CK ASSOCIATES
Environmental Consultants

17170 PERKINS ROAD
BATON ROUGE, LA 70810
PHONE (225) 755-1000
FAX (225) 751-2010
www.c-ka.com

HOUSTON, TX
PHONE (281) 397-9016
FAX (281) 397-6637

LAKE CHARLES, LA
PHONE (337)625-6577
FAX (337)625-6580

SHREVEPORT, LA
PHONE (318) 797-8636
FAX (318) 798-0478

LELAP Certification Number 02080

March 4, 2016

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: 11866
Test ID No.: 16020401

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
Quality Assurance Manager

MSE/hbb

Enc.: Toxicity Test Report

Issue Date: March 7, 2016

BRINE TOXICITY TEST REPORT

FOR

LOOP, LLC

DRAFT PERMIT NO.: LA0049492

AI NO.: 4634

TEST INITIATION DATE: February 4, 2016

TEST IDENTIFICATION NO.: 16020401

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.

3.7.16
Date
Gus Zieske
Laboratory Director

Monica S. Eues 3.4.16
Date
Monica S. Eues
Quality Assurance Manager

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.:	16020401	Dilution Water:	Synthetic Laboratory Water
Concentrations:	3.22, 4.29, 5.72, 7.63, and 10.17%		
Sample Dates:	February 3, 2016		
Test Initiation Date:	February 4, 2016		
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:	4.29%
	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 February 3, 2016, and was received by CK Associates on February 3, 2016. 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	100	0.27
3.22	100	0.28
4.29	90	0.26
5.72	70	0.14
7.63	0	0.00
10.17	0	0.00

The dilution control met performance criteria for survival, growth and variability. Based on the statistical analysis (pages 5 through 7) the survival and growth NOECs of the LOOP, LLC Outfall 004 Brine were 4.29% and 4.29%, respectively. The IC_{25} was 4.9%. Detailed data for the test, including survival, growth and water quality, are presented on pages 13 through 16 and 21 through 24.

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	100	1.63
3.22	98	1.63
4.29	100	1.67
5.72	98	1.61
7.63	96	1.58
10.17	0	0.00

The dilution control met performance criteria for survival, growth and variability. Based on the statistical analysis (pages 8 through 10) the survival and growth NOECs of the LOOP, LLC Outfall 004 Brine were 7.63% and 7.63%, respectively. The IC_{25} was 8.2%. Detailed data for the test, including survival, growth and water quality, are presented on pages 17 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 11 and 12).

-7 Day Survival

Start Date:	2/4/2016	Test ID:	16020401A	Sample ID:	LOOP
End Date:	2/11/2016	Lab ID:	16020401	Sample Type:	Outfall: 004
Sample Date:	2/3/2016	Protocol:	EPAMW02-EPA/821/R-02-01	Test Species:	MY-Mysidopsis bahia

Comments:

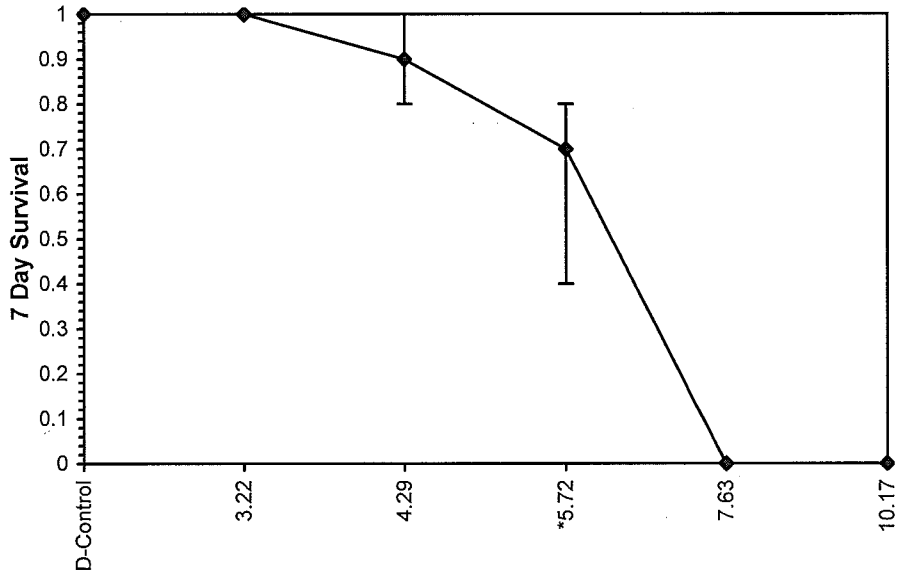
Conc-%	1	2	3	4	5	6	7	8
D-Control	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
3.22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4.29	0.80	0.80	1.00	0.80	1.00	1.00	1.00	0.80
5.72	0.80	0.80	0.80	0.60	0.40	0.60	0.80	0.80
7.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	1.00	1.0000	1.3453	1.3453	1.3453	0	8		
3.22	1.00	1.0000	1.3453	1.3453	1.3453	0	8	68.00	48.00
4.29	0.90	0.9000	1.2262	1.1071	1.3453	10	8	52.00	48.00
*5.72	0.70	0.7000	0.9991	0.6847	1.1071	16	8	36.00	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)	0.83338	0.904	-1.0184	1.99744
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	4.29	5.72	4.95367	23.31
Treatments vs D-Control				

Dose-Response Plot



-Growth-Weight

Start Date:	2/4/2016	Test ID:	16020401A	Sample ID:	LOOP
End Date:	2/11/2016	Lab ID:	16020401	Sample Type:	Outfall: 004
Sample Date:	2/3/2016	Protocol:	EPAMW02-EPA/821/R-02-01	Test Species:	MY-Mysidopsis bahia
Comments:					

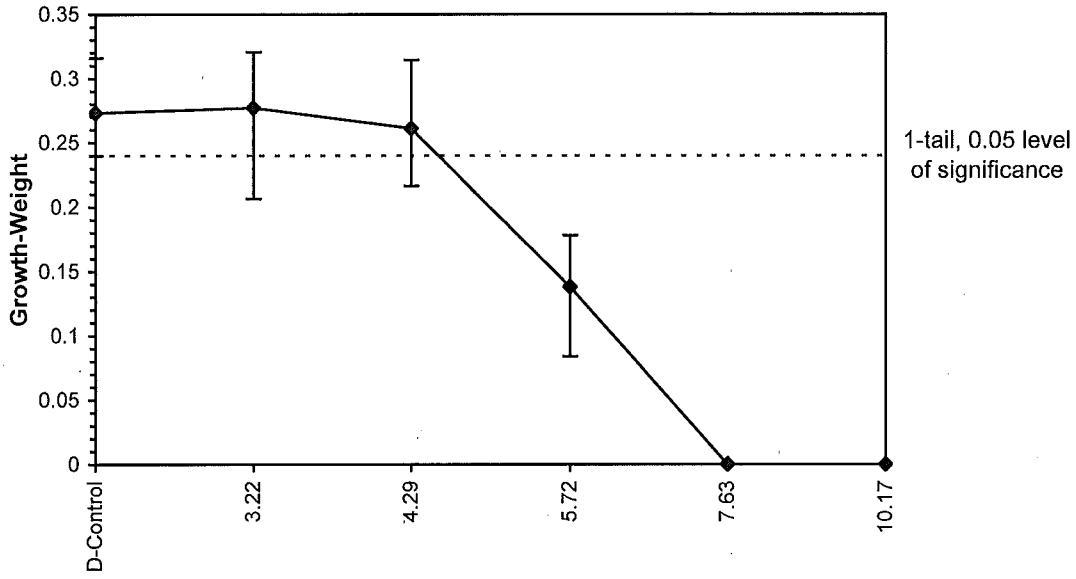
Conc-%	1	2	3	4	5	6	7	8
D-Control	0.24	0.27	0.31	0.29	0.27	0.24	0.24	0.32
3.22	0.32	0.29	0.26	0.29	0.27	0.21	0.28	0.30
4.29	0.22	0.23	0.25	0.28	0.27	0.31	0.30	0.23
5.72	0.16	0.18	0.16	0.13	0.08	0.09	0.13	0.17
7.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	0.27	1.0000	0.2730	0.2400	0.3160	11	8			
3.22	0.28	1.0128	0.2765	0.2060	0.3200	12	8	-0.213	2.024	0.0333
4.29	0.26	0.9542	0.2605	0.2160	0.3140	13	8	0.759	2.024	0.0333
5.72	0.14	0.5055	0.1380	0.0840	0.1780	25	8			
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)	0.97198	0.884	-0.2362	-0.3862
Bartlett's Test indicates equal variances (p = 0.96)	0.08307	9.21034		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	4.29	>4.29		23.31	0.03332	0.12207	0.00057	0.00108	0.60075	2, 21
Treatments vs D-Control										

Dose-Response Plot



-Growth-Weight

Start Date:	2/4/2016	Test ID:	16020401A	Sample ID:	LOOP
End Date:	2/11/2016	Lab ID:	16020401	Sample Type:	Outfall: 004
Sample Date:	2/3/2016	Protocol:	EPAMW02-EPA/821/R-02-01	Test Species:	MY-Mysidopsis bahia
Comments:					

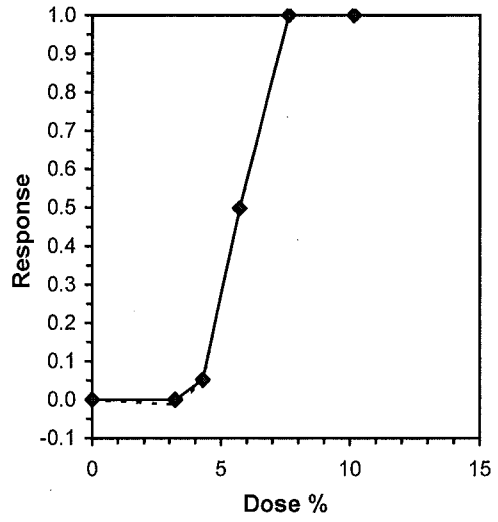
Conc-%	1	2	3	4	5	6	7	8
D-Control	0.24	0.27	0.31	0.29	0.27	0.24	0.24	0.32
3.22	0.32	0.29	0.26	0.29	0.27	0.21	0.28	0.30
4.29	0.22	0.23	0.25	0.28	0.27	0.31	0.30	0.23
5.72	0.16	0.18	0.16	0.13	0.08	0.09	0.13	0.17
7.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			Transform: Untransformed					Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	0.27	1.0000	0.2730	0.2400	0.3160	11	8	0.2748	1.0000
3.22	0.28	1.0128	0.2765	0.2060	0.3200	12	8	0.2748	1.0000
4.29	0.26	0.9542	0.2605	0.2160	0.3140	13	8	0.2605	0.9481
5.72	0.14	0.5055	0.1380	0.0840	0.1780	25	8	0.1380	0.5023
7.63	0.00	0.0000	0.0000	0.0000	0.0000	0	8	0.0000	0.0000
10.17	0.00	0.0000	0.0000	0.0000	0.0000	0	8	0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96791	0.904	-0.3158	-0.632
Bartlett's Test indicates equal variances (p = 0.99)	0.10383	11.3449		

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL		Skew
IC05	4.2515	0.7283	1.7823	4.4436	-1.7071
IC10	4.4444	0.3404	3.4043	4.5972	-2.8985
IC15	4.6047	0.1583	4.1362	4.7508	-1.6667
IC20	4.7651	0.1274	4.4483	4.9254	-0.7602
IC25	4.9255	0.1203	4.6136	5.0851	-0.5883
IC40	5.4066	0.1228	5.1676	5.6482	0.0876
IC50	5.7287	0.1348	5.4816	5.9900	0.0248



Larval Fish-7 Day Survival

Start Date:	2/4/2016	Test ID:	16020401M	Sample ID:	LOOP
End Date:	2/11/2016	Lab ID:	16020401	Sample Type:	Outfall: 004
Sample Date:	2/3/2016	Protocol:	EPAMW02-EPA/821/R-02-01	Test Species:	MB-Menidia beryllina
Comments:					

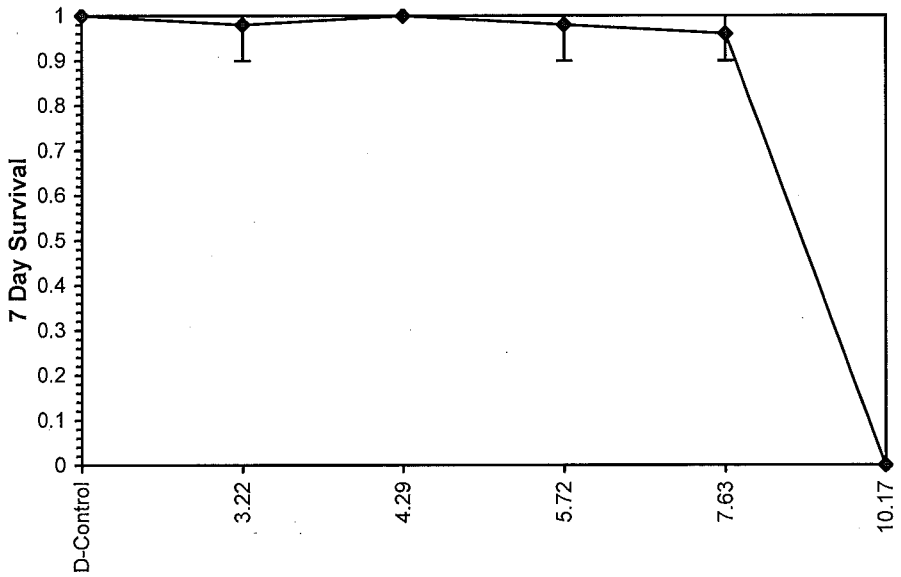
Conc-%	1	2	3	4	5
D-Control	1.00	1.00	1.00	1.00	1.00
3.22	1.00	1.00	0.90	1.00	1.00
4.29	1.00	1.00	1.00	1.00	1.00
5.72	0.90	1.00	1.00	1.00	1.00
7.63	1.00	1.00	0.90	1.00	0.90
10.17	0.00	0.00	0.00	0.00	0.00

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
D-Control	1.00	1.0000	1.4120	1.4120	1.4120	0	5		
3.22	0.98	0.9800	1.3794	1.2490	1.4120	5	5	25.00	17.00
4.29	1.00	1.0000	1.4120	1.4120	1.4120	0	5	27.50	17.00
5.72	0.98	0.9800	1.3794	1.2490	1.4120	5	5	25.00	17.00
7.63	0.96	0.9600	1.3468	1.2490	1.4120	7	5	22.50	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)	0.78117	0.888	-1.3638	1.17803
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:	2/4/2016	Test ID:	16020401M	Sample ID:	LOOP
End Date:	2/11/2016	Lab ID:	16020401	Sample Type:	Outfall: 004
Sample Date:	2/3/2016	Protocol:	EPAMW02-EPA/821/R-02-01	Test Species:	MB-Menidia beryllina
Comments:					

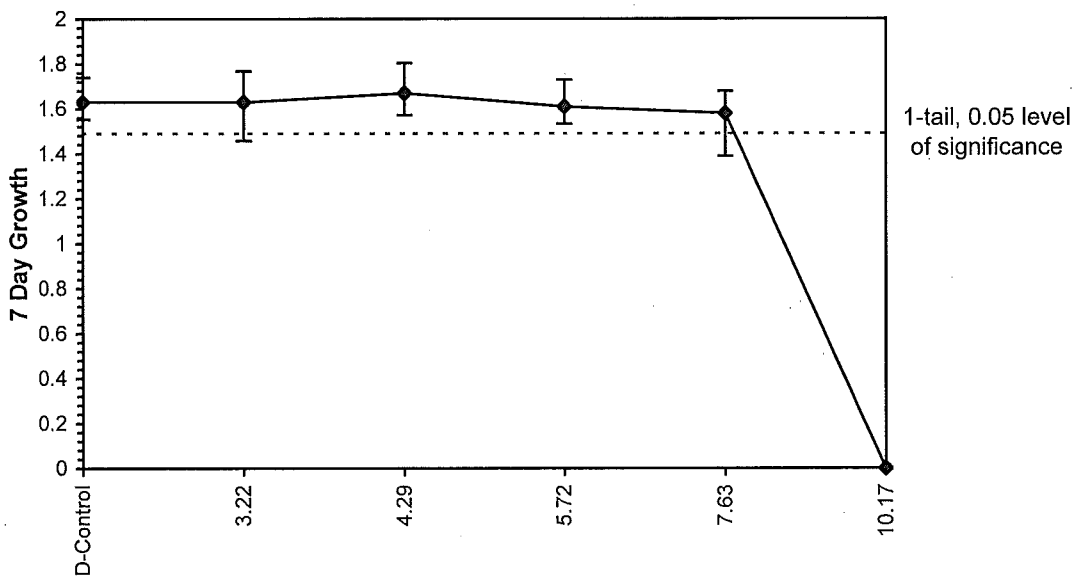
Conc-%	1	2	3	4	5
D-Control	1.61	1.60	1.56	1.66	1.74
3.22	1.70	1.61	1.63	1.77	1.46
4.29	1.71	1.58	1.64	1.81	1.64
5.72	1.53	1.59	1.58	1.62	1.73
7.63	1.67	1.65	1.55	1.62	1.39
10.17	0.00	0.00	0.00	0.00	0.00

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	1.63	1.0000	1.6322	1.5550	1.7420	4	5			
3.22	1.63	1.0012	1.6342	1.4610	1.7720	7	5	-0.033	2.300	0.1389
4.29	1.67	1.0256	1.6740	1.5760	1.8080	5	5	-0.692	2.300	0.1389
5.72	1.61	0.9855	1.6086	1.5310	1.7290	5	5	0.391	2.300	0.1389
7.63	1.58	0.9658	1.5764	1.3860	1.6740	7	5	0.924	2.300	0.1389
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)	0.95412	0.888	-0.2926	-0.1054
Bartlett's Test indicates equal variances (p = 0.81)	1.61048	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	0.13894	0.08513	0.00646	0.00912	0.59584	4, 20

Dose-Response Plot



Larval Fish-7 Day Growth

Start Date:	2/4/2016	Test ID:	16020401M	Sample ID:	LOOP
End Date:	2/11/2016	Lab ID:	16020401	Sample Type:	Outfall: 004
Sample Date:	2/3/2016	Protocol:	EPAMW02-EPA/821/R-02-01	Test Species:	MB-Menidia beryllina
Comments:					

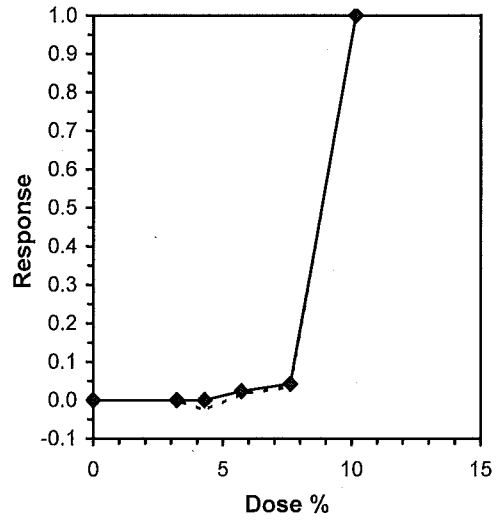
Conc-%	1	2	3	4	5
D-Control	1.61	1.60	1.56	1.66	1.74
3.22	1.70	1.61	1.63	1.77	1.46
4.29	1.71	1.58	1.64	1.81	1.64
5.72	1.53	1.59	1.58	1.62	1.73
7.63	1.67	1.65	1.55	1.62	1.39
10.17	0.00	0.00	0.00	0.00	0.00

			Transform: Untransformed					Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	1.63	1.0000	1.6322	1.5550	1.7420	4	5	1.6468	1.0000
3.22	1.63	1.0012	1.6342	1.4610	1.7720	7	5	1.6468	1.0000
4.29	1.67	1.0256	1.6740	1.5760	1.8080	5	5	1.6468	1.0000
5.72	1.61	0.9855	1.6086	1.5310	1.7290	5	5	1.6086	0.9768
7.63	1.58	0.9658	1.5764	1.3860	1.6740	7	5	1.5764	0.9573
10.17	0.00	0.0000	0.0000	0.0000	0.0000	0	5	0.0000	0.0000

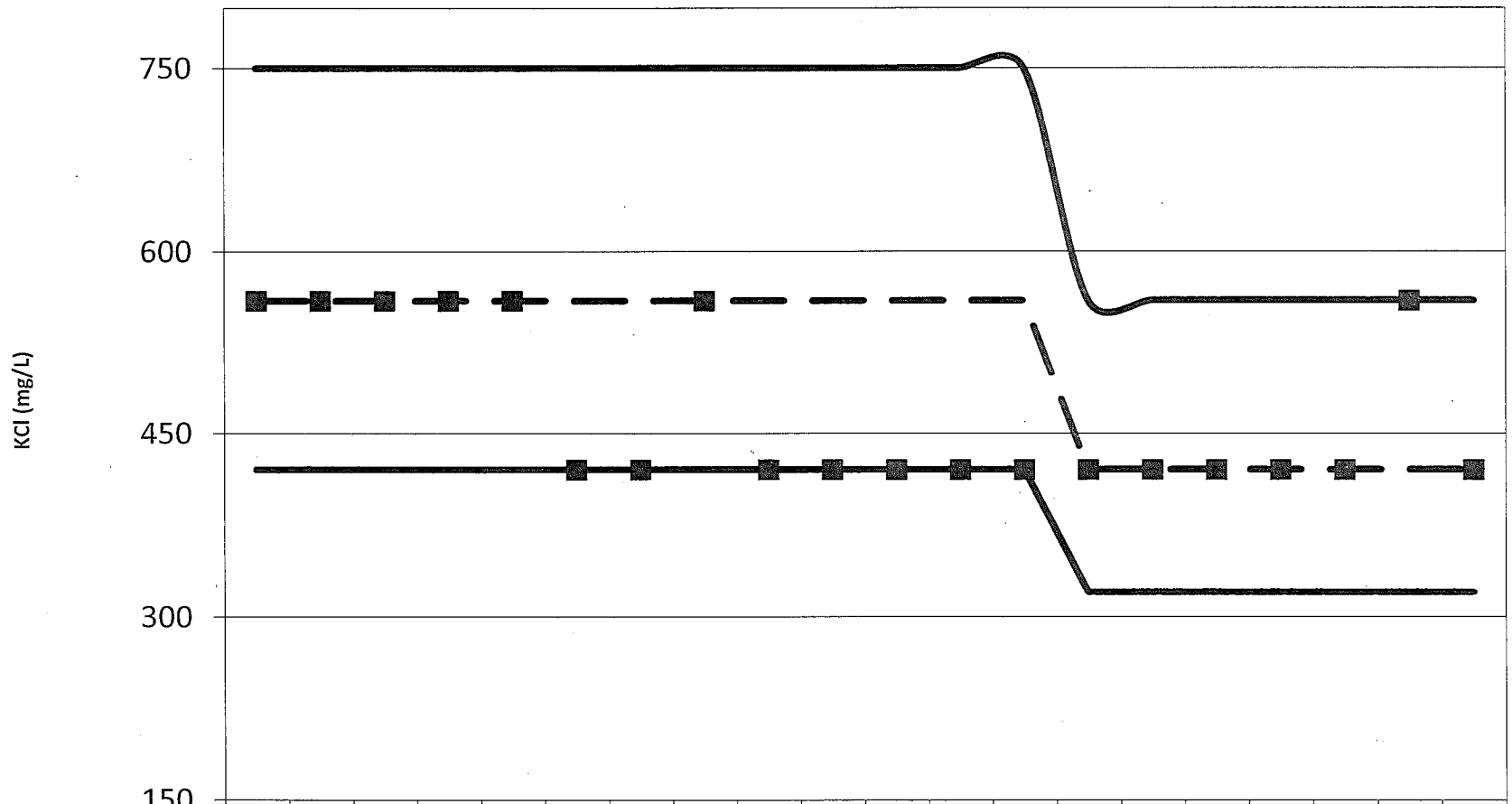
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.95412	0.888	-0.2926	-0.1054
Bartlett's Test indicates equal variances (p = 0.81)	1.61048	13.2767		

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)		Skew
IC05	7.6492	0.8654	3.7793	7.8109	-1.0535
IC10	7.7819	0.1324	7.0636	7.9350	-3.0296
IC15	7.9146	0.0719	7.6484	8.0592	-0.5386
IC20	8.0473	0.0676	7.7967	8.1834	-0.5386
IC25	8.1799	0.0634	7.9450	8.3075	-0.5386
IC40	8.5779	0.0507	8.3900	8.6800	-0.5386
IC50	8.8433	0.0423	8.6867	8.9284	-0.5386



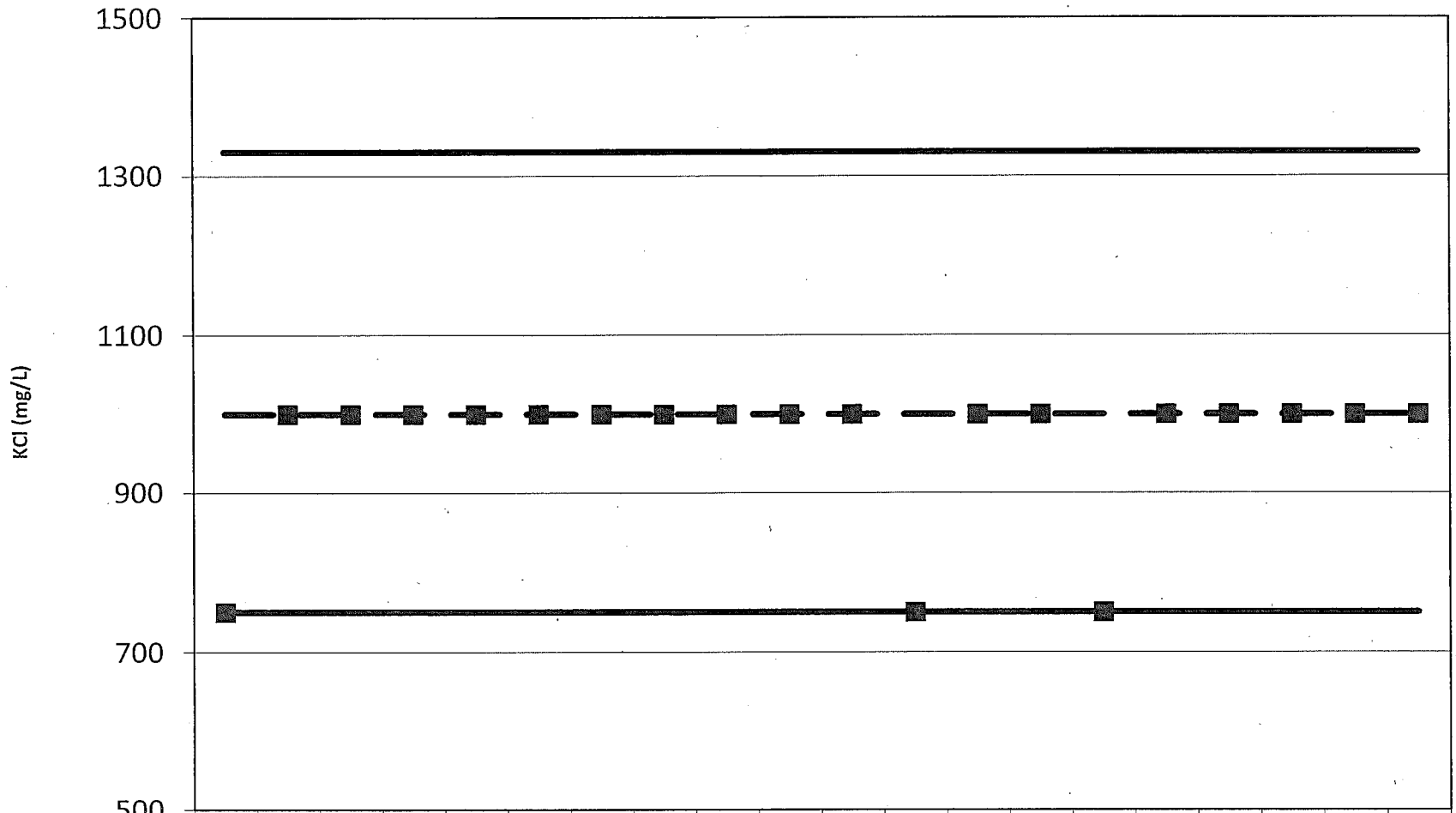
CK Associates
Potassium Chloride Reference Toxicant Control Chart
7-Day Chronic Survival NOEC for *Mysidopsis bahia*



	140623 02	140729 03	140811 07	140903 08	141020 01	141117 03	141215 03	150123 03	150223 03	150323 03	150413 03	150526 07	150630 03	150720 01	150803 01	150908 03	151012 02	151109 03	151228 03	160118 03
Survival NOEC	560	560	560	560	560	420	420	560	420	420	420	420	420	420	420	420	420	420	560	420
Central Tendency NOEC	560	560	560	560	560	560	560	560	560	560	560	560	560	420	420	420	420	420	420	420
Upper Acceptable NOEC	750	750	750	750	750	750	750	750	750	750	750	750	750	560	560	560	560	560	560	560
Lower Acceptable NOEC	420	420	420	420	420	420	420	420	420	420	420	420	420	320	320	320	320	320	320	320

Test ID No.: 16020401

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



	14072406	14081108	14090307	14102002	14111704	14121504	15012304	15022304	15032304	15041501	15051101	15061501	15072002	15080302	15090804	15092306	15101201	15110902	15122804	16011804
Survival NOEC	750	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	750	1000	1000	750	1000	1000	1000	1000	1000
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.: 16020401

Test ID No.: 16020401

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

Mysidopsis bahia

Client: LOOP - INVESTIGATIVE
Outfall: 004
Test ID: 16020401

CD(%) 7.63
Organism Age: 7d.o.
Organism Batch: 9379

Template: 8A-B
QC Review: 662

Exposure Period	Test Initiation	Observations Made at the End of 24-Hour Exposure Period:						
		1	2	3	4	5	6	7
Day	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu
Date	2/4/16	2-5-16	2-6-16	2-7-16	2/8/16	2-9-16	2/10/16	2/11/16
Time	1545	1500	1030	1120	1000	1100	1245	1450
Technician	OJT / RMW	RMW	CLW	CLW	KCS	CLW	OJT	KCS

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	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
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	4	4	4	4	4
	2	5	5	4	4	4	[A] 4	4	4
	3	5	5	5	5	5	5	5	5
	4	5	5	4	4	4	4	4	4
	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	4	4

Test ID No.: 16020401

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

Mysidopsis bahia

Client: LOOP - INVESTIGATIVE | Outfall: 004 | Test ID: 16020401

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

Effluent Conc. (%)	Rep	Number of Live Organisms							
5.72	1	5	5	5	5	4	4	4	4
	2	5	5	5	5	4	4	4	4
	3	5	5	5	5	4	4	4	4
	4	5	5	5	4	4	4	3	3
	5	5	5	5	4	4	4	2	2
	6	5	5	~~3~~ 4	~~3~~ 4	4	4	3	3
	7	5	5	5	5	5	5	4	4
	8	5	5	5	4	4	4	4	4
				KCS 2/8/16	KCS 2/8/16				
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						

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

Mysidopsis bahia

Client: LOOP - INVESTIGATIVE | Outfall: 004 | Test ID: 16020401

Feeding Documentation for 24-Hour Exposure Period:								
Exposure Period	1		2		3		4	
Day	Thu	Fri	Fri	Sat	Sat	Sun	Sun	Mon
Date	2-4-16	2-5-16	2-5-16	2-6-16	2-6-16	2-7-16	2/7/16	2/8/16
Time	1645	0830	1600	0830	1245	0905	1315	0815
Technician	RMW	MAM	RMW	CLW	CLW	CLW	KCS	KCS

Exposure Period	5		6		7
Day	Mon	Tue	Tue	Wed	Wed
Date	2-8-16	2-9-16	2/9/16	2/10/16	2/10/16
Time	1620	0830	1015	0830	1515
Technician	RMW	CLW	CLW	CJT	KCS

Technician's Observations			
Date	Time	Initials	Observations
2-9-16	1115	CLW	Tech spilt cup, all mysid were recovered
2/11/16	1515	KCS	Foils placed in Oven B

Test was / was not aerated following test initiation.

Continuous aeration was started on _____ at _____

Test ID No.: 16020401

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

Mysidopsis bahia

Client: LOOP - INVESTIGATIVE Outfall: 004 Test ID: 16020401

Effluent Concentration (%)	Exposure Period 1					
	Thu, Feb 4			Fri, Feb 5		
	pH	S	DO	pH	DO	T
Dilution	7.7	29	6.4	7.6	5.6	26.4
3.220	7.7	29	6.3	7.7	5.4	26.4
4.29	7.6	29	6.3	7.6	5.4	26.4
5.72	7.6	29	6.1	7.6	5.7	26.4
7.63	7.6	29	6.0	7.6	5.8	26.4
10.17	7.6	30	6.0	7.6	5.9	26.4
Meter ID	M15-~~3~~1			M15-1		T15-1

CJT 2/4/10

Effluent Concentration (%)	Exposure Period 2					
	Fri, Feb 5			Sat, Feb 6		
	pH	S	DO	pH	DO	T
Dilution	7.8	29	6.8	7.9	5.9	25.1
3.220	8.0	29	6.9	7.7	6.6	25.1
4.29	8.0	29	6.4	7.6	6.0	25.1
5.72	8.0	29	6.3	7.5	6.2	25.1
7.63	8.0	29	6.3	—	—	—
10.17	8.0	29	6.1	—	—	—
Meter ID	M15-1			M15-3		T15-1

Effluent Concentration (%)	Exposure Period 3					
	Sat, Feb 6			Sun, Feb 7		
	pH	S	DO	pH	DO	T
Dilution	8.1	30	7.3	8.0	6.3	25.7
3.22	8.2	30	7.2	7.8	6.0	25.7
4.29	8.2	29	7.0	7.8	6.1	25.7
5.72	8.2	29	7.1	7.6	6.1	25.7
7.63	8.2	29	6.8	—	—	—
10.17	7.7	30	6.7	—	—	—
Meter ID	M15-3			M15-3		T15-1

Effluent Concentration (%)	Exposure Period 4					
	Sun, Feb 7			Mon, Feb 8		
	pH	S	DO	pH	DO	T
Dilution	8.1	30	8.2	7.9	5.5	25.4
3.22	8.1	30	6.9	7.8	5.6	25.4
4.29	8.2	30	6.8	7.7	5.5	25.4
5.72	8.2	30	6.6	7.7	5.6	25.4
7.63	8.1	30	6.6	—	—	~~25.4~~
10.17	7.7	30	6.4	—	—	~~25.4~~
Meter ID	M15-3			M15-1		T-15-1

KS 2/8/10

Effluent Concentration (%)	Exposure Period 5					
	Mon, Feb 8			Tue, Feb 9		
	pH	S	DO	pH	DO	T
Dilution	8.0	30	6.7	7.9	5.9	25.4
3.22	8.1	30	6.5	7.8	6.0	25.4
4.29	8.1	29	6.3	7.7	6.2	25.4
5.72	8.1	29	6.2	7.6	6.2	25.4
7.63	8.1	29	6.2	—	—	—
10.17	8.2	30	6.0	—	—	—
Meter ID	M15-1			M15-3		T15-1

Effluent Concentration (%)	Exposure Period 6					
	Tue, Feb 9			Wed, Feb 10		
	pH	S	DO	pH	DO	T
Dilution	8.2	30	7.1	8.1	5.8	25.4
3.22	8.2	30	7.1	7.9	5.9	25.4
4.29	8.2	30	7.0	7.8	5.8	25.4
5.72	8.2	30	7.0	7.7	5.7	25.4
7.63	—	—	—	—	—	—
10.17	—	—	—	—	—	—
Meter ID	M15-3			M15-3		T15-1

Effluent Concentration (%)	Exposure Period 7					
	Wed, Feb 10			Thu, Feb 11		
	pH	S	DO	pH	DO	T
Dilution	8.1	30	7.1	8.0	6.1	25.4
3.2200	8.2	30	7.0	7.9	6.1	25.4
4.29	8.2	30	6.9	7.9	6.2	25.4
5.72	8.3	29	6.9	7.8	6.0	25.4
7.63	—	—	—	—	—	—
10.17	—	—	—	—	—	—
Meter ID	M15-3			M15-3		T-15-1

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

Test ID No.: 16020401

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

Menidia beryllina

Client: LOOP - INVESTIGATIVE
Outfall: 004
Test ID: 16020401

CD(%) 7.63
Organism Age: 11d.o.
Organism Batch: 8077

Template: 24A-C
QC Review: 662

Exposure Period	Test Initiation	Observations Made at the End of 24-Hour Exposure Period:						
		1	2	3	4	5	6	7
Day	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu
Date	2/4/16	2-5-16	2-6-16	2-7-16	2/8/16	2-9-16	2/10/16	2/11/16
Time	1530	1535	1030	1120	1000	1100	1245	1520
Technician	CJT RMW	RMW	CLW	CLW	KCS	CLW	CJT	KCS

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

Test ID No.: 16020401

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

Menidia beryllina

Client: LOOP - INVESTIGATIVE | Outfall: 004 | Test ID: 16020401

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

Effluent Conc. (%)	Rep	Number of Live Organisms							
10.17	1	10	10	10	3	1	0	0	0
	2	10	10	10	5	2	1	0	0
	3	10	9	8	3	0	0	0	0
	4	10	10	9	2	0	0	0	0
	5	10	10	8	6	0	0	0	0

Test ID No.: 16020401

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

Menidia beryllina

Client: LOOP - INVESTIGATIVE | Outfall: 004 | Test ID: 16020401

Feeding Documentation for 24-Hour Exposure Period:								
Exposure Period	1		2		3		4	
Day	Thu	Fri	Fri	Sat	Sat	Sun	Sun	Mon
Date	2-4-16	2-5-16	2-5-16	2-6-16	2-6-16	2-7-16	2/7/16	2/8/16
Time	1645	0830	1600	0830	1245	0905	1315	0815
Technician	RMW	MAM	RMW	CLW	CLW	CLW	KCS	KCS

Exposure Period	5		6		7
Day	Mon	Tue	Tue	Wed	Wed
Date	2-8-16	2-9-16	2/9/16	2/10/16	2/10/16
Time	1620	0830	1615	0830	1515
Technician	RMW	CLW	CLW	CJT	KCS

Technician's Observations			
Date	Time	Initials	Observations
2/5/16	0700	CJTZ/ KCS	DO Checked in AM - 5.3 mg/L
2-6/16	0810	CLW	AM DO Check = 5.3 mg/L
2/7/16	0820	KCS	AM DO Check = 4.8 mg/L
2/11/16	1605	KCS	Foils placed in Oven B

Test was / was not aerated following test initiation.

Continuous aeration was started on _____ at _____

Test ID No.: 16020401

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

Client: LOOP - INVESTIGATIVE Outfall: 004 Test ID: 16020401

Effluent Concentration (%)	Exposure Period 1					
	Thu, Feb 4			Fri, Feb 5		
	pH	S	DO	pH	DO	T
Dilution	7.7	29	6.4	7.6	5.2	26.4
3.22	7.7	29	6.3	7.7	5.1	26.4
4.29	7.6	29	6.3	7.6	4.8	26.4
5.72	7.6	29	6.1	7.6	4.9	26.4
7.63	7.6	29	6.0	7.5	4.5	26.4
10.17	7.6	30	6.0	7.6	4.6	26.4
Meter ID	M15-1			M15-1		T15-1

Effluent Concentration (%)	Exposure Period 2					
	Fri, Feb 5			Sat, Feb 6		
	pH	S	DO	pH	DO	T
Dilution	7.8	29	6.8	7.9	5.6	25.1
3.22	8.0	29	6.9	7.8	5.7	25.1
4.29	8.0	29	6.4	7.7	5.7	25.1
5.72	8.0	29	6.3	7.6	5.9	25.1
7.63	8.0	29	6.3	7.3	5.2	25.1
10.17	8.0	29	6.1	7.1	5.3	25.1
Meter ID	M15-1			M15-3		T15-1

Effluent Concentration (%)	Exposure Period 3					
	Sat, Feb 6			Sun, Feb 7		
	pH	S	DO	pH	DO	T
Dilution	8.1	30	7.3	7.9	5.5	25.7
3.22	8.2	30	7.2	7.7	5.1	25.7
4.29	8.2	29	7.0	7.6	5.3	25.7
5.72	8.2	29	7.1	7.4	5.0	25.7
7.63	8.2	29	6.8	7.3	4.9	25.7
10.17	7.7	30	6.7	7.1	5.0	25.7
Meter ID	M15-3			M15-3		T15-1

CW 2-6-16

Effluent Concentration (%)	Exposure Period 4					
	Sun, Feb 7			Mon, Feb 8		
	pH	S	DO	pH	DO	T
Dilution	8.1	30	8.2	7.7	5.0	25.4
3.22	8.1	30	6.9	7.7	4.6	25.4
4.29	8.2	30	6.8	7.7	4.9	25.4
5.72	8.2	30	6.6	7.6	4.2	25.4
7.63	8.1	30	6.6	7.5	4.3	25.4
10.17	7.7	30	6.4	7.6	4.4	25.4
Meter ID	M15-3			M15-1		T15-1

Effluent Concentration (%)	Exposure Period 5					
	Mon, Feb 8			Tue, Feb 9		
	pH	S	DO	pH	DO	T
Dilution	8.0	30	6.7	7.9	5.7	25.4
3.22	8.1	30	6.5	7.7	5.7	25.4
4.29	8.1	29	6.3	7.6	5.1	25.4
5.72	8.1	29	6.2	7.4	5.0	25.4
7.63	8.1	29	6.2	7.2	4.8	25.4
10.17	8.2	30	6.0	7.2	6.1	25.4
Meter ID	M15-1			M15-3		T15-1

Effluent Concentration (%)	Exposure Period 6					
	Tue, Feb 9			Wed, Feb 10		
	pH	S	DO	pH	DO	T
Dilution	8.2	30	7.1	8.0	5.3	25.4
3.22	8.2	30	7.1	7.9	5.2	25.4
4.29	8.2	30	7.0	7.7	4.6	25.4
5.72	8.2	30	7.0	7.6	5.1	25.4
7.63	8.2	29	6.8	7.4	4.7	25.4
10.17	7.6	30	6.7	7.3	4.9	25.4
Meter ID	M15-3			M15-3		T15-1

Effluent Concentration (%)	Exposure Period 7					
	Wed, Feb 10			Thu, Feb 11		
	pH	S	DO	pH	DO	T
Dilution	8.1	30	7.1	7.8	4.7	25.4
3.22	8.2	30	7.0	7.8	4.8	25.4
4.29	8.2	30	6.9	7.7	4.2	25.4
5.72	8.3	29	6.9	7.7	4.5	25.4
7.63	8.2	29	6.6	7.6	4.4	25.4
10.17	—	—	—	—	—	—
Meter ID	M15-3			M15-1		T15-1

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

Test ID No.: 16020401

Test Preparation Documentation

Client: LOOP - INVESTIGATIVE

Outfall: 004

Test ID: 16020401

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:	Thu, February 04, 2016
WQ Parameter Vol:	100 mL

Expiration Time Determination / Initial Parameters

Effluent No.	1
Sample ID	16020401
Collection Date	2.3.16
Collection Time	1420
Exp. Date - Initial Use	2.5.16
Exp. Time - Initial Use	0220
Exp. Date - Renewal	~~2.~~ N/A
Exp. Time - Renewal	↓
pH (SU)	6.6
Salinity (ppt)	315
D.O. (mg/L O2)	1.5
Meter ID	M15-1
TRC (mg/L Cl2)	0.03
Date	2/3/16
Time	1450
Technician	KCS

CS 2/4/16

Test ID No.: 16020401 **Test Preparation Documentation**

Client: LOOP - INVESTIGATIVE Outfall: 004 Test ID: 16020401

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

Exposure Period	1		2		3		4	
Preparation Day	Thu		Fri		Sat		Sun	
Preparation Date	2/4/16		2/5/16		2/6/16		2/7/16	
Preparation Time	1420		0925		0830		0830	
Effluent No.	1		1		1		1	
Technician	CJT	Meter ID	KCS	Meter ID	KCS	Meter ID	KCS	Meter ID
Beg. Eff. DO (% Sat)	40	M15-1	59	M15-3	71	M15-3	75	M15-3
Aerated (Y/N)	Y		Y		Y		Y	
Post Aer DO (% Sat)	72	M15-3	77	M15-3	78	M15-3	82	M15-3
Synthetic Water Batch	2472 (31ppt)		2472 (31ppt)		2472 (31ppt)		2472 (31ppt)	

A

Evening DO (mg/L)	6.0			
Technician/ Meter ID	RMW / M15-1	/	/	/

Exposure Period	5		6		7	
Preparation Day	Mon		Tue		Wed	
Preparation Date	2/8/16		2/9/16		2-10-16	
Preparation Time	0845		1015		0900	
Effluent No.	1		1		1	
Technician	KCS	Meter ID	CJT	Meter ID	RMW	Meter ID
Beg. Eff. DO (% Sat)	68	M15-1	75	M15-3	69	M15-1
Aerated (Y/N)	Y	KCS 2/8/16	Y		Y	
Post Aer DO (% Sat)	76	M15-3	87	M15-3	79	M15-1
Synthetic Water Batch	2472 (31ppt)		2473 (31ppt)		2473 (31ppt)	

A

Evening DO (mg/L)	4.6	5.2	5.5
Technician/ Meter ID	CJT / M15-1	CJT / M15-3	CJT / M15-3

(A) Sample aerated for maximum of 15 minutes. Results recorded. -CJT 2/4/16

CK Associates

Initial Water Quality Data

Synthetic Water, Receiving Water and Effluent Samples

Client: LOOP - INVESTIGATIVE

Outfall: 004

Test ID: 16020401

Synthetic Water

	Batch	Batch
Parameter	2472(31ppt)	2473(31ppt)
Dissolved Oxygen (mg/L O_2)	7.0	7.4
pH (SU)	8.0	8.3
Salinity (ppt)	31	31

Effluent

	Sample ID
Parameter	16020401
Ammonia (mg/L NH3)	4.0

CK ASSOCIATES Environmental Consultants

Pipettor Usage Documentation for Chronic Toxicity Tests

Test ID: 16020401

Pipettor ID: P-15-1

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

Pipettor ID: C-K 3

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

Investigative Test ID No.: 16020401 - LOOP Outfall 004 with SLW
2016 Brine Investigation

Monica Eues

From: Gus Zieske
Sent: Thursday, February 04, 2016 8:52 AM
To: Monica Eues
Subject: LOOP Brine Study Datapack

Importance: High

Monica,

The brine sample is at 315ppt, therefore the test dilutions must be mixed as follows;

Dilution	ASSW (31ppt)	DI	Brine (315ppt)
Control	3800	0	0
3.22%	2560	1118	122
4.29%	2144	1493	163
5.72%	1595	1988	217
7.63%	862	2648	290
10.17%	0	3414	386 - final salinity will be above target of 31ppt

Since this is non-compliance I took the liberty of minor rounding to make the mixing process easier.

Please generate final datapack so we can initiate this today.

Gus Zieske
Aquatic Toxicology Laboratory Director

CK ASSOCIATES
Environmental Consultants

17170 Perkins Road
Baton Rouge, LA 70810
225-755-1000 Office
225-923-6945 Direct
985-507-7226 Cell
www.c-ka.com

CK ASSOCIATES
Environmental Consultants

CHAIN OF CUSTODY AND ANALYTICAL REQUEST RECORD

CLIENT: Loop (Brine)
SAMPLED BY: CLW
PROJECT NO.:
DATE: 2-3-16

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	2-3-16 1420 →		W	(1) 5 gal	Ice			✓	✓						4.3	16020401

Test ID No.: 16020401

Sample	COLOR	ODOR	SOLIDS	OTHER	C-K TEMP METER ID
	Grey	Yes	NO		T-15-1

Env. Conditions	WEATHER	TEMP	OTHER

Comments:

Relinquished by:	(Name)	(Signature)	Date/Time	Received by:	(Name)	(Signature)	Date/Time
	Chris Welch	Ch Welch	1420 2-3-16				
Relinquished by:	(Name)	(Signature)	Date/Time	Received by:	(Name)	(Signature)	Date/Time
Relinquished by:	(Name)	(Signature)	Date/Time	Received by laboratory:	(Name)	(Signature)	Date/Time
					Chris Welch	Ch Welch	1650 2-3-16

Method of Shipment:	Condition of samples upon receipt at laboratory:	ISCO ID
CK	iced	N/A