnia magna* Toxicity Test Data
- APPENDIX G- Chain-of-Custody Forms

## 1.0 INTRODUCTION

Nautilus Environmental (Burnaby, BC) conducted toxicity tests for Rescan Environmental Services Ltd. on samples identified as SC2, STE2, NTR2 and SCR, all collected on July 5, 2009. The samples were delivered to the Nautilus Environmental Laboratory in Burnaby, BC on July 7, 2009. The samples were transported in thirty-six 20-L collapsible containers in coolers containing ice packs and were stored at 4°C in the dark prior to testing. The following sublethal toxicity tests were conducted on all four samples:

- *Ceriodaphnia dubia* survival and reproduction
- 7-d Rainbow trout (*Oncorhynchus mykiss*) embryo viability
- 7-d *Lemna minor* growth inhibition
- 72-h *Pseudokirchneriella subcapitata* (formerly identified as *Selenastrum capricornutum*) growth inhibition
- 96-h Rainbow trout (*Oncorhynchus mykiss*) LC50
- 48-h *Daphnia magna* LC50

The 7-d Rainbow trout (*Oncorhynchus mykiss*) embryo viability test was conducted by the Nautilus Environmental laboratory in Tacoma, Washington.

This report describes the results of these toxicity tests. Copies of raw laboratory data sheets and statistical analysis for each test species are provided in Appendices A to F. The chain of custody form is provided in Appendix G.

## 2.0 METHODS

Methods for the toxicity tests are summarized in Tables 1 to 6 and briefly described in Sections 2.1 to 2.6. Testing was conducted according to procedures described by the Environment Canada protocols (2000a, 2000b, 2007a, 2007b and 2007c). The rainbow trout embryo viability test followed modified procedures described by Environment Canada (1998) and Canaria et al. (1999). Statistical analyses for all the tests were performed using the CETIS computer program (Tidepool Scientific Software, 2007).

## 2.1 *Ceriodaphnia dubia* survival and reproduction test

The chronic water flea test was conducted using *Ceriodaphnia dubia* and followed Environment Canada (2007a, EPS 1/RM/21) using a static-renewal method. The endpoints were survival and reproduction over a  $7 \pm 1$ -day exposure period. The test was conducted using seven concentrations (1.6, 3.1, 6.25, 12.5, 25, 50 and 100%) and a laboratory control. Ten replicates per concentration, each with one daphnid and 15 mL of sample were tested. The control and dilution water was 20% Perrier water diluted with deionized water (hardness 80-100 mg/L CaCO<sub>3</sub>). Test solutions were renewed daily by transferring the adult daphnid into freshly prepared solution. During renewal, the number of young produced in the previous 24 hr period were counted and recorded.

Daphnids were fed daily with a mixture of YCT and *P. subcapitata* in a 0.5:1 ratio. The test was conducted at  $25 \pm 1^\circ\text{C}$  under a 16:8 h light:dark photoperiod. Temperature, dissolved oxygen (DO) and pH were measured daily in the old and new test solutions, and conductivity was measured daily in the new solutions. The No Observed Effect Concentration (NOEC) and the Lowest Observed Effect Concentration (LOEC) were determined for both survival and reproduction. The median lethal concentration (LC50) and 95% confidence limits were calculated for survival. For the reproductive endpoint, the inhibition concentrations (IC25 and IC50) and associated 95% confidence limits were calculated. A sodium chloride reference toxicant test was conducted within 14 days of test initiation and compared to historical data to assess the health and sensitivity of *C. dubia*.

For a valid test, daphnid survival in the control must be  $\geq 80\%$ . Of the surviving daphnids,  $\geq 60\%$  must produce three broods with an average of  $\geq 15$  young within  $7 \pm 1$  days.

## 2.2 7-d *Oncorhynchus mykiss* embryo viability test

The rainbow trout (*Oncorhynchus mykiss*) embryo viability test was conducted according to Environment Canada (1998, EPS 1/RM/28) and Canaria et al. (1999) using a static-renewal method. The endpoint was embryo viability at the end of a 7-day exposure period. The test was conducted using five concentrations (6.25, 12.5, 25, 50 and 100%) and a laboratory control, with four replicates per concentration and 2-L of sample in each replicate. The control and dilution water was moderately-soft water (approximately

40 mg/L CaCO<sub>3</sub> hardness), prepared by adding reagent-grade chemicals to municipal dechlorinated water.

Thirty fertilized rainbow trout eggs were exposed in each test container. Test solutions were renewed daily and aeration was provided throughout the test. The test was conducted at 14 ± 1°C under dark conditions. Temperature, DO, and pH were measured daily in each concentration in the old and new test solutions and conductivity was measured daily in the new solutions. The NOEC and LOEC were determined, and the median and 25% effect concentrations (EC50 and EC25) with 95% confidence limits were calculated. A sodium dodecyl sulphate reference toxicant test was conducted concurrently and compared to historical data to assess the health and sensitivity of each batch of rainbow trout gametes. For a valid test, embryo viability must be ≥70% in the control.

### **2.3 7-d *Lemna minor* growth inhibition test**

The *L. minor* test was conducted according to Environment Canada (2007b, EPS 1/RM/37) in a static system. The endpoints were plant growth defined by the number of fronds and the dry weight of the plants following a 7-day exposure period. Nutrients were added to the sample prior to preparing the test concentrations. The test was conducted using seven concentrations (1.5, 3.0, 6.1, 12.1, 24.3, 48.5, 97%) and a laboratory control, with four replicates per concentration and 150 mL of sample in each replicate. The control and dilution water was modified APHA media (i.e., deionized water with nutrients added).

Two healthy three-frond plants were placed in each test container at test initiation. The test was conducted at 25 ± 2°C under continuous light. Temperature was measured daily in the incubation chamber. Temperature and pH were measured at test initiation and termination. Conductivity was measured only at test initiation.

The NOEC and LOEC were determined for both growth endpoints. The IC25, IC50 values and associated 95% confidence limits were also calculated. A potassium chloride reference toxicant test was conducted within 14 days of test initiation and compared to historical data to assess the health and sensitivity of the duckweed.



For the test to be considered valid, the number of fronds at the end of the test must increase  $\geq 8$ -fold in the control (i.e., the mean number of fronds in the control must be at least 48).

#### **2.4 72-h *Pseudokirchneriella subcapitata* growth inhibition test**

The *P. subcapitata* test was conducted according to Environment Canada (2007c, EPS 1/RM/25) in a static system. The endpoint was algal growth measured as cell yield over a 72-h exposure period. The test was conducted in a 96-well microplate using seven concentrations (1.48, 2.95, 5.9, 11.9, 23.8, 47.6, 95.2%) and a laboratory control, with four replicates per sample concentration and eight replicates for the control. Nutrients were added to the sample prior to preparing the test concentrations. The control and dilution water was deionized water with nutrients added. The test volume was 220  $\mu\text{L}$  in each replicate.

Each well was inoculated with a density of approximately 10,000 algal cells/mL. The test was conducted in an incubation chamber maintained at  $24 \pm 2^\circ\text{C}$  under continuous light. Temperature and pH were measured in each concentration at test initiation. Temperature was measured daily in the incubation chamber. Algal cells in each well were counted using a hemacytometer under a compound microscope after the 72-h exposure period. The NOEC and LOEC were determined and the IC<sub>25</sub>, IC<sub>50</sub> and associated 95% confidence limits were also calculated. A zinc reference toxicant test was conducted within 14 days of test initiation and compared to historical data to assess the health and sensitivity of the algal culture.

For the test to be considered valid, the number of algal cells at the end of the test must increase by  $\geq 16$ -fold in the control. In addition, the controls cannot exhibit a positive or negative trend when analyzed statistically using the Mann-Kendall test and the coefficient of variation of the control replicates cannot exceed 20%.

#### **2.5 96-h LC<sub>50</sub> *Oncorhynchus mykiss* test**

The rainbow trout LC<sub>50</sub> test was conducted using juvenile fish and followed the Environment Canada protocol (2000a, EPS 1/RM/13) in a static system. The test was conducted using five concentrations (6.25, 12.5, 25, 50 and 100%) and a laboratory control. The control and dilution water was dechlorinated municipal water. The test

involved exposing ten juvenile rainbow trout (acclimated for  $\geq 14$  days, with wet weights of 0.3 to 2.5g) to each test concentration in glass aquaria.

The test was conducted at  $15 \pm 1^\circ\text{C}$  under a 16:8 h light:dark photoperiod. Temperature, DO and pH were measured daily in each concentration and conductivity was measured at test initiation and termination. After 96 h, the median lethal concentration (LC50) and 95% confidence limits were calculated. A monthly sodium dodecyl sulphate reference toxicant test was conducted and compared to historical data to assess the health and sensitivity of the juvenile rainbow trout. For the test to be considered valid, rainbow trout survival must be  $\geq 90\%$  in the control.

## **2.6 48-h LC50 *Daphnia magna* test**

The 48h LC50 *Daphnia magna* test was conducted according to Environment Canada (2000b, EPS 1/RM/14). The test was conducted using five concentrations (6.25, 12.5, 25, 50 and 100%) and a laboratory control. The control and dilution water was moderately-hard reconstituted water (hardness 80-100 mg/L), prepared by adding reagent-grade chemicals to deionized water. Ten *D. magna* (<24h old) were exposed in each test concentration using a 200-mL volume.

The test was conducted at  $20 \pm 2^\circ\text{C}$  under a 16:8 h light:dark photoperiod. Temperature and survival were measured daily while DO, pH and conductivity were measured at test initiation and termination. After 48 h, the median lethal concentration (LC50) and 95% confidence limits were calculated. A sodium chloride reference toxicant test was conducted within 14 days of test initiation, and compared to historical data to assess the health and sensitivity of *D. magna*. For a valid test, *D. magna* survival must be  $\geq 90\%$  in the control.

## **2.7 Quality Assurance/Quality Control (QA/QC)**

Nautilus follows a comprehensive QA/QC program to ensure that the data generated are of high quality and scientifically defensible. Our QA program is designed to ensure that all tests are performed in accordance with well-established and approved methods (e.g., Environment Canada, US EPA).

To meet these objectives, Nautilus has implemented a number of quality control procedures that include the following:

- Negative controls to ensure that appropriate testing performance criteria are met;
- Positive controls to assess the health and sensitivity of the test organisms;
- Use of appropriate species and life stage to meet the study objectives;
- Appropriate number of replicates to allow for proper statistical analyses;
- Calibration and proper maintenance of instruments to ensure accurate measurements;
- Proper documentation and recordkeeping to allow traceability of performance;
- Adequate supervision and training of staff to ensure that methods are followed;
- Proper handling and storage of samples to ensure their integrity;
- Procedures in place to address issues that may arise during testing and ensure the implementation of appropriate corrective actions; and
- Rigorous review of data by a registered professional biologist to ensure they are of good quality and scientifically defensible prior to releasing to the client.

**Table 1. Summary of test conditions: *Ceriodaphnia dubia* survival and reproduction test.**

Test organism	<i>Ceriodaphnia dubia</i>
Test organism source	In-house culture
Test organism age	<24 hr old neonates produced within 12 hr
Test type	Static renewal
Test duration	7 ± 1 day
Test chamber	20 mL test tube
Test solution volume	15 mL
Test concentrations (% sample)	Seven concentrations, plus laboratory control
Number of replicates	10
Control/dilution water	20% Perrier water (hardness 80-100mg/L CaCO <sub>3</sub> )
Test solution renewal	Daily
Test temperature	25 ± 1°C
Number of organisms/chamber	1
Feeding	Daily, with 0.1 ml <i>Pseudokirchneriella subcapitata</i> and 0.05 mL YCT
Light intensity	100 to 600 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test protocol	Environment Canada, 2007a, EPS 1/RM/21
Test endpoints	Survival and reproduction
Test acceptability criterion for controls	≥80% survival; ≥15 young per surviving control; ≥60% of controls producing three or more broods
Reference Toxicant	Sodium chloride

**Table 2. Summary of test conditions for the rainbow trout embryo viability test.**

---

Test organism	<i>Oncorhynchus mykiss</i>
Test organism source	Fraser Valley Trout Hatchery
Test organism age	< 24 hours
Test type	Static-renewal
Test duration	7 days
Test chamber	2-L plastic containers
Test solution volume	2 L
Test concentrations (% sample)	Five concentrations, plus laboratory control
Number of replicates	4
Control/Dilution water	Moderately-soft water (hardness 40 - 48 mg/L CaCO <sub>3</sub> )
Test solution renewal	Daily
Test temperature	14 ± 1°C
Number of organisms/chamber	30 eggs
Feeding	None
Light intensity	Dark
Photoperiod	24 hours dark
Aeration	6.5 ± 1 mL/min/L
Test protocol	Environment Canada (1998), EPS 1/RM/28
Test endpoint	Embryo viability
Test acceptability criteria for controls	Embryo viability ≥70%
Reference toxicant	Sodium dodecyl sulphate

---

**Table 3. Summary of test conditions for the *Lemna minor* growth inhibition test.**

---

Test organism	<i>Lemna minor</i>
Test organism source	In-house culture
Test organism age	7- to 10-day old
Test type	Static
Test duration	7 days
Test chamber	250-mL glass containers
Test solution volume	150 mL
Test concentrations (% sample)	Seven concentrations, plus laboratory control
Number of replicates	4
Control/Dilution water	Deionized or distilled water with nutrients added
Test solution renewal	None
Test temperature	25 ± 2°C
Number of organisms/chamber	Two 3-frond plants
Light intensity	4000 to 5300 lux full spectrum light
Photoperiod	Continuous
Aeration	None
Test protocol	Environment Canada (2007b), EPS 1/RM/37
Test endpoint	Number of fronds and dry weight
Test acceptability criteria for controls	≥ 8-fold increase in number of fronds
Reference toxicant	Potassium chloride

---

**Table 4. Summary of test conditions for the *Pseudokirchneriella subcapitata* growth inhibition test.**

Test organism	<i>Pseudokirchneriella subcapitata</i>
Test organism source	In-house culture
Test organism age	4- to 7-day old culture in logarithmic growth phase
Test type	Static
Test duration	72 hours
Test chamber	Microplate
Test solution volume	220 µL
Test concentrations (% sample)	Seven concentrations, plus laboratory control
Number of replicates	4 for treatments; 8 for control
Control/Dilution water	Deionized or distilled water
Test solution renewal	None
Test temperature	24 ± 2°C
Number of organisms/chamber	10,000 cells/mL
Light intensity	3600 to 4400 lux
Photoperiod	Continuous
Aeration	None
Test protocol	Environment Canada (2007c), EPS 1/RM/25
Test endpoint	Algal cell growth inhibition ≥ 16-fold increase in number of algal cells; no trend when analyzed with Mann-Kendall test; and CV ≤20%
Test acceptability criteria for controls	
Reference toxicant	Zinc

**Table 5. Summary of test conditions for the 96-h rainbow trout LC50 test.**

---

Test organism	<i>Oncorhynchus mykiss</i>
Test organism source	Commercial hatchery
Test organism age	Juveniles
Test type	Static
Test duration	96 hours
Test chamber	18.2 L glass aquarium
Test solution volume	10 L
Test concentrations (% sample)	Five concentrations, plus laboratory control
Number of replicates	1
Control/Dilution water	Municipal dechlorinated water
Test solution renewal	None
Test temperature	15 ± 1°C
Number of organisms/chamber	Ten
Feeding	None
Light intensity	100 to 500 lux
Photoperiod	16 hours light/8 hours dark
Aeration	6.5 ± 1 mL/min/L
Test protocol	Environment Canada (2000a), EPS 1/RM/13
Test endpoint	96-h LC50
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium dodecyl sulphate

---



**Table 6. Summary of test conditions for the 48-h *Daphnia magna* LC50 test.**

---

Test organism	<i>Daphnia magna</i>
Test organism source	In-house culture
Test organism age	< 24 h
Test type	Static
Test duration	48 hours
Test chamber	250-mL glass beakers
Test solution volume	200 mL
Test concentrations (% sample)	Five concentrations, plus laboratory control
Number of replicates	One
Control/Dilution water	Moderately-hard reconstituted water (hardness 80-100 mg/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Number of organisms/chamber	Ten
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test protocol	Environment Canada (2000b), EPS 1/RM/14
Test endpoint	48-h LC50
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride

---

## 3.0 RESULTS

### 3.1 *Ceriodaphnia dubia* survival and reproduction test

Results of the *C. dubia* test are summarized in Table 7. The *C. dubia* test did not exhibit any significant reduction in survival in any of the concentrations tested for any of samples (SC2, STE2, NTR2, SCR). The LC50 values were all >100%.

Of the concentrations tested for SC2, five of seven concentrations (6.25, 12.5, 25, 50, 100%) exhibited significant effects on reproduction. The IC25 and IC50 values (with 95% confidence limits) were 3.9 (0.3-36.5) and >100 % (v/v), respectively. Relative to the control, reproduction was not adversely affected in any of the concentrations tested for STE2. The IC25 and IC50 values for STE2 were both >100%. Note that although the average number of young in the control for STE2 was 13.5, this result met the Environment Canada criterion of  $\geq 15$  young per daphnid, since this criterion is based on organisms that had produced three broods.

With the exception of the 1.56% concentration, all the concentrations tested for NTR2 exhibited significant adverse effects on *C. dubia* reproduction, therefore the IC25 value (with 95% confidence intervals) was 5.4 (1.6-16.1) and the IC50 value was >100% (v/v). Significant adverse effects on reproduction were observed in the highest three concentrations (25, 50, 100% (v/v)) tested for SCR. This resulted in IC25 and IC50 values (with 95% confidence intervals) of 19.3 (8.8-26.2) and 34.1 (26.9-42.5)% (v/v), respectively.

### 3.2 7-d *Oncorhynchus mykiss* embryo viability test

Results of the 7-d rainbow trout embryo viability test are provided in Table 8. Rainbow trout embryo did not exhibit any statistically significant effects on embryo development in any of the concentrations tested for SC2, STE2, NTR2 and SCR. The EC50 for embryo viability was >100% for all samples. Results are presented on the basis of results from only three of the four replicates, as discussed in Section 3.7.

### 3.3 7-d *Lemna minor* growth inhibition test

The 7-d *L. minor* test did not exhibit inhibitory effects on frond growth in any concentrations tested for samples SC2, STE2 and NTR2. For these samples, the IC25 and IC50 values for frond growth were >97. Frond growth stimulation was observed in the 1.5, 3.0, 12.1, 24.2, 48.5% (v/v)

concentrations tested for SC2. Frond growth was stimulated in the 12.1, 24.2, 48.3, 55 and 97% concentrations of STE2, however the stimulation was not significantly different from the control. Similarly non-significant frond growth stimulation was exhibited in the 3.0, 6.1, 48.5 and 97% concentrations tested for NTR2.

Of the concentrations tested for SCR, frond growth was significantly inhibited only in the 48.5% concentration. The resulting IC25 and IC50 values with 95% confidence intervals for SCR were 21.5 (5.9-58.6) and >97%, respectively.

No adverse effects on dry weight were observed in any of the concentrations tested for SC2, STE2, and NTR2, therefore the IC25 and IC50 values were all >97%. For SC2, non-significant stimulation was observed in the 1.5 and 12.1% concentrations. Stimulation was exhibited in the 48.5% concentration of STE2 however it was not significantly different relative to the control. No stimulation on dry weight was observed in NTR2. Only one of the concentrations tested (48.5%) for SCR exhibited significant adverse effects on dry weight relative to the control. The IC25 and IC50 values (with 95% confidence intervals) for SCR were 9.8 (1.7-35.3) and >97%, respectively. The test results for this species are summarized in Table 9.

### **3.4 72-h *Pseudokirchneriella subcapitata* growth inhibition test**

Significant adverse effects in the 72-h *P. capitata* growth inhibition test were observed in the 11.9, 47.6 and 95.2% concentrations of SC2. The IC25 and IC50 with 95% confidence limits for this sample were 26.1 (24.5-27.6) and 33.0 (30.9-35.1)%, respectively. Of the concentrations tested for STE2, only the highest concentration, 95.2%, exhibited adverse effects on cell density. The resulting IC25 and IC50 values with 95% confidence limits were 61.7 (52.3-69.0) and 84.1 (71.4-95.2)%, respectively. Significant adverse effects were observed in four of the concentrations tested (11.9, 23.8, 47.6, 95.2%) for NTR2, therefore the IC25 and IC50 values (with 95% confidence limits) were 11.4 (9.4-14.0) and 19.0 (15.0-25.4)%, respectively. Relative to the control, only the 95.2% concentration of sample SCR exhibited significant adverse effects. The IC25 and IC50 values (with 95% confidence limits) for SCR were 51.1 (48.3-54.6) and 55.4 (51.5-61.2)%, respectively (See Table 10).

### **3.5 96-h LC50 *Oncorhynchus mykiss* test**

Results of the rainbow trout tests are provided in Table 11. Rainbow trout survival was 100% in all the test concentrations for samples SC2, STE2, NTR2, and SCR. The 96-h LC50 values for all the samples were >100%.

### 3.6 48-h LC50 *Daphnia magna* test

*D. magna* survival was 100% in all concentrations tested for SCR, STE2, NTR2, and SCR after 48-h of test exposure. Therefore, the 48-h LC50 values were >100% for all the samples. Results of the 48-h LC50 *D. magna* tests are summarized in Table 12.

### 3.7 Quality Assurance/Quality Control

The health history of the test organisms used in the exposures was acceptable and met the requirements of the Environment Canada protocol. Aside from the rainbow trout embryo tests, and the *C. dubia* test on SC2, tests met all control acceptability criteria and water quality parameters remained within acceptable ranges specified in the protocols throughout the tests. Data for one of the replicates in each of the toxicity tests using rainbow trout embryos were excluded prior to data analysis because of poor development. The four replicates in these tests were initiated using eggs from four separate female trout, and one of the four females produced eggs with 0% normal development compared to eggs from the other three females, which ranged from 71 to 90% normal. Eggs from this female were used for replicate B in this test and, consequently, the data for replicate B were excluded prior to analysis of the data. After exclusion of replicate B, the test met the control performance criterion of at least 70% normally developed embryos in the control. While control acceptability criteria were met for the *C. dubia* test on SC2, temperature was exceeded by 0.1 °C on day 6. This minor exceedance would not likely have affected the results. Uncertainty associated with this test is best described by the confidence intervals around the IC25 and IC50 estimates.

Results of the reference toxicant tests conducted during the testing program are summarized in Table 13. These results fell within the acceptable range for organism performance, with the exception of the *P. subcapitata* test. The reference toxicant result of the *P. subcapitata* test was slightly higher than the historical laboratory mean  $\pm$  two standard deviations (SD). However, one out of 20 results may fall outside of two SD on variability alone. This minor deviation was unlikely to have affected test results. The range is defined by an LC/EC/IC mean  $\pm$  two standard deviations, which is based on historical results obtained by the laboratory. The reference toxicant test results are summarized in Table 13.

**Table 7. Toxicity test results for the *Ceriodaphnia dubia* survival and reproduction test.**

Mean ± SD								
		SC2		STE2		NTR2		SCR
Concentration	Survival	Reproduction	Survival	Reproduction	Survival	Reproduction	Survival	Reproduction
(% v/v)	(%)	(No. of Young/Female)	(%)	(No. of Young/Female)	(%)	(No. of Young/Female)	(%)	(No. of Young/Female)
Control	100	16.3 ± 3.3	100	13.5 ± 3.7	100	20.4 ± 1.6	100	15.3 ± 4.3
1.6	100	13.3 ± 4.7	100	13.1 ± 4.1	100	18.0 ± 2.1	100	12.3 ± 4.8
3.1	100	12.8 ± 3.1	100	12.8 ± 2.1	100	13.5 ± 1.4*	100	12.3 ± 1.8
6.25	100	10.9 ± 4.1*	100	12.7 ± 3.2	100	15.7 ± 1.6*	100	13.5 ± 2.7
12.5	100	11.6 ± 1.8*	100	13.2 ± 2.9	100	14.3 ± 3.1*	100	13.7 ± 2.0
25	100	10.9 ± 2.8*	100	11.8 ± 4.1	100	14.1 ± 2.6*	100	9.2 ± 4.7*
50	100	11.1 ± 3.2*	100	11.2 ± 4.5	100	13.9 ± 3.5*	100	5.3 ± 5.2*
100	100	11.2 ± 3.0*	100	10.6 ± 2.3	100	13.6 ± 3.4*	100	0.2 ± 0.6*
<b>Test endpoint</b>								
<b>(% v/v)</b>								
NOEC	100	3.12	100	100	100	1.56	100	12.5
LOEC	>100	6.25	>100	>100	>100	3.12	>100	25
LC50	>100	--	>100	--	>100	--	>100	--
IC25 (95% CL)	--	3.9 (0.3-36.5)	--	>100	--	5.4 (1.6-16.1)	--	19.3 (8.8-26.2)
IC50 (95% CL)	--	>100	--	>100	--	>100	--	34.1 (26.9-42.5)

Asterisks (\*) indicate treatments that are significantly different from the control.

NOEC = No Observed Effect Concentration.

LOEC = Lowest Observed Effect Concentration.

LC = Lethal Concentration.

IC = Inhibition Concentration.

SD = Standard Deviation.

CL = Confidence Limits

**Table 8. Toxicity test results for the *Oncorhynchus mykiss* embryo viability test.**

Concentration (% v/v)	Embryo Viability (%) (Mean ± SD)			
	SC2	STE2	NTR2	SCR
Control	81.1 ± 5.1	90.0 ± 5.8	90.0 ± 12.0	71.1 ± 38.5
6.25	84.4 ± 16.8	84.4 ± 10.2	86.7 ± 14.5	80.0 ± 24.0
12.5	76.7 ± 23.3	87.8 ± 8.4	87.8 ± 15.8	85.6 ± 13.9
25	75.6 ± 18.4	78.9 ± 18.4	85.6 ± 19.2	85.6 ± 13.9
50	80.0 ± 6.7	84.4 ± 21.2	83.3 ± 20.8	81.1 ± 22.2
100	80.0 ± 10.0	82.2 ± 18.4	81.1 ± 24.1	85.6 ± 8.4

Test endpoint	Embryo Viability (% v/v)	Embryo Viability (% v/v)	Embryo Viability (% v/v)	Embryo Viability (% v/v)
NOEC	100	100	100	100
LOEC	>100	>100	>100	>100
EC25	>100	>100	>100	>100
EC50	>100	>100	>100	>100

NOEC = No Observed Effect Concentration.  
 LOEC = Lowest Observed Effect Concentration.  
 EC = Effective Concentration.  
 SD = Standard Deviation.

**Table 9. Toxicity test results for the *Lemna minor* growth inhibition test.**

Concentration (% v/v)	Mean ± SD							
	SC2		STE2		NTR2		SCR	
	FronD Growth (No. of Fronds) (Mean ± SD)	Dry Weight (mg) (Mean ± SD)	FronD Growth (No. of Fronds) (Mean ± SD)	Dry Weight (mg) (Mean ± SD)	FronD Growth (No. of Fronds) (Mean ± SD)	Dry Weight (mg) (Mean ± SD)	FronD Growth (No. of Fronds) (Mean ± SD)	Dry Weight (mg) (Mean ± SD)
Control	57.5 ± 10.0	4.7 ± 0.9	49.5 ± 15.7	3.6 ± 1.1	69.2 ± 13.5	5.8 ± 1.0	59.2 ± 17.6	4.6 ± 1.4
1.5	80.5 ± 21.2	5.8 ± 1.5	39.5 ± 2.1	2.8 ± 0.3	64.5 ± 8.0	4.6 ± 0.6	48.0 ± 16.8	3.8 ± 1.8
3	59.0 ± 10.6	4.1 ± 0.8	41.0 ± 1.4	2.5 ± 0.3	72.5 ± 1.9	5.3 ± 0.7	57.0 ± 15.4	3.9 ± 1.2
6.1	56.0 ± 14.7	4.1 ± 1.1	48.0 ± 11.9	2.5 ± 1.3	75.2 ± 12.5	5.5 ± 1.4	58.0 ± 14.8	4.4 ± 1.5
12.1	64.5 ± 8.7	4.8 ± 0.7	53.0 ± 11.2	3.0 ± 0.6	61.0 ± 16.8	4.0 ± 1.2	39.8 ± 6.1	2.8 ± 0.4
24.3	61.8 ± 6.7	4.6 ± 0.6	52.2 ± 10.2	3.2 ± 0.7	61.5 ± 21.8	3.9 ± 1.5	46.2 ± 4.8	3.4 ± 0.5
48.5	57.5 ± 3.9	4.6 ± 0.5	70.3 ± 10.4	4.5 ± 0.8	71.8 ± 18.5	4.9 ± 1.4	33.0 ± 3.6*	2.3 ± 0.2*
97	46.5 ± 2.1	3.9 ± 0.6	55.0 ± 16.2	3.4 ± 1.2	78.8 ± 5.4	5.4 ± 0.4	41.2 ± 5.2	2.9 ± 0.7
Test endpoint	FronD Growth (% v/v)	Dry Weight (% v/v)	FronD Growth (% v/v)	Dry Weight (% v/v)	FronD Growth (% v/v)	Dry Weight (% v/v)	FronD Growth (% v/v)	Dry Weight (% v/v)
NOEC	97	97	97	97	97	97	48.5	48.5
LOEC	>97	>97	>97	>97	>97	>97	97	97
IC25 (95% CL)	>97	>97	>97	>97	>97	>97	21.5 (5.9-58.6)	9.8 (1.7-35.3)
IC50	>97	>97	>97	>97	>97	>97	>97	>97

Asterisks (\*) indicate treatments that are significantly different from the control.

NOEC = No Observed Effect Concentration.

LOEC = Lowest Observed Effect Concentration.

IC = Inhibition Concentration.

SD = Standard Deviation.

CL = Confidence Limits

**Table 10. Toxicity test results for the *Pseudokirchneriella subcapitata* growth inhibition test.**

Concentration (% v/v)	Cell Density (x 10 <sup>4</sup> cells/mL) (Mean ± SD)			
	SC2	STE2	NTR2	SCR
Control	28.8 ± 4.0	29.8 ± 4.3	29.4 ± 5.8	29.1 ± 5.0
1.48	35.5 ± 2.1	34.5 ± 4.8	36.8 ± 7.1	27.8 ± 4.0
2.95	35.2 ± 3.3	32.2 ± 3.1	44.5 ± 4.7	27.0 ± 6.0
5.9	23.8 ± 4.1	48.2 ± 6.7	32.2 ± 7.1	41.0 ± 6.1
11.9	20.8 ± 3.2*	44.5 ± 4.7	17.8 ± 4.6*	53.5 ± 5.5
23.8	38.0 ± 6.8	57.8 ± 8.2	13.2 ± 3.0*	68.8 ± 6.6
47.6	3.25 ± 2.8*	28.8 ± 3.8	11.2 ± 3.3*	26.5 ± 4.5
95.2	0.0 ± 0.0*	12.0 ± 3.9*	1.5 ± 1.9*	2.8 ± 3.1*
Test endpoint	Cell Density (% v/v)	Cell Density (% v/v)	Cell Density (% v/v)	Cell Density (% v/v)
NOEC	5.9	47.6	5.9	47.6
LOEC	11.9	95.2	11.9	95.2
IC25 (95% CL)	26.1 (24.5-27.6)	61.7 (52.3-69.0)	11.4 (9.4-14.0)	51.1 (48.3-54.6)
IC50 (95% CL)	33.0 (30.9-35.1)	84.1 (71.4-95.2)	19.0 (15.0-25.4)	55.4 (51.5-61.2)

NOEC = No Observed Effect Concentration.

LOEC = Lowest Observed Effect Concentration.

IC = Inhibition Concentration.

SD = Standard Deviation.

CL = Confidence Limits



**Table 11. Toxicity test results for the 96-h LC50 *Oncorhynchus mykiss* test.**

Concentration (% v/v)	Survival (%)			
	SC2	STE2	NTR2	SCR
Control	100	100	100	100
6.25	100	100	100	100
12.5	100	100	100	100
25	100	100	100	100
50	100	100	100	100
100	100	100	100	100
<b>Test endpoint (% v/v)</b>				
LC50	>100	>100	>100	>100

LC = Lethal Concentration

**Table 12. Toxicity test results for the 48-h LC50 *Daphnia magna* test.**

Concentration (% v/v)	Survival (%)			
	SC2	STE2	NTR2	SCR
Control	100	100	100	100
6.25	100	100	100	100
12.5	100	100	100	100
25	100	100	100	100
50	100	100	100	100
100	100	100	100	100
<b>Test endpoint (% v/v)</b>				
LC50	>100	>100	>100	>100

LC = Lethal Concentration

**Table 13. Reference toxicant test results.**

Species	Endpoint	Historical range (mean $\pm$ 2 SD)	CV(%)	Date Setup
<i>C. dubia</i>	Survival (LC50): 2.0 g/L NaCl	1.7 $\pm$ 0.7	22	July 2, 2009
	Reproduction (IC50): 1.2 g/L NaCl	1.2 $\pm$ 0.3	14	
<i>O.mykiss</i> (embryo)	Viability (EC50): 1.0 mg/L SDS	3.3 $\pm$ 4.5	69	July 8, 2009
<i>L. minor</i>	No. Fronds (IC25): 2.8 g/L KCL	2.5 $\pm$ 1.1	22	June 24, 2009
<i>P. subcapitata</i>	Growth (IC50): 32.4 $\mu$ g/L Zn	17.1 $\pm$ 12.0	35	July 9, 2009
<i>O.mykiss</i> (juvenile)	Survival (LC50): 6.1 mg/L SDS	5.0 $\pm$ 1.1	11	June 30, 2009
<i>D. magna</i>	Survival (LC50): 3.9 g/L NaCl	4.2 $\pm$ 0.8	9	July 10, 2009

#### 4.0 REFERENCES

- Canaria, E.C., J.R. Elphick and H.C. Bailey. 1999. A simplified procedure for conducting small-scale short-term embryo toxicity tests with salmonids. *Environ Toxicol* 14:301-307.
- Environment Canada. 1998. Biological test method: toxicity tests using early life stages of salmonid fish (rainbow trout). Environmental Protection Series EPS 1/RM/28. Second Edition, July 1998. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 102 pp.
- Environment Canada. 2000a. Biological test method: reference method for determining acute lethality of effluents to rainbow trout. Environmental Protection Series. Report EPS 1/RM/13, Second Edition, December 2000, including May 2007 amendments. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 23 pp.
- Environment Canada. 2000b. Biological test method: reference method for determining acute lethality of effluents to *Daphnia magna*. Environmental Protection Series. Report EPS 1/RM/14, Second Edition, December 2000. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 21 pp.
- Environment Canada. 2007a. Biological test method: test of reproduction and survival using the cladoceran *Ceriodaphnia dubia*. Environmental Protection Series. Report EPS 1/RM/21, Second Edition, February 2007. Environment Canada, Method Development and Application Section, Environmental Science and Technology Centre, Science and Technology Branch, Ottawa, ON. 74 pp.
- Environment Canada. 2007b. Biological test method: tests for measuring the inhibition of growth using the freshwater macrophyte, *Lemna minor*. Environmental Protection Series, Report EPS 1/RM/37. Second Edition. January 2007. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 112 pp.
- Environment Canada. 2007c. Biological test method: growth inhibition test using the freshwater alga. Environmental Protection Series, Report EPS 1/RM/25. Second Edition, March 2007. Environment Canada, Method Development and Application Section, Environmental Science and Technology Centre, Science and Technology Branch, Ottawa, ON. 53 pp.

Tidepool Scientific Software. 2007. CETIS comprehensive environmental toxicity information system, version 1.5.0D. Tidepool Scientific Software, McKinleyville, CA. 222 pp.

**APPENDIX A - *Ceriodaphnia dubia* Toxicity Test Data**

## Ceriodaphnia dubia Summary Sheet

Client: Procon  
 Work Order No.: 09211

Start Date/Time: July 8 / 09 0925h  
 Set up by: Ans

**Sample Information:**

Sample ID: SC2  
 Sample Date: July 5 / 09  
 Date Received: July 7 / 09  
 Sample Volume: 9.20 L

**Test Organism Information:**

Broodstock No.: 063009  
 Age of young (Day 0): <24 (w/in 12-h)  
 Avg No. young in first 3 broods of previous 7 d: 16  
 Mortality (%) in previous 7 d: 2  
 Avg. No. of young in previous brood: 41, 44, 45, 47, 48, 49, 50, 53  
 Females Used  $\geq$  8 young for testing

**NaCl Reference Toxicant Results:**

Reference Toxicant ID: Cd 44  
 Stock Solution ID: OF Na 04  
 Date Initiated: July 2 / 09  
 7-d LC50 (95% CL): 2.0 (1.7 - 2.3)  
 7-d IC50 (95% CL): 1.2 (1.0 - 1.5)

7-d LC50 Reference Toxicant Mean  $\pm$  2 SD: 1.7  $\pm$  0.7 CV (%): 22  
 7-d IC50 Reference Toxicant Mean  $\pm$  2 SD: 1.2  $\pm$  0.3 CV (%): 25

**Test Results:**

	Survival	Reproduction
NOEC %(v/v)	100	3.12
LOEC %(v/v)	>100	6.25
LC50 %(v/v) (95% CL)	>100	
IC25 %(v/v) (95% CL)		<del>3.9 (0.3 - 3.87)</del> <u>3.9 (0.3 - 36.5)</u>
IC50 %(v/v) (95% CL)		>100

Reviewed by: [Signature]

Date reviewed: Aug 27 / 09

## Chronic Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Rescan  
 Sample ID: 5C2  
 Work Order #: 09211

Start Date & Time: July 5/02 @ 0925h  
 Stop Date: July 14/02 @ 1800h  
 Test Species: Ceriodaphnia dubia

Concentration <i>Control</i>	Days														
	0		1		2		3		4		5		6		7
	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	25.1	25.4	24.2	25.6	25.3	25.4	25.7	25.0	25.0	25.4	25.2	26.0			
DO (mg/L)	8.1	7.4	8.1	7.4	8.2	7.4	8.2	7.4	8.2	7.7	8.2	7.3			
pH	8.1	7.7	8.2	7.9	8.1	7.9	8.1	7.9	8.1	7.7	8.2	7.7			
Cond. (µS/cm)	211		212		205		202		205		206		207		
Initials	A	A	A	A	A	A	A	A	A	A	BPL	BPL	K		

Concentration <i>1.9</i>	Days														
	0		1		2		3		4		5		6		7
	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.6	25.4	24.3	25.6	24.9	25.4	25.2	25.6	25.3	25.4	25.0	26.0			
DO (mg/L)	8.2	7.4	8.1	7.5	8.2	7.4	8.2	7.4	8.2	7.8	8.2	7.1			
pH	8.1	7.8	8.2	7.2	8.1	7.8	8.1	7.8	8.2	7.9	8.2	7.7			
Cond. (µS/cm)	217		212		210		206		206		200		207		
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	K			

Concentration <i>125</i>	Days														
	0		1		2		3		4		5		6		7
	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.7	25.4	24.3	25.6	24.6	25.4	25.2	25.6	25.3	25.4	25.0	26.0			
DO (mg/L)	8.2	7.4	8.1	7.4	8.2	7.4	8.2	7.5	8.1	7.8	8.1	7.1			
pH	8.0	7.7	8.1	7.7	8.1	7.7	8.0	7.5	8.1	7.7	8.2	7.7			
Cond. (µS/cm)	211		209		208		199		202		198		209		
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	K			

Concentration <i>100</i>	Days														
	0		1		2		3		4		5		6		7
	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	25.4	25.4	24.8	25.6	25.2	25.4	25.5	25.6	25.6	25.4	24.9	26.0			
DO (mg/L)	8.0	7.3	8.1	7.4	8.1	7.4	8.2	7.5	8.0	7.7	8.2	7.5			
pH	7.2	7.4	7.3	7.5	7.4	7.6	7.5	7.6	7.6	7.6	7.4	7.2			
Cond. (µS/cm)	170		167		168		168		169		166		170		
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	K			

	Control	100%		
Hardness*	100	68		
Alkalinity*	80	24		

Analysts: JRS, BPL, AS

Reviewed by: [Signature]

Date reviewed: Aug 25, 2002

Sample Description: light yellow - opaque

Comments: used BS 063009



### Chronic Freshwater Toxicity Test C. dubia Reproduction Data

Client: Pescan  
 Sample ID: SC2  
 Work Order: 09211

Start Date & Time: July 8 / 09 0926h  
 Stop Date & Time: July 14 / 09 0700h  
 Set up by: Duo

0/2 (V/P)

Days	Concentration: Control											Concentration: <u>1/2 (V/P)</u>											Concentration: <u>3.125</u>										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	3	3	3	3	4	3	3	4	3	3	✓	3	✓	3	3	3	3	3	4	3	3	✓	4	4	3	4	4	3	3	3	3	3	✓
5	8	7	9	9	8	✓	7	7	8	6	BOL	6	✓	7	5	6	8	8	9	6	3	BOL	8	3	5	6	3	6	8	7	6	2	BOL
6	6	5	7	7	2	5	8	7	8	8	JRE	✓	5	5	2	2	1	9	6	7	10	JRE	3	7	1	4	7	✓	8	✓	2	8	JRE
7																																	
8																																	
Total	17	15	18	19	14	8	18	18	19	17	JRE	9	5	15	10	11	12	20	19	16	16	JRE	15	14	9	14	14	9	19	10	11	13	JRE

Days	Concentration: <u>6.25</u>											Concentration: <u>12.5</u>											Concentration: <u>25</u>										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	3	4	3	3	3	3	3	✓	2	✓	✓	3	3	4	3	3	3	6	3	3	2	✓	3	4	3	3	3	4	3	3	3	3	✓
5	4	6	5	6	6	✓	✓	8	4	BOL	✓	6	5	✓	5	6	7	✓	5	7	3	BOL	6	2	5	✓	5	✓	5	✓	4	3	BOL
6	2	4	7	✓	5	5	4	2	3	8	JRE	✓	3	7	3	2	4	4	4	3	5	JRE	3	8	5	5	5	4	6	8	3	✓	JRE
7																																	
8																																	
Total	9	14	15	9	14	14	7	2	13	12	✓	9	11	11	11	11	14	10	14	11	14	✓	12	14	13	8	13	8	14	11	10	6	✓

Days	Concentration: <u>50</u>											Concentration: <u>100</u>											Concentration:										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓											
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓											
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓											
4	3	3	✓	3	4	3	✓	2	2	3	✓	✓	✓	✓	3	✓	4	2	3	2	3	✓											
5	4	✓	3	5	6	4	8	5	6	7	BOL	✓	7	4	✓	7	9	✓	5	8	5	BOL											
6	5	4	3	5	6	5	5	7	✓	✓	JRE	6	7	6	7	7	✓	2	5	✓	4	✓											
7																																	
8																																	
Total	12	7	6	13	16	12	13	14	8	10	JRE	12	14	10	10	14	13	4	13	10	12	✓											

Notes: X = mortality.

Sample Description: \_\_\_\_\_  
 Comments: settling of sample on bottom of test tubes @ all test concentrations

Reviewed by: *[Signature]* Date reviewed: Aug 25, 2009

**CETIS Analytical Report**

Report Date: 19 Jul-09 16:05 (p 1 of 2)  
 Link/Link Code: 00-3778-8044/09211b

**Ceriodaphnia 7-d Survival and Reproduction Test** Nautilus Environmental

Analysis No: 13-7707-2943      Endpoint: 6d Survival Rate      CETIS Version: CETISv1.5.0  
 Analyzed: 19 Jul-09 16:02      Analysis: STP 2x2 Contingency Tables      Official Results: Yes

Sample No: 03-3207-8109      Code: 332078109      Client: Rescan  
 Sample Date: 05 Jul-09 09:30      Material: Mining Discharge/Runoff      Project:  
 Receive Date: 07 Jul-09 09:00      Source: Rescan  
 Sample Age: 72h      Station: SC2

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	100	<del>50</del> > 100	#Error	1	N/A

**Fisher Exact/Bonferroni-Holm Test**

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Negative Control		1.56	1.0000	1.0000	Non-Significant Effect
		3.12	1.0000	1.0000	Non-Significant Effect
		6.25	1.0000	1.0000	Non-Significant Effect
		12.5	1.0000	1.0000	Non-Significant Effect
		25	1.0000	1.0000	Non-Significant Effect
		50	1.0000	1.0000	Non-Significant Effect
		100	1.0000	1.0000	Non-Significant Effect

**Data Summary**

Conc-%	Control Type	No-Resp	Resp	Total
0	Negative Contr	10	0	10
1.56		10	0	10
3.12		10	0	10
6.25		10	0	10
12.5		10	0	10
25		10	0	10
50		10	0	10
100		10	0	10

**6d Survival Rate Detail**

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Contr	1	1	1	1	1	1	1	1	1	1
1.56		1	1	1	1	1	1	1	1	1	1
3.12		1	1	1	1	1	1	1	1	1	1
6.25		1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1

*ea Aug 25/09*

# CETIS Analytical Report

Report Date: 19 Jul-09 16:05 (p 2 of 2)  
Link/Link Code: 00-3778-8044/09211b

## Ceriodaphnia 7-d Survival and Reproduction Test

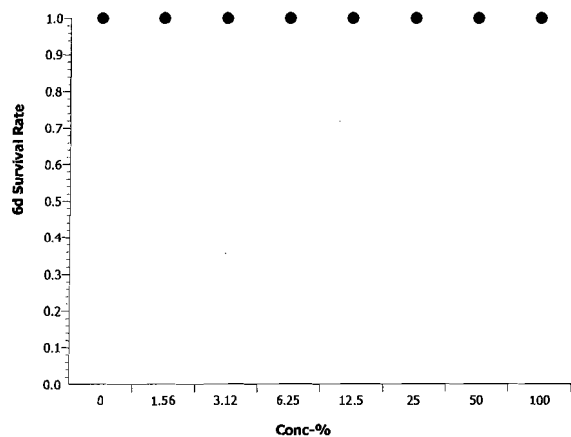
Nautilus Environmental

Analysis No: 13-7707-2943  
Analyzed: 19 Jul-09 16:02

Endpoint: 6d Survival Rate  
Analysis: STP 2x2 Contingency Tables

CETIS Version: CETISv1.5.0  
Official Results: Yes

### Graphics



*EE Aug 25/09*

**CETIS Analytical Report**

Report Date: 19 Jul-09 16:05 (p 1 of 2)  
 Link/Link Code: 00-3778-8044/09211b

**Ceriodaphnia 7-d Survival and Reproduction Test** **Nautilus Environmental**

Analysis No: 07-1221-6827      Endpoint: Reproduction      CETIS Version: CETISv1.5.0  
 Analyzed: 19 Jul-09 16:03      Analysis: Nonparametric-Control vs Treatments      Official Results: Yes

Sample No: 03-3207-8109      Code: 332078109      Client: Rescan  
 Sample Date: 05 Jul-09 09:30      Material: Mining Discharge/Runoff      Project:  
 Receive Date: 07 Jul-09 09:00      Source: Rescan  
 Sample Age: 72h      Station: SC2

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Rank		C > T	Not Run	3.12	6.25	4.416	32.05	22.02%

**Steel Many-One Rank Test**

Control	vs Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)
Negative Control	1.56	86.5	74	3	0.2954	Non-Significant Effect
	3.12	76	74	4	0.0705	Non-Significant Effect
	6.25*	66	74	2	0.0095	Significant Effect
	12.5*	66.5	74	1	0.0107	Significant Effect
	25*	64	74	2	0.0059	Significant Effect
	50*	65	74	2	0.0076	Significant Effect
	100*	65	74	1	0.0076	Significant Effect

**ANOVA Table**

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	242.9875	34.7125	7	3.069	0.0069	Significant Effect
Error	814.5	11.3125	72			
Total	1057.488	46.025	79			

**ANOVA Assumptions**

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	8.986	18.48	0.2537	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9579		0.0100	Non-normal Distribution

**Reproduction Summary**

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	10	16.3	15.01	17.59	8	19	0.6303	3.335	20.46%	0.0%
1.56		10	13.3	11.47	15.13	5	20	0.8911	4.715	35.45%	18.4%
3.12		10	12.8	11.59	14.01	9	19	0.5896	3.12	24.37%	21.47%
6.25		10	10.9	9.302	12.5	2	15	0.7789	4.122	37.81%	33.13%
12.5		10	11.6	10.91	12.29	9	14	0.3357	1.776	15.31%	28.83%
25		10	10.9	9.812	11.99	6	14	0.5304	2.807	25.75%	33.13%
50		10	11.1	9.841	12.36	6	16	0.6137	3.247	29.25%	31.9%
100		10	11.2	10.05	12.35	4	14	0.562	2.974	26.55%	31.29%

**Rank Transformed Summary**

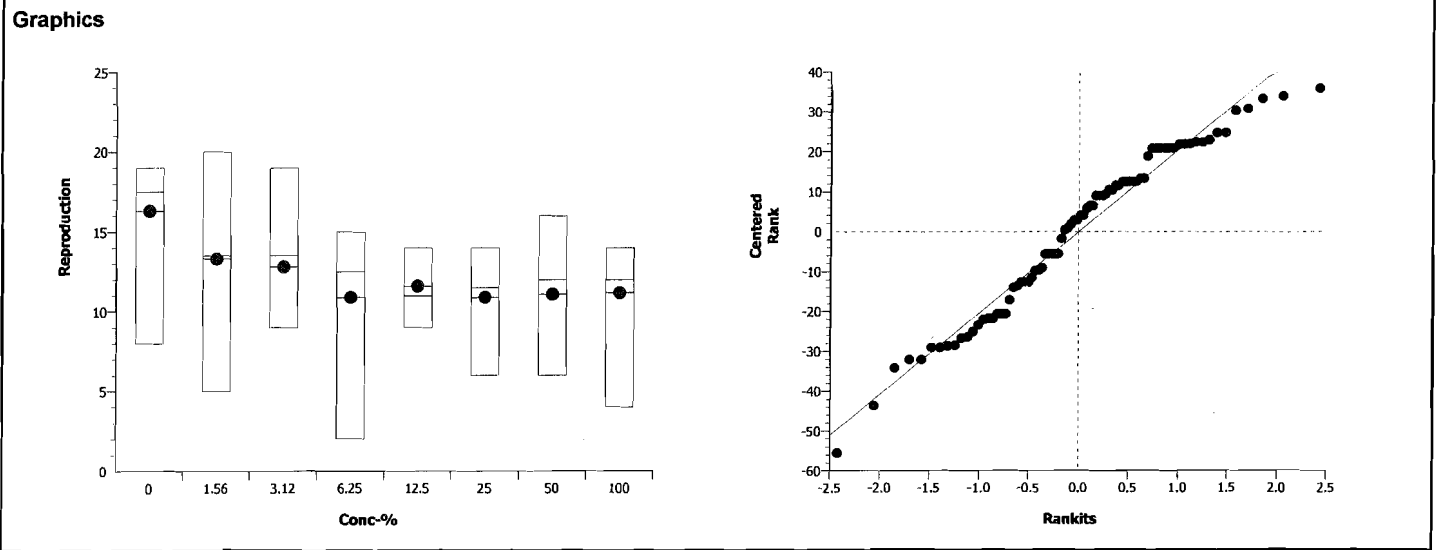
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	10	65.1	57.13	73.07	9.5	77.5	3.884	20.55	31.57%	0.0%
1.56		10	46.65	35.55	57.75	3	80	5.411	28.63	61.37%	28.34%
3.12		10	43.55	34.91	52.19	14.5	77.5	4.212	22.29	51.18%	33.1%
6.25		10	35.15	25.87	44.43	1	65.5	4.523	23.94	68.09%	46.01%
12.5		10	35.15	29.26	41.04	14.5	56	2.871	15.19	43.21%	46.01%
25		10	31.25	23.75	38.75	4.5	56	3.656	19.35	61.91%	52.0%
50		10	33	24.5	41.5	4.5	69	4.141	21.91	66.39%	49.31%
100		10	34.15	27.44	40.86	2	56	3.273	17.32	50.71%	47.54%

**CETIS Analytical Report**

Report Date: 19 Jul-09 16:05 (p 2 of 2)  
 Link/Link Code: 00-3778-8044/09211b

<b>Ceriodaphnia 7-d Survival and Reproduction Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 07-1221-6827	<b>Endpoint:</b> Reproduction	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 19 Jul-09 16:03	<b>Analysis:</b> Nonparametric-Control vs Treatments	<b>Official Results:</b> Yes			

<b>Reproduction Detail</b>											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Contr	19	19	18	18	18	17	17	15	14	8
1.56		20	19	16	16	15	12	11	10	9	5
3.12		19	15	14	14	14	13	11	10	9	9
6.25		15	14	14	14	13	12	9	9	7	2
12.5		14	14	14	11	11	11	11	11	10	9
25		14	14	13	13	12	11	10	8	8	6
50		16	14	13	13	12	12	10	8	7	6
100		14	14	13	13	12	12	10	10	10	4



*ECU Aug. 25/09*

**CETIS Analytical Report**

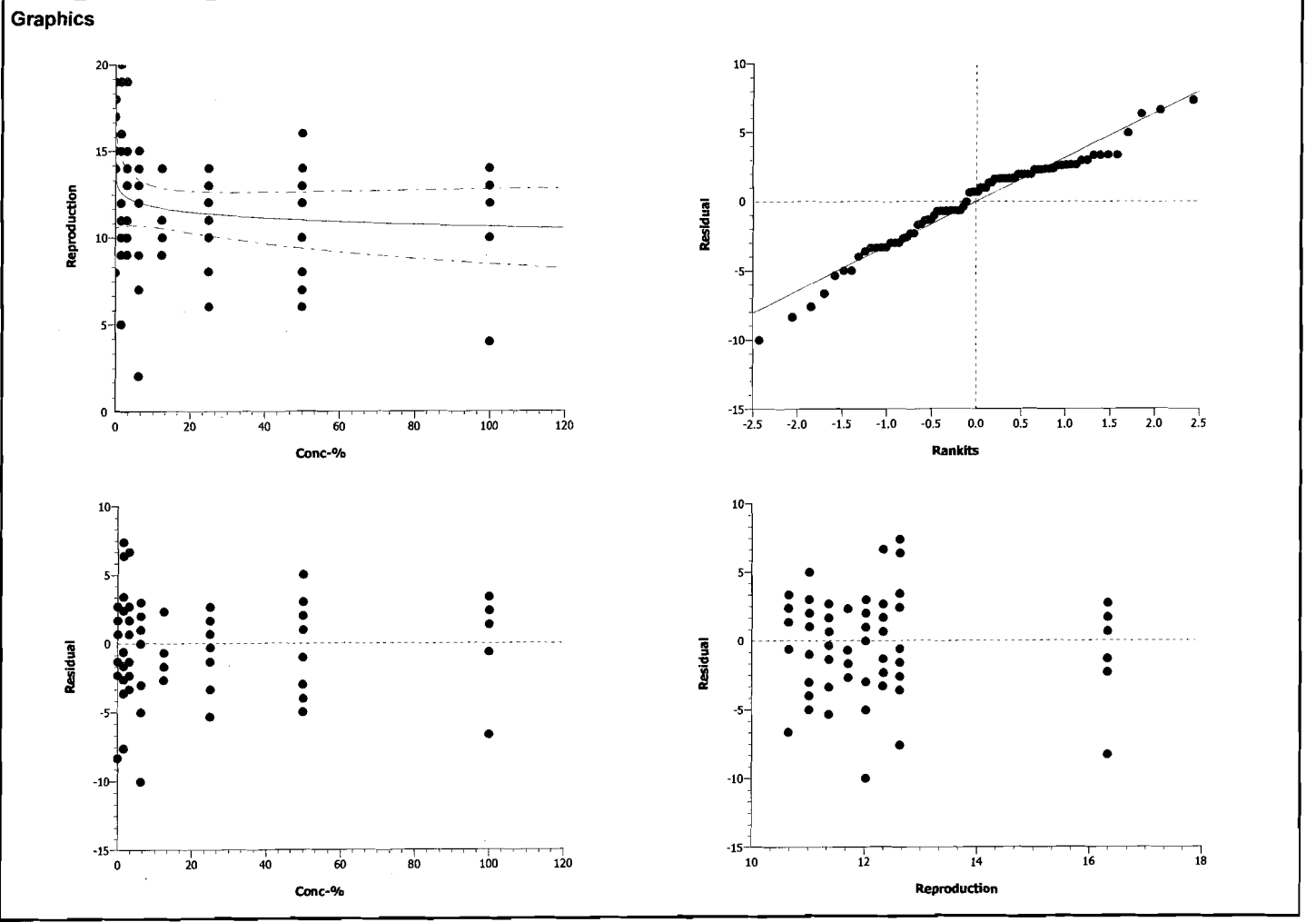
Report Date: 19 Jul-09 16:05 (p 1 of 2)  
 Link/Link Code: 00-3778-8044/09211b

Ceriodaphnia 7-d Survival and Reproduction Test							Nautilus Environmental		
Analysis No:	12-2531-6640	Endpoint:	Reproduction	CETIS Version:	CETISv1.5.0				
Analyzed:	19 Jul-09 16:04	Analysis:	Nonlinear Regression	Official Results:	Yes				
Sample No:	03-3207-8109	Code:	332078109	Client:	Rescan				
Sample Date:	05 Jul-09 09:30	Material:	Mining Discharge/Runoff	Project:					
Receive Date:	07 Jul-09 09:00	Source:	Rescan						
Sample Age:	72h	Station:	SC2						
<b>Non-Linear Regression Options</b>									
Model Function		X Transform	Y Transform	Weighting Function	PTBS Function				
3P Log-Logistic EV [Y=A/(1+(X/D)^C)]		None	None	Normal [W=1]	Off [Y*=Y]				
<b>Regression Summary</b>									
Iters	Log LL	AICc	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(1%)	
54	-134	274.4	0.1858	Yes	0.437	3.283	0.8213	Non-Significant Lack of Fit	
<b>Point Estimates</b>									
% Effect	Conc-%	95% LCL	95% UCL						
SNEC	0.358	0.0003647	23.81						
10	0.00184	N/A	3.963						
15	0.04612	9.052E-10	14.08						
20	0.5215	0.00132	25.57						
25	3.866	0.265	36.46						
40	482.5	3.017	39580						
50	8122	1.03	64080000						
<b>Regression Parameters</b>									
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)		
A	16.33	1.063	14.21	18.45	15.36	0.0000	Significant Parameter		
C	0.1436	0.092	-0.03959	0.3268	1.561	0.1226	Non-Significant Parameter		
D	8122	32450	-56490	72740	0.2503	0.8030	Non-Significant Parameter		
<b>ANOVA Table</b>									
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(1%)			
Model	218.2689	109.1345	2	10.01	0.0001	Significant			
Lack of Fit	24.71856	4.943712	5	0.437	0.8213	Non-Significant			
Pure Error	814.5	11.3125	72						
Residual	839.2186	10.89894	77						
<b>Residual Analysis</b>									
Attribute	Method	Test Stat	Critical	P-Value	Decision(1%)				
Variances	Bartlett Equality of Variance	8.986	18.48	0.2537	Equal Variances				
Distribution	Shapiro-Wilk Normality	0.9588		0.0114	Normal Distribution				
<b>Reproduction Summary</b>									
Conc-%	Control Type	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	10	16.3	8	19	0.6193	3.335	20.46%	0.0%
1.56		10	13.3	5	20	0.8756	4.715	35.45%	18.4%
3.12		10	12.8	9	19	0.5793	3.12	24.37%	21.47%
6.25		10	10.9	2	15	0.7654	4.122	37.81%	33.13%
12.5		10	11.6	9	14	0.3299	1.776	15.31%	28.83%
25		10	10.9	6	14	0.5212	2.807	25.75%	33.13%
50		10	11.1	6	16	0.603	3.247	29.25%	31.9%
100		10	11.2	4	14	0.5523	2.974	26.55%	31.29%

*ECU Aug 25/09*

Ceriodaphnia 7-d Survival and Reproduction Test						Nautilus Environmental					
Analysis No: 12-2531-6640		Endpoint: Reproduction				CETIS Version: CETISv1.5.0					
Analyzed: 19 Jul-09 16:04		Analysis: Nonlinear Regression				Official Results: Yes					

Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	17	15	18	19	14	8	18	18	19	17
1.56		9	5	15	10	11	12	20	19	16	16
3.12		15	14	9	14	14	9	19	10	11	13
6.25		9	14	15	9	14	14	7	2	13	12
12.5		9	11	11	11	11	14	10	14	11	14
25		12	14	13	8	13	8	14	11	10	6
50		12	7	6	13	16	12	13	14	8	10
100		12	14	10	10	14	13	4	13	10	12



*EC Aug 25/09*

## Ceriodaphnia dubia Summary Sheet

Client: Rescan  
 Work Order No.: 09211

Start Date/Time: July 8/09 @ 1600  
 Set up by: Foto AWD  
BFL

**Sample Information:**

Sample ID: STE 2  
 Sample Date: July 5/2009  
 Date Received: July 7/2009  
 Sample Volume: 200 µl x 20L

**Test Organism Information:**

Broodstock No.: 063009  
 Age of young (Day 0): <24 (within 12-h)  
 Avg No. young in first 3 broods of previous 7 d: 18  
 Mortality (%) in previous 7 d: 2  
 Individual female # used ≥8 young on test day: 32, 33, 34, 35, 36, 37, 38, 40, 41

**NaCl Reference Toxicant Results:**

Reference Toxicant ID: Cd 44  
 Stock Solution ID: 08Na2O4  
 Date Initiated: July 2/09

7-d LC50 (95% CL): 2.0 (1.7-2.3)  
 7-d IC50 (95% CL): 1.2 (1.0-1.5)

7-d LC50 Reference Toxicant Mean ± 2 SD: 1.7 ± 0.7 CV (%): 22  
 7-d IC50 Reference Toxicant Mean ± 2 SD: 1.2 ± 0.3 CV (%): 25.14

**Test Results:**

	Survival	Reproduction
NOEC %(v/v)	100	100
LOEC %(v/v)	>100	>100
LC50 %(v/v) (95% CL)	>100	
IC25 %(v/v) (95% CL)		>100
IC50 %(v/v) (95% CL)		>100

Reviewed by: *CA*

Date reviewed: Aug 27/09



## Chronic Freshwater Toxicity Test Initial and Final Water Quality Measurements

5

Client: RESCAN  
 Sample ID: STE2  
 Work Order #: 09211

Start Date & Time: July 8/09 @ 1600  
 Stop Date: July 15/09 @ 1600  
 Test Species: Ceriodaphnia dubia

Concentration <i>Control</i>	Days													
	0	1		2		3		4		5		6		7
	old	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.5	25.3	24.2	25.4	25.3	25.7	25.0	25.4	25.0	25.4	25.2	25.6	24.9	25.3
DO (mg/L)	8.0	7.4	8.1	7.1	8.2	7.3	8.2	7.4	8.2	7.5	8.2	7.3	8.1	7.4
pH	8.1	7.9	8.2	7.7	8.1	7.9	8.1	7.9	8.1	8.0	8.2	7.9	8.1	7.8
Cond. (µS/cm)	212	212		205		212		205		206		210		220
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	BPL	BPL	BPL

Concentration <i>1.9</i>	Days													
	0	1		2		3		4		5		6		7
	old	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.6	25.2	24.2	25.4	25.1	25.7	25.3	25.7	25.3	25.4	25.2	25.6	24.9	25.3
DO (mg/L)	8.1	7.4	8.1	7.2	8.2	7.4	8.1	7.3	8.2	7.5	8.2	7.3	8.1	7.3
pH	8.1	7.8	8.1	7.7	8.1	7.8	8.2	7.9	8.2	8.0	8.3	7.9	8.0	7.9
Cond. (µS/cm)	209	211		209		196		203		199		205		210
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	BPL	BPL	BPL

Concentration <i>12.5</i>	Days													
	0	1		2		3		4		5		6		7
	old	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	25.2	25.3	24.3	25.4	24.6	25.7	25.2	25.4	25.4	25.4	25.2	25.6	24.9	25.3
DO (mg/L)	8.1	7.4	8.2	7.5	8.2	7.4	8.2	7.4	8.1	7.4	8.2	7.3	8.0	7.4
pH	8.1	7.7	8.2	7.7	8.0	7.8	8.2	7.8	8.0	8.0	8.3	7.9	8.0	7.9
Cond. (µS/cm)	192	195		195		185		189		185		190		192
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	BPL	BPL	BPL

Concentration <i>100</i>	Days													
	0	1		2		3		4		5		6		7
	old	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	25.5	25.3	25.0	25.4	25.2	25.7	25.6	25.4	25.7	25.4	25.2	25.6	24.8	25.3
DO (mg/L)	8.0	7.5	8.2	7.5	8.2	8.2	7.5	8.1	7.5	8.2	7.4	8.1	7.4	7.4
pH	7.4	7.6	7.5	7.6	7.6	7.7	7.7	7.4	7.6	7.4	7.4	7.4	7.4	7.3
Cond. (µS/cm)	63	69		64		62		63		62		60		72
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	BPL	BPL	BPL

	Control	100%		
Hardness*	100	34		
Alkalinity*	80	6		

Analysts: BPL, m JRF

Reviewed by: ER

Date reviewed: Aug 25/09

\* mg/L as CaCO3

Sample Description: Clear

Comments: used BS 063009

**Chronic Freshwater Toxicity Test  
C. dubia Reproduction Data**

Client: Rescon  
 Sample ID: STE 2  
 Work Order: 09211

Start Date & Time: July 8 / 09 @ 1600  
 Stop Date & Time: July 15 / 09 @ 1600  
 Set up by: AUD

0% (V/V)

Days	Concentration: <u>Control</u>											Concentration: <u>1%</u>											Concentration: <u>3.25</u>										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8																																	
Total	4	15	16	15	17	14	15	15	13	11	BRL	15	17	11	10	14	13	16	17	15	4	BRL	13	12	17	13	14	13	11	14	12	10	BRL

Days	Concentration: <u>6.25</u>											Concentration: <u>12.5</u>											Concentration: <u>25</u>										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8																																	
Total	16	14	9	9	8	16	13	16	15	11	BRL	16	18	14	12	14	16	10	11	14	9	BRL	13	9	13	18	14	17	7	6	8	13	BRL

Days	Concentration: <u>50</u>											Concentration: <u>100</u>											Concentration:										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓											
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓											
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓											
4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓											
5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓											
6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓											
7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓											
8																																	
Total	8	10	7	14	10	7	22	12	13	9	BRL	11	10	11	13	8	10	14	11	6	12	BRL											

Notes: X = mortality.

Sample Description: \_\_\_\_\_  
 Comments: \_\_\_\_\_

Reviewed by: ica

Date reviewed: Aug. 25 / 09

**CETIS Analytical Report**

Report Date: 13 Aug-09 13:27 (p 1 of 2)

Link/Link Code: 02-6684-8950/09211-STE2

**Ceriodaphnia 7-d Survival and Reproduction Test** Nautilus Environmental

<b>Analysis No:</b> 16-7538-4546	<b>Endpoint:</b> 7d Survival Rate	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 13 Aug-09 13:23	<b>Analysis:</b> STP 2x2 Contingency Tables	<b>Official Results:</b> Yes

<b>Test Run No:</b> 19-6714-0337	<b>Test Type:</b> Reproduction-Survival (7d)	<b>Dil Water:</b> Perrier Water
<b>Start Date:</b> 08 Jul-09 16:00	<b>Protocol:</b> EPA/821/R-02-013 (2002)	<b>Brine:</b>
<b>Ending Date:</b>	<b>Species:</b> Ceriodaphnia dubia	
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture	

<b>Sample No:</b> 02-9960-3283	<b>Code:</b> STE 2-Jul	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09 13:15	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 75h	<b>Station:</b> STE 2	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	100	> ico	#Error	1	N/A

**Fisher Exact/Bonferroni-Holm Test**

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Negative Control		1.6	1.0000	1.0000	Non-Significant Effect
		3.13	1.0000	1.0000	Non-Significant Effect
		6.25	1.0000	1.0000	Non-Significant Effect
		12.5	1.0000	1.0000	Non-Significant Effect
		25	1.0000	1.0000	Non-Significant Effect
		50	1.0000	1.0000	Non-Significant Effect
		100	1.0000	1.0000	Non-Significant Effect

**Test Acceptability**

Attribute	Acceptability Range	Test Stat	Overlap	Decision
Control Resp	0.8 - NL	1	Yes	Passes acceptability criteria

**Data Summary**

Conc-%	Control Type	No-Resp	Resp	Total
0	Negative Contr	10	0	10
1.6		10	0	10
3.13		10	0	10
6.25		10	0	10
12.5		10	0	10
25		10	0	10
50		10	0	10
100		10	0	10

**7d Survival Rate Detail**

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Contr	1	1	1	1	1	1	1	1	1	1
1.6		1	1	1	1	1	1	1	1	1	1
3.13		1	1	1	1	1	1	1	1	1	1
6.25		1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1

*EW Aug 25/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 18:02 (p 1 of 2)  
 Link/Link Code: 02-6684-8950/09211-STE2

**Ceriodaphnia 7-d Survival and Reproduction Test** **Nautilus Environmental**

<b>Analysis No:</b> 03-4162-7141	<b>Endpoint:</b> Reproduction	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 26 Aug-09 18:01	<b>Analysis:</b> Parametric-Control vs Treatments	<b>Official Results:</b> Yes

<b>Test Run No:</b> 19-6714-0337	<b>Test Type:</b> Reproduction-Survival (7d)	<b>Dil Water:</b> Perrier Water
<b>Start Date:</b> 08 Jul-09 16:00	<b>Protocol:</b> EPA/821/R-02-013 (2002)	<b>Brine:</b>
<b>Ending Date:</b>	<b>Species:</b> Ceriodaphnia dubia	
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture	

<b>Sample No:</b> 02-9960-3283	<b>Code:</b> STE 2-Jul	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09 13:15	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 75h	<b>Station:</b> STE 2	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	100	<i>est</i> $\mu > 100$	#Error	1	27.42%

**Dunnett's Multiple Comparison Test**

Control	vs Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control	1.6	0.2579	2.386	3.702	0.7986	Non-Significant Effect
	3.13	0.4512	2.386	3.702	0.7264	Non-Significant Effect
	6.25	0.5157	2.386	3.702	0.6999	Non-Significant Effect
	12.5	0.1934	2.386	3.702	0.8199	Non-Significant Effect
	25	1.096	2.386	3.702	0.4322	Non-Significant Effect
	50	1.483	2.386	3.702	0.2661	Non-Significant Effect
	100	1.869	2.386	3.702	0.1426	Non-Significant Effect

**Test Acceptability**

Attribute	Acceptability Range	Test Stat	Overlap	Decision
Control Resp	15 - NL	13.5	Yes	Fails acceptability criteria
PMSD	0.13 - 0.47	0.2742	Yes	Passes acceptability criteria

**ANOVA Table**

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	76.1875	10.88393	7	0.9046	0.5079	Non-Significant Effect
Error	866.3	12.03194	72			
Total	942.4875	22.91587	79			

**ANOVA Assumptions**

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	8.593	18.48	0.2832	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9729		0.0874	Normal Distribution

**Reproduction Summary**

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	10	13.5	12.06	14.94	4	17	0.7029	3.719	27.55%	0.0%
1.6		10	13.1	11.51	14.69	4	17	0.7738	4.095	31.26%	2.96%
3.13		10	12.8	11.99	13.61	9	17	0.3964	2.098	16.39%	5.18%
6.25		10	12.7	11.46	13.94	8	16	0.6045	3.199	25.19%	5.93%
12.5		10	13.2	12.08	14.32	9	18	0.5477	2.898	21.96%	2.22%
25		10	11.8	10.2	13.4	6	18	0.7807	4.131	35.01%	12.59%
50		10	11.2	9.458	12.94	7	22	0.8489	4.492	40.11%	17.04%
100		10	10.6	9.701	11.5	6	14	0.4383	2.319	21.88%	21.48%

*EW*  
 Aug. 27/09

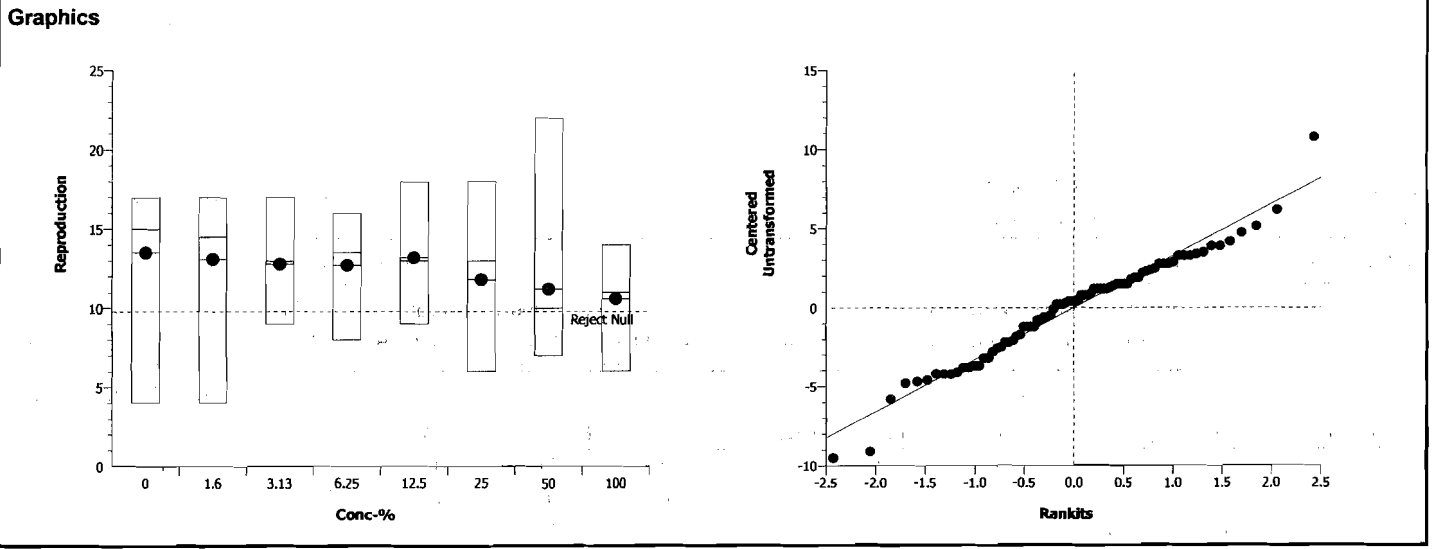
**CETIS Analytical Report**

Report Date: 26 Aug-09 18:02 (p 2 of 2)

Link/Link Code: 02-6684-8950/09211-STE2

<b>Ceriodaphnia 7-d Survival and Reproduction Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 03-4162-7141	<b>Endpoint:</b> Reproduction	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 26 Aug-09 18:01	<b>Analysis:</b> Parametric-Control vs Treatments	<b>Official Results:</b> Yes			

<b>Reproduction Detail</b>											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Contr	17	16	15	15	15	15	14	13	11	4
1.6		17	17	16	15	15	14	13	11	9	4
3.13		17	14	14	13	13	13	12	12	11	9
6.25		16	16	16	15	14	13	11	9	9	8
12.5		18	16	16	14	14	12	12	11	10	9
25		18	17	14	13	13	13	9	8	7	6
50		22	14	13	12	10	10	9	8	7	7
100		14	13	12	11	11	11	10	10	8	6



*Ea*  
Aug. 27/09

**CETIS Analytical Report**

Report Date: 26 Aug-09 18:02 (p 1 of 2)  
 Link/Link Code: 02-6684-8950/09211-STE2

Ceriodaphnia 7-d Survival and Reproduction Test						Nautilus Environmental					
Analysis No: 10-7757-5725		Endpoint: Reproduction		CETIS Version: CETISv1.5.0							
Analyzed: 26 Aug-09 18:00		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes							
Test Run No: 19-6714-0337		Test Type: Reproduction-Survival (7d)		Dil Water: Perrier Water							
Start Date: 08 Jul-09 16:00		Protocol: EPA/821/R-02-013 (2002)		Brine:							
Ending Date:		Species: Ceriodaphnia dubia									
Duration: N/A		Source: In-House Culture									
Sample No: 02-9960-3283		Code: STE 2-Jul		Client: Rescan							
Sample Date: 05 Jul-09 13:15		Material: Water Sample		Project:							
Receive Date: 07 Jul-09 09:00		Source: Rescan									
Sample Age: 75h		Station: STE 2									
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X + 1)	Linear	57951	200	Yes	Two-Point Interpolation						
Test Acceptability											
Attribute	Acceptability Range		Test Stat	Overlap	Decision						
Control Resp	15 - NL		13.5	Yes	Fails acceptability criteria						
Point Estimates											
% Effect	Conc-%	95% LCL	95% UCL								
5	13.12	0.348	56.25								
10	20.11	0.817	93.92								
15	36.45	1.449	N/A								
20	79.43	12.43	N/A								
25	> 100	N/A	N/A								
40	> 100	N/A	N/A								
50	> 100	N/A	N/A								
Reproduction Summary											
			Calculated Variate								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%		
0	Negative Control	10	13.5	4	17	0.6907	3.719	27.55%	0.0%		
1.6		10	13.1	4	17	0.7604	4.095	31.26%	2.96%		
3.13		10	12.8	9	17	0.3895	2.098	16.39%	5.18%		
6.25		10	12.7	8	16	0.594	3.199	25.19%	5.93%		
12.5		10	13.2	9	18	0.5382	2.898	21.96%	2.22%		
25		10	11.8	6	18	0.7671	4.131	35.01%	12.59%		
50		10	11.2	7	22	0.8341	4.492	40.11%	17.04%		
100		10	10.6	6	14	0.4306	2.319	21.88%	21.48%		
Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	4	15	16	15	17	14	15	15	13	11
1.6		15	17	11	14	9	13	16	17	15	4
3.13		13	12	17	13	14	13	11	14	12	9
6.25		16	14	9	9	8	16	13	16	15	11
12.5		16	18	14	12	12	16	10	11	14	9
25		13	9	13	18	14	17	7	6	8	13
50		8	10	7	14	10	7	22	12	13	9
100		11	10	11	13	8	10	14	11	6	12

*ea* Aug 27/09

**CETIS Analytical Report**

Report Date: 26 Aug-09 18:02 (p 2 of 2)

Link/Link Code: 02-6684-8950/09211-STE2

**Ceriodaphnia 7-d Survival and Reproduction Test**

**Nautilus Environmental**

Analysis No: 10-7757-5725

Endpoint: Reproduction

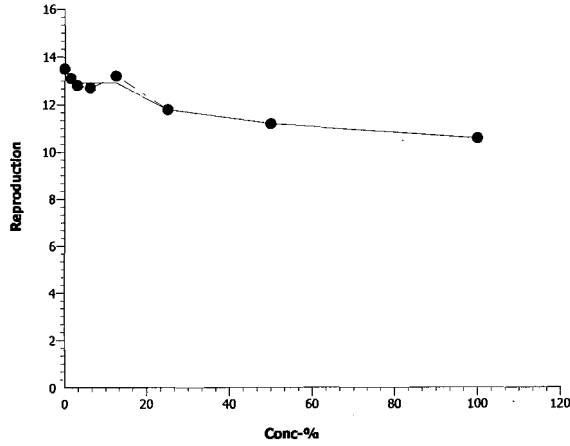
CETIS Version: CETISv1.5.0

Analyzed: 26 Aug-09 18:00

Analysis: Linear Interpolation (ICPIN)

Official Results: Yes

**Graphics**



*EC*  
Aug 27/09

## Ceriodaphnia dubia Summary Sheet

Client: Procon  
 Work Order No.: 09211

Start Date/Time: July 7 / 09 @ 1200h  
 Set up by: JRE

**Sample Information:**

Sample ID: NTR2  
 Sample Date: July 5 / 09  
 Date Received: July 7 / 09  
 Sample Volume: 9x20L

**Test Organism Information:**

Broodstock No.: 063009  
 Age of young (Day 0): 429 (w/in 12-h)  
 Avg No. young in first 3 broods of previous 7 d: 18  
 Mortality (%) in previous 7 d: 2  
 Avg. No. of young in previous brood: 31, 44, 45, 51, 68, 58, 63, 69, 69, 71, 75  
 Females Used  $\geq$  8 young for testing

**NaCl Reference Toxicant Results:**

Reference Toxicant ID: Cd 44  
 Stock Solution ID: OF Na2O4  
 Date Initiated: July 27/09  
 7-d LC50 (95% CL): 2.0 (1.7 - 2.3)  
 7-d IC50 (95% CL): 1.2 (1.0 - 1.5)

7-d LC50 Reference Toxicant Mean  $\pm$  2 SD: 1.7  $\pm$  0.7 CV (%): 22  
 7-d IC50 Reference Toxicant Mean  $\pm$  2 SD: 1.2  $\pm$  0.3 CV (%): 14 13.5%

**Test Results:**

	Survival	Reproduction
NOEC %(v/v)	100	1.56
LOEC %(v/v)	> 100	3.12
LC50 %(v/v) (95% CL)	> 100	
IC25 %(v/v) (95% CL)		5.4 (1.6 - 16.1)
IC50 %(v/v) (95% CL)		> 100

Reviewed by: [Signature]

Date reviewed: Aug 27/09



6

### Chronic Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Rescan  
Sample ID: NTR2  
Work Order #: 09211

Start Date & Time: July 7/09 @ 12:00h  
Stop Date: July 13/09 @ 16:00h  
Test Species: Ceriodaphnia dubia

Concentration <i>Control</i>	Days													
	0	1		2		3		4		5		6		7
	init.	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.1	25.1	24.5	25.3	24.2	25.3	25.2	25.3	25.0	25.4	25.0	25.4		
DO (mg/L)	8.0	7.2	8.0	7.6	8.1	7.5	8.2	7.4	8.2	6.9	8.2	7.4		
pH	8.1	8.0	8.1	7.7	8.2	7.8	8.1	7.9	8.1	7.4	8.1	7.9		
Cond. (µS/cm)	215		214		212		205		202		206		209	
Initials	JRE	A	A	A	A	A	A	A	A	A	A	A	BPL	

Concentration <i>~5.1.9</i>	Days													
	0	1		2		3		4		5		6		7
	init.	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.2	25.1	24.8	25.3	24.7	25.3	25.0	25.3	25.3	25.1	25.3	25.4		
DO (mg/L)	8.1	7.2	8.1	7.7	8.2	7.4	8.2	7.4	8.2	7.3	8.2	7.4		
pH	8.1	8.1	8.1	7.7	8.2	7.7	8.1	7.8	8.2	7.9	8.2	7.9		
Cond. (µS/cm)	213		212		208		200		198		203		204	
Initials	JRE	A	A	A	A	A	A	A	A	A	A	A	BPL	

Concentration <i>12.5</i>	Days													
	0	1		2		3		4		5		6		7
	init.	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.4	25.1	25.1	25.3	24.3	25.3	25.4	25.3	25.3	25.7	25.6	25.4		
DO (mg/L)	8.1	7.3	8.1	7.4	8.2	7.4	8.2	7.5	8.2	7.8	8.2	7.4		
pH	8.1	8.0	8.0	7.8	8.2	7.6	8.0	7.7	8.2	7.6	8.2	7.9		
Cond. (µS/cm)	197		194		196		190		184		192		194	
Initials	JRE	A	A	A	A	A	A	A	A	A	A	A	BPL	

Concentration <i>100</i>	Days													
	0	1		2		3		4		5		6		7
	init.	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	25.3	25.1	25.6	25.3	24.7	25.3	25.4	25.3	25.7	25.7	25.7	25.4		
DO (mg/L)	8.2	7.4	7.2	7.5	8.2	7.5	8.2	7.4	8.2	7.3	8.1	7.3		
pH	7.5	7.9	7.6	7.7	7.5	7.5	7.6	7.4	7.4	7.5	7.5	7.3		
Cond. (µS/cm)	68		69		69		69		67		68		74	
Initials	JRE	A	A	A	A	A	A	A	A	A	A	A	BPL	

	Control	100		
Hardness*	100	32		
Alkalinity*	80	16		

Analysts: BPL, AWA, JRE

Reviewed by: JRE

Date reviewed: Aug 27/09

\* mg/L as CaCO3

Sample Description: light brown <sup>opaque</sup> (1)

Comments: used BS 063009

**Chronic Freshwater Toxicity Test  
C. dubia Reproduction Data**

Client: Pescor  
 Sample ID: NTR2  
 Work Order: 09211

Start Date & Time: July 7/09 1200h  
 Stop Date & Time: July 13/09 1600h  
 Set up by: JRE

0.1 (1/1) P<sub>16</sub>

Days	Concentration: Control												Concentration: 0.1												Concentration: 3.125											
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init			
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n			
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n			
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	3	3	3	4	4	4	3	4	4	3	n	3	4	4	5	4	3	4	✓	4	4	n			
4	4	4	4	4	4	4	3	4	4	4	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n			
5	9	8	7	7	8	7	8	7	9	10	n	7	7	8	10	9	7	7	7	7	10	n	7	8	8	7	8	8	9	7	5	6	n			
6	8	9	8	10	10	6	8	10	9	7	BQL	4	7	6	2	8	9	5	7	8	7	BQL	5	2	✓	✓	✓	3	✓	4	6	4	BQL			
7																																				
8																																				
Total	21	21	19	21	22	17	19	21	22	21	n	16	17	17	16	21	20	15	18	20	20	n	15	14	12	12	12	14	12	15	15	14	n			

Days	Concentration: 6.25												Concentration: 12.5												Concentration: 25											
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init			
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n			
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n			
3	✓	✓	4	4	✓	✓	3	3	3	2	n	✓	✓	✓	3	✓	3	2	✓	3	3	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n			
4	3	3	✓	✓	5	3	6	✓	6	✓	n	3	3	4	6	3	7	7	4	6	5	n	5	4	3	4	5	4	4	4	6	5	n			
5	7	6	7	8	7	9	7	6	8	10	n	7	6	5	7	8	9	✓	7	9	7	n	7	7	7	6	6	8	7	8	5	7	n			
6	5	7	5	✓	5	5	6	5	4	4	BQL	3	2	✓	✓	2	✓	4	5	5	4	BQL	6	5	3	✓	4	✓	✓	2	6	3	BQL			
7																																				
8																																				
Total	15	16	16	12	17	17	18	14	17	17	n	13	11	9	6	13	19	13	16	18	15	n	18	16	13	10	15	12	11	14	17	15	n			

Days	Concentration: 50												Concentration: 100												Concentration: 200											
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init			
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n														
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n														
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n														
4	4	3	3	3	3	2	2	3	3	4	n	3	3	3	✓	3	4	4	✓	3	4	n														
5	7	7	6	8	6	7	6	9	7	6	n	6	5	4	4	7	8	6	9	8	7	n														
6	8	5	✓	✓	✓	4	7	✓	8	5	BQL	5	8	9	5	✓	5	✓	8	5	BQL															
7																																				
8																																				
Total	19	15	9	11	9	15	16	12	18	15	n	14	16	16	9	10	12	15	9	19	16	n														

Notes: X = mortality.

Sample Description: \_\_\_\_\_

Comments: \_\_\_\_\_

①

precipitation on the bottom of test tubes in all test concentrations

Reviewed by: EV

Date reviewed: \_\_\_\_\_

Aug 25/09

**CETIS Analytical Report**

Report Date: 19 Jul-09 16:18 (p 1 of 2)  
 Link/Link Code: 20-1336-9444/09211cNTR2

**Ceriodaphnia 7-d Survival and Reproduction Test** **Nautilus Environmental**

<b>Analysis No:</b> 16-4344-0181	<b>Endpoint:</b> 6d Survival Rate	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 19 Jul-09 16:16	<b>Analysis:</b> STP 2x2 Contingency Tables	<b>Official Results:</b> Yes

<b>Sample No:</b> 08-7470-6538	<b>Code:</b> 874706538	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09 15:15	<b>Material:</b> Mining Discharge/Runoff	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 45h	<b>Station:</b> NTR2	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	100	<i>ex &gt; 100</i>	#Error	1	N/A

**Fisher Exact/Bonferroni-Holm Test**

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Negative Control		1.56	1.0000	1.0000	Non-Significant Effect
		3.12	1.0000	1.0000	Non-Significant Effect
		6.25	1.0000	1.0000	Non-Significant Effect
		12.5	1.0000	1.0000	Non-Significant Effect
		25	1.0000	1.0000	Non-Significant Effect
		50	1.0000	1.0000	Non-Significant Effect
		100	1.0000	1.0000	Non-Significant Effect

**Data Summary**

Conc-%	Control Type	No-Resp	Resp	Total
0	Negative Contr	10	0	10
1.56		10	0	10
3.12		10	0	10
6.25		10	0	10
12.5		10	0	10
25		10	0	10
50		10	0	10
100		10	0	10

**6d Survival Rate Detail**

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Contr	1	1	1	1	1	1	1	1	1	1
1.56		1	1	1	1	1	1	1	1	1	1
3.12		1	1	1	1	1	1	1	1	1	1
6.25		1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1

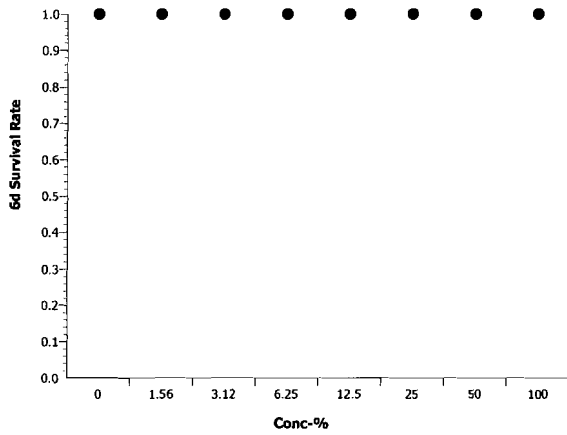
*EA*  
 Aug 25/09

# CETIS Analytical Report

Report Date: 19 Jul-09 16:18 (p 2 of 2)  
Link/Link Code: 20-1336-9444/09211cNTR2

<b>Ceriodaphnia 7-d Survival and Reproduction Test</b>		<b>Nautilus Environmental</b>
<b>Analysis No:</b> 16-4344-0181	<b>Endpoint:</b> 6d Survival Rate	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 19 Jul-09 16:16	<b>Analysis:</b> STP 2x2 Contingency Tables	<b>Official Results:</b> Yes

## Graphics



*Handwritten signature*  
Aug 25/09

**CETIS Analytical Report**

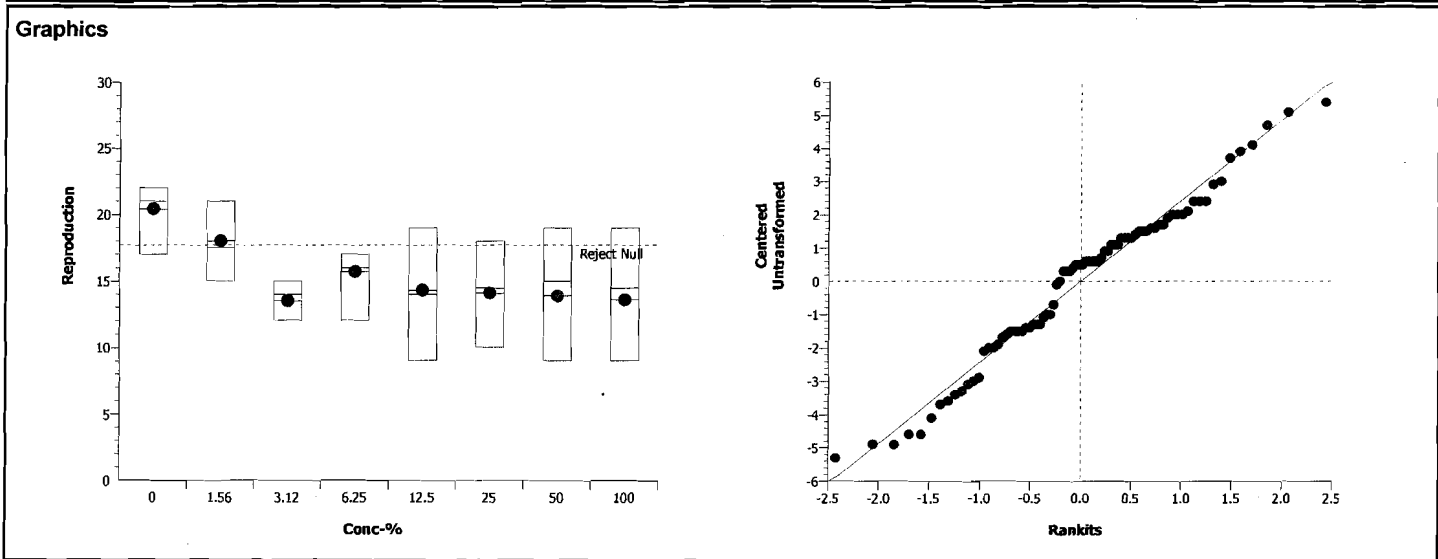
Report Date: 19 Jul-09 16:18 (p 1 of 2)  
 Link/Link Code: 20-1336-9444/09211cNTR2

Ceriodaphnia 7-d Survival and Reproduction Test								Nautilus Environmental			
Analysis No:	17-2487-9352	Endpoint:	Reproduction	CETIS Version:	CETISv1.5.0						
Analyzed:	19 Jul-09 16:16	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes						
Sample No:	08-7470-6538	Code:	874706538	Client:	Rescan						
Sample Date:	05 Jul-09 15:15	Material:	Mining Discharge/Runoff	Project:							
Receive Date:	07 Jul-09 09:00	Source:	Rescan								
Sample Age:	45h	Station:	NTR2								
<b>Data Transform</b>	<b>Zeta</b>	<b>Alt Hyp</b>	<b>Monte Carlo</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>TU</b>	<b>PMSD</b>			
Untransformed		C > T	Not Run	1.56	3.12	2.206	64.1	13.33%			
<b>Dunnett's Multiple Comparison Test</b>											
<b>Control</b>	<b>vs</b>	<b>Conc-%</b>	<b>Test Stat</b>	<b>Critical</b>	<b>MSD</b>	<b>P-Value</b>	<b>Decision(5%)</b>				
Negative Control		1.56	2.107	2.386	2.719	0.0908	Non-Significant Effect				
		3.12*	6.056	2.386	2.719	0.0000	Significant Effect				
		6.25*	4.125	2.386	2.719	0.0003	Significant Effect				
		12.5*	5.354	2.386	2.719	0.0000	Significant Effect				
		25*	5.53	2.386	2.719	0.0000	Significant Effect				
		50*	5.705	2.386	2.719	0.0000	Significant Effect				
		100*	5.968	2.386	2.719	0.0000	Significant Effect				
<b>ANOVA Table</b>											
<b>Source</b>	<b>Sum Squares</b>	<b>Mean Square</b>	<b>DF</b>	<b>F Stat</b>	<b>P-Value</b>	<b>Decision(5%)</b>					
Between	438.3875	62.62679	7	9.649	0.0000	Significant Effect					
Error	467.3	6.490278	72								
Total	905.6875	69.11707	79								
<b>ANOVA Assumptions</b>											
<b>Attribute</b>	<b>Test</b>	<b>Test Stat</b>	<b>Critical</b>	<b>P-Value</b>	<b>Decision(1%)</b>						
Variances	Bartlett Equality of Variance	15.69	18.48	0.0281	Equal Variances						
Distribution	Shapiro-Wilk Normality	0.9759		0.1359	Normal Distribution						
<b>Reproduction Summary</b>											
<b>Conc-%</b>	<b>Control Type</b>	<b>Count</b>	<b>Mean</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>Diff%</b>
0	Negative Contr	10	20.4	19.79	21.01	17	22	0.2981	1.578	7.73%	0.0%
1.56		10	18	17.18	18.82	15	21	0.3984	2.108	11.71%	11.76%
3.12		10	13.5	12.97	14.03	12	15	0.2559	1.354	10.03%	33.82%
6.25		10	15.7	15.07	16.33	12	17	0.3092	1.636	10.42%	23.04%
12.5		10	14.3	13.1	15.5	9	19	0.5845	3.093	21.63%	29.9%
25		10	14.1	13.09	15.11	10	18	0.4916	2.601	18.45%	30.88%
50		10	13.9	12.54	15.26	9	19	0.6634	3.51	25.25%	31.86%
100		10	13.6	12.27	14.93	9	19	0.6498	3.438	25.28%	33.33%

*TEC*  
 Aug. 25/09

Ceriodaphnia 7-d Survival and Reproduction Test				Nautilus Environmental			
Analysis No:	17-2487-9352	Endpoint:	Reproduction	CETIS Version:	CETISv1.5.0		
Analyzed:	19 Jul-09 16:16	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes		

Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Contr	22	22	21	21	21	21	21	19	19	17
1.56		21	20	20	20	18	17	17	16	16	15
3.12		15	15	15	14	14	14	12	12	12	12
6.25		17	17	17	17	16	16	16	15	14	12
12.5		19	18	16	16	15	13	13	13	11	9
25		18	17	16	15	15	14	13	12	11	10
50		19	18	16	15	15	15	12	11	9	9
100		19	16	16	16	15	14	12	10	9	9



*EA*  
 Aug 25/09

**CETIS Analytical Report**

Report Date: 19 Jul-09 16:18 (p 1 of 2)  
 Link/Link Code: 20-1336-9444/09211cNTR2

**Ceriodaphnia 7-d Survival and Reproduction Test** **Nautilus Environmental**

Analysis No: 11-1450-8739      Endpoint: Reproduction      CETIS Version: CETISv1.5.0  
 Analyzed: 19 Jul-09 16:17      Analysis: Nonlinear Regression      Official Results: Yes

Sample No: 08-7470-6538      Code: 874706538      Client: Rescan  
 Sample Date: 05 Jul-09 15:15      Material: Mining Discharge/Runoff      Project:  
 Receive Date: 07 Jul-09 09:00      Source: Rescan  
 Sample Age: 45h      Station: NTR2

**Non-Linear Regression Options**

Model Function	X Transform	Y Transform	Weighting Function	PTBS Function
3P Log-Logistic EV [Y=A/(1+(X/D)^C)]	None	None	Normal [W=1]	Off [Y*=Y]

**Regression Summary**

Iters	Log LL	AICc	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(1%)
83	-117.7	241.6	0.3686	Yes	2.777	3.283	0.0238	Non-Significant Lack of Fit

**Point Estimates**

% Effect	Conc-%	95% LCL	95% UCL
SNEC	0.04807	0.0001745	1.242
10	0.007832	4.004E-07	0.4374
15	0.1227	0.001631	2.091
20	0.9735	0.09765	6.272
25	5.387	1.618	16.06
40	332.3	35.2	2676
50	3705	86.48	158800

**Regression Parameters**

Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)
A	20.44	0.8052	18.84	22.05	25.39	0.0000	Significant Parameter
C	0.1681	0.05738	0.05389	0.2824	2.931	0.0045	Significant Parameter
D	3705	6810	-9855	17270	0.5441	0.5879	Non-Significant Parameter

**ANOVA Table**

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(1%)
Model	348.2759	174.138	2	24.06	0.0000	Significant
Lack of Fit	90.1116	18.02232	5	2.777	0.0238	Non-Significant
Pure Error	467.3	6.490278	72			
Residual	557.4116	7.239112	77			

**Residual Analysis**

Attribute	Method	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	15.69	18.48	0.0281	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9804		0.2583	Normal Distribution

**Reproduction Summary**

Conc-%	Control Type	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	10	20.4	17	22	0.293	1.578	7.73%	0.0%
1.56		10	18	15	21	0.3915	2.108	11.71%	11.76%
3.12		10	13.5	12	15	0.2514	1.354	10.03%	33.82%
6.25		10	15.7	12	17	0.3039	1.636	10.42%	23.04%
12.5		10	14.3	9	19	0.5744	3.093	21.63%	29.9%
25		10	14.1	10	18	0.483	2.601	18.45%	30.88%
50		10	13.9	9	19	0.6518	3.51	25.25%	31.86%
100		10	13.6	9	19	0.6385	3.438	25.28%	33.33%

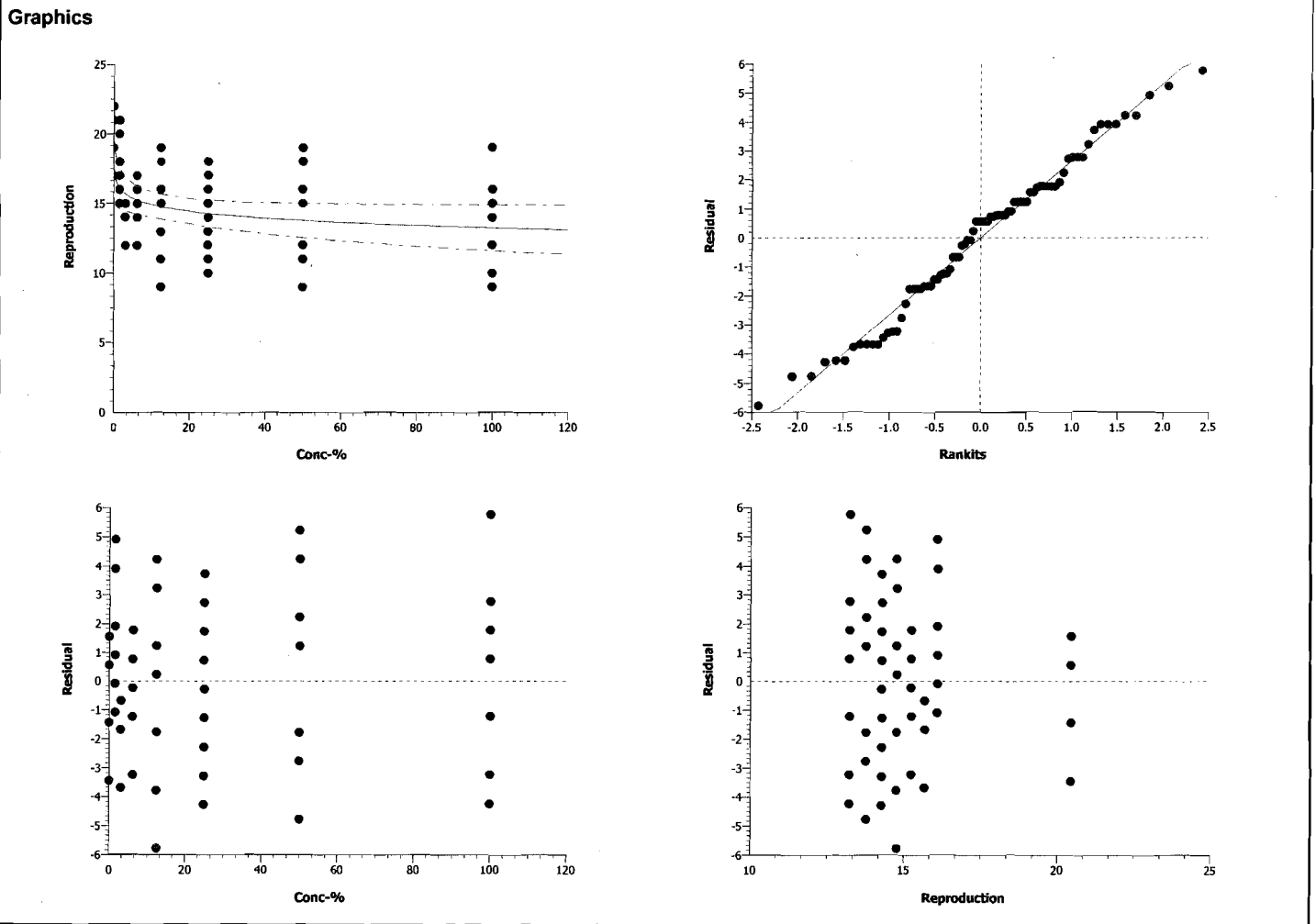
*ECU*  
*Aug 25/09*

**CETIS Analytical Report**

Report Date: 19 Jul-09 16:18 (p 2 of 2)  
 Link/Link Code: 20-1336-9444/09211cNTR2

<b>Ceriodaphnia 7-d Survival and Reproduction Test</b>				<b>Nautilus Environmental</b>			
<b>Analysis No:</b> 11-1450-8739	<b>Endpoint:</b> Reproduction			<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 19 Jul-09 16:17	<b>Analysis:</b> Nonlinear Regression			<b>Official Results:</b> Yes			

Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	21	21	19	21	22	17	19	21	22	21
1.56		16	17	17	16	21	20	15	18	20	20
3.12		15	14	12	12	12	14	12	15	15	14
6.25		15	16	16	12	17	17	16	14	17	17
12.5		13	11	9	16	13	19	13	16	18	15
25		18	16	13	10	15	12	11	14	17	15
50		19	15	9	11	9	15	16	12	18	15
100		14	16	16	9	10	12	15	9	19	16



*Handwritten signature*  
 Aug 25/09



# Ceriodaphnia dubia Summary Sheet

Client: Procon  
 Work Order No.: 09211

Start Date/Time: July 8 / 09 @ 1045h  
 Set up by: [Signature]

**Sample Information:**

Sample ID: SCC  
 Sample Date: July 5 / 09  
 Date Received: July 7 / 09  
 Sample Volume: 9x20L

**Test Organism Information:**

Broodstock No.: 063009  
 Age of young (Day 0): 429 (w/in 12-h)  
 Avg No. young in first 3 broods of previous 7 d: 19  
 Mortality (%) in previous 7 d: 2  
 Avg. No. of young in previous brood: 54, 56, 57, 58, 60, 61, 62, 64, 68  
 Females Used  $\geq$  8 young for testing

**NaCl Reference Toxicant Results:**

Reference Toxicant ID: Cd 44  
 Stock Solution ID: 0.1% NaO4  
 Date Initiated: July 27/09  
 7-d LC50 (95% CL): 2.0 (1.7 - 2.3)  
 7-d IC50 (95% CL): 1.2 (1.0 - 1.5)

7-d LC50 Reference Toxicant Mean  $\pm$  2 SD: 1.7  $\pm$  0.7 CV (%): 22  
 7-d IC50 Reference Toxicant Mean  $\pm$  2 SD: 1.2  $\pm$  0.3 CV (%): 14 130%

**Test Results:**

	Survival	Reproduction
NOEC %(v/v)	100	12.5
LOEC %(v/v)	> 100	25
LC50 %(v/v) (95% CL)	7100	
IC25 %(v/v) (95% CL)		24.2 (16.8 - 31.4) <sup>BR</sup>
IC50 %(v/v) (95% CL)		37.3 (30.1 - 46.2) <sup>BR</sup>

$\rightarrow$  19.3 (5.8 - 26.2)  
 $\rightarrow$  34.1 (26.9 - 43.5)

Reviewed by: [Signature]

Date reviewed: Aug. 27/09

# Chronic Freshwater Toxicity Test Initial and Final Water Quality Measurements

(4)

Client: RESCAN  
 Sample ID: SCR  
 Work Order #: 0911

Start Date & Time: July 2, 2002 10:45h  
 Stop Date: July 14, 2002 12:45h  
 Test Species: Ceriodaphnia dubia

Concentration	Days																								
	0	1	2	3	4	5	6	7	0		1		2		3		4		5		6		7		
Temperature (°C)	24.5	24.4	24.2	24.6	24.3	24.4	24.0	24.5	24.0	25.4	25.2	25.8	24.9	BRL		BRL		BRL		BRL		BRL		BRL	
DO (mg/L)	8.0	7.4	8.1	7.5	8.2	7.2	8.2	7.4	8.2	7.6	8.2	7.4	8.1	BRL		BRL		BRL		BRL		BRL		BRL	
pH	8.1	7.7	8.2	8.1	8.1	7.8	8.1	7.9	8.1	7.9	8.2	7.8	8.1	BRL		BRL		BRL		BRL		BRL		BRL	
Cond. (µS/cm)	210	212		205		212		205		206		210		BRL		BRL		BRL		BRL		BRL		BRL	
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	W	BPL	BRL		BRL		BRL		BRL		BRL		BRL	

Concentration	Days																								
	0	1	2	3	4	5	6	7	0		1		2		3		4		5		6		7		
Temperature (°C)	24.6	24.4	24.3	24.6	24.7	24.4	25.1	25.5	25.2	25.4	25.1	25.8	24.8	BRL		BPL		W		BPL		BPL		BPL	
DO (mg/L)	8.1	7.4	8.1	7.5	8.2	7.3	8.1	7.7	8.2	7.6	8.2	7.4	8.0	BRL		BPL		W		BPL		BPL		BPL	
pH	8.1	7.7	8.2	8.3	8.2	7.7	8.2	7.8	8.2	7.9	8.1	7.8	7.9	BRL		BPL		W		BPL		BPL		BPL	
Cond. (µS/cm)	210	210	210	205		206		202		205		205		BRL		BPL		W		BPL		BPL		BPL	
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	W	BPL	BRL		BPL		W		BPL		BPL		BPL	

Concentration	Days																								
	0	1	2	3	4	5	6	7	0		1		2		3		4		5		6		7		
Temperature (°C)	25.0	24.4	24.2	24.6	24.7	24.4	25.1	25.5	25.4	25.4	25.1	25.8	24.9	BRL		BPL		W		BPL		BPL		BPL	
DO (mg/L)	8.0	7.5	8.1	7.5	8.2	7.4	8.1	7.3	8.1	7.6	8.2	7.4	8.0	BRL		BPL		W		BPL		BPL		BPL	
pH	8.1	8.0	8.2	7.9	8.1	7.6	8.0	7.7	8.2	7.9	8.2	7.7	8.0	BRL		BPL		W		BPL		BPL		BPL	
Cond. (µS/cm)	203	202	201	192		196		192		196		196		BRL		BPL		W		BPL		BPL		BPL	
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	W	BPL	BRL		BPL		W		BPL		BPL		BPL	

Concentration	Days																								
	0	1	2	3	4	5	6	7	0		1		2		3		4		5		6		7		
Temperature (°C)	25.6	25.4	24.8	25.6	25.3	25.4	25.2	25.5	25.6	25.4	25.1	25.8	24.7	BRL		BPL		W		BPL		BPL		BPL	
DO (mg/L)	8.0	7.4	8.1	7.6	8.2	7.3	8.0	7.4	8.1	7.6	8.2	7.2	8.1	BRL		BPL		W		BPL		BPL		BPL	
pH	7.8	7.9	8.0	7.9	8.0	7.7	7.9	7.6	8.0	7.8	8.0	7.6	7.4	BRL		BPL		W		BPL		BPL		BPL	
Cond. (µS/cm)	118	121	123	124		124		121		128		128		BRL		BPL		W		BPL		BPL		BPL	
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	W	BPL	BRL		BPL		W		BPL		BPL		BPL	

Control	100%		
Hardness*	100	100	
Alkalinity*	80	138	

Analysts: BPL, JCB, W  
 Reviewed by: [Signature]  
 Date reviewed: Aug. 25/09

\* mg/L as CaCO3

Sample Description: light blue opaque

Comments: used BBS 063009

Analytical Environmental

**Chronic Freshwater Toxicity Test  
C. dubia Reproduction Data**

Client: Rescon  
 Sample ID: 522  
 Work Order: 0921

Start Date & Time: July 8 / 09 1045h  
 Stop Date & Time: July 14 / 09 1245h  
 Set up by: Ado

0.1 (1/1)

Days	Concentration: <u>Control</u>											Concentration: <u>0.1 (1/1)</u>											Concentration: <u>3.125</u>										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n
4	3	3	3	8	4	4	4	3	7	4	n	3	6	4	4	3	4	4	3	3	3	n	3	3	4	3	4	3	3	3	3	3	n
5	6	9	8	8	6	5	✓	7	✓	6	BR	✓	5	9	8	5	5	✓	✓	8	7	BR	6	7	6	6	5	7	5	7	6	7	BR
6	5	7	9	8	3	2	7	3	7	4	n	3	6	5	4	4	2	4	2	2	8	n	3	2	✓	2	2	2	3	5	5	5	n
7																																	
8																																	
Total	14	19	20	24	13	11	11	13	14	14	n	6	17	17	16	12	11	8	5	13	18	n	12	12	10	11	11	12	11	10	14	15	n

Days	Concentration: <u>6.25</u>											Concentration: <u>12.5</u>											Concentration: <u>25</u>										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n
4	2	3	3	3	3	3	3	2	3	2	n	3	2	2	3	3	2	3	2	3	6	n	4	3	2	2	✓	✓	✓	2	2	3	n
5	6	7	6	6	✓	5	5	8	7	✓	BR	6	5	7	8	5	7	3	6	3	✓	BR	6	3	6	3	✓	5	✓	6	✓	✓	BR
6	7	6	6	3	6	5	5	5	5	7	n	6	4	4	3	6	6	6	3	8	5	n	✓	7	4	7	2	6	2	8	4	5	n
7																																	
8																																	
Total	15	16	15	12	9	13	16	15	15	9	n	15	11	14	16	14	15	13	11	14	11	n	10	13	12	12	2	11	2	16	6	8	n

Days	Concentration: <u>50</u>											Concentration: <u>100</u>											Concentration:										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n											
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n											
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n											
4	3	3	3	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n											
5	3	3	6	4	3	✓	✓	✓	✓	✓	BR	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	BR											
6	5	3	6	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n											
7																																	
8																																	
Total	14	6	15	6	3	0	0	4	6	0	n	0	0	0	0	0	0	0	0	0	2	n											

Notes: X = mortality.

Sample Description: \_\_\_\_\_  
 Comments: \_\_\_\_\_

Reviewed by: \_\_\_\_\_ Date reviewed: \_\_\_\_\_

# CETIS Analytical Report

Report Date: 19 Jul-09 15:54 (p 1 of 2)  
 Link/Link Code: 12-2686-5825/09211a

<b>Ceriodaphnia 7-d Survival and Reproduction Test</b>	<b>Nautilus Environmental</b>
--	-------------------------------

<b>Analysis No:</b> 20-8693-5397	<b>Endpoint:</b> 6d Survival Rate	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 19 Jul-09 15:51	<b>Analysis:</b> STP 2x2 Contingency Tables	<b>Official Results:</b> Yes

<b>Sample No:</b> 04-7366-0763	<b>Code:</b> 473660763	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09 11:15	<b>Material:</b> Mining Discharge/Runoff	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 71h	<b>Station:</b> SCR	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	100	0	#Error	1	N/A

Fisher Exact/Bonferroni-Holm Test					
Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Negative Control		1.56	1.0000	1.0000	Non-Significant Effect
		3.12	1.0000	1.0000	Non-Significant Effect
		6.25	1.0000	1.0000	Non-Significant Effect
		12.5	1.0000	1.0000	Non-Significant Effect
		25	1.0000	1.0000	Non-Significant Effect
		50	1.0000	1.0000	Non-Significant Effect
		100	1.0000	1.0000	Non-Significant Effect

Data Summary				
Conc-%	Control Type	No-Resp	Resp	Total
0	Negative Contr	10	0	10
1.56		10	0	10
3.12		10	0	10
6.25		10	0	10
12.5		10	0	10
25		10	0	10
50		10	0	10
100		10	0	10

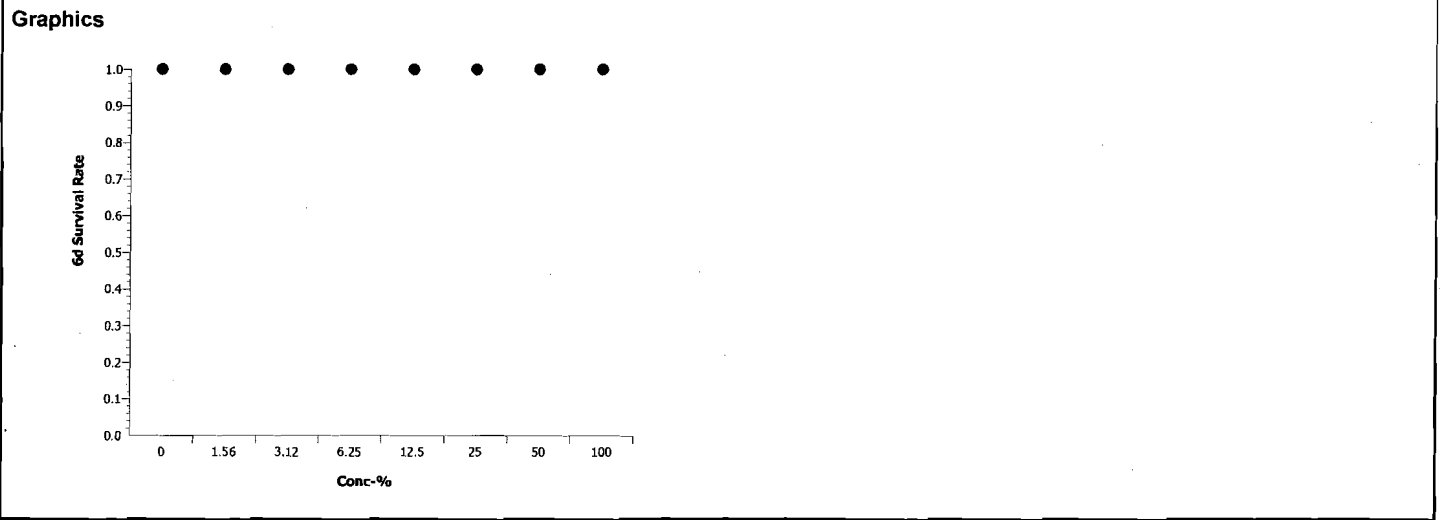
6d Survival Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Contr	1	1	1	1	1	1	1	1	1	1
1.56		1	1	1	1	1	1	1	1	1	1
3.12		1	1	1	1	1	1	1	1	1	1
6.25		1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1

*EEV*  
 Aug 25/09

# CETIS Analytical Report

Report Date: 19 Jul-09 15:54 (p 2 of 2)  
Link/Link Code: 12-2686-5825/09211a

Ceriodaphnia 7-d Survival and Reproduction Test		Nautilus Environmental
Analysis No: 20-8693-5397	Endpoint: 6d Survival Rate	CETIS Version: CETISv1.5.0
Analyzed: 19 Jul-09 15:51	Analysis: STP 2x2 Contingency Tables	Official Results: Yes



*ea*  
Aug 25/09

**CETIS Analytical Report**

Report Date: 26 Aug-09 17:49 (p 1 of 2)  
 Link/Link Code: 12-2686-5825/09211a

Ceriodaphnia 7-d Survival and Reproduction Test								Nautilus Environmental			
Analysis No:	21-3243-4406		Endpoint:	Reproduction		CETIS Version:	CETISv1.5.0				
Analyzed:	26 Aug-09 17:49		Analysis:	Nonparametric-Control vs Treatments		Official Results:	Yes				
Test Run No:	10-3678-0249		Test Type:	Reproduction-Survival (7d)		Dil Water:					
Start Date:	08 Jul-09 10:45		Protocol:	EC/EPS 1/RM/21		Brine:					
Ending Date:	14 Jul-09 12:45		Species:	Ceriodaphnia dubia							
Duration:	6d 2h		Source:								
Sample No:	04-7366-0763		Code:	473660763		Client:	Rescan				
Sample Date:	05 Jul-09 13:15		Material:	Mining Discharge/Runoff		Project:					
Receive Date:	07 Jul-09 09:00		Source:	Rescan							
Sample Age:	69h		Station:	SCR							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Rank		C > T	Not Run	12.5	25	17.68	8	25.23%			
<b>Steel Many-One Rank Test</b>											
Control	vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)				
Negative Control		1.56	89	74	2	0.3774	Non-Significant Effect				
		3.12	83.5	74	2	0.2099	Non-Significant Effect				
		6.25	102	74	1	0.8088	Non-Significant Effect				
		12.5	102.5	74	2	0.8211	Non-Significant Effect				
		25*	70	74	2	0.0229	Significant Effect				
		50*	65	74	1	0.0076	Significant Effect				
		100*	55	74	0	0.0005	Significant Effect				
<b>ANOVA Table</b>											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)					
Between	1829.75	261.3929	7	19.97	0.0000	Significant Effect					
Error	942.2	13.08611	72								
Total	2771.95	274.479	79								
<b>ANOVA Assumptions</b>											
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)						
Variances	Bartlett Equality of Variance	39.57	18.48	0.0000	Unequal Variances						
Distribution	Shapiro-Wilk Normality	0.9776		0.1730	Normal Distribution						
<b>Reproduction Summary</b>											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	10	15.3	13.64	16.96	11	24	0.807	4.27	27.91%	0.0%
1.56		10	12.3	10.45	14.15	5	18	0.9	4.762	38.72%	19.61%
3.12		10	12.3	11.61	12.99	10	15	0.3339	1.767	14.37%	19.61%
6.25		10	13.5	12.46	14.54	9	16	0.5059	2.677	19.83%	11.76%
12.5		10	13.7	12.92	14.48	11	16	0.3785	2.003	14.62%	10.46%
25		10	9.2	7.392	11.01	2	16	0.881	4.662	50.67%	39.87%
50		10	5.3	3.272	7.328	0	15	0.9882	5.229	98.66%	65.36%
100		10	0.2	-0.04524	0.4452	0	2	0.1195	0.6325	316.2%	98.69%
<b>Rank Transformed Summary</b>											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	10	57.3	50.73	63.87	34.5	80	3.2	16.93	29.55%	0.0%
1.56		10	49	39.6	58.4	18	77	4.58	24.24	49.46%	14.49%
3.12		10	44.5	39.57	49.43	28.5	64	2.403	12.72	28.58%	22.34%
6.25		10	54.45	47.78	61.12	26.5	71.5	3.252	17.21	31.6%	4.97%
12.5		10	54.25	48.52	59.98	34.5	71.5	2.792	14.77	27.23%	5.32%
25		10	34.35	27.39	41.31	14	71.5	3.391	17.94	52.23%	40.05%
50		10	22.9	15.48	30.32	6.5	64	3.617	19.14	83.58%	60.03%
100		10	7.25	6.33	8.17	6.5	14	0.4482	2.372	32.71%	87.35%

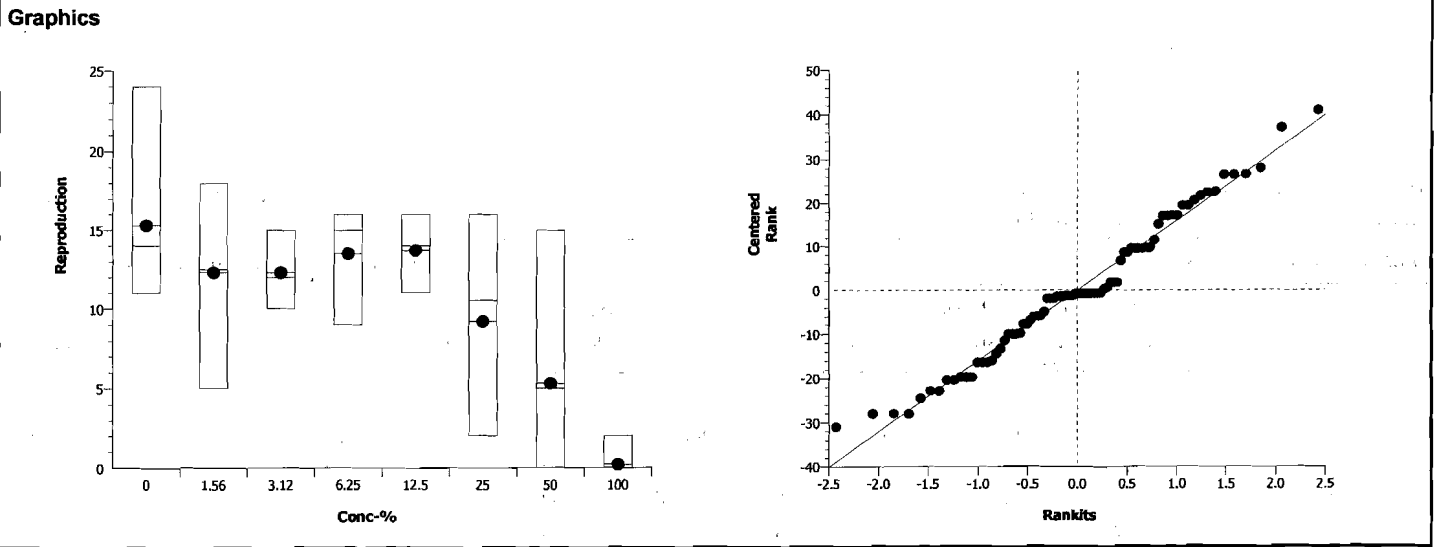
*EA Aug 27/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 17:49 (p 2 of 2)  
 Link/Link Code: 12-2686-5825/09211a

<b>Ceriodaphnia 7-d Survival and Reproduction Test</b>				<b>Nautilus Environmental</b>			
<b>Analysis No:</b> 21-3243-4406	<b>Endpoint:</b> Reproduction			<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 26 Aug-09 17:49	<b>Analysis:</b> Nonparametric-Control vs Treatments			<b>Official Results:</b> Yes			

<b>Reproduction Detail</b>											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Contr	24	20	19	14	14	14	13	13	11	11
1.56		18	17	17	16	13	12	11	8	6	5
3.12		15	15	14	12	12	12	11	11	11	10
6.25		16	16	15	15	15	15	13	12	9	9
12.5		16	16	15	15	14	14	14	11	11	11
25		16	13	12	12	11	10	8	6	2	2
50		15	13	6	6	6	4	3	0	0	0
100		2	0	0	0	0	0	0	0	0	0



*EC*  
 Aug 27/09

**CETIS Analytical Report**

Report Date: 26 Aug-09 17:49 (p 1 of 2)  
 Link/Link Code: 12-2686-5825/09211a

<b>Ceriodaphnia 7-d Survival and Reproduction Test</b>				<b>Nautilus Environmental</b>					
Analysis No: 14-6821-2677		Endpoint: Reproduction		CETIS Version: CETISv1.5.0					
Analyzed: 26 Aug-09 17:48		Analysis: Nonlinear Regression		Official Results: Yes					
Test Run No: 10-3678-0249		Test Type: Reproduction-Survival (7d)		Dil Water:					
Start Date: 08 Jul-09 10:45		Protocol: EC/EPS 1/RM/21		Brine:					
Ending Date: 14 Jul-09 12:45		Species: Ceriodaphnia dubia							
Duration: 6d 2h		Source:							
Sample No: 04-7366-0763		Code: 473660763		Client: Rescan					
Sample Date: 05 Jul-09 13:15		Material: Mining Discharge/Runoff		Project:					
Receive Date: 07 Jul-09 09:00		Source: Rescan							
Sample Age: 69h		Station: SCR							
<b>Non-Linear Regression Options</b>									
<b>Model Function</b>				<b>X Transform</b>	<b>Y Transform</b>	<b>Weighting Function</b>	<b>PTBS Function</b>		
3P Cumulative Log-Normal EV [Y=A*(1- Φ(log(X/D)/C))]				None	None	Normal [W=1]	Off [Y*=Y]		
<b>Regression Summary</b>									
<b>Iters</b>	<b>Log LL</b>	<b>AICc</b>	<b>Adj R2</b>	<b>Optimize</b>	<b>F Stat</b>	<b>Critical</b>	<b>P-Value</b>	<b>Decision(1%)</b>	
12	-142.1	290.5	0.6200	No	1.293	3.283	0.2765	Non-Significant Lack of Fit	
<b>Point Estimates</b>									
<b>% Effect</b>	<b>Conc-%</b>	<b>95% LCL</b>	<b>95% UCL</b>						
SNEC	5.463	N/A	15.32						
15	11.6	N/A	17.52						
20	15.95	N/A	22.36						
25	19.26	8.752	26.23						
40	27.99	20.72	35.75						
50	34.06	26.92	42.49						
<b>Regression Parameters</b>									
<b>Parameter</b>	<b>Estimate</b>	<b>Std Error</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>t Stat</b>	<b>P-Value</b>	<b>Decision(5%)</b>		
A	13.46	0.5575	12.35	14.57	24.15	0.0000	Significant Parameter		
C	0.6518	0.162	0.3292	0.9745	4.022	0.0001	Significant Parameter		
D	38.1	4.485	29.17	47.03	8.494	0.0000	Significant Parameter		
<b>ANOVA Table</b>									
<b>Source</b>	<b>Sum Squares</b>	<b>Mean Square</b>	<b>DF</b>	<b>F Stat</b>	<b>P-Value</b>	<b>Decision(1%)</b>			
Model	1745.157	872.5784	2	65.44	0.0000	Significant			
Lack of Fit	84.59325	16.91865	5	1.293	0.2765	Non-Significant			
Pure Error	942.2	13.08611	72						
Residual	1026.793	13.33498	77						
<b>Residual Analysis</b>									
<b>Attribute</b>	<b>Method</b>	<b>Test Stat</b>	<b>Critical</b>	<b>P-Value</b>	<b>Decision(1%)</b>				
Variances	Bartlett Equality of Variance	39.57	18.48	0.0000	Unequal Variances				
Distribution	Shapiro-Wilk Normality	0.9621		0.0180	Normal Distribution				
<b>Reproduction Summary</b>									
			<b>Calculated Variate</b>						
<b>Conc-%</b>	<b>Control Type</b>	<b>Count</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>Diff%</b>
0	Negative Control	10	15.3	11	24	0.7929	4.27	27.91%	0.0%
1.56		10	12.3	5	18	0.8843	4.762	38.72%	19.61%
3.12		10	12.3	10	15	0.3281	1.767	14.37%	19.61%
6.25		10	13.5	9	16	0.4971	2.677	19.83%	11.76%
12.5		10	13.7	11	16	0.3719	2.003	14.62%	10.46%
25		10	9.2	2	16	0.8657	4.662	50.67%	39.87%
50		10	5.3	0	15	0.971	5.229	98.66%	65.36%
100		10	0.2	0	2	0.1174	0.6325	316.2%	98.69%

*Aug 27/09*



**CETIS Analytical Report**

Report Date: 26 Aug-09 17:49 (p 2 of 2)  
 Link/Link Code: 12-2686-5825/09211a

**Ceriodaphnia 7-d Survival and Reproduction Test**

**Nautilus Environmental**

Analysis No: 14-6821-2677  
 Analyzed: 26 Aug-09 17:48

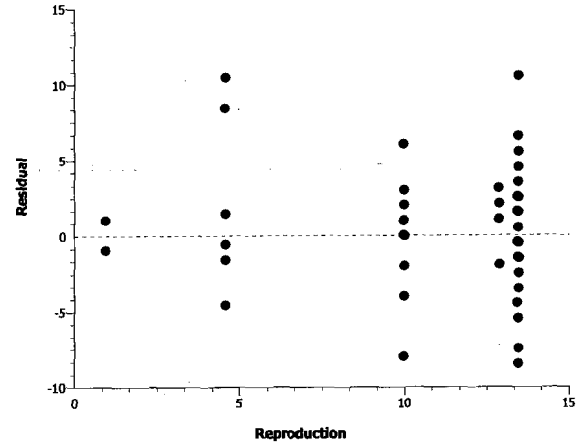
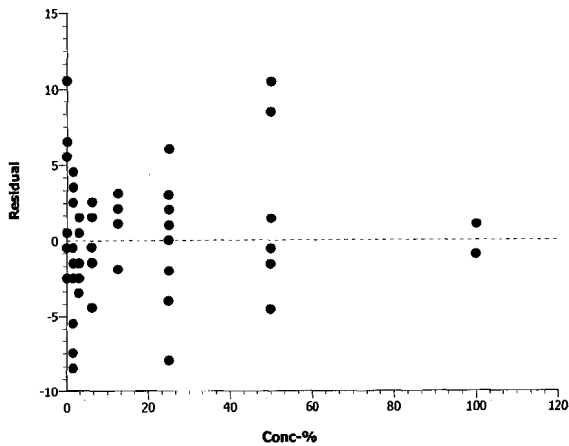
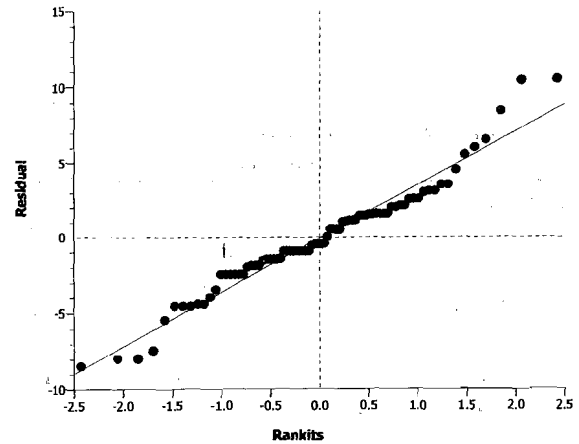
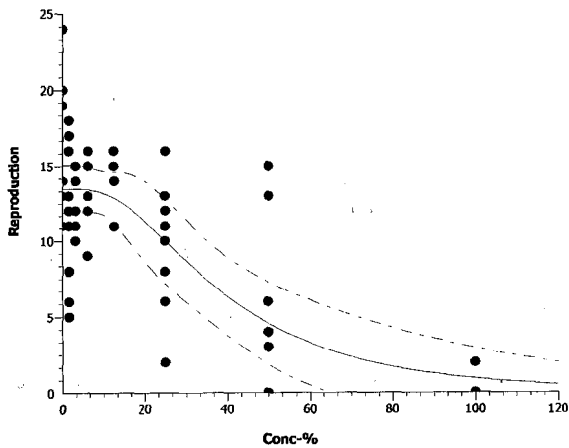
Endpoint: Reproduction  
 Analysis: Nonlinear Regression

CETIS Version: CETISv1.5.0  
 Official Results: Yes

**Reproduction Detail**

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	14	19	20	24	13	11	11	13	14	14
1.56		6	17	17	16	12	11	8	5	13	18
3.12		12	12	10	11	11	12	11	15	14	15
6.25		15	16	15	12	9	13	16	15	15	9
12.5		15	11	14	16	14	15	16	11	14	11
25		10	13	12	12	2	11	2	16	6	8
50		13	6	15	6	3	0	0	4	6	0
100		0	0	0	0	0	0	0	0	0	2

**Graphics**



*EA*  
 Aug 27/09

**APPENDIX B - *Oncorhynchus mykiss* embryo Toxicity Test Data**

Nautilus Environmental  
Washington Laboratory

Client: BC Lab  
Sample ID: SC2  
Test No: 0907-T009  
Log-In#: 09-200

Initial and Final Chemistries

Seven Day Chronic Freshwater Bioassay  
Start Date & Time: 7/8/09 1525  
Stop Date & Time: 7/15/09 1445  
Test Species: Oncorhynchus mykiss

Conc or % Con	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	7.97	7.00	7.46	7.05	7.48	7.34	7.10	7.23	7.53	7.24	7.11	7.21	7.18	7.42
DO (mg/l)	9.3	9.8	8.9	10.1	8.9	10.1	9.6	10.0	9.7	9.9	9.9	9.4	9.3	9.6
Cond. (µmhos-cm)	257	242	239	232	244	240	249	238	250	243	235	236	254	247
Temperature (°C)	14.6	13.3	14.7	13.1	14.2	13.5	14.4	13.0	13.8	14.6	14.9	14.9	14.9	14.7
6.25	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	8.00	7.10	7.49	7.07	7.51	7.36	7.13	7.31	7.56	7.30	7.08	7.15	7.25	7.42
DO (mg/l)	9.4	10.0	8.9	10.2	9.2	10.3	9.5	10.0	9.5	9.4	9.1	9.5	9.5	9.7
Cond. (µmhos-cm)	250	231	234	224	236	233	237	226	244	238	230	228	246	242
Temperature (°C)	14.6	13.0	14.8	13.2	14.2	13.5	14.5	13.2	13.8	14.4	14.8	14.4	14.9	14.8
12.5	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	7.96	7.13	7.49	6.95	7.51	7.36	7.13	7.33	7.54	7.31	7.07	7.17	7.28	7.39
DO (mg/l)	9.3	9.7	9.1	10.1	9.3	10.1	9.5	10.2	9.6	9.0	9.0	9.7	9.5	9.6
Cond. (µmhos-cm)	239	224	227	217	230	229	232	219	236	231	225	223	239	235
Temperature (°C)	14.4	13.1	14.9	13.0	14.1	14.0	14.3	13.2	14.0	14.5	14.9	14.5	14.9	14.9
25	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	7.91	7.13	7.46	6.96	7.48	7.36	7.10	7.32	7.51	7.29	7.08	7.18	7.28	7.35
DO (mg/l)	9.4	9.9	9.2	10.1	9.4	10.1	9.6	10.1	9.6	9.3	9.3	9.7	9.6	9.6
Cond. (µmhos-cm)	226	210	214	203	214	212	219	208	224	216	211	211	223	221
Temperature (°C)	14.5	13.1	14.6	13.0	14.0	13.6	14.6	13.3	14.1	14.5	14.8	14.6	14.8	14.8
50	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	7.81	7.09	7.42	6.96	7.42	7.33	6.99	7.24	7.41	7.23	7.06	7.17	7.27	7.31
DO (mg/l)	8.9	10.0	9.2	10.1	9.7	10.1	9.8	10.1	9.7	9.2	9.4	9.8	9.8	9.6
Cond. (µmhos-cm)	193	179	186	176	187	184	195	178	198	190	186	185	191	191
Temperature (°C)	14.8	13.0	14.7	13.0	14.0	13.6	14.6	13.2	14.2	14.5	14.8	14.6	14.8	14.9
100	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	7.55	7.06	7.09	6.91	7.38	7.17	6.73	7.17	7.21	7.07	6.86	7.02	7.18	7.14
DO (mg/l)	9.6	9.9	9.9	10.2	10.4	10.2	10.5	10.2	10.0	9.1	10.2	9.5	10.5	9.6
Cond. (µmhos-cm)	133	128	130	124	125	128	136	123	137	133	132	132	130	134
Temperature (°C)	14.8	13.1	14.6	13.0	13.2	13.6	14.6	13.3	14.2	14.7	14.6	14.6	14.2	14.8
Tech. Initials	EW	BP	BP	ET	BP	BP	BP	BP	BP	BP	BP	BP	BP	BP

Dilution Water Batch #: MHSW040  
Test Chamber: ENV.ch A

QA Check: 185

Sample Description: \_\_\_\_\_  
Animal Source: Trout lodge Date Received: 7/8/09 Date of Hatch: \_\_\_\_\_  
Comments: \_\_\_\_\_

Nautilus Environmental  
 Washington Laboratory  
 5009 Pacific Hwy. E., Suite 2  
 Tacoma, WA 98424

Raw Data Sheet  
 Rainbow Trout  
 (*Oncorhynchus mykiss*)  
 Trout Embryo Test

Client Name: BC Lab

Test No.: 0907-T009

Sample ID: SCZ

Conc.	Cont.	Rep.	# Embryos/Container								# Normal	# Abnormal	Mean % Viable	
			Days											
			0	1	2	3	4	5	6	7				
CON	501	1	30	30	30	30	30	30	30	26	26	0		
	502	2	30	29	29	29	29	29	29	29	0	29		
	503	3	30	30	30	30	30	30	30	28	23	5		
	504	4	30	30	30	30	30	30	29	27	24	3		
6.25	508	1	30	30	30	30	30	30	30	30	30	0		
	507	2	30	30	30	30	30	30	30	30	30	30		
	506	3	30	30	30	30	30	30	30	30	29	26		3
	505	4	30	30	30	30	30	30	30	29	20	9		
12.5	512	1	30	30	30	30	30	30	30	30	30	0		
	511	2	30	29	29	29	29	29	29	28	0	28		
	510	3	30	30	30	30	30	30	30	29	23	6		
	509	4	30	29	29	29	29	28	27	27	16	11		
25	516	1	30	30	30	30	30	30	30	30	29	1		
	515	2	30	30	30	30	30	30	30	30	0	30		
	514	3	30	30	30	30	30	30	30	30	19	11		
	513	4	30	30	30	30	30	30	30	29	20	9		
50	520	1	30	30	30	30	30	30	30	27	26	1		
	519	2	30	30	30	30	30	30	30	30	0	30		
	518	3	30	28	28	28	28	28	28	28	22	6		
	517	4	30	30	30	30	30	30	30	29	24	5		
100	524	1	30	30	30	30	30	30	30	28	27	1		
	523	2	30	28	28	28	27	27	27	27	0	27		
	522	3	30	30	30	30	30	30	30	27	24	3		
	521	4	30	30	30	30	30	30	30	30	21	9		
		1												
		2												
		3												
		4												
		1												
		2												
		3												
		4												
Tech Initials			MF	DP	ET	BP	GP	W	ET	MF	MF	MF		

QA Check: CC

Comments: \_\_\_\_\_  
 \_\_\_\_\_

# CETIS Summary Report

Report Date: 17 Jul-09 15:40 (p 1 of 1)  
 Link/Link Code: 06-5488-1127/0907-T009

Salmonid Embryo Survival and Development Test							Nautilus Environmental WA				
<b>Test Run No:</b> 11-9243-3530	<b>Test Type:</b> Survival-Development		<b>Analyst:</b> Meghan Feuk								
<b>Start Date:</b> 08 Jul-09 15:25	<b>Protocol:</b> EC/EPS 1/RM/28		<b>Diluent:</b> Mod-Hard Synthetic Water								
<b>Ending Date:</b> 15 Jul-09 14:45	<b>Species:</b> Oncorhynchus mykiss		<b>Brine:</b>								
<b>Duration:</b> 6d 23h	<b>Source:</b> Trout Lodge Fish Farm		<b>Age:</b>								
<b>Sample No:</b> 19-2263-9455	<b>Code:</b> 09-200		<b>Client:</b> Vancouver BC Lab								
<b>Sample Date:</b> 05 Jul-09 09:30	<b>Material:</b> Receiving Water		<b>Project:</b>								
<b>Receive Date:</b> 08 Jul-09 12:30	<b>Source:</b> Vancouver BC Lab										
<b>Sample Age:</b> 78h (13 °C)	<b>Station:</b>										
<b>Comparison Summary</b>											
<b>Analysis No</b>	<b>Endpoint</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>PMSD</b>	<b>Method</b>					
19-6250-5140	Combined Development	100	> 100	N/A	50.6%	Dunnett's Multiple Comparison Test					
<b>Point Estimate Summary</b>											
<b>Analysis No</b>	<b>Endpoint</b>	<b>Effect-%</b>	<b>Conc-%</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>Method</b>					
07-0094-9877	Combined Development	25	5.16E+08	N/A	N/A	Linear Regression (MLE)					
		50	8.41E+13	N/A	N/A						
<b>Combined Development Summary</b>											
<b>Conc-%</b>	<b>Control Type</b>	<b>Count</b>	<b>Mean</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>Diff%</b>
0	Dilution Water	3	0.811	0.792	0.83	0.767	0.867	0.0093	0.0509	6.28%	0.0%
6.25		3	0.844	0.782	0.907	0.667	1	0.0306	0.168	19.9%	-4.11%
12.5		3	0.767	0.68	0.854	0.533	1	0.0426	0.233	30.4%	5.48%
25		3	0.756	0.687	0.824	0.633	0.967	0.0335	0.184	24.3%	6.85%
50		3	0.8	0.775	0.825	0.733	0.867	0.0122	0.0667	8.33%	1.37%
100		3	0.8	0.763	0.837	0.7	0.9	0.0183	0.1	12.5%	1.37%
<b>Combined Development Detail</b>											
<b>Conc-%</b>	<b>Control Type</b>	<b>Rep 1</b>	<b>Rep 3</b>	<b>Rep 4</b>							
0	Dilution Water	0.867	0.767	0.8							
6.25		1	0.867	0.667							
12.5		1	0.767	0.533							
25		0.967	0.633	0.667							
50		0.867	0.733	0.8							
100		0.9	0.8	0.7							

**CETIS Analytical Report**

Report Date: 17 Jul-09 15:40 (p 1 of 2)  
 Link/Link Code: 06-5488-1127/0907-T009

Salmonid Embryo Survival and Development Test								Nautilus Environmental WA			
Analysis No: 19-6250-5140		Endpoint: Combined Development			CETIS Version: CETISv1.6.3						
Analyzed: 17 Jul-09 15:38		Analysis: Parametric-Control vs Treatments			Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)		C > T	Not Run	100	>100	N/A	1	50.6%			
Dunnett's Multiple Comparison Test											
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Dilution Water		6.25	-0.497	2.5	0.438	0.9380	Non-Significant Effect				
		12.5	0.0114	2.5	0.438	0.8300	Non-Significant Effect				
		25	0.205	2.5	0.438	0.7660	Non-Significant Effect				
		50	0.0733	2.5	0.438	0.8110	Non-Significant Effect				
		100	0.0447	2.5	0.438	0.8200	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)					
Between	0.02686	0.005372	5	0.117	0.9860	Non-Significant Effect					
Error	0.552100	0.046008	12								
Total	0.578960	0.051380	17								
ANOVA Assumptions											
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)						
Variances	Bartlett Equality of Variance	5.93	15.1	0.3130	Equal Variances						
Distribution	Shapiro-Wilk Normality	0.958		0.5650	Normal Distribution						
Combined Development Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	0.811	0.792	0.83	0.767	0.867	0.00946	0.0509	6.28%	0.0%
6.25		3	0.844	0.781	0.908	0.667	1	0.0312	0.168	19.9%	-4.11%
12.5		3	0.767	0.678	0.855	0.533	1	0.0433	0.233	30.4%	5.48%
25		3	0.756	0.686	0.825	0.633	0.967	0.0341	0.184	24.3%	6.85%
50		3	0.8	0.775	0.825	0.733	0.867	0.0124	0.0667	8.33%	1.37%
100		3	0.8	0.762	0.838	0.7	0.9	0.0186	0.1	12.5%	1.37%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	1.12	1.1	1.15	1.07	1.2	0.0124	0.0667	5.94%	0.0%
6.25		3	1.21	1.11	1.31	0.955	1.48	0.0487	0.262	21.7%	-7.74%
12.5		3	1.12	0.995	1.25	0.819	1.48	0.062	0.334	29.8%	0.18%
25		3	1.09	0.989	1.19	0.92	1.39	0.0483	0.26	23.9%	3.2%
50		3	1.11	1.08	1.14	1.03	1.2	0.0157	0.0845	7.61%	1.14%
100		3	1.12	1.07	1.16	0.991	1.25	0.024	0.129	11.6%	0.7%

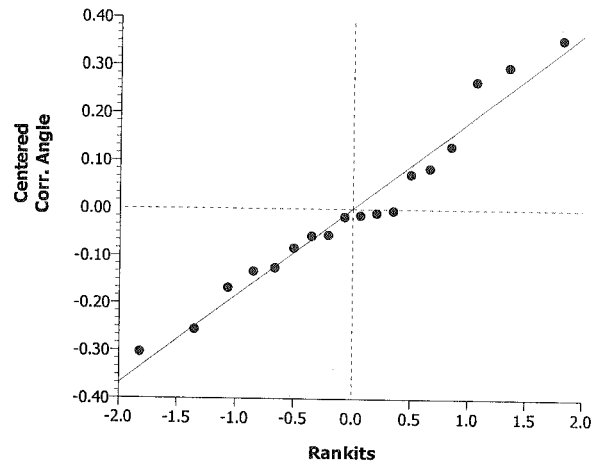
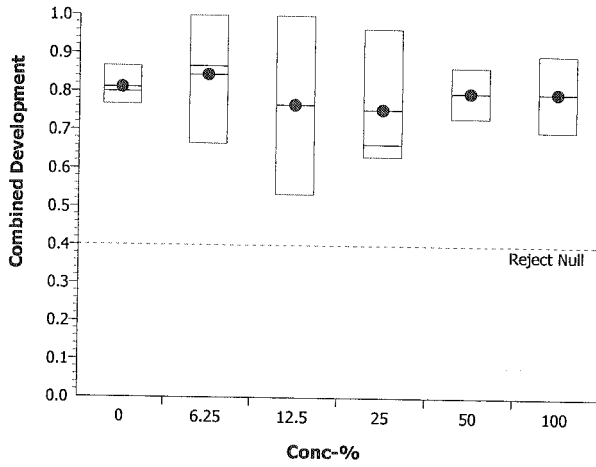
Salmonid Embryo Survival and Development Test

Nautilus Environmental WA

Analysis No: 19-6250-5140      Endpoint: Combined Development  
Analyzed: 17 Jul-09 15:38      Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1.6.3  
Official Results: Yes

Graphics



**CETIS Analytical Report**

Report Date: 17 Jul-09 15:40 (p 1 of 2)  
 Link/Link Code: 06-5488-1127/0907-T009

Salmonid Embryo Survival and Development Test							Nautilus Environmental WA				
Analysis No: 07-0094-9877		Endpoint: Combined Development			CETIS Version: CETISv1.6.3						
Analyzed: 17 Jul-09 15:39		Analysis: Linear Regression (MLE)			Official Results: Yes						
Linear Regression Options											
Model Function			Threshold Option	Threshold	Optimized Pooled		Het Corr	Weighted			
Log-Angle [Asin(P^0.5)=A+B*log(X)]			Control Threshold	0.1888889	Yes	No	Yes	Yes			
Regression Summary											
Iters	LL	QAICc	Mu	Sigma	G Stat	Chi-Sq	Critical	P-Value	Decision(5%)		
52	-50.2	54.6	1.71	19.9	136	26.3	22.4	0.0153	Significant Heterogeneity		
Point Estimates											
Effect-%	Conc-%	95% LCL	95% UCL								
25	516000000	N/A	N/A								
50	8.41E+13	N/A	N/A								
Regression Parameters											
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)				
Threshold	0.187	0.0585	0.0607	0.313	3.2	0.0070	Significant Parameter				
Slope	0.0502	0.272	-0.537	0.637	0.185	0.8560	Non-Significant Parameter				
Intercept	0.086	0.478	-0.947	1.12	0.18	0.8600	Non-Significant Parameter				
Residual Analysis											
Attribute	Method		Test Stat	Critical	P-Value	Decision(5%)					
Variances	Bartlett Equality of Variance		2.86	9.49	0.5810	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.967		0.8130	Normal Distribution					
Combined Development Summary											
			Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Dilution Water	3	0.811	0.767	0.867	0.0093	0.0509	6.28%	0.0%	73	90
6.25		3	0.844	0.667	1	0.0306	0.168	19.9%	-4.11%	76	90
12.5		3	0.767	0.533	1	0.0426	0.233	30.4%	5.48%	69	90
25		3	0.756	0.633	0.967	0.0335	0.184	24.3%	6.85%	68	90
50		3	0.8	0.733	0.867	0.0122	0.0667	8.33%	1.37%	72	90
100		3	0.8	0.7	0.9	0.0183	0.1	12.5%	1.37%	72	90
Combined Development Detail											
Conc-%	Control Type	Rep 1	Rep 3	Rep 4							
0	Dilution Water	0.867	0.767	0.8							
6.25		1	0.867	0.667							
12.5		1	0.767	0.533							
25		0.967	0.633	0.667							
50		0.867	0.733	0.8							
100		0.9	0.8	0.7							



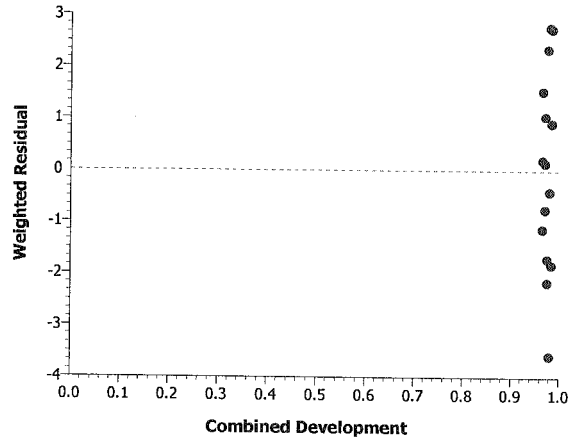
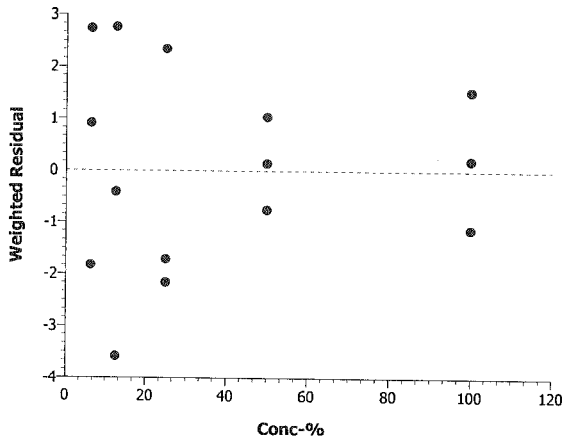
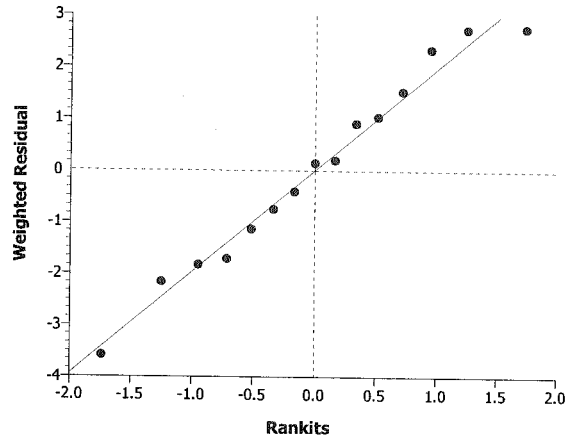
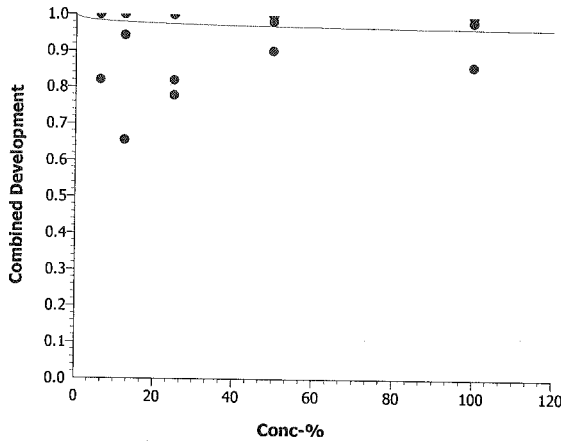
Salmonid Embryo Survival and Development Test

Nautilus Environmental WA

Analysis No: 07-0094-9877      Endpoint: Combined Development  
Analyzed: 17 Jul-09 15:39      Analysis: Linear Regression (MLE)

CETIS Version: CETISv1.6.3  
Official Results: Yes

Graphics



Nautilus Environmental  
Washington Laboratory

Client: BC Lab  
Sample ID: STF2  
Test No: 0907-1008  
Log-In#: 09-201

Initial and Final Chemistries

Seven Day Chronic Freshwater Bioassay  
Start Date & Time: 7/8/09 1435  
Stop Date & Time: 7/15/09 1300  
Test Species: Oncorhynchus mykiss

Conc or % Coh	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	8.11	7.03	7.54	7.05	7.25	7.14	7.31	7.13	7.03	7.52	6.99	7.22	7.04	7.58
DO (mg/l)	8.0	9.5	8.9	9.5	8.9	9.7	9.5	9.4	9.3	9.3	9.0	9.3	9.4	9.6
Cond. (µmhos-cm)	257	237	241	240	255	241	240	249	236	244	236	234	249	246
Temperature (°C)	14.8	14.6	14.9	14.4	14.8	14.0	14.0	14.5	13.8	14.6	14.8	14.5	14.9	14.0
pH	8.11	7.07	7.58	7.03	7.33	7.20	7.51	7.23	7.16	7.53	7.04	7.24	7.05	7.63
DO (mg/l)	8.5	9.5	9.0	9.7	9.0	9.9	8.9	9.6	9.3	9.3	8.9	9.8	9.2	9.7
Cond. (µmhos-cm)	246	225	228	227	247	232	226	227	220	231	227	223	239	237
Temperature (°C)	14.8	14.4	14.8	14.2	14.8	14.0	14.4	14.2	13.4	14.5	14.9	14.2	14.8	14.7
pH	8.10	7.09	7.59	7.09	7.37	7.22	7.54	7.26	7.16	7.52	7.06	7.24	7.07	7.63
DO (mg/l)	8.6	9.6	9.0	9.8	9.0	9.7	8.9	9.3	9.6	9.2	9.2	9.5	9.6	9.7
Cond. (µmhos-cm)	232	214	218	217	233	219	216	216	209	220	216	212	226	224
Temperature (°C)	14.8	14.4	14.7	14.2	14.9	13.9	14.5	14.4	13.5	14.6	14.9	14.2	14.7	14.7
pH	8.04	7.11	7.59	7.14	7.38	7.21	7.50	7.24	7.17	7.51	7.07	7.25	7.13	7.61
DO (mg/l)	8.5	9.4	9.2	9.8	9.3	9.7	9.0	9.4	9.3	9.2	9.3	9.6	9.7	9.8
Cond. (µmhos-cm)	204	193	196	193	203	192	195	192	187	197	189	188	197	198
Temperature (°C)	14.9	14.3	14.9	14.3	14.9	13.9	14.8	14.5	13.4	14.7	14.9	14.3	14.5	14.7
pH	7.97	7.09	7.57	7.18	7.37	7.18	7.36	7.18	7.15	7.45	7.07	7.26	7.15	7.55
DO (mg/l)	9.4	9.5	9.3	9.6	9.4	9.9	9.6	9.5	9.4	9.2	9.4	9.7	9.9	9.7
Cond. (µmhos-cm)	159	152	148	148	158	149	156	150	143	150	148	144	151	151
Temperature (°C)	15.0	14.2	14.9	14.2	14.9	13.8	14.9	14.3	13.5	14.5	14.9	14.2	14.3	14.6
pH	7.66	6.95	7.59	7.22	7.20	6.87	7.00	6.89	7.01	7.18	7.01	7.25	7.21	7.25
DO (mg/l)	9.6	9.6	10.0	9.8	10.2	9.8	10.1	9.6	9.8	9.3	10.1	9.6	10.5	9.74
Cond. (µmhos-cm)	50	51	49	49	50	48	52	48	48	49	49	49	48	49
Temperature (°C)	15.0	14.3	14.8	14.3	14.9	13.9	14.9	14.3	13.7	14.8	14.4	14.3	13.8	14.7
Tech. Initials	MD	GT	GT	GT	BP	MA	BP	BP	BP	MD	GT	GT	GT	OC

Dilution Water Batch #: MHSW040  
Test Chamber: Env Ch B

QA Check: 125

Sample Description: \_\_\_\_\_  
Animal Source: Troutlodge Date Received: 7/8/09 Date of Hatch: \_\_\_\_\_  
Comments: \_\_\_\_\_

Nautilus Environmental  
 Washington Laboratory  
 5009 Pacific Hwy. E., Suite 2  
 Tacoma, WA 98424

Raw Data Sheet  
 Rainbow Trout  
 (*Oncorhynchus mykiss*)  
 Trout Embryo Test

Client Name: BC Lab

Test No.: 0907-T008

Sample ID: STE2

# Embryos/Container

Conc.	Cont.	Rep.	Days							# Normal	# Abnormal	Mean % Viable	
			0	1	2	3	4	5	6				7
Con	201	1	30	30	30	30	30	30	30	29	28	1	
	202	2	30	29	29	29	29	29	29	29	0	29	
	203	3	30	30	30	30	30	30	30	30	28	2	
	204	4	30	30	30	30	30	29	29	29	29	4	
6.25	205	1	30	30	30	30	30	30	30	29	28	1	
	206	2	30	28	28	28	28	28	28	28	0	28	
	207	3	30	28	28	28	28	28	28	28	26	2	
	208	4	30	30	30	30	30	28	28	28	22	6	
12.5	209	1	30	30	30	30	30	30	30	30	29	1	
	210	2	30	29	29	29	29	29	28	27	0	27	
	211	3	30	30	30	30	30	30	30	29	26	3	
	212	4	30	30	30	30	29	28	28	28	24	4	
25	213	1	30	30	30	30	30	30	30	30	29	1	
	214	2	30	30	30	29	29	29	29	29	0	29	
	215	3	30	30	30	30	29	29	29	29	24	5	
	216	4	30	30	29	29	29	29	29	29	18	11	
50	217	1	30	30	30	30	30	28	28	28	18	10	
	218	2	30	29	29	29	29	29	29	29	0	29	
	219	3	30	30	30	30	30	30	30	30	29	1	
	220	4	30	30	30	30	30	30	30	30	29	1	
100	221	1	30	30	30	30	30	30	30	30	30	0	
	222	2	30	29	29	29	29	29	29	29	0	29	
	223	3	30	30	30	30	29	29	29	29	25	4	
	224	4	30	30	30	30	30	29	29	29	19	10	
		1											
		2											
		3											
		4											
		1											
		2											
		3											
		4											
Tech Initials			MF	CF	CF	MA	BP	CF	CF	MF	MF	MF	

QA Check: RS

Comments: \_\_\_\_\_

# CETIS Summary Report

Report Date: 17 Jul-09 15:18 (p 1 of 1)  
 Link/Link Code: 02-1430-2846/0907-T008

Salmonid Embryo Survival and Development Test							Nautilus Environmental WA				
<b>Test Run No:</b> 09-3136-5821	<b>Test Type:</b> Survival-Development		<b>Analyst:</b> Meghan Feuk								
<b>Start Date:</b> 08 Jul-09 14:35	<b>Protocol:</b> EC/EPS 1/RM/28		<b>Diluent:</b> Mod-Hard Synthetic Water								
<b>Ending Date:</b> 15 Jul-09 13:00	<b>Species:</b> Oncorhynchus mykiss		<b>Brine:</b>								
<b>Duration:</b> 6d 22h	<b>Source:</b> Trout Lodge Fish Farm		<b>Age:</b>								
<b>Sample No:</b> 19-9440-6980	<b>Code:</b> 09-201		<b>Client:</b> Vancouver BC Lab								
<b>Sample Date:</b> 05 Jul-09 13:15	<b>Material:</b> Receiving Water		<b>Project:</b>								
<b>Receive Date:</b> 08 Jul-09 12:30	<b>Source:</b> Vancouver BC Lab										
<b>Sample Age:</b> 73h (15 °C)	<b>Station:</b>										
<b>Comparison Summary</b>											
<b>Analysis No</b>	<b>Endpoint</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>PMSD</b>	<b>Method</b>					
13-2195-6944	Combined Development	100	> 100	N/A	40.7%	Dunnett's Multiple Comparison Test					
<b>Point Estimate Summary</b>											
<b>Analysis No</b>	<b>Endpoint</b>	<b>Effect-%</b>	<b>Conc-%</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>Method</b>					
09-3449-6703	Combined Development	25	183000	N/A	N/A	Linear Regression (MLE)					
		50	3.51E+08	N/A	N/A						
<b>Combined Development Summary</b>											
<b>Conc-%</b>	<b>Control Type</b>	<b>Count</b>	<b>Mean</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>Diff%</b>
0	Dilution Water	3	0.9	0.878	0.922	0.833	0.933	0.0105	0.0577	6.42%	0.0%
6.25		3	0.844	0.806	0.882	0.733	0.933	0.0186	0.102	12.1%	6.17%
12.5		3	0.878	0.846	0.909	0.8	0.967	0.0153	0.0839	9.56%	2.47%
25		3	0.789	0.72	0.857	0.6	0.967	0.0335	0.184	23.3%	12.3%
50		3	0.844	0.765	0.923	0.6	0.967	0.0387	0.212	25.1%	6.17%
100		3	0.822	0.754	0.891	0.633	1	0.0335	0.184	22.3%	8.64%
<b>Combined Development Detail</b>											
<b>Conc-%</b>	<b>Control Type</b>	<b>Rep 1</b>	<b>Rep 3</b>	<b>Rep 4</b>							
0	Dilution Water	0.933	0.933	0.833							
6.25		0.933	0.867	0.733							
12.5		0.967	0.867	0.8							
25		0.967	0.8	0.6							
50		0.6	0.967	0.967							
100		1	0.833	0.633							

**CETIS Analytical Report**

Report Date: 17 Jul-09 15:18 (p 1 of 2)  
 Link/Link Code: 02-1430-2846/0907-T008

Salmonid Embryo Survival and Development Test								Nautilus Environmental WA			
Analysis No: 13-2195-6944		Endpoint: Combined Development			CETIS Version: CETISv1.6.3						
Analyzed: 17 Jul-09 15:16		Analysis: Parametric-Control vs Treatments			Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)		C > T	Not Run	100	>100	N/A	1	40.7%			
Dunnnett's Multiple Comparison Test											
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Dilution Water		6.25	0.448	2.5	0.437	0.6710	Non-Significant Effect				
		12.5	0.149	2.5	0.437	0.7860	Non-Significant Effect				
		25	0.742	2.5	0.437	0.5410	Non-Significant Effect				
		50	0.208	2.5	0.437	0.7650	Non-Significant Effect				
		100	0.419	2.5	0.437	0.6830	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)					
Between	0.031893	0.006379	5	0.139	0.9800	Non-Significant Effect					
Error	0.549407	0.045784	12								
Total	0.5813	0.052163	17								
ANOVA Assumptions											
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)						
Variances	Bartlett Equality of Variance	3.1	15.1	0.6850	Equal Variances						
Distribution	Shapiro-Wilk Normality	0.974		0.8690	Normal Distribution						
Combined Development Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	0.9	0.878	0.922	0.833	0.933	0.0107	0.0577	6.41%	0.0%
6.25		3	0.844	0.806	0.883	0.733	0.933	0.0189	0.102	12.1%	6.17%
12.5		3	0.878	0.846	0.91	0.8	0.967	0.0156	0.0839	9.56%	2.47%
25		3	0.789	0.719	0.859	0.6	0.967	0.0341	0.184	23.3%	12.3%
50		3	0.844	0.764	0.925	0.6	0.967	0.0393	0.212	25.1%	6.17%
100		3	0.822	0.752	0.892	0.633	1	0.0341	0.184	22.3%	8.64%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	1.26	1.22	1.29	1.15	1.31	0.0171	0.092	7.32%	0.0%
6.25		3	1.18	1.12	1.23	1.03	1.31	0.0263	0.142	12.0%	6.23%
12.5		3	1.23	1.18	1.28	1.11	1.39	0.0266	0.143	11.6%	2.07%
25		3	1.13	1.03	1.22	0.886	1.39	0.0466	0.251	22.3%	10.3%
50		3	1.22	1.11	1.33	0.886	1.39	0.0537	0.289	23.7%	2.89%
100		3	1.18	1.08	1.29	0.92	1.48	0.0522	0.281	23.7%	5.82%

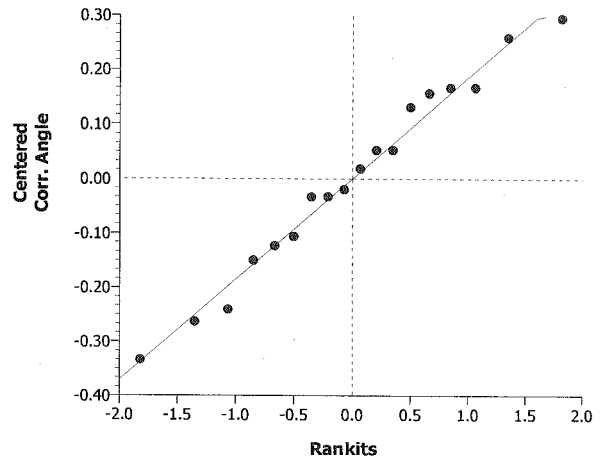
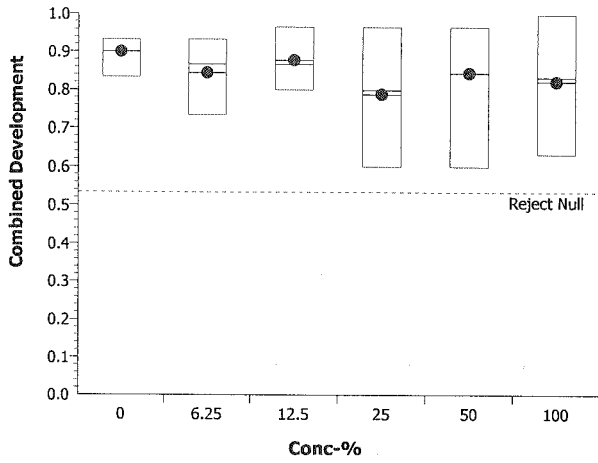
Salmonid Embryo Survival and Development Test

Nautilus Environmental WA

Analysis No: 13-2195-6944      Endpoint: Combined Development  
Analyzed: 17 Jul-09 15:16      Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1.6.3  
Official Results: Yes

Graphics



**CETIS Analytical Report**

Report Date: 17 Jul-09 15:18 (p 1 of 2)  
 Link/Link Code: 02-1430-2846/0907-T008

Salmonid Embryo Survival and Development Test							Nautilus Environmental WA					
Analysis No: 09-3449-6703		Endpoint: Combined Development			CETIS Version: CETISv1.6.3							
Analyzed: 17 Jul-09 15:17		Analysis: Linear Regression (MLE)			Official Results: Yes							
Linear Regression Options												
Model Function		Threshold Option		Threshold	Optimized Pooled		Het Corr	Weighted				
Log-Normal [NED=A+B*log(X)]		Control Threshold		0.1	Yes	No	Yes	Yes				
Regression Summary												
Iters	LL	QAICc	Mu	Sigma	G Stat	Chi-Sq	Critical	P-Value	Decision(5%)			
7	-116	80	15.8	4.87	41.3	40.1	22.4	0.0001	Significant Heterogeneity			
Point Estimates												
Effect-%	Conc-%	95% LCL	95% UCL									
25	183000	N/A	N/A									
50	351000000	N/A	N/A									
Regression Parameters												
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)					
Threshold	0.0998	0.0555	-0.0201	0.22	1.8	0.0953	Non-Significant Parameter					
Slope	0.205	0.611	-1.12	1.53	0.336	0.7420	Non-Significant Parameter					
Intercept	3.24	1.03	1.02	5.47	3.16	0.0076	Significant Parameter					
Residual Analysis												
Attribute	Method		Test Stat	Critical	P-Value	Decision(5%)						
Variances	Bartlett Equality of Variance		1.72	9.49	0.7870	Equal Variances						
Distribution	Shapiro-Wilk Normality		0.909		0.1290	Normal Distribution						
Combined Development Summary												
			Calculated Variate(A/B)									
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B	
0	Dilution Water	3	0.9	0.833	0.933	0.0105	0.0577	6.41%	0.0%	81	90	
6.25		3	0.844	0.733	0.933	0.0186	0.102	12.1%	6.17%	76	90	
12.5		3	0.878	0.8	0.967	0.0153	0.0839	9.56%	2.47%	79	90	
25		3	0.789	0.6	0.967	0.0335	0.184	23.3%	12.3%	71	90	
50		3	0.844	0.6	0.967	0.0387	0.212	25.1%	6.17%	76	90	
100		3	0.822	0.633	1	0.0335	0.184	22.3%	8.64%	74	90	
Combined Development Detail												
Conc-%	Control Type	Rep 1	Rep 3	Rep 4								
0	Dilution Water	0.933	0.933	0.833								
6.25		0.933	0.867	0.733								
12.5		0.967	0.867	0.8								
25		0.967	0.8	0.6								
50		0.6	0.967	0.967								
100		1	0.833	0.633								

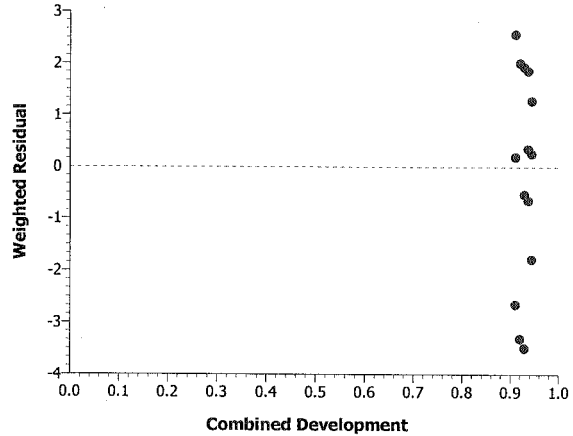
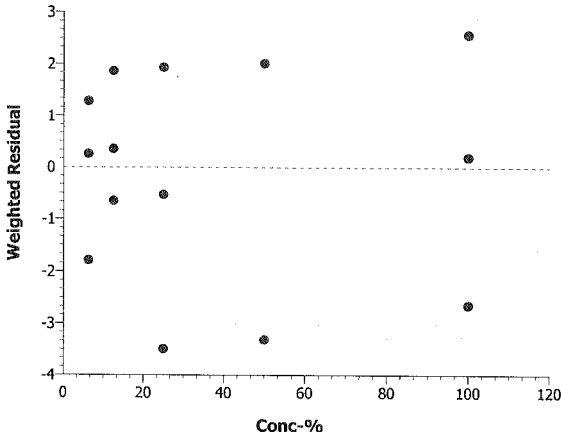
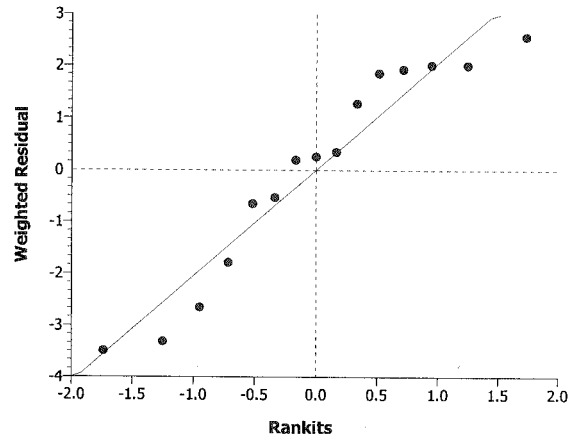
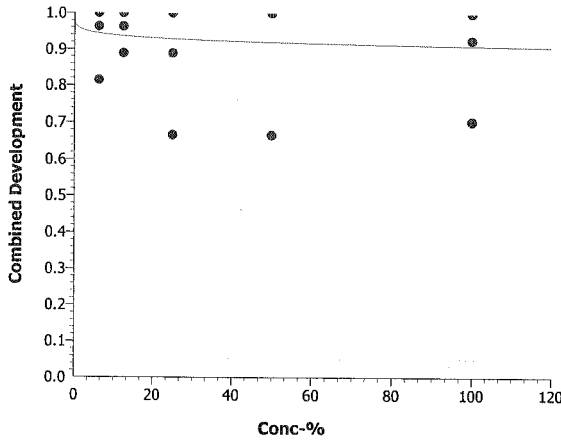
Salmonid Embryo Survival and Development Test

Nautilus Environmental WA

Analysis No: 09-3449-6703      Endpoint: Combined Development  
Analyzed: 17 Jul-09 15:17      Analysis: Linear Regression (MLE)

CETIS Version: CETISv1.6.3  
Official Results: Yes

Graphics





Nautilus Environmental  
Washington Laboratory

Client: BC Lab  
Sample ID: MTR2  
Test No: 0907-TD10  
Log-In#: 09-202

Initial and Final Chemistries

Seven Day Chronic Freshwater Bioassay  
Start Date & Time: 7/8/09 1435  
Stop Date & Time: 7/15/09 1330  
Test Species: Oncorhynchus mykiss

Conc. or % CDN	Days													
	0		1		*7.142		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	8.03	7.07	7.51	7.45	8.74	7.13	7.59	7.19	7.22	7.51	7.11	7.82	7.21	7.54
DO (mg/l)	9.4	9.6	8.8	9.6	8.8	9.7	8.7	9.5	9.4	9.2	9.2	9.6	9.5	9.6
Cond. (µmhos-cm)	253	246	245	242	258	253	236	238	232	245	239	236	253	244
Temperature (°C)	14.8	14.5	14.6	14.5	14.8	14.1	14.7	14.6	13.8	14.5	14.8	14.5	14.8	14.7

6.25	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	8.05	7.13	7.56	7.49	7.23	7.20	7.64	7.25	7.41	7.56	7.06	7.82	7.23	7.59
DO (mg/l)	9.4	9.5	9.0	9.6	9.2	9.6	8.9	9.5	9.0	9.1	8.9	9.8	9.4	9.8
Cond. (µmhos-cm)	238	235	235	230	245	237	227	228	215	225	232	223	242	235
Temperature (°C)	14.7	14.4	14.5	14.1	14.7	13.7	14.7	14.7	14.2	14.6	14.9	14.4	14.7	14.7

12.5	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	8.04	7.17	7.56	7.49	7.27	7.23	7.66	7.28	7.41	7.56	7.11	7.79	7.25	7.60
DO (mg/l)	9.4	9.6	9.1	9.7	9.0	9.5	9.1	9.3	9.0	9.1	9.2	9.8	9.4	9.7
Cond. (µmhos-cm)	226	224	223	220	230	223	216	218	208	216	217	211	228	224
Temperature (°C)	14.7	14.6	14.4	14.2	14.5	13.7	14.5	14.6	14.3	14.6	14.9	14.5	14.6	14.8

25	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	7.99	7.16	7.56	7.49	7.28	7.24	7.65	7.27	7.38	7.56	7.14	7.71	7.26	7.52
DO (mg/l)	9.3	9.4	9.2	9.5	9.2	9.7	9.3	9.5	9.5	9.1	9.3	9.7	9.3	9.8
Cond. (µmhos-cm)	203	200	200	196	207	201	194	195	192	201	196	194	203	201
Temperature (°C)	14.7	14.5	14.5	14.3	14.6	13.6	14.6	14.7	14.2	14.7	14.8	14.6	14.4	14.7

50	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	7.94	7.17	7.49	7.48	7.26	7.19	7.62	7.26	7.35	7.49	7.14	7.70	7.27	7.49
DO (mg/l)	9.5	9.4	9.5	9.6	9.6	9.5	9.5	9.5	9.4	9.2	9.5	9.8	9.8	9.7
Cond. (µmhos-cm)	153	152	152	149	158	152	149	149	148	152	147	145	151	149
Temperature (°C)	14.5	14.6	14.5	14.4	14.5	13.6	14.8	14.7	14.2	14.7	14.8	14.5	14.3	14.7

100	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	7.104	7.20	7.32	7.19	7.07	7.00	7.3	7.01	7.04	7.31	7.09	7.75	7.27	7.28
DO (mg/l)	9.9	9.5	10.2	9.5	10.4	9.8	10.4	9.5	9.9	9.2	9.8	9.8	10.3	10.0
Cond. (µmhos-cm)	53.4	56	53.0	53	53.0	53	53	52	53	54	54	54	52	54
Temperature (°C)	14.3	14.6	14.4	14.4	14.0	13.7	14.8	14.8	14.5	14.7	14.9	14.6	14.1	14.8

Tech. Initials: MS ST MS SP OP SP SP BP SP BP MS ST ST ST OC

Dilution Water Batch #: MHSW 040  
Test Chamber: Env Ch B

QA Check: 1ES

Sample Description: \_\_\_\_\_  
Animal Source: Trawlpage Date Received: 7/8/09 Date of Hatch: \_\_\_\_\_  
Comments: \_\_\_\_\_

Nautilus Environmental  
 Washington Laboratory  
 5009 Pacific Hwy. E., Suite 2  
 Tacoma, WA 98424

Raw Data Sheet  
 Rainbow Trout  
 (*Oncorhynchus mykiss*)  
 Trout Embryo Test

Client Name: BC Lab

Test No.: 0907-1010

Sample ID: NTR2

# Embryos/Container

Conc.	Cont.	Rep.	Days								# Normal	# Abnormal	Mean % Viable	
			0	1	2	3	4	5	6	7				
Con	301	1	30	30	30	30	30	30	30	30	30	30	0	
	302	2	30	30	30	30	30	30	29	29	0	29		
	303	3	30	30	30	30	30	30	30	30	28	2		
	304	4	30	30	30	30	30	28	28	28	23	5		
6.25	305	1	30	30	30	30	30	30	30	29	29	0		
	306	2	30	30	30	30	30	30	30	30	0	30		
	307	3	30	30	30	30	30	30	30	29	28	1		
	308	4	30	30	30	30	30	29	29	28	21	7		
12.5	309	1	30	30	30	30	30	30	30	30	30	0		
	310	2	30	30	30	30	30	30	30	29	0	29		
	311	3	30	30	30	30	30	30	28	28	28	0		
	312	4	30	30	30	30	30	29	29	29	21	8		
25	313	1	30	30	30	30	30	30	30	29	29	0		
	314	2	30	28	28	28	28	28	27	27	0	27		
	315	3	30	30	30	30	30	30	30	30	29	1		
	316	4	30	30	30	30	30	30	30	26	19	6		
50	317	1	30	30	30	30	30	30	30	30	30	0		
	318	2	30	30	30	30	30	28	28	28	0	28		
	319	3	30	30	30	30	30	30	30	30	27	3		
	320	4	30	30	30	30	30	30	29	29	18	11		
100	321	1	30	30	30	30	30	29	29	29	29	0		
	322	2	30	29	29	29	29	28	28	27	0	27		
	323	3	30	30	30	30	30	30	30	29	28	1		
	324	4	30	30	30	30	30	29	29	28	16	12		
		1												
		2												
		3												
		4												
		1												
		2												
		3												
		4												
Tech Initials			MF	(M)	gt	BP	OP	et	et	MF	MF	MF		

QA Check: 105

Comments: \_\_\_\_\_

# CETIS Summary Report

Report Date: 17 Jul-09 15:24 (p 1 of 1)  
 Link/Link Code: 13-8796-0510/0907-T010

<b>Salmonid Embryo Survival and Development Test</b>	<b>Nautilus Environmental WA</b>
--	----------------------------------

<b>Test Run No:</b> 02-1933-8693	<b>Test Type:</b> Survival-Development	<b>Analyst:</b> Meghan Feuk
<b>Start Date:</b> 08 Jul-09 14:35	<b>Protocol:</b> EC/EPS 1/RM/28	<b>Diluent:</b> Mod-Hard Synthetic Water
<b>Ending Date:</b> 15 Jul-09 13:30	<b>Species:</b> Oncorhynchus mykiss	<b>Brine:</b>
<b>Duration:</b> 6d 23h	<b>Source:</b> Trout Lodge Fish Farm	<b>Age:</b>

<b>Sample No:</b> 05-2632-7187	<b>Code:</b> 09-202	<b>Client:</b> Vancouver BC Lab
<b>Sample Date:</b> 05 Jul-09 15:15	<b>Material:</b> Receiving Water	<b>Project:</b>
<b>Receive Date:</b> 08 Jul-09 12:30	<b>Source:</b> Vancouver BC Lab	
<b>Sample Age:</b> 71h (14 °C)	<b>Station:</b>	

Comparison Summary						
Analysis No	Endpoint	NOEL	LOEL	TOEL	PMSD	Method
19-6356-3656	Combined Development	100	> 100	N/A	47.9%	Dunnett's Multiple Comparison Test

Point Estimate Summary						
Analysis No	Endpoint	Effect-%	Conc-%	95% LCL	95% UCL	Method
06-7354-0500	Combined Development	25	1290	N/A	N/A	Linear Regression (MLE)
		50	20100	N/A	N/A	

Combined Development Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	0.9	0.855	0.945	0.767	1	0.0219	0.12	13.4%	0.0%
6.25		3	0.867	0.812	0.921	0.7	0.967	0.0265	0.145	16.8%	3.7%
12.5		3	0.878	0.819	0.937	0.7	1	0.0288	0.158	17.9%	2.47%
25		3	0.856	0.784	0.927	0.633	0.967	0.0351	0.192	22.5%	4.94%
50		3	0.833	0.756	0.911	0.6	1	0.038	0.208	25.0%	7.41%
100		3	0.811	0.721	0.901	0.533	0.967	0.044	0.241	29.7%	9.88%

Combined Development Detail				
Conc-%	Control Type	Rep 1	Rep 3	Rep 4
0	Dilution Water	1	0.933	0.767
6.25		0.967	0.933	0.7
12.5		1	0.933	0.7
25		0.967	0.967	0.633
50		1	0.9	0.6
100		0.967	0.933	0.533

# CETIS Analytical Report

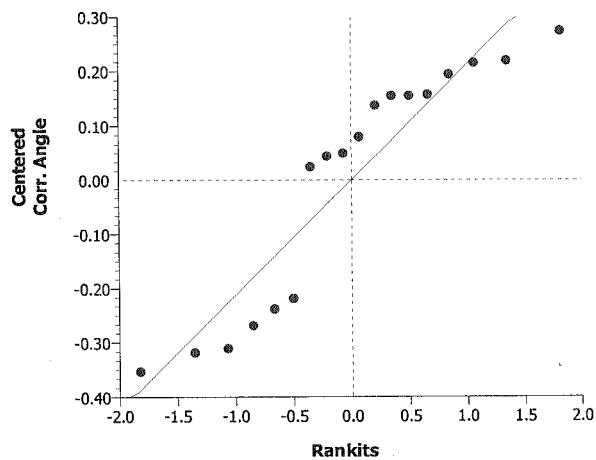
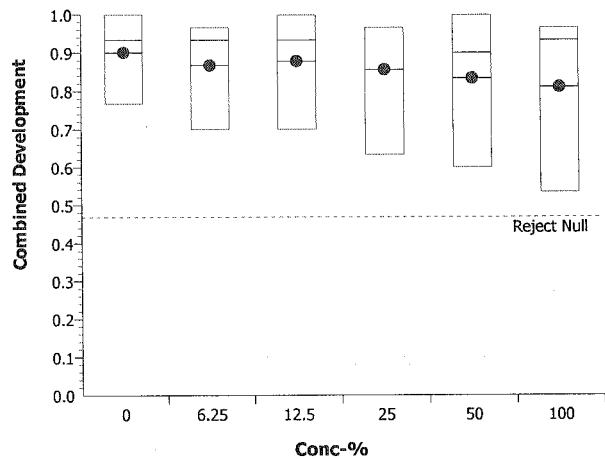
Report Date: 17 Jul-09 15:24 (p 1 of 2)  
 Link/Link Code: 13-8796-0510/0907-T010

Salmonid Embryo Survival and Development Test								Nautilus Environmental WA			
Analysis No: 19-6356-3656		Endpoint: Combined Development			CETIS Version: CETISv1.6.3						
Analyzed: 17 Jul-09 15:23		Analysis: Parametric-Control vs Treatments			Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)		C > T	Not Run	100	>100	N/A	1	47.9%			
Dunnett's Multiple Comparison Test											
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Dilution Water		6.25	0.263	2.5	0.531	0.7450	Non-Significant Effect				
		12.5	0.119	2.5	0.531	0.7960	Non-Significant Effect				
		25	0.253	2.5	0.531	0.7490	Non-Significant Effect				
		50	0.379	2.5	0.531	0.7000	Non-Significant Effect				
		100	0.534	2.5	0.531	0.6340	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)					
Between	0.023906	0.004781	5	0.0707	0.9960	Non-Significant Effect					
Error	0.811283	0.067607	12								
Total	0.835189	0.072388	17								
ANOVA Assumptions											
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)						
Variances	Bartlett Equality of Variance	0.475	15.1	0.9930	Equal Variances						
Distribution	Shapiro-Wilk Normality	0.857		0.0108	Normal Distribution						
Combined Development Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	0.9	0.854	0.946	0.767	1	0.0223	0.12	13.4%	0.0%
6.25		3	0.867	0.811	0.922	0.7	0.967	0.027	0.145	16.8%	3.7%
12.5		3	0.878	0.818	0.938	0.7	1	0.0293	0.158	17.9%	2.47%
25		3	0.856	0.782	0.929	0.633	0.967	0.0357	0.192	22.5%	4.94%
50		3	0.833	0.754	0.913	0.6	1	0.0387	0.208	25.0%	7.41%
100		3	0.811	0.719	0.903	0.533	0.967	0.0448	0.241	29.7%	9.88%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	1.29	1.21	1.36	1.07	1.48	0.0385	0.207	16.1%	0.0%
6.25		3	1.23	1.15	1.31	0.991	1.39	0.039	0.21	17.1%	4.35%
12.5		3	1.26	1.17	1.35	0.991	1.48	0.046	0.248	19.7%	1.96%
25		3	1.23	1.13	1.33	0.92	1.39	0.05	0.27	21.9%	4.17%
50		3	1.2	1.09	1.32	0.886	1.48	0.0555	0.299	24.8%	6.26%
100		3	1.17	1.05	1.29	0.819	1.39	0.0572	0.308	26.3%	8.82%

Salmonid Embryo Survival and Development Test Nautilus Environmental WA

Analysis No: 19-6356-3656      Endpoint: Combined Development      CETIS Version: CETISv1.6.3  
Analyzed: 17 Jul-09 15:23      Analysis: Parametric-Control vs Treatments      Official Results: Yes

Graphics



**CETIS Analytical Report**

Report Date: 17 Jul-09 15:24 (p 1 of 2)  
 Link/Link Code: 13-8796-0510/0907-T010

Salmonid Embryo Survival and Development Test										Nautilus Environmental WA	
Analysis No: 06-7354-0500		Endpoint: Combined Development			CETIS Version: CETISv1.6.3						
Analyzed: 17 Jul-09 15:23		Analysis: Linear Regression (MLE)			Official Results: Yes						
<b>Linear Regression Options</b>											
Model Function		Threshold Option		Threshold	Optimized		Pooled	Het Corr	Weighted		
Log-Normal [NED=A+B*log(X)]		Control Threshold		0.1	Yes	No	Yes	Yes			
<b>Regression Summary</b>											
Itrs	LL	QAICc	Mu	Sigma	G Stat	Chi-Sq	Critical	P-Value	Decision(5%)		
11	-93.8	44.6	4.54	1.77	20.8	61.5	22.4	0.0000	Significant Heterogeneity		
<b>Point Estimates</b>											
Effect-%	Conc-%	95% LCL	95% UCL								
25	1290	N/A	N/A								
50	20100	N/A	N/A								
<b>Regression Parameters</b>											
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)				
Threshold	0.101	0.0683	-0.0463	0.249	1.48	0.1620	Non-Significant Parameter				
Slope	0.565	1.19	-2.01	3.14	0.474	0.6440	Non-Significant Parameter				
Intercept	2.57	2.09	-1.94	7.08	1.23	0.2400	Non-Significant Parameter				
<b>Residual Analysis</b>											
Attribute	Method		Test Stat	Critical	P-Value	Decision(5%)					
Variances	Mod Levene Equality of Variance		1.51	3.48	0.2710	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.776		0.0018	Non-normal Distribution					
<b>Combined Development Summary</b>											
			Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Dilution Water	3	0.9	0.767	1	0.0219	0.12	13.4%	0.0%	81	90
6.25		3	0.867	0.7	0.967	0.0265	0.145	16.8%	3.7%	78	90
12.5		3	0.878	0.7	1	0.0288	0.158	17.9%	2.47%	79	90
25		3	0.856	0.633	0.967	0.0351	0.192	22.5%	4.94%	77	90
50		3	0.833	0.6	1	0.038	0.208	25.0%	7.41%	75	90
100		3	0.811	0.533	0.967	0.044	0.241	29.7%	9.88%	73	90
<b>Combined Development Detail</b>											
Conc-%	Control Type	Rep 1	Rep 3	Rep 4							
0	Dilution Water	1	0.933	0.767							
6.25		0.967	0.933	0.7							
12.5		1	0.933	0.7							
25		0.967	0.967	0.633							
50		1	0.9	0.6							
100		0.967	0.933	0.533							

Salmonid Embryo Survival and Development Test

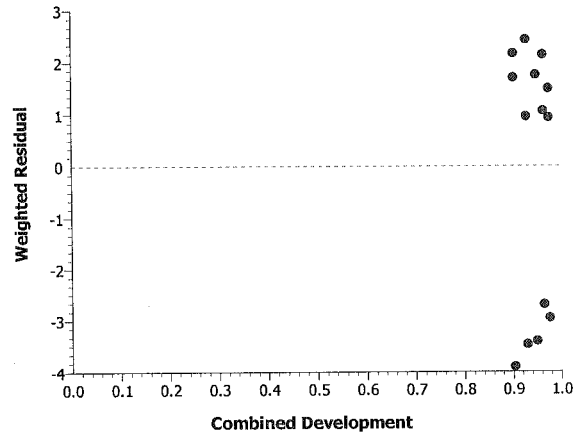
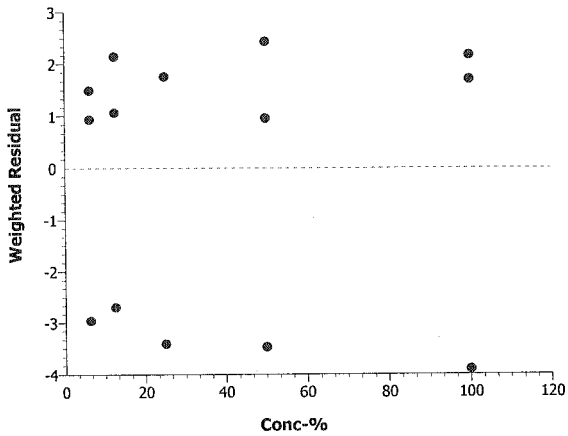
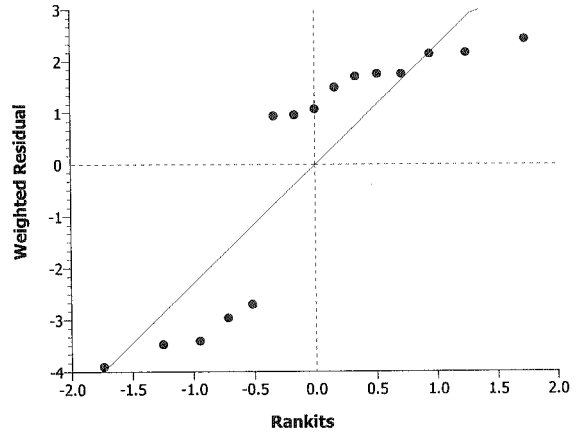
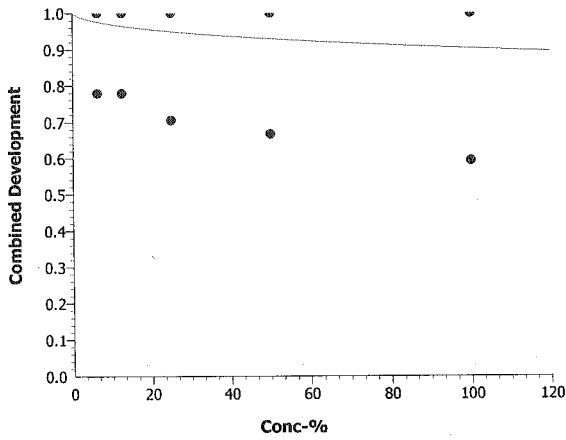
Nautilus Environmental WA

Analysis No: 06-7354-0500  
Analyzed: 17 Jul-09 15:23

Endpoint: Combined Development  
Analysis: Linear Regression (MLE)

CETIS Version: CETISv1.6.3  
Official Results: Yes

Graphics



Nautilus Environmental  
Washington Laboratory

Client: BC Lab  
Sample ID: SCR  
Test No: 0907-7007  
Log-In#: 09-199

Initial and Final Chemistries

Seven Day Chronic Freshwater Bioassay

Start Date & Time: 7/8/09 1435  
Stop Date & Time: 7/15/09 1415  
Test Species: Oncorhynchus mykiss

Conc. or %	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
0.250	Days													
	0		1		2		3		4		5		6	
pH	8.13	7.05	7.50	7.14	7.48	7.26	7.56	6.93	7.39	7.31	7.11	8.35	7.12	7.59
DO (mg/l)	8.7	9.5	8.9	9.5	9.0	9.8	9.0	9.3	9.0	8.9	8.9	9.7	9.3	9.0
Cond. (µmhos-cm)	258	239	248	244	243	245	242	244	224	232	235	232	252	243
Temperature (°C)	14.6	14.3	14.3	14.6	14.2	14.2	14.6	14.8	13.3	14.5	14.8	14.5	14.7	14.7
1.250	Days													
	0		1		2		3		4		5		6	
pH	8.17	7.01	7.53	7.19	7.54	7.28	7.59	6.99	7.54	7.45	7.17	8.28	7.15	7.63
DO (mg/l)	8.5	9.4	9.0	9.5	9.1	9.6	9.0	9.5	9.1	9.2	9.2	9.8	9.3	9.8
Cond. (µmhos-cm)	250	230	241	234	237	237	233	230	225	222	228	224	244	237
Temperature (°C)	14.1	14.3	14.1	14.5	14.2	14.2	14.4	14.4	13.4	14.2	14.7	14.2	14.8	14.4
2.5	Days													
	0		1		2		3		4		5		6	
pH	8.20	7.05	7.57	7.23	7.56	7.30	7.60	7.02	7.57	7.45	7.22	8.21	7.17	7.61
DO (mg/l)	8.2	9.6	8.8	9.5	9.3	9.7	9.1	9.5	9.2	9.1	9.3	9.7	9.4	9.7
Cond. (µmhos-cm)	239	217	230	223	228	228	223	220	220	216	220	216	232	227
Temperature (°C)	14.4	14.4	14.2	14.5	14.3	14.3	14.4	14.4	13.4	14.3	14.8	14.2	14.7	14.4
25	Days													
	0		1		2		3		4		5		6	
pH	8.13	7.06	7.58	7.24	7.60	7.28	7.62	7.02	7.58	7.44	7.26	8.15	7.18	7.63
DO (mg/l)	8.7	9.6	8.9	9.6	9.4	9.4	9.2	9.5	9.3	9.3	9.1	9.8	9.5	9.7
Cond. (µmhos-cm)	217	200	215	207	204	206	207	202	206	199	202	199	212	209
Temperature (°C)	14.4	14.3	14.3	14.5	14.2	14.3	14.5	14.3	13.3	14.4	14.8	14.2	14.4	14.6
50	Days													
	0		1		2		3		4		5		6	
pH	8.13	7.04	7.61	7.21	7.62	7.26	7.64	6.97	7.60	7.39	7.31	8.09	7.25	7.61
DO (mg/l)	8.9	9.4	9.4	9.5	9.7	9.6	9.5	9.5	9.4	9.0	9.4	9.7	9.7	9.7
Cond. (µmhos-cm)	170	169	174	170	171	173	171	167	174	165	168	165	173	172
Temperature (°C)	14.6	14.4	14.3	14.5	14.0	14.3	14.5	14.3	13.5	14.2	14.8	14.3	14.9	14.5
100	Days													
	0		1		2		3		4		5		6	
pH	8.15	7.03	7.65	7.19	7.71	7.21	7.66	6.94	7.61	7.39	7.40	8.05	7.28	7.57
DO (mg/l)	9.7	9.5	9.7	9.7	10.4	9.8	10.1	9.6	9.9	9.2	10.1	9.7	10.2	9.7
Cond. (µmhos-cm)	93	95	96	97	92	95	98	94	99	94	93	94	93	95
Temperature (°C)	14.7	14.2	14.5	14.5	14.0	14.6	14.2	14.4	13.6	14.4	14.1	14.3	14.1	14.5
Tech. Initials	(M)	ST	(M)	BP	BP	SH	BP	BP	BP	(M)	ST	ST	ST	(C)

Dilution Water Batch #: MHSN 040  
Test Chamber: Env Ch B

QA Check: 105

Sample Description:

Animal Source: Trout Lodge

Date Received: 7/8/09 Date of Hatch: —

Comments:



Nautilus Environmental  
 Washington Laboratory  
 5009 Pacific Hwy. E., Suite 2  
 Tacoma, WA 98424

Raw Data Sheet  
 Rainbow Trout  
 (*Oncorhynchus mykiss*)  
 Trout Embryo Test

Client Name: BC Lab

Test No.: 0907-T007

Sample ID: SCR

# Embryos/Container

Conc.	Cont.	Rep.	Days							# Normal	# Abnormal	Mean % Viable	
			0	1	2	3	4	5	6				7
CON	401	1	30	30	30	30	30	30	30	30	28	2	
	402	2	30	28	28	28	28	28	28	28	0	28	
	403	3	30	30	30	30	30	30	30	30	28	2	
	404	4	30	30	30	30	30	28	28	28	8	20	
0.250	405	1	30	30	30	30	30	30	30	30	30	0	
	406	2	30	30	30	30	30	30	30	30	0	30	
	407	3	30	30	30	30	30	30	30	29	26	22 <sup>#3</sup>	
	408	4	30	30	30	30	30	28	27	27 <sup>#26</sup>	16	10	
12.5	409	1	30	30	30	30	30	30	29	29	29	0	
	410	2	30	28	27	26	26	26	26	29	0	25	
	411	3	30	30	30	30	30	30	30	30	27	3	
	412	4	30	30	30	30	30	29	29	29	21	8	
25	413	1	30	30	30	30	30	30	30	30	29	1	
	414	2	30	28	28	28	28	28	28	28	0	28	
	415	3	30	30	30	30	30	30	30	30	27	3	
	416	4	30	30	30	30	30	30	30	30	21	9	
50	417	1	30	30	30	30	30	30	30	30	30	0	
	418	2	30	29	29	29	29	29	29	27	0	27	
	419	3	30	30	30	30	30	30	30	30	26	4	
	420	4	30	30	30	30	30	30	30	29	17	12	
100	421	1	30	30	30	30	30	30	30	30	28	2	
	422	2	30	30	30	29	29	29	29	29	0	27	
	423	3	30	30	30	29	29	29	28	28	27	1	
	424	4	30	30	30	30	30	30	30	30	23	7	
		1											
		2											
		3											
		4											
		1											
		2											
		3											
		4											
Tech Initials			JK	MB	BP	NA	GR	GC	ST	MF	MF	JK	

QA Check: 125

Comments: \_\_\_\_\_

**CETIS Summary Report**

Report Date: 22 Jul-09 14:47 (p 1 of 1)  
 Link/Link Code: 02-9538-3154/0907-T007

**Salmonid Embryo Survival and Development Test** **Nautilus Environmental WA**

<b>Test Run No:</b> 13-9278-2547	<b>Test Type:</b> Survival-Development	<b>Analyst:</b> Meghan Feuk
<b>Start Date:</b> 08 Jul-09 14:35	<b>Protocol:</b> EC/EPS 1/RM/28	<b>Diluent:</b> Mod-Hard Synthetic Water
<b>Ending Date:</b> 15 Jul-09 14:15	<b>Species:</b> Oncorhynchus mykiss	<b>Brine:</b>
<b>Duration:</b> 7d	<b>Source:</b> Trout Lodge Fish Farm	<b>Age:</b>

<b>Sample No:</b> 13-4788-1083	<b>Code:</b> 09-199	<b>Client:</b> Vancouver BC Lab
<b>Sample Date:</b> 05 Jul-09 11:15	<b>Material:</b> Receiving Water	<b>Project:</b>
<b>Receive Date:</b> 08 Jul-09 12:30	<b>Source:</b> Vancouver BC Lab	
<b>Sample Age:</b> 75h (14 °C)	<b>Station:</b>	

Comparison Summary						
Analysis No	Endpoint	NOEL	LOEL	TOEL	PMSD	Method
17-9287-0975	Combined Development	100	> 100	N/A	71.8%	Dunnett's Multiple Comparison Test

Point Estimate Summary						
Analysis No	Endpoint	Effect-%	Conc-%	95% LCL	95% UCL	Method
21-3218-7613	Combined Development	25	> 100	N/A	N/A	Linear Interpolation (ICPIN)
		50	> 100	N/A	N/A	

Combined Development Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	0.711	0.567	0.855	0.267	0.933	0.0703	0.385	54.1%	0.0%
6.25		3	0.8	0.71	0.89	0.533	1	0.0439	0.24	30.0%	-12.5%
12.5		3	0.856	0.804	0.907	0.7	0.967	0.0253	0.139	16.2%	-20.3%
25		3	0.856	0.804	0.907	0.7	0.967	0.0253	0.139	16.2%	-20.3%
50		3	0.811	0.728	0.894	0.567	1	0.0405	0.222	27.4%	-14.1%
100		3	0.856	0.824	0.887	0.767	0.933	0.0153	0.0839	9.8%	-20.3%

Combined Development Detail				
Conc-%	Control Type	Rep 1	Rep 3	Rep 4
0	Dilution Water	0.933	0.933	0.267
6.25		1	0.867	0.533
12.5		0.967	0.9	0.7
25		0.967	0.9	0.7
50		1	0.867	0.567
100		0.933	0.867	0.767

**CETIS Analytical Report**

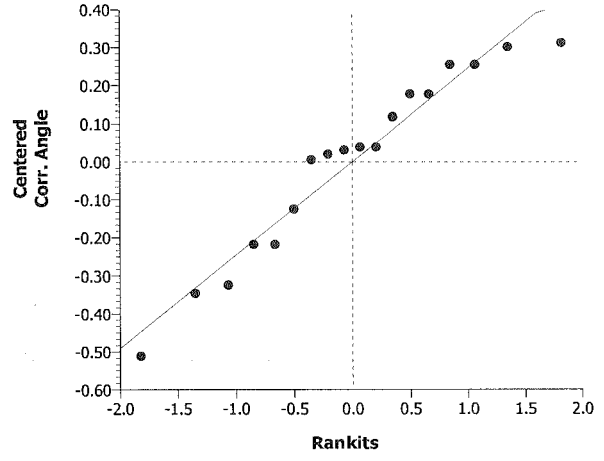
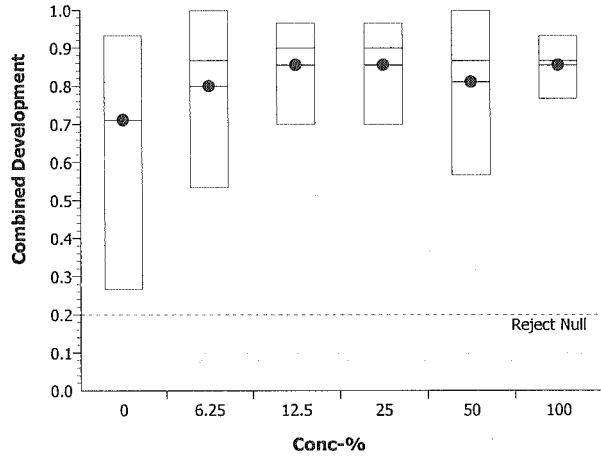
Report Date: 22 Jul-09 14:47 (p 1 of 2)  
 Link/Link Code: 02-9538-3154/0907-T007

Salmonid Embryo Survival and Development Test							Nautilus Environmental WA				
Analysis No: 17-9287-0975		Endpoint: Combined Development			CETIS Version: CETISv1.6.3						
Analyzed: 17 Jul-09 15:29		Analysis: Parametric-Control vs Treatments			Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)		C > T	Not Run	100	>100	N/A	1	71.8%			
Dunnett's Multiple Comparison Test											
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Dilution Water		6.25	-0.471	2.5	0.59	0.9350	Non-Significant Effect				
		12.5	-0.658	2.5	0.59	0.9570	Non-Significant Effect				
		25	-0.658	2.5	0.59	0.9570	Non-Significant Effect				
		50	-0.519	2.5	0.59	0.9410	Non-Significant Effect				
		100	-0.582	2.5	0.59	0.9490	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)					
Between	0.050982	0.010196	5	0.122	0.9850	Non-Significant Effect					
Error	1.000418	0.083368	12								
Total	1.0514	0.093565	17								
ANOVA Assumptions											
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)						
Variances	Bartlett Equality of Variance	3.15	15.1	0.6780	Equal Variances						
Distribution	Shapiro-Wilk Normality	0.937		0.2560	Normal Distribution						
Combined Development Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	0.711	0.565	0.858	0.267	0.933	0.0715	0.385	54.1%	0.0%
6.25		3	0.8	0.709	0.891	0.533	1	0.0446	0.24	30.0%	-12.5%
12.5		3	0.856	0.803	0.908	0.7	0.967	0.0258	0.139	16.2%	-20.3%
25		3	0.856	0.803	0.908	0.7	0.967	0.0258	0.139	16.2%	-20.3%
50		3	0.811	0.727	0.896	0.567	1	0.0412	0.222	27.4%	-14.1%
100		3	0.856	0.824	0.887	0.767	0.933	0.0156	0.0839	9.8%	-20.3%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	1.05	0.886	1.22	0.543	1.31	0.0822	0.443	42.0%	0.0%
6.25		3	1.17	1.04	1.29	0.819	1.48	0.0616	0.331	28.5%	-10.5%
12.5		3	1.21	1.13	1.29	0.991	1.39	0.0373	0.201	16.6%	-14.7%
25		3	1.21	1.13	1.29	0.991	1.39	0.0373	0.201	16.6%	-14.7%
50		3	1.18	1.06	1.3	0.852	1.48	0.0583	0.314	26.7%	-11.6%
100		3	1.19	1.14	1.24	1.07	1.31	0.0226	0.122	10.2%	-13.0%

Salmonid Embryo Survival and Development Test Nautilus Environmental WA

Analysis No: 17-9287-0975      Endpoint: Combined Development      CETIS Version: CETISv1.6.3  
Analyzed: 17 Jul-09 15:29      Analysis: Parametric-Control vs Treatments      Official Results: Yes

Graphics



# CETIS Analytical Report

Report Date: 22 Jul-09 14:47 (p 1 of 1)  
 Link/Link Code: 02-9538-3154/0907-T007

**Salmonid Embryo Survival and Development Test** **Nautilus Environmental WA**

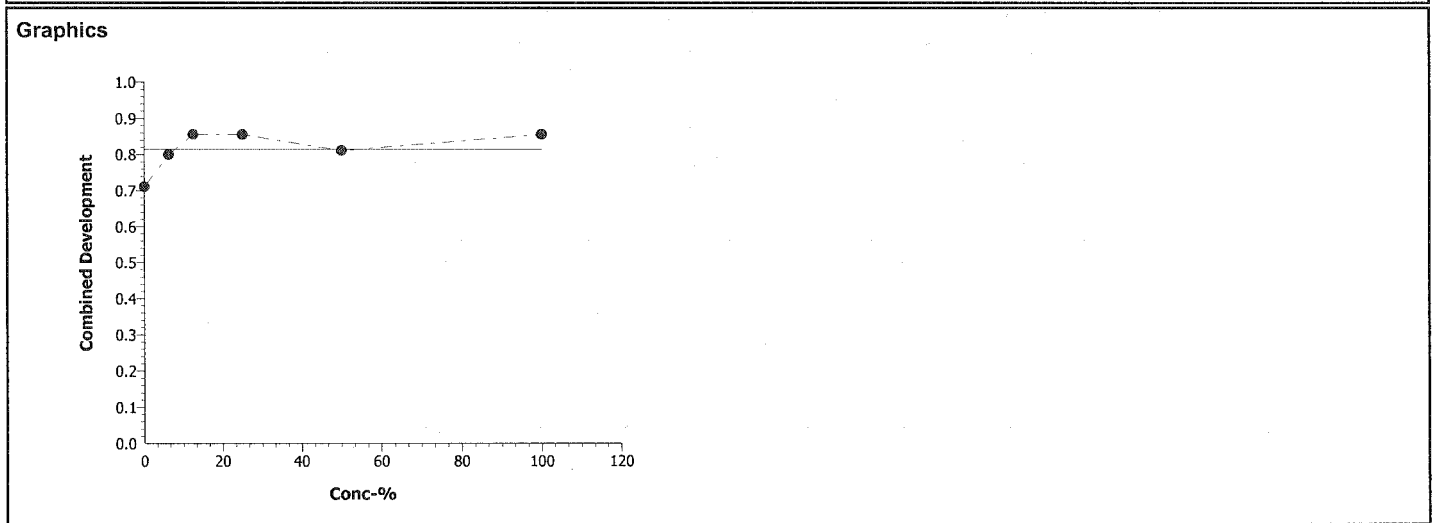
Analysis No: 21-3218-7613      Endpoint: Combined Development      CETIS Version: CETISv1.6.3  
 Analyzed: 22 Jul-09 14:46      Analysis: Linear Interpolation (ICPIN)      Official Results: Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	7055475	280	Yes	Two-Point Interpolation

Point Estimates			
Effect-%	Conc-%	95% LCL	95% UCL
25	> 100	N/A	N/A
50	> 100	N/A	N/A

Combined Development Summary			Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Dilution Water	3	0.711	0.267	0.933	0.0703	0.385	54.1%	0.0%	64	90
6.25		3	0.8	0.533	1	0.0439	0.24	30.0%	-12.5%	72	90
12.5		3	0.856	0.7	0.967	0.0253	0.139	16.2%	-20.3%	77	90
25		3	0.856	0.7	0.967	0.0253	0.139	16.2%	-20.3%	77	90
50		3	0.811	0.567	1	0.0405	0.222	27.4%	-14.1%	73	90
100		3	0.856	0.767	0.933	0.0153	0.0839	9.8%	-20.3%	77	90

Combined Development Detail				
Conc-%	Control Type	Rep 1	Rep 3	Rep 4
0	Dilution Water	0.933	0.933	0.267
6.25		1	0.867	0.533
12.5		0.967	0.9	0.7
25		0.967	0.9	0.7
50		1	0.867	0.567
100		0.933	0.867	0.767



**APPENDIX C - *Lemna minor* Toxicity Test Data**

## Lemna minor Summary Sheet

Client: Rescan  
 Work Order No.: 09210

Start Date: July 7/09  
 Set up by: ART

**Sample Information:**

Sample ID: SC2  
 Sample Date: July 5/2009  
 Date Received: July 7/2009  
 Sample Volume: 9x20L

**Test Organism Information:**

Culture Date: 300609  
~~17-06-09-09~~  
~~300609 BRL~~  
 Age of culture (Day 0): 7 days  
 >8X growth in APHA?: Y (35) Yes, 33 fronds.  
 BRL

**KCI Reference Toxicant Results:**

Reference Toxicant ID: LM40  
 Date Initiated: June 24/2009

7-d No. of Fronds IC25 (95% CL): 2.8 (0.9-4.9) g/L KCI

7-d No. Fronds IC25 Reference Toxicant Mean  $\pm$  2 SD: 2.5  $\pm$  1.1 CV (%): 22%

	Number of Fronds	Dry Weight
Test Results: NOEC %(v/v)	97	97
LOEC %(v/v)	>97	>97
IC25 %(v/v) (95% CL)	>97	>97
IC50 %(v/v) (95% CL)	>97	>97.

Reviewed by: 

Date reviewed: Aug 29/09

Blue

## Plant Growth Inhibition Toxicity Test Water Quality Measurements

Client: Rescan Setup by: ART  
 Sample ID: 502 Test Date: July 7/09  
 Work Order No.: 09210 Test Species: Lemna minor  
 Culture Source: UTCC #490  
 Test Culture Age: 7 days > 8X Growth? (Y/N): Y (33)  
 Light Intensity Range: 3600 - 3850 Date Measured: July 7, 2009

Day	0	1	2	3	4	5	6	7
Shelf Temp (°C)	24.4	24.9	24.3	25.4	24.6	24.6	24.9	25.1
Initials	ART	ART	ART	JLT	JLT	JLT	BCU	YLP

Sample Characteristics      Aeration? 20 min

Temperature (°C)      24.0      24.1

DO (mg/L)      10.2      9.6

pH      7.1      7.7

Conductivity (µS)      162      979

Concentration % (v/v)	Temperature (°C)		pH		Conductivity (µS) 0 h
	Day 0	Day 7	Day 0	Day 7	
Control	24.5	26.3	8.2	8.5	882
1.5	24.5	26.7	8.2	8.1	882
3.05	24.5	26.8	8.1	8.5	884
6.1	24.4	26.7	8.1	8.4	896
12.1	24.3	26.7	8.0	8.4	893
24.2	24.3	26.7	8.0	8.3	906
48.5	24.1	26.8	7.9	8.3	931
97	24.0	26.9	7.7	8.32	979
Initials	ART	YLP	ART	YLP	ART

Thermometer: Big Jumbo Thermometer Cond. Meter: C-1 pH meter: pH-1

Sample Description: slight turbidity with particulates

Comments: \_\_\_\_\_

Reviewed: EW Date Reviewed: Aug 25/09



Blue

Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts

Client: Rescan  
 Sample ID: 502  
 Work Order #: 09210

Start Date: July 7/09  
 Termination Date: July 14/09  
 Test set up by: ART

Concentration <i>90 (V/V)</i>	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
Control	A	6	52										<i>ART</i>
	B		65										<i>ART</i>
	C		61										<i>ART</i>
	D		76										<i>ART</i>
1.5	A		110	✓									<i>ART</i>
	B		62										<i>ART</i>
	C		97										<i>ART</i>
	D		77	✓									<i>ART</i>
3.05	A		55										<i>ART</i>
	B		69										<i>ART</i>
	C		58										<i>ART</i>
	D		78	✓					✓				<i>ART</i>
6.1	A		53	✓									<i>ART</i>
	B		55										<i>ART</i>
	C		56										<i>ART</i>
	D		84	✓									<i>ART</i>
12.1	A		77										<i>ART</i>
	B		64										<i>ART</i>
	C		62										<i>ART</i>
	D		79	✓									<i>ART</i>
24.2	A		69	✓									<i>ART</i>
	B		66	✓									<i>ART</i>
	C		60										<i>ART</i>
	D	✓	76	✓									<i>ART</i>

Comments:

Reviewed by: *ART*

Date Reviewed: Aug 25/09

Blue

**Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts**

Client: Rescan  
 Sample ID: 302  
 Work Order #: 09210

Start Date: July 7 / 09  
 Termination Date: July 14 / 09  
 Test set up by: ART

Concentration % (v/v)	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
48.5	A	6	70										
	B		63										
	C		62										
	D		60	✓									
97	A		50	✓									
	B		52	✓									
	C		53										
	D	✓	55										
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												

Comments: \_\_\_\_\_

Reviewed by: 

Date Reviewed: Aug 25/09

Blue

## 7-d Lemna minor Weight Data Sheet

Client: Rescan  
 Sample ID: 502  
 Work Order #: 09210

Start Date: July 7/09  
 Termination Date: July 14/09

Concentration % (v/v)	Rep	Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
Control	A	1	1310.34	1313.87	EG
	B	2	1325.26	1329.50	EG
	C	3	1318.35	1323.64	EG
	D	4	1322.85	1328.41	EG
1.5	A	5	1322.55	1329.52	EG
	B	6	1316.28	1319.96	EG
	C	7	1330.13	1336.84	EG
	D	8	1323.13	1328.81	EG
3.05	A	9	1318.17	1321.78	EG
	B	10	1320.27	1325.03	EG
	C	11	1337.32	1340.50	EG
	D	12	1338.81	1343.52	EG
6.1	A	13	1316.34	1319.87	EG
	B	14	1324.76	1327.85	EG
	C	15	1318.34	1322.34	EG
	D	16	1342.13	1347.82	EG
12.1	A	17	1330.81	1336.89	EG
	B	18	1316.66	1320.28	EG
	C	19	1326.91	1331.20	EG
	D	20	1339.24	1344.33	EG
24.2	A	21	1329.83	1334.47	EG
	B	22	1321.40	1325.97	EG
	C	23	1320.71	1324.48	EG
	D	24	1324.07	1329.31	EG
48.5	A	25	1316.43	1321.80	EG
	B	26	1323.17	1327.61	EG
	C	27	1321.63	1325.71	EG
	D	28	1315.28	1319.87	EG

Comments: \_\_\_\_\_

Reviewed by: EA

Date Reviewed: Aug 25/09

Blue

### 7-d Lemna minor Weight Data Sheet

Client: Rescan  
Sample ID: 302  
Work Order #: 09210

Start Date: July 7 / 09  
Termination Date: July 14 / 09

Concentration <i>o/p (✓)</i>	Rep	Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
97	A	29	1322.14	1326.07	<i>EH</i>
	B	30	1321.25	1325.29	<i>EH</i>
	C	31	1339.60	1342.70	<i>EH</i>
	D	32	1324.20	1328.67	<i>EH</i>
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				

Comments: \_\_\_\_\_

Reviewed by: *EH*

Date Reviewed: Aug 25 / 09

**CETIS Analytical Report**

Report Date: 25 Aug-09 10:04 (p 1 of 2)  
 Link/Link Code: 08-4576-8802/09210-SC2

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>
<b>Analysis No:</b> 17-7688-6623	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0	
<b>Analyzed:</b> 25 Aug-09 10:02	<b>Analysis:</b> Parametric-Control vs Treatments	<b>Official Results:</b> Yes	
<b>Test Run No:</b> 09-9927-0191	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water	
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>	
<b>Ending Date:</b>	<b>Species:</b> Lemna minor		
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture		
<b>Sample No:</b> 13-2840-0030	<b>Code:</b> SC2-July	<b>Client:</b> Rescan	
<b>Sample Date:</b> 05 Jul-09 09:30	<b>Material:</b> Water Sample	<b>Project:</b>	
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan		
<b>Sample Age:</b> 38h	<b>Station:</b> SC2		

<b>Data Transform</b>	<b>Zeta</b>	<b>Alt Hyp</b>	<b>Monte Carlo</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>TU</b>	<b>PMSD</b>
Untransformed		C > T	Not Run	97	<i>ok &gt; 97</i>	#Error	1.031	34.43%

<b>Dunnett's Multiple Comparison Test</b>							
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		1.5	-2.884	2.482	19.8	1.0000	Non-Significant Effect
		3.05	-0.1881	2.482	19.8	0.9158	Non-Significant Effect
		6.1	0.1881	2.482	19.8	0.8219	Non-Significant Effect
		12.1	-0.8776	2.482	19.8	0.9858	Non-Significant Effect
		24.2	-0.5328	2.482	19.8	0.9632	Non-Significant Effect
		48.5	0	2.482	19.8	0.8750	Non-Significant Effect
		97	1.379	2.482	19.8	0.3144	Non-Significant Effect

<b>ANOVA Table</b>						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2615.969	373.7098	7	2.937	0.0227	Significant Effect
Error	3053.75	127.2396	24			
Total	5669.719	500.9494	31			

<b>ANOVA Assumptions</b>						
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)	
Variances	Bartlett Equality of Variance	15.12	18.48	0.0344	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.9647		0.3661	Normal Distribution	

<b>Frond Count Summary</b>											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	57.5	53.64	61.36	46	70	1.88	9.95	17.3%	0.0%
1.5		4	80.5	72.27	88.73	56	104	4.013	21.24	26.38%	-40.0%
3.05		4	59	54.91	63.09	49	72	1.994	10.55	17.88%	-2.61%
6.1		4	56	50.29	61.71	47	78	2.782	14.72	26.29%	2.61%
12.1		4	64.5	61.11	67.89	56	73	1.651	8.737	13.55%	-12.17%
24.2		4	61.75	59.17	64.33	54	70	1.257	6.652	10.77%	-7.39%
48.5		4	57.5	56	59	54	63	0.7319	3.873	6.74%	0.0%
97		4	46.5	45.69	47.31	44	49	0.3934	2.082	4.48%	19.13%

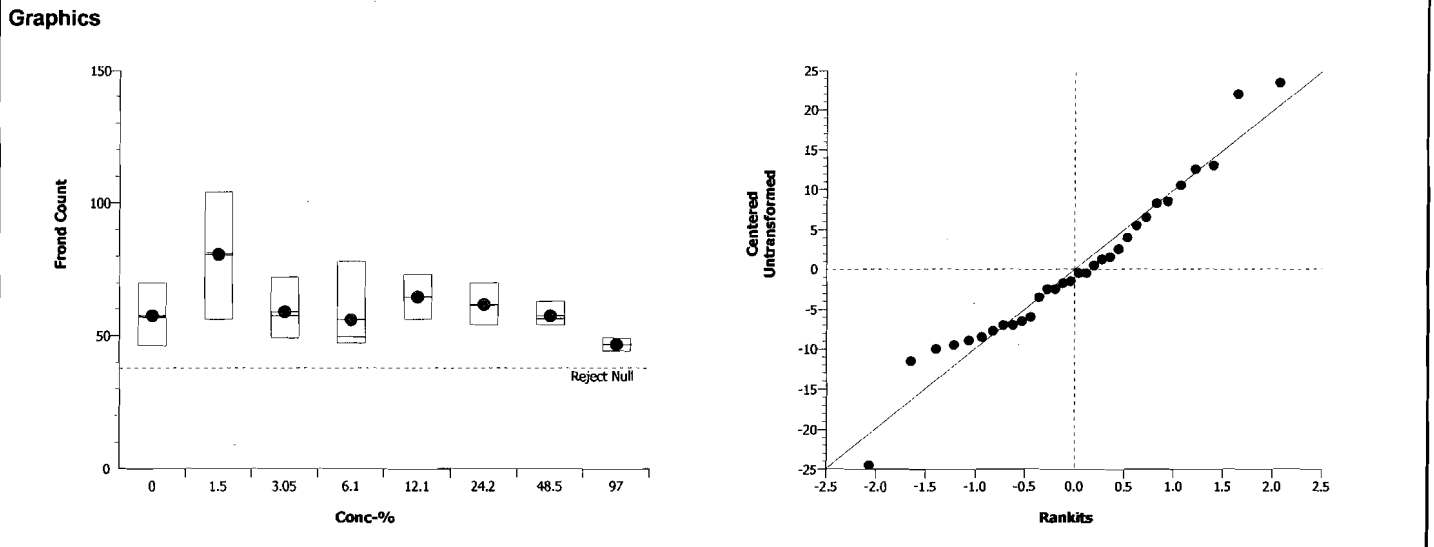
*ea Aug 25/09*

**CETIS Analytical Report**

Report Date: 25 Aug-09 10:05 (p 2 of 2)  
 Link/Link Code: 08-4576-8802/09210-SC2

<b>Lemna Growth Inhibition Test</b>		<b>Nautilus Environmental</b>	
<b>Analysis No:</b> 17-7688-6623	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0	
<b>Analyzed:</b> 25 Aug-09 10:02	<b>Analysis:</b> Parametric-Control vs Treatments	<b>Official Results:</b> Yes	

<b>Frond Count Detail</b>					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	70	59	55	46
1.5		104	91	71	56
3.05		72	63	52	49
6.1		78	50	49	47
12.1		73	71	58	56
24.2		70	63	60	54
48.5		63	57	56	54
97		49	47	46	44



*ea*  
 Aug 25/09

**CETIS Analytical Report**

Report Date: 26 Aug-09 10:32 (p 1 of 2)  
 Link/Link Code: 15-3856-2266/09210-SC2H

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>
<b>Analysis No:</b> 19-5254-6409	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0	
<b>Analyzed:</b> 26 Aug-09 10:32	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Official Results:</b> Yes	
<b>Test Run No:</b> 09-2067-6875	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water	
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>	
<b>Ending Date:</b> 14 Jul-09	<b>Species:</b> Lemna minor		
<b>Duration:</b> 7d 0h	<b>Source:</b> In-House Culture		
<b>Sample No:</b> 09-4281-8810	<b>Code:</b> SC2-Jul	<b>Client:</b> Rescan	
<b>Sample Date:</b> 05 Jul-09	<b>Material:</b> Water Sample	<b>Project:</b>	
<b>Receive Date:</b> 07 Jul-09	<b>Source:</b> Rescan		
<b>Sample Age:</b> 48h	<b>Station:</b> SC2		

<b>Linear Interpolation Options</b>					
<b>X Transform</b>	<b>Y Transform</b>	<b>Seed</b>	<b>Resamples</b>	<b>Exp 95% CL</b>	<b>Method</b>
Log(X + 1)	Linear	57951	200	Yes	Two-Point Interpolation

<b>Point Estimates</b>			
<b>% Effect</b>	<b>Conc-%</b>	<b>95% LCL</b>	<b>95% UCL</b>
5	57.13	N/A	62.67
10	68.93	N/A	79.66
15	83.12	N/A	103.1
20	> 97	N/A	N/A
25	> 97	N/A	N/A
40	> 97	N/A	N/A
50	> 97	N/A	N/A

<b>Fronnd Count Summary</b>			<b>Calculated Variate</b>						
<b>Conc-%</b>	<b>Control Type</b>	<b>Count</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>Diff%</b>
0	Negative Control	4	57.5	46	70	1.848	9.95	17.3%	0.0%
1.5		4	57.5	46	70	1.848	9.95	17.3%	0.0%
3.05		4	57.5	46	70	1.848	9.95	17.3%	0.0%
6.1		4	56	47	78	2.733	14.72	26.29%	2.61%
12.1		4	57.5	46	70	1.848	9.95	17.3%	0.0%
24.2		4	57.5	46	70	1.848	9.95	17.3%	0.0%
48.5		4	57.5	54	63	0.7192	3.873	6.74%	0.0%
97		4	46.5	44	49	0.3866	2.082	4.48%	19.13%

<b>Fronnd Count Detail</b>					
<b>Conc-%</b>	<b>Control Type</b>	<b>Rep 1</b>	<b>Rep 2</b>	<b>Rep 3</b>	<b>Rep 4</b>
0	Negative Control	46	59	55	70
1.5		46	59	55	70
3.05		46	59	55	70
6.1		47	49	50	78
12.1		46	59	55	70
24.2		46	59	55	70
48.5		63	57	56	54
97		44	46	47	49

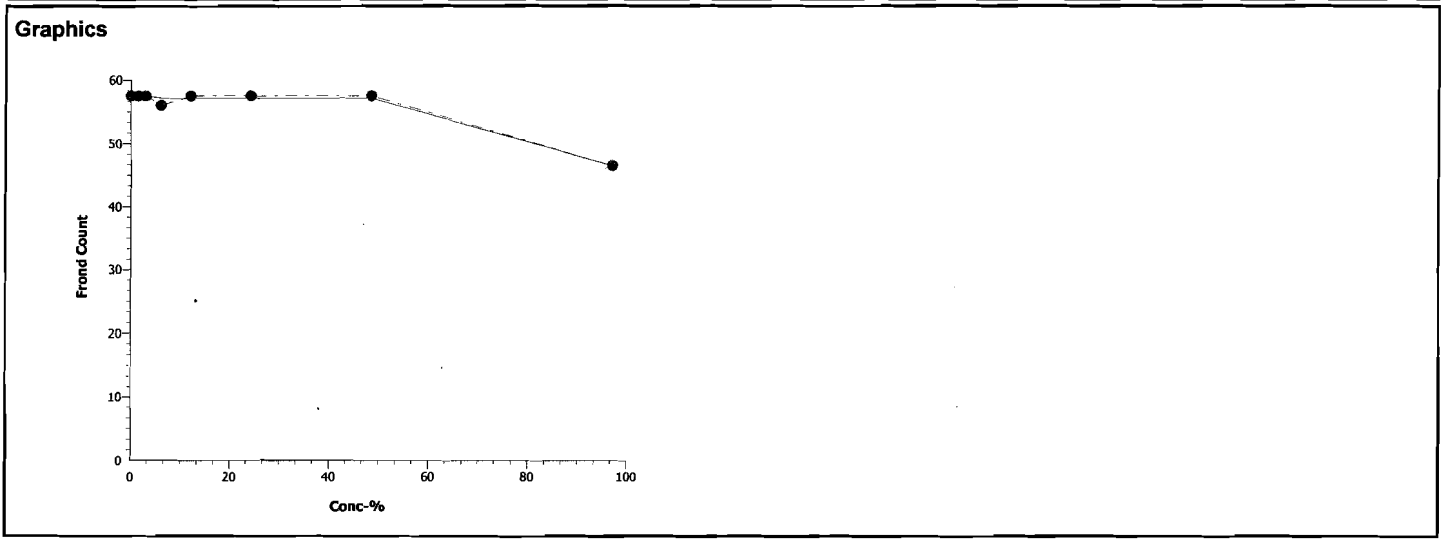
*CA* Aug-25/09

# CETIS Analytical Report

Report Date: 26 Aug-09 10:32 (p 2 of 2)

Link/Link Code: 15-3856-2266/09210-SC2H

Lemna Growth Inhibition Test		Nautilus Environmental	
Analysis No: 19-5254-6409	Endpoint: Frond Count	CETIS Version: CETISv1.5.0	
Analyzed: 26 Aug-09 10:32	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes	



*ea Aug 25/09*



**CETIS Analytical Report**

Report Date: 13 Aug-09 15:23 (p 1 of 2)  
 Link/Link Code: 08-4576-8802/09210-SC2

Lemna Growth Inhibition Test		Nautilus Environmental
------------------------------	--	------------------------

Analysis No: 11-1389-4767	Endpoint: Total Dry Weight-mg	CETIS Version: CETISv1.5.0
Analyzed: 13 Aug-09 15:22	Analysis: Parametric-Control vs Treatments	Official Results: Yes

Test Run No: 09-9927-0191	Test Type: Lemna Growth	Dil Water: Laboratory Water
Start Date: 07 Jul-09	Protocol: EC/EPS 1/RM/37	Brine:
Ending Date:	Species: Lemna minor	
Duration: N/A	Source: In-House Culture	

Sample No: 13-2840-0030	Code: SC2-July	Client: Rescan
Sample Date: 05 Jul-09 09:30	Material: Water Sample	Project:
Receive Date: 07 Jul-09 09:00	Source: Rescan	
Sample Age: 38h	Station: SC2	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	97	∞ > 97	#Error	1.031	33.88%

Dunnett's Multiple Comparison Test							
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		1.5	-1.739	2.482	1.577	0.9991	Non-Significant Effect
		3.05	0.9285	2.482	1.577	0.5143	Non-Significant Effect
		6.1	0.9088	2.482	1.577	0.5235	Non-Significant Effect
		12.1	-0.2202	2.482	1.577	0.9216	Non-Significant Effect
		24.2	0.1574	2.482	1.577	0.8314	Non-Significant Effect
		48.5	0.05518	2.482	1.577	0.8607	Non-Significant Effect
		97	1.212	2.482	1.577	0.3847	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	9.762757	1.39468	7	1.727	0.1501	Non-Significant Effect
Error	19.3839	0.8076625	24			
Total	29.14666	2.202342	31			

ANOVA Assumptions						
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)	
Variances	Bartlett Equality of Variance	5.332	18.48	0.6195	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.9787		0.7619	Normal Distribution	

Total Dry Weight-mg Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	4.655	4.29	5.02	3.53	5.56	0.178	0.9417	20.23%	0.0%
1.5		4	5.76	5.181	6.339	3.68	6.97	0.2824	1.494	25.94%	-23.74%
3.05		4	4.065	3.757	4.373	3.18	4.76	0.15	0.7936	19.52%	12.68%
6.1		4	4.077	3.636	4.519	3.09	5.69	0.2149	1.137	27.89%	12.41%
12.1		4	4.795	4.541	5.049	4.22	5.58	0.1239	0.6555	13.67%	-3.01%
24.2		4	4.555	4.321	4.789	3.77	5.24	0.1141	0.6036	13.25%	2.15%
48.5		4	4.62	4.409	4.831	4.08	5.37	0.1028	0.5439	11.77%	0.75%
97		4	3.885	3.663	4.107	3.1	4.47	0.1083	0.5729	14.75%	16.54%

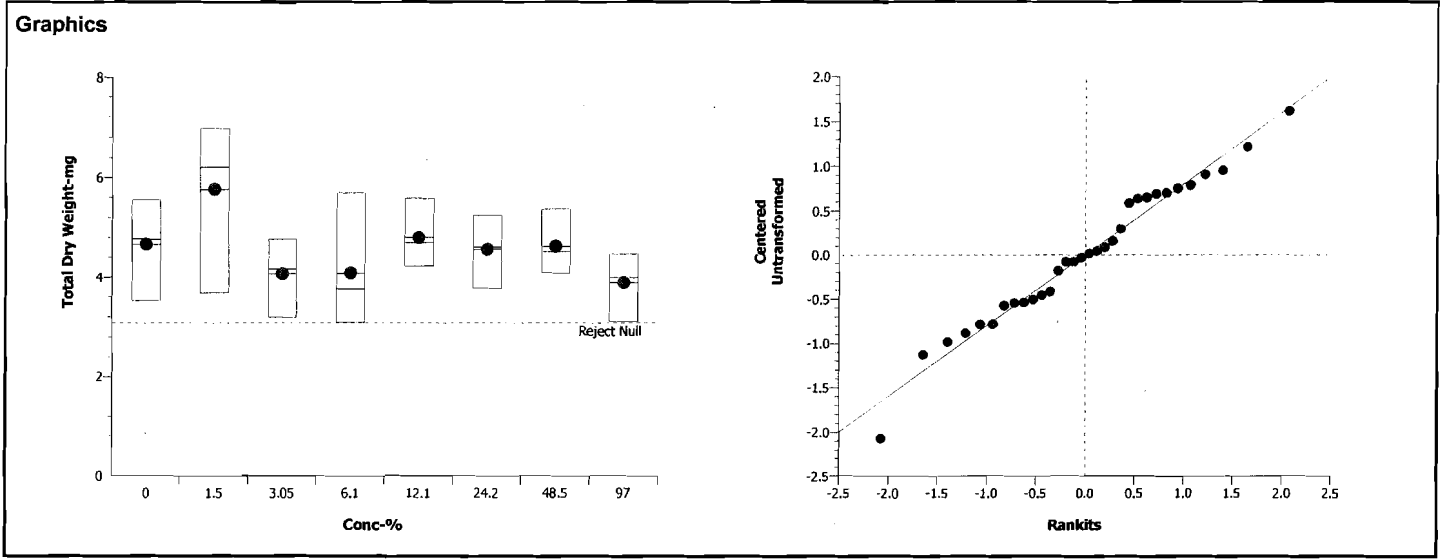
*EC Aug 25/09*

# CETIS Analytical Report

Report Date: 13 Aug-09 15:23 (p 2 of 2)  
 Link/Link Code: 08-4576-8802/09210-SC2

Lemna Growth Inhibition Test			Nautilus Environmental		
Analysis No:	11-1389-4767	Endpoint:	Total Dry Weight-mg	CETIS Version:	CETISv1.5.0
Analyzed:	13 Aug-09 15:22	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Total Dry Weight-mg Detail					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	5.56	5.29	4.24	3.53
1.5		6.97	6.71	5.68	3.68
3.05		4.76	4.71	3.61	3.18
6.1		5.69	4	3.53	3.09
12.1		5.58	5.09	4.29	4.22
24.2		5.24	4.64	4.57	3.77
48.5		5.37	4.59	4.44	4.08
97		4.47	4.04	3.93	3.1



*ELC Aug 25/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 10:43 (p 1 of 2)  
 Link/Link Code: 08-4576-8802/09210-SC2

<b>Lemna Growth Inhibition Test</b>		<b>Nautilus Environmental</b>
-------------------------------------	--	-------------------------------

<b>Analysis No:</b> 04-2717-8178	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 26 Aug-09 10:42	<b>Analysis:</b> Parametric-Two Sample	<b>Official Results:</b> Yes

<b>Test Run No:</b> 09-9927-0191	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>
<b>Ending Date:</b>	<b>Species:</b> Lemna minor	
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture	

<b>Sample No:</b> 13-2840-0030	<b>Code:</b> SC2-July	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09 09:30	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 38h	<b>Station:</b> SC2	

<b>Data Transform</b>	<b>Zeta</b>	<b>Alt Hyp</b>	<b>Monte Carlo</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>TU</b>	<b>PMSD</b>	
Untransformed		C < T	Not Run	97	82	0 > 97	#Error	1.031	N/A

Equal Variance t Two-Sample Test						
Control	vs Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control	1.5	1.251	1.943	1.716	0.1287	Non-Significant Effect
	3.05	-0.9583	1.943	1.196	0.8125	Non-Significant Effect
	6.1	-0.7823	1.943	1.435	0.7681	Non-Significant Effect
	12.1	0.2439	1.943	1.115	0.4077	Non-Significant Effect
	24.2	-0.1788	1.943	1.087	0.5680	Non-Significant Effect
	48.5	-0.06449	1.943	1.057	0.5247	Non-Significant Effect
	97	-1.397	1.943	1.071	0.8941	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	9.762757	1.39468	7	1.727	0.1501	Non-Significant Effect
Error	19.3839	0.8076625	24			
Total	29.14666	2.202342	31			

ANOVA Assumptions						
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)	
Variances	Bartlett Equality of Variance	5.332	18.48	0.6195	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.9787		0.7619	Normal Distribution	

Total Dry Weight-mg Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	4.655	4.29	5.02	3.53	5.56	0.178	0.9417	20.23%	0.0%
1.5		4	5.76	5.181	6.339	3.68	6.97	0.2824	1.494	25.94%	-23.74%
3.05		4	4.065	3.757	4.373	3.18	4.76	0.15	0.7936	19.52%	12.68%
6.1		4	4.077	3.636	4.519	3.09	5.69	0.2149	1.137	27.89%	12.41%
12.1		4	4.795	4.541	5.049	4.22	5.58	0.1239	0.6555	13.67%	-3.01%
24.2		4	4.555	4.321	4.789	3.77	5.24	0.1141	0.6036	13.25%	2.15%
48.5		4	4.62	4.409	4.831	4.08	5.37	0.1028	0.5439	11.77%	0.75%
97		4	3.885	3.663	4.107	3.1	4.47	0.1083	0.5729	14.75%	16.54%

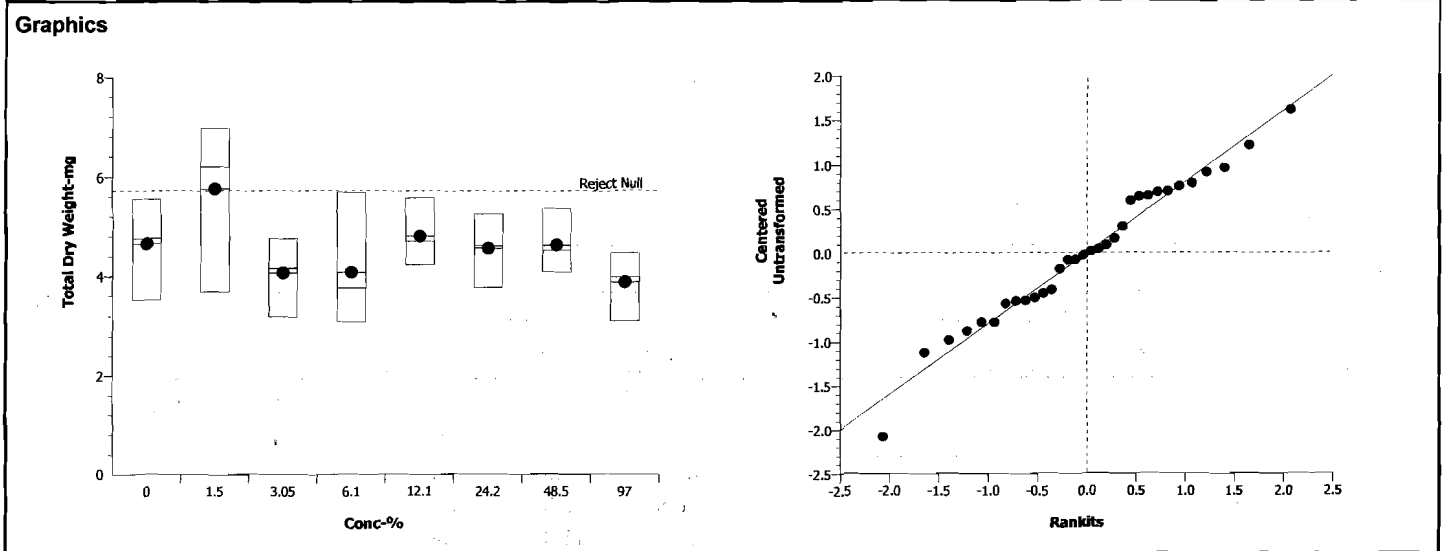
*Aug 26/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 10:43 (p 2 of 2)  
 Link/Link Code: 08-4576-8802/09210-SC2

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 04-2717-8178	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 26 Aug-09 10:42	<b>Analysis:</b> Parametric-Two Sample	<b>Official Results:</b> Yes			

<b>Total Dry Weight-mg Detail</b>					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	5.56	5.29	4.24	3.53
1.5		6.97	6.71	5.68	3.68
3.05		4.76	4.71	3.61	3.18
6.1		5.69	4	3.53	3.09
12.1		5.58	5.09	4.29	4.22
24.2		5.24	4.64	4.57	3.77
48.5		5.37	4.59	4.44	4.08
97		4.47	4.04	3.93	3.1



*EC Aug 26/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 10:45 (p 1 of 2)  
 Link/Link Code: 15-3856-2266/09210-SC2H

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>
<b>Analysis No:</b> 07-9452-1912	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.5.0	
<b>Analyzed:</b> 26 Aug-09 10:45	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Official Results:</b> Yes	
<b>Test Run No:</b> 09-2067-6875	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water	
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>	
<b>Ending Date:</b> 14 Jul-09	<b>Species:</b> Lemna minor		
<b>Duration:</b> 7d 0h	<b>Source:</b> In-House Culture		
<b>Sample No:</b> 09-4281-8810	<b>Code:</b> SC2-Jul	<b>Client:</b> Rescan	
<b>Sample Date:</b> 05 Jul-09	<b>Material:</b> Water Sample	<b>Project:</b>	
<b>Receive Date:</b> 07 Jul-09	<b>Source:</b> Rescan		
<b>Sample Age:</b> 48h	<b>Station:</b> SC2		

<b>Linear Interpolation Options</b>					
<b>X Transform</b>	<b>Y Transform</b>	<b>Seed</b>	<b>Resamples</b>	<b>Exp 95% CL</b>	<b>Method</b>
Log(X + 1)	Linear	57951	200	Yes	Two-Point Interpolation

<b>Point Estimates</b>			
<b>% Effect</b>	<b>Conc-%</b>	<b>95% LCL</b>	<b>95% UCL</b>
5	2.847	N/A	114.3
10	64.15	N/A	N/A
15	88.01	N/A	N/A
20	> 97	N/A	N/A
25	> 97	N/A	N/A
40	> 97	N/A	N/A
50	> 97	N/A	N/A

<b>Total Dry Weight-mg Summary</b>			<b>Calculated Variate</b>						
<b>Conc-%</b>	<b>Control Type</b>	<b>Count</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>Diff%</b>
0	Negative Control	4	4.655	3.53	5.56	0.1749	0.9417	20.23%	0.0%
1.5		4	4.655	3.53	5.56	0.1749	0.9417	20.23%	0.0%
3.05		4	4.065	3.18	4.76	0.1474	0.7936	19.52%	12.68%
6.1		4	4.077	3.09	5.69	0.2112	1.137	27.89%	12.41%
12.1		4	4.655	3.53	5.56	0.1749	0.9417	20.23%	0.0%
24.2		4	4.555	3.77	5.24	0.1121	0.6036	13.25%	2.15%
48.5		4	4.62	4.08	5.37	0.101	0.5439	11.77%	0.75%
97		4	3.885	3.1	4.47	0.1064	0.5729	14.75%	16.54%

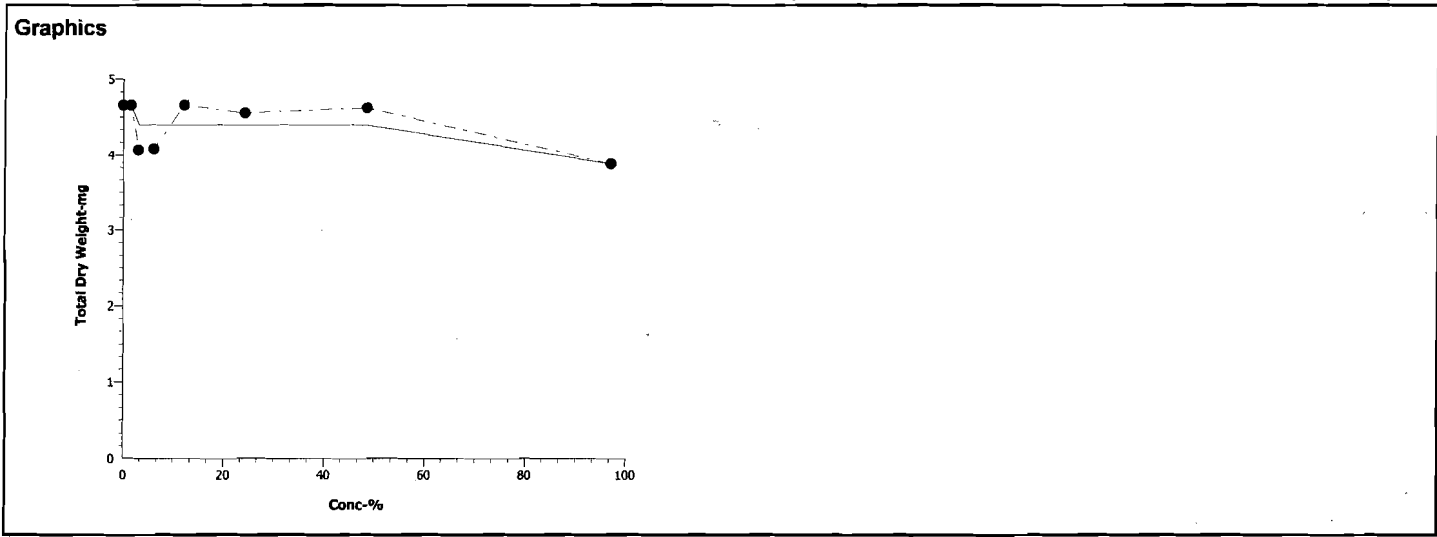
<b>Total Dry Weight-mg Detail</b>					
<b>Conc-%</b>	<b>Control Type</b>	<b>Rep 1</b>	<b>Rep 2</b>	<b>Rep 3</b>	<b>Rep 4</b>
0	Negative Control	3.53	4.24	5.29	5.56
1.5		3.53	4.24	5.29	5.56
3.05		3.61	4.76	3.18	4.71
6.1		3.53	3.09	4	5.69
12.1		3.53	4.24	5.29	5.56
24.2		4.64	4.57	3.77	5.24
48.5		5.37	4.44	4.08	4.59
97		3.93	4.04	3.1	4.47

*eu Aug 26/09*

# CETIS Analytical Report

Report Date: 26 Aug-09 10:45 (p 2 of 2)  
Link/Link Code: 15-3856-2266/09210-SC2H

Lemna Growth Inhibition Test		Nautilus Environmental
Analysis No: 07-9452-1912	Endpoint: Total Dry Weight-mg	CETIS Version: CETISv1.5.0
Analyzed: 26 Aug-09 10:45	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes



*tea Aug 26/09*

### Lemna minor Summary Sheet

Client: Rescan  
 Work Order No.: 09210

Start Date: July 7/09  
 Set up by: ART

**Sample Information:**

Sample ID: STE2  
 Sample Date: July 5/2009  
 Date Received: July 7/2009  
 Sample Volume: 9 x 20L

**Test Organism Information:**

Culture Date: 300609  
~~8/2009~~  
 Age of culture (Day 0): 7 days  
 >8X growth in APHA?: 7(33) Yes, 33 fronds  
BPL

**KCI Reference Toxicant Results:**

Reference Toxicant ID: LM40  
 Date Initiated: June 24/2009

7-d No. of Fronds IC25 (95% CL): 2.8 (0.9 - 4.9) q/L KCl

7-d No. Fronds IC25 Reference Toxicant Mean  $\pm$  2 SD: 2.5  $\pm$  1.1 CV (%): 22%

	Number of Fronds	Dry Weight
Test Results: NOEC %(v/v)	97	97
LOEC %(v/v)	>97	>97
IC25 %(v/v) (95% CL)	>97	>97
IC50 %(v/v) (95% CL)	>97	>97

Reviewed by: [Signature]

Date reviewed: Aug 26/09

# Plant Growth Inhibition Toxicity Test Water Quality Measurements

*Red*

Client: Rescan Setup by: ART  
 Sample ID: STEZ Test Date: July 7/09  
 Work Order No.: 09210 Test Species: Lemna minor  
 Culture Source: UTCC #490  
 Test Culture Age: 7 days > 8X Growth? (Y/N): Y (33)  
 Light Intensity Range: 3600 = 3850 Date Measured: July 7/09

Day	0	1	2	3	4	5	6	7
Shelf Temp (°C)	24.4	24.9	24.3	25.4	24.6	24.6	24.9	25.7
Initials	ART	ART	ART	JL	JLT	JLT	BL	BL

Sample Characteristics  
 Temperature (°C) 24.0 Aeration? 20 min  
 DO (mg/L) 9.0 24.0  
 pH 7.4 9.5  
 Conductivity (µS) at 880 61 7.7  
882

Concentration % (v/v)	Temperature (°C)		pH		Conductivity (µS) 0 h
	Day 0	Day 7	Day 0	Day 7	
Control	24.5	25.9	8.2	8.2	879
1.5	24.5	26.4	8.2	8.3	at 877 879
3.05	24.5	25.9	8.1	8.3	879
6.1	24.5	26.2	8.1	8.5	880
12.1	24.4	26.8	8.1	8.7	880
24.2	24.3	26.7	8.0	8.5	881
48.5	24.1	26.6	7.9	8.6	882
97	24.0	25.6	7.7	8.4	882
Initials	ART	BL	ART	BL	ART

Thermometer: Big Jumbo Thermometer Cond. Meter: C-1 pH meter: pH-1

Sample Description: clear, slight amber colour

Comments: \_\_\_\_\_

Reviewed: EW Date Reviewed: Aug. 25/09



Red

**Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts**

Client: Rescan  
 Sample ID: STE2  
 Work Order #: 09210

Start Date: July 7 / 09  
 Termination Date: July 14 / 09  
 Test set up by: ART

Concentration <i>g/v (v/v)</i>	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
Control	A	6	38										ES
	B		52	52									ES
	C		36										ES
	D		76										ES
1.5	A		48										ES
	B		43										ES
	C		45										ES
	D		46										ES
3.05	A		47										ES
	B		45										ES
	C		48										ES
	D		48										ES
6.1	A		54										ES
	B		55										ES
	C		68										ES
	D		39										ES
12.1	A		71										ES
	B		44										ES
	C		62										ES
	D		59										ES
24.2	A		54										ES
	B		71										ES
	C		47										ES
	D	✓	61										ES

Comments: \_\_\_\_\_

Reviewed by: EA

Date Reviewed: Aug 25/09

Red

### Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts

Client: Rescan  
 Sample ID: STE2  
 Work Order #: 09210

Start Date: July 7 / 09  
 Termination Date: July 14 / 09  
 Test set up by: ART

Concentration % (v/v)	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
48.5	A	6	- <sup>①</sup>									None initially	[Handwritten initials]
	B		73										
	C		88										
	D		68										
97	A		66										[Handwritten initials]
	B		71										
	C		70										
	D	↓	37										
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												

Comments: no duckweed were added to beaker at beginning of test.

Reviewed by: [Signature]

Date Reviewed: Aug 25/09

Red

### 7-d Lemna minor Weight Data Sheet

Client: Rescan  
 Sample ID: STEZ  
 Work Order #: 09240

Start Date: July 7 / 09  
 Termination Date: July 14 / 09

Concentration % (V/V)	Rep	Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
Control	A	1	1331.56	1333.68	EGS
	B	2	1332.64	1336.13	EGS
	C	3	1334.31	1338.30	EGS
	D	4	1330.50	1335.31	EGS
1.5	A	5	1323.95	1326.78	EGS
	B	6	1322.43	1325.40	EGS
	C	7	1327.73	<del>1329</del> 1330.03 <del>EGS</del>	EGS
	D	8	1326.09	1329.15	EGS
3.05	A	9	1323.28	1325.64	EGS
	B	10	1337.11	1339.25	EGS
	C	11	1333.37	1336.26	EGS
	D	12	1321.07	1323.54	EGS
6.1	A	13	1331.48	1334.43	EGS
	B	14	1335.05	1337.86	EGS
	C	15	1325.70	1329.35	EGS
	D	16	1341.54	1342.12	EGS
12.1	A	17	1336.45	1339.99	EGS
	B	18	1330.85	1332.90	EGS
	C	19	1337.47	1340.61	EGS
	D	20	1325.74	1328.83	EGS
24.2	A	21	1322.93	1326.03	EGS
	B	22	1325.87	1329.80	EGS
	C	23	1327.44	1329.77	EGS
	D	24	1327.65	1331.26	EGS
48.5	A	25	1326.91	-	EGS
	B	26	1327.01	1331.75	EGS
	C	27	1325.54	1330.65	EGS
	D	28	1324.42	1328.05	EGS

Comments: \_\_\_\_\_  
 \_\_\_\_\_

Reviewed by: EGS

Date Reviewed: Aug. 25 / 09

Red

### 7-d Lemna minor Weight Data Sheet

Client: Rescan  
Sample ID: STEZ  
Work Order #: 09210

Start Date: July 7 / 09  
Termination Date: July 14 / 09

Concentration % (✓/✓)	Rep	Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
97	A	29	1320.10	1328.48	
	B	30	1323.12	1327.45	
	C	31	1328.35	1332.45	
	D	32	1327.57	1329.30	
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				

Comments: \_\_\_\_\_  
\_\_\_\_\_

Reviewed by: EC

Date Reviewed: \_\_\_\_\_

**CETIS Analytical Report**

Report Date: 25 Aug-09 10:37 (p 1 of 2)

Link/Link Code: 04-3661-5443/09210-STE2

Lemna Growth Inhibition Test		Nautilus Environmental	
------------------------------	--	------------------------	--

Analysis No: 00-0548-9221	Endpoint: Frond Count	CETIS Version: CETISv1.5.0
Analyzed: 25 Aug-09 10:35	Analysis: Parametric-Multiple Comparison	Official Results: Yes

Test Run No: 01-3781-1703	Test Type: Lemna Growth	Dil Water: Laboratory Water
Start Date: 07 Jul-09	Protocol: EC/EPS 1/RM/37	Brine:
Ending Date:	Species: Lemna minor	
Duration: N/A	Source: In-House Culture	

Sample No: 02-9960-3283	Code: STE 2-Jul	Client: Rescan
Sample Date: 05 Jul-09 13:15	Material: Water Sample	Project:
Receive Date: 07 Jul-09 09:00	Source: Rescan	
Sample Age: 35h	Station: STE 2	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	97	<del>97</del> > 97	#Error	1.031	42.31%

Bonferroni Adj t Test							
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		1.5	1.266	2.651	20.94	0.7640	Non-Significant Effect
		3.05	1.076	2.651	20.94	1.0000	Non-Significant Effect
		6.1	0.1899	2.651	20.94	1.0000	Non-Significant Effect
		12.1	-0.443	2.651	20.94	1.0000	Non-Significant Effect
		24.2	-0.3481	2.651	20.94	1.0000	Non-Significant Effect
		48.5	-2.441	2.651	22.62	1.0000	Non-Significant Effect
		97	-0.6961	2.651	20.94	1.0000	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2172.261	310.323	7	2.486	0.0468	Significant Effect
Error	2871.417	124.8442	23			
Total	5043.678	435.1672	30			

ANOVA Assumptions						
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)	
Variances	Bartlett Equality of Variance	16.47	18.48	0.0212	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.9612		0.3142	Normal Distribution	

Frond Count Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	49.5	43.41	55.59	32	70	2.966	15.7	31.71%	0.0%
1.5		4	39.5	38.69	40.31	37	42	0.3934	2.082	5.27%	20.2%
3.05		4	41	40.45	41.55	39	42	0.2673	1.414	3.45%	17.17%
6.1		4	48	43.4	52.6	33	62	2.241	11.86	24.71%	3.03%
12.1		4	53	48.65	57.35	38	65	2.121	11.22	21.18%	-7.07%
24.2		4	52.25	48.28	56.22	41	65	1.936	10.24	19.6%	-5.56%
48.5		3	70.33	66.3	74.37	62	82	1.967	10.41	14.8%	-42.09%
97		4	55	48.74	61.26	31	65	3.051	16.15	29.35%	-11.11%

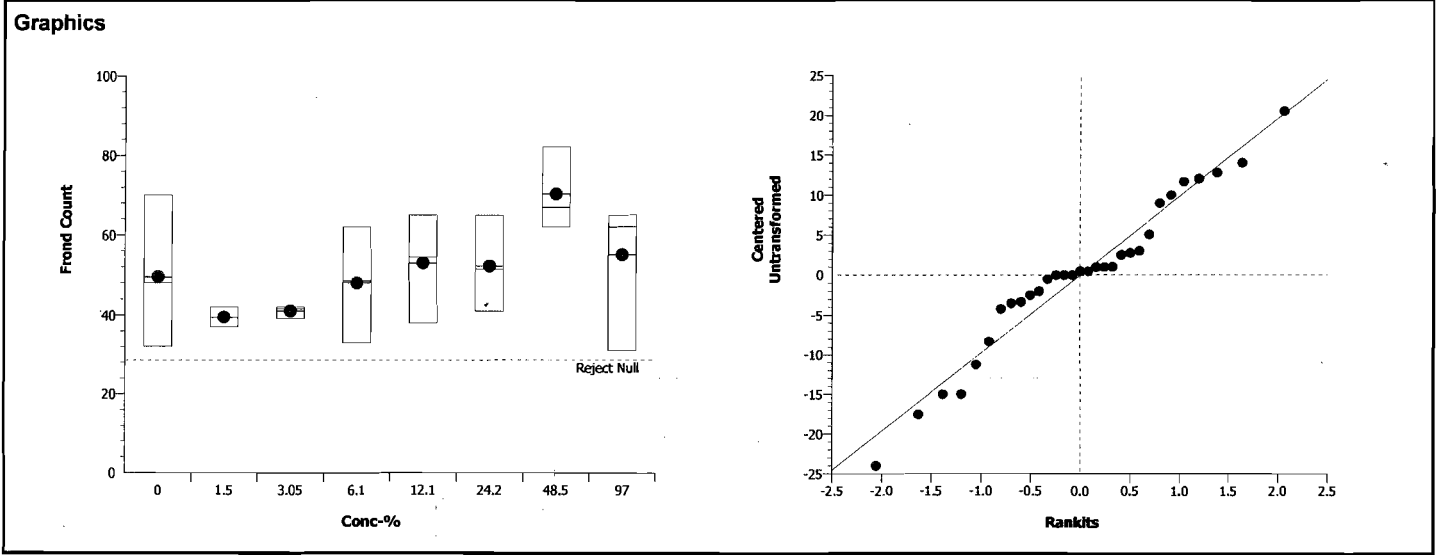
*EC Aug 25/09*

**CETIS Analytical Report**

Report Date: 25 Aug-09 10:37 (p 2 of 2)  
 Link/Link Code: 04-3661-5443/09210-STE2

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 00-0548-9221	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 25 Aug-09 10:35	<b>Analysis:</b> Parametric-Multiple Comparison	<b>Official Results:</b> Yes			

<b>Frond Count Detail</b>					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	70	50	46	32
1.5		42	40	39	37
3.05		42	42	41	39
6.1		62	49	48	33
12.1		65	56	53	38
24.2		65	55	48	41
48.5		82	67	62	
97		65	64	60	31



*ECR Aug 25/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 10:52 (p 1 of 2)  
 Link/Link Code: 04-3661-5443/09210-STE2

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 16-1120-6003	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 26 Aug-09 10:52	<b>Analysis:</b> Parametric-Two Sample	<b>Official Results:</b> Yes			
<b>Test Run No:</b> 01-3781-1703	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water			
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>			
<b>Ending Date:</b>	<b>Species:</b> Lemna minor				
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture				
<b>Sample No:</b> 02-9960-3283	<b>Code:</b> STE 2-Jul	<b>Client:</b> Rescan			
<b>Sample Date:</b> 05 Jul-09 13:15	<b>Material:</b> Water Sample	<b>Project:</b>			
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan				
<b>Sample Age:</b> 35h	<b>Station:</b> STE 2				

<b>Data Transform</b>	<b>Zeta</b>	<b>Alt Hyp</b>	<b>Monte Carlo</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>TU</b>	<b>PMSD</b>	
Untransformed		C < T	Not Run	97	62	97	#Error	1.031	N/A

<b>Equal Variance t Two-Sample Test</b>							
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		1.5	-1.263	1.943	15.38	0.8733	Non-Significant Effect
		3.05	-1.079	1.943	15.31	0.8389	Non-Significant Effect
		6.1	-0.1525	1.943	19.11	0.5581	Non-Significant Effect
		12.1	0.3628	1.943	18.75	0.3646	Non-Significant Effect
		24.2	0.2935	1.943	18.21	0.3895	Non-Significant Effect
		48.5	1.973	2.015	21.28	0.0528	Non-Significant Effect
		97	0.4885	1.943	21.88	0.3213	Non-Significant Effect

<b>ANOVA Table</b>						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2172.261	310.323	7	2.486	0.0468	Significant Effect
Error	2871.417	124.8442	23			
Total	5043.678	435.1672	30			

<b>ANOVA Assumptions</b>					
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	16.47	18.48	0.0212	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9612		0.3142	Normal Distribution

<b>Frond Count Summary</b>											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	49.5	43.41	55.59	32	70	2.966	15.7	31.71%	0.0%
1.5		4	39.5	38.69	40.31	37	42	0.3934	2.082	5.27%	20.2%
3.05		4	41	40.45	41.55	39	42	0.2673	1.414	3.45%	17.17%
6.1		4	48	43.4	52.6	33	62	2.241	11.86	24.71%	3.03%
12.1		4	53	48.65	57.35	38	65	2.121	11.22	21.18%	-7.07%
24.2		4	52.25	48.28	56.22	41	65	1.936	10.24	19.6%	-5.56%
48.5		3	70.33	66.3	74.37	62	82	1.967	10.41	14.8%	-42.09%
97		4	55	48.74	61.26	31	65	3.051	16.15	29.35%	-11.11%

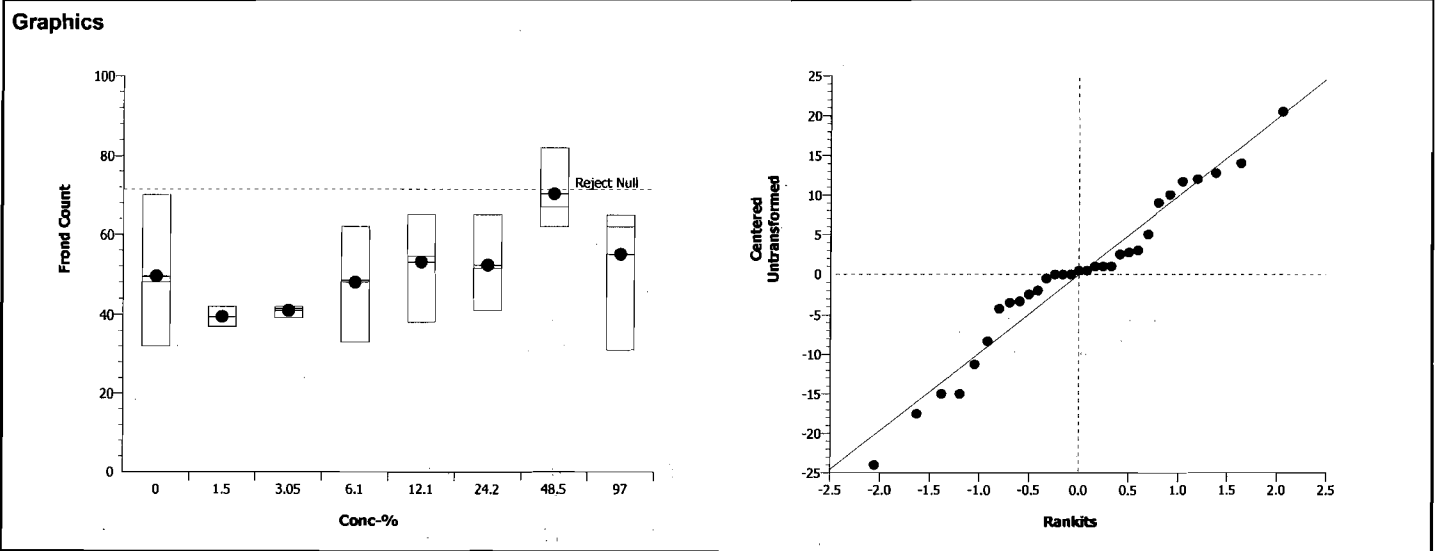
*ea Aug 26/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 10:52 (p 2 of 2)  
 Link/Link Code: 04-3661-5443/09210-STE2

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 16-1120-6003	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 26 Aug-09 10:52	<b>Analysis:</b> Parametric-Two Sample	<b>Official Results:</b> Yes			

<b>Frond Count Detail</b>					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	70	50	46	32
1.5		42	40	39	37
3.05		42	42	41	39
6.1		62	49	48	33
12.1		65	56	53	38
24.2		65	55	48	41
48.5		82	67	62	
97		65	64	60	31



*EA Aug 26/09*



**CETIS Analytical Report**

Report Date: 26 Aug-09 11:11 (p 1 of 2)  
 Link/Link Code: 00-8666-3256/09210STE2H

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>
<b>Analysis No:</b> 02-0357-3647	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0	
<b>Analyzed:</b> 26 Aug-09 11:11	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Official Results:</b> Yes	
<b>Test Run No:</b> 14-1257-3951	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water	
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>	
<b>Ending Date:</b> 14 Jul-09	<b>Species:</b> Lemna minor		
<b>Duration:</b> 7d 0h	<b>Source:</b> In-House Culture		
<b>Sample No:</b> 06-6927-5061	<b>Code:</b> STE 2-Jul	<b>Client:</b> Rescan	
<b>Sample Date:</b> 05 Jul-09 13:15	<b>Material:</b> Water Sample	<b>Project:</b>	
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan		
<b>Sample Age:</b> 35h	<b>Station:</b> STE 2		

<b>Linear Interpolation Options</b>					
<b>X Transform</b>	<b>Y Transform</b>	<b>Seed</b>	<b>Resamples</b>	<b>Exp 95% CL</b>	<b>Method</b>
Log(X + 1)	Linear	57951	200	Yes	Two-Point Interpolation

<b>Point Estimates</b>			
<b>% Effect</b>	<b>Conc-%</b>	<b>95% LCL</b>	<b>95% UCL</b>
5	1.212	N/A	N/A
10	> 97	N/A	N/A
15	> 97	N/A	N/A
20	> 97	N/A	N/A
25	> 97	N/A	N/A
40	> 97	N/A	N/A
50	> 97	N/A	N/A

<b>Frond Count Summary</b>			<b>Calculated Variate</b>						
<b>Conc-%</b>	<b>Control Type</b>	<b>Count</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>Diff%</b>
0	Negative Control	4	49.5	32	70	2.914	15.7	31.71%	0.0%
1.5		4	39.5	37	42	0.3866	2.082	5.27%	20.2%
3.05		4	41	39	42	0.2626	1.414	3.45%	17.17%
6.1		4	48	33	62	2.202	11.86	24.71%	3.03%
12.1		4	49.5	32	70	2.914	15.7	31.71%	0.0%
24.2		4	49.5	32	70	2.914	15.7	31.71%	0.0%
48.5		4	49.5	32	70	2.914	15.7	31.71%	0.0%
97		4	49.5	32	70	2.914	15.7	31.71%	0.0%

<b>Frond Count Detail</b>					
<b>Conc-%</b>	<b>Control Type</b>	<b>Rep 1</b>	<b>Rep 2</b>	<b>Rep 3</b>	<b>Rep 4</b>
0	Negative Control	32	46	50	70
1.5		42	37	39	40
3.05		41	39	42	42
6.1		49	62	33	48
12.1		32	46	50	70
24.2		32	46	50	70
48.5		32	46	50	70
97		32	46	50	70

*EA Aug 26/09*

# CETIS Analytical Report

Report Date: 26 Aug-09 11:11 (p 2 of 2)

Link/Link Code: 00-8666-3256/09210STE2H

Lemna Growth Inhibition Test

Nautilus Environmental

Analysis No: 02-0357-3647

Endpoint: Frond Count

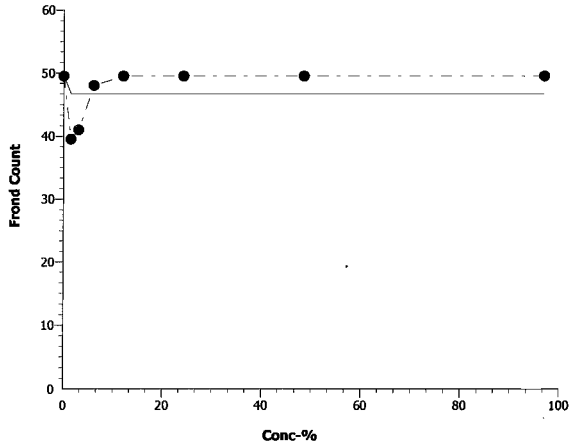
CETIS Version: CETISv1.5.0

Analyzed: 26 Aug-09 11:11

Analysis: Linear Interpolation (ICPIN)

Official Results: Yes

## Graphics



*Handwritten signature*  
Aug 26/09

**CETIS Analytical Report**

Report Date: 14 Aug-09 10:55 (p 1 of 2)  
 Link/Link Code: 04-3661-5443/09210-STE2

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 00-2260-0656	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 14 Aug-09 10:52	<b>Analysis:</b> Parametric-Multiple Comparison	<b>Official Results:</b> Yes			
<b>Test Run No:</b> 01-3781-1703	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water			
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>			
<b>Ending Date:</b>	<b>Species:</b> Lemna minor				
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture				
<b>Sample No:</b> 02-9960-3283	<b>Code:</b> STE 2-Jul	<b>Client:</b> Rescan			
<b>Sample Date:</b> 05 Jul-09 13:15	<b>Material:</b> Water Sample	<b>Project:</b>			
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan				
<b>Sample Age:</b> 35h	<b>Station:</b> STE 2				

<b>Data Transform</b>	<b>Zeta</b>	<b>Alt Hyp</b>	<b>Monte Carlo</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>TU</b>	<b>PMSD</b>
Untransformed		C > T	Not Run	97	3 <sup>rd</sup> > 4 <sup>th</sup>	#Error	1.031	45.74%

<b>Bonferroni Adj t Test</b>							
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		1.5	1.307	2.651	1.648	0.7144	Non-Significant Effect
		3.05	1.83	2.651	1.648	0.2809	Non-Significant Effect
		6.1	1.778	2.651	1.648	0.3104	Non-Significant Effect
		12.1	1.042	2.651	1.648	1.0000	Non-Significant Effect
		24.2	0.5791	2.651	1.648	1.0000	Non-Significant Effect
		48.5	-1.327	2.651	1.78	1.0000	Non-Significant Effect
		97	0.3499	2.651	1.648	1.0000	Non-Significant Effect

<b>ANOVA Table</b>						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	10.73227	1.533182	7	1.984	0.1017	Non-Significant Effect
Error	17.77437	0.7727988	23			
Total	28.50664	2.30598	30			

<b>ANOVA Assumptions</b>						
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)	
Variances	Bartlett Equality of Variance	8.821	18.48	0.2658	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.9287		0.0403	Normal Distribution	

<b>Total Dry Weight-mg Summary</b>											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	3.603	3.165	4.04	2.12	4.81	0.2132	1.128	31.32%	0.0%
1.5		4	2.79	2.658	2.922	2.3	3.06	0.06427	0.3401	12.19%	22.55%
3.05		4	2.465	2.343	2.587	2.14	2.89	0.05949	0.3148	12.77%	31.57%
6.1		4	2.497	1.982	3.013	0.58	3.65	0.2514	1.33	53.26%	30.67%
12.1		4	2.955	2.708	3.202	2.05	3.54	0.1202	0.636	21.52%	17.97%
24.2		4	3.243	2.972	3.513	2.33	3.93	0.1319	0.6978	21.52%	9.99%
48.5		3	4.493	4.195	4.792	3.63	5.11	0.1456	0.7702	17.14%	-24.73%
97		4	3.385	2.929	3.841	1.73	4.33	0.2221	1.175	34.72%	6.04%

*EA Aug 25/09*

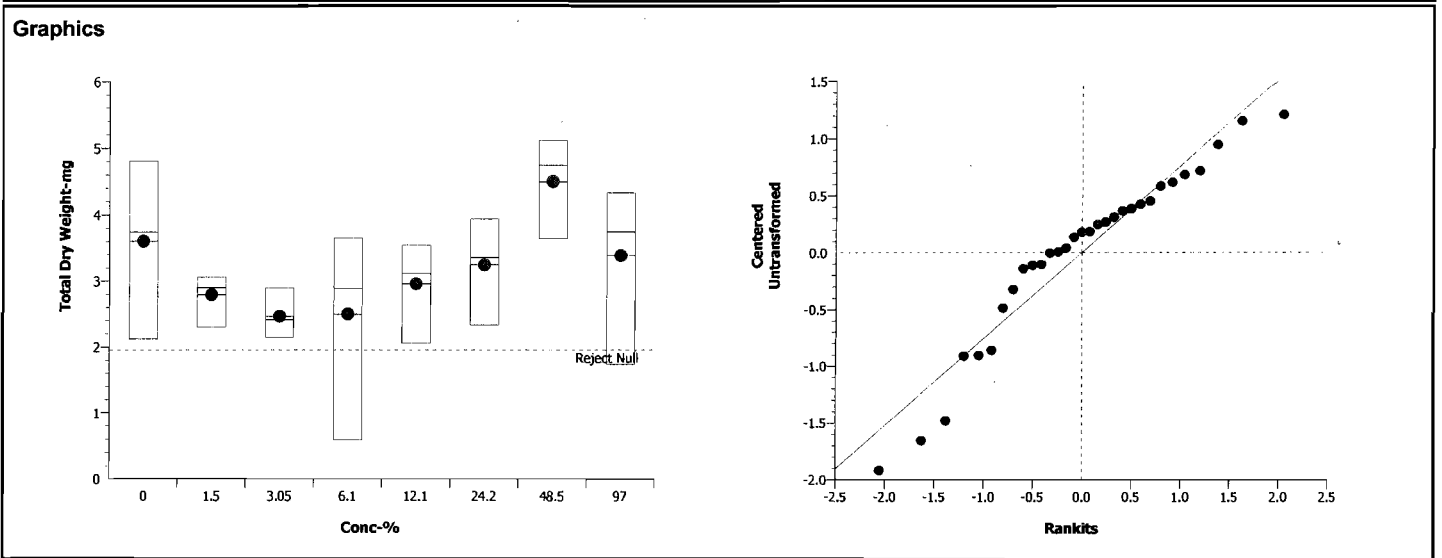
**CETIS Analytical Report**

Report Date: 14 Aug-09 10:55 (p 2 of 2)

Link/Link Code: 04-3661-5443/09210-STE2

Lemna Growth Inhibition Test			Nautilus Environmental		
Analysis No:	00-2260-0656	Endpoint:	Total Dry Weight-mg	CETIS Version:	CETISv1.5.0
Analyzed:	14 Aug-09 10:52	Analysis:	Parametric-Multiple Comparison	Official Results:	Yes

Total Dry Weight-mg Detail					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	4.81	3.99	3.49	2.12
1.5		3.06	2.97	2.83	2.3
3.05		2.89	2.47	2.36	2.14
6.1		3.65	2.95	2.81	0.58
12.1		3.54	3.14	3.09	2.05
24.2		3.93	3.61	3.1	2.33
48.5		5.11	4.74	3.63	
97		4.33	4.1	3.38	1.73



*GA*  
Aug 25/09

**CETIS Analytical Report**

Report Date: 26 Aug-09 10:52 (p 1 of 2)

Link/Link Code: 04-3661-5443/09210-STE2

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>
-------------------------------------	--	--	-------------------------------

<b>Analysis No:</b> 05-3242-3755	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 26 Aug-09 10:52	<b>Analysis:</b> Parametric-Two Sample	<b>Official Results:</b> Yes

<b>Test Run No:</b> 01-3781-1703	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>
<b>Ending Date:</b>	<b>Species:</b> Lemna minor	
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture	

<b>Sample No:</b> 02-9960-3283	<b>Code:</b> STE 2-Jul	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09 13:15	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 35h	<b>Station:</b> STE 2	

<b>Data Transform</b>	<b>Zeta</b>	<b>Alt Hyp</b>	<b>Monte Carlo</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>TU</b>	<b>PMSD</b>
Untransformed		C < T	Not Run	97	<del>97</del> > 97	#Error	1.031	N/A

Equal Variance t Two-Sample Test						
Control	vs Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control	1.5	-1.379	1.943	1.145	0.8914	Non-Significant Effect
	3.05	-1.942	1.943	1.138	0.9499	Non-Significant Effect
	6.1	-1.267	1.943	1.695	0.8740	Non-Significant Effect
	12.1	-0.9998	1.943	1.258	0.8220	Non-Significant Effect
	24.2	-0.5427	1.943	1.289	0.6966	Non-Significant Effect
	48.5	1.166	2.015	1.54	0.1481	Non-Significant Effect
	97	-0.267	1.943	1.583	0.6008	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	10.73227	1.533182	7	1.984	0.1017	Non-Significant Effect
Error	17.77437	0.7727988	23			
Total	28.50664	2.30598	30			

ANOVA Assumptions					
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	8.821	18.48	0.2658	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9287		0.0403	Normal Distribution

Total Dry Weight-mg Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	3.603	3.165	4.04	2.12	4.81	0.2132	1.128	31.32%	0.0%
1.5		4	2.79	2.658	2.922	2.3	3.06	0.06427	0.3401	12.19%	22.55%
3.05		4	2.465	2.343	2.587	2.14	2.89	0.05949	0.3148	12.77%	31.57%
6.1		4	2.497	1.982	3.013	0.58	3.65	0.2514	1.33	53.26%	30.67%
12.1		4	2.955	2.708	3.202	2.05	3.54	0.1202	0.636	21.52%	17.97%
24.2		4	3.243	2.972	3.513	2.33	3.93	0.1319	0.6978	21.52%	9.99%
48.5		3	4.493	4.195	4.792	3.63	5.11	0.1456	0.7702	17.14%	-24.73%
97		4	3.385	2.929	3.841	1.73	4.33	0.2221	1.175	34.72%	6.04%

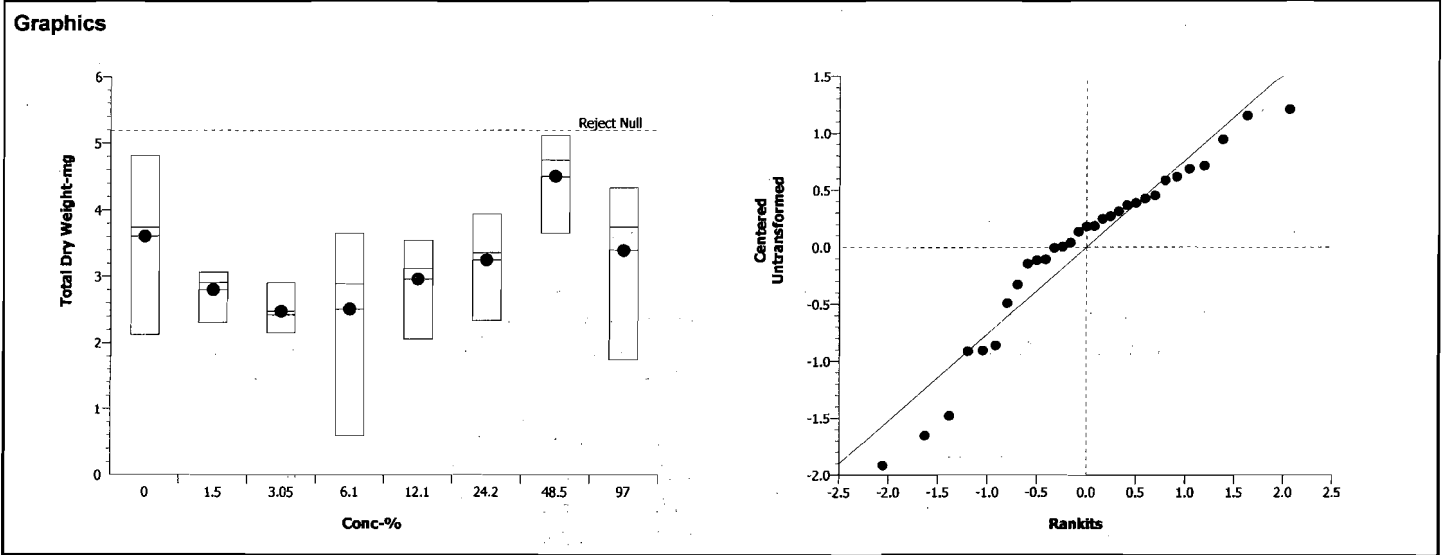
*EC Aug 26/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 10:52 (p 2 of 2)  
 Link/Link Code: 04-3661-5443/09210-STE2

<b>Lemna Growth Inhibition Test</b>		<b>Nautilus Environmental</b>	
<b>Analysis No:</b> 05-3242-3755	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.5.0	
<b>Analyzed:</b> 26 Aug-09 10:52	<b>Analysis:</b> Parametric-Two Sample	<b>Official Results:</b> Yes	

<b>Total Dry Weight-mg Detail</b>					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	4.81	3.99	3.49	2.12
1.5		3.06	2.97	2.83	2.3
3.05		2.89	2.47	2.36	2.14
6.1		3.65	2.95	2.81	0.58
12.1		3.54	3.14	3.09	2.05
24.2		3.93	3.61	3.1	2.33
48.5		5.11	4.74	3.63	
97		4.33	4.1	3.38	1.73



*KA Aug 26/09*

**CETIS Analytical Report**

Report Date: 17 Aug-09 16:00 (p 1 of 2)  
 Link/Link Code: 04-3661-5443/09210-STE2

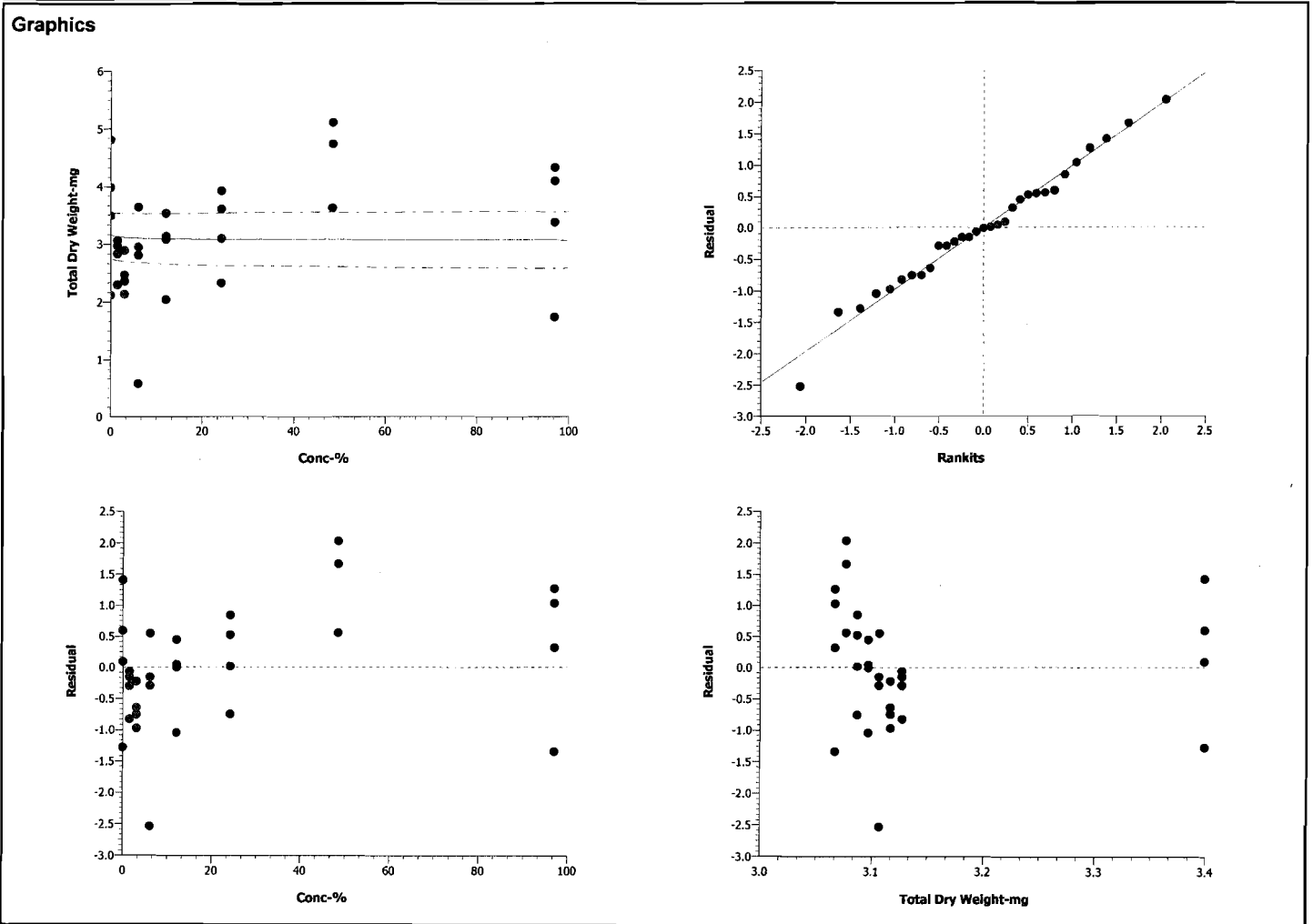
Lemna Growth Inhibition Test			Nautilus Environmental						
Analysis No:	11-3396-0145	Endpoint:	Total Dry Weight-mg	CETIS Version:		CETISv1.5.0			
Analyzed:	17 Aug-09 16:00	Analysis:	Nonlinear Regression	Official Results:		Yes			
Test Run No:	01-3781-1703	Test Type:	Lemna Growth	Dil Water:		Laboratory Water			
Start Date:	07 Jul-09	Protocol:	EC/EPS 1/RM/37	Brine:					
Ending Date:		Species:	Lemna minor						
Duration:	N/A	Source:	In-House Culture						
Sample No:	02-9960-3283	Code:	STE 2-Jul	Client:		Rescan			
Sample Date:	05 Jul-09 13:15	Material:	Water Sample	Project:					
Receive Date:	07 Jul-09 09:00	Source:	Rescan						
Sample Age:	35h	Station:	STE 2						
<b>Non-Linear Regression Options</b>									
Model Function		X Transform	Y Transform	Weighting Function	PTBS Function				
2P Linear [Y=A+BX]		Log(X)	None	Normal [W=1]	Off [Y*=Y]				
<b>Regression Summary</b>									
Iters	Log LL	AICc	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(1%)	
1	-14.02	32.49		Yes	2.244	3.71	0.0751	Non-Significant Lack of Fit	
<b>Point Estimates</b>									
% Effect	Conc-%	95% LCL	95% UCL						
10	170.3	N/A	2.661E+14						
15	22230000	N/A	5.503E+32						
20	2.901E+12	N/A	N/A						
25	3.786E+17	N/A	N/A						
40	8.414E+32	N/A	N/A						
<b>Regression Parameters</b>									
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)		
A	3.133	0.158	2.81	3.456	19.83	0.0000	Significant Parameter		
B	-0.03322	0.05111	-0.1378	0.07131	-0.6499	0.5209	Non-Significant Parameter		
<b>ANOVA Table</b>									
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(1%)			
Model	0.3264329	0.3264329	1	0.3359	0.5667	Non-Significant			
Lack of Fit	10.40584	1.734306	6	2.244	0.0751	Non-Significant			
Pure Error	17.77437	0.7727988	23						
Residual	28.18021	0.9717314	29						
<b>Residual Analysis</b>									
Attribute	Method	Test Stat	Critical	P-Value	Decision(1%)				
Variances	Bartlett Equality of Variance	8.821	18.48	0.2658	Equal Variances				
Distribution	Shapiro-Wilk Normality	0.9858		0.9447	Normal Distribution				
<b>Total Dry Weight-mg Summary</b>									
Conc-%	Control Type	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	4	3.603	2.12	4.81	0.2095	1.128	31.32%	0.0%
1.5		4	2.79	2.3	3.06	0.06315	0.3401	12.19%	22.55%
3.05		4	2.465	2.14	2.89	0.05846	0.3148	12.77%	31.57%
6.1		4	2.497	0.58	3.65	0.247	1.33	53.26%	30.67%
12.1		4	2.955	2.05	3.54	0.1181	0.636	21.52%	17.97%
24.2		4	3.243	2.33	3.93	0.1296	0.6978	21.52%	9.99%
48.5		3	4.493	3.63	5.11	0.143	0.7702	17.14%	-24.73%
97		4	3.385	1.73	4.33	0.2182	1.175	34.72%	6.04%

**CETIS Analytical Report**

Report Date: 17 Aug-09 16:00 (p 2 of 2)  
 Link/Link Code: 04-3661-5443/09210-STE2

Lemna Growth Inhibition Test		Nautilus Environmental	
Analysis No: 11-3396-0145	Endpoint: Total Dry Weight-mg	CETIS Version: CETISv1.5.0	
Analyzed: 17 Aug-09 16:00	Analysis: Nonlinear Regression	Official Results: Yes	

Total Dry Weight-mg Detail					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	2.12	3.49	3.99	4.81
1.5		2.83	2.97	2.3	3.06
3.05		2.36	2.14	2.89	2.47
6.1		2.95	2.81	3.65	0.58
12.1		3.54	2.05	3.14	3.09
24.2		3.1	3.93	2.33	3.61
48.5		4.74	5.11	3.63	
97		3.38	4.33	4.1	1.73



*EC*  
 Aug 25/09



## Lemna minor Summary Sheet

Client: Pescan  
 Work Order No.: 09210

Start Date: July 7/09  
 Set up by: ART

**Sample Information:**

Sample ID: NTR 2  
 Sample Date: July 5/2009  
 Date Received: July 7/2009  
 Sample Volume: 9x 20L

**Test Organism Information:**

Culture Date: BCL 20 300609  
 Age of culture (Day 0): 7 days  
 >8X growth in APHA?: ~~X (33)~~ Yes, 33 fronds.  
BR

**KCI Reference Toxicant Results:**

Reference Toxicant ID: LM40  
 Date Initiated: June 24/2009

7-d No. of Fronds IC25 (95% CL): 2.8 (0.9-4.9) g/L KCI

7-d No. Fronds IC25 Reference Toxicant Mean ± 2 SD: 2.5 ± 1.1 CV (%): 22%

	Number of Fronds	Dry Weight
Test Results: NOEC %(v/v)	97	97
LOEC %(v/v)	>97	>97
IC25 %(v/v) (95% CL)	>97	>97
IC50 %(v/v) (95% CL)	>97	>97

Reviewed by: 

Date reviewed: Aug 25/09

**Plant Growth Inhibition Toxicity Test  
Water Quality Measurements**

Green

Client: Rescan Setup by: ART  
 Sample ID: NTR2 Test Date: July 7/09  
 Work Order No.: 09210 Test Species: Lemna minor  
 Culture Source: UTCC #490  
 Test Culture Age: 7 days > 8X Growth? (Y/N): Y (33)  
 Light Intensity Range: 3600 - 3850 Date Measured: July 7, 2009

Day	0	1	2	3	4	5	6	7
Shelf Temp (°C)	24.4	24.9	24.3	25.4	24.6	24.6	24.9	25.1
Initials	ART	ART	JLT	JLT	JLT	JLT	BRU	ART

Sample Characteristics  
 Temperature (°C) 24.5  
 DO (mg/L) 9.6  
 pH 7.4  
 Conductivity (µS) AT 858 67

Aeration? 20 min  
 Temperature (°C) 24.5  
 DO (mg/L) 9.8  
 pH 7.6  
 Conductivity (µS) 893

Concentration % (v/v)	Temperature (°C)		pH		Conductivity (µS)
	Day 0	Day 7	Day 0	Day 7	0 h
Control	24.6	26.5	8.2	<del>8.2</del> 8.6	AT <del>877</del> 877
1.5	24.6	26.2	8.2	<del>8.2</del> 8.5	880
3.05	24.7	26.2	8.2	<del>8.2</del> 8.6	881
6.1	24.7	25.9	8.1	8.6	883
12.1	24.4	25.8	7.9	8.5	882
24.2	24.3	26.1	7.9	8.5	883
48.5	24.3	26.2	7.8	8.4	887
97	24.5	26.0	7.6	8.6	893
Initials	ART	ART	ART	ART	ART

Thermometer: Big Jumbo Thermometer Cond. Meter: C-1 pH meter: pH-1

Sample Description: clear, colourless

Comments: \_\_\_\_\_

Reviewed: ART Date Reviewed: Aug. 25/09

Green

## Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts

Client: Rescan  
 Sample ID: NTR2  
 Work Order #: 09210

Start Date: July 7 /09  
 Termination Date: July 14 /09  
 Test set up by: ART

Concentration	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
Control	A	6	54	77									
	B		94	87									
	C		60	81									
	D		59	86	✓								
1.5	A		73										
	B		80										
	C		68										
	D		61										
3.05	A		77										
	B		79										
	C		77										
	D		81	✓									
6.1	A		65										
	B		85										
	C		95										
	D		80										
12.1	A		57										
	B		54										
	C		66										
	D		91										
24.2	A		51										
	B		50										
	C		73										
	D	✓	76										

Comments: \_\_\_\_\_

Reviewed by: EADate Reviewed: Aug 25/09

Green

### Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts

Client: Rescan  
 Sample ID: NTR2  
 Work Order #: 09210

Start Date: July 7 / 09  
 Termination Date: July 14 / 09  
 Test set up by: ART

Concentration % (v/v)	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
48.5	A	6	70										[Handwritten initials]
	B		57										
	C		100										
	D		84										
97	A		91										[Handwritten initials]
	B		78										
	C		86										
	D	↓	84										
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												

Comments: \_\_\_\_\_

Reviewed by: [Signature]

Date Reviewed: Aug 25 / 09

## 7-d Lemna minor Weight Data Sheet

Client: Rescan  
 Sample ID: NTR2  
 Work Order #: 09210

Start Date: July 7 / 09  
 Termination Date: July 14 / 09

Concentration 90 (V/V)	Rep	Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
Control	A	1	1338.63	1344.00	EGG
	B	2	1337.68	1344.57	EGG
	C	3	1335.57	1341.81	EGG
	D	4	1324.32	1328.85	EGG
1.5	A	5	1334.13	1338.95	EGG
	B	6	1334.46	1339.67	EGG
	C	7	1333.22	1337.74	EGG
	D	8	1327.91	1331.77	EGG
3.05	A	9	1334.99	1340.75	EGG
	B	10	1335.56	1340.91	EGG
	C	11	1322.20	1326.43	EGG
	D	12	1337.63	1343.41	EGG
6.1	A	13	1337.75	1341.48	EGG
	B	14	1332.78	1338.00	EGG
	C	15	1333.92	1340.85	EGG
	D	16	1329.76	1335.73	EGG
12.1	A	17	1328.00	1331.05	EGG
	B	18	1330.51	1333.69	EGG
	C	19	1327.94	1332.89	EGG
	D	20	1329.30	1334.86	EGG
24.2	A	21	1328.77	1331.50	EGG
	B	22	1329.72	1332.25	EGG
	C	23	1328.70	1333.07	EGG
	D	24	1330.93	1336.76	EGG
48.5	A	25	1328.20	1332.30	EGG
	B	26	1339.18	1334.49 1342.50	EGG
	C	27	1328.12	1334.49	EGG
	D	28	1325.90	1331.52	EGG

Comments:

Reviewed by: EGG

Date Reviewed: Aug 25 / 09

### 7-d Lemna minor Weight Data Sheet

Client: Rescan  
 Sample ID: NTR2  
 Work Order #: 09210

Start Date: July 7 / 09  
 Termination Date: July 14 / 09

Concentration 97 (V/V)	Rep	Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
97	A	29	1331.440	1337.02	EBB
	B	30	1333.22	1338.03	EBB
	C	31	1330.81	1336.39	EBB
	D	32	1334.66	1340.40	EBB
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				

Comments: \_\_\_\_\_

Reviewed by: EW

Date Reviewed: Aug 25 / 09

**CETIS Analytical Report**

Report Date: 25 Aug-09 10:49 (p 1 of 2)

Link/Link Code: 19-5522-7579/09210-NTR2

Lemna Growth Inhibition Test			Nautilus Environmental
------------------------------	--	--	------------------------

Analysis No: 03-9533-0755	Endpoint: Frond Count	CETIS Version: CETISv1.5.0
Analyzed: 25 Aug-09 10:47	Analysis: Parametric-Control vs Treatments	Official Results: Yes

Test Run No: 19-6405-7540	Test Type: Lemna Growth	Dil Water: Laboratory Water
Start Date: 07 Jul-09	Protocol: EC/EPS 1/RM/37	Brine:
Ending Date:	Species: Lemna minor	
Duration: N/A	Source: In-House Culture	

Sample No: 03-3164-7920	Code: NTR2-Jul	Client: Rescan
Sample Date: 05 Jul-09 15:15	Material: Water Sample	Project:
Receive Date: 07 Jul-09 09:00	Source: Rescan	
Sample Age: 33h	Station: NTR2	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD	
Untransformed		C > T	Not Run	97	80	80	#Error	1.031	35.07%

Dunnnett's Multiple Comparison Test							
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		1.5	0.4854	2.482	24.29	0.7134	Non-Significant Effect
		3.05	-0.3321	2.482	24.29	0.9395	Non-Significant Effect
		6.1	-0.6132	2.482	24.29	0.9703	Non-Significant Effect
		12.1	0.8431	2.482	24.29	0.5543	Non-Significant Effect
		24.2	0.792	2.482	24.29	0.5781	Non-Significant Effect
		48.5	-0.2555	2.482	24.29	0.9277	Non-Significant Effect
		97	-0.9709	2.482	24.29	0.9893	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1174.875	167.8393	7	0.8764	0.5391	Non-Significant Effect
Error	4596	191.5	24			
Total	5770.875	359.3393	31			

ANOVA Assumptions					
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	14.19	18.48	0.0479	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9636		0.3438	Normal Distribution

Frond Count Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	69.25	64.02	74.48	50	81	2.547	13.48	19.46%	0.0%
1.5		4	64.5	61.39	67.61	55	74	1.516	8.021	12.44%	6.86%
3.05		4	72.5	71.76	73.24	71	75	0.3619	1.915	2.64%	-4.69%
6.1		4	75.25	70.4	80.1	59	89	2.362	12.5	16.61%	-8.66%
12.1		4	61	54.49	67.51	48	85	3.174	16.79	27.53%	11.91%
24.2		4	61.5	53.06	69.94	44	90	4.113	21.76	35.39%	11.19%
48.5		4	71.75	64.58	78.92	51	94	3.493	18.48	25.76%	-3.61%
97		4	78.75	76.66	80.84	72	85	1.016	5.377	6.83%	-13.72%

*ca Aug 25/09*

# CETIS Analytical Report

Report Date: 25 Aug-09 10:49 (p 2 of 2)

Link/Link Code: 19-5522-7579/09210-NTR2

## Lemna Growth Inhibition Test

Nautilus Environmental

Analysis No: 03-9533-0755  
 Analyzed: 25 Aug-09 10:47

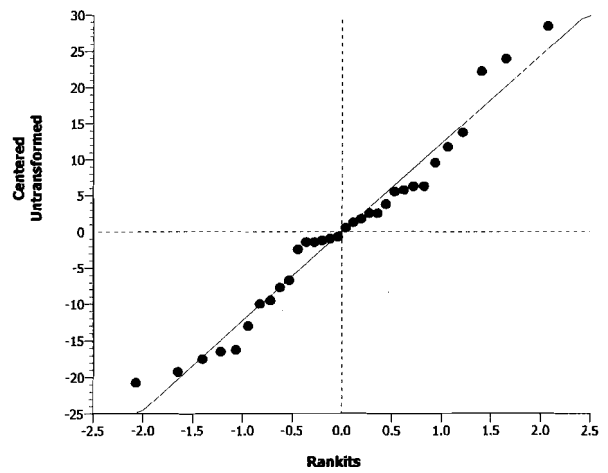
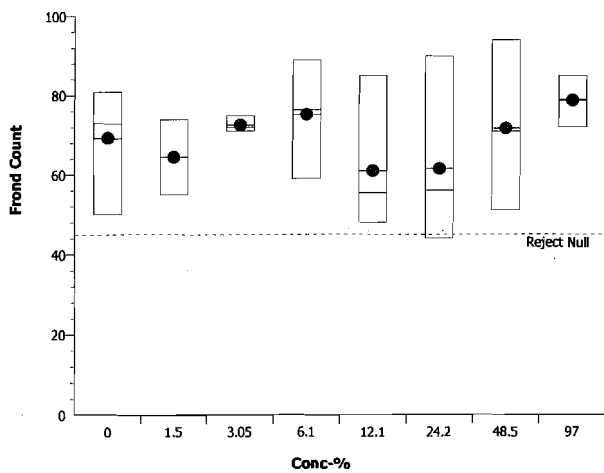
Endpoint: Frond Count  
 Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1.5.0  
 Official Results: Yes

### Frond Count Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	81	75	71	50
1.5		74	67	62	55
3.05		75	73	71	71
6.1		89	79	74	59
12.1		85	60	51	48
24.2		90	67	45	44
48.5		94	78	64	51
97		85	80	78	72

### Graphics



*Etc Aug 25/09*



**CETIS Analytical Report**

Report Date: 26 Aug-09 11:17 (p 1 of 2)

Link/Link Code: 19-5522-7579/09210-NTR2

<b>Lemna Growth Inhibition Test</b>	<b>Nautilus Environmental</b>
-------------------------------------	-------------------------------

<b>Analysis No:</b> 07-3881-0793	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 26 Aug-09 11:17	<b>Analysis:</b> Parametric-Two Sample	<b>Official Results:</b> Yes

<b>Test Run No:</b> 19-6405-7540	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>
<b>Ending Date:</b>	<b>Species:</b> Lemna minor	
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture	

<b>Sample No:</b> 03-3164-7920	<b>Code:</b> NTR2-Jul	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09 15:15	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 33h	<b>Station:</b> NTR2	

<b>Data Transform</b>	<b>Zeta</b>	<b>Alt Hyp</b>	<b>Monte Carlo</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>TU</b>	<b>PMSD</b>
Untransformed		C < T	Not Run	97	<i>97</i>	#Error	1.031	N/A

Equal Variance t Two-Sample Test							
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		1.5	-0.6058	1.943	15.24	0.7166	Non-Significant Effect
		3.05	0.4776	1.943	13.22	0.3249	Non-Significant Effect
		6.1	0.6529	1.943	17.86	0.2690	Non-Significant Effect
		12.1	-0.7663	1.943	20.92	0.7637	Non-Significant Effect
		24.2	-0.6055	1.943	24.87	0.7165	Non-Significant Effect
		48.5	0.2186	1.943	22.22	0.4171	Non-Significant Effect
		97	1.31	1.943	14.1	0.1191	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1174.875	167.8393	7	0.8764	0.5391	Non-Significant Effect
Error	4596	191.5	24			
Total	5770.875	359.3393	31			

ANOVA Assumptions						
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)	
Variances	Bartlett Equality of Variance	14.19	18.48	0.0479	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.9636		0.3438	Normal Distribution	

Frond Count Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	69.25	64.02	74.48	50	81	2.547	13.48	19.46%	0.0%
1.5		4	64.5	61.39	67.61	55	74	1.516	8.021	12.44%	6.86%
3.05		4	72.5	71.76	73.24	71	75	0.3619	1.915	2.64%	-4.69%
6.1		4	75.25	70.4	80.1	59	89	2.362	12.5	16.61%	-8.66%
12.1		4	61	54.49	67.51	48	85	3.174	16.79	27.53%	11.91%
24.2		4	61.5	53.06	69.94	44	90	4.113	21.76	35.39%	11.19%
48.5		4	71.75	64.58	78.92	51	94	3.493	18.48	25.76%	-3.61%
97		4	78.75	76.66	80.84	72	85	1.016	5.377	6.83%	-13.72%

*EA Aug 26/09*

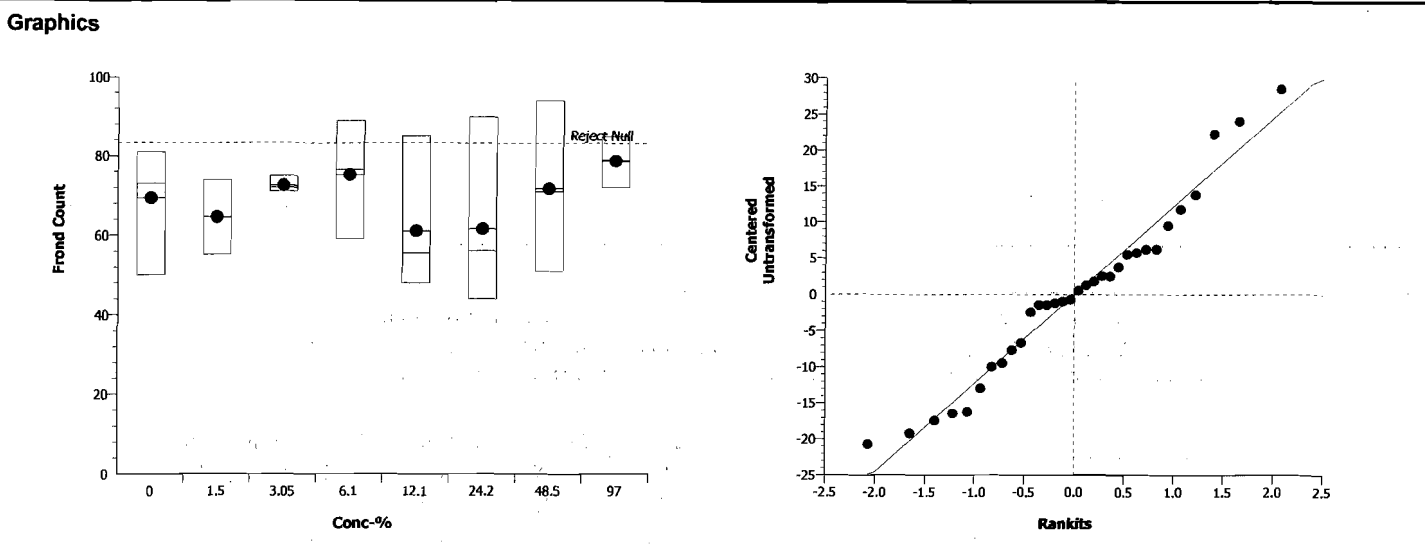
# CETIS Analytical Report

Report Date: 26 Aug-09 11:17 (p 2 of 2)  
 Link/Link Code: 19-5522-7579/09210-NTR2

Lemna Growth Inhibition Test Nautilus Environmental

Analysis No: 07-3881-0793      Endpoint: Frond Count      CETIS Version: CETISv1.5.0  
 Analyzed: 26 Aug-09 11:17      Analysis: Parametric-Two Sample      Official Results: Yes

Frond Count Detail					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	81	75	71	50
1.5		74	67	62	55
3.05		75	73	71	71
6.1		89	79	74	59
12.1		85	60	51	48
24.2		90	67	45	44
48.5		94	78	64	51
97		85	80	78	72



*the Aug 26/09*

**CETIS Analytical Report**

Report Date: 25 Aug-09 10:49 (p 1 of 2)

Link/Link Code: 19-5522-7579/09210-NTR2

Lemna Growth Inhibition Test			Nautilus Environmental						
Analysis No:	21-3562-6343	Endpoint:	FronD Count	CETIS Version:	CETISv1.5.0				
Analyzed:	25 Aug-09 10:49	Analysis:	Nonlinear Regression	Official Results:	Yes				
Test Run No:	19-6405-7540	Test Type:	Lemna Growth	Dil Water:	Laboratory Water				
Start Date:	07 Jul-09	Protocol:	EC/EPS 1/RM/37	Brine:					
Ending Date:		Species:	Lemna minor						
Duration:	N/A	Source:	In-House Culture						
Sample No:	03-3164-7920	Code:	NTR2-Jul	Client:	Rescan				
Sample Date:	05 Jul-09 15:15	Material:	Water Sample	Project:					
Receive Date:	07 Jul-09 09:00	Source:	Rescan						
Sample Age:	33h	Station:	NTR2						
Non-Linear Regression Options									
Model Function	X Transform	Y Transform	Weighting Function	PTBS Function					
2P Linear [Y=A+BX]	Log(X)	None	Normal [W=1]	Off [Y*=Y]					
Regression Summary									
Iters	Log LL	AICc	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(1%)	
1	-99.11	202.6		Yes	1.019	3.667	0.4369	Non-Significant Lack of Fit	
Regression Parameters									
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)		
A	69.32	2.447	64.32	74.32	28.33	0.0000	Significant Parameter		
B	0.1192	0.8004	-1.515	1.754	0.1489	0.8826	Non-Significant Parameter		
ANOVA Table									
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(1%)			
Model	4.245688	4.245688	1	0.02209	0.8828	Non-Significant			
Lack of Fit	1170.629	195.1049	6	1.019	0.4369	Non-Significant			
Pure Error	4596	191.5	24						
Residual	5766.629	192.221	30						
Residual Analysis									
Attribute	Method	Test Stat	Critical	P-Value	Decision(1%)				
Variances	Bartlett Equality of Variance	14.19	18.48	0.0479	Equal Variances				
Distribution	Shapiro-Wilk Normality	0.963		0.3301	Normal Distribution				
FronD Count Summary									
Conc-%	Control Type	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	4	69.25	50	81	2.502	13.48	19.46%	0.0%
1.5		4	64.5	55	74	1.489	8.021	12.44%	6.86%
3.05		4	72.5	71	75	0.3556	1.915	2.64%	-4.69%
6.1		4	75.25	59	89	2.321	12.5	16.61%	-8.66%
12.1		4	61	48	85	3.118	16.79	27.53%	11.91%
24.2		4	61.5	44	90	4.041	21.76	35.39%	11.19%
48.5		4	71.75	51	94	3.432	18.48	25.76%	-3.61%
97		4	78.75	72	85	0.9986	5.377	6.83%	-13.72%

*ECU*  
Aug. 25/09

**CETIS Analytical Report**

Report Date: 25 Aug-09 10:49 (p 2 of 2)  
 Link/Link Code: 19-5522-7579/09210-NTR2

**Lemna Growth Inhibition Test**

**Nautilus Environmental**

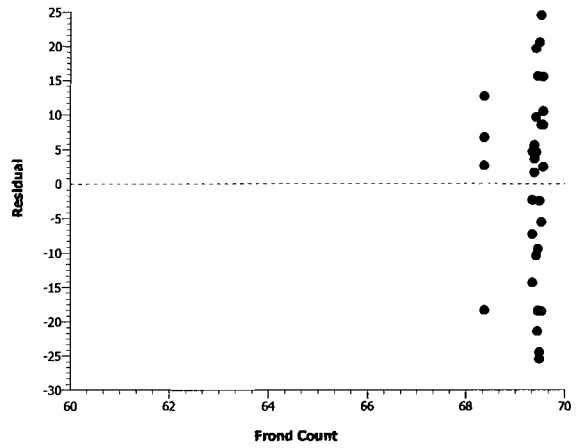
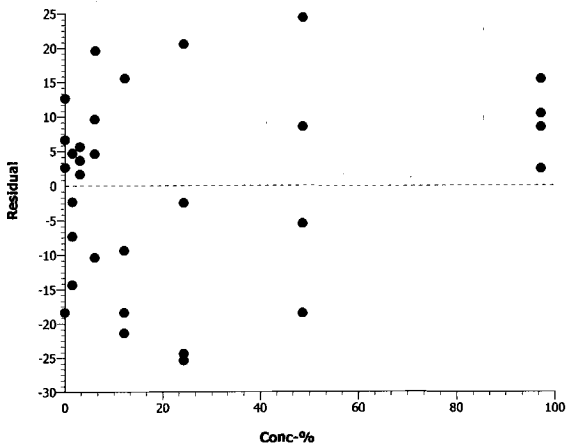
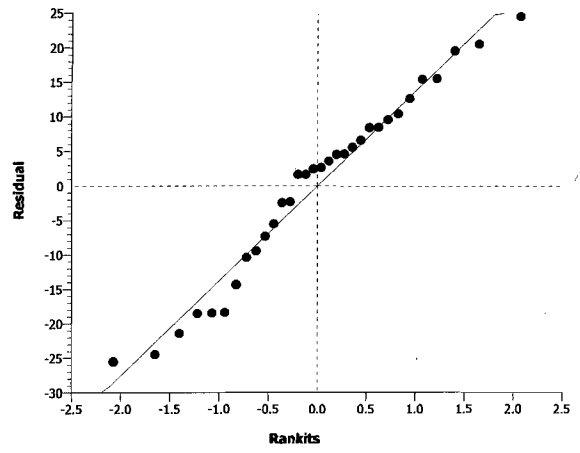
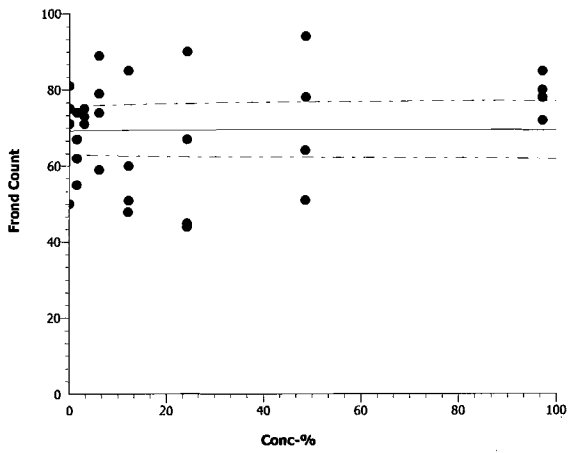
Analysis No: 21-3562-6343      Endpoint: Frond Count  
 Analyzed: 25 Aug-09 10:49      Analysis: Nonlinear Regression

CETIS Version: CETISv1.5.0  
 Official Results: Yes

**Frond Count Detail**

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	71	81	75	50
1.5		67	74	62	55
3.05		71	73	71	75
6.1		59	79	89	74
12.1		51	48	60	85
24.2		45	44	67	90
48.5		64	51	94	78
97		85	72	80	78

**Graphics**



*Eu Aug 25/09*

**CETIS Analytical Report**

Report Date: 13 Aug-09 15:38 (p 1 of 2)

Link/Link Code: 19-5522-7579/09210-NTR2

**Lemna Growth Inhibition Test** **Nautilus Environmental**

<b>Analysis No:</b> 05-0587-2900	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 13 Aug-09 15:36	<b>Analysis:</b> Parametric-Control vs Treatments	<b>Official Results:</b> Yes

<b>Test Run No:</b> 19-6405-7540	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>
<b>Ending Date:</b>	<b>Species:</b> Lemna minor	
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture	

<b>Sample No:</b> 03-3164-7920	<b>Code:</b> NTR2-Jul	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09 15:15	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 33h	<b>Station:</b> NTR2	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	97	97	#Error	1.031	33.43%

**Dunnett's Multiple Comparison Test**

Control	vs Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control	1.5	1.489	2.482	1.925	0.2718	Non-Significant Effect
	3.05	0.6157	2.482	1.925	0.6580	Non-Significant Effect
	6.1	0.3805	2.482	1.925	0.7549	Non-Significant Effect
	12.1	2.221	2.482	1.925	0.0828	Non-Significant Effect
	24.2	2.441	2.482	1.925	0.0543	Non-Significant Effect
	48.5	1.167	2.482	1.925	0.4045	Non-Significant Effect
	97	0.4127	2.482	1.925	0.7425	Non-Significant Effect

**ANOVA Table**

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	13.57665	1.939522	7	1.613	0.1798	Non-Significant Effect
Error	28.86352	1.202647	24			
Total	42.44017	3.142169	31			

**ANOVA Assumptions**

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	6.519	18.48	0.4806	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9698		0.4928	Normal Distribution

**Total Dry Weight-mg Summary**

Conc.-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	5.758	5.359	6.156	4.53	6.89	0.1943	1.028	17.86%	0.0%
1.5		4	4.603	4.382	4.824	3.86	5.21	0.1077	0.57	12.38%	20.06%
3.05		4	5.28	4.998	5.562	4.23	5.78	0.1375	0.7275	13.78%	8.29%
6.1		4	5.462	4.939	5.986	3.73	6.93	0.2552	1.35	24.72%	5.12%
12.1		4	4.035	3.58	4.49	3.05	5.56	0.2216	1.173	29.06%	29.92%
24.2		4	3.865	3.265	4.465	2.53	5.83	0.2925	1.548	40.05%	32.87%
48.5		4	4.853	4.313	5.392	3.32	6.37	0.2629	1.391	28.67%	15.72%
97		4	5.438	5.273	5.602	4.81	5.74	0.08009	0.4238	7.79%	5.56%

*Er*  
Aug 25/09

# CETIS Analytical Report

Report Date: 13 Aug-09 15:38 (p 2 of 2)

Link/Link Code: 19-5522-7579/09210-NTR2

## Lemna Growth Inhibition Test

Nautilus Environmental

Analysis No: 05-0587-2900  
 Analyzed: 13 Aug-09 15:36

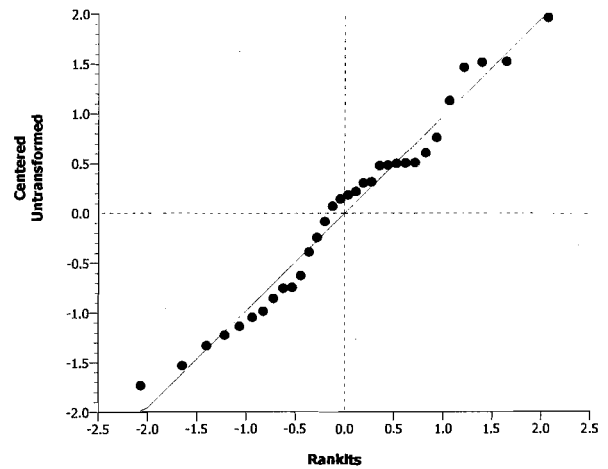
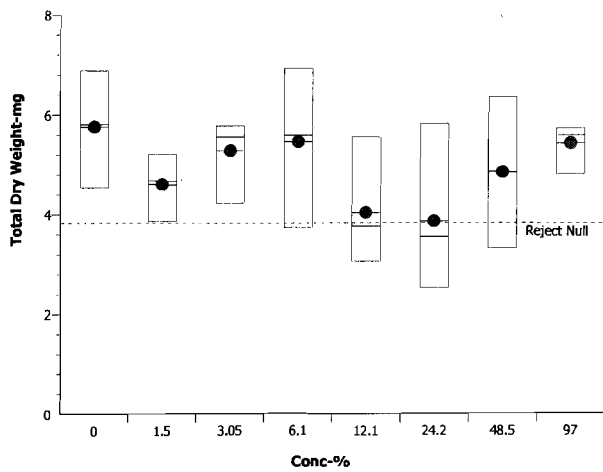
Endpoint: Total Dry Weight-mg  
 Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1.5.0  
 Official Results: Yes

### Total Dry Weight-mg Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	6.89	6.24	5.37	4.53
1.5		5.21	4.82	4.52	3.86
3.05		5.78	5.76	5.35	4.23
6.1		6.93	5.97	5.22	3.73
12.1		5.56	4.35	3.18	3.05
24.2		5.83	4.37	2.73	2.53
48.5		6.37	5.62	4.1	3.32
97		5.74	5.62	5.58	4.81

### Graphics



*EA*  
 Aug 25/09

**CETIS Analytical Report**

Report Date: 17 Aug-09 09:47 (p 1 of 2)  
 Link/Link Code: 19-5522-7579/09210-NTR2

Lemna Growth Inhibition Test				Nautilus Environmental					
Analysis No: 03-9497-6237		Endpoint: Total Dry Weight-mg		CETIS Version: CETISv1.5.0					
Analyzed: 17 Aug-09 9:46		Analysis: Nonlinear Regression		Official Results: Yes					
Test Run No: 19-6405-7540		Test Type: Lemna Growth		Dil Water: Laboratory Water					
Start Date: 07 Jul-09		Protocol: EC/EPS 1/RM/37		Brine:					
Ending Date:		Species: Lemna minor							
Duration: N/A		Source: In-House Culture							
Sample No: 03-3164-7920		Code: NTR2-Jul		Client: Rescan					
Sample Date: 05 Jul-09 15:15		Material: Water Sample		Project:					
Receive Date: 07 Jul-09 09:00		Source: Rescan							
Sample Age: 33h		Station: NTR2							
Non-Linear Regression Options									
Model Function			X Transform	Y Transform	Weighting Function	PTBS Function			
2P Linear [Y=A+BX]			Log(X)	None	Normal [W=1]	Off [Y*=Y]			
Regression Summary									
Iters	Log LL	AICc	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(1%)	
1	-19.29	43	0.0432	Yes	1.446	3.667	0.2387	Non-Significant Lack of Fit	
Point Estimates									
% Effect	Conc-%	95% LCL	95% UCL						
SNEC	0.01772	6.763E-07	464.3						
10	0.003847	5.061E-08	292.4						
15	2.386	0.0003008	18930						
20	1480	0.003626	604000000						
25	917800	0.002749	3.064E+14						
40	2.19E+14	5.653E-05	8.484E+32						
50	8.424E+19	2.473E-06	N/A						
Regression Parameters									
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)		
A	4.906	0.1939	4.51	5.302	25.3	0.0000	Significant Parameter		
B	-0.1025	0.06343	-0.2321	0.027	-1.617	0.1164	Non-Significant Parameter		
ANOVA Table									
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(1%)			
Model	3.142761	3.142761	1	2.399	0.1319	Non-Significant			
Lack of Fit	10.43389	1.738982	6	1.446	0.2387	Non-Significant			
Pure Error	28.86352	1.202647	24						
Residual	39.29741	1.309914	30						
Residual Analysis									
Attribute	Method	Test Stat	Critical	P-Value	Decision(1%)				
Variances	Bartlett Equality of Variance	6.519	18.48	0.4806	Equal Variances				
Distribution	Shapiro-Wilk Normality	0.9594		0.2644	Normal Distribution				
Total Dry Weight-mg Summary									
			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	4	5.758	4.53	6.89	0.1909	1.028	17.86%	0.0%
1.5		4	4.603	3.86	5.21	0.1058	0.57	12.38%	20.06%
3.05		4	5.28	4.23	5.78	0.1351	0.7275	13.78%	8.29%
6.1		4	5.462	3.73	6.93	0.2508	1.35	24.72%	5.12%
12.1		4	4.035	3.05	5.56	0.2178	1.173	29.06%	29.92%
24.2		4	3.865	2.53	5.83	0.2874	1.548	40.05%	32.87%
48.5		4	4.853	3.32	6.37	0.2583	1.391	28.67%	15.72%
97		4	5.438	4.81	5.74	0.07869	0.4238	7.79%	5.56%

*See Aug 25/09*

# CETIS Analytical Report

Report Date: 17 Aug-09 09:47 (p 2 of 2)

Link/Link Code: 19-5522-7579/09210-NTR2

## Lemna Growth Inhibition Test

Nautilus Environmental

Analysis No: 03-9497-6237  
 Analyzed: 17 Aug-09 9:46

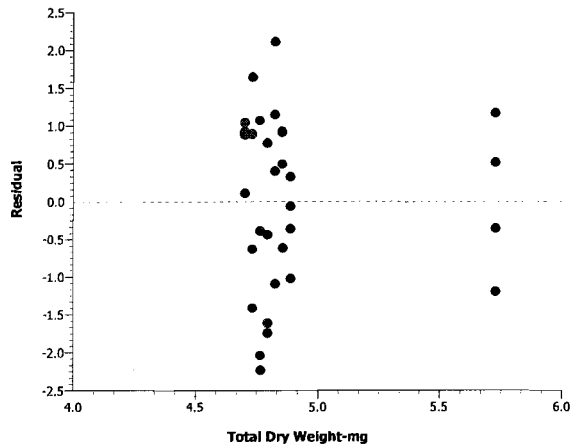
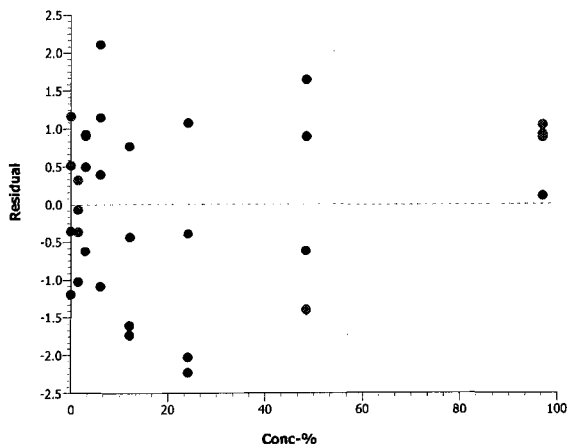
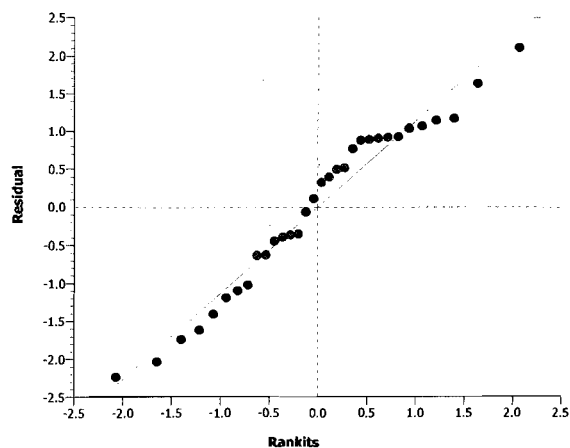
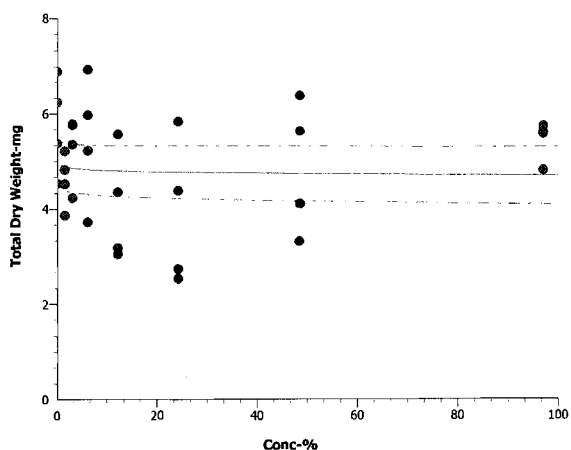
Endpoint: Total Dry Weight-mg  
 Analysis: Nonlinear Regression

CETIS Version: CETISv1.5.0  
 Official Results: Yes

### Total Dry Weight-mg Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	5.37	6.89	6.24	4.53
1.5		4.82	5.21	4.52	3.86
3.05		5.76	5.35	4.23	5.78
6.1		3.73	5.22	6.93	5.97
12.1		3.05	3.18	4.35	5.56
24.2		2.73	2.53	4.37	5.83
48.5		4.1	3.32	6.37	5.62
97		5.62	4.81	5.58	5.74

### Graphics



*CA Aug 25/09*



## Lemna minor Summary Sheet

Client: Rescan  
 Work Order No.: 09210

Start Date: July 7/09  
 Set up by: ART

**Sample Information:**

Sample ID: SCR  
 Sample Date: July 5/2009  
 Date Received: July 7/2009  
 Sample Volume: 9x20L

**Test Organism Information:**

Culture Date: 300609  
 Age of culture (Day 0): 7 days  
 >8X growth in APHA?: ~~only 4 (33)~~ <sup>BRL</sup> Yes, 33 fronds.


**KCI Reference Toxicant Results:**

Reference Toxicant ID: K440  
 Date Initiated: June 24/2009

7-d No. of Fronds IC25 (95% CL): 2.8 (0.9-4.9) <sup>BRL</sup> g/L KCl

7-d No. Fronds IC25 Reference Toxicant Mean  $\pm$  2 SD: 2.5  $\pm$  1.1 CV (%): 22%

	Number of Fronds	Dry Weight
Test Results: NOEC %(v/v)	97	97
LOEC %(v/v)	>97	>97
IC25 %(v/v) (95% CL)	<sup>21.5</sup> <del>(59.8-6)</del> <sup>BRL</sup> <del>27.2 (8.5-78.2)</del>	<sup>BRL</sup> <del>8.5 (1.4-29.6)</del> <sup>BRL</sup> 9.8 (1.7-35.3)
IC50 %(v/v) (95% CL)	>97	<del>95.2 (15.8-97)</del> <sup>BRL</sup> >97

Reviewed by: 

Date reviewed: Aug. 26/09

Black

### Plant Growth Inhibition Toxicity Test Water Quality Measurements

Client: Rescan Setup by: ART  
 Sample ID: SCR Test Date: July 7/09  
 Work Order No.: 09 210 Test Species: Lemna minor  
 Culture Source: UTCC #490  
 Test Culture Age: 7 days > 8X Growth? (Y/N): Y (33)  
 Light Intensity Range: 3600 - 3850 Date Measured: July 7/09

Day	0	1	2	3	4	5	6	7
Shelf Temp (°C)	24.4	24.9	24.3	24.4	24.6	24.6	24.9	25.1
Initials	ART	ART	ART	JLT	JLT	JLT	BL	407

Sample Characteristics  
 Temperature (°C) 24.7 Aeration? 20 min  
 DO (mg/L) 9.9 24.7  
 pH 8.0 9.6  
 Conductivity (µS) 113 7.7  
932

Concentration % (V/V)	Temperature (°C)		pH		Conductivity (µS) 0 h
	Day 0	Day 7	Day 0	Day 7	
Control	24.7	<del>24.7</del> 24.4	8.2	8.1	887
1.5	24.5	<del>24.5</del> 24.6	8.2	8.0	889
3.05	24.3	<del>24.3</del> 26.5	8.2	8.2	894
6.1	24.4	26.5	8.2	8.3	907
12.1	24.3	26.4	8.2	8.2	915
24.2	24.6	26.6	8.1	7.9	921
48.5	24.5	26.4	8.0	8.3	926
97	24.7	26.5	7.9	8.4	932
Initials	ART	ART	ART	ART	ART

Thermometer: Big Jumbo Thermometer Cond. Meter: C-1 pH meter: pH-1

Sample Description: slight amber with particulates

Comments: \_\_\_\_\_

Reviewed: EW Date Reviewed: Aug 25/09

SCR  
Black

Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts

Client: Rescan  
 Sample ID: SCR  
 Work Order #: 09210

Start Date: July 7 / 09  
 Termination Date: July 14 / 09  
 Test set up by: ART

Concentration <i>90 (v/v)</i>	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
Control	A	<i>6</i>	<i>51</i>										<i>ART</i>
	B		<i>91</i>										<i>ART</i>
	C		<i>60</i>										<i>ART</i>
	D		<i>59</i>										<i>ART</i>
1.5	A		<i>31</i>										<i>ART</i>
	B		<i>71</i>										<i>ART</i>
	C		<i>59</i>										<i>ART</i>
	D		<i>55</i>										<i>ART</i>
3.05	A		<i>69</i>										<i>ART</i>
	B		<i>82</i>										<i>ART</i>
	C		<i>52</i>										<i>ART</i>
	D		<i>49</i>										<i>ART</i>
6.1	A		<i>78</i>										<i>ART</i>
	B		<i>43</i>										<i>ART</i>
	C		<i>68</i>										<i>ART</i>
	D		<i>67</i>										<i>ART</i>
12.1	A		<i>38</i>										<i>ART</i>
	B		<i>46</i>										<i>ART</i>
	C		<i>53</i>										<i>ART</i>
	D		<i>46</i>										<i>ART</i>
24.2	A		<i>50</i>		✓								<i>ART</i>
	B		<i>47</i>										<i>ART</i>
	C		<i>54</i>										<i>ART</i>
	D	✓	<i>58</i>										<i>ART</i>

Comments: \_\_\_\_\_

Reviewed by: *EW*

Date Reviewed: *Aug 25 / 09*

LT  
\$ - Black

Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts

Client: Rescan  
 Sample ID: SCR  
 Work Order #: 09210

Start Date: July 7 / 09  
 Termination Date: July 14 / 09  
 Test set up by: ART

Concentration % (V/V)	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
48.5	A	6	34										ART
	B		42										ART
	C		41										ART
	D		39										ART
97	A		52										ART
	B		45										ART
	C		51										ART
	D	✓	41										ART
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												

Comments: LT

Reviewed by: EW

Date Reviewed: Aug 25/09

## 7-d Lemna minor Weight Data Sheet

Client: Rescan  
 Sample ID: SCR  
 Work Order #: 09210

Start Date: July 7/09  
 Termination Date: July 14/09

Concentration % (V/V)	Rep	Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
Control	A	1	1338.89	1342.98	ELS
	B	2	1333.01	1339.71	ELS
	C	3	1327.54	1331.64	ELS
	D	4	1329.58	1333.24	ELS
1.5	A	5	1327.8.01	1329.34	ELS
	B	6	1336.19	1341.92	ELS
	C	7	1325.42	1329.86	ELS
	D	8	1341.11	1344.97	ELS
3.05	A	9	1331.21	1335.29	ELS
	B	10	1337.72	1343.16	ELS
	C	11	1336.25	1338.97	ELS
	D	12	1334.47	1337.80	ELS
6.1	A	13	1338.14	1343.73	ELS
	B	14	1336.60	1338.75	ELS
	C	15	1337.30	1342.09	ELS
	D	16	1329.39	1334.41	ELS
12.1	A	17	1333.875	1336.21	ELS
	B	18	1331.05	1333.49	ELS
	C	19	1344.07	1347.34	ELS
	D	20	1338.17	1341.14	ELS
24.2	A	21	1317.57	1321.43	ELS
	B	22	1326.01	1328.70	ELS
	C	23	1327.79	1331.17	ELS
	D	24	1316.47	1320.19	ELS
48.5	A	25	1366.30	1308.88	ELS
	B	26	1333.34	1335.64	ELS
	C	27	1319.08	1321.21	ELS
	D	28	1306.56	1308.70	ELS

Comments:

---



---

Reviewed by: ELS

Date Reviewed: Aug 25/09

Black

### 7-d Lemna minor Weight Data Sheet

Client: Rescan  
Sample ID: SCR  
Work Order #: 09 210

Start Date: July 7/09  
Termination Date: July 14/09

Concentration % (V/V)	Rep	Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
97	A	29	1327.85	1330.92	gjs
	B	30	1317.99	1370.39	gjs
	C	31	1330.59	1334.35	gjs
	D	32	1311.78	1314.18	gjs
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				

Comments: \_\_\_\_\_

Reviewed by: KA

Date Reviewed: Aug 25/09

**CETIS Analytical Report**

Report Date: 25 Aug-09 11:10 (p 1 of 2)

Link/Link Code: 00-7170-8512/09210-SCR

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 06-7582-8182	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 25 Aug-09 11:09	<b>Analysis:</b> Parametric-Control vs Treatments	<b>Official Results:</b> Yes			
<b>Test Run No:</b> 13-2746-6947	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water			
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>			
<b>Ending Date:</b>	<b>Species:</b> Lemna minor				
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture				
<b>Sample No:</b> 15-6314-2133	<b>Code:</b> SCR-Jul	<b>Client:</b> Rescan			
<b>Sample Date:</b> 05 Jul-09 11:15	<b>Material:</b> Water Sample	<b>Project:</b>			
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan				
<b>Sample Age:</b> 37h	<b>Station:</b> SCR				

<b>Data Transform</b>	<b>Zeta</b>	<b>Alt Hyp</b>	<b>Monte Carlo</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>TU</b>	<b>PMSD</b>
Untransformed		C > T	Not Run	97	5.0 > 97	#Error	1.031	35.53%

<b>Dunnett's Multiple Comparison Test</b>						
Control	vs Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control	1.5	1.326	2.482	21.05	0.3358	Non-Significant Effect
	3.05	0.2653	2.482	21.05	0.7965	Non-Significant Effect
	6.1	0.1474	2.482	21.05	0.8345	Non-Significant Effect
	12.1	2.299	2.482	21.05	0.0715	Non-Significant Effect
	24.2	1.533	2.482	21.05	0.2561	Non-Significant Effect
	48.5*	3.095	2.482	21.05	0.0135	Significant Effect
	97	2.122	2.482	21.05	0.0994	Non-Significant Effect

<b>ANOVA Table</b>						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2595.875	370.8393	7	2.578	0.0393	Significant Effect
Error	3453	143.875	24			
Total	6048.875	514.7143	31			

<b>ANOVA Assumptions</b>						
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)	
Variances	Bartlett Equality of Variance	13.1	18.48	0.0697	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.9704		0.5108	Normal Distribution	

<b>Frond Count Summary</b>											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	59.25	52.41	66.09	45	85	3.332	17.63	29.76%	0.0%
1.5		4	48	41.5	54.5	25	65	3.17	16.77	34.94%	18.99%
3.05		4	57	51.02	62.98	43	76	2.915	15.43	27.07%	3.8%
6.1		4	58	52.24	63.76	37	72	2.807	14.85	25.61%	2.11%
12.1		4	39.75	37.37	42.13	32	47	1.159	6.131	15.42%	32.91%
24.2		4	46.25	44.39	48.11	41	52	0.9047	4.787	10.35%	21.94%
48.5		4	33	31.62	34.38	28	36	0.6726	3.559	10.78%	44.3%
97		4	41.25	39.24	43.26	35	46	0.9805	5.188	12.58%	30.38%

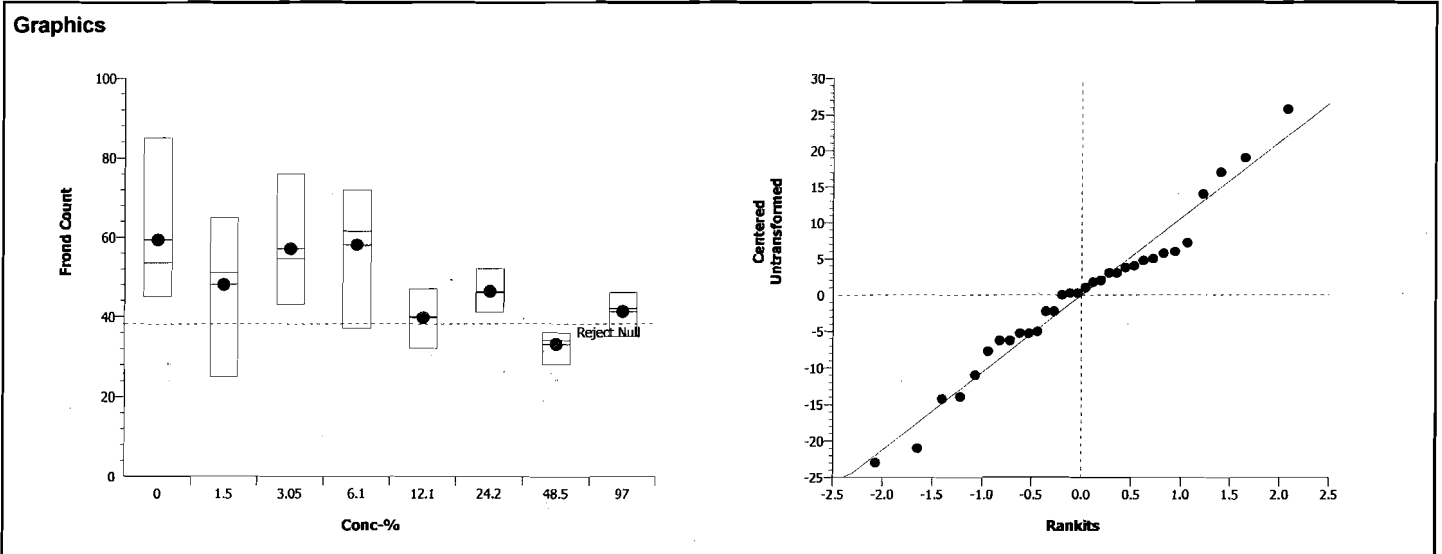
*CA*  
Aug 25/09

# CETIS Analytical Report

Report Date: 25 Aug-09 11:10 (p 2 of 2)  
 Link/Link Code: 00-7170-8512/09210-SCR

Lemna Growth Inhibition Test		Nautilus Environmental	
Analysis No: 06-7582-8182	Endpoint: Frond Count	CETIS Version: CETISv1.5.0	
Analyzed: 25 Aug-09 11:09	Analysis: Parametric-Control vs Treatments	Official Results: Yes	

Frond Count Detail					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	85	54	53	45
1.5		65	53	49	25
3.05		76	63	46	43
6.1		72	62	61	37
12.1		47	40	40	32
24.2		52	48	44	41
48.5		36	35	33	28
97		46	45	39	35



*EC*  
 Aug 25/09



**CETIS Analytical Report**

Report Date: 25 Aug-09 11:10 (p 1 of 2)  
 Link/Link Code: 00-7170-8512/09210-SCR

Lemna Growth Inhibition Test				Nautilus Environmental				
Analysis No:	20-6886-5030	Endpoint:	FronD Count	CETIS Version:	CETISv1.5.0			
Analyzed:	25 Aug-09 11:10	Analysis:	Nonlinear Regression	Official Results:	Yes			
Test Run No:	13-2746-6947	Test Type:	Lemna Growth	Dil Water:	Laboratory Water			
Start Date:	07 Jul-09	Protocol:	EC/EPS 1/RM/37	Brine:				
Ending Date:		Species:	Lemna minor					
Duration:	N/A	Source:	In-House Culture					
Sample No:	15-6314-2133	Code:	SCR-Jul	Client:	Rescan			
Sample Date:	05 Jul-09 11:15	Material:	Water Sample	Project:				
Receive Date:	07 Jul-09 09:00	Source:	Rescan					
Sample Age:	37h	Station:	SCR					
Non-Linear Regression Options								
Model Function	X Transform	Y Transform	Weighting Function	PTBS Function				
3P Log-Logistic EV [Y=A/(1+(X/D)^C)]	None	None	Normal [W=1]	Off [Y*=Y]				
Regression Summary								
Iters	Log LL	AICc	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(1%)
8	-95.17	197.2	0.2029	Yes	1.47	3.895	0.2365	Non-Significant Lack of Fit
Point Estimates								
% Effect	Conc-%	95% LCL	95% UCL					
SNEC	6.89	0.7082	26.85					
10	1.646	N/A	12.36					
15	4.854	0.2621	21.96					
20	10.96	1.977	35.61					
25	21.47	5.938	58.59					
40	108.6	16.41	546.5					
50	280.2	18.09	4339					
Regression Parameters								
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)	
A	59.4	5.844	47.44	71.35	10.16	0.0000	Significant Parameter	
C	0.4277	0.2419	-0.06699	0.9224	1.768	0.0875	Non-Significant Parameter	
D	280.2	325.3	-385.1	945.4	0.8613	0.3961	Non-Significant Parameter	
ANOVA Table								
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(1%)		
Model	1538.565	769.2826	2	4.946	0.0142	Non-Significant		
Lack of Fit	1057.31	211.462	5	1.47	0.2365	Non-Significant		
Pure Error	3453	143.875	24					
Residual	4510.31	155.5279	29					
Residual Analysis								
Attribute	Method	Test Stat	Critical	P-Value	Decision(1%)			
Variances	Bartlett Equality of Variance	13.1	18.48	0.0697	Equal Variances			
Distribution	Shapiro-Wilk Normality	0.9631		0.3333	Normal Distribution			

*EC Aug 25/09*

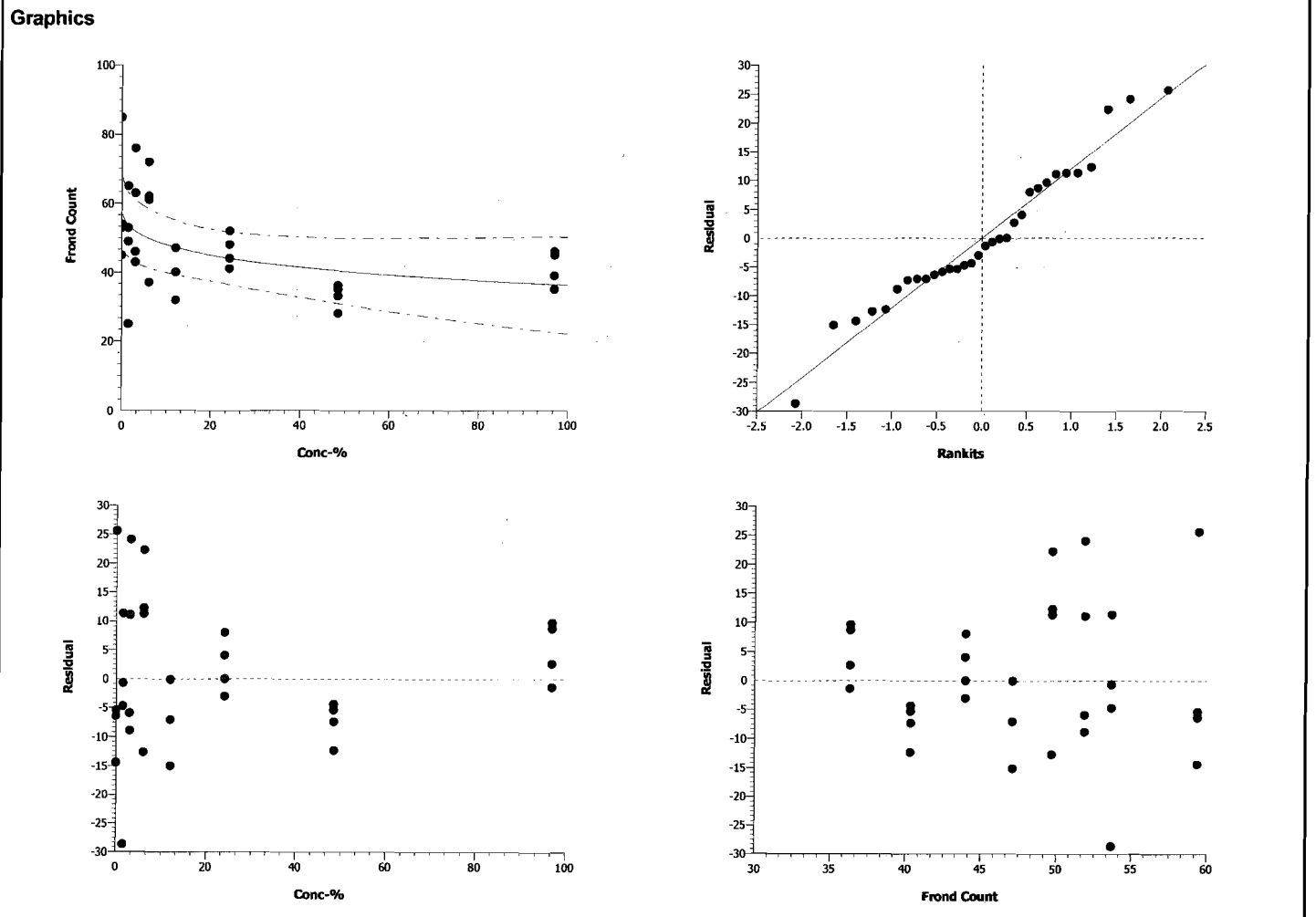
# CETIS Analytical Report

Report Date: 25 Aug-09 11:10 (p 2 of 2)  
 Link/Link Code: 00-7170-8512/09210-SCR

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 20-6886-5030	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 25 Aug-09 11:10	<b>Analysis:</b> Nonlinear Regression	<b>Official Results:</b> Yes			

Frond Count Summary			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	4	59.25	45	85	3.274	17.63	29.76%	0.0%
1.5		4	48	25	65	3.115	16.77	34.94%	18.99%
3.05		4	57	43	76	2.865	15.43	27.07%	3.8%
6.1		4	58	37	72	2.758	14.85	25.61%	2.11%
12.1		4	39.75	32	47	1.138	6.131	15.42%	32.91%
24.2		4	46.25	41	52	0.8889	4.787	10.35%	21.94%
48.5		4	33	28	36	0.6609	3.559	10.78%	44.3%
97		4	41.25	35	46	0.9634	5.188	12.58%	30.38%

Frond Count Detail					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	45	85	54	53
1.5		25	65	53	49
3.05		63	76	46	43
6.1		72	37	62	61
12.1		32	40	47	40
24.2		44	41	48	52
48.5		28	36	35	33
97		46	39	45	35



*EE Aug 25/09*

**CETIS Analytical Report**

Report Date: 14 Aug-09 11:35 (p 1 of 2)  
 Link/Link Code: 00-7170-8512/09210-SCR

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>
-------------------------------------	--	--	-------------------------------

<b>Analysis No:</b> 11-6048-2213	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 14 Aug-09 11:35	<b>Analysis:</b> Parametric-Control vs Treatments	<b>Official Results:</b> Yes

<b>Test Run No:</b> 13-2746-6947	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>
<b>Ending Date:</b>	<b>Species:</b> Lemna minor	
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture	

<b>Sample No:</b> 15-6314-2133	<b>Code:</b> SCR-Jul	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09 11:15	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 37h	<b>Station:</b> SCR	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	97	97	#Error	1.031	42.28%

Dunnett's Multiple Comparison Test						
Control	vs Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control	1.5	1.01	2.482	1.961	0.4764	Non-Significant Effect
	3.05	0.943	2.482	1.961	0.5075	Non-Significant Effect
	6.1	0.3165	2.482	1.961	0.7785	Non-Significant Effect
	12.1	2.377	2.482	1.961	0.0616	Non-Significant Effect
	24.2	1.551	2.482	1.961	0.2497	Non-Significant Effect
	48.5*	2.975	2.482	1.961	0.0176	Significant Effect
	97	2.19	2.482	1.961	0.0878	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	18.90298	2.700427	7	2.164	0.0751	Non-Significant Effect
Error	29.95177	1.24799	24			
Total	48.85476	3.948417	31			

ANOVA Assumptions					
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	15.11	18.48	0.0346	Equal Variances
Distribution	Shapiro-Wilk Normality	0.958		0.2415	Normal Distribution

Total Dry Weight-mg Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	4.637	4.098	5.177	3.66	6.7	0.2627	1.39	29.98%	0.0%
1.5		4	3.84	3.124	4.556	1.33	5.73	0.349	1.847	48.1%	17.2%
3.05		4	3.893	3.438	4.347	2.72	5.44	0.2215	1.172	30.11%	16.06%
6.1		4	4.387	3.795	4.98	2.15	5.59	0.289	1.529	34.85%	5.39%
12.1		4	2.76	2.591	2.929	2.36	3.27	0.08213	0.4346	15.75%	40.49%
24.2		4	3.413	3.21	3.615	2.69	3.86	0.09868	0.5222	15.3%	26.41%
48.5		4	2.287	2.206	2.369	2.13	2.58	0.03968	0.21	9.18%	50.67%
97		4	2.908	2.655	3.16	2.4	3.76	0.1229	0.6502	22.36%	37.3%

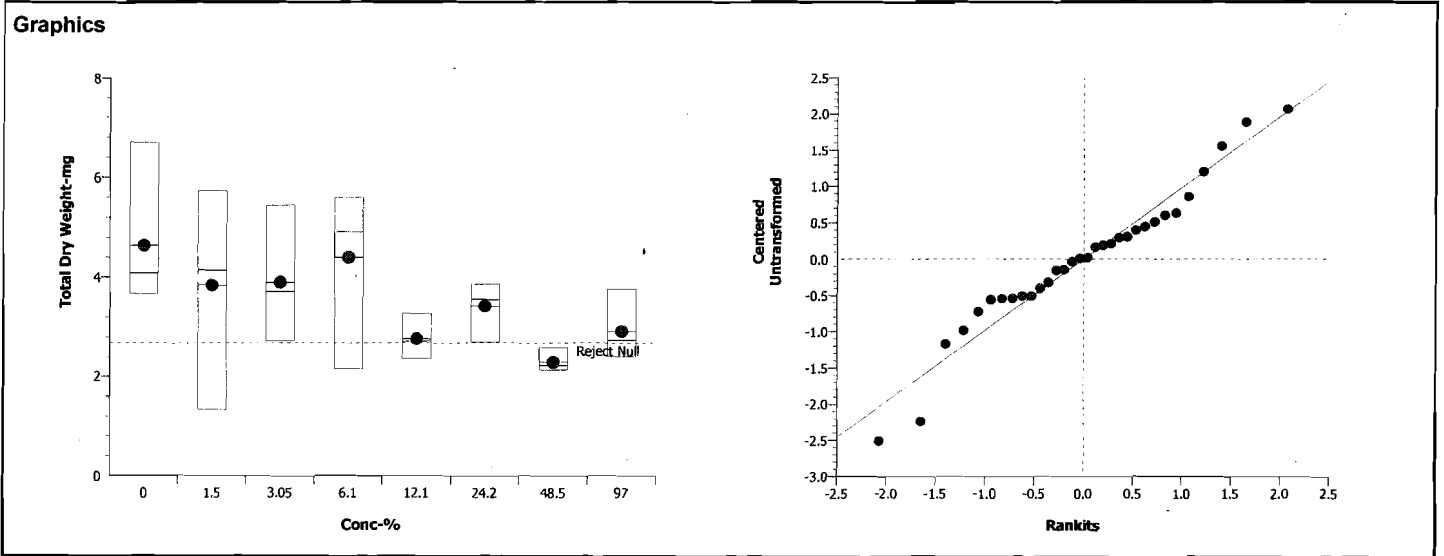
*EW*  
 Aug 25/09

**CETIS Analytical Report**

Report Date: 14 Aug-09 11:35 (p 2 of 2)  
 Link/Link Code: 00-7170-8512/09210-SCR

Lemna Growth Inhibition Test			Nautilus Environmental		
Analysis No:	11-6048-2213	Endpoint:	Total Dry Weight-mg	CETIS Version:	CETISv1.5.0
Analyzed:	14 Aug-09 11:35	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Total Dry Weight-mg Detail					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	6.7	4.1	4.09	3.66
1.5		5.73	4.44	3.86	1.33
3.05		5.44	4.08	3.33	2.72
6.1		5.59	5.02	4.79	2.15
12.1		3.27	2.97	2.44	2.36
24.2		3.86	3.72	3.38	2.69
48.5		2.58	2.3	2.14	2.13
97		3.76	3.07	2.4	2.4



*Handwritten signature*  
 Aug 25/09

**CETIS Analytical Report**

Report Date: 14 Aug-09 11:35 (p 1 of 2)  
 Link/Link Code: 00-7170-8512/09210-SCR

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>
<b>Analysis No:</b> 17-4328-7809	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.5.0	
<b>Analyzed:</b> 14 Aug-09 11:35	<b>Analysis:</b> Nonlinear Regression	<b>Official Results:</b> Yes	
<b>Test Run No:</b> 13-2746-6947	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water	
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>	
<b>Ending Date:</b>	<b>Species:</b> Lemna minor		
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture		
<b>Sample No:</b> 15-6314-2133	<b>Code:</b> SCR-Jul	<b>Client:</b> Rescan	
<b>Sample Date:</b> 05 Jul-09 11:15	<b>Material:</b> Water Sample	<b>Project:</b>	
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan		
<b>Sample Age:</b> 37h	<b>Station:</b> SCR		

<b>Non-Linear Regression Options</b>				
<b>Model Function</b>	<b>X Transform</b>	<b>Y Transform</b>	<b>Weighting Function</b>	<b>PTBS Function</b>
3P Log-Logistic EV [Y=A/(1+(X/D)^C)]	None	None	Normal [W=1]	Off [Y*=Y]

<b>Regression Summary</b>								
<b>Iters</b>	<b>Log LL</b>	<b>AICc</b>	<b>Adj R2</b>	<b>Optimize</b>	<b>F Stat</b>	<b>Critical</b>	<b>P-Value</b>	<b>Decision(1%)</b>
7	-17.93	42.74	0.2102	Yes	0.985	3.895	0.4473	Non-Significant Lack of Fit

<b>Point Estimates</b>			
<b>% Effect</b>	<b>Conc-%</b>	<b>95% LCL</b>	<b>95% UCL</b>
SNEC	5.314	0.4397	24.79
10	0.6366	N/A	8.847
15	2.013	0.005789	15.01
20	4.789	0.3315	23.44
25	9.798	1.712	35.3
40	54.98	11.02	227.1
50	150.8	14.15	1607

<b>Regression Parameters</b>							
<b>Parameter</b>	<b>Estimate</b>	<b>Std Error</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>t Stat</b>	<b>P-Value</b>	<b>Decision(5%)</b>
A	4.654	0.55	3.529	5.779	8.462	0.0000	Significant Parameter
C	0.4019	0.2269	-0.06226	0.866	1.771	0.0871	Non-Significant Parameter
D	150.8	171.6	-200.2	501.8	0.8786	0.3868	Non-Significant Parameter

<b>ANOVA Table</b>						
<b>Source</b>	<b>Sum Squares</b>	<b>Mean Square</b>	<b>DF</b>	<b>F Stat</b>	<b>P-Value</b>	<b>Decision(1%)</b>
Model	12.75683	6.378417	2	5.124	0.0124	Non-Significant
Lack of Fit	6.14615	1.22923	5	0.985	0.4473	Non-Significant
Pure Error	29.95177	1.24799	24			
Residual	36.09792	1.244756	29			

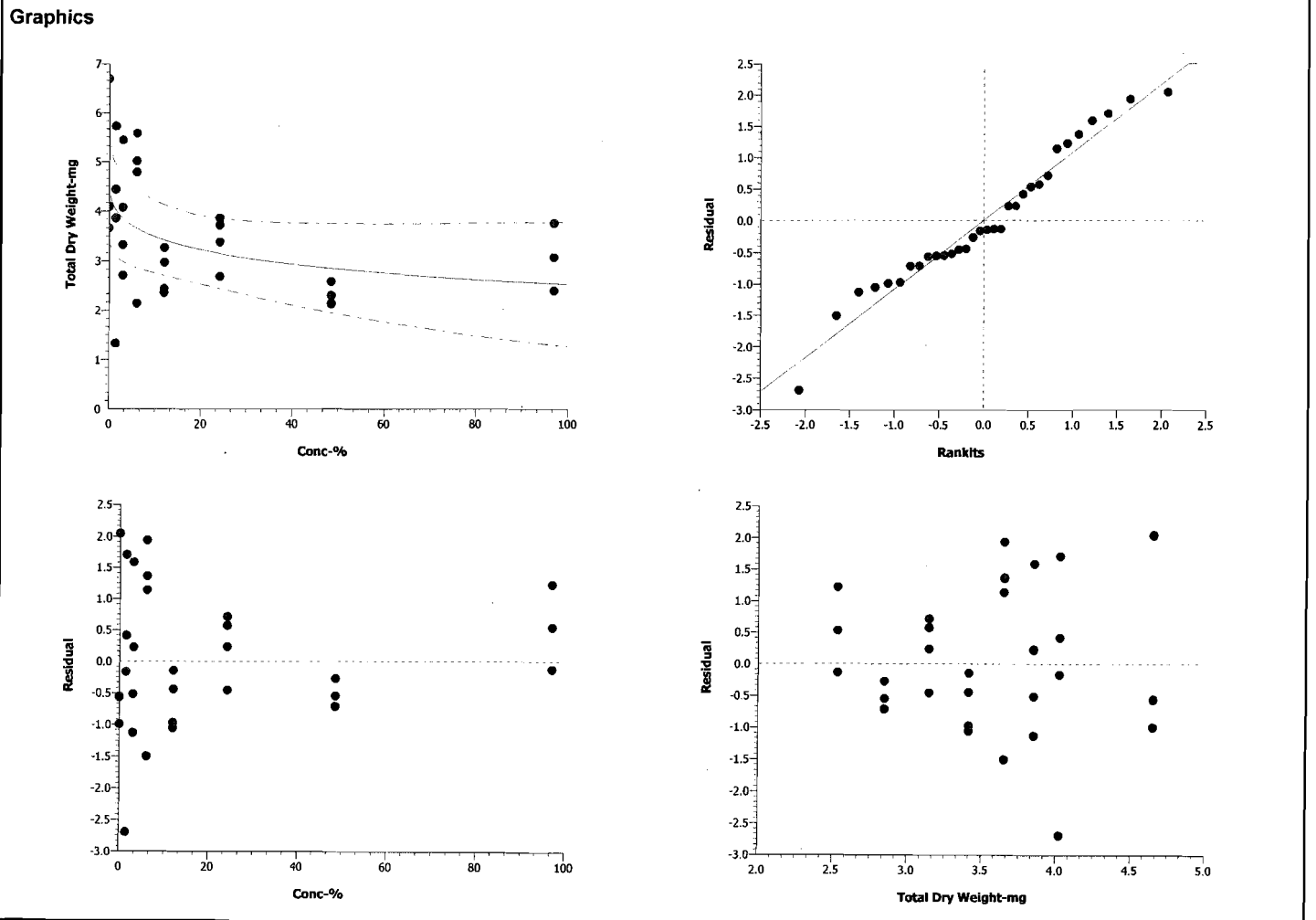
<b>Residual Analysis</b>					
<b>Attribute</b>	<b>Method</b>	<b>Test Stat</b>	<b>Critical</b>	<b>P-Value</b>	<b>Decision(1%)</b>
Variances	Bartlett Equality of Variance	15.11	18.48	0.0346	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9647		0.3681	Normal Distribution

*EC Aug 25/09*

Lemna Growth Inhibition Test			Nautilus Environmental		
Analysis No: 17-4328-7809	Endpoint: Total Dry Weight-mg	CETIS Version: CETISv1.5.0			
Analyzed: 14 Aug-09 11:35	Analysis: Nonlinear Regression	Official Results: Yes			

Total Dry Weight-mg Summary			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	4	4.637	3.66	6.7	0.2582	1.39	29.98%	0.0%
1.5		4	3.84	1.33	5.73	0.343	1.847	48.1%	17.2%
3.05		4	3.893	2.72	5.44	0.2176	1.172	30.11%	16.06%
6.1		4	4.387	2.15	5.59	0.2839	1.529	34.85%	5.39%
12.1		4	2.76	2.36	3.27	0.0807	0.4346	15.75%	40.49%
24.2		4	3.413	2.69	3.86	0.09697	0.5222	15.3%	26.41%
48.5		4	2.287	2.13	2.58	0.03899	0.21	9.18%	50.67%
97		4	2.908	2.4	3.76	0.1207	0.6502	22.36%	37.3%

Total Dry Weight-mg Detail					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	4.09	6.7	4.1	3.66
1.5		1.33	5.73	4.44	3.86
3.05		4.08	5.44	2.72	3.33
6.1		5.59	2.15	4.79	5.02
12.1		2.36	2.44	3.27	2.97
24.2		3.86	2.69	3.38	3.72
48.5		2.58	2.3	2.13	2.14
97		3.07	2.4	3.76	2.4



*ea Aug 25/09*

**APPENDIX D - *Pseudokirchneriella subcapitata* Toxicity Test Data**

**Pseudokirchneriella subcapitata Summary Sheet**

Client: RESEAN  
 Work Order No.: 09209

Start Date: July 7, 2009  
 Set up by: EW

**Sample Information:**

Sample ID: SC-2  
 Sample Date: July 5, 2009  
 Date Received: July 7, 2009  
 Sample Volume: 9 x 20L

**Test Organism Information:**

Culture Date: July 2, 2009  
 Age of culture (Day 0): 5d

**Zinc Reference Toxicant Results:**

Reference Toxicant ID: SC48  
 Stock Solution ID: 09Zn01  
 Date Initiated: July 9, 2009

72-h IC50 (95% CL): 32.4 28.5 29.0  
31.6 (24.9 - 36.5) µg/L Zn

72-h IC50 Reference Toxicant Mean ± 2 SD: 17.1 ± 11.9 µg/L Zn CV (%): 35

Test Results:	Algal Growth
NOEC %(v/v)	5.9
LOEC %(v/v)	11.9
IC25 %(v/v) (95% CL)	26.1 (24.5 - 27.6)
IC50 %(v/v) (95% CL)	33.0 (30.9 - 35.1)

Reviewed by: A. Terry

Date reviewed: August 26, 2009



## 72-h Algal Growth Inhibition Toxicity Test Water Quality Measurements

Client : Rescan Setup by: EC  
 Sample ID: SC-2 Test Date/Time: July 7, 2009 1400h  
 Work Order No.: 09209 Test Species: Pseudokirchneriella subcapitata

Culture Date: July 2, 2009 Age of Culture: 5 d Culture Health: Good  
 Culture Count: 1 237 2 223 Average: 230 Culture Cell Density (c1): 230 x 10<sup>4</sup>

$$v1 = \frac{220,000 \text{ cells/ml} \times 100 \text{ ml}}{(c1) 230 \times 10^4 \text{ cells/ml}} = 9.56 \text{ mL}$$

Time Zero Counts: 1 20 2 23 Average: 21.5 x 10<sup>4</sup>

No. of Cells/mL: 21.5 x 10<sup>4</sup> Initial Density:  $\# \text{ cells/mL} \div 220 \mu\text{L} \times 10 \mu\text{L} =$  9773

Concentration %(v/v)	Water Quality Measurements					Microplates rotated 2X per day?			
	pH	Temp (°C)				0 h	24 h	48 h	72 h
		0 h	24 h	48 h	72 h				
Control	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
1.48	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
2.95	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
5.9	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
11.9	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
23.8	7.1	24.6	24.9	24.3	25.4	✓	✓	✓	✓
47.6	7.1	24.7	24.9	24.3	25.4	✓	✓	✓	✓
95.2	7.2	24.8	24.9	24.3	25.4	✓	✓	✓	✓
Initials	<u>EC</u>	<u>EC</u>	<u>EC</u>	<u>SLT</u>	<u>SLT</u>	<u>EC</u>	<u>EC</u>	<u>SLT</u>	<u>SLT</u>

Initial control pH: Well 1: 6.8 Well 2: 6.8  
 Final control pH: Well 1: 6.8 Well 2: 6.8

Light intensity (lux): 4010 Date measured: July 7, 2009

Sample Description: light yellow, turbid

Comments: \_\_\_\_\_

Reviewed: L. Teng Date reviewed: August 26, 2009

***Pseudokirchneriella subcapitata* Toxicity Test Data Sheet**  
**72-h Algal Cell Counts**

Client: Rescan Start Date/Time: July 7/09 @ 1400h  
 Work Order #: 09209 Termination Date: July 10/09  
 Sample ID: SC-2 Test set up by: ECC  
 c/o (VIU)

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A	35					JLT
	B	26					
	C	30					
	D	24					
	E	29					
	F	33					
	G	27					
	H	34					
1.48	A	39					JLT
	B	37					
	C	34					
	D	36					
2.95	A	40					
	B	36					
	C	37					
	D	37					
5.9	A	30					
	B	21					
	C	22					
	D	26					
11.9	A	17	21				
	B	24					
	C	19					
	D	25					
23.8	A	46					
	B	26	34				
	C	42					
	D	38					
47.6	A	6					
	B	3					
	C	7					
	D	1					
95.2	A	0					
	B	0					
	C	0					
	D	0					

Comments: \_\_\_\_\_

Reviewed by: A. Terry Date Reviewed: August 25, 2009

***Pseudokirchneriella subcapitata* Algal Counts**

Client: Rescan  
 WO#: 09209  
 Sample ID: SC2

Start Date/Time: 7-Jul-09 @1400h  
 Termination Date: 10-Jul-09

Initial Cell Density: 9772.73 cell/mL  
 215000  
 0.22  
 0.01

Concentration % v/v	Rep	Count 1 (x 10 <sup>4</sup> )	Count 2 (x 10 <sup>4</sup> )	Count 3 (x 10 <sup>4</sup> )	Count 4 (x 10 <sup>4</sup> )	Mean (x 10 <sup>4</sup> )	Cell Yield (x 10 <sup>4</sup> ) cell/mL		9772.727
Control	A	35				35	34.0	mean	28.8
	B	26				26	25.0	SD	3.991061
	C	30				30	29.0	CV	13.87099
	D	24				24	23.0		
	E	29				29	28.0		
	F	33				33	32.0		
	G	27				27	26.0		
	H	34				34	33.0		
1.48	A	39				39	38.0		
	B	37				37	36.0		
	C	34				34	33.0		
	D	36				36	35.0		
2.95	A	40				40	39.0		
	B	36				36	35.0		
	C	32				32	31.0		
	D	37				37	36.0		
5.9	A	30				30	29.0		
	B	21				21	20.0		
	C	22				22	21.0		
	D	26				26	25.0		
11.9	A	17	21			19	18.0		
	B	24				24	23.0		
	C	19				19	18.0		
	D	25				25	24.0		
23.8	A	46				46	45.0		
	B	26	34			30	29.0		
	C	42				42	41.0		
	D	38				38	37.0		
47.6	A	6				6	5.0		
	B	3				3	2.0		
	C	7				7	6.0		
	D	1				1	0.0		
95.2	A	0				0	-1.0		
	B	0				0	-1.0		
	C	0				0	-1.0		
	D	0				0	-1.0		

ART  
 Aug 25/09

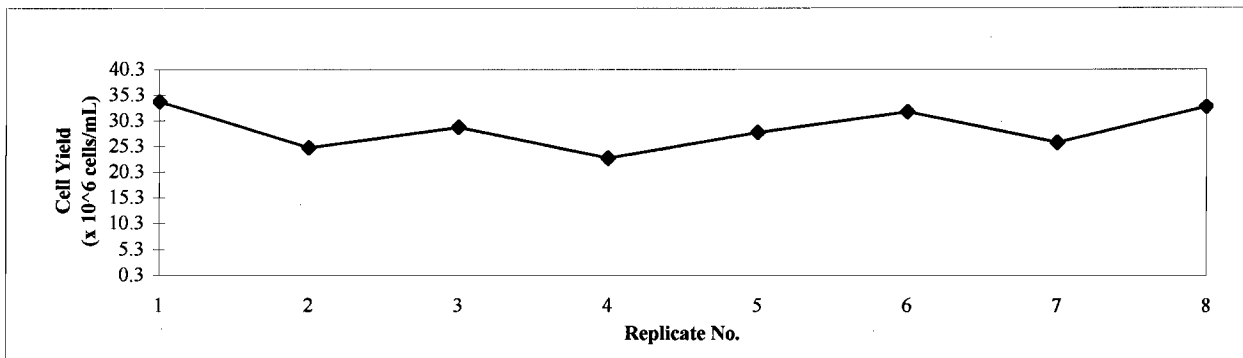
## 72-h *Pseudokirchneriella subcapitata* Test - Trend Analysis by Mann-Kendall Test.

**Instructions:**

1. Enter the project number, work order number and sample ID in the highlighted cells.
2. Enter the negative control cell yield data ( $X \times 10^6$  cells/mL) into the highlighted spreadsheet cells.
3. Compare the calculated S value to the table of critical S values at the bottom of the page.
4. If the calculated S value is smaller than the S value in the table, there is no statistically significant trend.

Client: Rescan                      Sample ID: SC2  
 W.O. No.: 09209                      Test Date: 7-Jul-09

Rep No.	1	2	3	4	5	6	7	8	Count of + Signs	Count of - Signs
<b>Data Value</b>	34.0	25.0	29.0	23.0	28.0	32.0	26.0	33.0		
(- Rep 1)		-9.000	-5.000	-11.000	-6.000	-2.000	-8.000	-1.000	0	7
(- Rep 2)			4.000	-2.000	3.000	7.000	1.000	8.000	5	1
(- Rep 3)				-6.000	-1.000	3.000	-3.000	4.000	2	3
(- Rep 4)					5.000	9.000	3.000	10.000	4	0
(- Rep 5)						4.000	-2.000	5.000	2	1
(- Rep 6)							-6.000	1.000	1	1
(- Rep 7)								7.000	1	0
<b>Totals</b>									15	13
									<b>S = 2</b>	



**Critical values of (S) at a probability of  $p = 0.05$ , when the number of replicates (n) is 10 or less.**

n	4	5	6	7	8	9	10
S	4	6	9	11	14	16	19

If your calculated value for S (for the applicable number of replicates) is equal to or less than the corresponding value for S in the above table, then there is no statistically significant trend present. Refer to Gilbert (1987) for complete table of probabilities for the Mann-Kendall test.

**Reference:**

Gilbert, R.O. 1987. Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold, NY. 320 pp.

*RET*  
Aug 25/09

**CETIS Analytical Report**

Report Date: 28 Jul-09 10:42 (p 1 of 2)  
 Link/Link Code: 17-3633-3134/09209SC2

<b>Selenastrum Growth Test</b>		<b>Nautilus Environmental</b>
--------------------------------	--	-------------------------------

<b>Analysis No:</b> 09-4574-1553	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 27 Jul-09 10:31	<b>Analysis:</b> Parametric-Multiple Comparison	<b>Official Results:</b> Yes

<b>Sample No:</b> 02-6887-8236	<b>Code:</b> SC2	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09	<b>Source:</b> Rescan	
<b>Sample Age:</b> 48h	<b>Station:</b>	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	5.9	11.9	8.379	16.95	21.9%

<b>Bonferroni Adj t Test</b>							
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		1.48	-2.751	2.566	6.297	1.0000	Non-Significant Effect
		2.95	-2.649	2.566	6.297	1.0000	Non-Significant Effect
		5.9	2.037	2.566	6.297	0.1570	Non-Significant Effect
		11.9*	3.26	2.566	6.297	0.0096	Significant Effect
		23.8	-3.769	2.566	6.297	1.0000	Non-Significant Effect
		47.6*	10.39	2.566	6.297	0.0000	Significant Effect

<b>ANOVA Table</b>						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	3522.5	587.0833	6	36.56	0.0000	Significant Effect
Error	401.5	16.06	25			
Total	3924	603.1433	31			

<b>ANOVA Assumptions</b>						
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)	
Variances	Bartlett Equality of Variance	4.824	16.81	0.5665	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.982		0.8562	Normal Distribution	

<b>Cell Density Summary</b>											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	8	28.75	27.2	30.3	23	34	0.7542	3.991	13.88%	0.0%
1.48		4	35.5	34.69	36.31	33	38	0.3934	2.082	5.86%	-23.48%
2.95		4	35.25	33.97	36.53	31	39	0.6244	3.304	9.37%	-22.61%
5.9		4	23.75	22.16	25.34	20	29	0.7773	4.113	17.32%	17.39%
11.9		4	20.75	19.51	21.99	18	24	0.605	3.202	15.43%	27.83%
23.8		4	38	35.35	40.65	29	45	1.291	6.831	17.98%	-32.17%
47.6		4	3.25	2.182	4.318	0	6	0.5204	2.754	84.73%	88.7%

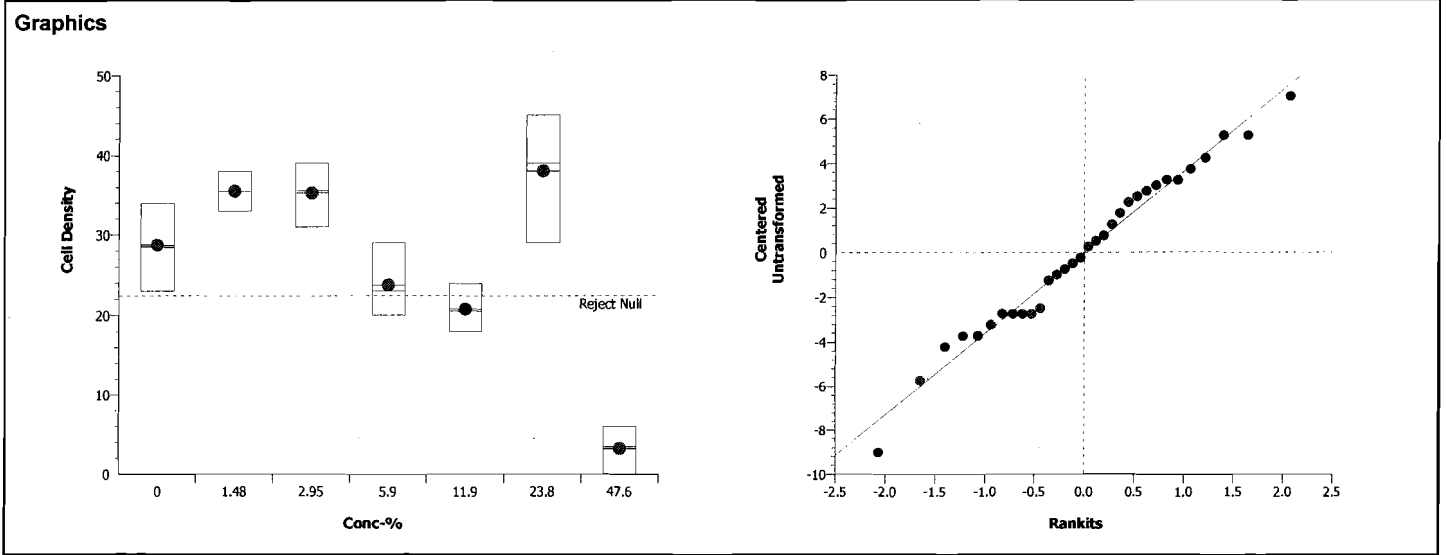
*KRT*  
*QA Aug 25/09*

**CETIS Analytical Report**

Report Date: 28 Jul-09 10:42 (p 2 of 2)  
 Link/Link Code: 17-3633-3134/09209SC2

<b>Selenastrum Growth Test</b>				<b>Nautilus Environmental</b>	
<b>Analysis No:</b> 09-4574-1553	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 27 Jul-09 10:31	<b>Analysis:</b> Parametric-Multiple Comparison	<b>Official Results:</b> Yes			

<b>Cell Density Detail</b>									
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Contr	34	33	32	29	28	26	25	23
1.48		38	36	35	33				
2.95		39	36	35	31				
5.9		29	25	21	20				
11.9		24	23	18	18				
23.8		45	41	37	29				
47.6		6	5	2	0				



**CETIS Analytical Report**

Report Date: 28 Jul-09 10:15 (p 1 of 2)  
 Link/Link Code: 11-1009-3030/09209SC2b

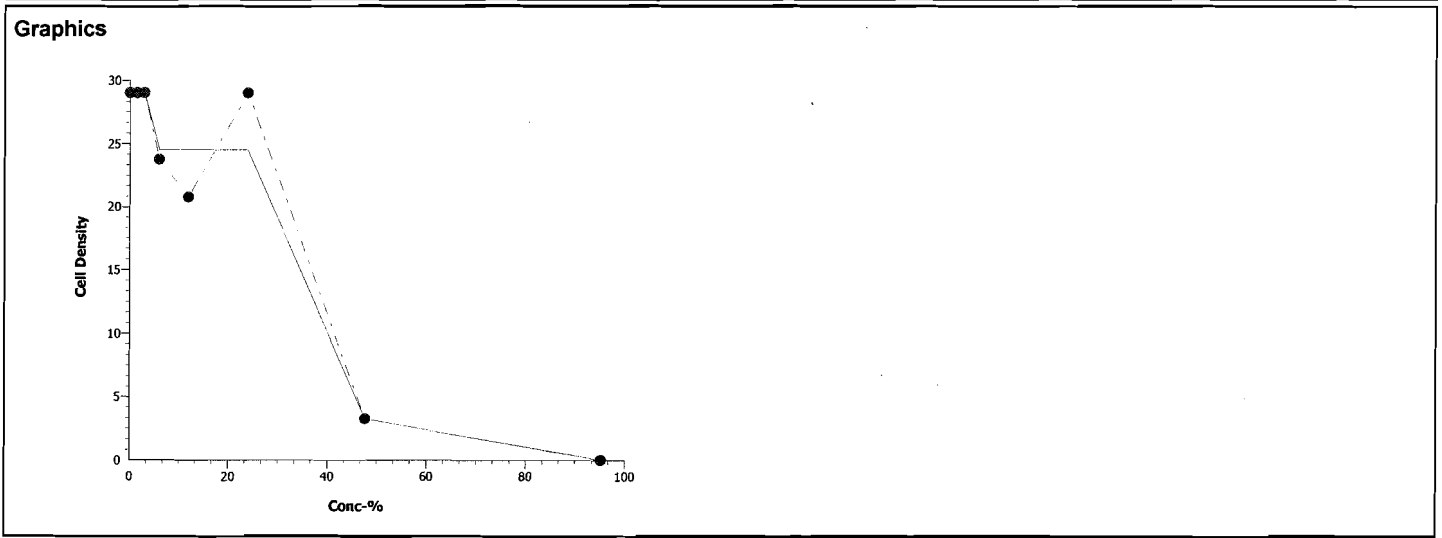
Selenastrum Growth Test				Nautilus Environmental					
Analysis No:	15-4593-8719	Endpoint:	Cell Density	CETIS Version:		CETISv1.5.0			
Analyzed:	28 Jul-09 10:15	Analysis:	Linear Interpolation (ICPIN)	Official Results:		Yes			
Sample No:	20-2276-2186	Code:	SC2	Client:	Rescan				
Sample Date:	05 Jul-09	Material:	Water Sample	Project:					
Receive Date:	07 Jul-09	Source:	Rescan						
Sample Age:	48h	Station:							
Linear Interpolation Options									
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method				
Log(X + 1)	Linear	57951	200	Yes	Two-Point Interpolation				
Point Estimates									
% Effect	Conc-%	95% LCL	95% UCL						
5	3.728	3.453	5.217						
10	4.659	4.013	9.319						
15	5.773	4.634	35.99						
20	24.84	23.33	26.36						
25	26.06	24.47	27.58						
40	30.05	28.33	31.74						
50	33.04	30.91	35.06						
Cell Density Summary			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	8	29	29	29	0	0	0.0%	0.0%
1.48		4	29	29	29	0	0	0.0%	0.0%
2.95		4	29	29	29	0	0	0.0%	0.0%
5.9		4	23.75	20	29	0.7638	4.113	17.32%	18.1%
11.9		4	20.75	18	24	0.5945	3.202	15.43%	28.45%
23.8		4	29	29	29	0	0	0.0%	0.0%
47.6		4	3.25	0	6	0.5114	2.754	84.73%	88.79%
95.2		4	0	0	0	0	0	100.0%	100.0%
Cell Density Detail									
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Control	29	29	29	29	29	29	29	29
1.48		29	29	29	29				
2.95		29	29	29	29				
5.9		29	20	21	25				
11.9		18	23	18	24				
23.8		29	29	29	29				
47.6		5	2	6	0				
95.2		0	0	0	0				

*ART*  
 09 Jul 25/09

# CETIS Analytical Report

Report Date: 28 Jul-09 10:15 (p 2 of 2)  
Link/Link Code: 11-1009-3030/09209SC2b

<b>Selenastrum Growth Test</b>		<b>Nautilus Environmental</b>
<b>Analysis No:</b> 15-4593-8719	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 28 Jul-09 10:15	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Official Results:</b> Yes





**Pseudokirchneriella subcapitata Summary Sheet**

Client: RESOAN  
 Work Order No.: 09209

Start Date: July 7, 2009  
 Set up by: EW

**Sample Information:**

Sample ID: STE-2  
 Sample Date: July 5, 2009  
 Date Received: July 7, 2009  
 Sample Volume: 9 x 20L

**Test Organism Information:**

Culture Date: July 2, 2009  
 Age of culture (Day 0): 5 d

**Zinc Reference Toxicant Results:**

Reference Toxicant ID: SCA8  
 Stock Solution ID: 09 Zn 01  
 Date Initiated: July 9, 2009

72-h IC50 (95% CL): 32.9 28.5 39.0  
~~31.4 (24.4 - 26.8)~~ µg/L Zn

72-h IC50 Reference Toxicant Mean ± 2 SD: 17.1 ± 12.0 µg/L Zn CV (%): 35

**Test Results:**

	Algal Growth
NOEC %(v/v)	47.6
LOEC %(v/v)	95.2
IC25 %(v/v) (95% CL)	61.7 (52.3 - 69.0)
IC50 %(v/v) (95% CL)	84.1 (71.4 - 95.2)

Reviewed by: A. Terry

Date reviewed: August 26, 2009

## 72-h Algal Growth Inhibition Toxicity Test Water Quality Measurements

Client : Rescan Setup by: ECU  
 Sample ID: STE-2 Test Date/Time: July 7, 2009 1400h  
 Work Order No.: 09209 Test Species: Pseudokirchneriella subcapitata

Culture Date: July 2, 2009 Age of Culture: 5 d Culture Health: Good  
 Culture Count: 1 237 2223 Average: 230 Culture Cell Density (c1): 230 x 10<sup>4</sup>

$$v1 = \frac{220,000 \text{ cells/ml} \times 100 \text{ ml}}{(c1) 230 \times 10^4 \text{ cells/ml}} = 9.56 \text{ mL}$$

Time Zero Counts: 1 20 2 23 Average: 21.5

No. of Cells/mL: \_\_\_\_\_ Initial Density: # cells/mL ÷ 220 µL x 10 µL = 9773

Concentration %(v/v)	Water Quality Measurements					Microplates rotated 2X per day?			
	pH	Temp (°C)							
	0 h	0 h	24 h	48 h	72 h	0 h	24 h	48 h	72 h
Control	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
1.48	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
2.95	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
5.9	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
11.9	6.9	24.7	24.9	24.3	25.4	✓	✓	✓	✓
23.8	7.1	24.7	24.9	24.3	25.4	✓	✓	✓	✓
47.6	7.2	24.8	24.9	24.3	25.4	✓	✓	✓	✓
95.2	7.3	24.8	24.9	24.3	25.4	✓	✓	✓	✓
Initials	ECU	ECU	ECU	JLT	JLT	ECU	ECU	JLT	JLT

Initial control pH: Well 1: 6.8 Well 2: 6.8  
 Final control pH: Well 1: 6.8 Well 2: 6.8

Light intensity (lux): 3870 Date measured: July 7, 2009

Sample Description: Clear

Comments: \_\_\_\_\_

Reviewed: L. Torey Date reviewed: August 26, 2009

***Pseudokirchneriella subcapitata* Toxicity Test Data Sheet**  
**72-h Algal Cell Counts**

Client: Rescan Start Date/Time: July 7/09 @ 1400  
 Work Order #: 09209 Termination Date: July 10/09  
 Sample ID: STE-2 Test set up by: ECC

%(VIV)

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A	36					JCT
	B	29					JCT
	C	34					
	D	23					
	E	30					
	F	35					
	G	28					
	H	31					
1.48	A	40					
	B	33					
	C	39					
	D	30					
2.95	A	35					
	B	29					
	C	33					
	D	36					
5.9	A	47					
	B	56					
	C	39	44				
	D	53					
11.9	A	50					
	B	41					
	C	49					
	D	42					
23.8	A	61					
	B	48	52				
	C	69					
	D	55					
47.6	A	35					
	B	27					
	C	30					
	D	27					
95.2	A	18					
	B	11					
	C	9					
	D	14					

Comments: \_\_\_\_\_  
 Reviewed by: A. Long Date Reviewed: August 25, 2009

**Pseudokirchneriella subcapitata Algal Counts**

Client: Rescan  
 WO#: 09209  
 Sample ID: SC2

Start Date/Time: 7-Jul-09 @1400h  
 Termination Date: 10-Jul-09

Initial Cell Density: 9772.73 cell/mL  
 215000  
 0.22  
 0.01

Concentration % v/v	Rep	Count 1 (x 10 <sup>4</sup> )	Count 2 (x 10 <sup>4</sup> )	Count 3 (x 10 <sup>4</sup> )	Count 4 (x 10 <sup>4</sup> )	Mean (x 10 <sup>4</sup> )	Cell Yield (x 10 <sup>4</sup> ) cell/mL		9772.727
Control	A	36				36	35.0	mean	29.8
	B	29				29	28.0	SD	4.26782
	C	34				34	33.0	CV	14.33466
	D	23				23	22.0		
	E	30				30	29.0		
	F	35				35	34.0		
	G	28				28	27.0		
	H	31				31	30.0		
1.48	A	40				40	39.0		
	B	33				33	32.0		
	C	39				39	38.0		
	D	30				30	29.0		
2.95	A	35				35	34.0		
	B	29				29	28.0		
	C	33				33	32.0		
	D	36				36	35.0		
5.9	A	47				47	46.0		
	B	56				56	55.0		
	C	39	44			41.5	40.5		
	D	53				53	52.0		
11.9	A	50				50	49.0		
	B	41				41	40.0		
	C	49				49	48.0		
	D	42				42	41.0		
23.8	A	61				61	60.0		
	B	48	52			50	49.0		
	C	69				69	68.0		
	D	55				55	54.0		
47.6	A	35				35	34.0		
	B	27				27	26.0		
	C	30				30	29.0		
	D	27				27	26.0		
95.2	A	18				18	17.0		
	B	11				11	10.0		
	C	9				9	8.0		
	D	14				14	13.0		

ART  
 Aug 25/09

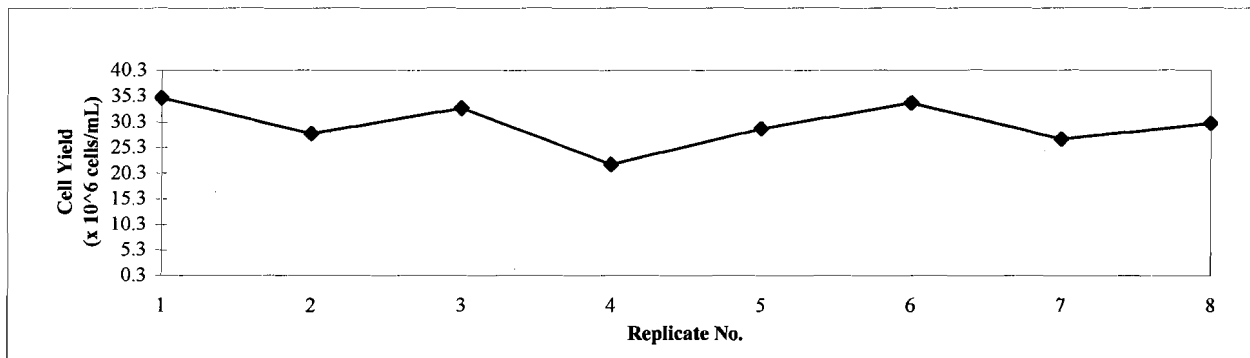
**72-h *Pseudokirchneriella subcapitata* Test - Trend Analysis by Mann-Kendall Test.**

**Instructions:**

1. Enter the project number, work order number and sample ID in the highlighted cells.
2. Enter the negative control cell yield data ( $X \times 10^6$  cells/mL) into the highlighted spreadsheet cells.
3. Compare the calculated S value to the table of critical S values at the bottom of the page.
4. If the calculated S value is smaller than the S value in the table, there is no statistically significant trend.

Client: Rescan Sample ID: SC2  
 W.O. No.: 09209 Test Date: 7-Jul-09

Rep No.	1	2	3	4	5	6	7	8	Count of + Signs	Count of - Signs
Data Value	35.0	28.0	33.0	22.0	29.0	34.0	27.0	30.0		
(- Rep 1)		-7.000	-2.000	-13.000	-6.000	-1.000	-8.000	-5.000	0	7
(- Rep 2)			5.000	-6.000	1.000	6.000	-1.000	2.000	4	2
(- Rep 3)				-11.000	-4.000	1.000	-6.000	-3.000	1	4
(- Rep 4)					7.000	12.000	5.000	8.000	4	0
(- Rep 5)						5.000	-2.000	1.000	2	1
(- Rep 6)							-7.000	-4.000	0	2
(- Rep 7)								3.000	1	0
<b>Totals</b>									12	16
									<b>S = -4</b>	



**Critical values of (S) at a probability of  $p = 0.05$ , when the number of replicates (n) is 10 or less.**

n	4	5	6	7	8	9	10
S	4	6	9	11	14	16	19

If your calculated value for S (for the applicable number of replicates) is equal to or less than the corresponding value for S in the above table, then there is no statistically significant trend present. Refer to Gilbert (1987) for complete table of probabilities for the Mann-Kendall test.

**Reference:**

Gilbert, R.O. 1987. Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold, NY. 320 pp.

ART  
Aug 25/09

**CETIS Analytical Report**

Report Date: 21 Jul-09 17:11 (p 1 of 2)  
 Link/Link Code: 14-5847-2245/09209STE2

Selenastrum Growth Test								Nautilus Environmental			
Analysis No: 03-9518-0825		Endpoint: Cell Density		CETIS Version: CETISv1.5.0							
Analyzed: 21 Jul-09 17:11		Analysis: Parametric-Multiple Comparison		Official Results: Yes							
Sample No: 14-2442-9580		Code: STE-2		Client: Rescan							
Sample Date: 05 Jul-09		Material: Water Sample		Project:							
Receive Date: 07 Jul-09		Source: Rescan									
Sample Age: 48h		Station:									
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Untransformed		C > T	Not Run	47.6	95.2	67.32	2.101	27.13%			
Bonferroni Adj t Test											
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Negative Control		1.48	-1.538	2.613	8.071	1.0000	Non-Significant Effect				
		2.95	-0.8093	2.613	8.071	1.0000	Non-Significant Effect				
		5.9	-5.989	2.613	8.071	1.0000	Non-Significant Effect				
		11.9	-4.775	2.613	8.071	1.0000	Non-Significant Effect				
		23.8	-9.064	2.613	8.071	1.0000	Non-Significant Effect				
		47.6	0.3237	2.613	8.071	1.0000	Non-Significant Effect				
		95.2*	5.746	2.613	8.071	0.0000	Significant Effect				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)					
Between	5654.722	807.8174	7	31.75	0.0000	Significant Effect					
Error	712.5	25.44643	28								
Total	6367.222	833.2639	35								
ANOVA Assumptions											
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)						
Variances	Bartlett Equality of Variance	4.26	18.48	0.7494	Equal Variances						
Distribution	Shapiro-Wilk Normality	0.9749		0.5737	Normal Distribution						
Cell Density Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	8	29.75	28.1	31.4	22	35	0.8065	4.268	14.35%	0.0%
1.48		4	34.5	32.64	36.36	29	39	0.9063	4.796	13.9%	-15.97%
2.95		4	32.25	31.05	33.45	28	35	0.585	3.096	9.6%	-8.4%
5.9		4	48.25	45.67	50.83	40	55	1.257	6.652	13.79%	-62.18%
11.9		4	44.5	42.7	46.3	40	49	0.8797	4.655	10.46%	-49.58%
23.8		4	57.75	54.58	60.92	49	68	1.546	8.18	14.16%	-94.12%
47.6		4	28.75	27.29	30.21	26	34	0.7134	3.775	13.13%	3.36%
95.2		4	12	10.48	13.52	8	17	0.74	3.916	32.63%	59.66%

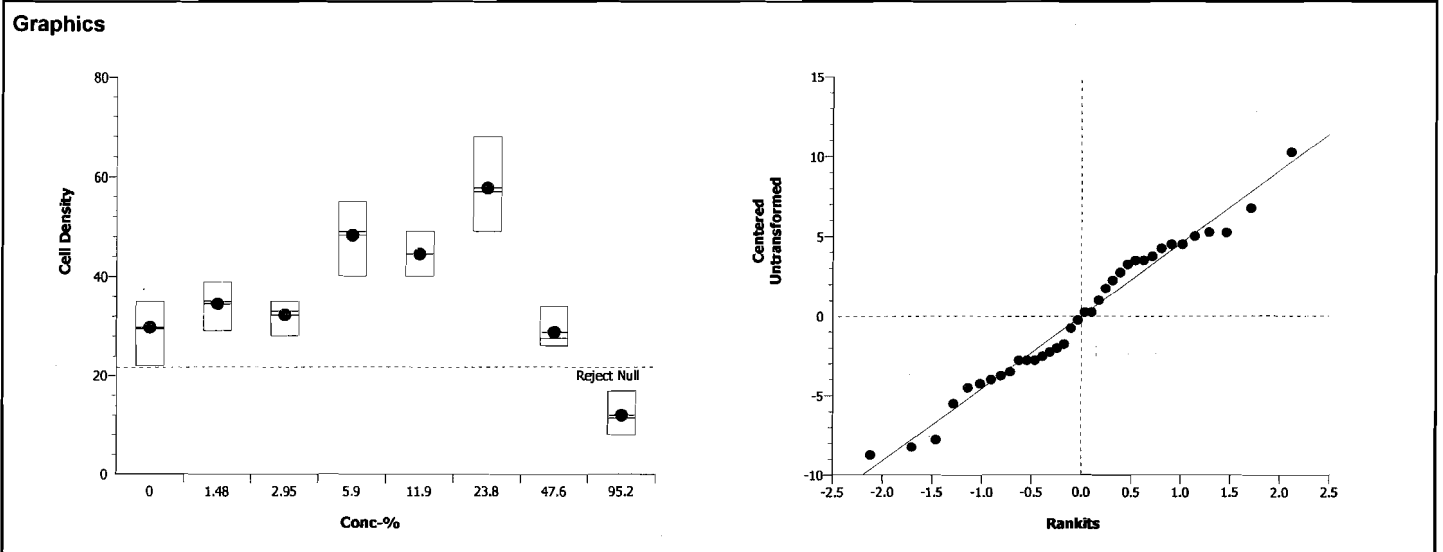
*ART*  
*QA/LQ 25/09*

**CETIS Analytical Report**

Report Date: 21 Jul-09 17:11 (p 2 of 2)  
 Link/Link Code: 14-5847-2245/09209STE2

<b>Selenastrum Growth Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 03-9518-0825	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 21 Jul-09 17:11	<b>Analysis:</b> Parametric-Multiple Comparison	<b>Official Results:</b> Yes			

<b>Cell Density Detail</b>									
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Contr	35	34	33	30	29	28	27	22
1.48		39	38	32	29				
2.95		35	34	32	28				
5.9		55	52	46	40				
11.9		49	48	41	40				
23.8		68	60	54	49				
47.6		34	29	26	26				
95.2		17	13	10	8				



ARF  
 QA Aug 25/09

**CETIS Analytical Report**

Report Date: 28 Jul-09 10:54 (p 1 of 2)  
 Link/Link Code: 19-5521-5314/09209STE2b

Selenastrum Growth Test				Nautilus Environmental					
Analysis No: 09-1835-6010		Endpoint: Cell Density		CETIS Version: CETISv1.5.0					
Analyzed: 28 Jul-09 10:53		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes					
Sample No: 07-7397-0574		Code: STE-2		Client: Rescan					
Sample Date: 05 Jul-09		Material: Water Sample		Project:					
Receive Date: 07 Jul-09		Source: Rescan							
Sample Age: 48h		Station:							
Linear Interpolation Options									
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method				
Log(X + 1)	Linear	57951	200	Yes	Two-Point Interpolation				
Point Estimates									
% Effect	Conc-%	95% LCL	95% UCL						
5	48.1	20.61	52.49						
10	51.19	33.41	56.17						
15	54.48	45.23	60.1						
20	57.98	48.65	64.47						
25	61.7	52.33	69.02						
40	74.33	63.21	85.85						
50	84.13	71.37	N/A						
Cell Density Summary			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	8	30	30	30	0	0	0.0%	0.0%
1.48		4	30	30	30	0	0	0.0%	0.0%
2.95		4	30	30	30	0	0	0.0%	0.0%
5.9		4	30	30	30	0	0	0.0%	0.0%
11.9		4	30	30	30	0	0	0.0%	0.0%
23.8		4	30	30	30	0	0	0.0%	0.0%
47.6		4	28.75	26	34	0.701	3.775	13.13%	4.17%
95.2		4	12	8	17	0.7271	3.916	32.63%	60.0%
Cell Density Detail									
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Control	30	30	30	30	30	30	30	30
1.48		30	30	30	30				
2.95		30	30	30	30				
5.9		30	30	30	30				
11.9		30	30	30	30				
23.8		30	30	30	30				
47.6		34	26	29	26				
95.2		17	10	8	13				

*ART*  
 QA Aug 25/09

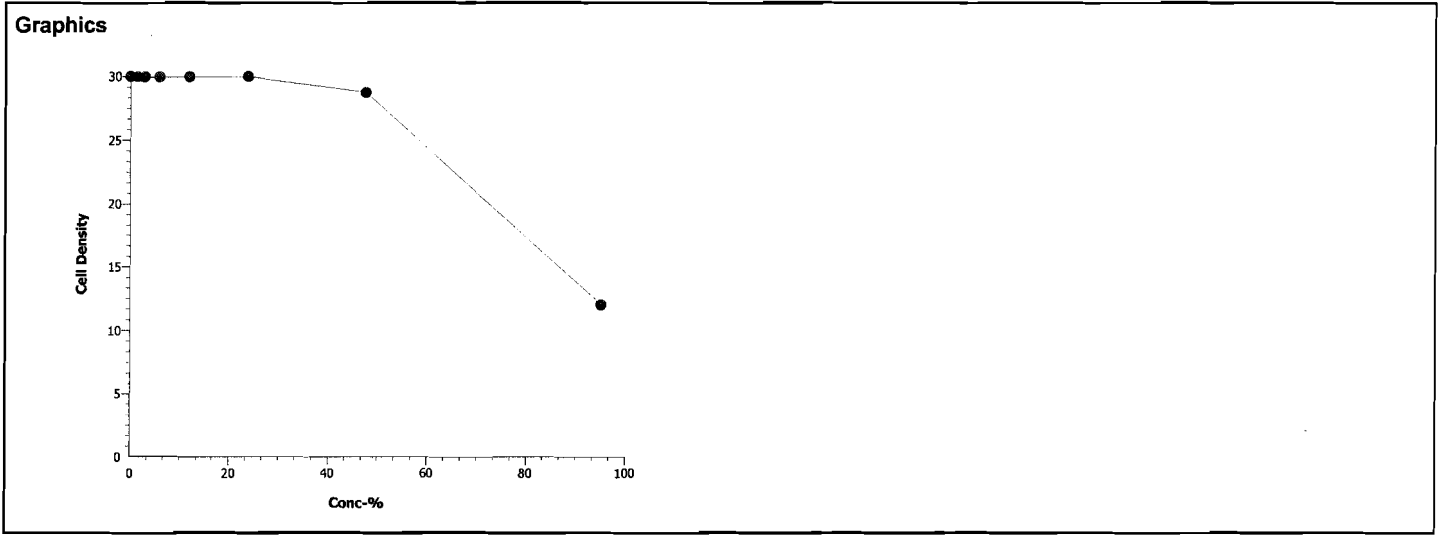


**CETIS Analytical Report**

Report Date: 28 Jul-09 10:54 (p 2 of 2)

Link/Link Code: 19-5521-5314/09209STE2b

<b>Selenastrum Growth Test</b>		<b>Nautilus Environmental</b>
<b>Analysis No:</b> 09-1835-6010	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 28 Jul-09 10:53	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Official Results:</b> Yes



ART  
QA AUG 25/09

**Pseudokirchneriella subcapitata Summary Sheet**

Client: RESCAN  
 Work Order No.: 09209

Start Date: July 7, 2009  
 Set up by: EW

**Sample Information:**

Sample ID: NTR-2  
 Sample Date: July 5, 2009  
 Date Received: July 7, 2009  
 Sample Volume: 9 x 20L

**Test Organism Information:**

Culture Date: July 2, 2009  
 Age of culture (Day 0): 5 d

**Zinc Reference Toxicant Results:**

Reference Toxicant ID: SC48  
 Stock Solution ID: 09201  
 Date Initiated: July 9, 2009

72-h IC50 (95% CL): 32.4 28.5 39.0  
31.6 (24.4 - 36.5) µg/L Zn  
EW EW EW

72-h IC50 Reference Toxicant Mean ± 2 SD: 17.1 ± 11.9 µg/L Zn CV (%): 35  
EW

**Test Results:**

	Algal Growth
NOEC %(v/v)	5.9
LOEC %(v/v)	11.9
IC25 %(v/v) (95% CL)	11.4 (9.4 - 14.0)
IC50 %(v/v) (95% CL)	19.0 (15.0 - 25.4)

Reviewed by: A. Terry

Date reviewed: August 26, 2009

## 72-h Algal Growth Inhibition Toxicity Test Water Quality Measurements

Client : Rescan Setup by: Ecc  
 Sample ID: NTR-2 Test Date/Time: July 7, 2009 1400h  
 Work Order No.: 09209 Test Species: Pseudokirchneriella subcapitata

Culture Date: July 2, 2009 Age of Culture: 5d Culture Health: Good  
 Culture Count: 1 237 2 223 Average: 230 Culture Cell Density (c1): 230 x 10<sup>4</sup>

$$v1 = \frac{220,000 \text{ cells/ml} \times 100 \text{ ml}}{(c1) 230 \times 10^4 \text{ cells/ml}} = 9.56 \text{ mL}$$

Time Zero Counts: 1 20 2 23 Average: 21.5 x 10<sup>4</sup>

No. of Cells/mL: 21.5 x 10<sup>4</sup> Initial Density: # cells/mL ÷ 220 μL x 10 μL = 9773

Concentration %(v/v)	Water Quality Measurements					Microplates rotated 2X per day?			
	pH	Temp (°C)				0 h	24 h	48 h	72 h
	0 h	0 h	24 h	48 h	72 h				
Control	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
1.48	6.9	24.7	24.9	24.3	25.4	✓	✓	✓	✓
2.95	6.9	24.7	24.9	24.3	25.4	✓	✓	✓	✓
5.9	6.9	24.8	24.9	24.3	25.4	✓	✓	✓	✓
11.9	7.0	24.8	24.9	24.3	25.4	✓	✓	✓	✓
23.8	7.1	24.9	24.9	24.3	25.4	✓	✓	✓	✓
47.6	7.2	25.1	24.9	24.3	25.4	✓	✓	✓	✓
95.2	7.4	25.1	24.9	24.3	25.4	✓	✓	✓	✓
Initials	<u>EW</u>	<u>EW</u>	<u>EW JLT</u>	<u>JLT</u>	<u>JLT</u>	<u>EW</u>	<u>EW</u>	<u>JLT</u>	<u>JLT</u>

Initial control pH: Well 1: 6.8 Well 2: 6.8  
 Final control pH: Well 1: 6.8 Well 2: 6.8

Light intensity (lux): 4050 Date measured: July 7, 2009

Sample Description: clear sample.

Comments: \_\_\_\_\_

Reviewed: A. Terry Date reviewed: August 25, 2009

***Pseudokirchneriella subcapitata* Toxicity Test Data Sheet**  
**72-h Algal Cell Counts**

Client: Rescan Start Date/Time: July 7/09 @ 1400  
 Work Order #: 09209 Termination Date: July 10/09  
 Sample ID: NTR-2 Test set up by: ECC  
 % (V/V)

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A	19	23				JET
	B	37					
	C	28					
	D	32					
	E	25					
	F	38					
	G	29					
	H	33					
1.48	A	35					JET
	B	43					
	C	27	32				
	D	44					
2.95	A	49					
	B	42					
	C	50					
	D	41					
5.9	A	31					
	B	23	29				
	C	43					
	D	33					
11.9	A	16					
	B	24					
	C	14					
	D	2					
23.8	A	18					
	B	13					
	C	15					
	D	11					
47.6	A	16					
	B	10					
	C	14					
	D	9					
95.2	A	5					
	B	0					
	C	3					
	D	1					

Comments:

Reviewed by: A. Long Date Reviewed: August 25, 2009

***Pseudokirchneriella subcapitata* Algal Counts**

Client: Rescan  
 WO#: 09209  
 Sample ID: NTR-2

Start Date/Time: 7-Jul-09 @1400h  
 Termination Date: 10-Jul-09

Initial Cell Density: 9772.73 cell/mL  
 215000  
 0.22  
 0.01  
 9772.727

Concentration % v/v	Rep	Count 1 (x 10 <sup>4</sup> )	Count 2 (x 10 <sup>4</sup> )	Count 3 (x 10 <sup>4</sup> )	Count 4 (x 10 <sup>4</sup> )	Mean (x 10 <sup>4</sup> )	Cell Yield (x 10 <sup>4</sup> ) cell/mL	
Control	A	19	23			21	20.0	mean
	B	37				37	36.0	SD
	C	28				28	27.0	CV
	D	32				32	31.0	
	E	25				25	24.0	
	F	38				38	37.0	
	G	29				29	28.0	
	H	33				33	32.0	
1.48	A	35				35	34.0	
	B	43				43	42.0	
	C	27	32			29.5	28.5	
	D	44				44	43.0	
2.95	A	49				49	48.0	
	B	42				42	41.0	
	C	50				50	49.0	
	D	41				41	40.0	
5.9	A	31				31	30.0	
	B	23	29			26	25.0	
	C	43				43	42.0	
	D	33				33	32.0	
11.9	A	16				16	15.0	
	B	24				24	23.0	
	C	14				14	13.0	
	D	21				21	20.0	
23.8	A	18				18	17.0	
	B	13				13	12.0	
	C	15				15	14.0	
	D	11				11	10.0	
47.6	A	16				16	15.0	
	B	10				10	9.0	
	C	14				14	13.0	
	D	9				9	8.0	
95.2	A	5				5	4.0	
	B	0				0	-1.0	
	C	3				3	2.0	
	D	1				1	0.0	

ARF  
 Aug 25/09

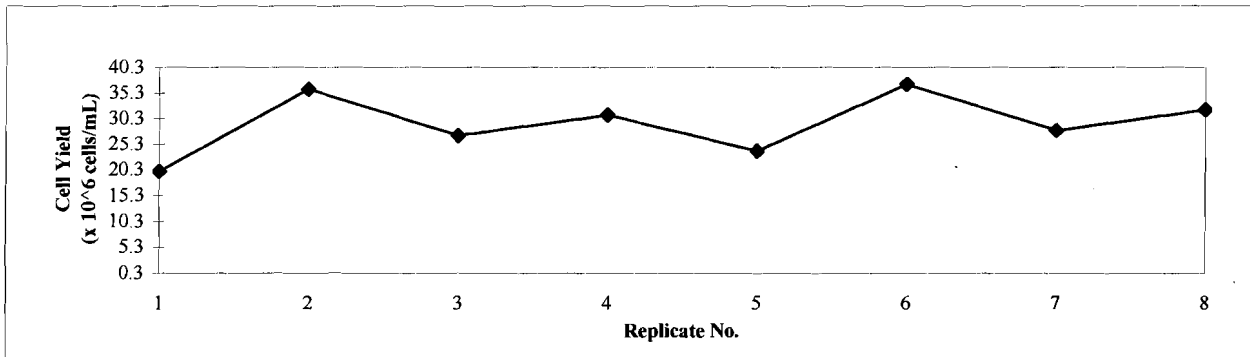
**72-h *Pseudokirchneriella subcapitata* Test - Trend Analysis by Mann-Kendall Test.**

**Instructions:**

1. Enter the project number, work order number and sample ID in the highlighted cells.
2. Enter the negative control cell yield data ( $X \times 10^6$  cells/mL) into the highlighted spreadsheet cells.
3. Compare the calculated S value to the table of critical S values at the bottom of the page.
4. If the calculated S value is smaller than the S value in the table, there is no statistically significant trend.

Client: Rescan                      Sample ID: NTR-2  
W.O. No.: 09209                      Test Date: 7-Jul-09

Rep No.	1	2	3	4	5	6	7	8	Count of + Signs	Count of - Signs
Data Value	20.0	36.0	27.0	31.0	24.0	37.0	28.0	32.0		
(- Rep 1)		16.000	7.000	11.000	4.000	17.000	8.000	12.000	7	0
(- Rep 2)			-9.000	-5.000	-12.000	1.000	-8.000	-4.000	1	5
(- Rep 3)				4.000	-3.000	10.000	1.000	5.000	4	1
(- Rep 4)					-7.000	6.000	-3.000	1.000	2	2
(- Rep 5)						13.000	4.000	8.000	3	0
(- Rep 6)							-9.000	-5.000	0	2
(- Rep 7)								4.000	1	0
<b>Totals</b>									18	10
									<b>S =</b>	<b>8</b>



**Critical values of (S) at a probability of p = 0.05, when the number of replicates (n) is 10 or less.**

n	4	5	6	7	8	9	10
S	4	6	9	11	14	16	19

If your calculated value for S (for the applicable number of replicates) is equal to or less than the corresponding value for S in the above table, then there is no statistically significant trend present. Refer to Gilbert (1987) for complete table of probabilities for the Mann-Kendall test.

**Reference:**

Gilbert, R.O. 1987. Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold, NY. 320 pp.

RET  
Aug 25/09

**CETIS Analytical Report**

Report Date: 22 Jul-09 11:39 (p 1 of 2)

Link/Link Code: 11-8479-9951/09209NTR2

<b>Selenastrum Growth Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 17-5662-5881	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 22 Jul-09 11:15	<b>Analysis:</b> Parametric-Multiple Comparison	<b>Official Results:</b> Yes			
<b>Sample No:</b> 15-8701-5008	<b>Code:</b> NTR-2	<b>Client:</b> Rescan			
<b>Sample Date:</b> 05 Jul-09	<b>Material:</b> Water Sample	<b>Project:</b>			
<b>Receive Date:</b> 07 Jul-09	<b>Source:</b> Rescan				
<b>Sample Age:</b> 48h	<b>Station:</b>				

<b>Data Transform</b>	<b>Zeta</b>	<b>Alt Hyp</b>	<b>Monte Carlo</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>TU</b>	<b>PMSD</b>
Untransformed		C > T	Not Run	5.9	11.9	8.379	16.95	27.96%

<b>Bonferroni Adj t Test</b>							
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		1.48	-2.346	2.613	8.212	1.0000	Non-Significant Effect
		2.95	-4.812	2.613	8.212	1.0000	Non-Significant Effect
		5.9	-0.9147	2.613	8.212	1.0000	Non-Significant Effect
		11.9*	3.699	2.613	8.212	0.0033	Significant Effect
		23.8*	5.13	2.613	8.212	0.0001	Significant Effect
		47.6*	5.767	2.613	8.212	0.0000	Significant Effect
		95.2*	8.869	2.613	8.212	0.0000	Significant Effect

<b>ANOVA Table</b>						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	6128.375	875.4821	7	33.23	0.0000	Significant Effect
Error	737.625	26.34375	28			
Total	6866	901.8259	35			

<b>ANOVA Assumptions</b>						
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)	
Variances	Bartlett Equality of Variance	6.674	18.48	0.4636	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.9856		0.9113	Normal Distribution	

<b>Cell Density Summary</b>											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	8	29.38	27.12	31.63	20	37	1.097	5.805	19.76%	0.0%
1.48		4	36.75	34	39.5	28	43	1.34	7.089	19.29%	-25.11%
2.95		4	44.5	42.7	46.3	40	49	0.8797	4.655	10.46%	-51.49%
5.9		4	32.25	29.48	35.02	25	42	1.349	7.136	22.13%	-9.79%
11.9		4	17.75	15.98	19.52	13	23	0.8643	4.573	25.77%	39.57%
23.8		4	13.25	12.09	14.41	10	17	0.5643	2.986	22.54%	54.89%
47.6		4	11.25	9.969	12.53	8	15	0.6244	3.304	29.37%	61.7%
95.2		4	1.5	0.7575	2.243	0	4	0.3619	1.915	127.7%	94.89%

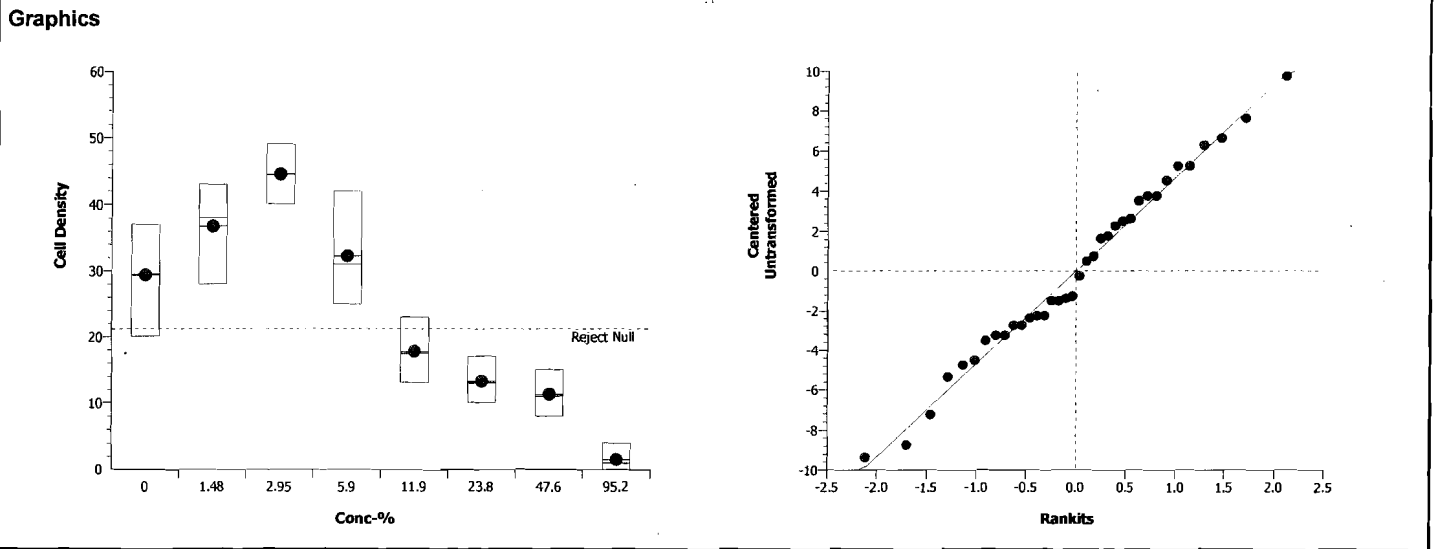
*ERT*  
*QA AUG 25/09*

**CETIS Analytical Report**

Report Date: 22 Jul-09 11:39 (p 2 of 2)  
 Link/Link Code: 11-8479-9951/09209NTR2

<b>Selenastrum Growth Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 17-5662-5881	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 22 Jul-09 11:15	<b>Analysis:</b> Parametric-Multiple Comparison	<b>Official Results:</b> Yes			

<b>Cell Density Detail</b>									
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Contr	37	36	32	31	28	27	24	20
1.48		43	42	34	28				
2.95		49	48	41	40				
5.9		42	32	30	25				
11.9		23	20	15	13				
23.8		17	14	12	10				
47.6		15	13	9	8				
95.2		4	2	0	0				



RT  
 QA Aug 25/09



**CETIS Analytical Report**

Report Date: 22 Jul-09 11:39 (p 3 of 4)

Link/Link Code: 11-8479-9951/09209NTR2

<b>Selenastrum Growth Test</b>		<b>Nautilus Environmental</b>
--------------------------------	--	-------------------------------

<b>Analysis No:</b> 11-4341-1068	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 22 Jul-09 11:16	<b>Analysis:</b> Nonlinear Regression	<b>Official Results:</b> Yes

<b>Sample No:</b> 15-8701-5008	<b>Code:</b> NTR-2	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09	<b>Source:</b> Rescan	
<b>Sample Age:</b> 48h	<b>Station:</b>	

<b>Non-Linear Regression Options</b>				
<b>Model Function</b>	<b>X Transform</b>	<b>Y Transform</b>	<b>Weighting Function</b>	<b>PTBS Function</b>
4P Log-Logistic+Hormesis EV [Y=A(1+EX)/(1+(2ED+1)(X/D)^C)]	None	None	Normal [W=1]	Off [Y*=Y]

<b>Regression Summary</b>								
<b>Iters</b>	<b>Log LL</b>	<b>AICc</b>	<b>Adj R2</b>	<b>Optimize</b>	<b>F Stat</b>	<b>Critical</b>	<b>P-Value</b>	<b>Decision(1%)</b>
13	-77.66	164.6	0.8423	Yes	2.395	4.074	0.0742	Non-Significant Lack of Fit

<b>Point Estimates</b>			
<b>% Effect</b>	<b>Conc-%</b>	<b>95% LCL</b>	<b>95% UCL</b>
SNEC	10.85	8.953	13.36
10	8.77	N/A	10.83
15	9.538	7.828	11.74
20	10.39	8.564	12.78
25	11.35	9.368	13.99
40	15.17	12.33	19.27
50	19.03	15	25.36

<b>Regression Parameters</b>							
<b>Parameter</b>	<b>Estimate</b>	<b>Std Error</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>t Stat</b>	<b>P-Value</b>	<b>Decision(5%)</b>
A	29	1.808	25.31	32.68	16.04	0.0000	Significant Parameter
C	1.804	0.1291	1.541	2.067	13.97	0.0000	Significant Parameter
D	19.03	2.819	13.29	24.77	6.751	0.0000	Significant Parameter
E	0.4068	0.157	0.08702	0.7265	2.591	0.0143	Significant Parameter

<b>ANOVA Table</b>						
<b>Source</b>	<b>Sum Squares</b>	<b>Mean Square</b>	<b>DF</b>	<b>F Stat</b>	<b>P-Value</b>	<b>Decision(1%)</b>
Model	5876	1958.667	3	63.31	0.0000	Significant
Lack of Fit	252.3751	63.09378	4	2.395	0.0742	Non-Significant
Pure Error	737.625	26.34375	28			
Residual	990.0001	30.9375	32			

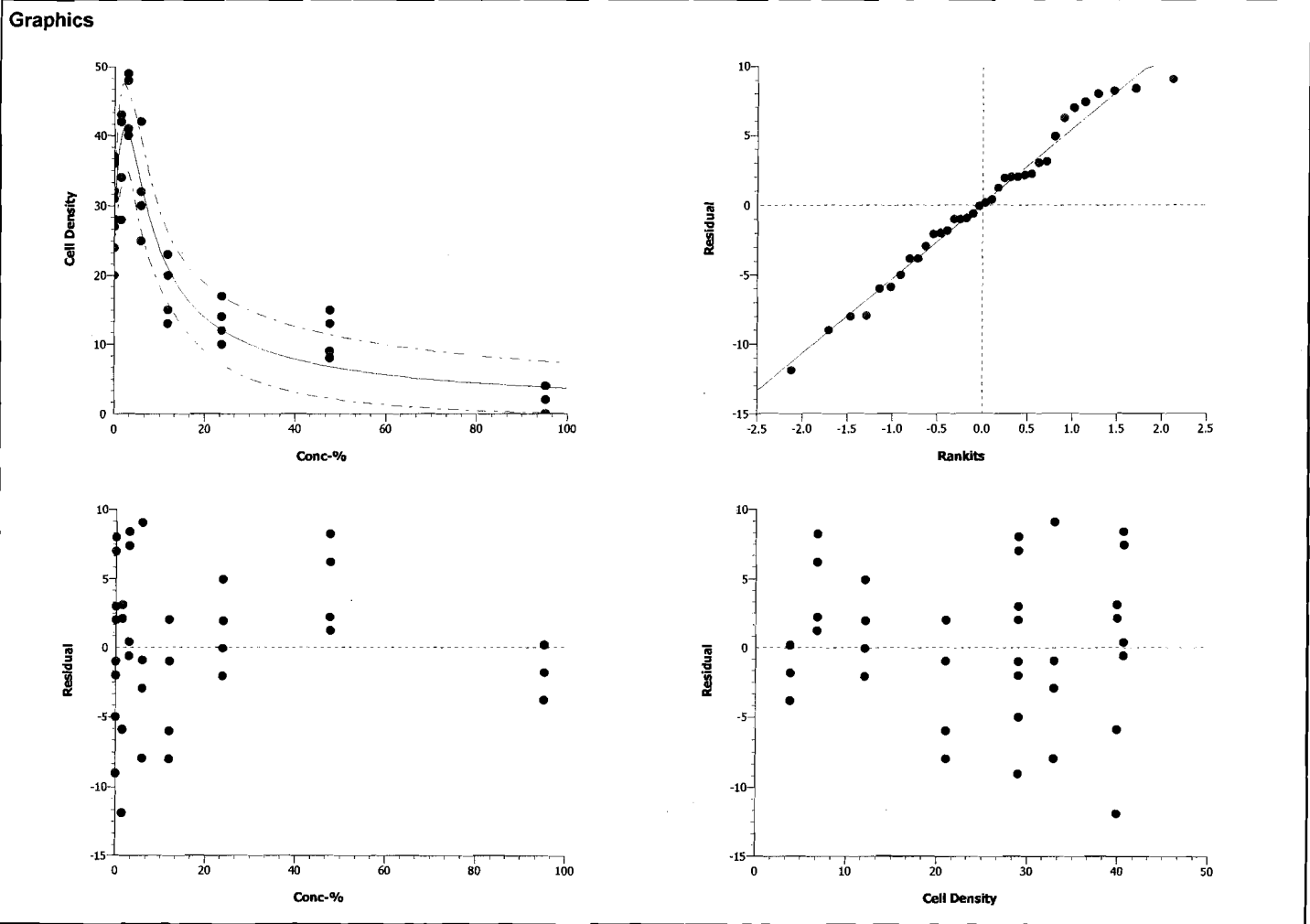
<b>Residual Analysis</b>					
<b>Attribute</b>	<b>Method</b>	<b>Test Stat</b>	<b>Critical</b>	<b>P-Value</b>	<b>Decision(1%)</b>
Variances	Bartlett Equality of Variance	6.674	18.48	0.4636	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9745		0.5619	Normal Distribution

<b>Cell Density Summary</b>			<b>Calculated Variate</b>						
<b>Conc-%</b>	<b>Control Type</b>	<b>Count</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>Diff%</b>
0	Negative Control	8	29.38	20	37	1.078	5.805	19.76%	0.0%
1.48		4	36.75	28	43	1.316	7.089	19.29%	-25.11%
2.95		4	44.5	40	49	0.8644	4.655	10.46%	-51.49%
5.9		4	32.25	25	42	1.325	7.136	22.13%	-9.79%
11.9		4	17.75	13	23	0.8493	4.573	25.77%	39.57%
23.8		4	13.25	10	17	0.5545	2.986	22.54%	54.89%
47.6		4	11.25	8	15	0.6135	3.304	29.37%	61.7%
95.2		4	1.5	0	4	0.3556	1.915	127.7%	94.89%

ART  
QA AUG 25/09

Selenastrum Growth Test			Nautilus Environmental		
Analysis No: 11-4341-1068	Endpoint: Cell Density	CETIS Version: CETISv1.5.0			
Analyzed: 22 Jul-09 11:16	Analysis: Nonlinear Regression	Official Results: Yes			

Cell Density Detail									
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Control	20	36	27	31	24	37	28	32
1.48		34	42	28	43				
2.95		48	41	49	40				
5.9		30	25	42	32				
11.9		15	23	13	20				
23.8		17	12	14	10				
47.6		15	9	13	8				
95.2		4	0	2	0				



**Pseudokirchneriella subcapitata Summary Sheet**

Client: RESCAN  
 Work Order No.: 09209

Start Date: July 7, 2009  
 Set up by: BA

**Sample Information:**

Sample ID: SCR  
 Sample Date: July 5, 2009  
 Date Received: July 7, 2009  
 Sample Volume: 9 X 112

**Test Organism Information:**

Culture Date: July 2, 2009  
 Age of culture (Day 0): 5d

**Zinc Reference Toxicant Results:**

Reference Toxicant ID: SC48  
 Stock Solution ID: 09 Zn 01  
 Date Initiated: July 9, 2009  
 72-h IC50 (95% CL): 32.4 28.5 39.0  
31.6 (24.4 - 36.5) µg/L Zn

72-h IC50 Reference Toxicant Mean ± 2 SD: 17.1 ± 12.0 µg/L Zn CV (%): 35

Test Results:	Algal Growth
NOEC %(v/v)	47.6
LOEC %(v/v)	95.2
IC25 %(v/v) (95% CL)	51.1 (48.3 - 54.6)
IC50 %(v/v) (95% CL)	55.4 (51.5 - 61.2)

Reviewed by: L. Terry

Date reviewed: August 26, 2009

## 72-h Algal Growth Inhibition Toxicity Test Water Quality Measurements

Client : Rescan Setup by: EE  
 Sample ID: SCF Test Date/Time: July 7, 2009 1400h  
 Work Order No.: 09209 Test Species: Pseudokirchneriella subcapitata

Culture Date: July 2, 2009 Age of Culture: 5 d Culture Health: Good  
 Culture Count: 1 237 2 223 Average: 230 Culture Cell Density (c1): 230 x 10<sup>4</sup>

$$v1 = \frac{220,000 \text{ cells/ml} \times 100 \text{ ml}}{(c1) 230 \times 10^4 \text{ cells/ml}} = 9.56 \text{ mL}$$

Time Zero Counts: 1 20 2 23 Average: 21.5 x 10<sup>4</sup>

No. of Cells/mL: 21.5 x 10<sup>4</sup> Initial Density: # cells/mL ÷ 220 µL x 10 µL = 9773

Concentration %(v/v)	Water Quality Measurements					Microplates rotated 2X per day?			
	pH	Temp (°C)				0 h	24 h	48 h	72 h
	0 h	0 h	24 h	48 h	72 h				
Control	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
1.48	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
2.95	6.9	24.6	24.7	24.3	25.4	✓	✓	✓	✓
5.9	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
11.9	7.0	24.7	24.9	24.3	25.4	✓	✓	✓	✓
23.8	7.1	24.7	24.9	24.3	25.4	✓	✓	✓	✓
47.6	7.2	24.9	24.9	24.3	25.4	✓	✓	✓	✓
95.2	7.4	24.9	24.9	24.3	25.4	✓	✓	✓	✓
Initials	EE	EE	EE	JLT	JLT	EE	EE	JLT	JLT

Initial control pH: Well 1: 6.8 Well 2: 6.8

Final control pH: Well 1: 6.8 Well 2: 6.8

Light intensity (lux): 3980 Date measured: July 7, 2009

Sample Description: light yellow, turbid

Comments: \_\_\_\_\_

Reviewed: A. Terry Date reviewed: August 25, 2009

***Pseudokirchneriella subcapitata* Toxicity Test Data Sheet**  
**72-h Algal Cell Counts**

Client: Rescan Start Date/Time: July 7/09 @ 1400h  
 Work Order #: 09209 Termination Date: July 10/09  
 Sample ID: SCR Test set up by: ECC  
 % (V/V)

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A	25					JLT
	B	31					
	C	27					
	D	35					
	E	32					
	F	28	24				
	G	39					
	H	26					
1.48	A	31					
	B	23					
	C	32					
	D	29					
2.95	A	35					
	B	19	26				
	C	31					
	D	23					
5.9	A	45					
	B	38					
	C	49					
	D	36					
11.9	A	52					
	B	60					
	C	78					
	D	48					
23.8	A	62					
	B	73					
	C	67					
	D	77					
47.6	A	21					
	B	31					
	C	28					
	D	30					
95.2	A	8					
	B	0					
	C	4					
	D	2					

Comments:

Reviewed by: A. Terry Date Reviewed: August 10, 2009

***Pseudokirchneriella subcapitata* Algal Counts**

Client: Rescan  
 WO#: 09209  
 Sample ID: SCR

Start Date/Time: 7-Jul-09 @1400h  
 Termination Date: 10-Jul-09

Initial Cell Density: 9772.73 cell/mL  
 215000  
 0.22  
 0.01  
 9772.727

Concentration % v/v	Rep	Count 1 (x 10 <sup>4</sup> )	Count 2 (x 10 <sup>4</sup> )	Count 3 (x 10 <sup>4</sup> )	Count 4 (x 10 <sup>4</sup> )	Mean (x 10 <sup>4</sup> )	Cell Yield (x 10 <sup>4</sup> ) cell/mL	
Control	A	25				25	24.0	mean
	B	31				31	30.0	SD
	C	27				27	26.0	CV
	D	35				35	34.0	
	E	32				32	31.0	
	F	28	24			26	25.0	
	G	39				39	38.0	
	H	26				26	25.0	
1.48	A	31				31	30.0	
	B	23				23	22.0	
	C	32				32	31.0	
	D	29				29	28.0	
2.95	A	35				35	34.0	
	B	19	26			22.5	21.5	
	C	31				31	30.0	
	D	23				23	22.0	
5.9	A	45				45	44.0	
	B	38				38	37.0	
	C	49				49	48.0	
	D	36				36	35.0	
11.9	A	52				52	51.0	
	B	60				60	59.0	
	C	58				58	57.0	
	D	48				48	47.0	
23.8	A	62				62	61.0	
	B	73				73	72.0	
	C	67				67	66.0	
	D	77				77	76.0	
47.6	A	21				21	20.0	
	B	31				31	30.0	
	C	28				28	27.0	
	D	30				30	29.0	
95.2	A	8				8	7.0	
	B	0				0	-1.0	
	C	4				4	3.0	
	D	2				2	1.0	

RET  
 Aug 25/09

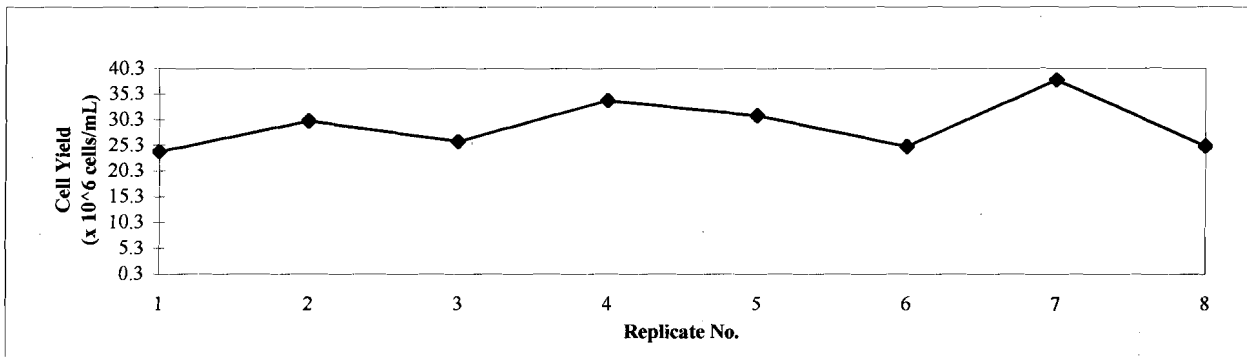
**72-h *Pseudokirchneriella subcapitata* Test - Trend Analysis by Mann-Kendall Test.**

**Instructions:**

1. Enter the project number, work order number and sample ID in the highlighted cells.
2. Enter the negative control cell yield data ( $X \times 10^6$  cells/mL) into the highlighted spreadsheet cells.
3. Compare the calculated S value to the table of critical S values at the bottom of the page.
4. If the calculated S value is smaller than the S value in the table, there is no statistically significant trend.

Client: Rescan                      Sample ID: SCR  
 W.O. No.: 09209                      Test Date: 7-Jul-09

Rep No.	1	2	3	4	5	6	7	8	Count of + Signs	Count of - Signs
Data Value	24.0	30.0	26.0	34.0	31.0	25.0	38.0	25.0		
(- Rep 1)		6.000	2.000	10.000	7.000	1.000	14.000	1.000	7	0
(- Rep 2)			-4.000	4.000	1.000	-5.000	8.000	-5.000	3	3
(- Rep 3)				8.000	5.000	-1.000	12.000	-1.000	3	2
(- Rep 4)					-3.000	-9.000	4.000	-9.000	1	3
(- Rep 5)						-6.000	7.000	-6.000	1	2
(- Rep 6)							13.000	0.000	1	0
(- Rep 7)								-13.000	0	1
<b>Totals</b>									16	11
									<b>S =</b>	5



**Critical values of (S) at a probability of p = 0.05, when the number of replicates (n) is 10 or less.**

n	4	5	6	7	8	9	10
S	4	6	9	11	14	16	19

If your calculated value for S (for the applicable number of replicates) is equal to or less than the corresponding value for S in the above table, then there is no statistically significant trend present. Refer to Gilbert (1987) for complete table of probabilities for the Mann-Kendall test.

**Reference:**

Gilbert, R.O. 1987. Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold, NY. 320 pp.

ART  
Aug 25/09

**CETIS Analytical Report**

Report Date: 22 Jul-09 11:38 (p 1 of 2)

Link/Link Code: 06-9460-0831/09209SCR

<b>Selenastrum Growth Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 12-1089-1511	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 22 Jul-09 11:22	<b>Analysis:</b> Parametric-Multiple Comparison	<b>Official Results:</b> Yes			
<b>Sample No:</b> 19-1989-8496	<b>Code:</b> SCR	<b>Client:</b> Rescan			
<b>Sample Date:</b> 05 Jul-09	<b>Material:</b> Water Sample	<b>Project:</b>			
<b>Receive Date:</b> 07 Jul-09	<b>Source:</b> Rescan				
<b>Sample Age:</b> 48h	<b>Station:</b>				

<b>Data Transform</b>	<b>Zeta</b>	<b>Alt Hyp</b>	<b>Monte Carlo</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>TU</b>	<b>PMSD</b>
Untransformed		C > T	Not Run	47.6	95.2	67.32	2.101	28.53%

<b>Bonferroni Adj t Test</b>							
<b>Control</b>	<b>vs</b>	<b>Conc-%</b>	<b>Test Stat</b>	<b>Critical</b>	<b>MSD</b>	<b>P-Value</b>	<b>Decision(5%)</b>
Negative Control		1.48	0.4324	2.613	8.309	1.0000	Non-Significant Effect
		2.95	0.6682	2.613	8.309	1.0000	Non-Significant Effect
		5.9	-3.734	2.613	8.309	1.0000	Non-Significant Effect
		11.9	-7.665	2.613	8.309	1.0000	Non-Significant Effect
		23.8	-12.46	2.613	8.309	1.0000	Non-Significant Effect
		47.6	0.8254	2.613	8.309	1.0000	Non-Significant Effect
		95.2*	8.294	2.613	8.309	0.0000	Significant Effect

<b>ANOVA Table</b>						
<b>Source</b>	<b>Sum Squares</b>	<b>Mean Square</b>	<b>DF</b>	<b>F Stat</b>	<b>P-Value</b>	<b>Decision(5%)</b>
Between	11220.76	1602.966	7	59.44	0.0000	Significant Effect
Error	755.125	26.96875	28			
Total	11975.89	1629.935	35			

<b>ANOVA Assumptions</b>						
<b>Attribute</b>	<b>Test</b>	<b>Test Stat</b>	<b>Critical</b>	<b>P-Value</b>	<b>Decision(1%)</b>	
Variances	Bartlett Equality of Variance	2.102	18.48	0.9540	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.9507		0.1098	Normal Distribution	

<b>Cell Density Summary</b>											
<b>Conc-%</b>	<b>Control Type</b>	<b>Count</b>	<b>Mean</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>Diff%</b>
0	Negative Contr	8	29.13	27.18	31.07	24	38	0.95	5.027	17.26%	0.0%
1.48		4	27.75	26.19	29.31	22	31	0.7618	4.031	14.53%	4.72%
2.95		4	27	24.67	29.33	22	34	1.134	6	22.22%	7.3%
5.9		4	41	38.65	43.35	35	48	1.144	6.055	14.77%	-40.77%
11.9		4	53.5	51.36	55.64	47	59	1.041	5.508	10.29%	-83.69%
23.8		4	68.75	66.19	71.31	61	76	1.248	6.602	9.6%	-136.1%
47.6		4	26.5	24.75	28.25	20	30	0.8522	4.509	17.02%	9.01%
95.2		4	2.75	1.55	3.95	0	7	0.585	3.096	112.6%	90.56%

*LR*  
*QA July 25/09*



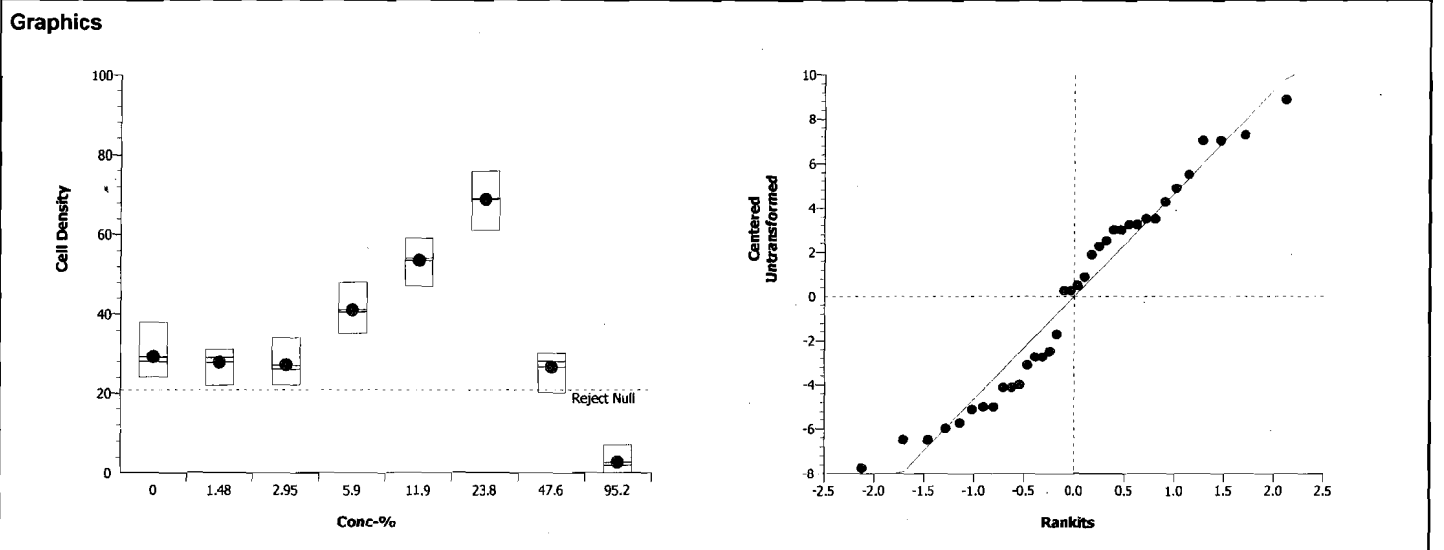
**CETIS Analytical Report**

Report Date: 22 Jul-09 11:38 (p 2 of 2)

Link/Link Code: 06-9460-0831/09209SCR

<b>Selenastrum Growth Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 12-1089-1511	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 22 Jul-09 11:22	<b>Analysis:</b> Parametric-Multiple Comparison	<b>Official Results:</b> Yes			

<b>Cell Density Detail</b>									
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Contr	38	34	31	30	26	25	25	24
1.48		31	30	28	22				
2.95		34	30	22	22				
5.9		48	44	37	35				
11.9		59	57	51	47				
23.8		76	72	66	61				
47.6		30	29	27	20				
95.2		7	3	1	0				



**CETIS Analytical Report**

Report Date: 22 Jul-09 11:38 (p 1 of 2)

Link/Link Code: 06-9460-0831/09209SCR

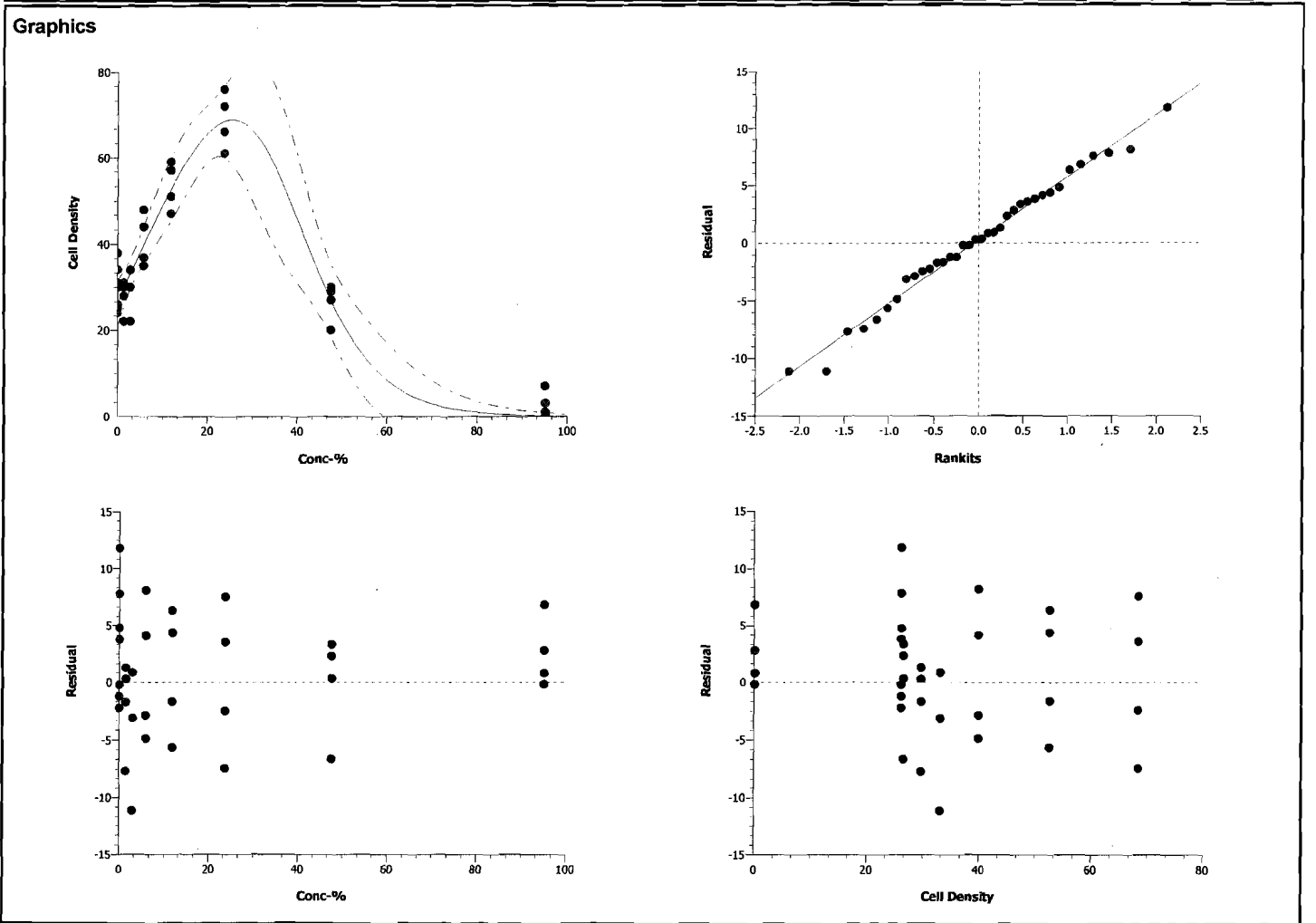
Selenastrum Growth Test			Nautilus Environmental						
Analysis No:	16-8820-8168	Endpoint:	Cell Density	CETIS Version:		CETISv1.5.0			
Analyzed:	22 Jul-09 11:24	Analysis:	Nonlinear Regression	Official Results:		Yes			
Sample No:	19-1989-8496	Code:	SCR	Client:	Rescan				
Sample Date:	05 Jul-09	Material:	Water Sample	Project:					
Receive Date:	07 Jul-09	Source:	Rescan						
Sample Age:	48h	Station:							
Non-Linear Regression Options									
Model Function	X Transform	Y Transform	Weighting Function	PTBS Function					
4P Logistic+Hormesis [Y=A(1+EX)/(1+exp(-C(X-D)))]	None	None	Normal [W=1]	Off [Y*=Y]					
Regression Summary									
Iters	Log LL	AICc	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(1%)	
14	-78.25	165.8	0.9065	Yes	2.486	4.074	0.0663	Non-Significant Lack of Fit	
Point Estimates									
% Effect	Conc-%	95% LCL	95% UCL						
SNEC	54.31	50.7	59.44						
10	49.05	N/A	51.91						
15	49.7	N/A	52.75						
20	50.39	N/A	53.66						
25	51.11	48.27	54.64						
40	53.52	50.11	58.19						
50	55.41	51.52	61.24						
Regression Parameters									
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)		
A	26.55	1.416	23.66	29.43	18.75	0.0000	Significant Parameter		
C	-0.1226	0.02439	-0.1723	-0.07292	-5.027	0.0000	Significant Parameter		
D	35.61	3.793	27.89	43.34	9.389	0.0000	Significant Parameter		
E	0.09178	0.02095	0.0491	0.1345	4.381	0.0001	Significant Parameter		
ANOVA Table									
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(1%)			
Model	10952.59	3650.865	3	114.2	0.0000	Significant			
Lack of Fit	268.1693	67.04233	4	2.486	0.0663	Non-Significant			
Pure Error	755.125	26.96875	28						
Residual	1023.294	31.97795	32						
Residual Analysis									
Attribute	Method	Test Stat	Critical	P-Value	Decision(1%)				
Variances	Bartlett Equality of Variance	2.102	18.48	0.9540	Equal Variances				
Distribution	Shapiro-Wilk Normality	0.9851		0.8979	Normal Distribution				
Cell Density Summary									
Conc-%	Control Type	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	8	29.13	24	38	0.9334	5.027	17.26%	0.0%
1.48		4	27.75	22	31	0.7486	4.031	14.53%	4.72%
2.95		4	27	22	34	1.114	6	22.22%	7.3%
5.9		4	41	35	48	1.124	6.055	14.77%	-40.77%
11.9		4	53.5	47	59	1.023	5.508	10.29%	-83.69%
23.8		4	68.75	61	76	1.226	6.602	9.6%	-136.1%
47.6		4	26.5	20	30	0.8373	4.509	17.02%	9.01%
95.2		4	2.75	0	7	0.5749	3.096	112.6%	90.56%

# CETIS Analytical Report

Report Date: 22 Jul-09 11:38 (p 2 of 2)  
 Link/Link Code: 06-9460-0831/09209SCR

<b>Selenastrum Growth Test</b>				<b>Nautilus Environmental</b>					
Analysis No: 16-8820-8168		Endpoint: Cell Density		CETIS Version: CETISv1.5.0					
Analyzed: 22 Jul-09 11:24		Analysis: Nonlinear Regression		Official Results: Yes					

Cell Density Detail									
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Control	24	30	26	34	31	25	38	25
1.48		30	22	31	28				
2.95		34	22	30	22				
5.9		44	37	48	35				
11.9		51	59	57	47				
23.8		61	72	66	76				
47.6		20	30	27	29				
95.2		7	0	3	1				



**APPENDIX E - 96-h LC50 *Oncorhynchus mykiss* Toxicity Test Data**

# Rainbow Trout Summary Sheet

Client: RESCHM

Start Date/Time: July 8/09 @ 1600

Work Order No.: 09207

Test Species: Oncorhynchus mykiss

## Sample Information:

Sample ID: SCV  
Sample Date: July 5/09  
Date Received: July 7/09  
Sample Volume: 2X20L  
Other: -

## Dilution Water:

Type: Dechlorinated municipal Tap Water  
Hardness (mg/L CaCO<sub>3</sub>): 12  
Alkalinity (mg/L CaCO<sub>3</sub>): 10

## Test Organism Information:

Batch No.: 061809  
Source: Sim Valley  
Test Volume/No. Fish: 1/10L  
Loading Density: 0.32  
Mean Length ± SD (mm): 32 ± 3 mm      Range: 28-37  
Mean Weight ± SD (g): 0.32 ± 0.04 g      Range: 0.27-0.41

## SDS Reference Toxicant Results:

Reference Toxicant ID: 09 RT 49  
Stock Solution ID: 09503  
Date Initiated: June 30/09  
96-h LC50 (95% CL): 6.1 (5.1-7.3)  
Reference Toxicant Mean ± 2 SD: 5.0 ± 1.1  
Reference Toxicant CV (%): 11.2

Test Results: The 96-h LC50 > 100% (d/d)

Reviewed by: [Signature]

Date reviewed: Aug 26/09

### 96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: Rexcon  
 Sample I.D. SC 2  
 W.O. # 09207  
 RBT Batch #: 061809  
 Date Collected/Time: July 5/09 @ 0930  
 Date Setup/Time: July 8/09 @ 1600  
 Sample Setup By: JLT

Number Fish/Volume: 10/10L  
 7-d % Mortality: 0 %  
 Total Pre-aeration Time (mins): 30 min  
 Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Y

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	14.5	/	14.5
pH	7.2	/	7.2
D.O. (mg/L)	10.0	/	10.0
Cond. (µS/cm)	171	/	171

D.O. meter: DO-1  
 pH meter: pH-1  
 Cond. Meter: C-1

Concentration % (V/V)	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
control				10	10	10	10	14.2	14.3	14.3	14.2	14.2	10.1	10.2	10.1	10.0	10.2	6.9	7.1	7.0	7.1	7.1	35	41
6.25				10	10	10	10	14.2	14.3	14.3	14.2	14.2	10.1	10.0	10.1	10.1	10.1	6.9	7.1	7.1	7.2	7.2	43	49
12.5				10	10	10	10	14.3	14.3	14.3	14.2	14.2	10.1	10.0	10.0	10.0	10.1	7.0	7.0	7.1	7.2	7.3	54	63
25				10	10	10	10	14.4	14.3	14.3	14.2	14.2	10.0	10.1	10.0	10.1	10.2	7.1	7.0	7.1	7.2	7.4	79	84
50				10	10	10	10	14.5	14.3	14.3	14.2	14.2	10.0	10.0	10.1	10.1	10.2	7.1	7.0	7.2	7.4	7.4	104	110
100				10	10	10	10	14.5	14.3	14.3	14.2	14.2	10.0	10.0	10.1	10.1	10.1	7.2	7.3	7.3	7.5	7.5	171	179
Initials				JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT

Sample Description/Comments: cloudy, some particulate

Fish Description at 96? all fish appear OK

Other Observations: \_\_\_\_\_

Reviewed by: EA

Date Reviewed: Aug. 26/09

# Rainbow Trout Summary Sheet

Client: Rescon

Start Date/Time: July 8/09 @ 1545

Work Order No.: 09207

Test Species: Oncorhynchus mykiss

## Sample Information:

Sample ID: STE 2  
Sample Date: July 5/09  
Date Received: July 7/09  
Sample Volume: 2x20L  
Other: \_\_\_\_\_

## Dilution Water:

Type: Dechlorinated municipal Tap Water  
Hardness (mg/L CaCO<sub>3</sub>): 12  
Alkalinity (mg/L CaCO<sub>3</sub>): 10

## Test Organism Information:

Batch No.: 061809  
Source: San Valley  
Test Volume/No. Fish: 1/10L  
Loading Density: 0.33  
Mean Length ± SD (mm): 33 ± 3 mm      Range: 30 - 38  
Mean Weight ± SD (g): 0.33 ± 0.03 g      Range: 0.29 - 0.39

## SDS Reference Toxicant Results:

Reference Toxicant ID: 09 RT 47  
Stock Solution ID: 09803  
Date Initiated: June 30/09  
96-h LC50 (95% CL): 6.1 (5.1 - 7.3)  
Reference Toxicant Mean ± 2 SD: 5.0 ± 1.1  
Reference Toxicant CV (%): 11%

Test Results: The 96-h LC50 > 100% (1/1)

Reviewed by: EW

Date reviewed: Aug 26/09

### 96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: Rescon  
 Sample I.D.: STEZ  
 W.O. #: 09207  
 RBT Batch #: 061809  
 Date Collected/Time: July 5/09 @ 1315  
 Date Setup/Time: July 18/09 @ 1545  
 Sample Setup By: JLT

Number Fish/Volume: 10/10L  
 7-d % Mortality: 0%  
 Total Pre-aeration Time (mins): 30 min  
 Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Y

D.O. meter: DO-1  
 pH meter: pH-1  
 Cond. Meter: C-1

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	14.4	/	14.4
pH	7.1	/	7.1
D.O. (mg/L)	10.0	/	10.0
Cond. (µS/cm)	60	/	60

Concentration % (V/V)	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
control				10	10	10	10	14.2	14.2	14.3	14.2	14.2	10.1	10.2	10.1	10.1	10.1	6.9	7.1	7.0	7.1	7.2	35	41
6.25				10	10	10	10	14.2	14.2	14.3	14.2	14.2	10.1	10.1	10.1	10.1	10.0	6.9	7.1	7.0	7.0	7.2	37	41
12.5				10	10	10	10	14.3	14.2	14.3	14.2	14.2	10.1	10.1	10.0	10.0	10.0	7.0	7.1	7.0	7.2	7.1	39	43
25				10	10	10	10	14.3	14.2	14.3	14.2	14.2	10.1	10.2	10.0	10.0	10.0	7.0	7.0	7.0	7.1	7.1	44	48
50				10	10	10	10	14.4	14.2	14.3	14.2	14.2	10.0	10.1	10.0	10.0	10.0	7.1	6.9	7.1	7.2	7.1	50	57
100				10	10	10	10	14.4	14.2	14.3	14.2	14.2	10.0	10.0	10.1	10.0	10.0	7.1	6.9	7.1	7.2	7.0	60	60
Initials				JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT

Sample Description/Comments: lightly cloudy some particulates

Fish Description at 96? all fish appear ok

Other Observations: \_\_\_\_\_

Reviewed by: JLT

Date Reviewed: Aug. 26/09



# Rainbow Trout Summary Sheet

Client: Rescon

Start Date/Time: July 8/09 @ 1550

Work Order No.: 09207

Test Species: Oncorhynchus mykiss

## Sample Information:

Sample ID: NTR2

Sample Date: July 5/09

Date Received: July 7/09

Sample Volume: 2x20L

Other: \_\_\_\_\_

## Dilution Water:

Type: Dechlorinated municipal Tap Water

Hardness (mg/L CaCO<sub>3</sub>): 12

Alkalinity (mg/L CaCO<sub>3</sub>): 10

## Test Organism Information:

Batch No.: 061809

Source: Sim Valley

Test Volume/No. Fish: 1/10L

Loading Density: 0.33

Mean Length ± SD (mm): 33 ± 3 mm

Range: 29-37

Mean Weight ± SD (g): 0.33 ± 0.05g

Range: 0.28-0.41

## SDS Reference Toxicant Results:

Reference Toxicant ID: 09 RT 47

Stock Solution ID: 09803

Date Initiated: June 30/09

96-h LC50 (95% CL): 6.1 (5.1-7.3)

Reference Toxicant Mean ± 2 SD: 5.0 ± 1.1

Reference Toxicant CV (%): 11.2

Test Results: The 96-h LC50 > 100% (1/1)

Reviewed by: EW

Date reviewed: Aug. 26/09

### 96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: Rescon  
 Sample I.D. NTR 2  
 W.O. # 09207  
 RBT Batch #: 061809  
 Date Collected/Time: July 5/09 @ 1515  
 Date Setup/Time: July 8/09 @ 1550  
 Sample Setup By: JLT

Number Fish/Volume: 10/10L  
 7-d % Mortality: 0%  
 Total Pre-aeration Time (mins): 30 min  
 Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Y

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	14.5	/	14.5
pH	7.3	/	7.3
D.O. (mg/L)	9.9	/	9.5
Cond. (µS/cm)	66	/	66

Concentration % (√/N)	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
control				10	10	10	10	14.2	14.2	14.3	14.1	14.0	10.1	10.2	10.1	10.2	10.1	6.9	7.1	7.0	7.1	7.1	35	41
6.25				10	10	10	10	14.2	14.2	14.3	14.1	14.0	10.1	10.1	10.1	10.1	10.1	7.0	7.1	7.1	7.2	7.2	39	43
12.5				10	10	10	10	14.3	14.2	14.3	14.1	14.0	10.0	10.1	10.0	10.1	10.1	7.1	7.1	7.1	7.1	7.1	40	45
25				10	10	10	10	14.4	14.2	14.3	14.1	14.0	10.0	10.0	10.0	10.2	10.2	7.2	7.2	7.2	7.2	7.1	43	48
50				10	10	10	10	14.4	14.2	14.3	14.1	14.0	9.9	10.0	10.0	10.2	10.2	7.2	7.2	7.1	7.2	7.2	51	55
100				10	10	10	10	14.5	14.2	14.3	14.1	14.0	9.9	10.1	10.0	10.1	10.2	7.3	7.2	7.3	7.3	7.2	66	71
Initials				JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT

Sample Description/Comments: clear

Fish Description at 96? all fish appear ok

Other Observations: \_\_\_\_\_

Reviewed by: JLT

Date Reviewed: Aug 26/09

Rainbow Trout Summary Sheet

Client: Rescan

Start Date/Time: JULY 8/09 @ 1555

Work Order No.: 09207

Test Species: Oncorhynchus mykiss

Sample Information:

Sample ID: SCR  
Sample Date: JULY 5/09 @ 11:12  
Date Received: JULY 7/09  
Sample Volume: 2 X 20L  
Other: —

Dilution Water:

Type: Dechlorinated Municipal Tap Water  
Hardness (mg/L CaCO<sub>3</sub>): 12  
Alkalinity (mg/L CaCO<sub>3</sub>): 10

Test Organism Information:

Batch No.: 061809  
Source: Sun Valley  
Test Volume/No. Fish: 17/16L  
Loading Density: 0.32  
Mean Length ± SD (mm): 32 ± 3 mm Range: 28-37  
Mean Weight ± SD (g): 0.32 ± 0.04 g Range: 0.28-0.42

SDS Reference Toxicant Results:

Reference Toxicant ID: 09 RT 47  
Stock Solution ID: 09503  
Date Initiated: JUNE 30/09  
96-h LC50 (95% CL): 6.1 (5.1-7.3)  
Reference Toxicant Mean ± 2 SD: 5.0 ± 1.1  
Reference Toxicant CV (%): 11.2

Test Results: The 96h LC50 > 100% (1/1)

Reviewed by: EA

Date reviewed: Aug. 26/09

### 96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: Rescan  
 Sample I.D.: SCR  
 W.O. #: 09207  
 RBT Batch #: 061809  
 Date Collected/Time: July 5/09 @ 1115  
 Date Setup/Time: July 3/09 @ 1555  
 Sample Setup By: JLT

Number Fish/Volume: 10/10L  
 7-d % Mortality: 0 %  
 Total Pre-aeration Time (mins): 30 min  
 Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Y

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	14.5		14.5
pH	7.6	/	7.6
D.O. (mg/L)	9.9	/	9.9
Cond. (µS/cm)	112		112

D.O. meter: DO-1  
 pH meter: pH-1  
 Cond. Meter: C-1

Concentration % (V/V)	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
control				10	10	10	10	14.2	14.0	14.3	14.2	14.1	10.1	10.2	10.1	10.1	10.1	6.9	7.1	7.0	7.1	7.2	35	40
6.25				10	10	10	10	14.2	14.0	14.3	14.2	14.1	10.1	10.1	10.1	10.1	10.2	7.0	7.2	7.1	7.2	7.1	33	49
12.5				10	10	10	10	14.3	14.0	14.3	14.2	14.1	10.1	10.1	10.1	10.2	10.2	7.2	7.3	7.3	7.3	7.2	33	49
25				10	10	10	10	14.4	14.0	14.3	14.2	14.1	10.0	10.1	10.0	10.1	10.1	7.4	7.4	7.4	7.3	7.4	44	55
50				10	10	10	10	14.5	14.0	14.3	14.2	14.1	10.0	10.1	10.1	10.1	10.1	7.5	7.5	7.5	7.5	7.6	74	78
100				10	10	10	10	14.5	14.0	14.3	14.2	14.1	9.9	10.1	10.0	10.2	10.2	7.6	7.5	7.5	7.7	7.8	112	119
Initials				JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT

Sample Description/Comments: cloudy, some particulate

Fish Description at 96? all fish appear ok

Other Observations: \_\_\_\_\_

Reviewed by: JLT

Date Reviewed: Aug 26/09

**APPENDIX F - 48-h LC50 *Daphnia magna* Toxicity Test Data**

# Daphnia magna Summary Sheet

Client: Rescom  
Work Order No.: 09204

Start Date/Time: July 7/09 @ 1530h  
Test Species: D. magna  
Set up by: Amber Eel

## Sample Information:

Sample ID: SC-2  
Sample Date: July 15/09  
Date Received: July 15/09  
Sample Volume: 9 L

## Test Organism Information:

Broodstock No.: 061709  
Age of young (Day 0): 24-h  
Avg No. young per brood in previous 7 d: 22  
Mortality (%) in previous 7 d: 0  
Days to first brood: 9

## NaCl Reference Toxicant Results:

Reference Toxicant ID: Om 48  
Stock Solution ID: 08Na04  
Date Initiated: July 10/09  
48-h LC50 (95% CL): 3.9 (3.2-4.9)  
Reference Toxicant Mean  $\pm$  2 SD: 4.2  $\pm$  0.8  
Reference Toxicant CV (%): 9.4

Test Results: The 48-h LC50 > 100% (N/N)

Reviewed by: A. Terry

Date reviewed: August 25, 2009

## Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: Rescan  
 Sample ID: SC-2  
 Work Order No.: 09208

Start Date/Time: July 7, 2009 1530h  
 No. Organisms/volume: 10/200mL  
 Test Organism: D.magna  
 Set up by: ECC

DO meter: DO-1 pH meter: pH-1 Conductivity meter: C-1

Concentration %(v/v)	Number of Live Organisms Rep	Number of Live Organisms		No. Immobilized	Temperature (°C)			Dissolved oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24	48		48	0	24	48	0	24	48	0	24	48	0
Control	A	10	10	0	20.3	19.8	19.7	8.6	8.7	7.9	7.7	7.9	7.7	362	364
	B														
	C														
	D														
6.25	A	10	10	0	20.3	19.8	19.7	8.7	8.7	7.9	7.7	7.9	7.8	348	353
	B														
	C														
	D														
12.5	A	10	10	0	20.3	19.8	19.7	8.7	8.7	7.9	7.7	7.9	7.8	336	344
	B														
	C														
	D														
25	A	10	10	0	20.3	19.8	19.7	8.9	8.9	7.8	7.7	7.8	7.7	312	321
	B														
	C														
	D														
50	A	10	10	0	20.1	19.8	19.7	9.0	9.0	7.6	7.6	7.6	7.3	263	272
	B														
	C														
	D														
100	A	10	10	0	20.1	19.8	19.7	9.1	9.1	7.6	7.3	7.3	7.4	164	172
	B														
	C														
	D														
Technician Initials		ECC		ECC		ECC		ECC		ECC		ECC		ECC	

	Hardness*	Alkalinity*
Conc.	*(mg/L as CaCo3)	
Control (MHW)	100	70
Highest conc.	68	24

	Initial WQ	Adjustment	Adjusted WQ
Temp (°C)	20.1		
DO (mg/L)	9.1		
pH	7.3		
Cond (µS/cm)	164		

Sample Description: light yellow, turbid  
 Comments: Batch#: 061709 7-d previous # young/brood: 22 Day of 1st Brood: 9 Previous 7-d % Mortality: 0  
 Reviewed by: A. Terry Date reviewed: August 25, 2009

Daphnia magna Summary Sheet

Client: Rescom  
Work Order No.: 09208

Start Date/Time: July 7/09 @ 1530h  
Test Species: D. magna  
Set up by: Anton ELL

Sample Information:

Sample ID: STEZ  
Sample Date: July 15/09  
Date Received: July 15/09  
Sample Volume: 9420L

Test Organism Information:

Broodstock No.: 061709  
Age of young (Day 0): 424-h  
Avg No. young per brood in previous 7 d: 22  
Mortality (%) in previous 7 d: 0  
Days to first brood: 9

NaCl Reference Toxicant Results:

Reference Toxicant ID: Om 48  
Stock Solution ID: 08Na04  
Date Initiated: July 10/09  
48-h LC50 (95% CL): 3.9 (3.2 - 4.9)  
Reference Toxicant Mean ± 2 SD: 4.2 ± 0.8  
Reference Toxicant CV (%): 9.4

Test Results: The 48-h LC50 > 100% (N/N)

Reviewed by: A. Terry

Date reviewed: August 25, 2009



## Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: Rescan  
 Sample ID: STE 2  
 Work Order No.: 09208

Start Date/Time: July 7, 2009 1530h  
 No. Organisms/volume: 10/200mL  
 Test Organism: D.magna  
 Set up by: ECC

DO meter: DO-1      pH meter: pH-1      Conductivity meter: C-1

Concentration %(v/v)	Number of Live Organisms Rep	Number of Live Organisms		No. Immobilized	Temperature (°C)			Dissolved oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24	48		48	0	24	48	0	24	48	0	24	48	0
Control	A	10	12	0	20.3	19.6	19.7	8.6		8.7	7.9		7.7	362	371
	B														
	C														
	D														
6.25	A	10	10	2	20.3	19.6	19.7	8.6		8.8	7.9		7.8	341	352
	B														
	C														
	D														
12.5	A	10	10	2	20.5	19.6	19.7	8.7		8.8	7.9		7.7	324	334
	B														
	C														
	D														
25	A	10	10	0	20.5	19.6	19.7	8.8		8.7	7.8		7.7	286	296
	B														
	C														
	D														
50	A	10	10	0	20.5	19.6	19.7	8.9		8.7	7.7		7.6	221	221
	B														
	C														
	D														
100	A	10	10	2	20.6	19.6	19.7	9.0		8.8	7.2		7.5	61	75
	B														
	C														
	D														
Technician Initials		<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>

Hardness*	Alkalinity*
Conc.	*(mg/L as CaCO <sub>3</sub> )
Control (MHW)	100      70
Highest conc.	34      6

	Initial WQ	Adjustment	Adjusted WQ
Temp (°C)	20.5		
DO (mg/L)	9.0		
pH	7.2		
Cond (µS/cm)	61		

Sample Description: clear  
 Comments: Batch#: 061709      7-d previous # young/brood: 27      Day of 1st Brood: 9      Previous 7-d % Mortality: 0

Reviewed by: A. Terry      Date reviewed: August 28, 2009

# Daphnia magna Summary Sheet

Client: Rescom  
Work Order No.: 09208

Start Date/Time: July 7/09 @ 1530h  
Test Species: D. magna  
Set up by: Anton ELL

## Sample Information:

Sample ID: NTR-2  
Sample Date: July 15/09  
Date Received: July 17/09  
Sample Volume: 9 x 20L

## Test Organism Information:

Broodstock No.: 061709  
Age of young (Day 0): 24-h  
Avg No. young per brood in previous 7 d: 22  
Mortality (%) in previous 7 d: 0  
Days to first brood: 9

## NaCl Reference Toxicant Results:

Reference Toxicant ID: Om 48  
Stock Solution ID: 08Na04  
Date Initiated: July 10/09  
48-h LC50 (95% CL): 3.9 (3.2-4.9)  
Reference Toxicant Mean  $\pm$  2 SD: 4.2  $\pm$  0.8  
Reference Toxicant CV (%): 9.4

Test Results: The 48-h LC50 > 100% (UN)

Reviewed by: A. Berg

Date reviewed: August 25, 2009

## Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: Rescan  
 Sample ID: NTK-2  
 Work Order No.: 09208

Start Date/Time: July 7, 2009 1530L  
 No. Organisms/volume: 10/200mL  
 Test Organism: D.magna  
 Set up by: ECC

DO meter: DO-1      pH meter: pH-1      Conductivity meter: C-1

Concentration %(v/v)	Number of Live Organisms Rep	Number of Live Organisms		No. Immobilized 48	Temperature (°C)			Dissolved oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24	48		0	24	48	0	24	48	0	24	48	0	48
Control	A	10	10	0	20.3	19.7	19.9	8.6	8.7	7.9	7.7	7.7	362	371	
	B														
	C														
	D														
6.25	A	10	10	0	20.3	19.7	19.7	8.7	8.8	7.9	7.8	7.8	343	348	
	B														
	C														
	D														
12.5	A	6	10	0	20.5	19.7	19.7	8.7	8.8	7.9	7.7	325	331		
	B														
	C														
	D														
25	A	10	10	0	20.5	19.7	19.7	8.8	8.7	7.8	7.7	287	293		
	B														
	C														
	D														
50	A	10	10	0	20.6	19.7	19.7	8.9	8.8	7.7	7.8	215	224		
	B														
	C														
	D														
100	A	10	10	0	20.6	19.7	19.7	9.1	8.8	7.4	7.8	67	74		
	B														
	C														
	D														
Technician Initials		N	N	N	EN	N	N	EN	N	EN	N	EN	N	N	

Hardness*	Alkalinity*
Conc. (mg/L as CaCO <sub>3</sub> )	
Control (MHW)	70
Highest conc.	16

	Initial WQ	Adjustment	Adjusted WQ
Temp (°C)	20.5		
DO (mg/L)	9.1		
pH	7.4		
Cond (µS/cm)	67		

Sample Description: clean  
 Comments: Batch#: 061709 7-d previous # young/brood: 22 Day of 1st Brood: 9 Previous 7-d % Mortality: 0  
 Reviewed by: A. Teng Date reviewed: August 25, 2009

# Daphnia magna Summary Sheet

Client: Rescan  
Work Order No.: 09208

Start Date/Time: July 7/09 @ 1530h  
Test Species: D. magna  
Set up by: Jason Lee

## Sample Information:

Sample ID: SCR  
Sample Date: July 5/09  
Date Received: July 7/09  
Sample Volume: 9 x 20L

## Test Organism Information:

Broodstock No.: 061709  
Age of young (Day 0): 24-h  
Avg No. young per brood in previous 7 d: 22  
Mortality (%) in previous 7 d: 0  
Days to first brood: 9

## NaCl Reference Toxicant Results:

Reference Toxicant ID: Om 48  
Stock Solution ID: 08Na04  
Date Initiated: July 10/09  
48-h LC50 (95% CL): 3.9 (3.2 - 4.9)  
Reference Toxicant Mean  $\pm$  2 SD: 4.2  $\pm$  0.8  
Reference Toxicant CV (%): 9.4

Test Results: The 48-h LC50 > 100% (UN)

Reviewed by: A. Teng

Date reviewed: August 25, 2009

## Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: Rescan  
 Sample ID: SCP  
 Work Order No.: 09208

Start Date/Time: July 7, 2009 1530h  
 No. Organisms/volume: 10/200mL  
 Test Organism: D.magna  
 Set up by: ECC

DO meter: DO-1 pH meter: pH-1 Conductivity meter: C-1

Concentration %(v/v)	Number of Live Organisms Rep	24		48		No. Immobilized	Temperature (°C)			Dissolved oxygen (mg/L)			pH			Conductivity (µS/cm)	
		0	24	48	0		24	48	0	24	48	0	24	48	0	48	
Control	A	10	10			0	20.3	19.8	19.7	8.6		8.7	7.9		7.7	342	363
	B																
	C																
	D																
6.25	A	10	10			0	20.3	19.8	19.7	8.6		8.8	7.9		7.8	346	350
	B																
	C																
	D																
12.5	A	10	10			0	20.4	19.8	19.7	8.7		8.8	7.9		7.8	331	337
	B																
	C																
	D																
25	A	10	10			0	20.4	19.8	19.2	8.9		8.8	7.9		7.9	301	307
	B																
	C																
	D																
50	A	10	10			0	20.9	19.8	19.5	8.9		8.9	7.9		7.9	238	244
	B																
	C																
	D																
100	A	10	10			2	20.5	19.5	19.7	9.1		8.9	7.9		7.9	117	125
	B																
	C																
	D																
Technician Initials		<u>W</u>	<u>N</u>				<u>W</u>	<u>N</u>	<u>N</u>	<u>W</u>		<u>N</u>	<u>W</u>	<u>N</u>	<u>W</u>	<u>N</u>	<u>W</u>

Hardness*	Alkalinity*
Conc.	*(mg/L as CaCo3)
Control (MHW)	<u>120</u> <u>70</u>
Highest conc.	<u>56</u> <u>38</u>

	Initial WQ	Adjustment	Adjusted WQ
Temp (°C)	<u>20.5</u>		
DO (mg/L)	<u>9.1</u>		
pH	<u>7.9</u>		
Cond (µS/cm)	<u>117</u>		

Sample Description: light yellow, turbid

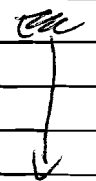
Comments: Batch#: 061709 7-d previous # young/brood: 27 Day of 1st Brood: 9 Previous 7-d % Mortality: 0

Reviewed by: A. Teng Date reviewed: August 25, 2009

Client: Rescan

W.O.#: 09211

### Hardness and Alkalinity Datasheet

Sample ID	Sample Date	Alkalinity				Hardness			Technician
		Sample Volume (mL)	(mL) 0.02N HCL/H <sub>2</sub> SO <sub>4</sub> used to pH 4.5	(mL) of 0.02N HCL/H <sub>2</sub> SO <sub>4</sub> used to pH 4.2	Total Alkalinity (mg/L CaCO <sub>3</sub> )	Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness (mg/L CaCO <sub>3</sub> )	
NTR-2	July 7/09	50.0	0.9	1.0	16	50	1.6	32	
STE-2	July 7/09	↓	0.4	0.5	6	50	1.7	34	
SC-2	↓	↓	1.3	1.4	24	50	3.4	68	
SCR	↓	↓	2.0	2.1	38	50	2.8	56	

Notes: \_\_\_\_\_

Reviewed by: A. Terry

Date Reviewed: August 25, 2009

**APPENDIX G - Chain-of-Custody Forms**

# Nautilus Environmental

# Chain of Custody (electronic)

- California: 5550 Morehouse Drive, Suite 150, San Diego, CA 92121
- Washington: 5009 Pacific Highway East, Suite 2, Tacoma, WA 98424
- British Columbia: 8664 Commerce Court, Burnaby, BC, V5A 4N7

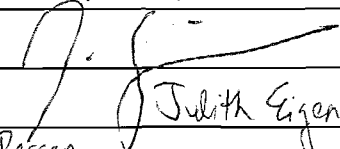
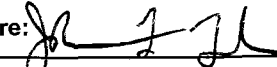
Date July 5, 09 Page 1 of 1

<b>Sample Collection By:</b>		<b>Report to:</b>	<b>Invoice to:</b> Project # 868-004-09 KSM
<b>Company:</b>		Rescan Environmental	Same as reporting address
<b>Address:</b>		1111 West Hastings, 6th floor	
<b>City/Prov/Postal Code:</b>		Vancouver, BC V6E 2J3	
<b>Contact:</b>		Judith Eigenbrod/Mark Whelley	
<b>Phone:</b>		604-689-9460	
<b>Email:</b>		jeigenbrod@rescan.com, mwhelley@rescan.com	

							ANALYSES REQUIRED						Receipt Temperature (°C)				
SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	# OF CONTAINERS	COMMENTS	Acute (Rainbow)	Acute (Daphnia)	Chronic (algae)	Chronic (Macrophyte)	Chronic (cerio)	Chronic (rainbow)					
1	SC2	7/5/2009	9:30am	water	carboy	9		X	X	X	X	X	X				8.6
2	✓ STE2	7/5/2009	13:15	water	carboy	9		X	X	X	X	X	X				
3	NTR2	7/5/2009	15:15	water	carboy	9		X	X	X	X	X	X				
4	SCR	7/5/2009	11:15am	water	carboy	9		X	X	X	X	X	X				
5																	
6																	
7																	
8																	
9																	
10																	

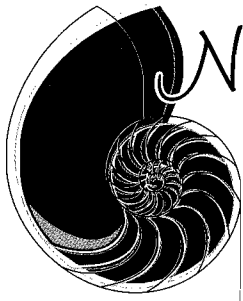
read @ 0900  
July 7/09  
scr

W# #  
 09207  
 09208  
 09209  
 09210  
 09211  
 09212

<b>PROJECT INFORMATION</b>		<b>SAMPLE RECEIPT</b>		<b>RELIQUINSHED BY (CLIENT)</b>		<b>RELIQUINSHED BY (COURIER)</b>	
Client: <u>Rescan</u>		Total # Containers:	<u>36</u>	Signature: 		Signature:	
P.O. No.:		Good Condition?	<input checked="" type="checkbox"/>	Print: <u>Judith Eigenbrod</u>		Print:	
Shipped Via:		Matches Schedule?	<input checked="" type="checkbox"/>	Company: <u>Rescan</u>		Company: <u>Bandstra</u>	
SPECIAL INSTRUCTIONS/COMMENTS: Can you please include visual observations of the level of turbidity / settling of solids during the tests + report them? Thank! ⓓ shipped to Tacoma lab as per ART				Time/Date: <u>July 5, 09, 7:00 pm</u>		Time/Date: <u>0900 July 7/09</u>	
				<b>RECEIVED BY (COURIER)</b>		<b>RECEIVED BY (LABORATORY)</b>	
				Signature:		Signature: 	
				Print:		Print: <u>John T. Nautilus Environmental</u>	
		Company:		Company: <u>Nautilus Environmental</u>		Time/Date: <u>0900 July 7/09</u>	

Additional costs may be required for sample disposal or storage. Net 30 unless otherwise contracted.





Nautilus Environmental

**Toxicity Testing on the samples SC2, STE2, NTR2 and  
SCR- July 2009**

**Final Toxicity Test Report**

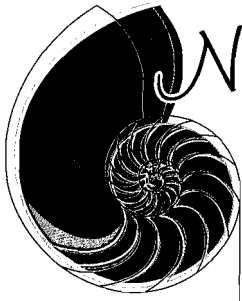
Report date: September 22, 2009

Submitted to:

**RESCAN ENVIRONMENTAL SERVICES LTD.**

Vancouver, BC

*Burnaby Laboratory*  
8664 Commerce  
Court  
Burnaby, BC  
V5A 4N7



# Nautilus Environmental

WO #: 09207-212

Ms. Judith Eigenbrod  
Rescan Environmental Services Ltd.  
6<sup>th</sup> Floor, 1111 W. Hastings Street  
Vancouver, BC  
V6E 2J3

September 22, 2009

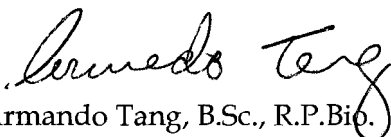
Ms. Eigenbrod:

**Re: Toxicity testing on samples SC2, STE2, NTR2, and SCR (all collected on July 5, 2009)**

Nautilus Environmental is pleased to provide you with the results of the toxicity tests conducted on samples SC2, STE2, NTR2 and SCR received on July 7, 2009. Testing was conducted following Environment Canada methods. All test acceptability criteria specified by Environment Canada protocols were met. A summary of the test methods and results are provided in the following report.

Please feel free to contact the undersigned at 604-420-8773 should you have any questions or require any additional information.

**Nautilus Environmental**

  
Armando Tang, B.Sc., R.P.Bio.  
Laboratory Manager

## TABLE OF CONTENTS

	Page
TABLE OF CONTENTS .....	i
1.0 INTRODUCTION .....	1
2.0 METHODS .....	1
2.1 <i>Ceriodaphnia dubia</i> survival and reproduction test.....	2
2.2 7-d <i>Oncorhynchus mykiss</i> embryo viability test.....	2
2.3 7-d <i>Lemna minor</i> growth inhibition test.....	3
2.4 72-h <i>Pseudokirchneriella subcapitata</i> growth inhibition test.....	4
2.5 96-h LC50 <i>Oncorhynchus mykiss</i> test.....	4
2.6 48-h LC50 <i>Daphnia magna</i> test.....	5
2.7 Quality Assurance/Quality Control (QA/QC) .....	5
3.0 RESULTS .....	13
3.1 <i>Ceriodaphnia dubia</i> survival and reproduction test.....	13
3.2 7-d <i>Oncorhynchus mykiss</i> embryo viability test.....	13
3.3 7-d <i>Lemna minor</i> growth inhibition test.....	13
3.4 72-h <i>Pseudokirchneriella subcapitata</i> growth inhibition test.....	14
3.5 96-h LC50 <i>Oncorhynchus mykiss</i> test .....	14
3.6 48-h LC50 <i>Daphnia magna</i> test.....	15
3.7 Quality Assurance/Quality Control .....	15
4.0 REFERENCES.....	23

## LIST OF TABLES

Table 1.	Summary of test conditions: <i>Ceriodaphnia dubia</i> survival and reproduction test. ....	7
Table 2.	Summary of test conditions for the rainbow trout embryo viability test.....	8
Table 3.	Summary of test conditions for the <i>Lemna minor</i> growth inhibition test.....	9
Table 4.	Summary of test conditions for the <i>Pseudokirchneriella subcapitata</i> growth inhibition test. ....	10
Table 5.	Summary of test conditions for the 96-h rainbow trout LC50 test. ....	11
Table 6.	Summary of test conditions for the 48-h <i>Daphnia magna</i> LC50 test.....	12
Table 7.	Toxicity test results for the <i>Ceriodaphnia dubia</i> survival and reproduction test.....	16
Table 8.	Toxicity test results for the <i>Oncorhynchus mykiss</i> embryo viability test.....	17
Table 9.	Toxicity test results for the <i>Lemna minor</i> growth inhibition test.....	18
Table 10.	Toxicity test results for the <i>Pseudokirchneriella subcapitata</i> growth inhibition test. ....	19

## TABLE OF CONTENTS

	<b>Page</b>
Table 11. Toxicity test results for the 96-h LC50 <i>Oncorhynchus mykiss</i> test.....	20
Table 12. Toxicity test results for the 48-h LC50 <i>Daphnia magna</i> test.....	21
Table 13. Reference toxicant test results.....	22

## LIST OF APPENDICES

- APPENDIX A - *Ceriodaphnia dubia* Toxicity Test Data
- APPENDIX B - *Oncorhynchus mykiss* embryo Toxicity Test Data
- APPENDIX C - *Lemna minor* Toxicity Test Data
- APPENDIX D- *Pseudokirchneriella subcapitata* Toxicity Test Data
- APPENDIX E - 96-h LC50 *Oncorhynchus mykiss* Toxicity Test Data
- APPENDIX F- 48-h LC50 *Daphnia magna* Toxicity Test Data
- APPENDIX G- Chain-of-Custody Forms

## 1.0 INTRODUCTION

Nautilus Environmental (Burnaby, BC) conducted toxicity tests for Rescan Environmental Services Ltd. on samples identified as SC2, STE2, NTR2 and SCR, all collected on July 5, 2009. The samples were delivered to the Nautilus Environmental Laboratory in Burnaby, BC on July 7, 2009. The samples were transported in thirty-six 20-L collapsible containers in coolers containing ice packs and were stored at 4°C in the dark prior to testing. The following sublethal toxicity tests were conducted on all four samples:

- *Ceriodaphnia dubia* survival and reproduction
- 7-d Rainbow trout (*Oncorhynchus mykiss*) embryo viability
- 7-d *Lemna minor* growth inhibition
- 72-h *Pseudokirchneriella subcapitata* (formerly identified as *Selenastrum capricornutum*) growth inhibition
- 96-h Rainbow trout (*Oncorhynchus mykiss*) LC50
- 48-h *Daphnia magna* LC50

The 7-d Rainbow trout (*Oncorhynchus mykiss*) embryo viability test was conducted by the Nautilus Environmental laboratory in Tacoma, Washington.

This report describes the results of these toxicity tests. Copies of raw laboratory data sheets and statistical analysis for each test species are provided in Appendices A to F. The chain of custody form is provided in Appendix G.

## 2.0 METHODS

Methods for the toxicity tests are summarized in Tables 1 to 6 and briefly described in Sections 2.1 to 2.6. Testing was conducted according to procedures described by the Environment Canada protocols (2000a, 2000b, 2007a, 2007b and 2007c). The rainbow trout embryo viability test followed modified procedures described by Environment Canada (1998) and Canaria et al. (1999). Statistical analyses for all the tests were performed using the CETIS computer program (Tidepool Scientific Software, 2007).

## 2.1 *Ceriodaphnia dubia* survival and reproduction test

The chronic water flea test was conducted using *Ceriodaphnia dubia* and followed Environment Canada (2007a, EPS 1/RM/21) using a static-renewal method. The endpoints were survival and reproduction over a  $7 \pm 1$ -day exposure period. The test was conducted using seven concentrations (1.6, 3.1, 6.25, 12.5, 25, 50 and 100%) and a laboratory control. Ten replicates per concentration, each with one daphnid and 15 mL of sample were tested. The control and dilution water was 20% Perrier water diluted with deionized water (hardness 80-100 mg/L CaCO<sub>3</sub>). Test solutions were renewed daily by transferring the adult daphnid into freshly prepared solution. During renewal, the number of young produced in the previous 24 hr period were counted and recorded.

Daphnids were fed daily with a mixture of YCT and *P. subcapitata* in a 0.5:1 ratio. The test was conducted at  $25 \pm 1^\circ\text{C}$  under a 16:8 h light:dark photoperiod. Temperature, dissolved oxygen (DO) and pH were measured daily in the old and new test solutions, and conductivity was measured daily in the new solutions. The No Observed Effect Concentration (NOEC) and the Lowest Observed Effect Concentration (LOEC) were determined for both survival and reproduction. The median lethal concentration (LC50) and 95% confidence limits were calculated for survival. For the reproductive endpoint, the inhibition concentrations (IC25 and IC50) and associated 95% confidence limits were calculated. A sodium chloride reference toxicant test was conducted within 14 days of test initiation and compared to historical data to assess the health and sensitivity of *C. dubia*.

For a valid test, daphnid survival in the control must be  $\geq 80\%$ . Of the surviving daphnids,  $\geq 60\%$  must produce three broods with an average of  $\geq 15$  young within  $7 \pm 1$  days.

## 2.2 7-d *Oncorhynchus mykiss* embryo viability test

The rainbow trout (*Oncorhynchus mykiss*) embryo viability test was conducted according to Environment Canada (1998, EPS 1/RM/28) and Canaria et al. (1999) using a static-renewal method. The endpoint was embryo viability at the end of a 7-day exposure period. The test was conducted using five concentrations (6.25, 12.5, 25, 50 and 100%) and a laboratory control, with four replicates per concentration and 2-L of sample in each replicate. The control and dilution water was moderately-soft water (approximately

40 mg/L CaCO<sub>3</sub> hardness), prepared by adding reagent-grade chemicals to municipal dechlorinated water.

Thirty fertilized rainbow trout eggs were exposed in each test container. Test solutions were renewed daily and aeration was provided throughout the test. The test was conducted at 14 ± 1°C under dark conditions. Temperature, DO, and pH were measured daily in each concentration in the old and new test solutions and conductivity was measured daily in the new solutions. The NOEC and LOEC were determined, and the median and 25% effect concentrations (EC50 and EC25) with 95% confidence limits were calculated. A sodium dodecyl sulphate reference toxicant test was conducted concurrently and compared to historical data to assess the health and sensitivity of each batch of rainbow trout gametes. For a valid test, embryo viability must be ≥70% in the control.

### **2.3 7-d *Lemna minor* growth inhibition test**

The *L. minor* test was conducted according to Environment Canada (2007b, EPS 1/RM/37) in a static system. The endpoints were plant growth defined by the number of fronds and the dry weight of the plants following a 7-day exposure period. Nutrients were added to the sample prior to preparing the test concentrations. The test was conducted using seven concentrations (1.5, 3.0, 6.1, 12.1, 24.3, 48.5, 97%) and a laboratory control, with four replicates per concentration and 150 mL of sample in each replicate. The control and dilution water was modified APHA media (i.e., deionized water with nutrients added).

Two healthy three-frond plants were placed in each test container at test initiation. The test was conducted at 25 ± 2°C under continuous light. Temperature was measured daily in the incubation chamber. Temperature and pH were measured at test initiation and termination. Conductivity was measured only at test initiation.

The NOEC and LOEC were determined for both growth endpoints. The IC25, IC50 values and associated 95% confidence limits were also calculated. A potassium chloride reference toxicant test was conducted within 14 days of test initiation and compared to historical data to assess the health and sensitivity of the duckweed.

For the test to be considered valid, the number of fronds at the end of the test must increase  $\geq 8$ -fold in the control (i.e., the mean number of fronds in the control must be at least 48).

#### **2.4 72-h *Pseudokirchneriella subcapitata* growth inhibition test**

The *P. subcapitata* test was conducted according to Environment Canada (2007c, EPS 1/RM/25) in a static system. The endpoint was algal growth measured as cell yield over a 72-h exposure period. The test was conducted in a 96-well microplate using seven concentrations (1.48, 2.95, 5.9, 11.9, 23.8, 47.6, 95.2%) and a laboratory control, with four replicates per sample concentration and eight replicates for the control. Nutrients were added to the sample prior to preparing the test concentrations. The control and dilution water was deionized water with nutrients added. The test volume was 220  $\mu\text{L}$  in each replicate.

Each well was inoculated with a density of approximately 10,000 algal cells/mL. The test was conducted in an incubation chamber maintained at  $24 \pm 2^\circ\text{C}$  under continuous light. Temperature and pH were measured in each concentration at test initiation. Temperature was measured daily in the incubation chamber. Algal cells in each well were counted using a hemacytometer under a compound microscope after the 72-h exposure period. The NOEC and LOEC were determined and the IC<sub>25</sub>, IC<sub>50</sub> and associated 95% confidence limits were also calculated. A zinc reference toxicant test was conducted within 14 days of test initiation and compared to historical data to assess the health and sensitivity of the algal culture.

For the test to be considered valid, the number of algal cells at the end of the test must increase by  $\geq 16$ -fold in the control. In addition, the controls cannot exhibit a positive or negative trend when analyzed statistically using the Mann-Kendall test and the coefficient of variation of the control replicates cannot exceed 20%.

#### **2.5 96-h LC<sub>50</sub> *Oncorhynchus mykiss* test**

The rainbow trout LC<sub>50</sub> test was conducted using juvenile fish and followed the Environment Canada protocol (2000a, EPS 1/RM/13) in a static system. The test was conducted using five concentrations (6.25, 12.5, 25, 50 and 100%) and a laboratory control. The control and dilution water was dechlorinated municipal water. The test



involved exposing ten juvenile rainbow trout (acclimated for  $\geq 14$  days, with wet weights of 0.3 to 2.5g) to each test concentration in glass aquaria.

The test was conducted at  $15 \pm 1^\circ\text{C}$  under a 16:8 h light:dark photoperiod. Temperature, DO and pH were measured daily in each concentration and conductivity was measured at test initiation and termination. After 96 h, the median lethal concentration (LC50) and 95% confidence limits were calculated. A monthly sodium dodecyl sulphate reference toxicant test was conducted and compared to historical data to assess the health and sensitivity of the juvenile rainbow trout. For the test to be considered valid, rainbow trout survival must be  $\geq 90\%$  in the control.

## **2.6 48-h LC50 *Daphnia magna* test**

The 48h LC50 *Daphnia magna* test was conducted according to Environment Canada (2000b, EPS 1/RM/14). The test was conducted using five concentrations (6.25, 12.5, 25, 50 and 100%) and a laboratory control. The control and dilution water was moderately-hard reconstituted water (hardness 80-100 mg/L), prepared by adding reagent-grade chemicals to deionized water. Ten *D. magna* (<24h old) were exposed in each test concentration using a 200-mL volume.

The test was conducted at  $20 \pm 2^\circ\text{C}$  under a 16:8 h light:dark photoperiod. Temperature and survival were measured daily while DO, pH and conductivity were measured at test initiation and termination. After 48 h, the median lethal concentration (LC50) and 95% confidence limits were calculated. A sodium chloride reference toxicant test was conducted within 14 days of test initiation, and compared to historical data to assess the health and sensitivity of *D. magna*. For a valid test, *D. magna* survival must be  $\geq 90\%$  in the control.

## **2.7 Quality Assurance/Quality Control (QA/QC)**

Nautilus follows a comprehensive QA/QC program to ensure that the data generated are of high quality and scientifically defensible. Our QA program is designed to ensure that all tests are performed in accordance with well-established and approved methods (e.g., Environment Canada, US EPA).

To meet these objectives, Nautilus has implemented a number of quality control procedures that include the following:

- Negative controls to ensure that appropriate testing performance criteria are met;
- Positive controls to assess the health and sensitivity of the test organisms;
- Use of appropriate species and life stage to meet the study objectives;
- Appropriate number of replicates to allow for proper statistical analyses;
- Calibration and proper maintenance of instruments to ensure accurate measurements;
- Proper documentation and recordkeeping to allow traceability of performance;
- Adequate supervision and training of staff to ensure that methods are followed;
- Proper handling and storage of samples to ensure their integrity;
- Procedures in place to address issues that may arise during testing and ensure the implementation of appropriate corrective actions; and
- Rigorous review of data by a registered professional biologist to ensure they are of good quality and scientifically defensible prior to releasing to the client.

**Table 1. Summary of test conditions: *Ceriodaphnia dubia* survival and reproduction test.**

Test organism	<i>Ceriodaphnia dubia</i>
Test organism source	In-house culture
Test organism age	<24 hr old neonates produced within 12 hr
Test type	Static renewal
Test duration	7 ± 1 day
Test chamber	20 mL test tube
Test solution volume	15 mL
Test concentrations (% sample)	Seven concentrations, plus laboratory control
Number of replicates	10
Control/dilution water	20% Perrier water (hardness 80-100mg/L CaCO <sub>3</sub> )
Test solution renewal	Daily
Test temperature	25 ± 1°C
Number of organisms/chamber	1
Feeding	Daily, with 0.1 ml <i>Pseudokirchneriella subcapitata</i> and 0.05 mL YCT
Light intensity	100 to 600 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test protocol	Environment Canada, 2007a, EPS 1/RM/21
Test endpoints	Survival and reproduction
Test acceptability criterion for controls	≥80% survival; ≥15 young per surviving control; ≥60% of controls producing three or more broods
Reference Toxicant	Sodium chloride

**Table 2. Summary of test conditions for the rainbow trout embryo viability test.**

---

Test organism	<i>Oncorhynchus mykiss</i>
Test organism source	Fraser Valley Trout Hatchery
Test organism age	< 24 hours
Test type	Static-renewal
Test duration	7 days
Test chamber	2-L plastic containers
Test solution volume	2 L
Test concentrations (% sample)	Five concentrations, plus laboratory control
Number of replicates	4
Control/Dilution water	Moderately-soft water (hardness 40 - 48 mg/L CaCO <sub>3</sub> )
Test solution renewal	Daily
Test temperature	14 ± 1°C
Number of organisms/chamber	30 eggs
Feeding	None
Light intensity	Dark
Photoperiod	24 hours dark
Aeration	6.5 ± 1 mL/min/L
Test protocol	Environment Canada (1998), EPS 1/RM/28
Test endpoint	Embryo viability
Test acceptability criteria for controls	Embryo viability ≥70%
Reference toxicant	Sodium dodecyl sulphate

---

**Table 3. Summary of test conditions for the *Lemna minor* growth inhibition test.**

---

Test organism	<i>Lemna minor</i>
Test organism source	In-house culture
Test organism age	7- to 10-day old
Test type	Static
Test duration	7 days
Test chamber	250-mL glass containers
Test solution volume	150 mL
Test concentrations (% sample)	Seven concentrations, plus laboratory control
Number of replicates	4
Control/Dilution water	Deionized or distilled water with nutrients added
Test solution renewal	None
Test temperature	25 ± 2°C
Number of organisms/chamber	Two 3-frond plants
Light intensity	4000 to 5300 lux full spectrum light
Photoperiod	Continuous
Aeration	None
Test protocol	Environment Canada (2007b), EPS 1/RM/37
Test endpoint	Number of fronds and dry weight
Test acceptability criteria for controls	≥ 8-fold increase in number of fronds
Reference toxicant	Potassium chloride

---

**Table 4. Summary of test conditions for the *Pseudokirchneriella subcapitata* growth inhibition test.**

Test organism	<i>Pseudokirchneriella subcapitata</i>
Test organism source	In-house culture
Test organism age	4- to 7-day old culture in logarithmic growth phase
Test type	Static
Test duration	72 hours
Test chamber	Microplate
Test solution volume	220 µL
Test concentrations (% sample)	Seven concentrations, plus laboratory control
Number of replicates	4 for treatments; 8 for control
Control/Dilution water	Deionized or distilled water
Test solution renewal	None
Test temperature	24 ± 2°C
Number of organisms/chamber	10,000 cells/mL
Light intensity	3600 to 4400 lux
Photoperiod	Continuous
Aeration	None
Test protocol	Environment Canada (2007c), EPS 1/RM/25
Test endpoint	Algal cell growth inhibition ≥ 16-fold increase in number of algal cells; no trend when analyzed with Mann-Kendall test; and CV ≤20%
Test acceptability criteria for controls	
Reference toxicant	Zinc

**Table 5. Summary of test conditions for the 96-h rainbow trout LC50 test.**

---

Test organism	<i>Oncorhynchus mykiss</i>
Test organism source	Commercial hatchery
Test organism age	Juveniles
Test type	Static
Test duration	96 hours
Test chamber	18.2 L glass aquarium
Test solution volume	10 L
Test concentrations (% sample)	Five concentrations, plus laboratory control
Number of replicates	1
Control/Dilution water	Municipal dechlorinated water
Test solution renewal	None
Test temperature	15 ± 1°C
Number of organisms/chamber	Ten
Feeding	None
Light intensity	100 to 500 lux
Photoperiod	16 hours light/8 hours dark
Aeration	6.5 ± 1 mL/min/L
Test protocol	Environment Canada (2000a), EPS 1/RM/13
Test endpoint	96-h LC50
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium dodecyl sulphate

---

**Table 6. Summary of test conditions for the 48-h *Daphnia magna* LC50 test.**

---

Test organism	<i>Daphnia magna</i>
Test organism source	In-house culture
Test organism age	< 24 h
Test type	Static
Test duration	48 hours
Test chamber	250-mL glass beakers
Test solution volume	200 mL
Test concentrations (% sample)	Five concentrations, plus laboratory control
Number of replicates	One
Control/Dilution water	Moderately-hard reconstituted water (hardness 80-100 mg/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Number of organisms/chamber	Ten
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test protocol	Environment Canada (2000b), EPS 1/RM/14
Test endpoint	48-h LC50
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride

---



## 3.0 RESULTS

### 3.1 *Ceriodaphnia dubia* survival and reproduction test

Results of the *C. dubia* test are summarized in Table 7. The *C. dubia* test did not exhibit any significant reduction in survival in any of the concentrations tested for any of samples (SC2, STE2, NTR2, SCR). The LC50 values were all >100%.

Of the concentrations tested for SC2, five of seven concentrations (6.25, 12.5, 25, 50, 100%) exhibited significant effects on reproduction. The IC25 and IC50 values (with 95% confidence limits) were 3.9 (0.3-36.5) and >100 % (v/v), respectively. Relative to the control, reproduction was not adversely affected in any of the concentrations tested for STE2. The IC25 and IC50 values for STE2 were both >100%. Note that although the average number of young in the control for STE2 was 13.5, this result met the Environment Canada criterion of  $\geq 15$  young per daphnid, since this criterion is based on organisms that had produced three broods.

With the exception of the 1.56% concentration, all the concentrations tested for NTR2 exhibited significant adverse effects on *C. dubia* reproduction, therefore the IC25 value (with 95% confidence intervals) was 5.4 (1.6-16.1) and the IC50 value was >100% (v/v). Significant adverse effects on reproduction were observed in the highest three concentrations (25, 50, 100% (v/v)) tested for SCR. This resulted in IC25 and IC50 values (with 95% confidence intervals) of 19.3 (8.8-26.2) and 34.1 (26.9-42.5)% (v/v), respectively.

### 3.2 7-d *Oncorhynchus mykiss* embryo viability test

Results of the 7-d rainbow trout embryo viability test are provided in Table 8. Rainbow trout embryo did not exhibit any statistically significant effects on embryo development in any of the concentrations tested for SC2, STE2, NTR2 and SCR. The EC50 for embryo viability was >100% for all samples. Results are presented on the basis of results from only three of the four replicates, as discussed in Section 3.7.

### 3.3 7-d *Lemna minor* growth inhibition test

The 7-d *L. minor* test did not exhibit inhibitory effects on frond growth in any concentrations tested for samples SC2, STE2 and NTR2. For these samples, the IC25 and IC50 values for frond growth were >97. Frond growth stimulation was observed in the 1.5, 3.0, 12.1, 24.2, 48.5% (v/v)

concentrations tested for SC2. Frond growth was stimulated in the 12.1, 24.2, 48.3, 55 and 97% concentrations of STE2, however the stimulation was not significantly different from the control. Similarly non-significant frond growth stimulation was exhibited in the 3.0, 6.1, 48.5 and 97% concentrations tested for NTR2.

Of the concentrations tested for SCR, frond growth was significantly inhibited only in the 48.5% concentration. The resulting IC25 and IC50 values with 95% confidence intervals for SCR were 21.5 (5.9-58.6) and >97%, respectively.

No adverse effects on dry weight were observed in any of the concentrations tested for SC2, STE2, and NTR2, therefore the IC25 and IC50 values were all >97%. For SC2, non-significant stimulation was observed in the 1.5 and 12.1% concentrations. Stimulation was exhibited in the 48.5% concentration of STE2 however it was not significantly different relative to the control. No stimulation on dry weight was observed in NTR2. Only one of the concentrations tested (48.5%) for SCR exhibited significant adverse effects on dry weight relative to the control. The IC25 and IC50 values (with 95% confidence intervals) for SCR were 9.8 (1.7-35.3) and >97%, respectively. The test results for this species are summarized in Table 9.

### **3.4 72-h *Pseudokirchneriella subcapitata* growth inhibition test**

Significant adverse effects in the 72-h *P. capitata* growth inhibition test were observed in the 11.9, 47.6 and 95.2% concentrations of SC2. The IC25 and IC50 with 95% confidence limits for this sample were 26.1 (24.5-27.6) and 33.0 (30.9-35.1)%, respectively. Of the concentrations tested for STE2, only the highest concentration, 95.2%, exhibited adverse effects on cell density. The resulting IC25 and IC50 values with 95% confidence limits were 61.7 (52.3-69.0) and 84.1 (71.4-95.2)%, respectively. Significant adverse effects were observed in four of the concentrations tested (11.9, 23.8, 47.6, 95.2%) for NTR2, therefore the IC25 and IC50 values (with 95% confidence limits) were 11.4 (9.4-14.0) and 19.0 (15.0-25.4)%, respectively. Relative to the control, only the 95.2% concentration of sample SCR exhibited significant adverse effects. The IC25 and IC50 values (with 95% confidence limits) for SCR were 51.1 (48.3-54.6) and 55.4 (51.5-61.2)%, respectively (See Table 10).

### **3.5 96-h LC50 *Oncorhynchus mykiss* test**

Results of the rainbow trout tests are provided in Table 11. Rainbow trout survival was 100% in all the test concentrations for samples SC2, STE2, NTR2, and SCR. The 96-h LC50 values for all the samples were >100%.

### 3.6 48-h LC50 *Daphnia magna* test

*D. magna* survival was 100% in all concentrations tested for SCR, STE2, NTR2, and SCR after 48-h of test exposure. Therefore, the 48-h LC50 values were >100% for all the samples. Results of the 48-h LC50 *D. magna* tests are summarized in Table 12.

### 3.7 Quality Assurance/Quality Control

The health history of the test organisms used in the exposures was acceptable and met the requirements of the Environment Canada protocol. Aside from the rainbow trout embryo tests, and the *C. dubia* test on SC2, tests met all control acceptability criteria and water quality parameters remained within acceptable ranges specified in the protocols throughout the tests. Data for one of the replicates in each of the toxicity tests using rainbow trout embryos were excluded prior to data analysis because of poor development. The four replicates in these tests were initiated using eggs from four separate female trout, and one of the four females produced eggs with 0% normal development compared to eggs from the other three females, which ranged from 71 to 90% normal. Eggs from this female were used for replicate B in this test and, consequently, the data for replicate B were excluded prior to analysis of the data. After exclusion of replicate B, the test met the control performance criterion of at least 70% normally developed embryos in the control. While control acceptability criteria were met for the *C. dubia* test on SC2, temperature was exceeded by 0.1 °C on day 6. This minor exceedance would not likely have affected the results. Uncertainty associated with this test is best described by the confidence intervals around the IC25 and IC50 estimates.

Results of the reference toxicant tests conducted during the testing program are summarized in Table 13. These results fell within the acceptable range for organism performance, with the exception of the *P. subcapitata* test. The reference toxicant result of the *P. subcapitata* test was slightly higher than the historical laboratory mean  $\pm$  two standard deviations (SD). However, one out of 20 results may fall outside of two SD on variability alone. This minor deviation was unlikely to have affected test results. The range is defined by an LC/EC/IC mean  $\pm$  two standard deviations, which is based on historical results obtained by the laboratory. The reference toxicant test results are summarized in Table 13.

**Table 7. Toxicity test results for the *Ceriodaphnia dubia* survival and reproduction test.**

Mean ± SD								
		SC2		STE2		NTR2		SCR
Concentration (% v/v)	Survival (%)	Reproduction (No. of Young/Female)		Reproduction (No. of Young/Female)		Reproduction (No. of Young/Female)		Reproduction (No. of Young/Female)
		Survival (%)	Survival (%)	Survival (%)	Survival (%)	Survival (%)	Survival (%)	
Control	100	16.3 ± 3.3	100	13.5 ± 3.7	100	20.4 ± 1.6	100	15.3 ± 4.3
1.6	100	13.3 ± 4.7	100	13.1 ± 4.1	100	18.0 ± 2.1	100	12.3 ± 4.8
3.1	100	12.8 ± 3.1	100	12.8 ± 2.1	100	13.5 ± 1.4*	100	12.3 ± 1.8
6.25	100	10.9 ± 4.1*	100	12.7 ± 3.2	100	15.7 ± 1.6*	100	13.5 ± 2.7
12.5	100	11.6 ± 1.8*	100	13.2 ± 2.9	100	14.3 ± 3.1*	100	13.7 ± 2.0
25	100	10.9 ± 2.8*	100	11.8 ± 4.1	100	14.1 ± 2.6*	100	9.2 ± 4.7*
50	100	11.1 ± 3.2*	100	11.2 ± 4.5	100	13.9 ± 3.5*	100	5.3 ± 5.2*
100	100	11.2 ± 3.0*	100	10.6 ± 2.3	100	13.6 ± 3.4*	100	0.2 ± 0.6*
<b>Test endpoint</b>								
<b>(% v/v)</b>								
NOEC	100	3.12	100	100	100	1.56	100	12.5
LOEC	>100	6.25	>100	>100	>100	3.12	>100	25
LC50	>100	--	>100	--	>100	--	>100	--
IC25 (95% CL)	--	3.9 (0.3-36.5)	--	>100	--	5.4 (1.6-16.1)	--	19.3 (8.8-26.2)
IC50 (95% CL)	--	>100	--	>100	--	>100	--	34.1 (26.9-42.5)

Asterisks (\*) indicate treatments that are significantly different from the control.

NOEC = No Observed Effect Concentration.

LOEC = Lowest Observed Effect Concentration.

LC = Lethal Concentration.

IC = Inhibition Concentration.

SD = Standard Deviation.

CL = Confidence Limits

**Table 8. Toxicity test results for the *Oncorhynchus mykiss* embryo viability test.**

Concentration (% v/v)	Embryo Viability (%) (Mean ± SD)			
	SC2	STE2	NTR2	SCR
Control	81.1 ± 5.1	90.0 ± 5.8	90.0 ± 12.0	71.1 ± 38.5
6.25	84.4 ± 16.8	84.4 ± 10.2	86.7 ± 14.5	80.0 ± 24.0
12.5	76.7 ± 23.3	87.8 ± 8.4	87.8 ± 15.8	85.6 ± 13.9
25	75.6 ± 18.4	78.9 ± 18.4	85.6 ± 19.2	85.6 ± 13.9
50	80.0 ± 6.7	84.4 ± 21.2	83.3 ± 20.8	81.1 ± 22.2
100	80.0 ± 10.0	82.2 ± 18.4	81.1 ± 24.1	85.6 ± 8.4

Test endpoint	Embryo Viability (% v/v)	Embryo Viability (% v/v)	Embryo Viability (% v/v)	Embryo Viability (% v/v)
NOEC	100	100	100	100
LOEC	>100	>100	>100	>100
EC25	>100	>100	>100	>100
EC50	>100	>100	>100	>100

NOEC = No Observed Effect Concentration.  
 LOEC = Lowest Observed Effect Concentration.  
 EC = Effective Concentration.  
 SD = Standard Deviation.

**Table 9. Toxicity test results for the *Lemna minor* growth inhibition test.**

Concentration (% v/v)	Mean ± SD							
	SC2		STE2		NTR2		SCR	
	FronD Growth (No. of Fronds) (Mean ± SD)	Dry Weight (mg) (Mean ± SD)	FronD Growth (No. of Fronds) (Mean ± SD)	Dry Weight (mg) (Mean ± SD)	FronD Growth (No. of Fronds) (Mean ± SD)	Dry Weight (mg) (Mean ± SD)	FronD Growth (No. of Fronds) (Mean ± SD)	Dry Weight (mg) (Mean ± SD)
Control	57.5 ± 10.0	4.7 ± 0.9	49.5 ± 15.7	3.6 ± 1.1	69.2 ± 13.5	5.8 ± 1.0	59.2 ± 17.6	4.6 ± 1.4
1.5	80.5 ± 21.2	5.8 ± 1.5	39.5 ± 2.1	2.8 ± 0.3	64.5 ± 8.0	4.6 ± 0.6	48.0 ± 16.8	3.8 ± 1.8
3	59.0 ± 10.6	4.1 ± 0.8	41.0 ± 1.4	2.5 ± 0.3	72.5 ± 1.9	5.3 ± 0.7	57.0 ± 15.4	3.9 ± 1.2
6.1	56.0 ± 14.7	4.1 ± 1.1	48.0 ± 11.9	2.5 ± 1.3	75.2 ± 12.5	5.5 ± 1.4	58.0 ± 14.8	4.4 ± 1.5
12.1	64.5 ± 8.7	4.8 ± 0.7	53.0 ± 11.2	3.0 ± 0.6	61.0 ± 16.8	4.0 ± 1.2	39.8 ± 6.1	2.8 ± 0.4
24.3	61.8 ± 6.7	4.6 ± 0.6	52.2 ± 10.2	3.2 ± 0.7	61.5 ± 21.8	3.9 ± 1.5	46.2 ± 4.8	3.4 ± 0.5
48.5	57.5 ± 3.9	4.6 ± 0.5	70.3 ± 10.4	4.5 ± 0.8	71.8 ± 18.5	4.9 ± 1.4	33.0 ± 3.6*	2.3 ± 0.2*
97	46.5 ± 2.1	3.9 ± 0.6	55.0 ± 16.2	3.4 ± 1.2	78.8 ± 5.4	5.4 ± 0.4	41.2 ± 5.2	2.9 ± 0.7
Test endpoint	FronD Growth (% v/v)	Dry Weight (% v/v)	FronD Growth (% v/v)	Dry Weight (% v/v)	FronD Growth (% v/v)	Dry Weight (% v/v)	FronD Growth (% v/v)	Dry Weight (% v/v)
NOEC	97	97	97	97	97	97	48.5	48.5
LOEC	>97	>97	>97	>97	>97	>97	97	97
IC25 (95% CL)	>97	>97	>97	>97	>97	>97	21.5 (5.9-58.6)	9.8 (1.7-35.3)
IC50	>97	>97	>97	>97	>97	>97	>97	>97

Asterisks (\*) indicate treatments that are significantly different from the control.

NOEC = No Observed Effect Concentration.

LOEC = Lowest Observed Effect Concentration.

IC = Inhibition Concentration.

SD = Standard Deviation.

CL = Confidence Limits

**Table 10. Toxicity test results for the *Pseudokirchneriella subcapitata* growth inhibition test.**

Concentration (% v/v)	Cell Density (x 10 <sup>4</sup> cells/mL) (Mean ± SD)			
	SC2	STE2	NTR2	SCR
Control	28.8 ± 4.0	29.8 ± 4.3	29.4 ± 5.8	29.1 ± 5.0
1.48	35.5 ± 2.1	34.5 ± 4.8	36.8 ± 7.1	27.8 ± 4.0
2.95	35.2 ± 3.3	32.2 ± 3.1	44.5 ± 4.7	27.0 ± 6.0
5.9	23.8 ± 4.1	48.2 ± 6.7	32.2 ± 7.1	41.0 ± 6.1
11.9	20.8 ± 3.2*	44.5 ± 4.7	17.8 ± 4.6*	53.5 ± 5.5
23.8	38.0 ± 6.8	57.8 ± 8.2	13.2 ± 3.0*	68.8 ± 6.6
47.6	3.25 ± 2.8*	28.8 ± 3.8	11.2 ± 3.3*	26.5 ± 4.5
95.2	0.0 ± 0.0*	12.0 ± 3.9*	1.5 ± 1.9*	2.8 ± 3.1*
Test endpoint	Cell Density (% v/v)	Cell Density (% v/v)	Cell Density (% v/v)	Cell Density (% v/v)
NOEC	5.9	47.6	5.9	47.6
LOEC	11.9	95.2	11.9	95.2
IC25 (95% CL)	26.1 (24.5-27.6)	61.7 (52.3-69.0)	11.4 (9.4-14.0)	51.1 (48.3-54.6)
IC50 (95% CL)	33.0 (30.9-35.1)	84.1 (71.4-95.2)	19.0 (15.0-25.4)	55.4 (51.5-61.2)

NOEC = No Observed Effect Concentration.

LOEC = Lowest Observed Effect Concentration.

IC = Inhibition Concentration.

SD = Standard Deviation.

CL = Confidence Limits

**Table 11. Toxicity test results for the 96-h LC50 *Oncorhynchus mykiss* test.**

Concentration (% v/v)	Survival (%)			
	SC2	STE2	NTR2	SCR
Control	100	100	100	100
6.25	100	100	100	100
12.5	100	100	100	100
25	100	100	100	100
50	100	100	100	100
100	100	100	100	100
<b>Test endpoint (% v/v)</b>				
LC50	>100	>100	>100	>100

LC = Lethal Concentration



**Table 12. Toxicity test results for the 48-h LC50 *Daphnia magna* test.**

Concentration (% v/v)	Survival (%)			
	SC2	STE2	NTR2	SCR
Control	100	100	100	100
6.25	100	100	100	100
12.5	100	100	100	100
25	100	100	100	100
50	100	100	100	100
100	100	100	100	100
<b>Test endpoint (% v/v)</b>				
LC50	>100	>100	>100	>100

LC = Lethal Concentration

**Table 13. Reference toxicant test results.**

Species	Endpoint	Historical range (mean $\pm$ 2 SD)	CV(%)	Date Setup
<i>C. dubia</i>	Survival (LC50): 2.0 g/L NaCl	1.7 $\pm$ 0.7	22	July 2, 2009
	Reproduction (IC50): 1.2 g/L NaCl	1.2 $\pm$ 0.3	14	
<i>O.mykiss</i> (embryo)	Viability (EC50): 1.0 mg/L SDS	3.3 $\pm$ 4.5	69	July 8, 2009
<i>L. minor</i>	No. Fronds (IC25): 2.8 g/L KCL	2.5 $\pm$ 1.1	22	June 24, 2009
<i>P. subcapitata</i>	Growth (IC50): 32.4 $\mu$ g/L Zn	17.1 $\pm$ 12.0	35	July 9, 2009
<i>O.mykiss</i> (juvenile)	Survival (LC50): 6.1 mg/L SDS	5.0 $\pm$ 1.1	11	June 30, 2009
<i>D. magna</i>	Survival (LC50): 3.9 g/L NaCl	4.2 $\pm$ 0.8	9	July 10, 2009

#### 4.0 REFERENCES

- Canaria, E.C., J.R. Elphick and H.C. Bailey. 1999. A simplified procedure for conducting small-scale short-term embryo toxicity tests with salmonids. *Environ Toxicol* 14:301-307.
- Environment Canada. 1998. Biological test method: toxicity tests using early life stages of salmonid fish (rainbow trout). Environmental Protection Series EPS 1/RM/28. Second Edition, July 1998. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 102 pp.
- Environment Canada. 2000a. Biological test method: reference method for determining acute lethality of effluents to rainbow trout. Environmental Protection Series. Report EPS 1/RM/13, Second Edition, December 2000, including May 2007 amendments. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 23 pp.
- Environment Canada. 2000b. Biological test method: reference method for determining acute lethality of effluents to *Daphnia magna*. Environmental Protection Series. Report EPS 1/RM/14, Second Edition, December 2000. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 21 pp.
- Environment Canada. 2007a. Biological test method: test of reproduction and survival using the cladoceran *Ceriodaphnia dubia*. Environmental Protection Series. Report EPS 1/RM/21, Second Edition, February 2007. Environment Canada, Method Development and Application Section, Environmental Science and Technology Centre, Science and Technology Branch, Ottawa, ON. 74 pp.
- Environment Canada. 2007b. Biological test method: tests for measuring the inhibition of growth using the freshwater macrophyte, *Lemna minor*. Environmental Protection Series, Report EPS 1/RM/37. Second Edition. January 2007. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 112 pp.
- Environment Canada. 2007c. Biological test method: growth inhibition test using the freshwater alga. Environmental Protection Series, Report EPS 1/RM/25. Second Edition, March 2007. Environment Canada, Method Development and Application Section, Environmental Science and Technology Centre, Science and Technology Branch, Ottawa, ON. 53 pp.

Tidepool Scientific Software. 2007. CETIS comprehensive environmental toxicity information system, version 1.5.0D. Tidepool Scientific Software, McKinleyville, CA. 222 pp.

**APPENDIX A - *Ceriodaphnia dubia* Toxicity Test Data**

## Ceriodaphnia dubia Summary Sheet

Client: Procon  
 Work Order No.: 09211

Start Date/Time: July 8 / 09 0925h  
 Set up by: Ans

**Sample Information:**

Sample ID: SC2  
 Sample Date: July 5 / 09  
 Date Received: July 7 / 09  
 Sample Volume: 9.20 L

**Test Organism Information:**

Broodstock No.: 063009  
 Age of young (Day 0): <24 (w/in 12-h)  
 Avg No. young in first 3 broods of previous 7 d: 16  
 Mortality (%) in previous 7 d: 2  
 Avg. No. of young in previous brood: 41, 44, 45, 47, 48, 49, 50, 53  
 Females Used  $\geq$  8 young for testing

**NaCl Reference Toxicant Results:**

Reference Toxicant ID: Cd 44  
 Stock Solution ID: OF Na 04  
 Date Initiated: July 2 / 09  
 7-d LC50 (95% CL): 2.0 (1.7 - 2.3)  
 7-d IC50 (95% CL): 1.2 (1.0 - 1.5)

7-d LC50 Reference Toxicant Mean  $\pm$  2 SD: 1.7  $\pm$  0.7 CV (%): 22  
 7-d IC50 Reference Toxicant Mean  $\pm$  2 SD: 1.2  $\pm$  0.3 CV (%): 25 H

**Test Results:**

	Survival	Reproduction
NOEC %(v/v)	100	3.12
LOEC %(v/v)	>100	6.25
LC50 %(v/v) (95% CL)	>100	
IC25 %(v/v) (95% CL)		<del>3.9 (0.3 - 3.87)</del> <u>3.9 (0.3 - 36.5)</u>
IC50 %(v/v) (95% CL)		>100

Reviewed by: [Signature]

Date reviewed: Aug 27 / 09

## Chronic Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Rescan  
 Sample ID: 5C2  
 Work Order #: 09211

Start Date & Time: July 5/2009 0925L  
 Stop Date: July 14/2009 1800L  
 Test Species: Ceriodaphnia dubia

Concentration <i>Control</i>	Days														
	0		1		2		3		4		5		6		7
	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	25.1	25.4	24.2	25.6	25.3	25.4	25.7	25.0	25.0	25.4	25.2	26.0			
DO (mg/L)	8.1	7.4	8.1	7.4	8.2	7.4	8.2	7.4	8.2	7.7	8.2	7.3			
pH	8.1	7.7	8.2	7.9	8.1	7.9	8.1	7.9	8.1	7.7	8.2	7.7			
Cond. (µS/cm)	211		212		205		202		205		206		207		
Initials	A	A	A	A	A	A	A	A	A	A	BPL	BPL	N		

Concentration <i>1.9</i>	Days														
	0		1		2		3		4		5		6		7
	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.6	25.2	24.3	25.6	24.9	25.4	25.2	25.6	25.3	25.4	25.0	26.0			
DO (mg/L)	8.2	7.4	8.1	7.5	8.2	7.4	8.2	7.4	8.2	7.8	8.2	7.1			
pH	8.1	7.8	8.2	7.2	8.1	7.8	8.1	7.8	8.2	7.9	8.2	7.7			
Cond. (µS/cm)	217		212		210		206		206		200		207		
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	N			

Concentration <i>12.5</i>	Days														
	0		1		2		3		4		5		6		7
	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.7	25.4	24.3	25.6	24.6	25.4	25.2	25.6	25.3	25.4	25.0	26.0			
DO (mg/L)	8.2	7.4	8.1	7.4	8.2	7.4	8.2	7.5	8.1	7.8	8.1	7.1			
pH	8.0	7.7	8.1	7.7	8.1	7.7	8.0	7.5	8.1	7.7	8.2	7.7			
Cond. (µS/cm)	211		209		208		199		202		198		209		
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	N			

Concentration <i>100</i>	Days														
	0		1		2		3		4		5		6		7
	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	25.4	25.4	24.8	25.6	25.2	25.4	25.5	25.6	25.6	25.4	24.9	26.0			
DO (mg/L)	8.0	7.3	8.1	7.4	8.1	7.4	8.2	7.5	8.0	7.7	8.2	7.5			
pH	7.2	7.4	7.3	7.5	7.4	7.6	7.5	7.6	7.6	7.6	7.4	7.2			
Cond. (µS/cm)	170		167		168		168		169		166		170		
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	N			

	Control	100%		
Hardness*	100	68		
Alkalinity*	80	24		

Analysts: JRS, BPL, AS

Reviewed by: CC

Date reviewed: Aug 25, 2009

Sample Description: light yellow - opaque

Comments: used BS 063009

Chronic Freshwater Toxicity Test  
C. dubia Reproduction Data

Client: Pescan  
Sample ID: SC2  
Work Order: 09011

Start Date & Time: July 8 / 09 0920h  
Stop Date & Time: July 14 / 09 0800h  
Set up by: AW

0/2 (V/N)

Days	Concentration: <u>Control</u>											Concentration: <u>0/2 (V/N)</u>											Concentration: <u>3.125</u>												
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init		
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~
4	3	3	3	3	4	3	3	4	3	3	~	3	✓	3	3	3	3	3	4	3	3	~	4	4	3	4	4	2	3	3	3	3	~		
5	8	7	9	9	9	✓	7	7	8	6	BOL	6	✓	7	5	6	8	8	9	6	3	BOL	8	3	5	6	3	6	8	7	6	2	BOL		
6	6	5	7	7	2	5	8	7	8	8	JRF	✓	5	5	2	2	1	9	6	7	10	JRF	3	7	1	4	7	✓	8	✓	2	8	JRF		
7																																			
8																																			
Total	17	15	18	19	14	8	18	18	19	17	JRF	9	5	15	10	11	12	20	19	16	16	JRF	15	14	9	14	14	9	19	10	11	13	JRF		

Days	Concentration: <u>6.25</u>											Concentration: <u>12.5</u>											Concentration: <u>25</u>										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~
4	3	4	3	3	3	3	3	✓	2	✓	~	3	3	4	3	3	3	6	3	3	2	~	3	4	3	3	3	4	3	3	3	3	~
5	4	6	5	6	6	✓	✓	8	4	BOL	6	5	✓	5	6	7	✓	2	5	7	BOL	6	2	5	✓	5	✓	5	✓	4	3	BOL	
6	2	4	7	✓	5	5	4	2	3	8	JRF	✓	3	7	3	2	4	4	4	3	5	JRF	3	8	5	5	5	4	6	8	3	✓	JRF
7																																	
8																																	
Total	9	14	15	9	14	14	7	2	13	12	~	9	11	11	11	11	14	10	14	11	14	~	12	14	13	8	13	8	14	11	10	6	~

Days	Concentration: <u>50</u>											Concentration: <u>100</u>											Concentration: <u></u>										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~											
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~											
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~											
4	3	3	✓	3	4	3	✓	2	2	3	~	✓	✓	✓	3	✓	4	2	3	2	3	~											
5	4	✓	3	5	6	4	8	5	6	7	BOL	6	7	4	✓	7	9	✓	5	8	5	BOL											
6	5	4	3	5	6	5	5	7	✓	✓	JRF	6	7	6	7	7	✓	2	5	✓	4	~											
7																																	
8																																	
Total	12	7	6	13	16	12	13	14	8	10	JRF	12	14	10	10	14	13	4	13	10	12	~											

Notes: X = mortality.

Sample Description: \_\_\_\_\_

Comments: settling of sample on bottom of test tubes @ all test concentrations

Reviewed by: AW

Date reviewed: Aug 25, 2009



**CETIS Analytical Report**

Report Date: 19 Jul-09 16:05 (p 1 of 2)  
 Link/Link Code: 00-3778-8044/09211b

**Ceriodaphnia 7-d Survival and Reproduction Test** Nautilus Environmental

Analysis No: 13-7707-2943      Endpoint: 6d Survival Rate      CETIS Version: CETISv1.5.0  
 Analyzed: 19 Jul-09 16:02      Analysis: STP 2x2 Contingency Tables      Official Results: Yes

Sample No: 03-3207-8109      Code: 332078109      Client: Rescan  
 Sample Date: 05 Jul-09 09:30      Material: Mining Discharge/Runoff      Project:  
 Receive Date: 07 Jul-09 09:00      Source: Rescan  
 Sample Age: 72h      Station: SC2

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	100	<del>50</del> > 100	#Error	1	N/A

**Fisher Exact/Bonferroni-Holm Test**

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Negative Control		1.56	1.0000	1.0000	Non-Significant Effect
		3.12	1.0000	1.0000	Non-Significant Effect
		6.25	1.0000	1.0000	Non-Significant Effect
		12.5	1.0000	1.0000	Non-Significant Effect
		25	1.0000	1.0000	Non-Significant Effect
		50	1.0000	1.0000	Non-Significant Effect
		100	1.0000	1.0000	Non-Significant Effect

**Data Summary**

Conc-%	Control Type	No-Resp	Resp	Total
0	Negative Contr	10	0	10
1.56		10	0	10
3.12		10	0	10
6.25		10	0	10
12.5		10	0	10
25		10	0	10
50		10	0	10
100		10	0	10

**6d Survival Rate Detail**

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Contr	1	1	1	1	1	1	1	1	1	1
1.56		1	1	1	1	1	1	1	1	1	1
3.12		1	1	1	1	1	1	1	1	1	1
6.25		1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1

*ea Aug 25/09*

# CETIS Analytical Report

Report Date: 19 Jul-09 16:05 (p 2 of 2)  
Link/Link Code: 00-3778-8044/09211b

## Ceriodaphnia 7-d Survival and Reproduction Test

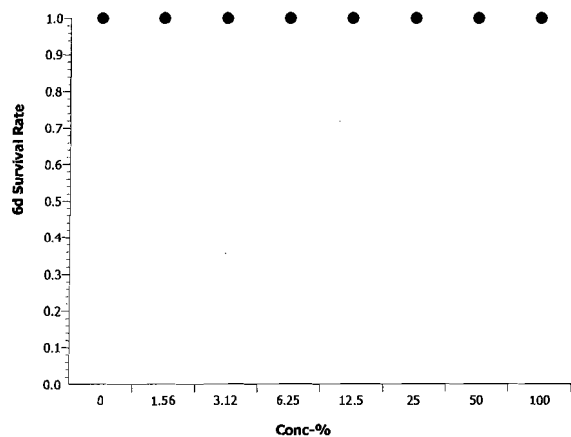
Nautilus Environmental

Analysis No: 13-7707-2943  
Analyzed: 19 Jul-09 16:02

Endpoint: 6d Survival Rate  
Analysis: STP 2x2 Contingency Tables

CETIS Version: CETISv1.5.0  
Official Results: Yes

### Graphics



*EE Aug 25/09*

**CETIS Analytical Report**

Report Date: 19 Jul-09 16:05 (p 1 of 2)  
 Link/Link Code: 00-3778-8044/09211b

**Ceriodaphnia 7-d Survival and Reproduction Test** **Nautilus Environmental**

Analysis No: 07-1221-6827      Endpoint: Reproduction      CETIS Version: CETISv1.5.0  
 Analyzed: 19 Jul-09 16:03      Analysis: Nonparametric-Control vs Treatments      Official Results: Yes

Sample No: 03-3207-8109      Code: 332078109      Client: Rescan  
 Sample Date: 05 Jul-09 09:30      Material: Mining Discharge/Runoff      Project:  
 Receive Date: 07 Jul-09 09:00      Source: Rescan  
 Sample Age: 72h      Station: SC2

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Rank		C > T	Not Run	3.12	6.25	4.416	32.05	22.02%

**Steel Many-One Rank Test**

Control	vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)
Negative Control		1.56	86.5	74	3	0.2954	Non-Significant Effect
		3.12	76	74	4	0.0705	Non-Significant Effect
		6.25*	66	74	2	0.0095	Significant Effect
		12.5*	66.5	74	1	0.0107	Significant Effect
		25*	64	74	2	0.0059	Significant Effect
		50*	65	74	2	0.0076	Significant Effect
		100*	65	74	1	0.0076	Significant Effect

**ANOVA Table**

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	242.9875	34.7125	7	3.069	0.0069	Significant Effect
Error	814.5	11.3125	72			
Total	1057.488	46.025	79			

**ANOVA Assumptions**

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	8.986	18.48	0.2537	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9579		0.0100	Non-normal Distribution

**Reproduction Summary**

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	10	16.3	15.01	17.59	8	19	0.6303	3.335	20.46%	0.0%
1.56		10	13.3	11.47	15.13	5	20	0.8911	4.715	35.45%	18.4%
3.12		10	12.8	11.59	14.01	9	19	0.5896	3.12	24.37%	21.47%
6.25		10	10.9	9.302	12.5	2	15	0.7789	4.122	37.81%	33.13%
12.5		10	11.6	10.91	12.29	9	14	0.3357	1.776	15.31%	28.83%
25		10	10.9	9.812	11.99	6	14	0.5304	2.807	25.75%	33.13%
50		10	11.1	9.841	12.36	6	16	0.6137	3.247	29.25%	31.9%
100		10	11.2	10.05	12.35	4	14	0.562	2.974	26.55%	31.29%

**Rank Transformed Summary**

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	10	65.1	57.13	73.07	9.5	77.5	3.884	20.55	31.57%	0.0%
1.56		10	46.65	35.55	57.75	3	80	5.411	28.63	61.37%	28.34%
3.12		10	43.55	34.91	52.19	14.5	77.5	4.212	22.29	51.18%	33.1%
6.25		10	35.15	25.87	44.43	1	65.5	4.523	23.94	68.09%	46.01%
12.5		10	35.15	29.26	41.04	14.5	56	2.871	15.19	43.21%	46.01%
25		10	31.25	23.75	38.75	4.5	56	3.656	19.35	61.91%	52.0%
50		10	33	24.5	41.5	4.5	69	4.141	21.91	66.39%	49.31%
100		10	34.15	27.44	40.86	2	56	3.273	17.32	50.71%	47.54%

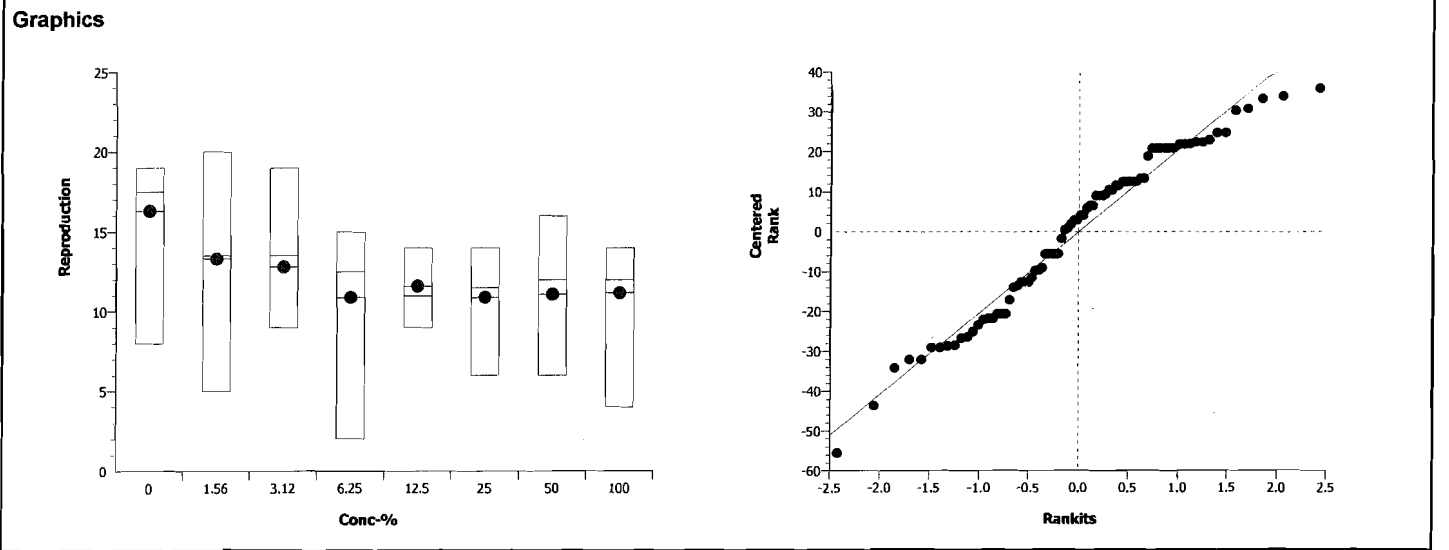
*Aug 25/09*

**CETIS Analytical Report**

Report Date: 19 Jul-09 16:05 (p 2 of 2)  
 Link/Link Code: 00-3778-8044/09211b

<b>Ceriodaphnia 7-d Survival and Reproduction Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 07-1221-6827	<b>Endpoint:</b> Reproduction	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 19 Jul-09 16:03	<b>Analysis:</b> Nonparametric-Control vs Treatments	<b>Official Results:</b> Yes			

<b>Reproduction Detail</b>											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Contr	19	19	18	18	18	17	17	15	14	8
1.56		20	19	16	16	15	12	11	10	9	5
3.12		19	15	14	14	14	13	11	10	9	9
6.25		15	14	14	14	13	12	9	9	7	2
12.5		14	14	14	11	11	11	11	11	10	9
25		14	14	13	13	12	11	10	8	8	6
50		16	14	13	13	12	12	10	8	7	6
100		14	14	13	13	12	12	10	10	10	4



*ECU Aug. 25/09*

**CETIS Analytical Report**

Report Date: 19 Jul-09 16:05 (p 1 of 2)  
 Link/Link Code: 00-3778-8044/09211b

Ceriodaphnia 7-d Survival and Reproduction Test							Nautilus Environmental		
Analysis No:	12-2531-6640	Endpoint:	Reproduction	CETIS Version:	CETISv1.5.0				
Analyzed:	19 Jul-09 16:04	Analysis:	Nonlinear Regression	Official Results:	Yes				
Sample No:	03-3207-8109	Code:	332078109	Client:	Rescan				
Sample Date:	05 Jul-09 09:30	Material:	Mining Discharge/Runoff	Project:					
Receive Date:	07 Jul-09 09:00	Source:	Rescan						
Sample Age:	72h	Station:	SC2						
Non-Linear Regression Options									
Model Function	X Transform	Y Transform	Weighting Function	PTBS Function					
3P Log-Logistic EV [Y=A/(1+(X/D)^C)]	None	None	Normal [W=1]	Off [Y*=Y]					
Regression Summary									
Iters	Log LL	AICc	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(1%)	
54	-134	274.4	0.1858	Yes	0.437	3.283	0.8213	Non-Significant Lack of Fit	
Point Estimates									
% Effect	Conc-%	95% LCL	95% UCL						
SNEC	0.358	0.0003647	23.81						
10	0.00184	N/A	3.963						
15	0.04612	9.052E-10	14.08						
20	0.5215	0.00132	25.57						
25	3.866	0.265	36.46						
40	482.5	3.017	39580						
50	8122	1.03	64080000						
Regression Parameters									
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)		
A	16.33	1.063	14.21	18.45	15.36	0.0000	Significant Parameter		
C	0.1436	0.092	-0.03959	0.3268	1.561	0.1226	Non-Significant Parameter		
D	8122	32450	-56490	72740	0.2503	0.8030	Non-Significant Parameter		
ANOVA Table									
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(1%)			
Model	218.2689	109.1345	2	10.01	0.0001	Significant			
Lack of Fit	24.71856	4.943712	5	0.437	0.8213	Non-Significant			
Pure Error	814.5	11.3125	72						
Residual	839.2186	10.89894	77						
Residual Analysis									
Attribute	Method	Test Stat	Critical	P-Value	Decision(1%)				
Variances	Bartlett Equality of Variance	8.986	18.48	0.2537	Equal Variances				
Distribution	Shapiro-Wilk Normality	0.9588		0.0114	Normal Distribution				
Reproduction Summary									
Conc-%	Control Type	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	10	16.3	8	19	0.6193	3.335	20.46%	0.0%
1.56		10	13.3	5	20	0.8756	4.715	35.45%	18.4%
3.12		10	12.8	9	19	0.5793	3.12	24.37%	21.47%
6.25		10	10.9	2	15	0.7654	4.122	37.81%	33.13%
12.5		10	11.6	9	14	0.3299	1.776	15.31%	28.83%
25		10	10.9	6	14	0.5212	2.807	25.75%	33.13%
50		10	11.1	6	16	0.603	3.247	29.25%	31.9%
100		10	11.2	4	14	0.5523	2.974	26.55%	31.29%

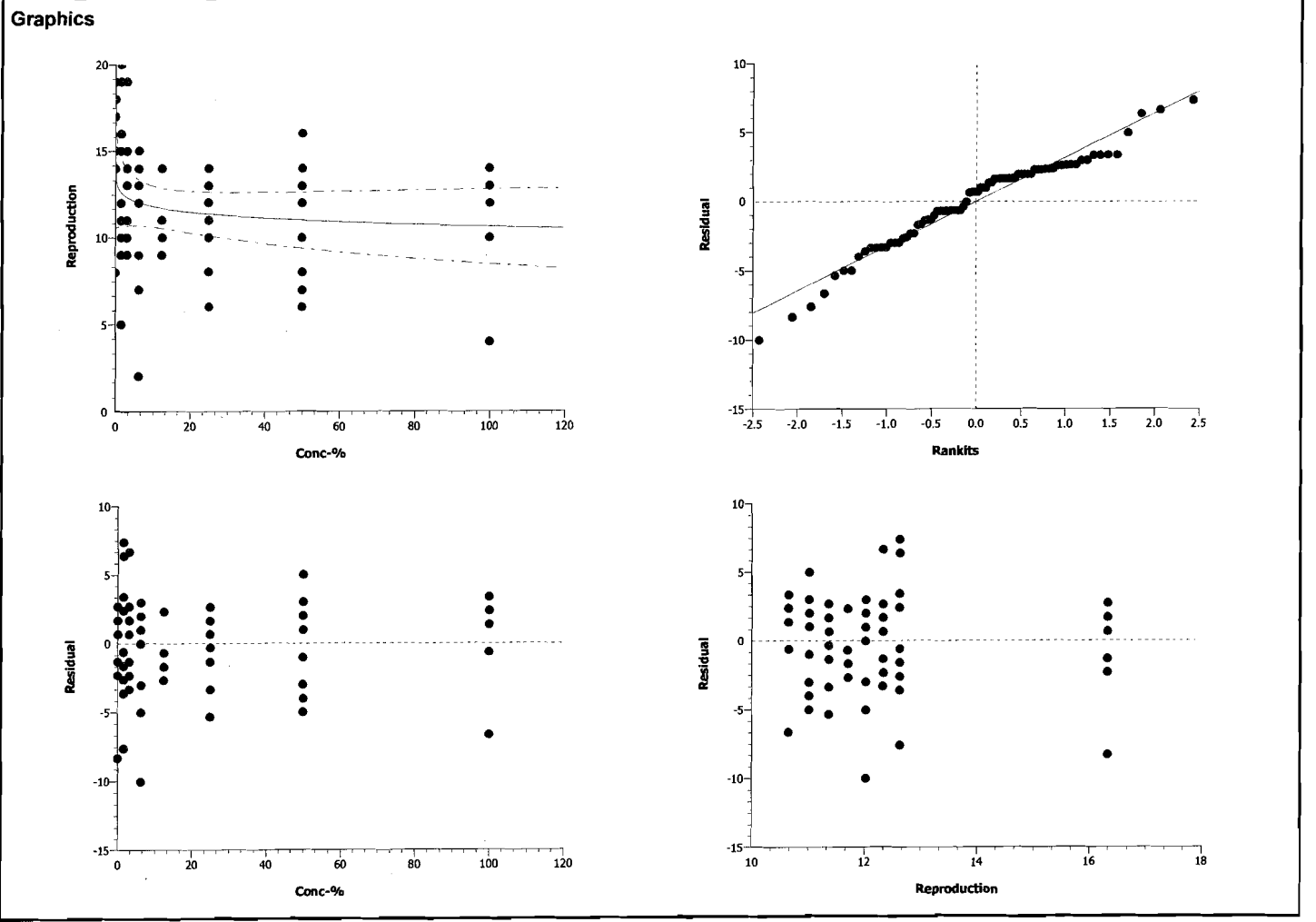
*ECU Aug 25/09*

**CETIS Analytical Report**

Report Date: 19 Jul-09 16:05 (p 2 of 2)  
 Link/Link Code: 00-3778-8044/09211b

<b>Ceriodaphnia 7-d Survival and Reproduction Test</b>						<b>Nautilus Environmental</b>					
Analysis No: 12-2531-6640		Endpoint: Reproduction				CETIS Version: CETISv1.5.0					
Analyzed: 19 Jul-09 16:04		Analysis: Nonlinear Regression				Official Results: Yes					

Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	17	15	18	19	14	8	18	18	19	17
1.56		9	5	15	10	11	12	20	19	16	16
3.12		15	14	9	14	14	9	19	10	11	13
6.25		9	14	15	9	14	14	7	2	13	12
12.5		9	11	11	11	11	14	10	14	11	14
25		12	14	13	8	13	8	14	11	10	6
50		12	7	6	13	16	12	13	14	8	10
100		12	14	10	10	14	13	4	13	10	12



*EC Aug 25/09*

## Ceriodaphnia dubia Summary Sheet

Client: Rescan  
 Work Order No.: 09211

Start Date/Time: July 8/09 @ 1600  
 Set up by: Foto AWD  
BFL

**Sample Information:**

Sample ID: STE 2  
 Sample Date: July 5/2009  
 Date Received: July 7/2009  
 Sample Volume: 200 µl x 20L

**Test Organism Information:**

Broodstock No.: 063009  
 Age of young (Day 0): <24 (within 12-h)  
 Avg No. young in first 3 broods of previous 7 d: 18  
 Mortality (%) in previous 7 d: 2  
 Individual female # used ≥8 young on test day: 32, 33, 34, 35, 36, 37, 38, 40, 41

**NaCl Reference Toxicant Results:**

Reference Toxicant ID: Cd 44  
 Stock Solution ID: 08Na04  
 Date Initiated: July 2/09  
 7-d LC50 (95% CL): 2.0 (1.7-2.3)  
 7-d IC50 (95% CL): 1.2 (1.0-1.5)

7-d LC50 Reference Toxicant Mean ± 2 SD: 1.7 ± 0.7 CV (%): 22  
 7-d IC50 Reference Toxicant Mean ± 2 SD: 1.2 ± 0.3 CV (%): 25.14

Test Results:

	Survival	Reproduction
NOEC %(v/v)	100	100
LOEC %(v/v)	>100	>100
LC50 %(v/v) (95% CL)	>100	
IC25 %(v/v) (95% CL)		>100
IC50 %(v/v) (95% CL)		>100

Reviewed by: *CA*

Date reviewed: Aug 27/09

## Chronic Freshwater Toxicity Test Initial and Final Water Quality Measurements

5

Client: RESCAN  
 Sample ID: STE2  
 Work Order #: 09211

Start Date & Time: July 8/09 @ 1600  
 Stop Date: July 15/09 @ 1600  
 Test Species: Ceriodaphnia dubia

Concentration <i>Control</i>	Days														
	0		1		2		3		4		5		6		7
	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.5	25.3	24.2	25.4	25.3	25.7	25.0	25.4	25.0	25.4	25.2	25.6	24.9	25.3	
DO (mg/L)	8.0	7.4	8.1	7.1	8.2	7.3	8.2	7.4	8.2	7.5	8.2	7.3	8.1	7.4	
pH	8.1	7.9	8.2	7.7	8.1	7.9	8.1	7.9	8.1	8.0	8.2	7.9	8.1	7.8	
Cond. (µS/cm)	212	212	212	205	212	212	212	212	212	206	206	210	210	220	
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	BPL	BPL	BPL	

Concentration <i>1.9</i>	Days														
	0		1		2		3		4		5		6		7
	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.6	25.2	24.2	25.4	25.1	25.7	25.3	25.7	25.3	25.4	25.2	25.6	24.9	25.3	
DO (mg/L)	8.1	7.4	8.1	7.2	8.2	7.4	8.1	7.3	8.2	7.5	8.2	7.3	8.1	7.3	
pH	8.1	7.8	8.1	7.7	8.1	7.8	8.2	7.9	8.2	8.0	8.3	7.9	8.0	7.9	
Cond. (µS/cm)	209	211	209	209	196	203	199	199	199	199	199	205	210	210	
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	BPL	BPL	BPL	

Concentration <i>12.5</i>	Days														
	0		1		2		3		4		5		6		7
	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	25.2	25.3	24.3	25.4	24.6	25.7	25.2	25.4	25.4	25.4	25.2	25.6	24.9	25.3	
DO (mg/L)	8.1	7.4	8.2	7.5	8.2	7.4	8.2	7.4	8.1	7.4	8.2	7.3	8.0	7.4	
pH	8.1	7.7	8.2	7.7	8.0	7.8	8.2	7.8	8.0	8.0	8.3	7.9	8.0	7.9	
Cond. (µS/cm)	192	195	195	195	185	185	189	189	185	185	185	190	192	192	
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	BPL	BPL	BPL	

Concentration <i>100</i>	Days														
	0		1		2		3		4		5		6		7
	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	25.5	25.3	25.0	25.4	25.2	25.7	25.6	25.4	25.7	25.4	25.2	25.6	24.8	25.3	
DO (mg/L)	8.0	7.5	8.2	7.5	8.2	7.2	8.2	7.5	8.1	7.5	8.2	7.4	8.1	7.4	
pH	7.4	7.6	7.5	7.6	7.6	7.7	7.7	7.4	7.6	7.4	7.4	7.4	7.4	7.3	
Cond. (µS/cm)	63	69	64	64	62	62	63	63	63	62	62	60	60	72	
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	BPL	BPL	BPL	

	Control	100%		
Hardness*	100	34		
Alkalinity*	80	6		

Analysts: BPL, m JRF

Reviewed by: ER

Date reviewed: Aug 25/09

\* mg/L as CaCO3

Sample Description: Clear

Comments: used BS 063009



**Chronic Freshwater Toxicity Test  
C. dubia Reproduction Data**

Client: Rescon  
 Sample ID: STE 2  
 Work Order: 09211

Start Date & Time: July 8 / 09 @ 1600  
 Stop Date & Time: July 15 / 09 @ 1600  
 Set up by: AUD

0% (V/V)

Days	Concentration: <u>Control</u>											Concentration: <u>1%</u>											Concentration: <u>3.25</u>										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8											~											~											~
Total	4	15	16	15	17	14	15	15	13	11	BRL	15	17	11	10	14	13	16	17	15	4	BRL	13	12	17	13	14	13	11	14	12	10	BRL

Days	Concentration: <u>6.25</u>											Concentration: <u>12.5</u>											Concentration: <u>25</u>										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8											~											~											~
Total	16	14	9	9	8	16	13	16	15	11	BRL	16	18	14	12	14	16	10	11	14	9	BRL	13	9	13	18	14	17	7	6	8	13	BRL

Days	Concentration: <u>50</u>											Concentration: <u>100</u>											Concentration:										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓											
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓											
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓											
4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓											
5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓											
6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓											
7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓											
8											~											~											
Total	8	10	7	14	10	7	22	12	13	9	BRL	11	10	11	13	8	10	14	11	6	12	BRL											

Notes: X = mortality.

Sample Description: \_\_\_\_\_  
 Comments: \_\_\_\_\_

Reviewed by: ica

Date reviewed: Aug. 25 / 09

**CETIS Analytical Report**

Report Date: 13 Aug-09 13:27 (p 1 of 2)

Link/Link Code: 02-6684-8950/09211-STE2

**Ceriodaphnia 7-d Survival and Reproduction Test** Nautilus Environmental

<b>Analysis No:</b> 16-7538-4546	<b>Endpoint:</b> 7d Survival Rate	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 13 Aug-09 13:23	<b>Analysis:</b> STP 2x2 Contingency Tables	<b>Official Results:</b> Yes

<b>Test Run No:</b> 19-6714-0337	<b>Test Type:</b> Reproduction-Survival (7d)	<b>Dil Water:</b> Perrier Water
<b>Start Date:</b> 08 Jul-09 16:00	<b>Protocol:</b> EPA/821/R-02-013 (2002)	<b>Brine:</b>
<b>Ending Date:</b>	<b>Species:</b> Ceriodaphnia dubia	
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture	

<b>Sample No:</b> 02-9960-3283	<b>Code:</b> STE 2-Jul	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09 13:15	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 75h	<b>Station:</b> STE 2	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	100	> ico	#Error	1	N/A

**Fisher Exact/Bonferroni-Holm Test**

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Negative Control		1.6	1.0000	1.0000	Non-Significant Effect
		3.13	1.0000	1.0000	Non-Significant Effect
		6.25	1.0000	1.0000	Non-Significant Effect
		12.5	1.0000	1.0000	Non-Significant Effect
		25	1.0000	1.0000	Non-Significant Effect
		50	1.0000	1.0000	Non-Significant Effect
		100	1.0000	1.0000	Non-Significant Effect

**Test Acceptability**

Attribute	Acceptability Range	Test Stat	Overlap	Decision
Control Resp	0.8 - NL	1	Yes	Passes acceptability criteria

**Data Summary**

Conc-%	Control Type	No-Resp	Resp	Total
0	Negative Contr	10	0	10
1.6		10	0	10
3.13		10	0	10
6.25		10	0	10
12.5		10	0	10
25		10	0	10
50		10	0	10
100		10	0	10

**7d Survival Rate Detail**

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Contr	1	1	1	1	1	1	1	1	1	1
1.6		1	1	1	1	1	1	1	1	1	1
3.13		1	1	1	1	1	1	1	1	1	1
6.25		1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1

*EW Aug 25/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 18:02 (p 1 of 2)  
 Link/Link Code: 02-6684-8950/09211-STE2

**Ceriodaphnia 7-d Survival and Reproduction Test** **Nautilus Environmental**

Analysis No: 03-4162-7141      Endpoint: Reproduction      CETIS Version: CETISv1.5.0  
 Analyzed: 26 Aug-09 18:01      Analysis: Parametric-Control vs Treatments      Official Results: Yes

Test Run No: 19-6714-0337      Test Type: Reproduction-Survival (7d)      Dil Water: Perrier Water  
 Start Date: 08 Jul-09 16:00      Protocol: EPA/821/R-02-013 (2002)      Brine:  
 Ending Date:      Species: Ceriodaphnia dubia  
 Duration: N/A      Source: In-House Culture

Sample No: 02-9960-3283      Code: STE 2-Jul      Client: Rescan  
 Sample Date: 05 Jul-09 13:15      Material: Water Sample      Project:  
 Receive Date: 07 Jul-09 09:00      Source: Rescan  
 Sample Age: 75h      Station: STE 2

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	100	<i>ct</i> $\rho > 100$	#Error	1	27.42%

**Dunnett's Multiple Comparison Test**

Control	vs Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control	1.6	0.2579	2.386	3.702	0.7986	Non-Significant Effect
	3.13	0.4512	2.386	3.702	0.7264	Non-Significant Effect
	6.25	0.5157	2.386	3.702	0.6999	Non-Significant Effect
	12.5	0.1934	2.386	3.702	0.8199	Non-Significant Effect
	25	1.096	2.386	3.702	0.4322	Non-Significant Effect
	50	1.483	2.386	3.702	0.2661	Non-Significant Effect
	100	1.869	2.386	3.702	0.1426	Non-Significant Effect

**Test Acceptability**

Attribute	Acceptability Range	Test Stat	Overlap	Decision
Control Resp	15 - NL	13.5	Yes	Fails acceptability criteria
PMSD	0.13 - 0.47	0.2742	Yes	Passes acceptability criteria

**ANOVA Table**

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	76.1875	10.88393	7	0.9046	0.5079	Non-Significant Effect
Error	866.3	12.03194	72			
Total	942.4875	22.91587	79			

**ANOVA Assumptions**

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	8.593	18.48	0.2832	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9729		0.0874	Normal Distribution

**Reproduction Summary**

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	10	13.5	12.06	14.94	4	17	0.7029	3.719	27.55%	0.0%
1.6		10	13.1	11.51	14.69	4	17	0.7738	4.095	31.26%	2.96%
3.13		10	12.8	11.99	13.61	9	17	0.3964	2.098	16.39%	5.18%
6.25		10	12.7	11.46	13.94	8	16	0.6045	3.199	25.19%	5.93%
12.5		10	13.2	12.08	14.32	9	18	0.5477	2.898	21.96%	2.22%
25		10	11.8	10.2	13.4	6	18	0.7807	4.131	35.01%	12.59%
50		10	11.2	9.458	12.94	7	22	0.8489	4.492	40.11%	17.04%
100		10	10.6	9.701	11.5	6	14	0.4383	2.319	21.88%	21.48%

*EW*  
 Aug. 27/09

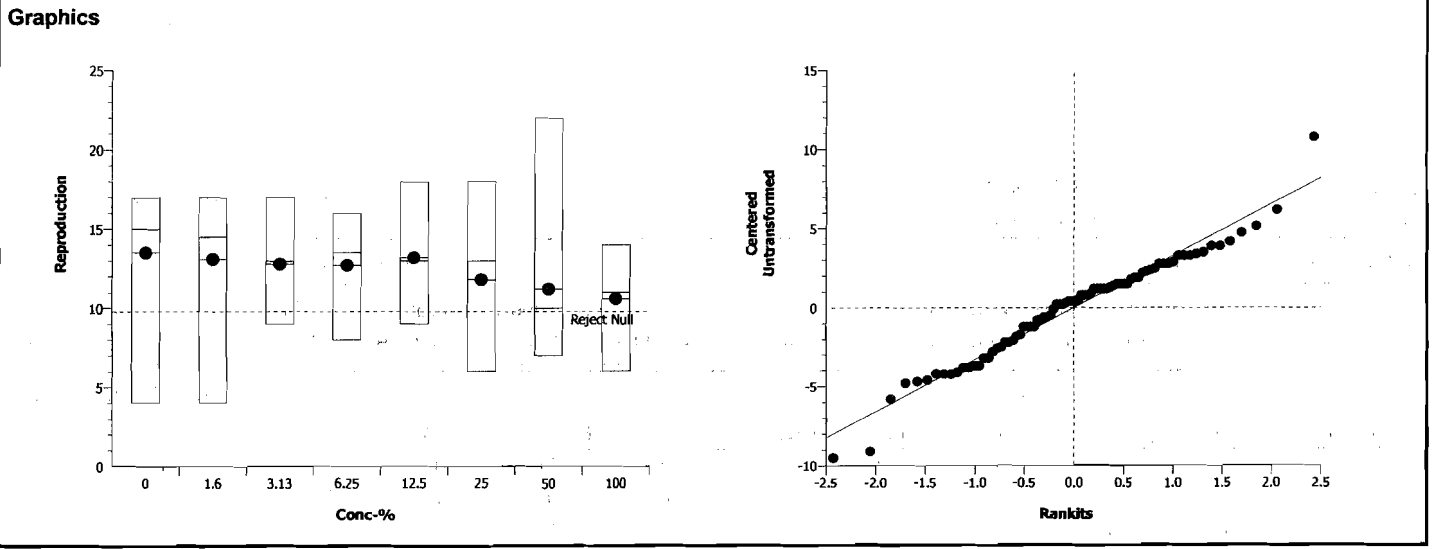
**CETIS Analytical Report**

Report Date: 26 Aug-09 18:02 (p 2 of 2)

Link/Link Code: 02-6684-8950/09211-STE2

<b>Ceriodaphnia 7-d Survival and Reproduction Test</b>						<b>Nautilus Environmental</b>					
<b>Analysis No:</b> 03-4162-7141		<b>Endpoint:</b> Reproduction				<b>CETIS Version:</b> CETISv1.5.0					
<b>Analyzed:</b> 26 Aug-09 18:01		<b>Analysis:</b> Parametric-Control vs Treatments				<b>Official Results:</b> Yes					

<b>Reproduction Detail</b>											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Contr	17	16	15	15	15	15	14	13	11	4
1.6		17	17	16	15	15	14	13	11	9	4
3.13		17	14	14	13	13	13	12	12	11	9
6.25		16	16	16	15	14	13	11	9	9	8
12.5		18	16	16	14	14	12	12	11	10	9
25		18	17	14	13	13	13	9	8	7	6
50		22	14	13	12	10	10	9	8	7	7
100		14	13	12	11	11	11	10	10	8	6



*ea*  
Aug. 27/09

**CETIS Analytical Report**

Report Date: 26 Aug-09 18:02 (p 1 of 2)  
 Link/Link Code: 02-6684-8950/09211-STE2

Ceriodaphnia 7-d Survival and Reproduction Test						Nautilus Environmental					
Analysis No: 10-7757-5725		Endpoint: Reproduction		CETIS Version: CETISv1.5.0							
Analyzed: 26 Aug-09 18:00		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes							
Test Run No: 19-6714-0337		Test Type: Reproduction-Survival (7d)		Dil Water: Perrier Water							
Start Date: 08 Jul-09 16:00		Protocol: EPA/821/R-02-013 (2002)		Brine:							
Ending Date:		Species: Ceriodaphnia dubia									
Duration: N/A		Source: In-House Culture									
Sample No: 02-9960-3283		Code: STE 2-Jul		Client: Rescan							
Sample Date: 05 Jul-09 13:15		Material: Water Sample		Project:							
Receive Date: 07 Jul-09 09:00		Source: Rescan									
Sample Age: 75h		Station: STE 2									
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X + 1)	Linear	57951	200	Yes	Two-Point Interpolation						
Test Acceptability											
Attribute	Acceptability Range		Test Stat	Overlap	Decision						
Control Resp	15 - NL		13.5	Yes	Fails acceptability criteria						
Point Estimates											
% Effect	Conc-%	95% LCL	95% UCL								
5	13.12	0.348	56.25								
10	20.11	0.817	93.92								
15	36.45	1.449	N/A								
20	79.43	12.43	N/A								
25	> 100	N/A	N/A								
40	> 100	N/A	N/A								
50	> 100	N/A	N/A								
Reproduction Summary											
			Calculated Variate								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%		
0	Negative Control	10	13.5	4	17	0.6907	3.719	27.55%	0.0%		
1.6		10	13.1	4	17	0.7604	4.095	31.26%	2.96%		
3.13		10	12.8	9	17	0.3895	2.098	16.39%	5.18%		
6.25		10	12.7	8	16	0.594	3.199	25.19%	5.93%		
12.5		10	13.2	9	18	0.5382	2.898	21.96%	2.22%		
25		10	11.8	6	18	0.7671	4.131	35.01%	12.59%		
50		10	11.2	7	22	0.8341	4.492	40.11%	17.04%		
100		10	10.6	6	14	0.4306	2.319	21.88%	21.48%		
Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	4	15	16	15	17	14	15	15	13	11
1.6		15	17	11	14	9	13	16	17	15	4
3.13		13	12	17	13	14	13	11	14	12	9
6.25		16	14	9	9	8	16	13	16	15	11
12.5		16	18	14	12	12	16	10	11	14	9
25		13	9	13	18	14	17	7	6	8	13
50		8	10	7	14	10	7	22	12	13	9
100		11	10	11	13	8	10	14	11	6	12

*ea* Aug 27/09

**CETIS Analytical Report**

Report Date: 26 Aug-09 18:02 (p 2 of 2)

Link/Link Code: 02-6684-8950/09211-STE2

**Ceriodaphnia 7-d Survival and Reproduction Test**

**Nautilus Environmental**

Analysis No: 10-7757-5725

Endpoint: Reproduction

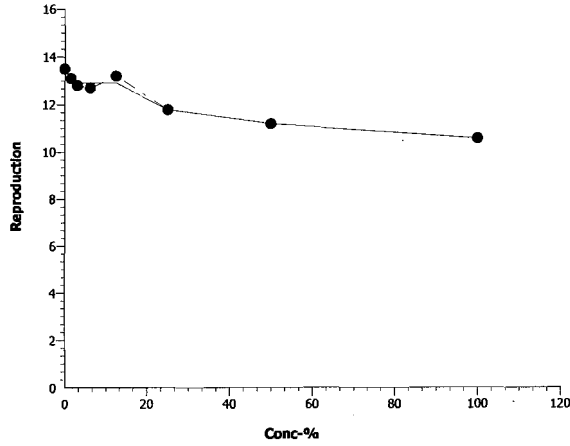
CETIS Version: CETISv1.5.0

Analyzed: 26 Aug-09 18:00

Analysis: Linear Interpolation (ICPIN)

Official Results: Yes

**Graphics**



*EC*  
Aug 27/09

## Ceriodaphnia dubia Summary Sheet

Client: Procon  
 Work Order No.: 09211

Start Date/Time: July 7 / 09 @ 1200h  
 Set up by: JRE

**Sample Information:**

Sample ID: NTR2  
 Sample Date: July 5 / 09  
 Date Received: July 7 / 09  
 Sample Volume: 9x20L

**Test Organism Information:**

Broodstock No.: 063009  
 Age of young (Day 0): 429 (w/in 12-h)  
 Avg No. young in first 3 broods of previous 7 d: 18  
 Mortality (%) in previous 7 d: 2  
 Avg. No. of young in previous brood: 31, 44, 45, 51, 68, 58, 63, 69, 69, 71, 75  
 Females Used  $\geq$  8 young for testing

**NaCl Reference Toxicant Results:**

Reference Toxicant ID: Cd 44  
 Stock Solution ID: OF Na2O4  
 Date Initiated: July 27/09  
 7-d LC50 (95% CL): 2.0 (1.7 - 2.3)  
 7-d IC50 (95% CL): 1.2 (1.0 - 1.5)

7-d LC50 Reference Toxicant Mean  $\pm$  2 SD: 1.7  $\pm$  0.7 CV (%): 22  
 7-d IC50 Reference Toxicant Mean  $\pm$  2 SD: 1.2  $\pm$  0.3 CV (%): 14 13.5%

**Test Results:**

	Survival	Reproduction
NOEC %(v/v)	100	1.56
LOEC %(v/v)	> 100	3.12
LC50 %(v/v) (95% CL)	> 100	
IC25 %(v/v) (95% CL)		5.4 (1.6 - 16.1)
IC50 %(v/v) (95% CL)		> 100

Reviewed by: [Signature]

Date reviewed: Aug 27/09

6

# Chronic Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Rescan  
Sample ID: NTR2  
Work Order #: 09211

Start Date & Time: July 7/09 @ 12:00h  
Stop Date: July 13/09 @ 16:00h  
Test Species: Ceriodaphnia dubia

Concentration <i>Control</i>	Days													
	0	1		2		3		4		5		6		7
	init.	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.1	25.1	24.5	25.3	24.2	25.3	25.2	25.3	25.0	25.4	25.0	25.4		
DO (mg/L)	8.0	7.2	8.0	7.6	8.1	7.5	8.2	7.4	8.2	6.9	8.2	7.4		
pH	8.1	8.0	8.1	7.7	8.2	7.8	8.1	7.9	8.1	7.4	8.1	7.9		
Cond. (µS/cm)	215		214		212		205		202		206		209	
Initials	JRE	A	A	A	A	A	A	A	A	A	A	A	BPL	

Concentration <i>~5.1.9</i>	Days													
	0	1		2		3		4		5		6		7
	init.	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.2	25.1	24.8	25.3	24.7	25.3	25.0	25.3	25.3	25.1	25.3	25.4		
DO (mg/L)	8.1	7.2	8.1	7.7	8.2	7.4	8.2	7.4	8.2	7.3	8.2	7.4		
pH	8.1	8.1	8.1	7.7	8.2	7.7	8.1	7.8	8.2	7.9	8.2	7.9		
Cond. (µS/cm)	213		212		208		200		198		203		204	
Initials	JRE	A	A	A	A	A	A	A	A	A	A	A	BPL	

Concentration <i>12.5</i>	Days													
	0	1		2		3		4		5		6		7
	init.	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.4	25.1	25.1	25.3	24.3	25.3	25.4	25.3	25.3	25.7	25.6	25.4		
DO (mg/L)	8.1	7.3	8.1	7.4	8.2	7.4	8.2	7.5	8.2	7.8	8.2	7.4		
pH	8.1	8.0	8.0	7.8	8.2	7.6	8.0	7.7	8.2	7.6	8.2	7.9		
Cond. (µS/cm)	197		194		196		190		184		192		194	
Initials	JRE	A	A	A	A	A	A	A	A	A	A	A	BPL	

Concentration <i>100</i>	Days													
	0	1		2		3		4		5		6		7
	init.	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	25.3	25.1	25.6	25.3	24.7	25.3	25.4	25.3	25.7	25.7	25.7	25.4		
DO (mg/L)	8.2	7.4	7.2	7.5	8.2	7.5	8.2	7.4	8.2	7.3	8.1	7.3		
pH	7.5	7.9	7.6	7.7	7.5	7.5	7.6	7.4	7.4	7.5	7.5	7.3		
Cond. (µS/cm)	68		69		69		69		67		68		74	
Initials	JRE	A	A	A	A	A	A	A	A	A	A	A	BPL	

	Control	100		
Hardness*	100	32		
Alkalinity*	80	16		

Analysts: BPL, AWS, JRE

Reviewed by: JRE

Date reviewed: Aug 27/09

\* mg/L as CaCO3

Sample Description: light brown opaque

Comments: used BS 063009



Chronic Freshwater Toxicity Test  
*C. dubia* Reproduction Data

Client: Rescon  
 Sample ID: NTR2  
 Work Order: 09211

Start Date & Time: July 7/09 1200h  
 Stop Date & Time: July 13/09 1600h  
 Set up by: JRE

0.1 (1/1) P16

Days	Concentration: Control												Concentration: 0.1												Concentration: 3.125											
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init			
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	3	3	3	4	4	4	3	4	4	3	✓	3	4	4	5	4	7	3	4	✓	4	✓			
4	4	4	4	4	4	4	3	4	4	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
5	9	8	7	7	8	7	8	7	9	10	✓	7	7	8	10	9	7	7	7	7	10	✓	7	8	8	7	8	8	9	7	5	6	✓			
6	8	9	8	10	10	6	8	10	9	7	BL	4	7	6	2	8	9	5	7	8	7	BL	5	2	✓	✓	✓	3	✓	4	6	4	BL			
7																																				
8																																				
Total	21	21	19	21	22	17	19	21	22	21	✓	16	17	17	16	21	20	15	18	20	20	✓	15	14	12	12	12	14	12	15	15	14	✓			

Days	Concentration: 6.25												Concentration: 12.5												Concentration: 25											
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init			
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
3	✓	✓	4	4	✓	✓	3	3	3	2	✓	✓	✓	✓	3	✓	3	2	✓	3	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
4	3	3	✓	✓	5	3	6	✓	6	✓	✓	3	3	4	6	3	7	7	4	6	5	✓	5	4	3	4	5	4	4	4	6	5	✓			
5	7	6	7	8	7	9	7	6	8	10	✓	7	6	5	7	7	9	✓	7	9	7	✓	7	7	7	6	6	8	7	8	5	7	✓			
6	5	7	5	✓	5	5	6	5	4	4	BL	3	2	✓	✓	2	✓	4	5	5	4	BL	6	5	3	✓	4	✓	✓	2	6	3	BL			
7																																				
8																																				
Total	15	16	16	12	17	17	14	14	17	17	✓	13	11	9	6	13	19	13	16	14	15	✓	18	16	13	10	15	12	11	14	17	15	✓			

Days	Concentration: 50												Concentration: 100												Concentration: 200											
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init			
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓														
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓														
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓														
4	4	3	3	3	3	2	2	3	3	4	✓	3	3	3	✓	3	4	4	✓	3	4	✓														
5	7	7	6	8	6	7	6	9	7	6	✓	6	5	4	4	7	8	6	9	8	7	✓														
6	8	5	✓	✓	✓	4	7	✓	8	5	BL	5	8	9	5	✓	5	✓	8	5	BL															
7																																				
8																																				
Total	19	15	9	11	9	15	16	12	18	15	✓	14	16	16	9	10	12	15	9	19	16	✓														

Notes: X = mortality.

Sample Description: \_\_\_\_\_  
 Comments: ① precipitation on the bottom of test tubes in all test concentrations

Reviewed by: EV

Date reviewed: Aug 25/09

**CETIS Analytical Report**

Report Date: 19 Jul-09 16:18 (p 1 of 2)  
 Link/Link Code: 20-1336-9444/09211cNTR2

**Ceriodaphnia 7-d Survival and Reproduction Test** **Nautilus Environmental**

<b>Analysis No:</b> 16-4344-0181	<b>Endpoint:</b> 6d Survival Rate	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 19 Jul-09 16:16	<b>Analysis:</b> STP 2x2 Contingency Tables	<b>Official Results:</b> Yes

<b>Sample No:</b> 08-7470-6538	<b>Code:</b> 874706538	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09 15:15	<b>Material:</b> Mining Discharge/Runoff	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 45h	<b>Station:</b> NTR2	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	100	<i>ex &gt; 100</i>	#Error	1	N/A

Fisher Exact/Bonferroni-Holm Test					
Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Negative Control		1.56	1.0000	1.0000	Non-Significant Effect
		3.12	1.0000	1.0000	Non-Significant Effect
		6.25	1.0000	1.0000	Non-Significant Effect
		12.5	1.0000	1.0000	Non-Significant Effect
		25	1.0000	1.0000	Non-Significant Effect
		50	1.0000	1.0000	Non-Significant Effect
		100	1.0000	1.0000	Non-Significant Effect

Data Summary				
Conc-%	Control Type	No-Resp	Resp	Total
0	Negative Contr	10	0	10
1.56		10	0	10
3.12		10	0	10
6.25		10	0	10
12.5		10	0	10
25		10	0	10
50		10	0	10
100		10	0	10

6d Survival Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Contr	1	1	1	1	1	1	1	1	1	1
1.56		1	1	1	1	1	1	1	1	1	1
3.12		1	1	1	1	1	1	1	1	1	1
6.25		1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1

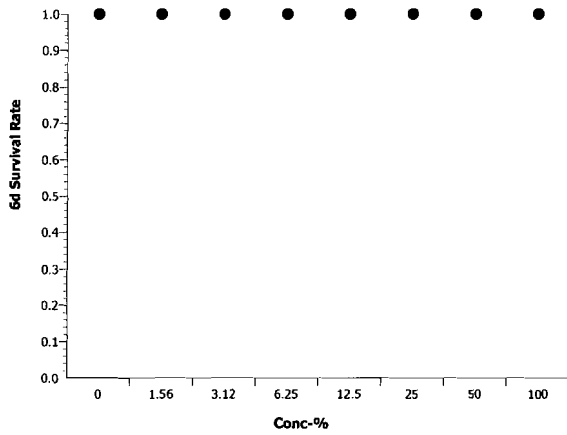
*EA*  
 Aug 25/09

# CETIS Analytical Report

Report Date: 19 Jul-09 16:18 (p 2 of 2)  
Link/Link Code: 20-1336-9444/09211cNTR2

<b>Ceriodaphnia 7-d Survival and Reproduction Test</b>		<b>Nautilus Environmental</b>
<b>Analysis No:</b> 16-4344-0181	<b>Endpoint:</b> 6d Survival Rate	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 19 Jul-09 16:16	<b>Analysis:</b> STP 2x2 Contingency Tables	<b>Official Results:</b> Yes

## Graphics



*AW*  
Aug 25/09

**CETIS Analytical Report**

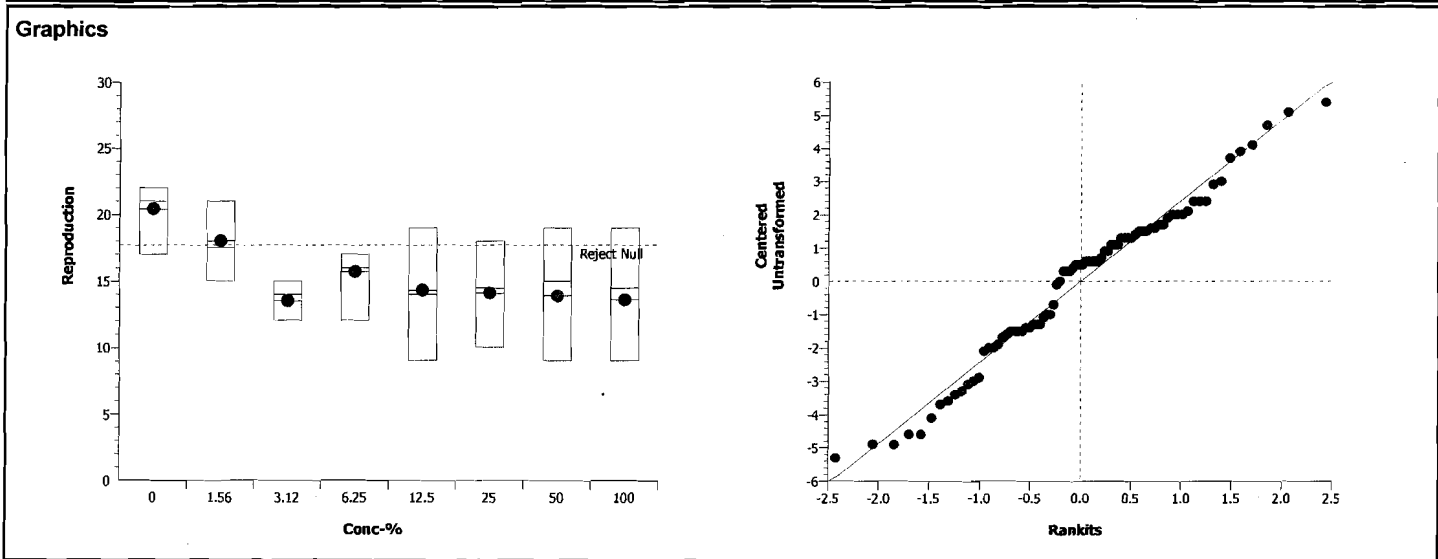
Report Date: 19 Jul-09 16:18 (p 1 of 2)  
 Link/Link Code: 20-1336-9444/09211cNTR2

Ceriodaphnia 7-d Survival and Reproduction Test								Nautilus Environmental			
Analysis No: 17-2487-9352		Endpoint: Reproduction		CETIS Version: CETISv1.5.0							
Analyzed: 19 Jul-09 16:16		Analysis: Parametric-Control vs Treatments		Official Results: Yes							
Sample No: 08-7470-6538		Code: 874706538		Client: Rescan							
Sample Date: 05 Jul-09 15:15		Material: Mining Discharge/Runoff		Project:							
Receive Date: 07 Jul-09 09:00		Source: Rescan									
Sample Age: 45h		Station: NTR2									
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Untransformed		C > T	Not Run	1.56	3.12	2.206	64.1	13.33%			
Dunnett's Multiple Comparison Test											
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Negative Control		1.56	2.107	2.386	2.719	0.0908	Non-Significant Effect				
		3.12*	6.056	2.386	2.719	0.0000	Significant Effect				
		6.25*	4.125	2.386	2.719	0.0003	Significant Effect				
		12.5*	5.354	2.386	2.719	0.0000	Significant Effect				
		25*	5.53	2.386	2.719	0.0000	Significant Effect				
		50*	5.705	2.386	2.719	0.0000	Significant Effect				
		100*	5.968	2.386	2.719	0.0000	Significant Effect				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)					
Between	438.3875	62.62679	7	9.649	0.0000	Significant Effect					
Error	467.3	6.490278	72								
Total	905.6875	69.11707	79								
ANOVA Assumptions											
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)						
Variances	Bartlett Equality of Variance	15.69	18.48	0.0281	Equal Variances						
Distribution	Shapiro-Wilk Normality	0.9759		0.1359	Normal Distribution						
Reproduction Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	10	20.4	19.79	21.01	17	22	0.2981	1.578	7.73%	0.0%
1.56		10	18	17.18	18.82	15	21	0.3984	2.108	11.71%	11.76%
3.12		10	13.5	12.97	14.03	12	15	0.2559	1.354	10.03%	33.82%
6.25		10	15.7	15.07	16.33	12	17	0.3092	1.636	10.42%	23.04%
12.5		10	14.3	13.1	15.5	9	19	0.5845	3.093	21.63%	29.9%
25		10	14.1	13.09	15.11	10	18	0.4916	2.601	18.45%	30.88%
50		10	13.9	12.54	15.26	9	19	0.6634	3.51	25.25%	31.86%
100		10	13.6	12.27	14.93	9	19	0.6498	3.438	25.28%	33.33%

*TEC*  
 Aug. 25/09

Ceriodaphnia 7-d Survival and Reproduction Test				Nautilus Environmental			
Analysis No:	17-2487-9352	Endpoint:	Reproduction	CETIS Version:	CETISv1.5.0		
Analyzed:	19 Jul-09 16:16	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes		

Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Contr	22	22	21	21	21	21	21	19	19	17
1.56		21	20	20	20	18	17	17	16	16	15
3.12		15	15	15	14	14	14	12	12	12	12
6.25		17	17	17	17	16	16	16	15	14	12
12.5		19	18	16	16	15	13	13	13	11	9
25		18	17	16	15	15	14	13	12	11	10
50		19	18	16	15	15	15	12	11	9	9
100		19	16	16	16	15	14	12	10	9	9



*EA*  
 Aug 25/09

**CETIS Analytical Report**

Report Date: 19 Jul-09 16:18 (p 1 of 2)  
 Link/Link Code: 20-1336-9444/09211cNTR2

**Ceriodaphnia 7-d Survival and Reproduction Test** **Nautilus Environmental**

Analysis No: 11-1450-8739      Endpoint: Reproduction      CETIS Version: CETISv1.5.0  
 Analyzed: 19 Jul-09 16:17      Analysis: Nonlinear Regression      Official Results: Yes

Sample No: 08-7470-6538      Code: 874706538      Client: Rescan  
 Sample Date: 05 Jul-09 15:15      Material: Mining Discharge/Runoff      Project:  
 Receive Date: 07 Jul-09 09:00      Source: Rescan  
 Sample Age: 45h      Station: NTR2

**Non-Linear Regression Options**

Model Function	X Transform	Y Transform	Weighting Function	PTBS Function
3P Log-Logistic EV [Y=A/(1+(X/D)^C)]	None	None	Normal [W=1]	Off [Y*=Y]

**Regression Summary**

Iters	Log LL	AICc	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(1%)
83	-117.7	241.6	0.3686	Yes	2.777	3.283	0.0238	Non-Significant Lack of Fit

**Point Estimates**

% Effect	Conc-%	95% LCL	95% UCL
SNEC	0.04807	0.0001745	1.242
10	0.007832	4.004E-07	0.4374
15	0.1227	0.001631	2.091
20	0.9735	0.09765	6.272
25	5.387	1.618	16.06
40	332.3	35.2	2676
50	3705	86.48	158800

**Regression Parameters**

Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)
A	20.44	0.8052	18.84	22.05	25.39	0.0000	Significant Parameter
C	0.1681	0.05738	0.05389	0.2824	2.931	0.0045	Significant Parameter
D	3705	6810	-9855	17270	0.5441	0.5879	Non-Significant Parameter

**ANOVA Table**

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(1%)
Model	348.2759	174.138	2	24.06	0.0000	Significant
Lack of Fit	90.1116	18.02232	5	2.777	0.0238	Non-Significant
Pure Error	467.3	6.490278	72			
Residual	557.4116	7.239112	77			

**Residual Analysis**

Attribute	Method	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	15.69	18.48	0.0281	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9804		0.2583	Normal Distribution

**Reproduction Summary**

Conc-%	Control Type	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	10	20.4	17	22	0.293	1.578	7.73%	0.0%
1.56		10	18	15	21	0.3915	2.108	11.71%	11.76%
3.12		10	13.5	12	15	0.2514	1.354	10.03%	33.82%
6.25		10	15.7	12	17	0.3039	1.636	10.42%	23.04%
12.5		10	14.3	9	19	0.5744	3.093	21.63%	29.9%
25		10	14.1	10	18	0.483	2.601	18.45%	30.88%
50		10	13.9	9	19	0.6518	3.51	25.25%	31.86%
100		10	13.6	9	19	0.6385	3.438	25.28%	33.33%

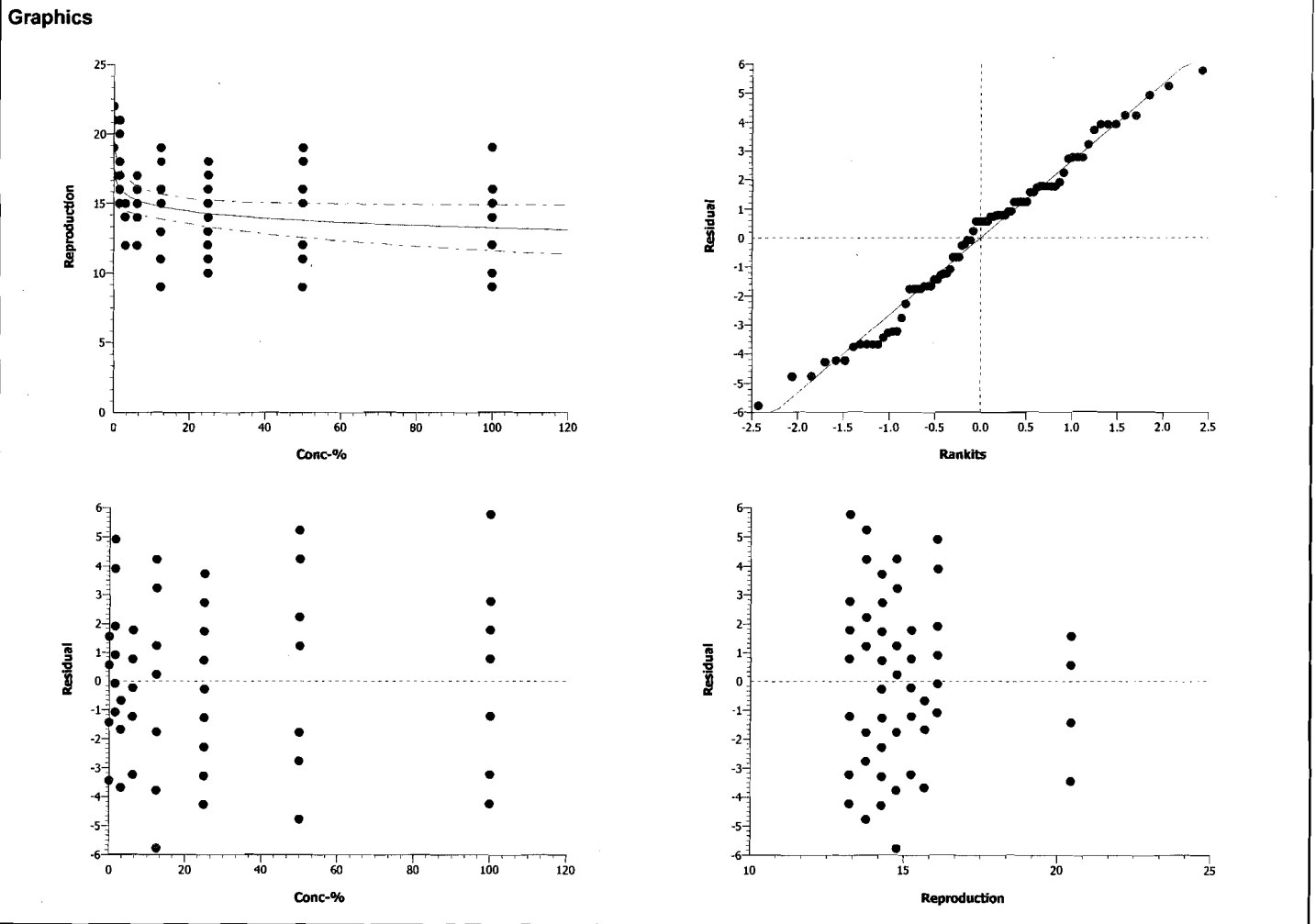
*ECU*  
*Aug 25/09*

**CETIS Analytical Report**

Report Date: 19 Jul-09 16:18 (p 2 of 2)  
 Link/Link Code: 20-1336-9444/09211cNTR2

<b>Ceriodaphnia 7-d Survival and Reproduction Test</b>				<b>Nautilus Environmental</b>			
<b>Analysis No:</b> 11-1450-8739	<b>Endpoint:</b> Reproduction			<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 19 Jul-09 16:17	<b>Analysis:</b> Nonlinear Regression			<b>Official Results:</b> Yes			

Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	21	21	19	21	22	17	19	21	22	21
1.56		16	17	17	16	21	20	15	18	20	20
3.12		15	14	12	12	12	14	12	15	15	14
6.25		15	16	16	12	17	17	16	14	17	17
12.5		13	11	9	16	13	19	13	16	18	15
25		18	16	13	10	15	12	11	14	17	15
50		19	15	9	11	9	15	16	12	18	15
100		14	16	16	9	10	12	15	9	19	16



*Handwritten signature and date:*  
 Aug 25/09

# Ceriodaphnia dubia Summary Sheet

Client: Procon  
 Work Order No.: 09211

Start Date/Time: July 8 / 09 @ 1045h  
 Set up by: [Signature]

**Sample Information:**

Sample ID: SCC  
 Sample Date: July 5 / 09  
 Date Received: July 7 / 09  
 Sample Volume: 9x20L

**Test Organism Information:**

Broodstock No.: 063009  
 Age of young (Day 0): 429 (w/in 12-h)  
 Avg No. young in first 3 broods of previous 7 d: 19  
 Mortality (%) in previous 7 d: 2  
 Avg. No. of young in previous brood: 54, 56, 57, 58, 60, 61, 62, 64, 68  
 Females Used  $\geq$  8 young for testing

**NaCl Reference Toxicant Results:**

Reference Toxicant ID: Cd 44  
 Stock Solution ID: 0.8 NaOH  
 Date Initiated: July 27/09  
 7-d LC50 (95% CL): 2.0 (1.7 - 2.3)  
 7-d IC50 (95% CL): 1.2 (1.0 - 1.5)

7-d LC50 Reference Toxicant Mean  $\pm$  2 SD: 1.7  $\pm$  0.7 CV (%): 22  
 7-d IC50 Reference Toxicant Mean  $\pm$  2 SD: 1.2  $\pm$  0.3 CV (%): 14 130%

**Test Results:**

	Survival	Reproduction
NOEC %(v/v)	100	12.5
LOEC %(v/v)	> 100	25
LC50 %(v/v) (95% CL)	7100	
IC25 %(v/v) (95% CL)		24.2 (16.8 - 31.4) <sup>BR</sup>
IC50 %(v/v) (95% CL)		37.3 (30.1 - 46.2) <sup>BR</sup>

19.3 (8.8 - 26.2)  
 34.1 (26.9 - 43.5)

Reviewed by: [Signature]

Date reviewed: Aug 27/09



# Chronic Freshwater Toxicity Test Initial and Final Water Quality Measurements

(4)

Client: RESCAN  
 Sample ID: SCR  
 Work Order #: 0911

Start Date & Time: July 2, 2002 10:55h  
 Stop Date: July 14, 2002 12:55h  
 Test Species: Ceriodaphnia dubia

Concentration <i>Control</i>	Days																																						
	0	1	2	3	4	5	6	7	0		1		2		3		4		5		6		7																
Temperature (°C)	24.5	24.4	24.2	24.6	24.3	24.4	24.0	24.5	24.0	25.4	25.2	25.8	24.9	24.5		24.4		24.2		24.6		24.3		24.4		24.0		24.5		24.0		25.4		25.2		25.8		24.9	
DO (mg/L)	8.0	7.4	8.1	7.5	8.2	7.2	8.2	7.4	8.2	7.6	8.2	7.4	8.1	8.0		7.4		8.1		7.5		8.2		7.2		8.2		7.4		8.2		7.6		8.2		7.4		8.1	
pH	8.1	7.7	8.2	8.1	8.1	7.8	8.1	7.9	8.1	7.9	8.2	7.8	8.1	8.1		7.7		8.2		8.1		8.1		7.8		8.1		7.9		8.2		7.9		8.2		7.8		8.1	
Cond. (µS/cm)	210	212		205		212		205		206		210		210		212		205		212		205		210		206		210		206		210		206		210			
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	W	BPL	A		A		A		A		A		BPL		BPL		W		BPL		BPL		BPL		BPL			

Concentration <i>1.9</i>	Days																																						
	0	1	2	3	4	5	6	7	0		1		2		3		4		5		6		7																
Temperature (°C)	24.6	24.4	24.3	24.6	24.9	25.4	25.1	25.5	25.2	25.4	25.1	25.8	24.8	24.6		24.4		24.3		24.6		24.9		25.4		25.1		25.5		25.2		25.4		25.1		25.8		24.8	
DO (mg/L)	8.1	7.4	8.1	7.5	8.2	7.3	8.1	7.7	8.2	7.6	8.2	7.4	8.0	8.1		7.4		8.1		7.5		8.2		7.3		8.1		7.7		8.2		7.6		8.2		7.4		8.0	
pH	8.1	7.7	8.2	8.1	8.1	7.7	8.1	7.8	8.2	7.9	8.1	7.8	7.9	8.1		7.7		8.2		8.1		8.1		7.7		8.1		7.8		8.2		7.9		8.1		7.8		7.9	
Cond. (µS/cm)	210	210	210	205	206		202	205		202		205		210		210		210		205		206		202		205		202		205		202		205		205		205	
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	W	BPL	A		A		A		A		A		BPL		BPL		W		BPL		BPL		BPL		BPL			

Concentration <i>12.5</i>	Days																																						
	0	1	2	3	4	5	6	7	0		1		2		3		4		5		6		7																
Temperature (°C)	25.0	24.4	24.2	24.6	24.2	25.4	25.1	25.5	25.4	25.4	25.1	25.8	24.9	25.0		24.4		24.2		24.6		24.2		25.4		25.1		25.5		25.4		25.4		25.1		25.8		24.9	
DO (mg/L)	8.0	7.5	8.1	7.5	8.2	7.4	8.1	7.3	8.1	7.6	8.2	7.4	8.0	8.0		7.5		8.1		7.5		8.2		7.4		8.1		7.3		8.1		7.6		8.2		7.4		8.0	
pH	8.1	8.0	8.2	7.9	8.1	7.8	8.0	7.7	8.2	7.9	8.2	7.7	8.0	8.1		8.0		8.2		7.9		8.1		7.8		8.0		7.7		8.2		7.9		8.2		7.7		8.0	
Cond. (µS/cm)	203	202	201	192	196		192	196		192		196		203		202		201		192		196		192		196		192		196		192		196		196		196	
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	W	BPL	A		A		A		A		A		BPL		BPL		W		BPL		BPL		BPL		BPL			

Concentration <i>100</i>	Days																																						
	0	1	2	3	4	5	6	7	0		1		2		3		4		5		6		7																
Temperature (°C)	25.6	25.4	24.8	25.6	25.3	25.4	25.2	25.5	25.6	25.4	25.1	25.8	24.7	25.6		25.4		24.8		25.6		25.3		25.4		25.2		25.5		25.6		25.4		25.1		25.8		24.7	
DO (mg/L)	8.0	7.4	8.1	7.6	8.2	7.3	8.0	7.4	8.1	7.6	8.2	7.2	8.1	8.0		7.4		8.1		7.6		8.2		7.3		8.0		7.4		8.1		7.6		8.2		7.2		8.1	
pH	7.8	7.9	8.0	7.9	8.0	7.7	7.9	7.6	8.0	7.8	8.0	7.6	7.4	7.8		7.9		8.0		7.9		8.0		7.7		7.9		7.6		8.0		7.8		8.0		7.6		7.4	
Cond. (µS/cm)	118	121	123	124	124		124	124		121		128		118		121		123		124		124		124		121		128		121		128		128		128		128	
Initials	A	A	A	A	A	A	A	A	A	BPL	BPL	W	BPL	A		A		A		A		A		BPL		BPL		W		BPL		BPL		BPL		BPL			

Control	100%		
Hardness*	100	100	
Alkalinity*	80	138	

Analysts: BPL, JCB, W  
 Reviewed by: [Signature]  
 Date reviewed: Aug. 25/09

\* mg/L as CaCO3

Sample Description: light brown opaque

Comments: used BS 063009

*Alumina Environmental*

**Chronic Freshwater Toxicity Test  
C. dubia Reproduction Data**

Client: Rescon  
 Sample ID: 522  
 Work Order: 0921

Start Date & Time: July 8 / 09 1045h  
 Stop Date & Time: July 14 / 09 1245h  
 Set up by: Ado

0.2 (1/1)

Days	Concentration: <u>Control</u>											Concentration: <u>0.2 (1/1)</u>											Concentration: <u>3.125</u>										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n
4	3	3	3	8	4	4	4	3	7	4	n	3	6	4	4	3	4	4	3	3	3	n	3	3	4	3	4	3	3	3	3	3	n
5	6	9	8	8	6	5	✓	7	✓	6	BR	✓	5	9	8	5	5	✓	✓	8	7	BR	6	7	6	6	5	7	5	7	6	7	BR
6	5	7	9	8	3	2	7	3	7	4	n	3	6	5	4	4	2	4	2	2	8	n	3	2	✓	2	2	2	3	5	5	5	n
7																																	
8																																	
Total	14	19	20	24	13	11	11	13	14	14	n	6	17	17	16	12	11	8	5	13	18	n	12	12	10	11	11	12	11	10	14	15	n

Days	Concentration: <u>6.25</u>											Concentration: <u>12.5</u>											Concentration: <u>25</u>										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n
4	2	3	3	3	3	3	3	2	3	2	n	3	2	2	3	3	2	3	2	3	6	n	4	3	2	2	✓	✓	✓	2	2	3	n
5	6	7	6	6	✓	5	5	8	7	✓	BR	6	5	7	8	5	7	3	6	3	✓	BR	6	3	6	3	✓	5	✓	6	✓	✓	BR
6	7	6	6	3	6	5	5	5	5	7	n	6	4	4	3	6	6	6	3	8	5	n	✓	7	4	7	2	6	2	8	4	5	n
7																																	
8																																	
Total	15	16	15	12	9	13	16	15	15	9	n	15	11	14	16	14	15	13	11	14	11	n	10	13	12	12	2	11	2	16	6	8	n

Days	Concentration: <u>50</u>											Concentration: <u>100</u>											Concentration:										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n
4	3	3	3	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n
5	3	3	6	4	3	✓	✓	✓	✓	✓	BR	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	BR	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	BR
6	5	3	6	✓	✓	✓	✓	✓	4	✓	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	2	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	n
7																																	
8																																	
Total	14	6	15	6	3	0	0	4	6	0	n	0	0	0	0	0	0	0	0	0	2	n											

Notes: X = mortality.

Sample Description: \_\_\_\_\_

Comments: \_\_\_\_\_

Reviewed by: \_\_\_\_\_

Date reviewed: \_\_\_\_\_

# CETIS Analytical Report

Report Date: 19 Jul-09 15:54 (p 1 of 2)  
 Link/Link Code: 12-2686-5825/09211a

<b>Ceriodaphnia 7-d Survival and Reproduction Test</b>	<b>Nautilus Environmental</b>
--	-------------------------------

<b>Analysis No:</b> 20-8693-5397	<b>Endpoint:</b> 6d Survival Rate	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 19 Jul-09 15:51	<b>Analysis:</b> STP 2x2 Contingency Tables	<b>Official Results:</b> Yes

<b>Sample No:</b> 04-7366-0763	<b>Code:</b> 473660763	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09 11:15	<b>Material:</b> Mining Discharge/Runoff	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 71h	<b>Station:</b> SCR	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	100	0	#Error	1	N/A

Fisher Exact/Bonferroni-Holm Test					
Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Negative Control		1.56	1.0000	1.0000	Non-Significant Effect
		3.12	1.0000	1.0000	Non-Significant Effect
		6.25	1.0000	1.0000	Non-Significant Effect
		12.5	1.0000	1.0000	Non-Significant Effect
		25	1.0000	1.0000	Non-Significant Effect
		50	1.0000	1.0000	Non-Significant Effect
		100	1.0000	1.0000	Non-Significant Effect

Data Summary				
Conc-%	Control Type	No-Resp	Resp	Total
0	Negative Contr	10	0	10
1.56		10	0	10
3.12		10	0	10
6.25		10	0	10
12.5		10	0	10
25		10	0	10
50		10	0	10
100		10	0	10

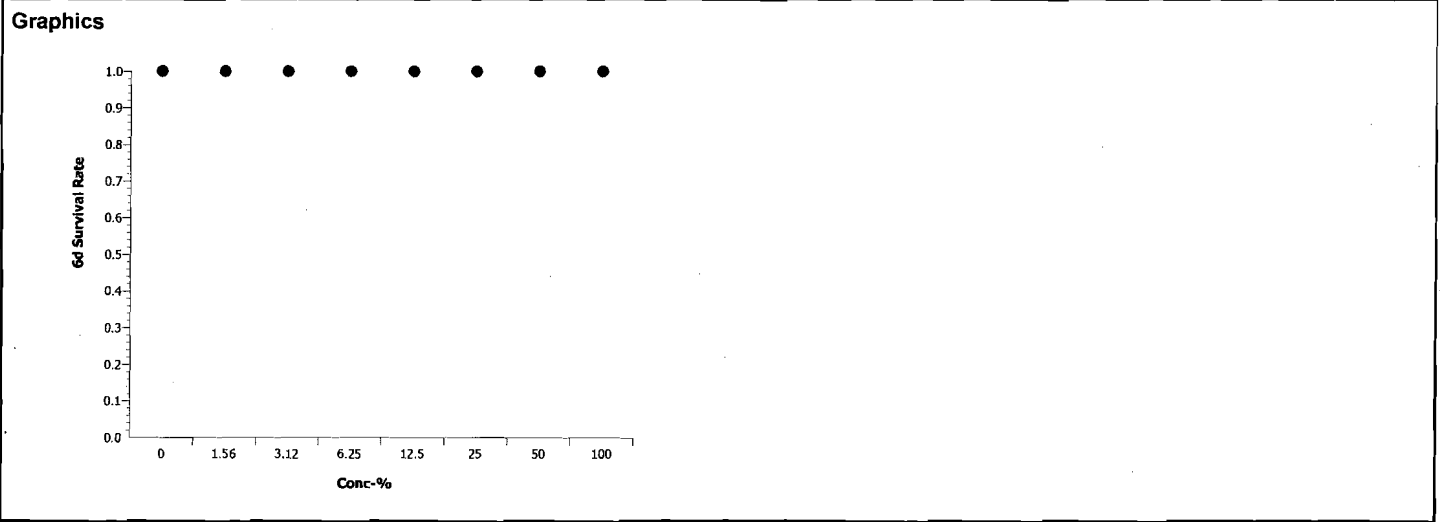
6d Survival Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Contr	1	1	1	1	1	1	1	1	1	1
1.56		1	1	1	1	1	1	1	1	1	1
3.12		1	1	1	1	1	1	1	1	1	1
6.25		1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1

*EEV*  
 Aug 25/09

# CETIS Analytical Report

Report Date: 19 Jul-09 15:54 (p 2 of 2)  
Link/Link Code: 12-2686-5825/09211a

Ceriodaphnia 7-d Survival and Reproduction Test		Nautilus Environmental
Analysis No: 20-8693-5397	Endpoint: 6d Survival Rate	CETIS Version: CETISv1.5.0
Analyzed: 19 Jul-09 15:51	Analysis: STP 2x2 Contingency Tables	Official Results: Yes



*ea*  
Aug 25/09

# CETIS Analytical Report

Report Date: 26 Aug-09 17:49 (p 1 of 2)  
 Link/Link Code: 12-2686-5825/09211a

Ceriodaphnia 7-d Survival and Reproduction Test								Nautilus Environmental			
Analysis No:	21-3243-4406		Endpoint:	Reproduction		CETIS Version:	CETISv1.5.0				
Analyzed:	26 Aug-09 17:49		Analysis:	Nonparametric-Control vs Treatments		Official Results:	Yes				
Test Run No:	10-3678-0249		Test Type:	Reproduction-Survival (7d)		Dil Water:					
Start Date:	08 Jul-09 10:45		Protocol:	EC/EPS 1/RM/21		Brine:					
Ending Date:	14 Jul-09 12:45		Species:	Ceriodaphnia dubia							
Duration:	6d 2h		Source:								
Sample No:	04-7366-0763		Code:	473660763		Client:	Rescan				
Sample Date:	05 Jul-09 13:15		Material:	Mining Discharge/Runoff		Project:					
Receive Date:	07 Jul-09 09:00		Source:	Rescan							
Sample Age:	69h		Station:	SCR							
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Rank		C > T	Not Run	12.5	25	17.68	8	25.23%			
Steel Many-One Rank Test											
Control	vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)				
Negative Control		1.56	89	74	2	0.3774	Non-Significant Effect				
		3.12	83.5	74	2	0.2099	Non-Significant Effect				
		6.25	102	74	1	0.8088	Non-Significant Effect				
		12.5	102.5	74	2	0.8211	Non-Significant Effect				
		25*	70	74	2	0.0229	Significant Effect				
		50*	65	74	1	0.0076	Significant Effect				
		100*	55	74	0	0.0005	Significant Effect				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)					
Between	1829.75	261.3929	7	19.97	0.0000	Significant Effect					
Error	942.2	13.08611	72								
Total	2771.95	274.479	79								
ANOVA Assumptions											
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)						
Variances	Bartlett Equality of Variance	39.57	18.48	0.0000	Unequal Variances						
Distribution	Shapiro-Wilk Normality	0.9776		0.1730	Normal Distribution						
Reproduction Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	10	15.3	13.64	16.96	11	24	0.807	4.27	27.91%	0.0%
1.56		10	12.3	10.45	14.15	5	18	0.9	4.762	38.72%	19.61%
3.12		10	12.3	11.61	12.99	10	15	0.3339	1.767	14.37%	19.61%
6.25		10	13.5	12.46	14.54	9	16	0.5059	2.677	19.83%	11.76%
12.5		10	13.7	12.92	14.48	11	16	0.3785	2.003	14.62%	10.46%
25		10	9.2	7.392	11.01	2	16	0.881	4.662	50.67%	39.87%
50		10	5.3	3.272	7.328	0	15	0.9882	5.229	98.66%	65.36%
100		10	0.2	-0.04524	0.4452	0	2	0.1195	0.6325	316.2%	98.69%
Rank Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	10	57.3	50.73	63.87	34.5	80	3.2	16.93	29.55%	0.0%
1.56		10	49	39.6	58.4	18	77	4.58	24.24	49.46%	14.49%
3.12		10	44.5	39.57	49.43	28.5	64	2.403	12.72	28.58%	22.34%
6.25		10	54.45	47.78	61.12	26.5	71.5	3.252	17.21	31.6%	4.97%
12.5		10	54.25	48.52	59.98	34.5	71.5	2.792	14.77	27.23%	5.32%
25		10	34.35	27.39	41.31	14	71.5	3.391	17.94	52.23%	40.05%
50		10	22.9	15.48	30.32	6.5	64	3.617	19.14	83.58%	60.03%
100		10	7.25	6.33	8.17	6.5	14	0.4482	2.372	32.71%	87.35%

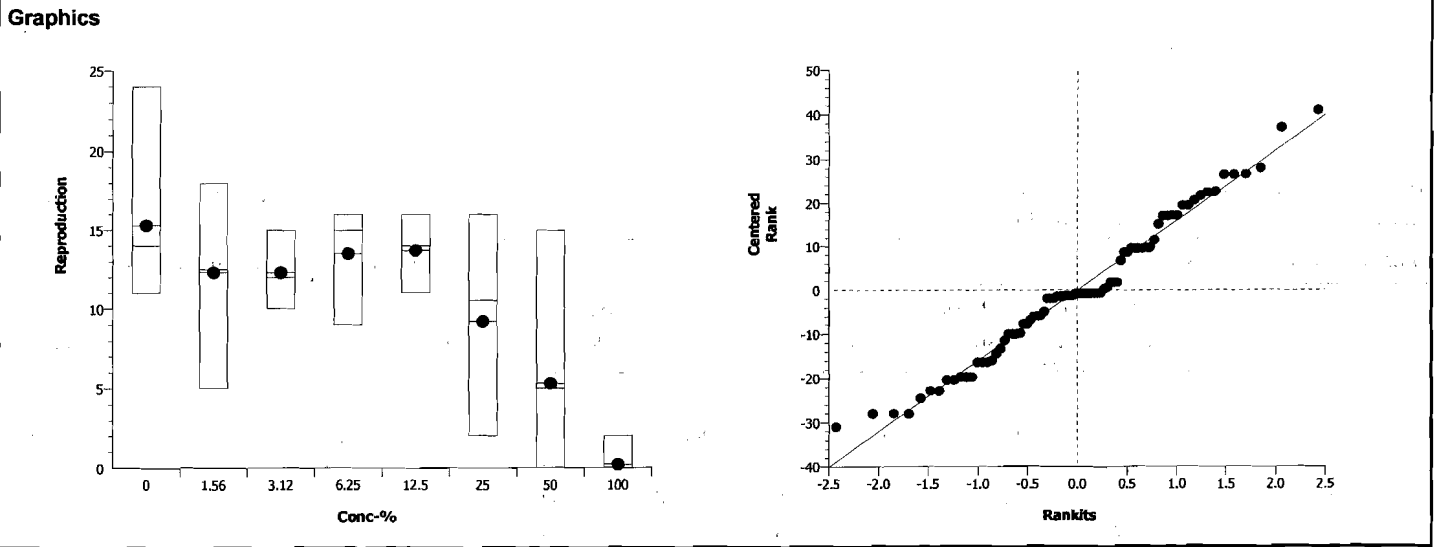
*EA Aug 27/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 17:49 (p 2 of 2)  
 Link/Link Code: 12-2686-5825/09211a

<b>Ceriodaphnia 7-d Survival and Reproduction Test</b>				<b>Nautilus Environmental</b>			
Analysis No: 21-3243-4406		Endpoint: Reproduction		CETIS Version: CETISv1.5.0			
Analyzed: 26 Aug-09 17:49		Analysis: Nonparametric-Control vs Treatments		Official Results: Yes			

Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Contr	24	20	19	14	14	14	13	13	11	11
1.56		18	17	17	16	13	12	11	8	6	5
3.12		15	15	14	12	12	12	11	11	11	10
6.25		16	16	15	15	15	15	13	12	9	9
12.5		16	16	15	15	14	14	14	11	11	11
25		16	13	12	12	11	10	8	6	2	2
50		15	13	6	6	6	4	3	0	0	0
100		2	0	0	0	0	0	0	0	0	0



*EC*  
 Aug 27/09

**CETIS Analytical Report**

Report Date: 26 Aug-09 17:49 (p 1 of 2)  
 Link/Link Code: 12-2686-5825/09211a

Ceriodaphnia 7-d Survival and Reproduction Test				Nautilus Environmental					
Analysis No: 14-6821-2677	Endpoint: Reproduction	CETIS Version: CETISv1.5.0							
Analyzed: 26 Aug-09 17:48	Analysis: Nonlinear Regression	Official Results: Yes							
Test Run No: 10-3678-0249	Test Type: Reproduction-Survival (7d)	Dil Water:							
Start Date: 08 Jul-09 10:45	Protocol: EC/EPS 1/RM/21	Brine:							
Ending Date: 14 Jul-09 12:45	Species: Ceriodaphnia dubia								
Duration: 6d 2h	Source:								
Sample No: 04-7366-0763	Code: 473660763	Client: Rescan							
Sample Date: 05 Jul-09 13:15	Material: Mining Discharge/Runoff	Project:							
Receive Date: 07 Jul-09 09:00	Source: Rescan								
Sample Age: 69h	Station: SCR								
Non-Linear Regression Options									
Model Function	X Transform	Y Transform	Weighting Function	PTBS Function					
3P Cumulative Log-Normal EV [Y=A*(1- Φ(log(X/D)/C))]	None	None	Normal [W=1]	Off [Y*=Y]					
Regression Summary									
Iters	Log LL	AICc	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(1%)	
12	-142.1	290.5	0.6200	No	1.293	3.283	0.2765	Non-Significant Lack of Fit	
Point Estimates									
% Effect	Conc-%	95% LCL	95% UCL						
SNEC	5.463	N/A	15.32						
15	11.6	N/A	17.52						
20	15.95	N/A	22.36						
25	19.26	8.752	26.23						
40	27.99	20.72	35.75						
50	34.06	26.92	42.49						
Regression Parameters									
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)		
A	13.46	0.5575	12.35	14.57	24.15	0.0000	Significant Parameter		
C	0.6518	0.162	0.3292	0.9745	4.022	0.0001	Significant Parameter		
D	38.1	4.485	29.17	47.03	8.494	0.0000	Significant Parameter		
ANOVA Table									
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(1%)			
Model	1745.157	872.5784	2	65.44	0.0000	Significant			
Lack of Fit	84.59325	16.91865	5	1.293	0.2765	Non-Significant			
Pure Error	942.2	13.08611	72						
Residual	1026.793	13.33498	77						
Residual Analysis									
Attribute	Method	Test Stat	Critical	P-Value	Decision(1%)				
Variances	Bartlett Equality of Variance	39.57	18.48	0.0000	Unequal Variances				
Distribution	Shapiro-Wilk Normality	0.9621		0.0180	Normal Distribution				
Reproduction Summary									
Conc-%	Control Type	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	10	15.3	11	24	0.7929	4.27	27.91%	0.0%
1.56		10	12.3	5	18	0.8843	4.762	38.72%	19.61%
3.12		10	12.3	10	15	0.3281	1.767	14.37%	19.61%
6.25		10	13.5	9	16	0.4971	2.677	19.83%	11.76%
12.5		10	13.7	11	16	0.3719	2.003	14.62%	10.46%
25		10	9.2	2	16	0.8657	4.662	50.67%	39.87%
50		10	5.3	0	15	0.971	5.229	98.66%	65.36%
100		10	0.2	0	2	0.1174	0.6325	316.2%	98.69%

*Aug 27/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 17:49 (p 2 of 2)  
 Link/Link Code: 12-2686-5825/09211a

**Ceriodaphnia 7-d Survival and Reproduction Test**

**Nautilus Environmental**

Analysis No: 14-6821-2677  
 Analyzed: 26 Aug-09 17:48

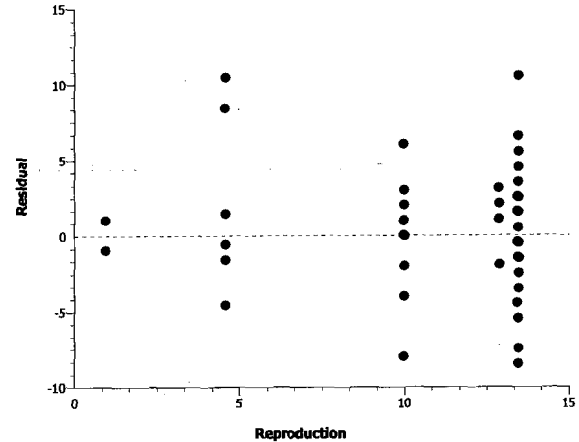
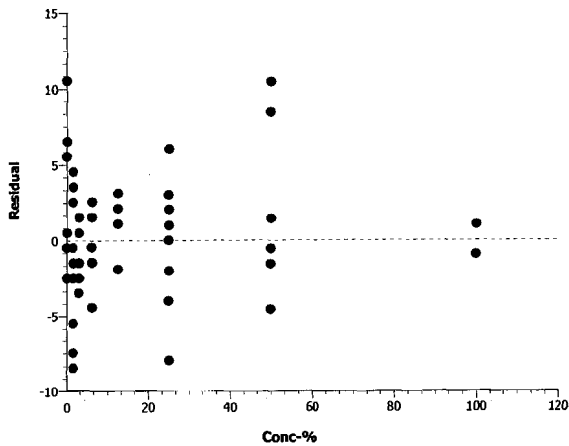
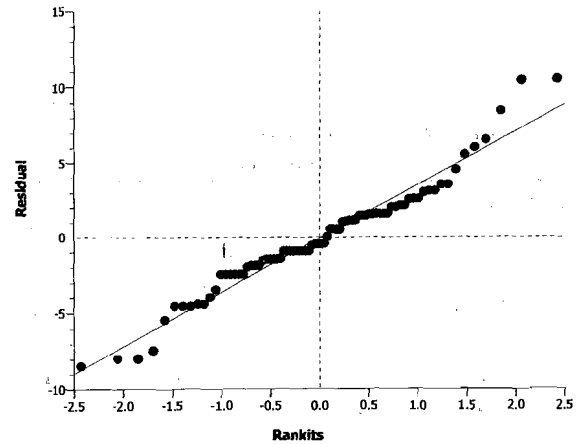
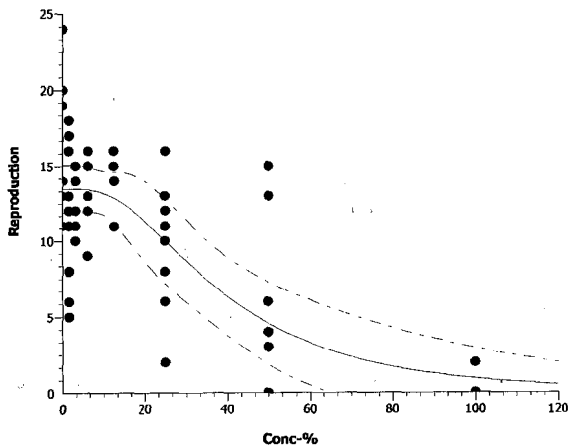
Endpoint: Reproduction  
 Analysis: Nonlinear Regression

CETIS Version: CETISv1.5.0  
 Official Results: Yes

**Reproduction Detail**

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	14	19	20	24	13	11	11	13	14	14
1.56		6	17	17	16	12	11	8	5	13	18
3.12		12	12	10	11	11	12	11	15	14	15
6.25		15	16	15	12	9	13	16	15	15	9
12.5		15	11	14	16	14	15	16	11	14	11
25		10	13	12	12	2	11	2	16	6	8
50		13	6	15	6	3	0	0	4	6	0
100		0	0	0	0	0	0	0	0	0	2

**Graphics**



*EA*  
 Aug 27/09



**APPENDIX B - *Oncorhynchus mykiss* embryo Toxicity Test Data**

Nautilus Environmental  
Washington Laboratory

Client: BC Lab  
Sample ID: SC2  
Test No: 0907-T009  
Log-In#: 09-200

Initial and Final Chemistries

Seven Day Chronic Freshwater Bioassay  
Start Date & Time: 7/8/09 1525  
Stop Date & Time: 7/15/09 1445  
Test Species: Oncorhynchus mykiss

Conc or % Con	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	7.97	7.00	7.46	7.05	7.48	7.34	7.10	7.23	7.53	7.24	7.11	7.21	7.18	7.42
DO (mg/l)	9.3	9.8	8.9	10.1	8.9	10.1	9.6	10.0	9.7	9.9	9.9	9.4	9.3	9.6
Cond. (µmhos-cm)	257	242	239	232	244	240	249	238	250	243	235	236	254	247
Temperature (°C)	14.6	13.3	14.7	13.1	14.2	13.5	14.4	13.0	13.8	14.6	14.9	14.9	14.9	14.7
6.25	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	8.00	7.10	7.49	7.07	7.51	7.36	7.13	7.31	7.56	7.30	7.08	7.15	7.25	7.42
DO (mg/l)	9.4	10.0	8.9	10.2	9.2	10.3	9.5	10.0	9.5	9.4	9.1	9.5	9.5	9.7
Cond. (µmhos-cm)	250	231	234	224	236	233	237	226	244	238	230	228	246	242
Temperature (°C)	14.6	13.0	14.8	13.2	14.2	13.5	14.5	13.2	13.8	14.4	14.8	14.4	14.9	14.8
12.5	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	7.96	7.13	7.49	6.95	7.51	7.36	7.13	7.33	7.54	7.31	7.07	7.17	7.28	7.39
DO (mg/l)	9.3	9.7	9.1	10.1	9.3	10.1	9.5	10.2	9.6	9.0	9.0	9.7	9.5	9.6
Cond. (µmhos-cm)	239	224	227	217	230	229	232	219	236	231	225	223	239	235
Temperature (°C)	14.4	13.1	14.9	13.0	14.1	14.0	14.3	13.2	14.0	14.5	14.9	14.5	14.9	14.9
25	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	7.91	7.13	7.46	6.96	7.48	7.36	7.10	7.32	7.51	7.29	7.08	7.18	7.28	7.35
DO (mg/l)	9.4	9.9	9.2	10.1	9.4	10.1	9.6	10.1	9.6	9.3	9.3	9.7	9.6	9.6
Cond. (µmhos-cm)	226	210	214	203	214	212	219	208	224	216	211	211	223	221
Temperature (°C)	14.5	13.1	14.6	13.0	14.0	13.6	14.6	13.3	14.1	14.5	14.8	14.6	14.8	14.8
50	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	7.81	7.09	7.42	6.96	7.42	7.33	6.99	7.24	7.41	7.23	7.06	7.17	7.27	7.31
DO (mg/l)	8.9	10.0	9.2	10.1	9.7	10.1	9.8	10.1	9.7	9.2	9.4	9.8	9.8	9.6
Cond. (µmhos-cm)	193	179	186	176	187	184	195	178	198	190	186	185	191	191
Temperature (°C)	14.8	13.0	14.7	13.0	14.0	13.6	14.6	13.2	14.2	14.5	14.8	14.6	14.8	14.9
100	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	7.55	7.06	7.09	6.91	7.38	7.17	6.73	7.17	7.21	7.07	6.86	7.02	7.18	7.14
DO (mg/l)	9.6	9.9	9.9	10.2	10.4	10.2	10.5	10.2	10.0	9.1	10.2	9.5	10.5	9.6
Cond. (µmhos-cm)	133	128	130	124	125	128	136	123	137	133	132	132	130	134
Temperature (°C)	14.8	13.1	14.6	13.0	13.2	13.6	14.6	13.3	14.2	14.7	14.6	14.6	14.2	14.8
Tech. Initials	EW	BP	BP	ET	BP	BP	BP	BP	BP	BP	BP	BP	BP	BP

Dilution Water Batch #: MHSW040  
Test Chamber: ENV.ch A

QA Check: 185

Sample Description: \_\_\_\_\_  
Animal Source: Trout lodge Date Received: 7/8/09 Date of Hatch: \_\_\_\_\_  
Comments: \_\_\_\_\_

Nautilus Environmental  
 Washington Laboratory  
 5009 Pacific Hwy. E., Suite 2  
 Tacoma, WA 98424

Raw Data Sheet  
 Rainbow Trout  
 (*Oncorhynchus mykiss*)  
 Trout Embryo Test

Client Name: BC Lab

Test No.: 0907-T009

Sample ID: SCZ

Conc.	Cont.	Rep.	# Embryos/Container								# Normal	# Abnormal	Mean % Viable	
			Days											
			0	1	2	3	4	5	6	7				
CON	501	1	30	30	30	30	30	30	30	26	26	0		
	502	2	30	29	29	29	29	29	29	29	0	29		
	503	3	30	30	30	30	30	30	30	28	23	5		
	504	4	30	30	30	30	30	30	29	27	24	3		
6.25	508	1	30	30	30	30	30	30	30	30	30	0		
	507	2	30	30	30	30	30	30	30	30	30	30		
	506	3	30	30	30	30	30	30	30	30	29	26		3
	505	4	30	30	30	30	30	30	30	29	20	9		
12.5	512	1	30	30	30	30	30	30	30	30	30	0		
	511	2	30	29	29	29	29	29	29	28	0	28		
	510	3	30	30	30	30	30	30	30	29	23	6		
	509	4	30	29	29	29	29	28	27	27	16	11		
25	516	1	30	30	30	30	30	30	30	30	29	1		
	515	2	30	30	30	30	30	30	30	30	0	30		
	514	3	30	30	30	30	30	30	30	30	19	11		
	513	4	30	30	30	30	30	30	30	29	20	9		
50	520	1	30	30	30	30	30	30	30	27	26	1		
	519	2	30	30	30	30	30	30	30	30	0	30		
	518	3	30	28	28	28	28	28	28	28	22	6		
	517	4	30	30	30	30	30	30	30	29	24	5		
100	524	1	30	30	30	30	30	30	30	28	27	1		
	523	2	30	28	28	28	27	27	27	27	0	27		
	522	3	30	30	30	30	30	30	30	27	24	3		
	521	4	30	30	30	30	30	30	30	30	21	9		
		1												
		2												
		3												
		4												
		1												
		2												
		3												
		4												
Tech Initials			MF	BP	ET	BP	GP	①	ET	MF	MF	MF		

QA Check: CC

Comments: \_\_\_\_\_  
 \_\_\_\_\_

**CETIS Summary Report**

Report Date: 17 Jul-09 15:40 (p 1 of 1)  
 Link/Link Code: 06-5488-1127/0907-T009

**Salmonid Embryo Survival and Development Test** **Nautilus Environmental WA**

<b>Test Run No:</b> 11-9243-3530	<b>Test Type:</b> Survival-Development	<b>Analyst:</b> Meghan Feuk
<b>Start Date:</b> 08 Jul-09 15:25	<b>Protocol:</b> EC/EPS 1/RM/28	<b>Diluent:</b> Mod-Hard Synthetic Water
<b>Ending Date:</b> 15 Jul-09 14:45	<b>Species:</b> Oncorhynchus mykiss	<b>Brine:</b>
<b>Duration:</b> 6d 23h	<b>Source:</b> Trout Lodge Fish Farm	<b>Age:</b>

<b>Sample No:</b> 19-2263-9455	<b>Code:</b> 09-200	<b>Client:</b> Vancouver BC Lab
<b>Sample Date:</b> 05 Jul-09 09:30	<b>Material:</b> Receiving Water	<b>Project:</b>
<b>Receive Date:</b> 08 Jul-09 12:30	<b>Source:</b> Vancouver BC Lab	
<b>Sample Age:</b> 78h (13 °C)	<b>Station:</b>	

**Comparison Summary**

Analysis No	Endpoint	NOEL	LOEL	TOEL	PMSD	Method
19-6250-5140	Combined Development	100	> 100	N/A	50.6%	Dunnett's Multiple Comparison Test

**Point Estimate Summary**

Analysis No	Endpoint	Effect-%	Conc-%	95% LCL	95% UCL	Method
07-0094-9877	Combined Development	25	5.16E+08	N/A	N/A	Linear Regression (MLE)
		50	8.41E+13	N/A	N/A	

**Combined Development Summary**

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	0.811	0.792	0.83	0.767	0.867	0.0093	0.0509	6.28%	0.0%
6.25		3	0.844	0.782	0.907	0.667	1	0.0306	0.168	19.9%	-4.11%
12.5		3	0.767	0.68	0.854	0.533	1	0.0426	0.233	30.4%	5.48%
25		3	0.756	0.687	0.824	0.633	0.967	0.0335	0.184	24.3%	6.85%
50		3	0.8	0.775	0.825	0.733	0.867	0.0122	0.0667	8.33%	1.37%
100		3	0.8	0.763	0.837	0.7	0.9	0.0183	0.1	12.5%	1.37%

**Combined Development Detail**

Conc-%	Control Type	Rep 1	Rep 3	Rep 4
0	Dilution Water	0.867	0.767	0.8
6.25		1	0.867	0.667
12.5		1	0.767	0.533
25		0.967	0.633	0.667
50		0.867	0.733	0.8
100		0.9	0.8	0.7

**CETIS Analytical Report**

Report Date: 17 Jul-09 15:40 (p 1 of 2)  
 Link/Link Code: 06-5488-1127/0907-T009

Salmonid Embryo Survival and Development Test								Nautilus Environmental WA			
Analysis No: 19-6250-5140		Endpoint: Combined Development			CETIS Version: CETISv1.6.3						
Analyzed: 17 Jul-09 15:38		Analysis: Parametric-Control vs Treatments			Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)		C > T	Not Run	100	>100	N/A	1	50.6%			
Dunnett's Multiple Comparison Test											
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Dilution Water		6.25	-0.497	2.5	0.438	0.9380	Non-Significant Effect				
		12.5	0.0114	2.5	0.438	0.8300	Non-Significant Effect				
		25	0.205	2.5	0.438	0.7660	Non-Significant Effect				
		50	0.0733	2.5	0.438	0.8110	Non-Significant Effect				
		100	0.0447	2.5	0.438	0.8200	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)					
Between	0.02686	0.005372	5	0.117	0.9860	Non-Significant Effect					
Error	0.552100	0.046008	12								
Total	0.578960	0.051380	17								
ANOVA Assumptions											
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)						
Variances	Bartlett Equality of Variance	5.93	15.1	0.3130	Equal Variances						
Distribution	Shapiro-Wilk Normality	0.958		0.5650	Normal Distribution						
Combined Development Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	0.811	0.792	0.83	0.767	0.867	0.00946	0.0509	6.28%	0.0%
6.25		3	0.844	0.781	0.908	0.667	1	0.0312	0.168	19.9%	-4.11%
12.5		3	0.767	0.678	0.855	0.533	1	0.0433	0.233	30.4%	5.48%
25		3	0.756	0.686	0.825	0.633	0.967	0.0341	0.184	24.3%	6.85%
50		3	0.8	0.775	0.825	0.733	0.867	0.0124	0.0667	8.33%	1.37%
100		3	0.8	0.762	0.838	0.7	0.9	0.0186	0.1	12.5%	1.37%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	1.12	1.1	1.15	1.07	1.2	0.0124	0.0667	5.94%	0.0%
6.25		3	1.21	1.11	1.31	0.955	1.48	0.0487	0.262	21.7%	-7.74%
12.5		3	1.12	0.995	1.25	0.819	1.48	0.062	0.334	29.8%	0.18%
25		3	1.09	0.989	1.19	0.92	1.39	0.0483	0.26	23.9%	3.2%
50		3	1.11	1.08	1.14	1.03	1.2	0.0157	0.0845	7.61%	1.14%
100		3	1.12	1.07	1.16	0.991	1.25	0.024	0.129	11.6%	0.7%

Salmonid Embryo Survival and Development Test

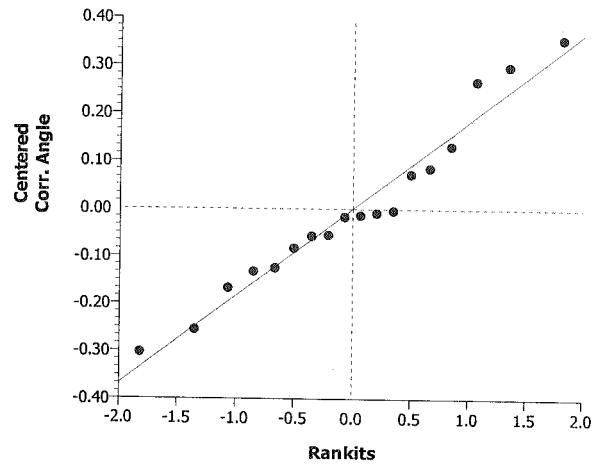
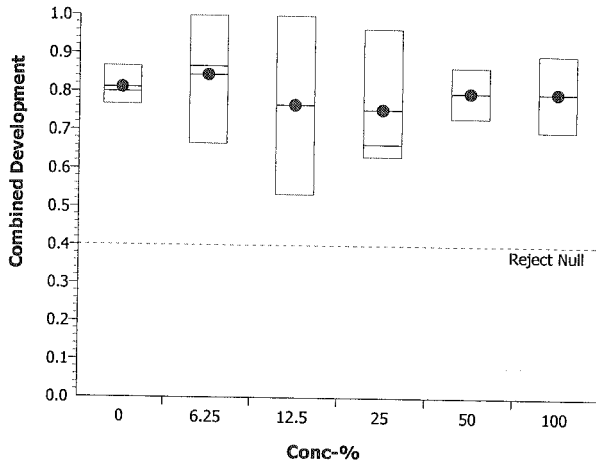
Nautilus Environmental WA

Analysis No: 19-6250-5140  
Analyzed: 17 Jul-09 15:38

Endpoint: Combined Development  
Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1.6.3  
Official Results: Yes

Graphics



**CETIS Analytical Report**

Report Date: 17 Jul-09 15:40 (p 1 of 2)  
 Link/Link Code: 06-5488-1127/0907-T009

<b>Salmonid Embryo Survival and Development Test</b>							<b>Nautilus Environmental WA</b>				
<b>Analysis No:</b> 07-0094-9877		<b>Endpoint:</b> Combined Development			<b>CETIS Version:</b> CETISv1.6.3						
<b>Analyzed:</b> 17 Jul-09 15:39		<b>Analysis:</b> Linear Regression (MLE)			<b>Official Results:</b> Yes						
<b>Linear Regression Options</b>											
<b>Model Function</b>		<b>Threshold Option</b>		<b>Threshold</b>		<b>Optimized Pooled</b>		<b>Het Corr</b>		<b>Weighted</b>	
Log-Angle [Asin(P^0.5)=A+B*log(X)]		Control Threshold		0.1888889		Yes No		Yes		Yes	
<b>Regression Summary</b>											
<b>Iters</b>	<b>LL</b>	<b>QAICc</b>	<b>Mu</b>	<b>Sigma</b>	<b>G Stat</b>	<b>Chi-Sq</b>	<b>Critical</b>	<b>P-Value</b>	<b>Decision(5%)</b>		
52	-50.2	54.6	1.71	19.9	136	26.3	22.4	0.0153	Significant Heterogeneity		
<b>Point Estimates</b>											
<b>Effect-%</b>	<b>Conc-%</b>	<b>95% LCL</b>	<b>95% UCL</b>								
25	516000000	N/A	N/A								
50	8.41E+13	N/A	N/A								
<b>Regression Parameters</b>											
<b>Parameter</b>	<b>Estimate</b>	<b>Std Error</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>t Stat</b>	<b>P-Value</b>	<b>Decision(5%)</b>				
Threshold	0.187	0.0585	0.0607	0.313	3.2	0.0070	Significant Parameter				
Slope	0.0502	0.272	-0.537	0.637	0.185	0.8560	Non-Significant Parameter				
Intercept	0.086	0.478	-0.947	1.12	0.18	0.8600	Non-Significant Parameter				
<b>Residual Analysis</b>											
<b>Attribute</b>	<b>Method</b>		<b>Test Stat</b>	<b>Critical</b>	<b>P-Value</b>	<b>Decision(5%)</b>					
Variances	Bartlett Equality of Variance		2.86	9.49	0.5810	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.967		0.8130	Normal Distribution					
<b>Combined Development Summary</b>											
			<b>Calculated Variate(A/B)</b>								
<b>Conc-%</b>	<b>Control Type</b>	<b>Count</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>Diff%</b>	<b>A</b>	<b>B</b>
0	Dilution Water	3	0.811	0.767	0.867	0.0093	0.0509	6.28%	0.0%	73	90
6.25		3	0.844	0.667	1	0.0306	0.168	19.9%	-4.11%	76	90
12.5		3	0.767	0.533	1	0.0426	0.233	30.4%	5.48%	69	90
25		3	0.756	0.633	0.967	0.0335	0.184	24.3%	6.85%	68	90
50		3	0.8	0.733	0.867	0.0122	0.0667	8.33%	1.37%	72	90
100		3	0.8	0.7	0.9	0.0183	0.1	12.5%	1.37%	72	90
<b>Combined Development Detail</b>											
<b>Conc-%</b>	<b>Control Type</b>	<b>Rep 1</b>	<b>Rep 3</b>	<b>Rep 4</b>							
0	Dilution Water	0.867	0.767	0.8							
6.25		1	0.867	0.667							
12.5		1	0.767	0.533							
25		0.967	0.633	0.667							
50		0.867	0.733	0.8							
100		0.9	0.8	0.7							

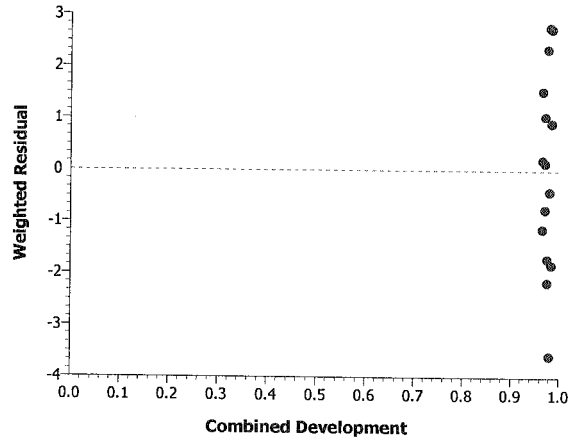
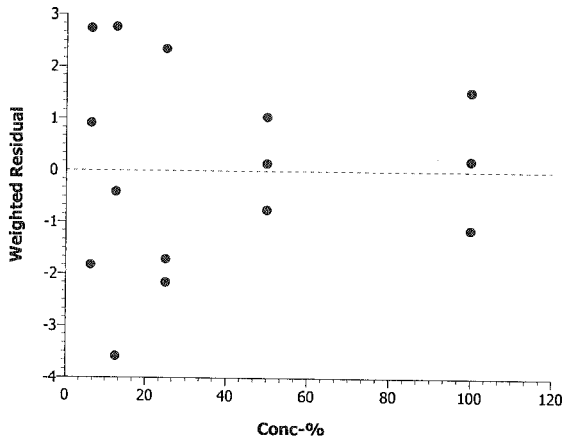
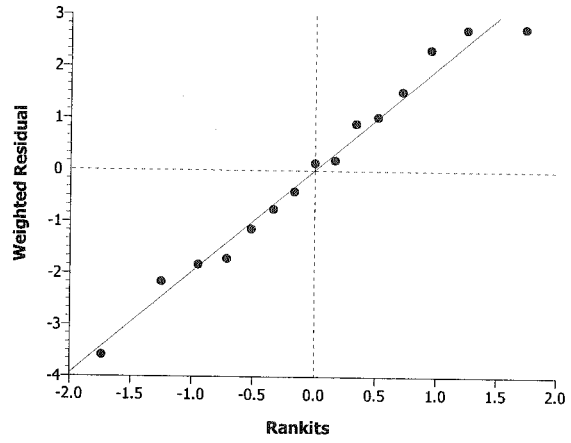
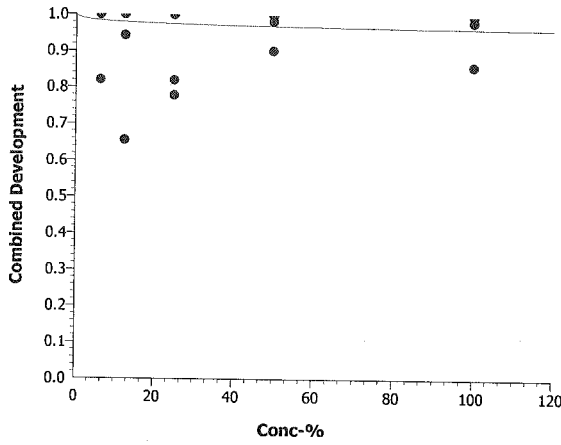
Salmonid Embryo Survival and Development Test

Nautilus Environmental WA

Analysis No: 07-0094-9877      Endpoint: Combined Development  
Analyzed: 17 Jul-09 15:39      Analysis: Linear Regression (MLE)

CETIS Version: CETISv1.6.3  
Official Results: Yes

Graphics





Nautilus Environmental  
Washington Laboratory

Client: BC Lab  
Sample ID: STF2  
Test No: 0907-1008  
Log-In#: 09-201

Initial and Final Chemistries

Seven Day Chronic Freshwater Bioassay  
Start Date & Time: 7/8/09 1435  
Stop Date & Time: 7/15/09 1300  
Test Species: Oncorhynchus mykiss

Conc or % Coh	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
pH	8.11	7.03	7.54	7.05	7.25	7.14	7.31	7.13	7.03	7.52	6.99	7.22	7.04	7.58
DO (mg/l)	8.0	9.5	8.9	9.5	8.9	9.7	9.5	9.4	9.3	9.3	9.0	9.3	9.4	9.6
Cond. (µmhos-cm)	257	237	241	240	255	241	240	249	236	244	236	234	249	246
Temperature (°C)	14.8	14.6	14.9	14.4	14.8	14.0	14.0	14.5	13.8	14.6	14.8	14.5	14.9	14.0
pH	8.11	7.07	7.58	7.03	7.33	7.20	7.51	7.23	7.16	7.53	7.04	7.24	7.05	7.63
DO (mg/l)	8.5	9.5	9.0	9.7	9.0	9.9	8.9	9.6	9.3	9.3	8.9	9.8	9.2	9.7
Cond. (µmhos-cm)	246	225	228	227	247	232	226	227	220	231	227	223	239	237
Temperature (°C)	14.8	14.4	14.8	14.2	14.8	14.0	14.4	14.2	13.4	14.5	14.9	14.2	14.8	14.7
pH	8.10	7.09	7.59	7.09	7.37	7.22	7.54	7.26	7.16	7.52	7.06	7.24	7.07	7.63
DO (mg/l)	8.6	9.6	9.0	9.8	9.0	9.7	8.9	9.3	9.6	9.2	9.2	9.5	9.6	9.7
Cond. (µmhos-cm)	232	214	218	217	233	219	216	216	209	220	216	212	226	224
Temperature (°C)	14.8	14.4	14.7	14.2	14.9	13.9	14.5	14.4	13.5	14.6	14.9	14.2	14.7	14.7
pH	8.04	7.11	7.59	7.14	7.38	7.21	7.50	7.24	7.17	7.51	7.07	7.25	7.13	7.61
DO (mg/l)	8.5	9.4	9.2	9.8	9.3	9.7	9.0	9.4	9.3	9.2	9.3	9.6	9.7	9.8
Cond. (µmhos-cm)	204	193	196	193	203	192	195	192	187	197	189	188	197	198
Temperature (°C)	14.9	14.3	14.9	14.3	14.9	13.9	14.8	14.5	13.4	14.7	14.9	14.3	14.5	14.7
pH	7.97	7.09	7.57	7.18	7.37	7.18	7.36	7.18	7.15	7.45	7.07	7.26	7.15	7.55
DO (mg/l)	9.4	9.5	9.3	9.6	9.4	9.9	9.6	9.5	9.4	9.2	9.4	9.7	9.9	9.7
Cond. (µmhos-cm)	159	152	148	148	158	149	156	150	143	150	148	144	151	151
Temperature (°C)	15.0	14.2	14.9	14.2	14.9	13.8	14.9	14.3	13.5	14.5	14.9	14.2	14.3	14.6
pH	7.66	6.95	7.59	7.22	7.20	6.87	7.00	6.89	7.01	7.18	7.01	7.25	7.21	7.25
DO (mg/l)	9.6	9.6	10.0	9.8	10.2	9.8	10.1	9.6	9.8	9.3	10.1	9.6	10.5	9.74
Cond. (µmhos-cm)	50	51	49	49	50	48	52	48	48	49	49	49	48	49
Temperature (°C)	15.0	14.3	14.8	14.3	14.9	13.9	14.9	14.3	13.7	14.8	14.4	14.3	13.8	14.7
Tech. Initials	MD	GT	GT	GT	BP	MA	BP	BP	BP	MD	GT	GT	GT	OC

Dilution Water Batch #: MHSW040  
Test Chamber: Env Ch B

QA Check: 125

Sample Description: \_\_\_\_\_  
Animal Source: Troutlodge Date Received: 7/8/09 Date of Hatch: \_\_\_\_\_  
Comments: \_\_\_\_\_

Nautilus Environmental  
 Washington Laboratory  
 5009 Pacific Hwy. E., Suite 2  
 Tacoma, WA 98424

Raw Data Sheet  
 Rainbow Trout  
 (*Oncorhynchus mykiss*)  
 Trout Embryo Test

Client Name: BC Lab

Test No.: 0907-T008

Sample ID: STE2

# Embryos/Container

Conc.	Cont.	Rep.	Days							# Normal	# Abnormal	Mean % Viable	
			0	1	2	3	4	5	6				7
Con	201	1	30	30	30	30	30	30	30	29	28	1	
	202	2	30	29	29	29	29	29	29	29	0	29	
	203	3	30	30	30	30	30	30	30	30	28	2	
	204	4	30	30	30	30	30	29	29	29	29	4	
6.25	205	1	30	30	30	30	30	30	30	29	28	1	
	206	2	30	28	28	28	28	28	28	28	0	28	
	207	3	30	28	28	28	28	28	28	28	26	2	
	208	4	30	30	30	30	30	28	28	28	22	6	
12.5	209	1	30	30	30	30	30	30	30	30	29	1	
	210	2	30	29	29	29	29	29	28	27	0	27	
	211	3	30	30	30	30	30	30	30	29	26	3	
	212	4	30	30	30	30	29	28	28	28	24	4	
25	213	1	30	30	30	30	30	30	30	30	29	1	
	214	2	30	30	30	29	29	29	29	29	0	29	
	215	3	30	30	30	30	29	29	29	29	24	5	
	216	4	30	30	29	29	29	29	29	29	18	11	
50	217	1	30	30	30	30	30	28	28	28	18	10	
	218	2	30	29	29	29	29	29	29	29	0	29	
	219	3	30	30	30	30	30	30	30	30	29	1	
	220	4	30	30	30	30	30	30	30	30	29	1	
100	221	1	30	30	30	30	30	30	30	30	30	0	
	222	2	30	29	29	29	29	29	29	29	0	29	
	223	3	30	30	30	30	29	29	29	29	25	4	
	224	4	30	30	30	30	30	29	29	29	19	10	
		1											
		2											
		3											
		4											
		1											
		2											
		3											
		4											
Tech Initials			MF	CF	CF	MA	BP	CF	CF	MF	MF	MF	

QA Check: RS

Comments: \_\_\_\_\_

# CETIS Summary Report

Report Date: 17 Jul-09 15:18 (p 1 of 1)  
 Link/Link Code: 02-1430-2846/0907-T008

Salmonid Embryo Survival and Development Test							Nautilus Environmental WA				
<b>Test Run No:</b> 09-3136-5821	<b>Test Type:</b> Survival-Development		<b>Analyst:</b> Meghan Feuk								
<b>Start Date:</b> 08 Jul-09 14:35	<b>Protocol:</b> EC/EPS 1/RM/28		<b>Diluent:</b> Mod-Hard Synthetic Water								
<b>Ending Date:</b> 15 Jul-09 13:00	<b>Species:</b> Oncorhynchus mykiss		<b>Brine:</b>								
<b>Duration:</b> 6d 22h	<b>Source:</b> Trout Lodge Fish Farm		<b>Age:</b>								
<b>Sample No:</b> 19-9440-6980	<b>Code:</b> 09-201		<b>Client:</b> Vancouver BC Lab								
<b>Sample Date:</b> 05 Jul-09 13:15	<b>Material:</b> Receiving Water		<b>Project:</b>								
<b>Receive Date:</b> 08 Jul-09 12:30	<b>Source:</b> Vancouver BC Lab										
<b>Sample Age:</b> 73h (15 °C)	<b>Station:</b>										
<b>Comparison Summary</b>											
<b>Analysis No</b>	<b>Endpoint</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>PMSD</b>	<b>Method</b>					
13-2195-6944	Combined Development	100	> 100	N/A	40.7%	Dunnett's Multiple Comparison Test					
<b>Point Estimate Summary</b>											
<b>Analysis No</b>	<b>Endpoint</b>	<b>Effect-%</b>	<b>Conc-%</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>Method</b>					
09-3449-6703	Combined Development	25	183000	N/A	N/A	Linear Regression (MLE)					
		50	3.51E+08	N/A	N/A						
<b>Combined Development Summary</b>											
<b>Conc-%</b>	<b>Control Type</b>	<b>Count</b>	<b>Mean</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>Diff%</b>
0	Dilution Water	3	0.9	0.878	0.922	0.833	0.933	0.0105	0.0577	6.42%	0.0%
6.25		3	0.844	0.806	0.882	0.733	0.933	0.0186	0.102	12.1%	6.17%
12.5		3	0.878	0.846	0.909	0.8	0.967	0.0153	0.0839	9.56%	2.47%
25		3	0.789	0.72	0.857	0.6	0.967	0.0335	0.184	23.3%	12.3%
50		3	0.844	0.765	0.923	0.6	0.967	0.0387	0.212	25.1%	6.17%
100		3	0.822	0.754	0.891	0.633	1	0.0335	0.184	22.3%	8.64%
<b>Combined Development Detail</b>											
<b>Conc-%</b>	<b>Control Type</b>	<b>Rep 1</b>	<b>Rep 3</b>	<b>Rep 4</b>							
0	Dilution Water	0.933	0.933	0.833							
6.25		0.933	0.867	0.733							
12.5		0.967	0.867	0.8							
25		0.967	0.8	0.6							
50		0.6	0.967	0.967							
100		1	0.833	0.633							

**CETIS Analytical Report**

Report Date: 17 Jul-09 15:18 (p 1 of 2)  
 Link/Link Code: 02-1430-2846/0907-T008

Salmonid Embryo Survival and Development Test								Nautilus Environmental WA			
Analysis No: 13-2195-6944		Endpoint: Combined Development			CETIS Version: CETISv1.6.3						
Analyzed: 17 Jul-09 15:16		Analysis: Parametric-Control vs Treatments			Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)		C > T	Not Run	100	>100	N/A	1	40.7%			
Dunnnett's Multiple Comparison Test											
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Dilution Water		6.25	0.448	2.5	0.437	0.6710	Non-Significant Effect				
		12.5	0.149	2.5	0.437	0.7860	Non-Significant Effect				
		25	0.742	2.5	0.437	0.5410	Non-Significant Effect				
		50	0.208	2.5	0.437	0.7650	Non-Significant Effect				
		100	0.419	2.5	0.437	0.6830	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)					
Between	0.031893	0.006379	5	0.139	0.9800	Non-Significant Effect					
Error	0.549407	0.045784	12								
Total	0.5813	0.052163	17								
ANOVA Assumptions											
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)						
Variances	Bartlett Equality of Variance	3.1	15.1	0.6850	Equal Variances						
Distribution	Shapiro-Wilk Normality	0.974		0.8690	Normal Distribution						
Combined Development Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	0.9	0.878	0.922	0.833	0.933	0.0107	0.0577	6.41%	0.0%
6.25		3	0.844	0.806	0.883	0.733	0.933	0.0189	0.102	12.1%	6.17%
12.5		3	0.878	0.846	0.91	0.8	0.967	0.0156	0.0839	9.56%	2.47%
25		3	0.789	0.719	0.859	0.6	0.967	0.0341	0.184	23.3%	12.3%
50		3	0.844	0.764	0.925	0.6	0.967	0.0393	0.212	25.1%	6.17%
100		3	0.822	0.752	0.892	0.633	1	0.0341	0.184	22.3%	8.64%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	1.26	1.22	1.29	1.15	1.31	0.0171	0.092	7.32%	0.0%
6.25		3	1.18	1.12	1.23	1.03	1.31	0.0263	0.142	12.0%	6.23%
12.5		3	1.23	1.18	1.28	1.11	1.39	0.0266	0.143	11.6%	2.07%
25		3	1.13	1.03	1.22	0.886	1.39	0.0466	0.251	22.3%	10.3%
50		3	1.22	1.11	1.33	0.886	1.39	0.0537	0.289	23.7%	2.89%
100		3	1.18	1.08	1.29	0.92	1.48	0.0522	0.281	23.7%	5.82%

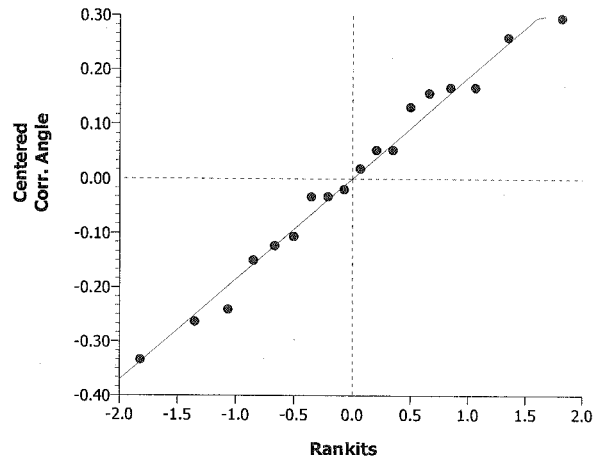
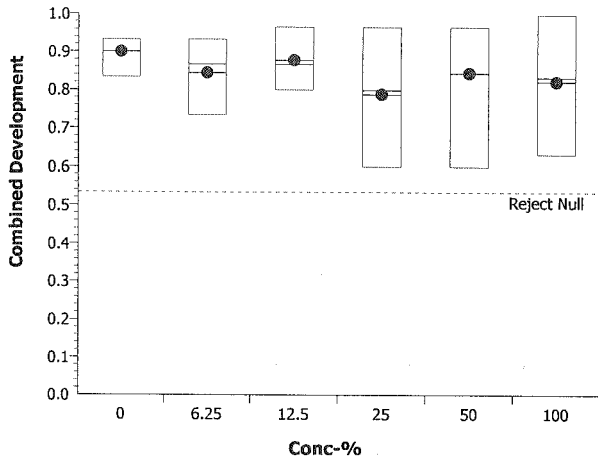
Salmonid Embryo Survival and Development Test

Nautilus Environmental WA

Analysis No: 13-2195-6944      Endpoint: Combined Development  
Analyzed: 17 Jul-09 15:16      Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1.6.3  
Official Results: Yes

Graphics



**CETIS Analytical Report**

Report Date: 17 Jul-09 15:18 (p 1 of 2)  
 Link/Link Code: 02-1430-2846/0907-T008

Salmonid Embryo Survival and Development Test							Nautilus Environmental WA					
Analysis No: 09-3449-6703		Endpoint: Combined Development			CETIS Version: CETISv1.6.3							
Analyzed: 17 Jul-09 15:17		Analysis: Linear Regression (MLE)			Official Results: Yes							
Linear Regression Options												
Model Function			Threshold Option		Threshold	Optimized Pooled		Het Corr	Weighted			
Log-Normal [NED=A+B*log(X)]			Control Threshold		0.1	Yes No		Yes	Yes			
Regression Summary												
Iters	LL	QAICc	Mu	Sigma	G Stat	Chi-Sq	Critical	P-Value	Decision(5%)			
7	-116	80	15.8	4.87	41.3	40.1	22.4	0.0001	Significant Heterogeneity			
Point Estimates												
Effect-%	Conc-%	95% LCL	95% UCL									
25	183000	N/A	N/A									
50	351000000	N/A	N/A									
Regression Parameters												
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)					
Threshold	0.0998	0.0555	-0.0201	0.22	1.8	0.0953	Non-Significant Parameter					
Slope	0.205	0.611	-1.12	1.53	0.336	0.7420	Non-Significant Parameter					
Intercept	3.24	1.03	1.02	5.47	3.16	0.0076	Significant Parameter					
Residual Analysis												
Attribute	Method		Test Stat	Critical	P-Value	Decision(5%)						
Variances	Bartlett Equality of Variance		1.72	9.49	0.7870	Equal Variances						
Distribution	Shapiro-Wilk Normality		0.909		0.1290	Normal Distribution						
Combined Development Summary												
			Calculated Variate(A/B)									
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B	
0	Dilution Water	3	0.9	0.833	0.933	0.0105	0.0577	6.41%	0.0%	81	90	
6.25		3	0.844	0.733	0.933	0.0186	0.102	12.1%	6.17%	76	90	
12.5		3	0.878	0.8	0.967	0.0153	0.0839	9.56%	2.47%	79	90	
25		3	0.789	0.6	0.967	0.0335	0.184	23.3%	12.3%	71	90	
50		3	0.844	0.6	0.967	0.0387	0.212	25.1%	6.17%	76	90	
100		3	0.822	0.633	1	0.0335	0.184	22.3%	8.64%	74	90	
Combined Development Detail												
Conc-%	Control Type	Rep 1	Rep 3	Rep 4								
0	Dilution Water	0.933	0.933	0.833								
6.25		0.933	0.867	0.733								
12.5		0.967	0.867	0.8								
25		0.967	0.8	0.6								
50		0.6	0.967	0.967								
100		1	0.833	0.633								

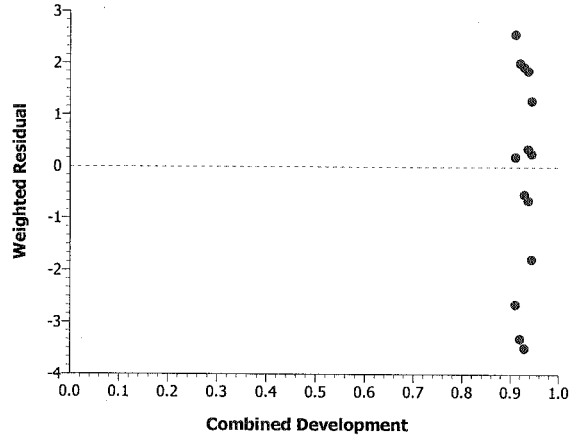
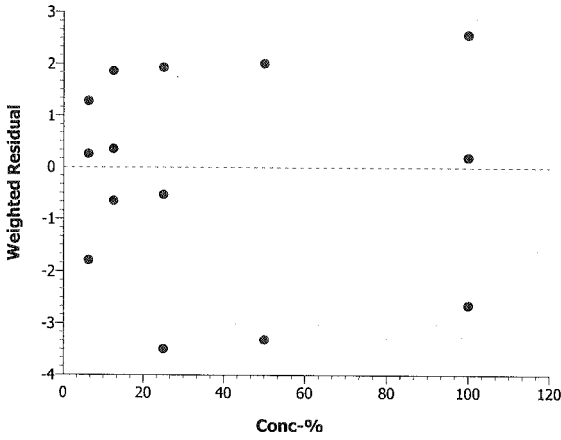
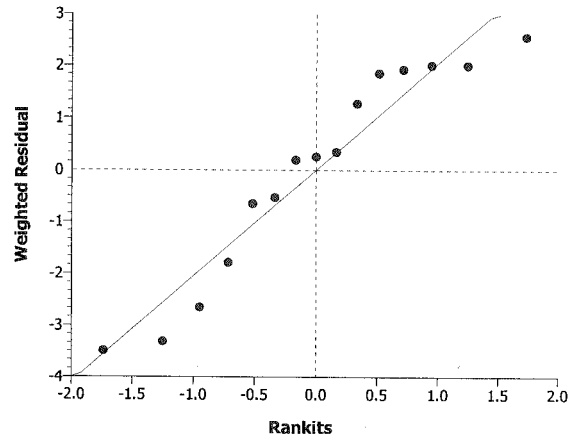
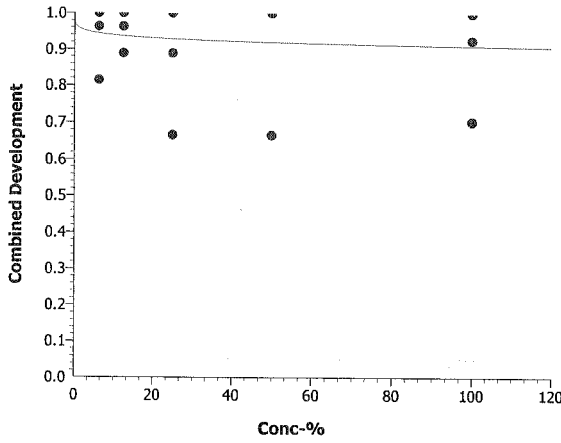
Salmonid Embryo Survival and Development Test

Nautilus Environmental WA

Analysis No: 09-3449-6703      Endpoint: Combined Development  
Analyzed: 17 Jul-09 15:17      Analysis: Linear Regression (MLE)

CETIS Version: CETISv1.6.3  
Official Results: Yes

Graphics



Nautilus Environmental  
Washington Laboratory

Client: BC Lab  
Sample ID: MTR2  
Test No: 0907-TD10  
Log-In#: 09-202

Initial and Final Chemistries

Seven Day Chronic Freshwater Bioassay  
Start Date & Time: 7/8/09 1435  
Stop Date & Time: 7/15/09 1330  
Test Species: Oncorhynchus mykiss

Conc. or % CDN	Days													
	0		1		*7.142		3		4		5		6	
	init	final	init	final	init	final	init	final	init	final	init	final	init	final
pH	8.03	7.07	7.51	7.45	8.74	7.13	7.59	7.19	7.22	7.51	7.11	7.82	7.21	7.54
DO (mg/l)	9.4	9.6	8.8	9.6	8.8	9.7	8.7	9.5	9.4	9.2	9.2	9.6	9.5	9.6
Cond. (µmhos-cm)	253	246	245	242	258	253	236	238	232	245	239	236	253	244
Temperature (°C)	14.8	14.5	14.6	14.5	14.8	14.1	14.7	14.6	13.8	14.5	14.8	14.5	14.8	14.7

6.25	Days													
	0		1		2		3		4		5		6	
	init	final	init	final	init	final	init	final	init	final	init	final	init	final
pH	8.05	7.13	7.56	7.49	7.23	7.20	7.64	7.25	7.41	7.56	7.06	7.82	7.23	7.59
DO (mg/l)	9.4	9.5	9.0	9.6	9.2	9.6	8.9	9.5	9.0	9.1	8.9	9.8	9.4	9.8
Cond. (µmhos-cm)	238	235	235	230	245	237	227	228	215	225	232	223	242	235
Temperature (°C)	14.7	14.4	14.5	14.1	14.7	13.7	14.7	14.7	14.2	14.6	14.9	14.4	14.7	14.7

12.5	Days													
	0		1		2		3		4		5		6	
	init	final	init	final	init	final	init	final	init	final	init	final	init	final
pH	8.04	7.17	7.56	7.49	7.27	7.23	7.66	7.28	7.41	7.56	7.11	7.79	7.25	7.60
DO (mg/l)	9.4	9.6	9.1	9.7	9.0	9.5	9.1	9.3	9.0	9.1	9.2	9.8	9.4	9.7
Cond. (µmhos-cm)	226	224	223	220	230	223	216	218	208	216	217	211	228	224
Temperature (°C)	14.7	14.6	14.4	14.2	14.5	13.7	14.5	14.6	14.3	14.6	14.9	14.5	14.6	14.8

25	Days													
	0		1		2		3		4		5		6	
	init	final	init	final	init	final	init	final	init	final	init	final	init	final
pH	7.99	7.16	7.56	7.49	7.28	7.24	7.65	7.27	7.38	7.56	7.14	7.71	7.26	7.52
DO (mg/l)	9.3	9.4	9.2	9.5	9.2	9.7	9.3	9.5	9.5	9.1	9.3	9.7	9.3	9.8
Cond. (µmhos-cm)	203	200	200	196	207	201	194	195	192	201	196	194	203	201
Temperature (°C)	14.7	14.5	14.5	14.3	14.6	13.6	14.6	14.7	14.2	14.7	14.8	14.6	14.4	14.7

50	Days													
	0		1		2		3		4		5		6	
	init	final	init	final	init	final	init	final	init	final	init	final	init	final
pH	7.94	7.17	7.49	7.48	7.26	7.19	7.62	7.26	7.35	7.49	7.14	7.70	7.27	7.49
DO (mg/l)	9.5	9.4	9.5	9.6	9.6	9.5	9.5	9.5	9.4	9.2	9.5	9.8	9.8	9.7
Cond. (µmhos-cm)	153	152	152	149	158	152	149	149	148	152	147	145	151	149
Temperature (°C)	14.5	14.5	14.5	14.4	14.5	13.6	14.8	14.7	14.2	14.7	14.8	14.5	14.3	14.7

100	Days													
	0		1		2		3		4		5		6	
	init	final	init	final	init	final	init	final	init	final	init	final	init	final
pH	7.104	7.20	7.32	7.19	7.07	7.00	7.31	7.01	7.04	7.31	7.09	7.75	7.27	7.28
DO (mg/l)	9.9	9.5	10.2	9.5	10.4	9.8	10.4	9.5	9.9	9.2	9.8	9.8	10.3	10.0
Cond. (µmhos-cm)	53.4	56	53.0	53	53.0	53	53	52	53	54	54	54	52	54
Temperature (°C)	14.3	14.6	14.4	14.4	14.0	13.7	14.8	14.8	14.5	14.7	14.9	14.6	14.1	14.8

Tech. Initials: MS ST MS SP OP SP SP SP SP SP MS ST ST ST OC

Dilution Water Batch #: MHSW 040  
Test Chamber: Env Ch B

QA Check: IES

Sample Description: \_\_\_\_\_  
Animal Source: Trawledge Date Received: 7/8/09 Date of Hatch: \_\_\_\_\_  
Comments: \_\_\_\_\_



Nautilus Environmental  
 Washington Laboratory  
 5009 Pacific Hwy. E., Suite 2  
 Tacoma, WA 98424

Raw Data Sheet  
 Rainbow Trout  
 (*Oncorhynchus mykiss*)  
 Trout Embryo Test

Client Name: BC Lab

Test No.: 0907-1010

Sample ID: NTR2

# Embryos/Container

Conc.	Cont.	Rep.	Days							# Normal	# Abnormal	Mean % Viable	
			0	1	2	3	4	5	6				7
Con	301	1	30	30	30	30	30	30	30	30	30	0	
	302	2	30	30	30	30	30	30	29	29	0	29	
	303	3	30	30	30	30	30	30	30	30	28	2	
	304	4	30	30	30	30	30	28	28	28	23	5	
6.25	305	1	30	30	30	30	30	30	30	29	29	0	
	306	2	30	30	30	30	30	30	30	30	0	30	
	307	3	30	30	30	30	30	30	30	29	28	1	
	308	4	30	30	30	30	30	29	29	28	21	7	
12.5	309	1	30	30	30	30	30	30	30	30	30	0	
	310	2	30	30	30	30	30	30	30	29	0	29	
	311	3	30	30	30	30	30	30	28	28	28	0	
	312	4	30	30	30	30	30	29	29	29	21	8	
25	313	1	30	30	30	30	30	30	30	29	29	0	
	314	2	30	28	28	28	28	28	27	27	0	27	
	315	3	30	30	30	30	30	30	30	30	29	1	
	316	4	30	30	30	30	30	30	30	26	19	6	
50	317	1	30	30	30	30	30	30	30	30	30	0	
	318	2	30	30	30	30	30	28	28	28	0	28	
	319	3	30	30	30	30	30	30	30	30	27	3	
	320	4	30	30	30	30	30	30	29	29	18	11	
100	321	1	30	30	30	30	30	29	29	29	29	0	
	322	2	30	29	29	29	29	28	28	27	0	27	
	323	3	30	30	30	30	30	30	30	29	28	1	
	324	4	30	30	30	30	30	29	29	28	16	12	
		1											
		2											
		3											
		4											
		1											
		2											
		3											
		4											
Tech Initials			MF	(MF)	MF	BP	BP	MF	MF	MF	MF	MF	

QA Check: 105

Comments: \_\_\_\_\_

# CETIS Summary Report

Report Date: 17 Jul-09 15:24 (p 1 of 1)  
 Link/Link Code: 13-8796-0510/0907-T010

**Salmonid Embryo Survival and Development Test** **Nautilus Environmental WA**

<b>Test Run No:</b> 02-1933-8693	<b>Test Type:</b> Survival-Development	<b>Analyst:</b> Meghan Feuk
<b>Start Date:</b> 08 Jul-09 14:35	<b>Protocol:</b> EC/EPS 1/RM/28	<b>Diluent:</b> Mod-Hard Synthetic Water
<b>Ending Date:</b> 15 Jul-09 13:30	<b>Species:</b> Oncorhynchus mykiss	<b>Brine:</b>
<b>Duration:</b> 6d 23h	<b>Source:</b> Trout Lodge Fish Farm	<b>Age:</b>

<b>Sample No:</b> 05-2632-7187	<b>Code:</b> 09-202	<b>Client:</b> Vancouver BC Lab
<b>Sample Date:</b> 05 Jul-09 15:15	<b>Material:</b> Receiving Water	<b>Project:</b>
<b>Receive Date:</b> 08 Jul-09 12:30	<b>Source:</b> Vancouver BC Lab	
<b>Sample Age:</b> 71h (14 °C)	<b>Station:</b>	

**Comparison Summary**

Analysis No	Endpoint	NOEL	LOEL	TOEL	PMSD	Method
19-6356-3656	Combined Development	100	> 100	N/A	47.9%	Dunnett's Multiple Comparison Test

**Point Estimate Summary**

Analysis No	Endpoint	Effect-%	Conc-%	95% LCL	95% UCL	Method
06-7354-0500	Combined Development	25	1290	N/A	N/A	Linear Regression (MLE)
		50	20100	N/A	N/A	

**Combined Development Summary**

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	0.9	0.855	0.945	0.767	1	0.0219	0.12	13.4%	0.0%
6.25		3	0.867	0.812	0.921	0.7	0.967	0.0265	0.145	16.8%	3.7%
12.5		3	0.878	0.819	0.937	0.7	1	0.0288	0.158	17.9%	2.47%
25		3	0.856	0.784	0.927	0.633	0.967	0.0351	0.192	22.5%	4.94%
50		3	0.833	0.756	0.911	0.6	1	0.038	0.208	25.0%	7.41%
100		3	0.811	0.721	0.901	0.533	0.967	0.044	0.241	29.7%	9.88%

**Combined Development Detail**

Conc-%	Control Type	Rep 1	Rep 3	Rep 4
0	Dilution Water	1	0.933	0.767
6.25		0.967	0.933	0.7
12.5		1	0.933	0.7
25		0.967	0.967	0.633
50		1	0.9	0.6
100		0.967	0.933	0.533

# CETIS Analytical Report

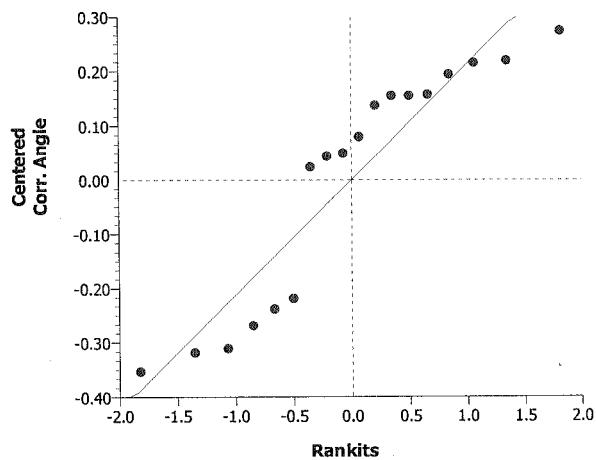
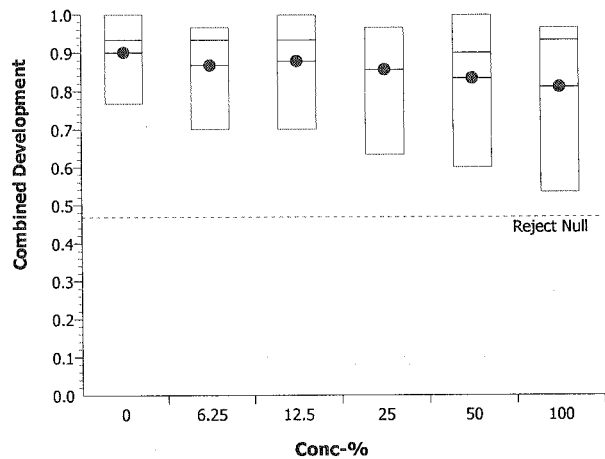
Report Date: 17 Jul-09 15:24 (p 1 of 2)  
 Link/Link Code: 13-8796-0510/0907-T010

Salmonid Embryo Survival and Development Test								Nautilus Environmental WA			
Analysis No: 19-6356-3656		Endpoint: Combined Development			CETIS Version: CETISv1.6.3						
Analyzed: 17 Jul-09 15:23		Analysis: Parametric-Control vs Treatments			Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)		C > T	Not Run	100	>100	N/A	1	47.9%			
Dunnett's Multiple Comparison Test											
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Dilution Water		6.25	0.263	2.5	0.531	0.7450	Non-Significant Effect				
		12.5	0.119	2.5	0.531	0.7960	Non-Significant Effect				
		25	0.253	2.5	0.531	0.7490	Non-Significant Effect				
		50	0.379	2.5	0.531	0.7000	Non-Significant Effect				
		100	0.534	2.5	0.531	0.6340	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)					
Between	0.023906	0.004781	5	0.0707	0.9960	Non-Significant Effect					
Error	0.811283	0.067607	12								
Total	0.835189	0.072388	17								
ANOVA Assumptions											
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)						
Variances	Bartlett Equality of Variance	0.475	15.1	0.9930	Equal Variances						
Distribution	Shapiro-Wilk Normality	0.857		0.0108	Normal Distribution						
Combined Development Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	0.9	0.854	0.946	0.767	1	0.0223	0.12	13.4%	0.0%
6.25		3	0.867	0.811	0.922	0.7	0.967	0.027	0.145	16.8%	3.7%
12.5		3	0.878	0.818	0.938	0.7	1	0.0293	0.158	17.9%	2.47%
25		3	0.856	0.782	0.929	0.633	0.967	0.0357	0.192	22.5%	4.94%
50		3	0.833	0.754	0.913	0.6	1	0.0387	0.208	25.0%	7.41%
100		3	0.811	0.719	0.903	0.533	0.967	0.0448	0.241	29.7%	9.88%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	1.29	1.21	1.36	1.07	1.48	0.0385	0.207	16.1%	0.0%
6.25		3	1.23	1.15	1.31	0.991	1.39	0.039	0.21	17.1%	4.35%
12.5		3	1.26	1.17	1.35	0.991	1.48	0.046	0.248	19.7%	1.96%
25		3	1.23	1.13	1.33	0.92	1.39	0.05	0.27	21.9%	4.17%
50		3	1.2	1.09	1.32	0.886	1.48	0.0555	0.299	24.8%	6.26%
100		3	1.17	1.05	1.29	0.819	1.39	0.0572	0.308	26.3%	8.82%

Salmonid Embryo Survival and Development Test Nautilus Environmental WA

Analysis No: 19-6356-3656      Endpoint: Combined Development      CETIS Version: CETISv1.6.3  
Analyzed: 17 Jul-09 15:23      Analysis: Parametric-Control vs Treatments      Official Results: Yes

Graphics



**CETIS Analytical Report**

Report Date: 17 Jul-09 15:24 (p 1 of 2)  
 Link/Link Code: 13-8796-0510/0907-T010

Salmonid Embryo Survival and Development Test										Nautilus Environmental WA	
Analysis No: 06-7354-0500			Endpoint: Combined Development			CETIS Version: CETISv1.6.3					
Analyzed: 17 Jul-09 15:23			Analysis: Linear Regression (MLE)			Official Results: Yes					
Linear Regression Options											
Model Function		Threshold Option		Threshold		Optimized Pooled		Het Corr		Weighted	
Log-Normal [NED=A+B*log(X)]		Control Threshold		0.1		Yes No		Yes		Yes	
Regression Summary											
Iters	LL	QAICc	Mu	Sigma	G Stat	Chi-Sq	Critical	P-Value	Decision(5%)		
11	-93.8	44.6	4.54	1.77	20.8	61.5	22.4	0.0000	Significant Heterogeneity		
Point Estimates											
Effect-%	Conc-%	95% LCL	95% UCL								
25	1290	N/A	N/A								
50	20100	N/A	N/A								
Regression Parameters											
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)				
Threshold	0.101	0.0683	-0.0463	0.249	1.48	0.1620	Non-Significant Parameter				
Slope	0.565	1.19	-2.01	3.14	0.474	0.6440	Non-Significant Parameter				
Intercept	2.57	2.09	-1.94	7.08	1.23	0.2400	Non-Significant Parameter				
Residual Analysis											
Attribute	Method		Test Stat	Critical	P-Value	Decision(5%)					
Variances	Mod Levene Equality of Variance		1.51	3.48	0.2710	Equal Variances					
Distribution	Shapiro-Wilk Normality		0.776		0.0018	Non-normal Distribution					
Combined Development Summary											
			Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Dilution Water	3	0.9	0.767	1	0.0219	0.12	13.4%	0.0%	81	90
6.25		3	0.867	0.7	0.967	0.0265	0.145	16.8%	3.7%	78	90
12.5		3	0.878	0.7	1	0.0288	0.158	17.9%	2.47%	79	90
25		3	0.856	0.633	0.967	0.0351	0.192	22.5%	4.94%	77	90
50		3	0.833	0.6	1	0.038	0.208	25.0%	7.41%	75	90
100		3	0.811	0.533	0.967	0.044	0.241	29.7%	9.88%	73	90
Combined Development Detail											
Conc-%	Control Type	Rep 1	Rep 3	Rep 4							
0	Dilution Water	1	0.933	0.767							
6.25		0.967	0.933	0.7							
12.5		1	0.933	0.7							
25		0.967	0.967	0.633							
50		1	0.9	0.6							
100		0.967	0.933	0.533							

Salmonid Embryo Survival and Development Test

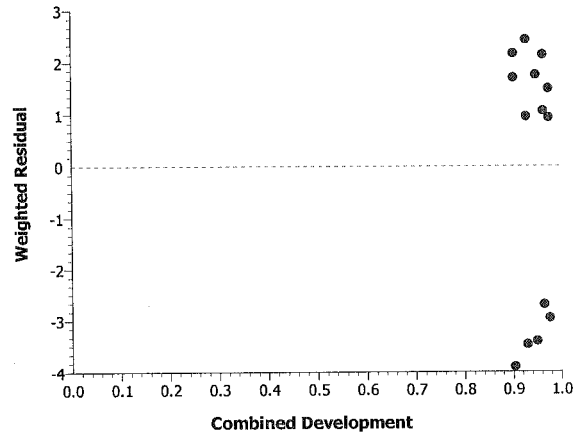
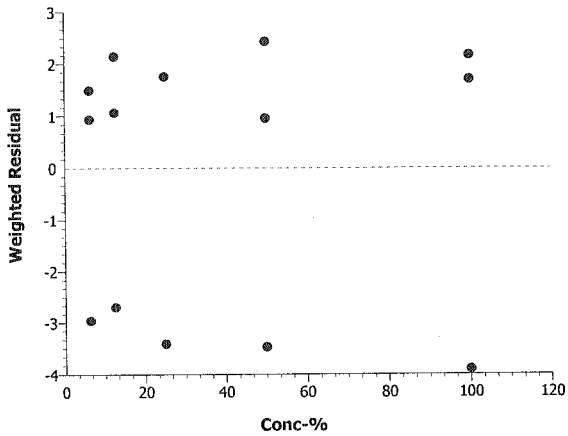
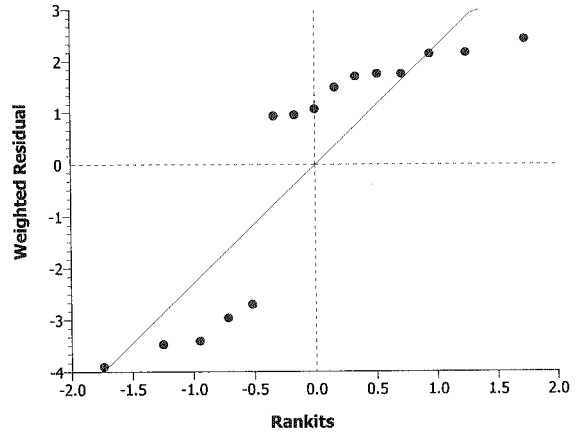
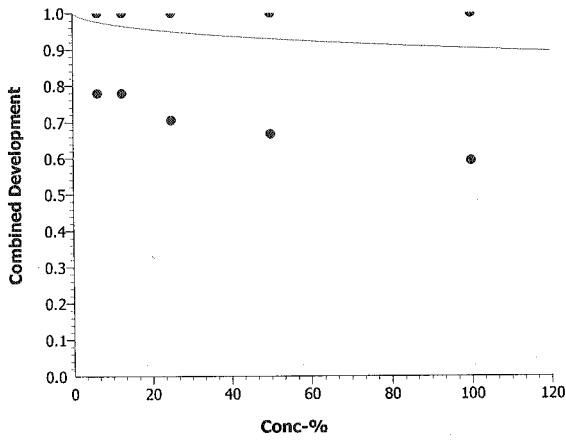
Nautilus Environmental WA

Analysis No: 06-7354-0500  
Analyzed: 17 Jul-09 15:23

Endpoint: Combined Development  
Analysis: Linear Regression (MLE)

CETIS Version: CETISv1.6.3  
Official Results: Yes

Graphics



Nautilus Environmental  
Washington Laboratory

Client: BC Lab  
Sample ID: SCR  
Test No: 0907-7007  
Log-In#: 09-199

Initial and Final Chemistries

Seven Day Chronic Freshwater Bioassay

Start Date & Time: 7/8/09 1435  
Stop Date & Time: 7/15/09 1415  
Test Species: Oncorhynchus mykiss

Conc. or %	Days													
	0		1		2		3		4		5		6	
	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final	init.	final
0.250	Days													
	0		1		2		3		4		5		6	
pH	8.13	7.05	7.50	7.14	7.48	7.26	7.56	6.93	7.39	7.31	7.11	8.35	7.12	7.59
DO (mg/l)	8.7	9.5	8.9	9.5	9.0	9.8	9.0	9.3	9.0	8.9	8.9	9.7	9.3	9.0
Cond. (µmhos-cm)	258	239	248	244	243	245	242	244	224	232	235	232	252	243
Temperature (°C)	14.6	14.3	14.3	14.6	14.2	14.2	14.6	14.8	13.3	14.5	14.8	14.5	14.7	14.7
1.25	Days													
	0		1		2		3		4		5		6	
pH	8.17	7.01	7.53	7.19	7.54	7.28	7.59	6.99	7.54	7.45	7.17	8.28	7.15	7.63
DO (mg/l)	8.5	9.4	9.0	9.5	9.1	9.6	9.0	9.5	9.1	9.2	9.2	9.8	9.3	9.8
Cond. (µmhos-cm)	250	230	241	234	237	237	233	230	225	222	228	224	244	237
Temperature (°C)	14.1	14.3	14.1	14.5	14.2	14.2	14.4	14.4	13.4	14.2	14.7	14.2	14.8	14.4
2.5	Days													
	0		1		2		3		4		5		6	
pH	8.20	7.05	7.57	7.23	7.56	7.30	7.60	7.02	7.57	7.45	7.22	8.21	7.17	7.61
DO (mg/l)	8.2	9.6	8.8	9.5	9.3	9.7	9.1	9.5	9.2	9.1	9.3	9.7	9.4	9.7
Cond. (µmhos-cm)	239	217	230	223	228	228	223	220	220	216	220	216	232	227
Temperature (°C)	14.4	14.4	14.2	14.5	14.3	14.3	14.4	14.4	13.4	14.3	14.8	14.2	14.7	14.4
25	Days													
	0		1		2		3		4		5		6	
pH	8.13	7.06	7.58	7.24	7.60	7.28	7.62	7.02	7.58	7.44	7.26	8.15	7.18	7.63
DO (mg/l)	8.7	9.6	8.9	9.6	9.4	9.4	9.2	9.5	9.3	9.3	9.1	9.8	9.5	9.7
Cond. (µmhos-cm)	217	200	215	207	204	206	207	202	206	199	202	199	212	209
Temperature (°C)	14.4	14.3	14.3	14.5	14.2	14.3	14.5	14.3	13.3	14.4	14.8	14.2	14.4	14.6
50	Days													
	0		1		2		3		4		5		6	
pH	8.13	7.04	7.61	7.21	7.62	7.26	7.64	6.97	7.60	7.39	7.31	8.09	7.25	7.61
DO (mg/l)	8.9	9.4	9.4	9.5	9.7	9.6	9.5	9.5	9.4	9.0	9.4	9.7	9.7	9.7
Cond. (µmhos-cm)	170	169	174	170	171	173	171	167	174	165	168	165	173	172
Temperature (°C)	14.6	14.4	14.3	14.5	14.0	14.3	14.5	14.3	13.5	14.2	14.8	14.3	14.9	14.5
100	Days													
	0		1		2		3		4		5		6	
pH	8.15	7.03	7.65	7.19	7.71	7.21	7.66	6.94	7.61	7.39	7.40	8.05	7.28	7.57
DO (mg/l)	9.7	9.5	9.7	9.7	10.4	9.8	10.1	9.6	9.9	9.2	10.1	9.7	10.2	9.7
Cond. (µmhos-cm)	93	95	96	97	92	95	98	94	99	94	93	94	93	95
Temperature (°C)	14.7	14.2	14.5	14.5	14.0	14.6	14.2	14.4	13.6	14.4	14.1	14.3	14.1	14.5
Tech. Initials	(M)	BT	(M)	BP	BP	SH	BP	BP	BP	(M)	BT	BT	BT	CC

Dilution Water Batch #: MHSN 040  
Test Chamber: Env Ch B

QA Check: 105

Sample Description:

Animal Source: Trout Lodge

Date Received: 7/8/09 Date of Hatch: —

Comments:

Nautilus Environmental  
 Washington Laboratory  
 5009 Pacific Hwy. E., Suite 2  
 Tacoma, WA 98424

Raw Data Sheet  
 Rainbow Trout  
 (*Oncorhynchus mykiss*)  
 Trout Embryo Test

Client Name: BC Lab

Test No.: 0907-T007

Sample ID: SCR

# Embryos/Container

Conc.	Cont.	Rep.	Days							# Normal	# Abnormal	Mean % Viable	
			0	1	2	3	4	5	6				7
CON	401	1	30	30	30	30	30	30	30	30	28	2	
	402	2	30	28	28	28	28	28	28	28	0	28	
	403	3	30	30	30	30	30	30	30	30	28	2	
	404	4	30	30	30	30	30	28	28	28	8	20	
0.250	405	1	30	30	30	30	30	30	30	30	30	0	
	406	2	30	30	30	30	30	30	30	30	0	30	
	407	3	30	30	30	30	30	30	30	29	26	29 <sup>#3</sup>	
	408	4	30	30	30	30	30	28	27	27 <sup>#26</sup>	16	10	
12.5	409	1	30	30	30	30	30	30	29	29	29	0	
	410	2	30	28	27	26	26	26	26	29	0	25	
	411	3	30	30	30	30	30	30	30	30	27	3	
	412	4	30	30	30	30	30	29	29	29	21	8	
25	413	1	30	30	30	30	30	30	30	30	29	1	
	414	2	30	28	28	28	28	28	28	28	0	28	
	415	3	30	30	30	30	30	30	30	30	27	3	
	416	4	30	30	30	30	30	30	30	30	21	9	
50	417	1	30	30	30	30	30	30	30	30	30	0	
	418	2	30	29	29	29	29	29	29	27	0	27	
	419	3	30	30	30	30	30	30	30	30	26	4	
	420	4	30	30	30	30	30	30	30	29	17	12	
100	421	1	30	30	30	30	30	30	30	30	28	2	
	422	2	30	30	30	29	29	29	29	29 <sup>#27</sup>	0	27	
	423	3	30	30	30	29	29	29	28	28 <sup>#27</sup>	28 <sup>#26</sup>	1	
	424	4	30	30	30	30	30	30	30	30	23	7	
		1											
		2											
		3											
		4											
		1											
		2											
		3											
		4											
Tech Initials			JK	MB	BP	NA	GR	GC	ST	MF	MF	JK	

QA Check: 125

Comments: \_\_\_\_\_



**CETIS Summary Report**

Report Date: 22 Jul-09 14:47 (p 1 of 1)  
 Link/Link Code: 02-9538-3154/0907-T007

**Salmonid Embryo Survival and Development Test** **Nautilus Environmental WA**

<b>Test Run No:</b> 13-9278-2547	<b>Test Type:</b> Survival-Development	<b>Analyst:</b> Meghan Feuk
<b>Start Date:</b> 08 Jul-09 14:35	<b>Protocol:</b> EC/EPS 1/RM/28	<b>Diluent:</b> Mod-Hard Synthetic Water
<b>Ending Date:</b> 15 Jul-09 14:15	<b>Species:</b> Oncorhynchus mykiss	<b>Brine:</b>
<b>Duration:</b> 7d	<b>Source:</b> Trout Lodge Fish Farm	<b>Age:</b>

<b>Sample No:</b> 13-4788-1083	<b>Code:</b> 09-199	<b>Client:</b> Vancouver BC Lab
<b>Sample Date:</b> 05 Jul-09 11:15	<b>Material:</b> Receiving Water	<b>Project:</b>
<b>Receive Date:</b> 08 Jul-09 12:30	<b>Source:</b> Vancouver BC Lab	
<b>Sample Age:</b> 75h (14 °C)	<b>Station:</b>	

**Comparison Summary**

Analysis No	Endpoint	NOEL	LOEL	TOEL	PMSD	Method
17-9287-0975	Combined Development	100	> 100	N/A	71.8%	Dunnett's Multiple Comparison Test

**Point Estimate Summary**

Analysis No	Endpoint	Effect-%	Conc-%	95% LCL	95% UCL	Method
21-3218-7613	Combined Development	25	> 100	N/A	N/A	Linear Interpolation (ICPIN)
		50	> 100	N/A	N/A	

**Combined Development Summary**

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	0.711	0.567	0.855	0.267	0.933	0.0703	0.385	54.1%	0.0%
6.25		3	0.8	0.71	0.89	0.533	1	0.0439	0.24	30.0%	-12.5%
12.5		3	0.856	0.804	0.907	0.7	0.967	0.0253	0.139	16.2%	-20.3%
25		3	0.856	0.804	0.907	0.7	0.967	0.0253	0.139	16.2%	-20.3%
50		3	0.811	0.728	0.894	0.567	1	0.0405	0.222	27.4%	-14.1%
100		3	0.856	0.824	0.887	0.767	0.933	0.0153	0.0839	9.8%	-20.3%

**Combined Development Detail**

Conc-%	Control Type	Rep 1	Rep 3	Rep 4
0	Dilution Water	0.933	0.933	0.267
6.25		1	0.867	0.533
12.5		0.967	0.9	0.7
25		0.967	0.9	0.7
50		1	0.867	0.567
100		0.933	0.867	0.767

**CETIS Analytical Report**

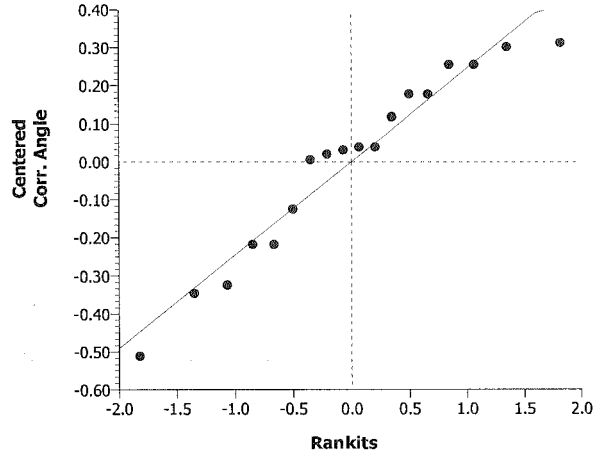
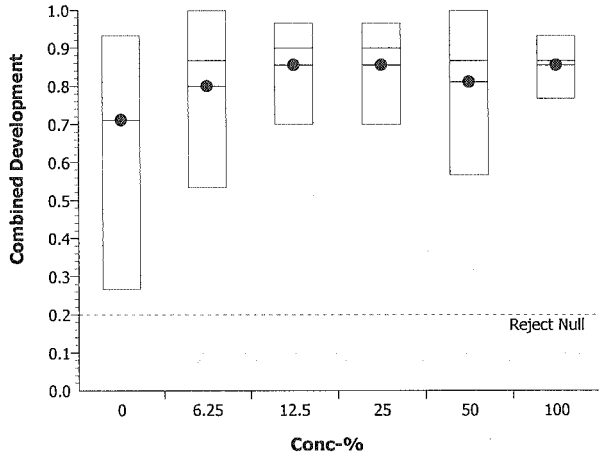
Report Date: 22 Jul-09 14:47 (p 1 of 2)  
 Link/Link Code: 02-9538-3154/0907-T007

Salmonid Embryo Survival and Development Test							Nautilus Environmental WA				
Analysis No: 17-9287-0975		Endpoint: Combined Development			CETIS Version: CETISv1.6.3						
Analyzed: 17 Jul-09 15:29		Analysis: Parametric-Control vs Treatments			Official Results: Yes						
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Angular (Corrected)		C > T	Not Run	100	>100	N/A	1	71.8%			
Dunnett's Multiple Comparison Test											
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Dilution Water		6.25	-0.471	2.5	0.59	0.9350	Non-Significant Effect				
		12.5	-0.658	2.5	0.59	0.9570	Non-Significant Effect				
		25	-0.658	2.5	0.59	0.9570	Non-Significant Effect				
		50	-0.519	2.5	0.59	0.9410	Non-Significant Effect				
		100	-0.582	2.5	0.59	0.9490	Non-Significant Effect				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)					
Between	0.050982	0.010196	5	0.122	0.9850	Non-Significant Effect					
Error	1.000418	0.083368	12								
Total	1.0514	0.093565	17								
ANOVA Assumptions											
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)						
Variances	Bartlett Equality of Variance	3.15	15.1	0.6780	Equal Variances						
Distribution	Shapiro-Wilk Normality	0.937		0.2560	Normal Distribution						
Combined Development Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	0.711	0.565	0.858	0.267	0.933	0.0715	0.385	54.1%	0.0%
6.25		3	0.8	0.709	0.891	0.533	1	0.0446	0.24	30.0%	-12.5%
12.5		3	0.856	0.803	0.908	0.7	0.967	0.0258	0.139	16.2%	-20.3%
25		3	0.856	0.803	0.908	0.7	0.967	0.0258	0.139	16.2%	-20.3%
50		3	0.811	0.727	0.896	0.567	1	0.0412	0.222	27.4%	-14.1%
100		3	0.856	0.824	0.887	0.767	0.933	0.0156	0.0839	9.8%	-20.3%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	3	1.05	0.886	1.22	0.543	1.31	0.0822	0.443	42.0%	0.0%
6.25		3	1.17	1.04	1.29	0.819	1.48	0.0616	0.331	28.5%	-10.5%
12.5		3	1.21	1.13	1.29	0.991	1.39	0.0373	0.201	16.6%	-14.7%
25		3	1.21	1.13	1.29	0.991	1.39	0.0373	0.201	16.6%	-14.7%
50		3	1.18	1.06	1.3	0.852	1.48	0.0583	0.314	26.7%	-11.6%
100		3	1.19	1.14	1.24	1.07	1.31	0.0226	0.122	10.2%	-13.0%

Salmonid Embryo Survival and Development Test Nautilus Environmental WA

Analysis No: 17-9287-0975      Endpoint: Combined Development      CETIS Version: CETISv1.6.3  
Analyzed: 17 Jul-09 15:29      Analysis: Parametric-Control vs Treatments      Official Results: Yes

Graphics



# CETIS Analytical Report

Report Date: 22 Jul-09 14:47 (p 1 of 1)  
 Link/Link Code: 02-9538-3154/0907-T007

**Salmonid Embryo Survival and Development Test** **Nautilus Environmental WA**

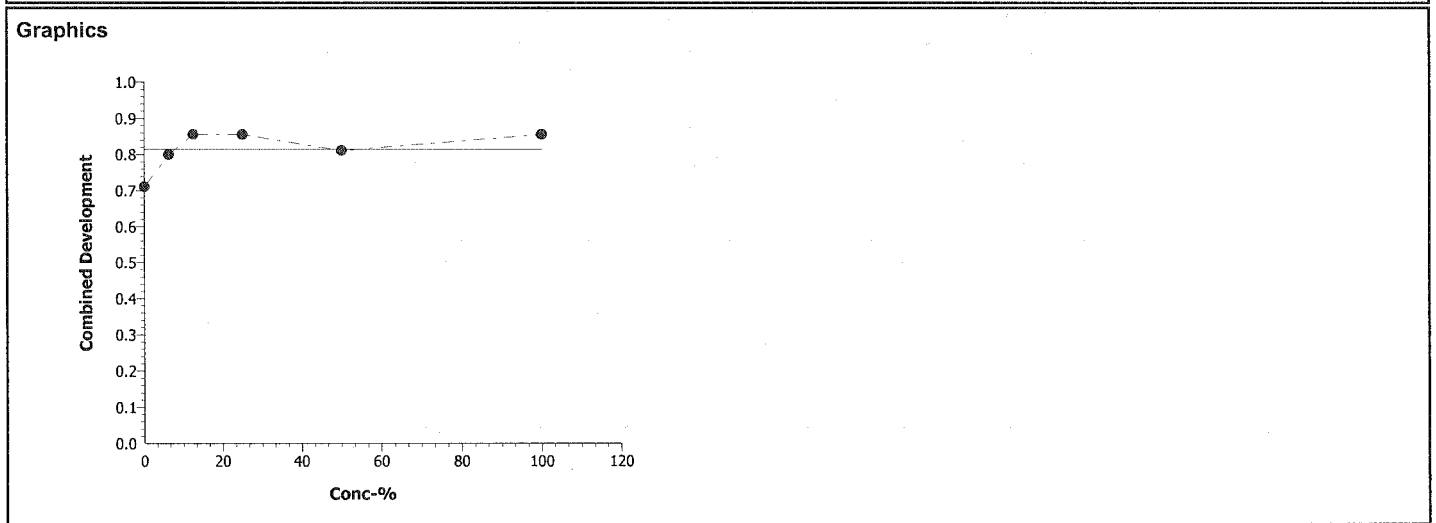
Analysis No: 21-3218-7613      Endpoint: Combined Development      CETIS Version: CETISv1.6.3  
 Analyzed: 22 Jul-09 14:46      Analysis: Linear Interpolation (ICPIN)      Official Results: Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	7055475	280	Yes	Two-Point Interpolation

Point Estimates			
Effect-%	Conc-%	95% LCL	95% UCL
25	> 100	N/A	N/A
50	> 100	N/A	N/A

Combined Development Summary			Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Dilution Water	3	0.711	0.267	0.933	0.0703	0.385	54.1%	0.0%	64	90
6.25		3	0.8	0.533	1	0.0439	0.24	30.0%	-12.5%	72	90
12.5		3	0.856	0.7	0.967	0.0253	0.139	16.2%	-20.3%	77	90
25		3	0.856	0.7	0.967	0.0253	0.139	16.2%	-20.3%	77	90
50		3	0.811	0.567	1	0.0405	0.222	27.4%	-14.1%	73	90
100		3	0.856	0.767	0.933	0.0153	0.0839	9.8%	-20.3%	77	90

Combined Development Detail				
Conc-%	Control Type	Rep 1	Rep 3	Rep 4
0	Dilution Water	0.933	0.933	0.267
6.25		1	0.867	0.533
12.5		0.967	0.9	0.7
25		0.967	0.9	0.7
50		1	0.867	0.567
100		0.933	0.867	0.767



**APPENDIX C - *Lemna minor* Toxicity Test Data**

### Lemna minor Summary Sheet

Client: Rescan  
 Work Order No.: 09210

Start Date: July 7/09  
 Set up by: ART

**Sample Information:**

Sample ID: SC2  
 Sample Date: July 5/2009  
 Date Received: July 7/2009  
 Sample Volume: 9x20L

**Test Organism Information:**

Culture Date: 300609  
~~17-06-09-09~~  
~~300609 BRL~~  
 Age of culture (Day 0): 7 days  
 >8X growth in APHA?: Y (35) Yes, 33 fronds.  
 BRL

**KCI Reference Toxicant Results:**

Reference Toxicant ID: LM40  
 Date Initiated: June 24/2009

7-d No. of Fronds IC25 (95% CL): 2.8 (0.9-4.9) g/L KCI

7-d No. Fronds IC25 Reference Toxicant Mean  $\pm$  2 SD: 2.5  $\pm$  1.1 CV (%): 22%

	Number of Fronds	Dry Weight
Test Results: NOEC %(v/v)	97	97
LOEC %(v/v)	>97	>97
IC25 %(v/v) (95% CL)	>97	>97
IC50 %(v/v) (95% CL)	>97	>97.

Reviewed by: 

Date reviewed: Aug 29/09

Blue

## Plant Growth Inhibition Toxicity Test Water Quality Measurements

Client: Rescan Setup by: ART  
 Sample ID: 502 Test Date: July 7/09  
 Work Order No.: 09210 Test Species: Lemna minor  
 Culture Source: UTCC #490  
 Test Culture Age: 7 days > 8X Growth? (Y/N): Y (33)  
 Light Intensity Range: 3600 - 3850 Date Measured: July 7, 2009

Day	0	1	2	3	4	5	6	7
Shelf Temp (°C)	24.4	24.9	24.3	25.4	24.6	24.6	24.9	25.1
Initials	ART	ART	ART	JLT	JLT	JLT	BCU	YLP

Sample Characteristics  
 Temperature (°C) 24.0  
 DO (mg/L) 10.2  
 pH 7.1  
 Conductivity (µS) 162

Aeration? 20 min  
24.1  
9.6  
7.7  
979

Concentration % (v/v)	Temperature (°C)		pH		Conductivity (µS) 0 h
	Day 0	Day 7	Day 0	Day 7	
Control	24.5	26.3	8.2	8.5	882
1.5	24.5	26.7	8.2	8.1	882
3.05	24.5	26.8	8.1	8.5	884
6.1	24.4	26.7	8.1	8.4	896
12.1	24.3	26.7	8.0	8.4	893
24.2	24.3	26.7	8.0	8.3	906
48.5	24.1	26.8	7.9	8.3	931
97	24.0	26.9	7.7	8.32	979
Initials	ART	YLP	ART	YLP	ART

Thermometer: Big Jumbo Thermometer Cond. Meter: C-1 pH meter: pH-1

Sample Description: slight turbidity with particulates

Comments: \_\_\_\_\_

Reviewed: EW Date Reviewed: Aug 25/09

Blue

Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts

Client: Rescan  
 Sample ID: 502  
 Work Order #: 09210

Start Date: July 7/09  
 Termination Date: July 14/09  
 Test set up by: ART

Concentration <i>90 (V/V)</i>	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
Control	A	6	52										<i>ART</i>
	B		65										<i>ART</i>
	C		61										<i>ART</i>
	D		76										<i>ART</i>
1.5	A		110	✓									<i>ART</i>
	B		62										<i>ART</i>
	C		97										<i>ART</i>
	D		77	✓									<i>ART</i>
3.05	A		55										<i>ART</i>
	B		69										<i>ART</i>
	C		58										<i>ART</i>
	D		78	✓					✓				<i>ART</i>
6.1	A		53	✓									<i>ART</i>
	B		55										<i>ART</i>
	C		56										<i>ART</i>
	D		84	✓									<i>ART</i>
12.1	A		77										<i>ART</i>
	B		64										<i>ART</i>
	C		62										<i>ART</i>
	D		79	✓									<i>ART</i>
24.2	A		69	✓									<i>ART</i>
	B		66	✓									<i>ART</i>
	C		60										<i>ART</i>
	D	✓	76	✓									<i>ART</i>

Comments:

Reviewed by: *ART*

Date Reviewed: Aug 25/09



Blue

### Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts

Client: Rescan  
 Sample ID: 302  
 Work Order #: 09210

Start Date: July 7 / 09  
 Termination Date: July 14 / 09  
 Test set up by: ART

Concentration % (v/v)	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
48.5	A	6	70										
	B		63										
	C		62										
	D		60	✓									
97	A		50	✓									
	B		52	✓									
	C		53										
	D	✓	55										
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												

Comments: \_\_\_\_\_

Reviewed by: [Signature]

Date Reviewed: Aug 25/09

Blue

## 7-d Lemna minor Weight Data Sheet

Client: Rescan  
 Sample ID: 502  
 Work Order #: 09210

Start Date: July 7/09  
 Termination Date: July 14/09

Concentration % (v/v)	Rep	Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
Control	A	1	1310.34	1313.87	EG
	B	2	1325.26	1329.50	EG
	C	3	1318.35	1323.64	EG
	D	4	1322.85	1328.41	EG
1.5	A	5	1322.55	1329.52	EG
	B	6	1316.28	1319.96	EG
	C	7	1330.13	1336.84	EG
	D	8	1323.13	1328.81	EG
3.05	A	9	1318.17	1321.78	EG
	B	10	1320.27	1325.03	EG
	C	11	1337.32	1340.50	EG
	D	12	1338.81	1343.52	EG
6.1	A	13	1316.34	1319.87	EG
	B	14	1324.76	1327.85	EG
	C	15	1318.34	1322.34	EG
	D	16	1342.13	1347.82	EG
12.1	A	17	1330.81	1336.89	EG
	B	18	1316.66	1320.28	EG
	C	19	1326.91	1331.20	EG
	D	20	1339.24	1344.33	EG
24.2	A	21	1329.83	1334.47	EG
	B	22	1321.40	1325.97	EG
	C	23	1320.71	1324.48	EG
	D	24	1324.07	1329.31	EG
48.5	A	25	1316.43	1321.80	EG
	B	26	1323.17	1327.61	EG
	C	27	1321.63	1325.71	EG
	D	28	1315.28	1319.87	EG

Comments: \_\_\_\_\_

Reviewed by: EA

Date Reviewed: Aug 25/09

Blue

### 7-d Lemna minor Weight Data Sheet

Client: Rescan  
Sample ID: 302  
Work Order #: 09210

Start Date: July 7 / 09  
Termination Date: July 14 / 09

Concentration <i>o/p (✓)</i>	Rep	Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
97	A	29	1322.14	1326.07	<i>EH</i>
	B	30	1321.25	1325.29	<i>EH</i>
	C	31	1339.60	1342.70	<i>EH</i>
	D	32	1324.20	1328.67	<i>EH</i>
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				

Comments: \_\_\_\_\_

Reviewed by: *EH*

Date Reviewed: Aug 25 / 09

**CETIS Analytical Report**

Report Date: 25 Aug-09 10:04 (p 1 of 2)  
 Link/Link Code: 08-4576-8802/09210-SC2

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>
<b>Analysis No:</b> 17-7688-6623	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0	
<b>Analyzed:</b> 25 Aug-09 10:02	<b>Analysis:</b> Parametric-Control vs Treatments	<b>Official Results:</b> Yes	
<b>Test Run No:</b> 09-9927-0191	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water	
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>	
<b>Ending Date:</b>	<b>Species:</b> Lemna minor		
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture		
<b>Sample No:</b> 13-2840-0030	<b>Code:</b> SC2-July	<b>Client:</b> Rescan	
<b>Sample Date:</b> 05 Jul-09 09:30	<b>Material:</b> Water Sample	<b>Project:</b>	
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan		
<b>Sample Age:</b> 38h	<b>Station:</b> SC2		

<b>Data Transform</b>	<b>Zeta</b>	<b>Alt Hyp</b>	<b>Monte Carlo</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>TU</b>	<b>PMSD</b>
Untransformed		C > T	Not Run	97	<i>ok &gt; 97</i>	#Error	1.031	34.43%

<b>Dunnett's Multiple Comparison Test</b>							
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		1.5	-2.884	2.482	19.8	1.0000	Non-Significant Effect
		3.05	-0.1881	2.482	19.8	0.9158	Non-Significant Effect
		6.1	0.1881	2.482	19.8	0.8219	Non-Significant Effect
		12.1	-0.8776	2.482	19.8	0.9858	Non-Significant Effect
		24.2	-0.5328	2.482	19.8	0.9632	Non-Significant Effect
		48.5	0	2.482	19.8	0.8750	Non-Significant Effect
		97	1.379	2.482	19.8	0.3144	Non-Significant Effect

<b>ANOVA Table</b>						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2615.969	373.7098	7	2.937	0.0227	Significant Effect
Error	3053.75	127.2396	24			
Total	5669.719	500.9494	31			

<b>ANOVA Assumptions</b>						
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)	
Variances	Bartlett Equality of Variance	15.12	18.48	0.0344	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.9647		0.3661	Normal Distribution	

<b>Frond Count Summary</b>											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	57.5	53.64	61.36	46	70	1.88	9.95	17.3%	0.0%
1.5		4	80.5	72.27	88.73	56	104	4.013	21.24	26.38%	-40.0%
3.05		4	59	54.91	63.09	49	72	1.994	10.55	17.88%	-2.61%
6.1		4	56	50.29	61.71	47	78	2.782	14.72	26.29%	2.61%
12.1		4	64.5	61.11	67.89	56	73	1.651	8.737	13.55%	-12.17%
24.2		4	61.75	59.17	64.33	54	70	1.257	6.652	10.77%	-7.39%
48.5		4	57.5	56	59	54	63	0.7319	3.873	6.74%	0.0%
97		4	46.5	45.69	47.31	44	49	0.3934	2.082	4.48%	19.13%

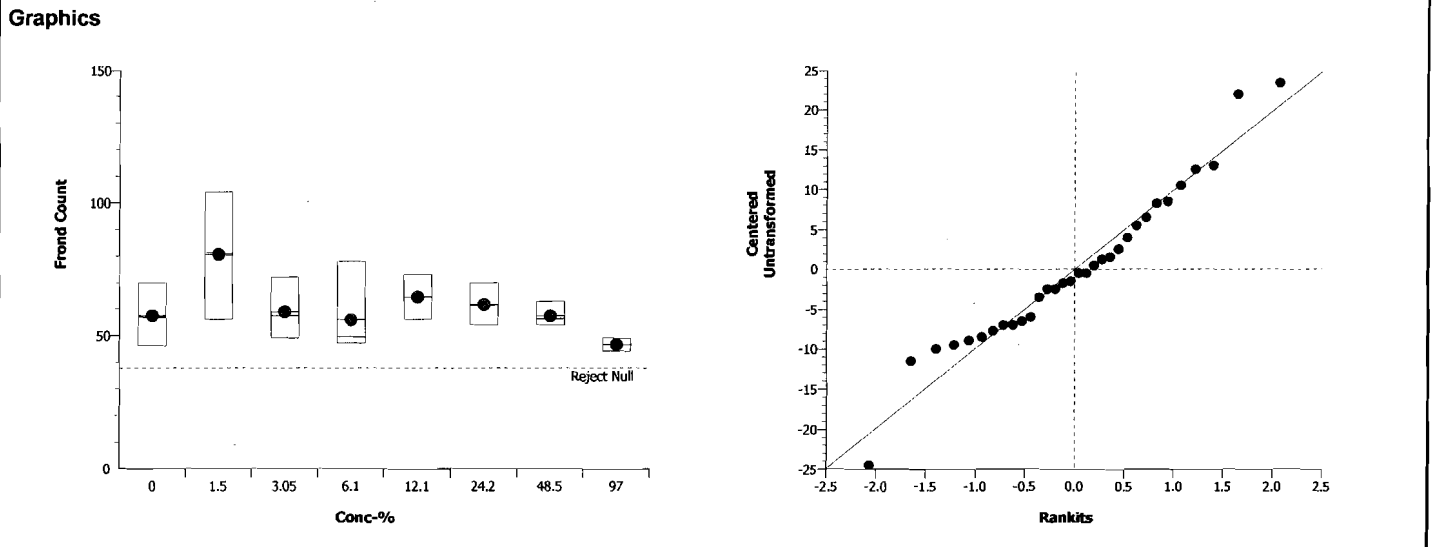
*ea Aug 25/09*

**CETIS Analytical Report**

Report Date: 25 Aug-09 10:05 (p 2 of 2)  
 Link/Link Code: 08-4576-8802/09210-SC2

<b>Lemna Growth Inhibition Test</b>		<b>Nautilus Environmental</b>	
<b>Analysis No:</b> 17-7688-6623	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0	
<b>Analyzed:</b> 25 Aug-09 10:02	<b>Analysis:</b> Parametric-Control vs Treatments	<b>Official Results:</b> Yes	

<b>Frond Count Detail</b>					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	70	59	55	46
1.5		104	91	71	56
3.05		72	63	52	49
6.1		78	50	49	47
12.1		73	71	58	56
24.2		70	63	60	54
48.5		63	57	56	54
97		49	47	46	44



*ea*  
 Aug 25/09

**CETIS Analytical Report**

Report Date: 26 Aug-09 10:32 (p 1 of 2)  
 Link/Link Code: 15-3856-2266/09210-SC2H

<b>Lemna Growth Inhibition Test</b>		<b>Nautilus Environmental</b>	
<b>Analysis No:</b> 19-5254-6409	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0	
<b>Analyzed:</b> 26 Aug-09 10:32	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Official Results:</b> Yes	
<b>Test Run No:</b> 09-2067-6875	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water	
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>	
<b>Ending Date:</b> 14 Jul-09	<b>Species:</b> Lemna minor		
<b>Duration:</b> 7d 0h	<b>Source:</b> In-House Culture		
<b>Sample No:</b> 09-4281-8810	<b>Code:</b> SC2-Jul	<b>Client:</b> Rescan	
<b>Sample Date:</b> 05 Jul-09	<b>Material:</b> Water Sample	<b>Project:</b>	
<b>Receive Date:</b> 07 Jul-09	<b>Source:</b> Rescan		
<b>Sample Age:</b> 48h	<b>Station:</b> SC2		

<b>Linear Interpolation Options</b>					
<b>X Transform</b>	<b>Y Transform</b>	<b>Seed</b>	<b>Resamples</b>	<b>Exp 95% CL</b>	<b>Method</b>
Log(X + 1)	Linear	57951	200	Yes	Two-Point Interpolation

<b>Point Estimates</b>			
<b>% Effect</b>	<b>Conc-%</b>	<b>95% LCL</b>	<b>95% UCL</b>
5	57.13	N/A	62.67
10	68.93	N/A	79.66
15	83.12	N/A	103.1
20	> 97	N/A	N/A
25	> 97	N/A	N/A
40	> 97	N/A	N/A
50	> 97	N/A	N/A

<b>FronD Count Summary</b>			<b>Calculated Variate</b>						
<b>Conc-%</b>	<b>Control Type</b>	<b>Count</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>Diff%</b>
0	Negative Control	4	57.5	46	70	1.848	9.95	17.3%	0.0%
1.5		4	57.5	46	70	1.848	9.95	17.3%	0.0%
3.05		4	57.5	46	70	1.848	9.95	17.3%	0.0%
6.1		4	56	47	78	2.733	14.72	26.29%	2.61%
12.1		4	57.5	46	70	1.848	9.95	17.3%	0.0%
24.2		4	57.5	46	70	1.848	9.95	17.3%	0.0%
48.5		4	57.5	54	63	0.7192	3.873	6.74%	0.0%
97		4	46.5	44	49	0.3866	2.082	4.48%	19.13%

<b>FronD Count Detail</b>					
<b>Conc-%</b>	<b>Control Type</b>	<b>Rep 1</b>	<b>Rep 2</b>	<b>Rep 3</b>	<b>Rep 4</b>
0	Negative Control	46	59	55	70
1.5		46	59	55	70
3.05		46	59	55	70
6.1		47	49	50	78
12.1		46	59	55	70
24.2		46	59	55	70
48.5		63	57	56	54
97		44	46	47	49

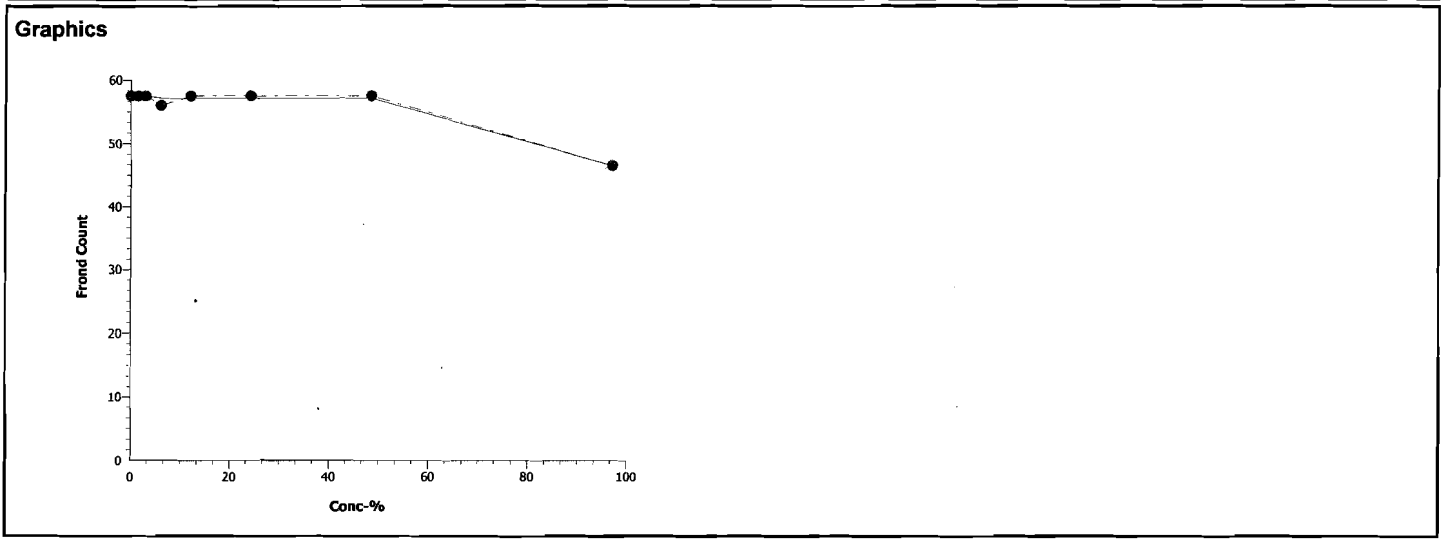
*CA* Aug-25/09

# CETIS Analytical Report

Report Date: 26 Aug-09 10:32 (p 2 of 2)

Link/Link Code: 15-3856-2266/09210-SC2H

Lemna Growth Inhibition Test		Nautilus Environmental	
Analysis No: 19-5254-6409	Endpoint: Frond Count	CETIS Version: CETISv1.5.0	
Analyzed: 26 Aug-09 10:32	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes	



*ea Aug 25/09*

**CETIS Analytical Report**

Report Date: 13 Aug-09 15:23 (p 1 of 2)  
 Link/Link Code: 08-4576-8802/09210-SC2

Lemna Growth Inhibition Test		Nautilus Environmental
------------------------------	--	------------------------

Analysis No: 11-1389-4767	Endpoint: Total Dry Weight-mg	CETIS Version: CETISv1.5.0
Analyzed: 13 Aug-09 15:22	Analysis: Parametric-Control vs Treatments	Official Results: Yes

Test Run No: 09-9927-0191	Test Type: Lemna Growth	Dil Water: Laboratory Water
Start Date: 07 Jul-09	Protocol: EC/EPS 1/RM/37	Brine:
Ending Date:	Species: Lemna minor	
Duration: N/A	Source: In-House Culture	

Sample No: 13-2840-0030	Code: SC2-July	Client: Rescan
Sample Date: 05 Jul-09 09:30	Material: Water Sample	Project:
Receive Date: 07 Jul-09 09:00	Source: Rescan	
Sample Age: 38h	Station: SC2	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	97	∞ > 97	#Error	1.031	33.88%

Dunnett's Multiple Comparison Test							
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		1.5	-1.739	2.482	1.577	0.9991	Non-Significant Effect
		3.05	0.9285	2.482	1.577	0.5143	Non-Significant Effect
		6.1	0.9088	2.482	1.577	0.5235	Non-Significant Effect
		12.1	-0.2202	2.482	1.577	0.9216	Non-Significant Effect
		24.2	0.1574	2.482	1.577	0.8314	Non-Significant Effect
		48.5	0.05518	2.482	1.577	0.8607	Non-Significant Effect
		97	1.212	2.482	1.577	0.3847	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	9.762757	1.39468	7	1.727	0.1501	Non-Significant Effect
Error	19.3839	0.8076625	24			
Total	29.14666	2.202342	31			

ANOVA Assumptions						
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)	
Variances	Bartlett Equality of Variance	5.332	18.48	0.6195	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.9787		0.7619	Normal Distribution	

Total Dry Weight-mg Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	4.655	4.29	5.02	3.53	5.56	0.178	0.9417	20.23%	0.0%
1.5		4	5.76	5.181	6.339	3.68	6.97	0.2824	1.494	25.94%	-23.74%
3.05		4	4.065	3.757	4.373	3.18	4.76	0.15	0.7936	19.52%	12.68%
6.1		4	4.077	3.636	4.519	3.09	5.69	0.2149	1.137	27.89%	12.41%
12.1		4	4.795	4.541	5.049	4.22	5.58	0.1239	0.6555	13.67%	-3.01%
24.2		4	4.555	4.321	4.789	3.77	5.24	0.1141	0.6036	13.25%	2.15%
48.5		4	4.62	4.409	4.831	4.08	5.37	0.1028	0.5439	11.77%	0.75%
97		4	3.885	3.663	4.107	3.1	4.47	0.1083	0.5729	14.75%	16.54%

*EC Aug 25/09*

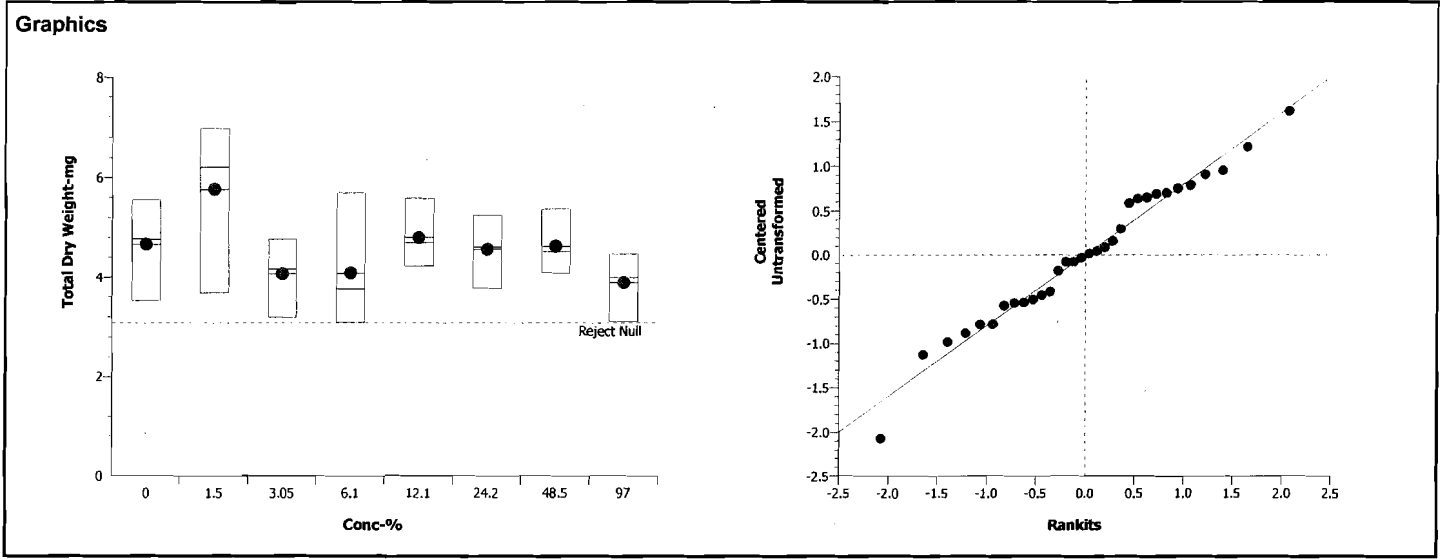


# CETIS Analytical Report

Report Date: 13 Aug-09 15:23 (p 2 of 2)  
 Link/Link Code: 08-4576-8802/09210-SC2

Lemna Growth Inhibition Test			Nautilus Environmental		
Analysis No:	11-1389-4767	Endpoint:	Total Dry Weight-mg	CETIS Version:	CETISv1.5.0
Analyzed:	13 Aug-09 15:22	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Total Dry Weight-mg Detail					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	5.56	5.29	4.24	3.53
1.5		6.97	6.71	5.68	3.68
3.05		4.76	4.71	3.61	3.18
6.1		5.69	4	3.53	3.09
12.1		5.58	5.09	4.29	4.22
24.2		5.24	4.64	4.57	3.77
48.5		5.37	4.59	4.44	4.08
97		4.47	4.04	3.93	3.1



*ELC Aug 25/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 10:43 (p 1 of 2)  
 Link/Link Code: 08-4576-8802/09210-SC2

<b>Lemna Growth Inhibition Test</b>		<b>Nautilus Environmental</b>
-------------------------------------	--	-------------------------------

<b>Analysis No:</b> 04-2717-8178	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 26 Aug-09 10:42	<b>Analysis:</b> Parametric-Two Sample	<b>Official Results:</b> Yes

<b>Test Run No:</b> 09-9927-0191	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>
<b>Ending Date:</b>	<b>Species:</b> Lemna minor	
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture	

<b>Sample No:</b> 13-2840-0030	<b>Code:</b> SC2-July	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09 09:30	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 38h	<b>Station:</b> SC2	

<b>Data Transform</b>	<b>Zeta</b>	<b>Alt Hyp</b>	<b>Monte Carlo</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>TU</b>	<b>PMSD</b>	
Untransformed		C < T	Not Run	97	82	0 > 97	#Error	1.031	N/A

<b>Equal Variance t Two-Sample Test</b>						
Control	vs Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control	1.5	1.251	1.943	1.716	0.1287	Non-Significant Effect
	3.05	-0.9583	1.943	1.196	0.8125	Non-Significant Effect
	6.1	-0.7823	1.943	1.435	0.7681	Non-Significant Effect
	12.1	0.2439	1.943	1.115	0.4077	Non-Significant Effect
	24.2	-0.1788	1.943	1.087	0.5680	Non-Significant Effect
	48.5	-0.06449	1.943	1.057	0.5247	Non-Significant Effect
	97	-1.397	1.943	1.071	0.8941	Non-Significant Effect

<b>ANOVA Table</b>						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	9.762757	1.39468	7	1.727	0.1501	Non-Significant Effect
Error	19.3839	0.8076625	24			
Total	29.14666	2.202342	31			

<b>ANOVA Assumptions</b>						
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)	
Variances	Bartlett Equality of Variance	5.332	18.48	0.6195	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.9787		0.7619	Normal Distribution	

<b>Total Dry Weight-mg Summary</b>											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	4.655	4.29	5.02	3.53	5.56	0.178	0.9417	20.23%	0.0%
1.5		4	5.76	5.181	6.339	3.68	6.97	0.2824	1.494	25.94%	-23.74%
3.05		4	4.065	3.757	4.373	3.18	4.76	0.15	0.7936	19.52%	12.68%
6.1		4	4.077	3.636	4.519	3.09	5.69	0.2149	1.137	27.89%	12.41%
12.1		4	4.795	4.541	5.049	4.22	5.58	0.1239	0.6555	13.67%	-3.01%
24.2		4	4.555	4.321	4.789	3.77	5.24	0.1141	0.6036	13.25%	2.15%
48.5		4	4.62	4.409	4.831	4.08	5.37	0.1028	0.5439	11.77%	0.75%
97		4	3.885	3.663	4.107	3.1	4.47	0.1083	0.5729	14.75%	16.54%

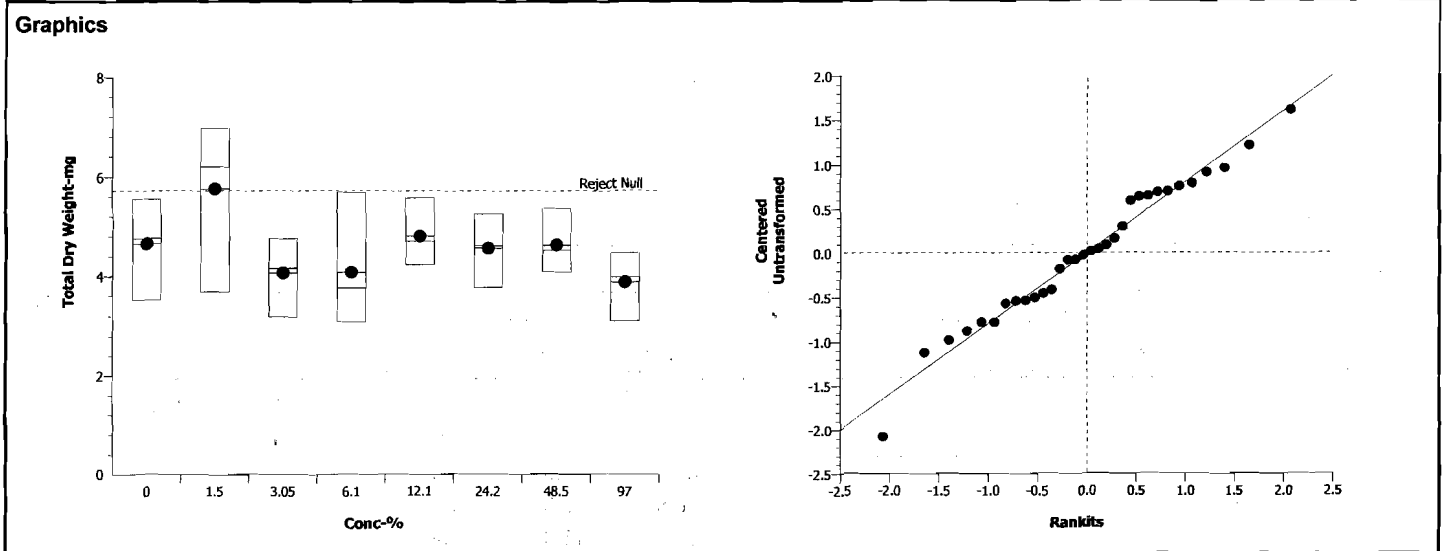
*Aug 26/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 10:43 (p 2 of 2)  
 Link/Link Code: 08-4576-8802/09210-SC2

<b>Lemna Growth Inhibition Test</b>		<b>Nautilus Environmental</b>	
<b>Analysis No:</b> 04-2717-8178	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.5.0	
<b>Analyzed:</b> 26 Aug-09 10:42	<b>Analysis:</b> Parametric-Two Sample	<b>Official Results:</b> Yes	

<b>Total Dry Weight-mg Detail</b>					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	5.56	5.29	4.24	3.53
1.5		6.97	6.71	5.68	3.68
3.05		4.76	4.71	3.61	3.18
6.1		5.69	4	3.53	3.09
12.1		5.58	5.09	4.29	4.22
24.2		5.24	4.64	4.57	3.77
48.5		5.37	4.59	4.44	4.08
97		4.47	4.04	3.93	3.1



*EC Aug 26/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 10:45 (p 1 of 2)  
 Link/Link Code: 15-3856-2266/09210-SC2H

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>
<b>Analysis No:</b> 07-9452-1912	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.5.0	
<b>Analyzed:</b> 26 Aug-09 10:45	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Official Results:</b> Yes	
<b>Test Run No:</b> 09-2067-6875	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water	
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>	
<b>Ending Date:</b> 14 Jul-09	<b>Species:</b> Lemna minor		
<b>Duration:</b> 7d 0h	<b>Source:</b> In-House Culture		
<b>Sample No:</b> 09-4281-8810	<b>Code:</b> SC2-Jul	<b>Client:</b> Rescan	
<b>Sample Date:</b> 05 Jul-09	<b>Material:</b> Water Sample	<b>Project:</b>	
<b>Receive Date:</b> 07 Jul-09	<b>Source:</b> Rescan		
<b>Sample Age:</b> 48h	<b>Station:</b> SC2		

<b>Linear Interpolation Options</b>					
<b>X Transform</b>	<b>Y Transform</b>	<b>Seed</b>	<b>Resamples</b>	<b>Exp 95% CL</b>	<b>Method</b>
Log(X + 1)	Linear	57951	200	Yes	Two-Point Interpolation

<b>Point Estimates</b>			
<b>% Effect</b>	<b>Conc-%</b>	<b>95% LCL</b>	<b>95% UCL</b>
5	2.847	N/A	114.3
10	64.15	N/A	N/A
15	88.01	N/A	N/A
20	> 97	N/A	N/A
25	> 97	N/A	N/A
40	> 97	N/A	N/A
50	> 97	N/A	N/A

<b>Total Dry Weight-mg Summary</b>			<b>Calculated Variate</b>						
<b>Conc-%</b>	<b>Control Type</b>	<b>Count</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>Diff%</b>
0	Negative Control	4	4.655	3.53	5.56	0.1749	0.9417	20.23%	0.0%
1.5		4	4.655	3.53	5.56	0.1749	0.9417	20.23%	0.0%
3.05		4	4.065	3.18	4.76	0.1474	0.7936	19.52%	12.68%
6.1		4	4.077	3.09	5.69	0.2112	1.137	27.89%	12.41%
12.1		4	4.655	3.53	5.56	0.1749	0.9417	20.23%	0.0%
24.2		4	4.555	3.77	5.24	0.1121	0.6036	13.25%	2.15%
48.5		4	4.62	4.08	5.37	0.101	0.5439	11.77%	0.75%
97		4	3.885	3.1	4.47	0.1064	0.5729	14.75%	16.54%

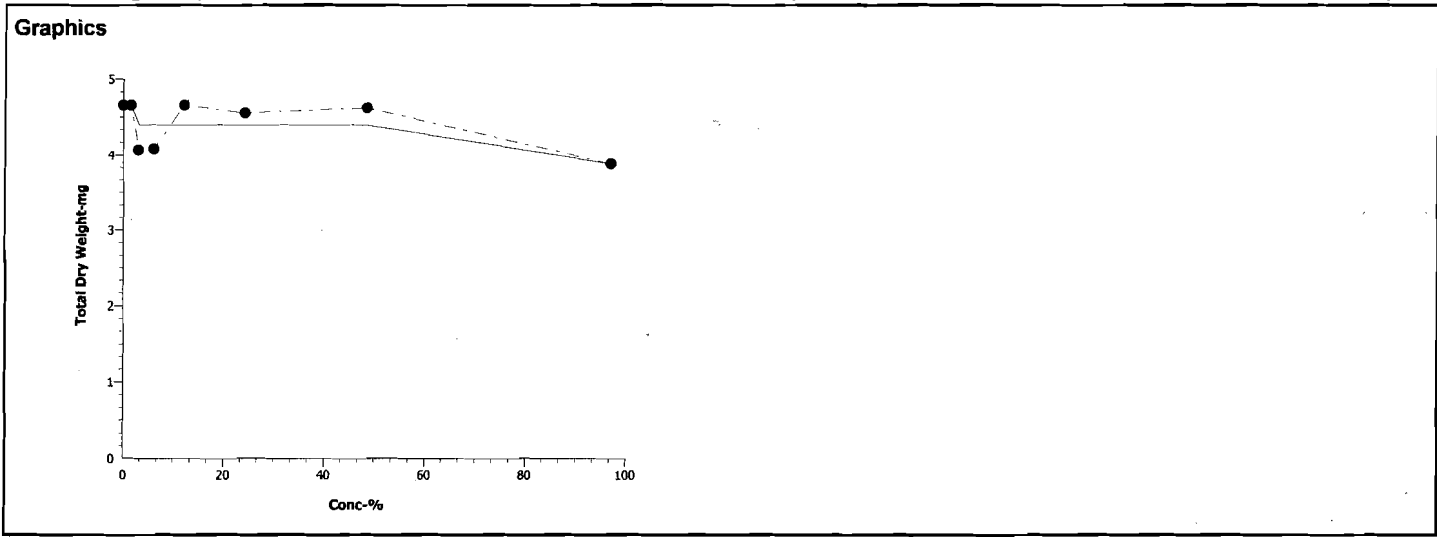
<b>Total Dry Weight-mg Detail</b>					
<b>Conc-%</b>	<b>Control Type</b>	<b>Rep 1</b>	<b>Rep 2</b>	<b>Rep 3</b>	<b>Rep 4</b>
0	Negative Control	3.53	4.24	5.29	5.56
1.5		3.53	4.24	5.29	5.56
3.05		3.61	4.76	3.18	4.71
6.1		3.53	3.09	4	5.69
12.1		3.53	4.24	5.29	5.56
24.2		4.64	4.57	3.77	5.24
48.5		5.37	4.44	4.08	4.59
97		3.93	4.04	3.1	4.47

*ew Aug 26/09*

# CETIS Analytical Report

Report Date: 26 Aug-09 10:45 (p 2 of 2)  
Link/Link Code: 15-3856-2266/09210-SC2H

Lemna Growth Inhibition Test		Nautilus Environmental
Analysis No: 07-9452-1912	Endpoint: Total Dry Weight-mg	CETIS Version: CETISv1.5.0
Analyzed: 26 Aug-09 10:45	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes



*tea Aug 26/09*

### Lemna minor Summary Sheet

Client: Rescan  
 Work Order No.: 09210

Start Date: July 7/09  
 Set up by: ART

**Sample Information:**

Sample ID: STE2  
 Sample Date: July 5/2009  
 Date Received: July 7/2009  
 Sample Volume: 9 x 20L

**Test Organism Information:**

Culture Date: 300609  
~~8/2009~~  
 Age of culture (Day 0): 7 days  
 >8X growth in APHA?: 7(33) Yes, 33 fronds  
BPL

**KCI Reference Toxicant Results:**

Reference Toxicant ID: LM40  
 Date Initiated: June 24/2009

7-d No. of Fronds IC25 (95% CL): 2.8 (0.9 - 4.9) q/L KCl

7-d No. Fronds IC25 Reference Toxicant Mean  $\pm$  2 SD: 2.5  $\pm$  1.1 CV (%): 22%

	Number of Fronds	Dry Weight
Test Results: NOEC %(v/v)	97	97
LOEC %(v/v)	>97	>97
IC25 %(v/v) (95% CL)	>97	>97
IC50 %(v/v) (95% CL)	>97	>97

Reviewed by: [Signature]

Date reviewed: Aug 26/09

# Plant Growth Inhibition Toxicity Test Water Quality Measurements

*Red*

Client: Rescan Setup by: ART  
 Sample ID: STEZ Test Date: July 7/09  
 Work Order No.: 09210 Test Species: Lemna minor  
 Culture Source: UTCC #490  
 Test Culture Age: 7 days > 8X Growth? (Y/N): Y (33)  
 Light Intensity Range: 3600 = 3850 Date Measured: July 7/09

Day	0	1	2	3	4	5	6	7
Shelf Temp (°C)	24.4	24.9	24.3	25.4	24.6	24.6	24.9	25.7
Initials	ART	ART	ART	JL	JLT	JLT	BL	BL

Sample Characteristics  
 Temperature (°C) 24.0 Aeration? 20 min  
 DO (mg/L) 9.0 24.0  
 pH 7.4 9.5  
 Conductivity (µS) at 880 61 7.7  
882

Concentration % (µS)	Temperature (°C)		pH		Conductivity (µS) 0 h
	Day 0	Day 7	Day 0	Day 7	
Control	24.5	25.9	8.2	8.2	879
1.5	24.5	26.4	8.2	8.3	at 877 879
3.05	24.5	25.9	8.1	8.3	879
6.1	24.5	26.2	8.1	8.5	880
12.1	24.4	26.8	8.1	8.7	880
24.2	24.3	26.7	8.0	8.5	881
48.5	24.1	26.6	7.9	8.6	882
97	24.0	25.6	7.7	8.4	882
Initials	ART	BL	ART	BL	ART

Thermometer: Big Jumbo Thermometer Cond. Meter: C-1 pH meter: pH-1

Sample Description: clear, slight amber colour

Comments: \_\_\_\_\_

Reviewed: EW Date Reviewed: Aug. 25/09

Red

**Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts**

Client: Rescan  
 Sample ID: STE2  
 Work Order #: 09210

Start Date: July 7 / 09  
 Termination Date: July 14 / 09  
 Test set up by: ART

Concentration <i>g/v (v/v)</i>	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
Control	A	6	38										ES
	B		52	52									ES
	C		36										ES
	D		76										ES
1.5	A		48										ES
	B		43										ES
	C		45										ES
	D		46										ES
3.05	A		47										ES
	B		45										ES
	C		48										ES
	D		48										ES
6.1	A		54										ES
	B		55										ES
	C		68										ES
	D		39										ES
12.1	A		71										ES
	B		44										ES
	C		62										ES
	D		59										ES
24.2	A		54										ES
	B		71										ES
	C		47										ES
	D	✓	61										ES

Comments: \_\_\_\_\_

Reviewed by: EA

Date Reviewed: Aug 25/09



Red

### Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts

Client: Rescan  
 Sample ID: STE2  
 Work Order #: 09210

Start Date: July 7 / 09  
 Termination Date: July 14 / 09  
 Test set up by: ART

Concentration %o (v/v)	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
48.5	A	6	- <sup>(1)</sup>									None initially	[Handwritten initials]
	B		73										
	C		88										
	D		68										
97	A		66										[Handwritten initials]
	B		71										
	C		70										
	D	↓	37										
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												

Comments: no duckweed were added to beaker at beginning of test.

Reviewed by: [Signature]

Date Reviewed: Aug 25/09

Red

### 7-d Lemna minor Weight Data Sheet

Client: Rescan  
 Sample ID: STEZ  
 Work Order #: 09240

Start Date: July 7 / 09  
 Termination Date: July 14 / 09

Concentration % (V/V)	Rep	Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
Control	A	1	1331.56	1333.68	EGS
	B	2	1332.64	1336.13	EGS
	C	3	1334.31	1338.30	EGS
	D	4	1330.50	1335.31	EGS
1.5	A	5	1323.95	1326.78	EGS
	B	6	1322.43	1325.40	EGS
	C	7	1327.73	<del>1329</del> 1330.03 <del>EGS</del>	EGS
	D	8	1326.09	1329.15	EGS
3.05	A	9	1323.28	1325.64	EGS
	B	10	1337.11	1339.25	EGS
	C	11	1333.37	1336.26	EGS
	D	12	1321.07	1323.54	EGS
6.1	A	13	1331.48	1334.43	EGS
	B	14	1335.05	1337.86	EGS
	C	15	1325.70	1329.35	EGS
	D	16	1341.54	1342.12	EGS
12.1	A	17	1336.45	1339.99	EGS
	B	18	1330.85	1332.90	EGS
	C	19	1337.47	1340.61	EGS
	D	20	1325.74	1328.83	EGS
24.2	A	21	1322.93	1326.03	EGS
	B	22	1325.87	1329.80	EGS
	C	23	1327.44	1329.77	EGS
	D	24	1327.65	1331.26	EGS
48.5	A	25	1326.91	-	EGS
	B	26	1327.01	1331.75	EGS
	C	27	1325.54	1330.65	EGS
	D	28	1324.42	1328.05	EGS

Comments: \_\_\_\_\_  
 \_\_\_\_\_

Reviewed by: EGS

Date Reviewed: Aug. 25 / 09

Red

### 7-d Lemna minor Weight Data Sheet

Client: Rescan  
Sample ID: STEZ  
Work Order #: 09210

Start Date: July 7 / 09  
Termination Date: July 14 / 09

Concentration % (✓/✓)	Rep	Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
97	A	29	1320.10	1328.48	
	B	30	1323.12	1327.45	
	C	31	1328.35	1332.45	
	D	32	1327.57	1329.30	
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				

Comments: \_\_\_\_\_  
\_\_\_\_\_

Reviewed by: EC

Date Reviewed: \_\_\_\_\_

**CETIS Analytical Report**

Report Date: 25 Aug-09 10:37 (p 1 of 2)

Link/Link Code: 04-3661-5443/09210-STE2

Lemna Growth Inhibition Test		Nautilus Environmental	
------------------------------	--	------------------------	--

Analysis No: 00-0548-9221	Endpoint: Frond Count	CETIS Version: CETISv1.5.0
Analyzed: 25 Aug-09 10:35	Analysis: Parametric-Multiple Comparison	Official Results: Yes

Test Run No: 01-3781-1703	Test Type: Lemna Growth	Dil Water: Laboratory Water
Start Date: 07 Jul-09	Protocol: EC/EPS 1/RM/37	Brine:
Ending Date:	Species: Lemna minor	
Duration: N/A	Source: In-House Culture	

Sample No: 02-9960-3283	Code: STE 2-Jul	Client: Rescan
Sample Date: 05 Jul-09 13:15	Material: Water Sample	Project:
Receive Date: 07 Jul-09 09:00	Source: Rescan	
Sample Age: 35h	Station: STE 2	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	97	<del>97</del> > 97	#Error	1.031	42.31%

Bonferroni Adj t Test							
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		1.5	1.266	2.651	20.94	0.7640	Non-Significant Effect
		3.05	1.076	2.651	20.94	1.0000	Non-Significant Effect
		6.1	0.1899	2.651	20.94	1.0000	Non-Significant Effect
		12.1	-0.443	2.651	20.94	1.0000	Non-Significant Effect
		24.2	-0.3481	2.651	20.94	1.0000	Non-Significant Effect
		48.5	-2.441	2.651	22.62	1.0000	Non-Significant Effect
		97	-0.6961	2.651	20.94	1.0000	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2172.261	310.323	7	2.486	0.0468	Significant Effect
Error	2871.417	124.8442	23			
Total	5043.678	435.1672	30			

ANOVA Assumptions						
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)	
Variances	Bartlett Equality of Variance	16.47	18.48	0.0212	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.9612		0.3142	Normal Distribution	

Frond Count Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	49.5	43.41	55.59	32	70	2.966	15.7	31.71%	0.0%
1.5		4	39.5	38.69	40.31	37	42	0.3934	2.082	5.27%	20.2%
3.05		4	41	40.45	41.55	39	42	0.2673	1.414	3.45%	17.17%
6.1		4	48	43.4	52.6	33	62	2.241	11.86	24.71%	3.03%
12.1		4	53	48.65	57.35	38	65	2.121	11.22	21.18%	-7.07%
24.2		4	52.25	48.28	56.22	41	65	1.936	10.24	19.6%	-5.56%
48.5		3	70.33	66.3	74.37	62	82	1.967	10.41	14.8%	-42.09%
97		4	55	48.74	61.26	31	65	3.051	16.15	29.35%	-11.11%

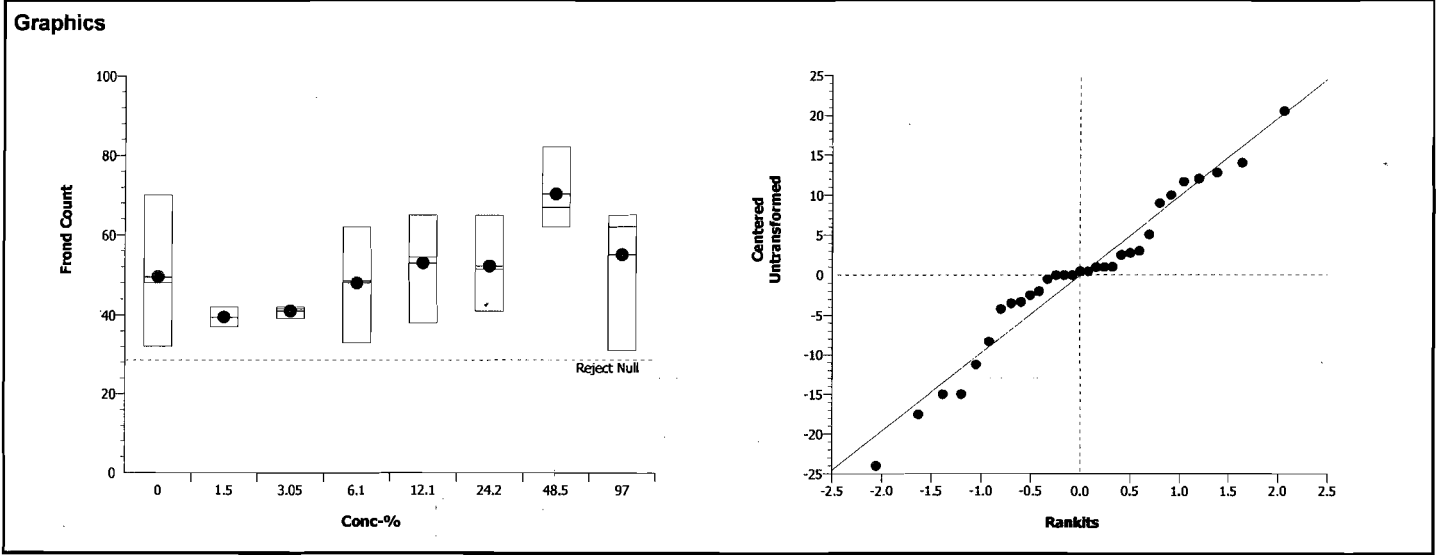
*EC Aug 25/09*

# CETIS Analytical Report

Report Date: 25 Aug-09 10:37 (p 2 of 2)  
 Link/Link Code: 04-3661-5443/09210-STE2

Lemna Growth Inhibition Test			Nautilus Environmental		
Analysis No: 00-0548-9221	Endpoint: Frond Count	CETIS Version: CETISv1.5.0		Official Results: Yes	
Analyzed: 25 Aug-09 10:35	Analysis: Parametric-Multiple Comparison				

Frond Count Detail					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	70	50	46	32
1.5		42	40	39	37
3.05		42	42	41	39
6.1		62	49	48	33
12.1		65	56	53	38
24.2		65	55	48	41
48.5		82	67	62	
97		65	64	60	31



*ECR Aug 25/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 10:52 (p 1 of 2)  
 Link/Link Code: 04-3661-5443/09210-STE2

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 16-1120-6003	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 26 Aug-09 10:52	<b>Analysis:</b> Parametric-Two Sample	<b>Official Results:</b> Yes			
<b>Test Run No:</b> 01-3781-1703	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water			
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>			
<b>Ending Date:</b>	<b>Species:</b> Lemna minor				
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture				
<b>Sample No:</b> 02-9960-3283	<b>Code:</b> STE 2-Jul	<b>Client:</b> Rescan			
<b>Sample Date:</b> 05 Jul-09 13:15	<b>Material:</b> Water Sample	<b>Project:</b>			
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan				
<b>Sample Age:</b> 35h	<b>Station:</b> STE 2				

<b>Data Transform</b>	<b>Zeta</b>	<b>Alt Hyp</b>	<b>Monte Carlo</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>TU</b>	<b>PMSD</b>	
Untransformed		C < T	Not Run	97	62	97	#Error	1.031	N/A

<b>Equal Variance t Two-Sample Test</b>							
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		1.5	-1.263	1.943	15.38	0.8733	Non-Significant Effect
		3.05	-1.079	1.943	15.31	0.8389	Non-Significant Effect
		6.1	-0.1525	1.943	19.11	0.5581	Non-Significant Effect
		12.1	0.3628	1.943	18.75	0.3646	Non-Significant Effect
		24.2	0.2935	1.943	18.21	0.3895	Non-Significant Effect
		48.5	1.973	2.015	21.28	0.0528	Non-Significant Effect
		97	0.4885	1.943	21.88	0.3213	Non-Significant Effect

<b>ANOVA Table</b>						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2172.261	310.323	7	2.486	0.0468	Significant Effect
Error	2871.417	124.8442	23			
Total	5043.678	435.1672	30			

<b>ANOVA Assumptions</b>					
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	16.47	18.48	0.0212	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9612		0.3142	Normal Distribution

<b>Frond Count Summary</b>											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	49.5	43.41	55.59	32	70	2.966	15.7	31.71%	0.0%
1.5		4	39.5	38.69	40.31	37	42	0.3934	2.082	5.27%	20.2%
3.05		4	41	40.45	41.55	39	42	0.2673	1.414	3.45%	17.17%
6.1		4	48	43.4	52.6	33	62	2.241	11.86	24.71%	3.03%
12.1		4	53	48.65	57.35	38	65	2.121	11.22	21.18%	-7.07%
24.2		4	52.25	48.28	56.22	41	65	1.936	10.24	19.6%	-5.56%
48.5		3	70.33	66.3	74.37	62	82	1.967	10.41	14.8%	-42.09%
97		4	55	48.74	61.26	31	65	3.051	16.15	29.35%	-11.11%

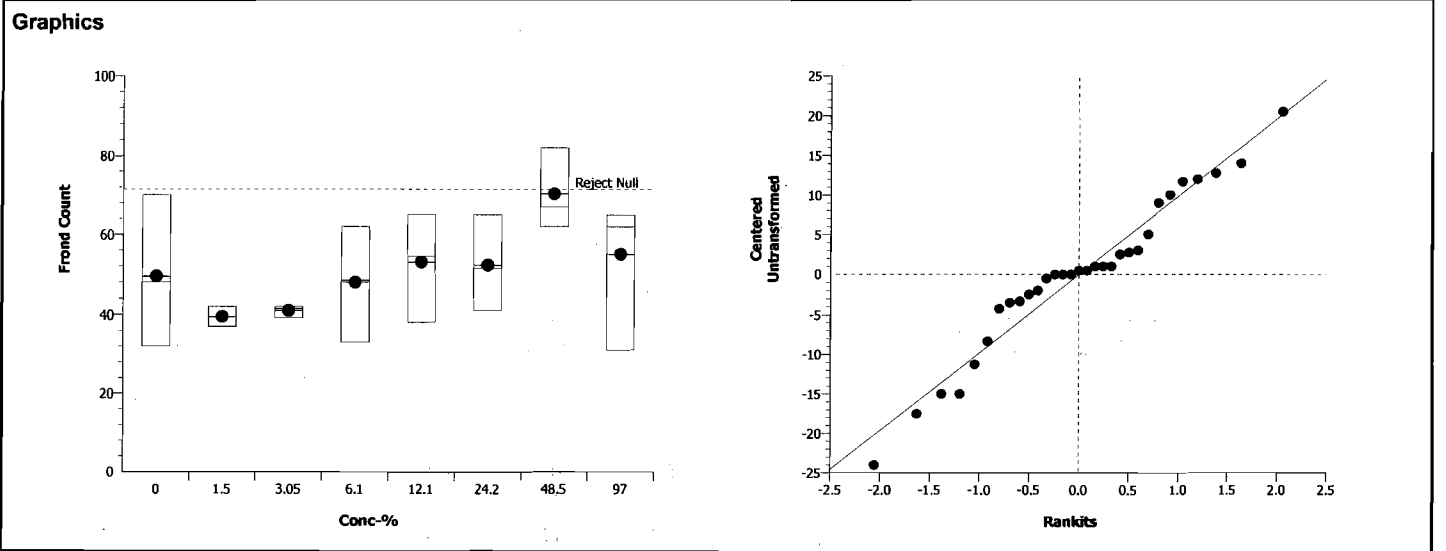
*ea Aug 26/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 10:52 (p 2 of 2)  
 Link/Link Code: 04-3661-5443/09210-STE2

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 16-1120-6003	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 26 Aug-09 10:52	<b>Analysis:</b> Parametric-Two Sample	<b>Official Results:</b> Yes			

<b>Frond Count Detail</b>					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	70	50	46	32
1.5		42	40	39	37
3.05		42	42	41	39
6.1		62	49	48	33
12.1		65	56	53	38
24.2		65	55	48	41
48.5		82	67	62	
97		65	64	60	31



*EA Aug 26/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 11:11 (p 1 of 2)  
 Link/Link Code: 00-8666-3256/09210STE2H

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 02-0357-3647	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 26 Aug-09 11:11	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Official Results:</b> Yes			
<b>Test Run No:</b> 14-1257-3951	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water			
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>			
<b>Ending Date:</b> 14 Jul-09	<b>Species:</b> Lemna minor				
<b>Duration:</b> 7d 0h	<b>Source:</b> In-House Culture				
<b>Sample No:</b> 06-6927-5061	<b>Code:</b> STE 2-Jul	<b>Client:</b> Rescan			
<b>Sample Date:</b> 05 Jul-09 13:15	<b>Material:</b> Water Sample	<b>Project:</b>			
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan				
<b>Sample Age:</b> 35h	<b>Station:</b> STE 2				

<b>Linear Interpolation Options</b>					
<b>X Transform</b>	<b>Y Transform</b>	<b>Seed</b>	<b>Resamples</b>	<b>Exp 95% CL</b>	<b>Method</b>
Log(X + 1)	Linear	57951	200	Yes	Two-Point Interpolation

<b>Point Estimates</b>			
<b>% Effect</b>	<b>Conc-%</b>	<b>95% LCL</b>	<b>95% UCL</b>
5	1.212	N/A	N/A
10	> 97	N/A	N/A
15	> 97	N/A	N/A
20	> 97	N/A	N/A
25	> 97	N/A	N/A
40	> 97	N/A	N/A
50	> 97	N/A	N/A

<b>Frond Count Summary</b>			<b>Calculated Variate</b>						
<b>Conc-%</b>	<b>Control Type</b>	<b>Count</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>Diff%</b>
0	Negative Control	4	49.5	32	70	2.914	15.7	31.71%	0.0%
1.5		4	39.5	37	42	0.3866	2.082	5.27%	20.2%
3.05		4	41	39	42	0.2626	1.414	3.45%	17.17%
6.1		4	48	33	62	2.202	11.86	24.71%	3.03%
12.1		4	49.5	32	70	2.914	15.7	31.71%	0.0%
24.2		4	49.5	32	70	2.914	15.7	31.71%	0.0%
48.5		4	49.5	32	70	2.914	15.7	31.71%	0.0%
97		4	49.5	32	70	2.914	15.7	31.71%	0.0%

<b>Frond Count Detail</b>					
<b>Conc-%</b>	<b>Control Type</b>	<b>Rep 1</b>	<b>Rep 2</b>	<b>Rep 3</b>	<b>Rep 4</b>
0	Negative Control	32	46	50	70
1.5		42	37	39	40
3.05		41	39	42	42
6.1		49	62	33	48
12.1		32	46	50	70
24.2		32	46	50	70
48.5		32	46	50	70
97		32	46	50	70

*EA Aug 26/09*



# CETIS Analytical Report

Report Date: 26 Aug-09 11:11 (p 2 of 2)

Link/Link Code: 00-8666-3256/09210STE2H

Lemna Growth Inhibition Test

Nautilus Environmental

Analysis No: 02-0357-3647

Endpoint: Frond Count

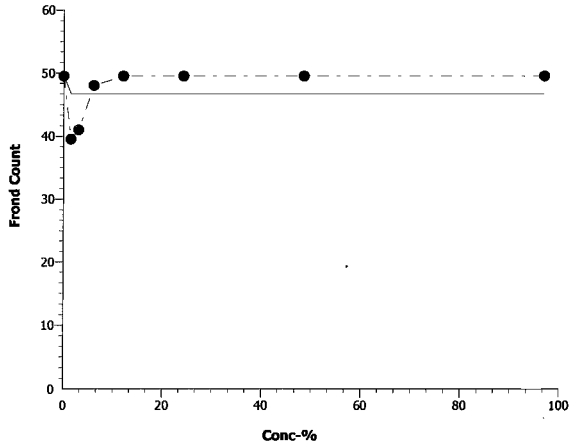
CETIS Version: CETISv1.5.0

Analyzed: 26 Aug-09 11:11

Analysis: Linear Interpolation (ICPIN)

Official Results: Yes

## Graphics



*Handwritten signature*  
Aug 26/09

**CETIS Analytical Report**

Report Date: 14 Aug-09 10:55 (p 1 of 2)  
 Link/Link Code: 04-3661-5443/09210-STE2

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 00-2260-0656	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 14 Aug-09 10:52	<b>Analysis:</b> Parametric-Multiple Comparison	<b>Official Results:</b> Yes			
<b>Test Run No:</b> 01-3781-1703	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water			
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>			
<b>Ending Date:</b>	<b>Species:</b> Lemna minor				
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture				
<b>Sample No:</b> 02-9960-3283	<b>Code:</b> STE 2-Jul	<b>Client:</b> Rescan			
<b>Sample Date:</b> 05 Jul-09 13:15	<b>Material:</b> Water Sample	<b>Project:</b>			
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan				
<b>Sample Age:</b> 35h	<b>Station:</b> STE 2				

<b>Data Transform</b>	<b>Zeta</b>	<b>Alt Hyp</b>	<b>Monte Carlo</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>TU</b>	<b>PMSD</b>
Untransformed		C > T	Not Run	97	3.6 > 4.7	#Error	1.031	45.74%

<b>Bonferroni Adj t Test</b>							
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		1.5	1.307	2.651	1.648	0.7144	Non-Significant Effect
		3.05	1.83	2.651	1.648	0.2809	Non-Significant Effect
		6.1	1.778	2.651	1.648	0.3104	Non-Significant Effect
		12.1	1.042	2.651	1.648	1.0000	Non-Significant Effect
		24.2	0.5791	2.651	1.648	1.0000	Non-Significant Effect
		48.5	-1.327	2.651	1.78	1.0000	Non-Significant Effect
		97	0.3499	2.651	1.648	1.0000	Non-Significant Effect

<b>ANOVA Table</b>						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	10.73227	1.533182	7	1.984	0.1017	Non-Significant Effect
Error	17.77437	0.7727988	23			
Total	28.50664	2.30598	30			

<b>ANOVA Assumptions</b>					
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	8.821	18.48	0.2658	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9287		0.0403	Normal Distribution

<b>Total Dry Weight-mg Summary</b>											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	3.603	3.165	4.04	2.12	4.81	0.2132	1.128	31.32%	0.0%
1.5		4	2.79	2.658	2.922	2.3	3.06	0.06427	0.3401	12.19%	22.55%
3.05		4	2.465	2.343	2.587	2.14	2.89	0.05949	0.3148	12.77%	31.57%
6.1		4	2.497	1.982	3.013	0.58	3.65	0.2514	1.33	53.26%	30.67%
12.1		4	2.955	2.708	3.202	2.05	3.54	0.1202	0.636	21.52%	17.97%
24.2		4	3.243	2.972	3.513	2.33	3.93	0.1319	0.6978	21.52%	9.99%
48.5		3	4.493	4.195	4.792	3.63	5.11	0.1456	0.7702	17.14%	-24.73%
97		4	3.385	2.929	3.841	1.73	4.33	0.2221	1.175	34.72%	6.04%

*EA Aug 25/09*

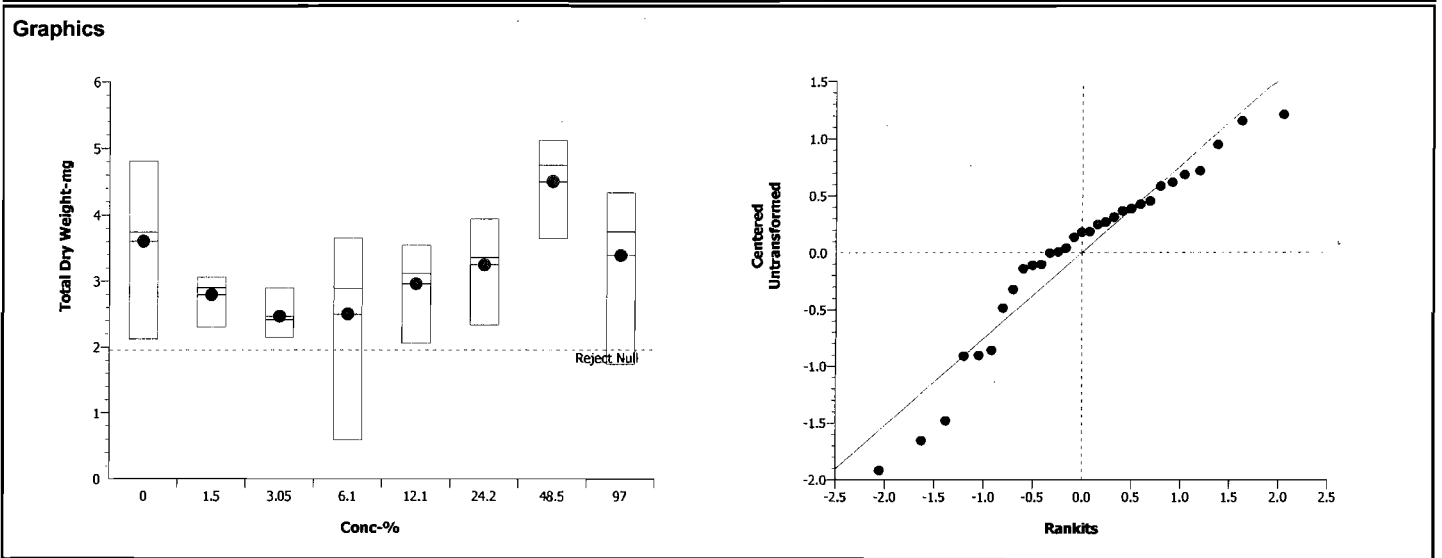
**CETIS Analytical Report**

Report Date: 14 Aug-09 10:55 (p 2 of 2)

Link/Link Code: 04-3661-5443/09210-STE2

Lemna Growth Inhibition Test			Nautilus Environmental		
Analysis No:	00-2260-0656	Endpoint:	Total Dry Weight-mg	CETIS Version:	CETISv1.5.0
Analyzed:	14 Aug-09 10:52	Analysis:	Parametric-Multiple Comparison	Official Results:	Yes

Total Dry Weight-mg Detail					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	4.81	3.99	3.49	2.12
1.5		3.06	2.97	2.83	2.3
3.05		2.89	2.47	2.36	2.14
6.1		3.65	2.95	2.81	0.58
12.1		3.54	3.14	3.09	2.05
24.2		3.93	3.61	3.1	2.33
48.5		5.11	4.74	3.63	
97		4.33	4.1	3.38	1.73



*GA*  
Aug 25/09

**CETIS Analytical Report**

Report Date: 26 Aug-09 10:52 (p 1 of 2)

Link/Link Code: 04-3661-5443/09210-STE2

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>
-------------------------------------	--	--	-------------------------------

<b>Analysis No:</b> 05-3242-3755	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 26 Aug-09 10:52	<b>Analysis:</b> Parametric-Two Sample	<b>Official Results:</b> Yes

<b>Test Run No:</b> 01-3781-1703	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>
<b>Ending Date:</b>	<b>Species:</b> Lemna minor	
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture	

<b>Sample No:</b> 02-9960-3283	<b>Code:</b> STE 2-Jul	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09 13:15	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 35h	<b>Station:</b> STE 2	

<b>Data Transform</b>	<b>Zeta</b>	<b>Alt Hyp</b>	<b>Monte Carlo</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>TU</b>	<b>PMSD</b>
Untransformed		C < T	Not Run	97	<del>97</del> > 97	#Error	1.031	N/A

Equal Variance t Two-Sample Test						
Control	vs Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control	1.5	-1.379	1.943	1.145	0.8914	Non-Significant Effect
	3.05	-1.942	1.943	1.138	0.9499	Non-Significant Effect
	6.1	-1.267	1.943	1.695	0.8740	Non-Significant Effect
	12.1	-0.9998	1.943	1.258	0.8220	Non-Significant Effect
	24.2	-0.5427	1.943	1.289	0.6966	Non-Significant Effect
	48.5	1.166	2.015	1.54	0.1481	Non-Significant Effect
	97	-0.267	1.943	1.583	0.6008	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	10.73227	1.533182	7	1.984	0.1017	Non-Significant Effect
Error	17.77437	0.7727988	23			
Total	28.50664	2.30598	30			

ANOVA Assumptions					
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	8.821	18.48	0.2658	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9287		0.0403	Normal Distribution

Total Dry Weight-mg Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	3.603	3.165	4.04	2.12	4.81	0.2132	1.128	31.32%	0.0%
1.5		4	2.79	2.658	2.922	2.3	3.06	0.06427	0.3401	12.19%	22.55%
3.05		4	2.465	2.343	2.587	2.14	2.89	0.05949	0.3148	12.77%	31.57%
6.1		4	2.497	1.982	3.013	0.58	3.65	0.2514	1.33	53.26%	30.67%
12.1		4	2.955	2.708	3.202	2.05	3.54	0.1202	0.636	21.52%	17.97%
24.2		4	3.243	2.972	3.513	2.33	3.93	0.1319	0.6978	21.52%	9.99%
48.5		3	4.493	4.195	4.792	3.63	5.11	0.1456	0.7702	17.14%	-24.73%
97		4	3.385	2.929	3.841	1.73	4.33	0.2221	1.175	34.72%	6.04%

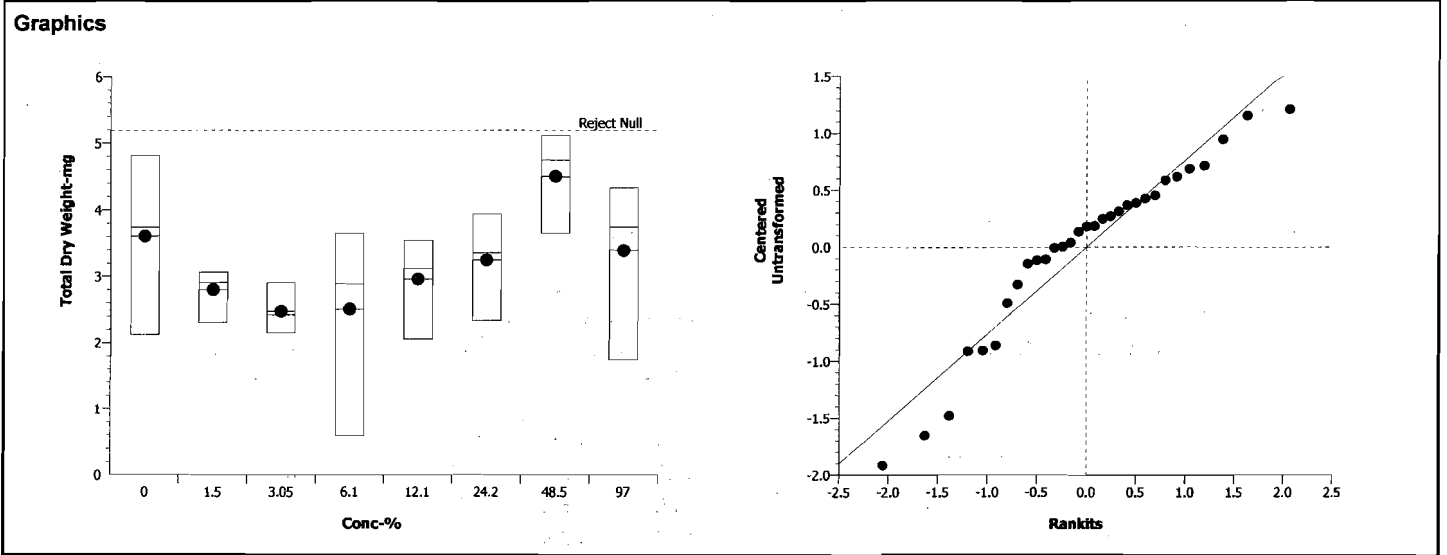
*EC Aug 26/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 10:52 (p 2 of 2)  
 Link/Link Code: 04-3661-5443/09210-STE2

<b>Lemna Growth Inhibition Test</b>		<b>Nautilus Environmental</b>	
<b>Analysis No:</b> 05-3242-3755	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.5.0	
<b>Analyzed:</b> 26 Aug-09 10:52	<b>Analysis:</b> Parametric-Two Sample	<b>Official Results:</b> Yes	

<b>Total Dry Weight-mg Detail</b>					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	4.81	3.99	3.49	2.12
1.5		3.06	2.97	2.83	2.3
3.05		2.89	2.47	2.36	2.14
6.1		3.65	2.95	2.81	0.58
12.1		3.54	3.14	3.09	2.05
24.2		3.93	3.61	3.1	2.33
48.5		5.11	4.74	3.63	
97		4.33	4.1	3.38	1.73



*Handwritten signature and date: Aug 26/09*

**CETIS Analytical Report**

Report Date: 17 Aug-09 16:00 (p 1 of 2)  
 Link/Link Code: 04-3661-5443/09210-STE2

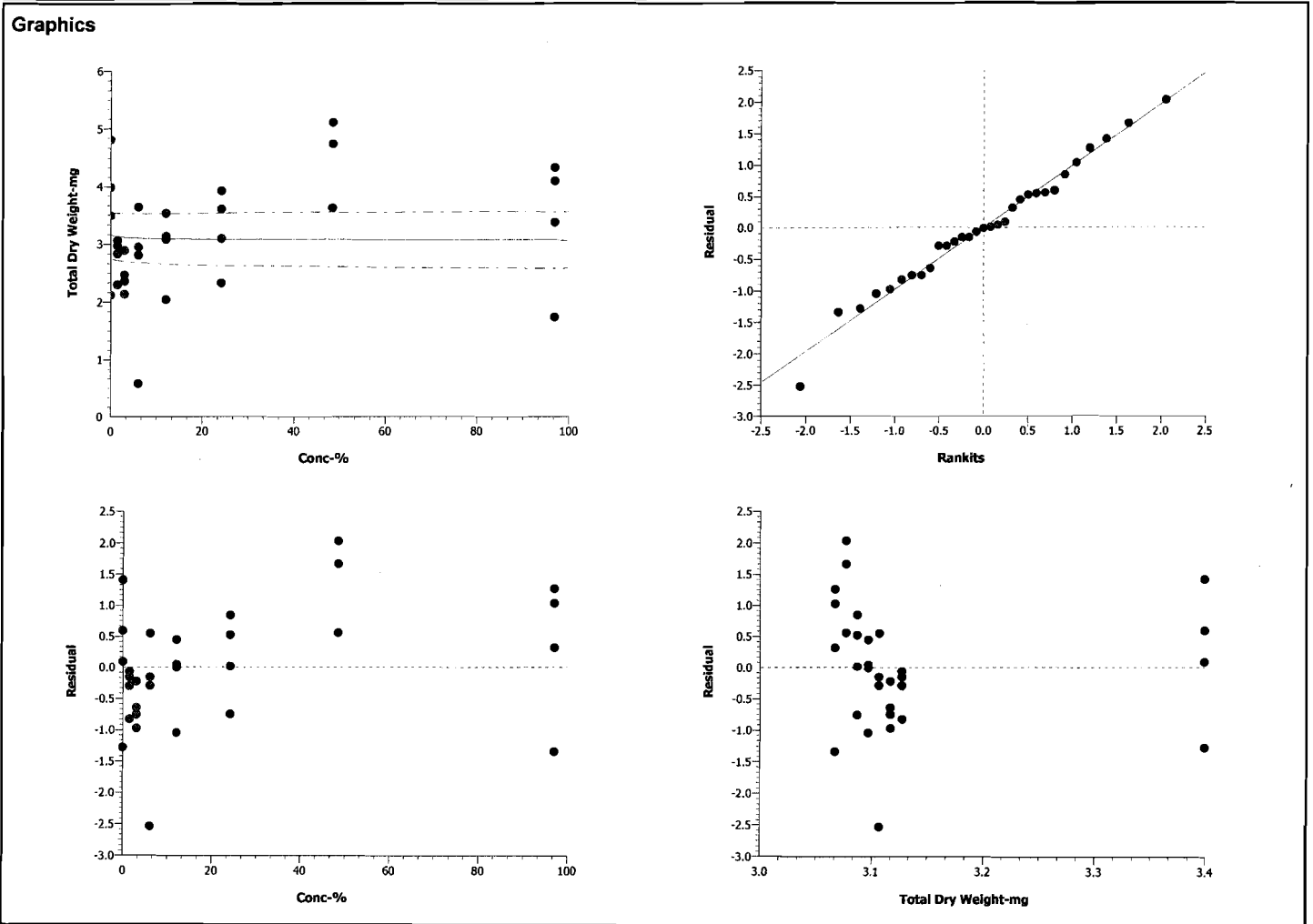
Lemna Growth Inhibition Test				Nautilus Environmental					
Analysis No: 11-3396-0145		Endpoint: Total Dry Weight-mg		CETIS Version: CETISv1.5.0					
Analyzed: 17 Aug-09 16:00		Analysis: Nonlinear Regression		Official Results: Yes					
Test Run No: 01-3781-1703		Test Type: Lemna Growth		Dil Water: Laboratory Water					
Start Date: 07 Jul-09		Protocol: EC/EPS 1/RM/37		Brine:					
Ending Date:		Species: Lemna minor							
Duration: N/A		Source: In-House Culture							
Sample No: 02-9960-3283		Code: STE 2-Jul		Client: Rescan					
Sample Date: 05 Jul-09 13:15		Material: Water Sample		Project:					
Receive Date: 07 Jul-09 09:00		Source: Rescan							
Sample Age: 35h		Station: STE 2							
Non-Linear Regression Options									
Model Function			X Transform	Y Transform	Weighting Function	PTBS Function			
2P Linear [Y=A+BX]			Log(X)	None	Normal [W=1]	Off [Y*=Y]			
Regression Summary									
Iters	Log LL	AICc	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(1%)	
1	-14.02	32.49		Yes	2.244	3.71	0.0751	Non-Significant Lack of Fit	
Point Estimates									
% Effect	Conc-%	95% LCL	95% UCL						
10	170.3	N/A	2.661E+14						
15	22230000	N/A	5.503E+32						
20	2.901E+12	N/A	N/A						
25	3.786E+17	N/A	N/A						
40	8.414E+32	N/A	N/A						
Regression Parameters									
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)		
A	3.133	0.158	2.81	3.456	19.83	0.0000	Significant Parameter		
B	-0.03322	0.05111	-0.1378	0.07131	-0.6499	0.5209	Non-Significant Parameter		
ANOVA Table									
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(1%)			
Model	0.3264329	0.3264329	1	0.3359	0.5667	Non-Significant			
Lack of Fit	10.40584	1.734306	6	2.244	0.0751	Non-Significant			
Pure Error	17.77437	0.7727988	23						
Residual	28.18021	0.9717314	29						
Residual Analysis									
Attribute	Method		Test Stat	Critical	P-Value	Decision(1%)			
Variances	Bartlett Equality of Variance		8.821	18.48	0.2658	Equal Variances			
Distribution	Shapiro-Wilk Normality		0.9858		0.9447	Normal Distribution			
Total Dry Weight-mg Summary									
Conc-%	Control Type	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	4	3.603	2.12	4.81	0.2095	1.128	31.32%	0.0%
1.5		4	2.79	2.3	3.06	0.06315	0.3401	12.19%	22.55%
3.05		4	2.465	2.14	2.89	0.05846	0.3148	12.77%	31.57%
6.1		4	2.497	0.58	3.65	0.247	1.33	53.26%	30.67%
12.1		4	2.955	2.05	3.54	0.1181	0.636	21.52%	17.97%
24.2		4	3.243	2.33	3.93	0.1296	0.6978	21.52%	9.99%
48.5		3	4.493	3.63	5.11	0.143	0.7702	17.14%	-24.73%
97		4	3.385	1.73	4.33	0.2182	1.175	34.72%	6.04%

**CETIS Analytical Report**

Report Date: 17 Aug-09 16:00 (p 2 of 2)  
 Link/Link Code: 04-3661-5443/09210-STE2

Lemna Growth Inhibition Test		Nautilus Environmental	
Analysis No: 11-3396-0145	Endpoint: Total Dry Weight-mg	CETIS Version: CETISv1.5.0	
Analyzed: 17 Aug-09 16:00	Analysis: Nonlinear Regression	Official Results: Yes	

Total Dry Weight-mg Detail					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	2.12	3.49	3.99	4.81
1.5		2.83	2.97	2.3	3.06
3.05		2.36	2.14	2.89	2.47
6.1		2.95	2.81	3.65	0.58
12.1		3.54	2.05	3.14	3.09
24.2		3.1	3.93	2.33	3.61
48.5		4.74	5.11	3.63	
97		3.38	4.33	4.1	1.73



*EC*  
 Aug 25/09

## Lemna minor Summary Sheet

Client: Pescan  
 Work Order No.: 09210

Start Date: July 7/09  
 Set up by: ART

**Sample Information:**

Sample ID: NTR 2  
 Sample Date: July 5/2009  
 Date Received: July 7/2009  
 Sample Volume: 9x 20L

**Test Organism Information:**

Culture Date: BCL 20 300609  
 Age of culture (Day 0): 7 days  
 >8X growth in APHA?: ~~X (33)~~ Yes, 33 fronds.  
BR

**KCI Reference Toxicant Results:**

Reference Toxicant ID: LM40  
 Date Initiated: June 24/2009

7-d No. of Fronds IC25 (95% CL): 2.8 (0.9-4.9) g/L KCI

7-d No. Fronds IC25 Reference Toxicant Mean  $\pm$  2 SD: 2.5  $\pm$  1.1 CV (%): 22%

	Number of Fronds	Dry Weight
Test Results: NOEC %(v/v)	97	97
LOEC %(v/v)	>97	>97
IC25 %(v/v) (95% CL)	>97	>97
IC50 %(v/v) (95% CL)	>97	>97

Reviewed by: 

Date reviewed: Aug 25/09



**Plant Growth Inhibition Toxicity Test  
Water Quality Measurements**

Green

Client: Rescan Setup by: ART  
 Sample ID: NTR2 Test Date: July 7/09  
 Work Order No.: 09210 Test Species: Lemna minor  
 Culture Source: UTCC #490  
 Test Culture Age: 7 days > 8X Growth? (Y/N): Y (33)  
 Light Intensity Range: 3600 - 3850 Date Measured: July 7, 2009

Day	0	1	2	3	4	5	6	7
Shelf Temp (°C)	24.4	24.9	24.3	25.4	24.6	24.6	24.9	25.1
Initials	ART	ART	JLT	JLT	JLT	JLT	BRU	ART

Sample Characteristics  
 Temperature (°C) 24.5 Aeration? 20 min  
 DO (mg/L) 9.6  
 pH 7.4  
 Conductivity (µS) AT 858 67 893

Concentration % (v/v)	Temperature (°C)		pH		Conductivity (µS)
	Day 0	Day 7	Day 0	Day 7	0 h
Control	24.6	26.5	8.2	<del>8.2</del> 8.6	AT <del>877</del> 877
1.5	24.6	26.2	8.2	<del>8.2</del> 8.5	880
3.05	24.7	26.2	8.2	<del>8.2</del> 8.6	881
6.1	24.7	25.9	8.1	8.6	883
12.1	24.4	25.8	7.9	8.5	882
24.2	24.3	26.1	7.9	8.5	883
48.5	24.3	26.2	7.8	8.4	887
97	24.5	26.0	7.6	8.6	893
Initials	ART	ART	ART	ART	ART

Thermometer: Big Jumbo Thermometer Cond. Meter: C-1 pH meter: pH-1

Sample Description: clear, colourless

Comments: \_\_\_\_\_

Reviewed: ART Date Reviewed: Aug. 25/09

Green

## Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts

Client: Rescan  
 Sample ID: NTR2  
 Work Order #: 09210

Start Date: July 7 / 09  
 Termination Date: July 14 / 09  
 Test set up by: ART

Concentration	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
Control 90 (✓)	A	6	54	77									
	B		94	87									
	C		60	81									
	D		59	86	✓								
1.5	A		73										
	B		80										
	C		68										
	D		61										
3.05	A		77										
	B		79										
	C		77										
	D		81	✓									
6.1	A		65										
	B		85										
	C		95										
	D		80										
12.1	A		57										
	B		54										
	C		66										
	D		91										
24.2	A		51										
	B		50										
	C		73										
	D	✓	76										

Comments:

Reviewed by: EADate Reviewed: Aug 25/09

Green

### Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts

Client: Rescan  
 Sample ID: NTR2  
 Work Order #: 09210

Start Date: July 7 / 09  
 Termination Date: July 14 / 09  
 Test set up by: ART

Concentration % (v/v)	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
48.5	A	6	70										[Handwritten initials]
	B		57										
	C		100										
	D		84										
97	A		91										[Handwritten initials]
	B		78										
	C		86										
	D	↓	84										
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												

Comments: \_\_\_\_\_

Reviewed by: [Signature]

Date Reviewed: Aug 25 / 09

## 7-d Lemna minor Weight Data Sheet

Client: Rescan  
 Sample ID: NTR2  
 Work Order #: 09210

Start Date: July 7 / 09  
 Termination Date: July 14 / 09

Concentration 90 (V/V)	Rep	Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
Control	A	1	1338.63	1344.00	EGG
	B	2	1337.68	1344.57	EGG
	C	3	1335.57	1341.81	EGG
	D	4	1324.32	1328.85	EGG
1.5	A	5	1334.13	1338.95	EGG
	B	6	1334.46	1339.67	EGG
	C	7	1333.22	1337.74	EGG
	D	8	1327.91	1331.77	EGG
3.05	A	9	1334.99	1340.75	EGG
	B	10	1335.56	1340.91	EGG
	C	11	1322.20	1326.43	EGG
	D	12	1337.63	1343.41	EGG
6.1	A	13	1337.75	1341.48	EGG
	B	14	1332.78	1338.00	EGG
	C	15	1333.92	1340.85	EGG
	D	16	1329.76	1335.73	EGG
12.1	A	17	1328.00	1331.05	EGG
	B	18	1330.51	1333.69	EGG
	C	19	1327.94	1332.89	EGG
	D	20	1329.30	1334.86	EGG
24.2	A	21	1328.77	1331.50	EGG
	B	22	1329.72	1332.25	EGG
	C	23	1328.70	1333.07	EGG
	D	24	1330.93	1336.76	EGG
48.5	A	25	1328.20	1332.30	EGG
	B	26	1339.18	1334.49 1342.50	EGG
	C	27	1328.12	1334.49	EGG
	D	28	1325.90	1331.52	EGG

Comments: \_\_\_\_\_

Reviewed by: EGG

Date Reviewed: Aug 25 / 09

### 7-d Lemna minor Weight Data Sheet

Client: Rescan  
 Sample ID: NTR2  
 Work Order #: 09210

Start Date: July 7 / 09  
 Termination Date: July 14 / 09

Concentration 97 (V/V)	Rep	Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
97	A	29	1331.440	1337.02	EBB
	B	30	1333.22	1338.03	EBB
	C	31	1330.81	1336.39	EBB
	D	32	1334.66	1340.40	EBB
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				

Comments: \_\_\_\_\_

Reviewed by: EW

Date Reviewed: Aug 25 / 09

**CETIS Analytical Report**

Report Date: 25 Aug-09 10:49 (p 1 of 2)

Link/Link Code: 19-5522-7579/09210-NTR2

<b>Lemna Growth Inhibition Test</b>	<b>Nautilus Environmental</b>
-------------------------------------	-------------------------------

<b>Analysis No:</b> 03-9533-0755	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 25 Aug-09 10:47	<b>Analysis:</b> Parametric-Control vs Treatments	<b>Official Results:</b> Yes

<b>Test Run No:</b> 19-6405-7540	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>
<b>Ending Date:</b>	<b>Species:</b> Lemna minor	
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture	

<b>Sample No:</b> 03-3164-7920	<b>Code:</b> NTR2-Jul	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09 15:15	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 33h	<b>Station:</b> NTR2	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	97	<i>97</i>	#Error	1.031	35.07%

Dunnnett's Multiple Comparison Test							
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		1.5	0.4854	2.482	24.29	0.7134	Non-Significant Effect
		3.05	-0.3321	2.482	24.29	0.9395	Non-Significant Effect
		6.1	-0.6132	2.482	24.29	0.9703	Non-Significant Effect
		12.1	0.8431	2.482	24.29	0.5543	Non-Significant Effect
		24.2	0.792	2.482	24.29	0.5781	Non-Significant Effect
		48.5	-0.2555	2.482	24.29	0.9277	Non-Significant Effect
		97	-0.9709	2.482	24.29	0.9893	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1174.875	167.8393	7	0.8764	0.5391	Non-Significant Effect
Error	4596	191.5	24			
Total	5770.875	359.3393	31			

ANOVA Assumptions					
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	14.19	18.48	0.0479	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9636		0.3438	Normal Distribution

Frond Count Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	69.25	64.02	74.48	50	81	2.547	13.48	19.46%	0.0%
1.5		4	64.5	61.39	67.61	55	74	1.516	8.021	12.44%	6.86%
3.05		4	72.5	71.76	73.24	71	75	0.3619	1.915	2.64%	-4.69%
6.1		4	75.25	70.4	80.1	59	89	2.362	12.5	16.61%	-8.66%
12.1		4	61	54.49	67.51	48	85	3.174	16.79	27.53%	11.91%
24.2		4	61.5	53.06	69.94	44	90	4.113	21.76	35.39%	11.19%
48.5		4	71.75	64.58	78.92	51	94	3.493	18.48	25.76%	-3.61%
97		4	78.75	76.66	80.84	72	85	1.016	5.377	6.83%	-13.72%

*CA Aug 25/09*

# CETIS Analytical Report

Report Date: 25 Aug-09 10:49 (p 2 of 2)

Link/Link Code: 19-5522-7579/09210-NTR2

## Lemna Growth Inhibition Test

Nautilus Environmental

Analysis No: 03-9533-0755  
 Analyzed: 25 Aug-09 10:47

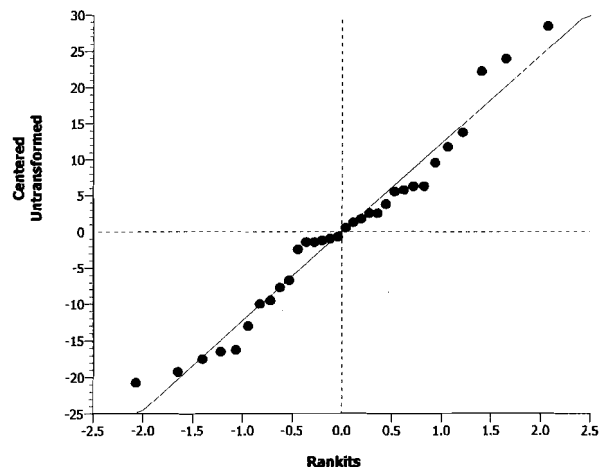
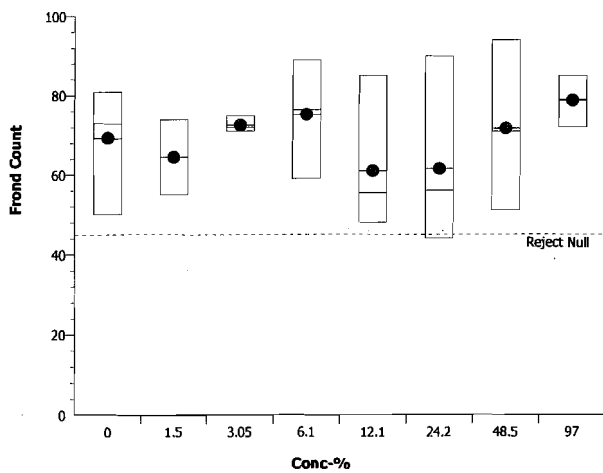
Endpoint: Frond Count  
 Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1.5.0  
 Official Results: Yes

### Frond Count Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	81	75	71	50
1.5		74	67	62	55
3.05		75	73	71	71
6.1		89	79	74	59
12.1		85	60	51	48
24.2		90	67	45	44
48.5		94	78	64	51
97		85	80	78	72

### Graphics



*Etc Aug 25/09*

**CETIS Analytical Report**

Report Date: 26 Aug-09 11:17 (p 1 of 2)  
 Link/Link Code: 19-5522-7579/09210-NTR2

<b>Lemna Growth Inhibition Test</b>	<b>Nautilus Environmental</b>
-------------------------------------	-------------------------------

<b>Analysis No:</b> 07-3881-0793	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 26 Aug-09 11:17	<b>Analysis:</b> Parametric-Two Sample	<b>Official Results:</b> Yes

<b>Test Run No:</b> 19-6405-7540	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>
<b>Ending Date:</b>	<b>Species:</b> Lemna minor	
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture	

<b>Sample No:</b> 03-3164-7920	<b>Code:</b> NTR2-Jul	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09 15:15	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 33h	<b>Station:</b> NTR2	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C < T	Not Run	97	<i>97</i>	#Error	1.031	N/A

Equal Variance t Two-Sample Test							
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		1.5	-0.6058	1.943	15.24	0.7166	Non-Significant Effect
		3.05	0.4776	1.943	13.22	0.3249	Non-Significant Effect
		6.1	0.6529	1.943	17.86	0.2690	Non-Significant Effect
		12.1	-0.7663	1.943	20.92	0.7637	Non-Significant Effect
		24.2	-0.6055	1.943	24.87	0.7165	Non-Significant Effect
		48.5	0.2186	1.943	22.22	0.4171	Non-Significant Effect
		97	1.31	1.943	14.1	0.1191	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1174.875	167.8393	7	0.8764	0.5391	Non-Significant Effect
Error	4596	191.5	24			
Total	5770.875	359.3393	31			

ANOVA Assumptions						
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)	
Variances	Bartlett Equality of Variance	14.19	18.48	0.0479	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.9636		0.3438	Normal Distribution	

Frond Count Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	69.25	64.02	74.48	50	81	2.547	13.48	19.46%	0.0%
1.5		4	64.5	61.39	67.61	55	74	1.516	8.021	12.44%	6.86%
3.05		4	72.5	71.76	73.24	71	75	0.3619	1.915	2.64%	-4.69%
6.1		4	75.25	70.4	80.1	59	89	2.362	12.5	16.61%	-8.66%
12.1		4	61	54.49	67.51	48	85	3.174	16.79	27.53%	11.91%
24.2		4	61.5	53.06	69.94	44	90	4.113	21.76	35.39%	11.19%
48.5		4	71.75	64.58	78.92	51	94	3.493	18.48	25.76%	-3.61%
97		4	78.75	76.66	80.84	72	85	1.016	5.377	6.83%	-13.72%

*EA Aug 26/09*



# CETIS Analytical Report

Report Date: 26 Aug-09 11:17 (p 2 of 2)  
 Link/Link Code: 19-5522-7579/09210-NTR2

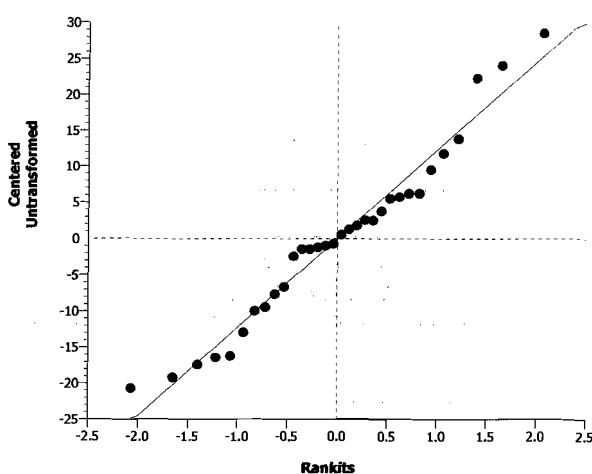
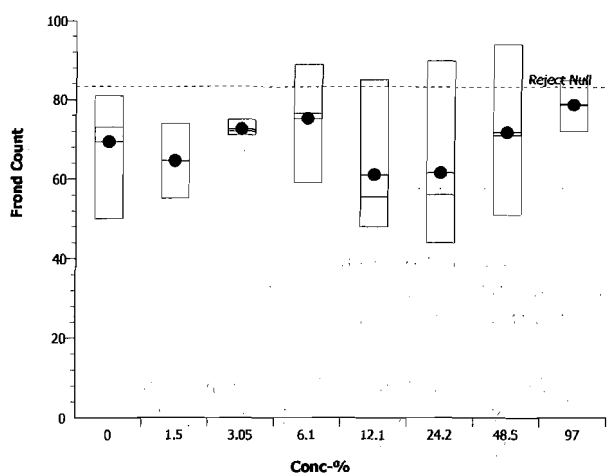
Lemna Growth Inhibition Test Nautilus Environmental

Analysis No: 07-3881-0793      Endpoint: Frond Count      CETIS Version: CETISv1.5.0  
 Analyzed: 26 Aug-09 11:17      Analysis: Parametric-Two Sample      Official Results: Yes

## Frond Count Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	81	75	71	50
1.5		74	67	62	55
3.05		75	73	71	71
6.1		89	79	74	59
12.1		85	60	51	48
24.2		90	67	45	44
48.5		94	78	64	51
97		85	80	78	72

## Graphics



*the Aug 26/09*

**CETIS Analytical Report**

Report Date: 25 Aug-09 10:49 (p 1 of 2)

Link/Link Code: 19-5522-7579/09210-NTR2

Lemna Growth Inhibition Test			Nautilus Environmental						
Analysis No:	21-3562-6343	Endpoint:	FronD Count	CETIS Version:	CETISv1.5.0				
Analyzed:	25 Aug-09 10:49	Analysis:	Nonlinear Regression	Official Results:	Yes				
Test Run No:	19-6405-7540	Test Type:	Lemna Growth	Dil Water:	Laboratory Water				
Start Date:	07 Jul-09	Protocol:	EC/EPS 1/RM/37	Brine:					
Ending Date:		Species:	Lemna minor						
Duration:	N/A	Source:	In-House Culture						
Sample No:	03-3164-7920	Code:	NTR2-Jul	Client:	Rescan				
Sample Date:	05 Jul-09 15:15	Material:	Water Sample	Project:					
Receive Date:	07 Jul-09 09:00	Source:	Rescan						
Sample Age:	33h	Station:	NTR2						
Non-Linear Regression Options									
Model Function	X Transform	Y Transform	Weighting Function	PTBS Function					
2P Linear [Y=A+BX]	Log(X)	None	Normal [W=1]	Off [Y*=Y]					
Regression Summary									
Iters	Log LL	AICc	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(1%)	
1	-99.11	202.6		Yes	1.019	3.667	0.4369	Non-Significant Lack of Fit	
Regression Parameters									
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)		
A	69.32	2.447	64.32	74.32	28.33	0.0000	Significant Parameter		
B	0.1192	0.8004	-1.515	1.754	0.1489	0.8826	Non-Significant Parameter		
ANOVA Table									
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(1%)			
Model	4.245688	4.245688	1	0.02209	0.8828	Non-Significant			
Lack of Fit	1170.629	195.1049	6	1.019	0.4369	Non-Significant			
Pure Error	4596	191.5	24						
Residual	5766.629	192.221	30						
Residual Analysis									
Attribute	Method	Test Stat	Critical	P-Value	Decision(1%)				
Variances	Bartlett Equality of Variance	14.19	18.48	0.0479	Equal Variances				
Distribution	Shapiro-Wilk Normality	0.963		0.3301	Normal Distribution				
FronD Count Summary									
Conc-%	Control Type	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	4	69.25	50	81	2.502	13.48	19.46%	0.0%
1.5		4	64.5	55	74	1.489	8.021	12.44%	6.86%
3.05		4	72.5	71	75	0.3556	1.915	2.64%	-4.69%
6.1		4	75.25	59	89	2.321	12.5	16.61%	-8.66%
12.1		4	61	48	85	3.118	16.79	27.53%	11.91%
24.2		4	61.5	44	90	4.041	21.76	35.39%	11.19%
48.5		4	71.75	51	94	3.432	18.48	25.76%	-3.61%
97		4	78.75	72	85	0.9986	5.377	6.83%	-13.72%

*ECU*  
Aug. 25/09

# CETIS Analytical Report

Report Date: 25 Aug-09 10:49 (p 2 of 2)  
 Link/Link Code: 19-5522-7579/09210-NTR2

## Lemna Growth Inhibition Test

Nautilus Environmental

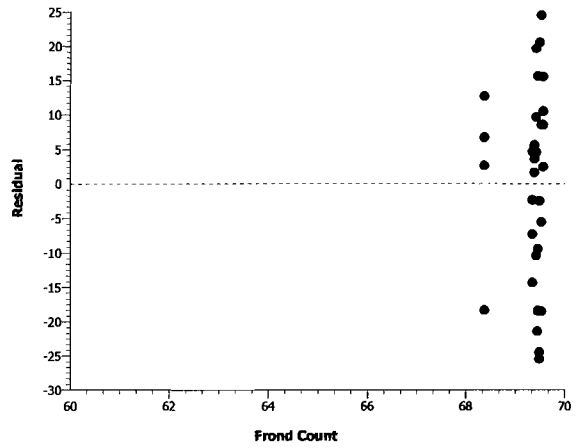
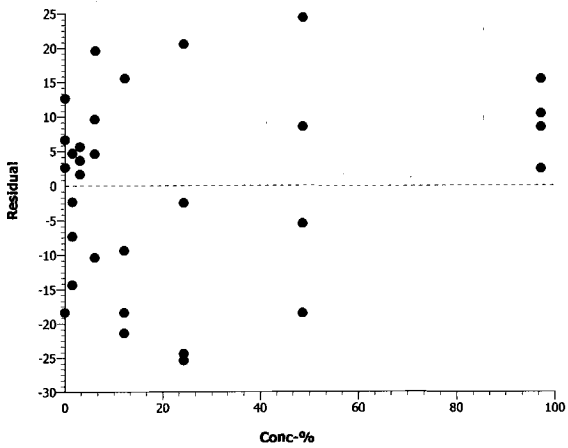
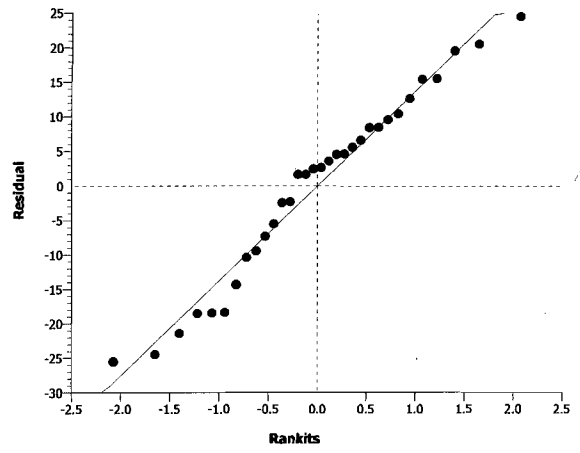
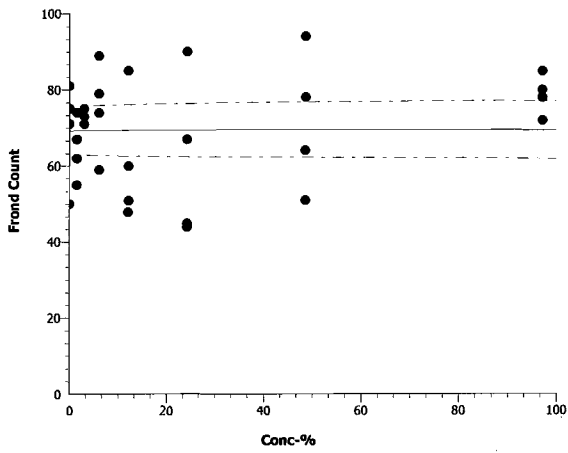
Analysis No: 21-3562-6343      Endpoint: Frond Count  
 Analyzed: 25 Aug-09 10:49      Analysis: Nonlinear Regression

CETIS Version: CETISv1.5.0  
 Official Results: Yes

### Frond Count Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	71	81	75	50
1.5		67	74	62	55
3.05		71	73	71	75
6.1		59	79	89	74
12.1		51	48	60	85
24.2		45	44	67	90
48.5		64	51	94	78
97		85	72	80	78

### Graphics



*Eu Aug 25/09*

**CETIS Analytical Report**

Report Date: 13 Aug-09 15:38 (p 1 of 2)

Link/Link Code: 19-5522-7579/09210-NTR2

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>
-------------------------------------	--	--	-------------------------------

<b>Analysis No:</b> 05-0587-2900	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 13 Aug-09 15:36	<b>Analysis:</b> Parametric-Control vs Treatments	<b>Official Results:</b> Yes

<b>Test Run No:</b> 19-6405-7540	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>
<b>Ending Date:</b>	<b>Species:</b> Lemna minor	
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture	

<b>Sample No:</b> 03-3164-7920	<b>Code:</b> NTR2-Jul	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09 15:15	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 33h	<b>Station:</b> NTR2	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	97	0.000000	#Error	1.031	33.43%

Dunnett's Multiple Comparison Test						
Control	vs Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control	1.5	1.489	2.482	1.925	0.2718	Non-Significant Effect
	3.05	0.6157	2.482	1.925	0.6580	Non-Significant Effect
	6.1	0.3805	2.482	1.925	0.7549	Non-Significant Effect
	12.1	2.221	2.482	1.925	0.0828	Non-Significant Effect
	24.2	2.441	2.482	1.925	0.0543	Non-Significant Effect
	48.5	1.167	2.482	1.925	0.4045	Non-Significant Effect
	97	0.4127	2.482	1.925	0.7425	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	13.57665	1.939522	7	1.613	0.1798	Non-Significant Effect
Error	28.86352	1.202647	24			
Total	42.44017	3.142169	31			

ANOVA Assumptions					
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	6.519	18.48	0.4806	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9698		0.4928	Normal Distribution

Total Dry Weight-mg Summary											
Conc.-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	5.758	5.359	6.156	4.53	6.89	0.1943	1.028	17.86%	0.0%
1.5		4	4.603	4.382	4.824	3.86	5.21	0.1077	0.57	12.38%	20.06%
3.05		4	5.28	4.998	5.562	4.23	5.78	0.1375	0.7275	13.78%	8.29%
6.1		4	5.462	4.939	5.986	3.73	6.93	0.2552	1.35	24.72%	5.12%
12.1		4	4.035	3.58	4.49	3.05	5.56	0.2216	1.173	29.06%	29.92%
24.2		4	3.865	3.265	4.465	2.53	5.83	0.2925	1.548	40.05%	32.87%
48.5		4	4.853	4.313	5.392	3.32	6.37	0.2629	1.391	28.67%	15.72%
97		4	5.438	5.273	5.602	4.81	5.74	0.08009	0.4238	7.79%	5.56%

*ER*  
Aug 25/09

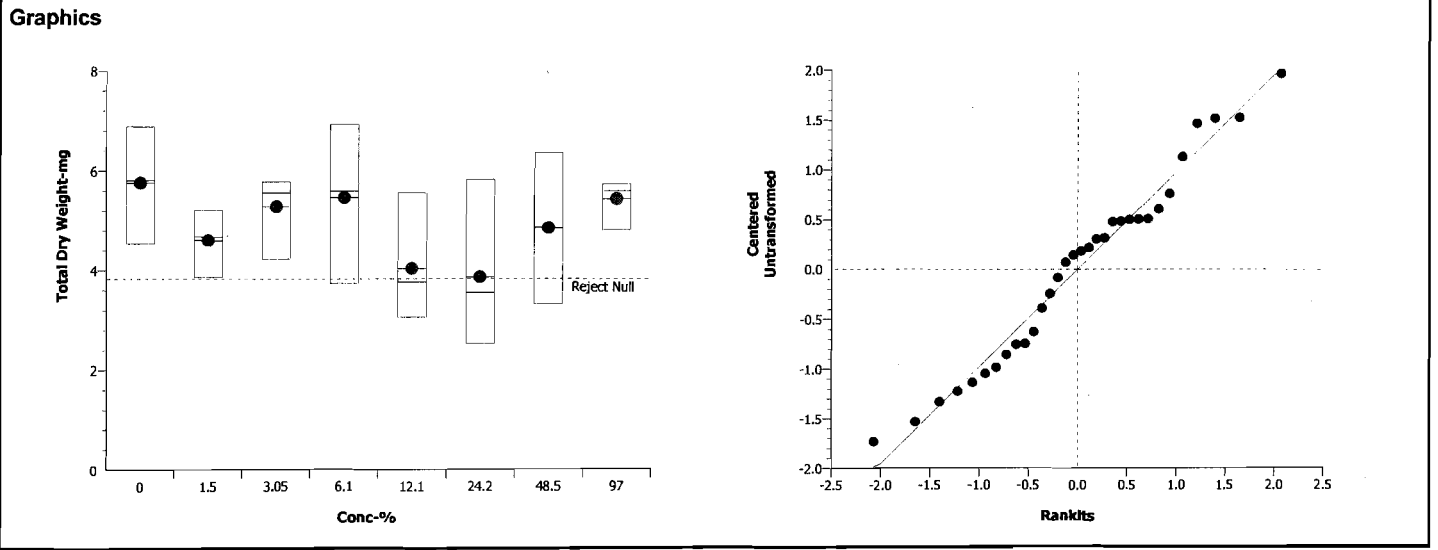
# CETIS Analytical Report

Report Date: 13 Aug-09 15:38 (p 2 of 2)

Link/Link Code: 19-5522-7579/09210-NTR2

Lemna Growth Inhibition Test			Nautilus Environmental		
Analysis No:	05-0587-2900	Endpoint:	Total Dry Weight-mg	CETIS Version:	CETISv1.5.0
Analyzed:	13 Aug-09 15:36	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Total Dry Weight-mg Detail					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	6.89	6.24	5.37	4.53
1.5		5.21	4.82	4.52	3.86
3.05		5.78	5.76	5.35	4.23
6.1		6.93	5.97	5.22	3.73
12.1		5.56	4.35	3.18	3.05
24.2		5.83	4.37	2.73	2.53
48.5		6.37	5.62	4.1	3.32
97		5.74	5.62	5.58	4.81



*EA*  
Aug 25/09

**CETIS Analytical Report**

Report Date: 17 Aug-09 09:47 (p 1 of 2)  
 Link/Link Code: 19-5522-7579/09210-NTR2

Lemna Growth Inhibition Test				Nautilus Environmental					
Analysis No: 03-9497-6237		Endpoint: Total Dry Weight-mg		CETIS Version: CETISv1.5.0					
Analyzed: 17 Aug-09 9:46		Analysis: Nonlinear Regression		Official Results: Yes					
Test Run No: 19-6405-7540		Test Type: Lemna Growth		Dil Water: Laboratory Water					
Start Date: 07 Jul-09		Protocol: EC/EPS 1/RM/37		Brine:					
Ending Date:		Species: Lemna minor							
Duration: N/A		Source: In-House Culture							
Sample No: 03-3164-7920		Code: NTR2-Jul		Client: Rescan					
Sample Date: 05 Jul-09 15:15		Material: Water Sample		Project:					
Receive Date: 07 Jul-09 09:00		Source: Rescan							
Sample Age: 33h		Station: NTR2							
Non-Linear Regression Options									
Model Function			X Transform	Y Transform	Weighting Function	PTBS Function			
2P Linear [Y=A+BX]			Log(X)	None	Normal [W=1]	Off [Y*=Y]			
Regression Summary									
Iters	Log LL	AICc	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(1%)	
1	-19.29	43	0.0432	Yes	1.446	3.667	0.2387	Non-Significant Lack of Fit	
Point Estimates									
% Effect	Conc-%	95% LCL	95% UCL						
SNEC	0.01772	6.763E-07	464.3						
10	0.003847	5.061E-08	292.4						
15	2.386	0.0003008	18930						
20	1480	0.003626	604000000						
25	917800	0.002749	3.064E+14						
40	2.19E+14	5.653E-05	8.484E+32						
50	8.424E+19	2.473E-06	N/A						
Regression Parameters									
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)		
A	4.906	0.1939	4.51	5.302	25.3	0.0000	Significant Parameter		
B	-0.1025	0.06343	-0.2321	0.027	-1.617	0.1164	Non-Significant Parameter		
ANOVA Table									
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(1%)			
Model	3.142761	3.142761	1	2.399	0.1319	Non-Significant			
Lack of Fit	10.43389	1.738982	6	1.446	0.2387	Non-Significant			
Pure Error	28.86352	1.202647	24						
Residual	39.29741	1.309914	30						
Residual Analysis									
Attribute	Method	Test Stat	Critical	P-Value	Decision(1%)				
Variances	Bartlett Equality of Variance	6.519	18.48	0.4806	Equal Variances				
Distribution	Shapiro-Wilk Normality	0.9594		0.2644	Normal Distribution				
Total Dry Weight-mg Summary									
			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	4	5.758	4.53	6.89	0.1909	1.028	17.86%	0.0%
1.5		4	4.603	3.86	5.21	0.1058	0.57	12.38%	20.06%
3.05		4	5.28	4.23	5.78	0.1351	0.7275	13.78%	8.29%
6.1		4	5.462	3.73	6.93	0.2508	1.35	24.72%	5.12%
12.1		4	4.035	3.05	5.56	0.2178	1.173	29.06%	29.92%
24.2		4	3.865	2.53	5.83	0.2874	1.548	40.05%	32.87%
48.5		4	4.853	3.32	6.37	0.2583	1.391	28.67%	15.72%
97		4	5.438	4.81	5.74	0.07869	0.4238	7.79%	5.56%

*See Aug 25/09*

# CETIS Analytical Report

Report Date: 17 Aug-09 09:47 (p 2 of 2)

Link/Link Code: 19-5522-7579/09210-NTR2

## Lemna Growth Inhibition Test

Nautilus Environmental

Analysis No: 03-9497-6237  
 Analyzed: 17 Aug-09 9:46

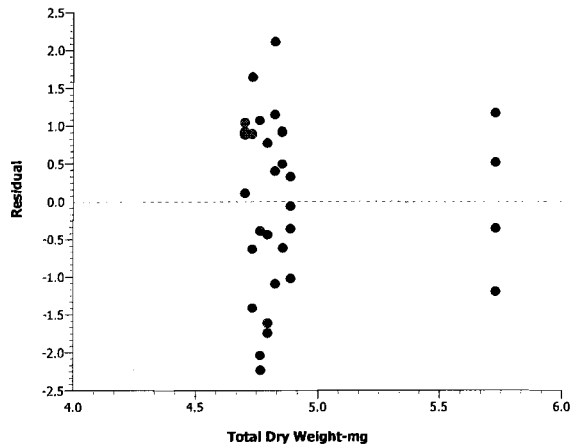
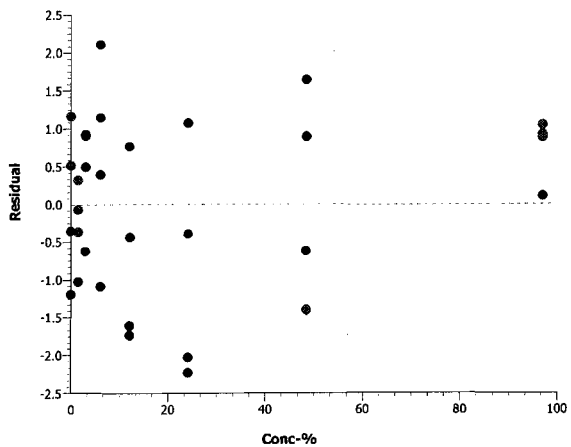
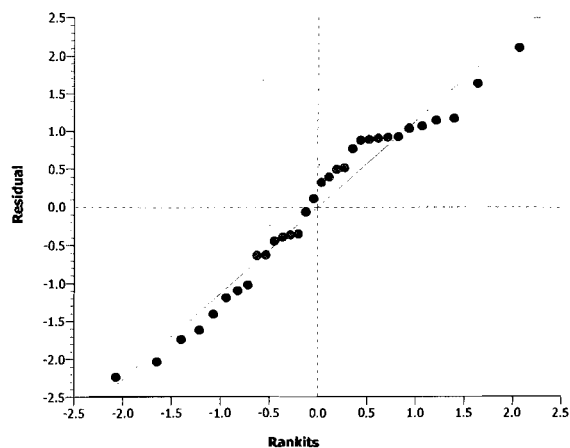
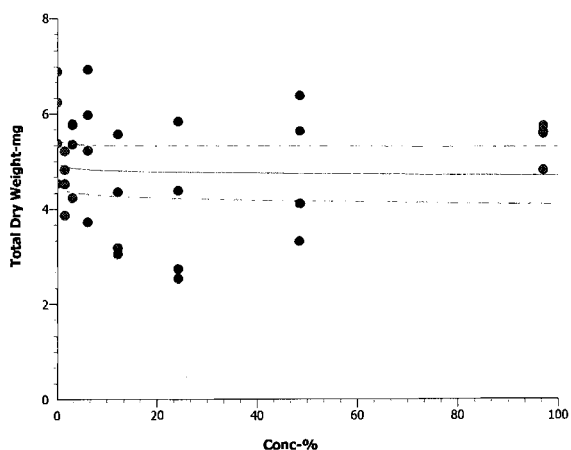
Endpoint: Total Dry Weight-mg  
 Analysis: Nonlinear Regression

CETIS Version: CETISv1.5.0  
 Official Results: Yes

### Total Dry Weight-mg Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	5.37	6.89	6.24	4.53
1.5		4.82	5.21	4.52	3.86
3.05		5.76	5.35	4.23	5.78
6.1		3.73	5.22	6.93	5.97
12.1		3.05	3.18	4.35	5.56
24.2		2.73	2.53	4.37	5.83
48.5		4.1	3.32	6.37	5.62
97		5.62	4.81	5.58	5.74

### Graphics



*CA Aug 25/09*

## Lemna minor Summary Sheet

Client: Rescan  
 Work Order No.: 09210

Start Date: July 7/09  
 Set up by: ART

**Sample Information:**

Sample ID: SCR  
 Sample Date: July 5/2009  
 Date Received: July 7/2009  
 Sample Volume: 9x20L

**Test Organism Information:**

Culture Date: 300609  
 Age of culture (Day 0): 7 days  
 >8X growth in APHA?: ~~only 4 (33)~~ <sup>BRL</sup> Yes, 33 fronds.


**KCI Reference Toxicant Results:**

Reference Toxicant ID: K440  
 Date Initiated: June 24/2009

7-d No. of Fronds IC25 (95% CL): 2.8 (0.9-4.9) g/L KCl

7-d No. Fronds IC25 Reference Toxicant Mean ± 2 SD: 2.5 ± 1.1 CV (%): 22%

	Number of Fronds	Dry Weight
Test Results: NOEC %(v/v)	97	97
LOEC %(v/v)	>97	>97
IC25 %(v/v) (95% CL)	<sup>21.5</sup> <del>(59.8-6)</del> <sup>BRL</sup> <del>27.2 (8.5-78.2)</del>	<sup>BRL</sup> <del>8.5 (1.4-29.6)</del>
IC50 %(v/v) (95% CL)	>97	<del>95.2 (15.8-97)</del> <sup>BRL</sup> <u>98 (17-353)</u>

Reviewed by: 

Date reviewed: Aug. 26/09



Black

### Plant Growth Inhibition Toxicity Test Water Quality Measurements

Client: Rescan Setup by: ART  
 Sample ID: SCR Test Date: July 7/09  
 Work Order No.: 09 210 Test Species: Lemna minor  
 Culture Source: UTCC #490  
 Test Culture Age: 7 days > 8X Growth? (Y/N): Y (33)  
 Light Intensity Range: 3600 - 3850 Date Measured: July 7/09

Day	0	1	2	3	4	5	6	7
Shelf Temp (°C)	24.4	24.9	24.3	24.4	24.6	24.6	24.9	25.1
Initials	ART	ART	ART	JLT	JLT	JLT	BL	407

Sample Characteristics  
 Temperature (°C) 24.7  
 DO (mg/L) 9.9  
 pH 8.0  
 Conductivity (µS) 113

Aeration? 20 min  
24.7  
9.6  
7.7  
932

Concentration % (V/V)	Temperature (°C)		pH		Conductivity (µS) 0 h
	Day 0	Day 7	Day 0	Day 7	
Control	24.7	<del>24.7</del> 24.4	8.2	8.1	887
1.5	24.5	<del>24.5</del> 24.6	8.2	8.0	889
3.05	24.3	<del>24.3</del> 26.5	8.2	8.2	894
6.1	24.4	26.5	8.2	8.3	907
12.1	24.3	26.4	8.2	8.2	915
24.2	24.6	26.6	8.1	7.9	921
48.5	24.5	26.4	8.0	8.3	926
97	24.7	26.5	7.9	8.4	932
Initials	ART	ART	ART	ART	ART

Thermometer: Big Jumbo Thermometer Cond. Meter: C-1 pH meter: pH-1

Sample Description: slight amber with particulates

Comments: \_\_\_\_\_

Reviewed: EW Date Reviewed: Aug 25/09

SCR  
Black

Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts

Client: Rescan  
 Sample ID: SCR  
 Work Order #: 09210

Start Date: July 7 / 09  
 Termination Date: July 14 / 09  
 Test set up by: ART

Concentration <i>90 (v/v)</i>	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
Control	A	<i>6</i>	<i>51</i>										<i>ART</i>
	B		<i>91</i>										<i>ART</i>
	C		<i>60</i>										<i>ART</i>
	D		<i>59</i>										<i>ART</i>
1.5	A		<i>31</i>										<i>ART</i>
	B		<i>71</i>										<i>ART</i>
	C		<i>59</i>										<i>ART</i>
	D		<i>55</i>										<i>ART</i>
3.05	A		<i>69</i>										<i>ART</i>
	B		<i>82</i>										<i>ART</i>
	C		<i>52</i>										<i>ART</i>
	D		<i>49</i>										<i>ART</i>
6.1	A		<i>78</i>										<i>ART</i>
	B		<i>43</i>										<i>ART</i>
	C		<i>68</i>										<i>ART</i>
	D		<i>67</i>										<i>ART</i>
12.1	A		<i>38</i>										<i>ART</i>
	B		<i>46</i>										<i>ART</i>
	C		<i>53</i>										<i>ART</i>
	D		<i>46</i>										<i>ART</i>
24.2	A		<i>50</i>		✓								<i>ART</i>
	B		<i>47</i>										<i>ART</i>
	C		<i>54</i>										<i>ART</i>
	D	✓	<i>58</i>										<i>ART</i>

Comments: \_\_\_\_\_

Reviewed by: *EW*

Date Reviewed: *Aug 25 / 09*

LT  
\$ - Black

Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts

Client: Rescan  
 Sample ID: SCR  
 Work Order #: 09210

Start Date: July 7 / 09  
 Termination Date: July 14 / 09  
 Test set up by: ART

Concentration % (V/V)	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
48.5	A	6	34										ART
	B		42										ART
	C		41										ART
	D		39										ART
97	A		52										ART
	B		45										ART
	C		51										ART
	D	✓	41										ART
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												

Comments: LT

Reviewed by: EW

Date Reviewed: Aug 25/09

## 7-d Lemna minor Weight Data Sheet

Client: Rescan  
 Sample ID: SCR  
 Work Order #: 09210

Start Date: July 7/09  
 Termination Date: July 14/09

Concentration % (V/V)	Rep	Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
Control	A	1	1338.89	1342.98	ELS
	B	2	1333.01	1339.71	ELS
	C	3	1327.54	1331.64	ELS
	D	4	1329.58	1333.24	ELS
1.5	A	5	1327.8.01	1329.34	ELS
	B	6	1336.19	1341.92	ELS
	C	7	1325.42	1329.86	ELS
	D	8	1341.11	1344.97	ELS
3.05	A	9	1331.21	1335.29	ELS
	B	10	1337.72	1343.16	ELS
	C	11	1336.25	1338.97	ELS
	D	12	1334.47	1337.80	ELS
6.1	A	13	1338.14	1343.73	ELS
	B	14	1336.60	1338.75	ELS
	C	15	1337.30	1342.09	ELS
	D	16	1329.39	1334.41	ELS
12.1	A	17	1333.875	1336.21	ELS
	B	18	1331.05	1333.49	ELS
	C	19	1344.07	1347.34	ELS
	D	20	1338.17	1341.14	ELS
24.2	A	21	1317.57	1321.43	ELS
	B	22	1326.01	1328.70	ELS
	C	23	1327.79	1331.17	ELS
	D	24	1316.47	1320.19	ELS
48.5	A	25	1366.30	1308.88	ELS
	B	26	1333.34	1335.64	ELS
	C	27	1319.08	1321.21	ELS
	D	28	1306.56	1308.70	ELS

Comments:

---



---

Reviewed by: ELS

Date Reviewed: Aug 25/09

Black

### 7-d Lemna minor Weight Data Sheet

Client: Rescan  
Sample ID: SCR  
Work Order #: 09 210

Start Date: July 7/09  
Termination Date: July 14/09

Concentration % (V/V)	Rep	Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
97	A	29	1327.85	1330.92	gjs
	B	30	1317.99	1370.39	gjs
	C	31	1330.59	1334.35	gjs
	D	32	1311.78	1314.18	gjs
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				

Comments: \_\_\_\_\_

Reviewed by: KA

Date Reviewed: Aug 25/09

**CETIS Analytical Report**

Report Date: 25 Aug-09 11:10 (p 1 of 2)

Link/Link Code: 00-7170-8512/09210-SCR

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 06-7582-8182	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 25 Aug-09 11:09	<b>Analysis:</b> Parametric-Control vs Treatments	<b>Official Results:</b> Yes			
<b>Test Run No:</b> 13-2746-6947	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water			
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>			
<b>Ending Date:</b>	<b>Species:</b> Lemna minor				
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture				
<b>Sample No:</b> 15-6314-2133	<b>Code:</b> SCR-Jul	<b>Client:</b> Rescan			
<b>Sample Date:</b> 05 Jul-09 11:15	<b>Material:</b> Water Sample	<b>Project:</b>			
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan				
<b>Sample Age:</b> 37h	<b>Station:</b> SCR				

<b>Data Transform</b>	<b>Zeta</b>	<b>Alt Hyp</b>	<b>Monte Carlo</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>TU</b>	<b>PMSD</b>
Untransformed		C > T	Not Run	97	5.0 > 97	#Error	1.031	35.53%

<b>Dunnett's Multiple Comparison Test</b>						
Control	vs Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control	1.5	1.326	2.482	21.05	0.3358	Non-Significant Effect
	3.05	0.2653	2.482	21.05	0.7965	Non-Significant Effect
	6.1	0.1474	2.482	21.05	0.8345	Non-Significant Effect
	12.1	2.299	2.482	21.05	0.0715	Non-Significant Effect
	24.2	1.533	2.482	21.05	0.2561	Non-Significant Effect
	48.5*	3.095	2.482	21.05	0.0135	Significant Effect
	97	2.122	2.482	21.05	0.0994	Non-Significant Effect

<b>ANOVA Table</b>						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2595.875	370.8393	7	2.578	0.0393	Significant Effect
Error	3453	143.875	24			
Total	6048.875	514.7143	31			

<b>ANOVA Assumptions</b>						
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)	
Variances	Bartlett Equality of Variance	13.1	18.48	0.0697	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.9704		0.5108	Normal Distribution	

<b>Frond Count Summary</b>											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	59.25	52.41	66.09	45	85	3.332	17.63	29.76%	0.0%
1.5		4	48	41.5	54.5	25	65	3.17	16.77	34.94%	18.99%
3.05		4	57	51.02	62.98	43	76	2.915	15.43	27.07%	3.8%
6.1		4	58	52.24	63.76	37	72	2.807	14.85	25.61%	2.11%
12.1		4	39.75	37.37	42.13	32	47	1.159	6.131	15.42%	32.91%
24.2		4	46.25	44.39	48.11	41	52	0.9047	4.787	10.35%	21.94%
48.5		4	33	31.62	34.38	28	36	0.6726	3.559	10.78%	44.3%
97		4	41.25	39.24	43.26	35	46	0.9805	5.188	12.58%	30.38%

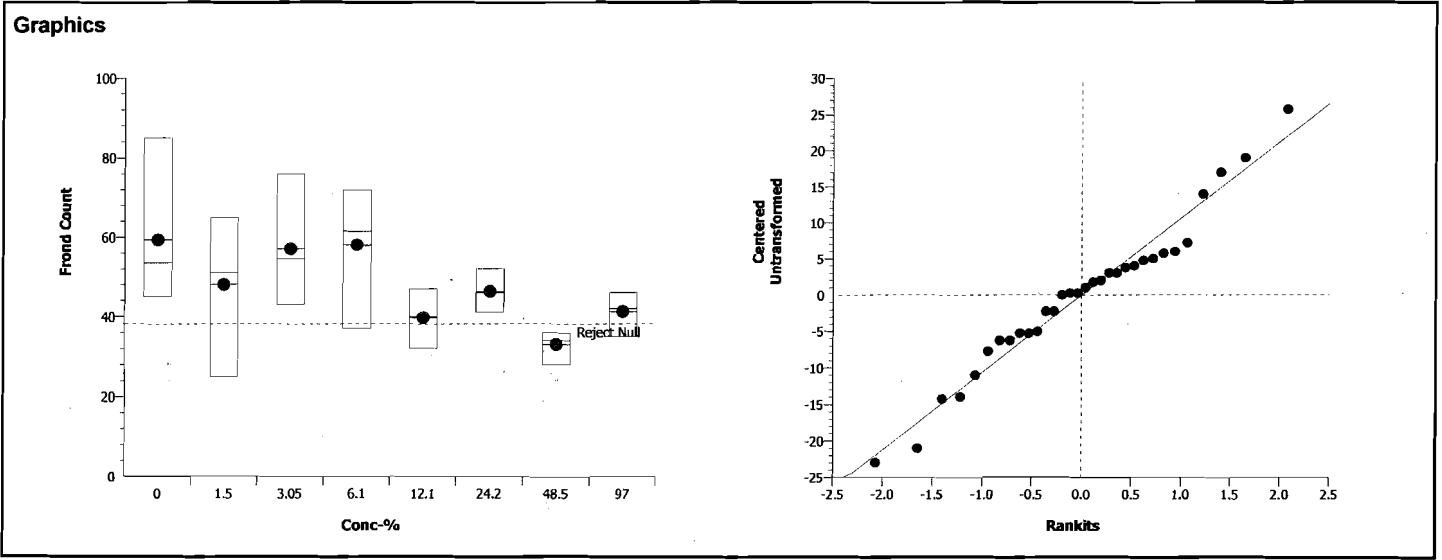
*CA*  
Aug 25/09

# CETIS Analytical Report

Report Date: 25 Aug-09 11:10 (p 2 of 2)  
 Link/Link Code: 00-7170-8512/09210-SCR

Lemna Growth Inhibition Test		Nautilus Environmental	
Analysis No: 06-7582-8182	Endpoint: Frond Count	CETIS Version: CETISv1.5.0	
Analyzed: 25 Aug-09 11:09	Analysis: Parametric-Control vs Treatments	Official Results: Yes	

Frond Count Detail					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	85	54	53	45
1.5		65	53	49	25
3.05		76	63	46	43
6.1		72	62	61	37
12.1		47	40	40	32
24.2		52	48	44	41
48.5		36	35	33	28
97		46	45	39	35



*EC*  
 Aug 25/09

**CETIS Analytical Report**

Report Date: 25 Aug-09 11:10 (p 1 of 2)  
 Link/Link Code: 00-7170-8512/09210-SCR

Lemna Growth Inhibition Test				Nautilus Environmental				
Analysis No:	20-6886-5030	Endpoint:	FronD Count	CETIS Version:	CETISv1.5.0			
Analyzed:	25 Aug-09 11:10	Analysis:	Nonlinear Regression	Official Results:	Yes			
Test Run No:	13-2746-6947	Test Type:	Lemna Growth	Dil Water:	Laboratory Water			
Start Date:	07 Jul-09	Protocol:	EC/EPS 1/RM/37	Brine:				
Ending Date:		Species:	Lemna minor					
Duration:	N/A	Source:	In-House Culture					
Sample No:	15-6314-2133	Code:	SCR-Jul	Client:	Rescan			
Sample Date:	05 Jul-09 11:15	Material:	Water Sample	Project:				
Receive Date:	07 Jul-09 09:00	Source:	Rescan					
Sample Age:	37h	Station:	SCR					
Non-Linear Regression Options								
Model Function	X Transform	Y Transform	Weighting Function	PTBS Function				
3P Log-Logistic EV [Y=A/(1+(X/D)^C)]	None	None	Normal [W=1]	Off [Y*=Y]				
Regression Summary								
Iters	Log LL	AICc	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(1%)
8	-95.17	197.2	0.2029	Yes	1.47	3.895	0.2365	Non-Significant Lack of Fit
Point Estimates								
% Effect	Conc-%	95% LCL	95% UCL					
SNEC	6.89	0.7082	26.85					
10	1.646	N/A	12.36					
15	4.854	0.2621	21.96					
20	10.96	1.977	35.61					
25	21.47	5.938	58.59					
40	108.6	16.41	546.5					
50	280.2	18.09	4339					
Regression Parameters								
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)	
A	59.4	5.844	47.44	71.35	10.16	0.0000	Significant Parameter	
C	0.4277	0.2419	-0.06699	0.9224	1.768	0.0875	Non-Significant Parameter	
D	280.2	325.3	-385.1	945.4	0.8613	0.3961	Non-Significant Parameter	
ANOVA Table								
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(1%)		
Model	1538.565	769.2826	2	4.946	0.0142	Non-Significant		
Lack of Fit	1057.31	211.462	5	1.47	0.2365	Non-Significant		
Pure Error	3453	143.875	24					
Residual	4510.31	155.5279	29					
Residual Analysis								
Attribute	Method	Test Stat	Critical	P-Value	Decision(1%)			
Variances	Bartlett Equality of Variance	13.1	18.48	0.0697	Equal Variances			
Distribution	Shapiro-Wilk Normality	0.9631		0.3333	Normal Distribution			

*EC Aug 25/09*



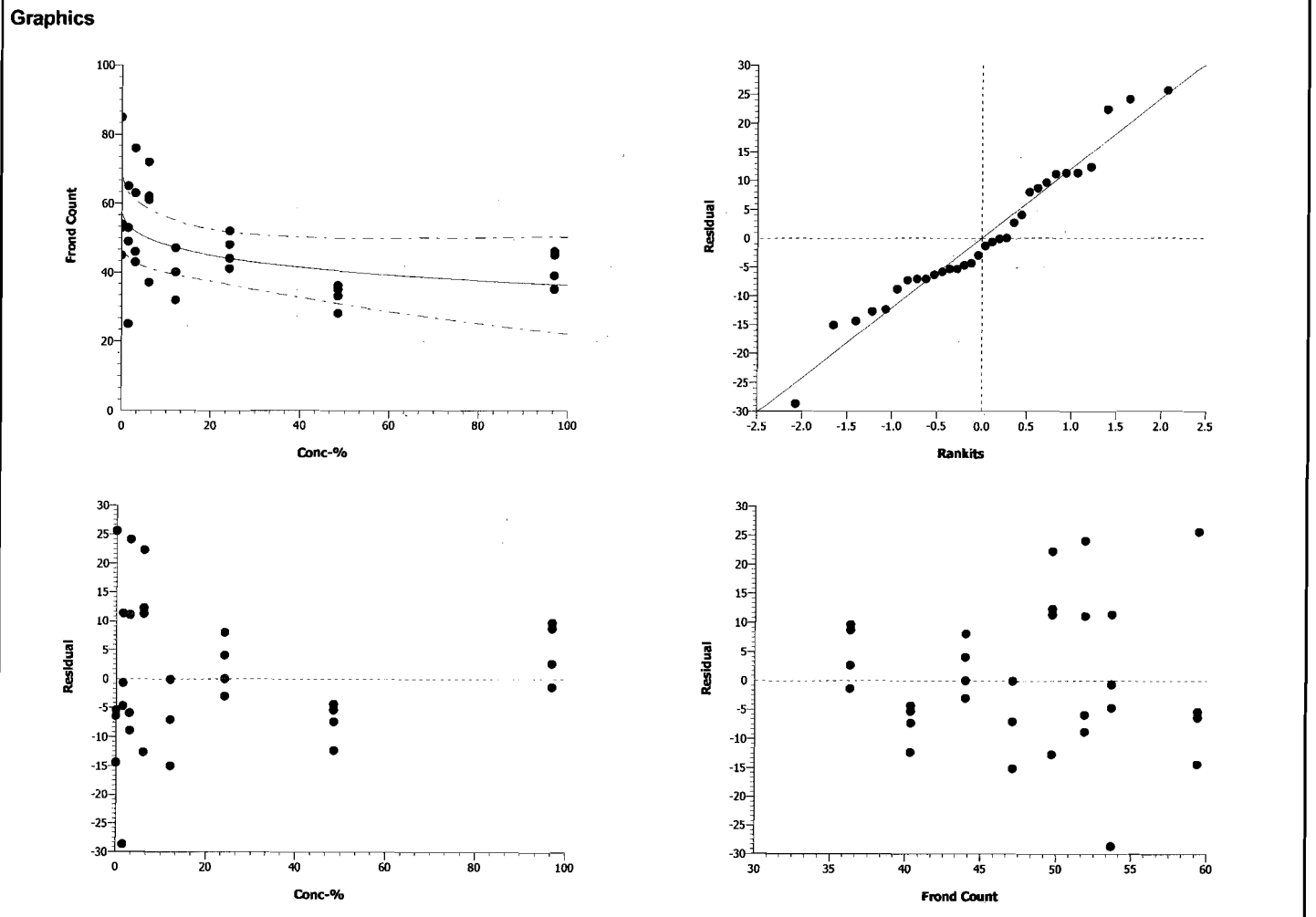
# CETIS Analytical Report

Report Date: 25 Aug-09 11:10 (p 2 of 2)  
 Link/Link Code: 00-7170-8512/09210-SCR

Lemna Growth Inhibition Test			Nautilus Environmental		
Analysis No:	20-6886-5030	Endpoint:	FronD Count	CETIS Version:	CETISv1.5.0
Analyzed:	25 Aug-09 11:10	Analysis:	Nonlinear Regression	Official Results:	Yes

FronD Count Summary			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	4	59.25	45	85	3.274	17.63	29.76%	0.0%
1.5		4	48	25	65	3.115	16.77	34.94%	18.99%
3.05		4	57	43	76	2.865	15.43	27.07%	3.8%
6.1		4	58	37	72	2.758	14.85	25.61%	2.11%
12.1		4	39.75	32	47	1.138	6.131	15.42%	32.91%
24.2		4	46.25	41	52	0.8889	4.787	10.35%	21.94%
48.5		4	33	28	36	0.6609	3.559	10.78%	44.3%
97		4	41.25	35	46	0.9634	5.188	12.58%	30.38%

FronD Count Detail					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	45	85	54	53
1.5		25	65	53	49
3.05		63	76	46	43
6.1		72	37	62	61
12.1		32	40	47	40
24.2		44	41	48	52
48.5		28	36	35	33
97		46	39	45	35



*Ea Aug 25/09*

**CETIS Analytical Report**

Report Date: 14 Aug-09 11:35 (p 1 of 2)  
 Link/Link Code: 00-7170-8512/09210-SCR

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>
-------------------------------------	--	--	-------------------------------

<b>Analysis No:</b> 11-6048-2213	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 14 Aug-09 11:35	<b>Analysis:</b> Parametric-Control vs Treatments	<b>Official Results:</b> Yes

<b>Test Run No:</b> 13-2746-6947	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>
<b>Ending Date:</b>	<b>Species:</b> Lemna minor	
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture	

<b>Sample No:</b> 15-6314-2133	<b>Code:</b> SCR-Jul	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09 11:15	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 37h	<b>Station:</b> SCR	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	97	<i>97</i>	#Error	1.031	42.28%

Dunnett's Multiple Comparison Test						
Control	vs Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control	1.5	1.01	2.482	1.961	0.4764	Non-Significant Effect
	3.05	0.943	2.482	1.961	0.5075	Non-Significant Effect
	6.1	0.3165	2.482	1.961	0.7785	Non-Significant Effect
	12.1	2.377	2.482	1.961	0.0616	Non-Significant Effect
	24.2	1.551	2.482	1.961	0.2497	Non-Significant Effect
	48.5*	2.975	2.482	1.961	0.0176	Significant Effect
	97	2.19	2.482	1.961	0.0878	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	18.90298	2.700427	7	2.164	0.0751	Non-Significant Effect
Error	29.95177	1.24799	24			
Total	48.85476	3.948417	31			

ANOVA Assumptions					
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	15.11	18.48	0.0346	Equal Variances
Distribution	Shapiro-Wilk Normality	0.958		0.2415	Normal Distribution

Total Dry Weight-mg Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	4	4.637	4.098	5.177	3.66	6.7	0.2627	1.39	29.98%	0.0%
1.5		4	3.84	3.124	4.556	1.33	5.73	0.349	1.847	48.1%	17.2%
3.05		4	3.893	3.438	4.347	2.72	5.44	0.2215	1.172	30.11%	16.06%
6.1		4	4.387	3.795	4.98	2.15	5.59	0.289	1.529	34.85%	5.39%
12.1		4	2.76	2.591	2.929	2.36	3.27	0.08213	0.4346	15.75%	40.49%
24.2		4	3.413	3.21	3.615	2.69	3.86	0.09868	0.5222	15.3%	26.41%
48.5		4	2.287	2.206	2.369	2.13	2.58	0.03968	0.21	9.18%	50.67%
97		4	2.908	2.655	3.16	2.4	3.76	0.1229	0.6502	22.36%	37.3%

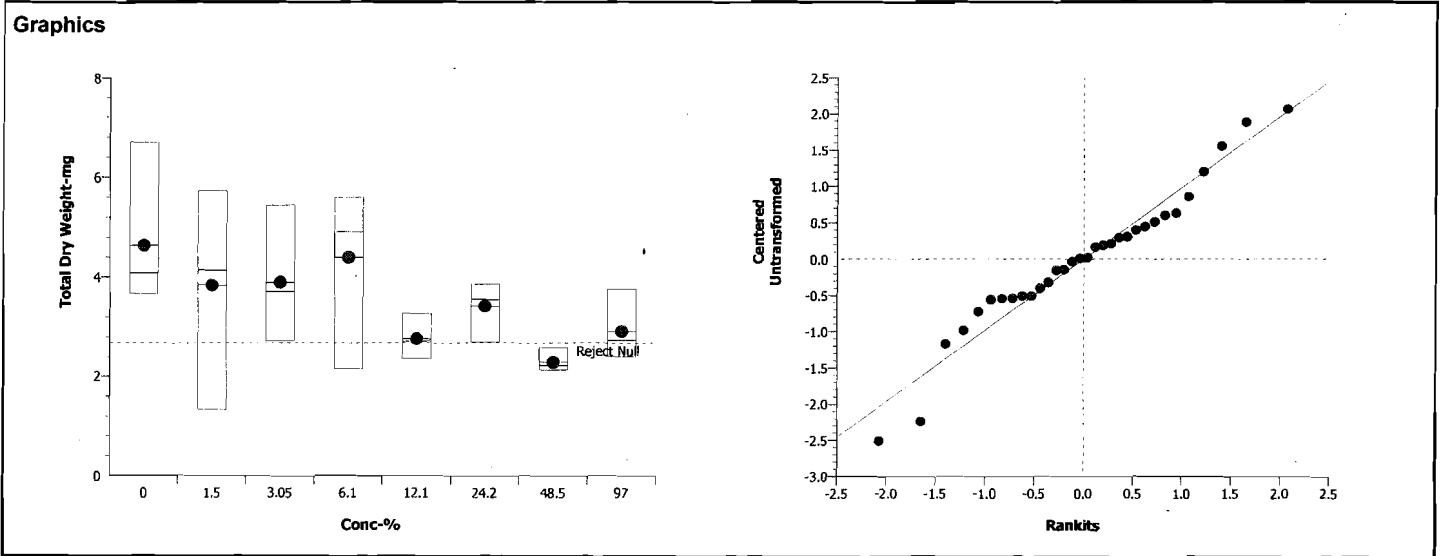
*EW*  
 Aug 25/09

**CETIS Analytical Report**

Report Date: 14 Aug-09 11:35 (p 2 of 2)  
 Link/Link Code: 00-7170-8512/09210-SCR

Lemna Growth Inhibition Test		Nautilus Environmental	
Analysis No: 11-6048-2213	Endpoint: Total Dry Weight-mg	CETIS Version: CETISv1.5.0	
Analyzed: 14 Aug-09 11:35	Analysis: Parametric-Control vs Treatments	Official Results: Yes	

Total Dry Weight-mg Detail					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Contr	6.7	4.1	4.09	3.66
1.5		5.73	4.44	3.86	1.33
3.05		5.44	4.08	3.33	2.72
6.1		5.59	5.02	4.79	2.15
12.1		3.27	2.97	2.44	2.36
24.2		3.86	3.72	3.38	2.69
48.5		2.58	2.3	2.14	2.13
97		3.76	3.07	2.4	2.4



*Handwritten signature*  
 Aug 25/09

**CETIS Analytical Report**

Report Date: 14 Aug-09 11:35 (p 1 of 2)  
 Link/Link Code: 00-7170-8512/09210-SCR

<b>Lemna Growth Inhibition Test</b>			<b>Nautilus Environmental</b>
<b>Analysis No:</b> 17-4328-7809	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.5.0	
<b>Analyzed:</b> 14 Aug-09 11:35	<b>Analysis:</b> Nonlinear Regression	<b>Official Results:</b> Yes	
<b>Test Run No:</b> 13-2746-6947	<b>Test Type:</b> Lemna Growth	<b>Dil Water:</b> Laboratory Water	
<b>Start Date:</b> 07 Jul-09	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Brine:</b>	
<b>Ending Date:</b>	<b>Species:</b> Lemna minor		
<b>Duration:</b> N/A	<b>Source:</b> In-House Culture		
<b>Sample No:</b> 15-6314-2133	<b>Code:</b> SCR-Jul	<b>Client:</b> Rescan	
<b>Sample Date:</b> 05 Jul-09 11:15	<b>Material:</b> Water Sample	<b>Project:</b>	
<b>Receive Date:</b> 07 Jul-09 09:00	<b>Source:</b> Rescan		
<b>Sample Age:</b> 37h	<b>Station:</b> SCR		

<b>Non-Linear Regression Options</b>				
<b>Model Function</b>	<b>X Transform</b>	<b>Y Transform</b>	<b>Weighting Function</b>	<b>PTBS Function</b>
3P Log-Logistic EV [Y=A/(1+(X/D)^C)]	None	None	Normal [W=1]	Off [Y*=Y]

<b>Regression Summary</b>								
<b>Iters</b>	<b>Log LL</b>	<b>AICc</b>	<b>Adj R2</b>	<b>Optimize</b>	<b>F Stat</b>	<b>Critical</b>	<b>P-Value</b>	<b>Decision(1%)</b>
7	-17.93	42.74	0.2102	Yes	0.985	3.895	0.4473	Non-Significant Lack of Fit

<b>Point Estimates</b>			
<b>% Effect</b>	<b>Conc-%</b>	<b>95% LCL</b>	<b>95% UCL</b>
SNEC	5.314	0.4397	24.79
10	0.6366	N/A	8.847
15	2.013	0.005789	15.01
20	4.789	0.3315	23.44
25	9.798	1.712	35.3
40	54.98	11.02	227.1
50	150.8	14.15	1607

<b>Regression Parameters</b>							
<b>Parameter</b>	<b>Estimate</b>	<b>Std Error</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>t Stat</b>	<b>P-Value</b>	<b>Decision(5%)</b>
A	4.654	0.55	3.529	5.779	8.462	0.0000	Significant Parameter
C	0.4019	0.2269	-0.06226	0.866	1.771	0.0871	Non-Significant Parameter
D	150.8	171.6	-200.2	501.8	0.8786	0.3868	Non-Significant Parameter

<b>ANOVA Table</b>						
<b>Source</b>	<b>Sum Squares</b>	<b>Mean Square</b>	<b>DF</b>	<b>F Stat</b>	<b>P-Value</b>	<b>Decision(1%)</b>
Model	12.75683	6.378417	2	5.124	0.0124	Non-Significant
Lack of Fit	6.14615	1.22923	5	0.985	0.4473	Non-Significant
Pure Error	29.95177	1.24799	24			
Residual	36.09792	1.244756	29			

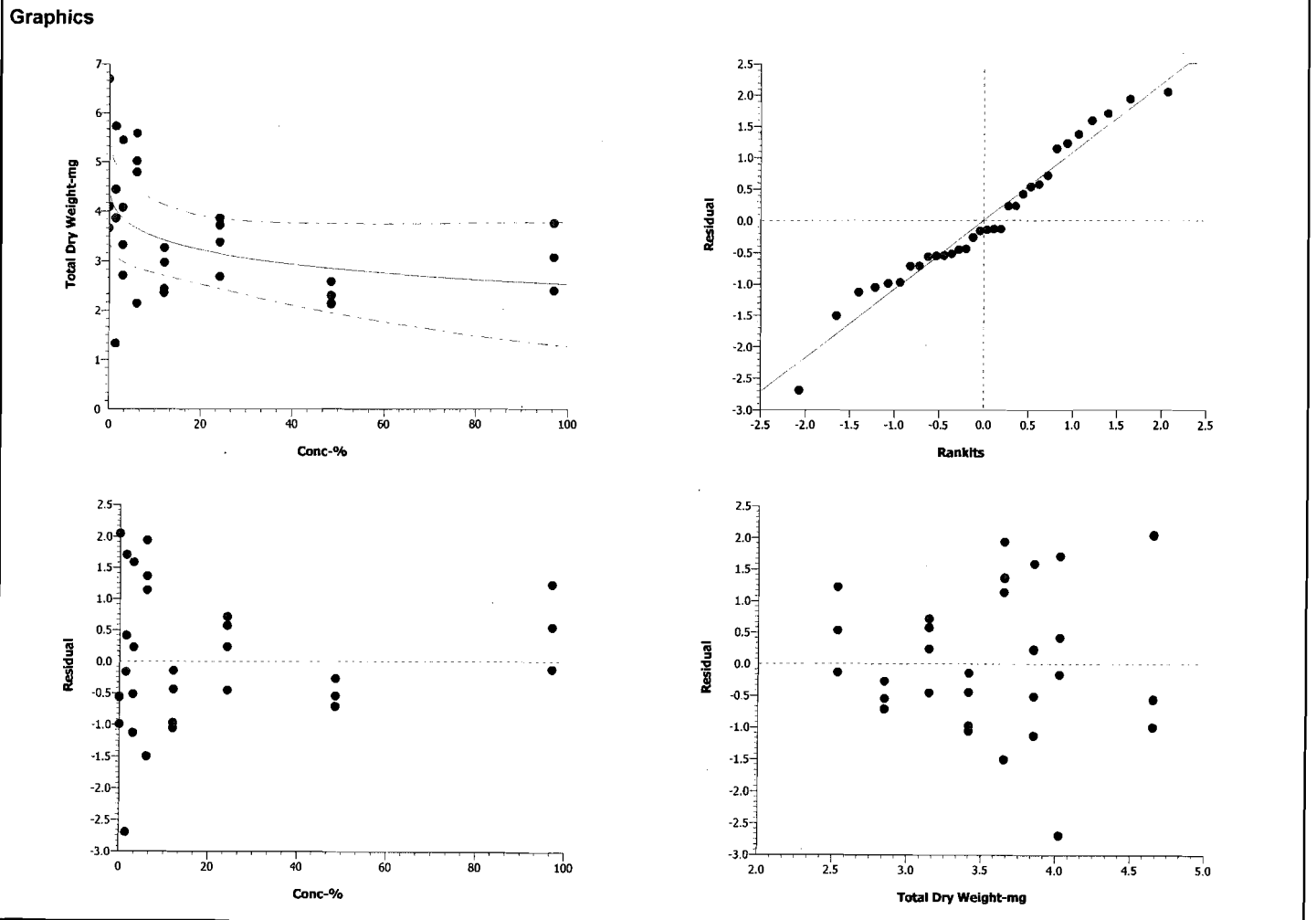
<b>Residual Analysis</b>					
<b>Attribute</b>	<b>Method</b>	<b>Test Stat</b>	<b>Critical</b>	<b>P-Value</b>	<b>Decision(1%)</b>
Variances	Bartlett Equality of Variance	15.11	18.48	0.0346	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9647		0.3681	Normal Distribution

*EC Aug 25/09*

Lemna Growth Inhibition Test			Nautilus Environmental		
Analysis No: 17-4328-7809	Endpoint: Total Dry Weight-mg	CETIS Version: CETISv1.5.0			
Analyzed: 14 Aug-09 11:35	Analysis: Nonlinear Regression	Official Results: Yes			

Total Dry Weight-mg Summary			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	4	4.637	3.66	6.7	0.2582	1.39	29.98%	0.0%
1.5		4	3.84	1.33	5.73	0.343	1.847	48.1%	17.2%
3.05		4	3.893	2.72	5.44	0.2176	1.172	30.11%	16.06%
6.1		4	4.387	2.15	5.59	0.2839	1.529	34.85%	5.39%
12.1		4	2.76	2.36	3.27	0.0807	0.4346	15.75%	40.49%
24.2		4	3.413	2.69	3.86	0.09697	0.5222	15.3%	26.41%
48.5		4	2.287	2.13	2.58	0.03899	0.21	9.18%	50.67%
97		4	2.908	2.4	3.76	0.1207	0.6502	22.36%	37.3%

Total Dry Weight-mg Detail					
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	4.09	6.7	4.1	3.66
1.5		1.33	5.73	4.44	3.86
3.05		4.08	5.44	2.72	3.33
6.1		5.59	2.15	4.79	5.02
12.1		2.36	2.44	3.27	2.97
24.2		3.86	2.69	3.38	3.72
48.5		2.58	2.3	2.13	2.14
97		3.07	2.4	3.76	2.4



*ea Aug 25/09*

**APPENDIX D - *Pseudokirchneriella subcapitata* Toxicity Test Data**

**Pseudokirchneriella subcapitata Summary Sheet**

Client: RESEAN  
 Work Order No.: 09209

Start Date: July 7, 2009  
 Set up by: EW

**Sample Information:**

Sample ID: SC-2  
 Sample Date: July 5, 2009  
 Date Received: July 7, 2009  
 Sample Volume: 9 x 20L

**Test Organism Information:**

Culture Date: July 2, 2009  
 Age of culture (Day 0): 5d

**Zinc Reference Toxicant Results:**

Reference Toxicant ID: SC48  
 Stock Solution ID: 09Zn01  
 Date Initiated: July 9, 2009

72-h IC50 (95% CL): 32.4 28.5 29.0  
31.6 (24.9 - 36.5) µg/L Zn

72-h IC50 Reference Toxicant Mean ± 2 SD: 17.1 ± 11.9 µg/L Zn CV (%): 35

Test Results:	Algal Growth
NOEC %(v/v)	5.9
LOEC %(v/v)	11.9
IC25 %(v/v) (95% CL)	26.1 (24.5 - 27.6)
IC50 %(v/v) (95% CL)	33.0 (30.9 - 35.1)

Reviewed by: A. Terry

Date reviewed: August 26, 2009

## 72-h Algal Growth Inhibition Toxicity Test Water Quality Measurements

Client : Rescan Setup by: EC  
 Sample ID: SC-2 Test Date/Time: July 7, 2009 1400h  
 Work Order No.: 09209 Test Species: Pseudokirchneriella subcapitata

Culture Date: July 2, 2009 Age of Culture: 5 d Culture Health: Good  
 Culture Count: 1 237 2 223 Average: 230 Culture Cell Density (c1): 230 x 10<sup>4</sup>

$$v1 = \frac{220,000 \text{ cells/ml} \times 100 \text{ ml}}{(c1) 230 \times 10^4 \text{ cells/ml}} = 9.56 \text{ mL}$$

Time Zero Counts: 1 20 2 23 Average: 21.5 x 10<sup>4</sup>

No. of Cells/mL: 21.5 x 10<sup>4</sup> Initial Density:  $\frac{\# \text{ cells/mL} \div 220 \mu\text{L} \times 10 \mu\text{L}}{1} = \underline{9773}$

Concentration %(v/v)	Water Quality Measurements					Microplates rotated 2X per day?			
	pH	Temp (°C)				0 h	24 h	48 h	72 h
		0 h	24 h	48 h	72 h				
Control	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
1.48	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
2.95	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
5.9	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
11.9	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
23.8	7.1	24.6	24.9	24.3	25.4	✓	✓	✓	✓
47.6	7.1	24.7	24.9	24.3	25.4	✓	✓	✓	✓
95.2	7.2	24.8	24.9	24.3	25.4	✓	✓	✓	✓
Initials	<u>EC</u>	<u>EC</u>	<u>EC</u>	<u>SLT</u>	<u>SLT</u>	<u>EC</u>	<u>EC</u>	<u>SLT</u>	<u>SLT</u>

Initial control pH: Well 1: 6.8 Well 2: 6.8  
 Final control pH: Well 1: 6.8 Well 2: 6.8

Light intensity (lux): 4010 Date measured: July 7, 2009

Sample Description: light yellow, turbid

Comments: \_\_\_\_\_

Reviewed: L. Teng Date reviewed: August 26, 2009



***Pseudokirchneriella subcapitata* Toxicity Test Data Sheet**  
**72-h Algal Cell Counts**

Client: Rescan Start Date/Time: July 7/09 @ 1400h  
 Work Order #: 09209 Termination Date: July 10/09  
 Sample ID: SC-2 Test set up by: ECC  
 c/o (VIU)

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A	35					JLT
	B	26					
	C	30					
	D	24					
	E	29					
	F	33					
	G	27					
	H	34					
1.48	A	39					JLT
	B	37					
	C	34					
	D	36					
2.95	A	40					
	B	36					
	C	37					
	D	37					
5.9	A	30					
	B	21					
	C	22					
	D	26					
11.9	A	17	21				
	B	24					
	C	19					
	D	25					
23.8	A	46					
	B	26	34				
	C	42					
	D	38					
47.6	A	6					
	B	3					
	C	7					
	D	1					
95.2	A	0					
	B	0					
	C	0					
	D	0					

Comments:

Reviewed by: A. Terry Date Reviewed: August 25, 2009

***Pseudokirchneriella subcapitata* Algal Counts**

Client: Rescan  
 WO#: 09209  
 Sample ID: SC2

Start Date/Time: 7-Jul-09 @1400h  
 Termination Date: 10-Jul-09

Initial Cell Density: 9772.73 cell/mL  
 215000  
 0.22  
 0.01

Concentration % v/v	Rep	Count 1 (x 10 <sup>4</sup> )	Count 2 (x 10 <sup>4</sup> )	Count 3 (x 10 <sup>4</sup> )	Count 4 (x 10 <sup>4</sup> )	Mean (x 10 <sup>4</sup> )	Cell Yield (x 10 <sup>4</sup> ) cell/mL		9772.727
Control	A	35				35	34.0	mean	28.8
	B	26				26	25.0	SD	3.991061
	C	30				30	29.0	CV	13.87099
	D	24				24	23.0		
	E	29				29	28.0		
	F	33				33	32.0		
	G	27				27	26.0		
	H	34				34	33.0		
1.48	A	39				39	38.0		
	B	37				37	36.0		
	C	34				34	33.0		
	D	36				36	35.0		
2.95	A	40				40	39.0		
	B	36				36	35.0		
	C	32				32	31.0		
	D	37				37	36.0		
5.9	A	30				30	29.0		
	B	21				21	20.0		
	C	22				22	21.0		
	D	26				26	25.0		
11.9	A	17	21			19	18.0		
	B	24				24	23.0		
	C	19				19	18.0		
	D	25				25	24.0		
23.8	A	46				46	45.0		
	B	26	34			30	29.0		
	C	42				42	41.0		
	D	38				38	37.0		
47.6	A	6				6	5.0		
	B	3				3	2.0		
	C	7				7	6.0		
	D	1				1	0.0		
95.2	A	0				0	-1.0		
	B	0				0	-1.0		
	C	0				0	-1.0		
	D	0				0	-1.0		

ART  
 Aug 25/09

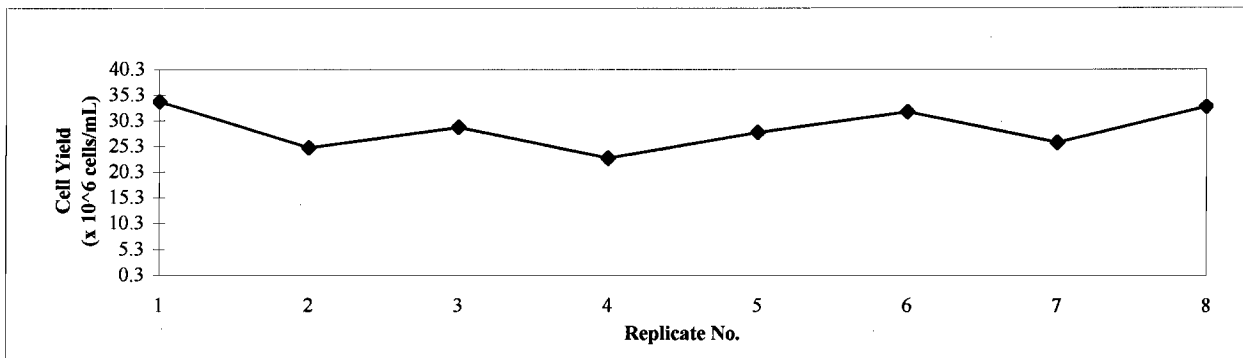
## 72-h *Pseudokirchneriella subcapitata* Test - Trend Analysis by Mann-Kendall Test.

**Instructions:**

1. Enter the project number, work order number and sample ID in the highlighted cells.
2. Enter the negative control cell yield data ( $X \times 10^6$  cells/mL) into the highlighted spreadsheet cells.
3. Compare the calculated S value to the table of critical S values at the bottom of the page.
4. If the calculated S value is smaller than the S value in the table, there is no statistically significant trend.

Client: Rescan                      Sample ID: SC2  
 W.O. No.: 09209                      Test Date: 7-Jul-09

Rep No.	1	2	3	4	5	6	7	8	Count of + Signs	Count of - Signs
<b>Data Value</b>	34.0	25.0	29.0	23.0	28.0	32.0	26.0	33.0		
(- Rep 1)		-9.000	-5.000	-11.000	-6.000	-2.000	-8.000	-1.000	0	7
(- Rep 2)			4.000	-2.000	3.000	7.000	1.000	8.000	5	1
(- Rep 3)				-6.000	-1.000	3.000	-3.000	4.000	2	3
(- Rep 4)					5.000	9.000	3.000	10.000	4	0
(- Rep 5)						4.000	-2.000	5.000	2	1
(- Rep 6)							-6.000	1.000	1	1
(- Rep 7)								7.000	1	0
<b>Totals</b>									15	13
<b>S =</b>									2	



**Critical values of (S) at a probability of  $p = 0.05$ , when the number of replicates (n) is 10 or less.**

n	4	5	6	7	8	9	10
S	4	6	9	11	14	16	19

If your calculated value for S (for the applicable number of replicates) is equal to or less than the corresponding value for S in the above table, then there is no statistically significant trend present. Refer to Gilbert (1987) for complete table of probabilities for the Mann-Kendall test.

**Reference:**

Gilbert, R.O. 1987. Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold, NY. 320 pp.

*RET*  
Aug 25/09

**CETIS Analytical Report**

Report Date: 28 Jul-09 10:42 (p 1 of 2)  
 Link/Link Code: 17-3633-3134/09209SC2

<b>Selenastrum Growth Test</b>		<b>Nautilus Environmental</b>
--------------------------------	--	-------------------------------

<b>Analysis No:</b> 09-4574-1553	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 27 Jul-09 10:31	<b>Analysis:</b> Parametric-Multiple Comparison	<b>Official Results:</b> Yes

<b>Sample No:</b> 02-6887-8236	<b>Code:</b> SC2	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09	<b>Source:</b> Rescan	
<b>Sample Age:</b> 48h	<b>Station:</b>	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T	Not Run	5.9	11.9	8.379	16.95	21.9%

Bonferroni Adj t Test							
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		1.48	-2.751	2.566	6.297	1.0000	Non-Significant Effect
		2.95	-2.649	2.566	6.297	1.0000	Non-Significant Effect
		5.9	2.037	2.566	6.297	0.1570	Non-Significant Effect
		11.9*	3.26	2.566	6.297	0.0096	Significant Effect
		23.8	-3.769	2.566	6.297	1.0000	Non-Significant Effect
		47.6*	10.39	2.566	6.297	0.0000	Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	3522.5	587.0833	6	36.56	0.0000	Significant Effect
Error	401.5	16.06	25			
Total	3924	603.1433	31			

ANOVA Assumptions						
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)	
Variances	Bartlett Equality of Variance	4.824	16.81	0.5665	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.982		0.8562	Normal Distribution	

Cell Density Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	8	28.75	27.2	30.3	23	34	0.7542	3.991	13.88%	0.0%
1.48		4	35.5	34.69	36.31	33	38	0.3934	2.082	5.86%	-23.48%
2.95		4	35.25	33.97	36.53	31	39	0.6244	3.304	9.37%	-22.61%
5.9		4	23.75	22.16	25.34	20	29	0.7773	4.113	17.32%	17.39%
11.9		4	20.75	19.51	21.99	18	24	0.605	3.202	15.43%	27.83%
23.8		4	38	35.35	40.65	29	45	1.291	6.831	17.98%	-32.17%
47.6		4	3.25	2.182	4.318	0	6	0.5204	2.754	84.73%	88.7%

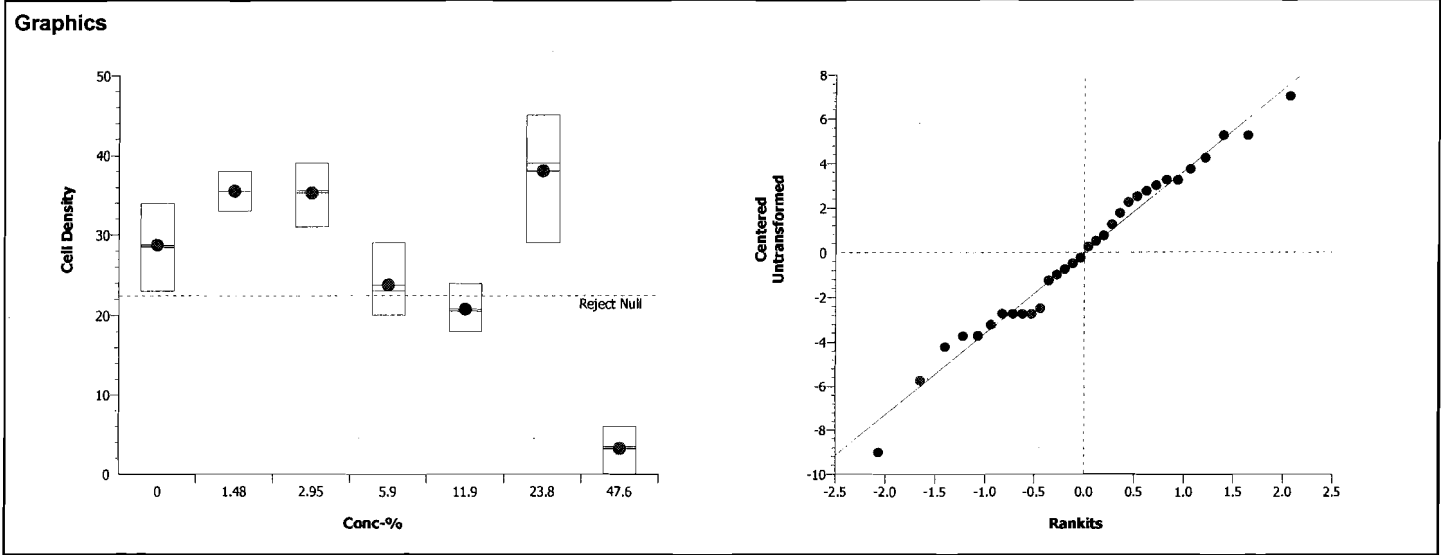
*ART*  
*QA Aug 25/09*

**CETIS Analytical Report**

Report Date: 28 Jul-09 10:42 (p 2 of 2)  
 Link/Link Code: 17-3633-3134/09209SC2

<b>Selenastrum Growth Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 09-4574-1553	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 27 Jul-09 10:31	<b>Analysis:</b> Parametric-Multiple Comparison	<b>Official Results:</b> Yes			

<b>Cell Density Detail</b>									
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Contr	34	33	32	29	28	26	25	23
1.48		38	36	35	33				
2.95		39	36	35	31				
5.9		29	25	21	20				
11.9		24	23	18	18				
23.8		45	41	37	29				
47.6		6	5	2	0				



**CETIS Analytical Report**

Report Date: 28 Jul-09 10:15 (p 1 of 2)  
 Link/Link Code: 11-1009-3030/09209SC2b

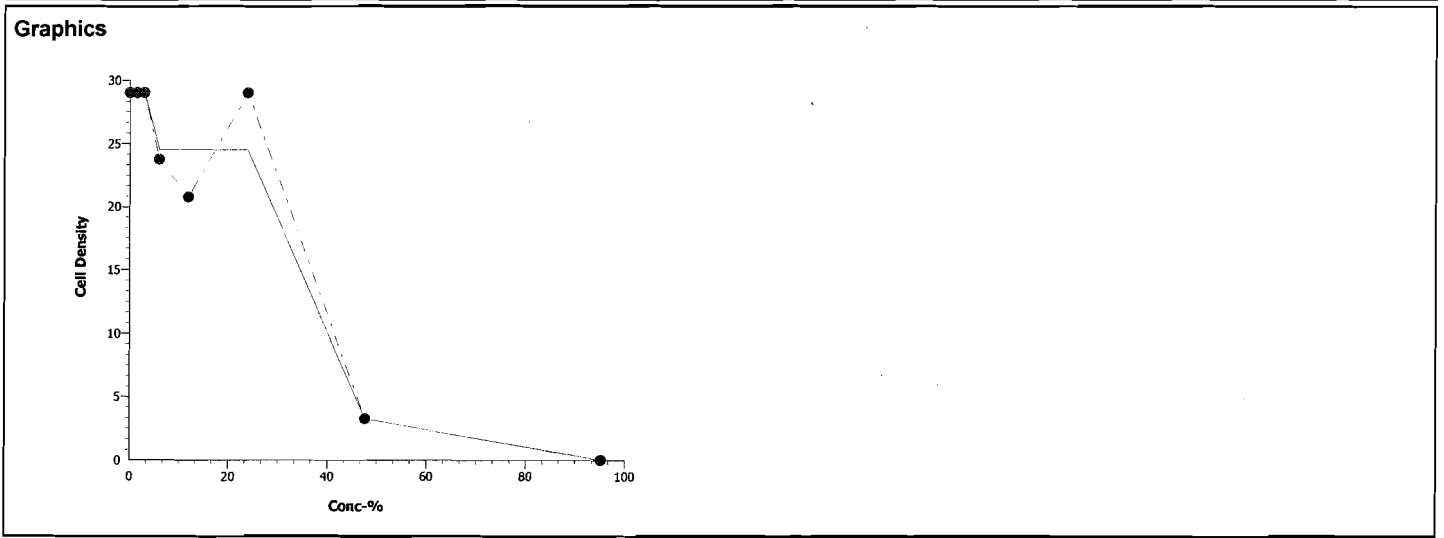
Selenastrum Growth Test				Nautilus Environmental					
Analysis No:	15-4593-8719	Endpoint:	Cell Density	CETIS Version:		CETISv1.5.0			
Analyzed:	28 Jul-09 10:15	Analysis:	Linear Interpolation (ICPIN)	Official Results:		Yes			
Sample No:	20-2276-2186	Code:	SC2	Client:		Rescan			
Sample Date:	05 Jul-09	Material:	Water Sample	Project:					
Receive Date:	07 Jul-09	Source:	Rescan						
Sample Age:	48h	Station:							
Linear Interpolation Options									
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method				
Log(X + 1)	Linear	57951	200	Yes	Two-Point Interpolation				
Point Estimates									
% Effect	Conc-%	95% LCL	95% UCL						
5	3.728	3.453	5.217						
10	4.659	4.013	9.319						
15	5.773	4.634	35.99						
20	24.84	23.33	26.36						
25	26.06	24.47	27.58						
40	30.05	28.33	31.74						
50	33.04	30.91	35.06						
Cell Density Summary			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	8	29	29	29	0	0	0.0%	0.0%
1.48		4	29	29	29	0	0	0.0%	0.0%
2.95		4	29	29	29	0	0	0.0%	0.0%
5.9		4	23.75	20	29	0.7638	4.113	17.32%	18.1%
11.9		4	20.75	18	24	0.5945	3.202	15.43%	28.45%
23.8		4	29	29	29	0	0	0.0%	0.0%
47.6		4	3.25	0	6	0.5114	2.754	84.73%	88.79%
95.2		4	0	0	0	0	0	100.0%	100.0%
Cell Density Detail									
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Control	29	29	29	29	29	29	29	29
1.48		29	29	29	29				
2.95		29	29	29	29				
5.9		29	20	21	25				
11.9		18	23	18	24				
23.8		29	29	29	29				
47.6		5	2	6	0				
95.2		0	0	0	0				

*ART*  
 09 Jul 25/09

**CETIS Analytical Report**

Report Date: 28 Jul-09 10:15 (p 2 of 2)  
Link/Link Code: 11-1009-3030/09209SC2b

<b>Selenastrum Growth Test</b>		<b>Nautilus Environmental</b>
Analysis No: 15-4593-8719	Endpoint: Cell Density	CETIS Version: CETISv1.5.0
Analyzed: 28 Jul-09 10:15	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes



ART  
QA Aug 25/09

**Pseudokirchneriella subcapitata Summary Sheet**

Client: RESOAN  
Work Order No.: 09209

Start Date: July 7, 2009  
Set up by: EW

**Sample Information:**

Sample ID: STE-2  
Sample Date: July 5, 2009  
Date Received: July 7, 2009  
Sample Volume: 9 x 20L

**Test Organism Information:**

Culture Date: July 2, 2009  
Age of culture (Day 0): 5 d

**Zinc Reference Toxicant Results:**

Reference Toxicant ID: SCA8  
Stock Solution ID: 09 Zn 01  
Date Initiated: July 9, 2009

72-h IC50 (95% CL): 32.9 28.5 39.0  
31.4 (24.4 - 26.8) µg/L Zn

72-h IC50 Reference Toxicant Mean ± 2 SD: 17.1 ± 12.0 µg/L Zn CV (%): 35

Test Results:

	Algal Growth
NOEC %(v/v)	47.6
LOEC %(v/v)	95.2
IC25 %(v/v) (95% CL)	61.7 (52.3 - 69.0)
IC50 %(v/v) (95% CL)	84.1 (71.4 - 95.2)

Reviewed by: A. Terry

Date reviewed: August 26, 2009



## 72-h Algal Growth Inhibition Toxicity Test Water Quality Measurements

Client : Rescan Setup by: ECU  
 Sample ID: STE-2 Test Date/Time: July 7, 2009 1400h  
 Work Order No.: 09209 Test Species: Pseudokirchneriella subcapitata

Culture Date: July 2, 2009 Age of Culture: 5 d Culture Health: Good  
 Culture Count: 1 237 2223 Average: 230 Culture Cell Density (c1): 230 x 10<sup>4</sup>

$$v1 = \frac{220,000 \text{ cells/ml} \times 100 \text{ ml}}{(c1) 230 \times 10^4 \text{ cells/ml}} = 9.56 \text{ mL}$$

Time Zero Counts: 1 20 2 23 Average: 21.5

No. of Cells/mL: \_\_\_\_\_ Initial Density: # cells/mL ÷ 220 µL x 10 µL = 9773

Concentration %(v/v)	Water Quality Measurements					Microplates rotated 2X per day?			
	pH	Temp (°C)							
	0 h	0 h	24 h	48 h	72 h	0 h	24 h	48 h	72 h
Control	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
1.48	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
2.95	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
5.9	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
11.9	6.9	24.7	24.9	24.3	25.4	✓	✓	✓	✓
23.8	7.1	24.7	24.9	24.3	25.4	✓	✓	✓	✓
47.6	7.2	24.8	24.9	24.3	25.4	✓	✓	✓	✓
95.2	7.3	24.8	24.9	24.3	25.4	✓	✓	✓	✓
Initials	ECU	ECU	ECU	JLT	JLT	ECU	ECU	JLT	JLT

Initial control pH: Well 1: 6.8 Well 2: 6.8  
 Final control pH: Well 1: 6.8 Well 2: 6.8

Light intensity (lux): 3870 Date measured: July 7, 2009

Sample Description: Clear

Comments: \_\_\_\_\_

Reviewed: A. Torey Date reviewed: August 26, 2009

***Pseudokirchneriella subcapitata* Toxicity Test Data Sheet**  
**72-h Algal Cell Counts**

Client: Rescan Start Date/Time: July 7/09 @ 1400  
 Work Order #: 09209 Termination Date: July 10/09  
 Sample ID: STE-2 Test set up by: ECC

% (VIV)

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A	36					JCT
	B	29					JCT
	C	34					
	D	23					
	E	30					
	F	35					
	G	28					
	H	31					
1.48	A	40					
	B	33					
	C	39					
	D	30					
2.95	A	35					
	B	29					
	C	33					
	D	36					
5.9	A	47					
	B	56					
	C	39	44				
	D	53					
11.9	A	50					
	B	41					
	C	49					
	D	42					
23.8	A	61					
	B	48	52				
	C	69					
	D	55					
47.6	A	35					
	B	27					
	C	30					
	D	27					
95.2	A	18					
	B	11					
	C	9					
	D	14					

Comments: \_\_\_\_\_  
 Reviewed by: A. Long Date Reviewed: August 25, 2009

**Pseudokirchneriella subcapitata Algal Counts**

Client: Rescan  
 WO#: 09209  
 Sample ID: SC2

Start Date/Time: 7-Jul-09 @1400h  
 Termination Date: 10-Jul-09

Initial Cell Density: 9772.73 cell/mL  
 215000  
 0.22  
 0.01

Concentration % v/v	Rep	Count 1 (x 10 <sup>4</sup> )	Count 2 (x 10 <sup>4</sup> )	Count 3 (x 10 <sup>4</sup> )	Count 4 (x 10 <sup>4</sup> )	Mean (x 10 <sup>4</sup> )	Cell Yield (x 10 <sup>4</sup> ) cell/mL		9772.727
Control	A	36				36	35.0	mean	29.8
	B	29				29	28.0	SD	4.26782
	C	34				34	33.0	CV	14.33466
	D	23				23	22.0		
	E	30				30	29.0		
	F	35				35	34.0		
	G	28				28	27.0		
	H	31				31	30.0		
1.48	A	40				40	39.0		
	B	33				33	32.0		
	C	39				39	38.0		
	D	30				30	29.0		
2.95	A	35				35	34.0		
	B	29				29	28.0		
	C	33				33	32.0		
	D	36				36	35.0		
5.9	A	47				47	46.0		
	B	56				56	55.0		
	C	39	44			41.5	40.5		
	D	53				53	52.0		
11.9	A	50				50	49.0		
	B	41				41	40.0		
	C	49				49	48.0		
	D	42				42	41.0		
23.8	A	61				61	60.0		
	B	48	52			50	49.0		
	C	69				69	68.0		
	D	55				55	54.0		
47.6	A	35				35	34.0		
	B	27				27	26.0		
	C	30				30	29.0		
	D	27				27	26.0		
95.2	A	18				18	17.0		
	B	11				11	10.0		
	C	9				9	8.0		
	D	14				14	13.0		

ART  
 Aug 25/09

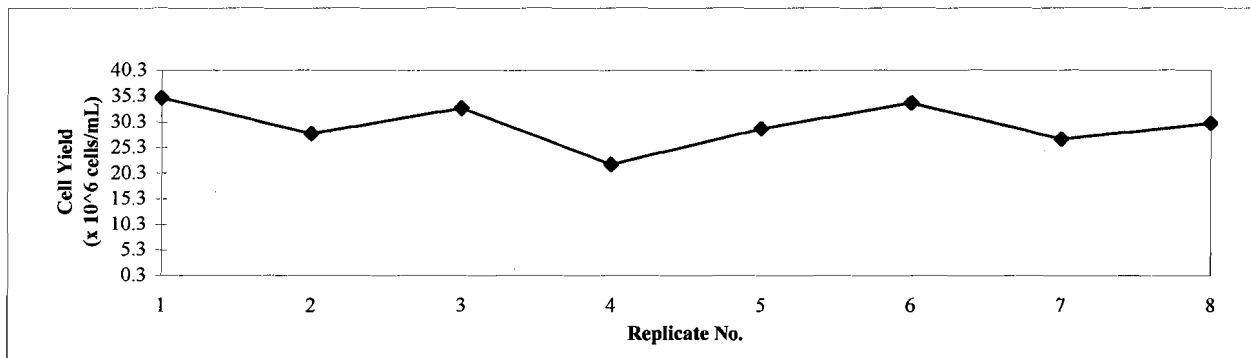
**72-h *Pseudokirchneriella subcapitata* Test - Trend Analysis by Mann-Kendall Test.**

**Instructions:**

1. Enter the project number, work order number and sample ID in the highlighted cells.
2. Enter the negative control cell yield data ( $X \times 10^6$  cells/mL) into the highlighted spreadsheet cells.
3. Compare the calculated S value to the table of critical S values at the bottom of the page.
4. If the calculated S value is smaller than the S value in the table, there is no statistically significant trend.

Client: Rescan                      Sample ID: SC2  
 W.O. No.: 09209                      Test Date: 7-Jul-09

Rep No.	1	2	3	4	5	6	7	8	Count of + Signs	Count of - Signs
Data Value	35.0	28.0	33.0	22.0	29.0	34.0	27.0	30.0		
(- Rep 1)		-7.000	-2.000	-13.000	-6.000	-1.000	-8.000	-5.000	0	7
(- Rep 2)			5.000	-6.000	1.000	6.000	-1.000	2.000	4	2
(- Rep 3)				-11.000	-4.000	1.000	-6.000	-3.000	1	4
(- Rep 4)					7.000	12.000	5.000	8.000	4	0
(- Rep 5)						5.000	-2.000	1.000	2	1
(- Rep 6)							-7.000	-4.000	0	2
(- Rep 7)								3.000	1	0
<b>Totals</b>									12	16
									<b>S =</b>	<b>-4</b>



**Critical values of (S) at a probability of  $p = 0.05$ , when the number of replicates (n) is 10 or less.**

n	4	5	6	7	8	9	10
S	4	6	9	11	14	16	19

If your calculated value for S (for the applicable number of replicates) is equal to or less than the corresponding value for S in the above table, then there is no statistically significant trend present. Refer to Gilbert (1987) for complete table of probabilities for the Mann-Kendall test.

**Reference:**

Gilbert, R.O. 1987. Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold, NY. 320 pp.

ART  
Aug 25/09

**CETIS Analytical Report**

Report Date: 21 Jul-09 17:11 (p 1 of 2)  
 Link/Link Code: 14-5847-2245/09209STE2

Selenastrum Growth Test								Nautilus Environmental			
Analysis No: 03-9518-0825		Endpoint: Cell Density		CETIS Version: CETISv1.5.0							
Analyzed: 21 Jul-09 17:11		Analysis: Parametric-Multiple Comparison		Official Results: Yes							
Sample No: 14-2442-9580		Code: STE-2		Client: Rescan							
Sample Date: 05 Jul-09		Material: Water Sample		Project:							
Receive Date: 07 Jul-09		Source: Rescan									
Sample Age: 48h		Station:									
Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD			
Untransformed		C > T	Not Run	47.6	95.2	67.32	2.101	27.13%			
Bonferroni Adj t Test											
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)				
Negative Control		1.48	-1.538	2.613	8.071	1.0000	Non-Significant Effect				
		2.95	-0.8093	2.613	8.071	1.0000	Non-Significant Effect				
		5.9	-5.989	2.613	8.071	1.0000	Non-Significant Effect				
		11.9	-4.775	2.613	8.071	1.0000	Non-Significant Effect				
		23.8	-9.064	2.613	8.071	1.0000	Non-Significant Effect				
		47.6	0.3237	2.613	8.071	1.0000	Non-Significant Effect				
		95.2*	5.746	2.613	8.071	0.0000	Significant Effect				
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)					
Between	5654.722	807.8174	7	31.75	0.0000	Significant Effect					
Error	712.5	25.44643	28								
Total	6367.222	833.2639	35								
ANOVA Assumptions											
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)						
Variances	Bartlett Equality of Variance	4.26	18.48	0.7494	Equal Variances						
Distribution	Shapiro-Wilk Normality	0.9749		0.5737	Normal Distribution						
Cell Density Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	8	29.75	28.1	31.4	22	35	0.8065	4.268	14.35%	0.0%
1.48		4	34.5	32.64	36.36	29	39	0.9063	4.796	13.9%	-15.97%
2.95		4	32.25	31.05	33.45	28	35	0.585	3.096	9.6%	-8.4%
5.9		4	48.25	45.67	50.83	40	55	1.257	6.652	13.79%	-62.18%
11.9		4	44.5	42.7	46.3	40	49	0.8797	4.655	10.46%	-49.58%
23.8		4	57.75	54.58	60.92	49	68	1.546	8.18	14.16%	-94.12%
47.6		4	28.75	27.29	30.21	26	34	0.7134	3.775	13.13%	3.36%
95.2		4	12	10.48	13.52	8	17	0.74	3.916	32.63%	59.66%

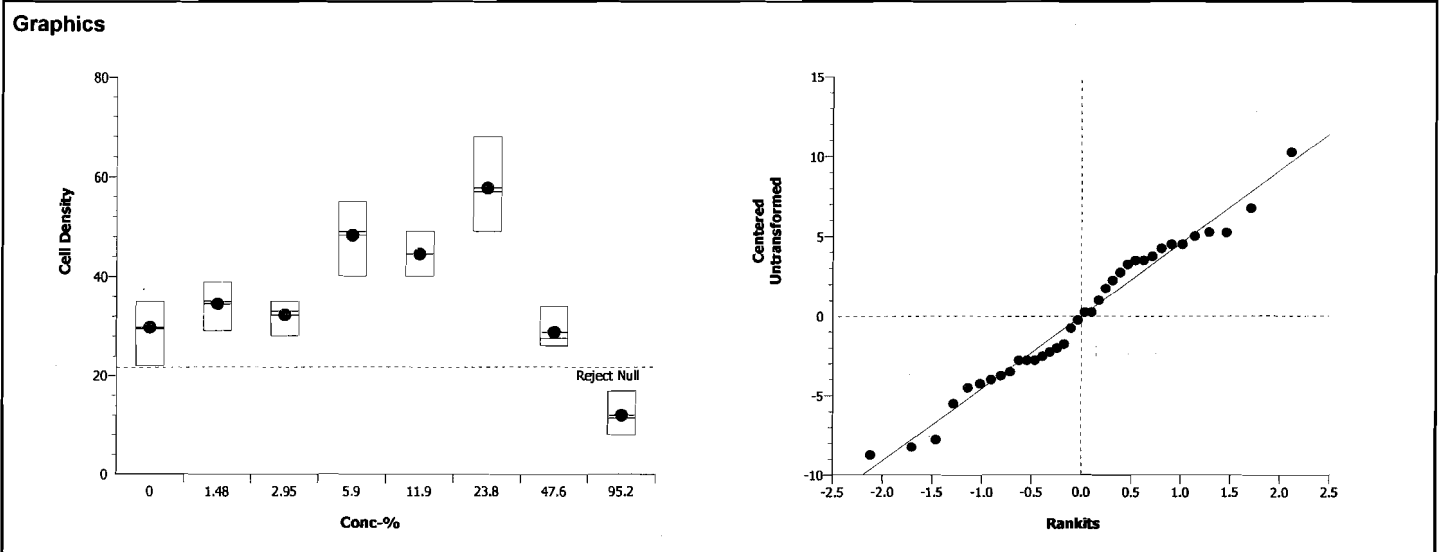
*ART*  
*QA/LQ 25/09*

**CETIS Analytical Report**

Report Date: 21 Jul-09 17:11 (p 2 of 2)  
 Link/Link Code: 14-5847-2245/09209STE2

<b>Selenastrum Growth Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 03-9518-0825	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 21 Jul-09 17:11	<b>Analysis:</b> Parametric-Multiple Comparison	<b>Official Results:</b> Yes			

<b>Cell Density Detail</b>									
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Contr	35	34	33	30	29	28	27	22
1.48		39	38	32	29				
2.95		35	34	32	28				
5.9		55	52	46	40				
11.9		49	48	41	40				
23.8		68	60	54	49				
47.6		34	29	26	26				
95.2		17	13	10	8				



ARF  
 QA Aug 25/09

**CETIS Analytical Report**

Report Date: 28 Jul-09 10:54 (p 1 of 2)  
 Link/Link Code: 19-5521-5314/09209STE2b

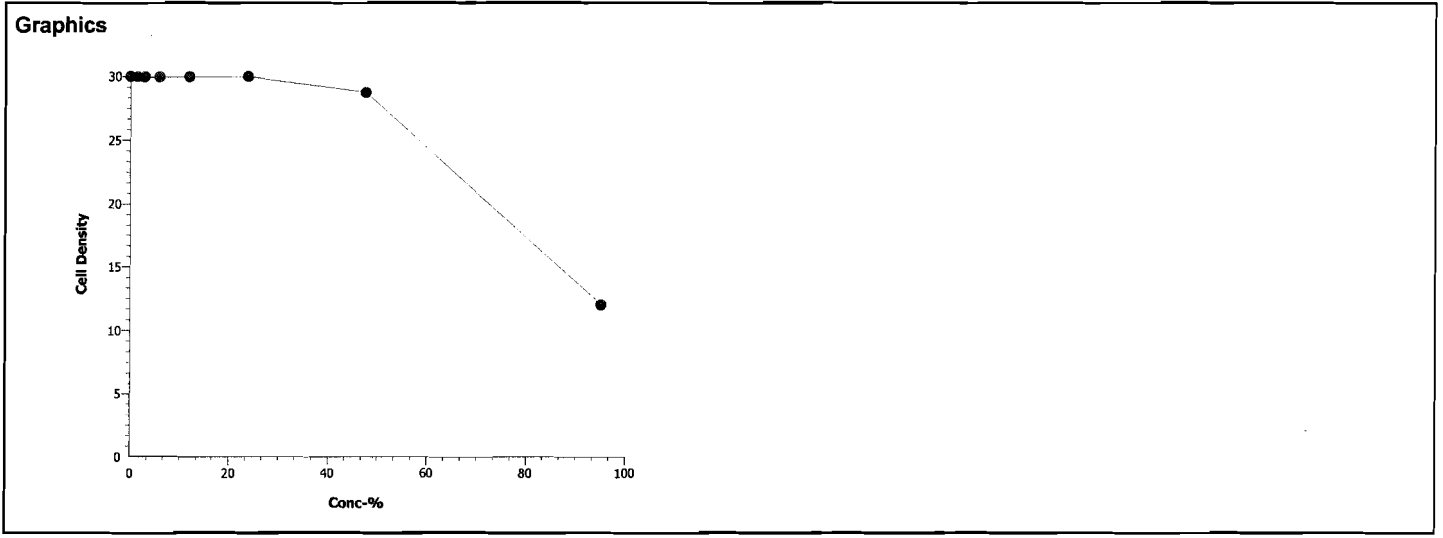
Selenastrum Growth Test				Nautilus Environmental					
Analysis No: 09-1835-6010		Endpoint: Cell Density		CETIS Version: CETISv1.5.0					
Analyzed: 28 Jul-09 10:53		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes					
Sample No: 07-7397-0574		Code: STE-2		Client: Rescan					
Sample Date: 05 Jul-09		Material: Water Sample		Project:					
Receive Date: 07 Jul-09		Source: Rescan							
Sample Age: 48h		Station:							
Linear Interpolation Options									
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method				
Log(X + 1)	Linear	57951	200	Yes	Two-Point Interpolation				
Point Estimates									
% Effect	Conc-%	95% LCL	95% UCL						
5	48.1	20.61	52.49						
10	51.19	33.41	56.17						
15	54.48	45.23	60.1						
20	57.98	48.65	64.47						
25	61.7	52.33	69.02						
40	74.33	63.21	85.85						
50	84.13	71.37	N/A						
Cell Density Summary			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	8	30	30	30	0	0	0.0%	0.0%
1.48		4	30	30	30	0	0	0.0%	0.0%
2.95		4	30	30	30	0	0	0.0%	0.0%
5.9		4	30	30	30	0	0	0.0%	0.0%
11.9		4	30	30	30	0	0	0.0%	0.0%
23.8		4	30	30	30	0	0	0.0%	0.0%
47.6		4	28.75	26	34	0.701	3.775	13.13%	4.17%
95.2		4	12	8	17	0.7271	3.916	32.63%	60.0%
Cell Density Detail									
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Control	30	30	30	30	30	30	30	30
1.48		30	30	30	30				
2.95		30	30	30	30				
5.9		30	30	30	30				
11.9		30	30	30	30				
23.8		30	30	30	30				
47.6		34	26	29	26				
95.2		17	10	8	13				

**CETIS Analytical Report**

Report Date: 28 Jul-09 10:54 (p 2 of 2)

Link/Link Code: 19-5521-5314/09209STE2b

<b>Selenastrum Growth Test</b>		<b>Nautilus Environmental</b>
<b>Analysis No:</b> 09-1835-6010	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 28 Jul-09 10:53	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Official Results:</b> Yes



ART  
QA AUG 25/09



**Pseudokirchneriella subcapitata Summary Sheet**

Client: RESCAN  
 Work Order No.: 09209

Start Date: July 7, 2009  
 Set up by: EW

**Sample Information:**

Sample ID: NTR-2  
 Sample Date: July 5, 2009  
 Date Received: July 7, 2009  
 Sample Volume: 9 x 20L

**Test Organism Information:**

Culture Date: July 2, 2009  
 Age of culture (Day 0): 5 d

**Zinc Reference Toxicant Results:**

Reference Toxicant ID: SC48  
 Stock Solution ID: 09201  
 Date Initiated: July 9, 2009

72-h IC50 (95% CL): ~~32.4~~ ~~31.6~~ ~~28.5~~ ~~24.4~~ ~~36.5~~ ~~39.0~~ <sup>20</sup> 12.0 17.1 19.0 25.4 35 μg/L Zn

72-h IC50 Reference Toxicant Mean ± 2 SD: 17.1 ± 11.9 μg/L Zn CV (%): 35

Test Results:	Algal Growth
NOEC %(v/v)	5.9
LOEC %(v/v)	11.9
IC25 %(v/v) (95% CL)	11.4 (9.4 - 14.0)
IC50 %(v/v) (95% CL)	19.0 (15.0 - 25.4)

Reviewed by: A. Terry

Date reviewed: August 26, 2009

## 72-h Algal Growth Inhibition Toxicity Test Water Quality Measurements

Client : Rescan Setup by: Ecc  
 Sample ID: NTR-2 Test Date/Time: July 7, 2009 1400h  
 Work Order No.: 09209 Test Species: Pseudokirchneriella subcapitata

Culture Date: July 2, 2009 Age of Culture: 5d Culture Health: Good  
 Culture Count: 1 237 2 223 Average: 230 Culture Cell Density (c1): 230 x 10<sup>4</sup>

$$v1 = \frac{220,000 \text{ cells/ml} \times 100 \text{ ml}}{(c1) 230 \times 10^4 \text{ cells/ml}} = 9.56 \text{ mL}$$

Time Zero Counts: 1 20 2 23 Average: 21.5 x 10<sup>4</sup>

No. of Cells/mL: 21.5 x 10<sup>4</sup> Initial Density: # cells/mL ÷ 220 µL x 10 µL = 9773

Concentration %(v/v)	Water Quality Measurements					Microplates rotated 2X per day?			
	pH	Temp (°C)				0 h	24 h	48 h	72 h
	0 h	0 h	24 h	48 h	72 h				
Control	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
1.48	6.9	24.7	24.9	24.3	25.4	✓	✓	✓	✓
2.95	6.9	24.7	24.9	24.3	25.4	✓	✓	✓	✓
5.9	6.9	24.8	24.9	24.3	25.4	✓	✓	✓	✓
11.9	7.0	24.8	24.9	24.3	25.4	✓	✓	✓	✓
23.8	7.1	24.9	24.9	24.3	25.4	✓	✓	✓	✓
47.6	7.2	25.1	24.9	24.3	25.4	✓	✓	✓	✓
95.2	7.4	25.1	24.9	24.3	25.4	✓	✓	✓	✓
Initials	<u>EW</u>	<u>EW</u>	<u>EW JLT</u>	<u>JLT</u>	<u>JLT</u>	<u>EW</u>	<u>EW</u>	<u>JLT</u>	<u>JLT</u>

Initial control pH: Well 1: 6.8 Well 2: 6.8  
 Final control pH: Well 1: 6.8 Well 2: 6.8

Light intensity (lux): 4050 Date measured: July 7, 2009

Sample Description: clear sample.

Comments: \_\_\_\_\_

Reviewed: A. Terry Date reviewed: August 25, 2009

***Pseudokirchneriella subcapitata* Toxicity Test Data Sheet**  
**72-h Algal Cell Counts**

Client: Rescan Start Date/Time: July 7/09 @ 1400  
 Work Order #: 09209 Termination Date: July 10/09  
 Sample ID: NTR-2 Test set up by: ECC  
 % (V/V)

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A	19	23				JET
	B	37					
	C	28					
	D	32					
	E	25					
	F	38					
	G	29					
	H	33					
1.48	A	35					JET
	B	43					
	C	27	32				
	D	44					
2.95	A	49					
	B	42					
	C	50					
	D	41					
5.9	A	31					
	B	23	29				
	C	43					
	D	33					
11.9	A	16					
	B	24					
	C	14					
	D	2					
23.8	A	18					
	B	13					
	C	15					
	D	11					
47.6	A	16					
	B	10					
	C	14					
	D	9					
95.2	A	5					
	B	0					
	C	3					
	D	1					

Comments:

Reviewed by: A. Terry Date Reviewed: August 25, 2009

***Pseudokirchneriella subcapitata* Algal Counts**

Client: Rescan  
 WO#: 09209  
 Sample ID: NTR-2

Start Date/Time: 7-Jul-09 @1400h  
 Termination Date: 10-Jul-09

Initial Cell Density: 9772.73 cell/mL  
 215000  
 0.22  
 0.01  
 9772.727

Concentration % v/v	Rep	Count 1 (x 10 <sup>4</sup> )	Count 2 (x 10 <sup>4</sup> )	Count 3 (x 10 <sup>4</sup> )	Count 4 (x 10 <sup>4</sup> )	Mean (x 10 <sup>4</sup> )	Cell Yield (x 10 <sup>4</sup> ) cell/mL	
Control	A	19	23			21	20.0	mean
	B	37				37	36.0	SD
	C	28				28	27.0	CV
	D	32				32	31.0	
	E	25				25	24.0	
	F	38				38	37.0	
	G	29				29	28.0	
	H	33				33	32.0	
1.48	A	35				35	34.0	
	B	43				43	42.0	
	C	27	32			29.5	28.5	
	D	44				44	43.0	
2.95	A	49				49	48.0	
	B	42				42	41.0	
	C	50				50	49.0	
	D	41				41	40.0	
5.9	A	31				31	30.0	
	B	23	29			26	25.0	
	C	43				43	42.0	
	D	33				33	32.0	
11.9	A	16				16	15.0	
	B	24				24	23.0	
	C	14				14	13.0	
	D	21				21	20.0	
23.8	A	18				18	17.0	
	B	13				13	12.0	
	C	15				15	14.0	
	D	11				11	10.0	
47.6	A	16				16	15.0	
	B	10				10	9.0	
	C	14				14	13.0	
	D	9				9	8.0	
95.2	A	5				5	4.0	
	B	0				0	-1.0	
	C	3				3	2.0	
	D	1				1	0.0	

ART  
 Aug 25/09

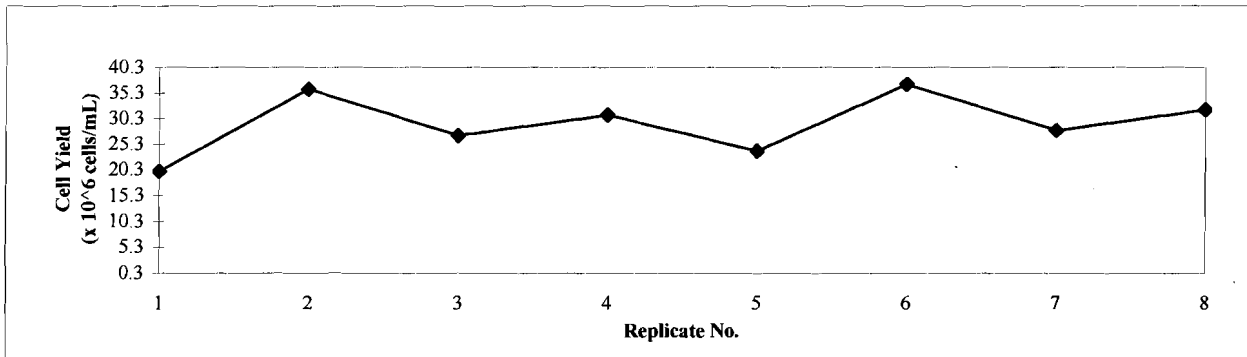
**72-h *Pseudokirchneriella subcapitata* Test - Trend Analysis by Mann-Kendall Test.**

**Instructions:**

1. Enter the project number, work order number and sample ID in the highlighted cells.
2. Enter the negative control cell yield data ( $X \times 10^6$  cells/mL) into the highlighted spreadsheet cells.
3. Compare the calculated S value to the table of critical S values at the bottom of the page.
4. If the calculated S value is smaller than the S value in the table, there is no statistically significant trend.

Client: Rescan Sample ID: NTR-2  
 W.O. No.: 09209 Test Date: 7-Jul-09

Rep No.	1	2	3	4	5	6	7	8	Count of + Signs	Count of - Signs
Data Value	20.0	36.0	27.0	31.0	24.0	37.0	28.0	32.0		
(- Rep 1)		16.000	7.000	11.000	4.000	17.000	8.000	12.000	7	0
(- Rep 2)			-9.000	-5.000	-12.000	1.000	-8.000	-4.000	1	5
(- Rep 3)				4.000	-3.000	10.000	1.000	5.000	4	1
(- Rep 4)					-7.000	6.000	-3.000	1.000	2	2
(- Rep 5)						13.000	4.000	8.000	3	0
(- Rep 6)							-9.000	-5.000	0	2
(- Rep 7)								4.000	1	0
<b>Totals</b>									18	10
									<b>S =</b>	<b>8</b>



**Critical values of (S) at a probability of p = 0.05, when the number of replicates (n) is 10 or less.**

n	4	5	6	7	8	9	10
S	4	6	9	11	14	16	19

If your calculated value for S (for the applicable number of replicates) is equal to or less than the corresponding value for S in the above table, then there is no statistically significant trend present. Refer to Gilbert (1987) for complete table of probabilities for the Mann-Kendall test.

**Reference:**

Gilbert, R.O. 1987. Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold, NY. 320 pp.

RET  
Aug 25/09

**CETIS Analytical Report**

Report Date: 22 Jul-09 11:39 (p 1 of 2)

Link/Link Code: 11-8479-9951/09209NTR2

<b>Selenastrum Growth Test</b>			<b>Nautilus Environmental</b>		
--------------------------------	--	--	-------------------------------	--	--

<b>Analysis No:</b> 17-5662-5881	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 22 Jul-09 11:15	<b>Analysis:</b> Parametric-Multiple Comparison	<b>Official Results:</b> Yes

<b>Sample No:</b> 15-8701-5008	<b>Code:</b> NTR-2	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09	<b>Source:</b> Rescan	
<b>Sample Age:</b> 48h	<b>Station:</b>	

<b>Data Transform</b>	<b>Zeta</b>	<b>Alt Hyp</b>	<b>Monte Carlo</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>TU</b>	<b>PMSD</b>
Untransformed		C > T	Not Run	5.9	11.9	8.379	16.95	27.96%

<b>Bonferroni Adj t Test</b>							
Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		1.48	-2.346	2.613	8.212	1.0000	Non-Significant Effect
		2.95	-4.812	2.613	8.212	1.0000	Non-Significant Effect
		5.9	-0.9147	2.613	8.212	1.0000	Non-Significant Effect
		11.9*	3.699	2.613	8.212	0.0033	Significant Effect
		23.8*	5.13	2.613	8.212	0.0001	Significant Effect
		47.6*	5.767	2.613	8.212	0.0000	Significant Effect
		95.2*	8.869	2.613	8.212	0.0000	Significant Effect

<b>ANOVA Table</b>						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	6128.375	875.4821	7	33.23	0.0000	Significant Effect
Error	737.625	26.34375	28			
Total	6866	901.8259	35			

<b>ANOVA Assumptions</b>						
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)	
Variances	Bartlett Equality of Variance	6.674	18.48	0.4636	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.9856		0.9113	Normal Distribution	

<b>Cell Density Summary</b>											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Contr	8	29.38	27.12	31.63	20	37	1.097	5.805	19.76%	0.0%
1.48		4	36.75	34	39.5	28	43	1.34	7.089	19.29%	-25.11%
2.95		4	44.5	42.7	46.3	40	49	0.8797	4.655	10.46%	-51.49%
5.9		4	32.25	29.48	35.02	25	42	1.349	7.136	22.13%	-9.79%
11.9		4	17.75	15.98	19.52	13	23	0.8643	4.573	25.77%	39.57%
23.8		4	13.25	12.09	14.41	10	17	0.5643	2.986	22.54%	54.89%
47.6		4	11.25	9.969	12.53	8	15	0.6244	3.304	29.37%	61.7%
95.2		4	1.5	0.7575	2.243	0	4	0.3619	1.915	127.7%	94.89%

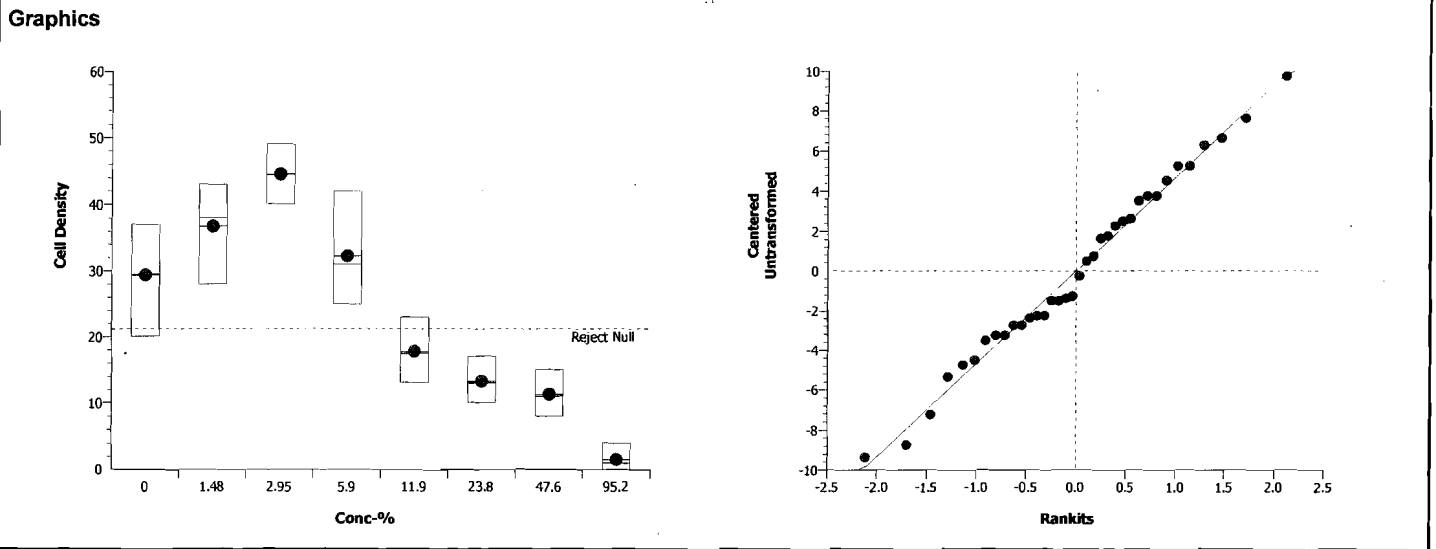
*ERT*  
*QA AUG 25/09*

**CETIS Analytical Report**

Report Date: 22 Jul-09 11:39 (p 2 of 2)  
 Link/Link Code: 11-8479-9951/09209NTR2

<b>Selenastrum Growth Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 17-5662-5881	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 22 Jul-09 11:15	<b>Analysis:</b> Parametric-Multiple Comparison	<b>Official Results:</b> Yes			

<b>Cell Density Detail</b>									
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Contr	37	36	32	31	28	27	24	20
1.48		43	42	34	28				
2.95		49	48	41	40				
5.9		42	32	30	25				
11.9		23	20	15	13				
23.8		17	14	12	10				
47.6		15	13	9	8				
95.2		4	2	0	0				



RT  
 QA Aug 25/09

**CETIS Analytical Report**

Report Date: 22 Jul-09 11:39 (p 3 of 4)

Link/Link Code: 11-8479-9951/09209NTR2

<b>Selenastrum Growth Test</b>		<b>Nautilus Environmental</b>
--------------------------------	--	-------------------------------

<b>Analysis No:</b> 11-4341-1068	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0
<b>Analyzed:</b> 22 Jul-09 11:16	<b>Analysis:</b> Nonlinear Regression	<b>Official Results:</b> Yes

<b>Sample No:</b> 15-8701-5008	<b>Code:</b> NTR-2	<b>Client:</b> Rescan
<b>Sample Date:</b> 05 Jul-09	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 07 Jul-09	<b>Source:</b> Rescan	
<b>Sample Age:</b> 48h	<b>Station:</b>	

<b>Non-Linear Regression Options</b>				
<b>Model Function</b>	<b>X Transform</b>	<b>Y Transform</b>	<b>Weighting Function</b>	<b>PTBS Function</b>
4P Log-Logistic+Hormesis EV [Y=A(1+EX)/(1+(2ED+1)(X/D)^C)]	None	None	Normal [W=1]	Off [Y*=Y]

<b>Regression Summary</b>								
<b>Iters</b>	<b>Log LL</b>	<b>AICc</b>	<b>Adj R2</b>	<b>Optimize</b>	<b>F Stat</b>	<b>Critical</b>	<b>P-Value</b>	<b>Decision(1%)</b>
13	-77.66	164.6	0.8423	Yes	2.395	4.074	0.0742	Non-Significant Lack of Fit

<b>Point Estimates</b>			
<b>% Effect</b>	<b>Conc-%</b>	<b>95% LCL</b>	<b>95% UCL</b>
SNEC	10.85	8.953	13.36
10	8.77	N/A	10.83
15	9.538	7.828	11.74
20	10.39	8.564	12.78
25	11.35	9.368	13.99
40	15.17	12.33	19.27
50	19.03	15	25.36

<b>Regression Parameters</b>							
<b>Parameter</b>	<b>Estimate</b>	<b>Std Error</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>t Stat</b>	<b>P-Value</b>	<b>Decision(5%)</b>
A	29	1.808	25.31	32.68	16.04	0.0000	Significant Parameter
C	1.804	0.1291	1.541	2.067	13.97	0.0000	Significant Parameter
D	19.03	2.819	13.29	24.77	6.751	0.0000	Significant Parameter
E	0.4068	0.157	0.08702	0.7265	2.591	0.0143	Significant Parameter

<b>ANOVA Table</b>						
<b>Source</b>	<b>Sum Squares</b>	<b>Mean Square</b>	<b>DF</b>	<b>F Stat</b>	<b>P-Value</b>	<b>Decision(1%)</b>
Model	5876	1958.667	3	63.31	0.0000	Significant
Lack of Fit	252.3751	63.09378	4	2.395	0.0742	Non-Significant
Pure Error	737.625	26.34375	28			
Residual	990.0001	30.9375	32			

<b>Residual Analysis</b>					
<b>Attribute</b>	<b>Method</b>	<b>Test Stat</b>	<b>Critical</b>	<b>P-Value</b>	<b>Decision(1%)</b>
Variances	Bartlett Equality of Variance	6.674	18.48	0.4636	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9745		0.5619	Normal Distribution

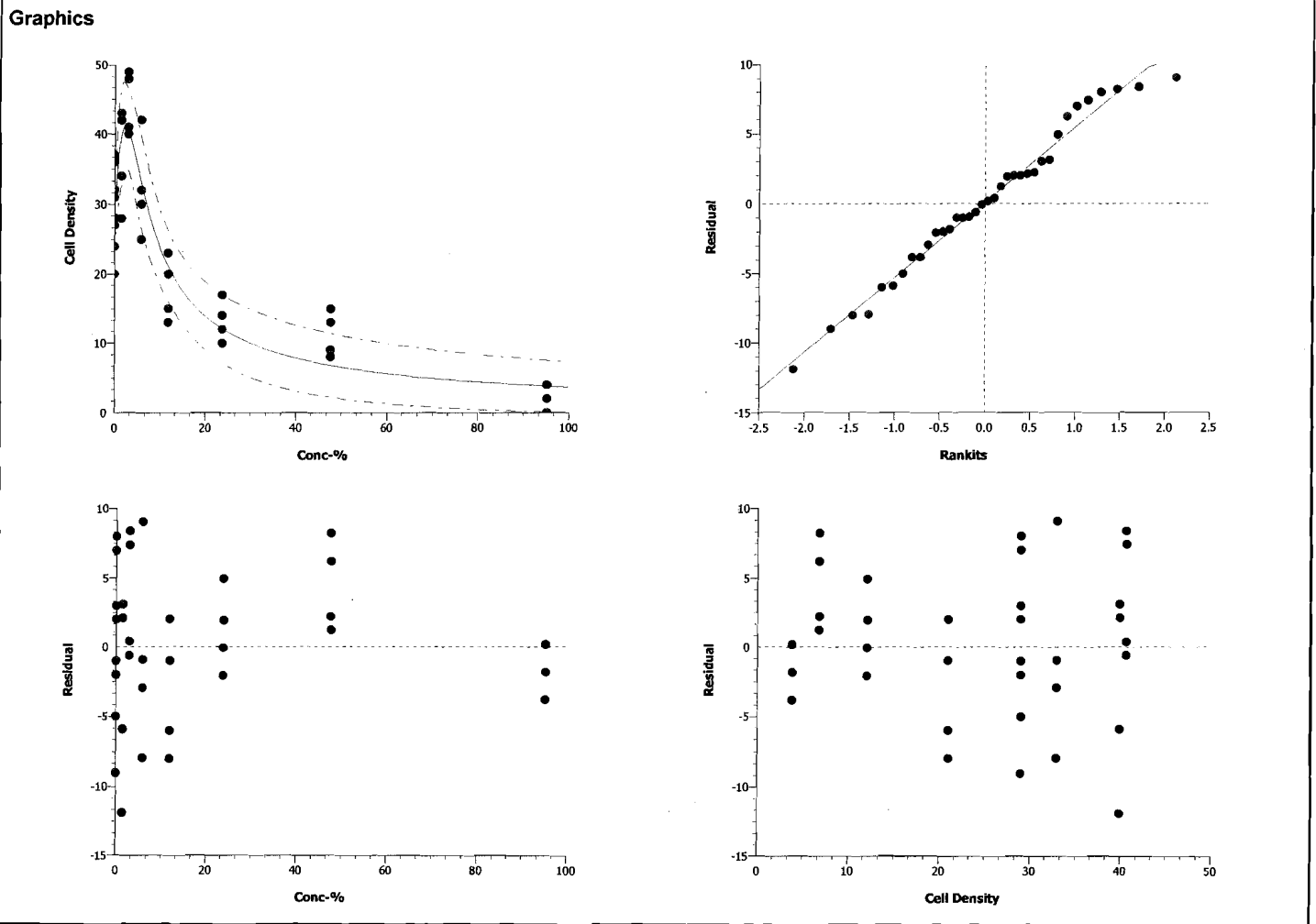
<b>Cell Density Summary</b>			<b>Calculated Variate</b>						
<b>Conc-%</b>	<b>Control Type</b>	<b>Count</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>Diff%</b>
0	Negative Control	8	29.38	20	37	1.078	5.805	19.76%	0.0%
1.48		4	36.75	28	43	1.316	7.089	19.29%	-25.11%
2.95		4	44.5	40	49	0.8644	4.655	10.46%	-51.49%
5.9		4	32.25	25	42	1.325	7.136	22.13%	-9.79%
11.9		4	17.75	13	23	0.8493	4.573	25.77%	39.57%
23.8		4	13.25	10	17	0.5545	2.986	22.54%	54.89%
47.6		4	11.25	8	15	0.6135	3.304	29.37%	61.7%
95.2		4	1.5	0	4	0.3556	1.915	127.7%	94.89%

ART  
QA AUG 25/09



Selenastrum Growth Test			Nautilus Environmental		
Analysis No: 11-4341-1068	Endpoint: Cell Density	CETIS Version: CETISv1.5.0			
Analyzed: 22 Jul-09 11:16	Analysis: Nonlinear Regression	Official Results: Yes			

Cell Density Detail									
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Control	20	36	27	31	24	37	28	32
1.48		34	42	28	43				
2.95		48	41	49	40				
5.9		30	25	42	32				
11.9		15	23	13	20				
23.8		17	12	14	10				
47.6		15	9	13	8				
95.2		4	0	2	0				



**Pseudokirchneriella subcapitata Summary Sheet**

Client: RESCAN  
 Work Order No.: 09209

Start Date: July 7, 2009  
 Set up by: BA

**Sample Information:**

Sample ID: SCR  
 Sample Date: July 5, 2009  
 Date Received: July 7, 2009  
 Sample Volume: 9 X 112

**Test Organism Information:**

Culture Date: July 2, 2009  
 Age of culture (Day 0): 5d

**Zinc Reference Toxicant Results:**

Reference Toxicant ID: SC48  
 Stock Solution ID: 09 Zn 01  
 Date Initiated: July 9, 2009  
 72-h IC50 (95% CL): 32.4 28.5 39.0  
31.6 (24.4 - 36.5) µg/L Zn

72-h IC50 Reference Toxicant Mean ± 2 SD: 17.1 ± 12.0 µg/L Zn CV (%): 35

Test Results:	Algal Growth
NOEC %(v/v)	47.6
LOEC %(v/v)	95.2
IC25 %(v/v) (95% CL)	51.1 (48.3 - 54.6)
IC50 %(v/v) (95% CL)	55.4 (51.5 - 61.2)

Reviewed by: L. Terry

Date reviewed: August 26, 2009

## 72-h Algal Growth Inhibition Toxicity Test Water Quality Measurements

Client : Rescan Setup by: EE  
 Sample ID: SCF Test Date/Time: July 7, 2009 1400h  
 Work Order No.: 09209 Test Species: Pseudokirchneriella subcapitata

Culture Date: July 2, 2009 Age of Culture: 5 d Culture Health: Good  
 Culture Count: 1 237 2 223 Average: 230 Culture Cell Density (c1): 230 x 10<sup>4</sup>

$$v1 = \frac{220,000 \text{ cells/ml} \times 100 \text{ ml}}{(c1) 230 \times 10^4 \text{ cells/ml}} = 9.56 \text{ mL}$$

Time Zero Counts: 1 20 2 23 Average: 21.5 x 10<sup>4</sup>

No. of Cells/mL: 21.5 x 10<sup>4</sup> Initial Density: # cells/mL ÷ 220 µL x 10 µL = 9773

Concentration %(v/v)	Water Quality Measurements					Microplates rotated 2X per day?			
	pH	Temp (°C)				0 h	24 h	48 h	72 h
	0 h	0 h	24 h	48 h	72 h				
Control	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
1.48	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
2.95	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
5.9	6.9	24.6	24.9	24.3	25.4	✓	✓	✓	✓
11.9	7.0	24.7	24.9	24.3	25.4	✓	✓	✓	✓
23.8	7.1	24.7	24.9	24.3	25.4	✓	✓	✓	✓
47.6	7.2	24.9	24.9	24.3	25.4	✓	✓	✓	✓
95.2	7.4	24.9	24.9	24.3	25.4	✓	✓	✓	✓
Initials	EE	EE	EE	JLT	JLT	EE	EE	JLT	JLT

Initial control pH: Well 1: 6.8 Well 2: 6.8

Final control pH: Well 1: 6.8 Well 2: 6.8

Light intensity (lux): 3980 Date measured: July 7, 2009

Sample Description: light yellow, turbid

Comments: \_\_\_\_\_

Reviewed: A. Terry Date reviewed: August 25, 2009

***Pseudokirchneriella subcapitata* Toxicity Test Data Sheet**  
**72-h Algal Cell Counts**

Client: Rescan Start Date/Time: July 7/09 @ 1400h  
 Work Order #: 09209 Termination Date: July 10/09  
 Sample ID: SCR Test set up by: ECC  
 % (V/V)

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A	25					JLT
	B	31					
	C	27					
	D	35					
	E	32					
	F	28	24				
	G	39					
	H	26					
1.48	A	31					
	B	23					
	C	32					
	D	29					
2.95	A	35					
	B	19	26				
	C	31					
	D	23					
5.9	A	45					
	B	38					
	C	49					
	D	36					
11.9	A	52					
	B	60					
	C	78					
	D	48					
23.8	A	62					
	B	73					
	C	67					
	D	77					
47.6	A	21					
	B	31					
	C	28					
	D	30					
95.2	A	8					
	B	0					
	C	4					
	D	2					

Comments:

Reviewed by: A. Terry Date Reviewed: August 10, 2009

***Pseudokirchneriella subcapitata* Algal Counts**

Client: Rescan  
 WO#: 09209  
 Sample ID: SCR

Start Date/Time: 7-Jul-09 @1400h  
 Termination Date: 10-Jul-09

Initial Cell Density: 9772.73 cell/mL  
 215000  
 0.22  
 0.01  
 9772.727

Concentration % v/v	Rep	Count 1 (x 10 <sup>4</sup> )	Count 2 (x 10 <sup>4</sup> )	Count 3 (x 10 <sup>4</sup> )	Count 4 (x 10 <sup>4</sup> )	Mean (x 10 <sup>4</sup> )	Cell Yield (x 10 <sup>4</sup> ) cell/mL	
Control	A	25				25	24.0	mean
	B	31				31	30.0	SD
	C	27				27	26.0	CV
	D	35				35	34.0	
	E	32				32	31.0	
	F	28	24			26	25.0	
	G	39				39	38.0	
	H	26				26	25.0	
1.48	A	31				31	30.0	
	B	23				23	22.0	
	C	32				32	31.0	
	D	29				29	28.0	
2.95	A	35				35	34.0	
	B	19	26			22.5	21.5	
	C	31				31	30.0	
	D	23				23	22.0	
5.9	A	45				45	44.0	
	B	38				38	37.0	
	C	49				49	48.0	
	D	36				36	35.0	
11.9	A	52				52	51.0	
	B	60				60	59.0	
	C	58				58	57.0	
	D	48				48	47.0	
23.8	A	62				62	61.0	
	B	73				73	72.0	
	C	67				67	66.0	
	D	77				77	76.0	
47.6	A	21				21	20.0	
	B	31				31	30.0	
	C	28				28	27.0	
	D	30				30	29.0	
95.2	A	8				8	7.0	
	B	0				0	-1.0	
	C	4				4	3.0	
	D	2				2	1.0	

RET  
 Aug 25/09

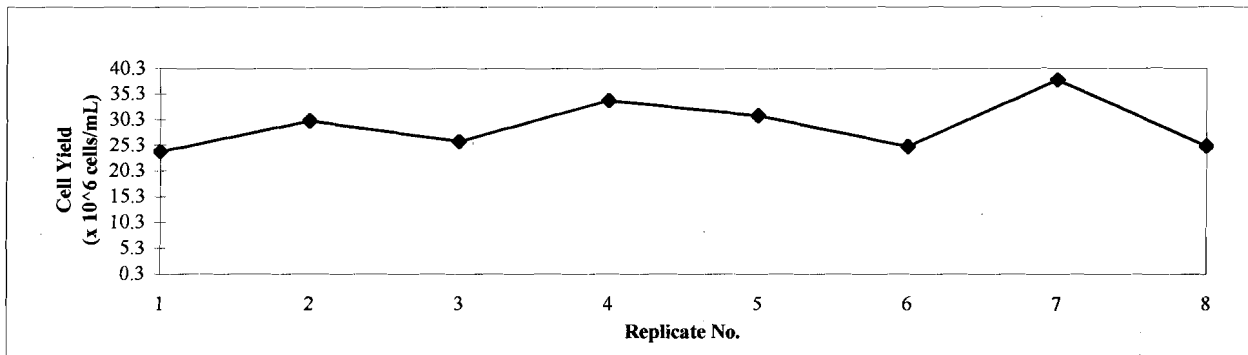
**72-h *Pseudokirchneriella subcapitata* Test - Trend Analysis by Mann-Kendall Test.**

**Instructions:**

1. Enter the project number, work order number and sample ID in the highlighted cells.
2. Enter the negative control cell yield data ( $X \times 10^6$  cells/mL) into the highlighted spreadsheet cells.
3. Compare the calculated S value to the table of critical S values at the bottom of the page.
4. If the calculated S value is smaller than the S value in the table, there is no statistically significant trend.

Client: Rescan Sample ID: SCR  
 W.O. No.: 09209 Test Date: 7-Jul-09

Rep No.	1	2	3	4	5	6	7	8	Count of + Signs	Count of - Signs
Data Value	24.0	30.0	26.0	34.0	31.0	25.0	38.0	25.0		
(- Rep 1)		6.000	2.000	10.000	7.000	1.000	14.000	1.000	7	0
(- Rep 2)			-4.000	4.000	1.000	-5.000	8.000	-5.000	3	3
(- Rep 3)				8.000	5.000	-1.000	12.000	-1.000	3	2
(- Rep 4)					-3.000	-9.000	4.000	-9.000	1	3
(- Rep 5)						-6.000	7.000	-6.000	1	2
(- Rep 6)							13.000	0.000	1	0
(- Rep 7)								-13.000	0	1
<b>Totals</b>									16	11
									<b>S =</b>	5



**Critical values of (S) at a probability of p = 0.05, when the number of replicates (n) is 10 or less.**

n	4	5	6	7	8	9	10
S	4	6	9	11	14	16	19

If your calculated value for S (for the applicable number of replicates) is equal to or less than the corresponding value for S in the above table, then there is no statistically significant trend present. Refer to Gilbert (1987) for complete table of probabilities for the Mann-Kendall test.

**Reference:**

Gilbert, R.O. 1987. Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold, NY. 320 pp.

ART  
Aug 25/09

**CETIS Analytical Report**

Report Date: 22 Jul-09 11:38 (p 1 of 2)

Link/Link Code: 06-9460-0831/09209SCR

<b>Selenastrum Growth Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 12-1089-1511	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 22 Jul-09 11:22	<b>Analysis:</b> Parametric-Multiple Comparison	<b>Official Results:</b> Yes			
<b>Sample No:</b> 19-1989-8496	<b>Code:</b> SCR	<b>Client:</b> Rescan			
<b>Sample Date:</b> 05 Jul-09	<b>Material:</b> Water Sample	<b>Project:</b>			
<b>Receive Date:</b> 07 Jul-09	<b>Source:</b> Rescan				
<b>Sample Age:</b> 48h	<b>Station:</b>				

<b>Data Transform</b>	<b>Zeta</b>	<b>Alt Hyp</b>	<b>Monte Carlo</b>	<b>NOEL</b>	<b>LOEL</b>	<b>TOEL</b>	<b>TU</b>	<b>PMSD</b>
Untransformed		C > T	Not Run	47.6	95.2	67.32	2.101	28.53%

<b>Bonferroni Adj t Test</b>							
<b>Control</b>	<b>vs</b>	<b>Conc-%</b>	<b>Test Stat</b>	<b>Critical</b>	<b>MSD</b>	<b>P-Value</b>	<b>Decision(5%)</b>
Negative Control		1.48	0.4324	2.613	8.309	1.0000	Non-Significant Effect
		2.95	0.6682	2.613	8.309	1.0000	Non-Significant Effect
		5.9	-3.734	2.613	8.309	1.0000	Non-Significant Effect
		11.9	-7.665	2.613	8.309	1.0000	Non-Significant Effect
		23.8	-12.46	2.613	8.309	1.0000	Non-Significant Effect
		47.6	0.8254	2.613	8.309	1.0000	Non-Significant Effect
		95.2*	8.294	2.613	8.309	0.0000	Significant Effect

<b>ANOVA Table</b>						
<b>Source</b>	<b>Sum Squares</b>	<b>Mean Square</b>	<b>DF</b>	<b>F Stat</b>	<b>P-Value</b>	<b>Decision(5%)</b>
Between	11220.76	1602.966	7	59.44	0.0000	Significant Effect
Error	755.125	26.96875	28			
Total	11975.89	1629.935	35			

<b>ANOVA Assumptions</b>						
<b>Attribute</b>	<b>Test</b>	<b>Test Stat</b>	<b>Critical</b>	<b>P-Value</b>	<b>Decision(1%)</b>	
Variances	Bartlett Equality of Variance	2.102	18.48	0.9540	Equal Variances	
Distribution	Shapiro-Wilk Normality	0.9507		0.1098	Normal Distribution	

<b>Cell Density Summary</b>											
<b>Conc-%</b>	<b>Control Type</b>	<b>Count</b>	<b>Mean</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>Diff%</b>
0	Negative Contr	8	29.13	27.18	31.07	24	38	0.95	5.027	17.26%	0.0%
1.48		4	27.75	26.19	29.31	22	31	0.7618	4.031	14.53%	4.72%
2.95		4	27	24.67	29.33	22	34	1.134	6	22.22%	7.3%
5.9		4	41	38.65	43.35	35	48	1.144	6.055	14.77%	-40.77%
11.9		4	53.5	51.36	55.64	47	59	1.041	5.508	10.29%	-83.69%
23.8		4	68.75	66.19	71.31	61	76	1.248	6.602	9.6%	-136.1%
47.6		4	26.5	24.75	28.25	20	30	0.8522	4.509	17.02%	9.01%
95.2		4	2.75	1.55	3.95	0	7	0.585	3.096	112.6%	90.56%

*LR*  
*QA July 25/09*

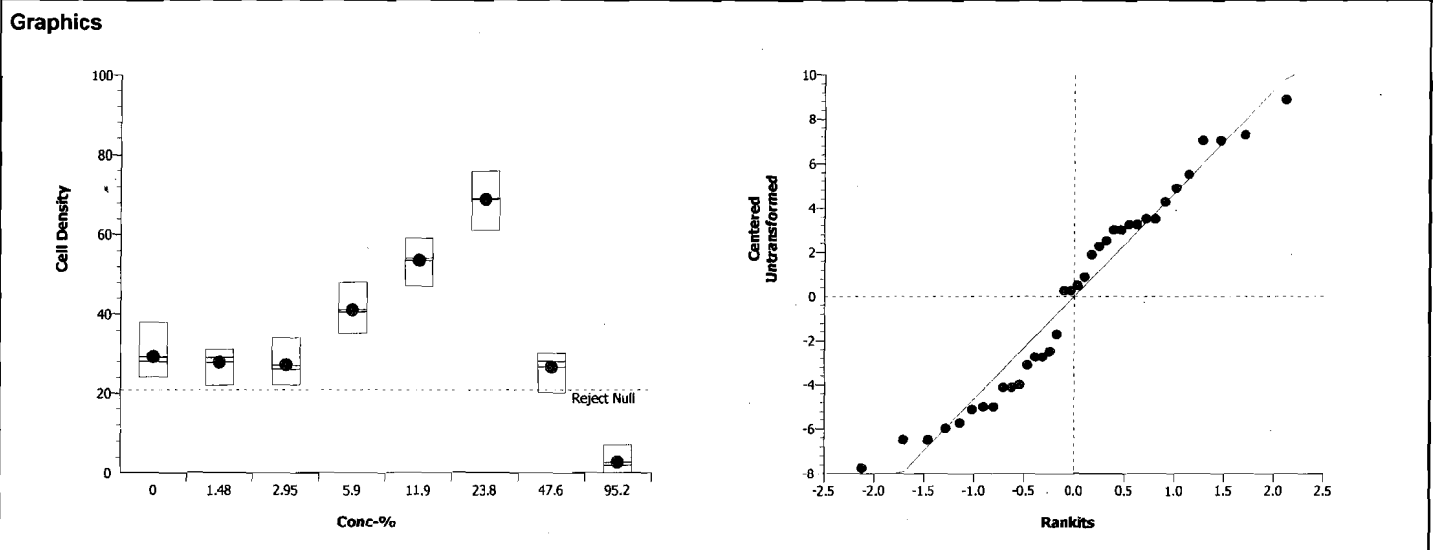
**CETIS Analytical Report**

Report Date: 22 Jul-09 11:38 (p 2 of 2)

Link/Link Code: 06-9460-0831/09209SCR

<b>Selenastrum Growth Test</b>			<b>Nautilus Environmental</b>		
<b>Analysis No:</b> 12-1089-1511	<b>Endpoint:</b> Cell Density	<b>CETIS Version:</b> CETISv1.5.0			
<b>Analyzed:</b> 22 Jul-09 11:22	<b>Analysis:</b> Parametric-Multiple Comparison	<b>Official Results:</b> Yes			

<b>Cell Density Detail</b>									
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Contr	38	34	31	30	26	25	25	24
1.48		31	30	28	22				
2.95		34	30	22	22				
5.9		48	44	37	35				
11.9		59	57	51	47				
23.8		76	72	66	61				
47.6		30	29	27	20				
95.2		7	3	1	0				





**CETIS Analytical Report**

Report Date: 22 Jul-09 11:38 (p 1 of 2)  
 Link/Link Code: 06-9460-0831/09209SCR

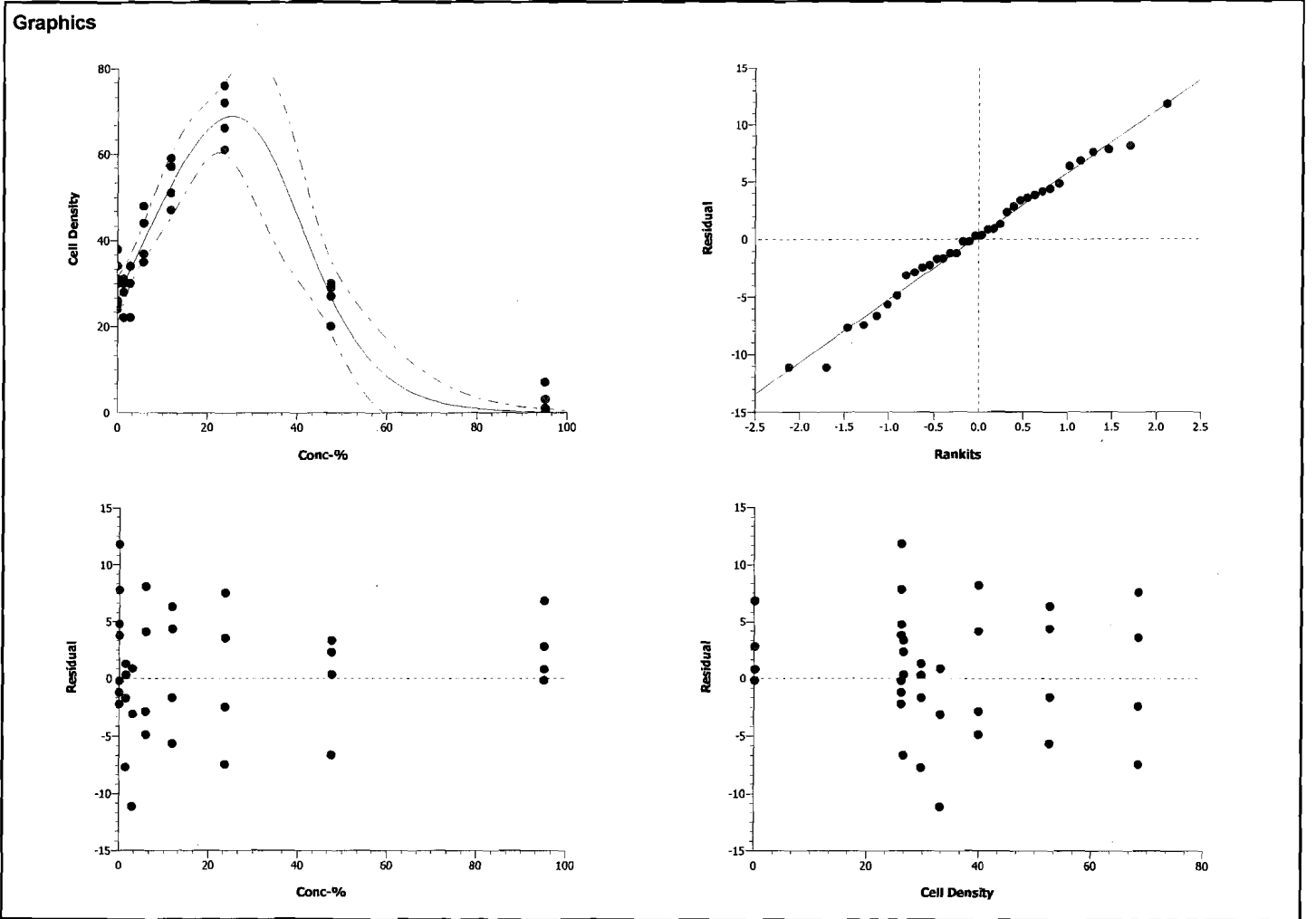
Selenastrum Growth Test			Nautilus Environmental						
Analysis No:	16-8820-8168	Endpoint:	Cell Density	CETIS Version:		CETISv1.5.0			
Analyzed:	22 Jul-09 11:24	Analysis:	Nonlinear Regression	Official Results:		Yes			
Sample No:	19-1989-8496	Code:	SCR	Client:	Rescan				
Sample Date:	05 Jul-09	Material:	Water Sample	Project:					
Receive Date:	07 Jul-09	Source:	Rescan						
Sample Age:	48h	Station:							
Non-Linear Regression Options									
Model Function			X Transform	Y Transform	Weighting Function	PTBS Function			
4P Logistic+Hormesis [Y=A(1+EX)/(1+exp(-C(X-D)))]			None	None	Normal [W=1]	Off [Y*=Y]			
Regression Summary									
Iters	Log LL	AICc	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(1%)	
14	-78.25	165.8	0.9065	Yes	2.486	4.074	0.0663	Non-Significant Lack of Fit	
Point Estimates									
% Effect	Conc-%	95% LCL	95% UCL						
SNEC	54.31	50.7	59.44						
10	49.05	N/A	51.91						
15	49.7	N/A	52.75						
20	50.39	N/A	53.66						
25	51.11	48.27	54.64						
40	53.52	50.11	58.19						
50	55.41	51.52	61.24						
Regression Parameters									
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(5%)		
A	26.55	1.416	23.66	29.43	18.75	0.0000	Significant Parameter		
C	-0.1226	0.02439	-0.1723	-0.07292	-5.027	0.0000	Significant Parameter		
D	35.61	3.793	27.89	43.34	9.389	0.0000	Significant Parameter		
E	0.09178	0.02095	0.0491	0.1345	4.381	0.0001	Significant Parameter		
ANOVA Table									
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(1%)			
Model	10952.59	3650.865	3	114.2	0.0000	Significant			
Lack of Fit	268.1693	67.04233	4	2.486	0.0663	Non-Significant			
Pure Error	755.125	26.96875	28						
Residual	1023.294	31.97795	32						
Residual Analysis									
Attribute	Method	Test Stat	Critical	P-Value	Decision(1%)				
Variances	Bartlett Equality of Variance	2.102	18.48	0.9540	Equal Variances				
Distribution	Shapiro-Wilk Normality	0.9851		0.8979	Normal Distribution				
Cell Density Summary									
Conc-%	Control Type	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	8	29.13	24	38	0.9334	5.027	17.26%	0.0%
1.48		4	27.75	22	31	0.7486	4.031	14.53%	4.72%
2.95		4	27	22	34	1.114	6	22.22%	7.3%
5.9		4	41	35	48	1.124	6.055	14.77%	-40.77%
11.9		4	53.5	47	59	1.023	5.508	10.29%	-83.69%
23.8		4	68.75	61	76	1.226	6.602	9.6%	-136.1%
47.6		4	26.5	20	30	0.8373	4.509	17.02%	9.01%
95.2		4	2.75	0	7	0.5749	3.096	112.6%	90.56%

# CETIS Analytical Report

Report Date: 22 Jul-09 11:38 (p 2 of 2)  
 Link/Link Code: 06-9460-0831/09209SCR

<b>Selenastrum Growth Test</b>				<b>Nautilus Environmental</b>					
Analysis No: 16-8820-8168		Endpoint: Cell Density		CETIS Version: CETISv1.5.0					
Analyzed: 22 Jul-09 11:24		Analysis: Nonlinear Regression		Official Results: Yes					

Cell Density Detail									
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Control	24	30	26	34	31	25	38	25
1.48		30	22	31	28				
2.95		34	22	30	22				
5.9		44	37	48	35				
11.9		51	59	57	47				
23.8		61	72	66	76				
47.6		20	30	27	29				
95.2		7	0	3	1				



**APPENDIX E - 96-h LC50 *Oncorhynchus mykiss* Toxicity Test Data**

# Rainbow Trout Summary Sheet

Client: RESCHM

Start Date/Time: July 8/09 @ 1600

Work Order No.: 09207

Test Species: Oncorhynchus mykiss

## Sample Information:

Sample ID: SCV  
Sample Date: July 5/09  
Date Received: July 7/09  
Sample Volume: 2X20L  
Other: -

## Dilution Water:

Type: Dechlorinated municipal Tap Water  
Hardness (mg/L CaCO<sub>3</sub>): 12  
Alkalinity (mg/L CaCO<sub>3</sub>): 10

## Test Organism Information:

Batch No.: 061809  
Source: Sim Valley  
Test Volume/No. Fish: 1/10L  
Loading Density: 0.32  
Mean Length ± SD (mm): 32 ± 3 mm Range: 28-37  
Mean Weight ± SD (g): 0.32 ± 0.04 g Range: 0.27-0.41

## SDS Reference Toxicant Results:

Reference Toxicant ID: 09 RT 49  
Stock Solution ID: 09503  
Date Initiated: June 30/09  
96-h LC50 (95% CL): 6.1 (5.1-7.3)  
Reference Toxicant Mean ± 2 SD: 5.0 ± 1.1  
Reference Toxicant CV (%): 11.2

Test Results: The 96-h LC50 > 100% (d/d)

Reviewed by: [Signature]

Date reviewed: Aug 26/09

### 96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: Rexcon  
 Sample I.D. SC 2  
 W.O. # 09207  
 RBT Batch #: 061809  
 Date Collected/Time: July 5/09 @ 0930  
 Date Setup/Time: July 8/09 @ 1600  
 Sample Setup By: JLT

Number Fish/Volume: 10/10L  
 7-d % Mortality: 0 %  
 Total Pre-aeration Time (mins): 30 min  
 Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Y

D.O. meter: DO-1  
 pH meter: pH-1  
 Cond. Meter: C-1

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	14.5	/	14.5
pH	7.2	/	7.2
D.O. (mg/L)	10.0	/	10.0
Cond. (µS/cm)	171	/	171

Concentration % (V/V)	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
control				10	10	10	10	14.2	14.3	14.3	14.2	14.2	10.1	10.2	10.1	10.0	10.2	6.9	7.1	7.0	7.1	7.1	35	41
6.25				10	10	10	10	14.2	14.3	14.3	14.2	14.2	10.1	10.0	10.1	10.1	10.1	6.9	7.1	7.1	7.2	7.2	43	49
12.5				10	10	10	10	14.3	14.3	14.3	14.2	14.2	10.1	10.0	10.0	10.0	10.1	7.0	7.0	7.1	7.2	7.3	54	63
25				10	10	10	10	14.4	14.3	14.3	14.2	14.2	10.0	10.1	10.0	10.1	10.2	7.1	7.0	7.1	7.2	7.4	79	84
50				10	10	10	10	14.5	14.3	14.3	14.2	14.2	10.0	10.0	10.1	10.1	10.2	7.1	7.0	7.2	7.4	7.4	104	110
100				10	10	10	10	14.5	14.3	14.3	14.2	14.2	10.0	10.0	10.1	10.1	10.1	7.2	7.3	7.3	7.5	7.5	171	179
Initials				JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT

Sample Description/Comments: cloudy, some particulate

Fish Description at 96? all fish appear DL

Other Observations: \_\_\_\_\_

Reviewed by: EA

Date Reviewed: Aug. 26/09

# Rainbow Trout Summary Sheet

Client: Rescon

Start Date/Time: July 8/09 @ 1545

Work Order No.: 09207

Test Species: Oncorhynchus mykiss

## Sample Information:

Sample ID: STE 2  
Sample Date: July 5/09  
Date Received: July 7/09  
Sample Volume: 2x20L  
Other: \_\_\_\_\_

## Dilution Water:

Type: Dechlorinated municipal Tap Water  
Hardness (mg/L CaCO<sub>3</sub>): 12  
Alkalinity (mg/L CaCO<sub>3</sub>): 10

## Test Organism Information:

Batch No.: 061809  
Source: San Valley  
Test Volume/No. Fish: 1/10L  
Loading Density: 0.33  
Mean Length ± SD (mm): 33 ± 3 mm      Range: 30 - 38  
Mean Weight ± SD (g): 0.33 ± 0.03 g      Range: 0.29 - 0.39

## SDS Reference Toxicant Results:

Reference Toxicant ID: 09 RT 47  
Stock Solution ID: 09803  
Date Initiated: June 30/09  
96-h LC50 (95% CL): 6.1 (5.1 - 7.3)  
Reference Toxicant Mean ± 2 SD: 5.0 ± 1.1  
Reference Toxicant CV (%): 11%

Test Results: The 96-h LC50 > 100% (1/1)

Reviewed by: [Signature]

Date reviewed: Aug 26/09

### 96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: Rescon  
 Sample I.D. STEZ  
 W.O. # 09207  
 RBT Batch #: 061809  
 Date Collected/Time: July 5/09 @ 1315  
 Date Setup/Time: July 18/09 @ 1545  
 Sample Setup By: JLT

Number Fish/Volume: 10/10L  
 7-d % Mortality: 0%  
 Total Pre-aeration Time (mins): 30 min  
 Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Y

D.O. meter: DO-1  
 pH meter: pH-1  
 Cond. Meter: C-1

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	14.4	/	14.4
pH	7.1	/	7.1
D.O. (mg/L)	10.0	/	10.0
Cond. (µS/cm)	60		60

Concentration % (V/V)	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
control				10	10	10	10	14.2	14.2	14.3	14.2	14.2	10.1	10.2	10.1	10.1	10.1	6.9	7.1	7.0	7.1	7.2	35	41
6.25				10	10	10	10	14.2	14.2	14.3	14.2	14.2	10.1	10.1	10.1	10.1	10.0	6.9	7.1	7.0	7.0	7.2	37	41
12.5				10	10	10	10	14.3	14.2	14.3	14.2	14.2	10.1	10.1	10.0	10.0	10.0	7.0	7.1	7.0	7.2	7.1	39	43
25				10	10	10	10	14.3	14.2	14.3	14.2	14.2	10.1	10.2	10.0	10.0	10.0	7.0	7.0	7.0	7.1	7.1	44	48
50				10	10	10	10	14.4	14.2	14.3	14.2	14.2	10.0	10.1	10.0	10.0	10.0	7.1	6.9	7.1	7.2	7.1	50	57
100				10	10	10	10	14.4	14.2	14.3	14.2	14.2	10.0	10.0	10.1	10.0	10.0	7.1	6.9	7.1	7.2	7.0	60	60
Initials				JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT

Sample Description/Comments: lightly cloudy some particulate

Fish Description at 96? all fish appear ok

Other Observations: \_\_\_\_\_

Reviewed by: [Signature]

Date Reviewed: Aug. 26/09

# Rainbow Trout Summary Sheet

Client: Rescon

Start Date/Time: July 8/09 @ 1550

Work Order No.: 09207

Test Species: Oncorhynchus mykiss

### Sample Information:

Sample ID: NTR2  
Sample Date: July 5/09  
Date Received: July 7/09  
Sample Volume: 2x20L  
Other: \_\_\_\_\_

### Dilution Water:

Type: Dechlorinated municipal Tap Water  
Hardness (mg/L CaCO<sub>3</sub>): 12  
Alkalinity (mg/L CaCO<sub>3</sub>): 10

### Test Organism Information:

Batch No.: 061809  
Source: Sim Valley  
Test Volume/No. Fish: 1/10L  
Loading Density: 0.33  
Mean Length ± SD (mm): 33 ± 3 mm      Range: 29-37  
Mean Weight ± SD (g): 0.33 ± 0.05g      Range: 0.28-0.41

### SDS Reference Toxicant Results:

Reference Toxicant ID: 09 RT 47  
Stock Solution ID: 09803  
Date Initiated: June 30/09  
96-h LC50 (95% CL): 6.1 (5.1-7.3)  
Reference Toxicant Mean ± 2 SD: 5.0 ± 1.1  
Reference Toxicant CV (%): 11.2

Test Results: The 96-h LC50 > 100% (1/1)

Reviewed by: EW

Date reviewed: Aug. 26/09



### 96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: Rescon  
 Sample I.D. NTR 2  
 W.O. # 09207  
 RBT Batch #: 061809  
 Date Collected/Time: July 5/09 @ 1515  
 Date Setup/Time: July 8/09 @ 1550  
 Sample Setup By: JLT

Number Fish/Volume: 10/10L  
 7-d % Mortality: 0%  
 Total Pre-aeration Time (mins): 30 min  
 Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Y

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	14.5	/	14.5
pH	7.3	/	7.3
D.O. (mg/L)	9.9	/	9.5
Cond. (µS/cm)	66	/	66

Concentration % (√/N)	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
control				10	10	10	10	14.2	14.2	14.3	14.1	14.0	10.1	10.2	10.1	10.2	10.1	6.9	7.1	7.0	7.1	7.1	35	41
6.25				10	10	10	10	14.2	14.2	14.3	14.1	14.0	10.1	10.1	10.1	10.1	10.1	7.0	7.1	7.1	7.2	7.2	39	43
12.5				10	10	10	10	14.3	14.2	14.3	14.1	14.0	10.0	10.1	10.0	10.1	10.1	7.1	7.1	7.1	7.1	7.1	40	45
25				10	10	10	10	14.4	14.2	14.3	14.1	14.0	10.0	10.0	10.0	10.2	10.2	7.2	7.2	7.2	7.2	7.1	43	48
50				10	10	10	10	14.4	14.2	14.3	14.1	14.0	9.9	10.0	10.0	10.2	10.2	7.2	7.2	7.1	7.2	7.2	51	55
100				10	10	10	10	14.5	14.2	14.3	14.1	14.0	9.9	10.1	10.0	10.1	10.2	7.3	7.2	7.3	7.3	7.2	66	71
Initials				JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT

Sample Description/Comments: clear

Fish Description at 96? all fish appear ok

Other Observations: \_\_\_\_\_

Reviewed by: JLT

Date Reviewed: Aug 26/09

Rainbow Trout Summary Sheet

Client: Rescan

Start Date/Time: JULY 8/09 @ 1555

Work Order No.: 09207

Test Species: Oncorhynchus mykiss

Sample Information:

Sample ID: SCR  
Sample Date: JULY 5/09 @ 11:00  
Date Received: JULY 7/09  
Sample Volume: 2 X 20L  
Other: —

Dilution Water:

Type: Dechlorinated Municipal Tap Water  
Hardness (mg/L CaCO<sub>3</sub>): 12  
Alkalinity (mg/L CaCO<sub>3</sub>): 10

Test Organism Information:

Batch No.: 061809  
Source: Sun Valley  
Test Volume/No. Fish: 17/16L  
Loading Density: 0.32  
Mean Length ± SD (mm): 32 ± 3 mm Range: 28-37  
Mean Weight ± SD (g): 0.32 ± 0.04 g Range: 0.28-0.42

SDS Reference Toxicant Results:

Reference Toxicant ID: 09 RT 47  
Stock Solution ID: 09503  
Date Initiated: June 30/09  
96-h LC50 (95% CL): 6.1 (5.1-7.3)  
Reference Toxicant Mean ± 2 SD: 5.0 ± 1.1  
Reference Toxicant CV (%): 11.2

Test Results: The 96h LC50 > 100% (1/1)

Reviewed by: EA

Date reviewed: Aug. 26/09

### 96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: Rescan  
 Sample I.D.: SCR  
 W.O. #: 09207  
 RBT Batch #: 061809  
 Date Collected/Time: July 5/09 @ 1115  
 Date Setup/Time: July 3/09 @ 1555  
 Sample Setup By: JLT

Number Fish/Volume: 10/10L  
 7-d % Mortality: 0 %  
 Total Pre-aeration Time (mins): 30 min  
 Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Y

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	14.5		14.5
pH	7.6	/	7.6
D.O. (mg/L)	9.9	/	9.9
Cond. (µS/cm)	112		112

D.O. meter: DO-1  
 pH meter: pH-1  
 Cond. Meter: C-1

Concentration % (V/V)	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
control				10	10	10	10	14.2	14.0	14.3	14.2	14.1	10.1	10.2	10.1	10.1	10.1	6.9	7.1	7.0	7.1	7.2	35	40
6.25				10	10	10	10	14.2	14.0	14.3	14.2	14.1	10.1	10.1	10.1	10.1	10.2	7.0	7.2	7.1	7.2	7.1	33	49
12.5				10	10	10	10	14.3	14.0	14.3	14.2	14.1	10.1	10.1	10.1	10.2	10.2	7.2	7.3	7.3	7.3	7.2	33	49
25				10	10	10	10	14.4	14.0	14.3	14.2	14.1	10.0	10.1	10.0	10.1	10.1	7.4	7.4	7.4	7.3	7.4	44	55
50				10	10	10	10	14.5	14.0	14.3	14.2	14.1	10.0	10.1	10.1	10.1	10.1	7.5	7.5	7.5	7.5	7.6	74	78
100				10	10	10	10	14.5	14.0	14.3	14.2	14.1	9.9	10.1	10.0	10.2	10.2	7.6	7.5	7.5	7.7	7.8	112	119
Initials				JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT	JLT

Sample Description/Comments: cloudy, some particulate

Fish Description at 96? all fish appear ok

Other Observations: \_\_\_\_\_

Reviewed by: JLT

Date Reviewed: Aug 26/09

**APPENDIX F - 48-h LC50 *Daphnia magna* Toxicity Test Data**

# Daphnia magna Summary Sheet

Client: Rescom  
Work Order No.: 09204

Start Date/Time: July 7/09 @ 1530h  
Test Species: D. magna  
Set up by: Amber Eel

## Sample Information:

Sample ID: SC-2  
Sample Date: July 15/09  
Date Received: July 15/09  
Sample Volume: 9 L

## Test Organism Information:

Broodstock No.: 061709  
Age of young (Day 0): 24-h  
Avg No. young per brood in previous 7 d: 22  
Mortality (%) in previous 7 d: 0  
Days to first brood: 9

## NaCl Reference Toxicant Results:

Reference Toxicant ID: Om 48  
Stock Solution ID: 08Na04  
Date Initiated: July 10/09  
48-h LC50 (95% CL): 3.9 (3.2-4.9)  
Reference Toxicant Mean  $\pm$  2 SD: 4.2  $\pm$  0.8  
Reference Toxicant CV (%): 9.4

Test Results: The 48-h LC50 > 100% (N/N)

Reviewed by: A. Terry

Date reviewed: August 25, 2009

## Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: Rescan  
 Sample ID: SC-2  
 Work Order No.: 09208

Start Date/Time: July 7, 2009 1530h  
 No. Organisms/volume: 10/200mL  
 Test Organism: D.magna  
 Set up by: ECC

DO meter: DO-1      pH meter: pH-1      Conductivity meter: C-1

Concentration %(v/v)	Number of Live Organisms Rep	Number of Live Organisms		No. Immobilized	Temperature (°C)			Dissolved oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24	48		48	0	24	48	0	24	48	0	24	48	0
Control	A	10	10	0	20.3	19.8	19.7	8.6	8.7	7.9	7.7	7.9	7.7	362	364
	B														
	C														
	D														
6.25	A	10	10	0	20.3	19.8	19.7	8.7	8.7	7.9	7.7	7.9	7.8	348	353
	B														
	C														
	D														
12.5	A	10	10	0	20.3	19.8	19.7	8.7	8.7	7.9	7.7	7.9	7.8	336	344
	B														
	C														
	D														
25	A	10	10	0	20.3	19.8	19.7	8.9	8.9	7.8	7.7	7.8	7.7	312	321
	B														
	C														
	D														
50	A	10	10	0	20.1	19.8	19.7	9.0	9.0	7.6	7.6	7.6	7.3	263	272
	B														
	C														
	D														
100	A	10	10	0	20.1	19.8	19.7	9.1	9.1	7.6	7.3	7.3	7.4	164	172
	B														
	C														
	D														
Technician Initials		ECC			ECC					ECC				ECC	

	Hardness*	Alkalinity*
Conc.	*(mg/L as CaCo3)	
Control (MHW)	100	70
Highest conc.	68	24

	Initial WQ	Adjustment	Adjusted WQ
Temp (°C)	20.1		
DO (mg/L)	9.1		
pH	7.3		
Cond (µS/cm)	164		

Sample Description: light yellow, turbid  
 Comments: Batch#: 061709    7-d previous # young/brood: 22    Day of 1st Brood: 9    Previous 7-d % Mortality: 0  
 Reviewed by: A. Terry    Date reviewed: August 25, 2009

Daphnia magna Summary Sheet

Client: Rescom  
Work Order No.: 09208

Start Date/Time: July 7/09 @ 1530h  
Test Species: D. magna  
Set up by: Anton ELL

Sample Information:

Sample ID: STEZ  
Sample Date: July 15/09  
Date Received: July 15/09  
Sample Volume: 9420L

Test Organism Information:

Broodstock No.: 061709  
Age of young (Day 0): 424-h  
Avg No. young per brood in previous 7 d: 22  
Mortality (%) in previous 7 d: 0  
Days to first brood: 9

NaCl Reference Toxicant Results:

Reference Toxicant ID: Om 48  
Stock Solution ID: 08Na04  
Date Initiated: July 10/09  
48-h LC50 (95% CL): 3.9 (3.2 - 4.9)  
Reference Toxicant Mean  $\pm$  2 SD: 4.2  $\pm$  0.8  
Reference Toxicant CV (%): 9.4

Test Results: The 48-h LC50 > 100% (N/N)

Reviewed by: A. Terry

Date reviewed: August 25, 2009

## Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: Rescan  
 Sample ID: STE 2  
 Work Order No.: 09208

Start Date/Time: July 7, 2009 1530h  
 No. Organisms/volume: 10/200mL  
 Test Organism: D.magna  
 Set up by: ECC

DO meter: DO-1      pH meter: pH-1      Conductivity meter: C-1

Concentration %(v/v)	Number of Live Organisms Rep	Number of Live Organisms		No. Immobilized	Temperature (°C)			Dissolved oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24	48		48	0	24	48	0	24	48	0	24	48	0
Control	A	10	10	0	20.3	19.6	19.7	8.6		8.7	7.9		7.7	362	371
	B														
	C														
	D														
6.25	A	10	10	0	20.3	19.6	19.7	8.6		8.8	7.9		7.8	341	352
	B														
	C														
	D														
12.5	A	10	10	0	20.5	19.6	19.7	8.7		8.8	7.9		7.7	324	334
	B														
	C														
	D														
25	A	10	10	0	20.5	19.6	19.7	8.8		8.7	7.8		7.7	286	296
	B														
	C														
	D														
50	A	10	10	0	20.5	19.6	19.7	8.9		8.7	7.7		7.6	221	221
	B														
	C														
	D														
100	A	10	10	0	20.6	19.6	19.7	9.0		8.8	7.2		7.5	61	75
	B														
	C														
	D														
Technician Initials		<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>

Hardness*	Alkalinity*
Conc.	*(mg/L as CaCO3)
Control (MHW)	100      70
Highest conc.	34      6

	Initial WQ	Adjustment	Adjusted WQ
Temp (°C)	20.5		
DO (mg/L)	9.0		
pH	7.2		
Cond (µS/cm)	61		

Sample Description: clear  
 Comments: Batch#: 061709      7-d previous # young/brood: 27      Day of 1st Brood: 9      Previous 7-d % Mortality: 0

Reviewed by: A. Terry      Date reviewed: August 28, 2009



# Daphnia magna Summary Sheet

Client: Rescom  
Work Order No.: 09208

Start Date/Time: July 7/09 @ 1530h  
Test Species: D. magna  
Set up by: Anton ELL

## Sample Information:

Sample ID: NTR-2  
Sample Date: July 15/09  
Date Received: July 17/09  
Sample Volume: 9 x 20L

## Test Organism Information:

Broodstock No.: 061709  
Age of young (Day 0): 24-h  
Avg No. young per brood in previous 7 d: 22  
Mortality (%) in previous 7 d: 0  
Days to first brood: 9

## NaCl Reference Toxicant Results:

Reference Toxicant ID: Om 48  
Stock Solution ID: 08Na04  
Date Initiated: July 10/09  
48-h LC50 (95% CL): 3.9 (3.2-4.9)  
Reference Toxicant Mean  $\pm$  2 SD: 4.2  $\pm$  0.8  
Reference Toxicant CV (%): 9.4

Test Results: The 48-h LC50 > 100% (UN)

Reviewed by: A. Berg

Date reviewed: August 25, 2009

## Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: Rescan  
 Sample ID: NTK-2  
 Work Order No.: 09208

Start Date/Time: July 7, 2009 1530L  
 No. Organisms/volume: 10/200mL  
 Test Organism: D.magna  
 Set up by: ECC

DO meter: DO-1      pH meter: pH-1      Conductivity meter: C-1

Concentration %(v/v)	Number of Live Organisms Rep	Live Organisms		No. Immobilized	Temperature (°C)			Dissolved oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24	48		48	0	24	48	0	24	48	0	24	48	0
Control	A	10	10	0	20.3	19.7	19.9	8.6		8.7	7.9		7.7	362	371
	B														
	C														
	D														
6.25	A	10	10	0	20.3	19.7	19.7	8.7		8.8	7.9		7.8	343	348
	B														
	C														
	D														
12.5	A	6	10	0	20.5	19.7	19.7	8.7		8.8	7.9		7.7	325	331
	B														
	C														
	D														
25	A	10	10	0	20.5	19.7	19.7	8.8		8.7	7.8		7.7	287	293
	B														
	C														
	D														
50	A	10	10	0	20.6	19.7	19.7	8.9		8.8	7.7		7.8	215	224
	B														
	C														
	D														
100	A	10	10	0	20.6	19.7	19.7	9.1		8.8	7.4		7.8	67	74
	B														
	C														
	D														
Technician Initials		N	N	N	EN	N	N	EN		N	EN		N	EN	N

Hardness*	Alkalinity*
Conc. (mg/L as CaCO <sub>3</sub> )	
Control (MHW)	100
Highest conc.	32

	Initial WQ	Adjustment	Adjusted WQ
Temp (°C)	20.50		
DO (mg/L)	9.1		
pH	7.4		
Cond (µS/cm)	67		

Sample Description: clean  
 Comments: Batch#: 061709 7-d previous # young/brood: 22 Day of 1st Brood: 9 Previous 7-d % Mortality: 0  
 Reviewed by: A. Teng Date reviewed: August 25, 2009

**Daphnia magna Summary Sheet**

Client: Rescan  
Work Order No.: 09208

Start Date/Time: July 7/09 @ 1530h  
Test Species: D. magna  
Set up by: Antoinette

**Sample Information:**

Sample ID: SCR  
Sample Date: July 5/09  
Date Received: July 7/09  
Sample Volume: 9 x 20L

**Test Organism Information:**

Broodstock No.: 061709  
Age of young (Day 0): 24-h  
Avg No. young per brood in previous 7 d: 22  
Mortality (%) in previous 7 d: 0  
Days to first brood: 9

**NaCl Reference Toxicant Results:**

Reference Toxicant ID: Om 48  
Stock Solution ID: 08Na04  
Date Initiated: July 10/09  
48-h LC50 (95% CL): 3.9 (3.2 - 4.9)  
Reference Toxicant Mean ± 2 SD: 4.2 ± 0.8  
Reference Toxicant CV (%): 9.4

Test Results: The 48-h LC50 > 100% (UN)

Reviewed by: A. Teng

Date reviewed: August 25, 2009

## Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: Rescan  
 Sample ID: SCP  
 Work Order No.: 09208

Start Date/Time: July 7, 2009 1530h  
 No. Organisms/volume: 10/200mL  
 Test Organism: D.magna  
 Set up by: ECC

DO meter: DO-1 pH meter: pH-1 Conductivity meter: C-1

Concentration %(v/v)	Number of Live Organisms Rep	24		48		No. Immobilized	Temperature (°C)			Dissolved oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24	48	48	0		24	48	0	24	48	0	24	48	0	48	
Control	A	10	10	0	20.3	19.8	19.7	8.6	8.7	7.9	7.7	342	363				
	B																
	C																
	D																
6.25	A	10	10	0	20.3	19.8	19.7	8.6	8.8	7.9	7.8	346	350				
	B																
	C																
	D																
12.5	A	10	10	0	20.4	19.8	19.7	8.7	8.8	7.9	7.8	331	337				
	B																
	C																
	D																
25	A	10	10	0	20.4	19.8	19.2	8.9	8.8	7.9	7.9	301	307				
	B																
	C																
	D																
50	A	10	10	0	20.9	19.8	19.5	8.9	8.9	7.9	7.9	238	244				
	B																
	C																
	D																
100	A	10	10	2	20.5	19.5	19.7	9.1	8.9	7.9	7.9	117	125				
	B																
	C																
	D																
Technician Initials		<u>W</u>	<u>N</u>	<u>M</u>	<u>W</u>	<u>N</u>	<u>W</u>	<u>N</u>	<u>W</u>	<u>N</u>	<u>W</u>	<u>N</u>	<u>W</u>	<u>N</u>			

Hardness*	Alkalinity*
Conc.	*(mg/L as CaCo3)
Control (MHW)	<u>120</u> <u>70</u>
Highest conc.	<u>56</u> <u>38</u>

	Initial WQ	Adjustment	Adjusted WQ
Temp (°C)	<u>20.5</u>		
DO (mg/L)	<u>9.1</u>		
pH	<u>7.9</u>		
Cond (µS/cm)	<u>117</u>		

Sample Description: light yellow, turbid

Comments: Batch#: 061709 7-d previous # young/brood: 27 Day of 1st Brood: 9 Previous 7-d % Mortality: 0

Reviewed by: A. Teng Date reviewed: August 25, 2009

Client: Rescan

W.O.#: 09211

### Hardness and Alkalinity Datasheet

Sample ID	Sample Date	Alkalinity				Hardness			Technician
		Sample Volume (mL)	(mL) 0.02N HCL/H <sub>2</sub> SO <sub>4</sub> used to pH 4.5	(mL) of 0.02N HCL/H <sub>2</sub> SO <sub>4</sub> used to pH 4.2	Total Alkalinity (mg/L CaCO <sub>3</sub> )	Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness (mg/L CaCO <sub>3</sub> )	
NTR-2	July 7/09	50.0	0.9	1.0	16	50	1.6	32	EJ
STE-2	July 7/09	↓	0.4	0.5	6	50	1.7	34	
SC-2	↓	↓	1.3	1.4	24	50	3.4	68	
SCR	↓	↓	2.0	2.1	38	50	2.8	56	

Notes: \_\_\_\_\_

Reviewed by: A. Terry

Date Reviewed: August 25, 2009

**APPENDIX G - Chain-of-Custody Forms**

# Nautilus Environmental

# Chain of Custody (electronic)

- California: 5550 Morehouse Drive, Suite 150, San Diego, CA 92121
- Washington: 5009 Pacific Highway East, Suite 2, Tacoma, WA 98424
- British Columbia: 8664 Commerce Court, Burnaby, BC, V5A 4N7

Date July 5, 09 Page 1 of 1

<b>Sample Collection By:</b>		<b>Report to:</b>	<b>Invoice to:</b> Project # 868-004-09 KSM
<b>Company</b>	Rescan Environmental	Same as reporting address	
<b>Address</b>	1111 West Hastings, 6th floor		
<b>City/Prov/Postal Code</b>	Vancouver, BC V6E 2J3		
<b>Contact</b>	Judith Eigenbrod/Mark Whelley		
<b>Phone</b>	604-689-9460		
<b>Email</b>	jeigenbrod@rescan.com, mwhelley@rescan.com		

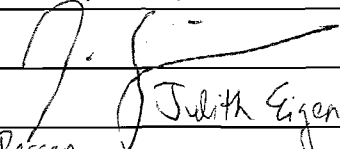
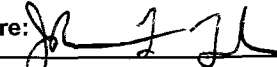
ANALYSES REQUIRED  
 Acute (Rainbow) <sup>9BL</sup> CCS  
 Acute (Daphnia) <sup>4BL</sup> CCS  
 Chronic (algae) <sup>72h</sup> P. sub. cap. tok  
 Chronic (Macrophyte) Lemnic  
 Chronic (cerio) <sup>7d</sup> Kimber  
 Chronic (rainbow) embryo

Receipt Temperature (°C)

SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	# OF CONTAINERS	COMMENTS	Acute (Rainbow)	Acute (Daphnia)	Chronic (algae)	Chronic (Macrophyte)	Chronic (cerio)	Chronic (rainbow)	embryo	Receipt Temperature (°C)
1 SC2	7/5/2009	9:30am	water	carboy	9		X	X	X	X	X	X		8.6
2 ✓ STE2	7/5/2009	13:15	water	carboy	9		X	X	X	X	X	X		
3 NTR2	7/5/2009	15:15	water	carboy	9		X	X	X	X	X	X		
4 SCR	7/5/2009	11:15am	water	carboy	9		X	X	X	X	X	X		
5														
6														
7														
8														
9														
10														

read @ 0900  
 July 7/09  
 JSC

W# #  
 09207  
 09208  
 09209  
 09210  
 09211  
 09212

<b>PROJECT INFORMATION</b>		<b>SAMPLE RECEIPT</b>		<b>RELIQUINSHED BY (CLIENT)</b>		<b>RELIQUINSHED BY (COURIER)</b>	
Client: <u>Rescan</u>	Total # Containers: <u>36</u>	Signature: 	Signature:	Print: <u>Judith Eigenbrod</u>	Print:	Company: <u>Bandstra</u>	Company:
P.O. No.:	Good Condition? <input checked="" type="checkbox"/>	Print:	Print:	Time/Date: <u>July 5, 09, 7:00 pm</u>	Time/Date: <u>0900 July 7/09</u>	Time/Date: <u>0900 July 7/09</u>	Time/Date:
Shipped Via:	Matches Schedule? <input checked="" type="checkbox"/>	Company: <u>Rescan</u>	Company: <u>Bandstra</u>	Time/Date: <u>July 5, 09, 7:00 pm</u>	Time/Date: <u>0900 July 7/09</u>	Time/Date: <u>0900 July 7/09</u>	Time/Date:
SPECIAL INSTRUCTIONS/COMMENTS: Can you please include visual observations of the level of turbidity / settling of solids during the tests + report them? Thank! (1) shipped to Tacoma lab as per ART				<b>RECEIVED BY (COURIER)</b>		<b>RECEIVED BY (LABORATORY)</b>	
				Signature:		Signature: 	
				Print:		Print: <u>John T. Nautilus Environmental</u>	
				Company:		Company: <u>Nautilus Environmental</u>	
		Time/Date:		Time/Date: <u>0900 July 7/09</u>		Time/Date:	

Additional costs may be required for sample disposal or storage. Net 30 unless otherwise contracted.



Nautilus Environmental

**Rescan Environmental Toxicity Testing Program - MC-2 tox  
test**

**Final Toxicity Test Report**

Report date: January 11, 2013

Submitted to:

Rescan Environmental Services Ltd.

Vancouver, BC

*Burnaby Laboratory*  
8664 Commerce  
Court  
Burnaby, BC  
V5A 4N7





Nautilus Environmental

WO #: 12599-600

Dr. Lesley Shelley  
Rescan Environmental  
1111 West Hastings Street, 6<sup>th</sup> floor  
Vancouver, BC  
V6E 2J3

January 11, 2013

Dr. Shelley:

**Re: Toxicity Testing on MC-2 tox test (collected on November 24, 2012)**

Nautilus Environmental is pleased to provide you with the results of the toxicity tests conducted on the sample identified as MC-2 tox test, received on November 24, 2012. Testing was conducted on the sample following Environment Canada methods. A summary of the test methods and results are provided in the following report.

Please feel free to contact the undersigned at 604-420-8773 should you have any questions or require any additional information.

Yours truly,

**Nautilus Environmental**

A handwritten signature in black ink, appearing to read 'A. Tang'. The signature is fluid and cursive, with a large, stylized 'T'.

Armando Tang, B.Sc., R.P. Bio.  
Laboratory Manager

## TABLE OF CONTENTS

	Page
TABLE OF CONTENTS.....	I
1.0 INTRODUCTION.....	1
2.0 METHODS.....	1
2.1 Quality Assurance/Quality Control (QA/QC).....	1
3.0 RESULTS.....	9
3.1 Quality Assurance/Quality Control.....	10
4.0 REFERENCES .....	15

## LIST OF TABLES

Table 1.	Summary of test conditions for the <i>Ceriodaphnia dubia</i> survival and reproduction test..	3
Table 2.	Summary of test conditions for the rainbow trout embryo viability test.....	4
Table 3.	Summary of test conditions for the <i>Lemna minor</i> growth inhibition test.....	5
Table 4.	Summary of test conditions for the <i>Pseudokirchneriella subcapitata</i> growth inhibition test. .....	6
Table 5.	Summary of test conditions for the 96-h rainbow trout LC50 test. ....	7
Table 6.	Summary of test conditions for the 48-h <i>Daphnia magna</i> LC50 test.....	8
Table 7.	Toxicity test results for the <i>Ceriodaphnia dubia</i> survival and reproduction test. ....	11
Table 8.	Toxicity test results for the rainbow trout embryo viability test. ....	11
Table 9.	Toxicity test results for the <i>Lemna minor</i> growth inhibition test. ....	12
Table 10.	Toxicity test results for the <i>Pseudokirchneriella subcapitata</i> growth inhibition test.....	12
Table 11.	Toxicity test results for the 96-h juvenile rainbow trout LC50 test.....	13
Table 12.	Toxicity test results for the 48-h <i>Daphnia magna</i> LC50 test. ....	13
Table 13.	Reference toxicant test results.....	14

## LIST OF APPENDICES

APPENDIX A – <i>Ceriodaphnia dubia</i> Toxicity Test Data
APPENDIX B – Rainbow Trout Embryo Toxicity Test Data
APPENDIX C – <i>Lemna minor</i> Toxicity Test Data
APPENDIX D – <i>Pseudokirchneriella subcapitata</i> Toxicity Test Data
APPENDIX E – Rainbow Trout LC50 Toxicity Test Data
APPENDIX F – <i>Daphnia magna</i> LC50 Toxicity Test Data
APPENDIX G – Chain-of-Custody Forms

## 1.0 INTRODUCTION

Nautilus Environmental conducted sub-lethal and acute toxicity tests for Rescan Environmental Services Ltd. The sample MC-2 tox test was collected on November 24, 2012 and delivered to the Nautilus Environmental Laboratory in Burnaby, BC on November 26, 2012. The sample was transported in eight 20-L plastic containers and stored in the dark at  $4 \pm 2^\circ\text{C}$  prior to testing. The following toxicity tests were performed on the sample:

- *Ceriodaphnia dubia* survival and reproduction
- 7-d Rainbow trout (*Oncorhynchus mykiss*) embryo viability
- 7-d *Lemna minor* growth inhibition
- 72-h *Pseudokirchneriella subcapitata* growth inhibition
- 96-h Rainbow trout (*Oncorhynchus mykiss*) LC50
- 48-h *Daphnia magna* LC50

This report describes the results of these toxicity tests. The test results reported herein relate only to the sample tested. Copies of raw laboratory data sheets and statistical analysis for each test species are provided in Appendices A to F. The chain-of-custody form is provided in Appendix G.

## 2.0 METHODS

Methods for the toxicity tests are summarized in Tables 1 to 6. Testing was conducted according to procedures described by the Environment Canada protocols (2000a, 2000b, 2007a, 2007b and 2007c). The rainbow trout embryo viability test followed modified procedures described by Environment Canada (1998) and Canaria et al. (1999). Statistical analyses for all the tests were performed using the software, CETIS (Tidepool Scientific Software, 2012).

### 2.1 Quality Assurance/Quality Control (QA/QC)

Nautilus follows a comprehensive QA/QC program to ensure that the data generated are of high quality and scientifically defensible. Our QA program is designed to ensure that all tests are performed in accordance with well-established and approved methods (e.g., Environment Canada, US EPA).

To meet these objectives, Nautilus has implemented a number of quality control procedures that include the following:

- Negative controls to ensure that appropriate testing performance criteria are met;
- Positive controls to assess the health and sensitivity of the test organisms;
- Use of appropriate species and life stage to meet the study objectives;
- Appropriate number of replicates to allow proper statistical analyses;
- Calibration and proper maintenance of instruments to ensure accurate measurements;
- Proper documentation and recordkeeping to allow traceability of performance;
- Adequate supervision and training of staff to ensure that methods are followed;
- Proper handling and storage of samples to ensure their integrity;
- Procedures in place to address issues that may arise during testing and ensure the implementation of appropriate corrective actions; and
- Rigorous review of data by a registered professional biologist to ensure they are of good quality and scientifically defensible prior to releasing to the client.

**Table 1. Summary of test conditions for the *Ceriodaphnia dubia* survival and reproduction test.**

Test organism	<i>Ceriodaphnia dubia</i>
Test organism source	In-house culture
Test organism age	<24 hr old neonates produced within 12 hr
Test type	Static renewal
Test duration	7 ± 1 day
Test chamber	20 mL test tube
Test solution volume	15 mL
Test concentrations (% sample)	Seven concentrations, plus laboratory control
Number of replicates	10
Control/dilution water	20% Perrier water (hardness 80-100mg/L CaCO <sub>3</sub> )
Test solution renewal	Daily
Test temperature	25 ± 1°C
Number of organisms/chamber	1
Feeding	Daily, with 0.1 ml <i>Pseudokirchneriella subcapitata</i> and 0.05 mL YCT
Light intensity	100 to 600 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test protocol	Environment Canada, 2007a, EPS 1/RM/21
Test endpoints	Survival and reproduction
Test acceptability criterion for controls	≥80% survival; ≥15 young per surviving control; ≥60% of controls producing three or more broods
Reference Toxicant	Sodium chloride

**Table 2. Summary of test conditions for the rainbow trout embryo viability test.**

Test organism	<i>Oncorhynchus mykiss</i>
Test organism source	Freshwater Fisheries Society of BC
Test organism age	< 24 hours
Test type	Static-renewal
Test duration	7 days
Test chamber	2-L plastic containers
Test solution volume	2 L
Test concentrations (% sample)	Five concentrations, plus laboratory control
Number of replicates	4
Control/Dilution water	Dechlorinated water (hardness 11 mg/L CaCO <sub>3</sub> )
Test solution renewal	Daily
Test temperature	14 ± 1°C
Number of organisms/chamber	30 eggs
Feeding	None
Light intensity	Dark
Photoperiod	24 hours dark
Aeration	6.5 ± 1 mL/min/L
Test protocol	Environment Canada (1998), EPS 1/RM/28
Test endpoint	Embryo viability
Test acceptability criteria for controls	Embryo viability ≥70%
Reference toxicant	Sodium dodecyl sulphate

**Table 3. Summary of test conditions for the *Lemna minor* growth inhibition test.**

Test organism	<i>Lemna minor</i>
Test organism source	In-house culture
Test organism age	7- to 10-day old
Test type	Static
Test duration	7 days
Test chamber	250-mL glass containers
Test solution volume	150 mL
Test concentrations (% sample)	Seven concentrations, plus laboratory control
Number of replicates	4
Control/Dilution water	Deionized or distilled water with nutrients added
Test solution renewal	None
Test temperature	25 ± 2°C
Number of organisms/chamber	Two 3-frond plants
Light intensity	3600 to 4400 lux full spectrum light
Photoperiod	Continuous
Aeration	None
Test protocol	Environment Canada (2007b), EPS 1/RM/37
Test endpoint	Number of fronds and dry weight
Test acceptability criteria for controls	≥ 8-fold increase in number of fronds
Reference toxicant	Potassium chloride

**Table 4. Summary of test conditions for the *Pseudokirchneriella subcapitata* growth inhibition test.**

Test organism	<i>Pseudokirchneriella subcapitata</i>
Test organism source	In-house culture
Test organism age	4- to 7-day old culture in logarithmic growth phase
Test type	Static
Test duration	72 hours
Test chamber	Microplate
Test solution volume	220 µL
Test concentrations (% sample)	Seven concentrations, plus laboratory control
Number of replicates	4 for treatments; 8 for control
Control/Dilution water	Deionized or distilled water
Test solution renewal	None
Test temperature	24 ± 2°C
Number of organisms/chamber	10,000 cells/mL
Light intensity	3600 to 4400 lux
Photoperiod	Continuous
Aeration	None
Test protocol	Environment Canada (2007c), EPS 1/RM/25
Test endpoint	Algal cell growth inhibition ≥ 16-fold increase in number of algal cells;
Test acceptability criteria for controls	CV ≤20%; no trend when analyzed using Mann-Kendall test
Reference toxicant	Zinc



**Table 5. Summary of test conditions for the 96-h rainbow trout LC50 test.**

Test organism	<i>Oncorhynchus mykiss</i>
Test organism source	Miracle Springs, BC
Test organism age	Juveniles
Test type	Static
Test duration	96 hours
Test solution volume	15 L
Test concentrations (% sample)	Five concentrations, plus laboratory control
Number of replicates	1
Control/Dilution water	Municipal dechlorinated water
Test solution renewal	None
Test temperature	15 ± 1°C
Number of organisms/chamber	Ten
Feeding	None
Light intensity	100 to 500 lux
Photoperiod	16 hours light/8 hours dark
Aeration	6.5 ± 1 mL/min/L
Test protocol	Environment Canada (2000a), EPS 1/RM/13
Test endpoint	96-h LC50
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium nitrite

**Table 6. Summary of test conditions for the 48-h *Daphnia magna* LC50 test.**

Test organism	<i>Daphnia magna</i>
Test organism source	In-house culture
Test organism age	< 24 h
Test type	Static
Test duration	48 hours
Test chamber	250-mL glass beakers
Test solution volume	200 mL
Test concentrations (% sample)	Five concentrations, plus laboratory control
Number of replicates	One
Control/Dilution water	Moderately-hard reconstituted water (hardness 80-100 mg/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Number of organisms/chamber	Ten
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test protocol	Environment Canada (2000b), EPS 1/RM/14
Test endpoint	48-h LC50
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride

### 3.0 RESULTS

Results of the *C. dubia* toxicity test are summarized in Table 7. There were effects to *C. dubia* survival from the 40 to 100% test concentrations; survival in these concentrations ranged from 0 and 60%. Survival was 100% in remaining test concentrations. The LC50 for survival value was 39.3%. Decreased reproduction was observed in all concentrations, except the lowest test concentration. The IC25 and IC50 were 10.0 and 18.8%, respectively.

Results of the 7-d rainbow trout embryo viability test are provided in Table 8. No effects to embryo viability were observed in the sample. Embryo viability ranged from 82.5 to 96.7% in the test concentrations. The EC25 and EC50 were both >100%.

Results of the *Lemna minor* growth inhibition test are summarized in Table 9. Frond count was somewhat reduced in the higher test concentrations relative to the negative control, however the IC25 and IC50 were both >97%. There were no effects to dry weight and both the IC25 and IC50 were >97%. Frond counts ranged from 47.0 to 68.8 while dry weight ranged from 6.8 to 7.9 mg.

Results of the 72-h *P. subcapitata* test are provided in Table 10. Algal cell density was enhanced at the lower test concentrations and inhibited at higher test concentrations relative to the negative control. Algal density in the lower test concentrations ranged from 130.8 to 157.0 x 10<sup>4</sup> cells/mL compared to 80.0 x 10<sup>4</sup> cells/mL in the negative control; percent algal cell enhancement ranged from 63.4 to 96.2% in these concentrations. Algal density in the higher test concentrations ranged from 0.5 to 78.0 10<sup>4</sup> cells/mL. The IC25 and IC50 values were 19.4 and 28.8%.

The 96-h rainbow trout results are shown in Table 11. The rainbow trout test exhibited an anomalous dose-response in which the lower test concentrations (6.25 to 25%) exhibited reduced fish survival, 30 to 70%, compared to the higher test concentrations (50 and 100%) in which fish survival was 90 to 100%. A 96-h LC50 was not calculable for this test. A follow-up rainbow trout test was conducted and the results are provided in Table 11. Survival in the follow-up test ranged from 90 to 100%, however, the test was conducted one day past the 5-day sample holding time. The 96-h LC50 for this test was >100%.

Results of the 48-h *D. magna* 48-h LC50 test are shown in Table 12. Effects to survival were observed in the highest two test concentrations. Survival was 40 and 0% in the 50 and 100% test

concentrations, respectively. Survival was 100% in the remaining test concentrations. The *D.magna* LC50 was 46.7%.

### **3.1 Quality Assurance/Quality Control**

All the tests reported herein met the acceptability criteria for test validity specified in their respective protocols, with the exception of sample holding time in the duckweed and rainbow trout embryo tests due to a lack of the appropriate age/size of test organisms within the 72-h sample holding time. The duckweed and rainbow trout tests exceeded the 72-h holding time for sublethal tests by one and two days, respectively. These tests were initiated at the request of the client.

Water quality parameters measured during the toxicity tests were within acceptable ranges and results of the reference toxicant tests conducted during the testing program were all within the in-house historical mean  $\pm$  two standard deviations. The reference toxicant test results are summarized in Table 13.

Table 7. Toxicity test results for the *Ceriodaphnia dubia* survival and reproduction test.

Concentration (% v/v)	Mean ± SD	
	Survival (%)	Reproduction (No. of Young/Female)
Control	100	24.4 ± 5.5
5	100	22.5 ± 3.0
10	100	18.3 ± 3.4
20	100	11.6 ± 3.4
40	60	5.4 ± 3.0
60	0	0 ± 0
80	0	0 ± 0
100	0	0 ± 0
<b>Test endpoint (% v/v)</b>		
LC50 (95% CL)	39.3 (33.2 - 46.6)	--
IC25 (95% CL)	--	10.0 (6.0 - 12.8)
IC50 (95% CL)	--	18.8 (14.8 - 23.6)

LC = Lethal Concentration; IC = Inhibition Concentration; SD = Standard Deviation; CL = Confidence Limit.

Table 8. Toxicity test results for the rainbow trout embryo viability test.

Concentration (% v/v)	Embryo Viability (%) (Mean ± SD)
Control	96.7 ± 2.7
6.25	96.7 ± 2.7
12.5	95.8 ± 1.7
25	95.8 ± 4.2
50	88.3 ± 4.3
100	82.5 ± 3.2
<b>Test endpoint (% v/v)</b>	
EC25	>100
EC50	>100

EC = Effective Concentration; SD = Standard Deviation.

Table 9. Toxicity test results for the *Lemna minor* growth inhibition test.

Concentration (% v/v)	Mean ± SD	
	Fronnd Growth (No. of Fronds)	Dry Weight (mg)
Control	59.2 ± 4.6	7.2 ± 0.3
1.5	68.8 ± 8.7	7.9 ± 0.4
3.0	56.8 ± 12.0	7.1 ± 1.5
6.1	63.5 ± 7.2	7.5 ± 1.1
12.1	61.0 ± 6.3	7.9 ± 0.9
24.2	53.0 ± 10.6	6.8 ± 0.9
48.5	48.2 ± 2.8	7.0 ± 0.8
97	47.0 ± 8.2	7.2 ± 1.0
<b>Test endpoint (% v/v)</b>		
IC25	>97	>97
IC50	>97	>97

IC = Inhibition Concentration; SD = Standard Deviation.

Table 10. Toxicity test results for the *Pseudokirchneriella subcapitata* growth inhibition test.

Concentration (% v/v)	Cell Density (x 10 <sup>4</sup> cells/mL) (mean ± SD)	Stimulation (%)
Control	80.0 ± 8.6	--
1.5	157.0 ± 14.7	96.2
3.0	146.3 ± 8.1	82.8
5.9	130.8 ± 10.2	63.4
11.9	78.0 ± 7.4	--
23.8	52.2 ± 13.6	--
47.6	7.2 ± 3.6	--
95.2	0.5 ± 0.6	--
<b>Test endpoint (% v/v)</b>		
IC25 (95% CL)	19.4 (13.0 - 26.8)	--
IC50 (95% CL)	28.8 (19.8 - 32.8)	--

IC = Inhibition Concentration; SD = Standard Deviation; CL = Confidence Limits.

**Table 11. Toxicity test results for the 96-h juvenile rainbow trout LC50 test.**

Concentration (% v/v)	Survival (%)	
	Test #1	Test #2
Control	100	100
6.25	70	90
12.5	60	90
25	30	90
50	100	100
100	90	100
<b>Test endpoint (% v/v)</b>		
LC50	NC	>100

LC = Lethal Concentration; NC = Not Calculable.

**Table 12. Toxicity test results for the 48-h *Daphnia magna* LC50 test.**

Concentration (% v/v)	Survival (%)
Control	100
6.25	100
12.5	100
25	100
50	40
100	0
<b>Test endpoint (% v/v)</b>	
LC50 (95% CL)	46.7 (37.6 - 57.8)

LC = Lethal Concentration; CL = Confidence Limits.

**Table 13. Reference toxicant test results.**

Test Species	Endpoint	Historical Range Mean (2SD Range)	CV (%)	Date Setup
<i>C. dubia</i>	Survival (IC50): 2.0 g/L NaCl	1.8 (1.3 - 2.4)	16	November 13, 2012
	Reproduction (IC50): 1.1 g/L NaCl	1.3 (0.9 - 1.9)	21	
<i>O. mykiss</i> (embryo)	Viability (EC50): 4.9 mg/L SDS	3.7 (1.7 - 8.0)	47	November 29, 2012
<i>L. minor</i>	No. Fronds (IC25): 4.8 g/L KCl	4.3 (3.4 - 5.3)	12	November 15, 2012
<i>P. subcapitata</i>	Growth (IC50): 31.7 µg/L Zn	20.9 (13.6 - 32.2)	24	December 7, 2012
<i>O. mykiss</i> (juvenile)	Survival (LC50): 8.1 mg/L NaNO <sub>2</sub>	5.2 (2.9 - 9.4)	34	November 23, 2012
<i>D. magna</i>	Survival (LC50): 4.2 g/L NaCl	4.0 (3.6 - 4.4)	5	November 20, 2012

LC = Lethal Concentration; IC = Inhibition Concentration; SD = Standard Deviation; CL = Confidence Limit.



#### 4.0 REFERENCES

- Canaria, E.C., J.R. Elphick and H.C. Bailey. 1999. A simplified procedure for conducting small-scale short-term embryo toxicity tests with salmonids. *Environ Toxicol* 14:301-307.
- Environment Canada. 1998. Biological test method: toxicity tests using early life stages of salmonid fish (rainbow trout). Environmental Protection Series EPS 1/RM/28. Second Edition, July 1998. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 102 pp.
- Environment Canada. 2000a. Biological test method: reference method for determining acute lethality of effluents to rainbow trout. Environmental Protection Series. Report EPS 1/RM/13, Second Edition, December 2000, including May 2007 amendments. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 23 pp.
- Environment Canada. 2000b. Biological test method: reference method for determining acute lethality of effluents to *Daphnia magna*. Environmental Protection Series. Report EPS 1/RM/14, Second Edition, December 2000. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 21 pp.
- Environment Canada. 2007a. Biological test method: test of reproduction and survival using the cladoceran *Ceriodaphnia dubia*. Environmental Protection Series. Report EPS 1/RM/21, Second Edition, February 2007. Environment Canada, Method Development and Application Section, Environmental Science and Technology Centre, Science and Technology Branch, Ottawa, ON. 74 pp.
- Environment Canada. 2007b. Biological test method: tests for measuring the inhibition of growth using the freshwater macrophyte, *Lemna minor*. Environmental Protection Series, Report EPS 1/RM/37. Second Edition. January 2007. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 112 pp.
- Environment Canada. 2007c. Biological test method: growth inhibition test using the freshwater alga. Environmental Protection Series, Report EPS 1/RM/25. Second Edition, March 2007.

Environment Canada, Method Development and Application Section, Environmental Science and Technology Centre, Science and Technology Branch, Ottawa, ON. 53 pp.

Tidepool Scientific Software. 2012. CETIS comprehensive environmental toxicity information system, version 1.8.4.29. Tidepool Scientific Software, McKinleyville, CA. 222 pp.

**APPENDIX A - *Ceriodaphnia dubia* Toxicity Test Data**

## Ceriodaphnia dubia Summary Sheet

Client: Rescan  
 Work Order No.: 12600

Start Date/Time: NOV 27/12 @ 1100h  
 Set up by: EMM

**Sample Information:**

Sample ID: MC - 2 tox test  
 Sample Date: NOV 24/12  
 Date Received: NOV 26/12  
 Sample Volume: 8 x 20L

**Test Validity Criteria:**

- 1) Mean survival of first generation controls is  $\geq 80\%$
- 2) At least 60% of controls have produced three broods within 8 days
- 3) An average of  $\geq 15$  live young produced per surviving female in the control solutions during the first three broods.
- 4) Invalid if ephippia observed in any control solution at any time.

**WQ Ranges:**

T ( $^{\circ}$ C) =  $25 \pm 1$ ; DO (mg/L) = 3.3 to 8.4; pH = 6.0 to 8.5

**Test Organism Information:**

Broodstock No.: 111412  
 Age of young (Day 0): <24-h (within 12-h)  
 Avg No. young in first 3 broods of previous 7 d: 45  
 Mortality (%) in previous 7 d: 7.7  
 Individual female # used  $\geq 8$  young on test day: 7, 11, 14, 15, 27, 33

**NaCl Reference Toxicant Results:**

Reference Toxicant ID: Cd 88  
 Stock Solution ID: 12 Na02  
 Date Initiated: NOV 13/12

7-d LC50 (95% CL): 2.0 (1.7 - 2.3) g/L NaCl  
 7-d IC50 (95% CL): 1.1 (0.9 - 1.6) g/L NaCl

7-d LC50 Reference Toxicant Mean and Historical Range: 1.8 (1.3 - 2.4) g/L NaCl CV (%): 16  
 7-d IC50 Reference Toxicant Mean and Historical Range: 1.3 (0.9 - 1.9) g/L NaCl CV (%): 21

**Test Results:**

	Survival	Reproduction
LC50 %(v/v) (95% CL)	39.3 (33.2 - 46.6)	
IC25 %(v/v) (95% CL)		10.0 (6.0 - 12.8)
IC50 %(v/v) (95% CL)		18.8 (14.8 - 23.6)

Reviewed by: A. Teng

Date reviewed: January 8, 2013

## Chronic Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Rexan Environmental  
 Sample ID: MC-2  
 Work Order #: 12600

Start Date & Time: NOV 27 / 12 @ 1100h  
 Stop Date & Time: DECEMBER 3 / 12 @ 1500h  
 Test Species: Ceriodaphnia dubia

Control Concentration % (v/v)	Days															
	0		1		2		3		4		5		Final 6		7	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.0	25.0	24.0	25.0	24.0	25.0	24.0	24.5	25.0	24.5	25.5	25.0				
DO (mg/L)	8.0	8.0	8.0	7.6	8.2	7.5	8.1	7.6	7.9	7.4	8.1	6.7				
pH	8.0	7.7	7.9	7.5	7.8	7.3	7.9	7.8	7.9	7.4	7.7	7.6				
Cond. (µS/cm)	196	195		191		192		186		184		195				
Initials	EMM	EMM		EMM		EMM		JJT		JJT		EMM				

5 Concentration	Days															
	0		1		2		3		4		5		Final 6		7	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.0	24.5	24.0	25.0	24.0	25.0	24.0	24.5	24.5	24.5	24.5	25.0				
DO (mg/L)	7.9	7.7	7.7	7.5	8.1	7.3	7.9	7.6	8.1	7.4	8.1	6.9				
pH	7.8	7.7	7.8	7.5	7.6	7.5	7.6	7.8	7.9	7.6	7.7	7.6				
Cond. (µS/cm)	205	209		209		207		215	200	197		196				
Initials	EMM	EMM		EMM		EMM		JJT		JJT		EMM				

40 Concentration	Days															
	0		1		2		3		4		5		Final 6		7	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.0	24.5	24.0	25.0	24.0	25.0	24.0	25.0	24.5	24.5	24.5	25.0				
DO (mg/L)	7.9	7.5	7.6	7.4	8.0	7.3	7.9	7.6	8.1	7.4	8.3	7.1				
pH	7.7	7.6	7.6	7.5	7.5	7.5	7.5	7.7	7.6	7.5	7.5	7.6				
Cond. (µS/cm)	293	300		301		294		294		284		280				
Initials	EMM	EMM		EMM		EMM		JJT		JJT		EMM				

100 Concentration	Days															
	0		1		2		3		4		5		6		7	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.0	24.5	24.0	25.0	24.0											
DO (mg/L)	7.6	7.5	7.5	7.7	8.1											
pH	7.3	7.1	7.2	7.4	7.2											
Cond. (µS/cm)	438	450		445												
Initials	EMM	EMM		EMM												

	Control	100% <sup>1(v/v)</sup> <del>100% <sup>1(v/v)</sup> <del>100%</del></del>		
Hardness*	90	230		
Alkalinity*	72	40		

\* mg/L as CaCO<sub>3</sub>

WQ Ranges: T (°C) = 25 ± 1; DO (mg/L) = 3.3 to 8.4 (mg/L); pH = 6 to 8.5

Sample Description: cloudy, slightly yellow, some ppt.

Comments: Broodboard Used: 111412

Analysts: KCS, JW,  
 Reviewed by: RET  
 Date reviewed: Jan 8/12 RET 13

**Chronic Freshwater Toxicity Test  
C. dubia Reproduction Data**

Client: Dexan Environmental  
 Sample ID: HCE-2  
 Work Order: 12600

Start Date & Time: Nov 27/12 @ 1100h  
 Stop Date & Time: Dec 3/12 @ 1500h  
 Set up by: Emm

% (v/v)

Days	Concentration: Control											Init	Concentration: 5											Init	Concentration: 10											Init
	A	B	C	D	E	F	G	H	I	J	A		B	C	D	E	F	G	H	I	J	A	B		C	D	E	F	G	H	I	J				
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Emm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Emm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Emm			
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Emm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Emm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Emm			
3	2	✓	✓	✓	✓	✓	✓	5	3	Emm	3	3	3	4	2	3	3	✓	✓	3	Emm	✓	✓	3	✓	✓	✓	2	3	✓	3	Emm				
4	6	6	✓	5	7	7	6	7	✓	JT	✓	9	✓	9	9	✓	✓	3	5	JT	5	✓	✓	7	7	6	✓	✓	5	✓	JT					
5	13	11	7	12	15	13	15	15	10	JT	9	✓	8	✓	✓	9	9	12	10	11	JT	7	6	8	10	13	12	10	9	12	8	JT				
6	15	12	10	15	✓	✓	✓	10	14	Emm	10	9	14	11	11	13	10	✓	10	10	Emm	✓	10	11	✓	✓	✓	8	12	✓	6	Emm				
7																																				
8																																				
Total	21	24	17	32	22	20	21	32	29	21	Emm	22	21	25	24	22	25	22	15	25	24	Emm	12	16	22	17	20	18	20	24	17	17	Emm			

Days	Concentration: 20											Init	Concentration: 40											Init	Concentration: 60											Init
	A	B	C	D	E	F	G	H	I	J	A		B	C	D	E	F	G	H	I	J	A	B		C	D	E	F	G	H	I	J				
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Emm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Emm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Emm			
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Emm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Emm	X	X	X	✓	✓	X	X	✓	✓	X	Emm			
3	✓	✓	✓	2	✓	3	✓	✓	✓	✓	Emm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Emm				X	X				X		Emm			
4	4	4	3	✓	5	✓	5	5	8	5	JT	✓	2	3	4	3	5	3	4	3	✓	JT									X		JT			
5	✓	6	4	6	✓	7	7	✓	✓	5	JT	✓	✓	✓	✓	✓	✓	✓	✓	✓	4	JT														
6	5	✓	✓	10	7	4	✓	6	7	✓	Emm	X	X	3	6	2	4	2	X	3	X	Emm														
7																																				
8																																				
Total	9	10	7	18	12	14	12	11	15	8	Emm	0 <sup>x</sup>	2 <sup>x</sup>	6	10	5	9	5	7 <sup>x</sup>	6	4 <sup>x</sup>	Emm	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	Emm			

Days	Concentration: 80											Init	Concentration: 100											Init	Concentration:											Init
	A	B	C	D	E	F	G	H	I	J	A		B	C	D	E	F	G	H	I	J	A	B		C	D	E	F	G	H	I	J				
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Emm	✓	✓	X	X	✓	✓	X	✓	X	X	Emm														
2	X	X	X	X	X	X	X	X	X	X	Emm	X	X	X	✓	X	X	X	X	X	X	Emm														
3																																				
4																																				
5																																				
6																																				
7																																				
8																																				
Total	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	Emm	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	0 <sup>x</sup>	Emm														

Notes: X = mortality.

Sample Description: cloudy, slightly yellow, some ppt  
 Comments: Total # Young only based on the first 3 Broods. Fourth and subsequent broods not included in total count.

Reviewed by: A. Long

Date reviewed: January 8, 2013

# CETIS Analytical Report

Report Date: 27 Dec-12 14:53 (p 1 of 1)  
 Test Code: 12600 | 09-9826-4918

## Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

<b>Analysis ID:</b> 13-9242-4689	<b>Endpoint:</b> 6d Survival Rate	<b>CETIS Version:</b> CETISv1.8.4
<b>Analyzed:</b> 27 Dec-12 14:51	<b>Analysis:</b> Untrimmed Spearman-Kärber	<b>Official Results:</b> Yes
<b>Batch ID:</b> 04-1003-3449	<b>Test Type:</b> Reproduction-Survival (7d)	<b>Analyst:</b> Jeslin Wijaya
<b>Start Date:</b> 27 Nov-12 11:00	<b>Protocol:</b> EC/EPS 1/RM/21	<b>Diluent:</b> 20% Perrier Water
<b>Ending Date:</b> 03 Dec-12 15:00	<b>Species:</b> Ceriodaphnia dubia	<b>Brine:</b>
<b>Duration:</b> 6d 4h	<b>Source:</b> In-House Culture	<b>Age:</b> <24h
<b>Sample ID:</b> 18-1070-4063	<b>Code:</b> 6BED26BF	<b>Client:</b> Rescan
<b>Sample Date:</b> 24 Nov-12	<b>Material:</b> Water Sample	<b>Project:</b> MMER
<b>Receive Date:</b> 26 Nov-12 11:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 83h	<b>Station:</b> MC-2 Tox Test	

### Spearman-Kärber Estimates

Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0	0.00%	1.595	0.03696	39.33	33.17	46.62

### 6d Survival Rate Summary

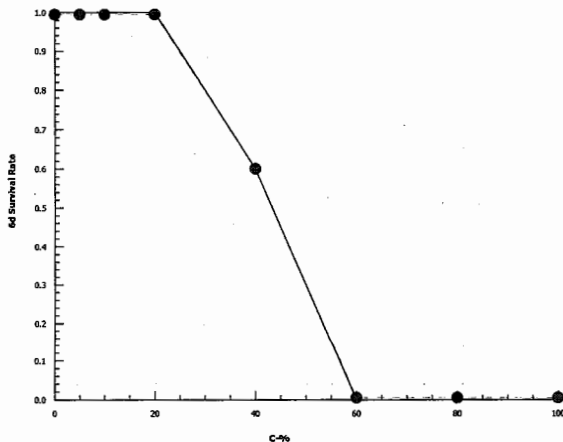
#### Calculated Variate(A/B)

C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	10	1	1	1	0	0	0.0%	0.0%	10	10
5		10	1	1	1	0	0	0.0%	0.0%	10	10
10		10	1	1	1	0	0	0.0%	0.0%	10	10
20		10	1	1	1	0	0	0.0%	0.0%	10	10
40		10	0.6	0	1	0.1633	0.5164	86.07%	40.0%	6	10
60		10	0	0	0	0	0		100.0%	0	10
80		10	0	0	0	0	0		100.0%	0	10
100		10	0	0	0	0	0		100.0%	0	10

### 6d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	1	1	1	1	1	1	1	1	1	1
5		1	1	1	1	1	1	1	1	1	1
10		1	1	1	1	1	1	1	1	1	1
20		1	1	1	1	1	1	1	1	1	1
40		0	0	1	1	1	1	1	0	1	0
60		0	0	0	0	0	0	0	0	0	0
80		0	0	0	0	0	0	0	0	0	0
100		0	0	0	0	0	0	0	0	0	0

### Graphics



**CETIS Analytical Report**

Report Date: 27 Dec-12 14:53 (p 1 of 2)  
 Test Code: 12600 | 09-9826-4918

**Ceriodaphnia 7-d Survival and Reproduction Test**

**Nautilus Environmental**

<b>Analysis ID:</b> 01-8071-9696	<b>Endpoint:</b> Reproduction	<b>CETIS Version:</b> CETISv1.8.4
<b>Analyzed:</b> 27 Dec-12 14:52	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Official Results:</b> Yes
<b>Batch ID:</b> 04-1003-3449	<b>Test Type:</b> Reproduction-Survival (7d)	<b>Analyst:</b> Jeslin Wijaya
<b>Start Date:</b> 27 Nov-12 11:00	<b>Protocol:</b> EC/EPS 1/RM/21	<b>Diluent:</b> 20% Perrier Water
<b>Ending Date:</b> 03 Dec-12 15:00	<b>Species:</b> Ceriodaphnia dubia	<b>Brine:</b>
<b>Duration:</b> 6d 4h	<b>Source:</b> In-House Culture	<b>Age:</b> <24h
<b>Sample ID:</b> 18-1070-4063	<b>Code:</b> 6BED26BF	<b>Client:</b> Rescan
<b>Sample Date:</b> 24 Nov-12	<b>Material:</b> Water Sample	<b>Project:</b> MMER
<b>Receive Date:</b> 26 Nov-12 11:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 83h	<b>Station:</b> MC-2 Tox Test	

**Linear Interpolation Options**

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	1075643	200	Yes	Two-Point Interpolation

**Point Estimates**

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	2.16	0.5068	6.411	46.3	15.6	197.3
IC10	5.486	1.27	8.331	18.23	12	78.72
IC15	6.735	2.421	10.44	14.85	9.579	41.31
IC20	8.224	4.155	11.5	12.16	8.697	24.07
IC25	10	5.982	12.77	10	7.829	16.72
IC40	14.66	11.28	18.23	6.821	5.486	8.864
IC50	18.82	14.76	23.59	5.314	4.238	6.774

**Reproduction Summary**

C-%	Control Type	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	10	24.4	17	32	1.74	5.502	22.55%	0.0%
5		10	22.5	15	25	0.9574	3.028	13.46%	7.79%
10		10	18.3	12	24	1.065	3.368	18.41%	25.0%
20		10	11.6	7	18	1.067	3.373	29.08%	52.46%
40		10	5.4	0	10	0.9452	2.989	55.35%	77.87%
60		10	0	0	0	0	0		100.0%
80		10	0	0	0	0	0		100.0%
100		10	0	0	0	0	0		100.0%

**Reproduction Detail**

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	21	29	17	32	22	20	21	32	29	21
5		22	21	25	24	22	25	22	15	25	24
10		12	16	22	17	20	18	20	24	17	17
20		9	10	7	18	12	14	12	11	15	8
40		0	2	6	10	5	9	5	7	6	4
60		0	0	0	0	0	0	0	0	0	0
80		0	0	0	0	0	0	0	0	0	0
100		0	0	0	0	0	0	0	0	0	0



# CETIS Analytical Report

Report Date: 27 Dec-12 14:53 (p 2 of 2)  
Test Code: 12600 | 09-9826-4918

## Ceriodaphnia 7-d Survival and Reproduction Test

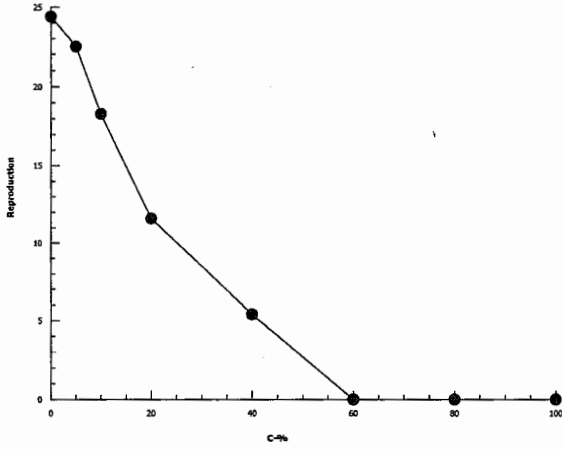
Nautilus Environmental

Analysis ID: 01-8071-9696  
Analyzed: 27 Dec-12 14:52

Endpoint: Reproduction  
Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.4  
Official Results: Yes

### Graphics



Client: Rescan Environmental

W.O.#: 12600

### Hardness and Alkalinity Datasheet

Sample ID	Sample Date	Alkalinity				Hardness			Technician
		Sample Volume (mL)	(mL) 0.02N HCL/H <sub>2</sub> SO <sub>4</sub> used to pH 4.5	(mL) of 0.02N HCL/H <sub>2</sub> SO <sub>4</sub> used to pH 4.2	Total Alkalinity (mg/L CaCO <sub>3</sub> )	Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness (mg/L CaCO <sub>3</sub> )	
KC-2	NOV 27/12	10 <sup>Ⓟ</sup>	0.5	0.6	40	10 <sup>Ⓟ</sup>	2.3	230	EMM
Perrier 20%	NOV 27/12	50	3.7	3.8	72	50	4.5	90	EMM

Notes: Ⓟ diluted to 100ml w/ D.I. water

Reviewed by: A. Terry

Date Reviewed: January 8, 2013

**APPENDIX B - Rainbow Trout Embryo Toxicity Test Data**

## Rainbow Trout Embryo Summary Sheet

Client: Rescan Start Date/Time: Nov. 29, 2012 14W<sup>h</sup>  
 Work Order No.: 12599 Test Species: Oncorhynchus mykiss

**Sample Information:**

Sample ID: MC-2 Tox Test  
 Sample Date: Nov. 24, 2012  
 Date Received: Nov. 26, 2012  
 Sample Volume: 8 x 20L

**Dilution Water:**

Type: Dechlorinated water  
 Hardness (mg/L CaCO<sub>3</sub>): 14  
 Alkalinity (mg/L CaCO<sub>3</sub>): 6

**Test Organism Information:**

Batch No.: Nov. 29, 2012  
 Source: FVTH  
 Loading Density: 0.975/L

**SDS Reference Toxicant Results:**

Reference Toxicant ID: RTE 42  
 Stock Solution ID: 12S03  
 Date Initiated: Nov. 29, 2012  
 7-d EC50 (95% CL): 4.9 (4.6-5.3) mg/L SDS  
 Reference Toxicant Mean and Range: 3.7 (1.7 - 8.0) mg/L SDS  
 Reference Toxicant CV (%): 47 ~~46~~%

**Test Results:**

	Sample ID	
	MC-2 Tox Test	
EC25 % (v/v) (95% CL)	/	>100
EC50 % (v/v) (95% CL)	/	>100

Reviewed by: A. Terry Date reviewed: January 8, 2013

## 7-d Chronic Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: REGOAN  
 Sample ID: MC-2 TOX TEST  
 Work Order #: 12599

Start Date & Time: 29-Nov-12 1410h  
 Stop Date & Time: 06-Dec-12 1400h  
 Test Species: Oncorhynchus mykiss

% (v/v) Concentration Control	Days													
	0	1		2		3		4		5		6		7
	init.	new	old	new	old	new	old	new	old	new	old	new	old	final
Temperature (°C)	13.5	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	10.2	10.1	10.0	10.1	10.0	10.1	10.0	10.1	10.2	10.2	10.1	10.1	10.2	10.1
pH	7.2	7.1	7.1	6.8	6.9	6.9	7.2	7.1	7.1	7.2	7.1	7.2	7.1	7.1
Cond. (µS/cm)	34	34		34		34		35		34		34		36
Initials	<u>EW</u>	~		~		~		<u>EW</u>		<u>EW</u>		<u>EW</u>		<u>EW</u>

Concentration 6.25	Days													
	0	1		2		3		4 (D)		5		6		7
	init.	new	old	new	old	new	old	new	old	new	old	new	old	final
Temperature (°C)	13.5	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	10.2	10.1	10.0	10.1	10.0	10.0	10.0	10.2	10.2	10.2	10.1	10.2	10.2	10.1
pH	7.1	7.1	7.1	6.8	7.1	7.0	7.2	7.1	7.2	7.2	7.1	7.2	7.2	7.2
Cond. (µS/cm)	65	62		64		62		64		59		63		64
Initials	<u>EW</u>	~		~		~		<u>EW</u>		<u>EW</u>		<u>EW</u>		<u>EW</u>

Concentration 25	Days													
	0	1		2		3		4 (D)		5		6		7
	init.	new	old	new	old	new	old	new	old	new	old	new	old	final
Temperature (°C)	13.5	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
DO (mg/L)	10.2	10.1	10.0	10.2	10.0	10.0	10.0	10.1	10.2	10.2	10.2	10.2	10.2	10.1
pH	6.9	7.0	7.0	6.7	7.1	7.0	7.1	7.2	7.3	7.1	7.2	7.2	7.2	7.3
Cond. (µS/cm)	140	151		150		152		149		148		150		156
Initials		~		~		~		<u>EW</u>		<u>EW</u>		<u>EW</u>		<u>EW</u>

Concentration 100	Days													
	0	1		2		3		4 (D)		5		6		7
	init.	new	old	new	old	new	old	new	old	new	old	new	old	final
Temperature (°C)	13.5	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	13.5	14.0	14.0
DO (mg/L)	10.1	10.1	10.0	10.1	10.0	9.9	10.0	9.9	10.2	10.1	10.2	10.1	10.2	10.1
pH	6.8	6.8	6.9	6.7	7.0	7.1	7.0	7.3	7.5	7.0	7.4	7.1	7.3	7.4
Cond. (µS/cm)	439	442		438		440		442		434		440		442
Initials	<u>EW</u>	~		~		~		<u>EW</u>		<u>EW</u>		<u>EW</u>		<u>EW</u>

DO meter: DO-1      pH meter: pH-1      Conductivity meter: C-1

	Control	100%		
Hardness*	14	230		
Alkalinity*	0	40		

Analysts: EW AND

Reviewed by: ART

Date reviewed: Jan 8/13

Sample Description: light yellow turbid

Comments: ① yellow precipitate - increasing in amount at higher concs.

## 7-d Embryo Toxicity Test Daily Mortality

Client: RESCAN  
 Sample ID: MC-2 TOX TEST  
 Work Order #: 12599

Start Date & Time: 29-Nov-12 1410h  
 Stop Date: 06-Dec-12 1400h  
 Test Species: Oncorhynchus mykiss

Concentration %(v/v)	Rep	Day of Test - No. of Mortalities							Total Dead Eggs	Total Undeveloped	Total No. Embryo	Total Exposed
		1	2	3	4	5	6	7				
Control	1	0	0	0	0	0	0	0	1	29	30	
	2	0	0	0	0	0	0	0	2	28	30	
	3	0	0	0	0	0	0	0	1	29	30	
	4	0	0	0	0	0	0	0	0	30	30	
6.25	1	0	0	0	0	0	0	0	2	28	30	
	2	0	0	0	0	0	0	0	0	30	30	
	3	0	0	0	0	0	0	0	1	29	30	
	4	0	0	0	0	0	0	0	1	29	30	
12.5	1	0	0	0	0	0	0	0	2	28	30	
	2	0	0	0	0	0	0	1	0	29	30	
	3	0	0	0	0	0	0	0	1	29	30	
	4	0	0	0	0	0	0	0	0	29	30	
25	1	0	0	0	0	0	0	0	0	30	30	
	2	0	0	0	0	0	0	0	1	28	29	
	3	0	0	0	0	0	0	0	2	27	30	
	4	0	0	0	0	0	0	0	1	29	30	
50	1	0	0	0	0	0	0	0	4	26	30	
	2	0	0	0	0	0	0	0	5	25	30	
	3	0	0	0	0	0	0	0	3	27	30	
	4	0	0	0	0	0	0	0	2	28	30	
100	1	0	0	0	0	0	0	0	6	24	30	
	2	0	0	0	0	0	0	0	6	24	30	
	3	0	0	0	0	0	0	0	5	25	30	
	4	0	0	0	0	0	0	0	4	26	30	
	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											
Tech Initials		~	~	~	~	~	~	~	~	~	~	

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Reviewed by: A. Terry

Date reviewed: January 8, 2013

# CETIS Analytical Report

Report Date: 14 Dec-12 17:26 (p 1 of 2)  
 Test Code: 12599 | 05-6891-1741

Salmonid Embryo Survival and Development Test			Nautilus Environmental		
Analysis ID:	12-7085-6907	Endpoint:	Proportion Normal	CETIS Version:	CETISv1.8.0
Analyzed:	12 Dec-12 10:35	Analysis:	Linear Regression (MLE)	Official Results:	Yes
Batch ID:	15-3384-8421	Test Type:	Development	Analyst:	
Start Date:	29 Nov-12	Protocol:	EC/EPS 1/RM/28	Diluent:	Dechlorinated Tap Water
Ending Date:	06 Dec-12	Species:	Oncorhynchus mykiss	Brine:	
Duration:	7d 0h	Source:	Fraser Valley Trout Hatchery	Age:	
Sample ID:	05-0969-1873	Code:	MC-2 Tox Test	Client:	Rescan
Sample Date:	24 Nov-12	Material:	Water Sample	Project:	
Receive Date:	26 Nov-12	Source:	Rescan		
Sample Age:	5d 0h	Station:			

Linear Regression Options						
Model Function	Threshold Option	Threshold	Optimized	Pooled	Het Corr	Weighted
Log-Normal [NED=A+B*log(X)]	Control Threshold	0.0333333	Yes	No	No	Yes

Regression Summary										
Iters	LL	AICc	BIC	Mu	Sigma	Adj R2	F Stat	Critical	P-Value	Decision(α:5%)
7	-158.4	324.4	325.8	0.5397	0.6365	0.7064	0.8999	3.682	0.4275	Non-Significant Lack of Fit

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC10	67.18	23.73	103.3	1.489	0.9684	4.215
EC15	96.21	61.78	256.5	1.039	0.3899	1.619
EC20	128	86.65	806.3	0.7812	0.124	1.154
EC25	163.5	105.6	2364	0.6115	0.04231	0.9473
EC40	303.2	158.3	38960	0.3298	0.002566	0.6318
EC50	439.5	197.9	214600	0.2275	0.0004661	0.5053

} > 100% (V/W)

Regression Parameters							
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(α:5%)
Threshold	0.03174	0.01181	0.008601	0.05488	2.688	0.0155	Significant Parameter
Slope	1.571	0.6286	0.3389	2.803	2.499	0.0230	Significant Parameter
Intercept	0.8479	1.161	-1.427	3.123	0.7304	0.4751	Non-Significant Parameter

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Model	25.68644	25.68644	1	47.72	<0.0001	Significant
Lack of Fit	0.9803327	0.4901664	2	0.8999	0.4275	Non-Significant
Pure Error	8.170239	0.5446826	15			
Residual	9.150572	0.538269	17			

Residual Analysis					
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Goodness-of-Fit	Pearson Chi-Sq GOF	9.151	27.59	0.9354	Non-Significant Heterogeneity
	Likelihood Ratio GOF	11.22	27.59	0.8452	Non-Significant Heterogeneity
Variances	Bartlett Equality of Variance	2.436	9.488	0.6562	Equal Variances
	Mod Levene Equality of Variance	0.4146	3.056	0.7955	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9706	0.9044	0.7678	Normal Distribution
	Anderson-Darling A2 Normality	0.3182	2.492	0.5597	Normal Distribution

ARF  
 QA Jan 8/13

**Salmonid Embryo Survival and Development Test**

**Nautilus Environmental**

Analysis ID: 12-7085-6907      Endpoint: Proportion Normal  
 Analyzed: 12 Dec-12 10:35      Analysis: Linear Regression (MLE)

CETIS Version: CETISv1.8.0  
 Official Results: Yes

**Proportion Normal Summary**

**Calculated Variate(A/B)**

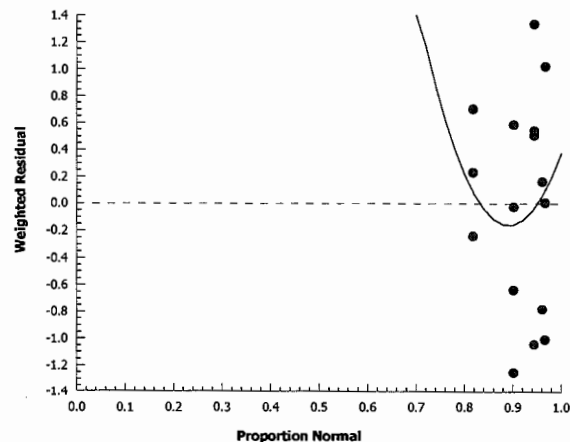
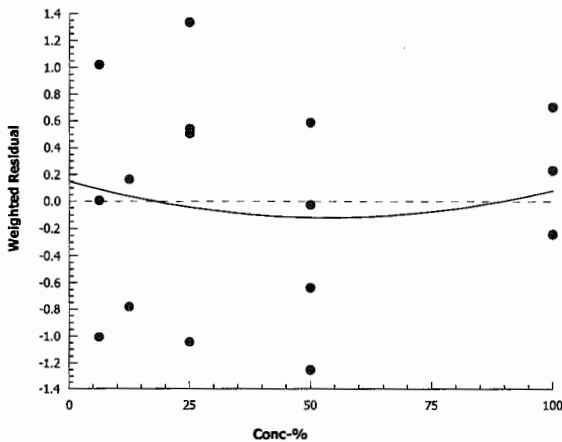
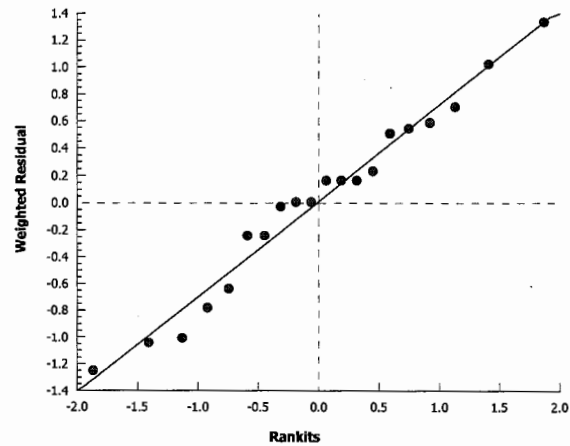
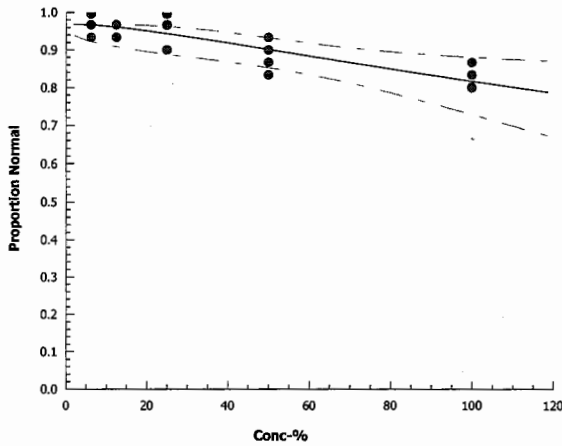
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	4	0.9667	0.9333	1	0.01361	0.02722	2.82%	0.0%	116	120
6.25		4	0.9667	0.9333	1	0.01361	0.02722	2.82%	0.0%	116	120
12.5		4	0.9583	0.9333	0.9667	0.008333	0.01667	1.74%	0.86%	115	120
25		4	0.958	0.9	1	0.02094	0.04187	4.37%	0.89%	114	119
50		4	0.8833	0.8333	0.9333	0.02152	0.04303	4.87%	8.62%	106	120
100		4	0.825	0.8	0.8667	0.01596	0.03191	3.87%	14.66%	99	120

**Proportion Normal Detail**

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	0.9667	0.9333	0.9667	1
6.25		0.9333	1	0.9667	0.9667
12.5		0.9333	0.9667	0.9667	0.9667
25		1	0.9655	0.9	0.9667
50		0.8667	0.8333	0.9	0.9333
100		0.8	0.8	0.8333	0.8667

**Graphics**

Log-Normal [NED=A+B\*log(X)]





**APPENDIX C - *Lemna minor* Toxicity Test Data**

## Lemna minor Summary Sheet

Client: Rescan  
 Work Order No.: 12601

Start Date: NOV 28/12  
 Set up by: KLB / JW

### Sample Information:

Sample ID: MC - 2 tox test  
 Sample Date: NOV 24 / 12  
 Date Received: NOV 26 / 12  
 Sample Volume: 8 X 20L

### Test Organism Information:

Culture Date: 11/21/12  
 Age of culture (Day 0): 7 days  
 >8X growth in APHA?: Y (25 fronds)

### KCI Reference Toxicant Results:

Reference Toxicant ID: LM 81  
 Date Initiated: NOV 19 / 12

7-d No. of Fronds IC50 (95% CL): 4.8 (4.5 - 5.1)

7-d No. Fronds IC50 Reference Toxicant Mean (2 SD Range): 4.3 (3.4 - 5.3) CV (%): 12

	Number of Fronds	Dry Weight
Test Results: IC25 %(v/v) (95% CL)	> 97	> 97
IC50 %(v/v) (95% CL)	> 97	> 97

Reviewed by: A. Tong

Date reviewed: January 9, 2013 <sup>AT</sup>

## Plant Growth Inhibition Toxicity Test Water Quality Measurements

Client: Rescan Setup by: KLB/JW  
 Sample ID: MC-2 tox test Test Date: Nov 28/12  
 Work Order No.: 12601 Test Species: Lemna minor  
 Culture Source: CPCC#490  
 Test Culture Age: 7 days > 8X Growth? (Y/N): Y (25 fronds)  
 Light Intensity Range: 4300-4700 lux Date Measured: Nov 28/12

Day	0	1	2	3	4	5	6	7
Shelf Temp (°C)	25.0	25.0	26.0	25.5	25.0	25.0	25.5	25.0
Initials	KLB	JW	JTJ	JTJ	KLB	KLB	JW	KLB

Sample Characteristics  
 Temperature (°C) 23.0  
 DO (mg/L) 9.3  
 pH 6.8  
 Conductivity (µS) 448

Aeration? 20 min  
23.0  
8.5  
7.7  
1192

Concentration % (v/v)	Temperature (°C)		pH		Conductivity (µS) 0 h
	Day 0	Day 7	Day 0	Day 7	
Control	23.0	24.0	8.3	8.6	868
1.5	23.0	25.0	8.1	8.9	876
3.05	23.0	25.0	8.1	8.7	882
6.1	23.0	24.0	8.1	8.6	895
12.1	23.0	25.0	8.1	8.6	917
24.2	23.0	25.5	8.0	8.5	955
48.5	23.0	25.5	7.9	8.3	1032
97	23.0	25.5	7.7	8.3	1192
Initials	KLB	KLB	KLB	KLB	KLB

Thermometer: Calibrated Thermometer Cond. Meter: C-1 pH meter: pH-1

Sample Description: turbid, yellow w/ some precipitate.

Comments: \_\_\_\_\_

Reviewed: A. Terry Date Reviewed: January 9, 2013

### Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts

Client: hescan  
 Sample ID: mc-2 tox test  
 Work Order #: 12601

Start Date: Nov 28/12  
 Termination Date: Dec 5/12  
 Test set up by: KCB/JSW

Concentration % (v/v)	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
Control	A	6	68										KCB
	B		63										
	C		60										
	D		70										
1.5	A		70										↓
	B		65										
	C		83										
	D		81										
3.05	A		46										
	B		74										
	C		68										
	D		63										
6.1	A		73										
	B		78										
	C		63										
	D		64										
12.1	A		65										
	B		59										
	C		73										
	D		71										
24.2	A		74										
	B		57										
	C		56										
	D		49										

Comments: \_\_\_\_\_

Reviewed by: A. Terry

Date Reviewed: January 9, 2013

**Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts**

Client: Bescan  
 Sample ID: mc-2 tox test  
 Work Order #: 12601

Start Date: Nov 28/12  
 Termination Date: Dec 5/12  
 Test set up by: CCB/TW

Concentration <i>µg/L</i>	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
48.5	A	6	51										CCB
	B		56										
	C		53										
	D		57										
97	A		64										
	B		45										
	C		49										
	D		54										
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												

Comments: \_\_\_\_\_

Reviewed by: A. Terry

Date Reviewed: January 9, 2013

### 7-d Lemna minor Weight Data Sheet

Client: Rescan  
 Sample ID: mc-2 tox test  
 Work Order #: 12601

Start Date: Nov 28 12  
 Termination Date: Dec 5 12

Concentration (% v/v)	Red Rep	Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
Control	A	1	1015.57	1022.88	KLB
	B	2	1045.33	1052.23	
	C	3	1010.25	1017.34	
	D	4	1006.91	1014.53	
1.5	A	5	1037.08	1044.80	
	B	6	1060.70	1068.09	
	C	7	1028.13	1036.33	
	D	8	1053.79	1062.07	
3.05	A	9	1038.48	1043.57	
	B	10	1040.18	1048.69	
	C	11	1044.82	1052.83	
	D	12	1033.20	1040.12	
6.1	A	13	1024.04	1032.34	
	B	14	1010.01	<sup>err</sup> 1018.5 1018.66	
	C	15	1037.48	1044.50	
	D	16	1015.92	1022.10	
12.1	A	17	1039.66	1047.72	
	B	18	1035.58	1042.20	
	C	19	1052.01	1060.44	
	D	20	1028.48	1036.98	
24.2	A	21	1050.48	1056.09	
	B	22	1061.77	1069.24	
	C	23	1030.55	1038.21	
	D	24	1027.11	1033.66	
48.5	A	25	1043.82	1049.93	
	B	26	1029.43	1036.35	
	C	27	1037.75	1044.80	
	D	28	1031.53	1039.55	

Comments: 10% Reweigh: Pan #2 = 1052.11 mg      Pan #21 = 1055.91 mg  
Pan #27 = 1044.77 mg

Reviewed by: A. Teng

Date Reviewed: January 9, 2013

### 7-d Lemna minor Weight Data Sheet

Client: Rescon  
 Sample ID: mc-2tox test  
 Work Order #: 12601

Start Date: Nov 28/12  
 Termination Date: Dec 5/12

Concentration <i>µg/L</i>	Rep	Red Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
97	A	29	1060.72	1069.05	REB ↓
	B	30	1056.83	1062.75	
	C	31	1053.95	1061.47	
	D	32	1038.82	1045.89	
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				

Comments: \_\_\_\_\_  
 \_\_\_\_\_

Reviewed by: A. Terry

Date Reviewed: January 9, 2013

**CETIS Analytical Report**

Report Date: 27 Dec-12 15:20 (p 1 of 2)  
 Test Code: 12601 | 19-5746-6644

Lemna Growth Inhibition Test			Nautilus Environmental		
Analysis ID: 07-9374-1418	Endpoint: Total Dry Weight-mg	CETIS Version: CETISv1.8.4	Batch ID: 20-6094-8960	Test Type: Lemna Growth	Analyst: Jeslin Wijaya
Analyzed: 27 Dec-12 15:19	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes	Start Date: 28 Nov-12	Protocol: EC/EPS 1/RM/37	Diluent: APHA
			Ending Date: 05 Dec-12	Species: Lemna minor	Brine:
			Duration: 7d 0h	Source: CPCC#490	Age: 7d
Sample ID: 07-7220-4436	Code: 2E06E794	Client: Rescan	Sample Date: 24 Nov-12	Material: Water Sample	Project:
Receive Date: 26 Nov-12 11:00	Source: Rescan		Sample Age: 96h	Station: MC-2 Tox Test	

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	1857426	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	19.4	N/A	N/A	5.154	NA	NA
IC10	>97	N/A	N/A	<1.031	NA	NA
IC15	>97	N/A	N/A	<1.031	NA	NA
IC20	>97	N/A	N/A	<1.031	NA	NA
IC25	>97	N/A	N/A	<1.031	NA	NA
IC40	>97	N/A	N/A	<1.031	NA	NA
IC50	>97	N/A	N/A	<1.031	NA	NA

Total Dry Weight-mg Summary			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	4	7.23	6.9	7.62	0.1547	0.3093	4.28%	0.0%
1.5		4	7.897	7.39	8.28	0.2095	0.419	5.31%	-9.23%
3.05		4	7.132	5.09	8.51	0.7574	1.515	21.24%	1.35%
6.1		4	7.537	6.18	8.65	0.5722	1.144	15.18%	-4.25%
12.1		4	7.902	6.62	8.5	0.4383	0.8765	11.09%	-9.3%
24.2		4	6.822	5.61	7.66	0.4712	0.9425	13.81%	5.64%
48.5		4	7.04	6.11	8.02	0.3921	0.7841	11.14%	2.63%
97		4	7.21	5.92	8.33	0.5028	1.006	13.95%	0.28%

Total Dry Weight-mg Detail					
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	7.31	6.9	7.09	7.62
1.5		7.72	7.39	8.2	8.28
3.05		5.09	8.51	8.01	6.92
6.1		8.3	8.65	7.02	6.18
12.1		8.06	6.62	8.43	8.5
24.2		5.61	7.47	7.66	6.55
48.5		6.11	6.92	7.11	8.02
97		8.33	5.92	7.52	7.07

*IRF*  
 QA Jan 9/13



# CETIS Analytical Report

Report Date: 27 Dec-12 15:20 (p 2 of 2)  
Test Code: 12601 | 19-5746-6644

Lemna Growth Inhibition Test

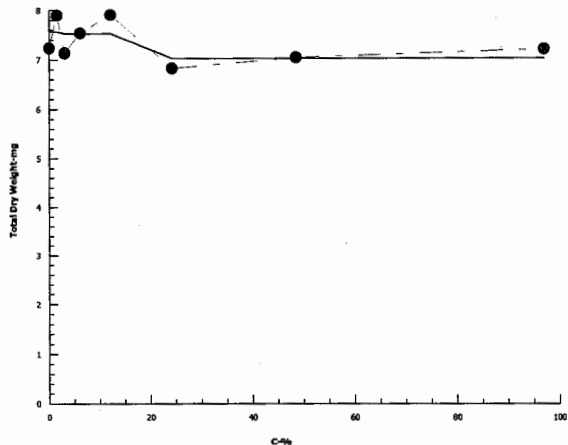
Nautilus Environmental

Analysis ID: 07-9374-1418  
Analyzed: 27 Dec-12 15:19

Endpoint: Total Dry Weight-mg  
Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.4  
Official Results: Yes

## Graphics



**CETIS Analytical Report**

Report Date: 27 Dec-12 15:16 (p 1 of 2)  
 Test Code: 12601 | 19-5746-6644

**Lemna Growth Inhibition Test**

**Nautilus Environmental**

<b>Analysis ID:</b> 09-4122-5669	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.8.4
<b>Analyzed:</b> 27 Dec-12 15:15	<b>Analysis:</b> Nonlinear Regression	<b>Official Results:</b> Yes
<b>Batch ID:</b> 20-6094-8960	<b>Test Type:</b> Lemna Growth	<b>Analyst:</b> Jeslin Wijaya
<b>Start Date:</b> 28 Nov-12	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Diluent:</b> APHA
<b>Ending Date:</b> 05 Dec-12	<b>Species:</b> Lemna minor	<b>Brine:</b>
<b>Duration:</b> 7d 0h	<b>Source:</b> CPCC#490	<b>Age:</b> 7d
<b>Sample ID:</b> 07-7220-4436	<b>Code:</b> 2E06E794	<b>Client:</b> Rescan
<b>Sample Date:</b> 24 Nov-12	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 26 Nov-12 11:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 96h	<b>Station:</b> MC-2 Tox Test	

**Non-Linear Regression Options**

Model Function	X Transform	Y Transform	Weighting Function	PTBS Function
4P Log-Logistic+Hormesis EV [Y=A(1+EX)/(1+(2ED+1)(X/D)^C)]	None	None	Normal [W=1]	Off [Y*=Y]

**Regression Summary**

Iters	Log LL	AICc	BIC	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(α:5%)
80	-81.34	172.2	176.6	0.3293	Yes	1.299	2.776	0.2985	Non-Significant Lack of Fit

**Point Estimates**

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	13.31	N/A	30.41	7.514	3.289	NA
IC10	24.85	11.64	55.76	4.024	1.793	8.595
IC15	47.97	18.04	139.5	2.085	0.7167	5.542
IC20	96.34	24.93	446.6	1.038	0.2239	4.011
IC25	202.5	33.73	N/A	0.4938	NA	2.965

**Regression Parameters**

Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(α:5%)
A	59.22	4.119	51.15	67.29	14.38	<0.0001	Significant Parameter
C	1.087	0.03264	1.023	1.151	33.29	<0.0001	Significant Parameter
D	21750	61420	-98640	142100	0.3541	0.7259	Non-Significant Parameter
E	5.278	37.97	-69.15	79.71	0.139	0.8905	Non-Significant Parameter

**ANOVA Table**

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Model	1236.663	1236.663	1	18.22	0.0002	Significant
Lack of Fit	338.2119	84.55297	4	1.299	0.2985	Non-Significant
Pure Error	1562	65.08334	24			
Residual	1900.212	67.86471	28			

**Residual Analysis**

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance	6.575	14.07	0.4744	Equal Variances
	Mod Levene Equality of Variance	0.6811	2.423	0.6865	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9498	0.9338	0.1423	Normal Distribution
	Anderson-Darling A2 Normality	0.5595	2.492	0.1519	Normal Distribution

**Frond Count Summary**

C-%	Control Type	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	4	59.25	54	64	2.287	4.573	7.72%	0.0%
1.5		4	68.75	59	77	4.328	8.655	12.59%	-16.03%
3.05		4	56.75	40	68	6.019	12.04	21.21%	4.22%
6.1		4	63.5	57	72	3.617	7.234	11.39%	-7.17%
12.1		4	61	53	67	3.162	6.325	10.37%	-2.95%
24.2		4	53	43	68	5.307	10.61	20.03%	10.55%
48.5		4	48.25	45	51	1.377	2.754	5.71%	18.57%
97		4	47	39	58	4.103	8.206	17.46%	20.68%

# CETIS Analytical Report

Report Date: 27 Dec-12 15:16 (p 2 of 2)  
 Test Code: 12601 | 19-5746-6644

## Lemna Growth Inhibition Test

Nautilus Environmental

Analysis ID: 09-4122-5669      Endpoint: Frond Count  
 Analyzed: 27 Dec-12 15:15      Analysis: Nonlinear Regression

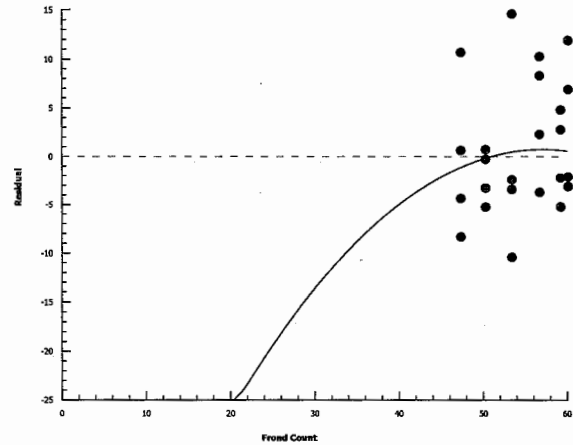
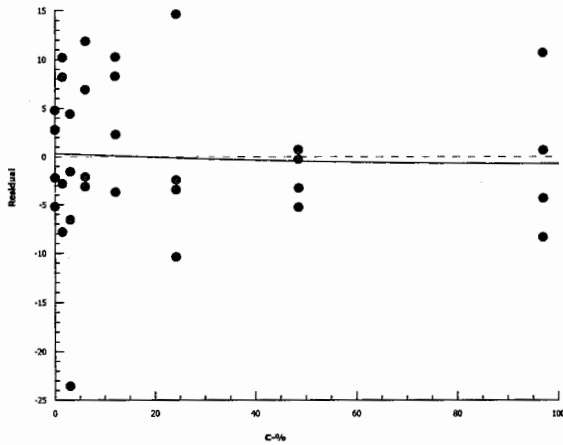
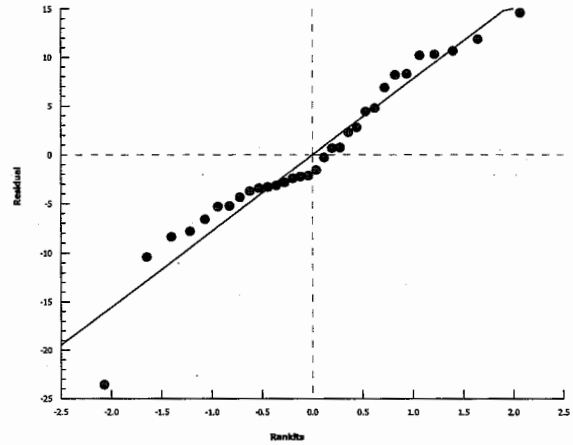
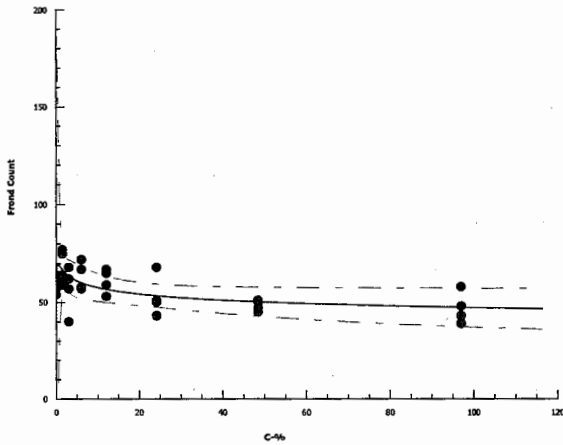
CETIS Version: CETISv1.8.4  
 Official Results: Yes

### Frond Count Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	62	57	54	64
1.5		64	59	77	75
3.05		40	68	62	57
6.1		67	72	57	58
12.1		59	53	67	65
24.2		68	51	50	43
48.5		45	50	47	51
97		58	39	43	48

### Graphics

4P Log-Logistic+Hormesis EV [Y=A(1+EX)/(1+(2ED+1)(X/D)^C)]



**APPENDIX D - *Pseudokirchneriella subcapitata* Toxicity Test Data**

**Pseudokirchneriella subcapitata Summary Sheet**

Client: Rescan  
Work Order No.: 12602

Start Date: Nov. 27, 2012  
Set up by: ECC

**Sample Information:**

Sample ID: MC-2 TOX TEST  
Sample Date: Nov. 24, 2012  
Date Received: Nov. 26, 2012  
Sample Volume: 8 x 20L

**Test Organism Information:**

Culture Date: Nov. 23, 2012  
Age of culture (Day 0): 4 d

**Zinc Reference Toxicant Results:**

Reference Toxicant ID: SC91a  
Stock Solution ID: 12Zn01  
Date Initiated: Dec. 7, 2012

72-h IC50 (95% CL): 31.7 (27.2 - 34.9) µg/L Zn

72-h IC50 Reference Toxicant Mean and Range: 20.9, 13.6 - 32.2 CV (%): 24  
21.6, 13.7 - 34.4 26%  
µg/L Zn

Test Results:

	Algal Growth
IC25 %(v/v) (95% CL)	19.4 (13.0 - 26.8)
IC50 %(v/v) (95% CL)	28.8 (19.9 - 32.8)

Reviewed by: A. Long

Date reviewed: January 8, 2013

## 72-h Algal Growth Inhibition Toxicity Test Water Quality Measurements

Client: Rescan Setup by: ECC

Sample ID: MC-2 TOX TEST Test Date/Time: NN-27, 2012 1100h

Work Order No.: 12602 Test Species: Pseudokirchneriella subcapitata

Culture Date: NN-23/12 Age of Culture: 4d Culture Health: Good

Culture Count: 1 101 2 103 Average: 102 Culture Cell Density (c1): 102 x 10<sup>4</sup>

$$v1 = \frac{220,000 \text{ cells/ml} \times 25 \text{ ml}}{(c1) 102 \times 10^4 \text{ cells/ml}} = 5.39 \text{ mL}$$

Time Zero Counts: 1 22 2 20 Average: 21 x 10<sup>4</sup>

No. of Cells/mL: 21 x 10<sup>4</sup> Initial Density: # cells/mL ÷ 220 µL × 10 µL = 9.5 x 10<sup>4</sup> cells/mL

Concentration	Water Quality Measurements					Microplates rotated 2X per day?			
	pH	Temp (°C)				0 h	24 h	48 h	72 h
	% (v/v)	0 h	24 h	48 h	72 h				
Control	6.8	23.5	25.0	25.0	25.5	✓	✓	✓	✓
1.5	6.8	23.5	25.0			✓	✓	✓	✓
3.0	6.8	23.5	25.0			✓	✓	✓	✓
5.9	6.8	23.5	25.0			✓	✓	✓	✓
11.9	6.9	23.5	25.0			✓	✓	✓	✓
23.8	6.9	23.5	25.0			✓	✓	✓	✓
47.6	7.0	23.5	25.0			✓	✓	✓	✓
95.2	7.1	24.0	25.0	↓	↓	✓	✓	✓	✓
Initials	<u>EN</u>	<u>EN</u>	<u>EN</u>	<u>EN</u>	<u>EN</u>	<u>EN</u>	<u>EN</u>	<u>EN</u>	<u>EN</u>

Initial control pH: Well 1: 6.8 Well 2: 6.8

Final control pH: Well 1: 6.5 Well 2: 6.5

Light intensity (lux): 3720 Date measured: NN-27, 2012

Sample Description: light yellow, turbid

Comments: \_\_\_\_\_

Reviewed: A. Terry Date reviewed: January 7, 2013

**Pseudokirchneriella subcapitata Toxicity Test Data Sheet**  
**72-h Algal Cell Counts**

Client: Rescan Start Date/Time: Nov. 27, 2012 1100h  
 Work Order #: 12602 Termination Date: Nov. 30, 2012 1100h  
 Sample ID: MC-2 Test set up by: ECC  
 %(v/v)

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A	83					ECC
	B	78					
	C	87					
	D	81					
	E	85					
	F	62	65				
	G	79					
	H	92					
1.5	A	163					ECC
	B	156					
	C	139					
	D	174					
3.0	A	139					
	B	148					
	C	144					
	D	158					
5.9	A	143					
	B	136					
	C	118	121				
	D	129					
11.9	A	83					
	B	78					
	C	69					
	D	86					
23.8	A	66					
	B	62					
	C	34	38				
	D	49					
47.6	A	5					
	B	9					
	C	13					
	D	6					
95.2	A	2					
	B	1					
	C	0					
	D	2					

Comments: \_\_\_\_\_  
 Reviewed by: A. Terry Date Reviewed: January 7, 2013

***Pseudokirchneriella subcapitata* Algal Counts**

Client: Copper Mountain  
 WO#: 12602  
 Sample ID: MC-2

Start Date/Time: 27-Nov-12 @1100h  
 Termination Date: 30-Dec-12 @1100h

Initial Cell Density: 9545 cell/mL 210000  
 0.22  
 0.01

Concentration % v/v	Rep	Count 1 (x 10 <sup>4</sup> )	Count 2 (x 10 <sup>4</sup> )	Count 3 (x 10 <sup>4</sup> )	Count 4 (x 10 <sup>4</sup> )	Mean (x 10 <sup>4</sup> )	Cell Yield (x 10 <sup>4</sup> )		9545.455
Control	A	83				83	82.0	mean	80.1
	B	78				78	77.0	SD	8.419525
	C	87				87	86.0	CV	10.51022
	D	81				81	80.0		
	E	85				85	84.0		
	F	62		65		63.5	62.5		
	G	79				79	78.0		
	H	92				92	91.0		
1.48	A	163				163	162.0		
	B	156				156	155.0		
	C	139				139	138.0		
	D	174				174	173.0		
2.95	A	139				139	138.0		
	B	148				148	147.0		
	C	144				144	143.0		
	D	158				158	157.0		
5.9	A	143				143	142.0		
	B	136				136	135.0		
	C	118		121		119.5	118.5		
	D	129				129	128.0		
11.9	A	83				83	82.0		
	B	78				78	77.0		
	C	69				69	68.0		
	D	86				86	85.0		
23.8	A	66				66	65.0		
	B	62				62	61.0		
	C	34		38		36	35.0		
	D	49				49	48.0		
47.6	A	5				5	4.0		
	B	9				9	8.0		
	C	13				13	12.0		
	D	6				6	5.0		
95.2	A	2				2	1.0		
	B	1				1	0.0		
	C	0				0	-1.0		
	D	2				2	1.0		

ART  
 Jan 7/13



**CETIS Analytical Report**

Report Date: 14 Dec-12 17:27 (p 1 of 2)  
 Test Code: 12602b | 02-5177-0367

**EC Alga Growth Inhibition Test**

**Nautilus Environmental**

<b>Analysis ID:</b> 11-2232-3214	<b>Endpoint:</b> Cell Yield	<b>CETIS Version:</b> CETISv1.8.0
<b>Analyzed:</b> 11 Dec-12 15:31	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Official Results:</b> Yes
<b>Batch ID:</b> 10-6219-4251	<b>Test Type:</b> Cell Growth	<b>Analyst:</b>
<b>Start Date:</b> 27 Nov-12	<b>Protocol:</b> EC/EPS 1/RM/25	<b>Diluent:</b> Deionized Water
<b>Ending Date:</b> 30 Nov-12	<b>Species:</b> Pseudokirchneriella subcapitata	<b>Brine:</b>
<b>Duration:</b> 72h	<b>Source:</b> In-House Culture	<b>Age:</b>
<b>Sample ID:</b> 12-7785-5216	<b>Code:</b> MC-2	<b>Client:</b> Rescan
<b>Sample Date:</b> 24 Nov-12	<b>Material:</b> Mining Discharge/Runoff	<b>Project:</b>
<b>Receive Date:</b> 26 Nov-12	<b>Source:</b> Rescan	
<b>Sample Age:</b> 72h	<b>Station:</b> MC-2 Tox Test	

**Linear Interpolation Options**

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	497040871	200	Yes	Two-Point Interpolation

**Residual Analysis**

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Control Trend	Mann-Kendall Trend	2		0.9049	Non-significant Trend in Controls

**Point Estimates**

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	12.57	N/A	14.06	7.954	7.114	N/A
IC10	14.02	5.459	16.19	7.132	6.177	18.32
IC15	15.63	9.685	18.78	6.399	5.324	10.33
IC20	17.4	11.46	23.36	5.746	4.281	8.726
IC25	19.37	12.97	26.77	5.162	3.736	7.712
IC40	25.43	17.04	29.66	3.933	3.371	5.869
IC50	28.78	19.83	32.84	3.474	3.045	5.042

**Cell Yield Summary**

**Calculated Variate**

Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	8	80	62	91	3.03	8.569	10.71%	0.0%
1.49		4	80	80	80	0	0	0.0%	0.0%
2.98		4	80	80	80	0	0	0.0%	0.0%
5.95		4	80	80	80	0	0	0.0%	0.0%
11.9		4	78	68	85	3.719	7.439	9.54%	2.5%
23.8		4	52.25	35	65	6.799	13.6	26.03%	34.69%
47.6		4	7.25	4	12	1.797	3.594	49.57%	90.94%
95.2		4	0.5	0	1	0.2887	0.5774	115.5%	99.37%

**Cell Yield Detail**

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Control	82	77	86	80	84	62	78	91
1.49		80	80	80	80				
2.98		80	80	80	80				
5.95		80	80	80	80				
11.9		82	77	68	85				
23.8		65	61	35	48				
47.6		4	8	12	5				
95.2		1	0	0	1				

QA: *[Signature]* 12/13

# CETIS Analytical Report

Report Date: 14 Dec-12 17:27 (p 2 of 2)  
Test Code: 12602b | 02-5177-0367

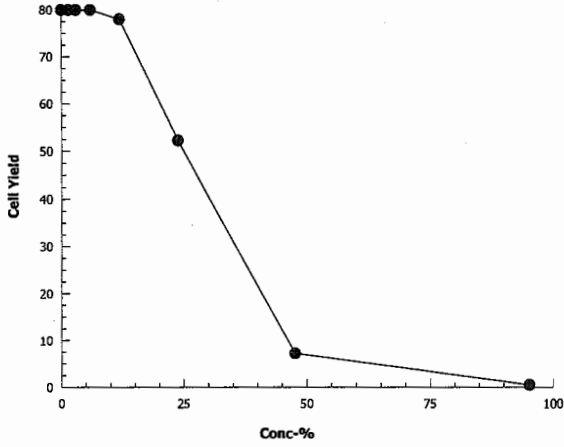
EC Alga Growth Inhibition Test

Nautilus Environmental

Analysis ID: 11-2232-3214      Endpoint: Cell Yield  
Analyzed: 11 Dec-12 15:31      Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.0  
Official Results: Yes

## Graphics



# CETIS Analytical Report

Report Date: 08 Jan-13 17:52 (p 1 of 2)  
 Test Code: 12602 | 09-8896-0408

## EC Alga Growth Inhibition Test

Nautilus Environmental

Analysis ID: 09-6915-4113	Endpoint: Cell Yield	CETIS Version: CETISv1.8.0
Analyzed: 08 Jan-13 17:52	Analysis: Parametric-Control vs Treatments	Official Results: Yes
Batch ID: 03-8922-3354	Test Type: Cell Growth	Analyst:
Start Date: 27 Nov-12	Protocol: EC/EPS 1/RM/25	Diluent: Deionized Water
Ending Date: 30 Nov-12	Species: Pseudokirchneriella subcapitata	Brine:
Duration: 72h	Source: In-House Culture	Age:
Sample ID: 18-4230-3067	Code: 12602	Client: Rescan
Sample Date: 24 Nov-12	Material: Mining Discharge/Runoff	Project:
Receive Date: 26 Nov-12	Source: Rescan	
Sample Age: <i>12h 48h</i>	Station: MC-2 Tox Test	

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run	95.2	>95.2	N/A	1.05	18.0%

### Dunnett's Multiple Comparison Test

Control	vs Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
Negative Control	1.49*	13.5	2.526	10	14.41	<0.0001	Significant Effect
	2.98*	11.61	2.526	10	14.41	<0.0001	Significant Effect
	5.95*	8.896	2.526	10	14.41	<0.0001	Significant Effect
	11.9	-0.3506	2.526	10	14.41	0.9728	Non-Significant Effect
	23.8	-4.864	2.526	10	14.41	1.0000	Non-Significant Effect
	47.6	-12.75	2.526	10	14.41	1.0000	Non-Significant Effect
	95.2	-13.94	2.526	10	14.41	1.0000	Non-Significant Effect

### Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Control Trend		2		0.9049	Non-significant Trend in Controls

### ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	101058	14436.86	7	166.4	<0.0001	Significant Effect
Error	2430	86.78571	28			
Total	103488	14523.64	35			

### Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	18.12	18.48	0.0114	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9549	0.9166	0.1492	Normal Distribution

### Cell Yield Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	8	80	76.74	83.26	62	91	3.03	8.569	10.71%	0.0%
1.49		4	157	151.4	162.6	138	173	7.337	14.67	9.35%	-96.25%
2.98		4	146.3	143.2	149.3	138	157	4.029	8.057	5.51%	-82.81%
5.95		4	130.8	126.9	134.6	118	142	5.121	10.24	7.83%	-63.44%
11.9		4	78	75.17	80.83	68	85	3.719	7.439	9.54%	2.5%
23.8		4	52.25	47.08	57.42	35	65	6.799	13.6	26.03%	34.69%
47.6		4	7.25	5.883	8.617	4	12	1.797	3.594	49.57%	90.94%
95.2		4	0.5	0.2804	0.7196	0	1	0.2887	0.5774	115.5%	99.37%

**EC Alga Growth Inhibition Test**

**Nautilus Environmental**

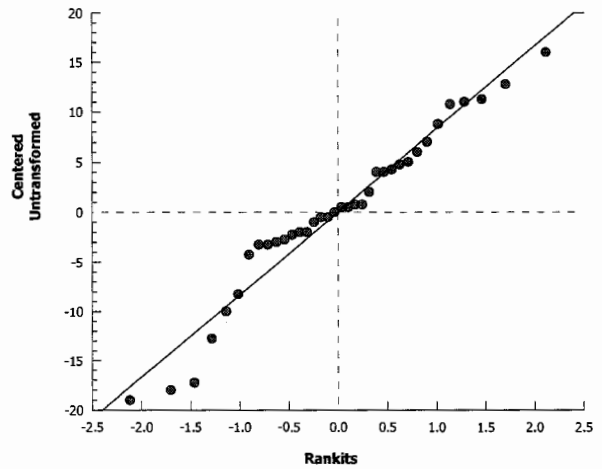
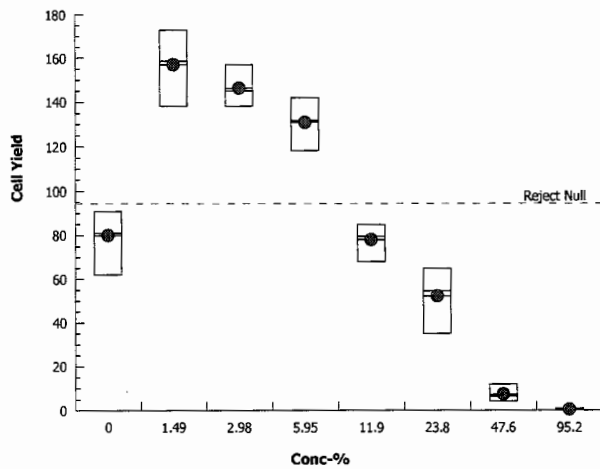
Analysis ID: 09-6915-4113      Endpoint: Cell Yield  
 Analyzed: 08 Jan-13 17:52      Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1.8.0  
 Official Results: Yes

**Cell Yield Detail**

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Control	82	77	86	80	84	62	78	91
1.49		162	155	138	173				
2.98		138	147	143	157				
5.95		142	135	118	128				
11.9		82	77	68	85				
23.8		65	61	35	48				
47.6		4	8	12	5				
95.2		1	0	0	1				

**Graphics**



**APPENDIX E - Rainbow Trout LC50 Toxicity Test Data**

# Rainbow Trout Summary Sheet

Client: Rescan Environmental

Start Date/Time: November 28/12 @ 1100

Work Order No.: 12603

Test Species: Oncorhynchus mykiss

## Sample Information:

Sample ID: MC-2 Tox test

Sample Date: November 24/12 @ N/A

Date Received: Nov November 26/12 @ 1100

Sample Volume: 4r 8 x 20L

Other: N/A

## Test Validity Criteria:

≥ 90% control survival

## WQ Ranges:

T (°C) = 15 ± 1, DO (mg/L) = 7.0 to 10.3, pH = 5.5 to 8.5

## Dilution Water:

Type: Dechlorinated Municipal Tap Water

Hardness (mg/L CaCO<sub>3</sub>): 12

Alkalinity (mg/L CaCO<sub>3</sub>): 7

## Test Organism Information:

Batch No.: 111412

Source: Miracle Spings

No. Fish/Volume (L): 10/10L

Loading Density: 0.36

Mean Length ± SD (mm): 35 ± 2

Range: 30 - 38

Mean Weight ± SD (g): 0.36 ± 0.04

Range: 0.30 - 0.42

## NaNO<sub>2</sub> Reference Toxicant Results:

Reference Toxicant ID: RTNt29

Stock Solution ID: 12Nt02

Date Initiated: November 23/12

96-h LC<sub>50</sub> (95% CL): 8.1 (6.1 - 10.7) mg/L NaNO<sub>2</sub>

Reference Toxicant Mean and Historical Range: 5.2 (2.9 - 9.4) mg/L NaNO<sub>2</sub>

Reference Toxicant CV (%): 34

Test Results: The 96-h LC<sub>50</sub> is incalculable.

Reviewed by: A. Tong

Date reviewed: January 8, 2013

### 96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: Rescan Environmental  
 Sample I.D. MC-2 tox test  
 W.O. # 12 603  
 RBT Batch #: 11/12  
 Date Collected/Time: November 24 12 @ N/A  
 Date Setup/Time: November 28 12 @ 1100  
 Sample Setup By: DBF

Number Fish/Volume: 10/10L  
 7-d % Mortality: 0.0  
 Total Pre-aeration Time (mins): 30  
 Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Y

D.O. meter: DO-1  
 pH meter: pH-1  
 Cond. Meter: C-1

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	14.0	/	14.0
pH	6.9	/	6.8
D.O. (mg/L)	10.0	/	10.2
Cond. (µS/cm)	440	/	440

Concentration (% v/v)	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
CONT				10	10	10	10	14.0	14.0	14.0	14.0	14.0	10.0	9.8	9.8	9.8	9.8	7.1	7.1	6.9	7.0	7.1	34	48
6.25				10	7	7	7	14.0	14.0	14.0	14.0	14.0	9.7	9.8	9.7	9.8	9.7	7.0	7.2	7.0	7.1	7.1	71	77
12.5				10	8	6	6	14.0	14.0	14.0	14.0	14.0	9.8	9.7	9.7	9.9	9.8	6.9	7.1	6.9	7.0	7.1	95	10
25				9	5	3	3	14.0	14.0	14.0	14.0	14.0	10.0	9.7	9.7	9.8	9.8	6.9	7.1	7.0	7.0	7.0	138	164
50				10	10	10	10	14.0	14.0	14.0	14.0	14.0	10.0	9.7	9.9	9.9	9.9	6.9	7.2	7.1	7.1	7.1	240	258
100				10	9	9	9	14.0	14.0	14.0	14.0	14.0	10.2	9.8	9.9	9.8	9.9	6.8	7.2	7.2	7.2	7.2	440	454
Initials				JAB	DBF	~	~	JAB	JAB	JAB	~	~	JAB	JAB	JAB	~	~	JAB	JAB	JAB	~	~	JAB	~

WQ Ranges: T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Sample Description/Comments: Turbid with orange precipitate

Fish Description at 96%: all remaining fish appear ok

Other Observations: \_\_\_\_\_

Reviewed by: A. Terry

Date Reviewed: January 8, 2013

## Rainbow Trout Summary Sheet

Client: Rescan Environmental

Start Date/Time: November 30/12 @ 1430

Work Order No.: 12603

Test Species: Oncorhynchus mykiss

### Sample Information:

Sample ID: MC-2 Tox test

Sample Date: November 24/12 @ N/A

Date Received: Nov 26/12 @ 1100

Sample Volume: AT 8 x 20L

Other: N/A

### Test Validity Criteria:

$\geq 90\%$  control survival

### WQ Ranges:

T (°C) =  $15 \pm 1$ , DO (mg/L) = 7.0 to 10.3, pH = 5.5 to 8.5

### Dilution Water:

Type: Dechlorinated Municipal Tap Water

Hardness (mg/L CaCO<sub>3</sub>): 12

Alkalinity (mg/L CaCO<sub>3</sub>): 7

### Test Organism Information:

Batch No.: 111412

Source: Miracle Spings

No. Fish/Volume (L): 10/10L

Loading Density: 0.38

Mean Length  $\pm$  SD (mm): 36  $\pm$  3

Range: 31 - 39

Mean Weight  $\pm$  SD (g): 0.38  $\pm$  0.08

Range: 0.30 - 0.50

### NaNO<sub>2</sub> Reference Toxicant Results:

Reference Toxicant ID: RTNt29

Stock Solution ID: 12Nt02

Date Initiated: November 23/12

96-h LC<sub>50</sub> (95% CL): 8.1 (6.1 - 10.7) mg/L NaNO<sub>2</sub>

Reference Toxicant Mean and Historical Range: 5.2 (2.9 - 9.4) mg/L NaNO<sub>2</sub>

Reference Toxicant CV (%): 34

Test Results: The 96-h LC<sub>50</sub> is > 100% (v/v).

Reviewed by: A. Teng

Date reviewed: January 8, 2013



### 96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: Rescan Environmental  
 Sample I.D. MC-2 tox test  
 W.O. # 12603  
 RBT Batch #: 11/14/12  
 Date Collected/Time: November 24/12 @ N/A  
 Date Setup/Time: November 30/12 @ 1430  
 Sample Setup By: SBF  
  
 D.O. meter: DO-1  
 pH meter: pH-1  
 Cond. Meter: C-1

Number Fish/Volume: 10/10L  
 7-d % Mortality: 0.0  
 Total Pre-aeration Time (mins): 30  
 Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Y

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	14.0	/	14.0
pH	6.8	/	6.9
D.O. (mg/L)	10.0	/	10.2
Cond. (µS/cm)	439	/	441

Concentration (% v/v)	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
CONT				10	10	10	10	14.0	14.0	14.0	14.0	14.0	9.9	9.8	9.8	9.3	9.8	7.0	7.1	7.1	7.1	7.0	31	36
6.25				10	10	9	9	14.0	14.0	14.0	14.0	14.0	10.0	9.9	9.9	9.4	9.8	6.8	7.0	7.0	7.0	7.0	64	6.8
12.5				10	10	9	9	14.0	14.0	14.0	14.0	14.0	10.1	9.8	9.8	9.5	9.8	6.8	7.1	7.0	7.0	7.0	90	95
25				10	9	9	9	14.0	14.0	14.0	14.0	14.0	10.1	9.8	9.8	9.5	9.7	6.8	7.0	7.0	7.1	7.0	145	149
50				10	10	10	10	14.0	14.0	14.0	14.0	14.0	10.2	9.8	9.8	9.6	9.7	6.9	7.0	7.1	7.2	7.2	254	257
100				10	10	10	10	14.0	14.0	14.0	14.0	14.0	10.2	9.8	9.9	9.6	9.7	6.9	7.1	7.0	7.1	7.1	441	442
Initials				~	~	SBF	SBF	~	~	SBF	SBF	SBF	~	~	SBF	SBF	SBF	~	~	SBF	SBF	SBF	SBF	SBF

WQ Ranges: T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Sample Description/Comments: Turbid with orange precipitate.

Fish Description at 96? Fish alive appear ok.

Other Observations: \_\_\_\_\_

Reviewed by: A. Long

Date Reviewed: January 8, 2013

**APPENDIX F - *Daphnia magna* LC50 Toxicity Test Data**

## Daphnia magna Summary Sheet

Client: Rescan Environmental  
Work Order No.: 12604

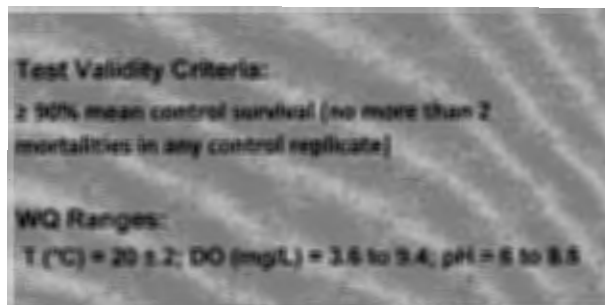
Start Date/Time: November 27, 2012 @ 0930h

Test Species: Daphnia magna

Set up by: EMM

### Sample Information:

Sample ID: MC-2 Tox Test  
Sample Date: Nov 24/12  
Date Received: Nov 26/12  
Sample Volume: 8 x 20L



### Test Organism Information:

Broodstock No.: 110712 A+B  
Age of young (Day 0): < 24 hours  
Avg No. young per brood in previous 7 d: 20  
Mortality (%) in previous 7 d: 0  
Days to first brood: 8

### NaCl Reference Toxicant Results:

Reference Toxicant ID: Dm91  
Stock Solution ID: 12Na02  
Date Initiated: Nov 20/12  
48-h LC50 (95% CL): 4.2 (3.7 - 4.8) g/L NaCL

Reference Toxicant Mean and Historical Range: 4.0 (3.6 - 4.4) g/L NaCL  
Reference Toxicant CV (%): 5

Test Results: The 48h LC50 is estimated at 46.7% with 95% confidence limits at 37.6 and 57.8% (v/v).  
\_\_\_\_\_  
\_\_\_\_\_

Reviewed by: A. Teng

Date reviewed: January 8, 2013

## Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: Rescan Environmental  
 Sample ID: HC-2  
 Work Order No.: 12604

Start Date/Time: NOV 27/12 92 930h  
 No. Organisms/volume: 10/200mL  
 Test Organism: D.magna  
 Set up by: Emm

DO meter: DO-1

pH meter: pH-1

Conductivity meter: C-1

Concentration % (v/v)	Number of Live Organisms Rep	No. Immobilized			Temperature (°C)			Dissolved oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24	48	48	0	24	48	0	24	48	0	24	48	0	48
Control	A	10	10	0	19.5	19.0	19.5	8.9		9.0	7.9		7.7	346	374
	B														
	C														
	D														
6.25	A	10	10	0	19.5	19.0	19.5	8.9		8.8	7.8		7.8	353	369
	B														
	C														
	D														
12.5	A	10	10	0	19.5	19.0	19.5	8.9		8.9	7.8		7.8	360	375
	B														
	C														
	D														
25	A	10	10	0	19.5	19.0	19.5	8.8		8.9	7.7		7.8	373	390
	B														
	C														
	D														
50	A	10	4	0	19.5	19.0	19.5	8.9		8.9	7.5		7.7	399	416
	B														
	C														
	D														
100	A	0	—	—	20.0	19.0	19.5	8.9		8.9	7.2		7.6	446	453
	B														
	C														
	D														
Technician Initials	UP	Emm	Emm	Emm	Emm	UP	Emm	Emm	Emm	Emm	Emm	Emm	Emm	Emm	Emm

WQ Ranges: T (°C) = 20 ± 2; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

07.2 Emm

	Hardness*	Alkalinity*
Conc.	*(mg/L as CaCO <sub>3</sub> )	
Control (MHW)	100	68
Highest conc.	230	40

	Initial WQ	Adjustment	Adjusted WQ
Temp (°C)	20.0	—	20.0
DO (mg/L)	9.8	5min aeration	8.9
pH	7.3	—	7.3 Emm 7.2
Cond (µS/cm)	449	—	446

Sample Description: cloudy, yellow

Comments: Batch#: 110712 7-d previous # young/brood: 20 Day of 1st Brood: 8 Previous 7-d % Mortality: 0

Reviewed by: A. Terry Date reviewed: January 8, 2013

**CETIS Analytical Report**

Report Date: 14 Dec-12 17:32 (p 1 of 1)  
 Test Code: 12603 | 10-0556-1564

**Daphnia magna 48-h Acute Survival Test**

**Nautilus Environmental**

<b>Analysis ID:</b> 08-0650-0734	<b>Endpoint:</b> 48h Survival Rate	<b>CETIS Version:</b> CETISv1.8.4
<b>Analyzed:</b> 14 Dec-12 17:31	<b>Analysis:</b> Untrimmed Spearman-Kärber	<b>Official Results:</b> Yes
<b>Batch ID:</b> 01-5584-2489	<b>Test Type:</b> Survival (48h)	<b>Analyst:</b>
<b>Start Date:</b> 27 Nov-12 09:30	<b>Protocol:</b> EC/EPS 1/RM/14	<b>Diluent:</b> Mod-Hard Synthetic Water
<b>Ending Date:</b> 29 Nov-12 11:30	<b>Species:</b> Daphnia magna	<b>Brine:</b>
<b>Duration:</b> 50h	<b>Source:</b> In-House Culture	<b>Age:</b> <24h
<b>Sample ID:</b> 18-1070-4063	<b>Code:</b> 6BED26BF	<b>Client:</b> Rescan
<b>Sample Date:</b> 24 Nov-12	<b>Material:</b> Water Sample	<b>Project:</b> MMER
<b>Receive Date:</b> 26 Nov-12 11:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 82h	<b>Station:</b> MC-2 Tox Test	

**Spearman-Kärber Estimates**

Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0	0.00%	1.669	0.04664	46.65	37.64	57.83

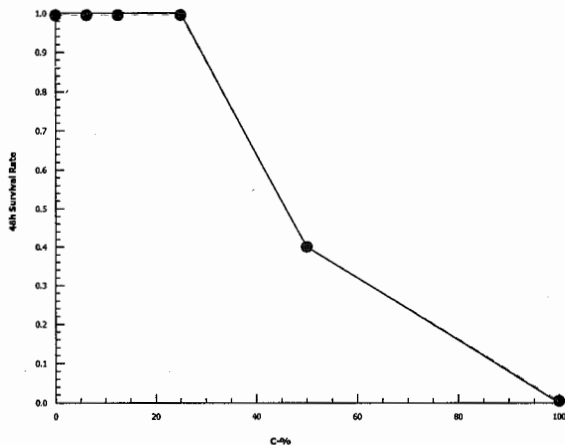
**48h Survival Rate Summary**

C-%	Control Type	Count	Calculated Variate(A/B)								
			Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	1	1	1	1	0	0	0.0%	0.0%	10	10
6.25		1	1	1	1	0	0	0.0%	0.0%	10	10
12.5		1	1	1	1	0	0	0.0%	0.0%	10	10
25		1	1	1	1	0	0	0.0%	0.0%	10	10
50		1	0.4	0.4	0.4	0	0	0.0%	60.0%	4	10
100		1	0	0	0	0	0		100.0%	0	10

**48h Survival Rate Detail**

C-%	Control Type	Rep 1
0	Negative Control	1
6.25		1
12.5		1
25		1
50		0.4
100		0

**Graphics**





**APPENDIX G - Chain-of-Custody Forms**

British Columbia: 8664 Commerce Court, Burnaby, BC, V5A 4N7

Date \_\_\_\_\_ Page \_\_\_ of \_\_\_

Sample Collection By:							ANALYSES REQUIRED										Receipt Temperature (°C)		
Report to:		Invoice to:					7-d rainbow trout embryo viability test	Ceriodaphnia survival/reproduction	7-d Lemna minor growth inhibition test	72-h Pseudokirchneriella subcapita growth	96-hr rainbow trout acute lethality test	48-hr Daphni magna acute lethality test							
Company	Address	City/Prov/Postal Code	Contact	Phone	Email	7-d rainbow trout embryo viability test											Ceriodaphnia survival/reproduction		
MC-2 tox test	Nov 24 2012		Water		8		X	X	X	X	X	X							
PROJECT INFORMATION			SAMPLE RECEIPT			RELIQUINSHED BY (CLIENT)				RELIQUINSHED BY (COURIER)									
Client:			Total # Containers:			Signature:				Signature:									
P.O. No.:			Good Condition?			Print:				Print:									
Shipped Via:			Matches Schedule?			Company:				Company:									
						Time/Date:				Time/Date:									
SPECIAL INSTRUCTIONS/COMMENTS: Identify sample as Rescan Project # 868-021-01 on invoices						RECEIVED BY (COURIER)				RECEIVED BY (LABORATORY)									
						Signature:				Signature: <i>Jacob Frank</i>									
						Print:				Print: <i>Jacob Frank</i>									
						Company:				Company: <i>Nautilus</i>									
				Time/Date:				Time/Date: <i>November 26/12 @ 11:00</i>											

Additional costs may be required for sample disposal or storage. Net 30 unless otherwise contracted.





Nautilus Environmental

## **Rescan Environmental Toxicity Testing Program**

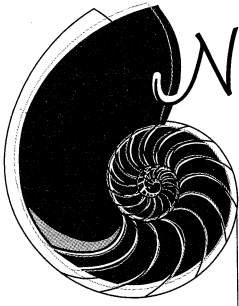
### **Final Toxicity Test Report**

Report date: January 15, 2013

Submitted to:

Rescan Environmental Services Ltd.  
Vancouver, BC

*Burnaby Laboratory*  
8664 Commerce  
Court  
Burnaby, BC  
V5A 4N7



Nautilus Environmental

WO #: 12655-659

Dr. Lesley Shelley  
Rescan Environmental  
1111 West Hastings Street, 6<sup>th</sup> floor  
Vancouver, BC  
V6E 2J3

January 15, 2013

Dr. Shelley:

**Re: Toxicity Testing on Tailing supernatant-Dec2012 (collected on December 18, 2012)**

Nautilus Environmental is pleased to provide you with the results of the toxicity tests conducted on the sample identified as Tailing supernatant-Dec2012, received on December 18, 2012. Testing was conducted on the sample following Environment Canada methods. A summary of the test methods and results are provided in the following report.

Please feel free to contact the undersigned at 604-420-8773 should you have any questions or require any additional information.

Yours truly,

**Nautilus Environmental**

A handwritten signature in black ink, appearing to read 'Krysta Banack', is written over the printed name.

Krysta Banack, B.Sc.  
Laboratory Biologist

## TABLE OF CONTENTS

	Page
TABLE OF CONTENTS.....	I
1.0 INTRODUCTION.....	1
2.0 METHODS.....	1
2.1 Quality Assurance/Quality Control (QA/QC).....	1
3.0 RESULTS.....	8
3.1 Quality Assurance/Quality Control.....	8
4.0 REFERENCES.....	13

## LIST OF TABLES

Table 1.	Summary of test conditions for the <i>Ceriodaphnia dubia</i> survival and reproduction test.	3
Table 2.	Summary of test conditions for the <i>Lemna minor</i> growth inhibition test. ....	4
Table 3.	Summary of test conditions for the <i>Pseudokirchneriella subcapitata</i> growth inhibition test. .....	5
Table 4.	Summary of test conditions for the 96-h rainbow trout LC50 test.....	6
Table 5.	Summary of test conditions for the 48-h <i>Daphnia magna</i> LC50 test.....	7
Table 6.	Toxicity test results for the <i>Ceriodaphnia dubia</i> survival and reproduction test.....	9
Table 7.	Toxicity test results for the <i>Lemna minor</i> growth inhibition test.....	10
Table 8.	Toxicity test results for the <i>Pseudokirchneriella subcapitata</i> growth inhibition test.....	10
Table 9.	Toxicity test results for the 96-h juvenile rainbow trout LC50 test. ....	11
Table 10.	Toxicity test results for the 48-h <i>Daphnia magna</i> LC50 test.....	11
Table 11.	Reference toxicant test results. ....	12

## LIST OF APPENDICES

APPENDIX A - <i>Ceriodaphnia dubia</i> Toxicity Test Data
APPENDIX B - <i>Lemna minor</i> Toxicity Test Data
APPENDIX C - <i>Pseudokirchneriella subcapitata</i> Toxicity Test Data
APPENDIX D - Rainbow Trout LC50 Toxicity Test Data
APPENDIX E - <i>Daphnia magna</i> LC50 Toxicity Test Data
APPENDIX F - Chain-of-Custody Forms

## 1.0 INTRODUCTION

Nautilus Environmental conducted sub-lethal and acute toxicity tests for Rescan Environmental Services Ltd. The sample Tailing supernatant-Dec2012 was collected on December 18, 2012 and delivered to the Nautilus Environmental Laboratory in Burnaby, BC on December 18, 2012. The sample was transported in three 20-L plastic containers and stored in the dark at  $4 \pm 2^{\circ}\text{C}$  prior to testing. The temperature of the sample upon arrival was  $15.9^{\circ}\text{C}$ . The following toxicity tests were performed on the sample:

- *Ceriodaphnia dubia* survival and reproduction
- 7-d *Lemna minor* growth inhibition
- 72-h *Pseudokirchneriella subcapitata* growth inhibition
- 96-h Rainbow trout (*Oncorhynchus mykiss*) LC50
- 48-h *Daphnia magna* LC50

This report describes the results of these toxicity tests. The test results reported herein relate only to the sample tested. Copies of raw laboratory data sheets and statistical analysis for each test species are provided in Appendices A to E. The chain-of-custody form is provided in Appendix F.

## 2.0 METHODS

Methods for the toxicity tests are summarized in Tables 1 to 5. Testing was conducted according to procedures described by the Environment Canada protocols (2000a, 2000b, 2007a, 2007b and 2007c). Statistical analyses for all the tests were performed using the software, CETIS (Tidepool Scientific Software, 2012).

### 2.1 Quality Assurance/Quality Control (QA/QC)

Nautilus follows a comprehensive QA/QC program to ensure that the data generated are of high quality and scientifically defensible. Our QA program is designed to ensure that all tests are performed in accordance with well-established and approved methods (e.g., Environment Canada, US EPA).

To meet these objectives, Nautilus has implemented a number of quality control procedures that include the following:

- Negative controls to ensure that appropriate testing performance criteria are met;
- Positive controls to assess the health and sensitivity of the test organisms;
- Use of appropriate species and life stage to meet the study objectives;
- Appropriate number of replicates to allow proper statistical analyses;
- Calibration and proper maintenance of instruments to ensure accurate measurements;
- Proper documentation and recordkeeping to allow traceability of performance;
- Adequate supervision and training of staff to ensure that methods are followed;
- Proper handling and storage of samples to ensure their integrity;
- Procedures in place to address issues that may arise during testing and ensure the implementation of appropriate corrective actions; and
- Rigorous review of data by a registered professional biologist to ensure they are of good quality and scientifically defensible prior to releasing to the client.

**Table 1. Summary of test conditions for the *Ceriodaphnia dubia* survival and reproduction test.**

Test organism	<i>Ceriodaphnia dubia</i>
Test organism source	In-house culture
Test organism age	<24 hr old neonates produced within 12 hr
Test type	Static renewal
Test duration	7 ± 1 day
Test chamber	20 mL test tube
Test solution volume	15 mL
Test concentrations (% sample)	Seven concentrations, plus laboratory control
Number of replicates	10
Control/dilution water	20% Perrier water (hardness 80-100mg/L CaCO <sub>3</sub> )
Test solution renewal	Daily
Test temperature	25 ± 1°C
Number of organisms/chamber	1
Feeding	Daily, with 0.1 ml <i>Pseudokirchneriella subcapitata</i> and 0.05 mL YCT
Light intensity	100 to 600 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test protocol	Environment Canada, 2007a, EPS 1/RM/21
Test endpoints	Survival and reproduction
Test acceptability criterion for controls	≥80% survival; ≥15 young per surviving control; ≥60% of controls producing three or more broods
Reference Toxicant	Sodium chloride

**Table 2. Summary of test conditions for the *Lemna minor* growth inhibition test.**

---

Test organism	<i>Lemna minor</i>
Test organism source	In-house culture
Test organism age	7- to 10-day old
Test type	Static
Test duration	7 days
Test chamber	250-mL glass containers
Test solution volume	150 mL
Test concentrations (% sample)	Seven concentrations, plus laboratory control
Number of replicates	4
Control/Dilution water	Deionized or distilled water with nutrients added
Test solution renewal	None
Test temperature	25 ± 2°C
Number of organisms/chamber	Two 3-frond plants
Light intensity	3600 to 4400 lux full spectrum light
Photoperiod	Continuous
Aeration	None
Test protocol	Environment Canada (2007b), EPS 1/RM/37
Test endpoint	Number of fronds and dry weight
Test acceptability criteria for controls	≥ 8-fold increase in number of fronds
Reference toxicant	Potassium chloride

---

**Table 3. Summary of test conditions for the *Pseudokirchneriella subcapitata* growth inhibition test.**

Test organism	<i>Pseudokirchneriella subcapitata</i>
Test organism source	In-house culture
Test organism age	4- to 7-day old culture in logarithmic growth phase
Test type	Static
Test duration	72 hours
Test chamber	Microplate
Test solution volume	220 µL
Test concentrations (% sample)	Seven concentrations, plus laboratory control
Number of replicates	4 for treatments; 8 for control
Control/Dilution water	Deionized or distilled water
Test solution renewal	None
Test temperature	24 ± 2°C
Number of organisms/chamber	10,000 cells/mL
Light intensity	3600 to 4400 lux
Photoperiod	Continuous
Aeration	None
Test protocol	Environment Canada (2007c), EPS 1/RM/25
Test endpoint	Algal cell growth inhibition ≥ 16-fold increase in number of algal cells;
Test acceptability criteria for controls	CV ≤20%; no trend when analyzed using Mann-Kendall test
Reference toxicant	Zinc



**Table 4. Summary of test conditions for the 96-h rainbow trout LC50 test.**

---

Test organism	<i>Oncorhynchus mykiss</i>
Test organism source	Miracle Springs, BC
Test organism age	Juveniles
Test type	Static
Test duration	96 hours
Test solution volume	12 L
Test concentrations (% sample)	Five concentrations, plus laboratory control
Number of replicates	1
Control/Dilution water	Municipal dechlorinated water
Test solution renewal	None
Test temperature	15 ± 1°C
Number of organisms/chamber	Ten
Feeding	None
Light intensity	100 to 500 lux
Photoperiod	16 hours light/8 hours dark
Aeration	6.5 ± 1 mL/min/L
Test protocol	Environment Canada (2000a), EPS 1/RM/13
Test endpoint	96-h LC50
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium nitrite

---

**Table 5. Summary of test conditions for the 48-h *Daphnia magna* LC50 test.**

Test organism	<i>Daphnia magna</i>
Test organism source	In-house culture
Test organism age	< 24 h
Test type	Static
Test duration	48 hours
Test chamber	250-mL glass beakers
Test solution volume	200 mL
Test concentrations (% sample)	Five concentrations, plus laboratory control
Number of replicates	One
Control/Dilution water	Moderately-hard reconstituted water (hardness 80-100 mg/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Number of organisms/chamber	Ten
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test protocol	Environment Canada (2000b), EPS 1/RM/14
Test endpoint	48-h LC50
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride

### 3.0 RESULTS

Results of the *C. dubia* toxicity test are summarized in Table 6. There were no effects to *C. dubia* survival. Survival ranged from 90 to 100% in all concentrations; the LC50 value was >100%. There were reproduction effects to *C. dubia*. The IC25 and IC50 were 2.4 and 9.8%, respectively.

Results of the *Lemna minor* growth inhibition test are summarized in Table 7. There were no effects to either frond count or dry weight; the IC25 and IC50 were both >97% for frond count and dry weight.

Results of the 72-h *P. subcapitata* test are provided in Table 8. Algal cell density was enhanced in all test concentrations relative to the negative control. The IC25 and IC50 values were >95.2%. Percent algal cell enhancement in the test concentrations ranged from 35 to 230%.

The 96-h rainbow trout and 48-h *D. magna* LC50 test results are shown in Table 9 and Table 10, respectively. Survival ranged from 90 to 100% in all test concentrations in the rainbow trout test. Survival was 100% in all test concentrations in the *D. magna* test. The 96-h rainbow trout and 48-h *D. magna* LC50 were both >100%.

#### 3.1 Quality Assurance/Quality Control

The health history of the test organisms used in the exposures was acceptable and met the requirements of the Environment Canada protocol. The test met all control acceptability criteria and water quality parameters remained within acceptable ranges specified in the protocol throughout the test. Uncertainty associated with this test is best described by the confidence intervals around the IC25 and IC50 estimates.

Results of the reference toxicant test conducted during the testing program are summarized in Table 11. Results for this test fell within the acceptable range for organism performance of mean and range, based on historical results obtained by the laboratory with this test. Thus, the sensitivity of the organisms evaluated in the reference toxicant test was appropriate.

**Table 6. Toxicity test results for the *Ceriodaphnia dubia* survival and reproduction test.**

Concentration (% v/v)	Mean ± SD	
	Survival (%)	Reproduction (No. of Young/Female)
Control	100	21.0 ± 3.2
5	90	13.3 ± 3.4
10	100	10.4 ± 3.7
20	100	9.6 ± 2.7
40	100	5.6 ± 2.1
60	100	3.5 ± 3.1
80	100	0.0 ± 0.0
100	100	0.0 ± 0.0
<b>Test endpoint (% v/v)</b>		
LC50	>100	--
IC25 (95% CL)	--	2.4 (1.7-4.6)
IC50 (95% CL)	--	9.8 (6.9-21.8)

LC = Lethal Concentration; IC = Inhibition Concentration; SD = Standard Deviation; CL = Confidence Limit.

**Table 7. Toxicity test results for the *Lemna minor* growth inhibition test.**

Concentration (% v/v)	Mean ± SD	
	FronD Growth (No. of Fronds)	Dry Weight (mg)
Control	65.5 ± 11.0	7.1 ± 1.0
1.5	73.0 ± 16.4	7.3 ± 1.4
3.0	70.5 ± 8.7	7.5 ± 0.7
6.1	61.8 ± 14.6	6.9 ± 1.3
12.1	63.0 ± 6.6	7.5 ± 0.6
24.2	59.8 ± 6.0	6.7 ± 0.5
48.5	64.0 ± 6.7	7.5 ± 0.8
97	58.0 ± 8.1	7.4 ± 0.6
<b>Test endpoint (% v/v)</b>		
IC25	>97	>97
IC50	>97	>97

IC = Inhibition Concentration; SD = Standard Deviation.

**Table 8. Toxicity test results for the *Pseudokirchneriella subcapitata* growth inhibition test.**

Concentration (% v/v)	Cell Density (x 10 <sup>4</sup> cells/mL) (mean ± SD)	Stimulation (%)
Control	76.2 ± 7.5	--
1.5	140.0 ± 9.6	83.6
3.0	153.3 ± 20.7	101.0
5.9	145.0 ± 22.1	90.2
11.9	184.3 ± 14.4	141.6
23.8	251.3 ± 14.7	229.5
47.6	172.8 ± 11.5	126.6
95.2	102.8 ± 9.0	34.8
<b>Test endpoint (% v/v)</b>		
IC25	>95.2	--
IC50	>95.2	--

IC = Inhibition Concentration; SD = Standard Deviation.

**Table 9. Toxicity test results for the 96-h juvenile rainbow trout LC50 test.**

<b>Concentration (% v/v)</b>	<b>Survival (%)</b>
Control	100
6.25	100
12.5	90
25	100
50	100
100	90
<b>Test endpoint (% v/v)</b>	
LC50	>100

LC = Lethal Concentration.

**Table 10. Toxicity test results for the 48-h *Daphnia magna* LC50 test.**

<b>Concentration (% v/v)</b>	<b>Survival (%)</b>
Control	100
6.25	100
12.5	100
25	100
50	100
100	100
<b>Test endpoint (% v/v)</b>	
LC50	>100

LC = Lethal Concentration.

**Table 11. Reference toxicant test results.**

Test Species	Endpoint	Historical Range Mean (2SD Range)	CV (%)	Date Setup
<i>C. dubia</i>	Survival (IC50): 2.0 g/L NaCl	1.8 (1.4 - 2.4)	15	December 5, 2012
	Reproduction (IC50): 1.3 g/L NaCl	1.3 (0.9 - 1.8)	20	
<i>L. minor</i>	No. Fronds (IC25): 3.8 g/L KCl	4.4 (3.5 - 5.5)	12	January 2, 2013
<i>P. subcapitata</i>	Growth (IC50): 31.7 µg/L Zn	20.9 (13.6 - 32.3)	32	December 7, 2012
<i>O.mykiss</i> (juvenile)	Survival (LC50): 8.1 mg/L NaNO <sub>2</sub>	5.2 (2.9 - 9.4)	34	November 23, 2012
<i>D magna</i>	Survival (LC50): 3.9 g/L NaCl	4.0 (3.6 - 4.4)	5	December 18, 2012

LC = Lethal Concentration; IC = Inhibition Concentration; SD = Standard Deviation; CL = Confidence Limit.

#### 4.0 REFERENCES

- Environment Canada. 2000a. Biological test method: reference method for determining acute lethality of effluents to rainbow trout. Environmental Protection Series. Report EPS 1/RM/13, Second Edition, December 2000, including May 2007 amendments. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 23 pp.
- Environment Canada. 2000b. Biological test method: reference method for determining acute lethality of effluents to *Daphnia magna*. Environmental Protection Series. Report EPS 1/RM/14, Second Edition, December 2000. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 21 pp.
- Environment Canada. 2007a. Biological test method: test of reproduction and survival using the cladoceran *Ceriodaphnia dubia*. Environmental Protection Series. Report EPS 1/RM/21, Second Edition, February 2007. Environment Canada, Method Development and Application Section, Environmental Science and Technology Centre, Science and Technology Branch, Ottawa, ON. 74 pp.
- Environment Canada. 2007b. Biological test method: tests for measuring the inhibition of growth using the freshwater macrophyte, *Lemna minor*. Environmental Protection Series, Report EPS 1/RM/37. Second Edition. January 2007. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 112 pp.
- Environment Canada. 2007c. Biological test method: growth inhibition test using the freshwater alga. Environmental Protection Series, Report EPS 1/RM/25. Second Edition, March 2007. Environment Canada, Method Development and Application Section, Environmental Science and Technology Centre, Science and Technology Branch, Ottawa, ON. 53 pp.
- Tidepool Scientific Software. 2012. CETIS comprehensive environmental toxicity information system, version 1.8.4.29. Tidepool Scientific Software, McKinleyville, CA. 222 pp.



**APPENDIX A - *Ceriodaphnia dubia* Toxicity Test Data**

## Ceriodaphnia dubia Summary Sheet

Client: Rescan Environmental Start Date/Time: Dec 18/12 @ 12:5h  
 Work Order No.: 12655 Set up by: KLB/EMM

**Sample Information:**

Sample ID: Tailings supernatant  
 Sample Date: Dec 18/12 <sup>Dec 2012</sup>  
 Date Received: Dec 18/12  
 Sample Volume: ~~7x1L~~ 3x20L  
WB

**Test Validity Criteria:**

- 1) Mean survival of first generation controls is  $\geq 80\%$
- 2) At least 60% of controls have produced three broods within 8 days
- 3) An average of  $\geq 15$  live young produced per surviving female in the control solutions during the first three broods.
- 4) Invalid if ephippia observed in any control solution at any time.

**WQ Ranges:**

T ( $^{\circ}$ C) =  $25 \pm 1$ ; DO (mg/L) = 3.3 to 8.4 ; pH = 6.0 to 8.5

**Test Organism Information:**

Broodstock No.: 120512  
 Age of young (Day 0): <24-h (within 12-h)  
 Avg No. young in first 3 broods of previous 7 d: 42  
 Mortality (%) in previous 7 d: 10  
 Individual female # used  $\geq 8$  young on test day: 1, 4, 7, 9, 10, 13

**NaCl Reference Toxicant Results:**

Reference Toxicant ID: Cd90  
 Stock Solution ID: 12Na02  
 Date Initiated: Dec 5/12

7-d LC50 (95% CL): 2.0 (1.7-2.3) g/L NaCL  
 7-d IC50 (95% CL): 1.3 (1.2-1.5) g/L NaCL

7-d LC50 Reference Toxicant Mean and Historical Range: 1.8 (1.4-2.4) g/L NaCL CV (%): 15  
 7-d IC50 Reference Toxicant Mean and Historical Range: 1.3 (0.9-1.8) g/L NaCL CV (%): 20

Test Results:	Survival	Reproduction
LC50 %(v/v) (95% CL)	>100	
IC25 %(v/v) (95% CL)		<u>2.2 (1.7-4.2)</u> <sup>WB</sup> 2.4 (1.7-4.0)
IC50 %(v/v) (95% CL)		<u>9.0 (7.0-23.3)</u> <sup>WB</sup> (6.9-21.8)

Reviewed by: A. Teng Date reviewed: January 13, 2013

## Chronic Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Bescan  
 Sample ID: Tailings Supernatant Dec2012  
 Work Order #: 12030 12055  
KLB

Start Date & Time: Dec 18 / 12 @ 12:15h  
 Stop Date & Time: Dec 24 / 12 @ 13:00h  
 Test Species: Ceriodaphnia dubia

Control Concentration % (v/v)	Days															
	0		1		2		3		4		5		Final 6		7	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.0	24.5	24.0	25.0	24.0	24.5	24.0	25.0	24.0	25.0	24.0	25.0	25.0			
DO (mg/L)	8.0	7.2	7.9	7.0	8.0	7.9	8.2	7.4	8.1	7.8	8.0	7.8	8.0	8.0		
pH	7.9	7.2	7.7	7.6	7.8	7.4	7.7	7.8	8.0	7.8	8.1	7.6	7.6			
Cond. (µS/cm)	190	192		191		190		190		190		193				
Initials	KLB	KLB		EMM		EMM		~		~		EMM				

5 Concentration	Days															
	0		1		2		3		4		5		Final 6		7	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.0	24.5	24.0	25.0	24.0	24.5	24.0	25.0	24.0	25.0	24.0	25.0	25.0			
DO (mg/L)	7.9	7.2	7.8	7.1	8.0	7.6	8.1	7.3	7.7	7.2	7.9	7.9	7.9			
pH	7.9	7.2	7.7	7.4	7.8	7.5	7.8	7.8	7.9	7.8	8.0	7.8	7.8			
Cond. (µS/cm)	222	223		221		223		216		211		218				
Initials	KLB	KLB		EMM		EMM		~		~		EMM				

40 Concentration	Days															
	0		1		2		3		4		5		Final 6		7	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.0	24.5	25.0	25.0	24.5	24.5	24.0	25.0	24.0	25.0	24.0	25.0	25.0			
DO (mg/L)	7.7	7.1	7.4	7.0	7.5	7.3	7.8	7.3	7.6	7.3	7.9	7.9	7.9			
pH	7.7	7.1	7.6	7.0	7.6	7.5	7.6	7.6	7.7	7.7	7.7	7.6	7.6			
Cond. (µS/cm)	402	415		402		403		418		406		392				
Initials	KLB	KLB		EMM		EMM		~		~		EMM				

100 Concentration	Days															
	0		1		2		3		4		5		Final 6		7	
	init.	old	new	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.0	24.5	25.5	25.0	25.0	24.5	24.0	25.0	24.0	25.0	24.0	25.0	25.0			
DO (mg/L)	7.2	6.3	6.7	6.3	6.5	6.4	6.7	7.0	7.7	7.3	7.6	7.4	7.4			
pH	7.4	6.9	7.4	6.9	7.3	7.4	7.2	7.5	7.4	7.6	7.5	7.6	7.6			
Cond. (µS/cm)	652	679		686		695		689		685		683				
Initials	KLB	KLB		EMM		EMM		~		~		EMM				

	Control	100		
Hardness*	94	460		
Alkalinity*	68	24		

Analysts: KLB, JW, EMM  
 Reviewed by: AKF  
 Date reviewed: Jan 14/13

\* mg/L as CaCO3

WQ Ranges: T (°C) = 25 ± 1; DO (mg/L) = 3.3 to 8.4 (mg/L); pH = 6 to 8.5

Sample Description: clear, slightly murky

Comments: Broodboard Used: 120512

**Chronic Freshwater Toxicity Test  
C. dubia Reproduction Data**

Client: Rescan  
 Sample ID: Tailings Supernatant Dec 2012  
 Work Order: 12630 12655  
KJS

Start Date & Time: Dec 18/12 @ 1215h  
 Stop Date & Time: Dec 24/12 @ 1300h  
 Set up by: KJS/EMM

Days	Concentration: Control											Concentration: 5											Concentration: 10										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM
3	3	4	3	✓	3	✓	✓	5	4	3	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM
4	✓	✓	✓	4	✓	3	✓	✓	✓	✓	~	3	4	3	3	4	3	3	2	4	✓	~	4	3	3	3	2	3	4	3	2	✓	~
5	✓	8	8	7	5	6	6	6	7	7	~	7	✓	5x	✓	✓	✓	5	4	✓	5	~	✓	5	3	✓	6	5	✓	✓	5	3	~
6	13	14	10	12	12	12	10	13	10	12	EMM	✓	9	✓	9	11	7	10	10	10	9	EMM	6	✓	✓	7	8	9	9	6	✓	5	KJL
7																																	
8																																	
Total	16	26	21	23	20	21	16	24	21	22	EMM	10	13	8x	12	18	10	18	16	14	14	EMM	10	8	6	10	16	17	13	9	7	8	KJL

Days	Concentration: 20											Concentration: 40											Concentration: 60											
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	
4	3	4	✓	✓	✓	✓	✓	4	4	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	
5	✓	✓	3	8	6	3	3	3	3	3	~	✓	✓	✓	✓	3	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	
6	7	7	8	6	5	8	4	6	7	4	KJL	4	3	4	5	7	8	8	6	8	EMM	5	6	✓	5	6	✓	✓	✓	6	7	KJL		
7																																		
8																																		
Total	10	11	11	11	8	10	7	EMM	EMM	10	14	KJL	9	3	4	5	3	7	8	8	6	8	EMM	5	6	0	5	6	0	0	0	6	7	KJL

Days	Concentration: 80											Concentration: 100											Concentration:										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM											
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM											
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM											
4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~											
5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~											
6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	KJL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM											
7																																	
8																																	
Total	0	0	0	0	0	0	0	0	0	0	KJL	0	0	0	0	0	0	0	0	0	0	EMM											

Notes: X = mortality.

Sample Description: clear, slightly murky  
 Comments: Total # Young only based on the first 3 Broods. Fourth and subsequent broods not included in total count.

Reviewed by: A. Terry

Date reviewed: January 13, 2012

**CETIS Analytical Report**

Report Date: 24 Dec-12 14:29 (p 1 of 2)  
 Test Code: 12655 | 08-1465-5301

**Ceriodaphnia 7-d Survival and Reproduction Test**

**Nautilus Environmental**

<b>Analysis ID:</b> 19-6098-4305	<b>Endpoint:</b> 6d Survival Rate	<b>CETIS Version:</b> CETISv1.8.4
<b>Analyzed:</b> 24 Dec-12 14:27	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Official Results:</b> Yes
<b>Batch ID:</b> 09-3858-3675	<b>Test Type:</b> Reproduction-Survival (7d)	<b>Analyst:</b> Krysta Banack
<b>Start Date:</b> 18 Dec-12 12:15	<b>Protocol:</b> EC/EPS 1/RM/21	<b>Diluent:</b> 20% Perrier Water
<b>Ending Date:</b> 24 Dec-12 13:00	<b>Species:</b> Ceriodaphnia dubia	<b>Brine:</b>
<b>Duration:</b> 6d 1h	<b>Source:</b> In-House Culture	<b>Age:</b> <24h
<b>Sample ID:</b> 07-4935-5219	<b>Code:</b> 2CAA40D3	<b>Client:</b> Rescan
<b>Sample Date:</b> 18 Dec-12	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 18 Dec-12 11:20	<b>Source:</b> Rescan	
<b>Sample Age:</b> 12h (15.9 °C)	<b>Station:</b> Tailings Supernatant Dec 2012	

**Linear Interpolation Options**

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	772293	200	Yes	Two-Point Interpolation

**Point Estimates**

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	>100	N/A	N/A	<1	NA	NA
EC10	>100	N/A	N/A	<1	NA	NA
EC15	>100	N/A	N/A	<1	NA	NA
EC20	>100	N/A	N/A	<1	NA	NA
EC25	>100	N/A	N/A	<1	NA	NA
EC40	>100	N/A	N/A	<1	NA	NA
EC50	>100	N/A	N/A	<1	NA	NA

**6d Survival Rate Summary**

**Calculated Variate(A/B)**

C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	10	1	1	1	0	0	0.0%	0.0%	10	10
5		10	0.9	0	1	0.1	0.3162	35.14%	10.0%	9	10
10		10	1	1	1	0	0	0.0%	0.0%	10	10
20		10	1	1	1	0	0	0.0%	0.0%	10	10
40		10	1	1	1	0	0	0.0%	0.0%	10	10
60		10	1	1	1	0	0	0.0%	0.0%	10	10
80		10	1	1	1	0	0	0.0%	0.0%	10	10
100		10	1	1	1	0	0	0.0%	0.0%	10	10

**6d Survival Rate Detail**

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	1	1	1	1	1	1	1	1	1	1
5		1	1	0	1	1	1	1	1	1	1
10		1	1	1	1	1	1	1	1	1	1
20		1	1	1	1	1	1	1	1	1	1
40		1	1	1	1	1	1	1	1	1	1
60		1	1	1	1	1	1	1	1	1	1
80		1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1

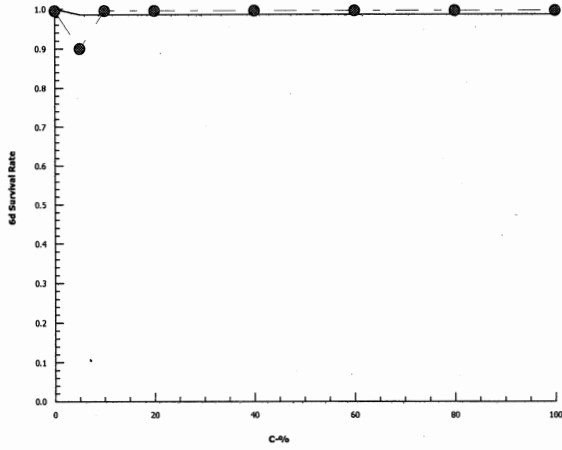
Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

Analysis ID: 19-6098-4305      Endpoint: 6d Survival Rate  
Analyzed: 24 Dec-12 14:27      Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.4  
Official Results: Yes

Graphics



**CETIS Analytical Report**

Report Date: 28 Dec-12 12:34 (p 1 of 2)  
 Test Code: 12655 | 08-1465-5301

**Ceriodaphnia 7-d Survival and Reproduction Test**

**Nautilus Environmental**

<b>Analysis ID:</b> 17-8546-1436	<b>Endpoint:</b> Reproduction	<b>CETIS Version:</b> CETISv1.8.4
<b>Analyzed:</b> 28 Dec-12 12:33	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Official Results:</b> Yes
<b>Batch ID:</b> 09-3858-3675	<b>Test Type:</b> Reproduction-Survival (7d)	<b>Analyst:</b> Krysta Banack
<b>Start Date:</b> 18 Dec-12 12:15	<b>Protocol:</b> EC/EPS 1/RM/21	<b>Diluent:</b> 20% Perrier Water
<b>Ending Date:</b> 24 Dec-12 13:00	<b>Species:</b> Ceriodaphnia dubia	<b>Brine:</b>
<b>Duration:</b> 6d 1h	<b>Source:</b> In-House Culture	<b>Age:</b> <24h
<b>Sample ID:</b> 07-4935-5219	<b>Code:</b> 2CAA40D3	<b>Client:</b> Rescan
<b>Sample Date:</b> 18 Dec-12	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 18 Dec-12 11:20	<b>Source:</b> Rescan	
<b>Sample Age:</b> 12h (15.9 °C)	<b>Station:</b> Tailings Supernatant Dec 2012	

**Linear Interpolation Options**

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	2030391	200	Yes	Two-Point Interpolation

**Point Estimates**

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	0.2768	0.2162	0.4098	361.3	244	462.5
IC10	0.6301	0.4791	0.9874	158.7	101.3	208.7
IC15	1.081	0.7989	1.802	92.48	55.5	125.2
IC20	1.657	1.188	2.95	60.34	33.9	84.19
IC25	2.393	1.661	4.568	41.79	21.89	60.21
IC40	5.945	3.787	11.15	16.82	8.971	26.41
IC50	9.772	6.855	21.77	10.23	4.594	14.59

**Reproduction Summary**

**Calculated Variate**

C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	10	21	16	26	1	3.162	15.06%	0.0%
5		10	13.3	8	18	1.075	3.401	25.57%	36.67%
10		10	10.4	6	17	1.185	3.748	36.03%	50.48%
20		10	9.6	4	14	0.8589	2.716	28.29%	54.29%
40		10	5.6	3	8	0.6532	2.066	36.89%	73.33%
60		10	3.5	0	7	0.969	3.064	87.55%	83.33%
80		10	0	0	0	0	0		100.0%
100		10	0	0	0	0	0		100.0%

**Reproduction Detail**

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	16	26	21	23	20	21	16	24	21	22
5		10	13	8	12	18	10	18	16	14	14
10		10	8	6	10	16	17	13	9	7	8
20		10	11	11	11	8	10	7	10	14	4
40		4	3	4	5	3	7	8	8	6	8
60		5	6	0	5	6	0	0	0	6	7
80		0	0	0	0	0	0	0	0	0	0
100		0	0	0	0	0	0	0	0	0	0

Ceriodaphnia 7-d Survival and Reproduction Test

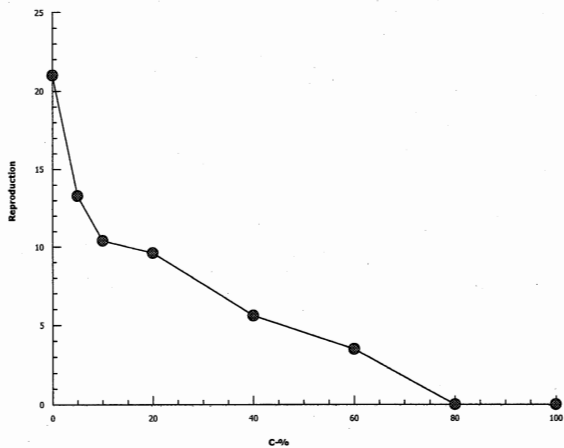
Nautilus Environmental

Analysis ID: 17-8546-1436  
Analyzed: 28 Dec-12 12:33

Endpoint: Reproduction  
Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.4  
Official Results: Yes

Graphics





**APPENDIX B - *Lemna minor* Toxicity Test Data**

**Lemna minor Summary Sheet**

Client: Rescan  
Work Order No.: 12656

Start Date: December 21/12  
Set up by: KLB

**Sample Information:**

Sample ID: Tailing Supernatant Dec 2012  
Sample Date: Dec 18/12  
Date Received: Dec 18/12  
Sample Volume: 3x20L

**Test Organism Information:**

Culture Date: 12/14/12  
Age of culture (Day 0): 7 days  
>8X growth in APHA?: Yes, 27 fronds

**KCI Reference Toxicant Results:**

Reference Toxicant ID: Lm 83  
Date Initiated: January 2/13

7-d No. of Fronds IC50 (95% CL): 3.8 (3.4-4.3)

7-d No. Fronds IC50 Reference Toxicant Mean (2 SD Range): 4.4 (3.5-5.5) CV (%): 12

	Number of Fronds	Dry Weight
Test Results: IC25 %(v/v) (95% CL)	797	797
IC50 %(v/v) (95% CL)	797	797

Reviewed by: A. Trig

Date reviewed: January 13<sup>14</sup> 2013

## Plant Growth Inhibition Toxicity Test Water Quality Measurements

Client: Rescan Setup by: KLB  
 Sample ID: Tailings Supernatant Decad2 Test Date: Dec 21/12  
 Work Order No.: 12656 Test Species: Lemna minor  
 Culture Source: CPCCT490  
 Test Culture Age: 7 days > 8X Growth? (Y/N): Y (27 fronds)  
 Light Intensity Range: 4700-5000 lux Date Measured: Dec 21/12

Day	0	1	2	3	4	5	6	7
Shelf Temp (°C)	23.0	25.0	26.0	26.0	25.0	25.0	24.0	24.0
Initials	KLB	~	~	EMM	JJT	JW	JW	KLB

Sample Characteristics  
 Temperature (°C) 23.5  
 DO (mg/L) 6.4  
 pH 7.2  
 Conductivity (µS) 680

Aeration? 20 min  
23.0  
7.8  
7.7  
1466

Concentration <i>Y<sub>i</sub> (µM)</i>	Temperature (°C)		pH		Conductivity (µS)
	Day 0	Day 7	Day 0	Day 7	0 h
Control	23.0	26.0	8.2	9.0	905
1.5	23.0	26.0	8.1	9.1	897
3.05	23.0	25.5	8.1	9.2	906
6.1	23.0	25.0	8.1	8.8	927
12.1	23.0	25.0	8.1	8.8	963
24.2	23.0	25.5	8.0	9.2	1042
48.5	23.0	25.5	7.9	9.1	1165
97	23.0	26.0	7.8	8.7	1439
Initials	KLB	KLB	KLB	KLB	KLB

Thermometer: Calibrated Thermometer Cond. Meter: C-1 pH meter: pH-1

Sample Description: light<sup>xib</sup> slightly murky white

Comments: \_\_\_\_\_

Reviewed: A. Tong Date Reviewed: January 14, 2013

**Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts**

Client: Rescan  
 Sample ID: Tailings Supernatant Dec 2012  
 Work Order #: 12656

Start Date: Dec 21/12  
 Termination Date: Dec 28/12  
 Test set up by: KUB

Concentration % (v/v)	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
Control	A	6	62										KUB
	B	6	82										
	C	6	80										
	D	6	62										
1.5	A	6	98										↓
	B	6	87										
	C	6	68										
	D	6	63										
3.05	A	6	81										
	B	6	85										
	C	6	65										
	D	6	75										
6.1	A	6	57										
	B	6	89										
	C	6	60										
	D	6	65										
12.1	A	6	62										
	B	6	73										
	C	6	69										
	D	6	76										
24.2	A	6	21										
	B	6	58										
	C	6	64										
	D	6	70										

Comments: \_\_\_\_\_

Reviewed by: A. T. [Signature]

Date Reviewed: January 13, 2013

### Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts

Client: Rescan  
 Sample ID: Tailings supernatant Dec 2012  
 Work Order #: 12656

Start Date: Dec 21/12  
 Termination Date: Dec 28/12  
 Test set up by: YCB

Concentration	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
48.5	A	6	76										YCB
	B	6	62										
	C	6	75										
	D	6	67										
97	A	6	72										↓
	B	6	57										
	C	6	57										
	D	6	70										
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												

Comments: \_\_\_\_\_

Reviewed by: A. Tong

Date Reviewed: January 13, 2013

### 7-d Lemna minor Weight Data Sheet

Client: Rescan  
 Sample ID: Tailings Supernatant Dec 2012  
 Work Order #: 12656

Start Date: Dec 21/12  
 Termination Date: Dec 28/12

Concentration ( $\mu\text{g/L}$ )	Rep	Brown Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
Control	A	1	1020.01	1026.60	KCB
	B	2	993.12	1000.38	
	C	3	1041.00	1049.42	
	D	4	1028.83	1034.88	
1.5	A	5	1027.28	1036.01	
	B	6	1025.30	1033.42	
	C	7	1065.76	1072.43	
	D	8	1030.14	1035.90	
3.05	A	9	1017.80	1025.98	
	B	10	994.84	1002.99	
	C	11	1037.22	1043.99	
	D	12	1039.36	1046.43	
6.1	A	13	1014.44	1020.38	
	B	14	1012.33	1021.18	
	C	15	1001.44	1007.98	
	D	16	1017.82	1024.19	
12.1	A	17	1023.76	1030.48	
	B	18	1036.88	1044.62	
	C	19	1000.41	1007.61	
	D	20	1021.35	1029.53	
24.2	A	21	1053.10	1060.00	
	B	22	1053.17	1059.30	
	C	23	1020.94	1027.42	
	D	24	1049.66	1057.00	
48.5	A	25	1050.46	1057.97	
	B	26	1055.38	1062.12	
	C	27	1010.24	1018.79	
	D	28	1030.36	1037.56	

Comments: 10% Reweigh: Pan #4 = 1034.81mg Pan #13 = 1020.21mg  
Pan #24 = 1056.89mg

Reviewed by: A. Teng

Date Reviewed: January 13, 2013

### 7-d Lemna minor Weight Data Sheet

Client: Rescan  
 Sample ID: Tailings Supernatant Dec2012  
 Work Order #: \_\_\_\_\_

Start Date: Dec 21/12  
 Termination Date: Dec 28/12

Concentration <i>1.0/1.0</i>	Rep	Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
97	A	29	1013.05	1020.79	KUB ↓
	B	30	1033.10	1039.86	
	C	31	1051.57	1058.76	
	D	32	1029.55	1037.60	
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				

Comments: \_\_\_\_\_  
 \_\_\_\_\_

Reviewed by: A. Teng

Date Reviewed: January 13, 2013

# CETIS Analytical Report

Report Date: 02 Jan-13 10:51 (p 1 of 2)  
 Test Code: 12656 | 06-5888-2631

## Lemna Growth Inhibition Test

Nautilus Environmental

<b>Analysis ID:</b> 05-8992-4061	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.8.4
<b>Analyzed:</b> 02 Jan-13 10:49	<b>Analysis:</b> Nonlinear Regression	<b>Official Results:</b> Yes
<b>Batch ID:</b> 15-6749-5061	<b>Test Type:</b> Lemna Growth	<b>Analyst:</b> Krysta Banack
<b>Start Date:</b> 21 Dec-12	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Diluent:</b> APHA
<b>Ending Date:</b> 28 Dec-12	<b>Species:</b> Lemna minor	<b>Brine:</b>
<b>Duration:</b> 7d 0h	<b>Source:</b> In-House Culture	<b>Age:</b> 7-d
<b>Sample ID:</b> 12-3999-7929	<b>Code:</b> 49E8DDE9	<b>Client:</b> Rescan
<b>Sample Date:</b> 19 Dec-12	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 18 Dec-12 11:20	<b>Source:</b> Rescan	
<b>Sample Age:</b> 48h (15.9 °C)	<b>Station:</b> Tailings Supernatant Dec 2012	

## Non-Linear Regression Options

Model Function	X Transform	Y Transform	Weighting Function	PTBS Function
3P Cumulative Log-Normal EV [Y=A*(1- Φ(log(X/D)/C))]	None	None	Normal [W=1]	Off [Y*=Y]

## Regression Summary

Iters	Log LL	AICc	BIC	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(α:5%)
20	-88.52	183.9	187.4	0.0460	Yes	0.6979	2.621	0.6303	Non-Significant Lack of Fit

## Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	9.773	N/A	57.43	10.23	1.741	NA
IC10	37.11	3.936	124.9	2.694	0.8005	25.4
IC15	91.31	4.552	423.4	1.095	0.2362	21.97 <sup>u/c</sup>
IC20	186.7	N/A	1863	0.5355	0.05368	NA
IC25	345	N/A	8726	0.2898	0.01146	NA
IC40	1620	N/A	N/A	0.06172	NA	NA
IC50	4109	N/A	N/A	0.02434	NA	NA

797% (u/c)

## Regression Parameters

Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(α:5%)
A	68.58	4.556	59.65	77.51	15.05	<0.0001	Significant Parameter
C	3.673	3.986	-4.14	11.49	0.9213	0.3645	Non-Significant Parameter
D	4109	17140	-29490	37710	0.2397	0.8123	Non-Significant Parameter

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Model	358.7055	358.7055	1	3.496	0.0716	Non-Significant
Lack of Fit	377.6695	75.5339	5	0.6979	0.6303	Non-Significant
Pure Error	2597.5	108.2292	24			
Residual	2975.169	102.592	29			

## Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance	5.495	14.07	0.5998	Equal Variances
	Mod Levene Equality of Variance	1.343	2.423	0.2739	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9547	0.9338	0.1951	Normal Distribution
	Anderson-Darling A2 Normality	0.5637	2.492	0.1483	Normal Distribution



Lemna Growth Inhibition Test

Nautilus Environmental

Analysis ID: 05-8992-4061  
 Analyzed: 02 Jan-13 10:49

Endpoint: Frond Count  
 Analysis: Nonlinear Regression

CETIS Version: CETISv1.8.4  
 Official Results: Yes

Frond Count Summary

Calculated Variate

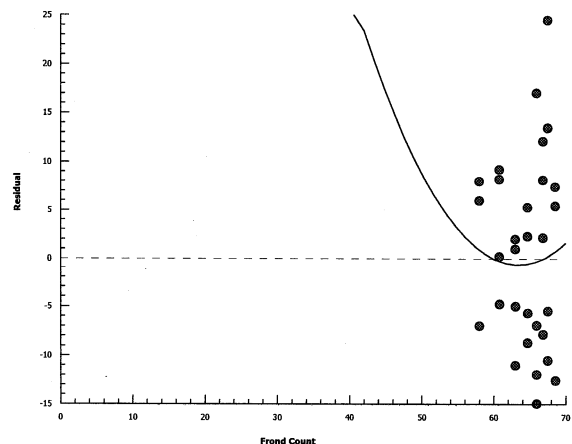
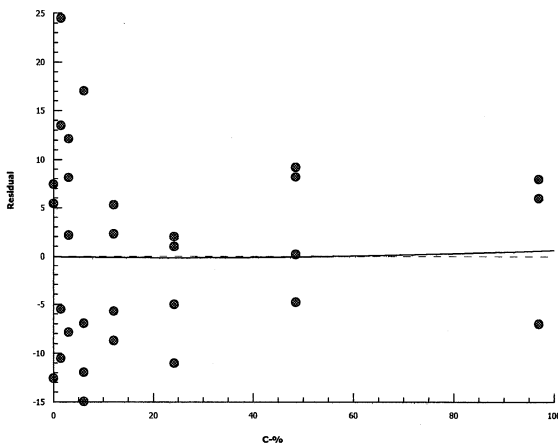
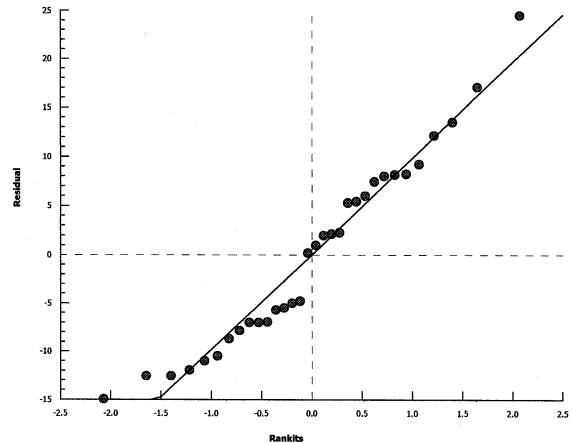
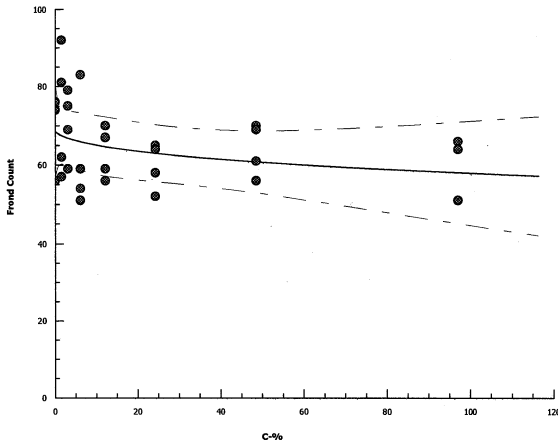
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	4	65.5	56	76	5.5	11	16.79%	0.0%
1.5		4	73	57	92	8.175	16.35	22.4%	-11.45%
3.05		4	70.5	59	79	4.349	8.699	12.34%	-7.63%
6.1		4	61.75	51	83	7.273	14.55	23.56%	5.73%
12.1		4	63	56	70	3.291	6.583	10.45%	3.82%
24.2		4	59.75	52	65	3.01	6.021	10.08%	8.78%
48.5		4	64	56	70	3.342	6.683	10.44%	2.29%
97		4	58	51	66	4.062	8.124	14.01%	11.45%

Frond Count Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	56	76	74	56
1.5		92	81	62	57
3.05		75	79	59	69
6.1		51	83	54	59
12.1		56	67	59	70
24.2		65	52	58	64
48.5		70	56	69	61
97		66	51	51	64

Graphics

3P Cumulative Log-Normal EV [Y=A\*(1- Φ(log(X/D)/C))]



**CETIS Analytical Report**

Report Date: 02 Jan-13 10:51 (p 1 of 2)  
 Test Code: 12656 | 06-5888-2631

**Lemna Growth Inhibition Test**

**Nautilus Environmental**

<b>Analysis ID:</b> 06-0156-2030	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.8.4
<b>Analyzed:</b> 02 Jan-13 10:51	<b>Analysis:</b> Nonlinear Regression	<b>Official Results:</b> Yes
<b>Batch ID:</b> 15-6749-5061	<b>Test Type:</b> Lemna Growth	<b>Analyst:</b> Krysta Banack
<b>Start Date:</b> 21 Dec-12	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Diluent:</b> APHA
<b>Ending Date:</b> 28 Dec-12	<b>Species:</b> Lemna minor	<b>Brine:</b>
<b>Duration:</b> 7d 0h	<b>Source:</b> In-House Culture	<b>Age:</b> 7-d
<b>Sample ID:</b> 12-3999-7929	<b>Code:</b> 49E8DDE9	<b>Client:</b> Rescan
<b>Sample Date:</b> 19 Dec-12	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 18 Dec-12 11:20	<b>Source:</b> Rescan	
<b>Sample Age:</b> 48h (15.9 °C)	<b>Station:</b> Tailings Supernatant Dec 2012	

**Non-Linear Regression Options**

Model Function	X Transform	Y Transform	Weighting Function	PTBS Function
3P Cumulative Log-Normal EV [Y=A*(1- Φ(log(X/D)/C))]	None	None	Normal [W=1]	Off [Y*=Y]

**Regression Summary**

Iters	Log LL	AICc	BIC	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(α:5%)
27	-11.72	30.3	33.84		Yes	1.026	2.621	0.4248	Non-Significant Lack of Fit

**Point Estimates**

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	1614	N/A	4.63E+09	0.06197	0.0000000	NA
IC10	39110	N/A	N/A	0.002557	NA	NA
IC15	336100	N/A	N/A	0.0002975	NA	NA
IC20	1857000	N/A	N/A	0.0000538	NA	NA
IC25	8050000	N/A	N/A	0.0000124	NA	NA
IC40	32410000	N/A	N/A	0.0000003	NA	NA
IC50	29940000	N/A	N/A	0.0000000	NA	NA

*Handwritten: 797% (u)*

**Regression Parameters**

Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(α:5%)
A	7.13	0.4537	6.241	8.019	15.72	<0.0001	Significant Parameter
C	8.775	51.9	-92.95	110.5	0.1691	0.8669	Non-Significant Parameter
D	2.99E+09	3.04E+11	-5.9E+11	5.98E+11	0.009865	0.9922	Non-Significant Parameter

**ANOVA Table**

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Model	0	0	1	0	1.0000	Non-Significant
Lack of Fit	4.311708	0.862342	5	1.026	0.4248	Non-Significant
Pure Error	20.17733	0.840722	24			
Residual	24.48904	0.84445	29			

**Residual Analysis**

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance	5.047	14.07	0.6542	Equal Variances
	Mod Levene Equality of Variance	0.7757	2.423	0.6135	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9663	0.9338	0.4041	Normal Distribution
	Anderson-Darling A2 Normality	0.3929	2.492	0.3811	Normal Distribution

# CETIS Analytical Report

Report Date: 02 Jan-13 10:51 (p 2 of 2)  
 Test Code: 12656 | 06-5888-2631

## Lemna Growth Inhibition Test

Nautilus Environmental

Analysis ID: 06-0156-2030      Endpoint: Total Dry Weight-mg      CETIS Version: CETISv1.8.4  
 Analyzed: 02 Jan-13 10:51      Analysis: Nonlinear Regression      Official Results: Yes

### Total Dry Weight-mg Summary

### Calculated Variate

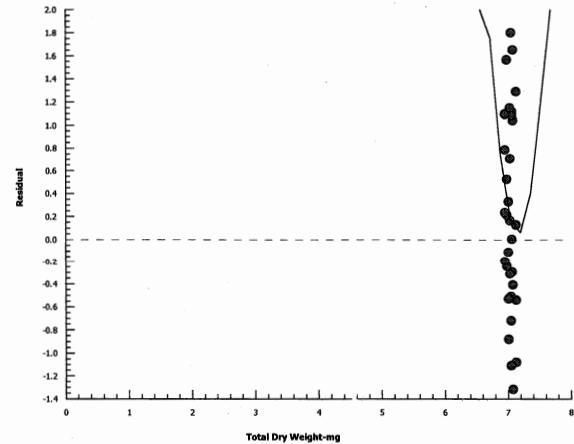
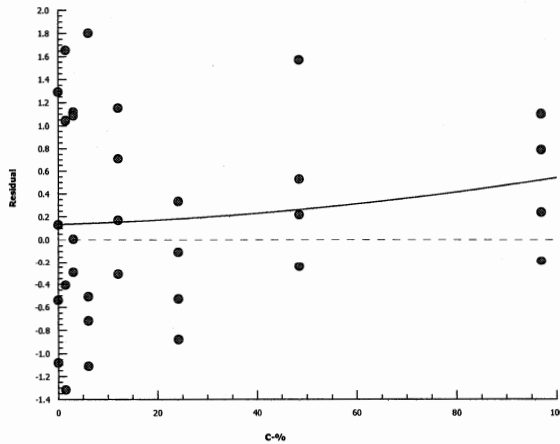
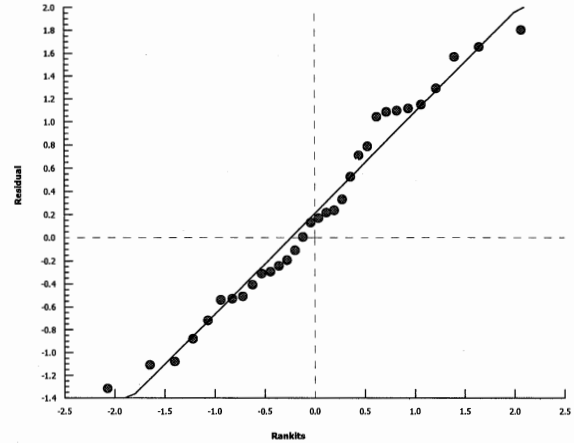
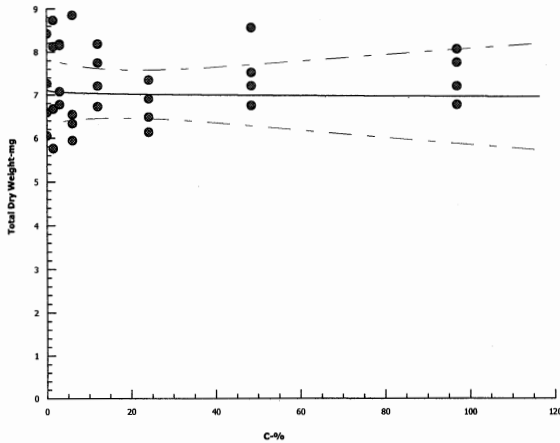
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	4	7.08	6.05	8.42	0.5106	1.021	14.42%	0.0%
1.5		4	7.32	5.76	8.73	0.676	1.352	18.47%	-3.39%
3.05		4	7.543	6.77	8.18	0.3646	0.7292	9.67%	-6.53%
6.1		4	6.915	5.94	8.85	0.6569	1.314	19.0%	2.33%
12.1		4	7.46	6.72	8.18	0.3178	0.6356	8.52%	-5.37%
24.2		4	6.713	6.13	7.34	0.2618	0.5235	7.8%	5.19%
48.5		4	7.5	6.74	8.55	0.3841	0.7681	10.24%	-5.93%
97		4	7.435	6.76	8.05	0.2868	0.5735	7.71%	-5.01%

### Total Dry Weight-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	6.59	7.26	8.42	6.05
1.5		8.73	8.12	6.67	5.76
3.05		8.18	8.15	6.77	7.07
6.1		5.94	8.85	6.54	6.33
12.1		6.72	7.74	7.2	8.18
24.2		6.9	6.13	6.48	7.34
48.5		7.51	6.74	8.55	7.2
97		7.74	6.76	7.19	8.05

### Graphics

3P Cumulative Log-Normal EV [Y=A\*(1- Φ(log(X/D)/C))]



**APPENDIX C - *Pseudokirchneriella subcapitata* Toxicity Test Data**

## ***Pseudokirchneriella subcapitata* Summary Sheet**

Client: Rescan  
Work Order No.: 12657

Start Date: December 18, 2012  
Set up by: ECC

### **Sample Information:**

Sample ID: Tailing Supernatant  
Sample Date: Dec. 18, 2012  
Date Received: Dec. 18, 2012  
Sample Volume: 3x20L

### **Test Organism Information:**

Culture Date: December 14, 2012  
Age of culture (Day 0): 4 d

### **Zinc Reference Toxicant Results:**

Reference Toxicant ID: SC91a  
Stock Solution ID: 12Zn01  
Date Initiated: Dec. 7, 2012

72-h IC50 (95% CL): 31.7 (27.2 - 34.9)

72-h IC50 Reference Toxicant Mean and Range: 20.9, 13.6 - 32.3 CV (%): 32%

Test Results:

	Algal Growth
IC25 %(v/v) (95% CL)	> 95.2
IC50 %(v/v) (95% CL)	> 95.2

Reviewed by: A. Tang

Date reviewed: January 13, 2013<sup>4</sup>

## 72-h Algal Growth Inhibition Toxicity Test Water Quality Measurements

Client: RESCAN

Setup by: ECC

Sample ID: TAILINGS SUPERNATANT

Test Date/Time: Dec-18, 2012 1430h

Work Order No.: 126577

Test Species: Pseudokirchneriella subcapitata

Culture Date: Dec-14/12 Age of Culture: 4 d Culture Health: Good

Culture Count: 1 143 2 149 Average: 146 Culture Cell Density (c1): 146 x 10<sup>4</sup>

$$v1 = \frac{220,000 \text{ cells/ml} \times 50 \text{ ml}}{(c1) 146 \times 10^4 \text{ cells/ml}} = 753 \text{ mL}$$

Time Zero Counts: 1 21 2 25 Average: 23 x 10<sup>4</sup>

No. of Cells/mL: 23 x 10<sup>4</sup> Initial Density: # cells/mL ÷ 220 µL x 10 µL = 10,455 cells/mL

Concentration % (v/v)	Water Quality Measurements					Microplates rotated 2X per day?			
	pH	Temp (°C)				0 h	24 h	48 h	72 h
		0 h	0 h	24 h	48 h				
Control	6.7	24.5	24.5	24.0	25.0	✓	✓	✓	✓
1.5	6.7	24.5	↓	↓	↓	✓	✓	✓	✓
3.0	6.7	24.5	↓	↓	↓	✓	✓	✓	✓
5.9	6.7	24.5	↓	↓	↓	✓	✓	✓	✓
11.9	6.7	24.5	↓	↓	↓	✓	✓	✓	✓
23.8	6.7	24.5	↓	↓	↓	✓	✓	✓	✓
47.6	6.6	25.0	↓	↓	↓	✓	✓	✓	✓
95.2	6.5	25.0	↓	↓	↓	✓	✓	✓	✓
Initials	<u>EN</u>	<u>EN</u>	<u>EN</u>	<u>EN</u>	<u>EN</u>	<u>EN</u>	<u>EN</u>	<u>EN</u>	<u>EN</u>

Initial control pH: Well 1: 6.8 Well 2: 6.8

Final control pH: Well 1: 6.5 Well 2: 6.5

Light intensity (lux): 3660 Date measured: Dec-18, 2012

Sample Description: clear, turbid.

Comments: \_\_\_\_\_

Reviewed: A. Tong Date reviewed: January 13, 2013

**Pseudokirchneriella subcapitata Toxicity Test Data Sheet**  
**72-h Algal Cell Counts**

Client: PESCAN Start Date/Time: Dec 18, 2012 1430h  
 Work Order #: 12657 Termination Date: Dec 21, 2012 1430h  
 Sample ID: TAILING SUPERNATANT Test set up by: EW  
 %(v/v)

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A	76					EW
	B	73					
	C	66					
	D	77					
	E	82					
	F	74					
	G	92					
	H	78					
1.5	A	151					EW
	B	144					
	C	128					
	D	141					
3.0	A	126	135				
	B	143					
	C	168					
	D	175					
5.9	A	121	132				
	B	134					
	C	172	181				
	D	146					
11.9	A	182					
	B	173					
	C	180					
	D	206					
23.8	A	248					
	B	234					
	C	268					
	D	259					
47.6	A	172					
	B	158	163				
	C	189					
	D	173					
95.2	A	99					
	B	92	96				
	C	108					
	D	114					

Comments:

Reviewed by: A. Berg

Date Reviewed: January 13, 2013

**Pseudokirchneriella subcapitata Algal Counts**

Client: Rescan  
 WO#: 12657  
 Sample ID: Tailing Supernatant

Start Date/Time: 18-Dec-12 @1530h  
 Termination Date: 21-Dec-12 @1535h

Initial Cell Density: 10455 cell/mL 230000  
 0.22  
 0.01

Concentration % v/v	Rep	Count 1 (x 10 <sup>4</sup> )	Count 2 (x 10 <sup>4</sup> )	Count 3 (x 10 <sup>4</sup> )	Count 4 (x 10 <sup>4</sup> )	Mean (x 10 <sup>4</sup> )	Cell Yield (x 10 <sup>4</sup> ) cell/mL		10454.55
Control	A	76				76	75.0	mean	76.2
	B	73				73	72.0	SD	7.53563
	C	66				66	65.0	CV	9.888688
	D	77				77	76.0		
	E	82				82	81.0		
	F	74				74	73.0		
	G	92				92	91.0		
	H	78				78	77.0		
1.48	A	151				151	150.0		
	B	144				144	143.0		
	C	128				128	127.0		
	D	141				141	140.0		
2.95	A	126	135			130.5	129.5		
	B	143				143	142.0		
	C	168				168	167.0		
	D	175				175	174.0		
5.9	A	121	132			126.5	125.5		
	B	134				134	133.0		
	C	172	181			176.5	175.5		
	D	146				146	145.0		
11.9	A	182				182	181.0		
	B	173				173	172.0		
	C	180				180	179.0		
	D	206				206	205.0		
23.8	A	248				248	247.0		
	B	234				234	233.0		
	C	268				268	267.0		
	D	259				259	258.0		
47.6	A	172				172	171.0		
	B	158	163			160.5	159.5		
	C	189				189	188.0		
	D	173				173	172.0		
95.2	A	99				99	98.0		
	B	92	96			94	93.0		
	C	108				108	107.0		
	D	114				114	113.0		

ART  
 Jan 13/13



**CETIS Analytical Report**

Report Date: 27 Dec-12 13:47 (p 1 of 2)  
 Test Code: 12657 | 19-6164-9329

**EC Alga Growth Inhibition Test**

**Nautilus Environmental**

<b>Analysis ID:</b> 12-9795-5553	<b>Endpoint:</b> Cell Yield	<b>CETIS Version:</b> CETISv1.8.0
<b>Analyzed:</b> 27 Dec-12 13:44	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Official Results:</b> Yes
<b>Batch ID:</b> 00-3591-5152	<b>Test Type:</b> Cell Growth	<b>Analyst:</b>
<b>Start Date:</b> 18 Dec-12	<b>Protocol:</b> EC/EPS 1/RM/25	<b>Diluent:</b> Deionized Water
<b>Ending Date:</b> 21 Dec-12	<b>Species:</b> Pseudokirchneriella subcapitata	<b>Brine:</b>
<b>Duration:</b> 72h	<b>Source:</b> In-House Culture	<b>Age:</b>
<b>Sample ID:</b> 08-5203-2975	<b>Code:</b> Tailing Supernatant	<b>Client:</b> Rescan
<b>Sample Date:</b> 18 Dec-12	<b>Material:</b> Mining Discharge/Runoff	<b>Project:</b>
<b>Receive Date:</b> 18 Dec-12	<b>Source:</b> Rescan	
<b>Sample Age:</b> N/A	<b>Station:</b>	

**Linear Interpolation Options**

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	2.007E+09	200	Yes	Two-Point Interpolation

**Residual Analysis**

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Control Trend	Mann-Kendall Trend	12		0.1788	Non-significant Trend in Controls

**Point Estimates**

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	52.44	51.51	53.87	1.907	1.856	1.942
IC10	57.77	55.72	60.94	1.731	1.641	1.795
IC15	63.63	60.26	68.9	1.572	1.451	1.659
IC20	70.07	65.16	77.86	1.427	1.284	1.535
IC25	77.15	70.44	87.95	1.296	1.137	1.42
IC40	>95.2	N/A	N/A	<1.05	N/A	N/A
IC50	>95.2	N/A	N/A	<1.05	N/A	N/A

} > 95.2

**Cell Yield Summary**

**Calculated Variate**

Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	8	76.25	65	91	2.664	7.536	9.88%	0.0%
1.49		4	140	127	150	4.813	9.626	6.88%	-83.61%
2.98		4	153.3	130	174	10.36	20.71	13.51%	-101.0%
5.95		4	145	126	176	11.05	22.11	15.25%	-90.16%
11.9		4	184.3	172	205	7.181	14.36	7.8%	-141.6%
23.8		4	251.3	233	267	7.33	14.66	5.84%	-229.5%
47.6		4	172.8	160	188	5.764	11.53	6.67%	-126.6%
95.2		4	102.8	93	113	4.479	8.958	8.72%	-34.75%

**Cell Yield Detail**

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Control	75	72	65	76	81	73	91	77
1.49		150	143	127	140				
2.98		130	142	167	174				
5.95		126	133	176	145				
11.9		181	172	179	205				
23.8		247	233	267	258				
47.6		171	160	188	172				
95.2		98	93	107	113				

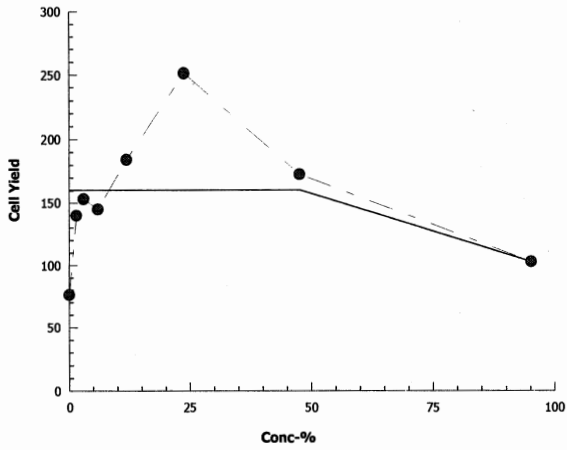
EC Alga Growth Inhibition Test

Nautilus Environmental

Analysis ID: 12-9795-5553      Endpoint: Cell Yield  
Analyzed: 27 Dec-12 13:44      Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.0  
Official Results: Yes

Graphics



**CETIS Analytical Report**

Report Date: 27 Dec-12 13:47 (p 1 of 4)  
 Test Code: 12657 | 19-6164-9329

**EC Alga Growth Inhibition Test**

**Nautilus Environmental**

<b>Analysis ID:</b> 00-6261-9912	<b>Endpoint:</b> Cell Yield	<b>CETIS Version:</b> CETISv1.8.0
<b>Analyzed:</b> 27 Dec-12 13:43	<b>Analysis:</b> Parametric-Two Sample	<b>Official Results:</b> Yes
<b>Batch ID:</b> 00-3591-5152	<b>Test Type:</b> Cell Growth	<b>Analyst:</b>
<b>Start Date:</b> 18 Dec-12	<b>Protocol:</b> EC/EPS 1/RM/25	<b>Diluent:</b> Deionized Water
<b>Ending Date:</b> 21 Dec-12	<b>Species:</b> Pseudokirchneriella subcapitata	<b>Brine:</b>
<b>Duration:</b> 72h	<b>Source:</b> In-House Culture	<b>Age:</b>
<b>Sample ID:</b> 08-5203-2975	<b>Code:</b> Tailing Supernatant	<b>Client:</b> Rescan
<b>Sample Date:</b> 18 Dec-12	<b>Material:</b> Mining Discharge/Runoff	<b>Project:</b>
<b>Receive Date:</b> 18 Dec-12	<b>Source:</b> Rescan	
<b>Sample Age:</b> N/A	<b>Station:</b>	

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run	<1.49	1.49	N/A	>67.11	11.6%

**Equal Variance t Two-Sample Test**

Control	vs Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
Negative Control	1.49*	12.67	1.812	10	9.122	<0.0001	Significant Effect
	2.98*	9.689	1.812	10	14.4	<0.0001	Significant Effect
	5.95*	8.224	1.812	10	15.15	<0.0001	Significant Effect
	11.9*	17.49	1.812	10	11.19	<0.0001	Significant Effect
	23.8*	27.99	1.812	10	11.33	<0.0001	Significant Effect
	47.6*	17.66	1.812	10	9.904	<0.0001	Significant Effect
	95.2*	5.417	1.812	10	8.867	0.0001	Significant Effect

**Auxiliary Tests**

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Control Trend		12		0.1788	Non-significant Trend in Controls

**ANOVA Table**

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	99719.05	14245.58	7	74.82	<0.0001	Significant Effect
Error	5331.25	190.4018	28			
Total	105050.3	14435.98	35			

**Distributional Tests**

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	7.554	18.48	0.3735	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9761	0.9166	0.6145	Normal Distribution

**Cell Yield Summary**

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	8	76.25	73.38	79.12	65	91	2.664	7.536	9.88%	0.0%
1.49		4	140	136.3	143.7	127	150	4.813	9.626	6.88%	-83.61%
2.98		4	153.3	145.4	161.1	130	174	10.36	20.71	13.51%	-101.0%
5.95		4	145	136.6	153.4	126	176	11.05	22.11	15.25%	-90.16%
11.9		4	184.3	178.8	189.7	172	205	7.181	14.36	7.8%	-141.6%
23.8		4	251.3	245.7	256.8	233	267	7.33	14.66	5.84%	-229.5%
47.6		4	172.8	168.4	177.1	160	188	5.764	11.53	6.67%	-126.6%
95.2		4	102.8	99.34	106.2	93	113	4.479	8.958	8.72%	-34.75%

QA: *Jan 13/13*

EC Alga Growth Inhibition Test

Nautilus Environmental

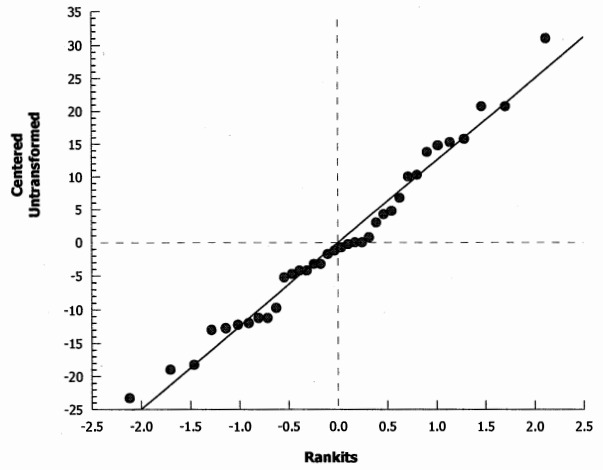
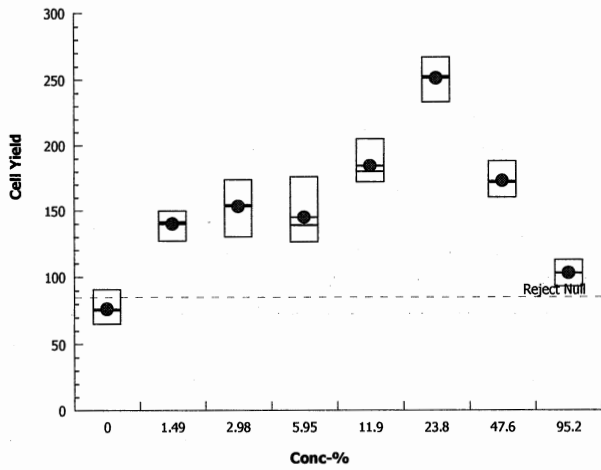
Analysis ID: 00-6261-9912      Endpoint: Cell Yield  
 Analyzed: 27 Dec-12 13:43      Analysis: Parametric-Two Sample

CETIS Version: CETISv1.8.0  
 Official Results: Yes

Cell Yield Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Control	75	72	65	76	81	73	91	77
1.49		150	143	127	140				
2.98		130	142	167	174				
5.95		126	133	176	145				
11.9		181	172	179	205				
23.8		247	233	267	258				
47.6		171	160	188	172				
95.2		98	93	107	113				

Graphics



**CETIS Analytical Report**

Report Date: 27 Dec-12 13:47 (p 3 of 4)  
 Test Code: 12657 | 19-6164-9329

**EC Alga Growth Inhibition Test**

**Nautilus Environmental**

<b>Analysis ID:</b> 06-9876-8619	<b>Endpoint:</b> Cell Yield	<b>CETIS Version:</b> CETISv1.8.0
<b>Analyzed:</b> 27 Dec-12 13:43	<b>Analysis:</b> Parametric-Control vs Treatments	<b>Official Results:</b> Yes
<b>Batch ID:</b> 00-3591-5152	<b>Test Type:</b> Cell Growth	<b>Analyst:</b>
<b>Start Date:</b> 18 Dec-12	<b>Protocol:</b> EC/EPS 1/RM/25	<b>Diluent:</b> Deionized Water
<b>Ending Date:</b> 21 Dec-12	<b>Species:</b> Pseudokirchneriella subcapitata	<b>Brine:</b>
<b>Duration:</b> 72h	<b>Source:</b> In-House Culture	<b>Age:</b>
<b>Sample ID:</b> 08-5203-2975	<b>Code:</b> Tailing Supernatant	<b>Client:</b> Rescan
<b>Sample Date:</b> 18 Dec-12	<b>Material:</b> Mining Discharge/Runoff	<b>Project:</b>
<b>Receive Date:</b> 18 Dec-12	<b>Source:</b> Rescan	
<b>Sample Age:</b> N/A	<b>Station:</b>	

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	95.2	>95.2	N/A	1.05	28.0%

**Dunnett's Multiple Comparison Test**

Control	vs	Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
Negative Control		1.49	-7.544	2.526	10	21.35	1.0000	Non-Significant Effect
		2.98	-9.113	2.526	10	21.35	1.0000	Non-Significant Effect
		5.95	-8.136	2.526	10	21.35	1.0000	Non-Significant Effect
		11.9	-12.78	2.526	10	21.35	1.0000	Non-Significant Effect
		23.8	-20.71	2.526	10	21.35	1.0000	Non-Significant Effect
		47.6	-11.42	2.526	10	21.35	1.0000	Non-Significant Effect
		95.2	-3.136	2.526	10	21.35	1.0000	Non-Significant Effect

**Auxiliary Tests**

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Control Trend		12		0.1788	Non-significant Trend in Controls

**ANOVA Table**

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	99719.05	14245.58	7	74.82	<0.0001	Significant Effect
Error	5331.25	190.4018	28			
Total	105050.3	14435.98	35			

**Distributional Tests**

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	7.554	18.48	0.3735	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9761	0.9166	0.6145	Normal Distribution

**Cell Yield Summary**

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	8	76.25	73.38	79.12	65	91	2.664	7.536	9.88%	0.0%
1.49		4	140	136.3	143.7	127	150	4.813	9.626	6.88%	-83.61%
2.98		4	153.3	145.4	161.1	130	174	10.36	20.71	13.51%	-101.0%
5.95		4	145	136.6	153.4	126	176	11.05	22.11	15.25%	-90.16%
11.9		4	184.3	178.8	189.7	172	205	7.181	14.36	7.8%	-141.6%
23.8		4	251.3	245.7	256.8	233	267	7.33	14.66	5.84%	-229.5%
47.6		4	172.8	168.4	177.1	160	188	5.764	11.53	6.67%	-126.6%
95.2		4	102.8	99.34	106.2	93	113	4.479	8.958	8.72%	-34.75%

EC Alga Growth Inhibition Test

Nautilus Environmental

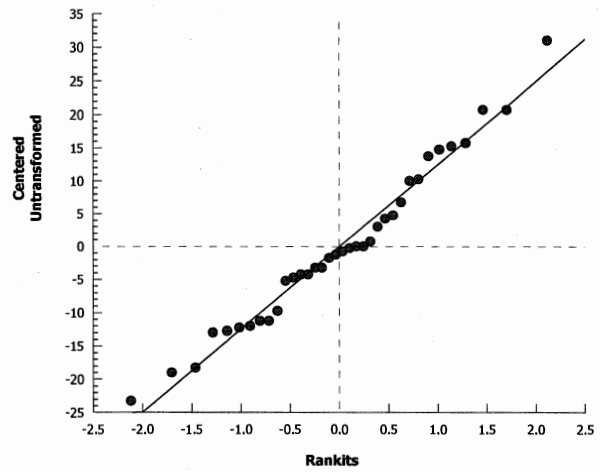
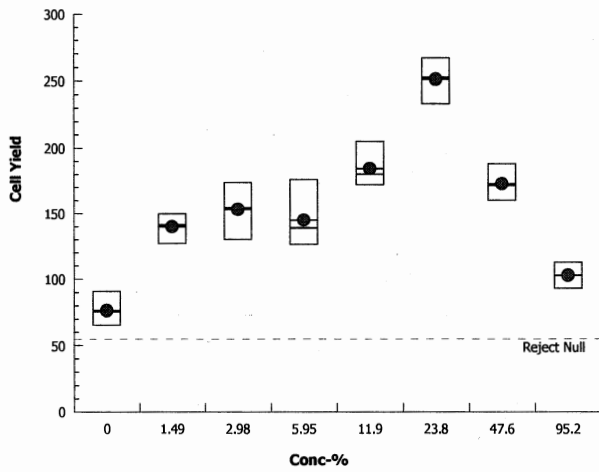
Analysis ID: 06-9876-8619      Endpoint: Cell Yield  
 Analyzed: 27 Dec-12 13:43      Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1.8.0  
 Official Results: Yes

Cell Yield Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Control	75	72	65	76	81	73	91	77
1.49		150	143	127	140				
2.98		130	142	167	174				
5.95		126	133	176	145				
11.9		181	172	179	205				
23.8		247	233	267	258				
47.6		171	160	188	172				
95.2		98	93	107	113				

Graphics



**APPENDIX D - Rainbow Trout LC50 Toxicity Test Data**

## Rainbow Trout Summary Sheet

Client: Rescan

Start Date/Time: December 20/12 @ 1100

Work Order No.: 12658

Test Species: Oncorhynchus mykiss

### Sample Information:

Sample ID: Tailings Supernatant Dec 2012  
Sample Date: December 18/12 @ N/A  
Date Received: December 18/12 @ 1120  
Sample Volume: 3 x 20L  
Other: N/A

### Test Validity Criteria:

≥ 90% control survival

### WQ Ranges:

T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

### Dilution Water:

Type: Dechlorinated Municipal Tap Water  
Hardness (mg/L CaCO<sub>3</sub>): 12  
Alkalinity (mg/L CaCO<sub>3</sub>): 7

### Test Organism Information:

Batch No.: 111412  
Source: Miracle Spings  
No. Fish/Volume (L): 10/12L  
Loading Density: 0.50  
Mean Length ± SD (mm): 38 ± 4 Range: 32 - 43  
Mean Weight ± SD (g): 0.61 ± 0.16 Range: 0.38 - 0.79

### NaNO<sub>2</sub> Reference Toxicant Results:

Reference Toxicant ID: RTNt29  
Stock Solution ID: 12Nt02  
Date Initiated: November 23/12  
96-h LC50 (95% CL): 8.1 (6.1 - 10.7) mg/L NaNO<sub>2</sub>

Reference Toxicant Mean and Historical Range: 5.2 (2.9 - 9.4) mg/L NaNO<sub>2</sub>  
Reference Toxicant CV (%): 34

Test Results: The 96-h LC50 is > 100% (v/v).

Reviewed by: A. Terry

Date reviewed: January 14, 2013



### 96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: Rescom  
 Sample I.D.: Tailings Supernatant Dec 2012  
 W.O. #: 12058  
 RBT Batch #: 111412  
 Date Collected/Time: Dec 18/12  
 Date Setup/Time: Dec 20/12 @ 1100L  
 Sample Setup By: AS

Number Fish/Volume: 10/12  
 7-d % Mortality: 0.90  
 Total Pre-aeration Time (mins): 30  
 Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Yes

D.O. meter: DO-1  
 pH meter: pH-1  
 Cond. Meter: C-1

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	14.0	/	14.0
pH	6.6		7.1
D.O. (mg/L)	8.0		9.1
Cond. (µS/cm)	693		691

Concentration (% v/v)	# Survivors						Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)		
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
<del>6.25</del>				10	10	10	10	14.0	14.0	14.0	14.0	14.5	10.1	9.8	9.9	9.7	9.7	6.9	7.0	6.9	6.8	6.7	30	39
6.25				10	10	10	10	14.0	14.0	14.0	14.0	14.5	10.1	9.6	9.8	9.9	9.5	7.0	7.8	6.8	6.8	6.9	68	79
12.5				10	10	10	9	14.0	14.0	14.0	14.0	14.5	10.0	9.7	9.9	9.8	9.5	7.0	7.7	7.0	6.8	6.9	124	131
25				10	10	10	10	14.0	14.0	14.0	14.0	14.5	10.0	9.7	9.7	9.9	9.8	7.0	7.6	7.1	6.9	6.9	205	213
50				10	10	10	10	14.0	14.0	14.0	14.0	14.5	9.8	9.8	9.8	9.9	9.8	7.0	7.5	7.0	6.8	7.1	382	390
100				10	10	10	9	14.0	14.0	14.0	14.0	14.5	9.1	9.8	9.8	9.8	9.6	7.1	7.4	7.2	7.0	7.1	691	711
Initials				JBF	~	~	EMM	~	JBF	~	~	EMM	~	JBF	~	~	EMM	~	JBF	~	~	EMM	~	EMM

WQ Ranges: T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Sample Description/Comments: sp. gas

Fish Description at 96? fish look okay.

Other Observations: \_\_\_\_\_

Reviewed by: A. Tong

Date Reviewed: January 14, 2012

**APPENDIX E - *Daphnia magna* LC50 Toxicity Test Data**

# Daphnia magna Summary Sheet

Client: Rescan Environmental  
Work Order No.: 12655 12659  
emm

Start Date/Time: Dec 21/12 @ 0945h  
Test Species: Daphnia magna  
Set up by: Emm

## Sample Information:

Sample ID: Tailings Supernatant Dec 2012  
Sample Date: Dec 18/12  
Date Received: Dec 18/12 @ 1120h  
Sample Volume: 3x20L

## Test Validity Criteria:

≥ 90% mean control survival (no more than 2 mortalities in any control replicate)

## WQ Ranges:

T (°C) = 20 ± 2; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

## Test Organism Information:

Broodstock No.: 120512A  
Age of young (Day 0): < 24 hours  
Avg No. young per brood in previous 7 d: 21  
Mortality (%) in previous 7 d: 0  
Days to first brood: 10

## NaCl Reference Toxicant Results:

Reference Toxicant ID: Dm 92  
Stock Solution ID: 12Na02  
Date Initiated: Dec 18/12  
48-h LC50 (95% CL): 3.9 (3.2 - 4.9) g/L NaCl

Reference Toxicant Mean and Historical Range: 4.0 (3.6 - 4.4) g/L NaCl

Reference Toxicant CV (%): 5

Test Results: The 48-h LC50 is >100% (v/v).

Reviewed by: A. Tong

Date reviewed: January 14, 2013

## Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: Rescan  
 Sample ID: tailings Supernatant  
 Work Order No.: 12655 12659  
                   emm

Start Date/Time: Dec 21/12 (A) 945h  
 No. Organisms/volume: 10/200mL  
 Test Organism: D.magna  
 Set up by: EMM

DO meter: DO-1

pH meter: pH-1

Conductivity meter: C-1

Concentration % (v/v)	Number of Live Organisms Rep	Number of Live Organisms		No. Immobilized	Temperature (°C)			Dissolved oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24	48		48	0	24	48	0	24	48	0	24	48	0
Control	A	10	10	0	19.0	19.0	19.0	8.9		8.8	7.5		7.8	350	350
	B														
	C														
	D														
6.25	A	10	10	0	19.0	19.0	19.0	8.9		8.9	7.4		7.7	371	376
	B														
	C														
	D														
12.5	A	10	10	0	19.0	19.0	19.0	8.9		8.9	7.4		7.7	395	393
	B														
	C														
	D														
25	A	10	10	0	19.0	19.0	19.0	8.6		8.9	7.2		7.1	440	443
	B														
	C														
	D														
50	A	10	10	0	19.5	19.0	19.0	8.7		8.9	7.2		7.5	525	521
	B														
	C														
	D														
100	A	10	10	0	19.0	19.0	19.0	7.9		8.8	7.1		7.4	693	603
	B														
	C														
	D														
Technician Initials		~	~	~	Emm	A	~	Emm	~	Emm	~	Emm	~	Emm	~

WQ Ranges: T (°C) = 20 ± 2; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

	Hardness*	Alkalinity*
Conc.	*(mg/L as CaCO3)	
Control (MHW)	100	70
Highest conc.	460	24

	Initial WQ	Adjustment	Adjusted WQ
Temp (°C)	19.0		
DO (mg/L)	7.9		
pH	7.1		
Cond (µS/cm)	693		

Sample Description: clear, slightly murky

Comments: Batch#: 126512 A 7-d previous # young/brood: 21 Day of 1st Brood: 10 Previous 7-d % Mortality: 0

Reviewed by: A. Teng Date reviewed: January 14, 2013

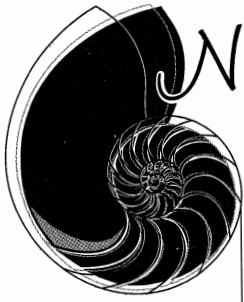


**APPENDIX F - Chain-of-Custody Forms**

British Columbia: 8664 Commerce Court, Burnaby, BC, V5A 4N7

Date \_\_\_\_\_ Page \_\_\_ of \_\_\_

Sample Collection By:							ANALYSES REQUIRED										Receipt Temperature (°C)			
Report to:		Invoice to:					7-d rainbow trout embryo viability test	Ceriodaphnia survival/reproduction	7-d Lemna minor growth inhibition test	72-h Pseudokirchneriella subcapita growth	96-hr rainbow trout acute lethality test	48-hr Daphni magna acute lethality test								
Company	Rescan Environmental	Rescan Environmental																		
Address	1111 West Hasting Street	1111 West Hasting Street																		
City/Prov/Postal Code	Vancouver, BC, V6E 2J3	Vancouver, BC, V6E 2J3																		
Contact	Lesley Shelley or Kelsey Norlund	Lesley Shelley or Kelsey Norlund																		
Phone	604-689-9460	604-689-9460																		
Email	lshelley@rescan.com; knorlund@rescan.com																			
SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	# OF CONTAINERS	COMMENTS														
1	Tailing supernatant-Dec2012	Dec 18/12	Water	20L	3			X	X	X	X	X								15.9
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
PROJECT INFORMATION		SAMPLE RECEIPT			RELIQUISHED BY (CLIENT)			RELIQUISHED BY (COURIER)												
Client:		Total # Containers:			Signature:			Signature:												
P.O. No.:		Good Condition?			Print:			Print:												
Shipped Via:		Matches Schedule?			Company:			Company:												
					Time/Date:			Time/Date:												
SPECIAL INSTRUCTIONS/COMMENTS: Identify sample as Rescan Project # 868-16-25-03 on invoices					RECEIVED BY (COURIER)					RECEIVED BY (LABORATORY)										
					Signature:					Signature: <i>[Signature]</i>										
					Print:					Print:										
					Company:					Company: NAUTILUS										
					Time/Date:					Time/Date: Dec 18/12 1120h										



# Nautilus Environmental

8664 Commerce Court, Burnaby, BC V5A 4N7

WO#: 12539-540

Ms. Lesley Shelley  
Rescan Environmental Services Ltd.  
1111 W. Hastings Street, 6<sup>th</sup> floor  
Vancouver, BC  
V6E 2J3

December 17, 2012

Dear Ms. Shelley:

**Re: Toxicity testing on the sample identified as PP Effluent Tox test 1  
(Collected on October 28, 2012)**

Nautilus Environmental is pleased to provide you the results of the 96-h LC50 rainbow trout and the 48-h LC50 *Daphnia magna* toxicity tests on the above sample, received on October 29, 2012. Testing was conducted according to Environment Canada 1/RM/13, (Second Edition, 2000, with May 2007 amendments) and 1/RM/14, (Second Edition, 2000) protocols. By the client's request, the sample's initial pH of 9.0 was adjusted to 7.3 and 8.5 for rainbow trout and *D. magna*, respectively. The results of these tests are provided in the tables below and are based on the appended data. All other acceptability criteria outlined in the Environment Canada protocols were met.

Table A. Results for the 96-h rainbow trout test.

Sample ID	Collection Date and Time	96-h LC50 (%v/v) <sup>1</sup>
PP Effluent Tox test 1	October 28, 2012 @ 0200h	>100

Table B. Results for the 48-h *D. magna* tests.

Sample ID	Collection Date and Time	48-h LC50 (%v/v) [with 95% confidence limits] <sup>1</sup>
PP Effluent Tox test 1	October 28, 2012 @ 0200h	16.5 (14.5 – 18.8)

<sup>1</sup> Results relate only to the samples tested.

Please feel free to contact the undersigned at 604-420-8773 should you have any questions or require any additional information.

Yours truly,

**Nautilus Environmental**

Jacob Frank, B.Sc.  
Laboratory Biologist



# Rainbow Trout Summary Sheet

Client: Rescan Environmental

Start Date/Time: October 31/12 @ 1545

Work Order No.: 12539

Test Species: Oncorhynchus mykiss

## Sample Information:

Sample ID: PP Effluent Tox Test 1

Sample Date: October 28/12 @ 0200

Date Received: October 29/12 @ 1300

Sample Volume: 2 x 20L

Other: N/A

## Test Validity Criteria:

≥ 90% control survival

## WQ Ranges:

T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

## Dilution Water:

Type: Dechlorinated Municipal Tap Water

Hardness (mg/L CaCO<sub>3</sub>): 11

Alkalinity (mg/L CaCO<sub>3</sub>): 11

## Test Organism Information:

Batch No.: 092512

Source: Miracle Spings

No. Fish/Volume (L): 10/15L

Loading Density: 0.49

Mean Length ± SD (mm): 41 ± 4

Range: 35 - 48

Mean Weight ± SD (g): 0.73 ± 0.21

Range: 0.42 - 1.19

## NaNO<sub>2</sub> Reference Toxicant Results:

Reference Toxicant ID: RTNt27

Stock Solution ID: 12Nt01

Date Initiated: October 10/12

96-h LC50 (95% CL): 8.1 (6.1 - 10.7) mg/L NaNO<sub>2</sub>

Reference Toxicant Mean and Historical Range: 5.0 (3.0 - 8.4) mg/L NaNO<sub>2</sub>

Reference Toxicant CV (%): 30

Test Results: The 96-h LC50 is >100% (v/v)

Reviewed by: Joh

Date reviewed: Nov. 30/12

## 96-Hour Rainbow Trout Toxicity Test Data Sheet

**Client/Project#:** Rescan Environmental  
**Sample I.D.:** PP Effluent Tox test 1  
**W.O. #:** 12639  
**RBT Batch #:** 092612  
**Date Collected/Time:** October 28 12 @ 0200  
**Date Setup/Time:** October 31 12 @ 1545  
**Sample Setup By:** SBF

**Number Fish/Volume:** 10/15  
**7-d % Mortality:** 0.15  
**Total Pre-aeration Time (mins):** 30  
**Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N):** Y

**D.O. meter:** DO-1  
**pH meter:** pH-1  
**Cond. Meter:** C-1

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	15.0	1M HCL	14.5
pH	9.0	Used to adjust	7.3
D.O. (mg/L)	9.9	pH to 7.5±1.	9.9
Cond. (µS/cm)	1814	then aerated	1839

Concentration (% v/v)	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
CONT				10	10	10	10	14.0	14.5	14.5	14.5	14.5	10.1	10.0	9.8	9.8	9.8	7.1	7.0	6.9	6.8	6.8	40	42
6.25				10	10	10	10	14.0	14.5	14.5	14.5	14.5	10.0	9.9	9.9	9.9	9.9	7.1	6.9	6.8	6.8	6.9	225	238
12.5				10	10	10	10	14.0	14.5	14.5	14.5	14.5	9.9	9.7	9.8	9.8	9.9	7.1	7.0	6.9	6.9	6.9	491	469
25				10	10	10	10	14.5	14.5	14.5	14.5	14.5	9.9	9.7	9.9	9.8	9.8	7.4	6.9	6.9	6.8	7.0	626	611
50				10	10	10	10	14.5	14.5	14.5	14.5	14.5	9.9	9.7	9.9	9.8	9.8	7.2	6.9	6.9	6.9	6.9	1103	1086
100				10	10	10	10	14.5	14.5	14.5	14.5	14.5	9.9	9.8	9.9	9.9	9.8	7.3	6.7	6.8	6.9	6.9	1839	1802
Initials				SBF				SBF	SBF				SBF	SBF				SBF	SBF				SBF	

WQ Ranges: T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Sample Description/Comments: Clear

Fish Description at 96? all fish ok

Other Observations: \_\_\_\_\_

Reviewed by: JGh

Date Reviewed: Nov. 30/12

## Daphnia magna Summary Sheet

Client: Rescan  
Work Order No.: 12540

Start Date/Time: NOV 1/12 @ 1045h  
Test Species: Daphnia magna  
Set up by: KLB

### Sample Information:

Sample ID: PP Effluent Tox test 1.  
Sample Date: Oct 28/12  
Date Received: Oct 29/12  
Sample Volume: 2 x 20L.

### Test Validity Criteria:

≥ 90% mean control survival (no more than 2 mortalities in any control replicate)

### WQ Ranges:

T (°C) = 20 ± 2; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

### Test Organism Information:

Broodstock No.: 101012 A  
Age of young (Day 0): < 24 hours  
Avg No. young per brood in previous 7 d: 22  
Mortality (%) in previous 7 d: 0  
Days to first brood: 9

### NaCl Reference Toxicant Results:

Reference Toxicant ID: DM 90  
Stock Solution ID: 12 NA 02  
Date Initiated: JW ~~DM~~ Oct 22/12  
48-h LC50 (95% CL): 3.9 (3.2 - 4.9) g/L NaCl

Reference Toxicant Mean and Historical Range: 4.0 (3.6 - 4.4) g/L NaCl  
Reference Toxicant CV (%): 5

Test Results: The 48h LC50 is estimated at 16.5 % (v/v) w/ 95 % confidence limits at 14.5 % & 18.8 % (v/v).

Reviewed by: JGh

Date reviewed: Nov 30/12

## Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: Rescan  
 Sample ID: PPEffluent  
 Work Order No.: 12540

Start Date/Time: Nov 11/12 @ 1045h  
 No. Organisms/volume: 10/200mL  
 Test Organism: D. magna  
 Set up by: KUB

DO meter: DO-1      pH meter: pH-1      Conductivity meter: C-1

Concentration % (v/v)	Number of Live Organisms Rep	No. Organisms		No. Immobilized	Temperature (°C)			Dissolved oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24	48		48	0	24	48	0	24	48	0	24	48	0
Control	A	10	10	0	19.0	20.0	20.0	9.0		8.4	8.1		8.0	355	361
	B														
	C														
	D														
6.25	A	10	10	0	19.0	20.0	20.0	9.0		8.3	8.0		8.1	478	477
	B														
	C														
	D														
12.5	A	10	9	0	19.0	20.0	20.0	9.0		8.3	8.0		8.1	599	591
	B														
	C														
	D														
25	A	10	0	-	19.5	20.0	20.0	9.0		8.3	8.1		8.3	808	800
	B														
	C														
	D														
50	A	10	0	-	19.5	20.0	20.0	9.0		8.4	8.1		8.4	1199	1199
	B														
	C														
	D														
100	A	0	—	—	19.5	20.0	—	9.0		—	8.5		—	1816	—
	B														
	C														
	D														
Technician Initials		KUB X~		~	KUB	KUB	-	KUB	~	KUB	~	KUB	~	KUB	~

WQ Ranges: T (°C) = 20 ± 2; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

Day 100% (un)adjusted: Temp (°C) = 19.5    pH = 9.2    DO (mg/L) = 9.0    Cond (µS/cm) = 1799

100% Unadjusted @ 4-h: 0 live organisms, 20.0°C

	Hardness*	Alkalinity*
Conc.	*(mg/L as CaCO3)	
Control (MHW)	100	70
Highest conc.	1060	24

	Initial WQ	Adjustment	Adjusted WQ
Temp (°C)	19.5	—	19.5
DO (mg/L)	9.1	—	9.0
pH	9.2	pH adjusted w/ 0.1M HCl	8.5
Cond (µS/cm)	1799	—	1816

Sample Description: clear

pH adjusted 100% (un) prior to dilutions according to client request

Comments: Batch# 10012A 7-d previous # young/brood: 22 Day of 1st Brood: 9 Previous 7-d % Mortality: 0

Reviewed by: JGU Date reviewed: Dec. 6/12

# CETIS Analytical Report

Report Date: 14 Nov-12 15:35 (p 1 of 1)  
 Test Code: 12540 | 12-2953-4277

## Daphnia magna 48-h Acute Survival Test

Nautilus Environmental

<b>Analysis ID:</b> 11-2283-3661	<b>Endpoint:</b> 48h Survival Rate	<b>CETIS Version:</b> CETISv1.8.4
<b>Analyzed:</b> 14 Nov-12 15:34	<b>Analysis:</b> Untrimmed Spearman-Kärber	<b>Official Results:</b> Yes
<b>Batch ID:</b> 19-0860-3573	<b>Test Type:</b> Survival (48h)	<b>Analyst:</b> Jeslin Wijaya
<b>Start Date:</b> 01 Nov-12 10:45	<b>Protocol:</b> EC/EPS 1/RM/14	<b>Diluent:</b> Mod-Hard Synthetic Water
<b>Ending Date:</b> 03 Nov-12 11:30	<b>Species:</b> Daphnia magna	<b>Brine:</b>
<b>Duration:</b> 49h	<b>Source:</b> In-House Culture	<b>Age:</b> <24h
<b>Sample ID:</b> 09-2962-7616	<b>Code:</b> 3768FDE0	<b>Client:</b> Rescan
<b>Sample Date:</b> 28 Oct-12 02:00	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 29 Oct-12 13:00	<b>Source:</b> Rescan	
<b>Sample Age:</b> 4d 9h (11.2 °C)	<b>Station:</b> PP Effluent	

### Spearman-Kärber Estimates

Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0	0.00%	1.217	0.02856	16.49	14.46	18.81

### 48h Survival Rate Summary

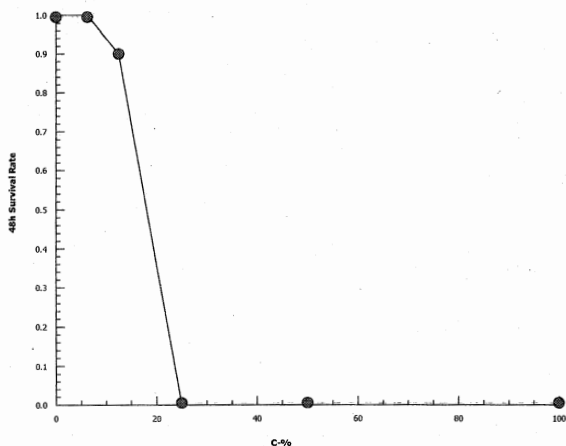
#### Calculated Variate(A/B)

C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	1	1	1	1	0	0	0.0%	0.0%	10	10
6.25		1	1	1	1	0	0	0.0%	0.0%	10	10
12.5		1	0.9	0.9	0.9	0	0	0.0%	10.0%	9	10
25		1	0	0	0	0	0		100.0%	0	10
50		1	0	0	0	0	0		100.0%	0	10
100		1	0	0	0	0	0		100.0%	0	10

### 48h Survival Rate Detail

C-%	Control Type	Rep 1
0	Negative Control	1
6.25		1
12.5		0.9
25		0
50		0
100		0

### Graphics



Client: Rescan

W.O.#: 12540

### Hardness and Alkalinity Datasheet

Sample ID	Sample Date	Alkalinity				Hardness			Technician
		Sample Volume (mL)	(mL) 0.02N HCL/H <sub>2</sub> SO <sub>4</sub> used to pH 4.5	(mL) of 0.02N HCL/H <sub>2</sub> SO <sub>4</sub> used to pH 4.2	Total Alkalinity (mg/L CaCO <sub>3</sub> )	Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness (mg/L CaCO <sub>3</sub> )	
PP Effluent	<del>Nov 11/12</del> Nov 20/12	50	1.3	1.4	24	100	10.6	1060	Emm
MHW	Nov 1/12	50	3.6	3.7	70	50	5.0	100	KUB

Notes: 5 diluted to 100ml w/ D.I. water

Reviewed by: JGh

Date Reviewed: Nov. 30/12

British Columbia: 8664 Commerce Court, Burnaby, BC, V5A 4N7

Date \_\_\_\_\_ Page \_\_\_ of \_\_\_

Sample Collection By:							ANALYSES REQUIRED												Receipt Temperature (°C)								
Report to:		Invoice to:					96 hr Acute Rainbow Trout Toxic	48 hr Acute Daphnia magna toxic																			
Company	Rescan Environmental	Rescan Environmental																									
Address	1111 West Hasting Street	1111 West Hasting Street																									
City/Prov/Postal Code	Vancouver, BC, V6E 2J3	Vancouver, BC, V6E 2J3																									
Contact	Lesley Shelley or Kelsey Norlund	Lesley Shelley or Kelsey Norlund																									
Phone	604-689-9460	604-689-9460																									
Email	lshelley@rescan.com; knorlund@rescan.com																										
SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	# OF CONTAINERS	COMMENTS																					
1	PP Effluent Tox Test 1	Oct 28/12	0200h	Water	20L	2																					11.2
2																											
3																											
4																											
5																											
6																											
7																											
8																											
9																											
10																											

PROJECT INFORMATION		SAMPLE RECEIPT		RELIQUINSHED BY (CLIENT)		RELIQUINSHED BY (COURIER)	
Client:	Total # Containers:	Signature:	Signature:	Signature:	Signature:	Signature:	Signature:
P.O. No.:	Good Condition?	Print:	Print:	Print:	Print:	Print:	Print:
Shipped Via:	Matches Schedule?	Company:	Company:	Company:	Company:	Company:	Company:
		Time/Date:	Time/Date:	Time/Date:	Time/Date:	Time/Date:	Time/Date:
SPECIAL INSTRUCTIONS/COMMENTS: Identify sample as Rescan Project # 868-021-01 on invoices				RECEIVED BY (COURIER)		RECEIVED BY (LABORATORY)	
				Signature:	Signature:	Signature:	Signature:
				Print:	Print:	Print:	Print:
				Company:	Company:	Company:	Company:
		Time/Date:	Time/Date:	Time/Date:	Time/Date:	Time/Date:	Time/Date:

Additional costs may be required for sample disposal or storage. Net 30 unless otherwise contracted.



Nautilus Environmental

## **Rescan Environmental Toxicity Testing Program**

### **Final Toxicity Test Report**

Report date: December 18, 2012

Submitted to:

Rescan Environmental Services Ltd.

Vancouver, BC

*Burnaby Laboratory*  
8664 Commerce  
Court  
Burnaby, BC  
V5A 4N7





Nautilus Environmental

WO #: 12554-12557, 12574-12575

Ms. Lesley Shelley  
Rescan Environmental  
1111 West Hastings Street, 6<sup>th</sup> floor  
Vancouver, BC  
V6E 2J3

December 18, 2012

Ms. Shelley:

**Re: Toxicity Testing on PP Effluent Tox Test 2 (collected on November 1, 2012)**

Nautilus Environmental is pleased to provide you with the results of the toxicity tests conducted on the sample identified as PP Effluent Tox Test 2, received on November 6, 2012. Testing was conducted on the sample following Environment Canada methods. A summary of the test methods and results are provided in the following report.

Please feel free to contact the undersigned at 604-420-8773 should you have any questions or require any additional information.

Yours truly,

**Nautilus Environmental**

A handwritten signature in black ink, appearing to read 'A. Tang'. The signature is written in a cursive, flowing style.

Armando Tang, B.Sc., R.P. Bio.  
Laboratory Manager

## TABLE OF CONTENTS

	Page
TABLE OF CONTENTS.....	I
1.0 INTRODUCTION.....	1
2.0 METHODS.....	1
2.1 Quality Assurance/Quality Control (QA/QC).....	1
3.0 RESULTS.....	9
3.1 Quality Assurance/Quality Control.....	9
4.0 REFERENCES .....	14

## LIST OF TABLES

Table 1.	Summary of test conditions for the <i>Ceriodaphnia dubia</i> survival and reproduction test..	3
Table 2.	Summary of test conditions for the rainbow trout embryo viability test.....	4
Table 3.	Summary of test conditions for the <i>Lemna minor</i> growth inhibition test.....	5
Table 4.	Summary of test conditions for the <i>Pseudokirchneriella subcapitata</i> growth inhibition test. .....	6
Table 5.	Summary of test conditions for the 96-h rainbow trout LC50 test. ....	7
Table 6.	Summary of test conditions for the 48-h <i>Daphnia magna</i> LC50 test. ....	8
Table 7.	Toxicity test results for the <i>Ceriodaphnia dubia</i> survival and reproduction test. ....	10
Table 8.	Toxicity test results for the rainbow trout embryo viability test. ....	11
Table 9.	Toxicity test results for the <i>Lemna minor</i> growth inhibition test. ....	11
Table 10.	Toxicity test results for the <i>Pseudokirchneriella subcapitata</i> growth inhibition test. ....	12
Table 11.	Toxicity test results for the 96-h juvenile rainbow trout LC50 test.....	12
Table 12.	Toxicity test results for the 48-h <i>Daphnia magna</i> LC50 test. ....	13
Table 13.	Reference toxicant test results.....	13

## LIST OF APPENDICES

APPENDIX A - <i>Ceriodaphnia dubia</i> Toxicity Test Data
APPENDIX B - Rainbow Trout Embryo Toxicity Test Data
APPENDIX C - <i>Lemna minor</i> Toxicity Test Data
APPENDIX D - <i>Pseudokirchneriella subcapitata</i> Toxicity Test Data
APPENDIX E - Rainbow Trout LC50 Toxicity Test Data
APPENDIX F - <i>Daphnia magna</i> LC50 Toxicity Test Data
APPENDIX G - Chain-of-Custody Forms

## 1.0 INTRODUCTION

Nautilus Environmental conducted sub-lethal and acute toxicity tests for Rescan Environmental Services Ltd. The sample PP Effluent Tox Test 2 was prepared by SGS Canada Inc. on November 1, 2012 and delivered to the Nautilus Environmental Laboratory in Burnaby, BC on November 6, 2012. The sample was transported in nine 20-L plastic containers and stored in the dark at  $4 \pm 2^{\circ}\text{C}$  prior to testing. The sample expired the specified holding time upon arrival, however, the tests were initiated at the request of the client. The following toxicity tests were performed on the sample:

- *Ceriodaphnia dubia* survival and reproduction
- 7-d Rainbow trout (*Oncorhynchus mykiss*) embryo viability
- 7-d *Lemna minor* growth inhibition
- 72-h *Pseudokirchneriella subcapitata* growth inhibition
- 96-h Rainbow trout (*Oncorhynchus mykiss*) LC50
- 48-h *Daphnia magna* LC50

This report describes the results of these toxicity tests. The test results reported herein relate only to the sample tested. Copies of raw laboratory data sheets and statistical analysis for each test species are provided in Appendices A to F. The chain-of-custody form is provided in Appendix G.

## 2.0 METHODS

Methods for the toxicity tests are summarized in Tables 1 to 6. Testing was conducted according to procedures described by the Environment Canada protocols (2000a, 2000b, 2007a, 2007b and 2007c). The rainbow trout embryo viability test followed modified procedures described by Environment Canada (1998) and Canaria et al. (1999). Statistical analyses for all the tests were performed using the software, CETIS (Tidepool Scientific Software, 2012).

### 2.1 Quality Assurance/Quality Control (QA/QC)

Nautilus follows a comprehensive QA/QC program to ensure that the data generated are of high quality and scientifically defensible. Our QA program is designed to ensure that all tests are performed in accordance with well-established and approved methods (e.g., Environment Canada, US EPA).

To meet these objectives, Nautilus has implemented a number of quality control procedures that include the following:

- Negative controls to ensure that appropriate testing performance criteria are met;
- Positive controls to assess the health and sensitivity of the test organisms;
- Use of appropriate species and life stage to meet the study objectives;
- Appropriate number of replicates to allow proper statistical analyses;
- Calibration and proper maintenance of instruments to ensure accurate measurements;
- Proper documentation and recordkeeping to allow traceability of performance;
- Adequate supervision and training of staff to ensure that methods are followed;
- Proper handling and storage of samples to ensure their integrity;
- Procedures in place to address issues that may arise during testing and ensure the implementation of appropriate corrective actions; and
- Rigorous review of data by a registered professional biologist to ensure they are of good quality and scientifically defensible prior to releasing to the client.

**Table 1. Summary of test conditions for the *Ceriodaphnia dubia* survival and reproduction test.**

Test organism	<i>Ceriodaphnia dubia</i>
Test organism source	In-house culture
Test organism age	<24 hr old neonates produced within 12 hr
Test type	Static renewal
Test duration	7 ± 1 day
Test chamber	20 mL test tube
Test solution volume	15 mL
Test concentrations (% sample)	Seven concentrations, plus laboratory control
Number of replicates	10
Control/dilution water	20% Perrier water (hardness 80-100mg/L CaCO <sub>3</sub> )
Test solution renewal	Daily
Test temperature	25 ± 1°C
Number of organisms/chamber	1
Feeding	Daily, with 0.1 ml <i>Pseudokirchneriella subcapitata</i> and 0.05 mL YCT
Light intensity	100 to 600 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test protocol	Environment Canada, 2007a, EPS 1/RM/21
Test endpoints	Survival and reproduction
Test acceptability criterion for controls	≥80% survival; ≥15 young per surviving control; ≥60% of controls producing three or more broods
Reference Toxicant	Sodium chloride

**Table 2. Summary of test conditions for the rainbow trout embryo viability test.**

Test organism	<i>Oncorhynchus mykiss</i>
Test organism source	Freshwater Fisheries Society of BC
Test organism age	< 24 hours
Test type	Static-renewal
Test duration	7 days
Test chamber	2-L plastic containers
Test solution volume	2 L
Test concentrations (% sample)	Five concentrations, plus laboratory control
Number of replicates	4
Control/Dilution water	Dechlorinated water (hardness 11 mg/L CaCO <sub>3</sub> )
Test solution renewal	Daily
Test temperature	14 ± 1°C
Number of organisms/chamber	30 eggs
Feeding	None
Light intensity	Dark
Photoperiod	24 hours dark
Aeration	6.5 ± 1 mL/min/L
Test protocol	Environment Canada (1998), EPS 1/RM/28
Test endpoint	Embryo viability
Test acceptability criteria for controls	Embryo viability ≥70%
Reference toxicant	Sodium dodecyl sulphate

**Table 3. Summary of test conditions for the *Lemna minor* growth inhibition test.**

Test organism	<i>Lemna minor</i>
Test organism source	In-house culture
Test organism age	7- to 10-day old
Test type	Static
Test duration	7 days
Test chamber	250-mL glass containers
Test solution volume	150 mL
Test concentrations (% sample)	Seven concentrations, plus laboratory control
Number of replicates	4
Control/Dilution water	Deionized or distilled water with nutrients added
Test solution renewal	None
Test temperature	25 ± 2°C
Number of organisms/chamber	Two 3-frond plants
Light intensity	3600 to 4400 lux full spectrum light
Photoperiod	Continuous
Aeration	None
Test protocol	Environment Canada (2007b), EPS 1/RM/37
Test endpoint	Number of fronds and dry weight
Test acceptability criteria for controls	≥ 8-fold increase in number of fronds
Reference toxicant	Potassium chloride

**Table 4. Summary of test conditions for the *Pseudokirchneriella subcapitata* growth inhibition test.**

Test organism	<i>Pseudokirchneriella subcapitata</i>
Test organism source	In-house culture
Test organism age	4- to 7-day old culture in logarithmic growth phase
Test type	Static
Test duration	72 hours
Test chamber	Microplate
Test solution volume	220 µL
Test concentrations (% sample)	Seven concentrations, plus laboratory control
Number of replicates	4 for treatments; 8 for control
Control/Dilution water	Deionized or distilled water
Test solution renewal	None
Test temperature	24 ± 2°C
Number of organisms/chamber	10,000 cells/mL
Light intensity	3600 to 4400 lux
Photoperiod	Continuous
Aeration	None
Test protocol	Environment Canada (2007c), EPS 1/RM/25
Test endpoint	Algal cell growth inhibition ≥ 16-fold increase in number of algal cells;
Test acceptability criteria for controls	CV ≤ 20%; no trend when analyzed using Mann-Kendall test
Reference toxicant	Zinc



**Table 5. Summary of test conditions for the 96-h rainbow trout LC50 test.**

Test organism	<i>Oncorhynchus mykiss</i>
Test organism source	Miracle Springs, BC
Test organism age	Juveniles
Test type	Static
Test duration	96 hours
Test solution volume	15 L
Test concentrations (% sample)	Five concentrations, plus laboratory control
Number of replicates	1
Control/Dilution water	Municipal dechlorinated water
Test solution renewal	None
Test temperature	15 ± 1°C
Number of organisms/chamber	Ten
Feeding	None
Light intensity	100 to 500 lux
Photoperiod	16 hours light/8 hours dark
Aeration	6.5 ± 1 mL/min/L
Test protocol	Environment Canada (2000a), EPS 1/RM/13
Test endpoint	96-h LC50
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium nitrite

**Table 6. Summary of test conditions for the 48-h *Daphnia magna* LC50 test.**

Test organism	<i>Daphnia magna</i>
Test organism source	In-house culture
Test organism age	< 24 h
Test type	Static
Test duration	48 hours
Test chamber	250-mL glass beakers
Test solution volume	200 mL
Test concentrations (% sample)	Five concentrations, plus laboratory control
Number of replicates	One
Control/Dilution water	Moderately-hard reconstituted water (hardness 80-100 mg/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Number of organisms/chamber	Ten
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test protocol	Environment Canada (2000b), EPS 1/RM/14
Test endpoint	48-h LC50
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride

### 3.0 RESULTS

Results of the *C. dubia* toxicity test are summarized in Table 7. There were effects to *C. dubia* survival and reproduction. The highest two test concentrations, 80 and 100%, exhibited 0% survival. Survival ranged from 90 to 100% in remaining five concentrations and the LC50 value was 66.9%. Decreased reproduction was observed in all test concentrations relative to the negative control. The IC25 and IC50 were 6.4 and 12.4%, respectively.

Results of the 7-d rainbow trout embryo viability test are provided in Table 8. Effects to embryo viability was observed in the sample and ranged from 71.7% to 95.8% in the test concentrations. The EC25 and EC50 values for this sample were 79.5 and >100%, respectively.

Results of the *Lemna minor* growth inhibition test are summarized in Table 9. Frond count was somewhat reduced in the higher test concentrations, however the IC25 and IC50 were both >97%. There were no effects to dry weight and both the IC25 and IC50 were >97%.

Results of the 72-h *P. subcapitata* test are provided in Table 10. Algal cell density was enhanced relative to the negative control. The IC25 and IC50 values were >95.2. Percent algal cell enhancement ranged from 100 to 299%.

The 96-h rainbow trout and 48-h *D. magna* 48-h LC50 test results are shown in Tables 11 and 12, respectively. There was 100% survival in all test concentrations in both the rainbow trout and *D. magna* tests. The 96-h rainbow trout and 48-h *D. magna* LC50 were both >100%.

#### 3.1 Quality Assurance/Quality Control

All the tests reported herein met the acceptability criteria for test validity specified in their respective protocols, with the exception of the 7-d duckweed test and sample holding time. The duckweed test did not meet the passing criterion of  $\geq 8$ -fold increase in the number of fronds at the end of the test (Environment Canada, 2007b). This was unlikely to have affected the results of the test.

The sample was prepared on November 1 and delivered to our laboratory on November 6, 2012. Upon arrival, the sample had exceeded the 72-h holding time allowable for the sublethal tests. Similarly, the acute rainbow trout and *D. magna* tests were initiated after the 5-day sample holding time expired. Tests were initiated at the request of the client.

Water quality parameters measured during the toxicity tests were within acceptable ranges and results of the reference toxicant tests conducted during the testing program were all within the in-house historical mean  $\pm$  two standard deviations. The reference toxicant test results are summarized in Table 13.

**Table 7. Toxicity test results for the *Ceriodaphnia dubia* survival and reproduction test.**

Concentration (% v/v)	Mean $\pm$ SD	
	Survival (%)	Reproduction (No. of Young/Female)
Control	100	24.5 $\pm$ 7.1
5	100	21.4 $\pm$ 5.9
10	100	12.4 $\pm$ 4.1
20	100	11.9 $\pm$ 4.5
40	100	4.9 $\pm$ 2.9
60	90	0.4 $\pm$ 0.8
80	0	0.0 $\pm$ 0.0
100	0	0.0 $\pm$ 0.0
<b>Test endpoint (% v/v)</b>		
LC50	66.9 (62.7 - 71.5)	--
IC25 (95% CL)	--	6.4 (3.8 - 8.1)
IC50 (95% CL)	--	12.4 (8.7 - 24.2)

LC = Lethal Concentration; IC = Inhibition Concentration; SD = Standard Deviation; CL = Confidence Limit.

**Table 8. Toxicity test results for the rainbow trout embryo viability test.**

Concentration (% v/v)	Embryo Viability (%) (Mean ± SD)
Control	100 ± 0.0
6.25	95.8 ± 3.2
12.5	94.2 ± 3.2
25	95.1 ± 1.9
50	77.5 ± 14.5
100	71.7 ± 15.0
<b>Test endpoint (% v/v)</b>	
EC25 (95% CL)	79.5 (53.9 - 100.0)
EC50	>100

EC = Effective Concentration; SD = Standard Deviation; CL = Confidence Limit .

**Table 9. Toxicity test results for the *Lemna minor* growth inhibition test.**

Concentration (% v/v)	Mean ± SD	
	FronD Growth (No. of Fronds)	Dry Weight (mg)
Control	41.0 ± 7.4	4.5 ± 0.6
1.5	41.0 ± 5.0	4.6 ± 0.9
3.0	39.3 ± 5.6	4.7 ± 0.7
6.1	41.0 ± 5.5	4.4 ± 0.3
12.1	38.0 ± 1.4	4.7 ± 0.6
24.2	37.5 ± 6.6	4.9 ± 0.8
48.5	33.5 ± 4.7	5.0 ± 0.6
97	31.5 ± 5.2	5.5 ± 0.7
<b>Test endpoint (% v/v)</b>		
IC25	>97	>97
IC50	>97	>97

IC = Inhibition Concentration; SD = Standard Deviation.

**Table 10. Toxicity test results for the *Pseudokirchneriella subcapitata* growth inhibition test.**

Concentration (% v/v)	Cell Density ( $\times 10^4$ cells/mL) (mean $\pm$ SD)	Stimulation (%)
Control	44.3 $\pm$ 6.8	--
1.5	176.5 $\pm$ 20.1	298.9
3.0	153.0 $\pm$ 19.7	245.8
5.9	154.8 $\pm$ 19.4	249.7
11.9	100.5 $\pm$ 13.2	127.1
23.8	94.5 $\pm$ 10.0	113.6
47.6	99.0 $\pm$ 14.6	123.7
95.2	88.8 $\pm$ 12.1	100.6
<b>Test endpoint (% v/v)</b>		
IC25	>95.2	--
IC50	>95.2	--

IC = Inhibition Concentration; SD = Standard Deviation.

**Table 11. Toxicity test results for the 96-h juvenile rainbow trout LC50 test.**

Concentration (% v/v)	Survival (%)
Control	100
6.25	100
12.5	100
25	100
50	100
100	100
<b>Test endpoint (% v/v)</b>	
LC50	>100

LC = Lethal Concentration.

**Table 12. Toxicity test results for the 48-h *Daphnia magna* LC50 test.**

Concentration (% v/v)	Survival (%)
Control	100
6.25	100
12.5	100
25	100
50	100
100	100
Test endpoint (% v/v)	
LC50	>100

LC = Lethal Concentration.

**Table 13. Reference toxicant test results.**

Test Species	Endpoint	Historical Range	CV	Date Setup
		Mean (2SD Range)	(%)	
<i>C. dubia</i>	Survival (IC50): 2.0 g/L NaCl	1.8 (1.3 - 2.4)	16	November 13, 2012
	Reproduction (IC50): 1.1 g/L NaCl	1.3 (0.9 - 1.9)	21	
<i>O. mykiss</i> (embryo)	Viability (EC50): 4.1 mg/L SDS	4.1 (1.8 - 9.5)	52	November 8, 2012
<i>L. minor</i>	No. Fronds (IC25): 4.8 g/L KCl	4.3 (3.4 - 5.3)	12	November 15, 2012
<i>P. subcapitata</i>	Growth (IC50): 25.0 µg/L Zn	21.5 (12.4 - 37.3)	32	November 7, 2012
<i>O. mykiss</i> (juvenile)	Survival (LC50): 7.6 mg/L NaNO <sub>2</sub>	5.1 (2.9 - 9.0)	33	November 14, 2012
<i>D magna</i>	Survival (LC50): 4.2 g/L NaCl	4.0 (3.6 - 4.4)	5	November 20, 2012

LC = Lethal Concentration; IC = Inhibition Concentration; SD = Standard Deviation; CL = Confidence Limit.

#### 4.0 REFERENCES

- Canaria, E.C., J.R. Elphick and H.C. Bailey. 1999. A simplified procedure for conducting small-scale short-term embryo toxicity tests with salmonids. *Environ Toxicol* 14:301-307.
- Environment Canada. 1998. Biological test method: toxicity tests using early life stages of salmonid fish (rainbow trout). Environmental Protection Series EPS 1/RM/28. Second Edition, July 1998. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 102 pp.
- Environment Canada. 2000a. Biological test method: reference method for determining acute lethality of effluents to rainbow trout. Environmental Protection Series. Report EPS 1/RM/13, Second Edition, December 2000, including May 2007 amendments. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 23 pp.
- Environment Canada. 2000b. Biological test method: reference method for determining acute lethality of effluents to *Daphnia magna*. Environmental Protection Series. Report EPS 1/RM/14, Second Edition, December 2000. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 21 pp.
- Environment Canada. 2007a. Biological test method: test of reproduction and survival using the cladoceran *Ceriodaphnia dubia*. Environmental Protection Series. Report EPS 1/RM/21, Second Edition, February 2007. Environment Canada, Method Development and Application Section, Environmental Science and Technology Centre, Science and Technology Branch, Ottawa, ON. 74 pp.
- Environment Canada. 2007b. Biological test method: tests for measuring the inhibition of growth using the freshwater macrophyte, *Lemna minor*. Environmental Protection Series, Report EPS 1/RM/37. Second Edition. January 2007. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 112 pp.
- Environment Canada. 2007c. Biological test method: growth inhibition test using the freshwater alga. Environmental Protection Series, Report EPS 1/RM/25. Second Edition, March 2007.



Environment Canada, Method Development and Application Section, Environmental Science and Technology Centre, Science and Technology Branch, Ottawa, ON. 53 pp.

Tidepool Scientific Software. 2012. CETIS comprehensive environmental toxicity information system, version 1.8.4.29. Tidepool Scientific Software, McKinleyville, CA. 222 pp.

**APPENDIX A - *Ceriodaphnia dubia* Toxicity Test Data**

## Ceriodaphnia dubia Summary Sheet

Client: Rescan  
 Work Order No.: 12555

Start Date/Time: NOV 8/12 @ 1000h  
 Set up by: EMM

**Sample Information:**

Sample ID: PP Effluent Tox test 2  
 Sample Date: NOV 1 / 12  
 Date Received: NOV 6 / 12  
 Sample Volume: 9 x 20L

**Test Validity Criteria:**

- 1) Mean survival of first generation controls is  $\geq 80\%$
- 2) At least 60% of controls have produced three broods within 8 days
- 3) An average of  $\geq 15$  live young produced per surviving female in the control solutions during the first three broods.
- 4) Invalid if ephippia observed in any control solution at any time.

**WQ Ranges:**

T ( $^{\circ}$ C) =  $25 \pm 1$ ; DO (mg/L) = 3.3 to 8.4 ; pH = 6 to 8.5

**Test Organism Information:**

Broodstock No.: 103112  
 Age of young (Day 0): <24-h (within 12-h)  
 Avg No. young in first 3 broods of previous 7 d: 24  
 Mortality (%) in previous 7 d: 0  
 Individual female # used  $\geq 8$  young on test day: 2, 7, 26, 27, 29, 30, 31, 33, 36

**NaCl Reference Toxicant Results:**

Reference Toxicant ID: Cd 88  
 Stock Solution ID: 12 Na02  
 Date Initiated: NOV 13 / 12

7-d LC50 (95% CL): 2.0 (1.7 - 2.3) g/L NaCl  
 7-d IC50 (95% CL): 1.1 (0.9 - 1.6) g/L NaCl

7-d LC50 Reference Toxicant Mean and Historical Range: 1.8 (1.3 - 2.4) g/L NaCl CV (%): 16  
 7-d IC50 Reference Toxicant Mean and Historical Range: 1.3 (0.9 - 1.9) g/L NaCl CV (%): 21

**Test Results:**

	Survival	Reproduction
LC50 %(v/v) (95% CL)	66.9 (62.7 - 71.5)	
IC25 %(v/v) (95% CL)		6.4 (3.8 - 8.1)
IC50 %(v/v) (95% CL)		12.4 (8.7 - 24.2)

Reviewed by: Joh

Date reviewed: Dec. 14/12

## Chronic Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Pescan  
 Sample ID: PP Effluent Tox test 2  
 Work Order #: 12555

Start Date & Time: Nov 8 / 12 @ 1000h  
 Stop Date & Time: Nov 15 / 12 @ 1530h  
 Test Species: Ceriodaphnia dubia

Control Concentration % (v/v)	Days													
	0	1		2		3		4		5		6		7
	init.	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.0	25.0	24.0	24.0	24.0	24.5	24.5	24.0	25.0	25.0	24.0	24.5	24.0	25.0
DO (mg/L)	7.9	7.8	8.0	7.6	8.2	7.2	7.9	7.2	7.7	7.6	7.9	7.1	8.0	7.2
pH	7.8	7.8	7.8	7.7	8.0	7.7	8.1	7.7	8.1	7.8	8.1	7.7	8.0	7.7
Cond. (µS/cm)	194	187		188		194		191		190		190		195
Initials	EMM	EMM		~		JT		JT		EMM		EMM		KUB

5	Days													
	0	1		2		3		4		5		6		7
	init.	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.0	25.0	24.0	24.0	24.0	24.5	24.0	24.0	24.5	25.0	24.0	24.5	24.0	25.0
DO (mg/L)	8.0	7.7	8.0	7.7	8.1	7.3	7.8	7.2	7.6	7.5	7.7	7.2	7.9	7.2
pH	7.6	7.8	7.8	7.5	7.8	7.7	8.0	7.7	8.0	7.7	7.9	7.7	8.0	7.7
Cond. (µS/cm)	316	293		301		319		304		299		305		306
Initials	EMM	EMM		~		JT		JT		EMM		KUB		KUB

40	Days													
	0	1		2		3		4		5		6		7
	init.	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.0	25.0	24.0	24.0	24.0	24.5	24.5	24.0	24.5	25.0	24.0	24.5	24.5	25.0
DO (mg/L)	8.1	7.7	8.0	7.7	8.1	7.4	7.6	7.2	7.6	7.5	7.7	7.2	7.9	7.1
pH	7.5	7.6	7.6	7.5	7.7	7.5	7.8	7.5	7.7	7.6	7.6	7.5	7.7	7.6
Cond. (µS/cm)	954	958		982		1007		968		963		962		931
Initials	EMM	EMM		~		JT		JT		EMM		KUB		KUB

100	Days													
	0	1		2		3		4		5		6		7
	init.	old	new	old	new	old	new	old	new	old	new	old	new	final
Temperature (°C)	24.0	25.0	24.0	24.0	24.0	24.5	24.5	24.0	24.5	25.0	24.0	24.5	26.0	
DO (mg/L)	8.1	7.7	8.1	7.8	8.1	7.4	7.6	7.5	7.8	7.5	7.8	7.2	7.7	
pH	7.0	7.1	7.0	7.4	7.5	6.9	7.1	7.0	7.1	6.9	7.0	7.0	7.0	
Cond. (µS/cm)	1878	1876		1865		1896		1858		1849		1855		
Initials	EMM	EMM		~		JT		JT		EMM		KUB		

	Control	100% <sup>1(v/v)</sup> <del>100%</del> KUB		
Hardness*	90	1100		
Alkalinity*	80	10		

Analysts: KUB, JT, EMM  
 Reviewed by: JGL  
 Date reviewed: Dec. 13 / 12

\* mg/L as CaCO<sub>3</sub>  
 WQ Ranges: T (°C) = 25 ± 1; DO (mg/L) = 3.3 to 8.4 (mg/L); pH = 6 to 8.5  
 Sample Description: clear

Comments: Broodboard Used: 103112

### Chronic Freshwater Toxicity Test C. dubia Reproduction Data

Client: Rexan  
 Sample ID: PP Effluent Tox test 2  
 Work Order: 12555

Start Date & Time: Nov 8/12 @ 1000h  
 Stop Date & Time: Nov 17/12 @ 1530h  
 Set up by: EMM

% (v/v)

Days	Concentration: Control											Concentration: 5											Concentration: 10												
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init		
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JIT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JIT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JIT
4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JIT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JIT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JIT
5	5	4	5	4	5	4	6	4	5	4	EMM	4	5	6	6	4	6	6	5	4	4	EMM	3	3	3	3	4	4	3	4	3	4	EMM		
6	9	11	10	11	10	✓	9	10	10	9	EMM	9	10	12	11	✓	10	✓	10	10	9	EMM	4	5	✓	✓	8	8	✓	✓	✓	✓	EMM		
7	12	16	13	16	13	6	14	✓	10	10	KUB	15	13	✓	✓	9	11	8	12	5	10	EMM	8	8	7	7	✓	10	7	7	6	9	EMM		
8																																			
Total	26	31	28	31	28	10	29	14	25	23	KUB	28	28	18	17	13	27	14	27	19	23	EMM	15	16	10	10	12	22	10	11	9	9	EMM		

Days	Concentration: 20											Concentration: 40											Concentration: 60										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM
3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JIT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JIT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JIT
4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JIT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JIT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	JIT
5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM
6	✓	7	6	7	✓	✓	10	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	3	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM
7	6	13	6	12	7	11	✓	11	9	8	KUB	7	6	5	7	7	8	✓	✓	✓	6	KUB	2	✓	✓	✓	2	✓	✓	✓	✓	✓	EMM
8																																	
Total	6	20	12	19	7	11	10	11	11	12	KUB	7	6	5	7	7	8	0	0	3	6	KUB	2	0	0	0	2	0	0	0	0	0	EMM

Days	Concentration: 80											Concentration: 100											Concentration:										
	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init	A	B	C	D	E	F	G	H	I	J	Init
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM											
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	EMM											
3	X	✓	✓	X	✓	X	✓	✓	X	✓	JIT	X	✓	X	X	X	✓	X	X	X	X	JIT											
4		X	✓		✓		✓	✓		✓	JIT		X				✓					JIT											
5			✓		X		✓	✓		✓	EMM						✓					EMM											
6			✓				✓	X		✓	EMM						X					EMM											
7			X				X			X	KUB																						
8																																	
Total	0	0	0	0	0	0	0	0	0	0	KUB	0	0	0	0	0	0	0	0	0	0	EMM											

Notes: X = mortality.

Sample Description: Clear  
 Comments: Total # Young only based on the first 3 Broods. Fourth and subsequent broods not included in total count.

Reviewed by: Jole Date reviewed: Dec. 13/12

# CETIS Analytical Report

Report Date: 20 Nov-12 09:08 (p 1 of 1)  
 Test Code: 12555 | 18-0146-6003

## Ceriodaphnia 7-d Survival and Reproduction Test

Nautilus Environmental

<b>Analysis ID:</b> 11-6556-4503	<b>Endpoint:</b> 7d Survival Rate	<b>CETIS Version:</b> CETISv1.8.4
<b>Analyzed:</b> 20 Nov-12 9:07	<b>Analysis:</b> Untrimmed Spearman-Kärber	<b>Official Results:</b> Yes
<b>Batch ID:</b> 16-4159-0855	<b>Test Type:</b> Reproduction-Survival (7d)	<b>Analyst:</b> Jeslin Wijaya
<b>Start Date:</b> 08 Nov-12 10:00	<b>Protocol:</b> EC/EPS 1/RM/21	<b>Diluent:</b> 20% Perrier Water
<b>Ending Date:</b> 15 Nov-12 15:30	<b>Species:</b> Ceriodaphnia dubia	<b>Brine:</b>
<b>Duration:</b> 7d 6h	<b>Source:</b> In-House Culture	<b>Age:</b> <24h
<b>Sample ID:</b> 18-3909-1456	<b>Code:</b> 6D9E4F00	<b>Client:</b> Rescan
<b>Sample Date:</b> 01 Nov-12 14:00	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 06 Nov-12 12:10	<b>Source:</b> Rescan	
<b>Sample Age:</b> 6d 20h (11.6 °C)	<b>Station:</b> PP Effluent Tox Test 2	

### Spearman-Kärber Estimates

Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0	0.00%	1.826	0.01428	66.92	62.66	71.47

### 7d Survival Rate Summary

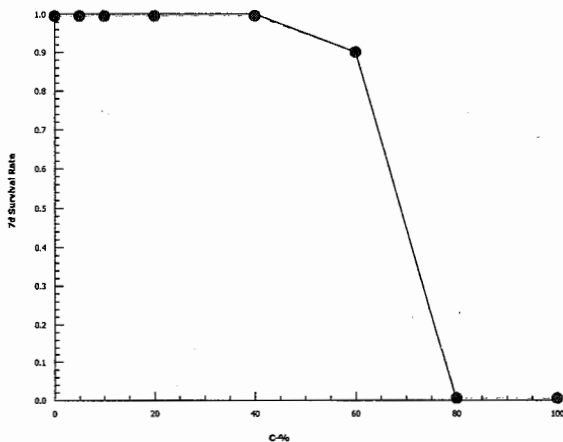
#### Calculated Variate(A/B)

C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	10	1	1	1	0	0	0.0%	0.0%	10	10
5		10	1	1	1	0	0	0.0%	0.0%	10	10
10		10	1	1	1	0	0	0.0%	0.0%	10	10
20		10	1	1	1	0	0	0.0%	0.0%	10	10
40		10	1	1	1	0	0	0.0%	0.0%	10	10
60		10	0.9	0	1	0.1	0.3162	35.14%	10.0%	9	10
80		10	0	0	0	0	0		100.0%	0	10
100		10	0	0	0	0	0		100.0%	0	10

### 7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	1	1	1	1	1	1	1	1	1	1
5		1	1	1	1	1	1	1	1	1	1
10		1	1	1	1	1	1	1	1	1	1
20		1	1	1	1	1	1	1	1	1	1
40		1	1	1	1	1	1	1	1	1	1
60		1	1	1	1	1	1	1	1	0	1
80		0	0	0	0	0	0	0	0	0	0
100		0	0	0	0	0	0	0	0	0	0

### Graphics



**CETIS Analytical Report**

Report Date: 20 Nov-12 09:08 (p 1 of 2)  
 Test Code: 12555 | 18-0146-6003

**Ceriodaphnia 7-d Survival and Reproduction Test**

**Nautilus Environmental**

<b>Analysis ID:</b> 07-5596-5004	<b>Endpoint:</b> Reproduction	<b>CETIS Version:</b> CETISv1.8.4
<b>Analyzed:</b> 20 Nov-12 9:08	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Official Results:</b> Yes
<b>Batch ID:</b> 16-4159-0855	<b>Test Type:</b> Reproduction-Survival (7d)	<b>Analyst:</b> Jeslin Wijaya
<b>Start Date:</b> 08 Nov-12 10:00	<b>Protocol:</b> EC/EPS 1/RM/21	<b>Diluent:</b> 20% Perrier Water
<b>Ending Date:</b> 15 Nov-12 15:30	<b>Species:</b> Ceriodaphnia dubia	<b>Brine:</b>
<b>Duration:</b> 7d 6h	<b>Source:</b> In-House Culture	<b>Age:</b> <24h
<b>Sample ID:</b> 18-3909-1456	<b>Code:</b> 6D9E4F00	<b>Client:</b> Rescan
<b>Sample Date:</b> 01 Nov-12 14:00	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 06 Nov-12 12:10	<b>Source:</b> Rescan	
<b>Sample Age:</b> 6d 20h (11.6 °C)	<b>Station:</b> PP Effluent Tox Test 2	

**Linear Interpolation Options**

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	1136811	200	Yes	Two-Point Interpolation

**Point Estimates**

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	1.03	0.3675	5.489	97.09	18.22	272.1
IC10	3.121	0.87	6.018	32.04	16.62	114.9
IC15	5.237	1.557	6.59	19.1	15.17	64.22
IC20	5.773	2.497	7.379	17.32	13.55	40.05
IC25	6.356	3.782	8.134	15.73	12.29	26.44
IC40	8.421	7.006	17.94	11.87	5.575	14.27
IC50	12.35	8.704	24.22	8.094	4.128	11.49

**Reproduction Summary**

**Calculated Variate**

C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	10	24.5	10	31	2.247	7.106	29.01%	0.0%
5		10	21.4	13	28	1.869	5.91	27.62%	12.65%
10		10	12.4	9	22	1.31	4.142	33.4%	49.39%
20		10	11.9	6	20	1.418	4.483	37.67%	51.43%
40		10	4.9	0	8	0.9244	2.923	59.65%	80.0%
60		10	0.4	0	2	0.2667	0.8433	210.8%	98.37%
80		10	0	0	0	0	0		100.0%
100		10	0	0	0	0	0		100.0%

**Reproduction Detail**

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	26	31	28	31	28	10	29	14	25	23
5		28	28	18	17	13	27	14	27	19	23
10		15	16	10	10	12	22	10	11	9	9
20		6	20	12	19	7	11	10	11	11	12
40		7	6	5	7	7	8	0	0	3	6
60		2	0	0	0	2	0	0	0	0	0
80		0	0	0	0	0	0	0	0	0	0
100		0	0	0	0	0	0	0	0	0	0

Ceriodaphnia 7-d Survival and Reproduction Test

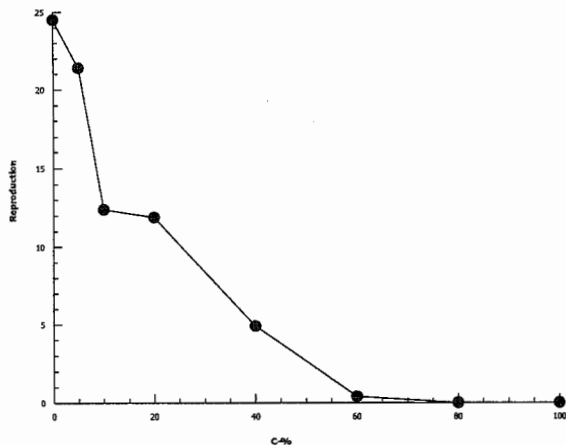
Nautilus Environmental

Analysis ID: 07-5596-5004  
Analyzed: 20 Nov-12 9:08

Endpoint: Reproduction  
Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.4  
Official Results: Yes

Graphics







**APPENDIX B - Rainbow Trout Embryo Toxicity Test Data**

## Rainbow Trout Embryo Summary Sheet

Client: Rescan

Start Date/Time: Nov. 8, 2012 1400h

Work Order No.: 12554

Test Species: Oncorhynchus mykiss

**Sample Information:**

Sample ID: PPEffluent Tox Test 2  
 Sample Date: Nov. 1, 2012  
 Date Received: Nov. 6, 2012  
 Sample Volume: 9.1 x 20L  
*on*

**Dilution Water:**

Type: Dechlorinated water  
 Hardness (mg/L CaCO<sub>3</sub>): 12  
 Alkalinity (mg/L CaCO<sub>3</sub>): 7

**Test Organism Information:**

Batch No.: Nov. 8, 2012  
 Source: FVTH  
 Loading Density: 0.92 g/L

**SDS Reference Toxicant Results:**

Reference Toxicant ID: RTE40  
 Stock Solution ID: 12S02  
 Date Initiated: Nov. 8, 2012  
 7-d EC50 (95% CL): 4.1 (4.0 - 4.2) mg/L SDS

Reference Toxicant Mean and Range: 4.1, 1.8 - 9.5 mg/L SDS  
 Reference Toxicant CV (%): 52

**Test Results:**

	Sample ID	
		PPEffluent
EC25 % (v/v) (95% CL)		79.5 (53.9 - 100.0)
EC50 % (v/v) (95% CL)		>100

Reviewed by: JGh

Date reviewed: Dec. 4/12

## 7-d Chronic Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Pescan  
 Sample ID: PPEFF Tox Test 2  
 Work Order #: 12554

Start Date & Time: Nov 8/12 @ 1400  
 Stop Date & Time: Nov 15/12 @ 1400  
 Test Species: Oncorhynchus mykiss

Concentration	Days													
	0	1		2		3		4		5		6		7
<u>Control</u>	init.	new	old	new	old	new	old	new	old	new	old	new	old	final
Temperature (°C)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.5	14.5	14.0
DO (mg/L)	10.1	10.2	10.1	10.1	10.1	10.1	10.0	10.1	10.1	10.1	10.0	10.1	10.2	10.2
pH	7.0	6.8	7.0	7.0	7.0	7.0	7.0	7.0	7.2	7.2	6.9	7.2	7.1	7.0
Cond. (µS/cm)	340	30		31		32		32		32		31		33
Initials	M	A		A		A		A		JIT		E		E

Concentration	Days													
	0	1		2		3		4		5		6		7
<u>625</u>	init.	new	old	new	old	new	old	new	old	new	old	new	old	final
Temperature (°C)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.5	14.5	14.0
DO (mg/L)	10.1	10.1	10.1	10.1	10.0	10.1	10.1	10.1	10.1	10.0	10.0	10.1	10.2	10.2
pH	7.1	6.8	6.9	6.9	7.2	7.0	6.9	7.0	7.1	6.8	6.8	7.2	7.1	6.8
Cond. (µS/cm)	211	218		24		222		225		202		213		215
Initials	M	A		A		A		A		JIT		E		E

Concentration	Days													
	0	1		2		3		4		5		6		7
<u>25</u>	init.	new	old	new	old	new	old	new	old	new	old	new	old	final
Temperature (°C)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.5	14.5	14.0
DO (mg/L)	10.1	10.1	10.1	10.1	10.1	10.1	10.0	10.1	10.1	10.1	10.0	10.1	10.2	10.2
pH	7.1	6.8	7.0	6.9	7.2	6.8	6.8	7.0	6.9	6.8	6.9	7.2	7.1	6.8
Cond. (µS/cm)	625	601		589		592		593		621		596		613
Initials	M	A		A		A		A		JIT		E		E

Concentration	Days													
	0	1		2		3		4		5		6		7
<u>100</u>	init.	new	old	new	old	new	old	new	old	new	old	new	old	final
Temperature (°C)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5	14.5	14.5	14.0
DO (mg/L)	10.2	10.2	10.2	10.2	10.1	10.1	10.0	10.1	10.1	10.1	10.0	10.2	10.2	10.2
pH	7.3	6.9	7.0	6.6	7.3	6.6	6.9	6.8	6.7	6.8	6.9	7.2	7.1	6.9
Cond. (µS/cm)	1855	1852		1862		1880		1852		1902		1856		1878
Initials	M	A		A		A		A		JIT		E		E

DO meter: DO-1      pH meter: pH-3      Conductivity meter: C-1

	Control	100%		
Hardness*	12	1100		
Alkalinity*	7	10		

\* mg/L as CaCO3

Analysts: EEC, ASD  
 Reviewed by: JGK  
 Date reviewed: Dec. 6/12

Sample Description: yellish - ppt present  
 Comments: JGK

# Embryo Toxicity Test Daily Mortality

Client: Bescan  
 Sample ID: PPEFF Tox test 2  
 Work Order #: 12574

Start Date & Time: Nov 8 / 12 1400h  
 Stop Date & Time: Nov 15 / 12 1400h  
 Test Species: Oncorhynchus mykiss

Concentration % (v/v)	Rep	Day of Test - No. of Mortalities							Total Dead Eggs	Total Undeveloped	Total No. Embryo	Total Exposed
		1	2	3	4	5	6	7				
control	1	0	0	0	0	0	0	0	0	0	30	30
	2					0	0	0	0	0	30	30
	3					0			0	0	33	33
	4					0			0	0	30	30
6.25	1					0			0	1	29	30
	2					0			0	2	28	30
	3					0			0	0	30	30
	4					0			0	2	28	30
12.5	1					0	↓	↓	0	2	28	30
	2					0			2	1	27	30
	3					0	0	0	0	1	29	30
	4					0			0	1	29	30
25	1					0			0	2	28	30
	2					0			0	2	29	31
	3					0			0	1	29	30
	4					0			0	1	29	30
50	1					0			0	3	27	30
	2					0			0	5	25	30
	3					0			0	6	24	30
	4			2		3	↓	↓	6	7	17	30
100	1			0		0	0	0	0	3	27	30
	2			0		0	0	0	1	7	22	30
	3			0		0	1	0	1	8	21	30
	4	↓	↓	0	↓	0	1	0	1	13	16	30
	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											
Tech Initials		m	n	n	n	JM	LS	LS	W	W	W	W

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Reviewed by: JGh Date reviewed: Dec. 4/12

# CETIS Analytical Report

Report Date: 27 Nov-12 14:51 (p 1 of 2)  
 Test Code: 12554 | 11-6428-7606

## Salmonid Embryo Survival and Development Test

Nautilus Environmental

Analysis ID: 04-9384-6288	Endpoint: Proportion Normal	CETIS Version: CETISv1.8.0
Analyzed: 27 Nov-12 14:32	Analysis: Linear Regression (MLE)	Official Results: Yes
Batch ID: 03-9078-8602	Test Type: Survival-Development	Analyst:
Start Date: 08 Nov-12	Protocol: EC/EPS 1/RM/28	Diluent: Dechlorinated Tap Water
Ending Date: 15 Nov-12	Species: Oncorhynchus mykiss	Brine:
Duration: 7d 0h	Source: Fraser Valley Trout Hatchery	Age:
Sample ID: 18-7265-4610	Code: PPEffluent <i>Tox Test 2</i>	Client: Rescan
Sample Date: 01 Nov-12	Material: Mining Discharge/Runoff	Project:
Receive Date: 06 Nov-12	Source: Rescan	
Sample Age: 7d 0h	Station:	

### Linear Regression Options

Model Function	Threshold Option	Threshold	Optimized	Pooled	Het Corr	Weighted
Log-Gompertz [ $\log(-\log(1-P)=A+B*\log(X))$ ]	Control Threshold	1E-08	Yes	No	Yes	Yes

### Regression Summary

Iters	LL	AICc	BIC	Mu	Sigma	Adj R2	F Stat	Critical	P-Value	Decision(α:5%)
3	-210.1	217.2	429.3	-2.522			1.635	3.682	0.2279	Non-Significant Lack of Fit

### Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC10	25.08	11.18	37.71	3.987	2.652	8.943
EC15	41.25	24.84	61.6	2.424	1.623	4.026
EC20	59.37	39.78	98.77	1.684	1.012	2.514
EC25	79.47	53.86	155.3	1.258	0.644	1.857
EC40	<del>153.7</del>	<del>93.81</del>	<del>491.8</del>	<del>0.6508</del>	<del>0.2033</del>	<del>1.066</del>
EC50	<del>218.1</del>	<del>122.1</del>	<del>936.3</del>	<del>0.4584</del>	<del>0.1068</del>	<del>0.8188</del>

*> > 100% (V1U)*

### Regression Parameters

Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(α:5%)
Threshold	1.143E-08	1.364E-05	-2.88E-05	2.878E-05	0.0008382	0.9993	Non-Significant Parameter
Slope	2.005	0.4537	1.048	2.963	4.42	0.0004	Significant Parameter
Intercept	-5.057	0.7849	-6.713	-3.401	-6.442	<0.0001	Significant Parameter

### ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Model	3.111729	3.111729	1	1.553	0.2296	Non-Significant
Lack of Fit	6.096031	3.048016	2	1.635	0.2279	Non-Significant
Pure Error	27.97121	1.864748	15			
Residual	34.06724	2.003956	17			

### Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Goodness-of-Fit	Pearson Chi-Sq GOF	34.07	27.59	0.0082	Significant Heterogeneity
	Likelihood Ratio GOF	33.28	27.59	0.0104	Significant Heterogeneity
Variances	Bartlett Equality of Variance	8.374	9.488	0.0788	Equal Variances
	Mod Levene Equality of Variance	0.8428	3.056	0.5195	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9287	0.9044	0.1457	Normal Distribution
	Anderson-Darling A2 Normality	0.6123	2.492	0.1122	Normal Distribution
Control Trend	Mann-Kendall Trend	6		1.0000	Non-significant Trend in Controls

Salmonid Embryo Survival and Development Test

Nautilus Environmental

Analysis ID: 04-9384-6288  
 Analyzed: 27 Nov-12 14:32

Endpoint: Proportion Normal  
 Analysis: Linear Regression (MLE)

CETIS Version: CETISv1.8.0  
 Official Results: Yes

Proportion Normal Summary

Calculated Variate(A/B)

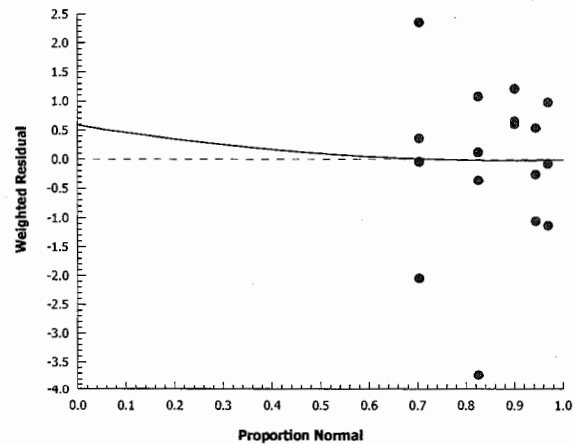
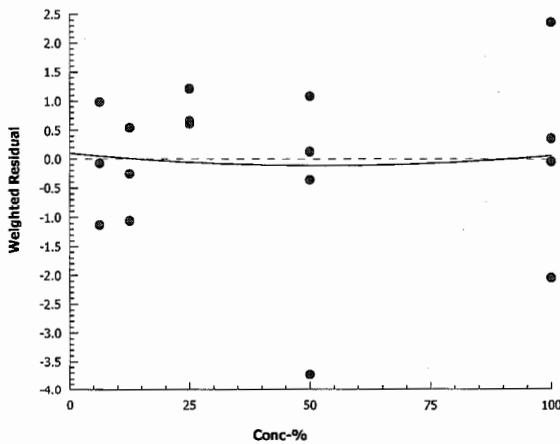
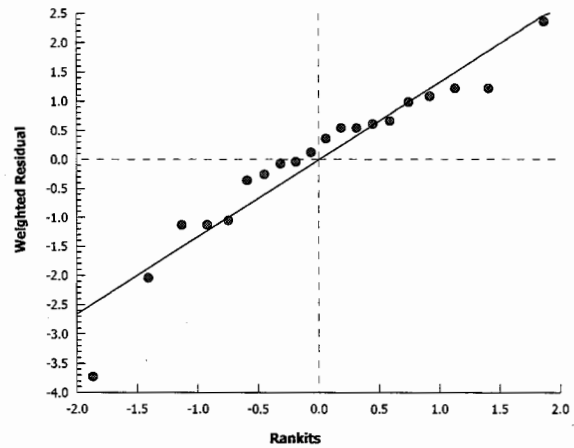
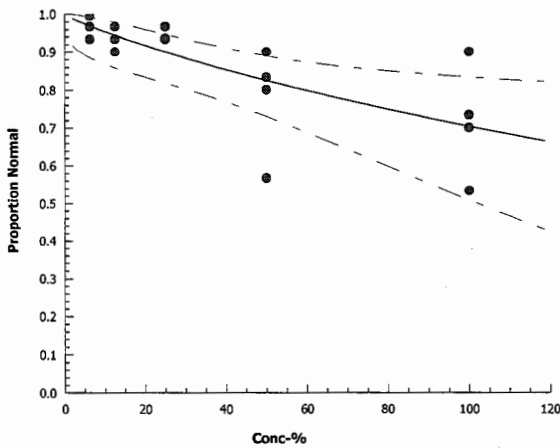
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Dilution Water	4	1	1	1	0	0	0.0%	0.0%	123	123
6.25		4	0.9583	0.9333	1	0.01596	0.03191	3.33%	4.17%	115	120
12.5		4	0.9417	0.9	0.9667	0.01596	0.03191	3.39%	5.83%	113	120
25		4	0.9505	0.9333	0.9667	0.009322	0.01864	1.96%	4.95%	115	121
50		4	0.775	0.5667	0.9	0.07249	0.145	18.71%	22.5%	93	120
100		4	0.7167	0.5333	0.9	0.07515	0.1503	20.97%	28.33%	86	120

Proportion Normal Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Dilution Water	1	1	1	1
6.25		0.9667 ✓	0.9333 ✓	1	0.9333 ✓
12.5		0.9333 ✓	0.9 ✓	0.9667 ✓	0.9667 ✓
25		0.9333 ✓	0.9355 ✓	0.9667 ✓	0.9667 ✓
50		0.9 ✓	0.8333 ✓	0.8 ✓	0.5667 ✓
100		0.9 ✓	0.7333 ✓	0.7 ✓	0.5333 ✓

Graphics

Log-Gompertz [ $\log(-\log(1-P))=A+B*\log(X)$ ]



**APPENDIX C - *Lemna minor* Toxicity Test Data**



### Lemna minor Summary Sheet

Client: Rescan  
Work Order No.: 12556

Start Date: NOV 8/12  
Set up by: KLB

#### Sample Information:

Sample ID: PP Effluent Tox test 2  
Sample Date: NOV 1 / 12  
Date Received: NOV 6 / 12  
Sample Volume: 9 x 20L

#### Test Organism Information:

Culture Date: 103112  
Age of culture (Day 0): 8 days  
>8X growth in APHA?: Y (30 fronds)

#### KCI Reference Toxicant Results:

Reference Toxicant ID: LM 81  
Date Initiated: NOV 15/12

7-d No. of Fronds IC50 (95% CL): 4.8 (4.5 - 5.1)

7-d No. Fronds IC50 Reference Toxicant Mean (2 SD Range): 4.3 (3.4 - 5.3) CV (%): 12

	Number of Fronds	Dry Weight
Test Results: IC25 %(v/v) (95% CL)	> 97	> 97
IC50 %(v/v) (95% CL)	> 97	> 97

Reviewed by: JGh

Date reviewed: Dec. 12/12

Note: Control failure.

## Plant Growth Inhibition Toxicity Test Water Quality Measurements

Client: Rescan Setup by: KLB  
 Sample ID: PP Effluent Test Date: Nov 8/12  
 Work Order No.: 12556 Test Species: Lemna minor  
 Culture Source: CPCC#490  
 Test Culture Age: 8 days > 8X Growth? (Y/N): Y (30 fronds)  
 Light Intensity Range: 4900 - 5000 Date Measured: Nov 8/12

Day	0	1	2	3	4	5	6	7
Shelf Temp (°C)	25.0	25.0	25.0	26.0	25.0	25.0	25.5	25.0
Initials	KLB	JW	J	JT	JT	KLB	KLB	KLB

Sample Characteristics  
 Temperature (°C) 23.0 Aeration? 20 min  
 DO (mg/L) 9.9 23.0  
 pH 7.0 8.2  
 Conductivity (µS) 1872 7.9  
2500

Concentration	Temperature (°C)		pH		Conductivity (µS) 0 h
	Day 0	Day 7	Day 0	Day 7	
Control	23.0	25.0	8.2	8.1	850
1.5	23.0	25.0	8.0	8.2	898
3.05	23.0	25.5	8.0	8.2	924
6.1	23.0	25.5	8.0	8.1	993
12.1	23.0	25.5	8.0	8.1	1118
24.2	23.0	25.5	8.0	8.1	1343
48.5	23.0	25.5	7.9	8.1	1759
97	23.0	26.0	7.9	8.0	2500
Initials	KLB	KLB	KLB	KLB	KLB

Thermometer: Calibrated Thermometer Cond. Meter: C-1 pH meter: pH-1

Sample Description: clear

Comments: \_\_\_\_\_

Reviewed: John Date Reviewed: Dec 12/12

**Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts**

Client: Rescan  
 Sample ID: PP Effluent  
 Work Order #: 12556

Start Date: Nov 8 12  
 Termination Date: Nov 15 12  
 Test set up by: KUB

Concentration <i>(µL)</i>	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
Control	A	6	58										KUB
	B		45										
	C		43										
	D		42										
1.5	A		44										
	B		47										
	C		43										
	D		54										
3.05	A		48										
	B		44										
	C		51										
	D		38										
6.1	A		41										
	B		45										
	C		48										
	D		54										
12.1	A		43										
	B		44										
	C		40										
	D		43										
24.2	A		49										
	B		40										
	C		36										
	D		49										

Comments: \_\_\_\_\_

Reviewed by: JGK

Date Reviewed: Dec. 12/12

**Lemna minor Toxicity Test Data Sheet - 7-d Frond Counts**

Client: Rescan  
 Sample ID: PP Effluent  
 Work Order #: 12556

Start Date: Nov 8/12  
 Termination Date: Nov 15/12  
 Test set up by: KCB

Concentration	Rep	No. of fronds		Chlorosis	Necrosis	Yellow	Abnormal size	Gibbosity	Single fronds	Root destruction	Loss of buoyancy	Comments	Initials
		Day 0	Day 7										
48.5	A	6	39										KCB
	B		35										
	C		38										
	D		46										
97	A		34										↓
	B		45										
	C		37										
	D	↓	34										
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												
	A												
	B												
	C												
	D												

Comments: \_\_\_\_\_

Reviewed by: JCB

Date Reviewed: Dec. 12/12

### 7-d Lemna minor Weight Data Sheet

Client: Rescan  
 Sample ID: PP Effluent  
 Work Order #: 12556

Start Date: Nov 8/12  
 Termination Date: Nov 15/12

Concentration (µg/L)	Rep	Black Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
Control	A	1	1056.32	1061.63	KUB
	B	2	1052.66	1057.24	
	C	3	1043.38	1047.47	
	D	4	1038.57	1042.44	
1.5	A	5	1021.41	1025.44	
	B	6	1042.11	1047.35	
	C	7	1042.65	1046.29	
	D	8	1050.97	1056.57	
3.05	A	9	1043.12	1048.69	
	B	10	990.47	994.52	
	C	11	1033.27	1038.32	
	D	12	1051.08	1055.20	
6.1	A	13	1046.09	1050.11	
	B	14	1050.65	1055.13	
	C	15	1044.63	1049.05	
	D	16	1042.23	1046.99	
12.1	A	17	1004.09	1008.90	
	B	18	1000.07	1004.43	
	C	19	1021.49	1027.06	
	D	20	1037.56	1041.81	
24.2	A	21	1029.81	1035.64	
	B	22	1019.64	1024.19	
	C	23	1000.29	1004.36	
	D	24	1016.26	1021.43	
48.5	A	25	1035.26	1040.08	
	B	26	1021.24	1026.10	
	C	27	1051.56	1056.13	
	D	28	1017.97	1023.89	

Comments: 10% Reweigh: Pan #1 = 1061.27 mg      Pan #14 = 1054.72 mg  
Pan #30 = 998.81 mg

Reviewed by: Jon      Date Reviewed: Dec. 12/12

### 7-d Lemna minor Weight Data Sheet

Client: Rescan  
 Sample ID: RP Effluent  
 Work Order #: 12556

Start Date: Nov 8/12  
 Termination Date: Nov 15/12

Concentration <i>1.0 (1.0)</i>	Rep	Black Pan No.	Pan weight (mg)	Pan + plant (mg)	Initials
97	A	29	1002.07	1007.17	KUB ↓
	B	30	992.48	999.10	
	C	31	1040.39	1045.73	
	D	32	1028.21	1033.22	
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				
	A				
	B				
	C				
	D				

Comments: \_\_\_\_\_

Reviewed by: Jon

Date Reviewed: Dec. 12/12

# CETIS Analytical Report

Report Date: 12 Dec-12 17:00 (p 1 of 2)  
 Test Code: 12556 | 13-9882-9587

## Lemna Growth Inhibition Test

Nautilus Environmental

<b>Analysis ID:</b> 11-9141-3624	<b>Endpoint:</b> Frond Count	<b>CETIS Version:</b> CETISv1.8.0
<b>Analyzed:</b> 12 Dec-12 16:49	<b>Analysis:</b> Nonlinear Regression	<b>Official Results:</b> Yes
<b>Batch ID:</b> 12-8897-9358	<b>Test Type:</b> Lemna Growth	<b>Analyst:</b> Jeslin Wijaya
<b>Start Date:</b> 08 Nov-12	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Diluent:</b> APHA
<b>Ending Date:</b> 15 Nov-12	<b>Species:</b> Lemna minor	<b>Brine:</b>
<b>Duration:</b> 7d 0h	<b>Source:</b> CPCC#490	<b>Age:</b> 8d
<b>Sample ID:</b> 14-0738-9874	<b>Code:</b> 53E310B2	<b>Client:</b> Rescan
<b>Sample Date:</b> 01 Nov-12 14:00	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 06 Nov-12 12:10	<b>Source:</b> Rescan	
<b>Sample Age:</b> 6d 10h	<b>Station:</b> PP Effluent	

## Non-Linear Regression Options

Model Function	X Transform	Y Transform	Weighting Function	PTBS Function
3P Cumulative Log-Normal EV [Y=A*(1- Φ(log(X/D)/C))]	None	None	Normal [W=1]	Off [Y*=Y]

## Regression Summary

Iters	Log LL	AICc	BIC	Adj R2	Optimize	F Stat	Critical	P-Value	Decision(α:5%)
8	-65.92	138.7	142.2	0.2763	Yes	0.1277	2.621	0.9846	Non-Significant Lack of Fit

## Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC10	23.53	5.251	52.84	4.25	1.893	19.04
IC15	42.8	18.06	80.08	2.336	1.249	5.538
IC20	68.87	29.92	131.1	1.452	0.763	3.342
IC25	103.6	34.45	238.7	0.9655	0.4189	2.903
IC40	289.6	27.27	1791	0.3453	0.05585	3.667
IC50	537.5	22.69	12730	0.1861	0.007853	4.408

## Regression Parameters

Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(α:5%)
A	41.05	1.889	37.18	44.91	21.73	<0.0001	Significant Parameter
C	2.441	1.398	-0.4181	5.301	1.746	0.0914	Non-Significant Parameter
D	537.5	610.6	-711.4	1786	0.8802	0.3860	Non-Significant Parameter

## ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Model	345.6911	345.6911	1	13.84	0.0009	Significant
Lack of Fit	18.77769	3.755538	5	0.1277	0.9846	Non-Significant
Pure Error	705.75	29.40625	24			
Residual	724.5277	24.98371	29			

## Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Variances	Bartlett Equality of Variance	5.736	14.07	0.5709	Equal Variances
	Mod Levene Equality of Variance	0.5489	2.423	0.7889	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9441	0.9338	0.0980	Normal Distribution
	Anderson-Darling A2 Normality	0.8816	2.492	0.0240	Non-normal Distribution

# CETIS Analytical Report

Report Date: 12 Dec-12 17:00 (p 2 of 2)  
 Test Code: 12556 | 13-9882-9587

## Lemna Growth Inhibition Test

Nautilus Environmental

Analysis ID: 11-9141-3624      Endpoint: Frond Count  
 Analyzed: 12 Dec-12 16:49      Analysis: Nonlinear Regression

CETIS Version: CETISv1.8.0  
 Official Results: Yes

### Frond Count Summary

### Calculated Variate

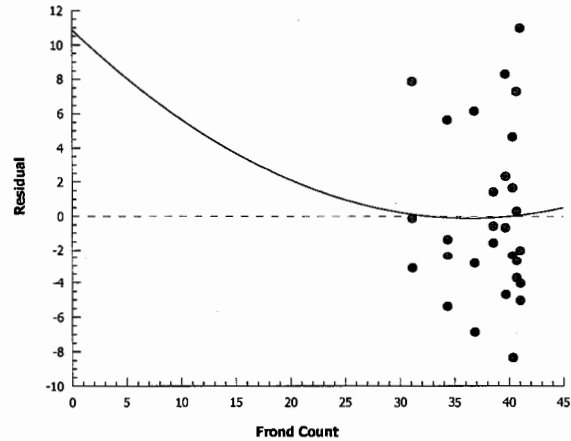
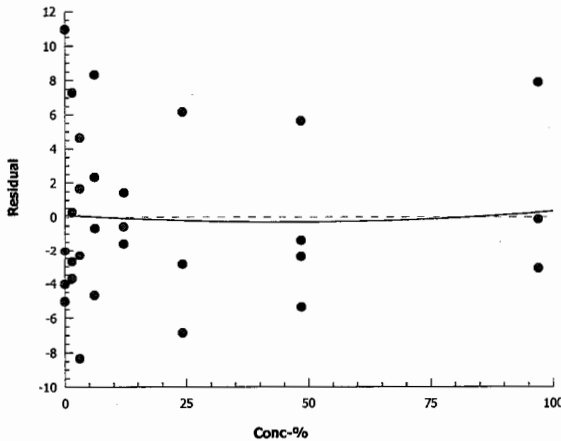
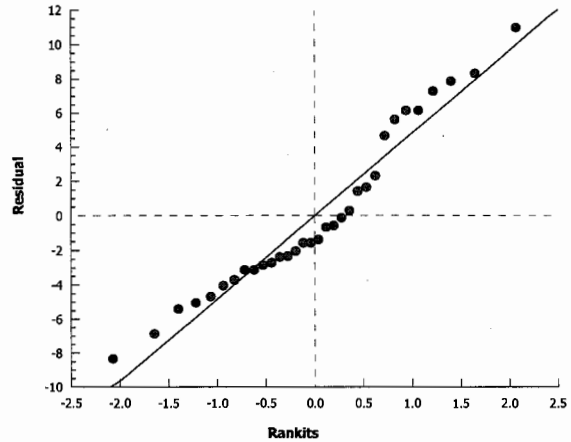
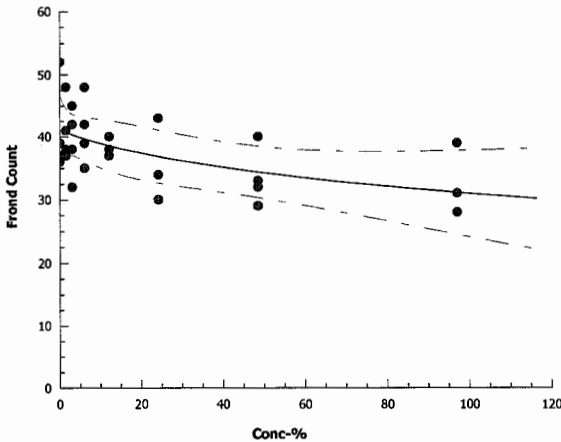
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	4	41	36	52	3.719	7.439	18.14%	0.0%
1.5		4	41	37	48	2.483	4.967	12.11%	0.0%
3.05		4	39.25	32	45	2.81	5.62	14.32%	4.27%
6.1		4	41	35	48	2.739	5.477	13.36%	0.0%
12.1		4	38	37	40	0.7071	1.414	3.72%	7.32%
24.2		4	37.5	30	43	3.279	6.557	17.49%	8.54%
48.5		4	33.5	29	40	2.327	4.655	13.89%	18.29%
97		4	31.5	28	39	2.598	5.196	16.5%	23.17%

### Frond Count Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	52	39	37	36
1.5		38	41	37	48
3.05		42	38	45	32
6.1		35	39	42	48
12.1		37	38	40	37
24.2		43	34	30	43
48.5		33	29	32	40
97		28	39	31	28

### Graphics

3P Cumulative Log-Normal EV [Y=A\*(1- Φ(log(X/D)/C))]





# CETIS Analytical Report

Report Date: 12 Dec-12 14:53 (p. 2 of 4)  
 Test Code: 12556 | 13-9882-9587

## Lemna Growth Inhibition Test

Nautilus Environmental

<b>Analysis ID:</b> 02-2675-8821	<b>Endpoint:</b> Total Dry Weight-mg	<b>CETIS Version:</b> CETISv1.8.4
<b>Analyzed:</b> 12 Dec-12 14:52	<b>Analysis:</b> Linear Interpolation (ICPIN)	<b>Official Results:</b> Yes
<b>Batch ID:</b> 12-8897-9358	<b>Test Type:</b> Lemna Growth	<b>Analyst:</b> Jeslin Wijaya
<b>Start Date:</b> 08 Nov-12	<b>Protocol:</b> EC/EPS 1/RM/37	<b>Diluent:</b> APHA
<b>Ending Date:</b> 15 Nov-12	<b>Species:</b> Lemna minor	<b>Brine:</b>
<b>Duration:</b> 7d 0h	<b>Source:</b> CPCC#490	<b>Age:</b> 8d
<b>Sample ID:</b> 14-0738-9874	<b>Code:</b> 53E310B2	<b>Client:</b> Rescan
<b>Sample Date:</b> 01 Nov-12 14:00	<b>Material:</b> Water Sample	<b>Project:</b>
<b>Receive Date:</b> 06 Dec-12 12:10	<b>Source:</b> Rescan	
<b>Sample Age:</b> 6d 10h	<b>Station:</b> PP Effluent	

### Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	229931	200	Yes	Two-Point Interpolation

### Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>97	N/A	N/A	<1.031	NA	NA
IC10	>97	N/A	N/A	<1.031	NA	NA
IC15	>97	N/A	N/A	<1.031	NA	NA
IC20	>97	N/A	N/A	<1.031	NA	NA
IC25	>97	N/A	N/A	<1.031	NA	NA
IC40	>97	N/A	N/A	<1.031	NA	NA
IC50	>97	N/A	N/A	<1.031	NA	NA

### Total Dry Weight-mg Summary

### Calculated Variate

C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	4	4.462	3.87	5.31	0.3191	0.6382	14.3%	0.0%
1.5		4	4.627	3.64	5.6	0.4702	0.9404	20.32%	-3.7%
3.05		4	4.697	4.05	5.57	0.3695	0.7389	15.73%	-5.27%
6.1		4	4.42	4.02	4.76	0.1525	0.3051	6.9%	0.95%
12.1		4	4.748	4.25	5.57	0.2997	0.5995	12.63%	-6.39%
24.2		4	4.905	4.07	5.83	0.3818	0.7636	15.57%	-9.92%
48.5		4	5.042	4.57	5.92	0.2995	0.599	11.88%	-13.0%
97		4	5.517	5.01	6.62	0.374	0.7481	13.56%	-23.64%

### Total Dry Weight-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	5.31	4.58	4.09	3.87
1.5		4.03	5.24	3.64	5.6
3.05		5.57	4.05	5.05	4.12
6.1		4.02	4.48	4.42	4.76
12.1		4.81	4.36	5.57	4.25
24.2		5.83	4.55	4.07	5.17
48.5		4.82	4.86	4.57	5.92
97		5.1	6.62	5.34	5.01

# CETIS Analytical Report

Report Date:

12 Dec-12 14:53 (p 2 of 2)

Test Code:

12556 | 13-9882-9587

Lemna Growth Inhibition Test

Nautilus Environmental

Analysis ID: 02-2675-8821

Endpoint: Total Dry Weight-mg

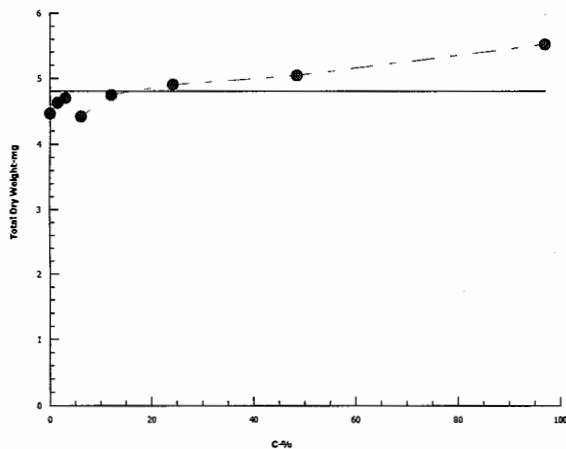
CETIS Version: CETISv1.8.4

Analyzed: 12 Dec-12 14:52

Analysis: Linear Interpolation (ICPIN)

Official Results: Yes

## Graphics



**APPENDIX D - *Pseudokirchneriella subcapitata* Toxicity Test Data**

**Pseudokirchneriella subcapitata Summary Sheet**

Client: Rescan  
Work Order No.: 12557

Start Date: Nov. 7, 2012  
Set up by: ECC

**Sample Information:**

Sample ID: PPEffluent Tox Test 2  
Sample Date: Nov. 1, 2012  
Date Received: Nov. 6, 2012  
Sample Volume: 9 x 200

**Test Organism Information:**

Culture Date: Nov. 2, 2012  
Age of culture (Day 0): 5 d

**Zinc Reference Toxicant Results:**

Reference Toxicant ID: SC90  
Stock Solution ID: 12Zn01  
Date Initiated: Nov. 7, 2012

72-h IC50 (95% CL): 25.0 (22.3 - 28.0) µg/L Zn

72-h IC50 Reference Toxicant Mean and Range: 21.5, 12.4 - 37.3 µg/L Zn CV (%): 32%

Test Results:	Algal Growth
IC25 %(v/v) (95% CL)	>95.2
IC50 %(v/v) (95% CL)	>95.2

Reviewed by: JGh

Date reviewed: Dec. 4/12

## 72-h Algal Growth Inhibition Toxicity Test Water Quality Measurements

Client: RESCAN Setup by: ECC  
 Sample ID: PPEFFLUENT Tox Test 2 Test Date/Time: Nov 7, 2012 1530h  
 Work Order No.: 12557 Test Species: Pseudokirchneriella subcapitata  
 Culture Date: Nov 2/12 Age of Culture: 5d Culture Health: Good  
 Culture Count: 1 179 2 161 Average: 170 Culture Cell Density (c1): 170 x 10<sup>4</sup>

$$v1 = \frac{220,000 \text{ cells/ml} \times 50 \text{ ml}}{(c1) 170 \times 10^4 \text{ cells/ml}} = 6.47 \text{ mL}$$

Time Zero Counts: 1 22 2 23 Average: 22.5 x 10<sup>4</sup>

No. of Cells/mL: 22.5 x 10<sup>4</sup> Initial Density: # cells/mL ÷ 220 µL x 10 µL = 10,227 cells/mL

Concentration  % (v/v)	Water Quality Measurements					Microplates rotated 2X per day?			
	pH	Temp (°C)				0 h	24 h	48 h	72 h
		0 h	0 h	24 h	48 h				
Lab Control	6.9	24.5	25.0	25.0	25.0	✓	✓	✓	✓
1.5	6.9	24.5	25.0	↓	↓	✓	✓	✓	✓
3.0	6.9	24.5	25.0	↓	↓	✓	✓	✓	✓
5.9	6.9	24.5	25.0	↓	↓	✓	✓	✓	✓
11.9	6.9	24.5	25.0	↓	↓	✓	✓	✓	✓
23.8	6.9	24.5	25.0	↓	↓	✓	✓	✓	✓
47.6	6.8	24.5	25.0	↓	↓	✓	✓	✓	✓
95.2	6.8	25.0	25.0	↓	↓	✓	✓	✓	✓
Initials	<u>EC</u>	<u>EC</u>	<u>EC</u>	<u>EC</u>	<u>EC</u>	<u>EC</u>	<u>EC</u>	<u>EC</u>	<u>EC</u>

Initial control pH: Well 1: 6.8 Well 2: 6.8  
 Final control pH: Well 1: 6.5 Well 2: 6.5  
 Light intensity (lux): 3690 Date measured: Nov 7, 2012

Sample Description: Clear sample

Comments: \_\_\_\_\_

Reviewed: JOB Date reviewed: Dec. 4/12

**Pseudokirchneriella subcapitata Toxicity Test Data Sheet**  
**72-h Algal Cell Counts**

Client: RESCAN Start Date/Time: Nov. 7/12 1530h  
 Work Order #: 1257 Termination Date: Nov. 10/12 1535h  
 Sample ID: PP EFFLUENT Test set up by: EM  
 %(v/v) 10X TEST 2

Concentration	Rep	Count 1	Count 2	Count 3	Count 4	Comments	Initials
Control	A	45					EM
	B	51					
	C	38					
	D	48					
	E	57	53				
	F	40	42				
	G	49					
	H	35					
1.5	A	146	158				EM
	B	178					
	C	172					
	D	188					
3.0	A	148					
	B	127	136				
	C	178					
	D	159					
5.9	A	168					
	B	154					
	C	172					
	D	131	128				
11.9	A	99					
	B	118					
	C	101					
	D	87					
23.8	A	83					
	B	104					
	C	92					
	D	103					
47.6	A	112					
	B	96					
	C	111					
	D	81					
95.2	A	93					
	B	108	103				
	C	77					
	D	84					

Comments: \_\_\_\_\_  
 Reviewed by: JGU Date Reviewed: Dec. 4/12

**Pseudokirchneriella subcapitata Algal Counts**

Client: Copper Mountain  
 WO#: 12557  
 Sample ID: PPEffluent *for test 2*

Start Date/Time: 07-Nov-12 @1530h  
 Termination Date: 10-Nov-12 @1535h

Initial Cell Density: 10227 cell/mL  
 225000  
 0.22  
 0.01

Concentration % v/v	Rep	Count 1 (x 10 <sup>4</sup> )	Count 2 (x 10 <sup>4</sup> )	Count 3 (x 10 <sup>4</sup> )	Count 4 (x 10 <sup>4</sup> )	Mean (x 10 <sup>4</sup> )	Cell Yield (x 10 <sup>4</sup> ) cell/mL		10227.27
Control	A	45				45	44.0	mean	44.2
	B	51				51	50.0	SD	6.819091
	C	38				38	37.0	CV	15.41829
	D	48				48	47.0		
	E	57	53			55	54.0		
	F	40	42			41	40.0		
	G	49				49	48.0		
	H	35				35	34.0		
1.48	A	146	158			152	151.0		
	B	198				198	197.0		
	C	172				172	171.0		
	D	188				188	187.0		
2.95	A	148				148	147.0		
	B	127	136			131.5	130.5		
	C	178				178	177.0		
	D	159				159	158.0		
5.9	A	168				168	167.0		
	B	154				154	153.0		
	C	172				172	171.0		
	D	131	128			129.5	128.5		
11.9	A	99				99	98.0		
	B	119				119	118.0		
	C	101				101	100.0		
	D	87				87	86.0		
23.8	A	83				83	82.0		
	B	104				104	103.0		
	C	92				92	91.0		
	D	103				103	102.0		
47.6	A	112				112	111.0		
	B	96				96	95.0		
	C	111				111	110.0		
	D	81				81	80.0		
95.2	A	93				93	92.0		
	B	108	103			105.5	104.5		
	C	77				77	76.0		
	D	84				84	83.0		

*Jobe  
 Dec. 4/12*

**CETIS Analytical Report**

Report Date: 21 Nov-12 16:20 (p 1 of 4)  
 Test Code: 12557 | 09-5290-3835

**EC Alga Growth Inhibition Test**

**Nautilus Environmental**

Analysis ID: 18-0368-8226      Endpoint: Cell Yield      CETIS Version: CETISv1.8.0  
 Analyzed: 21 Nov-12 15:20      Analysis: Parametric-Two Sample      Official Results: Yes

Sample ID: 00-1484-8724      Code: PPEffluent *Tox Test 2*      Client: Rescan  
 Sample Date: 01 Nov-12      Material: Water Sample      Project:  
 Receive Date: 06 Nov-12      Source: Rescan  
 Sample Age: 6d 0h      Station:

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run	<1.49	1.49	N/A	>67.11	21.9%

**Equal Variance t Two-Sample Test**

Control	vs	Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
Negative Control		1.49*	17.42	1.812	10	13.76	<0.0001	Significant Effect
		2.98*	14.54	1.812	10	13.55	<0.0001	Significant Effect
		5.95*	14.94	1.812	10	13.4	<0.0001	Significant Effect
		11.9*	9.972	1.812	10	10.22	<0.0001	Significant Effect
		23.8*	10.4	1.812	10	8.757	<0.0001	Significant Effect
		47.6*	9.09	1.812	10	10.92	<0.0001	Significant Effect
		95.2*	8.312	1.812	10	9.703	<0.0001	Significant Effect

**ANOVA Table**

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	70763	10109	7	49.35	<0.0001	Significant Effect
Error	5736	204.8571	28			
Total	76499	10313.86	35			

**Distributional Tests**

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	7.288	18.48	0.3995	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9804	0.9166	0.7574	Normal Distribution

**Cell Yield Summary**

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	8	44.25	41.66	46.84	34	54	2.411	6.819	15.41%	0.0%
1.49		4	176.5	168.9	184.1	151	197	10.05	20.09	11.38%	-298.9%
2.98		4	153	145.5	160.5	130	177	9.857	19.71	12.89%	-245.8%
5.95		4	154.8	147.4	162.1	128	171	9.716	19.43	12.56%	-249.7%
11.9		4	100.5	95.48	105.5	86	118	6.602	13.2	13.14%	-127.1%
23.8		4	94.5	90.72	98.28	82	103	4.975	9.95	10.53%	-113.6%
47.6		4	99	93.44	104.6	80	111	7.314	14.63	14.78%	-123.7%
95.2		4	88.75	84.15	93.35	76	104	6.047	12.09	13.63%	-100.6%



# CETIS Analytical Report

Report Date: 21 Nov-12 16:20 (p 2 of 4)  
 Test Code: 12557 | 09-5290-3835

## EC Alga Growth Inhibition Test

Nautilus Environmental

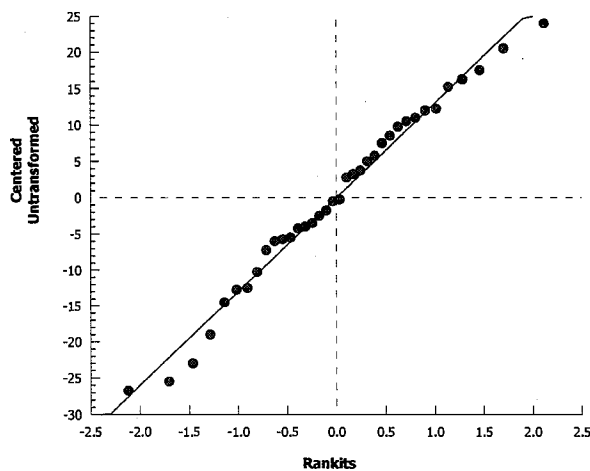
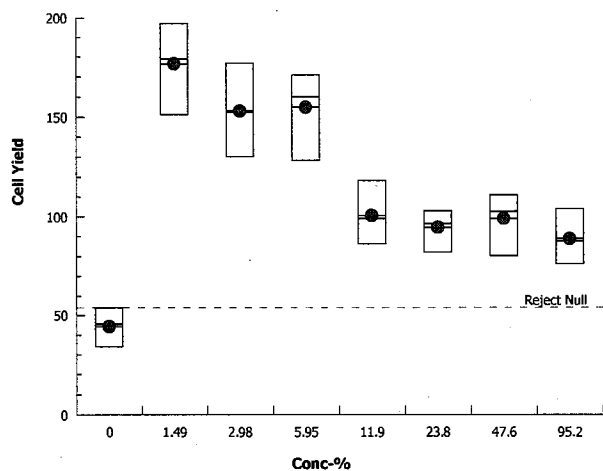
Analysis ID: 18-0368-8226      Endpoint: Cell Yield  
 Analyzed: 21 Nov-12 15:20      Analysis: Parametric-Two Sample

CETIS Version: CETISv1.8.0  
 Official Results: Yes

### Cell Yield Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Control	44	50	37	47	54	40	48	34
1.49		151	197	171	187				
2.98		147	130	177	158				
5.95		167	153	171	128				
11.9		98	118	100	86				
23.8		82	103	91	102				
47.6		111	95	110	80				
95.2		92	104	76	83				

### Graphics



# CETIS Analytical Report

Report Date: 21 Nov-12 16:20 (p 1 of 2)  
 Test Code: 12557 | 09-5290-3835

## EC Alga Growth Inhibition Test

Nautilus Environmental

Analysis ID: 13-2432-8720      Endpoint: Cell Yield      CETIS Version: CETISv1.8.0  
 Analyzed: 21 Nov-12 15:21      Analysis: Linear Interpolation (ICPIN)      Official Results: Yes

Sample ID: 00-1484-8724      Code: PPEffluent Fox Test 2      Client: Rescan  
 Sample Date: 01 Nov-12      Material: Water Sample      Project:  
 Receive Date: 06 Nov-12      Source: Rescan  
 Sample Age: 6d 0h      Station:

### Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	2.028E+09	200	Yes	Two-Point Interpolation

### Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	6.909	6.583	7.84	14.47	12.75	15.19
IC10	7.999	7.269	10.2	12.5	9.806	13.76
IC15	9.24	8.009	13.13	10.82	7.614	12.49
IC20	10.65	8.809	24.51	9.387	4.08	11.35
IC25	15.48	7.736	N/A	6.459	N/A	12.93
IC40	>95.2	N/A	N/A	<1.05	N/A	N/A
IC50	>95.2	N/A	N/A	<1.05	N/A	N/A

} > 95.2

### Cell Yield Summary

### Calculated Variate

Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	8	44.25	34	54	2.411	6.819	15.41%	0.0%
1.49		4	176.5	151	197	10.05	20.09	11.38%	-298.9%
2.98		4	153	130	177	9.857	19.71	12.89%	-245.8%
5.95		4	154.8	128	171	9.716	19.43	12.56%	-249.7%
11.9		4	100.5	86	118	6.602	13.2	13.14%	-127.1%
23.8		4	94.5	82	103	4.975	9.95	10.53%	-113.6%
47.6		4	99	80	111	7.314	14.63	14.78%	-123.7%
95.2		4	88.75	76	104	6.047	12.09	13.63%	-100.6%

### Cell Yield Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Control	44	50	37	47	54	40	48	34
1.49		151	197	171	187				
2.98		147	130	177	158				
5.95		167	153	171	128				
11.9		98	118	100	86				
23.8		82	103	91	102				
47.6		111	95	110	80				
95.2		92	104	76	83				

# CETIS Analytical Report

Report Date: 21 Nov-12 16:20 (p 2 of 2)  
Test Code: 12557 | 09-5290-3835

EC Alga Growth Inhibition Test

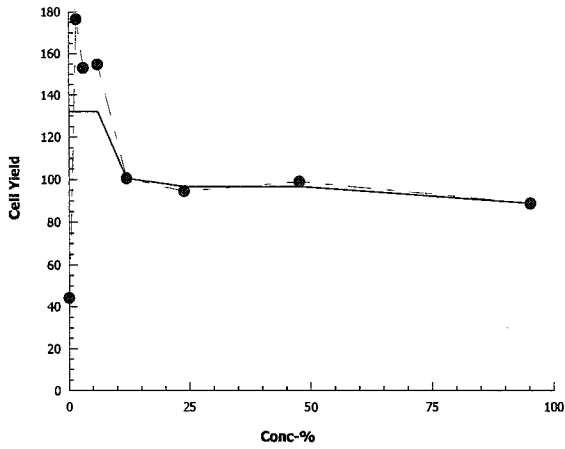
Nautilus Environmental

Analysis ID: 13-2432-8720  
Analyzed: 21 Nov-12 15:21

Endpoint: Cell Yield  
Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.0  
Official Results: Yes

## Graphics



**APPENDIX E - Rainbow Trout LC50 Toxicity Test Data**

## Rainbow Trout Summary Sheet

Client: Rescan Environmental

Start Date/Time: November 14/12 @ 1205

Work Order No.: 12574

Test Species: Oncorhynchus mykiss

### Sample Information:

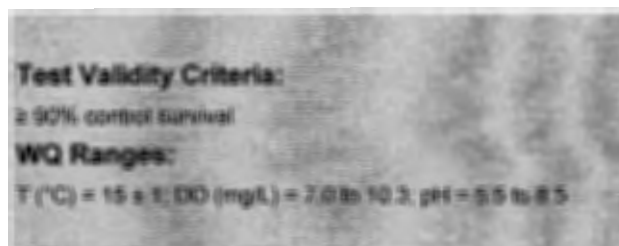
Sample ID: PP Effluent Tox Test 2

Sample Date: November 1/12 @ 1400

Date Received: November 6/12 @ 1210

Sample Volume: 9 x 20L

Other: N/A



### Dilution Water:

Type: Dechlorinated Municipal Tap Water

Hardness (mg/L CaCO<sub>3</sub>): 12

Alkalinity (mg/L CaCO<sub>3</sub>): 7

### Test Organism Information:

Batch No.: 101212

Source: Miracle Spings

No. Fish/Volume (L): 10/15L

Loading Density: 0.36

Mean Length ± SD (mm): 40 ± 3

Range: 37 - 45

Mean Weight ± SD (g): 0.54 ± 0.14

Range: 0.39 - 0.82

### NaNO<sub>2</sub> Reference Toxicant Results:

Reference Toxicant ID: RTNt28

Stock Solution ID: 12Nt01

Date Initiated: November 14/12

96-h LC<sub>50</sub> (95% CL): 7.6 (6.6 - 8.6) mg/L NaNO<sub>2</sub>

Reference Toxicant Mean and Historical Range: 5.1 (2.9 - 9.0) mg/L NaNO<sub>2</sub>

Reference Toxicant CV (%): 33

Test Results: The 96-h LC<sub>50</sub> is >100% (v/v).

Reviewed by: JGh

Date reviewed: Dec. 12/12

### 96-Hour Rainbow Trout Toxicity Test Data Sheet

**Client/Project#:** Rescan Environmental  
**Sample I.D.:** PP Effluent Tox test 2  
**W.O. #:** 12574  
**RBT Batch #:** 101212  
**Date Collected/Time:** November 1 12 @ 1400  
**Date Setup/Time:** November 14 12 @ 1205  
**Sample Setup By:** SBF

**Number Fish/Volume:** 10/15  
**7-d % Mortality:** 0.8  
**Total Pre-aeration Time (mins):** 30  
**Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N):** Y

**D.O. meter:** DO-1  
**pH meter:** pH-1  
**Cond. Meter:** C-1

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	15.5	/	14.5
pH	7.2	/	7.0
D.O. (mg/L)	10.1	/	10.0
Cond. (µS/cm)	1873	/	1889

Concentration (% v/v)	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
CONT				10	10	10	10	14.0	14.0	14.0	14.5	14.5	10.1	9.6	9.9	10.0	9.9	7.2	6.9	6.9	7.0	6.9	32	38
6.25				10	10	10	10	14.0	14.0	14.0	14.5	14.5	10.1	9.5	9.6	10.1	9.8	7.0	6.8	6.8	6.9	6.8	259	258
12.5				10	10	10	10	14.0	14.0	14.0	14.5	14.5	10.1	9.4	9.5	10.0	9.8	7.0	6.8	6.8	6.8	6.9	440	432
25				10	10	10	10	14.0	14.0	14.0	14.5	14.5	10.1	9.4	9.5	10.1	9.7	7.0	6.7	6.8	6.8	6.9	650	631
50				10	10	10	10	14.0	14.0	14.0	14.5	14.5	10.0	9.4	9.5	10.1	9.8	7.0	6.7	6.7	6.9	6.8	1096	6075
100				10	10	10	10	14.5	14.0	14.0	14.5	14.5	10.0	9.4	9.5	10.1	9.8	7.0	6.6	6.6	6.8	6.9	2889	1854
Initials				SBF	SBF	~	~	SBF	SBF	SBF	~	~	SBF	SBF	SBF	~	~	SBF	SBF	SBF	~	~	SBF	~

WQ Ranges: T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Sample Description/Comments: Clear

Fish Description at 96? all fish ok

Other Observations: \_\_\_\_\_

Reviewed by: JGh

Date Reviewed: Dec. 12/12

**APPENDIX F - *Daphnia magna* LC50 Toxicity Test Data**

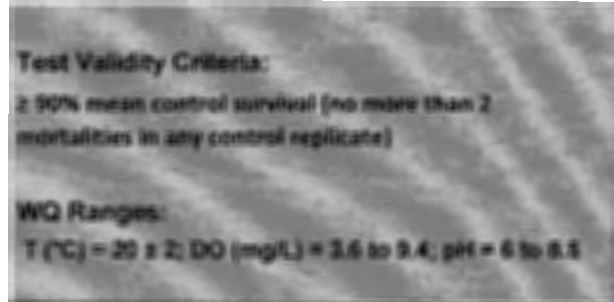
# Daphnia magna Summary Sheet

Client: Rescan  
Work Order No.: 12575

Start Date/Time: November 11, 2012 @ 1425h  
Test Species: Daphnia magna  
Set up by: JJT

## Sample Information:

Sample ID: PP Effluent tox test 2  
Sample Date: Nov 1/12  
Date Received: Nov 6/12  
Sample Volume: 9x20L



## Test Organism Information:

Broodstock No.: 102412 A+B  
Age of young (Day 0): < 24 hours  
Avg No. young per brood in previous 7 d: 25  
Mortality (%) in previous 7 d: 0  
Days to first brood: 9

## NaCl Reference Toxicant Results:

Reference Toxicant ID: Dm91  
Stock Solution ID: 12Na02  
Date Initiated: Nov 20/12  
48-h LC50 (95% CL): 4.2 (3.7 - 4.8) g/L NaCl

Reference Toxicant Mean and Historical Range: 4.0 (3.6 - 4.4) g/L NaCl  
Reference Toxicant CV (%): 5

Test Results: The 48h LC50 is >100%  
\_\_\_\_\_  
\_\_\_\_\_

Reviewed by: JGK

Date reviewed: Dec. 6/12



## Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: Rescan  
 Sample ID: DE Effluent tox test 2  
 Work Order No.: 12575

Start Date/Time: Nov 14/12 @ 1425L  
 No. Organisms/volume: 10/200mL  
 Test Organism: D. magna  
 Set up by: JJT

DO meter: DO-1 pH meter: pH-1 Conductivity meter: C-1

Concentration % (v/v)	Number of Live Organisms Rep	No. Organisms			Temperature (°C)			Dissolved oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24	48	48	0	24	48	0	24	48	0	24	48	0	48
Control	A	10	10	0	19.2	19.2	20.0	8.6		8.4	7.8		8.1	359	384
	B														
	C														
	D														
6.25	A	10	10	0	19.0	19.2	19.5	8.7		8.4	7.8		8.0	464	499
	B														
	C														
	D														
12.5	A	10	10	0	19.2	19.2	19.5	8.7		8.4	7.8		8.0	562	605
	B														
	C														
	D														
25	A	10	10	0	19.2	19.2	20.0	8.7		8.4	7.8		7.9	727	776
	B														
	C														
	D														
50	A	10	10	0	19.2	19.2	20.0	8.7		8.4	7.8		7.7	1267	1355
	B														
	C														
	D														
100	A	10	10	0	19.2	19.2	20.0	8.7		8.4	7.8		7.4	1838	1959
	B														
	C														
	D														
Technician Initials		~	UB	UB	~	~	UB	~		UB	~		UB	~	UB

WQ Ranges: T (°C) = 20 ± 2; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

	Hardness*	Alkalinity*
Conc.	*(mg/L as CaCo3)	
Control (MHW)	100	66.
Highest conc.	1100	10

	Initial WQ	Adjustment	Adjusted WQ
Temp (°C)	19.0		
DO (mg/L)	1.27		
pH	7.8		
Cond (µS/cm)	1838		

Sample Description: light yellow - ppt present  
 Comments: Batch#: 122412 ARS 7-d previous # young/brood: 25 Day of 1st Brood: 9 Previous 7-d % Mortality: 0  
 Reviewed by: JGU Date reviewed: Dec. 6/12



**APPENDIX G - Chain-of-Custody Forms**

British Columbia: 8664 Commerce Court, Burnaby, BC, V5A 4N7

Date \_\_\_\_\_ Page \_\_\_ of \_\_\_

Sample Collection By:							ANALYSES REQUIRED										Receipt Temperature (°C)		
Report to:	Invoice to:						7-d rainbow trout embryo viability test	Ceriodaphnia survival/reproduction	7-d Lemna minor growth inhibition test	72-h Pseudokirchneriella subcapitata growth inhibitor	RBT LC50	D. magna LC50							
Company	Rescan Environmental		Rescan Environmental																
Address	1111 West Hasting Street		1111 West Hasting Street																
City/Prov/Postal Code	Vancouver, BC, V6E 2J3		Vancouver, BC, V6E 2J3																
Contact	Lesley Shelley or Kelsey Norlund		Lesley Shelley or Kelsey Norlund																
Phone	604-689-9460		604-689-9460																
Email	lshelley@rescan.com; knorlund@rescan.com																		
SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	# OF CONTAINERS	COMMENTS													
1	PP Effluent Tox Test 2	Nov 11/12	14:00h	Water	20L	9		X	X	X	X								116°C
2																			
3								12554	12555	12556	12557	12574	12575						
4																			
5																			
6																			
7																			
8																			
9																			
10																			
PROJECT INFORMATION			SAMPLE RECEIPT			RELIQUISHED BY (CLIENT)				RELIQUISHED BY (COURIER)									
Client:			Total # Containers:			Signature:				Signature:									
P.O. No.:			Good Condition?			Print:				Print:									
Shipped Via:			Matches Schedule?			Company:				Company:									
						Time/Date:				Time/Date:									
SPECIAL INSTRUCTIONS/COMMENTS: Identify sample as Rescan Project # 868-021-01 on invoices						RECEIVED BY (COURIER)				RECEIVED BY (LABORATORY)									
						Signature:				Signature: <i>Banjo</i>									
						Print:				Print: <i>BR</i>									
						Company:				Company: <i>Nautilus</i>									
						Time/Date:				Time/Date: <i>Nov 6/12 @ 12:10</i>									

Received  
Nov 6/12  
@ 12:10