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LELAP Certification Number 02080

May 11, 2017

LOOP, LLC
c/o CK Associates, LLC
17170 Perkins Road
Baton Rouge, Louisiana 70810
Attn: Mr. Doug LaBar

Ref: Whole Effluent Toxicity Results
CK Project No: 8873
Test ID No.: 17042705

Dear Mr. LaBar:

Enclosed please find the Toxicity Test Report containing results of a set of 7-Day Chronic Toxicity Tests using *Mysidopsis bahia* and *Menidia beryllina* performed on the LOOP, LLC 004 Brine sample. If you have any questions concerning this toxicity testing report or if I can be of any further assistance to you, please call me at (225) 755-1011 x 1100.

Sincerely,
CK Associates

Monica S. Eues

Monica S. Eues
Laboratory Director

MSE/hbb

Enc.: Toxicity Test Report

Issue Date: May 15, 2017

BRINE TOXICITY TEST REPORT

FOR

LOOP, LLC

DRAFT PERMIT NO.: LA0049492

AI NO.: 4634

TEST INITIATION DATE: April 28, 2017

TEST IDENTIFICATION NO.: 17042705

CK ASSOCIATES
Environmental Consultants

17170 Perkins Road
Baton Rouge, Louisiana 70810
225-755-1000

The results of this analysis relate only to the referenced sample as it was submitted to CK Associates. Unless otherwise noted, all test results meet the requirements of TNI. This report shall not be reproduced in full or in part without the written consent of CK Associates.

Ph.D. P.E. 5.15.17
Chad Cristina, Ph.D., P.E. Date
Water Program Manager

Monica S. Eues 5.11.17
Monica S. Eues Date
Laboratory Director

SUMMARY AND CONCLUSIONS

Permittee:	LOOP, LLC P.O. Box 7250 Metairie, Louisiana 70010-7250	Laboratory:	CK Associates 17170 Perkins Road Baton Rouge, Louisiana 70810 LELAP Certification #02080

Method(s): *Mysidopsis bahia* Survival and Growth Toxicity Test, EPA 821-R-02-014, Method 1007.0

Menidia beryllina Larval Survival and Growth Toxicity Test, EPA 821-R-02-014, Method 1006.0

Test Sample:	Outfall 004 - Brine	Critical Dilution:	7.63%
Test ID No.:	17042705	Dilution Water:	Synthetic Laboratory Water
Concentrations:	3.22, 4.29, 5.72, 7.63, and 10.17%		
Sample Dates:	April 27, 2017		
Test Initiation Date:	April 28, 2017		
Purpose:	Investigative		

Test Acceptance Criteria

Performance criteria for *M. bahia* survival, growth and variability were met.

Performance criteria for *M. beryllina* survival, growth and variability were met.

Test Results

M. bahia	Survival NOEC:	5.72%
	Growth NOEC:	4.29%
M. beryllina	Survival NOEC:	7.63%
	Growth NOEC:	7.63%

Test Conclusions

M. bahia	Significant lethality at the critical dilution?	Yes	Fail
	Significant sublethality at the critical dilution?	Yes	Fail
M. beryllina	Significant lethality at the critical dilution?	No	Pass
	Significant sublethality at the critical dilution?	No	Pass

INTRODUCTION

A grab sample of LOOP, LLC Outfall 004 Brine was collected on April 27, 2017, and was received by CK Associates on April 27, 2017. A *Mysidopsis bahia* Survival and Growth Toxicity Test and a *Menidia beryllina* Larval Survival and Growth Toxicity Test were conducted as described below.

METHODS

The samples were tested in accordance with Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms, Third Edition. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA 821–R–02–014, October 2002. The following effluent concentrations were established for testing: 3.22, 4.29, 5.72, 7.63, and 10.17%. The dilution water was an aged synthetic seawater control tested concurrently with the effluent concentrations.

Test Parameters	*Mysidopsis bahia*	*Menidia beryllina*
Test Method	1007.0	1006.0
Organism Source	CK Associates	CK Associates
Organism Age	7 days	11 days
Test Chamber Material	Polypropylene	Polypropylene
Test Chamber Volume (mL)	300	710
Test Solution Volume (mL)	150	500

Following termination, the data were analyzed using TOXCALC version 5.0.23j.

The reference toxicant, potassium chloride, was used to monitor the sensitivity of the test organisms and the precision of the testing procedure. Chronic reference toxicant tests are performed at least monthly and the resulting NOEC values are plotted to determine if the results are within prescribed limits.

RESULTS

Mysidopsis bahia

Average survival and average weight per original organism after 7 days of exposure are tabulated below.

Percent Effluent	Percent Survival	Growth (mg)
Dilution Control	95	0.38
3.22	100	0.36
4.29	95	0.32
5.72	88	0.23
7.63	0	0
10.17	0	0

The dilution control met performance criteria for survival, growth and variability. Based on the statistical analysis (pages 5 and 6) the survival and growth NOECs of the LOOP, LLC Outfall 004 Brine were 5.72% and 4.29%, respectively. Detailed data for the test, including survival, growth and water quality, are presented on pages 11 through 14 and 19 through 22.

Menidia beryllina

Average survival and average weight per original organism after 7 days of exposure are tabulated below.

Percent Effluent	Percent Survival	Growth (mg)
Dilution Control	98	1.54
3.22	98	1.70
4.29	98	1.65
5.72	100	1.73
7.63	88	1.28
10.17	0	0

The dilution control met performance criteria for survival, growth and variability. Based on the statistical analysis (pages 7 and 8) the survival and growth NOECs of the LOOP, LLC Outfall 004 Brine were 7.63% and 7.63%, respectively. Detailed data for the test, including survival, growth and water quality, are presented on pages 15 through 24.

QUALITY CONTROL

The reference toxicant NOEC was within one NOEC of the mode of the twenty most recent reference toxicant NOEC values (pages 9 and 10).

-7 Day Survival

Start Date:	4/28/2017	Test ID:	17042705A	Sample ID:	LOOP
End Date:	5/5/2017	Lab ID:	17042705	Sample Type:	OUTFALL: 0
Sample Date:	4/27/2017	Protocol:	EPAMW02-EPA/821/R-02-01	Test Species:	MY-Mysidopsis bahia
Comments:					

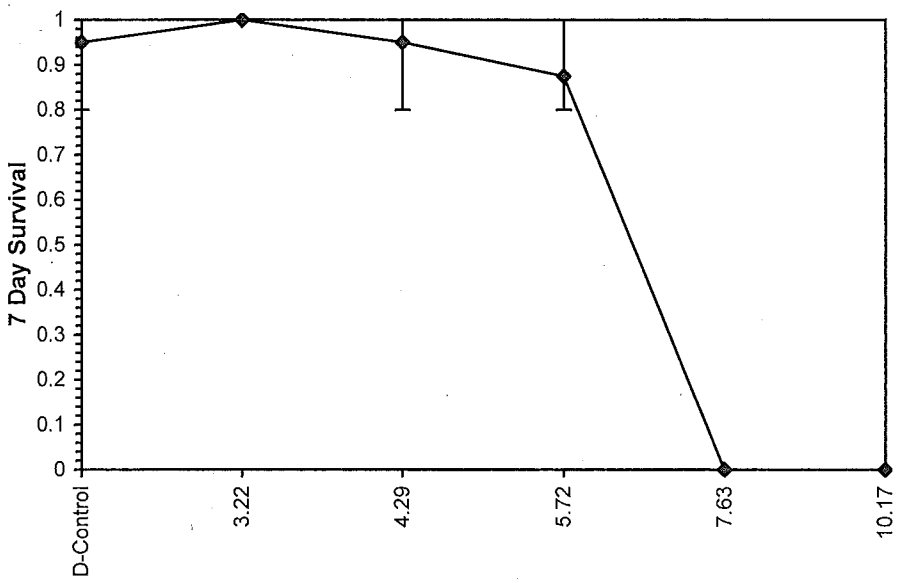
Conc-%	1	2	3	4	5	6	7	8
D-Control	1.00	1.00	1.00	1.00	0.80	1.00	1.00	0.80
3.22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4.29	1.00	0.80	0.80	1.00	1.00	1.00	1.00	1.00
5.72	1.00	0.80	1.00	0.80	0.80	0.80	0.80	1.00
7.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	0.95	1.0000	1.2857	1.1071	1.3453	9	8		
3.22	1.00	1.0526	1.3453	1.3453	1.3453	0	8	76.00	48.00
4.29	0.95	1.0000	1.2857	1.1071	1.3453	9	8	68.00	48.00
5.72	0.88	0.9211	1.1964	1.1071	1.3453	10	8	56.00	48.00
7.63	0.00	0.0000	0.2255	0.2255	0.2255	0	8		
10.17	0.00	0.0000	0.2255	0.2255	0.2255	0	8		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.87874	0.904	-0.569	-0.3544
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	5.72	7.63	6.60633	17.4825
Treatments vs D-Control				

Dose-Response Plot



-Growth-Weight

Start Date:	4/28/2017	Test ID:	17042705A	Sample ID:	LOOP
End Date:	5/5/2017	Lab ID:	17042705	Sample Type:	OUTFALL: 0
Sample Date:	4/27/2017	Protocol:	EPAMW02-EPA/821/R-02-01	Test Species:	MY-Mysidopsis bahia
Comments:					

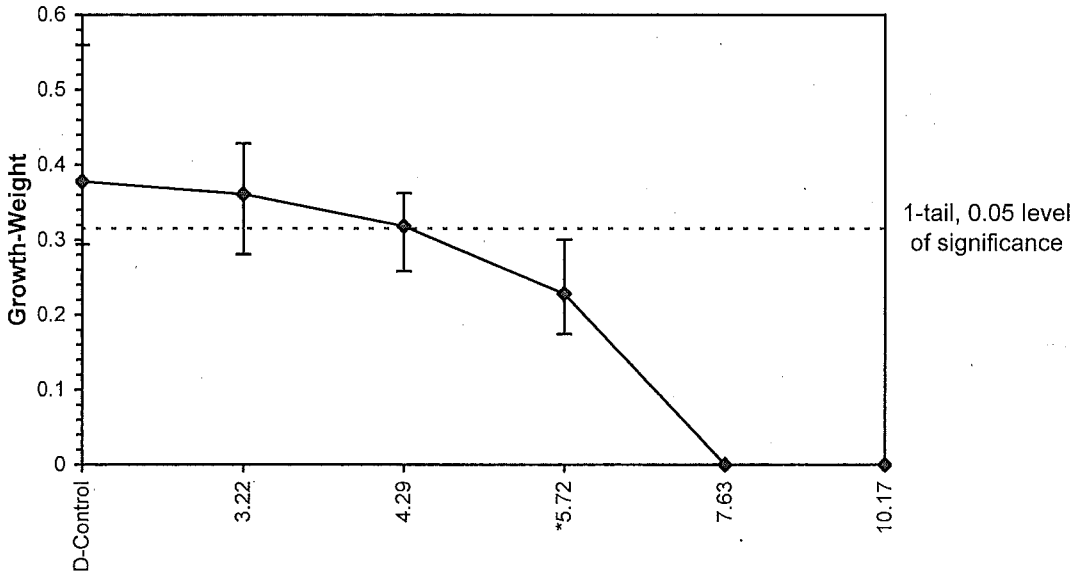
Conc-%	1	2	3	4	5	6	7	8
D-Control	0.45	0.56	0.37	0.31	0.29	0.38	0.32	0.34
3.22	0.36	0.43	0.34	0.40	0.30	0.38	0.28	0.40
4.29	0.32	0.26	0.27	0.36	0.36	0.31	0.34	0.33
5.72	0.26	0.17	0.22	0.18	0.20	0.22	0.30	0.26
7.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.38	1.0000	0.3783	0.2940	0.5600	23	8			
3.22	0.36	0.9531	0.3605	0.2800	0.4280	14	8	0.607	2.156	0.0630
4.29	0.32	0.8407	0.3180	0.2580	0.3620	12	8	2.060	2.156	0.0630
*5.72	0.23	0.6021	0.2278	0.1740	0.3000	19	8	5.146	2.156	0.0630
7.63	0.00	0.0000	0.0000	0.0000	0.0000	0	8			
10.17	0.00	0.0000	0.0000	0.0000	0.0000	0	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93463	0.904	0.9693	2.20369
Bartlett's Test indicates equal variances (p = 0.11)	6.03047	11.3449		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs D-Control	4.29	5.72	4.95367	23.31	0.06304	0.16667	0.03611	0.00342	8.2E-05	3, 28

Dose-Response Plot



Larval Fish-7 Day Survival

Start Date:	4/28/2017	Test ID:	17042705M	Sample ID:	LOOP
End Date:	5/5/2017	Lab ID:	17042705	Sample Type:	Outfall: 004
Sample Date:	4/27/2017	Protocol:	EPAMW02-EPA/821/R-02-01	Test Species:	MB-Menidia beryllina
Comments:					

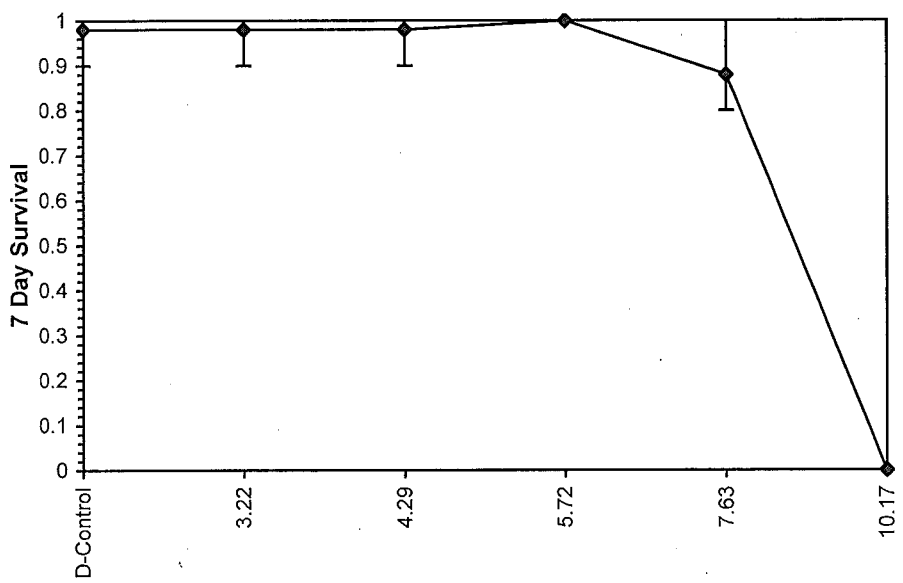
Conc-%	1	2	3	4	5
D-Control	1.00	0.90	1.00	1.00	1.00
3.22	1.00	1.00	1.00	1.00	0.90
4.29	1.00	1.00	0.90	1.00	1.00
5.72	1.00	1.00	1.00	1.00	1.00
7.63	0.80	0.90	1.00	0.90	0.80
10.17	0.00	0.00	0.00	0.00	0.00

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	0.98	1.0000	1.3794	1.2490	1.4120	5	5		
3.22	0.98	1.0000	1.3794	1.2490	1.4120	5	5	27.50	17.00
4.29	0.98	1.0000	1.3794	1.2490	1.4120	5	5	27.50	17.00
5.72	1.00	1.0204	1.4120	1.4120	1.4120	0	5	30.00	17.00
7.63	0.88	0.8980	1.2249	1.1071	1.4120	10	5	19.00	17.00
10.17	0.00	0.0000	0.1588	0.1588	0.1588	0	5		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.75389	0.888	-0.3403	1.29916
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	7.63	10.17	8.80892	13.1062
Treatments vs D-Control				

Dose-Response Plot



Larval Fish-7 Day Growth

Start Date:	4/28/2017	Test ID:	17042705M	Sample ID:	LOOP
End Date:	5/5/2017	Lab ID:	17042705	Sample Type:	Outfall: 004
Sample Date:	4/27/2017	Protocol:	EPAMW02-EPA/821/R-02-01	Test Species:	MB-Menidia beryllina
Comments:					

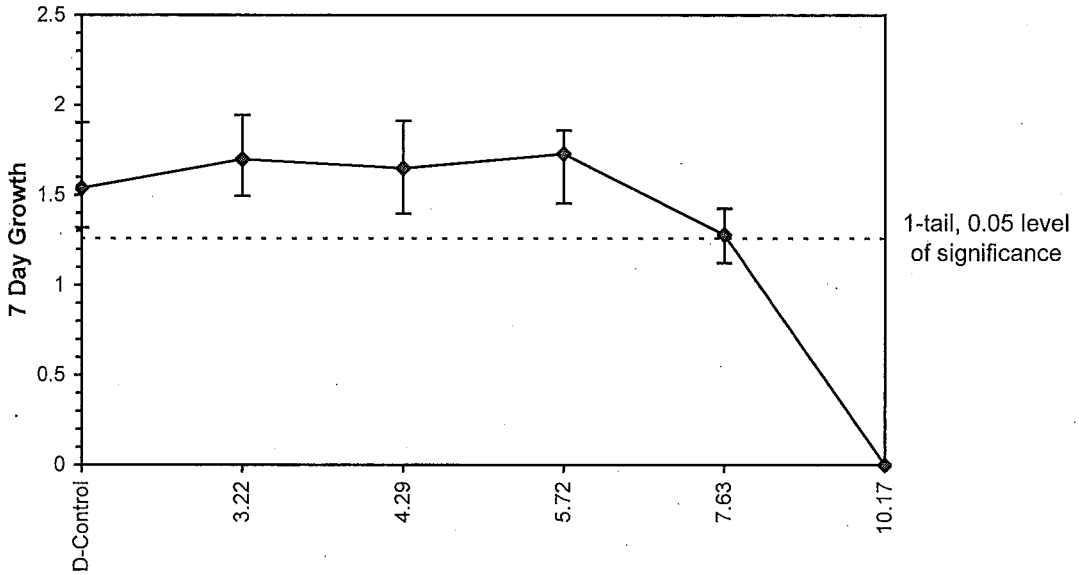
Conc-%	1	2	3	4	5
D-Control	1.91	1.63	1.34	1.32	1.52
3.22	1.56	1.50	1.95	1.62	1.89
4.29	1.63	1.87	1.40	1.91	1.44
5.72	1.85	1.79	1.79	1.74	1.45
7.63	1.19	1.32	1.42	1.34	1.12
10.17	0.00	0.00	0.00	0.00	0.00

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	1.54	1.0000	1.5442	1.3220	1.9080	16	5			
3.22	1.70	1.1022	1.7020	1.4960	1.9460	12	5	-1.261	2.300	0.2877
4.29	1.65	1.0677	1.6488	1.3950	1.9110	14	5	-0.836	2.300	0.2877
5.72	1.73	1.1172	1.7252	1.4480	1.8540	9	5	-1.447	2.300	0.2877
7.63	1.28	0.8270	1.2770	1.1190	1.4230	10	5	2.136	2.300	0.2877
10.17	0.00	0.0000	0.0000	0.0000	0.0000	0	5			

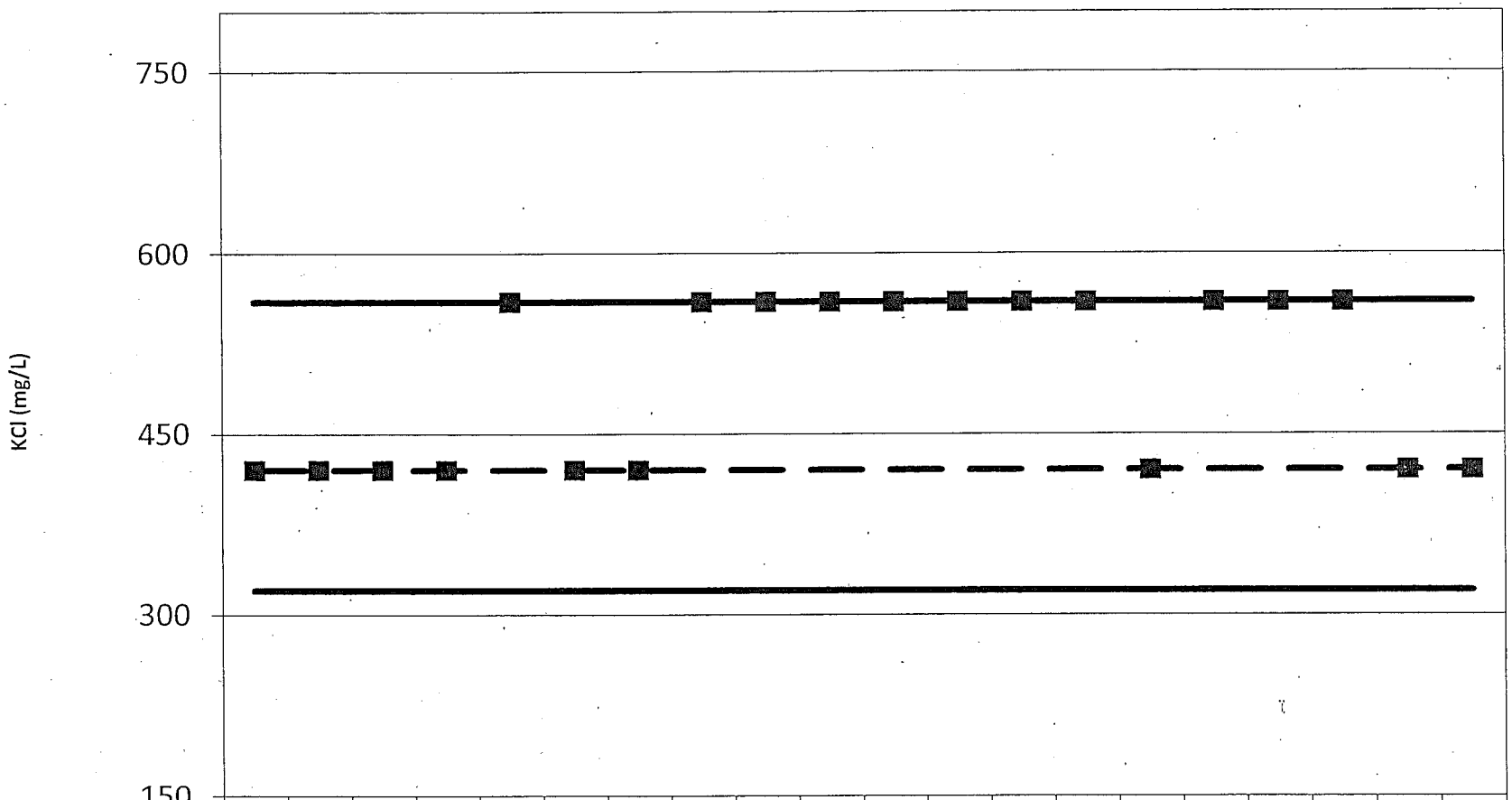
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.95965	0.888	0.16346	-0.9296
Bartlett's Test indicates equal variances (p = 0.70)	2.17123	13.2767		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs D-Control	7.63	10.17	8.80892	13.1062	0.28772	0.18632	0.16724	0.03912	0.01163	4, 20

Dose-Response Plot



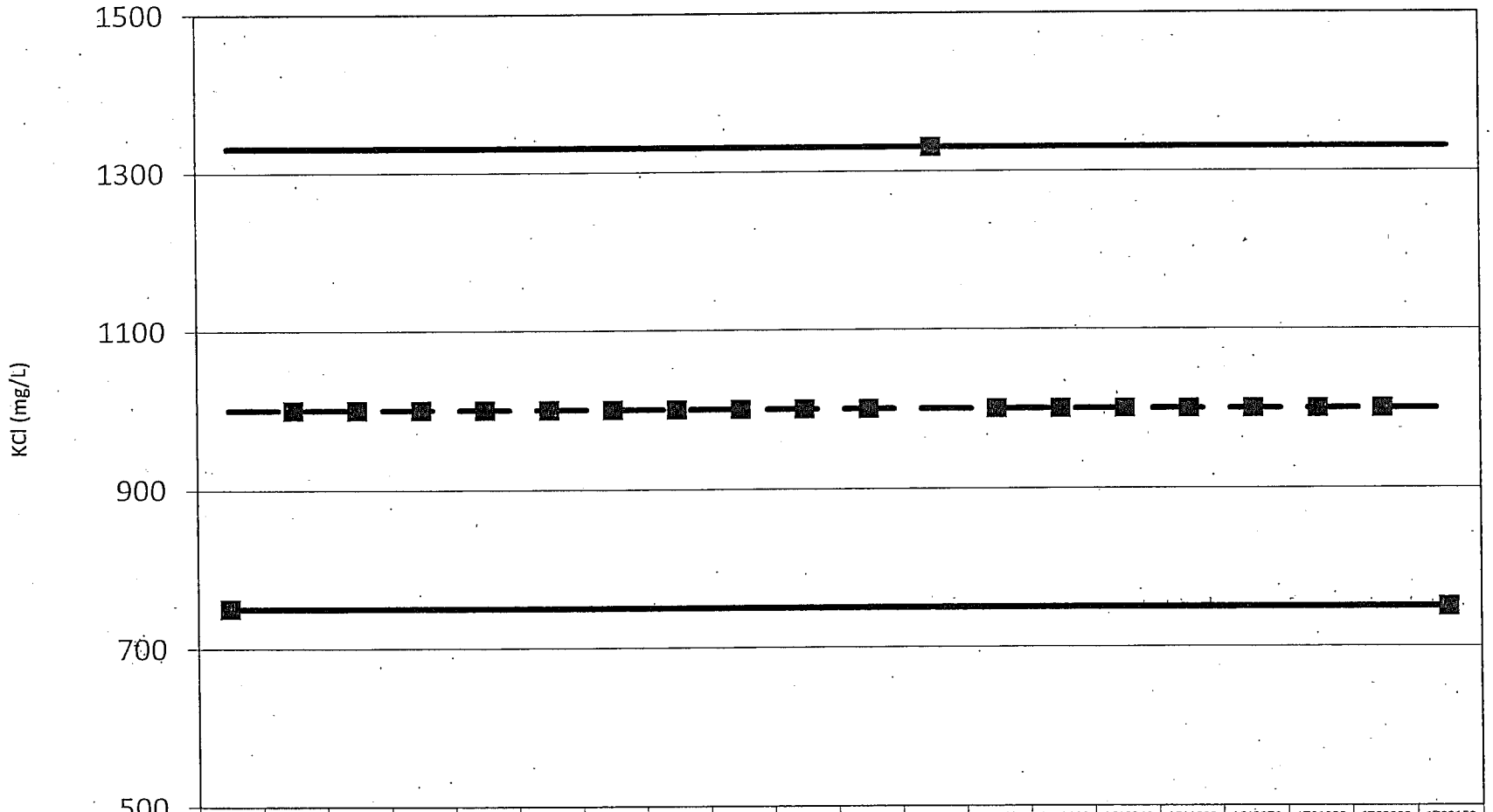
CK Associates
Potassium Chloride Reference Toxicant Control Chart
7-Day Chronic Survival NOEC for *Mysidopsis bahia*



	150803 01	150908 03	151012 02	151109 03	151228 03	160118 03	160215 05	160308 01	160419 03	160525 02	160623 02	160725 04	160817 01	160919 01	161024 07	161109 02	161227 08	170103 02	170209 03	170315 03
Survival NOEC	420	420	420	420	560	420	420	560	560	560	560	560	560	560	420	560	560	560	420	420
Central Tendency NOEC	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
Upper Acceptable NOEC	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560
Lower Acceptable NOEC	320	320	320	320	320	320	320	320	320	320	320	320	320	320	320	320	320	320	320	320

Test ID No.: 17042705

CK Associates
Potassium Chloride Reference Toxicant Control Chart
7-Day Chronic Survival NOEC for *Menidia beryllina*



	15090804	15092306	15101201	15110902	15122804	16011804	16021506	16030802	16041904	16052503	16062303	16072505	16081702	16091902	16102408	16110903	16122709	17010303	17020904	17031504
Survival NOEC	750	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1330	1000	1000	1000	1000	1000	1000	1000	750
Central Tendency NOEC	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Upper Acceptable NOEC	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330
Lower Acceptable NOEC	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750	750

Test ID No.: 17042705

Test ID No.: 17042705

CK Associates **Survival Data for 7-Day Chronic Toxicity Test**

Mysidopsis bahia

Client: LOOP - INVESTIGATIVE
Outfall: 004
Test ID: 17042705

CD(%) 7.63
Organism Age: 7 DO
Organism Batch: 0129

Template: M95 SA-SB
QC Review: CJT

Exposure Period	Test Initiation	Observations Made at the End of 24-Hour Exposure Period:						
		1	2	3	4	5	6	7
Day	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri
Date	4-28-17	4-29-17	4-30-17	5.1.17	5/2/17	5-3-17	5-4-17	5-5-17
Time	1340	1215	1020	1000	1445	1425	1155	1320
Technician	CAJ / CJT	CAJ	CAJ	CJT	CJT	CJT	JRH	CJT

Effluent Conc. (%)	Rep	Number of Live Organisms							
Dilution Control	1	5	5	5	5	5	5	5	5
	2	5	5	5	5	5	5	5	5
	3	5	5	5	5	5	5	5	5
	4	5	5	5	5	5	5	5	5
	5	5	5	5	5	5	4	4	4
	6	5	5	5	5	5	5	5	5
	7	5	5	5	5	5	5	5	5
	8	5	5	5	5	4	4	4	4
3.22	1	5	5	5	5	5	5	5	5
	2	5	5	5	5	5	5	5	5
	3	5	5	5	5	5	5	5	5
	4	5	5	5	5	5	5	5	5
	5	5	5	5	5	5	5	5	5
	6	5	5	5	5	5	5	5	5
	7	5	5	5	5	5	5	5	5
	8	5	5	5	5	5	5	5	5
4.29	1	5	5	5	5	5	5	5	5
	2	5	5	4	4	4	4	4	4
	3	5	4	4	4	4	4	4	4
	4	5	5	5	5	5	5	5	5
	5	5	5	5	5	5	5	5	5
	6	5	5	5	5	5	5	5	5
	7	5	5	5	5	5	5	5	5
	8	5	5	5	5	5	5	5	5

Test ID No.: 17042705

CK Associates **Survival Data for 7-Day Chronic Toxicity Test**

Mysidopsis bahia

Client: LOOP - INVESTIGATIVE | Outfall: 004 | Test ID: 17042705

Exposure Period	Test Initiation	Observations Made at the End of 24-Hour Exposure Period:						
		1	2	3	4	5	6	7
Day	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri

Effluent Conc. (%)	Rep	Number of Live Organisms							
5.72	1	5	5	5	5	5	5	5	5
	2	5	4	4	4	4	4	4	4
	3	5	5	5	5	5	5	5	5
	4	5	4	4	4	4	4	4	4
	5	5	4	4	4	4	4	4	4
	6	5	5	5	5	4	4	4	4
	7	5	4	4	4	4	4	4	4
	8	5	5	5	5	5	5	5	5
7.63	1	5	0						
	2	5	0						
	3	5	0						
	4	5	0						
	5	5	0						
	6	5	0						
	7	5	0						
	8	5	0						
10.17	1	5	0						
	2	5	0						
	3	5	0						
	4	5	0						
	5	5	0						
	6	5	0						
	7	5	0						
	8	5	0						

Test ID No.: 17042705

CK ASSOCIATES **Survival Data for 7-Day Chronic Toxicity Test**

Mysidopsis bahia

Client: LOOP - INVESTIGATIVE | Outfall: 004 | Test ID: 17042705

Feeding Documentation for 24-Hour Exposure Period:								
Exposure Period	1		2		3		4	
Day	Fri	Sat	Sat	Sun	Sun	Mon	Mon	Tue
Date	4-28-17	4-29-17	4-29-17	4-30-17	4.30.17	5.1.17	5/1/17	5/2/17
Time	1620	0845	1540	0925	1400	0810	1700	0840
Technician	ACF	CAJ	CAJ	CAJ	CAJ	JRH	JRH	CAJ

Exposure Period	5		6		7
Day	Tue	Wed	Wed	Thu	Thu
Date	5.2.17	5.3.17	5-3-17	5-4-17	5.4.17
Time	1700	0840	1800	0810	1550
Technician	JRH	CJT	CJT	acf	acf

Technician's Observations			
Date	Time	Initials	Observations
5/5/17	1345	acf	Foils placed in oven A-

Test was / was not aerated following test initiation.

Continuous aeration was started on _____ at _____

Test ID No.: 17042705

CK Associates **Water Quality Data for 7-Day Chronic Toxicity Test**

Mysidopsis bahia

Client: LOOP - INVESTIGATIVE Outfall: 004 Test ID: 17042705

Effluent Concentration (%)	Exposure Period 1					
	Fri, Apr 28			Sat, Apr 29		
	pH	S	DO	pH	DO	T
Dilution	8.2	32	7.3	8.3	5.5	26.1
3.220	8.1	32	6.9	8.2	5.5	26.1
4.29	8.2	31	6.9	8.1	5.6	26.1
5.72	8.1	31	6.8	7.8	5.0	26.1
7.63	8.1	32	6.7	7.7	5.1	26.1
10.17	7.4	32	6.6	7.3	4.6	26.1
Meter ID	M15-1			M15-3		T-17-1

ACF 4-28-17

Effluent Concentration (%)	Exposure Period 2					
	Sat, Apr 29			Sun, Apr 30		
	pH	S	DO	pH	DO	T
Dilution	8.3	33	6.9	8.1	5.6	25.8
3.220	8.4	33	6.7	8.0	5.6	25.8
4.29	8.5	33	6.7	7.9	5.5	25.8
5.72	8.5	33	6.7	7.8	5.5	25.8
7.63	8.5	34	6.6			
10.17	8.2	35	6.5			
Meter ID	M15-3			M15-3		T-17-1

Effluent Concentration (%)	Exposure Period 3					
	Sun, Apr 30			Mon, May 1		
	pH	S	DO	pH	DO	T
Dilution	8.2	32	6.9	8.1	5.8	25.5
3.22	8.3	32	6.8	8.0	5.8	25.5
4.29	8.3	33	6.7	7.9	5.7	25.5
5.72	8.4	32	6.6	7.7	5.7	25.5
7.63	8.4	33	6.6			
10.17	7.2	33	6.4			
Meter ID	M15-3			M15-3		T17-1

Effluent Concentration (%)	Exposure Period 4					
	Mon, May 1			Tue, May 2		
	pH	S	DO	pH	DO	T
Dilution	8.1	32	7.1	8.2	5.4	26.4
3.22	8.2	33	6.9	7.9	5.1	26.4
4.29	8.3	31	6.9	7.9	5.3	26.4
5.72	8.3	33	6.8	7.8	5.3	26.4
7.63						
10.17						
Meter ID	M15-3			M15-1		T17-1

Effluent Concentration (%)	Exposure Period 5					
	Tue, May 2			Wed, May 3		
	pH	S	DO	pH	DO	T
Dilution	8.0	33	6.7	8.1	5.8	25.3
3.22	8.2	33	6.8	7.9	5.3	25.3
4.29	8.2	33	6.7	7.8	5.3	25.3
5.72	8.3	33	6.7	7.7	5.2	25.3
7.63						
10.17						
Meter ID	M15-1			M15-1		T17-1

Effluent Concentration (%)	Exposure Period 6					
	Wed, May 3			Thu, May 4		
	pH	S	DO	pH	DO	T
Dilution	8.1	32	7.1	8.2	5.5	25.6
3.22	8.3	33	6.8	8.0	5.3	25.6
4.29	8.3	33	6.7	7.9	5.4	25.6
5.72	8.4	33	6.8	7.7	5.3	25.6
7.63						
10.17						
Meter ID	M15-1			M15-1		T-17-1

Effluent Concentration (%)	Exposure Period 7					
	Thu, May 4			Fri, May 5		
	pH	S	DO	pH	DO	T
Dilution	8.2	32	7.1	8.1	5.6	25.5
3.2200	8.3	33	6.9	8.0	5.6	25.5
4.29	8.4	32	6.7	7.9	5.3	25.5
5.72	8.4	32	6.6	7.8	5.3	25.5
7.63						
10.17						
Meter ID	M15-1			M15-3		T17-1

DO = Dissolved Oxygen (mg/L O_2) pH = pH (SU) S = Salinity (ppt) T = Temperature (°C)

Test ID No.: 17042705

CK Associates **Survival Data for 7-Day Chronic Toxicity Test**

Menidia beryllina

Client: LOOP - INVESTIGATIVE
Outfall: 004
Test ID: 17042705

CD(%) 7.63
Organism Age: 11 d 0
Organism Batch: 9127

Template: Men. 24 A-C
QC Review: CJT

Exposure Period	Test Initiation	Observations Made at the End of 24-Hour Exposure Period:						
		1	2	3	4	5	6	7
Day	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri
Date	4.28.17	4-29-17	4-30-17	5.1.17	5/2/17	5.3.17	5-4-17	5/5/17
Time	1345	1215	1025	1000	1500	1450	1155	1400
Technician	ACF/CJT	CAJ	CAJ	CJT	CJT	ACF	JRH	CJT

Effluent Conc. (%)	Rep	Number of Live Organisms							
Dilution Control	1	10	10	10	10	10	10	10	10
	2	10	10	9	9	9	9	9	9
	3	10	10	10	10	10	10	10	10
	4	10	10	10	10	10	10	10	10
	5	10	10	10	10	10	10	10	10
3.22	1	10	10	10	10	10	10	10	10
	2	10	10	10	10	10	10	10	10
	3	10	10	10	10	10	10	10	10
	4	10	10	10	10	10	10	10	10
	5	10	9	9	9	9	9	9	9
4.29	1	10	10	10	10	10	10	10	10
	2	10	10	10	10	10	10	10	10
	3	10	9	9	9	9	9	9	9
	4	10	10	10	10	10	10	10	10
	5	10	10	10	10	10	10	10	10
5.72	1	10	10	10	10	10	10	10	10
	2	10	10	10	10	10	10	10	10
	3	10	10	10	10	10	10	10	10
	4	10	10	10	10	10	10	10	10
	5	10	10	10	10	10	10	10	10
7.63	1	10	9	8	8	8	8	8	8
	2	10	10	10	10	10	9	9	9
	3	10	10	10	10	10	10	10	10
	4	10	9	9	9	9	9	9	9
	5	10	10	10	10	9	9	9	8

Test ID No.: 17042705

CK Associates **Survival Data for 7-Day Chronic Toxicity Test**

Menidia beryllina

Client: LOOP - INVESTIGATIVE | Outfall: 004 | Test ID: 17042705

Exposure Period	Test Initiation	Observations Made at the End of 24-Hour Exposure Period:						
		1	2	3	4	5	6	7
Day	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri

Effluent Conc. (%)	Rep	Number of Live Organisms							
10.17	1	10	9	9	5	1	0	0	0
	2	10	7	6	4	1	0	0	0
	3	10	10	9	4	0	0	0	0
	4	10	10	10	1	1	0	0	0
	5	10	6	3	2	1	0	0	0

Test ID No.: 17042705

CK Associates **Survival Data for 7-Day Chronic Toxicity Test**

Menidia beryllina

Client: LOOP - INVESTIGATIVE | Outfall: 004 | Test ID: 17042705

Feeding Documentation for 24-Hour Exposure Period:								
Exposure Period	1		2		3		4	
Day	Fri	Sat	Sat	Sun	Sun	Mon	Mon	Tue
Date	4-28-17	4-29-17	4-29-17	4-30-17	4.30.17	5.1.17	5/1/17	5/2/17
Time	1620	0845	1540	0925	1400	0810	1700	0840
Technician	ACF	CJT	CJT	CJT	CJ	JRH	JRH	CJ

Exposure Period	5		6		7
Day	Tue	Wed	Wed	Thu	Thu
Date	5.2.17	5.3.17	5-3-17	5-4-17	5/4/17
Time	1700	0840	1800	0810	1550
Technician	JRH	CJT	CJT	acf	acf

Technician's Observations			
Date	Time	Initials	Observations
5/4/17	1425	CJT	Foils in each A.

Test was / was not aerated following test initiation.

Continuous aeration was started on _____ at _____

Test ID No.: 17042705

CK Associates

Water Quality Data for 7-Day Chronic Toxicity Test
Menidia beryllina

Client: LOOP - INVESTIGATIVE Outfall: 004 Test ID: 17042705

Effluent Concentration (%)	Exposure Period 1					
	Fri, Apr 28			Sat, Apr 29		
	pH	S	DO	pH	DO	T
Dilution	8.2	32	7.3	8.3	4.9	26.1
3.22	8.1	31	6.9	8.1	4.2	26.1
4.29	8.2	31	6.9	8.0	4.3	26.1
5.72	8.1	31	6.8	7.9	4.4	26.1
7.63	8.1	32	6.7	7.7	4.4	26.1
10.17	7.4	32	6.6	7.4	4.8	26.1
Meter ID	M15-1			M15-3		T-17-1

Effluent Concentration (%)	Exposure Period 2					
	Sat, Apr 29			Sun, Apr 30		
	pH	S	DO	pH	DO	T
Dilution	8.3	33	6.9	8.1	5.1	25.8
3.22	8.4	33	6.7	8.0	5.1	25.8
4.29	8.5	33	6.7	8.0	4.6	25.8
5.72	8.5	33	6.7	7.8	4.3	25.8
7.63	8.5	34	6.6	7.5	4.2	25.8
10.17	8.2	35	6.5	7.3	4.8	25.8
Meter ID	M15-3			M15-3		T-17-1

Effluent Concentration (%)	Exposure Period 3					
	Sun, Apr 30			Mon, May 1		
	pH	S	DO	pH	DO	T
Dilution	8.2	32	6.9	8.1	5.0	25.5
3.22	8.3	32	6.8	8.0	4.9	25.5
4.29	8.3	33	6.7	7.9	4.6	25.5
5.72	8.4	32	6.6	7.6	4.0	25.5
7.63	8.4	33	6.6	7.4	4.1	25.5
10.17	7.2	33	6.4	7.2	4.9	25.5
Meter ID	M15-3			M15-3		T-17-1

Effluent Concentration (%)	Exposure Period 4					
	Mon, May 1			Tue, May 2		
	pH	S	DO	pH	DO	T
Dilution	8.1	32	7.1	7.9	4.7	26.4
3.22	8.2	33	6.9	7.9	4.1	26.4
4.29	8.3	31	6.9	7.8	4.1	26.4
5.72	8.3	33	6.8	7.6	4.0	26.4
7.63	8.2	33	6.6	7.4	4.1	26.4
10.17	7.9	35	6.4	7.2	4.2	26.4
Meter ID	M15-3			M15-3		T-17-1

CJT 9/1/17

Effluent Concentration (%)	Exposure Period 5					
	Tue, May 2			Wed, May 3		
	pH	S	DO	pH	DO	T
Dilution	8.0	33	6.7	8.1	4.4	25.3
3.22	8.2	33	6.8	7.9	4.3	25.3
4.29	8.2	33	6.7	7.8	4.3	25.3
5.72	8.3	33	6.7	7.6	4.0	25.3
7.63	8.3	33	6.5	7.5	4.5	25.3
10.17	8.0	36	6.2	7.4	4.8	25.3
Meter ID	M15-1			M15-1		T17-1

Effluent Concentration (%)	Exposure Period 6					
	Wed, May 3			Thu, May 4		
	pH	S	DO	pH	DO	T
Dilution	8.1	32	7.1	8.1	4.2	25.6
3.22	8.3	33	6.8	7.9	4.1	25.6
4.29	8.3	33	6.7	7.9	4.5	25.6
5.72	8.4	33	6.8	7.7	4.2	25.6
7.63	8.3	33	6.5	7.4	4.3	25.6
10.17	7.9	34	6.1			
Meter ID	M15-1			M15-1		T-17-1

Effluent Concentration (%)	Exposure Period 7					
	Thu, May 4			Fri, May 5		
	pH	S	DO	pH	DO	T
Dilution	8.2	32	7.1	7.6	4.1	25.5
3.22	8.3	33	6.9	7.8	4.1	25.5
4.29	8.4	32	6.7	7.7	4.0	25.5
5.72	8.4	32	6.6	7.5	4.0	25.5
7.63	8.4	32	6.4	7.4	4.4	25.5
10.17						
Meter ID	M15-1			M15-1		T-17-1

DO = Dissolved Oxygen (mg/L O_2) pH = pH (SU) S = Salinity (ppt) T = Temperature (°C)

Test ID No.: 17042705

Test Preparation Documentation

Client: LOOP - INVESTIGATIVE

Outfall: 004

Test ID: 17042705

Site-spec. Instruct.: Due to the high salinity of the effluent (brine @ 315 ppt), the dilution water is prepared at a salinity gradient to maintain a constant salinity in the final test solution. The final target salinity is 31ppt.

Note: All volumes are expressed in milliliters (mL)

Both Species

Final Volume (mL) =			3,800
Conc.(%)	Effluent	DI	ASSW (31)
Dilution	0	0	3,800
3.22	122	1,118	2,560
4.29	163	1,493	2,144
5.72	217	1,988	1,595
7.63	290	2,648	862
10.17	386	3,414	0
Total/Day	1,178	10,661	10,961

Critical Dilution:	7.63 volume percent
Initiation Date:	Fri, April 28, 2017
WQ Parameter Vol:	100 mL

Expiration Time Determination / Initial Parameters

Effluent No.	1
Sample ID	17042705
Collection Date	4-27-17
Collection Time	1230
Exp. Date - Initial Use	4-29-17
Exp. Time - Initial Use	0030
Exp. Date - Renewal	N/A
Exp. Time - Renewal	N/A
pH (SU)	6.7
Salinity (ppt)	284
D.O. (mg/L O2)	1.2
Meter ID	M15.3
TRC (mg/L Cl2)	0.1
Date	4.27.17
Time	1642
Technician	FMW

Client: LOOP - INVESTIGATIVE Outfall: 004 Test ID: 17042705

Test Preparation Documentation for the Beginning of 24-Hour Exposure Period

Exposure Period	1		2		3		4	
Preparation Day	Fri		Sat		Sun		Mon	
Preparation Date	4-28-17		4-29-17		4-30-17		5-1-17	
Preparation Time	1115		0920		0930		0850	
Effluent No.	1		1		1		1	
Technician	CST	Meter ID	RMW	Meter ID	RMW	Meter ID	RMW	Meter ID
Beg. Eff. DO (% Sat)	40	MIS-3	41.0	MIS-3	32	MIS-1	39	MIS 1
Aerated (Y/N)	Y		Y		Y		Y	
Post Aer DO (% Sat) (A)	67	MIS3	74	MIS-1	69	MIS-3	68	MIS-1
Synthetic Water Batch	2525		2525		2525		2526 5 5-2-17	

Evening DO (mg/L)				
Technician/ Meter ID	/	/	/	/

Exposure Period	5		6		7	
Preparation Day	Tue		Wed		Thu	
Preparation Date	5-2-17		5-3-17		5-4-17	
Preparation Time	1000		1045		1045	
Effluent No.	1		1		1	
Technician	JRH	Meter ID	JRH	Meter ID	JRH	Meter ID
Beg. Eff. DO (% Sat)	46	MIS-1	51	MIS-3	61	MIS-3
Aerated (Y/N)	Y		Y		Y	
Post Aer DO (% Sat) (A)	68	MIS-1	67	MIS-3	73 [B]	MIS-1
Synthetic Water Batch	2526 5 JRH 5-2-17		2525		2526 5 CST 5-4-17	

Evening DO (mg/L)			
Technician/ Meter ID	/	/	/

(A) Sample was aerated for maximum 15 minutes. CST 4/28/17

[B] Sample was aerated for maximum 15 minutes. CST 5/4/17.

4-29-17 JRH
4-30-17 JRH
5-1-17 JRH
5-2-17 JRH
5-3-17 JRH

CK Associates

Initial Water Quality Data

Synthetic Water, Receiving Water and Effluent Samples

Client: LOOP - INVESTIGATIVE

Outfall: 004

Test ID: 17042705

Synthetic Water

	Batch	Batch
Parameter	2525	~~2526~~
Dissolved Oxygen (mg/L O_2)	6.1	~~6.7~~
pH (SU)	8.1	~~8.2~~
Salinity (ppt)	31 (adjusted)	

JPH 5-2-17

Effluent

	Sample ID
Parameter	17042705
Ammonia (mg/L NH3)	1.14

CK ASSOCIATES Environmental Consultants

Pipettor Usage Documentation for Chronic Toxicity Tests

Test ID: 17042705

Pipettor ID: P-15-1

Concentration	Exposure Period						
	1	2	3	4	5	6	7
Lab Control	N/A						
Dilution	N/A						
1	CJT	RMW	RMW	RMW	JRH	JRH	JRH
2	↓	↓	↓	↓	↓	↓	↓
3	↓	↓	↓	↓	↓	↓	↓
4	N/A	NA	NA	NA	NA	N/A	N/A
5	CJT	RMW	RMW	RMW	JRH	JRH	↓

Pipettor ID: C-K 3

Concentration	Exposure Period						
	1	2	3	4	5	6	7
Lab Control	N/A						
Dilution	N/A						
1	NA	NA	NA	NA	N/A	N/A	N/A
2	↓	↓	↓	↓	↓	↓	↓
3	↓	↓	↓	↓	↓	↓	↓
4	↓	↓	↓	↓	↓	↓	↓
5	↓	↓	↓	↓	↓	↓	↓

Pipettor ID: P-14-1

Concentration	Exposure Period						
	1	2	3	4	5	6	7
Lab Control	N/A						
Dilution	N/A						
1	NA	NA	NA	NA	N/A	N/A	N/A
2	↓	↓	↓	↓	↓	↓	↓
3	↓	↓	↓	↓	↓	↓	↓
4	↓	↓	↓	↓	↓	↓	↓
5	↓	↓	↓	↓	↓	↓	↓

CK ASSOCIATES
Environmental Consultants

CHAIN OF CUSTODY AND ANALYTICAL REQUEST RECORD

CLIENT: Loop
SAMPLED BY: CLW
PROJECT NO.: Brine Pond
DATE: 4/27/17

SAMPLE IDENTIFICATION	DATE Start-End	TIME Start-End	MATRIX	NO. OF CONTAINERS	PRESERVATIVE	CHRONIC P. promelas	CHRONIC C. dubia	CHRONIC M. bahia	CHRONIC M. beryllina	ACUTE P. promelas	ACUTE C. dubia	ACUTE D. pulex	ACUTE M. bahia	ACUTE M. beryllina	Lab Use Only TEMP°C (Rec'd)	Lab Use Only C-K LAB ID
Brine	4/27/17	1230	W	(2) 5gal	Ice			✓	✓						4.2	17042705

Test ID No.: 17042705

Sample	COLOR	ODOR	SOLIDS	OTHER	C-K TEMP METER ID
	Black	Yes	No		T-17-1
Env. Conditions	WEATHER	TEMP	OTHER		

Comments:

Relinquished by: (Name) / (Signature)	Date/Time	Received by: (Name) / (Signature)	Date/Time
		Chris Weber	1230 4/27/17
Chris Weber	1455 4/27/17		
4-27-17 JRH	Date/Time JRH 4-27-17	Received by laboratory: Jed Hoover	4-27-17 1600

Method of Shipment: C-K

Condition of samples upon receipt at laboratory: On ice

ISCO ID: NA