Chronic Toxicity Testing and Toxicity Identification Evaluation (TIE) of the Chevron/Cawelo Water District Effluent

Samples collected April 21, 2009

Prepared For:

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1. INTRODUCTION

Precision Analytical has contracted Pacific EcoRisk (PER) to perform NPDES compliance evaluations of the acute and chronic toxicity of Chevron USA Inc. and Cawelo Water District (Chevron/Cawelo) effluent. These evaluations consist of performing the following US EPA freshwater acute and chronic toxicity tests:

- Acute (96-hr) survival test with fathead minnows;
- 96-hr algal growth test with the green alga *Selenastrum capricornutum;*
- 3-brood (6-8-day) survival and reproduction test with the crustacean *Ceriodaphnia dubia;* and
- 7-day survival and growth test with larval fathead minnows (*Pimephales promelas*).

In recent testing of this effluent, significant toxicity to *Ceriodaphnia dubia* and fathead minnows was observed. Consistent with the Chevron/Cawelo NPDES permit, re-testing of a dilution series of the effluent and a Toxicity Identification and Evaluation (TIE) were implemented. In addition, water samples from nearby waterbodies were also collected and tested. The current testing was performed using water samples that were collected on April 21, 2009. In order to assess the sensitivity of the test organisms to chronic toxic stress, reference toxicant tests were also performed. This report describes the performance and results of these tests.

2. TOXICITY TEST PROCEDURES

The methods used in conducting the standard chronic toxicity tests followed EPA testing manual "Short-Term Methods for Estimating the Chronic Effects of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition" (EPA-821-R-02-013).

The methods used in conducting the Phase I TIE toxicity testing followed the guidelines established by the following EPA manuals:

- Methods for Aquatic Toxicity Identification Evaluations: Phase I: Toxicity Characterization Procedures. EPA-600/6-91/003 (Second Edition). U.S. EPA, Environmental Research Laboratory, Duluth, MN.
- Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluent, Phase I. EPA-600-6-91-005F. U.S. EPA, Environmental Research Laboratory, Duluth, MN.
- Toxicity Reduction Evaluation Protocol for Municipal Wastewater Treatment Plants. EPA-600/2-88/062 1989. U.S. EPA, Risk Reduction Engineering Laboratory, Cincinnati, OH.

2.1 Sample Receipt and Handling

On April 21, Chevron/Cawelo effluent and other water samples (Table 1) were collected into appropriately cleaned sample containers. These samples were transported that same day, on ice

and under chain-of-custody, to the PER laboratory in Fairfield. Upon receipt at the testing laboratory, aliquots of each sample were collected for analysis of initial water quality characteristics (Table 2), with the remainder of the samples being stored at 0-6°C except when being used to prepare test solutions. The chain-of-custody record for the collection and delivery of these samples are provided in Appendix A.

Table 1. Description of the collected water samples.

Sample Collection Date	Sample Receipt Date	Sample #	Sample ID
4/21/09	4/21/09	1	Inlet Resv B (Inlet to Reservoir B)
4/21/09	4/21/09	4	V.W. (Valley Waste)
4/21/09	4/21/09	5	Irrigation Canal–Top of Hill
4/21/09	4/21/09	6	Irrigation Canal–Dilution Water

Table 2. Initial water quality characteristics of the Chevron/Cawelo effluent[a] and other water samples

Sample ID	Temp (°C)	pH	D.O. (mg/L)	Alkalinity (mg/L)	Hardness (mg/L)	Conductivity (µS/cm)	Total Ammonia (mg/L N)
Inlet Resv B[a]	10.5	6.83	6.4	220	88	805	<1.0
V.W.	22.1	7.73	4.8	341	46	945	<1.0
Irrigation Canal–Top of Hill	0.6	7.19	7.2	217	87	798	<1.0
Irrigation Canal–Dilution Water	4.5	8.04	9.0	59	53	215	<1.0

a – Chevron/Cawelo effluent = Inlet Resv. B sample

2.2 Survival and Reproduction Toxicity Testing with *Ceriodaphnia dubia*

The short-term chronic *Ceriodaphnia* test consists of exposing individual females to effluent (or ambient water sample) for the length of time it takes for the Lab Control treatment females to produce 3 broods (typically 6-8 days), after which effects on survival and reproduction are evaluated. The specific procedures used in these tests are described below.

The Chevron/Cawelo effluent = Sample #1 (Inlet Resv. B). The Receiving Water Control and dilution water for the effluent test = Sample #6 (Irrigation Canal–Dilution Water). The effluent and the Control/dilution water were used to prepare test solutions at the 12.5, 25, 50, 75, and 100% effluent concentrations. The other water samples were tested at the 100% concentration only. A Lab Water Control, consisting of a mixture of commercial spring waters (80% Arrowhead:20% Evian), was also prepared and tested. Fresh test solutions were prepared daily; for each treatment, 200 mL of test solution was amended with the alga *Selenastrum capricornutum* and Yeast-Cerophyll®-Trout Food (YCT) to provide food for the test organisms.

"New" water quality characteristics (pH, D.O., and conductivity) were measured on these food-amended test solutions prior to use in this test. Each day of the test, fresh test solutions and a "new" set of replicate cups were prepared and characterized, as before.

There were 10 replicates for each test treatment, each replicate consisting of 15 mL of test solution in a 30-mL plastic cup. This "3-brood" test was initiated by allocating one neonate (<24 hrs old) *Ceriodaphnia*, obtained from ongoing laboratory cultures, into each replicate. The replicate cups were placed into a temperature-controlled room at 25°C, under cool-white fluorescent lighting on a 16L:8D photoperiod.

Each test replicate cup was examined daily, with surviving "original" individual organisms being transferred to the corresponding new cup containing fresh test solution. The contents of each remaining "old" replicate cup were carefully examined, and the number of neonate offspring produced by each original organism was determined, after which "old" water quality characteristics (pH, D.O., and conductivity) were measured for the "old" media from one randomly-selected replicate at each treatment.

After it was determined that ≥ 60% of the *Ceriodaphnia* in the Lab Water Control treatment had produced their third brood of offspring, the tests were terminated. The resulting survival and reproduction (number of offspring) data were analyzed to evaluate any impairment(s) caused by the effluent (or other water samples); all statistical analyses were performed using the CETIS® statistical software.

2.2.1 Reference Toxicant Testing of the *Ceriodaphnia dubia*

In order to assess the sensitivity of the *Ceriodaphnia* test organisms to toxic stress, a reference toxicant test was performed. The reference toxicant test was performed similarly to the effluent test except that test solutions consisted of "Lab Control" media spiked with NaCl at test concentrations of 250, 500, 1000, 1500 and 2000 mg/L. The resulting test response data were statistically analyzed to determine key dose-response point estimates (e.g., EC_{50}); all statistical analyses were made using the CETIS® software. These response endpoints were then compared to the typical response range established by the mean ± 2 SD of the point estimates generated by the most recent previous reference toxicant tests performed by this lab.

2.3 Survival and Growth Toxicity Testing with Larval Fathead Minnows

The chronic fathead minnow test consists of exposing larval fish to effluent (or ambient water samples) for 7 days, after which effects on survival and growth are evaluated. The specific procedures used in these tests are described below.

The Chevron/Cawelo effluent = Sample #1 (Inlet Resv. B). The Receiving Water Control and dilution water for the effluent test = Sample #6 (Irrigation Canal–Dilution Water). The effluent and the Control/dilution water were used to prepare test solutions at the 12.5, 25, 50, 75, and

100% effluent concentrations. The other water samples were tested at the 100% concentration only. A Lab Water Control, consisting of US EPA synthetic moderately-hard water, was also prepared and tested. Fresh test solutions were prepared daily. "New" water quality characteristics (pH, D.O., and conductivity) were measured on these test solutions prior to use in the tests.

There were 4 replicates at each test treatment, each replicate consisting of 400 mL of test media in a 600-mL glass beaker. This test was initiated by randomly allocating 10 larval fathead minnows (<48 hrs old) into each replicate. The replicate beakers were placed in a temperature-controlled room at 25°C, under cool-white fluorescent lighting on a 16L:8D photoperiod. The test fish were fed brine shrimp nauplii twice daily.

Each replicate was examined daily, with any dead animals, uneaten food, wastes, and other detritus being removed. The number of live fish in each replicate was determined and then approximately 80% of the test media in each beaker was carefully poured out and replaced with fresh test solution. "Old" water quality characteristics (pH, D.O., and conductivity) were measured on the old test water that had been discarded from one randomly-selected replicate at each treatment.

After 7 days exposure, the number of live fish in each replicate beaker was recorded. The fish from each replicate were then carefully euthanized in methanol, rinsed in de-ionized water, and transferred to a pre-dried and pre-tared weighing pan. These fish were then dried at 100°C for >24 hrs and re-weighed to determine the total weight of fish in each replicate; the total weight was then divided by the initial number of fish per replicate (n=10) to determine the "biomass value". The resulting survival and growth ("biomass value") data were analyzed to evaluate any impairment(s) caused by the effluent (or the other water samples); all statistical analyses were performed using the CETIS® statistical software.

2.3.1 Reference Toxicant Testing of the Larval Fathead Minnows

In order to assess the sensitivity of the fish to toxic stress, a reference toxicant test was performed. The reference toxicant test was performed similarly to the effluent test, except that test solutions consisted of "Lab Control" media spiked with NaCl at test concentrations of 0.75, 1.5, 3, 6, and 9 gm/L. The resulting test response data were analyzed to determine key dose-response point estimates (e.g., EC_{50}); all statistical analyses were made using the CETIS® software. These response endpoints were then compared to the 'typical response' range established by the mean ± 2 SD of the point estimates generated by the 20 most recent previous reference toxicant tests performed by this lab.

2.4 Phase I TIE Testing Procedures

The goal of the Phase I TIE is to determine the class of compounds (organics, metals, ammonia, etc.) responsible for effluent toxicity. This is achieved by performing physical and chemical manipulations on the effluent samples. The observed changes in effluent toxicity that result from

these manipulations provide clues as to the nature of toxicity. As per consultation with Chevron staff, a "targeted" Phase I TIE consisting of selected TIE treatments rather than the full complement of TIE treatments was performed.

The TIE testing was performed as described above for the initial effluent tests, except that each of the TIE treatments was tested at the 50% and 100% concentrations, and there were 5 replicates at each test treatment for the *Ceriodaphnia dubia* tests and 2 replicates per treatment for the fathead minnows.

2.4.1 TIE Fractionation Method Blanks

As part of the TIE process, a method blank is utilized for each fractionation treatment to determine whether any of the fractionation procedures contribute any artifactual toxicity to the manipulated sample. The fractionation method blanks for this test consisted of aliquots of the "Lab Water Control" water (for each species) that were subjected to each of the fractionation test treatments discussed below. All method blanks were tested at the 100% treatment only.

2.4.2 Baseline Test Procedures

The Baseline toxicity test is performed concurrently with the TIE fractionation tests, and consists of a test of the untreated effluent sample to assess toxicity at the time of the performance of the TIE, and to serve as a reference benchmark against which toxicity removal by the other TIE treatments can be assessed. The physical chemical nature of the compound(s) responsible for the observed toxicity can be determined by the pattern of toxicity removal by the TIE fractionation treatments relative to the Baseline test.

2.4.3 Centrifugation Test Procedures

Centrifugation of the effluent sample can affect sample toxicity through the removal of toxicants associated with suspended particulates. An aliquot of the effluent sample was centrifuged at 4500g for 30 minutes; a sub-sample of the supernatant was set aside for direct testing, with the remaining supernatant being used in C18SPE treatments. The centrifuged effluent test solution was then tested to determine if changes in effluent toxicity had occurred as a result of the centrifugation. A method blank was prepared in an identical fashion.

2.4.4 C18 Solid Phase Extraction (SPE) Fractionation Procedures

The C18SPE test is used to identify effluent toxicity that is due to compounds (non-polar organics and some relatively non-polar metal chelates) that are removed or sorbed onto chromatography resin specific for non-polar organic compounds. An appropriate volume of the centrifuged effluent sample was passed over a C18SPE column. A method blank was prepared in an identical fashion.

2.4.5 Aeration Treatment Procedures

This fractionation is designed to determine the extent of effluent toxicity that can be attributed to volatile, sublatable, or oxidizable compounds. Using a pipette connected to an air-delivery

system, aliquots of the effluent were vigorously aerated under a ventilation hood for 1 hour. After this aeration period, the treated effluents were carefully siphoned off into glass beakers to ensure that any compounds deposited on the aeration glassware via sublation (e.g., foam) were not introduced back into the samples. Method blanks were prepared in a similar fashion.

2.4.6 Piperonyl Butoxide (PBO)

The PBO treatment is used to identify contaminants whose toxicity is mediated by the Cytochrome P-450 (Cyp450) enzyme system. PBO inactivates this enzyme system, so that the toxicity of contaminants whose toxicity would have been removed by Cyp450 is increased (e.g., pyrethroid pesticides, etc), whereas the toxicity of contaminants whose toxicity would have been increased by Cyp450 is reduced (e.g., OP pesticides [such as chlorpyrifos], etc.). Two PBO treatments were used: 25 μg/L PBO and 100 μg/L PBO.

3. RESULTS OF THE INITIAL TOXICITY TESTING

3.1 Chronic Effects of the Chevron/Cawelo Effluent

3.1.1 Effects of Chevron/Cawelo Effluent (Sample #1 - Inlet Resv B) on *Ceriodaphnia dubia*

The results of this test are summarized below in Table 3. There was 100% survival at the Receiving Water Control treatment. There were no significant reductions in survival in the sample; the survival NOEC was 100% sample, resulting in 1.0 TUc (where TUc =100/NOEC).

There was a mean of 28.7 offspring per female at the Receiving Water Control treatment. There were significant reductions in reproduction; the reproduction NOEC was 25% sample, resulting in 4.0 TUc (where TUc =100/NOEC).

The test data and summary of statistical analyses for this test are presented in Appendix B.

Table 3. Effects of Chevron/Cawelo effluent (Sample #1) on *Ceriodaphnia dubia*.

Effluent Treatment	% Survival	Reproduction (# neonates /female)
Lab Water Control	100	25.4
Receiving Water Control (= Sample #6)	100	28.7
12.5%	100	26.8
25%	100	23.6[a]
50%	100	**15.9***
75%	100	**8.2***
100%	100	**1.9***
Summary of Statistics		
No Observable Effect Concentration (NOEC) =	100% effluent	25% effluent
TUc (where TUc = 100/NOEC) =	1.0	4.0
Survival EC_{25} or Reproduction IC_{25} =	Could not be calculated, but can be assumed to be >100% effluent	30.2% effluent
Survival EC_{50} or Reproduction IC_{50} =		54.3% effluent

* Significantly less than the Lab Control treatment response at $p < 0.05$.

a - As per EPA guidance (see page 6-8 of EPA 833-R-00-003 and pages 51-52 of EPA 821-R-02-013), this treatment should not be considered toxic even though the CETIS statistical summary sheets indicate that the sample is statistically less than the accompanying Control. The EPA guidance indicates that treatments with a very small relative difference from the Control treatment (i.e., smaller than the lower PMSD limit) are treated as though they do not differ significantly from the Lab Control (even if they do so statistically). The relative difference between the designated sample and the Lab Control is less than the Lower PMSD Bound of 13% established for the chronic *Ceriodaphnia* test. The EPA established this approach to avoid false positives that might otherwise result due to the high degree of precision achieved by the testing lab, and further notes that the Lower PMSD Bound represents a practical limit to the sensitivity of the test method because few laboratories are able to achieve such precision on a regular basis and most do not achieve it even occasionally.

3.1.2 Effects of Chevron/Cawelo Effluent (Sample #1 - Inlet Resv B) on Fathead Minnows

The results of this test are summarized below in Table 4. There was 100% survival at the Lab Water Control treatment. There were significant reductions in survival in the effluent; the NOEC was 12.5% effluent, resulting in 8.0 TUc (where TUc =100/NOEC).

There was a mean 'biomass value' of 0.48 mg at the Lab Water Control treatment. The growth NOEC was also 12.5% effluent, resulting in 8.0 TUc.

The test data and the summary of statistical analyses for this test are presented in Appendix C.

Table 4. Effects of Chevron/Cawelo effluent (Sample #1) on fathead minnows.

Effluent Treatment	% Survival	Mean Fish Biomass Value (mg)
Lab Water Control	100	0.48
Receiving Water Control (= Sample #6)	55[a]	0.30
12.5%	67.5[a]	0.23
25%	**22.5*[a]**	0.05
50%	**0*[a]**	-
75%	**0***	-
100%	**0***	-
Summary of Statistics		
No Observable Effect Concentration (NOEC) =	12.5% effluent	12.5% effluent
TUc (where TUc = 100/NOEC) =	8.0	8.0
Survival EC_{25} or Growth IC_{25} =	16.5% effluent	12.7% effluent
Survival EC_{50} or Growth IC_{50} =	21.7% effluent	16.9% effluent

* Significantly less than the Lab Water Control treatment response at $p < 0.05$.
a – Many of the mortalities at this test treatment were due to pathogen-related mortalities (PRM).

3.2 Chronic Toxicity Testing Results for the Remaining Water Samples

3.2.1 Effects of Sample #4 (Valley Waste) on *Ceriodaphnia dubia*

The results of this test are summarized below in Table 5. There was 80% survival at the Lab Water Control treatment. There was no significant reduction in survival in the Sample #4 water; the survival NOEC was 100% effluent.

There was a mean of 15.8 offspring per female at the Lab Water Control treatment. There was a significant reduction in reproduction in the Sample #4 water; the reproduction NOEC was <100% effluent.

The test data and summary of statistical analyses for this test are presented in Appendix D.

Table 5. Effects of Sample #4 (Valley Waste) on *Ceriodaphnia dubia*.

Effluent Treatment	% Survival	Reproduction (# neonates /female)
Lab Water Control	80	15.8
100%	90	**2.2***
Summary of Statistics		
No Observable Effect Concentration (NOEC) =	100% effluent	<100% effluent
TUc (where TUc = 100/NOEC) =	1.0	>1.0

* Significantly less than the Lab Control treatment response at $p < 0.05$.

3.2.2 Effects of Sample #4 (Valley Waste) on Fathead Minnows

The results of this test are summarized below in Table 6. There was 97.5% survival at the Lab Water Control treatment. There was complete mortality in the Sample #4 water; the survival NOEC was <100% effluent.

The test data and summary of statistical analyses for this test are presented in Appendix E.

Table 6. Effects of Sample #4 (Valley Waste) on fathead minnow survival and reproduction.

Effluent Treatment	% Survival	Mean Fish Biomass Value (mg)
Lab Water Control	97.5	0.48
100%	**0***	-[a]
Summary of Statistics		
No Observable Effect Concentration (NOEC) =	<100% effluent	<100% effluent
TUc (where TUc = 100/NOEC) =	>1.0	>1.0

* Significantly less than the Lab Control treatment response at $p < 0.05$.

[a] – Due to complete mortality in the sample, growth endpoint was not evaluated

3.2.3 Effects of Sample #5 (Irrigation Canal – Top of Hill) on *Ceriodaphnia dubia*

The results of this test are summarized below in Table 7. There was 80% survival at the Lab Water Control treatment. There was no significant reduction in survival in the Sample #5 water; the survival NOEC was 100% effluent.

There was a mean of 15.8 offspring per female at the Lab Water Control treatment. There were significant reductions in reproduction in the Sample #5 water; the reproduction NOEC was <100% effluent.

The test data and summary of statistical analyses for this test are presented in Appendix F.

Table 7. Effects of Sample #5 (Irrigation Canal - Top of Hill) on *Ceriodaphnia dubia*.

Effluent Treatment	% Survival	Reproduction (# neonates /female)
Lab Water Control	80	15.8
100%	90	**4.1***
Summary of Statistics		
No Observable Effect Concentration (NOEC) =	100% effluent	<100% effluent
TUc (where TUc = 100/NOEC) =	1.0	>1.0

3.2.4 Effects of Sample #5 (Irrigation Canal – Top of Hill) on Fathead Minnows

The results of this test are summarized below in Table 8. There was 97.5% survival at the Lab Water Control treatment. There was complete mortality in the Sample #5 water; the survival NOEC was <100% effluent. The test data and summary of statistical analyses for this test are presented in Appendix G.

Table 8. Effects of Sample #5 (Irrigation Canal - Top of Hill) on fathead minnows.

Effluent Treatment	% Survival	Mean Fish Biomass Value (mg)
Lab Water Control	97.5	0.48
100%	**0***	-[a]
Summary of Statistics		
No Observable Effect Concentration (NOEC) =	<100% effluent	<100% effluent
TUc (where TUc = 100/NOEC) =	>1.0	>1.0

* Significantly less than the Lab Control treatment response at $p < 0.05$.

[a] – Due to complete mortality in the sample, growth endpoint was not evaluated

3.2.5 Effects of Sample #6 (Irrigation Canal – Dilution Water) on *Ceriodaphnia dubia*

The results of this test are summarized below in Table 9. There was 100% survival at the Lab Water Control treatment. There were no significant reductions in survival in the Sample #6 water; the survival NOEC was 100% effluent.

There was a mean of 25.4 offspring per female at the Lab Water Control treatment. There were no significant reductions in reproduction; the reproduction NOEC was 100% effluent.

The test data and summary of statistical analyses for this test are presented in Appendix H.

Table 9. Effects of Sample #6 (Irrigation Canal - Dilution Water) on *Ceriodaphnia dubia* .

Effluent Treatment	% Survival	Reproduction (# neonates /female)
Lab Water Control	100	25.4
100%	100	28.7
Summary of Statistics		
No Observable Effect Concentration (NOEC) =	100% effluent	100% effluent
TUc (where TUc = 100/NOEC) =	1.0	1.0

3.2.6 Effects of Sample #6 (Irrigation Canal – Dilution Water) on Fathead Minnows

The results of this test are summarized below in Table 10. There was 100% survival at the Lab Water Control treatment. There were significant reductions in survival in the Sample #6 water; the survival NOEC was <100% effluent.

There was a mean 'biomass value' of 0.48 mg at the Lab Water Control treatment. There were concomitant reductions in growth in the Sample #6 water; the growth NOEC was <100% effluent.

The test data and summary of statistical analyses for this test are presented in Appendix I.

Table 10. Effects of Sample #6 (Irrigation Canal - Dilution Water) on fathead minnows.

Effluent Treatment	% Survival	Mean Fish Biomass Value (mg)
Lab Water Control	100	0.48
100%	**55***	0.30
Summary of Statistics		
No Observable Effect Concentration (NOEC) =	<100% effluent	<100% effluent
TUc (where TUc = 100/NOEC) =	>1.0	>1.0

* Significantly less than the Lab Control treatment response at $p < 0.05$.

3.3 Reference Toxicant Toxicity to *Ceriodaphnia dubia*

Results of this test are summarized below in Table 11. There was 90% survival and a mean of 29.8 neonates per female at the Lab Control treatment. The survival EC_{50} was 1710 mg/L NaCl, and the reproduction IC_{50} was 1080 mg/L NaCl.

These reference toxicant test results are consistent with previous *Ceriodaphnia dubia* reference toxicant tests performed in this laboratory, indicating that these organisms were responding to toxic stress in a typical fashion.

The test data and the summary of statistical analyses for this test are presented in Appendix J.

Table 11. Reference toxicant testing: Effects of NaCl on *Ceriodaphnia dubia*

Treatment (mg/L NaCl)	% Survival	Reproduction (# neonates/female)
Lab Control	90	29.8
250	100	29.7
500	100	**23.3***
1000	90	**17.1***
1500	100	**5.5***
2000	**0***	0
Summary of Key Statistics		
Survival EC_{50} or Reproduction IC_{50} =	1710 mg/L NaCl	1080 mg/L NaCl

* Significantly less than the Lab Control treatment response at $p < 0.05$.

3.4 Reference Toxicant Toxicity to Fathead Minnows

The results of this test are summarized below in Table 12. There was 87.5% survival and a mean biomass value of 0.40 mg at the Lab Control treatment. The survival EC_{50} was 2.4 gm/L NaCl and the growth IC_{50} was 1.9 gm/L NaCl.

These reference toxicant test results are consistent with previous fathead minnow reference toxicant tests performed in this laboratory, indicating that these organisms were responding to toxic stress in a typical fashion.

The test data and summary of statistical analyses for this test are presented in Appendix K.

Table 12. Reference toxicant testing: effects of NaCl on fathead minnows.

NaCl Treatment (gm/L)	% Survival	Mean Fish Biomass Value (mg)
Lab Control	87.5	0.40
0.75	82.5	0.34
1.5	**72.5***	**0.26**
3	**25***	**0.07**
6	**0***	**0.0**
9	**0***	**0.0**
Summary of Statistics		
Survival EC_{50} or Growth IC_{50} =	2.4 gm/L NaCl	1.9 gm/L NaCl

* Significantly less than the Lab Control treatment response at $p < 0.05$.

4. RESULTS OF THE CHEVRON/CAWELO EFFLUENT TIE

4.1 Chronic TIE Results for *Ceriodaphnia dubia*

The results of these tests are listed below. Note that due to the poor reproduction exhibited by the *Ceriodaphnia dubia* in the initial TIE, a TIE re-test was performed. The results of both sets of TIEs are reported here.

The results of the initial TIE are presented in Tables 13a and 13b. As in the initial test (Section 3.1.1), there was no toxicity to *Ceriodaphnia* survival in the untreated effluent (= Baseline). However, the reduction to 60% survival at the 100 μg/L PBO treatment is suggestive of the presence of pyrethroid pesticides (or other contaminants that normally would be detoxified by the Cytochrome P-450 enzyme system).

The reduction in reproduction in the untreated effluent (= Baseline) is also consistent with the initial test, and confirms that this toxicity was persistent and present at the time of the TIE.

- There was a partial removal of toxicity by the centrifugation treatment, which suggests that some fraction of the toxicants present were associated with particulates (again, this is consistent with pyrethroids or other contaminants with a high affinity for sorption to particulates);
- There was similar partial removal of the reproduction toxicity by aeration which suggests that some fraction of the toxicants present were subject to volatilization and/or oxidation, or that may have become associated with the foam that forms during aeration (i.e., sublatable);
- The toxicity remaining after centrifugation was effectively removed by the C18SPE treatment, indicating that non-polar organics were a primary cause of the observed toxicity;
- There was an increase in toxicity at the 100 μg/L PBO treatment (particularly apparent at the 50% effluent concentration), which again is suggestive of the presence of pyrethroid pesticides (or other contaminants that normally would be detoxified by the Cytochrome P-450 enzyme system).

The test data & summary of statistical analyses for this initial TIE are presented in Appendix L.

Table 13a. Effects of the TIE treatments on the toxicity of the Chevron/Cawelo effluent to *Ceriodaphnia dubia* – Initial Testing

TIE Treatment	Mean % Survival			Toxicity Removal?
	Control/Blank	50% effluent	100% effluent	
Baseline	100	100	100	
Centrifugation	100	100	100	n/a
C18SPE	80	100	100	n/a
Aeration	100	100	100	n/a
PBO (25 μg/L)	100	80	100	n/a
PBO (100 μg/L)	100	100	60	**toxicity increased?**

Table 13b. Effects of the TIE treatments on the toxicity of the Chevron/Cawelo effluent to *Ceriodaphnia dubia* – Initial TIE Testing.

TIE Treatment	Mean # of Offspring per Female			Toxicity Removal?
	Control/Blank	50% effluent	100% effluent	
Baseline	28.6	26.2	2.6	
Centrifugation	0.6	27.6	13.8	partial removal
C18SPE	20.0	26.8	21.6	**YES**
Aeration	14.4	23.8	11.2	partial removal
PBO (25 μg/L)	22.4	18.6	2.0	no
PBO (100 μg/L)	21.6	5.6	0	**toxicity increased**

The results of the second TIE are presented in Tables 14a and 14b. As in the initial test (Section 3.1.1) and initial TIE, there was no toxicity to *Ceriodaphnia* survival in the untreated effluent (= Baseline). The absence of increased mortalities at the 100 μg/L PBO treatment suggests that the toxicant that had been responsible for the mortalities in the initial TIE was degrading and/or was becoming more sorbed to the sample container materials (the latter of which is a common characteristic of pyrethroids).

The reduction in reproduction in the untreated effluent (= Baseline) is also consistent with the initial test and initial TIE, again confirming that this toxicity was persistent and present at the time of the TIE.

- There was removal of the reproduction toxicity by the C18SPE treatment, indicating that non-polar organics were a cause of the observed toxicity;
- There was a slight increase in toxicity at the 100 μg/L PBO treatment, which again is suggestive of the presence of pyrethroid pesticides (or other contaminants that normally would be detoxified by the Cytochrome P-450 enzyme system).

The test data & summary of statistical analyses for this second TIE are presented in Appendix M.

Table 14a. Effects of the TIE treatments on the toxicity of the Chevron/Cawelo effluent to *Ceriodaphnia dubia* – Re-tests.

TIE Treatment	Mean % Survival			Toxicity Removal?
	Control/Blank	50% effluent	100% effluent	
Baseline	100	100	100	
Centrifugation	100	100	100	n/a
C18SPE	100	100	100	n/a
Aeration	100	100	100	n/a
PBO (25 μg/L)	100	100	100	n/a
PBO (100 μg/L)	100	100	100	n/a

Table 14b. Effects of the TIE treatments on the toxicity of the Chevron/Cawelo effluent to *Ceriodaphnia dubia* – Re-tests.

TIE Treatment	Mean # of Offspring per Female			Toxicity Removal?
	Control/Blank	50% effluent	100% effluent	
Baseline	24.8	26.8	7.8	
Centrifugation	24.2	19.8	9.2	no
C18SPE	25.2	29.0	20.2	**YES**
Aeration	23.0	24.0	8.8	no
PBO (25 μg/L)	24.6	27.0	9.8	no
PBO (100 μg/L)	20.8	21.0	2.8	**slight increase?**

4.2 Chronic TIE Results for Fathead Minnows

The results of this TIE are presented in Tables 15a and 15b. Please note that PRMs were observed in the C18SPE Blank. As a result, this TIE treatment was immediately re-tested.

As in the initial test (Section 3.1.2), there were significant reductions in survival in the untreated effluent (= Baseline), confirming that this toxicity was persistent and present at the time of the TIE.

- There was a partial removal of survival toxicity by the centrifugation treatment at the 50% effluent concentration, which suggests that some fraction of the toxicants present were associated with particulates (again, this is consistent with pyrethroids or other contaminants with a high affinity for sorption to particulates);
- There was similarly partial removal of the survival toxicity by aeration at the 50% effluent concentration which suggests that some fraction of the toxicants present were subject to volatilization and/or oxidation, or that may have become associated with the foam that forms during aeration (i.e., sublatable).
- There was complete removal of toxicity by the C18SPE treatment, indicating that non-polar organics were a major cause of the observed toxicity;
- The re-test with C18SPE re-confirmed the complete removal of toxicity by the C18SPE treatment.

The growth results of the TIE generally mirror those of the survival data.

The test data & summary of statistical analyses for the initial TIE with fathead minnows are presented in Appendix N. The test data & summary of statistical analyses for the re-test of the C18SPE treatment are presented in Appendix O.

Table 15a. Effects of the TIE treatments on the toxicity of the Chevron/Cawelo effluent to fathead minnows.

TIE Treatment	Mean % Survival			Toxicity Removal?
	Control/Blank	50% effluent	100% effluent	
Baseline	90	20	0	
Centrifugation	100	50	0	partial at 50%
C18SPE	30[a]	90	100	**YES**
Aeration	100	70	0	partial at 50%
C18SPE Re-test				
Baseline	100	30	0	
C18SPE	70[a]	100	90	**YES**

a – PRM was associated with dead fish.

Table 15b. Effects of the TIE treatments on the toxicity of the Chevron/Cawelo effluent to fathead minnows.

TIE Treatment	Mean 'Biomass Value' (mg)			Toxicity Removal?
	Control/Blank	50% effluent	100% effluent	
Baseline	0.53	0.01	0	
Centrifugation	0.44	0.09	0	no
C18SPE	0.13[a]	0.76	0.88	**YES**
Aeration	0.64	0.23	0	Partial at 50%
C18SPE Re-test				
Baseline	0.67	0.05	0.01	
C18SPE[a]	0.33	0.62	0.65	**YES**

a – The reduction in 'biomass value' was the result of the PRM mortalities.

5. SUMMARY AND CONCLUSIONS

Chronic Effects of Chevron/Cawelo Effluent on *Ceriodaphnia dubia*
There were no significant reductions in survival in the sample; the survival NOEC was 100% sample, resulting in 1.0 TUc (where TUc =100/NOEC). There were significant reductions in reproduction; the reproduction NOEC was 25% sample, resulting in 4.0 TUc.

Chronic Effects of Chevron/Cawelo Effluent on Fathead Minnows
There were significant reductions in survival in the effluent; the NOEC was 12.5% effluent, resulting in 8.0 TUc (where TUc =100/NOEC). The growth NOEC was also 12.5% effluent, resulting in 8.0 TUc.

Other Water Samples
The results of the tests of the other water samples that were collected for toxicity testing follow:

Sample 4 – Valley Waste
Ceriodaphnia dubia
There were no significant reductions in survival; however there was a significant reduction in reproduction.

Fathead Minnows
There was complete mortality in the Valley Waste water sample.

Sample 5 – Irrigation Canal–Top of Hill
Ceriodaphnia dubia
There were no significant reductions in survival; however there was a significant reduction in reproduction.

Fathead Minnows
There was complete mortality in the Irrigation Canal–Top of Hill water sample.

Sample 6 – Irrigation Canal–Dilution Water
Ceriodaphnia dubia
There were no significant reductions in survival or reproduction.

Fathead Minnows
There were significant reductions in survival in the Irrigation Canal–Dilution Water sample; these mortalities were attributed primarily to pathogen-related mortalities (PRM). The reduction in survival resulted in a concomitant reduction in growth as 'biomass value'; however, there were no reductions in growth as 'mean dry weight per surviving individual'.

Results of the TIEs with *Ceriodaphnia dubia*

Initial TIE

As in the initial test, there was no toxicity to *Ceriodaphnia* survival in the untreated effluent. However, the reduction to 60% survival at the 100 μg/L PBO treatment is suggestive of the presence of pyrethroid pesticides (or other contaminants that normally would be detoxified by the Cytochrome P-450 enzyme system).

The reduction in reproduction in the untreated effluent is also consistent with the initial test, and confirms that this toxicity was persistent and present at the time of the TIE.

- There was a partial removal of toxicity by the centrifugation treatment, which suggests that some fraction of the toxicants present were associated with particulates (again, this is consistent with pyrethroids or other contaminants with a high affinity for sorption to particulates);
- There was similarly partial removal of the reproduction toxicity by aeration which suggests that some fraction of the toxicants present were subject to volatilization and/or oxidation, or that may have become associated with the foam that forms during aeration (i.e., sublatable);
- The toxicity remaining after centrifugation was effectively removed by the C18SPE treatment, indicating that non-polar organics were a cause of the observed toxicity;
- There was an increase in toxicity at the 100 μg/L PBO treatment (particularly apparent at the 50% effluent concentration), which again is suggestive of the presence of pyrethroid pesticides (or other contaminants that normally would be detoxified by the Cytochrome P-450 enzyme system).

TIE Re-Test

Note that due to the poor reproduction exhibited by the *Ceriodaphnia dubia* in the initial TIE, a TIE re-test was performed.

As in the initial test (and initial TIE), there was no toxicity to *Ceriodaphnia* survival in the untreated effluent. The absence of increased mortalities at the 100 μg/L PBO treatment suggests that the toxicant that had been responsible for the mortalities in the initial TIE was degrading and/or was becoming more sorbed to the sample container materials (the latter of which is a common characteristic of pyrethroids).

The reduction in reproduction in the untreated effluent is also consistent with the initial test and initial TIE, again confirming that this toxicity was persistent and present at the time of the TIE.

- There was removal of the reproduction toxicity by the C18SPE treatment, indicating that non-polar organics were a cause of the observed toxicity;
- There was a slight increase in toxicity at the 100 μg/L PBO treatment, which again is suggestive of is suggestive of the presence of pyrethroid pesticides (or other contaminants that normally would be detoxified by the Cytochrome P-450 enzyme system).

Results of the TIEs with Fathead Minnows

Please note that PRMs were observed in the C18SPE Blank. As a result, this TIE treatment was immediately re-tested.

As in the initial test, there were significant reductions in survival in the untreated effluent, confirming that this toxicity was persistent and present at the time of the TIE.

- There was a partial removal of survival toxicity by the centrifugation treatment at the 50% effluent concentration, suggesting that some fraction of the toxicants present were associated with particulates (again, this is consistent with pyrethroids or other contaminants with a high affinity for sorption to particulates);
- There was similarly partial removal of the survival toxicity by aeration at the 50% effluent concentration, suggesting that some fraction of the toxicants present were subject to volatilization and/or oxidation, or that may have become associated with the foam that forms during aeration (i.e., sublatable);
- There was complete removal of toxicity by the C18SPE treatment, indicating that non-polar organics were a major cause of the observed toxicity;
- The re-test with C18SPE re-confirmed the complete removal of toxicity by the C18SPE treatment.

The growth results of the TIE generally mirror those of the survival data.

Other TIE Notes

Note that in several places in this interpretation of TIE results, pyrethroid pesticides have been mentioned as an example of a contaminant that would "fit" the TIE effect being observed. This should not be interpreted as a strong signal that it is, in fact, pyrethroid pesticides causing the toxicity. For instance, polymers (e.g., polymers used as flocculating agents in the wastewater treatment process) might also be expected to exhibit many of the same TIE effects. However, pyrethroids have recently received a great deal of attention as its use (and identification as a cause of toxicity) has increased in recent years, and it has been observed to cause toxicity in wastewater treatment plant effluents. On that basis, we would recommend that future toxic effluent samples be analyzed for pyrethroid pesticides.

The removal of toxicity by the C18SPE treatment is an important observation, as that lends itself to further identification of the contaminants via a Phase II TIE. The C18SPE columns were frozen after their use in treating the effluent. These columns could be eluted with the eluate being tested for toxicity. If toxicity can be recovered in the eluate, then the eluate could undergo further testing and analyses to attempt to identify the specific contaminant(s) responsible for the toxicity.

5.1 QA/QC Summary

Test Conditions – Test conditions (pH, D.O., temperature, etc.) were all within acceptable limits for these tests. All analyses were performed according to laboratory Standard Operating Procedures.

Negative Lab Control – The biological responses in the Lab Water Control treatments for these tests were within acceptable limits.

Positive Control – The results of the concurrent reference toxicant test were consistent with the previous reference toxicant tests performed in our lab for both species, indicating that the test organisms used in the current tests were responding to toxic stress in a typical and consistent fashion.

Concentration Response Relationships – There were valid concentration-response relationships for the reference toxicant tests, which were determined to be acceptable for this testing.

Appendix A

Chain-of-Custody Record for the Collection and Delivery of the Chevron/Cawelo Effluent Sample and Other Water Samples

CHAIN OF CUSTODY RECORD

PACIFIC ECORISK
2250 Cordelia Rd
Fairfield, CA 94534
Ph: (707) 207-7760
Fax: (707) 207-7916
www.pacificecorisk.com

RESULTS TO:
PRECISION ANALYTICAL INC
321 - 19th St
BAKERSFIELD CA 93301
Attn: Stephen Harris
Phone: 661-323-1682
Email: SHARRIS@PALAB-INC.COM

BILL TO:
SAME
Attn:
Phone:
Email:

PROJECT:
CHEVRON / CANCO

ANALYSES REQUESTED

	SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE MATRIX	GRAB/ COMP.	# CONTAINERS/TYPE	REMARKS
1	Inlet Resv B	4/21/09	0944	W	G	1	
2	Splitter Box	↓	1100	↓	↓	1	
3	Eff. CATTAIL CELL	↓	1013	↓	↓	1	
4	V.W.	↓	0921	↓	↓	1	
5	Irrigation Canal-Top of Hill	↓	1120	↓	↓	1	
6	Irrigation Canal-Dilution water	↓	1210	↓	↓	1	
						1	
						1	

METHOD OF SHIPMENT: FedEx:____ UPS:____ HAND:____ OTHER: COURIER

COMMENTS:
#1 - 6 CONTAINERS
#2 - 1 "
#3 - 1 "
#4 - 1 CONTAINER
#5 - 1 CONTAINER
#6 - 6 CONTAINERS

CODES:

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	PAGE #
[signature]	4/21/09	1400	[signature]	4-21-09	1400	OF
[signature]	4-21-09	1900	[signature]	4/21/09	1900	

WHITE - RETURN W/ SAMPLE YELLOW - KEEP FOR YOUR RECORDS

Appendix B

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Chevron/Cawelo Effluent to *Ceriodaphnia dubia*

CETIS Summary Report

Report Date: 14 May-09 17:02 (p 1 of 2)
Test Code: 09-1960-5150/32721

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Batch ID:	11-4677-6643	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Quang Do
Start Date:	22 Apr-09 19:00	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	
Ending Date:	29 Apr-09 16:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	01-9321-2529	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	21 Apr-09 19:00	**Source:**	Precision Analytical		
Sample Age:	33h (10.5 °C)	**Station:**	Inlet Resv B		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
12-7062-1284	7d Survival Rate	100	>100	N/A	N/A	1	Fisher Exact/Bonferroni-Holm Test
11-0773-5916	Reproduction	12.5	25	17.7	15.8%	8	Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
10-2275-5499	Reproduction	IC5	6.14	1.09	25.8	16.3	Linear Interpolation (ICPIN)
		IC10	15.5	3.36	28.7	6.47	
		IC15	21.1	8.09	31.8	4.74	
		IC20	26.5	15.6	35.6	3.77	
		IC25	30.2	20.2	41.7	3.31	
		IC40	44.4	34.9	55.8	2.25	
		IC50	54.3	44.8	61.7	1.84	

7d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	10	1	1	1	1	1	0	0	0.0%	0.0%
0	Receiving Water	10	1	1	1	1	1	0	0	0.0%	0.0%
12.5		10	1	1	1	1	1	0	0	0.0%	0.0%
25		10	1	1	1	1	1	0	0	0.0%	0.0%
50		10	1	1	1	1	1	0	0	0.0%	0.0%
75		10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	0.0%

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	10	25.4	23.6	27.2	16	31	0.879	4.81	18.9%	0.0%
0	Receiving Water	10	28.7	26.7	30.7	19	38	0.959	5.25	18.3%	-13.0%
12.5		10	26.8	25.6	28	21	31	0.582	3.19	11.9%	-5.51%
25		10	23.6	21.6	25.6	15	32	0.986	5.4	22.9%	7.09%
50		10	15.9	14	17.8	9	23	0.933	5.11	32.1%	37.4%
75		10	8.2	6.53	9.87	0	14	0.816	4.47	54.5%	67.7%
100		10	1.9	1.07	2.73	0	5	0.408	2.23	118.0%	92.5%

Ceriodaphnia 7-d Survival and Reproduction Test — Pacific EcoRisk

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	Lab Water Contr	1	1	1	1	1	1	1	1	1	1
0	Receiving Water	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
75		1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1

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	Lab Water Contr	31	28	30	16	19	25	26	28	23	28
0	Receiving Water	29	19	30	38	29	25	30	24	29	34
12.5		21	26	28	25	31	29	30	23	29	26
25		22	18	15	20	29	32	29	26	21	24
50		11	22	19	18	19	14	23	15	9	9
75		2	9	8	0	11	13	9	10	6	14
100		1	5	2	1	0	5	0	0	0	5

CETIS Analytical Report

Report Date: 30 Apr-09 12:36 (p 1 of 1)
Test Code: 09-1960-5150/32721

Ceriodaphnia 7-d Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	12-7062-1284	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	30 Apr-09 12:34	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

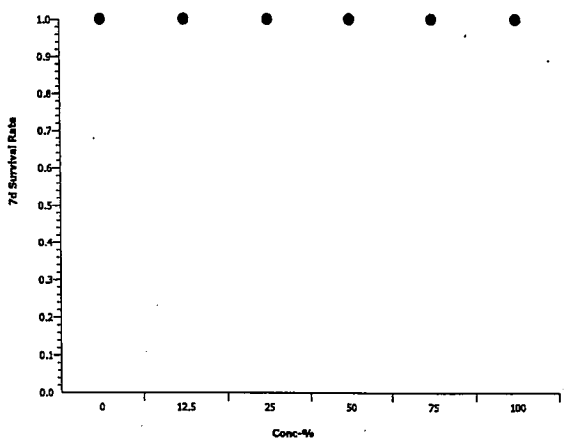
Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Receiving Water		12.5	1	1.0000	Non-Significant Effect
		25	1	1.0000	Non-Significant Effect
		50	1	1.0000	Non-Significant Effect
		75	1	1.0000	Non-Significant Effect
		100	1	1.0000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Receiving Wate	10	0	10
12.5		10	0	10
25		10	0	10
50		10	0	10
75		10	0	10
100		10	0	10

Graphics



CETIS Analytical Report

Report Date: 30 Apr-09 12:35 (p 1 of 1)
Test Code: 09-1960-5150/32721

Ceriodaphnia 7-d Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	11-0773-5916	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	30 Apr-09 12:34	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	12.5	25	17.7	8	15.8%

Dunnett's Multiple Comparison Test

Control vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Receiving Water	12.5	0.958	2.29	4.54	0.4356	Non-Significant Effect
	25*	2.57	2.29	4.54	0.0261	Significant Effect
	50*	6.46	2.29	4.54	<0.0001	Significant Effect
	75*	10.3	2.29	4.54	<0.0001	Significant Effect
	100*	13.5	2.29	4.54	<0.0001	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.29	3.2	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	5815.483	1163.097	5	59.2	<0.0001	Significant Effect
Error	1061.5	19.65741	54			
Total	6876.983	1182.754	59			

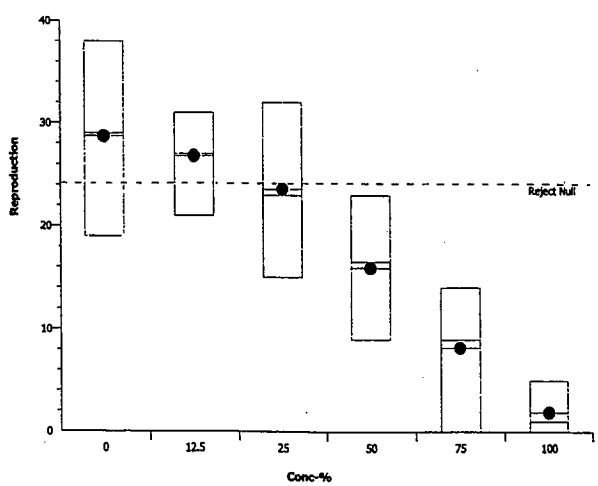
ANOVA Assumptions

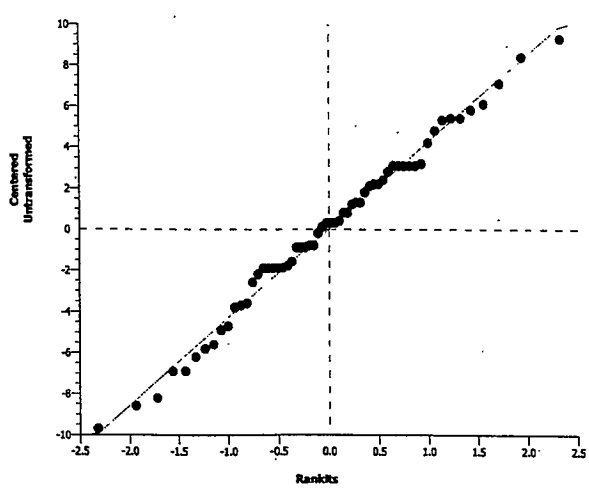
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	8.62	15.1	0.1254	Equal Variances
Distribution	Shapiro-Wilk Normality	0.989		0.8567	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Receiving Water	10	28.7	26.7	30.7	19	38	0.975	5.25	18.3%	0.0%
12.5		10	26.8	25.6	28	21	31	0.592	3.19	11.9%	6.62%
25		10	23.6	21.5	25.7	15	32	1	5.4	22.9%	17.8%
50		10	15.9	14	17.8	9	23	0.949	5.11	32.1%	44.6%
75		10	8.2	6.5	9.9	0	14	0.83	4.47	54.5%	71.4%
100		10	1.9	1.05	2.75	0	5	0.415	2.23	118.0%	93.4%

Graphics





CETIS Analytical Report

Report Date: 30 Apr-09 12:36 (p 1 of 1)
Test Code: 09-1960-5150/32721

Ceriodaphnia 7-d Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	10-2275-5499	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	30 Apr-09 12:34	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

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

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(5%)
Extreme Value	Grubbs Extreme Value	2.29	3.2	1.0000	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	6.14	1.09	25.8	16.3	3.88	92
IC10	15.5	3.36	28.7	6.47	3.48	29.8
IC15	21.1	8.09	31.8	4.74	3.15	12.4
IC20	26.5	15.6	35.6	3.77	2.81	6.42
IC25	30.2	20.2	41.7	3.31	2.4	4.95
IC40	44.4	34.9	55.8	2.25	1.79	2.86
IC50	54.3	44.8	61.7	1.84	1.62	2.23

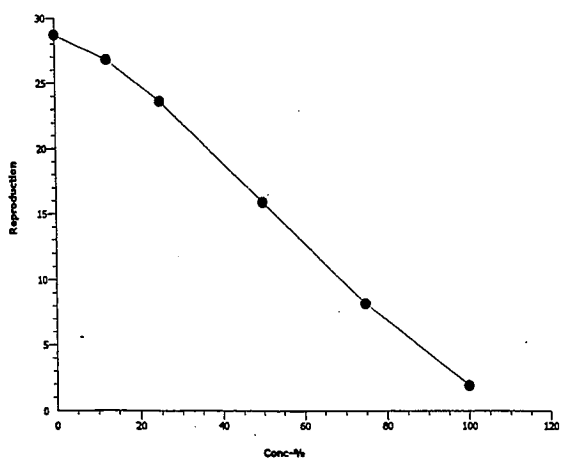
Reproduction Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Receiving Water	10	28.7	19	38	0.959	5.25	18.3%	0.0%
12.5		10	26.8	21	31	0.582	3.19	11.9%	6.62%
25		10	23.6	15	32	0.986	5.4	22.9%	17.8%
50		10	15.9	9	23	0.933	5.11	32.1%	44.6%
75		10	8.2	0	14	0.816	4.47	54.5%	71.4%
100		10	1.9	0	5	0.408	2.23	118.0%	93.4%

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	Receiving Water	29	19	30	38	29	25	30	24	29	34
12.5		21	26	28	25	31	29	30	23	29	26
25		22	18	15	20	29	32	29	26	21	24
50		11	22	19	18	19	14	23	15	9	9
75		2	9	8	0	11	13	9	10	6	14
100		1	5	2	1	0	5	0	0	0	5

Graphics



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (inlet to res B)** Test Date: 4/22/09

Project #: 14722 Test ID: 32721 Control / Diluent: Receiving Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	A	B	C	D	E	F	G	H	I	J	SAMPLE ID
Receiving Water	0	7.91		9.3		217	25.8	0	0	0	0	0	0	0	0	0	0	21978
	1	8.21	7.94	9.7	7.9	217	25.9	0	0	0	0	0	0	0	0	0	0	
	2	8.17	7.85	8.1	7.5	218	25.10	0	0	0	0	0	0	0	0	0	0	
	3	7.68	8.23	10.2	7.4	215	25.6	0	0	0	0	0	0	0	0	0	0	
	4	7.98	8.39	10.3	7.4	217	25.5	6	3	4	5	7	6	5	5	5	7	
	5	8.24	8.26	10.0	8.7	206	25.5	0	0	0	0	7	0	0	0	0	0	
	6	7.49	8.06	10.3	8.0	214	25.6	11	0	10	16	0	5	10	9	11	13	
	7	—	8.25	—	7.9	245	25.5	12	16	16	17	15	14	15	10	13	14	
	8																	
							Total=	29	19	30	38	29	25	30	24	29	34	Mean Neonates/Female = ~~26.5~~ 28.7

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	A	B	C	D	E	F	G	H	I	J	SAMPLE ID
12.5%	0	7.81		9.4		292	0	0	0	0	0	0	0	0	0	0	21973
	1	7.91	8.01	9.5	8.2	292	0	0	0	0	0	0	0	0	0	0	21973
	2	7.76	7.98	8.9	7.5	290	0	0	0	0	0	0	0	0	0	0	21973
	3	7.54	8.24	9.8	7.7	295	0	0	0	0	0	0	0	0	0	0	21973
	4	7.70	8.31 ~~8.50~~	9.7	7.4	294	4	2	5	4	5	7	7	5	5	5	21973
	5	7.69	8.16	10.9	8.1	294	0	0	0	0	0	0	11	0	0	0	21973
	6	7.43	8.08	10.6	8.0	296	10	12	10	6	13	8	0	7	10	8	21973
	7	—	8.27	—	8.3	328	7	12	13	15	13	14	12	11	14	13	—
	8																
							Total= 21	26	28	25	31	29	30	23	29	26	Mean Neonates/Female = 26.8

Pacific EcoRisk

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: Precision Analytical Sample ID: Sample 1 (inlet to res B) Test Date: 4/22/09

Project #: 14722 Test ID: 32721 Control / Diluent: Receiving Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	A	B	C	D	E	F	G	H	I	J
25%	0	7.58		9.2		367		0	0	0	0	0	0	0	0	0	0
	1	7.75	8.13	9.2	8.3	367		0	0	0	0	0	0	0	0	0	0
	2	7.72	8.09	8.8	7.7	365		0	0	0	0	0	0	0	0	0	0
	3	7.45	8.33	10.1	7.6	364		0	0	0	0	0	0	0	0	0	0
	4	7.52	8.35	10.0	7.4	365		5	4	4	3	5	6	6	4	5	2
	5	7.53	8.24	11.0	8.6	359		0	0	0	0	0	0	0	0	0	4
	6	7.33	8.17	10.6	7.9	371		7	9	8	8	10	10	10	9	6	9
	7	—	8.35	—	7.9	408		10	5	3	9	14	16	13	13	10	9
	8																
							Total=	22	18	15	20	29	32	29	26	21	24

Mean Neonates/Female = ~~20.4~~ 23.4

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	A	B	C	D	E	F	G	H	I	J
50%	0	[illegible]		9.1		507	0	0	0	0	0	0	0	0	0	0
	1	7.58	8.29	9.0	8.7	510	0	0	0	0	0	0	0	0	0	0
	2	7.58	8.29	8.6	7.8	509	0	0	0	0	0	0	0	0	0	0
	3	7.34	8.49	10.3	7.2	518	0	0	0	0	0	0	0	0	0	0
	4	7.35	8.43	9.1	7.5	508	0	2	3	0	2	0	4	0	0	0
	5	7.37	8.34	11.0	8.2	514	0	0	0	2	0	0	0	0	0	2
	6	7.19	8.35	10.6	8.0	530	0	7	5	5	5	3	8	5	7	7
	7	—	8.56	—	7.2	577	5	13	11	11	12	11	11	10	2	0
	8															
							Total= 11	22	19	18	19	14	23	15	9	9

Mean Neonates/Female = 15.9

Pacific EcoRisk

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (inlet to res B)** Test Date: 4/22/09

Project #: 14722 Test ID: 32721 Control / Diluent: Receiving Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	A	B	C	D	E	F	G	H	I	J
75%	0	7.30		8.6		653		0	0	0	0	0	0	0	0	0	0
	1	7.49	8.42	9.0	7.8	653		0	0	0	0	0	0	0	0	0	0
	2	7.49	8.42	8.6	7.9	660		0	0	0	0	0	0	0	0	0	0
	3	7.29	8.60	10.7	7.8	658		0	0	0	0	0	0	0	0	0	0
	4	7.23	8.54	9.6	7.5	658		0	0	0	0	1	3	0	0	0	0
	5	7.24	8.50	10.9	8.5	658		2	0	0	0	0	0	0	1	2	0
	6	7.14	8.48	10.6	7.9	681		0	0	3	0	2	4	4	4	0	6
	7	—	8.47	—	7.8	723		0	9	5	0	8	6	5	5	4	8
	8																
							Total=	2	9	8	0	11	13	9	10	6	14

Mean Neonates/Female = 8.2

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		A	B	C	D	E	F	G	H	I	J
100%	0	7.17		8.3		793		0	0	0	0	0	0	0	0	0	0
	1	7.39	8.43	8.6	7.2	797		0	0	0	0	0	0	0	0	0	0
	2	7.35	8.48	8.5	7.9	803		0	0	0	0	0	0	0	0	0	0
	3	7.23	8.70	10.8	7.9	802		0	0	0	0	0	0	0	0	0	0
	4	7.14	8.64	9.1	7.8	797		0	0	0	0	0	0	0	0	0	0
	5	7.17	8.57	10.8	8.3	797		1	0	0	0	0	0	0	0	0	0
	6	7.09	8.60	10.5	8.1	816		0	2	0	1	0	0	0	0	0	0
	7	—	8.61	—	7.7	852		0	3	2	0	0	5	0	0	0	5
	8																
							Total=	1	5	2	1	0	5	0	0	0	5

Mean Neonates/Female = 1.9

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (inlet to res B)** Test Date: 4/22/09

Project #: 14722 Test ID: 32721 Control / Diluent: Receiving Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	A	B	C	D	E	F	G	H	I	J	SIGN-OFF
Lab Water	0	7.72		9.0		215	25.8	0	0	0	0	0	0	0	0	0	0	Date: 4/22/09 New WQ: MTM Test Init.: JW Sol'n Prep: JW Time: 1900
	1	8.35	8.09	9.1	8.5	215	25.9	0	0	0	0	0	0	[illegible]	0	0	0	Date: 4/23/09 New WQ: PA Counts: JPC Sol'n Prep: PA Old WQ: JPC Time: 1700
	2	8.20	8.07	7.9	7.9	218	25.6	0	0	0	0	0	0	0	0	0	0	Date: 4/24/09 New WQ: VK Counts: W Sol'n Prep: EKK Old WQ: JJ Time: 1200
	3	8.12	8.35	8.4	7.3	215	25.6	0	0	0	0	0	0	0	0	0	0	Date: 4.25.09 New WQ: EKK Counts: JPC Sol'n Prep: EKK Old WQ: EKK Time: 1130
	4	8.34	8.34	9.3	7.4	219	25.5	4	1	5	4	4	0	5	5	0	0	Date: 4/26/09 New WQ: PA Counts: RV Sol'n Prep: JL Old WQ: RV Time: 1625
	5	8.09	8.29	10.1	10.1	215	25.5	0	0	0	0	0	0	0	0	0	0	Date: 4/27/09 New WQ: MTM Counts: EW Sol'n Prep: AB Old WQ: AK Time: 1415
	6	8.03	8.17	9.8	8.4	224	25.6	13	12	11	10	1	12	9	10	8	11	Date: 4/28/09 New WQ: PA Counts: JW Sol'n Prep: JW Old WQ: JB Time: 1550
	7	—	8.33	—	8.7	262	25.5	14	15	14	2	14	13	12	13	15 JW ~~13~~	17	Date: 4/29/09 New WQ: — Counts: JW Sol'n Prep: — Old WQ: JW Time: 1600
	8																	Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
							Total=	31	28	30	16	19	25	~~28~~ 26	28	23	28	Mean Neonates/Female = 25.4

Appendix C

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Chevron/Cawelo Effluent to Fathead Minnows

CETIS Summary Report

Report Date: 21 May-09 14:21 (p 1 of 2)
Test Code: 12-1033-4724/32727

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Batch ID:	00-5146-8528	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Quang Do
Start Date:	22 Apr-09 16:25	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	
Ending Date:	29 Apr-09 09:50	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 17h	**Source:**	Aquatic Biosystems, CO	**Age:**	1

Sample ID:	01-9321-2529	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	21 Apr-09 19:00	**Source:**	Precision Analytical		
Sample Age:	31h (10.5 °C)	**Station:**	Inlet Resv B		

Sample Note: Baseline

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
10-2793-1400	7d Survival Rate	12.5	25	17.7	59.2%	8	Dunnett's Multiple Comparison Test
14-6208-7088	Mean Dry Biomass-mg	12.5	25	17.7	26.3%	8	Dunnett's Multiple Comparison Test
20-1691-4777	Mean Dry Weight-mg	<12.5	12.5	N/A	28.1%	>8	Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
20-3592-0886	7d Survival Rate	EC5	13.2	N/A	14.1	7.57	Linear Interpolation (ICPIN)
		EC10	14	5.28	15.9	7.16	
		EC15	14.8	11.9	17.9	6.77	
		EC20	15.6	12.9	20.1	6.41	
		EC25	16.5	14	22.6	6.06	
		EC40	19.4	15.4	30.1	5.15	
		EC50	21.7	16.4	33.6	4.62	
01-7958-5242	Mean Dry Biomass-mg	IC5	0.734	0.196	20	136	Linear Interpolation (ICPIN)
		IC10	2.01	0.323	20.3	49.8	
		IC15	4.21	0.244	20.1	23.7	
		IC20	8.04	N/A	19	12.4	
		IC25	12.7	N/A	17.4	7.88	
		IC40	15.1	11.3	20	6.62	
		IC50	16.9	13.3	21.9	5.9	

7d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	1	1	1	1	1	0	0	0.0%	0.0%
0	Receiving Water	4	0.55	0.502	0.598	0.4	0.7	0.0236	0.129	23.5%	45.0%
12.5		4	0.675	0.592	0.758	0.4	0.9	0.0405	0.222	32.8%	32.5%
25		4	0.225	0.148	0.302	0	0.4	0.0376	0.206	91.6%	77.5%
50		4	0	0	0	0	0	0	0		100.0%
75		4	0	0	0	0	0	0	0		100.0%
100		4	0	0	0	0	0	0	0		100.0%

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	0.476	0.467	0.484	0.445	0.5	0.00416	0.0228	4.79%	0.0%
0	Receiving Water	4	0.3	0.275	0.326	0.22	0.373	0.0124	0.0682	22.7%	36.9%
12.5		4	0.229	0.215	0.243	0.176	0.266	0.00693	0.038	16.6%	51.8%
25		4	0.0467	0.0311	0.0624	0	0.097	0.00767	0.042	89.9%	90.2%
50		4	0	0	0	0	0	0	0		100.0%
75		4	0	0	0	0	0	0	0		100.0%
100		4	0	0	0	0	0	0	0		100.0%

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Mean Dry Weight-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	0.476	0.467	0.484	0.445	0.5	0.00416	0.0228	4.79%	0.0%
0	Receiving Water	4	0.553	0.516	0.59	0.44	0.678	0.0179	0.0979	17.7%	-16.2%
12.5		4	0.357	0.33	0.384	0.296	0.44	0.0133	0.0729	20.4%	24.9%
25		4	0.169	0.123	0.216	0	0.28	0.0227	0.124	73.5%	64.4%
50		4	0	0	0	0	0	0	0		100.0%
75		4	0	0	0	0	0	0	0		100.0%
100		4	0	0	0	0	0	0	0		100.0%

7d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	1	1	1	1
0	Receiving Water	0.7	0.6	0.5	0.4
12.5		0.6	0.8	0.9	0.4
25		0.4	0.1	0.4	0
50		0	0	0	0
75		0	0	0	0
100		0	0	0	0

Mean Dry Biomass-mg Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	0.445	0.5	0.48	0.478
0	Receiving Water	0.373	0.337	0.22	0.271
12.5		0.238	0.237	0.266	0.176
25		0.062	0.028	0.097	0
50		0	0	0	0
75		0	0	0	0
100		0	0	0	0

Mean Dry Weight-mg Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	0.445	0.5	0.48	0.478
0	Receiving Water	0.533	0.562	0.44	0.678
12.5		0.397	0.296	0.296	0.44
25		0.155	0.28	0.243	0
50		0	0	0	0
75		0	0	0	0
100		0	0	0	0

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	10-2793-1400	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	30 Apr-09 12:52	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	12.5	25	17.7	8	59.2%

Dunnett's Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Receiving Water		12.5	-0.919	2.18	0.344	0.9161	Non-Significant Effect
		25*	2.37	2.18	0.344	0.0367	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.51	2.41	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.5743461	0.2871731	2	5.78	0.0243	Significant Effect
Error	0.4473962	0.04971069	9			
Total	1.021742	0.3368838	11			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	1.29	9.21	0.5246	Equal Variances
Distribution	Shapiro-Wilk Normality	0.925		0.3339	Normal Distribution

7d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Receiving Water	4	0.55	0.501	0.599	0.4	0.7	0.024	0.129	23.5%	0.0%
12.5		4	0.675	0.591	0.759	0.4	0.9	0.0412	0.222	32.8%	-22.7%
25		4	0.225	0.147	0.303	0	0.4	0.0383	0.206	91.6%	59.1%
50		4	0	0	0	0	0	0	0		100.0%
75		4	0	0	0	0	0	0	0		100.0%
100		4	0	0	0	0	0	0	0		100.0%

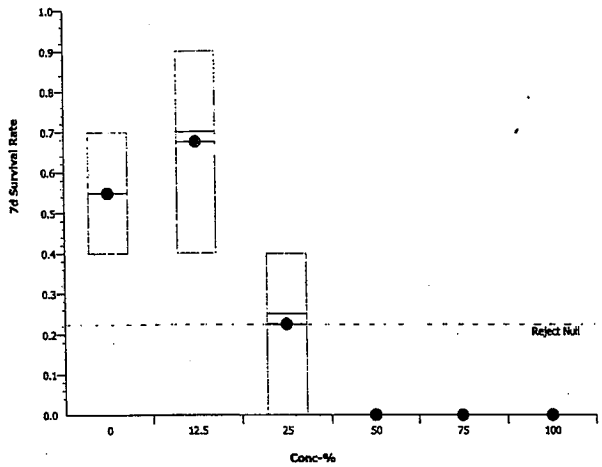
Angular (Corrected) Transformed Summary

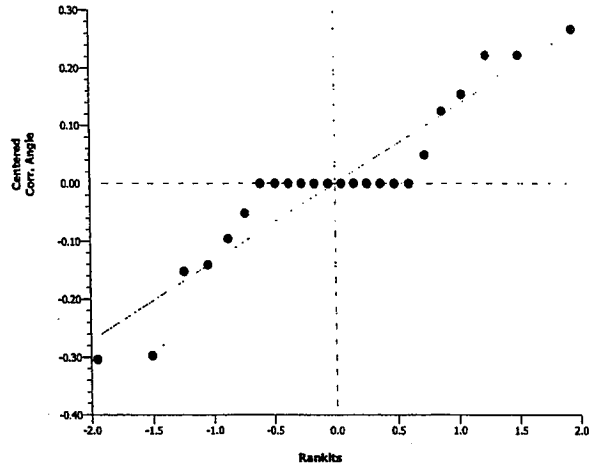
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Receiving Wate	4	0.837	0.787	0.887	0.685	0.991	0.0245	0.132	15.7%	0.0%
12.5		4	0.982	0.887	1.08	0.685	1.25	0.0461	0.248	25.3%	-17.3%
25		4	0.462	0.362	0.563	0.159	0.685	0.0492	0.265	57.3%	44.7%
50		4	0.159	0.159	0.159	0.159	0.159	0	0	0.0%	81.0%
75		4	0.159	0.159	0.159	0.159	0.159	0	0	0.0%	81.0%
100		4	0.159	0.159	0.159	0.159	0.159	0	0	0.0%	81.0%

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	10-2793-1400	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	30 Apr-09 12:52	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Graphics





Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	14-6208-7088	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	30 Apr-09 12:52	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	12.5	25	17.7	8	26.3%

Dunnett's Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Receiving Water		12.5	1.96	2.18	0.0789	0.0702	Non-Significant Effect
		25*	7.01	2.18	0.0789	<0.0001	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.73	2.41	0.7946	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.136813	0.06840651	2	26.1	0.0002	Significant Effect
Error	0.02355601	0.002617334	9			
Total	0.160369	0.07102384	11			

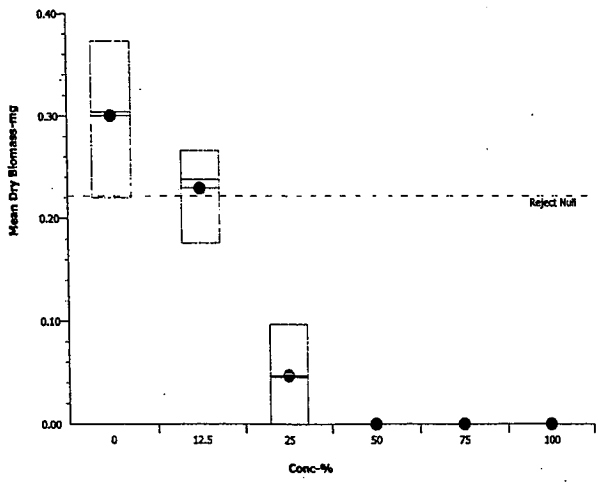
ANOVA Assumptions

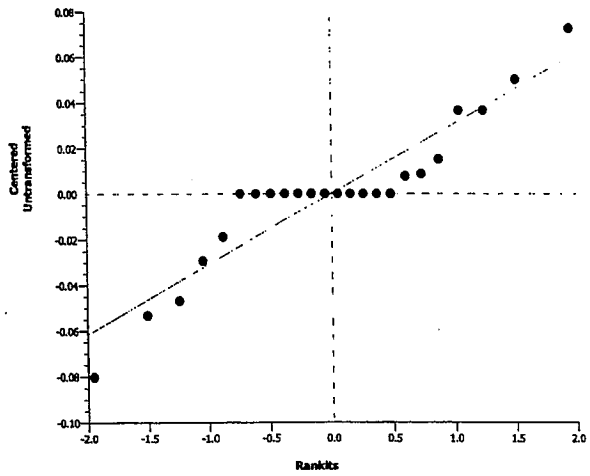
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	1.09	9.21	0.5799	Equal Variances
Distribution	Shapiro-Wilk Normality	0.973		0.9424	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Receiving Water	4	0.3	0.274	0.326	0.22	0.373	0.0127	0.0682	22.7%	0.0%
12.5		4	0.229	0.215	0.244	0.176	0.266	0.00705	0.038	16.6%	23.6%
25		4	0.0467	0.0308	0.0627	0	0.097	0.0078	0.042	89.9%	84.4%
50		4	0	0	0	0	0	0	0		100.0%
75		4	0	0	0	0	0	0	0		100.0%
100		4	0	0	0	0	0	0	0		100.0%

Graphics





Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	20-1691-4777	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	30 Apr-09 12:54	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	<12.5	12.5	N/A	>8	28.1%

Dunnett's Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Receiving Water		12.5*	2.75	2.18	0.155	0.0201	Significant Effect
		25*	5.39	2.18	0.155	0.0004	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.86	2.41	0.5434	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.2943915	0.1471957	2	14.5	0.0015	Significant Effect
Error	0.0911577	0.01012863	9			
Total	0.3855492	0.1573244	11			

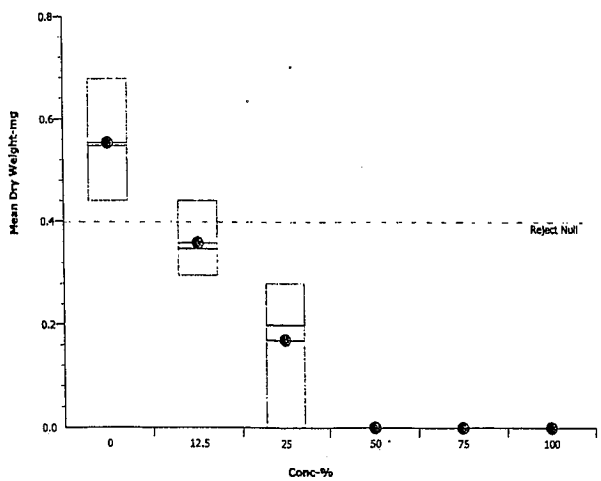
ANOVA Assumptions

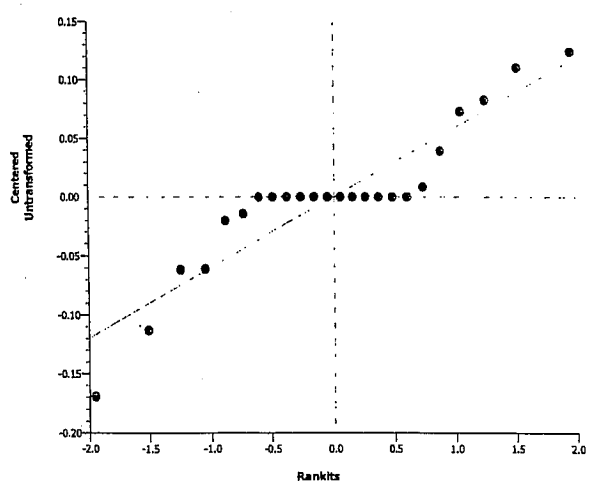
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	0.722	9.21	0.6971	Equal Variances
Distribution	Shapiro-Wilk Normality	0.965		0.8551	Normal Distribution

Mean Dry Weight-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Receiving Water	4	0.553	0.516	0.59	0.44	0.678	0.0182	0.0979	17.7%	0.0%
12.5		4	0.357	0.329	0.385	0.296	0.44	0.0135	0.0729	20.4%	35.4%
25		4	0.169	0.122	0.217	0	0.28	0.0231	0.124	73.5%	69.4%
50		4	0	0	0	0	0	0	0		100.0%
75		4	0	0	0	0	0	0	0		100.0%
100		4	0	0	0	0	0	0	0		100.0%

Graphics





CETIS Analytical Report

Report Date: 21 May-09 14:21 (p 1 of 2)
Test Code: 12-1033-4724/32727

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	20-3592-0886	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	21 May-09 14:19	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

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

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	13.2	N/A	14.1	7.57	7.08	N/A
EC10	14	5.28	15.9	7.16	6.28	18.9
EC15	14.8	11.9	17.9	6.77	5.58	8.4
EC20	15.6	12.9	20.1	6.41	4.97	7.77
EC25	16.5	14	22.6	6.06	4.43	7.17
EC40	19.4	15.4	30.1	5.15	3.32	6.47
EC50	21.7	16.4	33.6	4.62	2.98	6.09

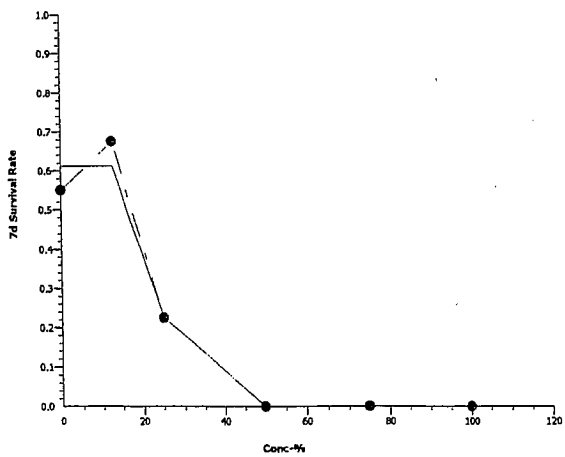
7d Survival Rate Summary

			Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Receiving Water	4	0.55	0.4	0.7	0.0236	0.129	23.5%	0.0%	22	40
12.5		4	0.675	0.4	0.9	0.0405	0.222	32.8%	-22.7%	27	40
25		4	0.225	0	0.4	0.0376	0.206	91.6%	59.1%	9	40
50		4	0	0	0	0	0		100.0%	0	40
75		4	0	0	0	0	0		100.0%	0	40
100		4	0	0	0	0	0		100.0%	0	40

7d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Receiving Water	0.7	0.6	0.5	0.4
12.5		0.6	0.8	0.9	0.4
25		0.4	0.1	0.4	0
50		0	0	0	0
75		0	0	0	0
100		0	0	0	0

Graphics



Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	01-7958-5242	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.7.0
Analyzed:	30 Apr-09 12:52	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Linear Interpolation Options

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

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(5%)
Extreme Value	Grubbs Extreme Value	2.51	2.8	0.1723	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	0.734	0.196	20	136	4.99	509
IC10	2.01	0.323	20.3	49.8	4.92	310
IC15	4.21	0.244	20.1	23.7	4.97	410
IC20	8.04	N/A	19	12.4	5.26	N/A
IC25	12.7	N/A	17.4	7.88	5.74	N/A
IC40	15.1	11.3	20	6.62	5	8.85
IC50	16.9	13.3	21.9	5.9	4.57	7.55

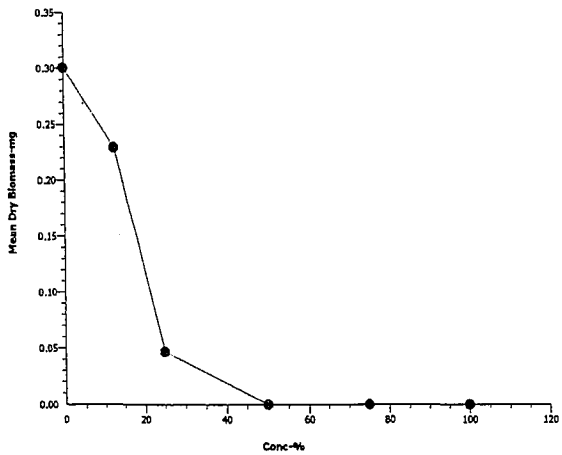
Mean Dry Biomass-mg Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Receiving Water	4	0.3	0.22	0.373	0.0124	0.0682	22.7%	0.0%
12.5		4	0.229	0.176	0.266	0.00693	0.038	16.6%	23.6%
25		4	0.0467	0	0.097	0.00767	0.042	89.9%	84.4%
50		4	0	0	0	0	0		100.0%
75		4	0	0	0	0	0		100.0%
100		4	0	0	0	0	0		100.0%

Mean Dry Biomass-mg Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Receiving Water	0.373	0.337	0.22	0.271
12.5		0.238	0.237	0.266	0.176
25		0.062	0.028	0.097	0
50		0	0	0	0
75		0	0	0	0
100		0	0	0	0

Graphics



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Precision Analytical
Test Material: Sample 1 (inlet to res B)
Test ID#: 32727 Project #: 14727
Test Date: 4/22/09 Randomization: 4.7.4

Organism Log#: 4500 Age: <48 hrs
Organism Supplier: ABS
Control/Diluent: Receiving Water
Control Water Batch: 1195

Treatment (% Effluent)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. old	Conductivity (µs/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Receiving Water	26.0	7.87		9.7		215	10	10	10	10	Date: 4/22/09
12.5%	26.0	7.75		9.7		285	10	10	10	10	Sample ID: 21973
25%	26.0	7.52		9.5		364	10	10	10	10	Test Solution Prep: [illegible]
50%	26.0	7.38		9.3		514	10	10	10	10	New WQ: [illegible]
75%	26.0	7.26		9.1		664	10	10	10	10	Initiation Time: 1625
100%	26.0	7.15		8.8		800	10	10	10	10	Initiation Signoff: KO
Meter ID	24A	pH03		DO13		EC05					
Receiving Water	25.9	8.10	7.86	9.9	8.6	216	10	10	10	10	Date: 4/23/09
12.5%	25.9	7.70	7.84	10.0	8.5	289	10	10	10	9 EKK	Sample ID: 21973
25%	25.9	7.53	7.87	9.9	8.2	361	10	10	10	10	Test Solution Prep: PA
50%	25.9	7.39	7.94	9.7	7.8	504	9	9	8	9	New WQ: [illegible]
75%	25.9	7.30	8.16	9.5	7.9	656	9	9	8	5	Renewal Time: 1715
100%	25.9	7.21	8.15	9.0	7.9	805	1	3	1	1	Renewal Signoff: EKK
Meter ID	24A	pH11	pH12	DO14	DO12	EC01					Old WQ: AR
Receiving Water	25.6	8.24	7.70	8.5	6.8	218	10	10	10	10	Date: 4.24.09
12.5%	25.6	8.02	7.73	8.5	6.9	293	10	10	10	9	Sample ID: 21973
25%	25.6	7.96	7.75	8.5	6.6	368	9	10	10	10	Test Solution Prep: EKK
50%	25.6	7.83	7.90	8.5	6.6	523	9	9	8	8	New WQ: [illegible]
75%	25.6	7.74	8.03	8.5	6.8	666	9	9	8	4	Renewal Time: 1545
100%	25.6	7.67	7.97	8.4	6.7	811	0	0	0	1	Renewal Signoff: EKK
Meter ID	24A	pH12	pH14	DO12	DO14	EC01					Old WQ: [illegible]
Receiving Water	25.6	7.93	7.72	9.5	7.6	219	10	10	10	8	Date: 4.25.09
12.5%	25.6	7.68	7.85	10.3	8.0	298	10	10	10	9	Sample ID: 21973
25%	25.6	7.48	7.87	10.4	7.9	366	8	10	10	10	Test Solution Prep: EKK
50%	25.6	7.30	8.04	10.6	7.9	518	6	8	7	7	New WQ: EKK
75%	25.6	7.28	8.15	10.7	8.1	665	5	4	4	2	Renewal Time: 1550
100%	25.6	7.26	8.07	10.5	8.1	809	—	—	—	0	Renewal Signoff: EKK
Meter ID	24A	pH 14	pH12	DO12	DO13	EC01					Old WQ: JPC

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Precision Analytical
Test Material: Sample 1 (inlet to res B)
Test ID#: 32727 Project #: 14727
Test Date: 4/22/09 Randomization: 4.7.4

Organism Log#: 4500 Age: <48 hrs
Organism Supplier: ABS
Control/Diluent: Receiving Water
Control Water Batch: 1195

Treatment (% Effluent)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Conductivity (µs/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Receiving Water	25.6	7.89	7.83	9.7	8.1	224	10	9	9	8	Date: 4/26/09
12.5%	25.6	7.45	7.93	10.8	7.9	291	10	10	10	8	Sample ID: 21973
25%	25.6	7.28	7.99	10.9	8.0	362	8	10	10	10	Test Solution Prep: JC
50%	25.6	7.15	8.10	10.8	8.1	511	2	5	6	5	New WQ: PA
75%	25.6	7.07	8.24	10.6	8.1	657	5	1	4	2	Renewal Time: 1715
100%	25.6	6.94	–	10.0	–	719	–	–	–	–	Renewal Signoff: SH
Meter ID	24A	pH14	pH12	DO14	DO12	Eco5					Old WQ: SH
Receiving Water	25.5	8.41	8.14	9.6	9.4	211	7	6	9	5	Date: 4-27-09
12.5%	25.5	7.76	8.06	10.8	9.1	293	10	9	10	6	Sample ID: 21973
25%	25.5	7.60	8.03	10.4	7.9	365	7	10	10	9	Test Solution Prep: AB
50%	25.5	7.45	8.02	10.0	7.9	511	1	2	5	1	New WQ: AM
75%	25.5	7.32	8.15	10.0	7.8	648	0	0	0	0	Renewal Time: 1245
100%	25.5	–	–	–	–	–	–	–	–	–	Renewal Signoff: PA
Meter ID	24A	pH12	pH12	DO13	DO12	Eco5					Old WQ: AR
Receiving Water	25.6	7.66	7.96	10.4	7.0	216	7	6	8	4	Date: 4/28/09
12.5%	25.6	7.45	7.93	10.8	6.6	295	9	9	9	6	Sample ID: 21973
25%	25.6	7.30	7.98	11.0	6.9	373	4	1	5	2	Test Solution Prep: JPW
50%	25.6	7.07	7.92	11.1	6.8	519	0	0	1	1	New WQ: AR
75%	–	–	–	–	–	–	–	–	–	–	Renewal Time: 1100
100%	–	–	–	–	–	–	–	–	–	–	Renewal Signoff: JPW
Meter ID	24A	pH14	pH12	DO13	DO12	Eco3					Old WQ: AMP
Receiving Water	25.6		7.76 ~~7.99~~ sm		7.4 ~~8.2~~ sm	280 ~~334~~ sm	7	6	5	4	Date: 4/29/09
12.5%	25.6		7.66 ~~7.76~~ sm		6.4 ~~7.4~~ sm	313 ~~290~~ sm	6	8	9	4	Termination Time: 0950
25%	25.6		7.81 ~~7.66~~ sm		7.0 ~~6.4~~ sm	~~313~~ 389 sm	4	1	4	0	Termination Signoff: JT
50%	25.6		7.82		6.8	544	–	–	0		Old WQ: sm
75%	–		–		–	–	–	–	–	–	
100%	–		–		–	–	–	–	–	–	
Meter ID	24A		pH14		DO13	Eco3					

Fathead Minnow Dry Weight Data Sheet

Client: **Precision Analytical** Test ID #: 32727 Project # 14727

Sample: Sample 1 (inlet to res B) Tare Weight Date: 4/27/09 Sign-off: MK

Test Date: 4-22-09 Final Weight Date: 4-30-09 Sign-off: MEC

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	RW	A	169.81	173.54	10	0.373
2	Control	B	172.75	176.12	10	0.337
3		C	160.18	162.38	10	0.220
4		D	~~160.17~~ 158.14	160.85	10	0.271
5	12.5	A	~~158.09~~ 180.26	182.64	10	0.238
6		B	~~180.24~~ 172.16	174.53	10	0.237
7		C	171.10 ~~170.10~~	173.82	10	0.266
8		D	175.25	177.01	10	0.176
9	25	A	166.08	166.70	10	0.062
10		B	170.90	171.18	10	0.028
11		C	181.20	182.17	10	0.097
12		D	175.48	—	10	0
13	50	A	161.16	—	10	0
14		B	163.74	—	10	0
15		C	161.02	—	10	0
16		D	162.10	—	10	0
17	75	A	165.48	—	10	0
18		B	166.78	—	10	0
19		C	162.72	—	10	0
20		D	170.69	—	10	0
21	100	A	172.76	—	10	0
22		B	159.41	—	10	0
23		C	165.61	—	10	0
24		D	184.06	—	10	0
QA 1			158.34	158.36		
QA 2			161.62	161.63		
Balance ID			1	1		

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Precision Analytical
Test Material: Lab Water Control
Test ID#: 32727 Project #: 14727
Test Date: 4/22/09 Randomization: 4.7.4

Organism Log#: 4500 Age: <48 hrs
Organism Supplier: ABS
Control/Diluent: EPAMH
Control Water Batch: 1195

Test Treatment	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. old	Conductivity (µS/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Water Control	26.0	7.54		9.1		321	10	10	10	10	Date: 4/22/09
											Test Solution Prep: [illegible]
											Initiation Time: 1625
Meter ID	24A	PH03		DO13		EC05	New WQ: MTM				Initiation Signoff: KO
Lab Water Control	25.9	8.19	7.77	9.2	9.9	322	10	10	10	10	Date: 4/23/09
											Test Solution Prep: [illegible]
											Renewal Time: 1715
Meter ID	24A	PH11	PH12	DO14	DO12	EC01	New WQ: [illegible]		Old WQ: AR		Renewal Signoff: EKK
Lab Water Control	25.6	8.25	7.82	8.3	7.2	331	10	10	10	10	Date: 4.24.09
											Test Solution Prep: EKK
											Renewal Time: 1545
Meter ID	24A	PH12	PH14	DO12	DO14	EC01	New WQ: JT		Old WQ: JT		Renewal Signoff: EKK
Lab Water Control	25.6	8.05	7.81	9.0	8.3	310	10	10	10	10	Date: 4.25.09
											Test Solution Prep: EKK
											Renewal Time: 1550
Meter ID	24A	PH14	PH12	DO12	DO13	EC01	New WQ: EKK		Old WQ: JPL		Renewal Signoff: EKK
Lab Water Control	25.6	7.99	7.84	9.5	8.6	332	10	10	10	10	Date: 4/26/09
											Test Solution Prep: JL
											Renewal Time: 1715
Meter ID	24A	PH14	PH12	DO14	DO12	EC05	New WQ: PA		Old WQ: SH		Renewal Signoff: SH
Lab Water Control	25.5	8.47	8.11	9.0	10.3	309	10	10	10	10	Date: 4/27/09
											Test Solution Prep: AB
											Renewal Time: 1245
Meter ID	24A	PH12	PH12	DO13	DO12	EC05	New WQ: MTM		Old WQ: AR		Renewal Signoff: PA
Lab Water Control	25.6	8.16	7.96	10.2	8.0	722	10	10	10	10	Date: 4/28/09
											Test Solution Prep: [illegible]
											Renewal Time: 1100
Meter ID	24A	PH14	PH12	DO13	DO12	EC03	New WQ: AR		Old WQ: [illegible]		Renewal Signoff: [illegible]
Lab Water Control	25.6		7.93		8.2	334	10	10	10	10	Date: 4/29/09
											Termination Time: 0950
Meter ID	24A		~~PH10~~ PH14 JM		DO13	EC03			Old WQ: JM		Termination Signoff: JT

Fathead Minnow Dry Weight Data Sheet

Client: **Precision Analytical** Test ID #: 32727 Project # 14727

Sample ID: Lab Water Control Tare Weight Date: 4/27/09 Sign-off: YM

Test Date: 4-22-09 Final Weight Date: 4-30-09 Sign-off: MEC

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
25	Control	A	169.99	174.44	10	0.445
26		B	156.56	161.56	10	0.500
27		C	157.18	161.98	10	0.480
28		D	159.25	164.03	10	0.478
QA 3			168.01	168.01		

Appendix D

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Sample #4 (Valley Waste) Water to *Ceriodaphnia dubia*

CETIS Summary Report

Report Date: 14 May-09 19:28 (p 1 of 1)
Test Code: 19-2082-2977/32724

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Batch ID:	11-2072-6929	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Quang Do
Start Date:	22 Apr-09 17:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Apr-09 13:30	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 20h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	08-5022-4755	**Code:**	Smaple #4	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:21	**Material:**	Effluent	**Project:**	14727
Receive Date:	21 Apr-09 19:00	**Source:**	Precision Analytical		
Sample Age:	32h (22.1 °C)	**Station:**	Valley Waste		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
06-8988-5769	7d Survival Rate	100	>100	N/A	N/A	1	Fisher Exact Test
01-0264-2050	Reproduction	<100	100	N/A	28.0%	>1	Unequal Variance t Two-Sample Test

7d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	10	0.8	0.643	0.957	0	1	0.077	0.422	52.7%	0.0%
100		10	0.9	0.782	1	0	1	0.0577	0.316	35.1%	-12.5%

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	10	15.8	13	18.6	0	24	1.35	7.39	46.8%	0.0%
100		10	2.2	1.27	3.13	0	7	0.454	2.49	113.0%	86.1%

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	Lab Water Contr	1	1	1	1	1	1	1	0	1	0
100		1	1	1	1	0	1	1	1	1	1

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	Lab Water Contr	22	10	21	11	19	24	19	0	20	12
100		3	0	1	0	0	4	2	7	5	0

CETIS Analytical Report

Report Date: 14 May-09 19:28 (p 1 of 1)
Test Code: 19-2082-2977/32724

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	06-8988-5769	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 19:21	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

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

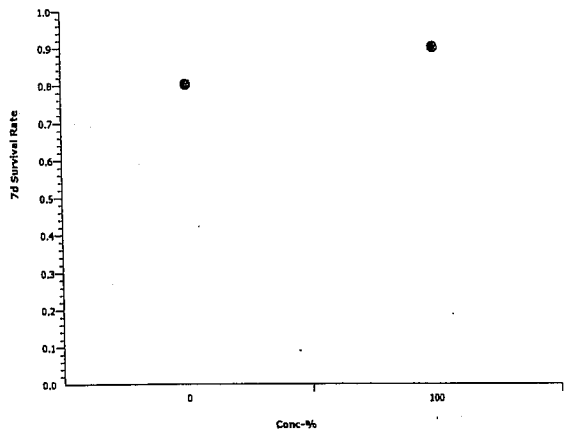
Fisher Exact Test

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Lab Water Control		100	1	1.0000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Lab Water Cont	8	2	10
100		9	1	10

Graphics



CETIS Analytical Report

Report Date: 14 May-09 19:27 (p 1 of 1)
Test Code: 19-2082-2977/32724

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	01-0264-2050	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 19:21	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	<100	100	N/A	>1	28.0%

Unequal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		100*	5.52	1.8	4.43	<0.0001	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.94	2.71	0.0141	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	924.8	924.8	1	30.4	<0.0001	Significant Effect
Error	547.2	30.4	18			
Total	1472	955.2	19			

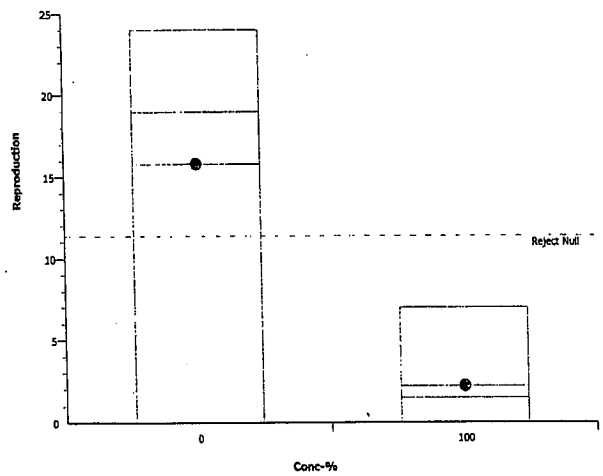
ANOVA Assumptions

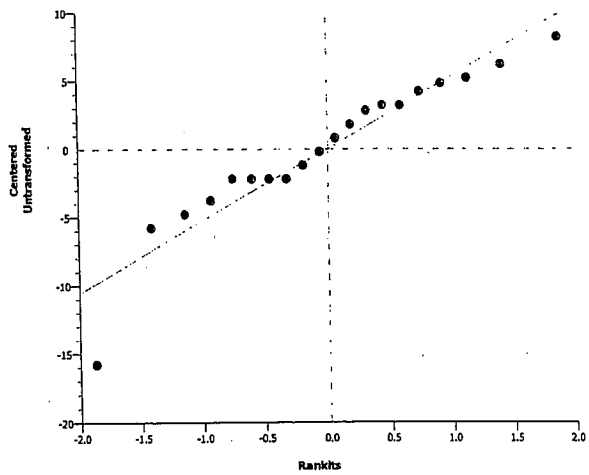
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	8.84	6.54	0.0033	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.918		0.0917	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	10	15.8	13	18.6	0	24	1.37	7.39	46.8%	0.0%
100		10	2.2	1.25	3.15	0	7	0.462	2.49	113.0%	86.1%

Graphics





Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: Precision Analytical Material: Sample 4 (Valley Waste) Test Date: 4/22/09

Project #: 14727 Test ID: 32724 Control Water: Lab Water (80:20)

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	A	B	C	D	E	F	G	H	I	J
Lab Water Control	0	7.44		9.1		214	25.8	0	0	0	0	0	0	0	0	0	0
	1	8.15	8.05	8.7	8.4	214	25.4	0	0	0	0	0	0	0	0	0	0
	2	8.31	8.11	9.0	7.8	223	25.6	0	0	0	0	0	0	0	0	0	0
	3	8.12	8.39	8.4	9.0	215	25.6	0	0	0	0	0	0	0	X/0	0	0
	4	8.28	8.26	8.8	8.8	219	25.3	2	0	3	0	2	4	0	-	0	5
	5	8.20	8.18	10.0	9.5	223	25.6	0	2	0	2	0	0	2	-	3	0
	6	8.03	7.97	9.8	8.0	224	25.7	8	8	7	9	6	7	6	-	5	X/7
	7	—	8.09	—	9.2	257	25.4	12	0	11	0	11	13	11	-	12	—
	8														—		—
							Total=	22	10	21	11	19	24	19	X/0	20	X/12

SIGN-OFF

	Date	New WQ	Test Init.	Sol'n Prep	Old WQ	Counts	Time
	4/22/09						
	4/23/09	P.A		PA	JPC		1300
	4/24/09						1140
	4.25.09	BUK		BUK	BUK	JPC	1100
	4.26.09	PA		EV	QD		1200
	4.27.09						1130
	4.28.09	PA			AMP		1140
	4.29.09	—		—			1330
	Date:	Old WQ:				Counts:	Time:

Mean Neonates/Female = 15.8

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	A	B	C	D	E	F	G	H	I	J
100%	0	8.31		8.5		885	0	0	0	0	0	0	0	0	0	0
	1	7.94	8.73	7.4	7.6	890	0	0	0	0	0	0	0	0	0	0
	2	7.99	8.74	8.0	7.7	906	0	0	0	0	0	0	0	0	0	0
	3	7.70	8.95	7.7	8.0	903	0	0	0	0	0	0	0	0	0	0
	4	7.77	8.81	7.7	8.9	886	0	0	1	0	X/0	0	0	0	0	0
	5	7.94	8.74	9.3	8.7	874	0	0	0	0	—	0	0	0	0	0
	6	7.79	8.80	10.0	7.4	900	0	0	0	0	—	0	2	0	0	0
	7	—	8.64	—	7.7	989	3	0	0	0	—	4	0	1	5	0
	8										—					
							Total=	3	0	1	0	X/0	4	2	1	5	0

SAMPLE ID

~~21974~~ 21976
21976
21976
21976
21976
21976
21976
—

Mean Neonates/Female = 2.2

Appendix E

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Sample #4 (Valley Waste) Water to Fathead Minnows

CETIS Summary Report

Report Date: 14 May-09 19:42 (p 1 of 1)
Test Code: 05-4792-0404/32730

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Batch ID:	05-5204-8197	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Quang Do
Start Date:	22 Apr-09 17:00	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Apr-09 09:30	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 16h	**Source:**	Aquatic Biosystems, CO	**Age:**	1

Sample ID:	08-5022-4755	**Code:**	Smaple #4	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:21	**Material:**	Effluent	**Project:**	14727
Receive Date:	21 Apr-09 19:00	**Source:**	Precision Analytical		
Sample Age:	32h (22.1 °C)	**Station:**	Valley Waste		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
14-3929-2717	7d Survival Rate	<100	100	N/A	5.2%	>1	Wilcoxon Rank Sum Two-Sample Test
14-2662-8012	Mean Dry Biomass-mg	<100	100	N/A	4.82%	>1	Equal Variance t Two-Sample Test

7d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	0.975	0.956	0.994	0.9	1	0.00913	0.05	5.13%	0.0%
100		4	0	0	0	0	0	0	0		100.0%

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	0.476	0.467	0.485	0.449	0.505	0.00431	0.0236	4.96%	0.0%
100		4	0	0	0	0	0	0	0		100.0%

7d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	1	1	0.9	1
100		0	0	0	0

Mean Dry Biomass-mg Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	0.482	0.505	0.468	0.449
100		0	0	0	0

CETIS Analytical Report

Report Date: 14 May-09 19:39 (p 1 of 2)
Test Code: 05-4792-0404/32730

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	14-2662-8012	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 19:38	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	<100	100	N/A	>1	4.82%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		100*	40.3	1.94	0.0229	<0.0001	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.88	2.13	0.2328	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.4531517	0.4531517	1	1630	<0.0001	Significant Effect
Error	0.00166998	0.0002783299	6			
Total	0.4548217	0.45343	7			

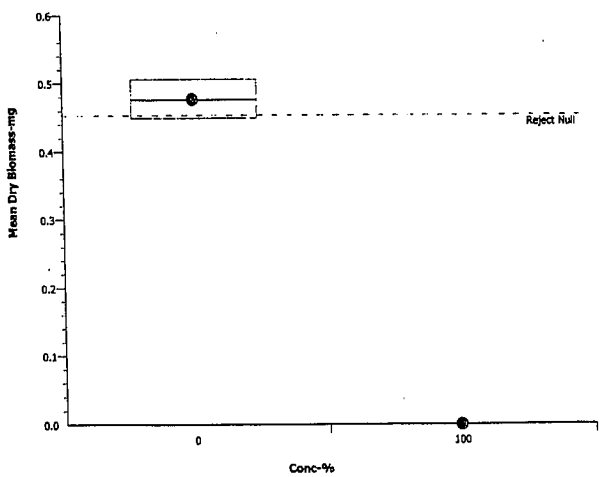
ANOVA Assumptions

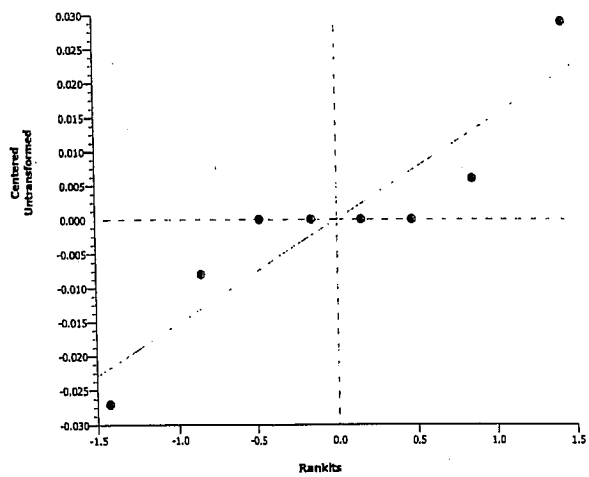
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Variance	8.19	13.7	0.0288	Equal Variances
Distribution	Shapiro-Wilk Normality	0.879		0.1839	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	0.476	0.467	0.485	0.449	0.505	0.00438	0.0236	4.96%	0.0%
100		4	0	0	0	0	0	0	0		100.0%

Graphics





Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	14-3929-2717	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 19:38	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	<100	100	N/A	>1	5.2%

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)
Lab Water Control		100*	10		0	0.0143	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.29	2.13	0.0077	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2.94028	2.94028	1	886	<0.0001	Significant Effect
Error	0.0199195	0.003319917	6			
Total	2.960199	2.9436	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Variance	1	13.7	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.706		0.0027	Non-normal Distribution

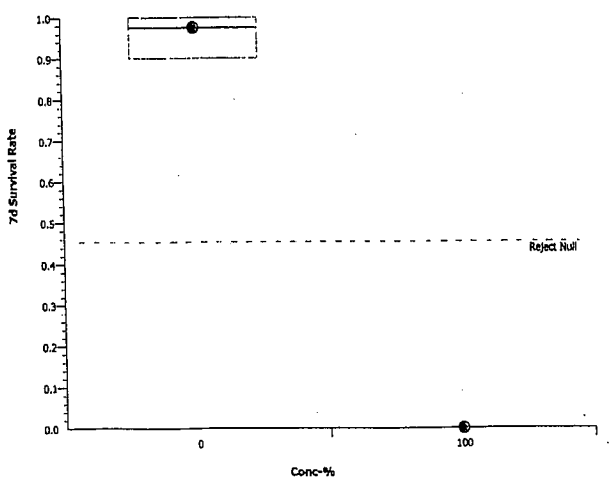
7d Survival Rate Summary

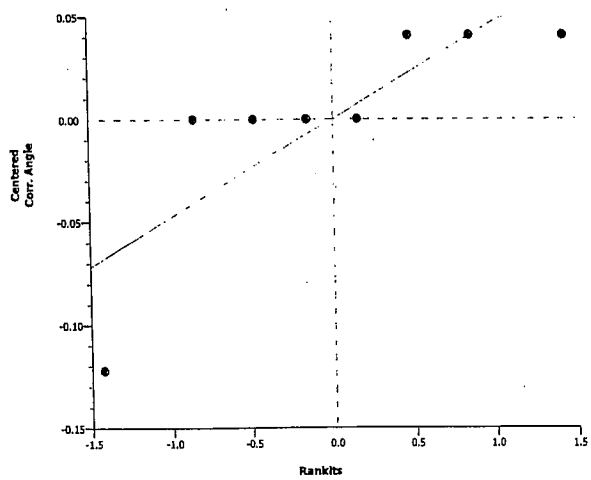
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	0.975	0.956	0.994	0.9	1	0.00928	0.05	5.13%	0.0%
100		4	0	0	0	0	0	0	0		100.0%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	4	1.37	1.34	1.4	1.25	1.41	0.0151	0.0815	5.94%	0.0%
100		4	0.159	0.159	0.159	0.159	0.159	0	0	0.0%	88.4%

Graphics





7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Precision Analytical
Test Material: Sample 4 (Valley Waste)
Test ID#: 32730 Project #: 14727
Test Date: 4/22/09 Randomization: 4.3.1

Organism Log#: 4500 Age: <48 hrs
Organism Supplier: ABS
Control/Diluent: EPAMH
Control Water Batch: 1195

Test Treatment	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Conductivity (µS/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Control	24.0	7.78		9.0		321	10	10	10	10	Date: 4/22/09 Test Solution Prep: [illegible]
100%	24.0	7.92		8.1		911	10	10	10	10	Sample ID: 21976 Initiation Time: 1700
Meter ID	24A	pH03		D013		EC05	New WQ: [illegible]				Initiation Signoff: KO
Lab Control	25.9	8.33	7.83	8.9	7.4	323	10	10	10	10	Date: 4/23/09 Test Solution Prep: PA
100%	25.9	8.16	8.52	7.2	7.3	905	10	10	10	10	Sample ID: 21976 Renewal Time: 1700
Meter ID	24A	pH03	pH03	D013	D013	EC05	New WQ: AB		Old WQ: JPL		Renewal Signoff: [illegible]
Lab Water Control	25.6	8.35	7.92	8.1	7.5	327	10	10	10	10	Date: 4.24.09 Test Solution Prep: EKK
100%	25.6	8.36	7.61	7.6	7.3	928	9	9	10	10	Sample ID: 21976 Renewal Time: 1620
Meter ID	24A	pH12	pH03	D012	D013	EC01	New WQ: JT		Old WQ: [illegible]		Renewal Signoff: JPL
Lab Control	25.6	7.96	8.14	9.1	7.1	310	10	10	10	10	Date: 4.25.09 Test Solution Prep: EKK
100%	25.6	7.77	8.62	7.8	7.0	914	5	7 PA	6	7 PA	Sample ID: 21976 Renewal Time: 1145
Meter ID	24A	pH14	pH03	D012	D012	EC01	New WQ: EKK		Old WQ: EKK		Renewal Signoff: PA
Lab Control	25.4	8.25	7.77	10.0	7.8	313	10	10	9	10	Date: 4.26.09 Test Solution Prep: JL
100%	25.4	7.80	8.49	8.5	7.8	899	1	1	2	1	Sample ID: 21976 Renewal Time: 1130
Meter ID	24A	pH14	pH03	D014	D013	EC05	New WQ: PA		Old WQ: RV		Renewal Signoff: PA
Lab Control	25.6	8.06	8.07	10.6	10.3	308	10	10	9	10	Date: 4-27-09 Test Solution Prep: AB
100%	25.6	7.92	8.58	9.7	8.7	893	0	0	0	0	Sample ID: 21976 Renewal Time: 1230
Meter ID	24A	pH12	pH12	D013	D013	EC05	New WQ: [illegible]		Old WQ: AR		Renewal Signoff: [illegible]
Lab Control	25.6	8.16	7.84	10.2	7.9	322	10	10	9	10	Date: 4/28/09 Test Solution Prep: [illegible]
100%	25.6	8.00 AR	—	9.5 AR	—	—	—	—	—	—	Sample ID: — Renewal Time: 1115
Meter ID	24A	pH14	pH12	D013	D012	EC03	New WQ: AR		Old WQ: [illegible]		Renewal Signoff: JPL
Lab Control	25.4		7.67		8.3	327	10	10	9	10	Date: 4/29/09 Termination Time: 0930
100%	25.4		—		—	—	—	—	—	—	Termination Signoff: JPL
Meter ID	24A		pH14		D013	EC03			Old WQ: [illegible]		

Fathead Minnow Dry Weight Data Sheet

Client: **Precision Analytical** Test ID #: 32730 Project # 14727

Sample ID: Sample 4 (Valley Waste) Tare Weight Date: 4/27/09 Sign-off: YK

Test Date: 4-22-09 Final Weight Date: 4/30/09 Sign-off: MEC

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Lab Control	A	172.73	177.55	10	0.482
2		B	164.32	169.37	10	0.505
3		C	181.28	185.96	10	0.468
4		D	173.71	178.20	10	0.449
5	100%	A	165.15	—	10	0
6		B	148.56	—	10	0
7		C	155.90	—	10	0
8		D	167.33	—	10	0
QA1			175.15	175.18		

Appendix F

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Sample #5 (Irrigation Water – Top of Hill) Water to *Ceriodaphnia dubia*

CETIS Summary Report

Report Date: 14 May-09 19:27 (p 1 of 1)
Test Code: 10-7252-8431/32725

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Batch ID:	11-2072-6929	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Quang Do
Start Date:	22 Apr-09 17:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Apr-09 13:30	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 20h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	16-1575-2138	**Code:**	Sample #5	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 11:20	**Material:**	Effluent	**Project:**	14727
Receive Date:	21 Apr-09 19:00	**Source:**	Precision Analytical		
Sample Age:	30h (0.6 °C)	**Station:**	Irrigation Canal-top of hill		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
17-2522-7869	7d Survival Rate	100	>100	N/A	N/A	1	Fisher Exact Test
13-5968-1761	Reproduction	<100	100	N/A	30.2%	>1	Equal Variance t Two-Sample Test

7d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	10	0.8	0.643	0.957	0	1	0.077	0.422	52.7%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	-25.0%

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	10	15.8	13	18.6	0	24	1.35	7.39	46.8%	0.0%
100		10	4.1	2.38	5.82	0	14	0.841	4.61	112.0%	74.1%

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	Lab Water Contr	1	1	1	1	1	1	1	0	1	0
100		1	1	1	1	1	1	1	1	1	1

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	Lab Water Contr	22	10	21	11	19	24	19	0	20	12
100		4	0	3	8	0	14	0	5	7	0

CETIS Analytical Report

Report Date: 14 May-09 19:27 (p 1 of 1)
Test Code: 10-7252-8431/32725

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	17-2522-7869	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 19:26	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

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

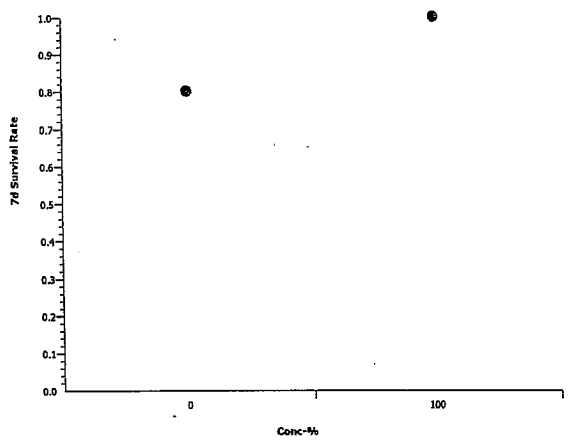
Fisher Exact Test

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Lab Water Control		100	1	1.0000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Lab Water Cont	8	2	10
100		10	0	10

Graphics



CETIS Analytical Report

Report Date: 14 May-09 19:26 (p 1 of 1)
Test Code: 10-7252-8431/32725

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	13-5968-1761	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 19:26	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	<100	100	N/A	>1	30.2%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		100*	4.25	1.73	4.78	0.0002	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.64	2.71	0.0702	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	684.45	684.45	1	18.1	0.0005	Significant Effect
Error	682.5	37.91667	18			
Total	1366.95	722.3667	19			

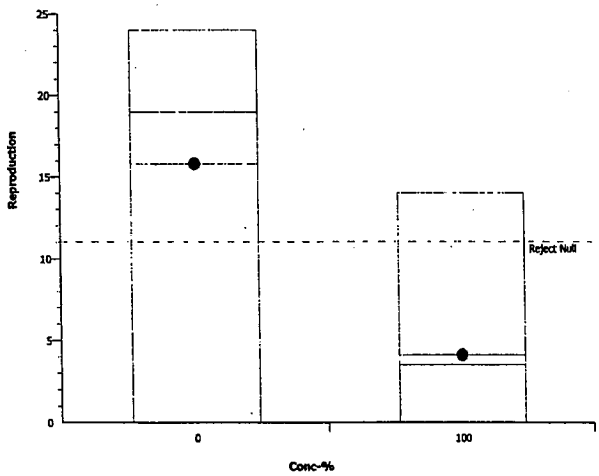
ANOVA Assumptions

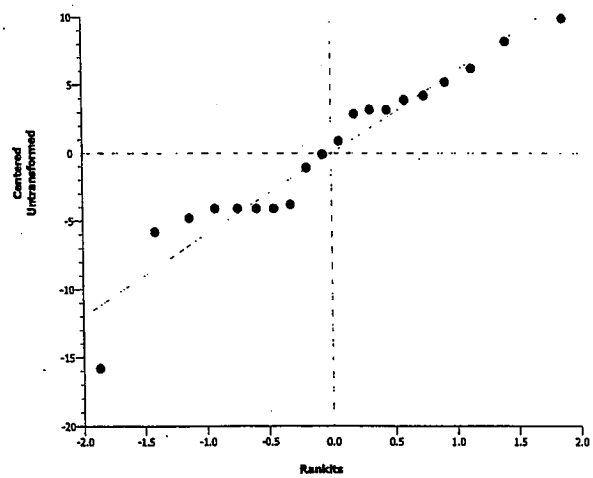
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.58	6.54	0.1750	Equal Variances
Distribution	Shapiro-Wilk Normality	0.939		0.2263	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	10	15.8	13	18.6	0	24	1.37	7.39	46.8%	0.0%
100		10	4.1	2.35	5.85	0	14	0.855	4.61	112.0%	74.1%

Graphics





Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Material: Sample 5 (Irr. Canal - top of hill) Test Date: 4/22/09

Project #: 14727 Test ID: 32725 Control Water: Lab Water (80:20)

Lab Water Control

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	A	B	C	D	E	F	G	H	I	J
0	7.44		9.1		214	25.8	0	0	0	0	0	0	0	0	0	0
1	8.15	8.05	8.7	8.4	214	25.4	0	0	0	0	0	0	0	0	0	0
2	8.31	8.11	9.0	7.8	223	25.6	0	0	0	0	0	0	0	0	0	0
3	8.12	8.39	8.4	9.0	215	25.6	0	0	0	0	0	0	0	x/0	0	0
4	8.28	8.26	8.8	8.8	219	25.3	2	0	3	0	2	4	0	–	0	5
5	8.20	8.18	10.0	9.5	223	25.6	0	2	0	2	0	0	2	–	3	0
6	8.03	7.97	9.8	8.0	224	25.7	8	8	7	9	6	7	6	–	5	x/7
7	–	8.09	–	9.2	257	25.4	12	0	11	0	11	13	11	–	12	–
8														–		–
						Total=	22	10	21	11	19	24	19	x/0	20	x/12

SIGN-OFF

Date	New WQ	Test Init	Sol'n Prep	Old WQ	Counts	Time
4/22/09	[illegible]	[illegible]	2W	[illegible]	2W	1730
[illegible]	[illegible]	PA	[illegible]	JPC	[illegible]	1500
4/24/09	JPC	W	EKK	Sm	1140	
4.25.09	EKK	JPC	EKK	EKK	1100	
4/26/09	PA	2W	RV	QD	1200	
4/27/09	[illegible]	2W	AB	AR	1130	
4/28/09	PA	2W	JPW	[illegible]	1100	
4/29/09	–	JPW	–	Sm	1330	

Mean Neonates/Female = 15.8

100%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	A	B	C	D	E	F	G	H	I	J	SAMPLE ID
0	7.61		7.7		790	0	0	0	0	0	0	0	0	0	0	21977
1	~~7.55~~ 7.45 PO	8.56	7.5	7.7	781	0	0	0	0	0	0	0	0	0	0	21977
2	7.45	8.55	7.3	7.6	796	0	0	0	0	0	0	0	0	0	0	21977
3	7.18	8.71	8.6	8.1	792	0	0	0	0	0	0	0	0	0	0	21977
4	7.37	8.63	9.1	8.6	782	0	0	0	0	0	0	0	0	0	0	21977
5	7.40	8.51	9.9	9.0	783	0	0	0	1	0	4	0	0	0	0	21977
6	7.38	8.67	10.5	7.4	769	0	0	2	0	0	2	0	1	0	0	21977
7	–	8.55	–	7.8	888	4	0	1	7	0	8	0	4	7	0	
8																
					Total=	4	0	3	8	0	14	0	5	7	0	

Mean Neonates/Female = 4.1

Appendix G

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Sample #5 (Irrigation Water – Top of Hill) Water to Fathead Minnows

CETIS Summary Report

Report Date: 14 May-09 19:44 (p 1 of 1)
Test Code: 11-5570-4037/32731

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Batch ID:	05-5204-8197	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Quang Do
Start Date:	22 Apr-09 17:00	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Not Applicable
Ending Date:	29 Apr-09 09:30	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 16h	**Source:**	Aquatic Biosystems, CO	**Age:**	1

Sample ID:	16-1575-2138	**Code:**	Sample #5	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 11:20	**Material:**	Effluent	**Project:**	14727
Receive Date:	21 Apr-09 19:00	**Source:**	Precision Analytical		
Sample Age:	30h (0.6 °C)	**Station:**	Irrigation Canal-top of hill		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
20-3213-1211	7d Survival Rate	<100	100	N/A	5.2%	>1	Wilcoxon Rank Sum Two-Sample Test
19-7587-6367	Mean Dry Biomass-mg	<100	100	N/A	4.82%	>1	Equal Variance t Two-Sample Test

7d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	0.975	0.956	0.994	0.9	1	0.00913	0.05	5.13%	0.0%
100		4	0	0	0	0	0	0	0		100.0%

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	0.476	0.467	0.485	0.449	0.505	0.00431	0.0236	4.96%	0.0%
100		4	0	0	0	0	0	0	0		100.0%

7d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	1	1	0.9	1
100		0	0	0	0

Mean Dry Biomass-mg Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	0.482	0.505	0.468	0.449
100		0	0	0	0

CETIS Analytical Report

Report Date: 14 May-09 19:43 (p 1 of 2)
Test Code: 11-5570-4037/32731

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	19-7587-6367	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 19:38	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	<100	100	N/A	>1	4.82%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		100*	40.3	1.94	0.0229	<0.0001	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.88	2.13	0.2328	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.4531517	0.4531517	1	1630	<0.0001	Significant Effect
Error	0.00166998	0.0002783299	6			
Total	0.4548217	0.45343	7			

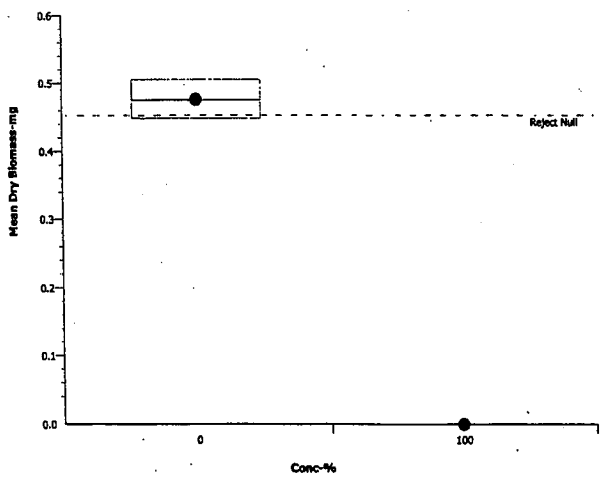
ANOVA Assumptions

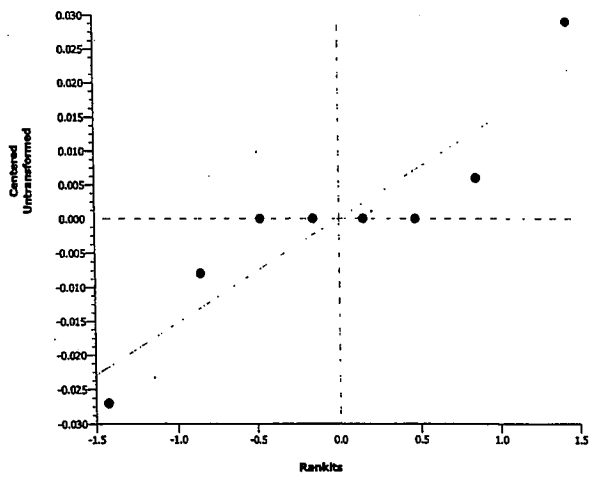
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Variance	8.19	13.7	0.0288	Equal Variances
Distribution	Shapiro-Wilk Normality	0.879		0.1839	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	0.476	0.467	0.485	0.449	0.505	0.00438	0.0236	4.96%	0.0%
100		4	0	0	0	0	0	0	0		100.0%

Graphics





Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	20-3213-1211	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 19:38	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	<100	100	N/A	>1	5.2%

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)
Lab Water Control		100*	10		0	0.0143	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.29	2.13	0.0077	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2.94028	2.94028	1	886	<0.0001	Significant Effect
Error	0.0199195	0.003319917	6			
Total	2.960199	2.9436	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Variance	1	13.7	0.3559	Equal Variances
Distribution	Shapiro-Wilk Normality	0.706		0.0027	Non-normal Distribution

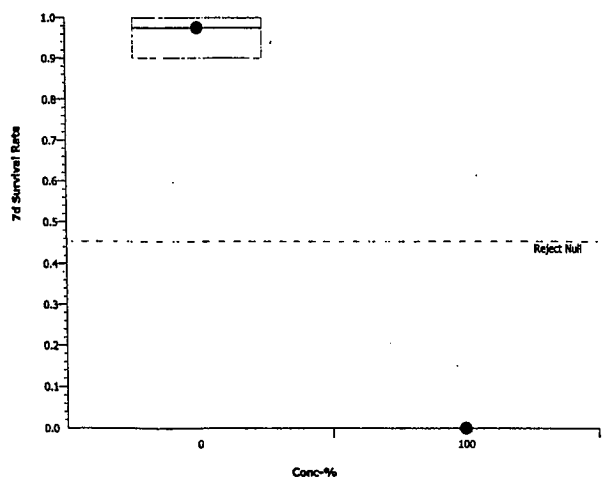
7d Survival Rate Summary

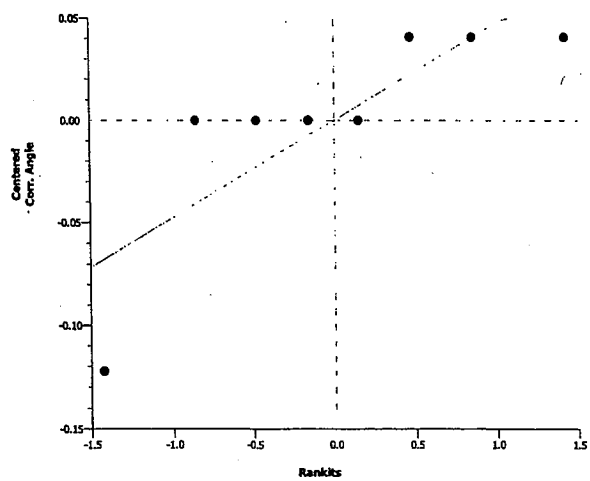
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	0.975	0.956	0.994	0.9	1	0.00928	0.05	5.13%	0.0%
100		4	0	0	0	0	0	0	0		100.0%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	4	1.37	1.34	1.4	1.25	1.41	0.0151	0.0815	5.94%	0.0%
100		4	0.159	0.159	0.159	0.159	0.159	0	0	0.0%	88.4%

Graphics





7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Precision Analytical**
Test Material: Sample 5 (Irrigation Canal - Top of Hill)
Test ID#: 32731 Project #: 14727
Test Date: 4/22/09 Randomization: 4.3.1

Organism Log#: 4500 Age: <48 hrs
Organism Supplier: ABS
Control/Diluent: EPAMH
Control Water Batch: 1195

Test Treatment	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. old	Conductivity (µS/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Control	24.0	7.78		9.0		321	10	10	10	10	Date: 4/22/09 Test Solution Prep: JW
100%	24.0	7.42		7.0		792	10	10	10	10	Sample ID: 21977 Initiation Time: 1700
Meter ID	24A	pH03		DO13		EC05	New WQ: AM				Initiation Signoff: KO
Lab Control	25.9	8.33	7.83	8.9	7.4	323	10	10	10	10	Date: 4/23/09 Test Solution Prep: PA
100%	25.9	7.61	8.21	7.9	7.4	782	8	9	8	8	Sample ID: 21977 Renewal Time: 1700
Meter ID	24A	pH03	pH03	DO13	DO13	EC05	New WQ: AB		Old WQ: JPL		Renewal Signoff: JW
Lab Water Control	25.6	8.35	7.92	8.1	7.5	327	10	10	10	10	Date: 4. 24. 09 Test Solution Prep: EKK
100%	25.6	7.88	8.38	7.8	7.3	807	5	8	8	4	Sample ID: 21977 Renewal Time: 1620
Meter ID	24A	pH12	pH03	DO12	DO13	EC01	New WQ: JP		Old WQ: SM		Renewal Signoff: JP
Lab Control	25.6	7.96	8.14	9.1	7.1	310	10	10	10	10	Date: 4. 25. 09 Test Solution Prep: EKK
100%	25.6	7.24	8.34	8.7	7.1	800	–	6	0	2	Sample ID: 21977 Renewal Time: 1140
Meter ID	24A	pH14	pH03	DO12	DO12	EC01	New WQ: EKK		Old WQ: EKK		Renewal Signoff: PA
Lab Control	~~25.6~~ 25.4 PA	8.25 PA	7.77	10.0	7.8	313	10	10	~~10~~ 9 PA	10	Date: 4/26/09 Test Solution Prep: JR
100%	~~25.6~~ 25.4 PA	7.24	8.19	9.2	7.8	781	–	0	–	1	Sample ID: 21977 Renewal Time: 1130
Meter ID	24A	pH14	pH03	DO14	DO13	EC05	New WQ: PA		Old WQ: KY		Renewal Signoff: PA
Lab Control	25.6	8.06	8.07	10.6	10.3	308	10	10	9	10	Date: 4-27-09 Test Solution Prep: 21977
100%	25.6	7.35	8.25	10.3	9.4	795	–	–	–	0	Sample ID: AB Renewal Time: 1230
Meter ID	24A	pH12	pH12	DO13	DO12	EC05	New WQ: AM		Old WQ: AR		Renewal Signoff: JW
Lab Control	25.6	8.16	7.74	10.2	7.9	322	10	10	9	10	Date: 4/28/09 Test Solution Prep: JW
100%	25.6	–	–	–	–	–	–	–	–	–	Sample ID: – Renewal Time: 1115
Meter ID	24A	pH14	pH12	DO13	DO12	EC03	New WQ: AR		Old WQ: [illegible]		Renewal Signoff: JW
Lab Control	25.4		7.67		8.3	327	10	10	9	10	Date: 4/29/09 Termination Time: 0930
100%	25.4		–		–	–	–	–	–	–	Termination Signoff: JW
Meter ID	24A		pH14		DO13	EC03			Old WQ: SM		

Fathead Minnow Dry Weight Data Sheet

Client: **Precision Analytical** Test ID #: 32731 Project # 14727

Sample ID: Sample 5 (Irrigation Canal - Top of Hill) Tare Weight Date: 4/27/09 Sign-off: YK

Test Date: 4-22-09 Final Weight Date: 4/30/09 Sign-off: MEC

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Lab Control	A	172.73	177.55	10	0.482
2		B	164.32	169.37	10	0.505
3		C	181.28	185.96	10	0.468
4		D	173.71	178.20	10	0.449
9	100%	A	170.58	–	10	0
10		B	156.57	–	10	0
11		C	171.36	–	10	0
12		D	160.35	–	10	0
QA2			165.81	165.83		

Appendix H

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Sample #6 (Irrigation Water – Dilution Water) Water to *Ceriodaphnia dubia*

CETIS Summary Report

Report Date: 30 Apr-09 12:35 (p 1 of 1)
Test Code: 13-8561-8818/32726

Ceriodaphnia 7-d Survival and Reproduction Test — Pacific EcoRisk

Batch ID:	11-4677-6643	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Quang Do
Start Date:	22 Apr-09 19:00	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	
Ending Date:	29 Apr-09 16:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	21-0095-2584	**Code:**	Sample #6	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 12:00	**Material:**	Dilution Water	**Project:**	14727
Receive Date:	21 Apr-09 19:00	**Source:**	Precision Analytical		
Sample Age:	31h (4.5 °C)	**Station:**	Irrigation Canal		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
20-9466-6361	7d Survival Rate	100	>100	N/A	25.0%	1	Equal Variance t Two-Sample Test
11-4141-2892	Reproduction	100	>100	N/A	15.4%	1	Equal Variance t Two-Sample Test

7d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	10	1	1	1	1	1	0	0	0.0%	0.0%
100	Receiving Water	10	1	1	1	1	1	0	0	0.0%	0.0%

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	10	25.4	23.6	27.2	16	31	0.879	4.81	18.9%	0.0%
100	Receiving Water	10	28.7	26.7	30.7	19	38	0.959	5.25	18.3%	-13.0%

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	Lab Water Contr	1	1	1	1	1	1	1	1	1	1
100	Receiving Water	1	1	1	1	1	1	1	1	1	1

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	Lab Water Contr	31	28	30	16	19	25	26	28	23	28
100	Receiving Water	29	19	30	38	29	25	30	24	29	34

Ceriodaphnia 7-d Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	20-9466-6361	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	30 Apr-09 12:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	100	>100	N/A	1	25.0%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		100	0	1.73	0	0.5000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0	0	1	65500	<0.0001	Significant Effect
Error	0	0	18			
Total	0	0	19			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Variance	65500	8.29	<0.0001	Unequal Variances

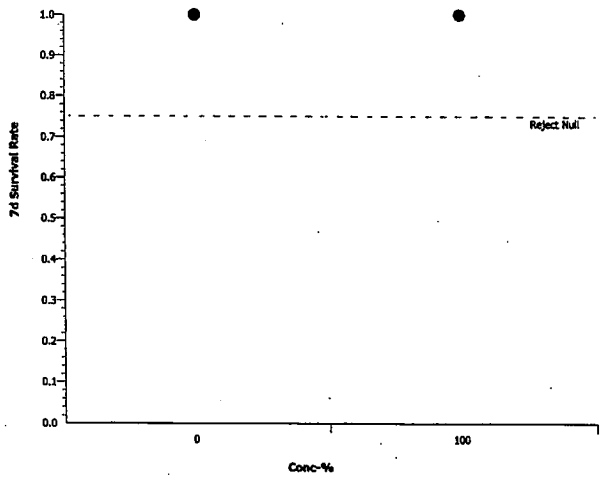
7d Survival Rate Summary

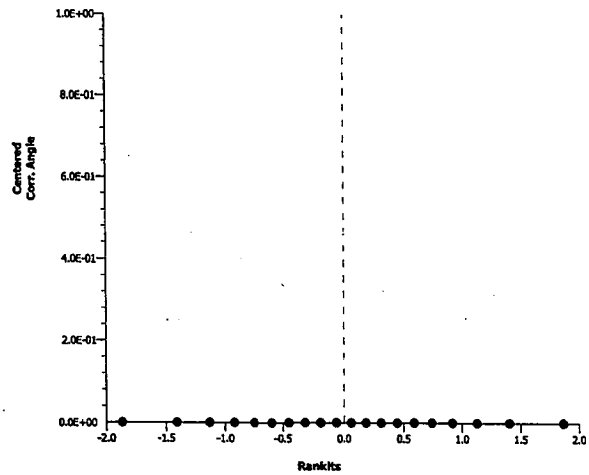
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	10	1	1	1	1	1	0	0	0.0%	0.0%
100	Receiving Water	10	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	10	1.05	1.05	1.05	1.05	1.05	0	0	0.0%	0.0%
100	Receiving Wate	10	1.05	1.05	1.05	1.05	1.05	0	0	0.0%	0.0%

Graphics





CETIS Analytical Report

Report Date: 30 Apr-09 12:35 (p 1 of 2)
Test Code: 13-8561-8818/32726

Ceriodaphnia 7-d Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	11-4141-2892	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	30 Apr-09 12:27	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	100	>100	N/A	1	15.4%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		100	-1.47	1.73	3.91	0.9200	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.98	2.71	0.7694	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	54.45	54.45	1	2.15	0.1601	Non-Significant Effect
Error	456.5	25.36111	18			
Total	510.95	79.81111	19			

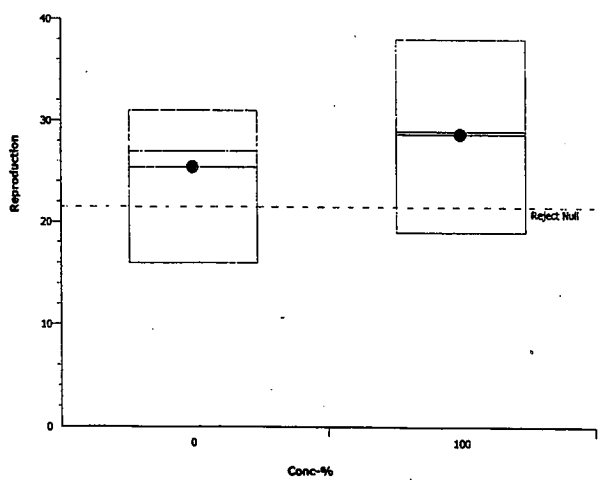
ANOVA Assumptions

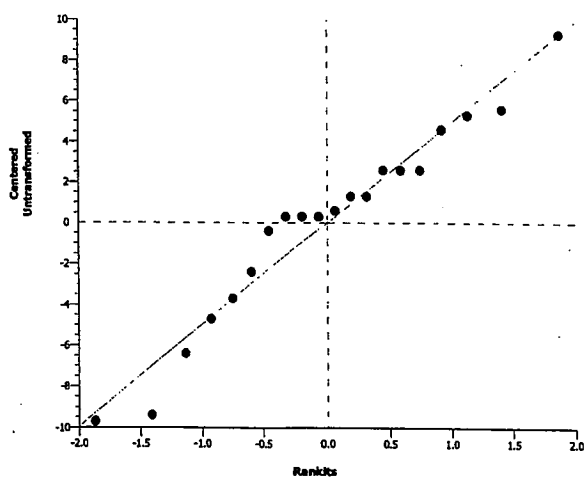
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.19	6.54	0.7993	Equal Variances
Distribution	Shapiro-Wilk Normality	0.957		0.4853	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	10	25.4	23.6	27.2	16	31	0.894	4.81	18.9%	0.0%
100	Receiving Water	10	28.7	26.7	30.7	19	38	0.975	5.25	18.3%	-13.0%

Graphics





Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: Precision Analytical Material: Sample 6 (Irr. Canal - dil'n water) Test Date: 4-22-09

Project #: 14727 Test ID: 32726 Control Water: Lab Water (80:20)

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	A	B	C	D	E	F	G	H	I	J	SIGN-OFF
Lab Water Control	0	~~7.91~~ 7.72		9.0		215	25.8	0	0	0	0	0	0	0	0	0	0	Date: 4/22/09 New WQ: Test Init.: [illegible] Sol'n Prep: [illegible] Time: 1900
	1	8.35	8.09	9.1	8.5	215	25.9	0	0	0	0	0	0	0	0	0	0	Date: 4/23/09 New WQ: PA Counts: JPC Sol'n Prep: PA Old WQ: JPC Time: 1700
	2	8.20	8.07	7.9	7.9	218	25.6	0	0	0	0	0	0	0	0	0	0	Date: 4/24/09 New WQ: [illegible] Counts: W Sol'n Prep: [illegible] Old WQ: [illegible] Time: 1200
	3	8.12	8.35	8.4	7.3	215	25.6	0	0	0	0	0	0	0	0	0	0	Date: 4/25/09 New WQ: [illegible] Counts: JPC Sol'n Prep: [illegible] Old WQ: [illegible] Time: 1130
	4	8.34	8.52	9.3	7.6	219	25.5	4	1	5	4	4	0	5	5	0	0	Date: 4/26/09 New WQ: PA Counts: RV Sol'n Prep: JL Old WQ: RV Time: 1625
	5	8.09	8.29	10.1	10.1	215	25.5	0	0	0	0	0	0	0	0	0	0	Date: 4/27/09 New WQ: [illegible] Counts: [illegible] Sol'n Prep: [illegible] Old WQ: [illegible] Time: 1915
	6	8.03	8.17	9.8	8.4	224	25.6	13	12	11	10	1	12	9	10	8	11	Date: 4/28/09 New WQ: PA Counts: [illegible] Sol'n Prep: [illegible] Old WQ: [illegible] Time: 1550
	7	—	8.33	—	8.7	262	25.6	14	15	14	2	14	13	12	13	15	12	Date: 4/29/09 New WQ: — Counts: JPC Sol'n Prep: — Old WQ: JPC Time: 1600
	8																	Date: Old WQ: Counts: Time:
							Total=	31	28	30	16	19	25	26	28	23	29	Mean Neonates/Female = 25.4

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		A	B	C	D	E	F	G	H	I	J	SAMPLE ID
100%	0	7.91		9.3		217		0	0	0	0	0	0	0	0	0	0	21978
	1	8.21	7.94	9.7	7.9	217		0	0	0	0	0	0	0	0	0	0	21978
	2	8.17	7.85	8.1	7.5	218		0	0	0	0	0	0	0	0	0	0	21978
	3	7.58	8.23	10.2	7.4	215		0	0	0	0	0	0	0	0	0	0	21978
	4	7.98	8.33	10.3	7.1	218		6	3	4	5	~~[illegible]~~ 7	6	5	5	5	7	21978
	5	8.24	8.26	10.0	8.7	206		0	0	0	0	7	0	0	0	0	0	21978
	6	7.49	8.06	10.3	8.0	214		11	0	10	16	0	5	10	9	11	13	21978
	7	—	8.35	—	7.9 ~~8.36~~	245		12	16	16	17	15	14	15	10	13	14	—
	8																	
							Total=	29	19	30	38	29	25	30	24	29	34	Mean Neonates/Female = ~~26.5~~ 28.7

RD

Appendix I

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Sample #6 (Irrigation Water – Dilution Water) Water to Fathead Minnows

CETIS Summary Report

Report Date: 30 Apr-09 12:56 (p 1 of 1)
Test Code: 14-8089-9702/32732

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Batch ID:	00-5146-8528	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Quang Do
Start Date:	22 Apr-09 16:25	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	
Ending Date:	29 Apr-09 09:50	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 17h	**Source:**	Aquatic Biosystems, CO	**Age:**	1

Sample ID:	21-0095-2584	**Code:**	Sample #6	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 12:00	**Material:**	Dilution Water	**Project:**	14727
Receive Date:	21 Apr-09 19:00	**Source:**	Precision Analytical		
Sample Age:	28h (4.5 °C)	**Station:**	Irrigation Canal		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
07-0989-8846	7d Survival Rate	<100	100	N/A	8.0%	>1	Equal Variance t Two-Sample Test
05-4781-4360	Mean Dry Biomass-mg	<100	100	N/A	14.7%	>1	Equal Variance t Two-Sample Test
03-0389-0866	Mean Dry Weight-mg	100	>100	N/A	20.5%	1	Equal Variance t Two-Sample Test

7d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	1	1	1	1	1	0	0	0.0%	0.0%
100	Receiving Water	4	0.55	0.502	0.598	0.4	0.7	0.0236	0.129	23.5%	45.0%

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	0.476	0.467	0.484	0.445	0.5	0.00416	0.0228	4.79%	0.0%
100	Receiving Water	4	0.3	0.275	0.326	0.22	0.373	0.0124	0.0682	22.7%	36.9%

Mean Dry Weight-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	0.476	0.467	0.484	0.445	0.5	0.00416	0.0228	4.79%	0.0%
100	Receiving Water	4	0.553	0.516	0.59	0.44	0.678	0.0179	0.0979	17.7%	-16.2%

7d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	1	1	1	1
100	Receiving Water	0.7	0.6	0.5	0.4

Mean Dry Biomass-mg Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	0.445	0.5	0.48	0.478
100	Receiving Water	0.373	0.337	0.22	0.271

Mean Dry Weight-mg Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	0.445	0.5	0.48	0.478
100	Receiving Water	0.533	0.562	0.44	0.678

CETIS Analytical Report

Report Date: 30 Apr-09 12:55 (p 1 of 3)
Test Code: 14-8089-9702/32732

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	03-0389-0866	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	30 Apr-09 12:48	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	100	>100	N/A	1	20.5%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		100	-1.54	1.94	0.0977	0.9124	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.89	2.13	0.2172	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.01193718	0.01193718	1	2.36	0.1751	Non-Significant Effect
Error	0.03030674	0.005051124	6			
Total	0.04224392	0.0169883	7			

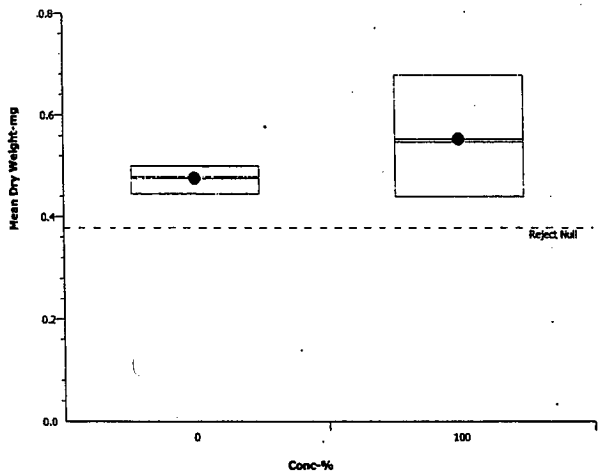
ANOVA Assumptions

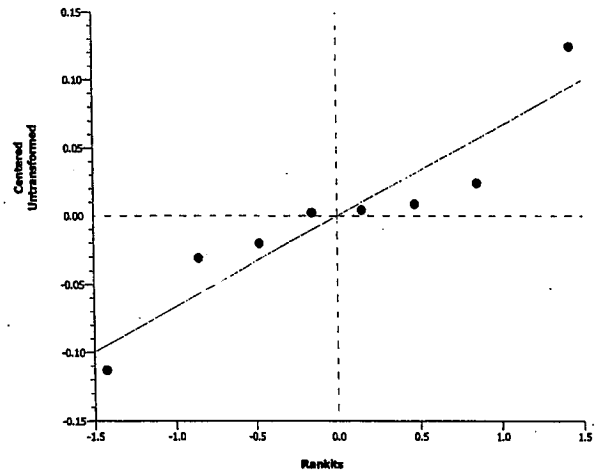
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	18.5	47.5	0.0389	Equal Variances
Distribution	Shapiro-Wilk Normality	0.912		0.3687	Normal Distribution

Mean Dry Weight-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	0.476	0.467	0.484	0.445	0.5	0.00423	0.0228	4.79%	0.0%
100	Receiving Water	4	0.553	0.516	0.59	0.44	0.678	0.0182	0.0979	17.7%	-16.2%

Graphics





Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	05-4781-4360	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	30 Apr-09 12:47	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	<100	100	N/A	>1	14.7%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		100*	4.88	1.94	0.0698	0.0014	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.71	2.13	0.4692	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.06160031	0.06160031	1	23.9	0.0028	Significant Effect
Error	0.01549519	0.002582531	6			
Total	0.07709549	0.06418283	7			

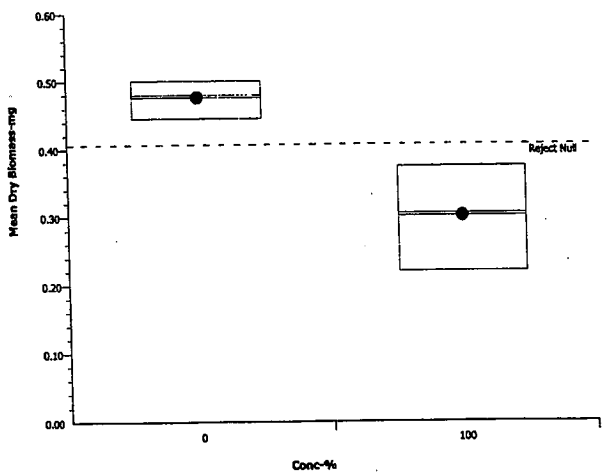
ANOVA Assumptions

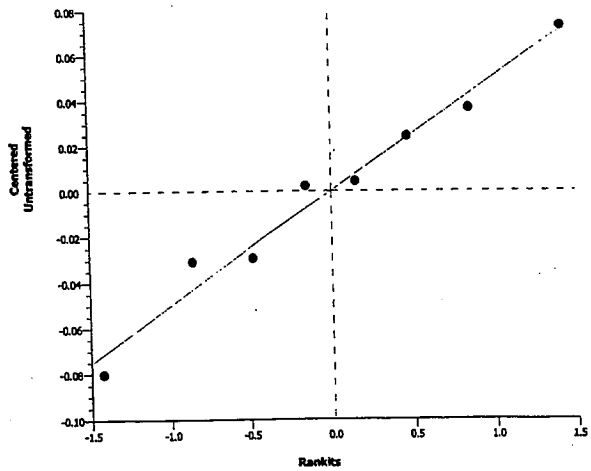
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	8.95	47.5	0.1048	Equal Variances
Distribution	Shapiro-Wilk Normality	0.983		0.9754	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	0.476	0.467	0.484	0.445	0.5	0.00423	0.0228	4.79%	0.0%
100	Receiving Water	4	0.3	0.274	0.326	0.22	0.373	0.0127	0.0682	22.7%	36.9%

Graphics





Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	07-0989-8846	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	30 Apr-09 12:47	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	<100	100	N/A	>1	8.0%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		100*	8.74	1.94	0.128	<0.0001	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.79	2.13	0.3407	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.6616603	0.6616603	1	76.3	0.0001	Significant Effect
Error	0.0520249	0.008670817	6			
Total	0.7136852	0.6703311	7			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Variance	11.7	13.7	0.0140	Equal Variances
Distribution	Shapiro-Wilk Normality	0.907		0.3353	Normal Distribution

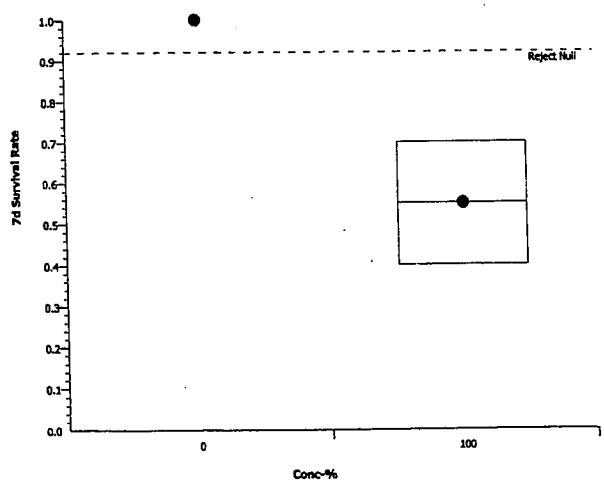
7d Survival Rate Summary

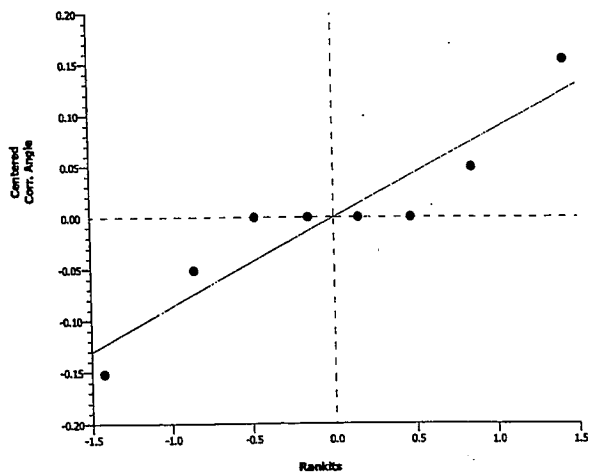
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	4	1	1	1	1	1	0	0	0.0%	0.0%
100	Receiving Water	4	0.55	0.501	0.599	0.4	0.7	0.024	0.129	23.5%	45.0%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	4	1.41	1.41	1.41	1.41	1.41	0	0	0.0%	0.0%
100	Receiving Wate	4	0.837	0.787	0.887	0.685	0.991	0.0245	0.132	15.7%	40.7%

Graphics





7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Precision Analytical
Test Material: Sample 6 (Irrigation Canal - dil'n water)
Test ID#: 32732 Project #: 14727
Test Date: 4/22/09 Randomization: 4.7.4

Organism Log#: 4500 Age: <48 hrs
Organism Supplier: ABS
Control/Diluent: EPAMH
Control Water Batch: 1195

Test Treatment	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. old	Conductivity (µS/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Control	26.0	7.54		9.1		321	10	10	10	10	Date: 4/22/09 Test Solution Prep: [illegible]
100%	26.0	7.87		9.7		215	10	10	10	10	Sample ID: 21978 Initiation Time: 1625
Meter ID	24A	pH03		DO13		EC05	New WQ: [illegible]				Initiation Signoff: KO
Lab Control	25.9	8.19	7.77	9.2	9.9	322	10	10	10	10	Date: 4/23/09 Test Solution Prep: PA
100%	25.9	8.10	7.86	9.9	8.6	216	10	10	10	10	Sample ID: 21978 Renewal Time: 1715
Meter ID	24A	pH12	pH12	DO12	DO12	EC05	New WQ: [illegible]		Old WQ: [illegible]		Renewal Signoff: EKK
Lab Water Control	25.6	8.25	7.82	8.3	7.2	331	10	10	10	10	Date: 4.24.09 Test Solution Prep: EKK
100%	25.6	8.24	[illegible]	8.5	6.8	218	10	10	10	10	Sample ID: 21978 Renewal Time: 1545
Meter ID	24A	pH12	[illegible]	DO12	DO14	EC01	New WQ: [illegible]		Old WQ: [illegible]		Renewal Signoff: EKK
Lab Control	25.6	8.05	7.81	9.0	8.3	310	10	10	10	10	Date: 4.25.09 Test Solution Prep: EKK
100%	25.6	7.93	7.72	9.5	7.6	219	10	10	10	8	Sample ID: 21978 Renewal Time: 1550
Meter ID	24A	pH14	pH12	DO12	DO13	EC01	New WQ: EKK		Old WQ: JR		Renewal Signoff: EKK
Lab Control	25.6	7.99	7.84	9.5	8.4	332	10	10	10	10	Date: 4/26/09 Test Solution Prep: JR
100%	25.6	8.24	7.83	8.5	8.1	224	10	9	9	8	Sample ID: 21978 Renewal Time: 1715
Meter ID	24A	pH14	pH12	DO14	DO12	~~DO14~~ EC05	New WQ: PA		Old WQ: SA		Renewal Signoff: SA
Lab Control	25.5	8.47	8.11	9.0	10.3	309	10	10	10	10	Date: 4-27-09 Test Solution Prep: AR
100%	25.5	8.41	8.14	9.6	9.4	211	7	6	9	5	Sample ID: 21978 Renewal Time: 1245
Meter ID	24A	pH12	pH12	DO13	DO12	EC05	New WQ: [illegible]		Old WQ: AR		Renewal Signoff: PA
Lab Control	25.6	8.16	7.96	10.2	7.0	322	10	10	10	10	Date: 4/28/09 Test Solution Prep: [illegible]
100%	25.6	7.66	7.96	10.4	7.0	216	7	6	8	4	Sample ID: 21978 Renewal Time: 1100
Meter ID	24A	pH14	pH12	DO13	DO12	EC03	New WQ: AR		Old WQ: [illegible]		Renewal Signoff: JPW
Lab Control	25.6		7.93		8.2	334	10	10	10	10	Date: 4/29/09 Termination Time: 0950
100%	25.6		7.76		7.1	230	7	6	5	4	Termination Signoff: [illegible]
Meter ID	24A		pH14		DO13	EC03			Old WQ: [illegible]		

Fathead Minnow Dry Weight Data Sheet

Client: **Precision Analytical** Test ID #: 32732 Project # 14727

Sample ID: Sample 6 (Irrigation Canal - dil'n water) Tare Weight Date: 4/27/09 Sign-off: MC

Test Date: 4-22-09 Final Weight Date: 4-30-09 Sign-off: MEC

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
25	Lab Control	A	169.99	174.44	10	0.445
26		B	156.56	161.56	10	0.500
27		C	157.18	161.98	10	0.480
28		D	159.25	164.03	10	0.478
1	100%	A	169.81	173.54	10	0.373
2		B	172.75	176.12	10	0.337
3		C	160.18	162.38	10	0.220
4		D	158.14	160.85	10	0.271
QA1			158.34	158.36	—	0.02

Appendix J

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the *Ceriodaphnia dubia*

CETIS Summary Report

Report Date: 01 May-09 16:22 (p 1 of 2)
Test Code: 20-0908-3016/32734

Ceriodaphnia 7-d Survival and Reproduction Test — Pacific EcoRisk

Batch ID:	17-4006-2145	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Lisa Nugent
Start Date:	22 Apr-09 19:00	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	29 Apr-09 14:30	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 20h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	20-8803-9043	**Code:**	NaCl	**Client:**	Reference Toxicant
Sample Date:	22 Apr-09 19:00	**Material:**	Sodium chloride	**Project:**	14729
Receive Date:	22 Apr-09 19:00	**Source:**	Reference Toxicant		
Sample Age:	N/A (25.8 °C)	**Station:**	In House		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
10-3601-5952	7d Survival Rate	1500	2000	1730	N/A		Fisher Exact/Bonferroni-Holm Test
11-7195-8995	Reproduction	250	500	354	20.5%		Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method
16-1415-8057	7d Survival Rate	EC50	1710	1620	1800		Spearman-Kärber
00-4319-8387	Reproduction	IC5	291	6.32	366		Linear Interpolation (ICPIN)
		IC10	342	52.6	512		
		IC15	401	258	570		
		IC20	472	326	648		
		IC25	556	373	747		
		IC40	917	508	1080		
		IC50	1080	810	1190		

7d Survival Rate Summary

Conc-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Control	10	0.9	0.782	1	0	1	0.0577	0.316	35.1%	0.0%
250		10	1	1	1	1	1	0	0	0.0%	-11.1%
500		10	1	1	1	1	1	0	0	0.0%	-11.1%
1000		10	0.9	0.782	1	0	1	0.0577	0.316	35.1%	0.0%
1500		10	1	1	1	1	1	0	0	0.0%	-11.1%
2000		10	0	0	0	0	0	0	0		100.0%

Reproduction Summary

Conc-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Control	10	29.8	28.3	31.3	21	35	0.729	3.99	13.4%	0.0%
250		10	29.7	27.7	31.7	17	37	0.985	5.4	18.2%	0.34%
500		10	23.3	20.5	26.1	7	30	1.38	7.56	32.4%	21.8%
1000		10	17.1	14	20.2	0	28	1.52	8.32	48.7%	42.6%
1500		10	5.5	3.93	7.07	1	14	0.766	4.2	76.3%	81.5%
2000		10	0	0	0	0	0	0	0		100.0%

Ceriodaphnia 7-d Survival and Reproduction Test — Pacific EcoRisk

7d Survival Rate Detail

Conc-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Control	0	1	1	1	1	1	1	1	1	1
250		1	1	1	1	1	1	1	1	1	1
500		1	1	1	1	1	1	1	1	1	1
1000		1	1	1	1	1	1	1	1	0	1
1500		1	1	1	1	1	1	1	1	1	1
2000		0	0	0	0	0	0	0	0	0	0

Reproduction Detail

Conc-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Control	21	28	31	28	31	27	33	35	33	31
250		27	30	29	29	37	34	29	34	17	31
500		25	27	16	29	30	25	17	7	30	27
1000		20	12	11	19	28	22	12	22	0	25
1500		5	5	1	3	12	14	5	4	4	2
2000		0	0	0	0	0	0	0	0	0	0

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Reference Toxicant** Material: **Sodium Chloride** Test Date: 4/22/09

Project #: 14729 Test ID: 32734 Randomization: Board S Control Water: Lab Water (80:20)

Lab Water Control

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	A	B	C	D	E	F	G	H	I	J
0	7.80		11.7		220	25.8	0	0	0	0	0	0	0	0	0	0
1	8.08	8.13	9.0	8.1	214	25.9	0	0	0	0	0	0	0	0	0	0
2	8.35	8.32	8.3	8.7	225	25.6	0	0	0	0	0	0	0	0	0	0
3	8.12	8.29	8.5	7.8	218	25.6	0	0	0	0	0	0	0	0	0	0
4	8.19	8.31	9.0	8.6	220	25.5	6	5	5	5	5	5	5	6	5	5
5	8.02	8.27	9.6	9.3	217	25.3	0	0	0	0	0	0	0	0	0	0
6	7.66	8.55	10.3	8.2	222	25.5	11	9	10	11	12	8	13	12	12	11
7	—	8.32	—	9.0	248	25.5	X/4	14	16	12	14	14	15	17	16	15
8																
						Total=	X/21	28	31	28	31	27	33	~~34~~ 35	33	31

SIGN-OFF

Date	New WQ	Test Init. / Sol'n Prep	Time
4/22/09	[illegible]	JT	1900
4/23/09	PA	PA	1545
4/24/09	[illegible]	[illegible]	1425
4/25/09	[illegible]	[illegible]	1020
4/26/09	RV	RV	1540
4/27/09	PA	PA	1215
4/28/09	[illegible]	[illegible]	1730
4/29/09	—	[illegible]	1430

Mean Neonates/Female = 29.8

250 mg/L

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	A	B	C	D	E	F	G	H	I	J
0	8.02		10.8		710	0	0	0	0	0	0	0	0	0	0
1	8.08	8.01	9.0	8.1	723	0	0	0	0	0	0	0	0	0	0
2	8.23	8.30	8.0	8.5	729	0	0	0	0	0	0	0	0	0	0
3	8.11	8.24	8.6	8.0	703	0	0	0	0	0	0	0	0	0	0
4	8.16	8.24	9.7	8.5	728	6	6	6	5	7	5	0	5	0	5
5	8.00	8.14	8.9	8.4	731	0	0	0	0	0	0	6	0	7	0
6	7.91	8.34	10.0	8.1	718	6	10	9	11	12	12	10	11	10	12
7	—	8.30	—	8.5	762	15	14	14	13	18	17	13	18	0	14
8															
					Total=	27	30	29	29	37	34	29	34	17	31

Mean Neonates/Female = 29.7

Pacific EcoRisk

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: Reference Toxicant | Material: Sodium Chloride | Test Date: 4/22/09

Project #: 14729 | Test ID: 32734 | Randomization: Board 5 | Control Water: Lab Water (80:20)

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	A	B	C	D	E	F	G	H	I	J	SIGN-OFF
500 mg/L	0	8.07		10.5		1195		0	0	0	0	0	0	0	0	0	0	
	1	8.06	8.02	9.3	7.8	1250		0	0	0	0	0	0	0	0	0	0	
	2	8.18	8.24	8.1	8.3	1231		0	0	0	0	0	0	0	0	0	0	
	3	8.08	8.18	8.8	8.2	1210		0	0	0	0	0	0	0	0	0	0	
	4	8.05	8.24	9.9	8.3	1203		5	5	0	5	4	5	5	0	7	4	
	5	7.98	8.09	8.9	8.1	1226		0	0	6	0	0	0	0	5	0	0	
	6	7.96	8.26	9.9	8.0	1228		9	9	8	11	10	9	1	2	8	9	
	7	—	8.29	—	8.0	1339		11	13	2	13	16	11	11	0	15	14	
	8																	
							Total=	25	27	16	29	30	25	17	7	30	27	Mean Neonates/Female = 23.3

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		A	B	C	D	E	F	G	H	I	J	
1000 mg/L	0	8.06		10.2		2157		0	0	0	0	0	0	0	0	0	0	
	1	8.03	7.99	9.0	7.9	2145		0	0	0	0	0	0	0	0	0	0	
	2	8.11	8.22	8.2	8.2	2180		0	0	0	0	0	0	0	0	0	0	
	3	8.02	8.19	9.1	8.3	2157		0	0	0	0	0	0	0	0	0	0	
	4	7.96	8.16	10.3	8.3	2167		3	5	0	4	6	5	0	4	x/0	5	
	5	7.94	8.03	9.1	8.6	2176		0	0	5	0	0	0	5	0	-	0	
	6	7.95	8.19	9.8	7.8	2171		9	7	6	7	9	8	7	8	-	9	
	7	—	8.26	—	9.0	2276		8	0	0	8	13	9	0	10	-	11	
	8															-		
							Total=	20	12	11	19	28	22	12	22	x/0	25	Mean Neonates/Female = 17.1

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: Reference Toxicant | Material: Sodium Chloride | Test Date: 4/22/09

Project #: 14729 | Test ID: 32734 | Randomization: Board 5 | Control Water: Lab Water (80:20)

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	A	B	C	D	E	F	G	H	I	J	SIGN-OFF
1500 mg/L	0	8.05		10.6		3060		0	0	0	0	0	0	0	0	0	0	
	1	8.00	7.98	9.1	8.2	3100		0	0	0	0	0	0	0	0	0	0	
	2	8.03	8.21	8.3	8.2	3070		0	0	0	0	0	0	0	0	0	0	
	3	7.98	8.17	9.5	8.4	3080		0	0	0	0	0	0	0	0	0	0	
	4	7.92	8.15	10.7	8.2	3100		0	2	0	0	3	0	0	0	0	1	
	5	7.91	8.01	9.7	8.6	3110		3	0	0	3	0	0	3	0	2	0	
	6	7.94	8.26	9.9	8.4	3130		2	3	1	0	3	4	2	4	2	1	
	7	—	8.25	—	8.4	3300		0	0	0	0	6	10	0	0	0	0	
	8																	
							Total=	5	5	1	3	12	14	5	4	4	2	Mean Neonates/Female = 5.5

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	A	B	C	D	E	F	G	H	I	J
2000 mg/L	0	8.03		10.4		4000	0	0	0	0	0	0	0	0	0	0
	1	7.98	8.03	9.3	8.2	4000	x/o	x/o	x/o	0	x/o	x/o	x/o	0	x/o	x/o
	2	7.93	8.25	8.8	8.2	4030	—	—	—	0	—	—	—	x/o	—	—
	3	7.93	8.19	9.9	8.3	4020	—	—	—	0	—	—	—	—	—	—
	4	7.86	8.21	11.1	8.3	4000	—	—	—	0	—	—	—	—	—	—
	5	7.87	8.03	9.4	8.6	4040	—	—	—	x/o	—	—	—	—	—	—
	6	7.93	—	10.0	—	4070	—	—	—	—	—	—	—	—	—	—
	7	—		—			—	—	—	—	—	—	—	—	—	—
	8									—				—		
						Total=	x/o	x/o	x/o	x/o	x/o	x/o	x/o	x/o	x/o	x/o

Mean Neonates/Female = 0

Appendix K

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the Fathead Minnows

CETIS Summary Report

Report Date: 01 May-09 15:41 (p 1 of 2)
Test Code: 12-1600-8695/32733

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Batch ID:	12-4089-2819	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Lisa Nugent
Start Date:	22 Apr-09 18:15	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	29 Apr-09 09:45	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 16h	**Source:**	Aquatic Biosystems, CO	**Age:**	1

Sample ID:	05-0548-4124	**Code:**	NaCl	**Client:**	Reference Toxicant
Sample Date:	22 Apr-09 18:15	**Material:**	Sodium chloride	**Project:**	14728
Receive Date:	22 Apr-09 18:15	**Source:**	Reference Toxicant		
Sample Age:	N/A (26 °C)	**Station:**	In House		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
12-5691-2387	7d Survival Rate	0.75	1.5	1.06	11.4%		Dunnett's Multiple Comparison Test
06-7554-6451	Mean Dry Biomass-mg	0.75	1.5	1.06	18.6%		Dunnett's Multiple Comparison Test
16-4702-0121	Mean Dry Weight-mg	1.5	3	2.12	23.8%		Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method
19-8956-6827	7d Survival Rate	EC5	1.25	0.673	1.65		Linear Regression (MLE)
		EC10	1.44	0.85	1.84		
		EC15	1.58	0.994	1.97		
		EC20	1.71	1.12	2.09		
		EC25	1.82	1.25	2.21		
		EC40	2.14	1.61	2.53		
		EC50	2.36	1.86	2.77		
02-5653-5893	Mean Dry Biomass-mg	IC5	0.216	0.0787	1.2		Linear Interpolation (ICPIN)
		IC10	0.478	0.156	1.23		
		IC15	0.77	0.247	1.43		
		IC20	0.927	0.453	1.84		
		IC25	1.1	0.662	1.9		
		IC40	1.62	0.983	2.08		
		IC50	1.88	1.07	2.3		

7d Survival Rate Summary

Conc-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Control	4	0.875	0.856	0.894	0.8	0.9	0.00913	0.05	5.71%	0.0%
0.75		4	0.825	0.789	0.861	0.7	0.9	0.0175	0.0957	11.6%	5.71%
1.5		4	0.725	0.706	0.744	0.7	0.8	0.00913	0.05	6.9%	17.1%
3		4	0.25	0.228	0.272	0.2	0.3	0.0105	0.0577	23.1%	71.4%
6		4	0	0	0	0	0	0	0		100.0%
9		4	0	0	0	0	0	0	0		100.0%

Mean Dry Biomass-mg Summary

Conc-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Control	4	0.403	0.387	0.419	0.34	0.439	0.00793	0.0434	10.8%	0.0%
0.75		4	0.345	0.331	0.359	0.313	0.392	0.00691	0.0379	11.0%	14.3%
1.5		4	0.261	0.235	0.287	0.163	0.317	0.0127	0.0697	26.7%	35.3%
3		4	0.0648	0.0575	0.072	0.047	0.091	0.00354	0.0194	29.9%	83.9%
6		4	0	0	0	0	0	0	0		100.0%
9		4	0	0	0	0	0	0	0		100.0%

Mean Dry Weight-mg Summary

Conc-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Control	4	0.462	0.439	0.486	0.378	0.525	0.0114	0.0625	13.5%	0.0%
0.75		4	0.423	0.397	0.449	0.351	0.514	0.0128	0.0699	16.5%	8.5%
1.5		4	0.359	0.325	0.393	0.233	0.453	0.0168	0.0918	25.6%	22.4%
3		4	0.258	0.244	0.271	0.223	0.303	0.00661	0.0362	14.0%	44.2%

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

7d Survival Rate Detail

Conc-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Control	0.9	0.9	0.9	0.8
0.75		0.9	0.9	0.8	0.7
1.5		0.8	0.7	0.7	0.7
3		0.3	0.2	0.3	0.2
6		0	0	0	0
9		0	0	0	0

Mean Dry Biomass-mg Detail

Conc-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Control	0.413	0.439	0.34	0.42
0.75		0.316	0.392	0.313	0.36
1.5		0.304	0.163	0.317	0.259
3		0.091	0.054	0.067	0.047
6		0	0	0	0
9		0	0	0	0

Mean Dry Weight-mg Detail

Conc-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Control	0.459	0.488	0.378	0.525
0.75		0.351	0.436	0.391	0.514
1.5		0.38	0.233	0.453	0.37
3		0.303	0.27	0.223	0.235

7 Day Chronic Fathead Minnow Reference Toxicant Test Data

Client: Reference Toxicant
Test Material: Sodium Chloride
Test ID#: 32733 Project #: 14728
Test Date: [illegible]/09 Randomization: 4.6.2

Organism Log#: 4500 Age: <48 hrs
Organism Supplier: ABS
Control/Diluent: EPAMH
Control Water Batch: 1195

Treatment (g/L)	Temp (°C)	pH New	pH Old	D.O. (mg/L) New	D.O. (mg/L) Old	Conductivity (µs/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Control	[illegible]	7.55		10.7		318	10	10	[illegible]	[illegible]	Date: [illegible]/22/09
0.75	26.0	[illegible]		9.8		1697	10	[illegible]	10	10	Test Solution Prep: [illegible]
1.5	26.0	7.66		10.4		3200	10	[illegible]	10	10	New WQ: AR
3	26.0	7.67		10.1		5990	10	[illegible]	10	10	Initiation Time: 1815
6	26.0	7.67		10.8		11150	10	10	10	10	Initiation Signoff: [illegible]
9	26.0	7.67		11.3		16310	10	[illegible]	[illegible]	[illegible]	
Meter ID	24A	pH11		DO14		Ecol					
Control	25.4	8.04	7.90	9.0	7.9	321	10	9	9	8	Date: 4/23/09
0.75	25.4	7.99	7.89	8.8	7.8	1812	9	10	10	10	Test Solution Prep: PA
1.5	25.4	7.96	7.87	8.8	7.9	3450	10	10	10	10	New WQ: PA
3	25.4	7.91	7.83	8.9	7.8	5850	10	10	10	9	Renewal Time: 1600
6	25.4	7.84	7.76	8.9	7.8	11030	10	10	[illegible]	10	Renewal Signoff: [illegible]
9	25.4	7.79	7.74	9.1	8.1	15990	10	1	0	0	Old WQ: SL
Meter ID	24A	pH03	pH12	~~DO17~~ DO12	DO12	ECOS					
Control	25.6	8.13	7.88	8.1	8.3	326	9	9	9	8	Date: 4/24/09
0.75	25.6	8.05	7.86 ~~7.79~~	8.2	7.3 ~~7.9~~	1756	9	10	9	10	Test Solution Prep: [illegible]
1.5	25.6	8.06	7.78	7.9	7.1	3240	10	10	10 ~~9~~	9	New WQ: W
3	25.6	7.99	7.77	7.9	7.9	5810	10	10	9	9	Renewal Time: 1455
6	25.6	7.90	7.77	8.0	7.3	11240	8	8	7	6	Renewal Signoff: [illegible]
9	25.6	7.85	7.80	8.2	7.5	16250	–	0	–	–	Old WQ: [illegible]
Meter ID	24A	pH12	pH03	DO12	DO13	ECOS					
Control	25.5	8.12	7.76	8.5	8.4	314	9	9	9	8	Date: 4/25/09
0.75	25.5	8.05	7.68	8.8	8.1	1615	9	9	9	10	Test Solution Prep: SH
1.5	25.5	8.01	7.74	8.8	8.5	3180	10	10	10	8	New WQ: EKK
3	25.5	7.97	7.71	8.5	8.4	5900	10	10	9	9	Renewal Time: 1445
6	25.5	7.90	7.68	8.6	8.3	10990	5	5	6	5	Renewal Signoff: PA
9	–	–	–	–	–	–	–	–	–	–	Old WQ: JPL
Meter ID	24A	pH03	pH12	DO12	DO13	EC01					

7 Day Chronic Fathead Minnow Reference Toxicant Test Data

Client: Reference Toxicant
Test Material: Sodium Chloride
Test ID#: 32733 Project #: 14728
Test Date: 4/22/09 Randomization: 4-6-2

Organism Log#: 4500 Age: <48 hrs
Organism Supplier: ABS
Control/Diluent: EPAMH
Control Water Batch: 1195

Treatment (g/L)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Conductivity (µs/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Control	25.3	8.18	8.11	9.8	9.1	311	9	9	9	8	Date: 4/26/09
0.75	25.3	8.08	8.00	9.9	8.4	1745	9	9	9	9	Test Solution Prep: JC
1.5	25.3	8.03	7.87	9.9	8.6	3150	9	10	10	8	New WQ: RV
3	25.3	7.96	7.81	10.0	8.5	5820	8	8	7	8	Renewal Time: 1045
6	25.3	7.87	7.76	10.0	8.6	10940	2	3	3	2	Renewal Signoff: QD
9	—	—	—	—	—	—	—	—	—	—	Old WQ: QD
Meter ID	24A	pH12	pH12	DO12	DO14	ECO1					
Control	25.6	8.68	7.85	10.7	8.8	317	9	9	9	8	Date: 4-27-09
0.75	25.6	8.38	7.77	9.6	8.6	1796	9	9	9	9	Test Solution Prep: AB
1.5	25.6	7.99	7.74	10.9	8.4	3260	9	10	10	8	New WQ: AR
3	25.6	7.95	7.70	10.4	8.6	5850	7	6	7	8	Renewal Time: 1050
6	25.6	7.79	7.67	10.0	8.7	10890	0	1	2	0	Renewal Signoff: [illegible]
9	—	—	—	—	—	—	—	—	—	—	Old WQ: [illegible]
Meter ID	24A	pH12	pH12	DO13	DO13	ECO5					
Control	25.7	8.18	7.74	10.7	7.4	319	9	9	9	8	Date: 4/28/09
0.75	25.7	~~7.80~~ 7.94	7.68	10.4	8.1	1718	9	9	9	8	Test Solution Prep: JPC
1.5	25.7	~~7.97~~ 7.94	7.68	10.7	8.0	3180	9	8	9	8	New WQ: PA
3	25.7	7.86	7.65	10.6	8.0	6000	4	4	5	6	Renewal Time: 1115
6	25.7	7.79	7.65	10.8	7.5	11280	—	0	2	—	Renewal Signoff: PA
9	—	—	—	—	—	—	—	—	—	—	Old WQ: PA
Meter ID	24A	pH14	pH12	DO13	DO12	ECO3					
Control	25.4		7.99		8.2	319	9	9	9	8	Date: 4/29/09
0.75	25.4		7.83		7.6	1750	9	9	8	7	Termination Time: 0945
1.5	25.4		7.72		7.3	3250	8	7	7	7	Termination Signoff: SH
3	25.4		7.68		7.6	6120	3	2	3	2	Old WQ: [illegible]
6	25.4		7.67		7.8	11420	—	—	0	—	
9	—		—		—	—	—	—	—	—	
Meter ID	24A		pH14		DO13	ECO3					

Fathead Minnow Dry Weight Data Sheet

Client: **Reference Toxicant** Test ID #: 32733 Project # 14728

Sample: Sodium Chloride Tare Weight Date: 4/27/09 Sign-off: YK

Test Date: 4/22/09 Final Weight Date: 4-30-09 Sign-off: MEC

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Control	A	175.33	179.46	10	0.413
2		B	193.13	197.52	10	0.439
3		C	180.11	183.51	10	0.340
4		D	172.00	176.20	10	0.420
5	0.75	A	183.90	187.52	10	0.316
6		B	179.14	183.06	10	0.392
7		C	187.54	190.67	10	0.313
8		D	178.28	181.88	10	0.360
9	1.5	A	173.13	176.17	10	0.304
10		B	181.60	183.23	10	0.163
11		C	183.79	186.96	10	0.317
12		D	192.25	194.84	10	0.259
13	3	A	189.51	190.42	10	0.091
14		B	170.67	171.21	10	0.054
15		C	166.99	167.66	10	0.067
16		D	153.29	153.76	10	0.047
17	6	A	154.91	—	10	0
18		B	178.26	—	10	0
19		C	151.30	—	10	0
20		D	164.83	—	10	0
21	9	A	169.31	—	10	0
22		B	168.02	—	10	0
23		C	176.02	—	10	0
24		D	177.94	—	10	0
QA1			161.51	161.53		0.02
QA2			170.83	170.84		0.01
QA3			171.05	171.09		0.04
Balance ID:			1	1		

Appendix L

Test Data and Summary of Statistics for the Toxicity Identification & Evaluation (TIE) of the Chronic Toxicity of Chevron/Cawelo Effluent to *Ceriodaphnia dubia* – Initial Test

CETIS Summary Report

Report Date: 23 May-09 14:20 (p 1 of 1)
Test Code: 01-6556-8403/32887Base

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Batch ID:	13-4806-0086	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Lisa Nugent
Start Date:	01 May-09 17:55	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	09 May-09 17:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	7d 23h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	01-9321-2529	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	21 Apr-09 19:00	**Source:**	Precision Analytical		
Sample Age:	10d 8h (10.5 °C)	**Station:**	Inlet Resv B		

Batch Note: T.I.E.

Sample Note: Baseline

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
05-6467-8120	8d Survival Rate	100	>100	N/A	N/A	1	Fisher Exact/Bonferroni-Holm Test
16-6425-3136	Reproduction	50	100	70.7	24.3%	2	Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
07-9500-2788	Reproduction	IC5	9.41	N/A	73.4	10.6	Linear Interpolation (ICPIN)
		IC10	50.7	N/A	56	1.97	
		IC15	52.9	N/A	58.3	1.89	
		IC20	55.1	N/A	60.7	1.81	
		IC25	57.5	8.19	63.1	1.74	
		IC40	65.3	51.6	71.1	1.53	
		IC50	71	58.8	77	1.41	

8d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	1	1	1	1	1	0	0	0.0%	0.0%
50		5	1	1	1	1	1	0	0	0.0%	0.0%
100		5	1	1	1	1	1	0	0	0.0%	0.0%

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	28.6	25.8	31.4	21	37	1.38	7.57	26.5%	0.0%
50		5	26.2	24.5	27.9	22	33	0.85	4.66	17.8%	8.39%
100		5	2.6	2.03	3.17	1	5	0.277	1.52	58.3%	90.9%

8d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	1	1	1	1	1
50		1	1	1	1	1
100		1	1	1	1	1

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	21	27	22	37	36
50		24	29	23	22	33
100		3	2	2	1	5

CETIS Analytical Report

Report Date: 23 May-09 14:20 (p 1 of 1)
Test Code: 01-6556-8403/32887Base

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	16-6425-3136	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:01	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	50	100	70.7	2	24.3%

Dunnett's Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50	0.729	2.11	6.94	0.3653	Non-Significant Effect
		100*	7.9	2.11	6.94	<0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2064.533	1032.267	2	38.1	<0.0001	Significant Effect
Error	325.2	27.1	12			
Total	2389.733	1059.367	14			

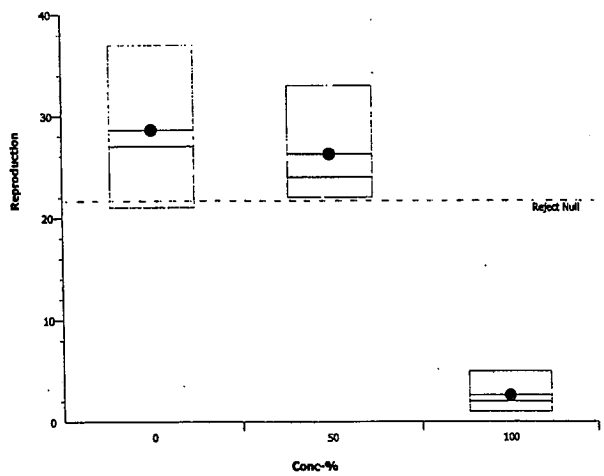
ANOVA Assumptions

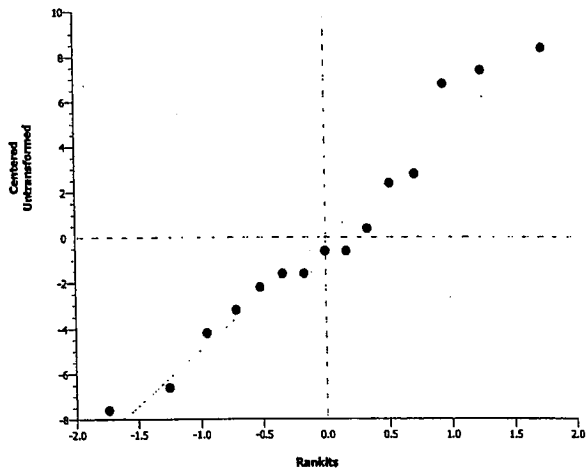
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	6.98	9.21	0.0304	Equal Variances
Distribution	Shapiro-Wilk Normality	0.95		0.5323	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	28.6	25.7	31.5	21	37	1.41	7.57	26.5%	0.0%
50		5	26.2	24.4	28	22	33	0.865	4.66	17.8%	8.39%
100		5	2.6	2.02	3.18	1	5	0.282	1.52	58.3%	90.9%

Graphics





CETIS Analytical Report

Report Date: 23 May-09 14:20 (p 1 of 1)
Test Code: 01-6556-8403/32887Base

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	07-9500-2788	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:20	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

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

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	9.41	N/A	73.4	10.6	1.36	N/A
IC10	50.7	N/A	56	1.97	1.79	N/A
IC15	52.9	N/A	58.3	1.89	1.72	N/A
IC20	55.1	N/A	60.7	1.81	1.65	N/A
IC25	57.5	8.19	63.1	1.74	1.58	12.2
IC40	65.3	51.6	71.1	1.53	1.41	1.94
IC50	71	58.8	77	1.41	1.3	1.7

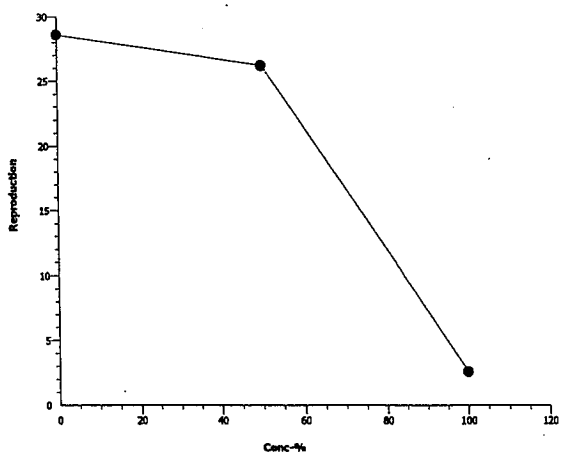
Reproduction Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contro	5	28.6	21	37	1.38	7.57	26.5%	0.0%
50		5	26.2	22	33	0.85	4.66	17.8%	8.39%
100		5	2.6	1	5	0.277	1.52	58.3%	90.9%

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	21	27	22	37	36
50		24	29	23	22	33
100		3	2	2	1	5

Graphics



CETIS Analytical Report

Report Date: 23 May-09 14:20 (p 1 of 1)
Test Code: 01-6556-8403/32887Base

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	05-6467-8120	**Endpoint:**	8d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:01	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

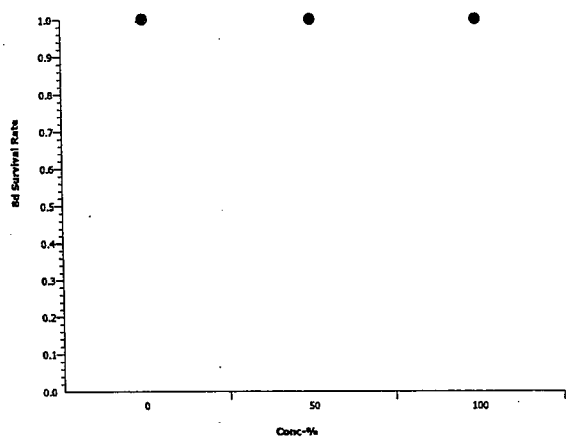
Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Lab Water Control		50	1	1.0000	Non-Significant Effect
		100	1	1.0000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Lab Water Cont	5	0	5
50		5	0	5
100		5	0	5

Graphics



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5/1/09

Project #: 14727 Test ID: 32887 Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E
Lab Water Control	0	8.08		7.3		217	25.4	0	0	0	0	0
	1	8.21	8.32	9.4	8.0	219	24.6	0	0	0	0	0
	2	8.34	8.25	9.9	9.2	236	24.8	0	0	0	0	0
	3	8.23	8.27	8.1	8.1	216	25.6	0	0	0	0	0
	4	8.24	8.22	8.3	8.8	217	25.8	0	0	0	0	0
	5	8.34	8.22	8.4	7.8	220	25.6	0	0	1	6	0
	6	7.80	8.29	8.4	8.0	235	25.8	7	7	7	0	10
	7	8.41	8.33	8.2	7.6	228	25.3	14	11	0	15	13
	8	—	8.32	—	8.9	244	25.4	0	9	14	16	13
							Total=	21	27	22	37	36

SIGN-OFF

Date: 5/1/09	New WQ:	Test Init.: JT	
Sol'n Prep: KO		Time: 1765	
Date: 5/2/09	New WQ: JT	Counts: JT	
Sol'n Prep: KO	Old WQ: SM	Time: 1200	
Date: 5/3/09	New WQ: AK	Counts: JK	
Sol'n Prep: JW	Old WQ: AK	Time: 1344	
Date: 5/4/09	New WQ: SL	Counts: JW	
Sol'n Prep: JW	Old WQ: SL	Time: 1100	
Date: 5/5/09	New WQ: PA	Counts: LW	
Sol'n Prep: JW	Old WQ: JW	Time: 1648	
Date: 5/6/09	New WQ: EKK	Counts: KO	
Sol'n Prep: PA	Old WQ: EKK	Time: 1610	
Date: 5/7/09	New WQ: PA	Counts: KO	
Sol'n Prep: KO	Old WQ: JW	Time: 1930	
Date: 5/8/09	New WQ: LW	Counts: EKK	
Sol'n Prep: KO	Old WQ: JT	Time: 1630	
Date: 5/9/09	New WQ: —	Counts: JL	
Sol'n Prep: —	Old WQ: LW	Time: 1700	

Mean Neonates/Female = 28.6

Pacific EcoRisk

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: Precision Analytical Sample ID: Sample 1 (Inlet to res B) Test Date: 5/1/09

Project #: 14727 Test ID: 32887 Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
50%	0	7.70		7.5		502		0	0	0	0	0	
	1	7.99	8.53	9.7	8.1	508		0	0	0	0	0	
	2	7.99	8.48	9.4	8.7	537		0	0	0	0	0	
	3	7.68	8.53	8.6	7.8	520		0	0	0	0	0	
	4	7.80	8.48	8.6	8.3	523		8	7	5	6	6	
	5	7.86	8.41	8.4	7.8	510		6	8	8	7	12	
	6	7.74	8.38	8.3	7.5	523		0	0	10	9	0	
	7	8.22	8.56	8.6	7.4	483		10	14	0	0	15	
	8	—	8.49	—	9.3	501		*14	*13	*6	0	*3	
							Total=	24	29	23	22	33	Mean Neonates/Female = 26.2

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
100%	0	7.60		7.6		783	0	0	0	0	0	21973
	1	7.98	8.67	9.8	8.1	791	0	0	0	0	0	21973
	2	7.60	8.69	9.7	8.8	824	0	0	0	0	0	21973
	3	7.40	8.69	9.0	7.9	814	0	0	0	0	0	21973
	4	7.58	8.56	8.8	7.5	807	0	0	0	0	0	21973
	5	7.54	8.48	8.7	7.1	790	0	0	0	0	0	21973
	6	7.55	8.52	9.1	7.7	813	0	0	0	0	0	21973
	7	8.20	8.54	8.8	7.2	790	3	2	2	1	0	—
	8	—	8.71	—	9.3	838	0	0	0	0	5	
							Total= 3	2	2	1	5	Mean Neonates/Female = 2.6

* 4th brood

CETIS Summary Report

Report Date: 23 May-09 14:26 (p 1 of 1)
Test Code: 16-8792-0442/32887Cent

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Batch ID:	13-4770-2513	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Lisa Nugent
Start Date:	01 May-09 17:55	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	09 May-09 17:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	7d 23h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	07-2482-2361	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	01 May-09 12:00	**Source:**	Precision Analytical		
Sample Age:	10d 8h (6 °C)	**Station:**	Inlet Resv B		

Batch Note: T.I.E.

Sample Note: Centrifugation

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
04-7669-3397	8d Survival Rate	0	>0		N/A		Fisher Exact Test
17-0256-7190		100	>100	N/A	N/A	1	Fisher Exact/Bonferroni-Holm Test
18-8795-8764	Reproduction	<0	0		25.4%		Unequal Variance t Two-Sample Test
01-1260-7196		50	100	70.7	25.2%	2	Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
02-3221-7796	Reproduction	IC5	51.1	N/A	57	1.96	Linear Interpolation (ICPIN)
		IC10	54.9	N/A	63.4	1.82	
		IC15	59	N/A	70.5	1.69	
		IC20	63.4	19	78.3	1.58	
		IC25	68.2	45.2	87	1.47	
		IC40	84.5	61.9	N/A	1.18	
		IC50	97.5	73.5	N/A	1.03	

8d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Cent Blank	5	1	1	1	1	1	0	0	0.0%	0.0%
0	Lab Water Contr	5	1	1	1	1	1	0	0	0.0%	0.0%
50		5	1	1	1	1	1	0	0	0.0%	0.0%
100		5	1	1	1	1	1	0	0	0.0%	0.0%

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Cent Blank	5	0.6	0.266	0.934	0	2	0.163	0.894	149.0%	0.0%
0	Lab Water Contr	5	28.6	25.8	31.4	21	37	1.38	7.57	26.5%	-4670.0%
50		5	27.6	26.3	28.9	23	31	0.627	3.44	12.4%	-4500.0%
100		5	13.8	12.2	15.4	9	19	0.79	4.32	31.3%	-2200.0%

8d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Cent Blank	1	1	1	1	1
0	Lab Water Contr	1	1	1	1	1
50		1	1	1	1	1
100		1	1	1	1	1

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Cent Blank	2	1	0	0	0
0	Lab Water Contr	21	27	22	37	36
50		25	23	31	30	29
100		19	17	10	14	9

CETIS Analytical Report

Report Date: 23 May-09 14:17 (p 1 of 2)
Test Code: 16-8792-0442/32887Cent

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	01-1260-7196	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:16	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	50	100	70.7	2	25.2%

Dunnett's Multiple Comparison Test

Control vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control	50	0.292	2.11	7.21	0.5466	Non-Significant Effect
	100*	4.33	2.11	7.21	0.0009	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	684.1334	342.0667	2	11.7	0.0015	Significant Effect
Error	351.2	29.26667	12			
Total	1035.333	371.3333	14			

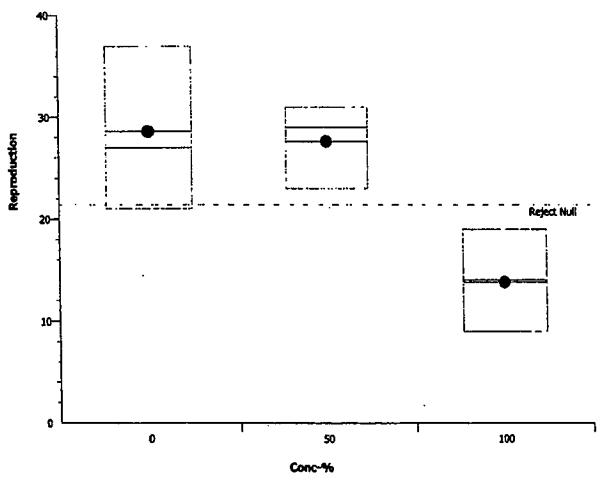
ANOVA Assumptions

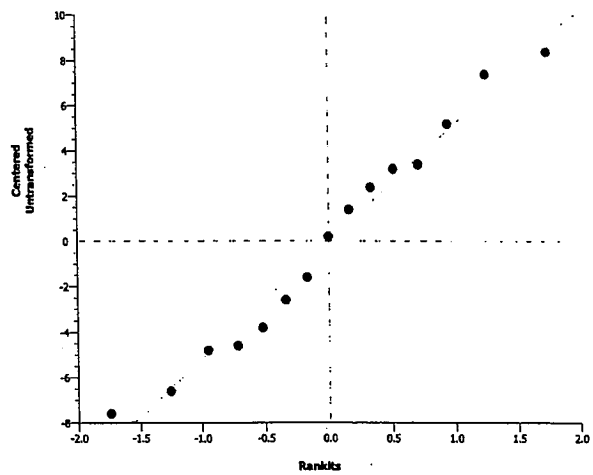
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	2.46	9.21	0.2917	Equal Variances
Distribution	Shapiro-Wilk Normality	0.962		0.7342	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	28.6	25.7	31.5	21	37	1.41	7.57	26.5%	0.0%
50		5	27.6	26.3	28.9	23	31	0.638	3.44	12.4%	3.5%
100		5	13.8	12.2	15.4	9	19	0.803	4.32	31.3%	51.7%

Graphics





Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	18-8795-8764	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:16	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	<0	0			25.4%

Unequal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		Cent Blank	8.21	2.13	7.27	0.0006	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1960	1960	1	67.5	<0.0001	Significant Effect
Error	232.4	29.05	8			
Total	2192.4	1989.05	9			

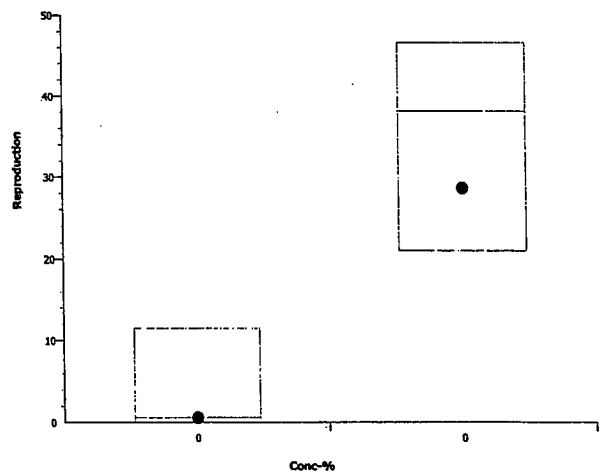
ANOVA Assumptions

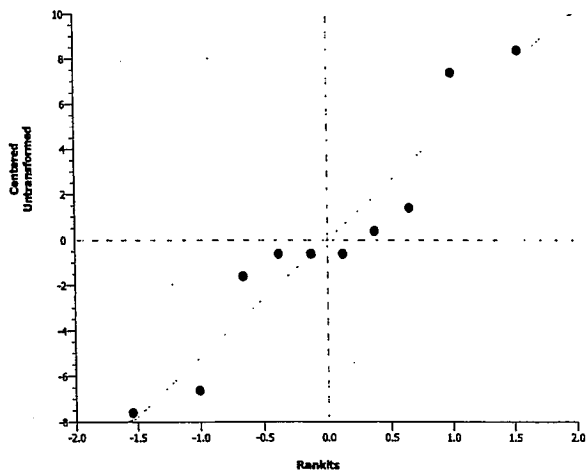
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	71.6	23.2	0.0011	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.911		0.2883	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	28.6	25.7	31.5	21	37	1.41	7.57	26.5%	0.0%
0	Cent Blank	5	0.6	0.26	0.94	0	2	0.166	0.894	149.0%	97.9%

Graphics





CETIS Analytical Report

Report Date: 23 May-09 14:18 (p 1 of 1)
Test Code: 16-8792-0442/32887Cent

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	02-3221-7796	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:16	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

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

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	51.1	N/A	57	1.96	1.75	N/A
IC10	54.9	N/A	63.4	1.82	1.58	N/A
IC15	59	N/A	70.5	1.69	1.42	N/A
IC20	63.4	19	78.3	1.58	1.28	5.26
IC25	68.2	45.2	87	1.47	1.15	2.21
IC40	84.5	61.9	N/A	1.18	N/A	1.61
IC50	97.5	73.5	N/A	1.03	N/A	1.36

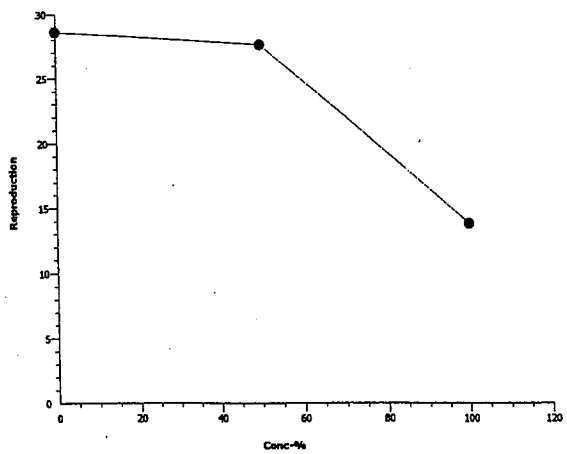
Reproduction Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contro	5	28.6	21	37	1.38	7.57	26.5%	0.0%
50		5	27.6	23	31	0.627	3.44	12.4%	3.5%
100		5	13.8	9	19	0.79	4.32	31.3%	51.7%

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	21	27	22	37	36
50		25	23	31	30	29
100		19	17	10	14	9

Graphics



CETIS Analytical Report

Report Date: 23 May-09 14:18 (p 1 of 2)
Test Code: 16-8792-0442/32887Cent

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	04-7669-3397	**Endpoint:**	8d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:16	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

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

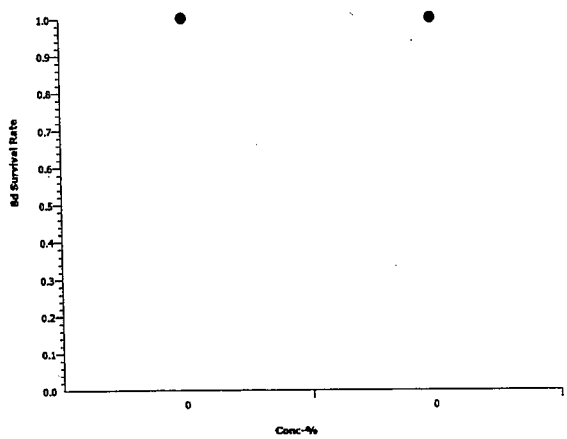
Fisher Exact Test

Control	vs	Control	Test Stat	P-Value	Decision(0.05)
Lab Water Control		Cent Blank	1	1.0000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Cent Blank	5	0	5
0	Lab Water Cont	5	0	5

Graphics



Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	17-0256-7190	**Endpoint:**	8d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:13	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

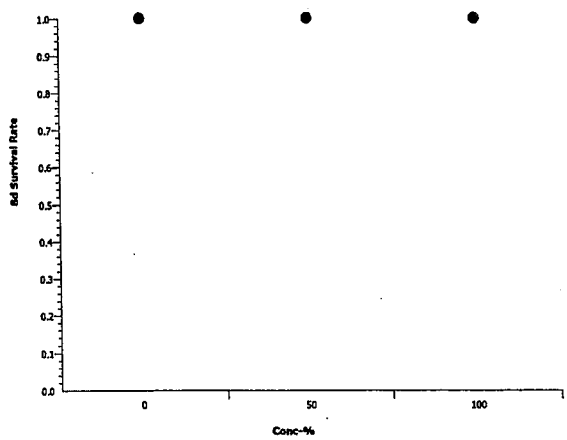
Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Lab Water Control		50	1	1.0000	Non-Significant Effect
		100	1	1.0000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Lab Water Cont	5	0	5
50		5	0	5
100		5	0	5

Graphics



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5/1/09

Project #: 14727 Test ID: 32887 Treatment: **Centrifugation** Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E
Centrifugation Blank	0	7.95		7.5		237	25.4	0	0	0	0	0
	1	8.12	8.35	10.2	8.2	219	24.6	0	0	0	0	0
	2	7.95	8.42	9.7	8.5	228	24.8	0	0	0	0	0
	3	7.95	8.46	9.4	8.1	237	25.6	0	0	0	0	0
	4	8.05	8.31	8.9	8.1	228	25.8	0	20	30	30	30
	5	7.99	8.21	9.1	7.9	217	25.4	0	0	0	0	0
	6	7.94	8.32	9.6	7.6	233	25.8	0	1	0	0	0
	7	8.30	8.31	9.0	7.7	220	25.3	2	0	0	0	0
	8	—	8.51	—	9.6	236	25.4	20	0	0	0	0
							Total=	2	1	0	0	0

SIGN-OFF

	Date	New WQ	Old WQ	Sol'n Prep	Counts	Time	Test Init.
	5/1/09					1755	
	5/2/09					1200	
	5/3/09					1345	
	5/4/09						
	5/5/09					1645	
	5/6/09					1610	
	5/7/09					1930	
	5/8/09					1630	
	5/9/09						

Mean Neonates/Female = 0.6

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5/1/09

Project #: 14727 Test ID: 32887 Treatment: **Centrifugation** Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
50%	0	7.69		7.6		496		0	0	0	0	0	
	1	7.75	8.33	9.9	8.1	512		0	0	0	0	0	
	2	7.93	8.52	9.8	8.5	529		0	0	0	0	0	
	3	7.76	8.58	9.9	8.0	517		0	0	0	0	0	
	4	7.98	8.46	8.1	8.3	519		8	5	8	7	5	
	5	8.00	8.43	8.4	8.0	489		10	8	9	9	9	
	6	7.91	8.34	8.6	7.7	505		7	0	0	0	0	
	7	8.29	8.49	8.7	7.7	494		0	10	14	14	15	
	8	—	8.52	—	9.4	515		*12	*12	*12	*11	*15	
							Total=	25	23	31	30	29	Mean Neonates/Female = 27.6

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
100%	0	7.46		7.8		785	0	0	0	0	0	21973
	1	7.57	8.62	10.2	8.4	803	0	0	0	0	0	21973
	2	7.81	8.67	9.5	8.4	829	0	0	0	0	0	21973
	3	7.60	8.66	9.3	7.9	801	0	0	0	0	0	21973
	4	7.83	8.52	8.3	8.0	802	0	0	0	0	0	21973
	5	8.01	8.55	8.8	7.4	785	5	0	1	5	0	21973
	6	7.79	8.54	9.2	7.8	812	0	7	0	0	0	21973
	7	8.24	8.37	8.7	7.4	792	8	3	2	4	5	21973
	8	—	8.69	—	9.3	819	6	7	7	5	4	—
							Total= 19	17	10	14	9	Mean Neonates/Female = 13.8

*4th brood

118/250

CETIS Summary Report

Report Date: 23 May-09 14:35 (p 1 of 1)
Test Code: 03-5180-6947/32887Cent+C18

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Batch ID:	09-5119-6493	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Lisa Nugent
Start Date:	01 May-09 17:55	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	09 May-09 17:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	7d 23h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	14-3310-2711	**Code:**	Samples #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	01 May-09 12:30	**Source:**	Precision Analytical		
Sample Age:	10d 8h (6 °C)	**Station:**	Inlet Resv B		

Batch Note: T.I.E.

Sample Note: Centrifugation + C18 SPE

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
06-3442-8420	8d Survival Rate	0	>0		N/A		Fisher Exact Test
09-8672-1873		100	>100	N/A	N/A	1	Fisher Exact/Bonferroni-Holm Test
01-5984-3356	Reproduction	<0	0		23.6%		Equal Variance t Two-Sample Test
08-3962-5288		100	>100	N/A	21.5%	1	Steel Many-One Rank Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
12-9770-7233	Reproduction	IC5	21.7	N/A	91.2	4.6	Linear Interpolation (ICPIN)
		IC10	57.6	N/A	110	1.74	
		IC15	69.7	N/A	N/A	1.43	
		IC20	84.4	10.1	N/A	1.19	
		IC25	>100	N/A	N/A	<1	
		IC40	>100	N/A	N/A	<1	
		IC50	>100	N/A	N/A	<1	

8d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Cent+C18 Blank	5	0.8	0.633	0.967	0	1	0.0816	0.447	55.9%	0.0%
0	Lab Water Contr	5	1	1	1	1	1	0	0	0.0%	-25.0%
50		5	1	1	1	1	1	0	0	0.0%	-25.0%
100		5	1	1	1	1	1	0	0	0.0%	-25.0%

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Cent+C18 Blank	5	20	18.9	21.1	18	25	0.532	2.92	14.6%	0.0%
0	Lab Water Contr	5	28.6	25.8	31.4	21	37	1.38	7.57	26.5%	-43.0%
50		5	26.8	26.2	27.4	25	29	0.271	1.48	5.53%	-34.0%
100		5	21.6	20.8	22.4	19	24	0.379	2.07	9.6%	-8.0%

8d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Cent+C18 Blank	1	1	1	0	1
0	Lab Water Contr	1	1	1	1	1
50		1	1	1	1	1
100		1	1	1	1	1

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Cent+C18 Blank	18	20	18	19	25
0	Lab Water Contr	21	27	22	37	36
50		27	25	26	27	29
100		19	24	20	22	23

CETIS Analytical Report

Report Date: 23 May-09 14:34 (p 1 of 2)
Test Code: 03-5180-6947/32887Cent+C18

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	08-3962-5288	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:33	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	100	>100	N/A	1	21.5%

Steel Many-One Rank Test

Control vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)
Lab Water Control	50	27	18	1	0.6241	Non-Significant Effect
	100	20.5	18	1	0.1234	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Bet.veen	132.1333	66.06667	2	3.11	0.0818	Non-Significant Effect
Error	255.2	21.26667	12			
Total	387.3333	87.33333	14			

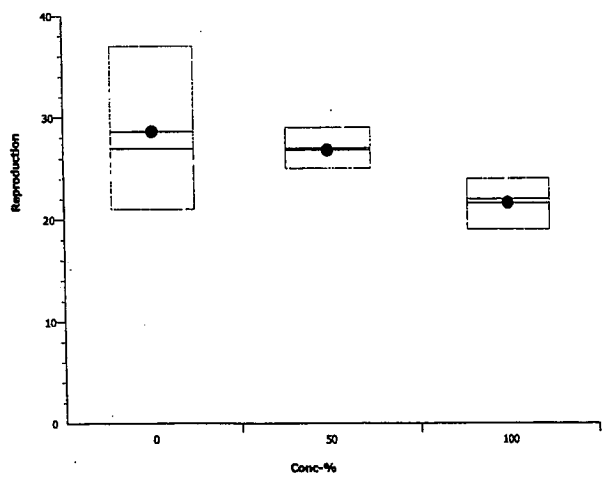
ANOVA Assumptions

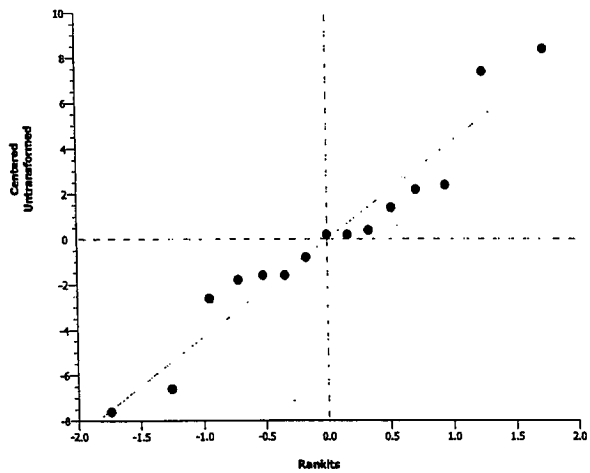
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	10.4	9.21	0.0056	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.941		0.3927	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	28.6	25.7	31.5	21	37	1.41	7.57	26.5%	0.0%
50		5	26.8	26.2	27.4	25	29	0.275	1.48	5.53%	6.29%
100		5	21.6	20.8	22.4	19	24	0.385	2.07	9.6%	24.5%

Graphics





Analyst: ____ QA: ____

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	01-5984-3356	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:33	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	<0	0			23.6%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		Cent+C18 Blank	2.37	1.86	6.75	0.0226	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	184.9	184.9	1	5.62	0.0452	Significant Effect
Error	263.2	32.9	8			
Total	448.1	217.8	9			

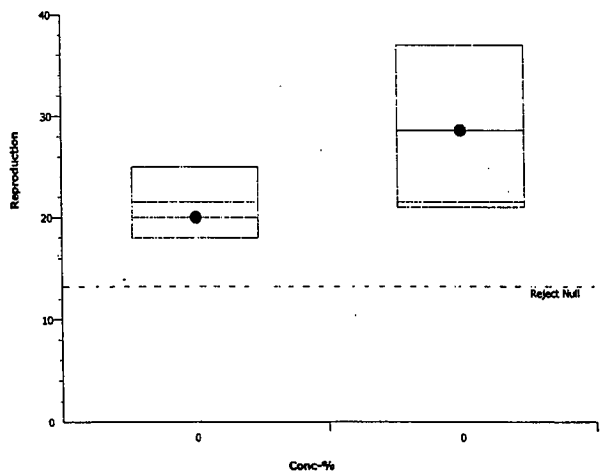
ANOVA Assumptions

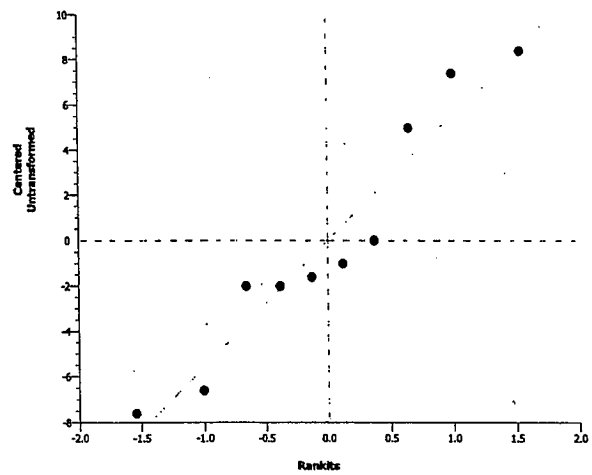
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	6.74	23.2	0.0915	Equal Variances
Distribution	Shapiro-Wilk Normality	0.919		0.3512	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	28.6	25.7	31.5	21	37	1.41	7.57	26.5%	0.0%
0	Cent+C18 Blank	5	20	18.9	21.1	18	25	0.541	2.92	14.6%	30.1%

Graphics





CETIS Analytical Report

Report Date: 23 May-09 14:35 (p 1 of 1)
Test Code: 03-5180-6947/32887Cent+C18

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	12-9770-7233	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:33	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

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

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	21.7	N/A	91.2	4.6	1.1	N/A
IC10	57.6	N/A	110	1.74	0.911	N/A
IC15	69.7	N/A	N/A	1.43	N/A	N/A
IC20	84.4	10.1	N/A	1.19	N/A	9.87
IC25	>100	N/A	N/A	<1	N/A	N/A
IC40	>100	N/A	N/A	<1	N/A	N/A
IC50	>100	N/A	N/A	<1	N/A	N/A

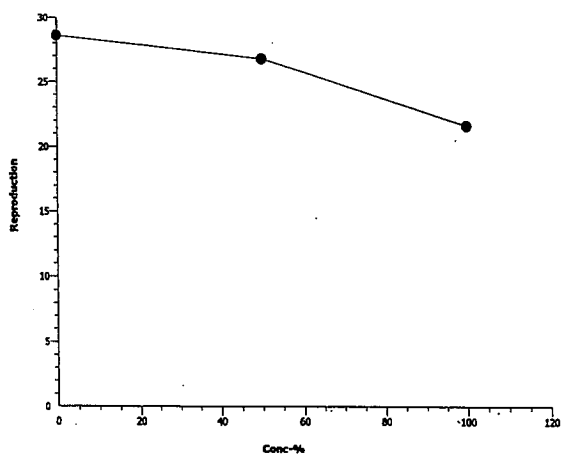
Reproduction Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contro	5	28.6	21	37	1.38	7.57	26.5%	0.0%
50		5	26.8	25	29	0.271	1.48	5.53%	6.29%
100		5	21.6	19	24	0.379	2.07	9.6%	24.5%

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	21	27	22	37	36
50		27	25	26	27	29
100		19	24	20	22	23

Graphics



CETIS Analytical Report

Report Date: 23 May-09 14:35 (p 1 of 2)
Test Code: 03-5180-6947/32887Cent+C18

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	06-3442-8420	**Endpoint:**	8d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:33	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

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

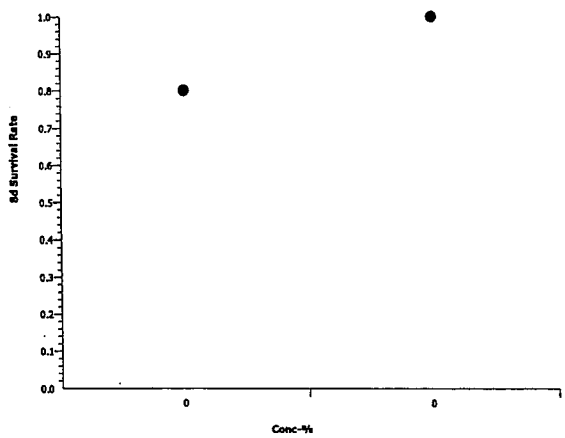
Fisher Exact Test

Control	vs	Control	Test Stat	P-Value	Decision(0.05)
Lab Water Control		Cent+C18 Blank	0.5	0.5000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Cent+C18 Blan	4	1	5
0	Lab Water Cont	5	0	5

Graphics



Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	09-8672-1873	**Endpoint:**	8d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:33	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

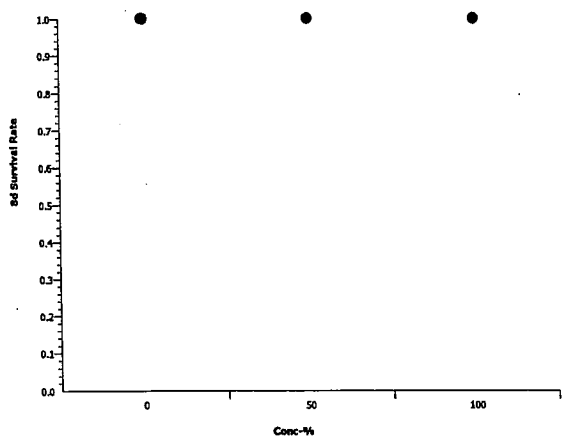
Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Lab Water Control		50	1	1.0000	Non-Significant Effect
		100	1	1.0000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Lab Water Cont	5	0	5
50		5	0	5
100		5	0	5

Graphics



Pacific EcoRisk

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: Precision Analytical Sample ID: Sample 1 (Inlet to res B) Test Date: 5/1/09

Project #: 14727 Test ID: 32887 Treatment: Centrifugation + C18 SPE Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E
Centrifugation + C18 SPE Blank	0	7.90		7.5		233	25.4	0	0	0	0	0
	1	8.01	8.48	10.2	8.6	218	24.6	0	0	0	0	0
	2	8.03	8.48	10.3	8.7	224	24.8	0	0	0	0	0
	3	8.01	8.46	9.9	7.9	230	25.6	0	0	0	0	0
	4	8.14	8.40	8.7	7.8	219	25.8	0	2	5	3	5
	5	8.14	8.23	9.0	7.9	223	25.6	0	0	6	5	7
	6	8.03	8.28	9.5	7.5	224	25.8	6	6	7	0	0
	7	8.24	8.33	9.1	7.6	227	25.3	10	12	0	X/11	13
	8	—	8.41	—	9.7	232	25.4	2	0	*6	—	0
							Total=	18	20	18	X/19	25

* 4th brood

SIGN-OFF

Date: 5/1/09 New WQ: Test Init.: JT
Sol'n Prep: AB Time: 1755

Date: 5/2/09 New WQ: JT Counts: JT
Sol'n Prep: JT Old WQ: Time: 1230

Date: 5/3/09 New WQ: Counts: JW
Sol'n Prep: JW Old WQ: Time: 1343

Date: 5/4/09 New WQ: Counts: JW
Sol'n Prep: JW Old WQ: Time: 1100

Date: 5/5/09 New WQ: Counts: LO
Sol'n Prep: JW Old WQ: JW Time: 1645

Date: 5/6/09 New WQ: Counts: KO
Sol'n Prep: DA Old WQ: Time: 1610

Date: 5/7/09 New WQ: Counts: KO
Sol'n Prep: KO Old WQ: JW Time: 1930

Date: 5/8/09 New WQ: Counts:
Sol'n Prep: KO Old WQ: Time: 1630

Date: 5/9/09 New WQ: — Counts: OT
Sol'n Prep: — Old WQ: LW Time: 0700

Mean Neonates/Female = 20

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5/1/09

Project #: 14727 Test ID: 32887 Treatment: **Centrifugation + C18 SPE** Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
50%	0	7.76	8.53	7.5		495		0	0	0	0	0	
	1	7.99	~~8.[illegible]~~	10.0	8.3	517		0	0	0	0	0	
	2	8.09	8.52	9.7	8.2	519		0	0	0	0	0	
	3	8.03	8.56	9.0	8.0	525		0	0	0	0	0	
	4	8.21	8.52	8.6	8.2	524		8	5	7	7	9	
	5	8.28	8.37	8.6	7.8	497		0	5	8	9	9	
	6	8.25	8.39	8.5	7.9	518		8	0	11	11	0	
	7	8.28	8.51	8.7	7.9	490		11	15	0	0	15	
	8	—	8.46	—	9.5	475		*12	*14	13*	14*	13*	
							Total=	27	25	26	27	29	Mean Neonates/Female = 26.4

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
100%	0	7.66		7.6		784	0	0	0	0	0	21973
	1	7.91	8.68	10.1	8.2	808	0	0	0	0	0	21973
	2	8.03	8.68	9.6	8.3	816	0	0	0	0	0	21973
	3	7.94	8.69	9.2	8.0	805	0	0	0	0	0	21973
	4	8.20	8.61	8.6	8.0	818	2	4	3	4	3	21973
	5	8.27	8.74	8.9	7.3	792	0	0	8	6	0	21973
	6	8.22	8.55	9.1	7.7	821	6	7	9	0	8	21973
	7	8.24	8.57	8.6	7.6	783	11	13	0	12	12	21973
	8	—	8.70	—	9.3	847	*15	*10	*10	*14	*12	—
							Total= 19	24	20	22	23	Mean Neonates/Female = 21.6

* 4th brood

CETIS Summary Report

Report Date: 23 May-09 14:44 (p 1 of 1)
Test Code: 09-4115-5475/32887Aeration

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Batch ID:	00-4559-7145	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Lisa Nugent
Start Date:	01 May-09 17:55	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	09 May-09 17:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	7d 23h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	09-8972-6690	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	01 May-09 13:00	**Source:**	Precision Analytical		
Sample Age:	10d 8h (6 °C)	**Station:**	Inlet Resv B		

Batch Note: T.I.E.

Sample Note: Aeration

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
03-1640-2870	8d Survival Rate	0	>0		N/A		Fisher Exact Test
17-0826-3851		100	>100	N/A	N/A	1	Fisher Exact/Bonferroni-Holm Test
13-6209-1543	Reproduction	<0	0		25.9%		Equal Variance t Two-Sample Test
07-4986-9750		50	100	70.7	31.6%	2	Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
14-8061-6755	Reproduction	IC5	2.23	0.0288	79.8	44.9	Linear Interpolation (ICPIN)
		IC10	9.41	N/A	83.1	10.6	
		IC15	32.6	N/A	79.9	3.07	
		IC20	52.6	N/A	79.6	1.9	
		IC25	56.9	N/A	92.7	1.76	
		IC40	72.1	48.6	N/A	1.39	
		IC50	84.4	58.6	N/A	1.19	

8d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Aeration Blank	5	1	1	1	1	1	0	0	0.0%	0.0%
0	Lab Water Contr	5	1	1	1	1	1	0	0	0.0%	0.0%
50		5	1	1	1	1	1	0	0	0.0%	0.0%
100		5	1	1	1	1	1	0	0	0.0%	0.0%

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Aeration Blank	5	14.4	12.6	16.2	9	22	0.862	4.72	32.8%	0.0%
0	Lab Water Contr	5	28.6	25.8	31.4	21	37	1.38	7.57	26.5%	-98.6%
50		5	23.8	22.4	25.2	18	28	0.663	3.63	15.3%	-65.3%
100		5	11.2	8.13	14.3	0	23	1.5	8.23	73.5%	22.2%

8d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Aeration Blank	1	1	1	1	1
0	Lab Water Contr	1	1	1	1	1
50		1	1	1	1	1
100		1	1	1	1	1

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Aeration Blank	9	13	22	14	14
0	Lab Water Contr	21	27	22	37	36
50		18	24	24	28	25
100		13	10	0	23	10

CETIS Analytical Report

Report Date: 23 May-09 14:43 (p 1 of 2)
Test Code: 09-4115-5475/32887Aeration

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	07-4986-9750	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:42	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	50	100	70.7	2	31.6%

Dunnett's Multiple Comparison Test

Control vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control	50	1.12	2.11	9.05	0.2296	Non-Significant Effect
	100*	4.05	2.11	9.05	0.0015	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	807.6	403.8	2	8.77	0.0045	Significant Effect
Error	552.8	46.06667	12			
Total	1360.4	449.8666	14			

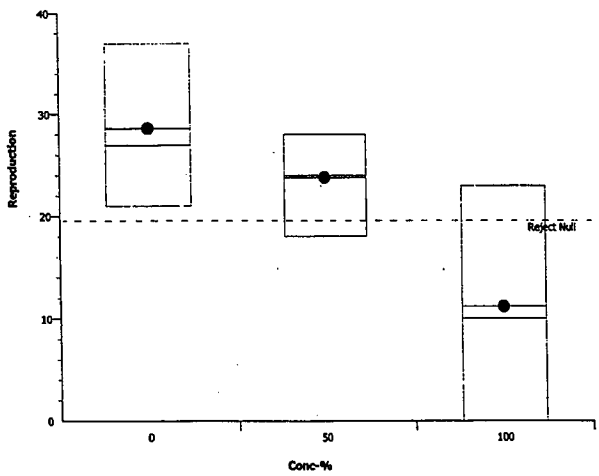
ANOVA Assumptions

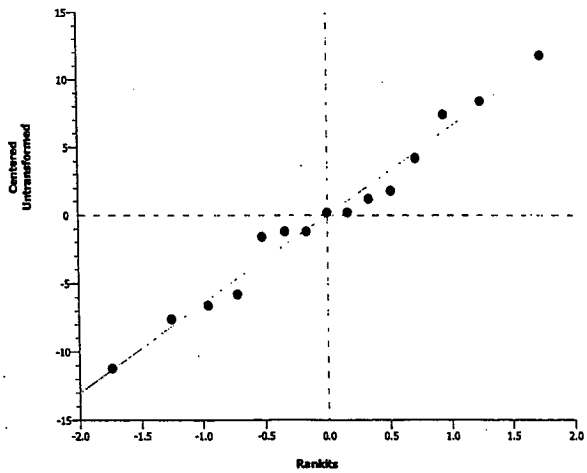
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	2.33	9.21	0.3122	Equal Variances
Distribution	Shapiro-Wilk Normality	0.977		0.9419	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	28.6	25.7	31.5	21	37	1.41	7.57	26.5%	0.0%
50		5	23.8	22.4	25.2	18	28	0.675	3.63	15.3%	16.8%
100		5	11.2	8.07	14.3	0	23	1.53	8.23	73.5%	60.8%

Graphics





Analyst: ____ QA: ____

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	13-6209-1543	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:42	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	<0	0			25.9%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		Aeration Blank	3.56	1.86	7.42	0.0037	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	504.1	504.1	1	12.7	0.0074	Significant Effect
Error	318.4	39.8	8			
Total	822.5	543.9	9			

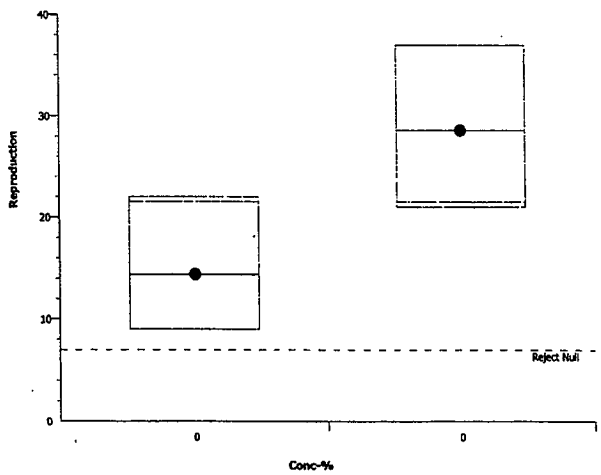
ANOVA Assumptions

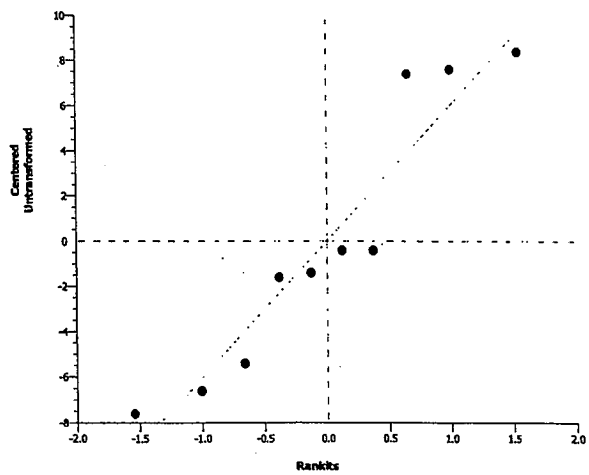
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.57	23.2	0.3830	Equal Variances
Distribution	Shapiro-Wilk Normality	0.885		0.1470	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	28.6	25.7	31.5	21	37	1.41	7.57	26.5%	0.0%
0	Aeration Blank	5	14.4	12.6	16.2	9	22	0.877	4.72	32.8%	49.7%

Graphics





CETIS Analytical Report

Report Date: 23 May-09 14:44 (p 1 of 1)
Test Code: 09-4115-5475/32887Aeration

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	14-8061-6755	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:42	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

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

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	2.23	0.0288	79.8	44.9	1.25	3480
IC10	9.41	N/A	83.1	10.6	1.2	N/A
IC15	32.6	N/A	79.9	3.07	1.25	N/A
IC20	52.6	N/A	79.6	1.9	1.26	N/A
IC25	56.9	N/A	92.7	1.76	1.08	N/A
IC40	72.1	48.6	N/A	1.39	N/A	2.06
IC50	84.4	58.6	N/A	1.19	N/A	1.71

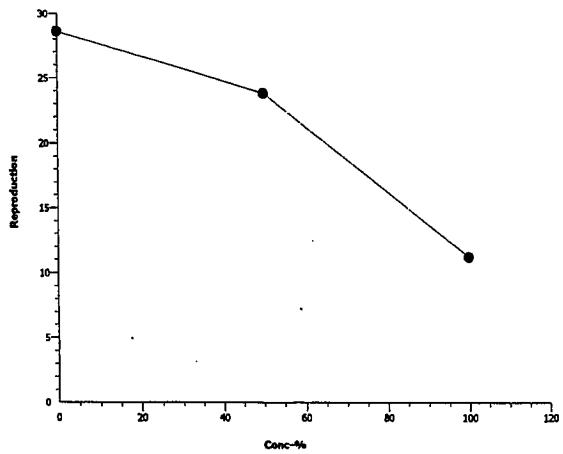
Reproduction Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contro	5	28.6	21	37	1.38	7.57	26.5%	0.0%
50		5	23.8	18	28	0.663	3.63	15.3%	16.8%
100		5	11.2	0	23	1.5	8.23	73.5%	60.8%

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	21	27	22	37	36
50		18	24	24	28	25
100		13	10	0	23	10

Graphics



CETIS Analytical Report

Report Date: 23 May-09 14:44 (p 1 of 2)
Test Code: 09-4115-5475/32887Aeration

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	03-1640-2870	**Endpoint:**	8d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:42	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

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

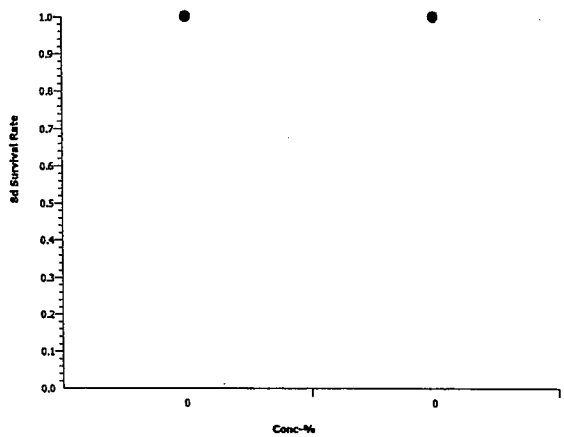
Fisher Exact Test

Control	vs	Control	Test Stat	P-Value	Decision(0.05)
Lab Water Control		Aeration Blank	1	1.0000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Aeration Blank	5	0	5
0	Lab Water Cont	5	0	5

Graphics



CETIS Analytical Report

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	17-0826-3851	**Endpoint:**	8d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:42	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

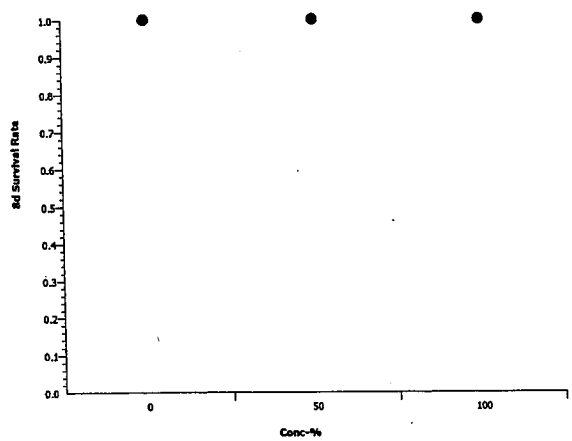
Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Lab Water Control		50	1	1.0000	Non-Significant Effect
		100	1	1.0000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Lab Water Cont	5	0	5
50		5	0	5
100		5	0	5

Graphics



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5/1/09

Project #: 14727 Test ID: 32887 Treatment: **Aeration** Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SIGN-OFF
Aeration Blank	0	7.96		7.3		243	25.4	0	0	0	0	0	Date: 5/1/09 New WQ: Test Init.: Sol'n Prep: Time: 1755
	1	8.12	8.35	9.5	8.3	219	24.6	0	0	0	0	0	Date: 5/2/09 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1200
	2	8.09	8.41	9.7	8.8	220	24.8	0	0	0	0	0	Date: 5/3/09 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1345
	3	8.03	8.43	9.5	8.0	235	25.6	0	0	0	0	0	Date: 5/4/09 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1100
	4	8.05	8.34	8.8	7.5	223	25.8	0	3	0	0	5	Date: 5/5/09 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1645
	5	8.17	8.29	9.1	7.6	221	25.4	9	0	0	6	0	Date: 5/6/09 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1610
	6	8.11	8.34	9.1	7.7	221	25.8	0	7	8	0	8	Date: 5/7/09 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1930
	7	8.24	8.34	8.9	8.0	226	25.0	0	3	13	8	1	Date: 5/8/09 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1630
	8	—	8.41	—	9.6	234	25.4	0	0	1	0	0	Date: 5/9/09 New WQ: — Counts: Sol'n Prep: — Old WQ: Time: 1200
							Total=	9	13	22	14	14	Mean Neonates/Female = 14.4

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5/1/09

Project #: 14727 Test ID: 32887 Treatment: **Aeration** Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
50%	0	8.22		7.5		476		0	0	0	0	0	
	1	8.40	8.53	9.4	8.2	516		0	0	0	0	0	
	2	8.32	8.50	9.7	8.3	520		0	0	0	0	0	
	3	8.33	8.58	9.0	8.0	513		0	0	0	0	0	
	4	8.39	8.42	8.8	8.0	516		4	7	5	4	6	
	5	8.37	8.49	8.8	7.9	506		7	9	10	11	5	
	6	8.33	8.42	7.9	7.6	513		7	0	0	0	0	
	7	8.42	8.47	8.8	7.8	462		0	8	9	13	14	
	8	—	8.50	—	9.2	505		*18	*12	*11	*11	*10	
							Total=	18	24	24	28	25	Mean Neonates/Female = 23.8

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
100%	0	8.33		7.6		774	0	0	0	0	0	21973
	1	8.47	8.65	9.8	8.2	801	0	0	0	0	0	21973
	2	8.43	8.64	9.9	8.4	812	0	0	0	0	0	21973
	3	8.40	8.66	8.9	8.0	800	0	0	0	0	0	21973
	4	8.45	8.56	8.8	8.2	792	0	5	0	0	3	21973
	5	8.45	8.58	9.1	7.8	784	0	0	0	0	0	21973
	6	8.44	8.54	8.9	7.7	815	2	0	0	6	3	21973
	7	8.53	8.57	8.7	7.7	782	5	5	0	10	4	21973
	8	—	8.68	—	9.3	805	6	0	0	7	0	—
							Total= 13	10	0	23	10	Mean Neonates/Female = 11.2

*4th brood

CETIS Summary Report

Report Date: 23 May-09 14:57 (p 1 of 1)
Test Code: 12-4985-0156/32887PBO@25

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Batch ID:	18-4859-4887	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Lisa Nugent
Start Date:	01 May-09 17:55	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	09 May-09 17:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	7d 23h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	12-9678-1136	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	01 May-09 13:30	**Source:**	Precision Analytical		
Sample Age:	10d 8h (6 °C)	**Station:**	Inlet Resv B		

Batch Note: T.I.E.

Sample Note: PBO at 25 µg/L

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
09-6797-2237	8d Survival Rate	0	>0		N/A		Fisher Exact Test
00-4332-0791		100	>100	N/A	N/A	1	Fisher Exact/Bonferroni-Holm Test
05-3704-8951	Reproduction	0	>0		23.2%		Equal Variance t Two-Sample Test
08-2136-5195		50	100	70.7	36.6%	2	Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
05-8795-8158	Reproduction	IC5	0.755	0.105	76.9	133	Linear Interpolation (ICPIN)
		IC10	2.08	0.0813	79.7	48.1	
		IC15	4.4	N/A	81.6	22.7	
		IC20	8.48	N/A	82.8	11.8	
		IC25	15.6	N/A	82.5	6.4	
		IC40	53.1	N/A	74.5	1.88	
		IC50	59.9	N/A	79.6	1.67	

8d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	1	1	1	1	1	0	0	0.0%	0.0%
0	PBO Blank	5	1	1	1	1	1	0	0	0.0%	0.0%
50		5	0.8	0.633	0.967	0	1	0.0816	0.447	55.9%	20.0%
100		5	1	1	1	1	1	0	0	0.0%	0.0%

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	28.6	25.8	31.4	21	37	1.38	7.57	26.5%	0.0%
0	PBO Blank	5	22.4	21.5	23.3	20	26	0.458	2.51	11.2%	21.7%
50		5	18.6	14.6	22.6	0	28	1.96	10.8	57.9%	35.0%
100		5	2	0.706	3.29	0	8	0.632	3.46	173.0%	93.0%

8d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	1	1	1	1	1
0	PBO Blank	1	1	1	1	1
50		1	1	0	1	1
100		1	1	1	1	1

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	21	27	22	37	36
0	PBO Blank	26	21	21	20	24
50		22	28	0	22	21
100		0	0	8	0	2

CETIS Analytical Report

Report Date: 23 May-09 14:57 (p 1 of 2)
Test Code: 12-4985-0156/32887PBO@25

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	08-2136-5195	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:56	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	50	100	70.7	2	36.6%

Dunnett's Multiple Comparison Test

Control vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control	50	2.01	2.11	10.5	0.0588	Non-Significant Effect
	100*	5.35	2.11	10.5	0.0002	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1805.2	902.6	2	14.6	0.0006	Significant Effect
Error	740.4	61.7	12			
Total	2545.6	964.3	14			

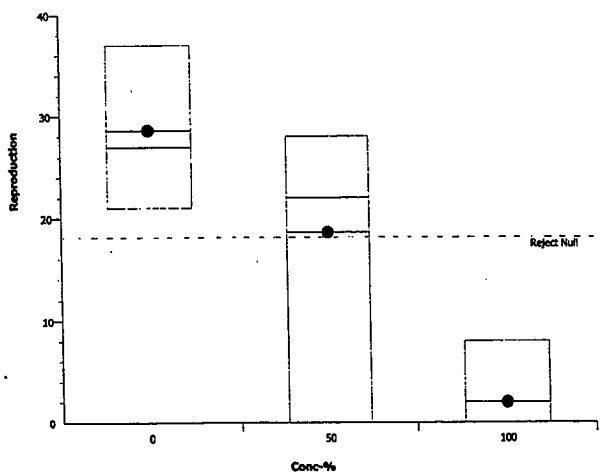
ANOVA Assumptions

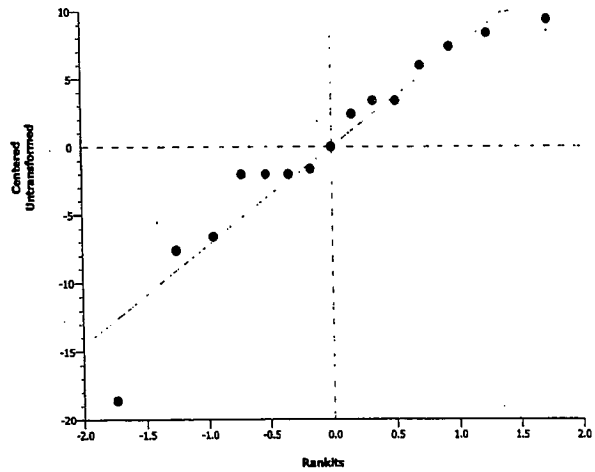
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	3.89	9.21	0.1427	Equal Variances
Distribution	Shapiro-Wilk Normality	0.919		0.1854	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	28.6	25.7	31.5	21	37	1.41	7.57	26.5%	0.0%
50		5	18.6	14.5	22.7	0	28	2	10.8	57.9%	35.0%
100		5	2	0.682	3.32	0	8	0.643	3.46	173.0%	93.0%

Graphics





CETIS Analytical Report

Report Date: 23 May-09 14:57 (p 2 of 2)
Test Code: 12-4985-0156/32887PBO@25

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	05-3704-8951	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	0	>0			23.2%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		PBO Blank	1.74	1.86	6.63	0.0602	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	96.1	96.1	1	3.02	0.1203	Non-Significant Effect
Error	254.4	31.8	8			
Total	350.5	127.9	9			

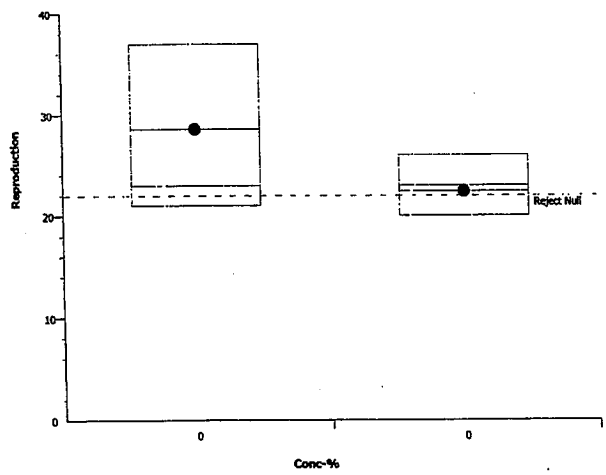
ANOVA Assumptions

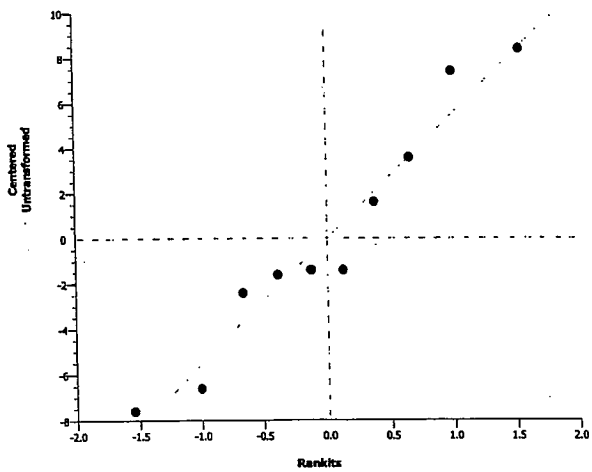
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	9.1	23.2	0.0550	Equal Variances
Distribution	Shapiro-Wilk Normality	0.94		0.5530	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	PBO Blank	5	22.4	21.4	23.4	20	26	0.466	2.51	11.2%	0.0%
0	Lab Water Contr	5	28.6	25.7	31.5	21	37	1.41	7.57	26.5%	-27.7%

Graphics





CETIS Analytical Report

Report Date: 23 May-09 14:57 (p 1 of 1)
Test Code: 12-4985-0156/32887PBO@25

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	05-8795-8158	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:56	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

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

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	0.755	0.105	76.9	133	1.3	949
IC10	2.08	0.0813	79.7	48.1	1.25	1230
IC15	4.4	N/A	81.6	22.7	1.22	N/A
IC20	8.48	N/A	82.8	11.8	1.21	N/A
IC25	15.6	N/A	82.5	6.4	1.21	N/A
IC40	53.1	N/A	74.5	1.88	1.34	N/A
IC50	59.9	N/A	79.6	1.67	1.26	N/A

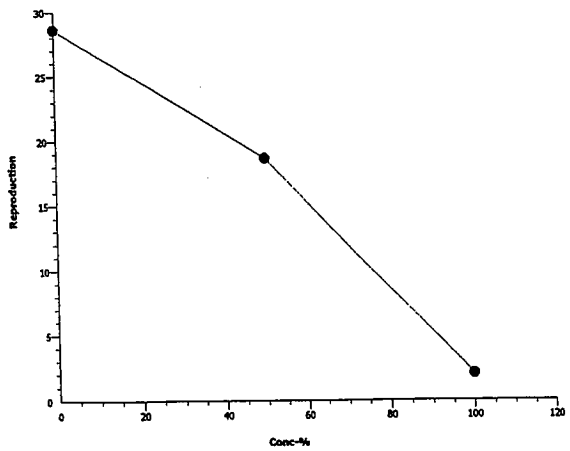
Reproduction Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contro	5	28.6	21	37	1.38	7.57	26.5%	0.0%
50		5	18.6	0	28	1.96	10.8	57.9%	35.0%
100		5	2	0	8	0.632	3.46	173.0%	93.0%

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	21	27	22	37	36
50		22	28	0	22	21
100		0	0	8	0	2

Graphics



Analyst: W QA: JJ

CETIS Analytical Report

Report Date: 23 May-09 14:57 (p 1 of 2)
Test Code: 12-4985-0156/32887PBO@25

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	09-6797-2237	**Endpoint:**	8d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:55	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

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

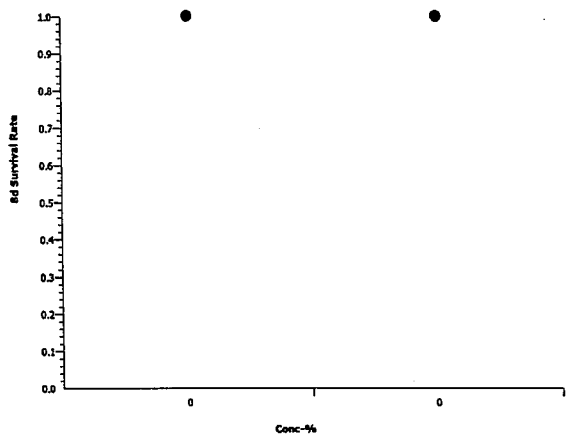
Fisher Exact Test

Control	vs	Control	Test Stat	P-Value	Decision(0.05)
Lab Water Control		PBO Blank	1	1.0000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Lab Water Cont	5	0	5
0	PBO Blank	5	0	5

Graphics



Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	00-4332-0791	**Endpoint:**	8d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 14:55	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

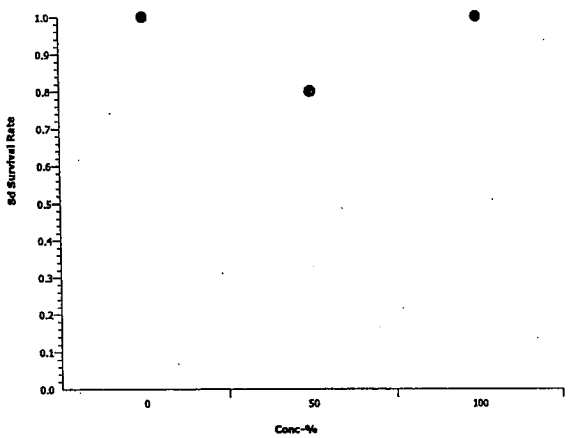
Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Lab Water Control		50	0.5	1.0000	Non-Significant Effect
		100	1	1.0000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Lab Water Cont	5	0	5
50		4	1	5
100		5	0	5

Graphics



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5/1/09

Project #: 14727 Test ID: 32887 Treatment: **PB0 (25 µg/L) Blank** Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SIGN-OFF
PB0 (25 µg/L) Blank	0	8.20		7.5		239	25.4	0	0	0	0	0	Date: 5/1/09 New WQ: Test Init.: JT Sol'n Prep: AB Time: 1755
	1	8.24	8.18	8.9	7.9	218	24.6	0	0	0	0	0	Date: 5/2/09 New WQ: JT Counts: JT Sol'n Prep: JT Old WQ: JT Time: 1200
	2	8.27	8.42	9.5	9.2	226	24.8	0	0	0	0	0	Date: 5/3/09 New WQ: AR Counts: JW Sol'n Prep: JW Old WQ: AR Time: 1345
	3	8.28	8.47	8.6	8.0	233	25.6	0	0	0	0	0	Date: 5/4/09 New WQ: SL Counts: JW Sol'n Prep: JW Old WQ: JL Time: 1100
	4	8.21	8.35	8.3	8.4	218	25.8	0	0	1	5	2	Date: 5/5/09 New WQ: PA Counts: W Sol'n Prep: JW Old WQ: JW Time: 1645
	5	8.25	8.29	8.5	8.2	220	25.6	3	0	0	0	0	Date: 5/6/09 New WQ: EKK Counts: KO Sol'n Prep: PA Old WQ: EKK Time: 1610
	6	8.22	8.32	8.8	8.7	237	25.8	0	7	8	4	6	Date: 5/7/09 New WQ: KO/PA Counts: KO Sol'n Prep: KO Old WQ: JW Time: 1930
	7	8.32	8.31	8.3	8.0	231	25.3	15	14	12	11	16	Date: 5/8/09 New WQ: W Counts: EKK Sol'n Prep: KO Old WQ: JT Time: 1630
	8	—	8.55	—	9.5	236	26.4	8	0	0	*7	0	Date: 5/9/9 New WQ: — Counts: JL Sol'n Prep: I Old WQ: W Time: 1700
							Total=	26	21	21	20	24	Mean Neonates/Female = 22.4

* 4th brood

Pacific EcoRisk

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5/1/09

Project #: 14727 Test ID: 32887 Treatment: **PB0 (25 µg/L) Blank** Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
50%	0	7.77		7.5		496		0	0	0	0	0	
	1	8.07	8.48	9.2	7.9	512		0	0	0	0	0	
	2	7.85	8.48	8.4	8.7	535		0	0	X/0	0	0	
	3	7.84	8.54	8.5	7.9	500		0	0	–	0	0	
	4	7.89	8.46	8.3	8.4	514		4	1	–	3	4	
	5	7.83	8.46	8.3	8.2	495		8	7	–	9	9	
	6	7.92	8.38	7.8	8.0	527		10	0	–	0	0	
	7	8.23	8.47	8.6	7.8	542		0	11	–	3	8	
	8	—	8.50	—	9.2	472		0	9	–	7	*8	
							Total=	22	28	X/0	22	21	Mean Neonates/Female = 18.6

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
100%	0	7.56		7.7		775	0	0	0	0	0	21973
	1	7.95	8.73	9.8	8.1	805	0	0	0	0	0	21973
	2	7.57	8.63	9.4	8.2	812	0	0	0	0	0	21973
	3	7.59	8.68	8.6	7.9	795	0	0	0	0	0	21973
	4	7.63	8.60	8.6	8.2	796	0	0	0	0	0	21973
	5	7.65	8.50	8.6	7.6	787	0	0	0	0	0	21973
	6	7.71	8.55	9.5	8.9	820	0	0	0	0	0	21973
	7	8.26	8.52	8.6	7.8	802	0	0	8	0	2	21973
	8	—	8.69	—	9.4	837	0	0	0	0	0	—
							Total= 0	0	8	0	2	Mean Neonates/Female = 2

* 4th brood

CETIS Summary Report

Report Date: 23 May-09 15:10 (p 1 of 1)
Test Code: 04-1653-1164/32887PBO@100

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Batch ID:	03-8639-1639	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Lisa Nugent
Start Date:	01 May-09 17:55	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	09 May-09 17:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	7d 23h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	12-0766-6284	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	01 May-09 14:00	**Source:**	Precision Analytical		
Sample Age:	10d 8h (6 °C)	**Station:**	Inlet Resv B		

Batch Note: T.I.E.

Sample Note: PBO at 100 µg/L

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
02-2045-6052	8d Survival Rate	0	>0		N/A		Fisher Exact Test
01-5227-4300		100	>100	N/A	N/A	1	Fisher Exact/Bonferroni-Holm Test
05-5797-9427	Reproduction	0	>0		30.0%		Equal Variance t Two-Sample Test
06-8596-4370		<50	50	N/A	26.5%	>2	Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
01-5454-8853	Reproduction	IC5	0.277	0.209	0.408	361	Linear Interpolation (ICPIN)
		IC10	0.631	0.46	0.977	159	
		IC15	1.08	0.761	1.77	92.4	
		IC20	1.66	1.12	2.87	60.3	
		IC25	2.39	1.55	4.39	41.8	
		IC40	6.07	3.41	13.5	16.5	
		IC50	10.5	5.28	26.8	9.5	

8d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	1	1	1	1	1	0	0	0.0%	0.0%
0	PBO Blank	5	1	1	1	1	1	0	0	0.0%	0.0%
50		5	1	1	1	1	1	0	0	0.0%	0.0%
100		5	0.6	0.395	0.805	0	1	0.1	0.548	91.3%	40.0%

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	28.6	25.8	31.4	21	37	1.38	7.57	26.5%	0.0%
0	PBO Blank	5	21.6	19	24.2	11	28	1.28	7.02	32.5%	24.5%
50		5	5.6	3.7	7.5	0	11	0.927	5.08	90.7%	80.4%
100		5	0	0	0	0	0	0	0		100.0%

8d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	1	1	1	1	1
0	PBO Blank	1	1	1	1	1
50		1	1	1	1	1
100		1	0	1	1	0

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	21	27	22	37	36
0	PBO Blank	18	11	25	28	26
50		3	0	11	11	3
100		0	0	0	0	0

CETIS Analytical Report

Report Date: 23 May-09 15:09 (p 1 of 2)
Test Code: 04-1653-1164/32887PBO@100

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	05-5797-9427	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 15:08	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	0	>0			30.0%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		PBO Blank	1.52	1.86	8.59	0.0840	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	122.5	122.5	1	2.3	0.1680	Non-Significant Effect
Error	426.4	53.3	8			
Total	548.9	175.8	9			

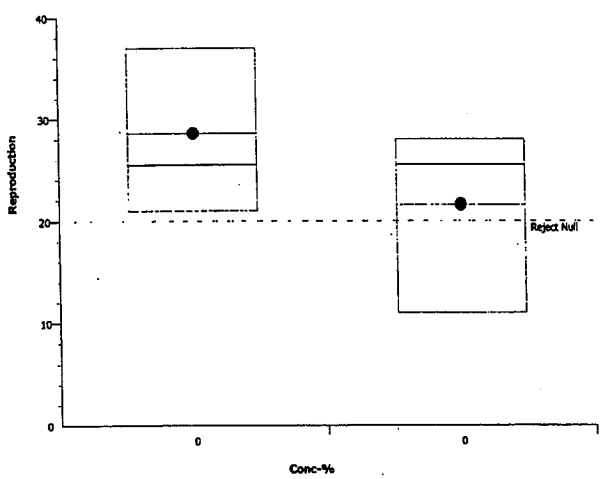
ANOVA Assumptions

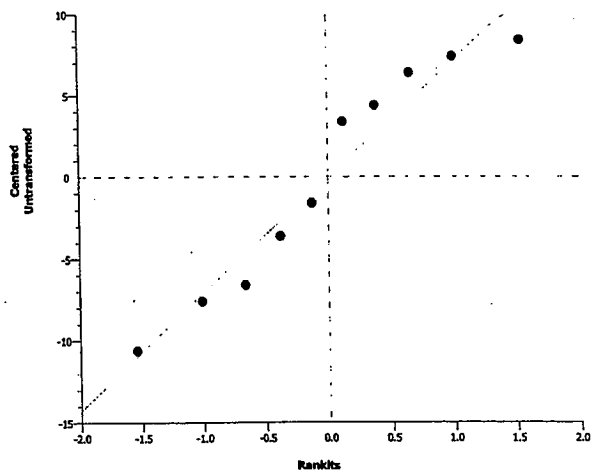
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.16	23.2	0.8876	Equal Variances
Distribution	Shapiro-Wilk Normality	0.92		0.3555	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	PBO Blank	5	21.6	18.9	24.3	11	28	1.3	7.02	32.5%	0.0%
0	Lab Water Contr	5	28.6	25.7	31.5	21	37	1.41	7.57	26.5%	-32.4%

Graphics





Analyst: V QA: J

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	06-8596-4370	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 15:08	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	<50	50	N/A	>2	26.5%

Dunnett's Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50*	5.64	1.86	7.58	0.0002	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1322.5	1322.5	1	31.8	0.0005	Significant Effect
Error	332.4	41.55	8			
Total	1654.9	1364.05	9			

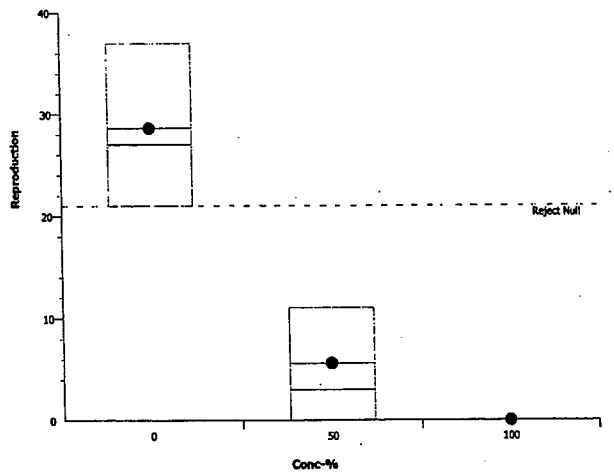
ANOVA Assumptions

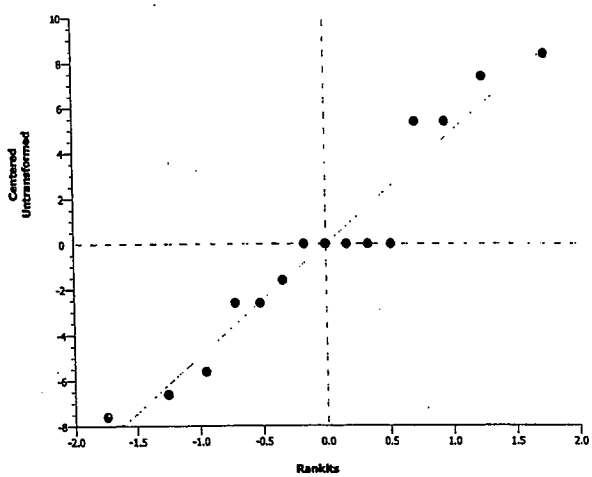
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.22	23.2	0.4586	Equal Variances
Distribution	Shapiro-Wilk Normality	0.886		0.1545	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	28.6	25.7	31.5	21	37	1.41	7.57	26.5%	0.0%
50		5	5.6	3.67	7.53	0	11	0.943	5.08	90.7%	80.4%
100		5	0	0	0	0	0	0	0		100.0%

Graphics





CETIS Analytical Report

Report Date: 23 May-09 15:10 (p 1 of 1)
Test Code: 04-1653-1164/32887PBO@100

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	01-5454-8853	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 15:08	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

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

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	0.277	0.209	0.408	361	245	479
IC10	0.631	0.46	0.977	159	102	217
IC15	1.08	0.761	1.77	92.4	56.6	131
IC20	1.66	1.12	2.87	60.3	34.9	89.1
IC25	2.39	1.55	4.39	41.8	22.8	64.4
IC40	6.07	3.41	13.5	16.5	7.42	29.4
IC50	10.5	5.28	26.8	9.5	3.74	18.9

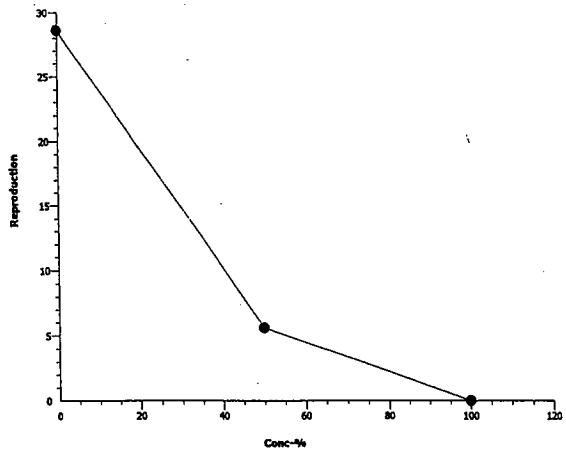
Reproduction Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contro	5	28.6	21	37	1.38	7.57	26.5%	0.0%
50		5	5.6	0	11	0.927	5.08	90.7%	80.4%
100		5	0	0	0	0	0		100.0%

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	21	27	22	37	36
50		3	0	11	11	3
100		0	0	0	0	0

Graphics



CETIS Analytical Report

Report Date: 23 May-09 15:10 (p 1 of 2)
Test Code: 04-1653-1164/32887PBO@100

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	01-5227-4300	**Endpoint:**	8d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 15:07	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

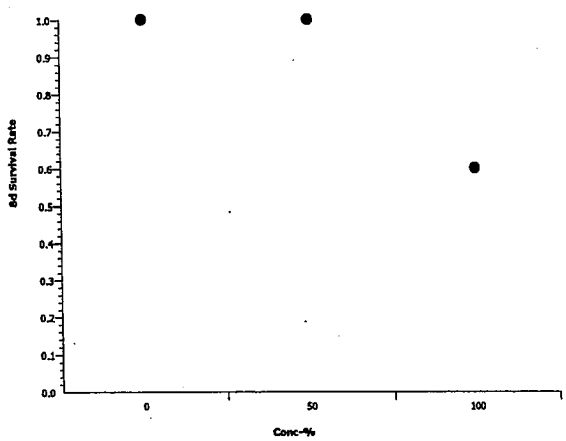
Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Lab Water Control		50	1	1.0000	Non-Significant Effect
		100	0.222	0.2222	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Lab Water Cont	5	0	5
50		5	0	5
100		3	2	5

Graphics



Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	02-2045-6052	**Endpoint:**	8d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	23 May-09 15:07	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

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

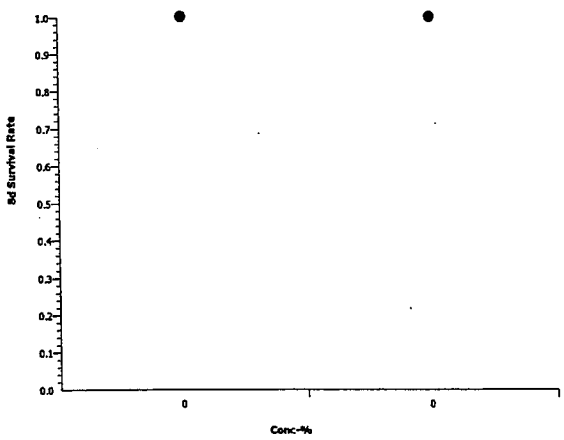
Fisner Exact Test

Control	vs	Control	Test Stat	P-Value	Decision(0.05)
Lab Water Control		PBO Blank	1	1.0000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Lab Water Cont	5	0	5
0	PBO Blank	5	0	5

Graphics



Pacific EcoRisk

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5/1/09

Project #: 14727 Test ID: 32887 Treatment: **PB0 (100 µg/L) Blank** Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SIGN-OFF
PB0 (100 µg/L) Blank	0	7.72		7.5		235	25.4	0	0	0	0	0	Date: 5/1/09 New WQ: Test Init. JT Sol'n Prep: KB Time: 1755
	1	8.21	8.21	9.4	7.9	215	24.6	0	0	0	0	0	Date: 5/2/09 New WQ: JT Counts: JT Sol'n Prep: JT Old WQ: Time: 1200
	2	7.95	8.37	9.5	8.7	216	24.8	0	0	0	0	0	Date: 5/3/09 New WQ: Counts: NW Sol'n Prep: Old WQ: Time: 1745
	3	8.10	8.45	8.4	8.0	232	25.6	0	0	0	0	0	Date: 5/4/09 New WQ: Counts: NW Sol'n Prep: Old WQ: Time: 1100
	4	8.18	8.36	8.0	8.0	213	25.8	0	0	0	0	0	Date: 5/5/09 New WQ: PA Counts: 69 10 Sol'n Prep: Old WQ: Time: 1645
	5	8.15	8.28	8.6	8.1	220	25.6	0	0	0	0	0	Date: 5/6/09 New WQ: Counts: 40 Sol'n Prep: PA Old WQ: Time: 1410
	6	8.02	8.36	9.0	7.7	227	25.8	7	0	9	7	5	Date: 5/7/09 New WQ: Counts: 40 Sol'n Prep: Old WQ: Time: 1930
	7	8.28	8.34	8.2	8.1	221	25.3	11	0	6	12	14	Date: 5/8/09 New WQ: Counts: CKK Sol'n Prep: Old WQ: Time: 1630
	8	—	8.43	—	9.6	238	25.4	0	11	10	9	7	Date: 5/9/09 New WQ: — Counts: JT Sol'n Prep: — Old WQ: Time:
							Total=	18	11	25	28	26	Mean Neonates/Female = 21.6

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5/1/09

Project #: 14727 Test ID: 32887 Treatment: **PB0 (100 µg/L) Blank** Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
50%	0	7.63		7.3		491		0	0	0	0	0	
	1	8.07	8.47	9.4	7.4	501		0	0	0	0	0	
	2	7.70	8.42	9.2	8.4	504		0	0	0	0	0	
	3	7.62	8.50	8.5	7.9	515		0	0	0	0	0	
	4	7.80	8.98	8.3	7.2	506		1	0	8	1	3	
	5	7.92	8.38	8.3	8.0	481		0	0	0	5	0	
	6	7.86	8.41	8.2	8.0	516		2	0	3	0	0	
	7	8.26	8.46	8.5	7.6	530		0	0	0	3	0	
	8	—	8.54	—	9.2	557		0	0	0	2	0	
							Total=	3	0	11	11	3	Mean Neonates/Female = 5.6

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
100%	0	7.54		7.6		773	0	0	0	0	0	21973
	1	7.97	8.67	9.5	7.8	791	0	0	0	0	0	21973
	2	7.49	8.62	9.4	8.2	802	0	0	0	0	0	21973
	3	7.41	8.66	8.9	8.1	784	0	0	0	0	0	21973
	4	7.63	8.61	8.4	8.0	786	0	0	0	0	X/0	21973
	5	7.70	8.49	8.6	7.4	775	0	0	0	0	—	21973
	6	7.66	8.53	9.2	7.7	800	0	X/0	0	0	—	21973
	7	8.24	8.43	8.4	7.6	786	0	—	0	0	—	21973
	8	—	8.66	—	9.0	819	0	—	0	0	—	—
							Total= 0	X/0	0	0	X/0	Mean Neonates/Female = 0

Appendix M

Test Data and Summary of Statistics for the Toxicity Identification & Evaluation (TIE) of the Chronic Toxicity of Chevron/Cawelo Effluent to *Ceriodaphnia dubia* – Re-Test

CETIS Summary Report

Report Date: 14 May-09 18:19 (p 1 of 1)
Test Code: 07-0914-0436/32974Base

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Batch ID:	02-9585-1599	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Quang Do
Start Date:	07 May-09 18:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	13 May-09 18:30	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 0h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	01-9321-2529	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	21 Apr-09 19:00	**Source:**	Precision Analytical		
Sample Age:	16d 9h (10.5 °C)	**Station:**	Inlet Resv B		

Batch Note: T.I.E.

Sample Note: Baseline

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
20-2351-5671	6d Survival Rate	100	>100	N/A	N/A	1	Fisher Exact/Bonferroni-Holm Test
19-2637-3987	Reproduction	50	100	70.7	35.3%	2	Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
15-2703-0324	Reproduction	IC5	52.6	N/A	53.4	1.9	Linear Interpolation (ICPIN)
		IC10	55.2	N/A	57.1	1.81	
		IC15	58.1	N/A	61	1.72	
		IC20	61	31.6	65.1	1.64	
		IC25	64.1	46.7	69.5	1.56	
		IC40	74.5	58.6	84.6	1.34	
		IC50	82.2	66.7	96.4	1.22	

6d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	1	1	1	1	1	0	0	0.0%	0.0%
50		5	1	1	1	1	1	0	0	0.0%	0.0%
100		5	1	1	1	1	1	0	0	0.0%	0.0%

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	24.8	20.9	28.7	12	34	1.9	10.4	42.0%	0.0%
50		5	26.8	25.5	28.1	23	31	0.638	3.49	13.0%	-8.06%
100		5	7.8	6.7	8.9	4	12	0.539	2.95	37.8%	68.5%

6d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	1	1	1	1	1
50		1	1	1	1	1
100		1	1	1	1	1

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	12	34	32	15	31
50		25	30	25	23	31
100		9	7	4	12	7

CETIS Analytical Report

Report Date: 14 May-09 18:19 (p 1 of 1)
Test Code: 07-0914-0436/32974Base

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	20-2351-5671	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 17:43	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

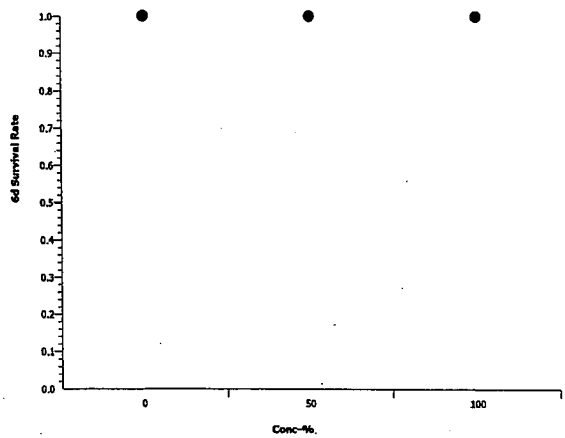
Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Lab Water Control		50	1	1.0000	Non-Significant Effect
		100	1	1.0000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Lab Water Cont	5	0	5
50		5	0	5
100		5	0	5

Graphics



CETIS Analytical Report

Report Date: 14 May-09 18:18 (p 1 of 1)
Test Code: 07-0914-0436/32974Base

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	19-2637-3987	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 17:44	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	50	100	70.7	2	35.3%

Dunnett's Multiple Comparison Test

Control vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control	50	-0.481	2.11	8.76	0.8274	Non-Significant Effect
	100*	4.09	2.11	8.76	0.0014	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.1	2.55	0.3429	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1090	545	2	12.6	0.0011	Significant Effect
Error	518.4	43.2	12			
Total	1608.4	588.2	14			

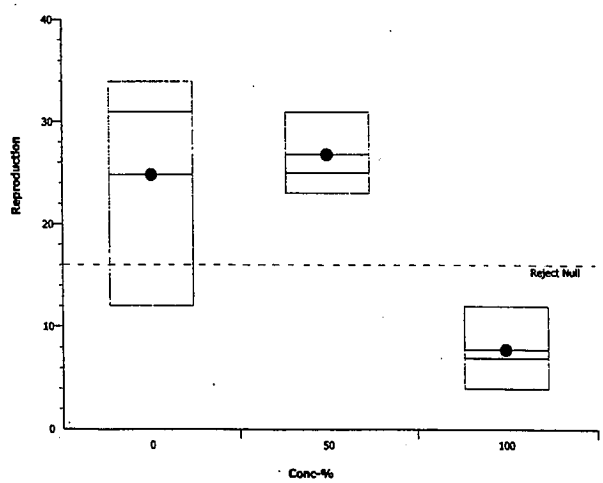
ANOVA Assumptions

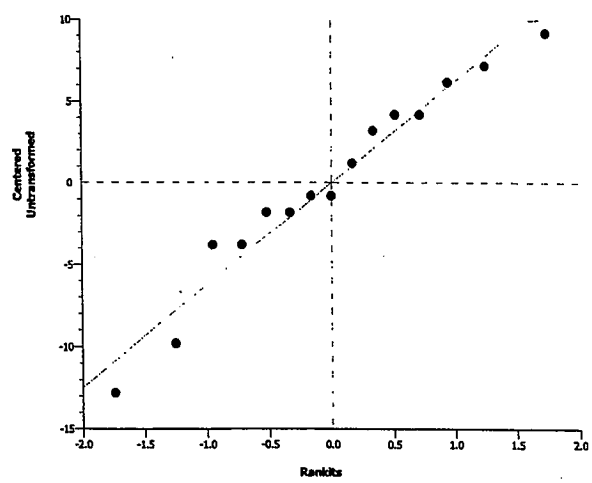
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	7	9.21	0.0302	Equal Variances
Distribution	Shapiro-Wilk Normality	0.958		0.6624	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	24.8	20.8	28.8	12	34	1.94	10.4	42.0%	0.0%
50		5	26.8	25.5	28.1	23	31	0.649	3.49	13.0%	-8.06%
100		5	7.8	6.68	8.92	4	12	0.548	2.95	37.8%	68.5%

Graphics





Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5/7/09

Project #: 14727 Test ID: 32974 Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SIGN-OFF
Lab Water Control	0	7.88		8.2		222	26.0	0	0	0	0	0	Date: 5/7/09 New WQ: PA Test Init.: [illegible] Sol'n Prep: [illegible] Time: 1830
	1	7.91	8.27	9.1	8.1	222	25.3	0	0	0	0	0	Date: 5-8-09 New WQ: [illegible] Counts: [illegible] Sol'n Prep: [illegible] Old WQ: [illegible] Time: 1600
	2	8.28	8.53	11.3	9.1	229	25.4	0	0	0	0	0	Date: 5/9/09 New WQ: [illegible] Counts: [illegible] Sol'n Prep: [illegible] Old WQ: [illegible] Time: 435
	3	8.06	8.40	9.3	7.8	232	25.8	0	0	0	0	0	Date: 5/10/09 New WQ: [illegible] Counts: [illegible] Sol'n Prep: PA Old WQ: [illegible] Time: 1615
	4	8.26	8.55	9.2	8.8	225	25.1	5	7	6	6	6	Date: 5/11/09 New WQ: [illegible] Counts: [illegible] Sol'n Prep: [illegible] Old WQ: [illegible] Time: 1730
	5	8.41	8.29	8.4	7.6	228	25.3	7	10	11	9	10	Date: 5/12/09 New WQ: [illegible] Counts: [illegible] Sol'n Prep: PA Old WQ: [illegible] Time: 1750
	6	8.53	8.50	8.8	7.6	238	25.7	0	17	15	0	15	Date: 5/13/09 New WQ: [illegible] Counts: [illegible] Sol'n Prep: SH Old WQ: [illegible] Time: 1830
	7												Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	8												Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
							Total=	12	34	32	15	31	Mean Neonates/Female = 24.8

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5/7/09

Project #: 14727 Test ID: 32974 Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
50%	0	7.52		8.2		523		0	0	0	0	0	
	1	7.62	8.48	9.0	7.7	506		0	0	0	0	0	
	2	7.75	8.75	10.6	9.0	506		0	0	0	0	0	
	3	7.64	8.80	9.5	7.8	521		0	0	0	0	0	
	4	7.84	8.52	9.4	8.2	512		5	6	4	5	5	
	5	7.86	8.45	9.0	7.4	509		9	10	8	10	11	
	6	7.80	8.46	9.0	7.1	521		11	14	13	8	15	
	7												
	8												
							Total=	25	30	25	23	31	Mean Neonates/Female = 26.8

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
100%	0	7.48		8.2		814	0	0	0	0	0	21973
	1	7.59	8.55	9.1	7.6	790	0	0	0	0	0	21973
	2	7.56	8.86	10.1	9.0	783	0	0	0	0	0	21973
	3	7.59	8.62	10.1	7.7	792	0	0	0	0	0	21973
	4	7.55	8.63	10.2	8.3	796	2	3	3	3	2	21973
	5	7.72	8.57	9.7	7.2	784	7	4	1	9	5	21973
	6	7.61	8.58	9.5	7.6	791	0	0	0	0	0	21973
	7						~~9~~	~~7~~	~~4~~	~~12~~	~~7~~	
	8											
							Total= 9	7	4	12	7	Mean Neonates/Female = 7.8

CETIS Summary Report

Report Date: 14 May-09 18:18 (p 1 of 1)
Test Code: 13-1680-6965/32974Cent

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Batch ID:	02-9585-1599	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Quang Do
Start Date:	07 May-09 18:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	13 May-09 18:30	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 0h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	01-5302-1468	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	07 May-09 12:00	**Source:**	Precision Analytical		
Sample Age:	16d 9h (6 °C)	**Station:**	Inlet Resv B		

Batch Note: T.I.E.

Sample Note: Centrifugation

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
10-9638-9816	6d Survival Rate	100	>100	N/A	N/A	1	Fisher Exact/Bonferroni-Holm Test
19-8777-0705	Reproduction	0	>0		42.2%		Equal Variance t Two-Sample Test
05-1536-4923		50	100	70.7	44.6%	2	Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
18-6188-4185	Reproduction	IC5	1.65	N/A	80.8	60.6	Linear Interpolation (ICPIN)
		IC10	6.03	N/A	85.8	16.6	
		IC15	17.6	N/A	87.8	5.67	
		IC20	48.4	N/A	80.8	2.07	
		IC25	54.1	N/A	87.2	1.85	
		IC40	69	N/A	112	1.45	
		IC50	81.2	32.6	N/A	1.23	

6d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Cent Blank	5	1	1	1	1	1	0	0	0.0%	0.0%
0	Lab Water Contr	5	1	1	1	1	1	0	0	0.0%	0.0%
50		5	1	1	1	1	1	0	0	0.0%	0.0%
100		5	1	1	1	1	1	0	0	0.0%	0.0%

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Cent Blank	5	24.2	21.6	26.8	16	34	1.29	7.05	29.1%	0.0%
0	Lab Water Contr	5	24.8	20.9	28.7	12	34	1.9	10.4	42.0%	-2.48%
50		5	19.8	16.5	23.1	11	30	1.61	8.84	44.7%	18.2%
100		5	9.2	7.54	10.9	2	14	0.81	4.44	48.2%	62.0%

6d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Cent Blank	1	1	1	1	1
0	Lab Water Contr	1	1	1	1	1
50		1	1	1	1	1
100		1	1	1	1	1

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Cent Blank	27	34	25	16	19
0	Lab Water Contr	12	34	32	15	31
50		18	30	28	11	12
100		2	10	9	14	11

CETIS Analytical Report

Report Date: 14 May-09 18:18 (p 1 of 1)
Test Code: 13-1680-6965/32974Cent

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	10-9638-9816	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 17:48	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

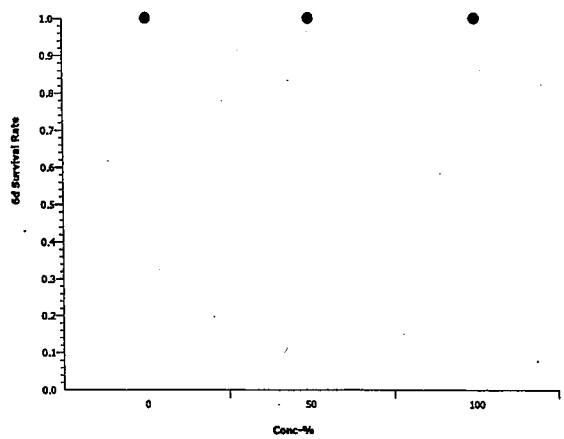
Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Lab Water Control		50	1	1.0000	Non-Significant Effect
		100	1	1.0000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Lab Water Cont	5	0	5
50		5	0	5
100		5	0	5

Graphics



Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	05-1536-4923	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 17:48	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	50	100	70.7	2	44.6%

Dunnett's Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50	0.953	2.11	11.1	0.2829	Non-Significant Effect
		100*	2.97	2.11	11.1	0.0107	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.67	2.55	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	634.5333	317.2667	2	4.61	0.0328	Significant Effect
Error	826.4	68.86667	12			
Total	1460.933	386.1333	14			

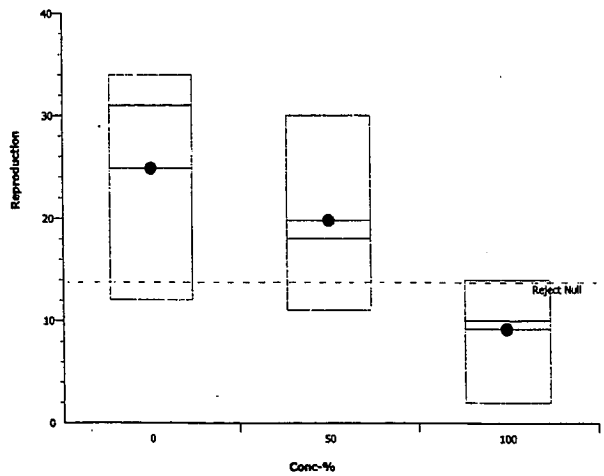
ANOVA Assumptions

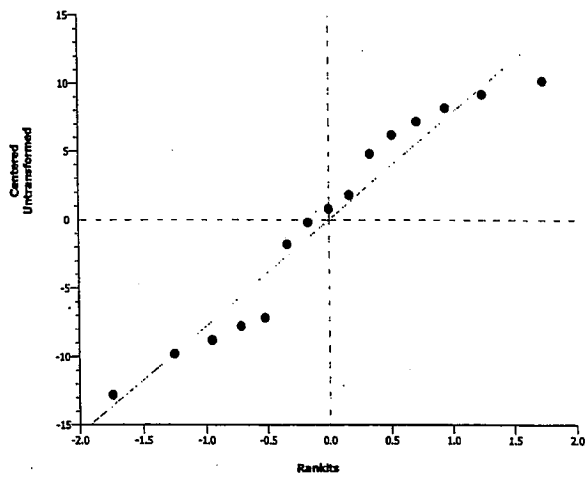
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	2.4	9.21	0.3005	Equal Variances
Distribution	Shapiro-Wilk Normality	0.926		0.2397	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	24.8	20.8	28.8	12	34	1.94	10.4	42.0%	0.0%
50		5	19.8	16.4	23.2	11	30	1.64	8.84	44.7%	20.2%
100		5	9.2	7.51	10.9	2	14	0.824	4.44	48.2%	62.9%

Graphics





CETIS Analytical Report

Report Date: 14 May-09 18:18 (p 1 of 1)
Test Code: 13-1680-6965/32974Cent

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	18-6188-4185	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 17:49	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

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

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(5%)
Extreme Value	Grubbs Extreme Value	1.67	2.55	1.0000	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	1.65	N/A	80.8	60.6	1.24	N/A
IC10	6.03	N/A	85.8	16.6	1.17	N/A
IC15	17.6	N/A	87.8	5.67	1.14	N/A
IC20	48.4	N/A	80.8	2.07	1.24	N/A
IC25	54.1	N/A	87.2	1.85	1.15	N/A
IC40	69	N/A	112	1.45	0.89	N/A
IC50	81.2	32.6	N/A	1.23	N/A	3.07

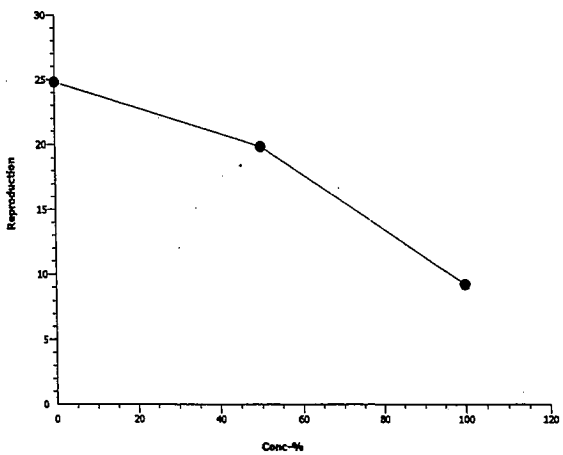
Reproduction Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contro	5	24.8	12	34	1.9	10.4	42.0%	0.0%
50		5	19.8	11	30	1.61	8.84	44.7%	20.2%
100		5	9.2	2	14	0.81	4.44	48.2%	62.9%

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	12	34	32	15	31
50		18	30	28	11	12
100		2	10	9	14	11

Graphics



CETIS Analytical Report

Report Date: 14 May-09 18:17 (p 1 of 2)
Test Code: 13-1680-6965/32974Cent

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	19-8777-0705	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 17:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	0	>0			42.2%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		Cent Blank	0.107	1.86	10.5	0.4589	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.53	2.29	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.9	0.9	1	0.0114	0.9177	Non-Significant Effect
Error	633.6	79.2	8			
Total	634.5	80.1	9			

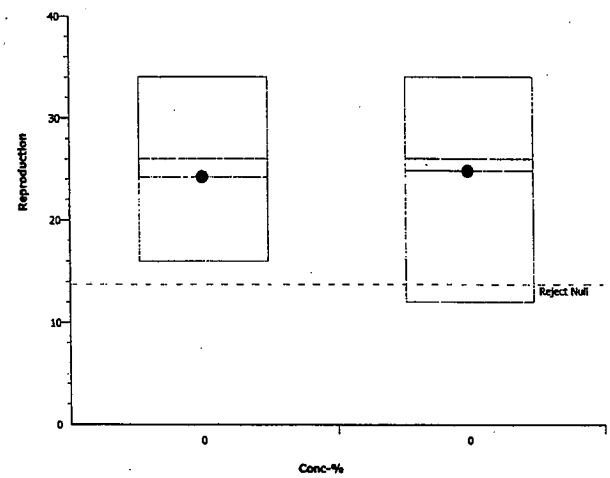
ANOVA Assumptions

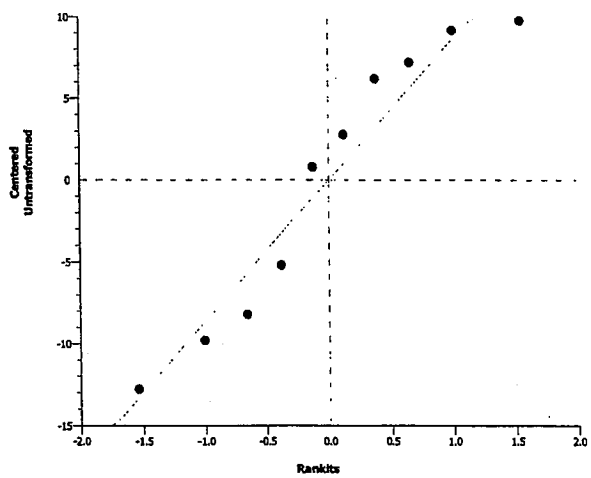
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.19	23.2	0.4671	Equal Variances
Distribution	Shapiro-Wilk Normality	0.909		0.2735	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	24.8	20.8	28.8	12	34	1.94	10.4	42.0%	0.0%
0	Cent Blank	5	24.2	21.5	26.9	16	34	1.31	7.05	29.1%	2.42%

Graphics





Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5-7-09

Project #: 14727 Test ID: 32974 Treatment: **Centrifugation** Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E
Centrifugation Blank	0	7.94		8.4		225	26.0	0	0	0	0	0
	1	7.83	8.34	9.0	7.6	220	25.3	0	0	0	0	0
	2	8.14	8.58	11.0	9.3	221	25.4	0	0	0	0	0
	3	7.95	8.39	10.3	7.7	229	25.0	4	0	0	0	0
	4	7.98	8.42	10.7	8.1	219	25.1	0	5	4	6	5
	5	8.18	8.29	10.5	7.2	223	25.3	11	13	10	10	14
	6	8.12	8.33	10.0	7.5	218	25.7	12	16	11	0	0
	7											
	8											
							Total=	27	34	25	16	19

SIGN-OFF

Date: 5-7-09	New WQ: PA	Test Init: [illegible]	
Sol'n Prep: [illegible]		Time: 1830	
Date: 5-8-09	New WQ: [illegible]	Counts: JPC	
Sol'n Prep: [illegible]	Old WQ: [illegible]	Time: 1600	
Date: 5/9/09	New WQ: [illegible]	Counts: KO	
Sol'n Prep: [illegible]	Old WQ: [illegible]	Time: 1135	
Date: 5/10/09	New WQ: [illegible]	Counts: [illegible]	
Sol'n Prep: PA	Old WQ: [illegible]	Time: 1615	
Date: 5/11/09	New WQ: [illegible]	Counts: [illegible]	
Sol'n Prep: PA	Old WQ: [illegible]	Time: 1730	
Date: 5/12/09	New WQ: [illegible]	Counts: [illegible]	
Sol'n Prep: PA	Old WQ: [illegible]	Time: 1750	
Date: 5/13/09	New WQ: JPC	Counts: [illegible]	
Sol'n Prep: SH	Old WQ: [illegible]	Time: 1830	
Date:	New WQ:	Counts:	
Sol'n Prep:	Old WQ:	Time:	
Date:	New WQ:	Counts:	
Sol'n Prep:	Old WQ:	Time:	

Mean Neonates/Female = 24.2

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5-7-09

Project #: 14727 Test ID: 32974 Treatment: **Centrifugation** Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
50%	0	7.55		8.3		534		0	0	0	0	0	
	1	7.78	8.51	9.1	7.6	504		0	0	0	0	0	
	2	7.99	8.73	10.7	9.2	509		0	0	0	0	0	
	3	7.55	8.60	10.6	7.8	520		3	5	4	0	0	
	4	8.08	8.56	10.5	8.0	506		0	0	0	3	4	
	5	8.37	8.44	9.9	7.1	501		8	10	10	8	8	
	6	8.44	8.43	9.2	6.8	510		7	15	14	0	0	
	7												
	8												
							Total=	18	30	28	11	12	Mean Neonates/Female = 17.8

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
100%	0	7.43		8.3		811	0	0	0	0	0	21973
	1	7.69	8.56	9.3	7.6	797	0	0	0	0	0	21973
	2	7.88	8.87	11.[illegible]	9.4	782	0	0	0	0	0	21973
	3	7.89	8.71	10.5	9.5	799	2	0	0	0	0	21973
	4	8.09	8.68	11.0	7.9	782	0	4	4	5	2	21973
	5	8.37	8.57	10.7	7.0	792	0	6	5	9	9	21973
	6	8.47	8.55	9.2	7.3	784	0	0	0	0	0	21973
	7											
	8											
							Total= 2	10	9	14	11	Mean Neonates/Female = 9.2

CETIS Summary Report

Report Date: 14 May-09 18:17 (p 1 of 1)
Test Code: 15-8555-4585/32974Cent+C18

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Batch ID:	02-9585-1599	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Quang Do
Start Date:	07 May-09 18:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	13 May-09 18:30	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 0h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	14-6106-2031	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	07 May-09 12:30	**Source:**	Precision Analytical		
Sample Age:	16d 9h (6 °C)	**Station:**	Inlet Resv B		

Batch Note: T.I.E.

Sample Note: Centrifugation + C18 SPE

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
02-0142-9060	6d Survival Rate	100	>100	N/A	N/A	1	Fisher Exact/Bonferroni-Holm Test
21-1606-7698	Reproduction	100	>100	N/A	38.9%	1	Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
06-2009-0704	Reproduction	IC5	57.5	N/A	N/A	1.74	Linear Interpolation (ICPIN)
		IC10	66.1	N/A	N/A	1.51	
		IC15	76	7.98	N/A	1.32	
		IC20	87.3	44.9	N/A	1.15	
		IC25	>100	N/A	N/A	<1	
		IC40	>100	N/A	N/A	<1	
		IC50	>100	N/A	N/A	<1	

6d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Cent+C18 Blank	5	1	1	1	1	1	0	0	0.0%	0.0%
0	Lab Water Contr	5	1	1	1	1	1	0	0	0.0%	0.0%
50		5	1	1	1	1	1	0	0	0.0%	0.0%
100		5	1	1	1	1	1	0	0	0.0%	0.0%

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Cent+C18 Blank	5	25.2	22.5	27.9	13	31	1.32	7.22	28.7%	0.0%
0	Lab Water Contr	5	24.8	20.9	28.7	12	34	1.9	10.4	42.0%	1.59%
50		5	29	27.2	30.8	21	33	0.866	4.74	16.4%	-15.1%
100		5	20.2	18.3	22.1	15	28	0.926	5.07	25.1%	19.8%

6d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Cent+C18 Blank	1	1	1	1	1
0	Lab Water Contr	1	1	1	1	1
50		1	1	1	1	1
100		1	1	1	1	1

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Cent+C18 Blank	30	31	25	13	27
0	Lab Water Contr	12	34	32	15	31
50		21	33	30	32	29
100		19	17	22	15	28

CETIS Analytical Report

Report Date: 14 May-09 18:16 (p 1 of 1)
Test Code: 15-8555-4585/32974Cent+C18

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	02-0142-9060	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 17:57	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

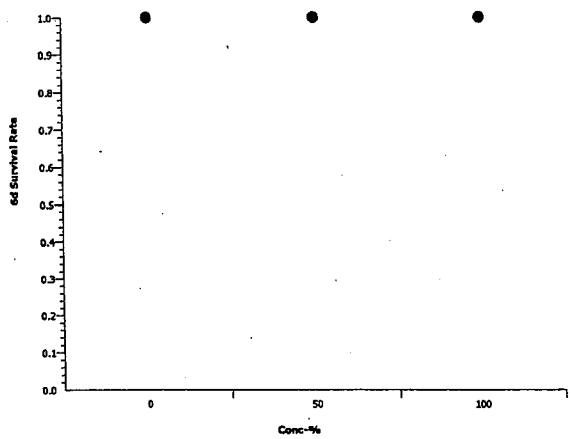
Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Lab Water Control		50	1	1.0000	Non-Significant Effect
		100	1	1.0000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Lab Water Cont	5	0	5
50		5	0	5
100		5	0	5

Graphics



CETIS Analytical Report

Report Date: 14 May-09 18:16 (p 1 of 1)
Test Code: 15-8555-4585/32974Cent+C18

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	21-1606-7698	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 17:57	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	100	>100	N/A	1	38.9%

Dunnett's Multiple Comparison Test

Control vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control	50	-0.918	2.11	9.64	0.9183	Non-Significant Effect
	100	1.01	2.11	9.64	0.2651	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.91	2.55	0.6399	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	193.7333	96.86667	2	1.85	0.1991	Non-Significant Effect
Error	627.6	52.3	12			
Total	821.3333	149.1667	14			

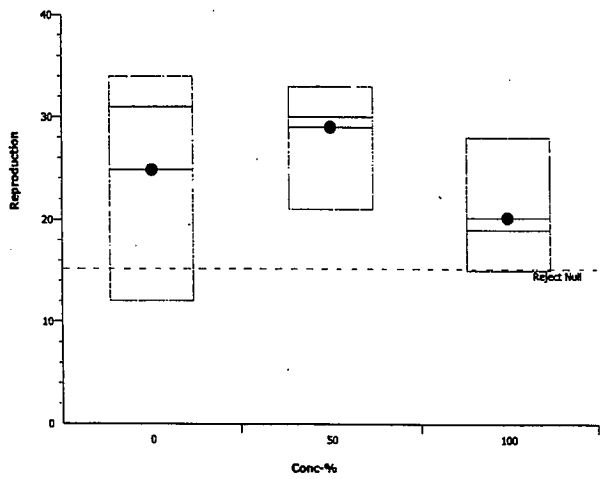
ANOVA Assumptions

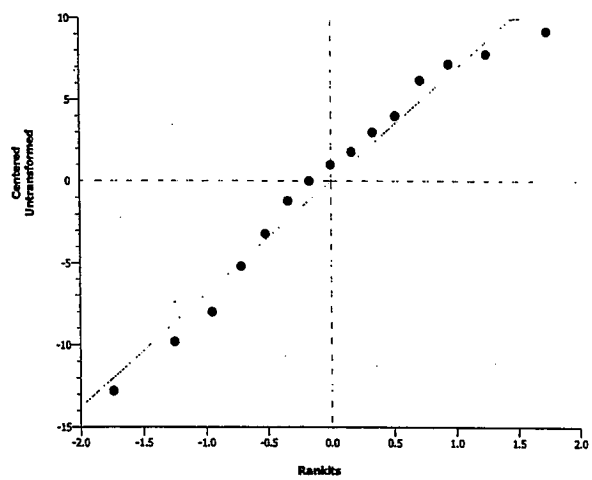
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	2.96	9.21	0.2276	Equal Variances
Distribution	Shapiro-Wilk Normality	0.957		0.6352	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	24.8	20.8	28.8	12	34	1.94	10.4	42.0%	0.0%
50		5	29	27.2	30.8	21	33	0.881	4.74	16.4%	-16.9%
100		5	20.2	18.3	22.1	15	28	0.941	5.07	25.1%	18.5%

Graphics





CETIS Analytical Report

Report Date: 14 May-09 18:16 (p 1 of 1)
Test Code: 15-8555-4585/32974Cent+C18

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	06-2009-0704	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 17:58	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

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

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(5%)
Extreme Value	Grubbs Extreme Value	1.91	2.55	0.6399	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	57.5	N/A	N/A	1.74	N/A	N/A
IC10	66.1	N/A	N/A	1.51	N/A	N/A
IC15	76	7.98	N/A	1.32	N/A	12.5
IC20	87.3	44.9	N/A	1.15	N/A	2.23
IC25	>100	N/A	N/A	<1	N/A	N/A
IC40	>100	N/A	N/A	<1	N/A	N/A
IC50	>100	N/A	N/A	<1	N/A	N/A

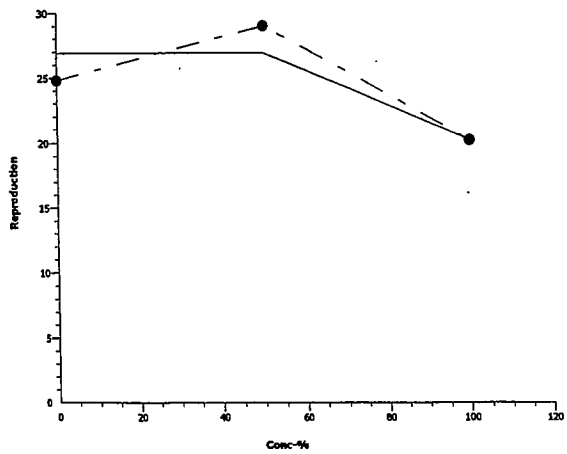
Reproduction Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contro	5	24.8	12	34	1.9	10.4	42.0%	0.0%
50		5	29	21	33	0.866	4.74	16.4%	-16.9%
100		5	20.2	15	28	0.926	5.07	25.1%	18.5%

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	12	34	32	15	31
50		21	33	30	32	29
100		19	17	22	15	28

Graphics



Pacific EcoRisk

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5-7-09

Project #: 14727 Test ID: 32974 Treatment: **Centrifugation + C18 SPE** Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E
Centrifugation + C18 SPE Blank	0	7.91		7.8		232	26.0	0	0	0	0	0
	1	7.99	8.32	9.1	7.7	216	25.3	0	0	0	0	0
	2	8.12	8.50	11.0	8.8	216	25.4	0	0	0	0	0
	3	7.92	8.38	10.7	7.5	220	25.0	0	0	4	0	5
	4	8.04	8.33	10.7	8.5	216	25.1	5	5	0	5	10
	5	8.19	8.29	10.0	7.3	224	25.3	12	10	8	8	0
	6	8.21	8.35	9.7	7.7	215	25.7	13	16	13	0	12
	7											
	8											
							Total=	30	31	25	13	27

SIGN-OFF

Date: 5-7-09	New WQ: PA	Test Init.: [illegible]	
Sol'n Prep: [illegible]		Time: 1830	
Date: 5-8-09	New WQ: [illegible]	Counts: JPC	
Sol'n Prep: [illegible]	Old WQ: [illegible]	Time: 1600	
Date: 5/9/09	New WQ: [illegible]	Counts: [illegible]	
Sol'n Prep: [illegible]	Old WQ: [illegible]	Time: 1130	
Date: 5/10/09	New WQ: [illegible]	Counts: [illegible]	
Sol'n Prep: [illegible]	Old WQ: [illegible]	Time: 1615	
Date: 5/11/09	New WQ: [illegible]	Counts: [illegible]	
Sol'n Prep: [illegible]	Old WQ: [illegible]	Time: [illegible]	
Date: 5/12/09	New WQ: [illegible]	Counts: [illegible]	
Sol'n Prep: [illegible]	Old WQ: [illegible]	Time: 1750	
Date: 5/13/09	New WQ: JPC	Counts: [illegible]	
Sol'n Prep: [illegible]	Old WQ: [illegible]	Time: 1830	
Date:	New WQ:	Counts:	
Sol'n Prep:	Old WQ:	Time:	
Date:	New WQ:	Counts:	
Sol'n Prep:	Old WQ:	Time:	

Mean Neonates/Female = 25.2

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5-7-09

Project #: 14727 Test ID: 32974 Treatment: **Centrifugation + C18 SPE** Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
50%	0	7.95		8.0		527		0	0	0	0	0	
	1	8.05	8.57	9.2	7.7	510		0	0	0	0	0	
	2	8.20	8.70	10.8	9.1	503		0	0	0	0	0	
	3	7.92	8.51	10.4	7.7	508		0	0	0	0	0	
	4	8.08	8.50	10.3	8.1	502		5	5	4	6	6	
	5	8.27	8.44	8.8	7.4	500		7	12	10	11	10	
	6	8.24	8.45	9.4	7.3	500		9	16	16	15	13	
	7												
	8												
							Total=	21	33	30	32	29	Mean Neonates/Female = 29.0

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
100%	0	7.94		8.3		813	0	0	0	0	0	21973
	1	8.07	8.58	9.3	7.6	793	0	0	0	0	0	21973
	2	8.15	8.84	11.0	9.5	782	0	0	0	0	0	21973
	3	7.92	8.64	10.7	7.3	771	0	0	0	0	0	21973
	4	8.08	8.26	10.5	8.0	780	5	5	5	5	5	21973
	5	8.23	8.57	10.0	7.4	783	8	5	7	10	9	21973
	6	8.21	8.60	9.8	7.3	783	6	7	10	0	14	21973
	7											
	8											
							Total= 19	17	22	15	28	Mean Neonates/Female = 20.2

CETIS Summary Report

Report Date: 14 May-09 18:16 (p 1 of 1)
Test Code: 14-7868-7441/32974Aeration

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Batch ID:	02-9585-1599	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Quang Do
Start Date:	07 May-09 18:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	13 May-09 18:30	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 0h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	02-4274-2609	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	07 May-09 13:00	**Source:**	Precision Analytical		
Sample Age:	16d 9h (6 °C)	**Station:**	Inlet Resv B		

Batch Note: T.I.E.

Sample Note: Aeration

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
07-3366-4825	6d Survival Rate	100	>100	N/A	N/A	1	Fisher Exact/Bonferroni-Holm Test
02-7454-8625	Reproduction	0	>0		45.2%		Equal Variance t Two-Sample Test
02-0522-8181		50	100	70.7	39.8%	2	Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
04-7815-1245	Reproduction	IC5	51	N/A	55.1	1.96	Linear Interpolation (ICPIN)
		IC10	54	N/A	59.5	1.85	
		IC15	57.2	N/A	64.4	1.75	
		IC20	60.5	N/A	69.6	1.65	
		IC25	64	N/A	75.2	1.56	
		IC40	75.8	47.4	94.7	1.32	
		IC50	84.9	57.9	N/A	1.18	

6d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Aeration Blank	5	1	1	1	1	1	0	0	0.0%	0.0%
0	Lab Water Contr	5	1	1	1	1	1	0	0	0.0%	0.0%
50		5	1	1	1	1	1	0	0	0.0%	0.0%
100		5	1	1	1	1	1	0	0	0.0%	0.0%

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Aeration Blank	5	23	19.8	26.2	14	34	1.56	8.54	37.1%	0.0%
0	Lab Water Contr	5	24.8	20.9	28.7	12	34	1.9	10.4	42.0%	-7.83%
50		5	24	21.7	26.3	14	31	1.13	6.2	25.9%	-4.35%
100		5	8.8	7.25	10.3	3	14	0.757	4.15	47.1%	61.7%

6d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Aeration Blank	1	1	1	1	1
0	Lab Water Contr	1	1	1	1	1
50		1	1	1	1	1
100		1	1	1	1	1

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Aeration Blank	24	34	15	14	28
0	Lab Water Contr	12	34	32	15	31
50		25	31	14	26	24
100		9	3	7	11	14

CETIS Analytical Report

Report Date: 14 May-09 18:16 (p 1 of 1)
Test Code: 14-7868-7441/32974Aeration

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	07-3366-4825	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 18:03	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

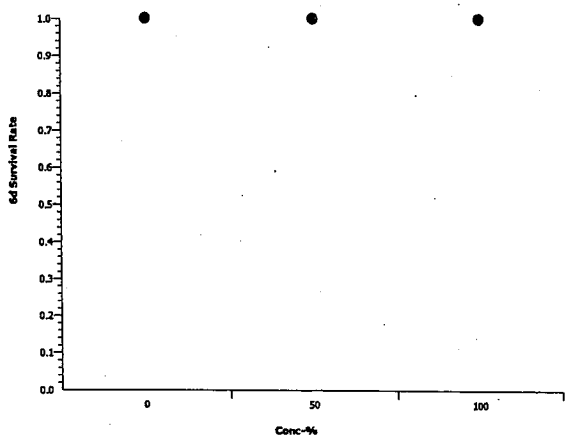
Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Lab Water Control		50	1	1.0000	Non-Significant Effect
		100	1	1.0000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Lab Water Cont	5	0	5
50		5	0	5
100		5	0	5

Graphics



Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	02-0522-8181	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 18:03	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	50	100	70.7	2	39.8%

Dunnett's Multiple Comparison Test

Control vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control	50	0.171	2.11	9.87	0.5976	Non-Significant Effect
	100*	3.42	2.11	9.87	0.0047	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.87	2.55	0.7292	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	812.8	406.4	2	7.42	0.0080	Significant Effect
Error	657.6	54.8	12			
Total	1470.4	461.2	14			

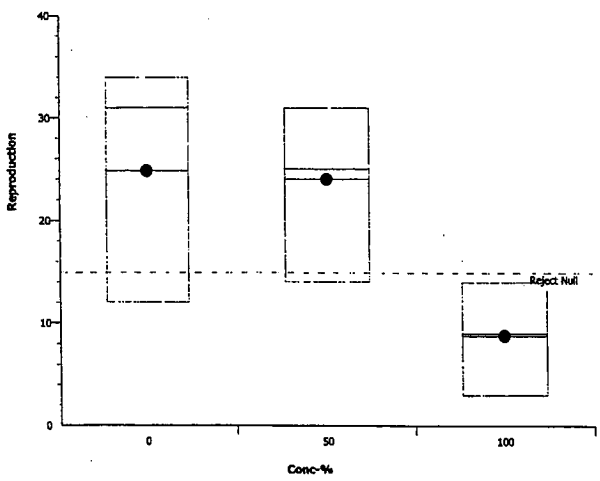
ANOVA Assumptions

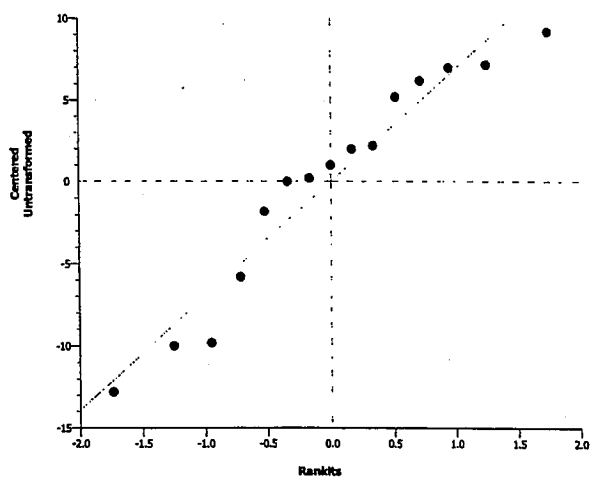
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	2.98	9.21	0.2257	Equal Variances
Distribution	Shapiro-Wilk Normality	0.926		0.2389	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	24.8	20.8	28.8	12	34	1.94	10.4	42.0%	0.0%
50		5	24	21.6	26.4	14	31	1.15	6.2	25.9%	3.23%
100		5	8.8	7.22	10.4	3	14	0.77	4.15	47.1%	64.5%

Graphics





CETIS Analytical Report

Report Date: 14 May-09 18:16 (p 1 of 1)
Test Code: 14-7868-7441/32974Aeration

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	04-7815-1245	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 18:03	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

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

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(5%)
Extreme Value	Grubbs Extreme Value	1.87	2.55	0.7292	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	51	N/A	55.1	1.96	1.82	N/A
IC10	54	N/A	59.5	1.85	1.68	N/A
IC15	57.2	N/A	64.4	1.75	1.55	N/A
IC20	60.5	N/A	69.6	1.65	1.44	N/A
IC25	64	N/A	75.2	1.56	1.33	N/A
IC40	75.8	47.4	94.7	1.32	1.06	2.11
IC50	84.9	57.9	N/A	1.18	N/A	1.73

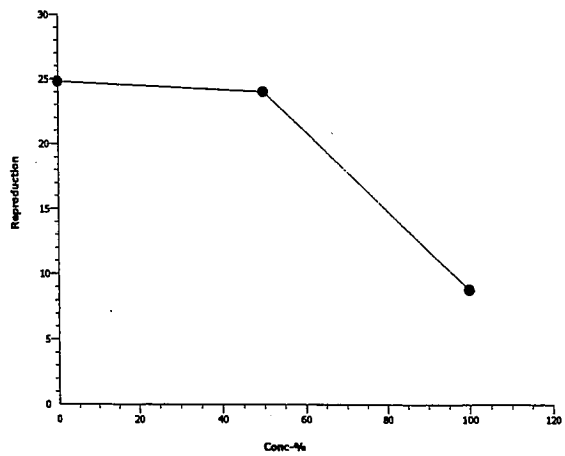
Reproduction Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contro	5	24.8	12	34	1.9	10.4	42.0%	0.0%
50		5	24	14	31	1.13	6.2	25.9%	3.23%
100		5	8.8	3	14	0.757	4.15	47.1%	64.5%

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	12	34	32	15	31
50		25	31	14	26	24
100		9	3	7	11	14

Graphics



CETIS Analytical Report

Report Date: 14 May-09 18:15 (p 1 of 2)
Test Code: 14-7868-7441/32974Aeration

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	02-7454-8625	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 18:03	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	0	>0			45.2%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		Aeration Blank	0.299	1.86	11.2	0.3864	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.42	2.29	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	8.1	8.1	1	0.0892	0.7729	Non-Significant Effect
Error	726.8	90.85	8			
Total	734.9	98.95	9			

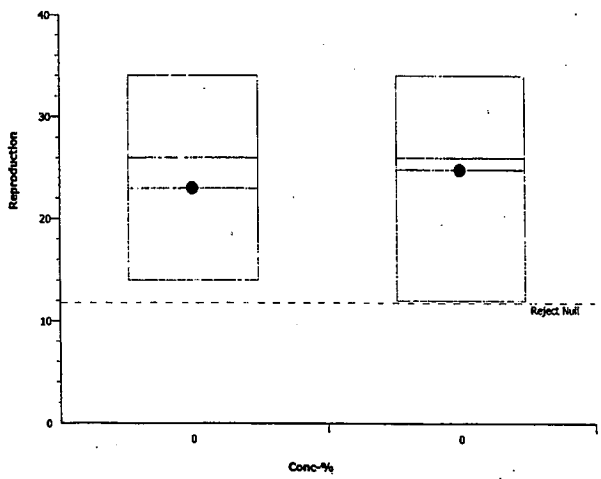
ANOVA Assumptions

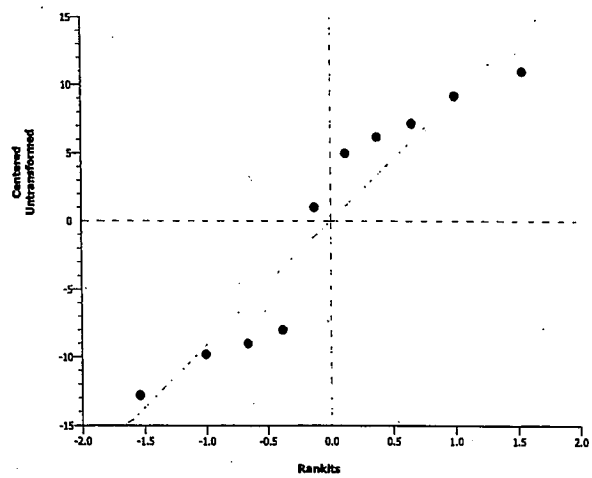
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.49	23.2	0.7091	Equal Variances
Distribution	Shapiro-Wilk Normality	0.879		0.1284	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	24.8	20.8	28.8	12	34	1.94	10.4	42.0%	0.0%
0	Aeration Blank	5	23	19.8	26.2	14	34	1.59	8.54	37.1%	7.26%

Graphics





Pacific EcoRisk Environmental Consulting and Testing

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5-7-09

Project #: 14727 Test ID: 32974 Treatment: **Aeration** Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SIGN-OFF
Aeration Blank	0	8.13		8.0		224	26.0	0	0	0	0	0	Date: 5-7-09 New WQ: PA Test Init. MM Sol'n Prep: KB Time: 1830
	1	8.11	8.35	9.2	8.0	221	25.3	0	0	0	0	0	Date: 5-8-09 New WQ: LW Counts: JPC Sol'n Prep: KB Old WQ: JT Time: 1600
	2	8.25	8.44	10.8	9.2	221	25.4	0	0	0	0	0	Date: 5/9/09 New WQ: EKK Counts: KO Sol'n Prep: JT Old WQ: EKK Time: 1435
	3	8.22	8.41	10.7	8.0	222	25.0	0	5	0	0	0	Date: 5/10/09 New WQ: JPW Counts: JPW Sol'n Prep: PA Old WQ: JPW Time: 1415
	4	8.07	8.33	10.5	8.0	220	25.1	3	0	5	3	5	Date: 5/11/09 New WQ: JPW Counts: SH Sol'n Prep: PA Old WQ: JPW Time: 1730
	5	8.15	8.23	9.7	7.3	225	25.3	8	11	10	11	10	Date: 5/12/09 New WQ: JPW Counts: SH Sol'n Prep: PA Old WQ: JT Time: 1750
	6	8.14	8.37	10.0	8.2	222	25.7	13	18	0	0	13	Date: 5/13/09 New WQ: JPC Counts: SH Sol'n Prep: SH Old WQ: JPW Time: 1830
	7												Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	8												Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
							Total=	24	34	15	14	28	Mean Neonates/Female = 23

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: Precision Analytical Sample ID: Sample 1 (Inlet to res B) Test Date: 5-7-09

Project #: 14727 Test ID: 32974 Treatment: Aeration Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
50%	0	8.28		8.1		522		0	0	0	0	0	
	1	8.29	8.50	9.3	7.7	510		0	0	0	0	0	
	2	8.47	8.69	10.4	9.1	501		0	0	0	0	0	
	3	8.15	8.52	10.5	7.8	504		4	0	0	0	0	
	4	8.26	8.40	10.4	8.0	505		0	5	4	5	5	
	5	8.36	8.44	9.5	7.3	499		8	10	10	9	9	
	6	8.40	8.39	9.2	7.8	511		13	16	0	12	10	
	7												
	8												
							Total=	25	31	14	26	24	Mean Neonates/Female = 24

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
100%	0	8.40		8.4		809	0	0	0	0	0	21973
	1	8.40	8.58	9.1	7.6	795	0	0	0	0	0	21973
	2	8.51	8.84	11.1	9.4	775	0	0	0	0	0	21973
	3	8.26	8.65	10.3	7.8	791	0	0	0	0	0	21973
	4	8.30	8.62	10.2	8.1	776	0	1	4	4	5	21973
	5	8.41	8.57	10.0	7.3	789	4	0	2	6	9	21973
	6	8.44	8.56	9.4	8.0	788	5	2	1	1	0	21973
	7											
	8											
							Total= 9	3	7	11	14	Mean Neonates/Female = 8.8

CETIS Summary Report

Report Date: 14 May-09 18:14 (p 1 of 1)
Test Code: 19-1233-1384/32974PBO@25

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Batch ID:	02-9585-1599	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Quang Do
Start Date:	07 May-09 18:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	13 May-09 18:30	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 0h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	07-5163-0041	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	07 May-09 13:30	**Source:**	Precision Analytical		
Sample Age:	16d 9h (6 °C)	**Station:**	Inlet Resv B		

Batch Note: T.I.E.

Sample Note: PBO at 25 µg/L

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
00-0018-3136	6d Survival Rate	100	>100	N/A	N/A	1	Fisher Exact/Bonferroni-Holm Test
15-2497-7133	Reproduction	0	>0		37.9%		Equal Variance t Two-Sample Test
04-3159-4750		50	100	70.7	33.6%	2	Steel Many-One Rank Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
11-4361-4290	Reproduction	IC5	52.9	N/A	53.6	1.89	Linear Interpolation (ICPIN)
		IC10	55.9	N/A	57.4	1.79	
		IC15	59.1	N/A	61.6	1.69	
		IC20	62.5	44.3	66	1.6	
		IC25	66.1	47.9	70.7	1.51	
		IC40	78.2	60.8	86.9	1.28	
		IC50	87.4	70.5	99.6	1.14	

6d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	1	1	1	1	1	0	0	0.0%	0.0%
0	PBO Blank	5	1	1	1	1	1	0	0	0.0%	0.0%
50		5	1	1	1	1	1	0	0	0.0%	0.0%
100		5	1	1	1	1	1	0	0	0.0%	0.0%

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	24.8	20.9	28.7	12	34	1.9	10.4	42.0%	0.0%
0	PBO Blank	5	24.6	23	26.2	17	28	0.792	4.34	17.6%	0.81%
50		5	27	26	28	24	31	0.5	2.74	10.1%	-8.87%
100		5	9.8	9.39	10.2	9	11	0.2	1.1	11.2%	60.5%

6d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	1	1	1	1	1
0	PBO Blank	1	1	1	1	1
50		1	1	1	1	1
100		1	1	1	1	1

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	12	34	32	15	31
0	PBO Blank	28	26	17	26	26
50		25	31	24	27	28
100		9	9	9	11	11

CETIS Analytical Report

Report Date: 14 May-09 18:14 (p 1 of 1)
Test Code: 19-1233-1384/32974PBO@25

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	00-0018-3136	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 18:06	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

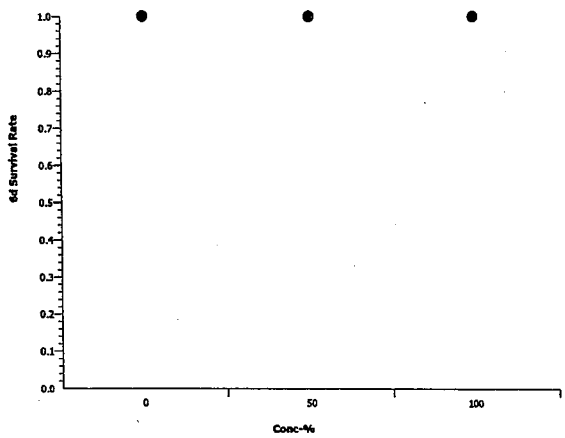
Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Lab Water Control		50	1	1.0000	Non-Significant Effect
		100	1	1.0000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Lab Water Cont	5	0	5
50		5	0	5
100		5	0	5

Graphics



CETIS Analytical Report

Report Date: 14 May-09 18:13 (p 2 of 2)
Test Code: 19-1233-1384/32974PBO@25

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	04-3159-4750	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 18:06	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	50	100	70.7	2	33.6%

Steel Many-One Rank Test

Control vs	Conc-%	Test Stat	Critical	Ties	P-Value	Decision(5%)
Lab Water Control	50	25.5	18	1	0.4894	Non-Significant Effect
	100*	15	18	0	0.0086	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.21	2.55	0.2317	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	876.1334	438.0667	2	11.2	0.0018	Significant Effect
Error	469.6	39.13334	12			
Total	1345.733	477.2	14			

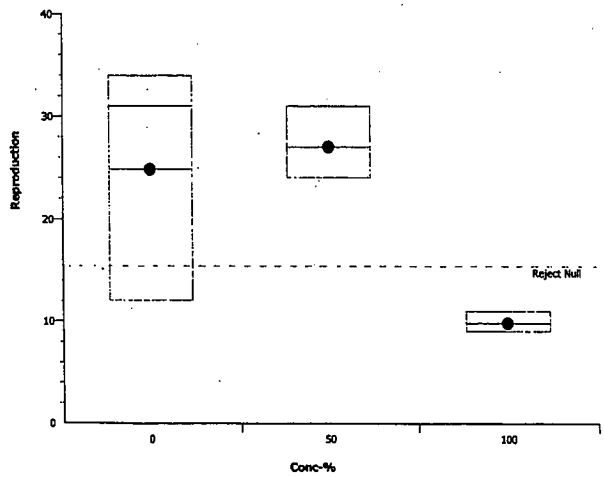
ANOVA Assumptions

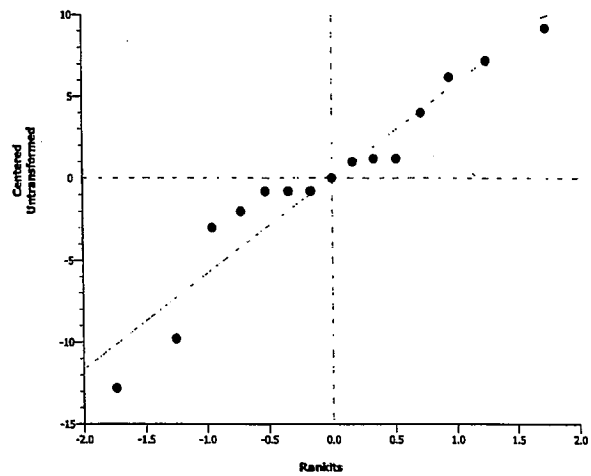
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	14.8	9.21	0.0006	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.93		0.2729	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	24.8	20.8	28.8	12	34	1.94	10.4	42.0%	0.0%
50		5	27	26	28	24	31	0.509	2.74	10.1%	-8.87%
100		5	9.8	9.38	10.2	9	11	0.203	1.1	11.2%	60.5%

Graphics





CETIS Analytical Report

Report Date: 14 May-09 18:14 (p 1 of 1)
Test Code: 19-1233-1384/32974PBO@25

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	11-4361-4290	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 18:06	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

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

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(5%)
Extreme Value	Grubbs Extreme Value	2.21	2.55	0.2317	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	52.9	N/A	53.6	1.89	1.87	N/A
IC10	55.9	N/A	57.4	1.79	1.74	N/A
IC15	59.1	N/A	61.6	1.69	1.62	N/A
IC20	62.5	44.3	66	1.6	1.52	2.26
IC25	66.1	47.9	70.7	1.51	1.41	2.09
IC40	78.2	60.8	86.9	1.28	1.15	1.64
IC50	87.4	70.5	99.6	1.14	1	1.42

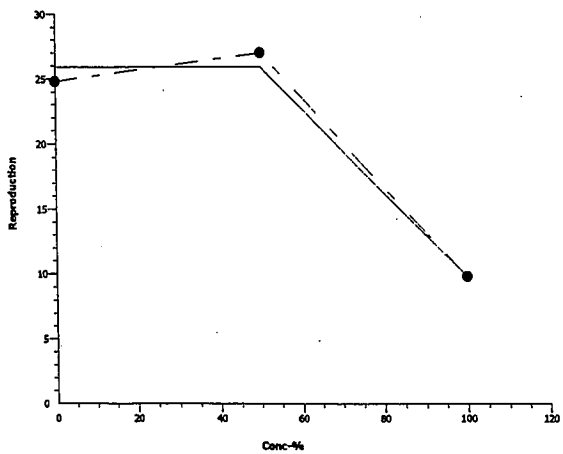
Reproduction Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contro	5	24.8	12	34	1.9	10.4	42.0%	0.0%
50		5	27	24	31	0.5	2.74	10.1%	-8.87%
100		5	9.8	9	11	0.2	1.1	11.2%	60.5%

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	12	34	32	15	31
50		25	31	24	27	28
100		9	9	9	11	11

Graphics



CETIS Analytical Report

Report Date: 14 May-09 18:13 (p 1 of 2)
Test Code: 19-1233-1384/32974PBO@25

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	15-2497-7133	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 18:07	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	0	>0			37.9%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		PBO Blank	0.0396	1.86	9.39	0.4847	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.7	2.29	0.6816	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.1	0.1	1	0.00157	0.9694	Non-Significant Effect
Error	510	63.75	8			
Total	510.1	63.85	9			

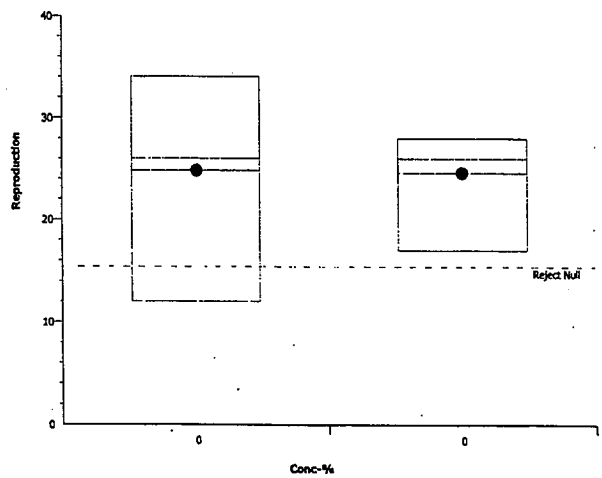
ANOVA Assumptions

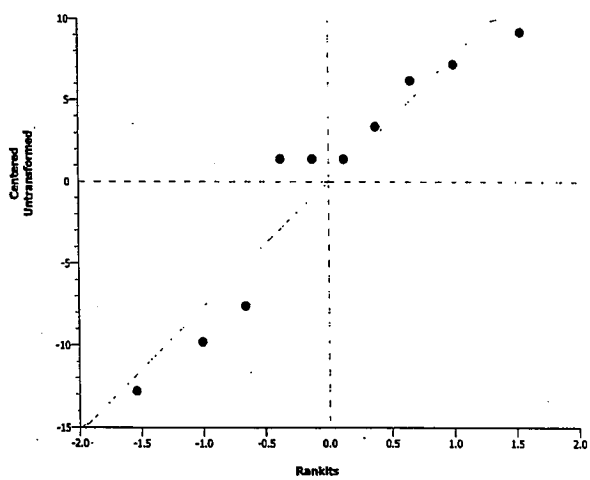
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	5.78	23.2	0.1176	Equal Variances
Distribution	Shapiro-Wilk Normality	0.899		0.2161	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	PBO Blank	5	24.6	23	26.2	17	28	0.805	4.34	17.6%	0.0%
0	Lab Water Contr	5	24.8	20.8	28.8	12	34	1.94	10.4	42.0%	-0.81%

Graphics





Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5-7-09

Project #: 14727 Test ID: 32974 Treatment: **PB0 (25 µg/L)** ~~Blank~~ Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SIGN-OFF
PB0 (25 µg/L) Blank	0	8.21		8.1		229	26.0	0	0	0	0	0	Date: 5-7-09 New WQ: PA Test Init.: Sol'n Prep: Time: 1530
	1	8.13	8.23	8.8	8.0	220	25.3	0	0	0	0	0	Date: 5-8-09 New WQ: Counts: Sol'n Prep: Old WQ: Time:
	2	8.36	8.49	9.6	9.7	221	25.4	0	0	0	0	0	Date: 5/9/09 New WQ: Counts: 10 Sol'n Prep: Old WQ: Time: 1135
	3	8.11	8.43	9.6	9.9	227	25.0	0	0	0	0	0	Date: 5/10/09 New WQ: Counts: Sol'n Prep: PA Old WQ: Time: 1615
	4	8.11	8.28	10.0	8.1	225	25.1	5	4	6	5	4	Date: 5/11/09 New WQ: Counts: Sol'n Prep: PA Old WQ: Time: 1730
	5	8.28	8.26	9.1	7.5	218	25.3	7	7	11	9	11	Date: 5/12/09 New WQ: Counts: Sol'n Prep: PA Old WQ: Time: 1730
	6	8.18	8.52	8.6	6.9	217	25.7	16	15	0	12	11	Date: 5/13/09 New WQ: Counts: Sol'n Prep: Old WQ: Time: 1830
	7												Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
	8												Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
							Total=	28	26	17	26	26	Mean Neonates/Female = 24.6

Pacific EcoRisk

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5-7-09

Project #: 14727 Test ID: 32974 Treatment: **PB0 (25 µg/L)** ~~Blank~~ Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
50%	0	7.67		8.0		527		0	0	0	0	0	
	1	7.81	8.48	8.8	7.9	497		0	0	0	0	0	
	2	7.71	8.66	9.4	9.3	505		0	0	0	0	0	
	3	7.72	8.85	9.5	7.8	516		0	5	0	0	0	
	4	7.89	8.46	9.9	8.1	506		5	0	6	5	6	
	5	7.83	8.46	9.0	7.2	499		8	11	8	9	11	
	6	7.73	8.59	8.8	7.3	516		12	15	10	13	11	
	7												
	8												
							Total=	25	31	24	27	28	Mean Neonates/Female = 27.0

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
100%	0	7.45		7.8		812	0	0	0	0	0	21973
	1	7.61	8.56	8.5	7.8	793	0	0	0	0	0	21973
	2	7.51	8.79	9.8	9.3	785	0	0	0	0	0	21973
	3	7.52	8.69	9.7	7.8	801	0	0	0	0	0	21973
	4	7.22	8.61	9.5	8.1	780	2	0	5	3	3	21973
	5	7.59	8.59	9.3	7.1	782	7	2	4	8	8	21973
	6	7.67	8.72	8.8	7.1	776	0	7	0	0	0	21973
	7											
	8											
							Total= 9	9	9	11	11	Mean Neonates/Female = 10.8

CETIS Summary Report

Report Date: 14 May-09 18:12 (p 1 of 1)
Test Code: 02-7150-8198/32974PBO@100

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Batch ID:	02-9585-1599	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Quang Do
Start Date:	07 May-09 18:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	13 May-09 18:30	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 0h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	02-5364-2189	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	07 May-09 14:00	**Source:**	Precision Analytical		
Sample Age:	16d 9h (6 °C)	**Station:**	Inlet Resv B		

Batch Note: T.I.E.

Sample Note: PBO at 100 µg/L

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
21-0884-6729	6d Survival Rate	100	>100	N/A	N/A	1	Fisher Exact/Bonferroni-Holm Test
12-9765-7883	Reproduction	0	>0		45.1%		Equal Variance t Two-Sample Test
05-2359-6693		50	100	70.7	38.0%	2	Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
08-9011-2897	Reproduction	IC5	2.61	N/A	77.1	38.4	Linear Interpolation (ICPIN)
		IC10	12	N/A	75.9	8.32	
		IC15	45.9	N/A	62.7	2.18	
		IC20	52.3	N/A	63.4	1.91	
		IC25	54.8	N/A	66.1	1.82	
		IC40	63.2	15.7	75.2	1.58	
		IC50	69.4	46	81.9	1.44	

6d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	1	1	1	1	1	0	0	0.0%	0.0%
0	PBO Blank	5	1	1	1	1	1	0	0	0.0%	0.0%
50		5	1	1	1	1	1	0	0	0.0%	0.0%
100		5	1	1	1	1	1	0	0	0.0%	0.0%

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	24.8	20.9	28.7	12	34	1.9	10.4	42.0%	0.0%
0	PBO Blank	5	20.8	17.6	24	13	31	1.55	8.5	40.9%	16.1%
50		5	21	18.8	23.2	11	25	1.06	5.79	27.6%	15.3%
100		5	2.8	1.76	3.84	0	6	0.507	2.77	99.1%	88.7%

6d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	1	1	1	1	1
0	PBO Blank	1	1	1	1	1
50		1	1	1	1	1
100		1	1	1	1	1

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	12	34	32	15	31
0	PBO Blank	31	29	15	16	13
50		24	21	11	24	25
100		3	0	0	6	5

CETIS Analytical Report

Report Date: 14 May-09 18:12 (p 1 of 1)
Test Code: 02-7150-8198/32974PBO@100

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	21-0884-6729	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 18:10	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

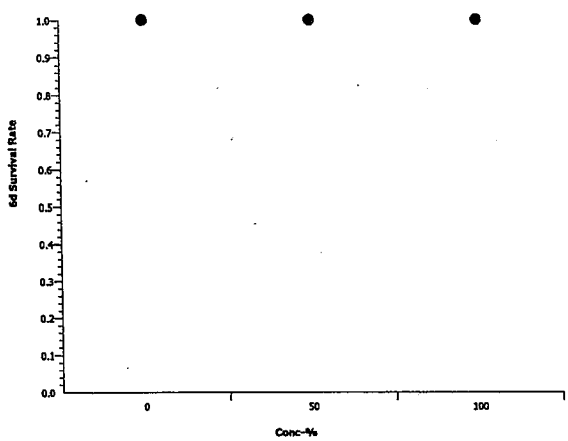
Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-%	Test Stat	P-Value	Decision(0.05)
Lab Water Control		50	1	1.0000	Non-Significant Effect
		100	1	1.0000	Non-Significant Effect

Data Summary

Conc-%	Control Type	No-Resp	Resp	Total
0	Lab Water Cont	5	0	5
50		5	0	5
100		5	0	5

Graphics



Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	05-2359-6693	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 18:10	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	50	100	70.7	2	38.0%

Dunnett's Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50	0.85	2.11	9.42	0.3194	Non-Significant Effect
		100*	4.92	2.11	9.42	0.0003	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.96	2.55	0.5589	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1382.8	691.4	2	13.8	0.0008	Significant Effect
Error	599.6	49.96667	12			
Total	1982.4	741.3667	14			

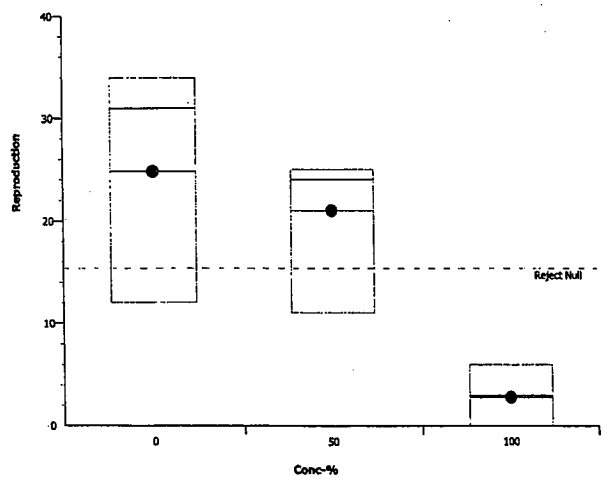
ANOVA Assumptions

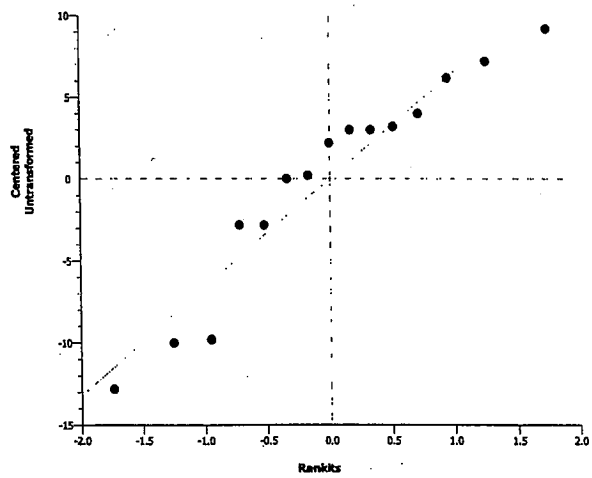
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	5.37	9.21	0.0681	Equal Variances
Distribution	Shapiro-Wilk Normality	0.92		0.1897	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	5	24.8	20.8	28.8	12	34	1.94	10.4	42.0%	0.0%
50		5	21	18.8	23.2	11	25	1.07	5.79	27.6%	15.3%
100		5	2.8	1.74	3.86	0	6	0.515	2.77	99.1%	88.7%

Graphics





CETIS Analytical Report

Report Date: 14 May-09 18:12 (p 1 of 1)
Test Code: 02-7150-8198/32974PBO@100

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	08-9011-2897	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 18:10	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

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

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(5%)
Extreme Value	Grubbs Extreme Value	1.96	2.55	0.5589	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	2.61	N/A	77.1	38.4	1.3	N/A
IC10	12	N/A	75.9	8.32	1.32	N/A
IC15	45.9	N/A	62.7	2.18	1.6	N/A
IC20	52.3	N/A	63.4	1.91	1.58	N/A
IC25	54.8	N/A	66.1	1.82	1.51	N/A
IC40	63.2	15.7	75.2	1.58	1.33	6.36
IC50	69.4	46	81.9	1.44	1.22	2.17

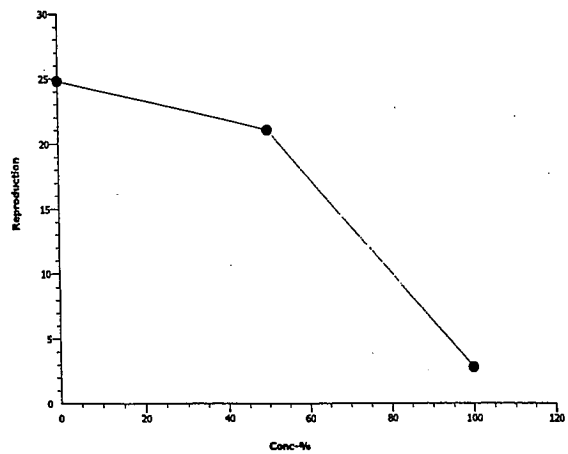
Reproduction Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contro	5	24.8	12	34	1.9	10.4	42.0%	0.0%
50		5	21	11	25	1.06	5.79	27.6%	15.3%
100		5	2.8	0	6	0.507	2.77	99.1%	88.7%

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Control	12	34	32	15	31
50		24	21	11	24	25
100		3	0	0	6	5

Graphics



CETIS Analytical Report

Report Date: 14 May-09 18:11 (p 1 of 2)
Test Code: 02-7150-8198/32974PBO@100

Ceriodaphnia Survival and Reproduction Test — **Pacific EcoRisk**

Analysis ID:	12-9765-7883	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 18:11	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	0	>0			45.1%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		PBO Blank	0.665	1.86	11.2	0.2624	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.43	2.29	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	40	40	1	0.442	0.5247	Non-Significant Effect
Error	723.6	90.45	8			
Total	763.6	130.45	9			

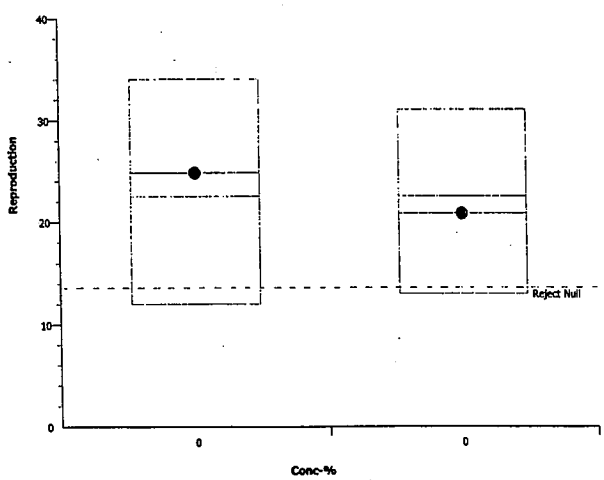
ANOVA Assumptions

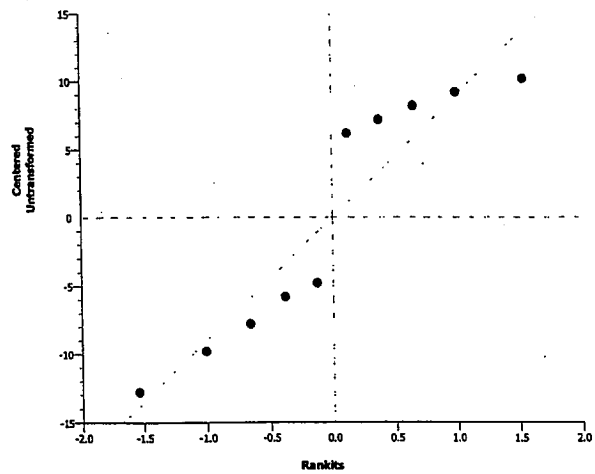
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.51	23.2	0.7015	Equal Variances
Distribution	Shapiro-Wilk Normality	0.858		0.0717	Normal Distribution

Reproduction Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	PBO Blank	5	20.8	17.6	24	13	31	1.58	8.5	40.9%	0.0%
0	Lab Water Contr	5	24.8	20.8	28.8	12	34	1.94	10.4	42.0%	-19.2%

Graphics





Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5-7-09

Project #: 14727 Test ID: 32974 Treatment: **PB0 (100 µg/L)** ~~Blank~~ Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SIGN-OFF
PB0 (100 µg/L) Blank	0	8.01		7.6		238	26.0	0	0	0	0	0	Date: 5-7-09 New WQ: PA Test Init.: [illegible] Sol'n Prep: [illegible] Time: 1830
	1	7.85	8.25	9.0	7.2	202	25.3	0	0	0	0	0	Date: 5-8-09 New WQ: W Counts: JPC Sol'n Prep: [illegible] Old WQ: JT Time: 1600
	2	8.33	8.46	9.6	9.3	219	25.4	0	0	0	0	0	Date: 5/9/09 New WQ: EKK Counts: [illegible] Sol'n Prep: [illegible] Old WQ: EKK Time: 1135
	3	7.91	8.38	9.2	7.7	223	25.0	0	4	0	0	0	Date: 5/10/09 New WQ: JPW Counts: [illegible] Sol'n Prep: PA Old WQ: [illegible] Time: 615
	4	8.10	8.28	9.4	6.4	224	25.1	5	0	5	6	5	Date: 5/11/09 New WQ: JPW Counts: [illegible] Sol'n Prep: PA Old WQ: [illegible] Time: 1730
	5	8.21	8.23	9.1	7.6	234	25.3	11	9	10	10	8	Date: 5/12/09 New WQ: [illegible] Counts: [illegible] Sol'n Prep: PA Old WQ: JT Time: 1750
	6	8.19	8.36	8.8	6.8	225	25.7	15	16	0	0	0	Date: 5/13/09 New WQ: JPC Counts: [illegible] Sol'n Prep: SH Old WQ: [illegible] Time: 1820
	7												Date: [illegible] New WQ: Counts: [illegible] Sol'n Prep: Old WQ: Time:
	8								29				Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:
							Total=	31	30	15	16	13	Mean Neonates/Female = 208

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Precision Analytical** Sample ID: **Sample 1 (Inlet to res B)** Test Date: 5-7-09

Project #: 14727 Test ID: 32974 Treatment: **PB0 (100 µg/L) ~~Blank~~** Control / Diluent: Lab Water

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
50%	0	7.59		7.3		523		0	0	0	0	0	
	1	7.72	8.49	8.4	7.3	493		0	0	0	0	0	
	2	7.73	8.64	9.8	9.3	489		0	0	0	0	0	
	3	7.60	8.49	9.3	7.4	505		0	4	0	0	0	
	4	7.70	8.46	9.6	6.1	499		5	0	4	5	5	
	5	7.94	8.45	9.0	7.2	501		8	7	7	9	8	
	6	7.74	8.57	8.3	6.7	494		11	10	0	10	12	
	7												
	8												
							Total=	24	21	11	24	25	Mean Neonates/Female = 21

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	SAMPLE ID
100%	0	7.42		7.8		806	0	0	0	0	0	21973
	1	7.58	8.54	8.6	7.3	782	0	0	0	0	0	21973
	2	7.47	8.78	10.0	[redacted]	780	0	0	0	0	0	21973
	3	7.39	8.65	9.8	7.5	784	0	0	0	0	0	21973
	4	7.64	8.59	9.7	7.9	781	3	0	0	0	0	21973
	5	7.67	8.57	9.1	7.2	770	0	0	0	6	5	21973
	6	7.62	8.65	8.8	6.9	777	0	0	0	0	0	21973
	7											
	8											
						Total=	3	0	0	6	5	Mean Neonates/Female = 2.8

Appendix N

Test Data and Summary of Statistics for the Toxicity Identification & Evaluation (TIE) of the Chronic Toxicity of Chevron/Cawelo Effluent to Fathead Minnows

CETIS Summary Report

Report Date: 20 May-09 16:56 (p 1 of 2)
Test Code: 06-7715-2814/32888Base

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Batch ID:	13-4740-6149	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Quang Do
Start Date:	01 May-09 17:00	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	08 May-09 14:30	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	Enviro Sciences, Inc.	**Age:**	1

Sample ID:	01-9321-2529	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	21 Apr-09 19:00	**Source:**	Precision Analytical		
Sample Age:	10d 7h (10.5 °C)	**Station:**	Inlet Resv B		

Batch Note: T.I.E.

Sample Note: Baseline

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
17-9886-6591	7d Survival Rate	<50	50	N/A	34.2%	>2	Equal Variance t Two-Sample Test
01-2214-9933	Mean Dry Biomass-mg	<50	50	N/A	13.4%	>2	Equal Variance t Two-Sample Test
18-5572-3091	Mean Dry Weight-mg	<50	50	N/A	20.6%	>2	Equal Variance t Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
19-2453-1500	Mean Dry Biomass-mg	IC5	0.221	0.215	0.228	452	Linear Interpolation (ICPIN)
		IC10	0.492	0.477	0.508	203	
		IC15	0.822	0.795	0.852	122	
		IC20	1.23	1.18	1.28	81.6	
		IC25	1.72	1.65	1.79	58.2	
		IC40	3.95	3.76	4.17	25.3	
		IC50	6.39	6.02	6.8	15.7	

7d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.9	0.847	0.953	0.8	1	0.0258	0.141	15.7%	0.0%
50		2	0.2	0.2	0.2	0.2	0.2	0	0	0.0%	77.8%
100		2	0	0	0	0	0	0	0		100.0%

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.528	0.515	0.541	0.504	0.552	0.0062	0.0339	6.43%	0.0%
50		2	0.009	0.00742	0.0106	0.006	0.012	0.000774	0.00424	47.1%	98.3%
100		2	0	0	0	0	0	0	0		100.0%

Mean Dry Weight-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.591	0.57	0.612	0.552	0.63	0.0101	0.0552	9.33%	0.0%
50		2	0.045	0.0371	0.0529	0.03	0.06	0.00387	0.0212	47.1%	92.4%
100		2	0	0	0	0	0	0	0		100.0%

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

7d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Lab Water Contr	1	0.8
50		0.2	0.2
100		0	0

Mean Dry Biomass-mg Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Lab Water Contr	0.552	0.504
50		0.006	0.012
100		0	0

Mean Dry Weight-mg Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Lab Water Contr	0.552	0.63
50		0.03	0.06
100		0	0

CETIS Analytical Report

Report Date: 20 May-09 16:55 (p 1 of 3)
Test Code: 06-7715-2814/32888Base

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	18-5572-3091	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:29	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	<50	50	N/A	>2	20.6%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50*	13.1	2.92	0.122	0.0029	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.14	1.48	0.9515	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.2981097	0.2981097	1	171	0.0058	Significant Effect
Error	0.003491674	0.001745837	2			
Total	0.3016013	0.2998555	3			

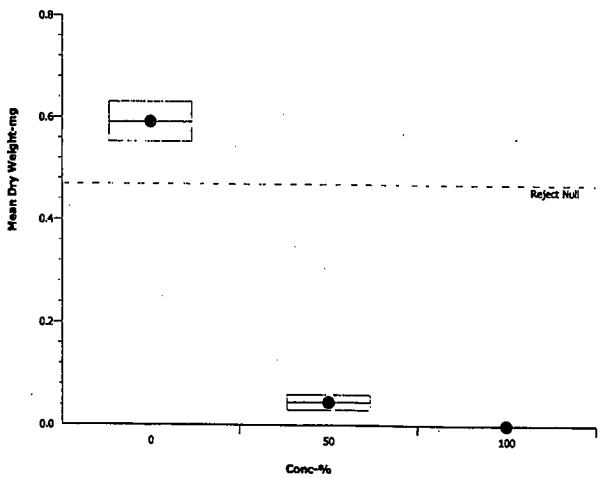
ANOVA Assumptions

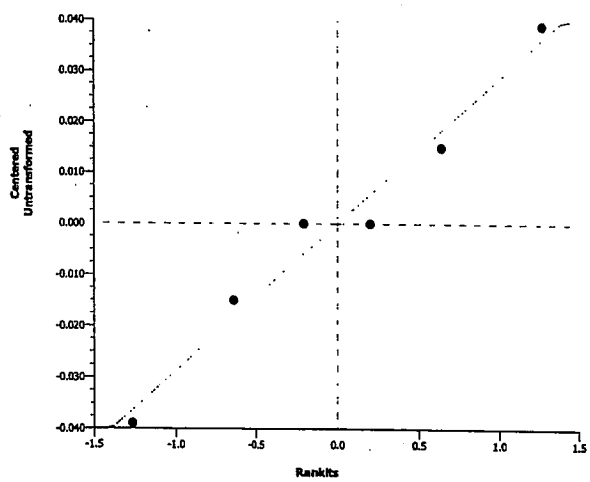
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	6.77	16200	0.4673	Equal Variances
Distribution	Shapiro-Wilk Normality	0.983		0.9212	Normal Distribution

Mean Dry Weight-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.591	0.57	0.612	0.552	0.63	0.0102	0.0552	9.33%	0.0%
50		2	0.045	0.0369	0.0531	0.03	0.06	0.00394	0.0212	47.1%	92.4%
100		2	0	0	0	0	0	0	0		100.0%

Graphics





Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	01-2214-9933	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:29	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	<50	50	N/A	>2	13.4%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50*	21.5	2.92	0.0706	0.0011	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.22	1.48	0.7592	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.2693597	0.2693597	1	460	0.0022	Significant Effect
Error	0.001169888	0.0005849438	2			
Total	0.2705296	0.2699446	3			

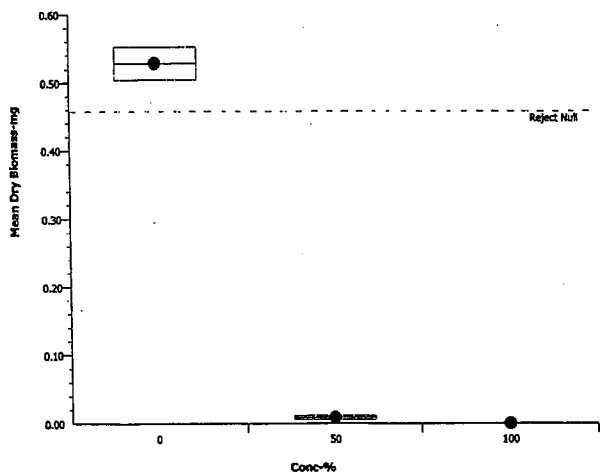
ANOVA Assumptions

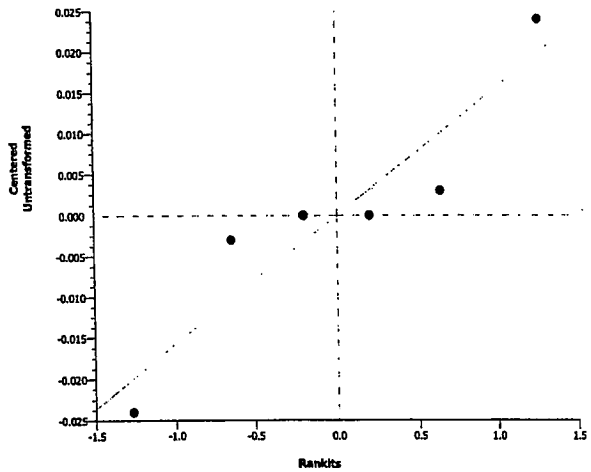
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	64.1	16200	0.1583	Equal Variances
Distribution	Shapiro-Wilk Normality	0.987		0.9430	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.528	0.515	0.541	0.504	0.552	0.0063	0.0339	6.43%	0.0%
50		2	0.009	0.00739	0.0106	0.006	0.012	0.000787	0.00424	47.1%	98.3%
100		2	0	0	0	0	0	0	0		100.0%

Graphics





Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	17-9886-6591	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:28	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	<50	50	N/A	>2	34.2%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50*	6.4	2.92	0.348	0.0118	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.22	1.48	0.7340	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.5815102	0.5815102	1	41	0.0235	Significant Effect
Error	0.02835395	0.01417698	2			
Total	0.6098642	0.5956872	3			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Variance	65500	98.5	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.945		0.6830	Normal Distribution

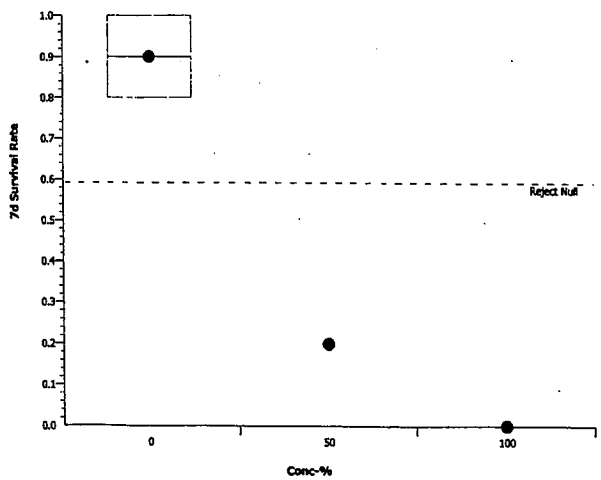
7d Survival Rate Summary

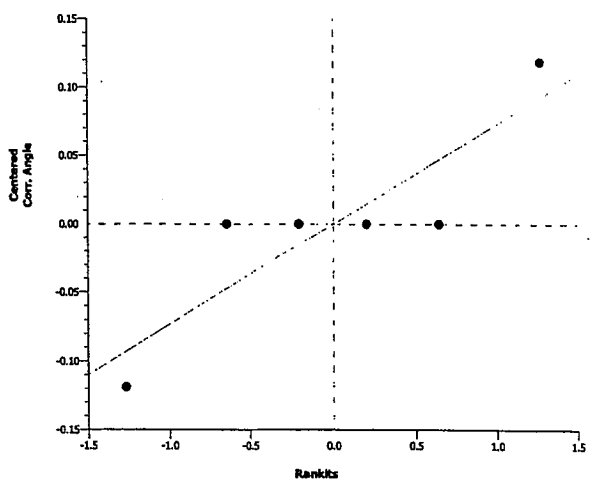
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.9	0.846	0.954	0.8	1	0.0263	0.141	15.7%	0.0%
50		2	0.2	0.2	0.2	0.2	0.2	0	0	0.0%	77.8%
100		2	0	0	0	0	0	0	0		100.0%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	2	1.23	1.16	1.29	1.11	1.35	0.0313	0.168	13.7%	0.0%
50		2	0.464	0.464	0.464	0.464	0.464	0	0	0.0%	62.2%
100		2	0.226	0.225	0.226	0.226	0.226	0	0	0.0%	81.6%

Graphics





CETIS Analytical Report

Report Date: 20 May-09 16:56 (p 1 of 1)
Test Code: 06-7715-2814/32888Base

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	19-2453-1500	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:29	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

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

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(5%)
Extreme Value	Grubbs Extreme Value	1.57	1.89	0.4447	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	0.221	0.215	0.228	452	438	464
IC10	0.492	0.477	0.508	203	197	210
IC15	0.822	0.795	0.852	122	117	126
IC20	1.23	1.18	1.28	81.6	78.4	84.7
IC25	1.72	1.65	1.79	58.2	55.7	60.6
IC40	3.95	3.76	4.17	25.3	24	26.6
IC50	6.39	6.02	6.8	15.7	14.7	16.6

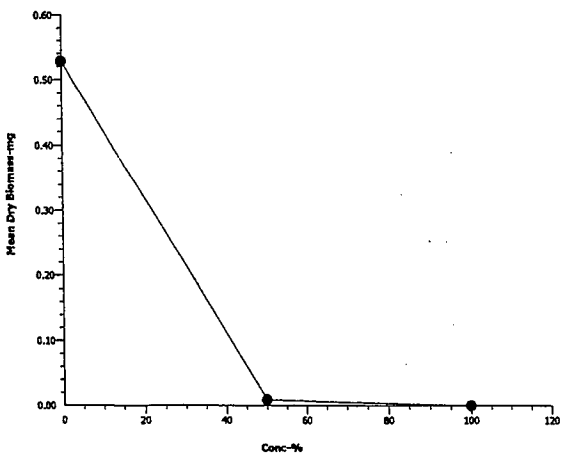
Mean Dry Biomass-mg Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contro	2	0.528	0.504	0.552	0.0062	0.0339	6.43%	0.0%
50		2	0.009	0.006	0.012	0.000774	0.00424	47.1%	98.3%
100		2	0	0	0	0	0		100.0%

Mean Dry Biomass-mg Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Lab Water Control	0.552	0.504
50		0.006	0.012
100		0	0

Graphics



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Precision Analytical**
Test Material: Sample 1 (Inlet to res B)
Test ID#: 32888 Project #: 14727
Test Date: 5/1/09 Randomization: -

Organism Log#: 4513 Age: < 24 hrs
Organism Supplier: Enviro Sciences
Control/Diluent: EPAMH
Control Water Batch: 1197
Treatment: Baseline

Treatment	Temp (°C)	pH New	pH Old	D.O. (mg/L) New	D.O. (mg/L) Old	Conductivity (µs/cm)	# Live Organisms A	# Live Organisms B	SIGN-OFF
Lab Water Control	25.2	8.21		7.8		316	5	5	Date: 5/1/09
50%	25.2	7.75		7.9		553	5	5	Test Solution Prep: KB
100%	25.2	7.53		7.9		793	5	5	New WQ: MM
									Initiation Time: 1700
									Initiation Signoff: JPC
Meter ID	24A	pH12		DO14		EC05			
Lab Water Control	JPC 25.2 ~~25.2~~	8.14	8.15	9.4	7.4	319	5	5	Date: 5-2-09
50%	25.2	7.88	8.39	9.8	7.5	558	5	5	Test Solution Prep: Ø
100%	25.2	7.73	8.55	10.3	7.4	790	5	5	New WQ: PA
									Renewal Time: 1105
									Renewal Signoff: PA
									Old WQ: [illegible]
Meter ID	24A	pH 12	pH11	DO12	DO14	EC03			
Lab Water Control	24.8	8.27	8.20	8.9	8.7	320	5	5	Date: 5/3/09
50%	24.8	7.78	8.26	9.3	8.2	558	5	4	Test Solution Prep: JPW
100%	24.8	7.61	8.44	9.9	8.2	801	5	5	New WQ: SL
									Renewal Time: 1315
									Renewal Signoff: JPW
									Old WQ: AR
Meter ID	24A	pH12	pH11	DO14	DO12	EC01			
Lab Water Control	25.5	8.12	8.25	8.4	6.8	316	5	5	Date: 5/4/09
50%	25.5	7.51	8.22	8.8	7.0	550	5	4	Test Solution Prep: JPW
100%	25.5	7.32	8.37	9.4	6.8	792	1	2	New WQ: SH
									Renewal Time: 1200
									Renewal Signoff: JPW
									Old WQ: MM
Meter ID	24A	pH14	pH11	DO14	DO12	EC05			

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Precision Analytical**
Test Material: Sample 1 (Inlet to res B)
Test ID#: 32888 Project #: 14727
Test Date: 5/1/09 Randomization: —

Organism Log#: 4513 Age: c 24 hrs
Organism Supplier: Enviro Sciences
Control/Diluent: EPAMH
Control Water Batch: 1197
Treatment: Baseline

Treatment	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Conductivity (µs/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Water Control	25.5	8.25	7.85	7.3	8.0	330	5	5			Date: 5/5/09
50%	25.5	8.22	8.15	7.0	8.1	570	4	3			Test Solution Prep: JPL
100%	25.5	8.37	8.37	7.8	8.1	812	1	1			New WQ: JPL
											Renewal Time: 1000
											Renewal Signoff: JPL
											Old WQ: JPL
Meter ID	24A	pH11	pH11	DO13	DO7	EC03					
Lab Water Control	25.5	8.08	8.07	8.8	7.5	330	5	5			Date: 5/6/09
50%	25.5	7.47	8.15	8.9	7.2	582	1	3			Test Solution Prep: PA
100%	25.5	7.22	8.35	9.3	7.4	821	0	0			New WQ: Ø
											Renewal Time: 1200
											Renewal Signoff: JPL
											Old WQ: EKK
Meter ID	24A	pH 14	pH11	DO14	DO13	EC03					
Lab Water Control	25.9	8.43	8.07	7.3	7.2	336	5	4			Date: 5/7/09
50%	25.9	7.76	8.05	8.2	6.6	576	1	1			Test Solution Prep: KO
100%	—	—	—	—	—	—	—	—			New WQ: PA
											Renewal Time: 1730
											Renewal Signoff: KO
											Old WQ: PA
Meter ID	24A	PH14	PH11	DO14	DO13	EC03					
Lab Water Control	25.2		7.99		6.9	386	5	4			Date: 5/8/09
50%	25.2		8.22		6.9	632	1	1			Termination Time: 1430
100%	—		—		—	—	—	—			Termination Signoff: JPL
											Old WQ: EKK
Meter ID	24A		pH11		DO12	EC01					

Fathead Minnow Dry Weight Data Sheet

Client: **Precision Analytical** Test ID #: 32888 Project # 14727

Sample: Sample 1 (Inlet to res B) Tare Weight Date: 5/2/09 Sign-off: MEC

Test Date: 5/1/09 Final Weight Date: 5/10/09 Sign-off: MEC

Treatment: Baseline

Pan ID	Treatment	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Control	A	162.32	165.08	5	0.552
2		B	169.61	172.13	5	0.504
3	50%	A	160.18	160.21	5	0.006
4		B	166.46	166.52	5	0.012
5	100%	A	169.84	—	5	0
6		B	173.04	—	5	0
QA1			161.53	161.51		0.02
Balance ID:			1	1		

CETIS Summary Report

Report Date: 20 May-09 16:54 (p 1 of 2)
Test Code: 10-3089-6725/32888Cent

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Batch ID:	13-4740-6149	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Quang Do
Start Date:	01 May-09 17:00	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	08 May-09 14:30	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	Enviro Sciences, Inc.	**Age:**	1

Sample ID:	01-5302-1468	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	01 May-09 12:30	**Source:**	Precision Analytical		
Sample Age:	10d 7h (6 °C)	**Station:**	Inlet Resv B		

Batch Note: T.I.E.

Sample Note: Centrifugation

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
04-6062-1297	7d Survival Rate	0	>0		34.2%		Equal Variance t Two-Sample Test
06-4735-3248		50	100	70.7	46.1%	2	Equal Variance t Two-Sample Test
03-5395-5263	Mean Dry Biomass-mg	0	>0		28.7%		Equal Variance t Two-Sample Test
16-0368-1362		<50	50	N/A	20.4%	>2	Equal Variance t Two-Sample Test
13-8822-9209	Mean Dry Weight-mg	<50	50	N/A	22.2%	>2	Bonferroni Adj t Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
06-8803-5899	7d Survival Rate	EC50	53.6	37.7	76.3	1.87	Trimmed Spearman-Kärber
03-5831-0964	Mean Dry Biomass-mg	IC5	0.265	0.189	0.363	378	Linear Interpolation (ICPIN)
		IC10	0.599	0.408	0.85	167	
		IC15	1.02	0.663	1.5	97.8	
		IC20	1.56	0.956	2.38	64.2	
		IC25	2.24	1.29	3.54	44.7	
		IC40	5.55	2.55	9.9	18	
		IC50	9.47	3.57	18.3	10.6	

7d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Cent Blank	2	1	1	1	1	1	0	0	0.0%	0.0%
0	Lab Water Contr	2	0.9	0.847	0.953	0.8	1	0.0258	0.141	15.7%	10.0%
50		2	0.5	0.447	0.553	0.4	0.6	0.0258	0.141	28.3%	50.0%
100		2	0	0	0	0	0	0	0		100.0%

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Cent Blank	2	0.444	0.42	0.468	0.398	0.49	0.0119	0.0651	14.7%	0.0%
0	Lab Water Contr	2	0.528	0.515	0.541	0.504	0.552	0.0062	0.0339	6.43%	-18.9%
50		2	0.086	0.0712	0.101	0.058	0.114	0.00723	0.0396	46.0%	80.6%
100		2	0	0	0	0	0	0	0		100.0%

Mean Dry Weight-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Cent Blank	2	0.444	0.42	0.468	0.398	0.49	0.0119	0.0651	14.7%	0.0%
0	Lab Water Contr	2	0.591	0.57	0.612	0.552	0.63	0.0101	0.0552	9.33%	-33.1%
50		2	0.167	0.156	0.179	0.145	0.19	0.00581	0.0318	19.0%	62.3%
100		2	0	0	0	0	0	0	0		100.0%

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

7d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Cent Blank	1	1
0	Lab Water Contr	1	0.8
50		0.6	0.4
100		0	0

Mean Dry Biomass-mg Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Cent Blank	0.398	0.49
0	Lab Water Contr	0.552	0.504
50		0.114	0.058
100		0	0

Mean Dry Weight-mg Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Cent Blank	0.398	0.49
0	Lab Water Contr	0.552	0.63
50		0.19	0.145
100		0	0

CETIS Analytical Report

Report Date: 20 May-09 16:53 (p 1 of 5)
Test Code: 10-3089-6725/32888Cent

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	03-5395-5263	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:35	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	0	>0			28.7%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		Cent Blank	1.62	2.92	0.152	0.1234	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.09	1.48	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.007055681	0.007055681	1	2.62	0.2469	Non-Significant Effect
Error	0.005384032	0.002692016	2			
Total	0.01243971	0.009747697	3			

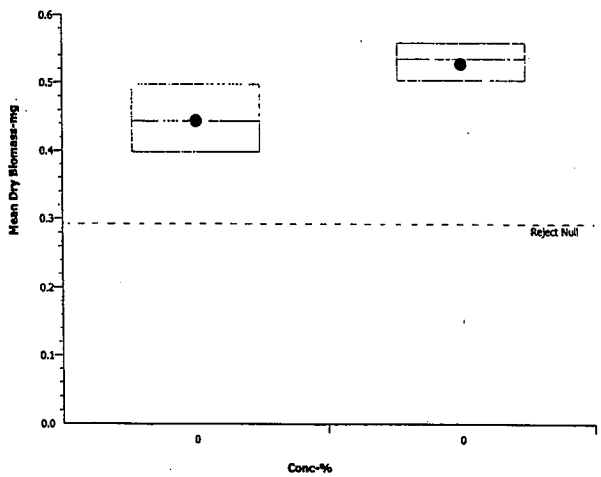
ANOVA Assumptions

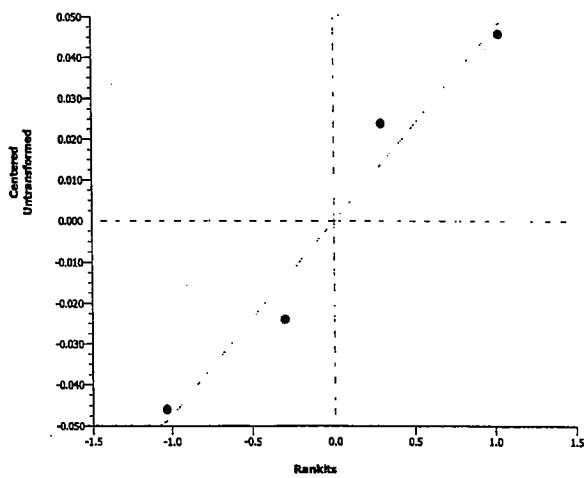
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.67	16200	0.6123	Equal Variances
Distribution	Shapiro-Wilk Normality	0.942		0.6660	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.528	0.515	0.541	0.504	0.552	0.0063	0.0339	6.43%	0.0%
0	Cent Blank	2	0.444	0.419	0.469	0.398	0.49	0.0121	0.0651	14.7%	15.9%

Graphics





Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	04-6062-1297	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:34	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	0	>0			34.2%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		Cent Blank	-1	2.92	0.348	0.7887	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.22	1.48	0.7340	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.01417698	0.01417698	1	1	0.4226	Non-Significant Effect
Error	0.02835395	0.01417698	2			
Total	0.04253092	0.02835395	3			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Variance	65500	98.5	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.945		0.6830	Normal Distribution

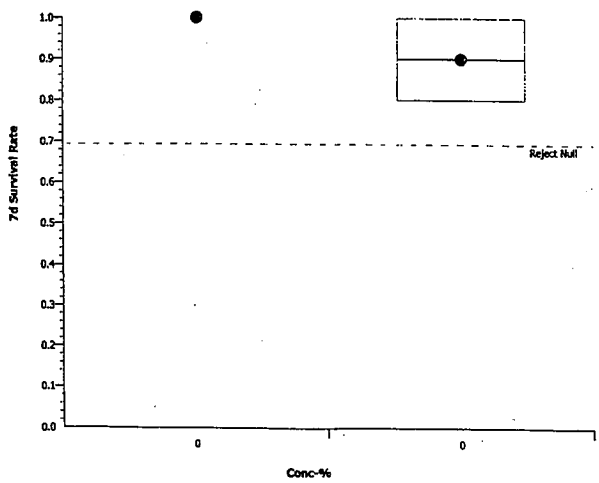
7d Survival Rate Summary

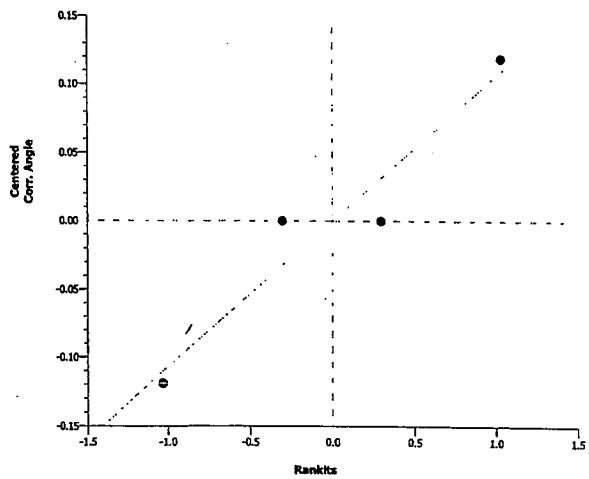
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.9	0.846	0.954	0.8	1	0.0263	0.141	15.7%	0.0%
0	Cent Blank	2	1	1	1	1	1	0	0	0.0%	-11.1%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	2	1.23	1.16	1.29	1.11	1.35	0.0313	0.168	13.7%	0.0%
0	Cent Blank	2	1.35	1.35	1.35	1.35	1.35	0	0	0.0%	-9.71%

Graphics





Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	13-8822-9209	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:34	**Analysis:**	Parametric-Multiple Comparison	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	<50	50	N/A	>2	22.2%

Bonferroni Adj t Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50*	9.41	2.92	0.131	0.0056	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.06	1.48	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.1793526	0.1793526	1	88.5	0.0111	Significant Effect
Error	0.004054929	0.002027465	2			
Total	0.1834076	0.1813801	3			

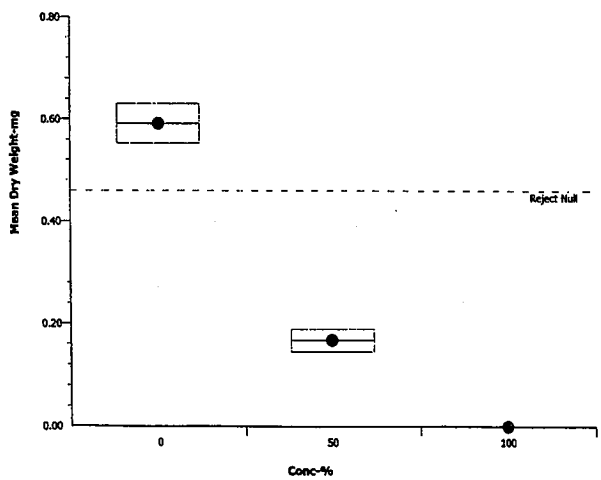
ANOVA Assumptions

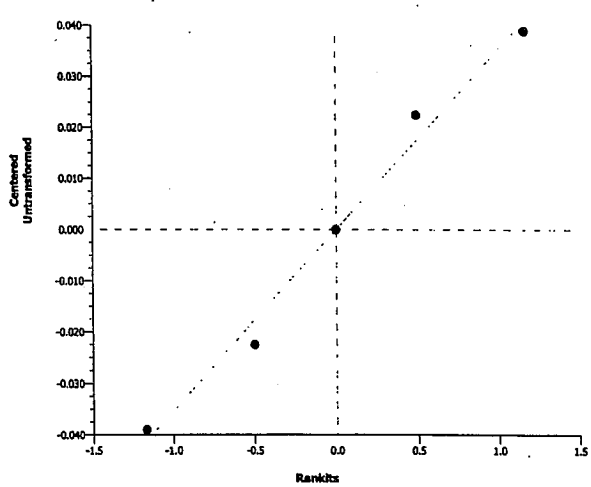
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3	16200	0.6663	Equal Variances
Distribution	Shapiro-Wilk Normality	0.92		0.5397	Normal Distribution

Mean Dry Weight-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.591	0.57	0.612	0.552	0.63	0.0102	0.0552	9.33%	0.0%
50		2	0.167	0.155	0.18	0.145	0.19	0.00591	0.0318	19.0%	71.7%
100		1	0			0	0	0	0		100.0%

Graphics





Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	16-0368-1362	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:33	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	<50	50	N/A	>2	20.4%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50*	12	2.92	0.108	0.0034	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	0.93	1.48	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.1953638	0.1953638	1	144	0.0069	Significant Effect
Error	0.002720065	0.001360032	2			
Total	0.1980839	0.1967239	3			

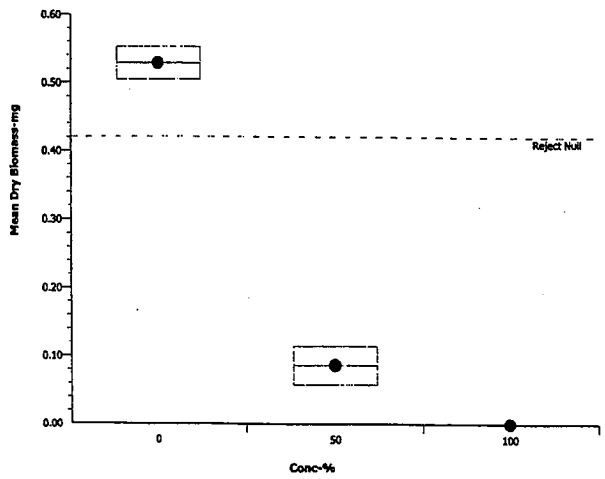
ANOVA Assumptions

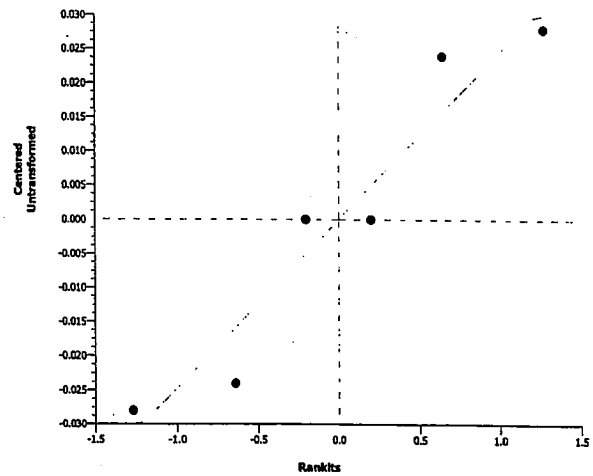
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.36	16200	0.9022	Equal Variances
Distribution	Shapiro-Wilk Normality	0.794		0.0919	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.528	0.515	0.541	0.504	0.552	0.0063	0.0339	6.43%	0.0%
50		2	0.086	0.0709	0.101	0.058	0.114	0.00735	0.0396	46.0%	83.7%
100		2	0	0	0	0	0	0	0		100.0%

Graphics





CETIS Analytical Report

Report Date: 20 May-09 16:54 (p 5 of 5)
Test Code: 10-3089-6725/32888Cent

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	06-4735-3248	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:33	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	50	100	70.7	2	46.1%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50	2.83	2.92	0.455	0.0528	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	0.935	1.48	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.1943202	0.1943202	1	7.99	0.1057	Non-Significant Effect
Error	0.04862646	0.02431323	2			
Total	0.2429467	0.2186334	3			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.4	16200	0.8937	Equal Variances
Distribution	Shapiro-Wilk Normality	0.799		0.1011	Normal Distribution

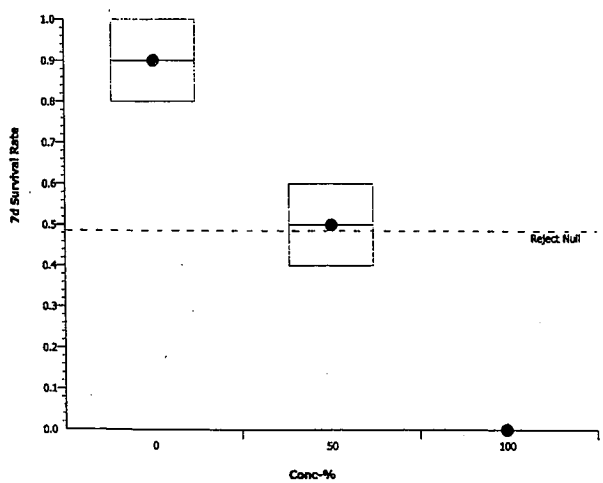
7d Survival Rate Summary

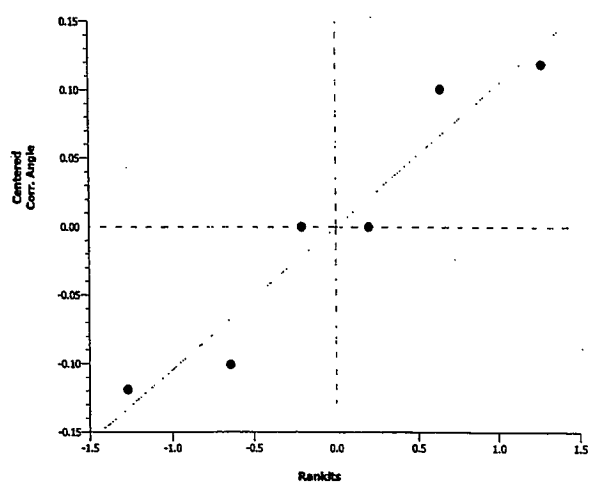
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.9	0.846	0.954	0.8	1	0.0263	0.141	15.7%	0.0%
50		2	0.5	0.446	0.554	0.4	0.6	0.0263	0.141	28.3%	44.4%
100		2	0	0	0	0	0	0	0		100.0%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	2	1.23	1.16	1.29	1.11	1.35	0.0313	0.168	13.7%	0.0%
50		2	0.785	0.731	0.84	0.685	0.886	0.0264	0.142	18.1%	35.9%
100		2	0.226	0.225	0.226	0.226	0.226	0	0	0.0%	81.6%

Graphics





CETIS Analytical Report

Report Date: 20 May-09 16:54 (p 1 of 1)
Test Code: 10-3089-6725/32888Cent

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	03-5831-0964	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:34	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

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

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(5%)
Extreme Value	Grubbs Extreme Value	1.2	1.89	1.0000	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	0.265	0.189	0.363	378	276	530
IC10	0.599	0.408	0.85	167	118	245
IC15	1.02	0.663	1.5	97.8	66.5	151
IC20	1.56	0.956	2.38	64.2	42.1	105
IC25	2.24	1.29	3.54	44.7	28.2	77.5
IC40	5.55	2.55	9.9	18	10.1	39.2
IC50	9.47	3.57	18.3	10.6	5.45	28

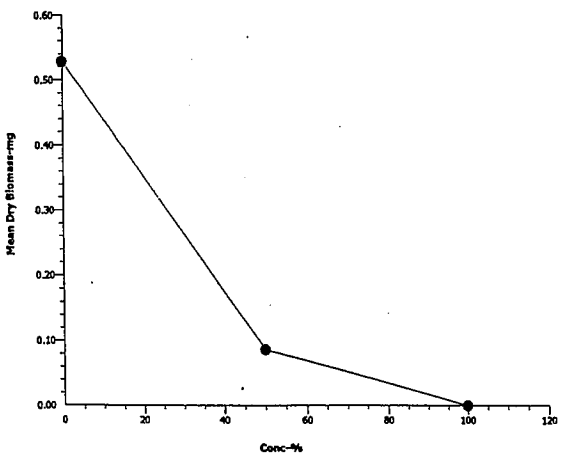
Mean Dry Biomass-mg Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contro	2	0.528	0.504	0.552	0.0062	0.0339	6.43%	0.0%
50		2	0.086	0.058	0.114	0.00723	0.0396	46.0%	83.7%
100		2	0	0	0	0	0		100.0%

Mean Dry Biomass-mg Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Lab Water Control	0.552	0.504
50		0.114	0.058
100		0	0

Graphics



CETIS Analytical Report

Report Date: 20 May-09 16:54 (p 1 of 1)
Test Code: 10-3089-6725/32888Cent

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	06-8803-5899	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:33	**Analysis:**	Trimmed Spearman-Kärber	**Official Results:**	Yes

Trimmed Spearman-Kärber Estimates

Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0.1	44.44%	1.73	0.0766	53.6	37.7	76.3

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(5%)
Extreme Value	Grubbs Extreme Value	1.21	1.89	1.0000	No Outliers Detected

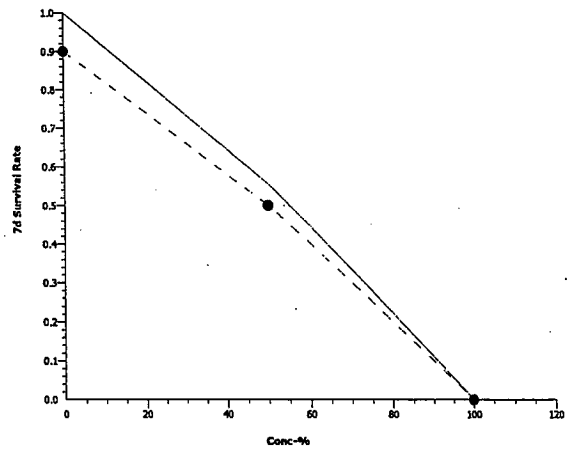
7d Survival Rate Summary

			Calculated Variate(A/B)								
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%	A	B
0	Lab Water Contro	2	0.9	0.8	1	0.0258	0.141	15.7%	0.0%	9	10
50		2	0.5	0.4	0.6	0.0258	0.141	28.3%	44.4%	5	10
100		2	0	0	0	0	0		100.0%	0	10

7d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Lab Water Control	1	0.8
50		0.6	0.4
100		0	0

Graphics



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Precision Analytical**
Test Material: Sample 1 (Inlet to res B)
Test ID#: 32888 Project #: 14727
Test Date: 5/1/09 Randomization: —

Organism Log#: 4513 Age: <24 hrs
Organism Supplier: Enviro Sciences
Control/Diluent: EPAMH
Control Water Batch: 1197
Treatment: Centrifugation

Treatment	Temp (°C)	pH New	pH Old	D.O. (mg/L) New	D.O. (mg/L) Old	Conductivity (µs/cm)	# Live Organisms A	# Live Organisms B			SIGN-OFF
Blank	25.2	8.02		7.5		331	5	5			Date: 5/1/09
50%	25.2	7.70		7.8		555	5	5			Test Solution Prep: AB
100%	25.2	7.47		8.0		797	5	5			New WQ: MTM
											Initiation Time: 1700
											Initiation Signoff: JPC
Meter ID	24A	PH12		DO14		EC05					
Blank	25.2	8.03	8.19	9.5	7.6	316	5	5			Date: 5/2/09
50%	25.2	7.66	8.36	~~10.7~~ 10.1	7.6	570	5	5			Test Solution Prep: JJ
100%	25.2	7.44	8.51	10.5	7.5	803	5	5			New WQ: PA
											Renewal Time: 1105
											Renewal Signoff: PA
											Old WQ: DAP
Meter ID	24A	PH12	PH11	DO12	DO14	EC03					
Blank	24.8	8.05	8.12	9.5	8.2	321	5	5			Date: 5/3/09
50%	24.8	7.66	8.17	9.5	8.2	559	5	5			Test Solution Prep: JPW
100%	24.8	7.53	8.40	9.8	7.8	799	3	5			New WQ: SL
											Renewal Time: 1315
											Renewal Signoff: JPW
											Old WQ: AR
Meter ID	24A	PH12	PH11	DO14	DO12	EC01					
Blank	25.5	8.10	[illegible]	9.4	7.0	316	5	5			Date: 5/4/09
50%	25.5	7.74	8.07	9.1	7.0	557	5	5			Test Solution Prep: JPW
100%	25.5	7.70	8.29	9.6	7.0	792	3	3			New WQ: SH
											Renewal Time: 1200
											Renewal Signoff: JPW
											Old WQ: MTM
Meter ID	24A	PH14	PH11	DO14	DO12	EC05					

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Precision Analytical**
Test Material: Sample 1 (Inlet to res B)
Test ID#: 32888 Project #: 14727
Test Date: 5/1/09 Randomization: —

Organism Log#: 4513 Age: <24 hrs
Organism Supplier: Enviro Sciences
Control/Diluent: EPAMH
Control Water Batch: 1197
Treatment: Centrifugation

Treatment	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Conductivity (µs/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Blank	25.5	7.69	8.13	10.0	7.7	332	5	5			Date: 5/5/09
50%	25.5	7.56	8.20	10.4	8.1	~~5~~ 563 JPW	4	4			Test Solution Prep: JPW
100%	25.5	7.52	8.36	10.5	8.2	820	0	0			New WQ: JPW
											Renewal Time: 1000
											Renewal Signoff: JPW
											Old WQ: JPW
Meter ID	24A	pH11	pH11	DO13	DO13	EC03					
Blank	25.5	7.89	8.02	10.2	7.3	325	5	5			Date: 5/6/09
50%	25.5	7.80	8.17	9.7	7.0	575	4	2			Test Solution Prep: PA
100%	—	—	—	—	—	—	—	—			New WQ: JT
											Renewal Time: 1200
											Renewal Signoff: JPW
											Old WQ: EKK
Meter ID	24A	pH14	pH11	DO14	DO13	EC03					
Blank	25.9	8.05	8.01	9.3	6.8	330	5	5			Date: 5/7/09
50%	25.9	7.84	8.05	8.8	6.9	580	3	2			Test Solution Prep: KO
100%	—	—	—	—	—	—	—	—			New WQ: PA
											Renewal Time: 1730
											Renewal Signoff: KO
											Old WQ: PA
Meter ID	24A	pH14	pH11	DO14	DO13	EC03					
Blank	25.2		7.99		6.7	348	5	5			Date: 5/8/09
50%	25.2		8.23		6.6	618	3	2			Termination Time: 1430
100%	—		—		—	—	—	—			Termination Signoff: JPW
											Old WQ: EKK
Meter ID	24A		pH11		DO12	EC03					

Fathead Minnow Dry Weight Data Sheet

Client: **Precision Analytical** Test ID #: 32888 Project # 14727

Sample: Sample 1 (Inlet to res B) Tare Weight Date: 5-2-09 Sign-off: MEC

Test Date: 5/1/09 Final Weight Date: 5/10/09 Sign-off: MEC

Treatment: JPO ~~Baseline~~ Centrifugation

Pan ID	Treatment	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
7	Control	A	168.73	170.72	5	0.398
8		B	175.26	177.71	5	0.490
9	50%	A	170.12	170.69	5	0.114
10		B	170.89	171.18	5	0.058
11	100%	A	163.72	—	5	0
12		B	157.64	—	5	0
QA1			161.53	161.51		-0.02
Balance ID:			1	1		

CETIS Summary Report

Report Date: 20 May-09 16:51 (p 1 of 2)
Test Code: 07-4745-4163/32888Cent+C8

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Batch ID:	13-4740-6149	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Quang Do
Start Date:	01 May-09 17:00	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	08 May-09 14:30	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	Enviro Sciences, Inc.	**Age:**	1

Sample ID:	14-6106-2031	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	01 May-09 12:30	**Source:**	Precision Analytical		
Sample Age:	10d 7h (6 °C)	**Station:**	Inlet Resv B		

Batch Note: T.I.E.

Sample Note: Centrifugation + C18 SPE

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
13-2808-2468	7d Survival Rate	100	>100	N/A	34.2%	1	Equal Variance t Two-Sample Test
12-6062-6470	Mean Dry Biomass-mg	100	>100	N/A	28.7%	1	Equal Variance t Two-Sample Test
17-8134-0388	Mean Dry Weight-mg	100	>100	N/A	29.8%	1	Equal Variance t Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
09-9127-4401	Mean Dry Biomass-mg	IC5	>100	N/A	N/A	<1	Linear Interpolation (ICPIN)
		IC10	>100	N/A	N/A	<1	
		IC15	>100	N/A	N/A	<1	
		IC20	>100	N/A	N/A	<1	
		IC25	>100	N/A	N/A	<1	
		IC40	>100	N/A	N/A	<1	
		IC50	>100	N/A	N/A	<1	

7d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Cent+C8 Blank	2	0.3	0.247	0.353	0.2	0.4	0.0258	0.141	47.1%	0.0%
0	Lab Water Contr	2	0.9	0.847	0.953	0.8	1	0.0258	0.141	15.7%	-200.0%
50		2	0.9	0.847	0.953	0.8	1	0.0258	0.141	15.7%	-200.0%
100		2	1	1	1	1	1	0	0	0.0%	-233.0%

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Cent+C8 Blank	2	0.131	0.0967	0.165	0.066	0.196	0.0168	0.0919	70.2%	0.0%
0	Lab Water Contr	2	0.528	0.515	0.541	0.504	0.552	0.0062	0.0339	6.43%	-303.0%
50		2	0.76	0.744	0.776	0.73	0.79	0.00775	0.0424	5.58%	-480.0%
100		2	0.876	0.852	0.9	0.83	0.922	0.0119	0.0651	7.43%	-569.0%

Mean Dry Weight-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Cent+C8 Blank	2	0.41	0.368	0.452	0.33	0.49	0.0207	0.113	27.6%	0.0%
0	Lab Water Contr	2	0.591	0.57	0.612	0.552	0.63	0.0101	0.0552	9.33%	-44.1%
50		2	0.851	0.819	0.884	0.79	0.912	0.0158	0.0866	10.2%	-108.0%
100		2	0.876	0.852	0.9	0.83	0.922	0.0119	0.0651	7.43%	-114.0%

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

7d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Cent+C8 Blank	0.2	0.4
0	Lab Water Contr	1	0.8
50		1	0.8
100		1	1

Mean Dry Biomass-mg Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Cent+C8 Blank	0.066	0.196
0	Lab Water Contr	0.552	0.504
50		0.79	0.73
100		0.922	0.83

Mean Dry Weight-mg Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Cent+C8 Blank	0.33	0.49
0	Lab Water Contr	0.552	0.63
50		0.79	0.912
100		0.922	0.83

CETIS Analytical Report

Report Date: 20 May-09 16:50 (p 1 of 3)
Test Code: 07-4745-4163/32888Cent+C8

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	17-8134-0388	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:38	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	100	>100	N/A	1	29.8%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50	-3.58	2.92	0.212	0.9651	Non-Significant Effect
		100	-4.73	2.92	0.176	0.9790	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.13	1.89	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.09971119	0.04985559	2	10.1	0.0464	Significant Effect
Error	0.01477731	0.004925768	3			
Total	0.1144885	0.05478136	5			

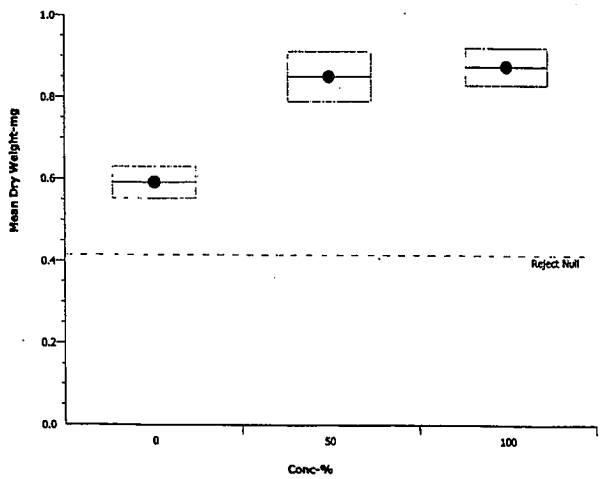
ANOVA Assumptions

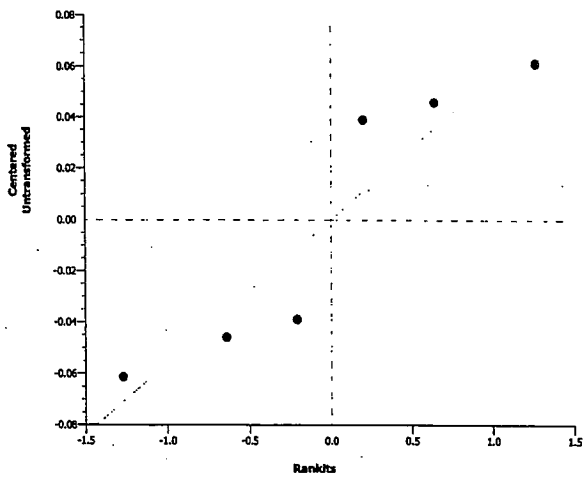
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	0.147	9.21	0.9290	Equal Variances
Distribution	Shapiro-Wilk Normality	0.841		0.1326	Normal Distribution

Mean Dry Weight-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.591	0.57	0.612	0.552	0.63	0.0102	0.0552	9.33%	0.0%
50		2	0.851	0.818	0.884	0.79	0.912	0.0161	0.0866	10.2%	-44.0%
100		2	0.876	0.851	0.901	0.83	0.922	0.0121	0.0651	7.43%	-48.2%

Graphics





Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	12-6062-6470	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:37	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	100	>100	N/A	1	28.7%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50	-6.04	2.92	0.112	0.9868	Non-Significant Effect
		100	-6.71	2.92	0.152	0.9892	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.21	1.89	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.1255889	0.06279447	2	26.2	0.0126	Significant Effect
Error	0.007184064	0.002394688	3			
Total	0.132773	0.06518916	5			

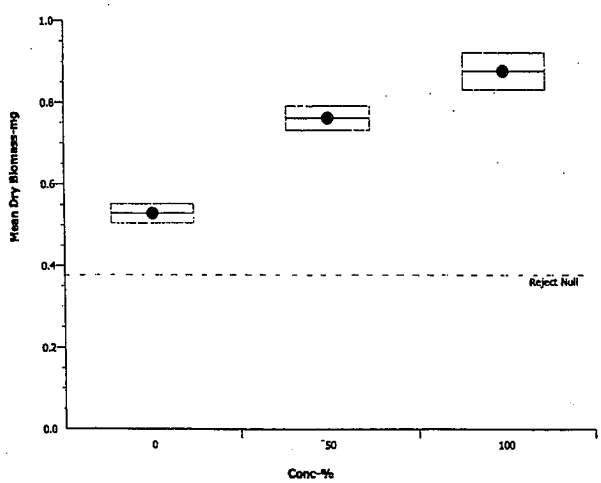
ANOVA Assumptions

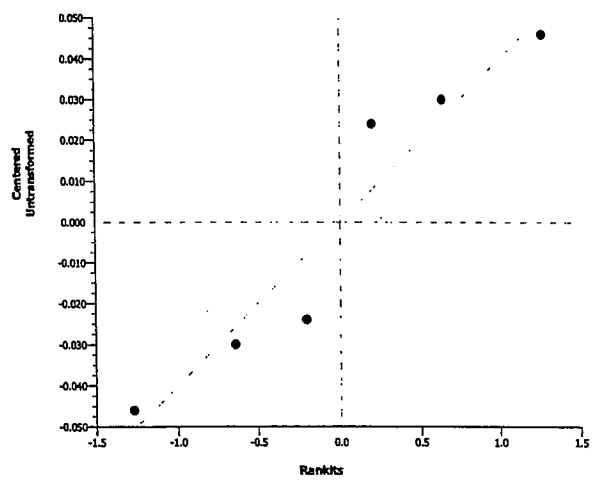
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	0.31	9.21	0.8564	Equal Variances
Distribution	Shapiro-Wilk Normality	0.896		0.3512	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.528	0.515	0.541	0.504	0.552	0.0063	0.0339	6.43%	0.0%
50		2	0.76	0.744	0.776	0.73	0.79	0.00788	0.0424	5.58%	-43.9%
100		2	0.876	0.851	0.901	0.83	0.922	0.0121	0.0651	7.43%	-65.9%

Graphics





Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	13-2808-2468	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:37	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	100	>100	N/A	1	34.2%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50	0	2.92	0.492	0.5000	Non-Significant Effect
		100	-1	2.92	0.348	0.7887	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.12	1.89	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.01890263	0.009451317	2	0.5	0.6495	Non-Significant Effect
Error	0.0567079	0.01890263	3			
Total	0.07561053	0.02835395	5			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Variance	65500	30.8	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.853		0.1670	Normal Distribution

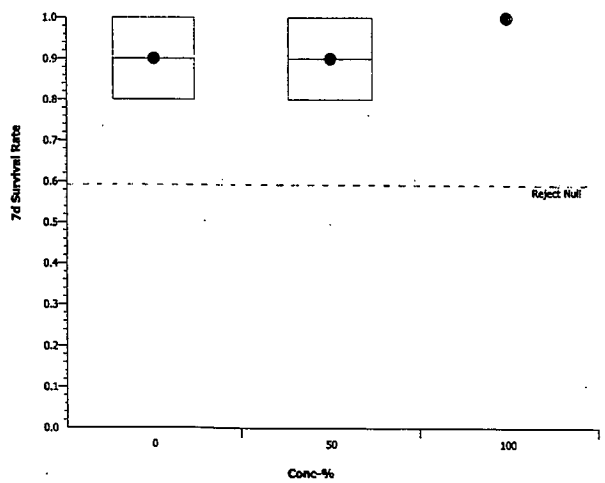
7d Survival Rate Summary

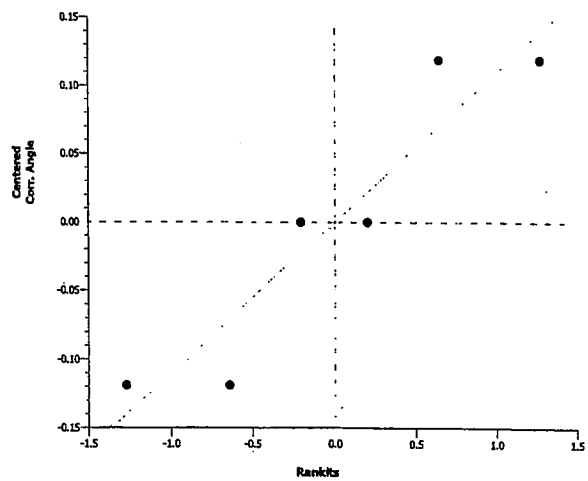
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.9	0.846	0.954	0.8	1	0.0263	0.141	15.7%	0.0%
50		2	0.9	0.846	0.954	0.8	1	0.0263	0.141	15.7%	0.0%
100		2	1	1	1	1	1	0	0	0.0%	-11.1%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	2	1.23	1.16	1.29	1.11	1.35	0.0313	0.168	13.7%	0.0%
50		2	1.23	1.16	1.29	1.11	1.35	0.0313	0.168	13.7%	0.0%
100		2	1.35	1.35	1.35	1.35	1.35	0	0	0.0%	-9.71%

Graphics





CETIS Analytical Report

Report Date: 20 May-09 16:51 (p 1 of 1)
Test Code: 07-4745-4163/32888Cent+C8

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	09-9127-4401	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:38	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

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

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(5%)
Extreme Value	Grubbs Extreme Value	1.21	1.89	1.0000	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>100	N/A	N/A	<1	N/A	N/A
IC10	>100	N/A	N/A	<1	N/A	N/A
IC15	>100	N/A	N/A	<1	N/A	N/A
IC20	>100	N/A	N/A	<1	N/A	N/A
IC25	>100	N/A	N/A	<1	N/A	N/A
IC40	>100	N/A	N/A	<1	N/A	N/A
IC50	>100	N/A	N/A	<1	N/A	N/A

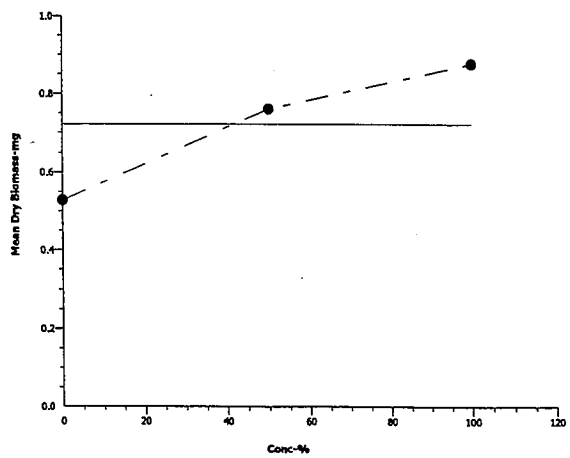
Mean Dry Biomass-mg Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contro	2	0.528	0.504	0.552	0.0062	0.0339	6.43%	0.0%
50		2	0.76	0.73	0.79	0.00775	0.0424	5.58%	-43.9%
100		2	0.876	0.83	0.922	0.0119	0.0651	7.43%	-65.9%

Mean Dry Biomass-mg Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Lab Water Control	0.552	0.504
50		0.79	0.73
100		0.922	0.83

Graphics



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Precision Analytical**
Test Material: Sample 1 (Inlet to res B)
Test ID#: 32888 Project #: 14727
Test Date: 5/1/09 Randomization: —

Organism Log#: 4513 Age: <24 hrs
Organism Supplier: Enviro Sciences
Control/Diluent: EPAMH
Control Water Batch: 1197
Treatment: Centrifugation + C18 SPE

Treatment	Temp (°C)	pH New	pH Old	D.O. (mg/L) New	D.O. (mg/L) Old	Conductivity (µs/cm)	# Live Organisms A	# Live Organisms B			SIGN-OFF
Blank	25.2	7.95		7.4		326	5	5			Date: 5/1/09
50%	25.2	7.83		7.6		544	5	5			Test Solution Prep: MB
100%	25.2	7.69		7.8		799	5	5			New WQ: [illegible]
											Initiation Time: 1700
											Initiation Signoff: JPC
Meter ID	24A	PH12		DO14		E005					
Blank	25.2	7.95	8.24	10.9	7.5	320	5	5			Date: 5/2/09
50%	25.2	7.89	8.36	10.4	7.3	581	5	5			Test Solution Prep: [illegible]
100%	25.2	7.79	8.49	10.3	7.2	809	5	5			New WQ: PA
											Renewal Time: 1105
											Renewal Signoff: PA
											Old WQ: [illegible]
Meter ID	24A	PH12	PH11	DO12	DO14	E003					
Blank	24.8	7.96	8.19	10.8	9.1	316	5	5			Date: 5/3/09
50%	24.8	7.98	8.14	9.6	7.6	561	5	5			Test Solution Prep: JPW
100%	24.8	7.93	8.31	9.8	7.8	798	5	5			New WQ: SL
											Renewal Time: 1315
											Renewal Signoff: JPW
											Old WQ: [illegible]
Meter ID	24A	PH12	PH11	DO14	DO12	E001					
Blank	25.5	8.10	8.16	10.1	6.9	316	4	5			Date: 5/4/09
50%	25.5	8.06	8.09	9.1	6.8	550	5	5			Test Solution Prep: JPW
100%	25.5	8.02	8.25	9.5	6.7	793	5	5			New WQ: SH
											Renewal Time: 1200
											Renewal Signoff: JPW
											Old WQ: [illegible]
Meter ID	24A	PH14	PH11	DO14	[illegible]	E005					

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Precision Analytical**
Test Material: Sample 1 (Inlet to res B)
Test ID#: 32888 Project #: 14727
Test Date: 5/1/09 Randomization: –

Organism Log#: 4513 Age: <24 hrs
Organism Supplier: Enviro Sciences
Control/Diluent: EPAMH
Control Water Batch: H97
Treatment: Centrifugation + C18 SPE

Treatment	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Conductivity (µs/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Blank	25.5	7.85	8.32	10.7	8.0	329	2	5			Date: 5/5/09
50%	25.5	7.99	8.15	10.8	7.9	585	5	5			Test Solution Prep: JPW
100%	25.5	8.07	8.56	10.7	7.9	824	5	5			New WQ: JPW
											Renewal Time: 1000
											Renewal Signoff: JPW
											Old WQ: JPW
Meter ID	24A	pH11	pH11	DO13	DO13	EC03					
Blank	25.5	7.98	8.06	10.7	8.1	330	1	4			Date: 5/6/09
50%	25.5	8.20	8.30	9.8	7.5	578	5	5			Test Solution Prep: PA
100%	25.5	8.21	8.46	10.1	7.4	813	5	5			New WQ: JP
											Renewal Time: 1700
											Renewal Signoff: JPW
											Old WQ: EKK
Meter ID	24A	pH14	pH11	DO14	DO13	EC03					
Blank	25.9	8.05	8.10	9.5	8.0	338	1	4			Date: 5/7/09
50%	25.9	8.27	~~8.44~~ 8.30	8.7	7.8	576	5	4			Test Solution Prep: KO
100%	25.9	8.32	~~8.29~~ 8.49 PA	9.2	7.8	~~813~~ 813 PA	5	5			New WQ: PA
											Renewal Time: 1730
											Renewal Signoff: KO
											Old WQ: PA
Meter ID	24A	pH14	pH11	DO14	DO13	EC03					
Blank	25.2		8.08		7.2	380	1	2			Date: 5/8/09
50%	25.2		8.35		7.1	629	5	4			Termination Time: 1436
100%	25.2		8.55		7.3	886	5	5			Termination Signoff: JPW
											Old WQ: EKK
Meter ID	24A		pH11		DO12	EC03					

Fathead Minnow Dry Weight Data Sheet

Client: **Precision Analytical** Test ID #: 32888 Project # 14727

Sample: Sample 1 (Inlet to res B) Tare Weight Date: 5-2-09 Sign-off: MEC

Test Date: 5/1/09 Final Weight Date: 5/10/09 Sign-off: MEC

Treatment: Centrifugation + C18 SPE

Pan ID	Treatment	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
13	Control	A	185.65	185.98	5	0.066
14		B	161.41	162.39	5	0.196
15	50%	A	149.71	153.66	5	0.790
16		B	167.52	171.17	5	0.730
17	100%	A	180.24	184.85	5	0.922
18		B	167.24	171.39	5	0.830
QA~~1~~2			167.22	167.23		
Balance ID:			1	1		

CETIS Summary Report

Report Date: 20 May-09 17:00 (p 1 of 2)
Test Code: 17-5561-9600/32888Aeration

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Batch ID:	13-4740-6149	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Quang Do
Start Date:	01 May-09 17:00	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	08 May-09 14:30	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 21h	**Source:**	Enviro Sciences, Inc.	**Age:**	1

Sample ID:	02-4274-2609	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	01 May-09 13:30	**Source:**	Precision Analytical		
Sample Age:	10d 7h (6 °C)	**Station:**	Inlet Resv B		

Batch Note: T.I.E.

Sample Note: Aeration

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
10-8640-9698	7d Survival Rate	0	>0		34.2%		Equal Variance t Two-Sample Test
20-8560-9279		50	100	70.7	48.2%	2	Equal Variance t Two-Sample Test
16-9237-3817	Mean Dry Biomass-mg	<50	50	N/A	27.7%	>2	Equal Variance t Two-Sample Test
11-9770-8443	Mean Dry Weight-mg	50	100	70.7	58.8%	2	Equal Variance t Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
13-3750-0048	Mean Dry Biomass-mg	IC5	0.42	0.129	0.917	238	Linear Interpolation (ICPIN)
		IC10	1.02	0.212	2.49	98.4	
		IC15	1.86	0.193	5.14	53.7	
		IC20	3.07	N/A	9.55	32.6	
		IC25	4.77	N/A	16.8	20.9	
		IC40	15.5	N/A	78.8	6.44	
		IC50	32.3	N/A	115	3.09	

7d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Aeration Blank	2	1	1	1	1	1	0	0	0.0%	0.0%
0	Lab Water Contr	2	0.9	0.847	0.953	0.8	1	0.0258	0.141	15.7%	10.0%
50		2	0.7	0.647	0.753	0.6	0.8	0.0258	0.141	20.2%	30.0%
100		2	0	0	0	0	0	0	0		100.0%

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Aeration Blank	2	0.642	0.591	0.693	0.546	0.738	0.0248	0.136	21.1%	0.0%
0	Lab Water Contr	2	0.528	0.515	0.541	0.504	0.552	0.0062	0.0339	6.43%	17.8%
50		2	0.232	0.209	0.255	0.188	0.276	0.0114	0.0622	26.8%	63.9%
100		2	0	0	0	0	0	0	0		100.0%

Mean Dry Weight-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Aeration Blank	2	0.642	0.591	0.693	0.546	0.738	0.0248	0.136	21.1%	0.0%
0	Lab Water Contr	2	0.591	0.57	0.612	0.552	0.63	0.0101	0.0552	9.33%	7.94%
50		2	0.347	0.288	0.407	0.235	0.46	0.029	0.159	45.8%	45.9%
100		2	0	0	0	0	0	0	0		100.0%

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

7d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Aeration Blank	1	1
0	Lab Water Contr	1	0.8
50		0.6	0.8
100		0	0

Mean Dry Biomass-mg Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Aeration Blank	0.738	0.546
0	Lab Water Contr	0.552	0.504
50		0.276	0.188
100		0	0

Mean Dry Weight-mg Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Aeration Blank	0.738	0.546
0	Lab Water Contr	0.552	0.63
50		0.46	0.235
100		0	0

CETIS Analytical Report

Report Date: 20 May-09 17:00 (p 1 of 1)
Test Code: 17-5561-9600/32888Aeration

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	11-9770-8443	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 17:00	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	50	100	70.7	2	58.8%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50	2.05	2.92	0.348	0.0888	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.16	1.48	0.9142	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.05929293	0.05929293	1	4.18	0.1775	Non-Significant Effect
Error	0.02835375	0.01417688	2			
Total	0.08764669	0.07346981	3			

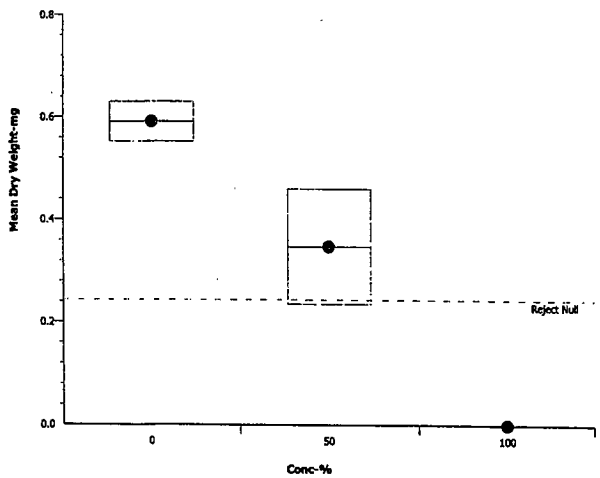
ANOVA Assumptions

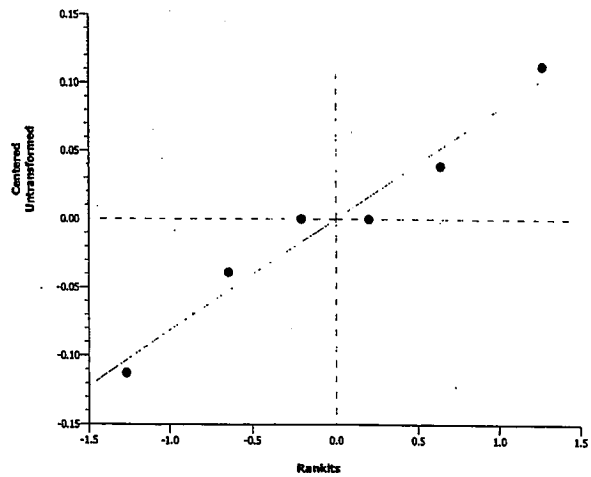
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	8.32	16200	0.4249	Equal Variances
Distribution	Shapiro-Wilk Normality	0.991		0.9613	Normal Distribution

Mean Dry Weight-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.591	0.57	0.612	0.552	0.63	0.0102	0.0552	9.33%	0.0%
50		2	0.347	0.287	0.408	0.235	0.46	0.0295	0.159	45.8%	41.2%
100		2	0	0	0	0	0	0	0		100.0%

Graphics





CETIS Analytical Report

Report Date: 20 May-09 16:48 (p 1 of 3)
Test Code: 17-5561-9600/32888Aeration

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	10-8640-9698	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:48	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	0	>0			34.2%

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		Aeration Blank	-1	2.92	0.348	0.7887	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.22	1.48	0.7340	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.01417698	0.01417698	1	1	0.4226	Non-Significant Effect
Error	0.02835395	0.01417698	2			
Total	0.04253092	0.02835395	3			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Variance	65500	98.5	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.945		0.6830	Normal Distribution

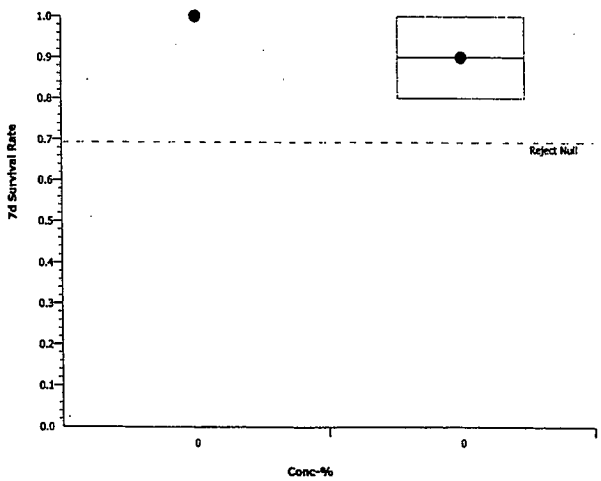
7d Survival Rate Summary

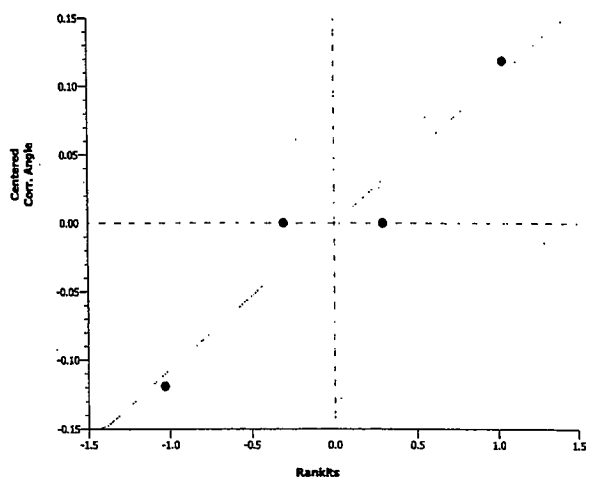
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.9	0.846	0.954	0.8	1	0.0263	0.141	15.7%	0.0%
0	Aeration Blank	2	1	1	1	1	1	0	0	0.0%	-11.1%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	2	1.23	1.16	1.29	1.11	1.35	0.0313	0.168	13.7%	0.0%
0	Aeration Blank	2	1.35	1.35	1.35	1.35	1.35	0	0	0.0%	-9.71%

Graphics





Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	16-9237-3817	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:47	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	<50	50	N/A	>2	27.7%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50*	5.91	2.92	0.146	0.0137	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.08	1.48	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.08761639	0.08761639	1	34.9	0.0275	Significant Effect
Error	0.005023683	0.002511841	2			
Total	0.09264007	0.09012824	3			

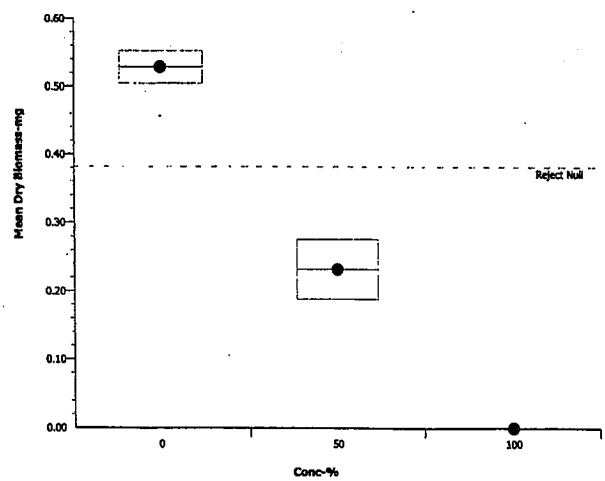
ANOVA Assumptions

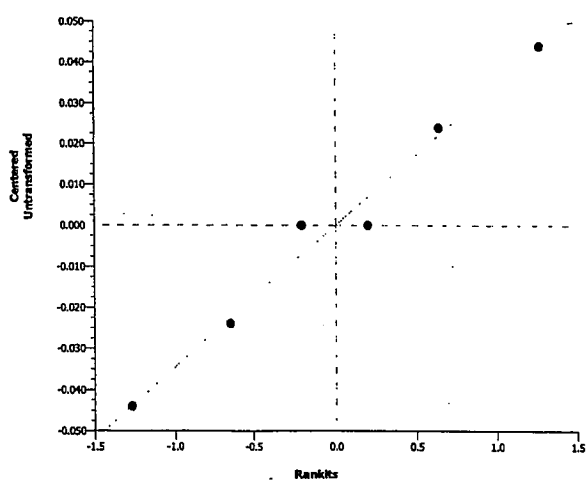
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.36	16200	0.6358	Equal Variances
Distribution	Shapiro-Wilk Normality	0.933		0.6120	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.528	0.515	0.541	0.504	0.552	0.0063	0.0339	6.43%	0.0%
50		2	0.232	0.208	0.256	0.188	0.276	0.0116	0.0622	26.8%	56.1%
100		2	0	0	0	0	0	0	0		100.0%

Graphics





Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	20-8560-9279	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:45	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	50	100	70.7	2	48.2%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50	1.41	2.92	0.474	0.1466	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	0.898	1.48	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.05271749	0.05271749	1	2	0.2931	Non-Significant Effect
Error	0.05279027	0.02639514	2			
Total	0.1055078	0.07911263	3			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.16	16200	0.9527	Equal Variances
Distribution	Shapiro-Wilk Normality	0.761		0.0487	Normal Distribution

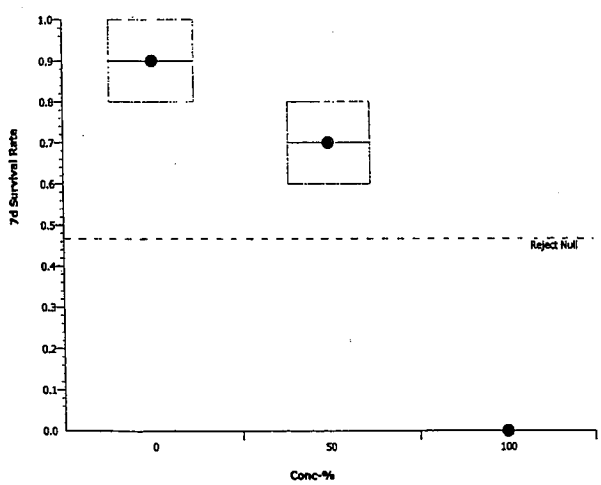
7d Survival Rate Summary

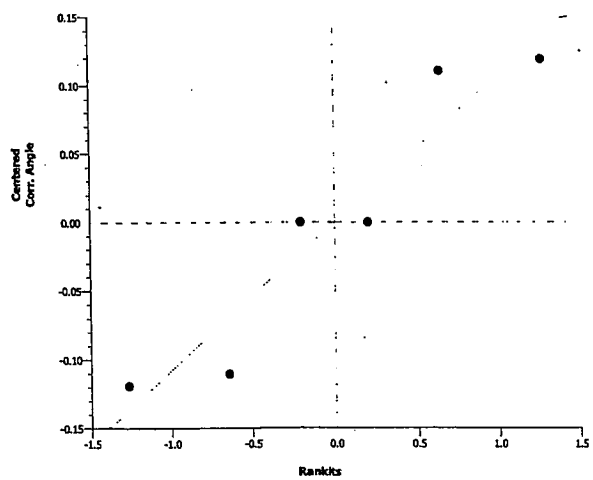
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.9	0.846	0.954	0.8	1	0.0263	0.141	15.7%	0.0%
50		2	0.7	0.646	0.754	0.6	0.8	0.0263	0.141	20.2%	22.2%
100		2	0	0	0	0	0	0	0		100.0%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	2	1.23	1.16	1.29	1.11	1.35	0.0313	0.168	13.7%	0.0%
50		2	0.997	0.937	1.06	0.886	1.11	0.029	0.156	15.7%	18.7%
100		2	0.226	0.225	0.226	0.226	0.226	0	0	0.0%	81.6%

Graphics





CETIS Analytical Report

Report Date: 20 May-09 16:49 (p 1 of 1)
Test Code: 17-5561-9600/32888Aeration

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	13-3750-0048	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 16:47	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

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

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(5%)
Extreme Value	Grubbs Extreme Value	1.39	1.89	0.8232	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	0.42	0.129	0.917	238	109	774
IC10	1.02	0.212	2.49	98.4	40.2	472
IC15	1.86	0.193	5.14	53.7	19.5	518
IC20	3.07	N/A	9.55	32.6	10.5	N/A
IC25	4.77	N/A	16.8	20.9	5.95	N/A
IC40	15.5	N/A	78.8	6.44	1.27	N/A
IC50	32.3	N/A	115	3.09	0.866	N/A

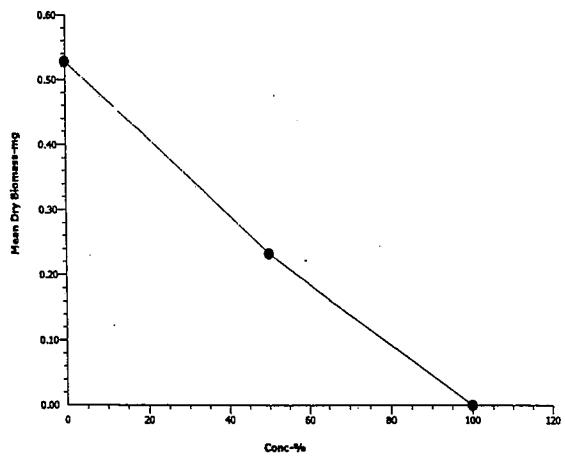
Mean Dry Biomass-mg Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contro	2	0.528	0.504	0.552	0.0062	0.0339	6.43%	0.0%
50		2	0.232	0.188	0.276	0.0114	0.0622	26.8%	56.1%
100		2	0	0	0	0	0		100.0%

Mean Dry Biomass-mg Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Lab Water Control	0.552	0.504
50		0.276	0.188
100		0	0

Graphics



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Precision Analytical**
Test Material: Sample 1 (Inlet to res B)
Test ID#: 32888 Project #: 14727
Test Date: 5/1/09 Randomization: –

Organism Log#: 4513 Age: <24 hrs
Organism Supplier: Enviro Sciences
Control/Diluent: EPAMH
Control Water Batch: 1197
Treatment: Aeration

Treatment	Temp (°C)	pH New	pH Old	D.O. (mg/L) New	D.O. (mg/L) Old	Conductivity (µs/cm)	# Live Organisms A	# Live Organisms B			SIGN-OFF
Blank	25.2	8.05		7.6		325	5	5			Date: 5/1/09
50%	25.2	8.44		7.4		553	5	5			Test Solution Prep: KB
100%	25.2	8.49		7.6		790	5	5			New WQ: [illegible]
											Initiation Time: 1700
											Initiation Signoff: JPC
Meter ID	24A	pH12		DO14		EC05					
Blank	25.2	8.02	8.14	10.1	7.3	320	5	5			Date: 5/2/09
50%	25.2	8.43	8.48	9.8	7.1	574	5	5			Test Solution Prep: Ø
100%	25.2	8.49	8.69	10.1	7.2	814	5	5			New WQ: PA
											Renewal Time: 1105
											Renewal Signoff: PA
											Old WQ: RMP
Meter ID	24A	pH12	pH11	DO12	DO14	EC03					
Blank	24.8	8.04	8.16	9.9	8.6	316	5	5			Date: 5/3/09
50%	24.8	8.44	8.26	9.3	8.4	559	5	5			Test Solution Prep: JPW
100%	24.8	8.49	8.50	9.6	8.7	SC ~~7.98~~ 798	5	5			New WQ: SL
											Renewal Time: 1315
											Renewal Signoff: JPW
											Old WQ: AR
Meter ID	24A	pH12	pH11	DO14	DO12	EC01					
Blank	25.5	7.84	8.35	9.7	6.8	320	5	5			Date: 5/4/09
50%	25.5	8.34	8.25	9.2	6.9	551	5	5			Test Solution Prep: JPW
100%	25.5	8.46	8.38	9.8	6.9	790	4	3			New WQ: SH
											Renewal Time: 1200
											Renewal Signoff: JPW
											Old WQ: [illegible]
Meter ID	24A	pH14	pH11	DO14	DO12	EC05					

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Precision Analytical**
Test Material: Sample 1 (Inlet to res B)
Test ID#: 32888 Project #: 14727
Test Date: 5/1/09 Randomization: —

Organism Log#: 4513 Age: <24 hrs
Organism Supplier: Enviro Sciences
Control/Diluent: EPAMH
Control Water Batch: 1197
Treatment: Aeration

Treatment	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Conductivity (µs/cm)	# Live Organisms A	# Live Organisms B	# Live Organisms C	# Live Organisms D	SIGN-OFF
Blank	25.5	8.07	8.27	10.9	7.9	334	5	5			Date: 5/5/09
50%	25.5	8.38	8.14	11.0	8.0	574	5	4			Test Solution Prep: JPW
100%	25.5	8.44	8.36	10.7	8.0	800	3	2			New WQ: JPW
											Renewal Time: 1000
											Renewal Signoff: JPW
											Old WQ: JPW
Meter ID	24A	pH11	pH11	DO13	DO13	EC03					
Blank	25.5	8.05	8.12	10.5	7.2	321	5	5			Date: 5/6/09
50%	25.5	8.42	8.18	9.7	7.3	574	3	4			Test Solution Prep: PA
100%	25.5	8.48	8.45	10.3	7.2	814	1	1			New WQ: JT
											Renewal Time: 1200
											Renewal Signoff: JPW
											Old WQ: EKK
Meter ID	24A	pH 14	pH 11	DO14	DO13	EC03					
Blank	25.9	8.25	8.03	9.5	7.2	329	5	5			Date: 5/7/09
50%	25.9	8.42	8.09	8.7	7.1	582	3	4			Test Solution Prep: KO
100%	25.9	8.47	8.37	9.8	7.0	808	0	0			New WQ: PA
											Renewal Time: 1730
											Renewal Signoff: KO
											Old WQ: PA
Meter ID	24A	pH14	pH11	DO14	DO13	EC03					
Blank	25.2		8.06		7.3	355	5	5			Date: 5/8/09
50%	25.2		8.24		6.2	626	3	4			Termination Time: 1430
100%	—		—		—	—	—	—			Termination Signoff: JPC
											Old WQ: EKK
Meter ID	24A		pH11		DO12	EC03					

Fathead Minnow Dry Weight Data Sheet

Client: **Precision Analytical** Test ID #: 32888 Project # 14727

Sample: Sample 1 (Inlet to res B) Tare Weight Date: 5-2-09 Sign-off: MEC

Test Date: 5/1/09 Final Weight Date: 5/10/09 Sign-off: MEC

Treatment: Aeration

Pan ID	Treatment	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
19	Control	A	158.91	162.60	5	0.738
20		B	161.48	164.21	5	0.546
21	50%	A	163.56	164.43	5	0.276
22		B	158.67	159.61	5	0.188
23	100%	A	163.05	~~164.43~~ –	5	0
24		B	175.63	—	5	0
QA 2			167.22	167.23		0.01
Balance ID:			1	1		

Appendix O

Test Data and Summary of Statistics for the Toxicity Identification & Evaluation (TIE) of the Chronic Toxicity of Chevron/Cawelo Effluent to Fathead Minnows – Re-Test of the C18SPE Treatment

CETIS Summary Report

Report Date: 20 May-09 15:57 (p 1 of 2)
Test Code: 04-5106-6114/32955Base

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Batch ID:	02-5641-3284	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Quang Do
Start Date:	06 May-09 14:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	13 May-09 09:00	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 19h	**Source:**	Aquatic Biosystems, CO	**Age:**	1

Sample ID:	01-9321-2529	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	21 Apr-09 19:00	**Source:**	Precision Analytical		
Sample Age:	15d 5h (10.5 °C)	**Station:**	Inlet Resv B		

Batch Note: TIE retest

Sample Note: Baseline

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
17-7357-9406	7d Survival Rate	<50	50	N/A	27.2%	>2	Equal Variance t Two-Sample Test
21-1949-4783	Mean Dry Biomass-mg	<50	50	N/A	3.96%	>2	Equal Variance t Two-Sample Test
07-7301-2514	Mean Dry Weight-mg	<50	50	N/A	3.94%	>2	Equal Variance t Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
17-3602-7306	Mean Dry Biomass-mg	IC5	0.236	0.234	0.239	423	Linear Interpolation (ICPIN)
		IC10	0.529	0.522	0.536	189	
		IC15	0.89	0.877	0.903	112	
		IC20	1.34	1.32	1.36	74.8	
		IC25	1.89	1.86	1.92	52.9	
		IC40	4.46	4.36	4.56	22.4	
		IC50	7.35	7.16	7.54	13.6	

7d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	1	1	1	1	1	0	0	0.0%	0.0%
50		2	0.3	0.247	0.353	0.2	0.4	0.0258	0.141	47.1%	70.0%
100		2	0	0	0	0	0	0	0		100.0%

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.667	0.662	0.672	0.658	0.676	0.00232	0.0127	1.91%	0.0%
50		2	0.049	0.0485	0.0495	0.048	0.05	0.000258	0.00142	2.89%	92.7%
100		2	0.011	0.0105	0.0115	0.01	0.012	0.000258	0.00141	12.8%	98.4%

Mean Dry Weight-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.667	0.662	0.672	0.658	0.676	0.00232	0.0127	1.91%	0.0%
50		2	0.182	0.152	0.213	0.125	0.24	0.0148	0.0813	44.6%	72.6%
100		2	0.0000055	5.24E-06	5.76E-06	0.000005	0.000006	1.29E-07	7.07E-07	12.8%	100.0%

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

7d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Lab Water Contr	1	1
50		0.4	0.2
100		0	0

Mean Dry Biomass-mg Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Lab Water Contr	0.658	0.676
50		0.05	0.048
100		0.01	0.012

Mean Dry Weight-mg Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Lab Water Contr	0.658	0.676
50		0.125	0.24
100		0.000005	0.000006

CETIS Analytical Report

Report Date: 20 May-09 15:58 (p 1 of 1)
Test Code: 04-5106-6114/32955Base

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	07-7301-2514	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 May-09 15:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	<50	50	N/A	>2	3.94%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50*	8.33	2.92	0.17	0.0071	Significant Effect
		100*	74.1	2.92	0.0263	<0.0001	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.56	1.89	0.4571	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.4752834	0.2376417	2	105	0.0017	Significant Effect
Error	0.006773363	0.002257788	3			
Total	0.4820568	0.2398995	5			

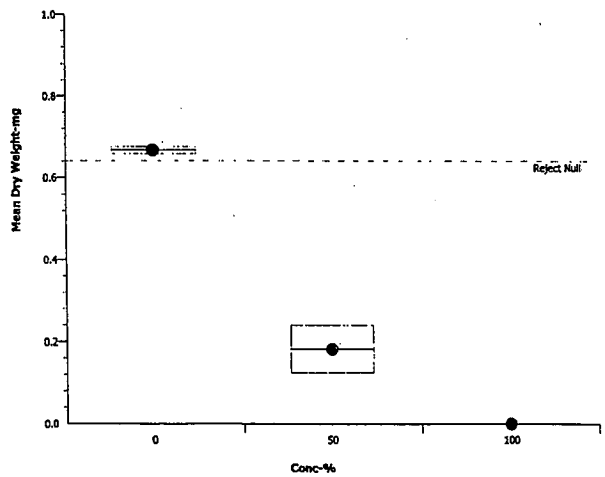
ANOVA Assumptions

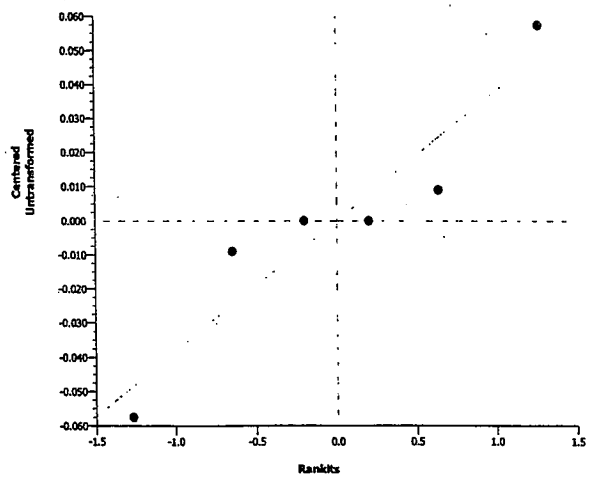
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	16.5	9.21	0.0003	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.921		0.5135	Normal Distribution

Mean Dry Weight-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.667	0.662	0.672	0.658	0.676	0.00236	0.0127	1.91%	0.0%
50		2	0.182	0.152	0.213	0.125	0.24	0.0151	0.0813	44.6%	72.6%
100		2	0.0000055	5.23E-06	5.77E-06	0.000005	0.000006	1.31E-07	7.07E-07	12.8%	100.0%

Graphics





CETIS Analytical Report

Report Date: 14 May-09 20:23 (p 1 of 2)
Test Code: 04-5106-6114/32955Base

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	21-1949-4783	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 20:11	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	<50	50	N/A	>2	3.96%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50*	68.2	2.92	0.0264	0.0001	Significant Effect
		100*	72.4	2.92	0.0264	<0.0001	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.56	1.89	0.4573	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.5424671	0.2712336	2	4900	<0.0001	Significant Effect
Error	0.0001659879	5.53293E-05	3			
Total	0.5426331	0.2712889	5			

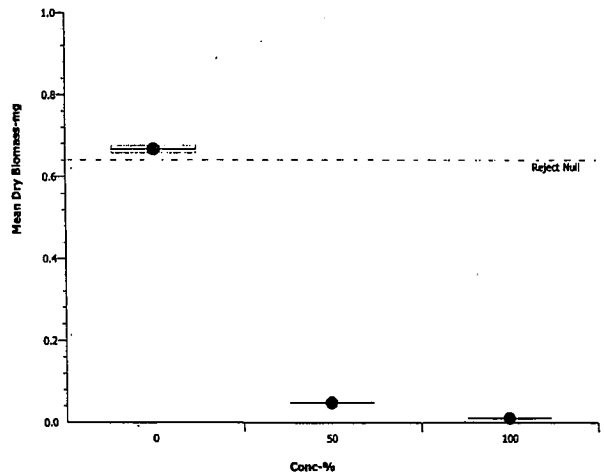
ANOVA Assumptions

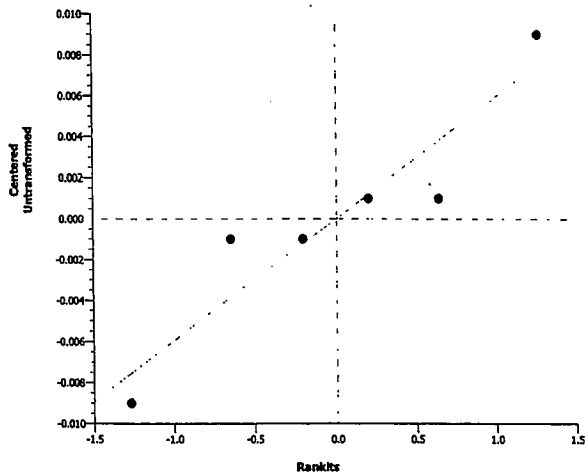
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	3.85	9.21	0.1457	Equal Variances
Distribution	Shapiro-Wilk Normality	0.913		0.4574	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.667	0.662	0.672	0.658	0.676	0.00236	0.0127	1.91%	0.0%
50		2	0.049	0.0485	0.0495	0.048	0.05	0.000263	0.00142	2.89%	92.7%
100		2	0.011	0.0105	0.0115	0.01	0.012	0.000262	0.00141	12.8%	98.4%

Graphics





Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	17-7357-9406	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 20:10	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	<50	50	N/A	>2	27.2%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50*	6.98	2.92	0.323	0.0100	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.22	1.48	0.7340	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.5945945	0.5945945	1	48.7	0.0199	Significant Effect
Error	0.02443632	0.01221816	2			
Total	0.6190308	0.6068127	3			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Variance	65500	98.5	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.945		0.6830	Normal Distribution

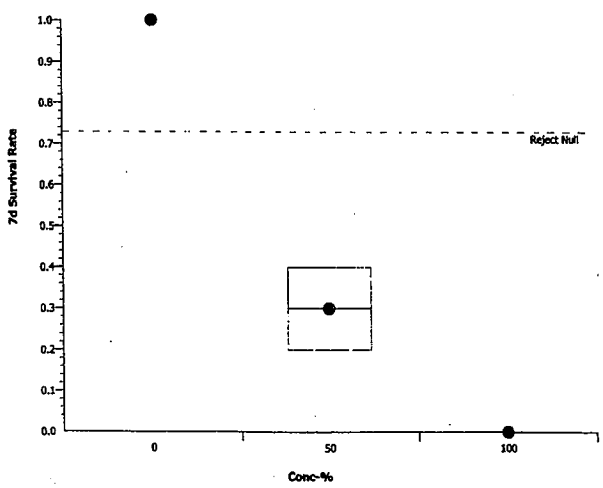
7d Survival Rate Summary

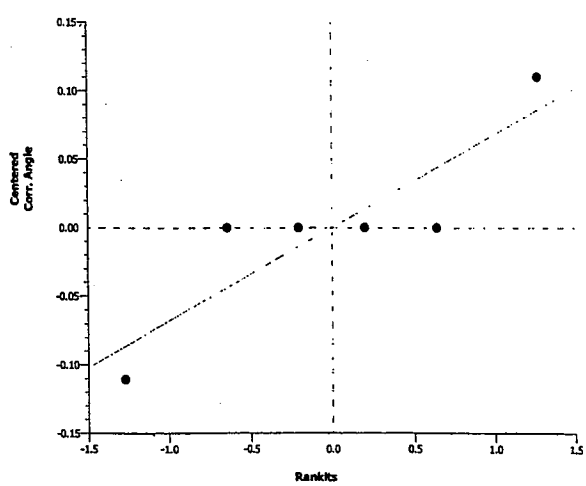
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	1	1	1	1	1	0	0	0.0%	0.0%
50		2	0.3	0.246	0.354	0.2	0.4	0.0263	0.141	47.1%	70.0%
100		2	0	0	0	0	0	0	0		100.0%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	2	1.35	1.35	1.35	1.35	1.35	0	0	0.0%	0.0%
50		2	0.574	0.515	0.634	0.464	0.685	0.029	0.156	27.2%	57.3%
100		2	0.226	0.225	0.226	0.226	0.226	0	0	0.0%	83.2%

Graphics





CETIS Analytical Report

Report Date: 14 May-09 20:23 (p 1 of 1)
Test Code: 04-5106-6114/32955Base

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	17-3602-7306	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 20:16	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

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

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(5%)
Extreme Value	Grubbs Extreme Value	1.56	1.89	0.4573	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	0.236	0.234	0.239	423	418	428
IC10	0.529	0.522	0.536	189	187	192
IC15	0.89	0.877	0.903	112	111	114
IC20	1.34	1.32	1.36	74.8	73.6	76
IC25	1.89	1.86	1.92	52.9	52	53.9
IC40	4.46	4.36	4.56	22.4	21.9	22.9
IC50	7.35	7.16	7.54	13.6	13.3	14

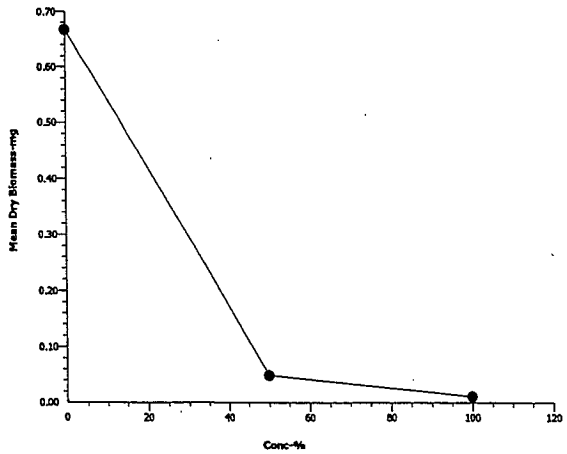
Mean Dry Biomass-mg Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contro	2	0.667	0.658	0.676	0.00232	0.0127	1.91%	0.0%
50		2	0.049	0.048	0.05	0.000258	0.00142	2.89%	92.7%
100		2	0.011	0.01	0.012	0.000258	0.00141	12.8%	98.4%

Mean Dry Biomass-mg Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Lab Water Control	0.658	0.676
50		0.05	0.048
100		0.01	0.012

Graphics



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Precision Analytical**
Test Material: Sample 1 (Inlet to res B)
Test ID#: 32955 Project #: 14727
Test Date: 5/6/09 Randomization: —

Organism Log#: 4521 Age: <48hr
Organism Supplier: ABS
Control/Diluent: EPAMH
Control Water Batch: 1198
Treatment: Baseline

Treatment	Temp (°C)	pH New	pH Old	D.O. (mg/L) New	D.O. (mg/L) Old	Conductivity (µs/cm)	# Live Organisms A	# Live Organisms B			SIGN-OFF
Lab Water Control	25.6	7.82		8.6		320	5	5			Date: 5/6/09
50%	25.6	7.60		8.5		552	5	5			Test Solution Prep: PA
100%	25.6	7.26		8.7		801	5	5			New WQ: [illegible]
											Initiation Time: 1430
											Initiation Signoff: JPL
Meter ID	24A	pH14		DO14		Ec 03					
Lab Water Control	25.8	8.13	~~8.06~~ 8.00	7.7	~~6.9~~ 7.21	342	5	5			Date: 5/7/09
50%	25.8	7.76	8.15	8.4	7.3	571	5	5			Test Solution Prep: KO
100%	25.8	[illegible]7	8.33	9.4	7.2	818	4	3			New WQ: PA
											Renewal Time: 1645
											Renewal Signoff: [illegible]
											Old WQ: PA
Meter ID	24A	[illegible]14	pH11	[illegible]	DO13	[illegible]03					
Lab Water Control	25.3	[illegible]	7.9[illegible]	[illegible]	7.1	348	5	5			Date: 5/8/09
50%	25.3	[illegible]	8.26	8.4	7.1	5.88	5	5			Test Solution Prep: KO
100%	25.3	[illegible]	8.41	8.6	7.2	837	4	3			New WQ: EMK
											Renewal Time: 1550
											Renewal Signoff: KO
											Old WQ: EMK
Meter ID	24A	pH 11	pH 11	[illegible]	DO12	EC03					
Lab Water Control	25.6	[illegible]	8.45	9.5	7.9	338	5	5			Date: 5/9/09
50%	25.6	7.42	8.49	9.8	8.3	559	4	4			Test Solution Prep: JPL
100%	25.6	7.25	8.69	10.4	8.2	789	1	2			New WQ: EMK
											Renewal Time: 1720
											Renewal Signoff: KO
											Old WQ: W
Meter ID	24A	pH 14	pH 14	DO13	DO13	EC 05					

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Precision Analytical**
Test Material: Sample 1 (Inlet to res B)
Test ID#: 32955 Project #: 14727
Test Date: 5/6/09 Randomization: —

Organism Log#: 4521 Age: <48hr
Organism Supplier: ABS
Control/Diluent: EPAMH
Control Water Batch: 1198
Treatment: Baseline

Treatment	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Conductivity (µs/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Lab Water Control	25.4	8.31	8.47	8.6	7.2	314	5	5			Date: 5/10/09
50%	25.4	8.08	8.38	8.8	7.1	565	4	4			Test Solution Prep: PA
100%	25.4	7.71	8.48	9.2	7.3	920	1	0			New WQ: JPW
											Renewal Time: 1500
											Renewal Signoff: JPW
											Old WQ: JPW
Meter ID	24A	pH12	pH11	DO14	DO12	EC03					
Lab Water Control	25.4	8.02	8.23	9.7	8.3	320	5	5			Date: 5/11/09
50%	25.4	7.40	8.29	10.4	8.0	552	4	3			Test Solution Prep: PA
100%	25.4	7.18	8.47	11.2	8.0	796	1	—			New WQ: JPW
											Renewal Time: 1030
											Renewal Signoff: JPW
											Old WQ: JPW
Meter ID	24A	pH12	pH11	DO14	DO13	EC05					
Lab Water Control	25.3	8.19	7.90	9.8	7.0	321	5	5			Date: 5/12/09
50%	25.3	7.44	8.09	10.2	6.7	579	4	1			Test Solution Prep: JPW
100%	25.3	7.25	8.15	11.5	6.8	810	0	—			New WQ: JPW
											Renewal Time: 1630
											Renewal Signoff: JPW
											Old WQ: JPW
Meter ID	24A	pH11	pH12	DO13	DO12	EC01					
Lab Water Control	25.1		~~8.0~~ 8.15		8.1	339	5	5			Date: 5/13/09
50%	25.1		8.21		7.5	579	2	1			Termination Time: 0900
100%	—		—		—	—	—	—			Termination Signoff: JPW
											Old WQ: JPW
Meter ID	24A		pH11		DO12	EC01					

Fathead Minnow Dry Weight Data Sheet

Client: **Precision Analytical** Test ID #: 32955 Project # 14727

Sample: Sample 1 (Inlet to res B) Tare Weight Date: 5/10/09 Sign-off: MEC

Test Date: 5-6-09 Final Weight Date: 5/13/09 Sign-off: MJM

Treatment: Baseline

Pan ID	Treatment	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Control	A	163.44	166.73	5	0.658
2		B	162.21	165.59	5	0.676
3	50%	A	160.16	160.41	5	0.050
4		B	156.30	156.54	5	0.048
5	100%	A	164.41	164.46	5	0.010
6		B	161.33	161.39	5	0.012
QA1			164.90	164.84		-0.06
Balance ID:			1	1		

CETIS Summary Report

Report Date: 20 May-09 16:17 (p 1 of 2)
Test Code: 00-8575-4627/32955Cent+C18

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Batch ID:	02-5641-3284	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Quang Do
Start Date:	06 May-09 14:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	13 May-09 09:00	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	6d 19h	**Source:**	Aquatic Biosystems, CO	**Age:**	1

Sample ID:	14-6106-2031	**Code:**	Sample #1	**Client:**	Precision Analytical
Sample Date:	21 Apr-09 09:44	**Material:**	Effluent	**Project:**	14727
Receive Date:	01 May-09 12:30	**Source:**	Precision Analytical		
Sample Age:	15d 5h (6 °C)	**Station:**	Inlet Resv B		

Batch Note: TIE retest

Sample Note: Centrifugation + C18 SPE

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
00-8814-7267	7d Survival Rate	100	>100	N/A	29.4%	1	Equal Variance t Two-Sample Test
14-2443-7417	Mean Dry Biomass-mg	100	>100	N/A	4.04%	1	Equal Variance t Two-Sample Test
14-0152-8718	Mean Dry Weight-mg	100	>100	N/A	34.6%	1	Equal Variance t Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
02-5071-3522	Mean Dry Biomass-mg	IC5	39.2	N/A	N/A	2.55	Linear Interpolation (ICPIN)
		IC10	>100	N/A	N/A	<1	
		IC15	>100	N/A	N/A	<1	
		IC20	>100	N/A	N/A	<1	
		IC25	>100	N/A	N/A	<1	
		IC40	>100	N/A	N/A	<1	
		IC50	>100	N/A	N/A	<1	

7d Survival Rate Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Cent+C18 Blank	2	0.7	0.647	0.753	0.6	0.8	0.0258	0.141	20.2%	0.0%
0	Lab Water Contr	2	1	1	1	1	1	0	0	0.0%	-42.9%
50		2	1	1	1	1	1	0	0	0.0%	-42.9%
100		2	0.9	0.847	0.953	0.8	1	0.0258	0.141	15.7%	-28.6%

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Cent+C18 Blank	2	0.329	0.298	0.36	0.27	0.388	0.0152	0.0834	25.4%	0.0%
0	Lab Water Contr	2	0.667	0.662	0.672	0.658	0.676	0.00232	0.0127	1.91%	-103.0%
50		2	0.617	0.6	0.634	0.584	0.65	0.00852	0.0467	7.56%	-87.5%
100		2	0.646	0.645	0.647	0.644	0.648	0.000516	0.00283	0.44%	-96.4%

Mean Dry Weight-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Cent+C18 Blank	2	0.468	0.458	0.477	0.45	0.485	0.00452	0.0247	5.29%	0.0%
0	Lab Water Contr	2	0.667	0.662	0.672	0.658	0.676	0.00232	0.0127	1.91%	-42.7%
50		2	0.617	0.6	0.634	0.584	0.65	0.00852	0.0467	7.56%	-32.0%
100		2	0.726	0.685	0.768	0.648	0.805	0.0203	0.111	15.3%	-55.4%

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

7d Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Cent+C18 Blank	0.8	0.6
0	Lab Water Contr	1	1
50		1	1
100		0.8	1

Mean Dry Biomass-mg Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Cent+C18 Blank	0.388	0.27
0	Lab Water Contr	0.658	0.676
50		0.65	0.584
100		0.644	0.648

Mean Dry Weight-mg Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Cent+C18 Blank	0.485	0.45
0	Lab Water Contr	0.658	0.676
50		0.65	0.584
100		0.805	0.648

CETIS Analytical Report

Report Date: 14 May-09 20:21 (p 1 of 2)
Test Code: 00-8575-4627/32955Cent+C18

Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	14-2443-7417	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 20:20	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	100	>100	N/A	1	4.04%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50	1.46	2.92	0.0999	0.1407	Non-Significant Effect
		100	2.28	2.92	0.0269	0.0752	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.52	1.89	0.5314	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.002521183	0.001260592	2	1.61	0.3349	Non-Significant Effect
Error	0.002348	0.0007826667	3			
Total	0.004869184	0.002043258	5			

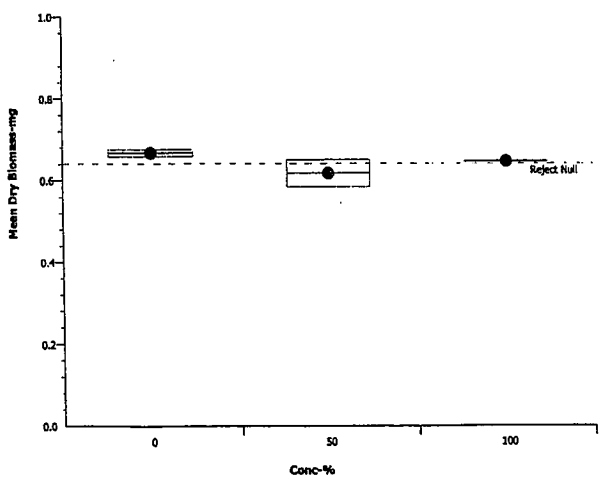
ANOVA Assumptions

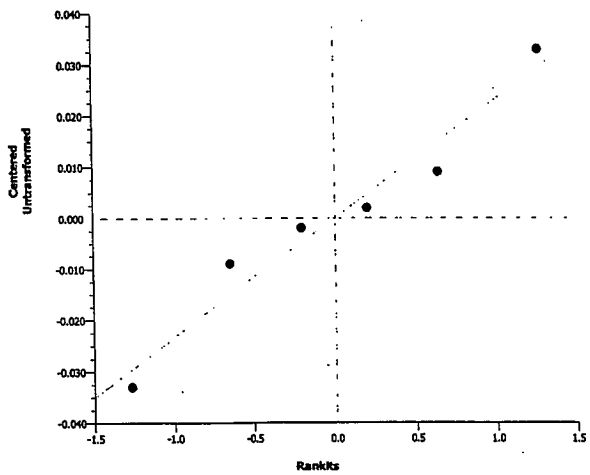
Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	3.56	9.21	0.1690	Equal Variances
Distribution	Shapiro-Wilk Normality	0.975		0.9230	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	0.667	0.662	0.672	0.658	0.676	0.00236	0.0127	1.91%	0.0%
50		2	0.617	0.599	0.635	0.584	0.65	0.00867	0.0467	7.56%	7.5%
100		2	0.646	0.645	0.647	0.644	0.648	0.000525	0.00283	0.44%	3.15%

Graphics





Chronic Larval Fish Survival and Growth Test — **Pacific EcoRisk**

Analysis ID:	00-8814-7267	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 20:20	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	100	>100	N/A	1	29.4%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Lab Water Control		50	0	2.92	0	0.5000	Non-Significant Effect
		100	1	2.92	0.348	0.2113	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.58	1.89	0.4229	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.01890263	0.009451317	2	1	0.4648	Non-Significant Effect
Error	0.02835395	0.009451317	3			
Total	0.04725658	0.01890263	5			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Variance	65500	30.8	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.827		0.1010	Normal Distribution

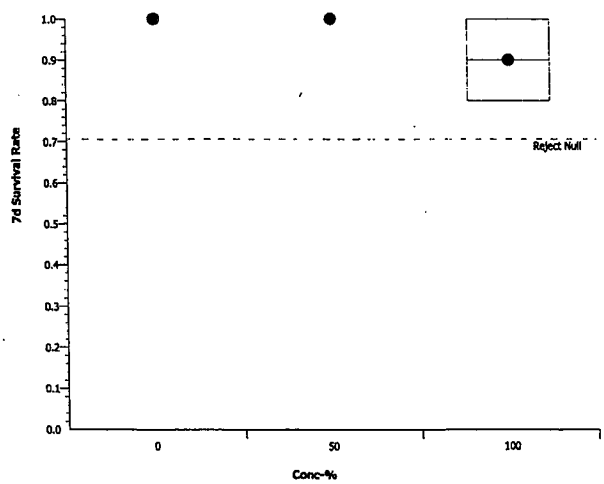
7d Survival Rate Summary

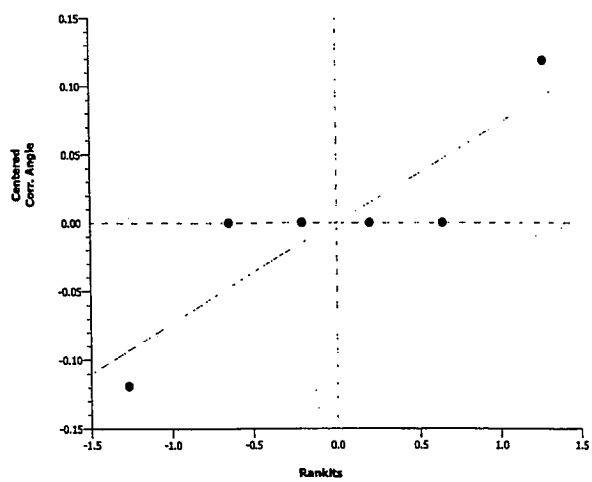
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contr	2	1	1	1	1	1	0	0	0.0%	0.0%
50		2	1	1	1	1	1	0	0	0.0%	0.0%
100		2	0.9	0.846	0.954	0.8	1	0.0263	0.141	15.7%	10.0%

Angular (Corrected) Transformed Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Cont	2	1.35	1.35	1.35	1.35	1.35	0	0	0.0%	0.0%
50		2	1.35	1.35	1.35	1.35	1.35	0	0	0.0%	0.0%
100		2	1.23	1.16	1.29	1.11	1.35	0.0313	0.168	13.7%	8.85%

Graphics





CETIS Analytical Report

Report Date: 14 May-09 20:22 (p 1 of 1)
Test Code: 00-8575-4627/32955Cent+C18

Chronic Larval Fish Survival and Growth Test — Pacific EcoRisk

Analysis ID:	02-5071-3522	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.7.0
Analyzed:	14 May-09 20:20	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

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

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(5%)
Extreme Value	Grubbs Extreme Value	1.52	1.89	0.5314	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	39.2	N/A	N/A	2.55	N/A	N/A
IC10	>100	N/A	N/A	<1	N/A	N/A
IC15	>100	N/A	N/A	<1	N/A	N/A
IC20	>100	N/A	N/A	<1	N/A	N/A
IC25	>100	N/A	N/A	<1	N/A	N/A
IC40	>100	N/A	N/A	<1	N/A	N/A
IC50	>100	N/A	N/A	<1	N/A	N/A

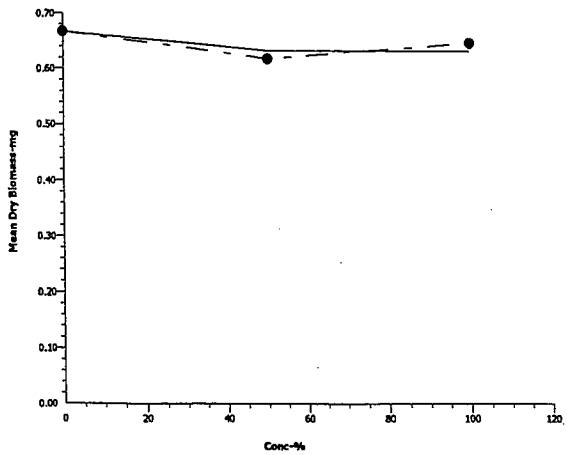
Mean Dry Biomass-mg Summary

			Calculated Variate						
Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Lab Water Contro	2	0.667	0.658	0.676	0.00232	0.0127	1.91%	0.0%
50		2	0.617	0.584	0.65	0.00852	0.0467	7.56%	7.5%
100		2	0.646	0.644	0.648	0.000516	0.00283	0.44%	3.15%

Mean Dry Biomass-mg Detail

Conc-%	Control Type	Rep 1	Rep 2
0	Lab Water Control	0.658	0.676
50		0.65	0.584
100		0.644	0.648

Graphics



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Precision Analytical**
Test Material: Sample 1 (Inlet to res B)
Test ID#: 32955 Project #: 14727
Test Date: 5/6/09 Randomization: —

Organism Log#: 4521 Age: <48hr
Organism Supplier: ABS
Control/Diluent: EPAMH
Control Water Batch: 1198
Treatment: Centrifugation + C18 SPE

Treatment	Temp (°C)	pH New	pH Old	D.O. (mg/L) New	D.O. (mg/L) Old	Conductivity (µs/cm)	# Live Organisms A	# Live Organisms B			SIGN-OFF
Blank	25.6	7.71		9.0		342	5	5			Date: 5/6/09
50%	25.6	7.77		9.3		576	5	5			Test Solution Prep: PA
100%	25.6	7.82		9.1		799	5	5			New WQ:
											Initiation Time: 1430
											Initiation Signoff: JPW
Meter ID	24A	pH14		DO14		EC03					
Blank	25.8	7.86	8.06	9.4	6.9	538	5	5			Date: 5/7/09
50%	25.8	7.86	8.12	8.8	6.5	577	5	5			Test Solution Prep: KO
100%	25.8	7.87	8.39	8.8	6.8	817	5	5			New WQ: PA
											Renewal Time: 1645
											Renewal Signoff: JPW
											Old WQ: PA
Meter ID	24A	pH14	pH14	DO14	DO13	EC03					
Blank	25.3	8.12	7.86	8.5	5.5	352	5	5			Date: 5/8/09
50%	25.3	8.23	8.17	7.9	6.1	572	5	5			Test Solution Prep: KO
100%	25.3	8.18	8.41	8.4	6.5	824	5	5			New WQ: EKK
											Renewal Time: 1550
											Renewal Signoff: KO
											Old WQ: EKK
Meter ID	24A	pH 11	pH 11	DO 12	DO 12	EC 03					
Blank	25.6	7.96	8.31	12.3	8.4	330	5	5			Date: 5/9/09
50%	25.6	8.02	8.39	12.6	7.8	562	5	5			Test Solution Prep: JPC
100%	25.6	7.99	8.49	11.7	7.8	792	5	5			New WQ: EKK
											Renewal Time: 1720
											Renewal Signoff: KO
											Old WQ: W
Meter ID	24A	pH 11	pH14	DO 13	DO13	EC 03					

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: **Precision Analytical**
Test Material: Sample 1 (Inlet to res B)
Test ID#: 32955 Project #: 14727
Test Date: 5/6/09 Randomization: —

Organism Log#: 4521 Age: <48h
Organism Supplier: ABS
Control/Diluent: EPAMH
Control Water Batch: 1198
Treatment: Centrifugation + C18 SPE

Treatment	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Conductivity (µs/cm)	# Live Organisms A	B	C	D	SIGN-OFF
Blank	25.4	7.93	8.22	10.3	5.7	332	5	5			Date: 5/10/09
50%	25.4	8.00	8.14	10.3	6.2	559	5	5			Test Solution Prep: PA
100%	25.4	8.09	8.43	9.9	6.4	828	5	5			New WQ: JPW
											Renewal Time: 1560
											Renewal Signoff: JPW
											Old WQ: JPW
Meter ID	24A	pH12	pH11	DO14	DO12	ECO7					
Blank	25.4	7.83	8.13	11.5	7.8	333	5	5			Date: 5/11/09
50%	25.4	7.96	8.28	11.0	7.6	548	5	5			Test Solution Prep: PA
100%	25.4	7.94	8.50	12.0	7.6	783	5	5			New WQ: [illegible]
											Renewal Time: 1030
											Renewal Signoff: JPW
											Old WQ: [illegible]
Meter ID	24A	pH12	pH11	DO14	DO13	ECO5					
Blank	25.3	8.05	8.03	10.0	6.4	316	5	4			Date: 5/12/09
50%	25.3	8.07	8.02	11.1	6.2	583	5	5			Test Solution Prep: JPW
100%	25.3	8.05	8.23	12.7	6.4	802	4	5			New WQ: [illegible]
											Renewal Time: 1630
											Renewal Signoff: JPW
											Old WQ: JT
Meter ID	24A	pH11	pH12	DO13	DO12	ECO1					
Blank	25.1		8.13		7.3	336	4	4			Date: 5/13/09
50%	25.1		8.23		7.5	572	5	5			Termination Time: 0900
100%	25.1		8.38		7.5	813	4	5			Termination Signoff: JT
											Old WQ: [illegible]
Meter ID	24A		pH11		DO12	ECO1					

Fathead Minnow Dry Weight Data Sheet

Client: **Precision Analytical** Test ID #: 32955 Project # 14727

Sample: Sample 1 (Inlet to res B) Tare Weight Date: 5/10/09 Sign-off: MEC

Test Date: 5-6-09 Final Weight Date: 5/13/09 Sign-off: MM

Treatment: Centrifugation + C18 SPE

Pan ID	Treatment	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
13	Control	A	150.79	152.73	5	0.388
14		B	168.00	169.35	5	0.270
15	50%	A	160.14	163.39	5	0.650
16		B	163.73	166.65	5	0.584
17	100%	A	162.95	166.17	5	0.644
18		B	164.74	167.98	5	0.648
QA2			163.07	163.11		0.04
Balance ID:			1	1		