aquatic bioassay & consulting laboratories, inc

August 17, 2016

Dr. Thant Zin Win, D.V.M., M.P.H., Chief
County of Los Angeles-ACWMD
Environmental Toxicology Laboratory
11012 Garfield Avenue-Bldg. B
South Gate, CA 90280

Dear Dr. Win:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" EPA-821-R-02-013*. Results were as follows:

CLIENT:	County of Los Angeles
SAMPLE I.D.:	ME00005945 Dominguez Channel MES (S28)
DATE RECEIVED:	29 July- 2016
ABC LAB. NO.:	CLA0716.298

CHRONIC CERIODAPHNIA SURVIVAL & REPRODUCTION BIOASSAY

IWC = 50.00%

TST RESULT

SURVIVAL = PASS % EFFECT = 0.00 %

*REPRODUCTION = PASS % EFFECT = -28.45 %
* Passes permit TIE limitation of ≥ 50% effect

Yours very truly,

Scott Johnson
Laboratory Director

*Note: The chronic survival TST analysis is not available for ceriodaphnia dubia, see CETIS report using TST-Welch's t Test

TST Summary Sheet

Lab Name	Aquatic Bioassay and Consulting Labs	**Client Name**	County of Los Angeles
Test ID	ME00005945	**Test Species**	*C. dubia (water flea)*
Test Date	7/29/2016	**Test Type**	Chronic
Test Duration	7 days	**Endpoint**	Reproduction
Critical Conc.	50%		

Statistic	Control	Critical Concentration
Mean of Raw Data	24.25	31.15
Mean used in Calculation (non-transformed)	24.25	31.15
Variance used in Calculation (non-transformed)	12.934	10.661
Standard Deviation of Raw Data	3.596	3.265
CV of Raw Data	0.148	0.105
n	20	20

Mean % Effect at Critical Conc.

-28.45

Calculated t-value	Degrees of Freedom	Table t-value	Percent Difference
13.6880	36	0.8517	

Results

Pass	Sample is Non-toxic

Raw Data

Control Data		Critical Concentration Data	
No. of Organisms Exposed or Counted	Response (Final Count, Weight, Length, etc.)	No. of Organisms Exposed or Counted	Response (Final Count, Weight, Length, etc.)
1	28	1	30
1	27	1	25
1	25	1	31
1	23	1	31
1	30	1	29
1	26	1	28
1	24	1	30
1	21	1	28
1	24	1	27
1	18	1	31
1	25	1	34
1	19	1	29
1	19	1	33
1	20	1	30
1	23	1	32
1	30	1	32
1	29	1	34
1	25	1	36
1	23	1	34
1	26	1	39

CETIS Summary Report

Ceriodaphnia 7-d Survival and Reproduction Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	13-7092-3041	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	29 Jul-16 15:56	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	05 Aug-16 14:20	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Aquatic Biosystems, CO	**Age:**	
Sample ID:	16-3794-5497	**Code:**	CLA0716.298	**Client:**	County of Los Angeles
Sample Date:	28 Jul-16 14:20	**Material:**	Sample Water	**Project:**	
Receive Date:	29 Jul-16 13:20	**Source:**	Bioassay Report		
Sample Age:	26h (4.1 °C)	**Station:**	ME00005945		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
08-5857-7855	7d Survival Rate	50	>50	NA	25.0%	2	TST-Welch's t Test
12-3899-6162	Reproduction	50	>50	NA	3.33%	2	TST-Welch's t Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
02-2633-1114	7d Survival Rate	EC5	>50	N/A	N/A	<2	Linear Interpolation (ICPIN)
		EC10	>50	N/A	N/A	<2	
		EC15	>50	N/A	N/A	<2	
		EC20	>50	N/A	N/A	<2	
		EC25	>50	N/A	N/A	<2	
		EC40	>50	N/A	N/A	<2	
		EC50	>50	N/A	N/A	<2	
17-9102-3857	Reproduction	IC5	>50	N/A	N/A	<2	Linear Interpolation (ICPIN)
		IC10	>50	N/A	N/A	<2	
		IC15	>50	N/A	N/A	<2	
		IC20	>50	N/A	N/A	<2	
		IC25	>50	N/A	N/A	<2	
		IC40	>50	N/A	N/A	<2	
		IC50	>50	N/A	N/A	<2	

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
02-2633-1114	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
08-5857-7855	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
12-3899-6162	Reproduction	Control Resp	24.25	15 - NL	Yes	Passes Acceptability Criteria
17-9102-3857	Reproduction	Control Resp	24.25	15 - NL	Yes	Passes Acceptability Criteria
12-3899-6162	Reproduction	PMSD	0.03326	0.13 - 0.47	Yes	Below Acceptability Criteria

7d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	20	1	1	1	1	1	0	0	0.0%	0.0%
50		20	1	1	1	1	1	0	0	0.0%	0.0%

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	20	24.25	22.57	25.93	18	30	0.8042	3.596	14.83%	0.0%
50		20	31.15	29.62	32.68	25	39	0.7301	3.265	10.48%	-28.45%

Ceriodaphnia 7-d Survival and Reproduction Test **Aquatic Bioassay & Consulting Labs, Inc.**

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	1	1	1	1	1	1	1	1	1	1
		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
		1	1	1	1	1	1	1	1	1	1

Reproduction Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	28	27	25	23	30	26	24	21	24	18
		25	19	19	20	23	30	29	25	23	26
50		30	25	31	31	29	28	30	28	27	31
		34	29	33	30	32	32	34	36	34	39

7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID: 08-5857-7855 **Endpoint:** 7d Survival Rate **CETIS Version:** CETISv1.8.7
Analyzed: 16 Aug-16 15:41 **Analysis:** Parametric Bioequivalence-Two Sample **Official Results:** Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	TST b	PMSD	Test Result
Angular (Corrected)	NA	C*b < T	NA	NA	0.75	25.0%	Passes 7d survival rate

TST-Welch's t Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:20%)
Negative Control		50*	153100000	0.852	1E-09	35	<0.0001	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1	65540	<0.0001	Significant Effect
Error	0	0	38			
Total	0		39			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1	3.432	1.0000	Equal Variances

7d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	20	1	1	1	1	1	1	0	0.0%	0.0%
50		20	1	1	1	1	1	1	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	20	1.047	1.047	1.047	1.047	1.047	1.047	0	0.0%	0.0%
50		20	1.047	1.047	1.047	1.047	1.047	1.047	0	0.0%	0.0%

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	1	1	1	1	1	1	1	1	1	1
		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
		1	1	1	1	1	1	1	1	1	1

Angular (Corrected) Transformed Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	1.047	1.047	1.047	1.047	1.047	1.047	1.047	1.047	1.047	1.047
50		1.047	1.047	1.047	1.047	1.047	1.047	1.047	1.047	1.047	1.047

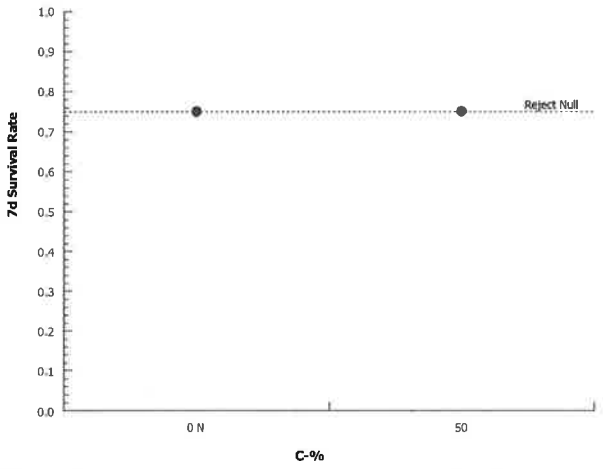
7d Survival Rate Binomials

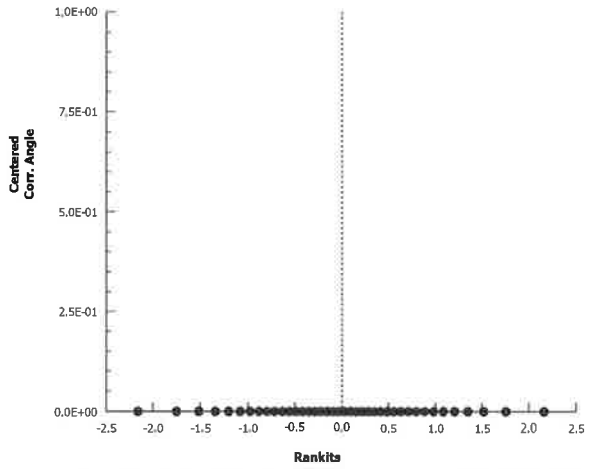
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	08-5857-7855	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	16 Aug-16 15:41	**Analysis:**	Parametric Bioequivalence-Two Sample	**Official Results:**	Yes

Graphics





Ceriodaphnia 7-d Survival and Reproduction Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID: 12-3899-6162 **Endpoint:** Reproduction **CETIS Version:** CETISv1.8.7
Analyzed: 16 Aug-16 15:41 **Analysis:** Parametric Bioequivalence-Two Sample **Official Results:** Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	TST b	PMSD	Test Result
Untransformed	NA	C*b < T	NA	NA	0.75	3.33%	Passes reproduction

TST-Welch's t Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:20%)
Negative Control		50*	13.69	0.8517	0.807	36	<0.0001	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	476.1	476.1	1	40.36	<0.0001	Significant Effect
Error	448.3	11.79737	38			
Total	924.4		39			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.213	3.432	0.6778	Equal Variances
Variances	Mod Levene Equality of Variance	0.363	7.353	0.5504	Equal Variances
Variances	Levene Equality of Variance	0.3195	7.353	0.5753	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9832	0.9236	0.8043	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.08118	0.1617	0.7317	Normal Distribution
Distribution	D'Agostino Skewness	0.4022	2.576	0.6876	Normal Distribution
Distribution	D'Agostino Kurtosis	0.2744	2.576	0.7838	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	0.237	9.21	0.8882	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.2269	3.878	0.8473	Normal Distribution

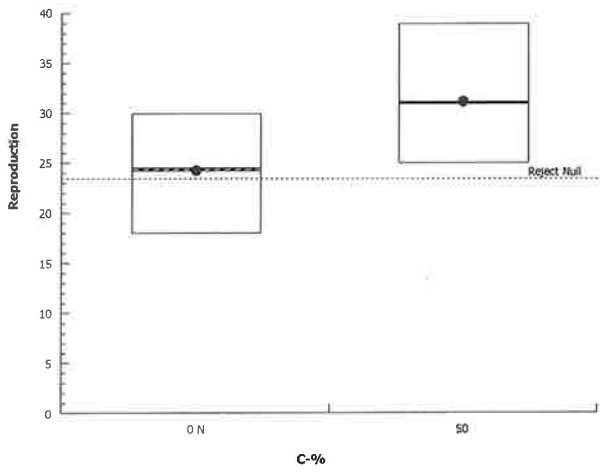
Reproduction Summary

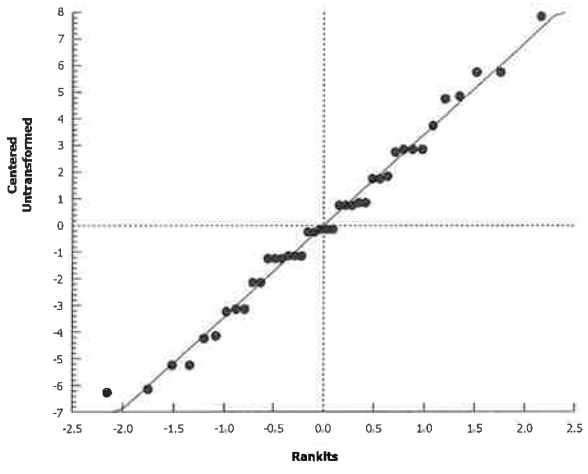
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	20	24.25	22.57	25.93	24.5	18	30	0.8042	14.83%	0.0%
50		20	31.15	29.62	32.68	31	25	39	0.7301	10.48%	-28.45%

Reproduction Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	28	27	25	23	30	26	24	21	24	18
		25	19	19	20	23	30	29	25	23	26
50		30	25	31	31	29	28	30	28	27	31
		34	29	33	30	32	32	34	36	34	39

Graphics





CETIS Analytical Report

Ceriodaphnia 7-d Survival and Reproduction Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	02-2633-1114	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	16 Aug-16 15:41	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	>50	N/A	N/A	<2	NA	NA
EC10	>50	N/A	N/A	<2	NA	NA
EC15	>50	N/A	N/A	<2	NA	NA
EC20	>50	N/A	N/A	<2	NA	NA
EC25	>50	N/A	N/A	<2	NA	NA
EC40	>50	N/A	N/A	<2	NA	NA
EC50	>50	N/A	N/A	<2	NA	NA

7d Survival Rate Summary

			Calculated Variate(A/B)								
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	20	1	1	1	0	0	0.0%	0.0%	20	20
50		20	1	1	1	0	0	0.0%	0.0%	20	20

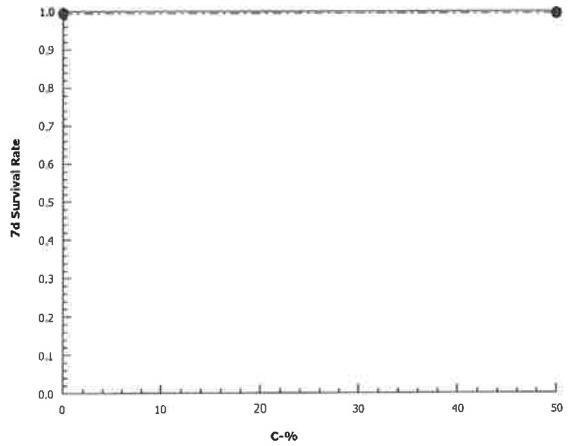
7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	1	1	1	1	1	1	1	1	1	1
		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
		1	1	1	1	1	1	1	1	1	1

7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	17-9102-3857	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	16 Aug-16 15:41	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	684472	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>50	N/A	N/A	<2	NA	NA
IC10	>50	N/A	N/A	<2	NA	NA
IC15	>50	N/A	N/A	<2	NA	NA
IC20	>50	N/A	N/A	<2	NA	NA
IC25	>50	N/A	N/A	<2	NA	NA
IC40	>50	N/A	N/A	<2	NA	NA
IC50	>50	N/A	N/A	<2	NA	NA

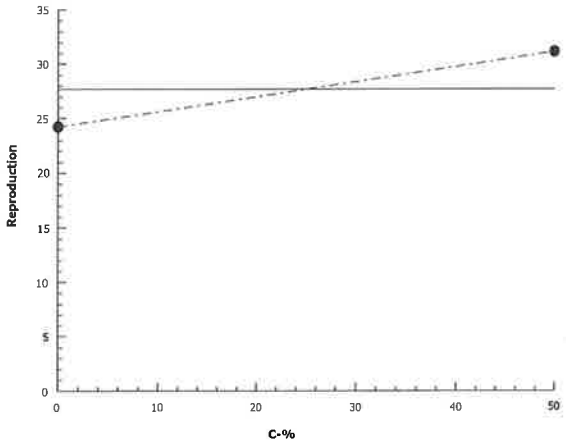
Reproduction Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	20	24.25	18	30	0.8042	3.596	14.83%	0.0%
50		20	31.15	25	39	0.7301	3.265	10.48%	-28.45%

Reproduction Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Negative Control	28	27	25	23	30	26	24	21	24	18
		25	19	19	20	23	30	29	25	23	26
50		30	25	31	31	29	28	30	28	27	31
		34	29	33	30	32	32	34	36	34	39

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	13-7092-3041	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	29 Jul-16 15:56	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	05 Aug-16 14:20	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Aquatic Biosystems, CO	**Age:**	
Sample ID:	16-3794-5497	**Code:**	CLA0716.298	**Client:**	County of Los Angeles
Sample Date:	28 Jul-16 14:20	**Material:**	Sample Water	**Project:**	
Receive Date:	29 Jul-16 13:20	**Source:**	Bioassay Report		
Sample Age:	26h (4.1 °C)	**Station:**	ME00005945		

Alkalinity (CaCO3)-mg/L

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	67.88	66.58	69.17	66	69	0.5489	1.553	2.29%	0
50		8	65	65	65	65	65	0	0	0.0%	0
Overall		16	66.44			65	69				0 (0%)

Conductivity-µmhos

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	336.8	331.1	342.4	330	348	2.396	6.777	2.01%	0
50		8	833.4	827.7	839	827	847	2.397	6.781	0.81%	0
Overall		16	585.1			330	847				0 (0%)

Dissolved Oxygen-mg/L

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	7.375	7.038	7.712	6.9	8.1	0.1424	0.4027	5.46%	0
50		8	7.025	5.457	8.593	4.8	10	0.6633	1.876	26.7%	0
Overall		16	7.2			4.8	10				0 (0%)

Hardness (CaCO3)-mg/L

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	91.13	88.96	93.29	88	93	0.9149	2.588	2.84%	0
50		8	212	212	212	212	212	0	0	0.0%	0
Overall		16	151.6			88	212				0 (0%)

pH-Units

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	8.125	7.978	8.272	7.8	8.4	0.06196	0.1753	2.16%	0
50		8	7.838	7.57	8.105	7.4	8.5	0.1133	0.3204	4.09%	0
Overall		16	7.981			7.4	8.5				0 (0%)

Temperature-°C

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	24.01	23.98	24.04	24	24.1	0.01249	0.03531	0.15%	0
50		8	24.1	24	24.2	24	24.3	0.04225	0.1195	0.5%	0
Overall		16	24.06			24	24.3				0 (0%)

Ceriodaphnia 7-d Survival and Reproduction Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Alkalinity (CaCO3)-mg/L

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	69	69	69	69	69	66	66	66
50		65	65	65	65	65	65	65	65

Conductivity-µmhos

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	335	344	330	334	341	348	330	332
50		827	833	831	847	840	831	830	828

Dissolved Oxygen-mg/L

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	8.1	7.6	7.4	7.1	7.5	6.9	7.5	6.9
50		10	9.3	7.5	7.1	4.8	5	6	6.5

Hardness (CaCO3)-mg/L

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	93	93	93	93	93	88	88	88
50		212	212	212	212	212	212	212	212

pH-Units

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	8.2	8	7.8	8.1	8.2	8.1	8.2	8.4
50		8.5	8	7.9	7.8	7.4	7.7	7.7	7.7

Temperature-°C

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	24	24.1	24	24	24	24	24	24
50		24	24.2	24.3	24	24.2	24.1	24	24