Georgia-Pacific

Georgia-Pacific Crossett LLC
Consumer Products

Crossett Paper Operations
100 Mill Supply Road
P.O. Box 3333
Crossett, AR 71635
(870) 567-8000
(870) 364-9076 (fax)
www.gp.com

May 25, 2016

Mr. Richard Healey
NPDES Enforcement Section
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

Reference: Georgia-Pacific Crossett LLC
NPDES Permit # **AR0001210**

Dear Mr. Healey:

Attached are the Discharge Monitoring Reports (DMRs) for the Georgia-Pacific Crossett Paper Operations' - NPDES Permit # **AR0001210** - for April 2016. As required by Part III, Section 4 paragraph a, of our NPDES Permit, a full report fo the chronic toxicity testing has also been included with this submittal.

If you have any questions or need additional information, please feel free to contact Rachel Johnson at (870) 567-8170 or by email at rachel.johnson2@gapac.com .

Sincerely,

Sarah M. Ross
Environmental Manager
Crossett Paper Operations

Prepared for
Georgia-Pacific Crossett Mill
Crossett, AR

Date
March 2016

CHRONIC TOXICITY TEST RESULTS – OUTFALL 001 EFFLUENT PROJECT NUMBER: 38-39396A

RAMBOLL ENVIRON

RAMBOLL ENVIRON

Ms. Rachel Johnson
Georgia-Pacific Crossett Mill
100 Mill Supply Road
Crossett, Arkansas 71635

CHRONIC TOXICITY TEST RESULTS - OUTFALL 001 EFFLUENT
RAMBOLL ENVIRON PROJECT NO. 38-39396A

Dear Ms. Johnson:

April 27, 2016

Ramboll Environ
201 Summit View Dr. Ste 300
Brentwood, TN 37027
USA

T +1 615 277 7570
F +1 615 377 4976
www.ramboll-environ.com

Ramboll Environ conducted a chronic (7-day) whole effluent toxicity (WET) test for the Georgia-Pacific Crossett, AR facility. The test was conducted according to requirements in Arkansas NPDES permit AR0001210, and is a follow up for a non-compliant test conducted February 16, 2016. The test organism utilized for the chronic toxicity test was the water flea *Ceriodaphnia dubia* (*C. dubia*).

Composite samples of Outfall 001 effluent were collected on March 21, 23, and 25, 2016. The samples were received at Ramboll Environ on March 22, 24, and 28, 2016. The first and second samples were delivered within the USEPA-required receipt holding time of 36 hours, and temperature range of 0-6.0 °C. The third sample was received outside of USEPA receipt requirements due to a problem with the shipping courier. After consultation with Mary Barnet (ADEQ), the delayed third sample receipt was determined to not invalidate the WET test (correspondence in Attachment 2). The grab samples of river water were received in good condition on the same days as the effluent samples. The tests were initiated upon receipt of the first sample. Test concentrations consisted of 25, 34, 45, 60, and 80 percent effluent and a river water control. A secondary control of moderately hard water was also initiated.

Tests were conducted in accordance with *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition (EPA-821-R-02-013). Controls met test acceptability criteria (TAC). The results of the chronic toxicity tests are as follows:

TEST RESULTS FOR OUTFALL 001 EFFLUENT	
Permit Limits	***C. dubia***
NOEC Value 80% (lethality)	80%
NOEC Value 80% (sub-lethality)	80%

The results of the chronic test with *C. dubia* indicated no observed effect concentration (NOEC) values for lethality and sub-lethality of 80 percent effluent. These test results indicate no lethal nor sub-lethal toxicity for *C. dubia*.

The *C. dubia* reproduction CV values (for surviving adults) for the river water control and critical dilution are 15.4 and 8.9 percent, respectively, and meet the CV limit of 40 percent for findings of no toxicity. Test precision for reproduction results (as Percent Minimum Significant Difference, PMSD) was 12.3 percent, which is below the USEPA PMSD bounds of 13 to 47 percent for *C. dubia* reproduction. A low PMSD indicates high test precision, but in this case no false positive conditions of toxicity were detected. The effluent concentration-response can be described as flat and is not described in EPA 821-B-00-004 *Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing*. A flat concentration-response curve is indicative of a lack of toxicity. This test is considered valid for assessment of permit compliance. The monthly reference toxicant test also met all the test acceptability criteria.

Copies of the laboratory bench sheets with statistical data are presented in Attachment 1. Chain-of-custody documentation and reference toxicant data are presented in Attachment 2. In order to meet the NELAP requirement for listing the total number of report pages; this report consists of 28 pages, including this cover letter, attachment pages and separator pages.

If you have any questions please contact Rick Lockwood at (615) 277-7523. Ramboll Environ appreciates the opportunity to assist Georgia-Pacific with their testing needs.

Yours sincerely,

Richard Lockwood
Project Manager
Water Quality and Ecotoxicology

D 615-277-7523
RLOCKWOOD@RAMBOLL.COM

Robin L. Richards, REM
Department Head
Water Management and Planning

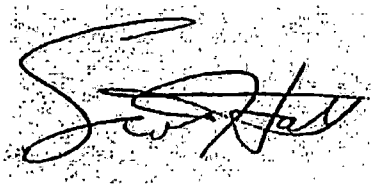
2/2

Data Review Form

Acute and Chronic WET Tests

Ramboll Environ

The raw data (i.e., laboratory bench sheets) and data in the applicable summary sheets have been checked and found to be complete. Additionally, test conditions and control performance meet test acceptability criteria specified by the US Environmental Protection Agency and the certifying state authority for the tests conducted[1].



Scott Hall, Department Manager
Water Quality and Ecotoxicology

[1] Any data limitations regarding their applicability for determining NPDES permit compliance are discussed in the report cover letter.

ATTACHMENT 1

LABORATORY BENCH SHEETS AND STATISTICAL DATA

Ceriodaphnia 7-d Survival and Reproduction Test — **Ramboll Environ**

Analysis ID:	16-4918-9746	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.4
Analyzed:	05 Apr-16 13:34	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes
Batch ID:	19-6351-7034	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	22 Mar-16	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	29 Mar-16	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	In-House Culture	**Age:**	
Sample ID:	10-5658-8218	**Code:**	3EFA41BA	**Client:**	GPAC Crossett
Sample Date:	21 Mar-16	**Material:**	Industrial Effluent	**Project:**	WET Monthly Compliance Test (MAR)
Receive Date:	22 Mar-16	**Source:**	Discharge Monitoring Report		
Sample Age:	24h	**Station:**	001		

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU
Untransformed		C > T	NA	NA	80	>80	NA	1.25

Fisher Exact/Bonferroni-Holm Test

Control	vs	C-%	Test Stat	P-Value	P-Type	Decision(α:5%)
Receiving Water		25	1	1.0000	Exact	Non-Significant Effect
		34	1	1.0000	Exact	Non-Significant Effect
		45	1	1.0000	Exact	Non-Significant Effect
		60	1	1.0000	Exact	Non-Significant Effect
		80	1	1.0000	Exact	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria

Data Summary

C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Receiving Wate	10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
34		10	0	10	1	0	0.0%
45		10	0	10	1	0	0.0%
60		10	0	10	1	0	0.0%
80		10	0	10	1	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	Receiving Water	1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
34		1	1	1	1	1	1	1	1	1	1
45		1	1	1	1	1	1	1	1	1	1
60		1	1	1	1	1	1	1	1	1	1
80		1	1	1	1	1	1	1	1	1	1

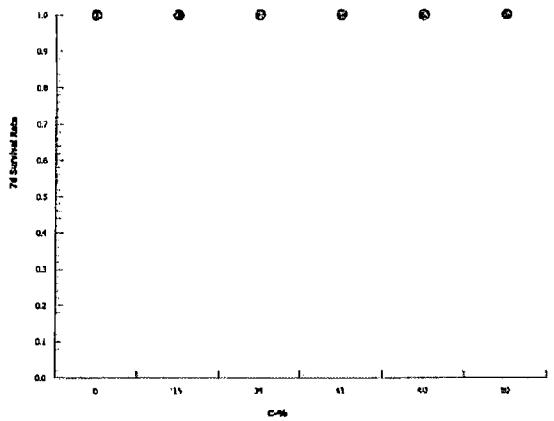
7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Receiving Water	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
34		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
45		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
60		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
80		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 **Ramboll Environ**

Analysis ID:	16-4918-9746	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.4
Analyzed:	05 Apr-16 13:34	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — **Ramboll Environ**

Analysis ID:	02-4316-6685	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.4
Analyzed:	05 Apr-16 13:34	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes
Batch ID:	19-6351-7034	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	22 Mar-16	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	29 Mar-16	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	In-House Culture	**Age:**	
Sample ID:	10-5658-8218	**Code:**	3EFA41BA	**Client:**	GPAC Crossett
Sample Date:	21 Mar-16	**Material:**	Industrial Effluent	**Project:**	WET Monthly Compliance Test (MAR)
Receive Date:	22 Mar-16	**Source:**	Discharge Monitoring Report		
Sample Age:	24h	**Station:**	001		

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	NA	C > T	NA	NA	80	>80	NA	1.25	12.3%

Dunnett Multiple Comparison Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Receiving Water		25	-0.3848	2.289	3.569	18	0.9230	CDF	Non-Significant Effect
		34	-1.475	2.289	3.569	18	0.9966	CDF	Non-Significant Effect
		45	-1.219	2.289	3.569	18	0.9919	CDF	Non-Significant Effect
		60	-1.539	2.289	3.569	18	0.9972	CDF	Non-Significant Effect
		80	-2.117	2.289	3.569	18	0.9997	CDF	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	28.9	15 - NL	Yes	Passes Acceptability Criteria
PMSD	0.1235	0.13 - 0.47	Yes	Below Acceptability Criteria

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value	2.728	3.2	0.2970	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	75.35	15.07	5	1.24	0.3034	Non-Significant Effect
Error	656.3	12.1537	54			
Total	731.65		59			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	5.014	15.09	0.4141	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9872	0.9459	0.7824	Normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Receiving Water	10	28.9	25.71	32.09	29	21	38	1.41	15.43%	0.0%
25		10	29.5	26.3	32.7	30	22	36	1.416	15.18%	-2.08%
34		10	31.2	28.97	33.43	31	26	35	0.9866	10.0%	-7.96%
45		10	30.8	28.81	32.79	30.5	27	36	0.8794	9.03%	-6.57%
60		10	31.3	29.36	33.24	31	27	35	0.857	8.66%	-8.3%
80		10	32.2	30.15	34.25	32	28	39	0.9043	8.88%	-11.42%

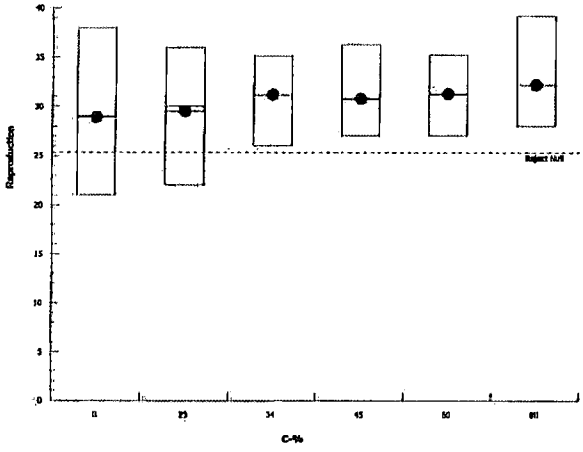
Ceriodaphnia 7-d Survival and Reproduction Test — **Ramboll Environ**

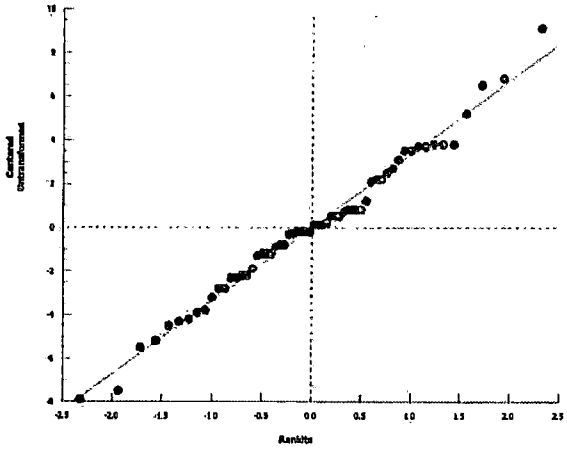
Analysis ID:	02-4316-6685	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.4
Analyzed:	05 Apr-16 13:34	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

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	Receiving Water	25	27	28	31	29	38	29	29	21	32
25		30	36	24	32	25	22	33	30	33	30
34		28	29	31	35	35	26	31	30	35	32
45		30	33	31	30	27	28	36	32	28	33
60		32	34	29	29	30	31	35	35	27	31
80		31	31	33	32	32	39	30	33	28	33

Graphics





CETIS Analytical Report

Ceriodaphnia 7-d Survival and Reproduction Test

Ramboll Environ

Analysis ID:	10-1150-4184	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.4
Analyzed:	05 Apr-16 13:35	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes
Batch ID:	19-6351-7034	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	22 Mar-16	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	29 Mar-16	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	In-House Culture	**Age:**	
Sample ID:	10-5658-8218	**Code:**	3EFA41BA	**Client:**	GPAC Crossett
Sample Date:	21 Mar-16	**Material:**	Industrial Effluent	**Project:**	WET Monthly Compliance Test (MAR)
Receive Date:	22 Mar-16	**Source:**	Discharge Monitoring Report		
Sample Age:	24h	**Station:**	001		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1661874	1000	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	28.9	15 - NL	Yes	Passes Acceptability Criteria

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value	2.728	3.2	0.2970	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	>80	N/A	N/A	<1.25	NA	NA

Reproduction Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Receiving Water	10	28.9	21	38	1.41	4.458	15.43%	0.0%
25		10	29.5	22	36	1.416	4.478	15.18%	-2.08%
34		10	31.2	26	35	0.9866	3.12	10.0%	-7.96%
45		10	30.8	27	36	0.8794	2.781	9.03%	-6.57%
60		10	31.3	27	35	0.857	2.71	8.66%	-8.3%
80		10	32.2	28	39	0.9043	2.86	8.88%	-11.42%

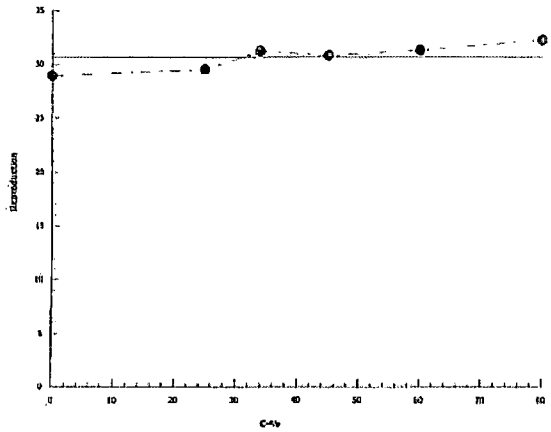
Reproduction Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Receiving Water	25	27	28	31	29	38	29	29	21	32
25		30	36	24	32	25	22	33	30	33	30
34		28	29	31	35	35	26	31	30	35	32
45		30	33	31	30	27	28	36	32	28	33
60		32	34	29	29	30	31	35	35	27	31
80		31	31	33	32	32	39	30	33	28	33

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

Analysis ID:	10-1150-4184	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.4
Analyzed:	05 Apr-16 13:35	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



RAMBOLL ENVIRON CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION 3-BROOD CHRONIC TOXICITY TEST

EPA-821-R-02-013 Method 1002.0

TEST LOG NO.: 18119

JOB NUMBER.: 3839396A

INDUSTRY: Georgia Pacific-Crossett

EFFLUENT: Outfall 001

DILUTION WATER: River Water

NPDES (Y/N) : Yes

PHOTOPERIOD: 16 hr light/8 hr dark

FEEDING REGIME: 0.1 mL YCT / 0.1 mL R. subcapitata per 15 mL

TEST VESSEL CAPACITY: 30 mL

TEST SOLUTION VOLUME: 15 mL

NO. ORGANISMS/REPLICATE: 1

NO. REPLICATES: 10

ORGANISM SOURCE INFORMATION:

AGE (date): 3/21/16

TEMP @ TEST START: 24.7

RANDOMIZED BY: LM

SOURCE ID:	AGE (time):
11313	1216-1430
11315	1217-1440

TEST START:

HOURS: 1018 DATE: 3/22/16

TEST END:

HOURS: 1218 DATE: 3/29/16

SURVIVAL AND REPRODUCTION DATA

Test Start & Feeding/ End Initials/ Time	Daily Renewal & Feeding Initials/ Time	Date	Control River Water Temp (°C)			REPLICATES 313 (1) 315 (2–6) 313 (7–10)										Notes
						1	2	3	4	5	6	7	8	9	10	
					Adult	14	18	17	7	2	5	9	18	12	10	
LM 1018		3/22	24.8		Day 0	✓	✓	✓	✓	–		✓	✓	–	✓	
	LM 1030	3/23	24.6	24.7	Day 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1120	3/24	24.3	24.7	Day 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	ATH 0933	3/25	24.7	24.9	Day 3	5	6	4	5	4	2	✓	✓	1	5	
	AW 1338	3/26	24.3	24.0	Day 4	6	✓	7	8	9	✓	3	3	✓	9	
	AW 1104	3/27	25.3	25.0	Day 5	✓	2	2	✓	✓	13	8	✓	4	✓	
	ATH 1120	3/28	24.2	25.1	Day 6	14	19	✓	18	16	19	19	9	✓	✓	SDE
ATH 1210		3/29		24.6	Day 7	16	17	15	16	17	17	18	17	16	18	100%
					Day 8											
			Total			25	27	28	31	29	38	29	29	21	32	289

✓ = Test Organism Alive
D = Test Organism Dead
0 = Live neonates
(-0) = Dead neonates
Miss = Lost or Missing
M = Male

(1) work babies in wrong pt. DW 3/28/16

TEST LOG # 18119 JOB # 3839396A

CLIENT/SAMPLE ID: Georgia Pacific - Crossett LAB/STATE: RAMBOLL ENVIRON / TN

SURVIVAL AND REPRODUCTION DATA

Test Start & Feeding/ End Initials/ Time	Daily Renewal & Feeding Initials/ Time	Date	Concentration 25% Temp (°C)			REPLICATES 1	2	3	4	5	6	7	8	9	10	Notes
					Adult											
LM 1018		3/22	24.7		Day 0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1030	3/23	24.9	24.8	Day 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1122	3/24	24.7	25.4	Day 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	AW 0933	3/25	24.0	24.8	Day 3	5	5	5	5	4	3	5	5	6	5	
	AW 1338	3/26	24.1	25.0	Day 4	9	11	7	11	10	7	12	9	✓	8	
	AW 1104	3/27	24.6	25.2	Day 5	✓	✓	12	✓	11	✓	✓	✓	9	✓	
	AW 1124	3/28	24.7	24.8	Day 6	16	20	✓	16	✓	12	16	16	18	17	
AW 1218		3/29		24.6	Day 7	17	16	17	17	16	16	17	17	16	18	
					Day 8											
			Total			30	26	24	32	25	22	33	30	38	30	295

SURVIVIAL AND REPRODUCTION DATA

Test Start & Feeding/ End Initials/ Time	Daily Renewal & Feeding Initials/ Time	Date	Concentration 34% Temp (°C)			REPLICATES 1	2	3	4	5	6	7	8	9	10	Notes
LM 1018		3/22	24.5		Day 0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1030	3/23	24.8	24.1	Day 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1122	3/24	24.4	24.8	Day 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	AW 0933	3/25	24.9	24.5	Day 3	5	4	3	5	5	4	5	3	✓	5	
	AW 1338	3/26	24.0	24.6	Day 4	7	8	9	13	✓	7	10	11	5	11	
	AW 1104	3/27	25.2	24.9	Day 5	✓	✓	3	17	14	✓	✓	✓	13	✓	
	AW 1128	3/28	25.3	24.7	Day 6	16	17	16	✓	17	15	16	16	17	16	
AW 1218		3/29		24.4	Day 7	17	18	17	17	18	18	17	17	17	17	
					Day 8											
			Total			28	29	31	35	35	26	31	30	35	32	312

✓ = Test Organism Alive 0 = Live neonates Miss = Lost or Missing

D = Test Organism Dead (-0) = Dead neonates M = Male

L/Ecotoxlab/Labforms/ToxTestSheets/7DchronicCD.doc

TEST LOG # 18119 JOB # 3839396A

CLIENT/SAMPLE ID: Georgia Pacific - Crossett LAB/STATE: RAMBOLL ENVIRON / TN

SURVIVAL AND REPRODUCTION DATA

Test Start & Feeding/ End Initials/ Time	Daily Renewal & Feeding Initials/ Time	Date	Concentration 45% Temp (°C)			REPLICATES 1	2	3	4	5	6	7	8	9	10	Notes
					Adult											
LM 1018		3/22	24.8		Day 0	✓	✓	✓	✓	✓	✓		✓	✓	✓	
	LM 1020	3/23	24.7	24.8	Day 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1122	3/24	24.9	24.7	Day 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	AH 0933	3/25	24.6	24.6	Day 3	5	5	6	5	3	5	5	✓	✓	3	
	AW 1338	3/26	24.1	24.3	Day 4	8	(10)	9	✓	8	6	✓	4	3	(0)	
	AW 1104	3/27	25.3	25.1	Day 5	✓	(2)	✓	9	✓	✓	14	11	9	3	
	AH 1128	3/28	24.3	24.7	Day 6	17	16	16	16	16	17	17	17	16	17	
AH 1214		3/29		24.3	Day 7	19	18	17	17	15	16	18	18	17	18	
					Day 8											
			Total			50	33	31	30	27	28	36	32	28	33	308

SURVIVIAL AND REPRODUCTION DATA

Test Start & Feeding/ End Initials/ Time	Daily Renewal & Feeding Initials/ Time	Date	Concentration 60% Temp (°C)			REPLICATES 1	2	3	4	5	6	7	8	9	10	Notes
LM 1018		3/22	24.6		Day 0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1030	3/23	24.8	24.9	Day 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1122	3/24	24.7	24.4	Day 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	AH 0933	3/25	25.2	25.1	Day 3	5	✓	5	3	5	✓	✓	5	✓	5	
	AW 1338	3/26	24.1	24.9	Day 4	✓	5	8	9	11	3	6	13	2	9	
	AW 1104	3/27	25.2	25.0	Day 5	10	12	✓	17	14	11	✓	✓	9	✓	
	AH 1128	3/28	24.2	24.8	Day 6	17	17	16	✓	✓	17	12	17	16	17	
AH 1218		3/29		24.4	Day 7	✓	16	17	16	17	17	17	19	17	18	
					Day 8											
			Total			32	34	29	29	30	31	35	35	27	31	313

✓ = Test Organism Alive
D = Test Organism Dead
0 = Live neonates
(-0) = Dead neonates
Miss = Lost or Missing
M = Male

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TEST LOG # 18119 JOB # 3839396A

CLIENT/SAMPLE ID: Georgia Pacific - Crossett LAB/STATE: RAMBOLL ENVIRON / TN

SURVIVAL AND REPRODUCTION DATA

Test Start & Feeding/ End Initials/ Time	Daily Renewal & Feeding Initials/ Time	Date	Concentration 80% Temp (°C)			REPLICATES 1	2	3	4	5	6	7	8	9	10	Notes
					Adult											
LM 1018		3/22	24.7		Day 0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1030	3/23	24.8	24.9	Day 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1122	3/24	24.7	24.6	Day 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	AH 0933	3/25	24.6	24.5	Day 3	5	6	5	✓	✓	✓	5	5	5	5	
	AW 1338	3/26	24.0	24.7	Day 4	10	7	13	5	6	7	9	11	7	11	
	AW 1104	3/27	24.9	25.3	Day 5	✓	2	15	✓	9	✓	✓	✓	✓	✓	
	AH 1128	3/28	24.7	24.6	Day 6	16	16	✓	10	✓	15	16	17	16	17	75%
AH 1218		3/29			Day 7	17	17	17	17	17	17	18	18	18	18	
					Day 8											
			Total			31	31	33	32	32	39	30	33	28	33	327

SURVIVIAL AND REPRODUCTION DATA

Test Start & Feeding/ End Initials/ Time	Daily Renewal & Feeding Initials/ Time	Date	Concentration MH Temp (°C)			REPLICATES 1	2	3	4	5	6	7	8	9	10	Notes
LM 1018		3/20	24.1		Day 0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1030	3/23	24.0	24.0	Day 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1122	3/24	24.3	24.1	Day 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	AH 0933	3/25	24.8	24.9	Day 3	5	2	5	5	5	5	5	4	5	5	
	AW 1338	3/26	24.0	25.0	Day 4	14	8	8	7	✓	10	9	9	7	(3)	
	AW 1104	3/27	24.6	25.2	Day 5	✓	✓	✓	✓	11	✓	✓	✓	✓	(3)	
	AH 1128	3/28	24.5	24.2	Day 6	20	16	16	14	16	16	18	18	18	18	100
AH 1240		3/29		25.4	Day 7	17	17	18	17	17	17	19	17	17	16	
					Day 8											
			Total			39	26	29	26	32	31	32	31	30	29	305

✓ = Test Organism Alive
D = Test Organism Dead
0 = Live neonates
(-0) = Dead neonates
Miss = Lost or Missing
M = Male

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TEST LOG NO. 18119

JOB NO. 20-19675I

CLIENT/SAMPLE ID: Georgia Pacific Crossett

TEST ORGANISM: Cd

DATE: 3/22/16

D.O. (mg/L)

Concentration (%)	Start	Day 1 Old	Day 1 New	Day 2 Old	Day 2 New	Day 3 Old	Day 3 New	Day 4 Old	Day 4 New	Day 5 Old	Day 5 New	Day 6 Old	Day 6 New	Day 7
RW	8.4	8.3	8.2	8.2	8.3	8.4	8.6	7.8	8.0	8.2	7.7	8.2	8.4	8.3
25	8.3	8.3	8.3	8.2	8.3	8.4	8.6	7.8	8.1	8.2	7.6	8.2	8.4	8.4
34	8.2	8.4	8.2	8.2	8.4	8.4	8.5	7.6	8.0	8.4	7.9	8.2	8.3	8.4
45	8.2	8.3	8.2	8.2	8.4	8.4	8.4	7.9	8.3	8.4	7.8	8.2	8.3	8.4
60	8.2	8.2	8.2	8.2	8.4	8.3	8.4	7.9	8.1	8.0	7.8	8.2	8.2	8.4
80	8.2	8.2	8.2	8.2	8.3	8.2	8.2	7.9	8.0	8.3	8.0	8.2	8.2	8.3
MH	8.2	8.4	8.4	8.4	8.4	8.4	8.3	7.8	8.1	8.3	8.0	8.6	8.3	8.4

pH (s.u.)

Concentration (%)	Start	Day 1 Old	Day 1 New	Day 2 Old	Day 2 New	Day 3 Old	Day 3 New	Day 4 Old	Day 4 New	Day 5 Old	Day 5 New	Day 6 Old	Day 6 New	Day 7
RW	8.01	7.60	8.26	8.10	8.10	8.05	8.01	7.61	7.63	7.43	6.65	8.19	8.14	8.17
25	7.67	7.70	7.74	7.75	7.62	7.89	8.14	8.08	7.80	7.99	7.05	7.95	7.96	7.98
34	7.49	7.87	7.64	7.86	7.51	7.96	8.10	8.23	7.14	8.09	7.21	7.97	7.55	8.10
45	7.45	8.05	7.59	7.92	7.77	8.05	8.31	8.33	7.20	8.18	7.42	8.09	7.47	8.22
60	7.45	8.30	7.56	8.07	7.69	8.18	8.11	8.45	7.39	8.32	7.64	8.22	7.46	8.39
80	7.45	8.41	7.53	8.19	7.54	8.30	8.59	8.48	7.48	8.43	7.63	8.37	7.46	8.48
MH	7.90	7.93	8.03	7.96	7.94	7.87	7.96	7.98	7.71	7.99	7.86	7.93	7.85	7.85

Conductivity (µmhos/cm)

Concentration (%)	Start	Day 1 Old	Day 1 New	Day 2 Old	Day 2 New	Day 3 Old	Day 3 New	Day 4 Old	Day 4 New	Day 5 Old	Day 5 New	Day 6 Old	Day 6 New	Day 7
RW	92	43	91	109	98	104	42	39	35	56	45	106	97	137
25	415	304	379	469	418	447	387	380	365	394	346	376	429	460
34	549	478	537	582	552	577	559	502	489	536	478	554	551	610
45	675	626	636	692	684	709	709	649	612	668	642	685	702	790
60	786	794	833	885	833	862	844	832	815	902	806	860	961	1058
80	914	1016	1066	1122	1102	1130	1058	1052	1018	1085	1022	1096	1160	1257
MH	243	210	256	269	248	282	281	211	238	235	223	264	260	287

Params Init/Time:	AH 1019	LM1040	AH 0935	AH 1132	AH 0951	AH 0946	LM0836	AW1353	AW1332	AW1119	AW 0915	AH 1126	AH 1105	AH 1126
Dilutions Init/Time:	AH 1032		AH 0938		AH 0955		LM0926		AW1322		AW 0905		AH 1103	
Control Water Batch#:	6177		6177		6177									
Feed Batch	5478,5489		5478,84		5499,74		9938		9538		9978		9960	

1) AW ie 3/27/16

TEST LOG NO. _____ CLIENT: Georgia Pacific Crossett DATE OF TEST: _____

JOB NO. 20-19675I TEST TYPE(S) PERFORMED: Fm & Cd Chronic

100% EFFLUENT

Batch #	Sample ID	Sample Date	1st Use Date	Hardness mg/L CaCO3	Alkalinity mg/L	TRC mg/L	NH_3N mg/L
19586	Outfall 001 0.7	3/21/16	3/22/16	200	305	<0.02	0.643
19598	Outfall 001 2.2	3/23/16	3/24/16	216	290	<0.02	0.873
19603	Outfall 001 0.1	3/25/16	3/26/16	228	290	0.04	1.31

CONTROL / DILUTION WATER

Batch #	Sample ID	Sample Date	1st Use Date	Hardness mg/L CaCO3	Alkalinity mg/L	TRC mg/L	NH_3N mg/L
1954985	River Water	3/21/16	3/22/16	11.2	12	<0.02	<0.1
19597	River Water	3/21/16	3/24/16	7.2	14	0.03	<0.1
19602	River Water	3/21/16	3/28/16	8.8	16	<0.02	<0.1
6177	MH	3/18/16	3/20/16	80.8	45	<0.02	
6180	MH	3/22/16	3/24/16	~~82.4~~ ~~80.8~~ 87.4	~~42~~ ~~45~~ 42	<0.02	

ATTACHMENT 2

CHAIN OF CUSTODY DOCUMENTATION AND REFERENCE TOXICANT DATA

Ramboll Environ Test Log No. 18119

CHAIN-OF-CUSTODY

RAMBOLL ENVIRON

201 Summit View Drive, Suite 300
Brentwood, TN 37027
PHONE: (615) 277-7570
FAX: (615) 377-4976

Project Name: Project Number:

Industry: GEORGIA PACIFIC PAPER

Phone: 870-567-8170 FAX: 870-364-9071

County: ASHLEY City: CROSSETT State: AR.

Sample Collected by (print): CHRIS / DANNY / BOBBIE

NPDES Permit No.: AR 0001210

Sample Collected by (signature): [signature]

NPDES Test: ☐ No ☑ Yes

Sample Location / ID	Comp/Grab	Container Type	Chilled During Collection (Y/N)	Start Date/Time	End Date/Time	No. of Cntrs	Total Volume in liters	Acute Fathead minnow	Acute Bannerfin shiner	Acute *Ceriodaphnia dubia*	Acute *Daphnia pulex*	Chronic Fathead minnow	Chronic *Ceriodaphnia dubia*	Continuous Batch Tests	Discrete Batch Tests	Other	Description Definitive or Screen	Sample B# (lab only)	Receipt Temp °C
RIVER	G	PLASTIC	NA	3-21-16 2:10pm		2	20										DILUTION WATER	19585	2.9
OUTFALL 001	C	PLASTIC	YES	3-20-16 7:18am	3-21-16 0655am	2	20					✓	✓					19586	0.2

* Matrix: SS - Soil GW - Groundwater WW - Wastewater AW - Ambient Water ML - Mixed Liquor SL - Sludge SD - Sediment OT - Other ________

Remarks:

Measured TRC (if applicable): 0.00 mg/L

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Samples shipped via:	Condition: (lab use only)
[signature]	3-21-16	4:00Pm		☑ FedEx ☐ Other Courier ☐ UPS ☐ Hand Delivered	cold
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Containers/Volume Received: 20L eff 001 20L river	
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature) [signature]	Date: 3/22/16 Time: 0043	pH upon arrival: 85) 6.60 86) 7.53 DO upon arrival: 8.5 8.2

Sample Receipt Checklist:

Client: GP Cornith

Date/Time received 3/22/16 0843 by AM

1. Cooler sealed and intact upon arrival? (Yes) No
2. Custody seals present? Yes (No)
3. Samples received below 6 degrees Celsius? (Yes) No
4. Was ice present? (Yes) No
5. Is the COC filled out correctly including the sample date/time and signed? (Yes) No
6. Was the sample received within 36 hours of collection? (Yes) No
7. Did the sample(s) arrive in good condition? (Yes) No
8. Was pH and DO measured and in range? (Yes) No
9. Was residual chlorine present? Yes (No)
   - 1.0 mg/L? (did dechlor occur) Yes (No)

Comments:

Batch #	Sample ID	Temp (C°)	pH	DO	TRC
19585	River	2.9	6.60	8.5	<0.02
19586	Outfall 001	0.7	7.53	8.2	<0.02

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CHAIN-OF-CUSTODY

ENVIRON
201 Summit View Drive, Suite 300
Brentwood, TN 37027
PHONE: (615) 277-7570
FAX: (615) 377-4976

Project Name: | Project Number:

Industry: Georgia Pacific Paper

Phone: 870-567-8170 FAX: 870-364-9076

County: Ashley City: Crossett State: AR

Sample Collected by (print): Chris / Danny / Bobby

Sample Collected by (signature): Chris Roan

NPDES Permit No.: AR0001210

NPDES Test: ☐ No ☑ Yes

Sample Location / ID	Comp/Grab	Container Type	Chilled During Collection (Y/N)	Start Date/Time	End Date/Time	No. of Cntrs	Total Volume in liters	Analysis Requested: Acute Fathead minnow	Acute Bannerfin shiner	Acute *Ceriodaphnia dubia*	Acute *Daphnia pulex*	Chronic Fathead minnow	Chronic *Ceriodaphnia dubia*	Continuous Batch Tests	Discrete Batch Tests	Other	Description Definitive or Screen	Sample B# (lab only)	Receipt Temp °C
River	G	Plastic	No	3-24-16 2:10 PM		2	20										DIL H2O		2.3
Outfall	C	Plastic	Yes	3-22-16 6:55 AM	3-23-16 6:50 AM	2	20					✓	✓						2.2

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - Wastewater **AW** - Ambient Water **ML** - Mixed Liquor **SL** - Sludge **SD** - Sediment **OT** - Other _____

Remarks:

Measured TRC (if applicable): 0 mg/L

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Samples shipped via: ☑ FedEx ☐ Other Courier ☐ UPS ☐ Hand Delivered	Condition: (lab use only)
Chris Roan	3-23-16	4:00			
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Containers/Volume Received: 2 1L PW + 2 1L amber	
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 3/24/16 ① Time: 0940	pH upon arrival: 9.7 9.76	DO upon arrival: 8.4 7.0

① PH is 9/24/16

Sample Receipt Checklist:

Client: GP Crossett

Date/Time received 3/24/16 0849 by AD

1. Cooler sealed and intact upon arrival? (Yes) No
2. Custody seals present? Yes (No)
3. Samples received below 6 degrees Celsius? (Yes) No
4. Was ice present? (Yes) No
5. Is the COC filled out correctly including the sample date/time and signed? (Yes) No
6. Was the sample received within 36 hours of collection? (Yes) No
7. Did the sample(s) arrive in good condition? (Yes) No
8. Was pH and DO measured and in range? Yes (No)
9. Was residual chlorine present? (Yes) No
   - 1.0 mg/L? (did dechlor occur) Yes (No)

Comments:

Batch #	Sample ID	Temp (C°)	pH	DO	TRC
19597	River	2.3	7.02	8.4	0.03
19598	Outfall 001	2.2	7.67	8.0	<0.02

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CHAIN-OF-CUSTODY

ENVIRON
201 Summit View Drive, Suite 300
Brentwood, TN 37027
PHONE: (615) 277-7570
FAX: (615) 377-4976

Project Name: Project Number:

Industry: Georgia Pacific

Phone: 870-567-8170 FAX:

County: Ashley City: Crossett State: AR

Sample Collected by (print): Chris / Danny

NPDES Permit No.: AR0001210

Sample Collected by (signature):

NPDES Test: ☐ No ☑ Yes

Sample Location / ID	Comp/Grab	Container Type	Chilled During Collection (Y/N)	Start Date/Time	End Date/Time	No. of Cntrs	Total Volume in liters	Acute Fathead minnow	Acute Bannerfin shiner	Acute *Ceriodaphnia dubia*	Acute *Daphnia pulex*	Chronic Fathead minnow	Chronic *Ceriodaphnia dubia*	Continuous Batch Tests	Discrete Batch Tests	Other	Description Definitive or Screen	Sample B# (lab only)	Receipt Temp °C
River	G	Plastic	NA	3-21-16 2:10PM		2	10										Dil H2O	14602	9.2
OUTFALL	C	Plastic	Yes	3/24/16 6:52	3/25/16 6:49	2	10					✓	✓					14603	10.1

* Matrix: SS - Soil GW - Groundwater WW - Wastewater AW - Ambient Water ML - Mixed Liquor SL - Sludge SD - Sediment OT - Other ________

Remarks:

Measured TRC (if applicable): 0.00 mg/L

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Samples shipped via: ☑ FedEx ☐ Other Courier ☑ UPS ☐ Hand Delivered	Condition: (lab use only) Cool
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Containers/Volume Received: 10,10,1,10	
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature) [signature]	Date: 3/28/16 Time: 0830	pH upon arrival: 02 7.40 / 03 7.56 — DO upon arrival: 8.2 / 8.1

Sample Receipt Checklist:

Client: GP Crosslett

Date/Time received 5/28/16 0830 by AH

1. Cooler sealed and intact upon arrival? (Yes) No
2. Custody seals present? Yes (No)
3. Samples received below 6 degrees Celsius? Yes (No)
4. Was ice present? Yes (No)
5. Is the COC filled out correctly including the sample date/time and signed? (Yes) No
6. Was the sample received within 36 hours of collection? Yes (No)
7. Did the sample(s) arrive in good condition? (Yes) No
8. Was pH and DO measured and in range? (Yes) No
9. Was residual chlorine present? Yes (No)
   - 1.0 mg/L? (did dechlor occur) Yes (No)

Comments:

Batch #	Sample ID	Temp (C°)	pH	DO	TRC
19602	River	9.2	740	8.2	<0.02
19603	Outfall 001	10.1	756	8.1	0.04

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Rick Lockwood

From: Johnson, Rachel M. (Crossett) <Rachel.JOHNSON2@GAPAC.com>
Sent: Monday, April 04, 2016 2:17 PM
To: Rick Lockwood
Subject: FW: Georgia-Pacific Crossett LLC - NPDES Permit #AR0001210

FYI.

From: Barnett, Mary [mailto:BARNETT@adeq.state.ar.us]
Sent: Monday, April 04, 2016 2:01 PM
To: Johnson, Rachel M. (Crossett)
Subject: RE: Georgia-Pacific Crossett LLC - NPDES Permit #AR0001210

Sent by an external sender

Rachel,

As per our conversation on Tuesday, for the test conducted from March 22 – March 29, 2016, the third sample was received late due to shipping currier error.

According to the EPA Chronic method manual "In static-renewal tests, each grab or composite sample may also be used to prepare test solutions for renewal at 24 h, 48 h, and/or 72 h after first use,
if stored at 0-6°C, with minimum head space, as described in Subsection 8.5. If shipping problems (e.g., unsuccessful Saturday delivery) are encountered with renewal samples after a test has been initiated, the permitting authority may allow the continued use of the most recently used sample for test renewal."

Based on the timeline you provided below the test is an acceptable test.

Mary Barnett
Ecologist Coordinator
501-682-0666

From: Johnson, Rachel M. (Crossett) [mailto:Rachel.JOHNSON2@GAPAC.com]
Sent: Wednesday, March 30, 2016 7:59 AM
To: Barnett, Mary
Subject: Georgia-Pacific Crossett LLC - NPDES Permit #AR0001210

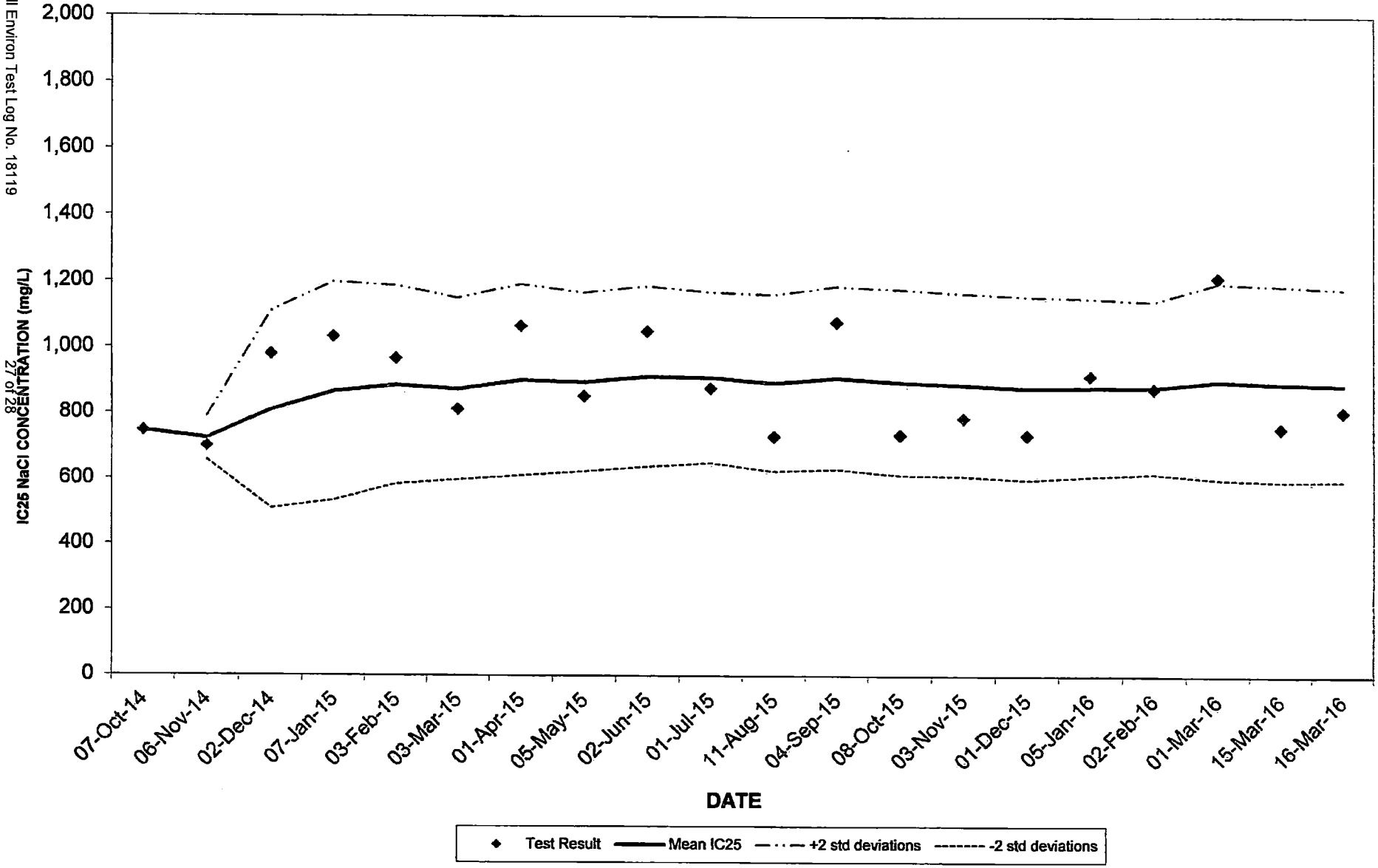
Mary,
As per our conversation yesterday, Georgia-Pacific Crossett LLC (NPDES Permit #AR0001210) did have an issue with our most recent Ceriodaphnia dubia (C.dubia) chronic toxicity test. The third sample (collected on 3/25/16) did not make it to the lab on Saturday (3/26/16), due to a shipping error. The lab was able to continue the test using the sample collected on 3/23/16. The third sample was received on Monday (3/28/16); however, it was received above the required temperature (10.1 °C). The schedule for the test was as follows:

1st , B# 19586 sample pulled / shipped 3/21/16. Arrived and first use 3/22/16. Used for renewal on 3/23 (24 hours).
2nd , B# 19598 sample pulled / shipped 3/23/16. Arrived and first use 3/24/16. Used for renewals on 3/25, 26, 27 (72 hours).
3rd , B# 19603 sample pulled / shipped 3/25/16. Arrived and first use 3/28/16. Test ended 3/29, no renewal.

Sample holding time is <36 hours for the first two samples. Holding time for 3rd sample is ~72 hours. As we are at the end of the month, we will be unable to repeat the test during the month of March. (The test was originally scheduled for earlier in the month; however due to severe flooding conditions we were required to postpone the testing.) We will test again in April; however, due to sub-lethal effects observed in January, we are required to monitor monthly during the months of February, March and April. Please let us know if this test will be accepted as a repeat sample. Thank you.

Rachel M. Johnson
Environmental Engineer
Crossett Paper Operations
(870) 567-8170

CHRONIC REFERENCE TOXICANT (NaCl) 2014-2016
Ceriodaphnia dubia



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4/5/2016

Ceriodaphnia dubia **CHRONIC REFERENCE TOXICANT TESTING - SODIUM CHLORIDE (NaCl) 2014-2016**

Test Number	Log Number	Test Initiation Date	Control Survival (%) (*)	3 Brood Production (%) (*)	Control Average Repro (*)	Survival		Reproduction			IC25 VALUE (mg/L)	IC25 CUMULATIVE MEAN (mg/L)	IC25 ST. DEV. (mg/L)	IC25 2+ STD. DEV.	IC25 2- STD. DEV.	Coefficient of Variation (%)
						NOEC (mg/L)	LOEC (mg/L)	NOEC (mg/L)	LOEC (mg/L)	PMSD						
1	17124	07-Oct-14	100	100	29.7	1,000	2,000	500	1,000	26.8	747	747				
2	17201	06-Nov-14	100	80	23.8	1,000	2,000	500	1,000	21.5	700	724	33	790	657	3
3	17248	02-Dec-14	100	80	26.1	2,000	>2000	500	1,000	14.1	980	809	150	1,109	509	15
4	17316	07-Jan-15	100	90	28.2	2,000	>2000	500	1,000	17.8	1,032	865	166	1,198	534	17
5	17380	03-Feb-15	100	90	33.2	2,000	>2000	500	1,000	18.7	966	885	150	1,186	584	15
6	17427	03-Mar-15	100	90	26.7	1,000	2,000	500	1,000	21.4	811	873	138	1,148	597	14
7	17504	01-Apr-15	100	90	24.5	1,000	2,000	1,000	2,000	24.9	1,064	900	145	1,190	610	15
8	17571	05-May-15	100	80	22.9	2,000	>2000	500	1,000	22.0	851	894	135	1,165	623	14
9	17622	02-Jun-15	100	80	27.4	1,000	2,000	1,000	2,000	22.3	1,048	911	137	1,185	637	14
10	17675	01-Jul-15	100	100	26.4	2,000	>2000	500	1,000	16.0	875	907	129	1,166	649	14
11	17746	11-Aug-15	100	80	20.6	2,000	>2000	500	1,000	33.1	728	891	134	1,159	623	14
12	17798	04-Sep-15	100	100	27.7	2,000	>2000	500	1,000	13.4	1,075	906	139	1,183	629	15
13	17856	08-Oct-15	100	80	25.5	2,000	>2000	500	1,000	22.0	733	893	141	1,175	611	15
14	17904	03-Nov-15	100	100	27.8	1,000	2,000	500	1,000	12.4	783	885	139	1,163	608	15
15	17947	01-Dec-15	100	100	26.0	2,000	>2,000	500	1,000	19.8	732	875	139	1,154	596	15
16	17995	05-Jan-16	100	90	30.4	2,000	>2,000	500	1,000	19.1	912	877	135	1,147	607	15
17	18024	02-Feb-16	100	100	27.7	1,000	2,000	500	1,000	23.5	873	877	131	1,138	616	14
18	18073	01-Mar-16	100	100	35.0	2,000	>2,000	500	1,000	7.4	1,210	896	149	1,194	597	16
19	18107	15-Mar-16	90	90	32.7	2,000	>2,000	500	1,000	22.6	753	888	149	1,185	591	16
20	18112	16-Mar-16	100	90	31.9	2,000	>2,000	500	1,000	16.4	802	884	146	1,175	592	16
		Avg	100	91	27	1611	778	556	1111	20	884	867	135	1144	605	

Notes:
NOEC - No Observable Effect Concentration (survival or reproduction)
LOEC - Lowest Observable Effect Concentration (survival or reproduction)
(*) Minimum USEPA CONTROL CRITERIA - 80 percent survival, 80 percent with 3 broods, and average reproduction of 15 neonates/adult.

Prepared for
Georgia-Pacific Crossett Mill
Crossett, AR

Date
April 2016

CHRONIC TOXICITY TEST RESULTS – OUTFALL 001 EFFLUENT PROJECT NUMBER: 38-39396A

RAMBOLL ENVIRON

Ms. Rachel Johnson
Georgia-Pacific Crossett Mill
100 Mill Supply Road
Crossett, Arkansas 71635

CHRONIC TOXICITY TEST RESULTS - OUTFALL 001 EFFLUENT
RAMBOLL ENVIRON PROJECT NO. 38-39396A

Dear Ms. Johnson:

April 27, 2016

Ramboll Environ
201 Summit View Dr. Ste 300
Brentwood, TN 37027
USA

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Ramboll Environ conducted chronic (7-day) whole effluent toxicity (WET) tests for the Georgia-Pacific Crossett, AR facility. The tests were conducted according to requirements in Arkansas NPDES permit AR0001210. Composite samples of Outfall 001 effluent were collected on April 11, 13, and 15, 2016. The samples were received at Ramboll Environ on April 12, 14, and 16, 2016, within the USEPA-required receipt temperature range of 0-6.0 °C. The grab samples of river water were received in good condition on the same days as the effluent samples. Test organisms utilized for the chronic toxicity tests were the fathead minnow (*Pimephales promelas*) and *Ceriodaphnia dubia* (*C. dubia*). The tests were initiated upon receipt of the first sample. Test concentrations consisted of 25, 34, 45, 60, and 80 percent effluent and a river water control. A secondary control of moderately hard water was also initiated.

Tests were conducted in accordance with *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition (EPA-821-R-02-013). All controls met test acceptability criteria (TAC). The results of the chronic toxicity tests are as follows:

TEST RESULTS FOR OUTFALL 001 EFFLUENT		
Permit Limits	**Fathead Minnow**	***C. dubia***
NOEC Value 80% (lethality)	80%	80%
NOEC Value 80% (sub-lethality)	80%	80%

The results of the chronic test with the fathead minnow indicated a No Observable Effect Concentration (NOEC) value for lethality and sub-lethality of 80 percent effluent. The results of the chronic test with *C. dubia* indicated NOEC values for lethality and sub-lethality of 80 percent effluent. These test results indicate no significant toxicity at the critical dilution (80 percent effluent) for the fathead minnow and *C. dubia* and the permit limit.

The Coefficient of Variation (CV) values for the fathead minnow survival in the river water control and critical dilution are 5.7 and zero percent respectively. The CV values for growth in the control and critical dilution are 10.3 and 8.7 percent, respectively, and meet the CV limit of 40 percent for findings of no toxicity. Test precision for growth results (as Percent Minimum Significant Difference, PMSD) value was 20.6, which is within the USEPA PMSD bounds of 12 to 30 percent when alpha 0.05 is used for hypothesis testing. The effluent concentration-response curve can be described as a Type 10 response in EPA 821-B-00-004 *Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing*. A Type 10 (inverse) concentration-response curve is indicative of a lack of toxicity, with effluent growth response exceeding control growth. This test is considered valid for assessment of permit compliance. The monthly reference toxicant test also met all the test acceptability criteria.

The *C. dubia* reproduction CV values (for surviving adults) for the river water control and critical dilution are 26.7 and 16.6 percent respectively. The PMSD value was 23.1 percent, which is within the USEPA PMSD bounds of 13 to 47 percent for *C. dubia* reproduction. The effluent concentration-response is flat and not described in EPA 821-B-00-004. A flat concentration-response curve is indicative of a lack of toxicity. This test is considered valid for assessment of permit compliance. The monthly reference toxicant test also met all the test acceptability criteria.

Copies of the laboratory bench sheets with statistical data are presented in Attachment 1. Chain-of-custody documentation and reference toxicant data are presented in Attachment 2. In order to meet the NELAP requirement for listing the total number of report pages; this report consists of 37 pages, including this cover letter, attachment pages and separator pages.

If you have any questions please contact Rick Lockwood at (615) 277-7523. Ramboll Environ appreciates the opportunity to assist Georgia-Pacific with their testing needs.

Yours sincerely,

Richard Lockwood
Project Manager
Water Quality and Ecotoxicology

D 615-277-7523
RLOCKWOOD@RAMBOLL.COM

Robin L. Richards, REM
Department Head
Water Management and Planning

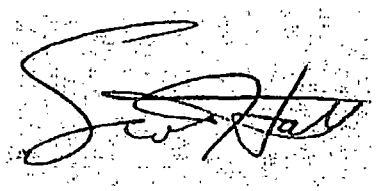
2/2

Data Review Form

Acute and Chronic WET Tests

Ramboll Environ

The raw data (i.e., laboratory bench sheets) and data in the applicable summary sheets have been checked and found to be complete. Additionally, test conditions and control performance meet test acceptability criteria specified by the US Environmental Protection Agency and the certifying state authority for the tests conducted[1].



Scott Hall, Department Manager
Water Quality and Ecotoxicology

[1] Any data limitations regarding their applicability for determining NPDES permit compliance are discussed in the report cover letter.

ATTACHMENT 1

LABORATORY BENCH SHEETS AND STATISTICAL DATA

Fathead Minnow 7-d Larval Survival and Growth Test — **Ramboll Environ**

Analysis ID:	03-2787-0572	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.4
Analyzed:	20 Apr-16 17:37	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes
Batch ID:	03-3996-4964	**Test Type:**	Growth-Survival (7d)	**Analyst:**	
Start Date:	12 Apr-16	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	19 Apr-16	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Environmental Consult & Test	**Age:**	
Sample ID:	10-0782-1817	**Code:**	3C1223F9	**Client:**	GPAC Crossett
Sample Date:	11 Apr-16	**Material:**	Industrial Effluent	**Project:**	WET Monthly Compliance Test (APR)
Receive Date:	12 Apr-16	**Source:**	Discharge Monitoring Report		
Sample Age:	24h	**Station:**	001		

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	NA	C > T	NA	NA	80	>80	NA	1.25	9.93%

Steel Many-One Rank Sum Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Receiving Water		25	27.5	16	2	8	0.8333	Asymp	Non-Significant Effect
		34	27.5	16	2	8	0.8333	Asymp	Non-Significant Effect
		45	27	16	1	8	0.8003	Asymp	Non-Significant Effect
		60	25	16	2	8	0.6353	Asymp	Non-Significant Effect
		80	30	16	1	8	0.9446	Asymp	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	0.975	0.8 - NL	Yes	Passes Acceptability Criteria

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value	3.198	2.908	0.0123	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.01787841	0.003575681	5	0.3952	0.8472	Non-Significant Effect
Error	0.2171379	0.009047412	24			
Total	0.2350163		29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	116.8	15.09	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.7421	0.9031	<0.0001	Non-normal Distribution

7d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Receiving Water	5	0.975	0.9056	1	1	0.875	1	0.025	5.73%	0.0%
25		5	0.975	0.9056	1	1	0.875	1	0.025	5.73%	0.0%
34		5	0.975	0.9056	1	1	0.875	1	0.025	5.73%	0.0%
45		5	0.95	0.8112	1	1	0.75	1	0.05	11.77%	2.56%
60		5	0.95	0.865	1	1	0.875	1	0.03062	7.21%	2.56%
80		5	1	1	1	1	1	1	0	0.0%	-2.56%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Receiving Wate	5	1.356	1.254	1.458	1.393	1.209	1.393	0.03673	6.06%	0.0%
25		5	1.356	1.254	1.458	1.393	1.209	1.393	0.03673	6.06%	0.0%
34		5	1.356	1.254	1.458	1.393	1.209	1.393	0.03673	6.06%	0.0%
45		5	1.324	1.132	1.516	1.393	1.047	1.393	0.06918	11.68%	2.39%
60		5	1.32	1.195	1.445	1.393	1.209	1.393	0.04499	7.62%	2.71%
80		5	1.393	1.393	1.393	1.393	1.393	1.393	0	0.0%	-2.71%

Fathead Minnow 7-d Larval Survival and Growth Test — **Ramboll Environ**

Analysis ID:	03-2787-0572	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.4
Analyzed:	20 Apr-16 17:37	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Receiving Water	1	1	1	0.875	1
25		0.875	1	1	1	1
34		1	0.875	1	1	1
45		0.75	1	1	1	1
60		0.875	1	0.875	1	1
80		1	1	1	1	1

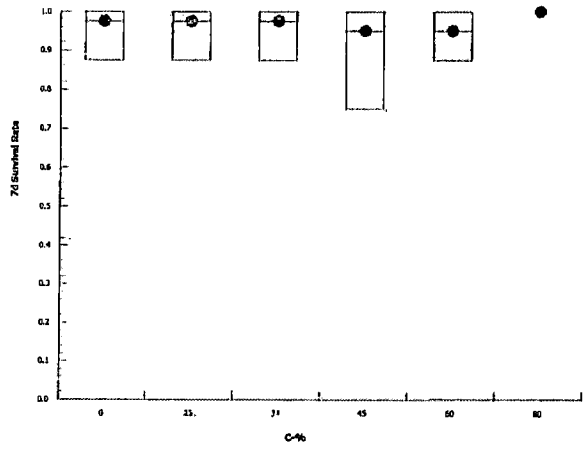
Angular (Corrected) Transformed Detail

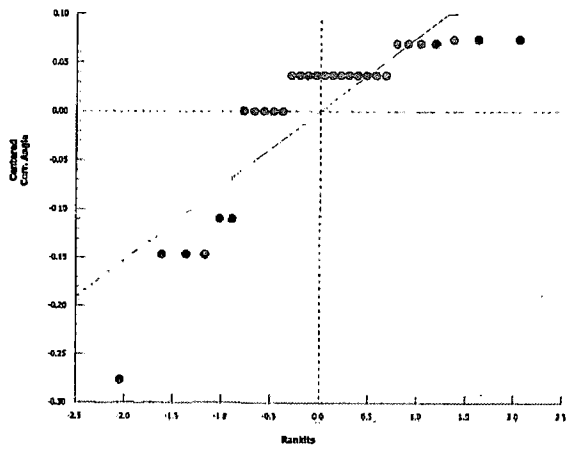
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Receiving Water	1.393	1.393	1.393	1.209	1.393
25		1.209	1.393	1.393	1.393	1.393
34		1.393	1.209	1.393	1.393	1.393
45		1.047	1.393	1.393	1.393	1.393
60		1.209	1.393	1.209	1.393	1.393
80		1.393	1.393	1.393	1.393	1.393

7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Receiving Water	8/8	8/8	8/8	7/8	8/8
25		7/8	8/8	8/8	8/8	8/8
34		8/8	7/8	8/8	8/8	8/8
45		6/8	8/8	8/8	8/8	8/8
60		7/8	8/8	7/8	8/8	8/8
80		8/8	8/8	8/8	8/8	8/8

Graphics





Fathead Minnow 7-d Larval Survival and Growth Test — **Ramboll Environ**

Analysis ID:	18-4820-5382	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.4
Analyzed:	20 Apr-16 17:37	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes
Batch ID:	03-3996-4964	**Test Type:**	Growth-Survival (7d)	**Analyst:**	
Start Date:	12 Apr-16	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	19 Apr-16	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Environmental Consult & Test	**Age:**	
Sample ID:	10-0782-1817	**Code:**	3C1223F9	**Client:**	GPAC Crossett
Sample Date:	11 Apr-16	**Material:**	Industrial Effluent	**Project:**	WET Monthly Compliance Test (APR)
Receive Date:	12 Apr-16	**Source:**	Discharge Monitoring Report		
Sample Age:	24h	**Station:**	001		

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	NA	C > T	NA	NA	80	>80	NA	1.25	20.6%

Dunnett Multiple Comparison Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Receiving Water		25	-2.259	2.362	0.103	8	0.9997	CDF	Non-Significant Effect
		34	-2.453	2.362	0.103	8	0.9998	CDF	Non-Significant Effect
		45	-3.505	2.362	0.103	8	1.0000	CDF	Non-Significant Effect
		60	-4.168	2.362	0.103	8	1.0000	CDF	Non-Significant Effect
		80	-5.426	2.362	0.103	8	1.0000	CDF	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	0.5022	0.25 - NL	Yes	Passes Acceptability Criteria
PMSD	0.2056	0.12 - 0.3	Yes	Passes Acceptability Criteria

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value	2.377	2.908	0.3847	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.1658331	0.03316663	5	6.94	0.0004	Significant Effect
Error	0.1147026	0.004779273	24			
Total	0.2805357		29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	6.547	15.09	0.2566	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.97	0.9031	0.5388	Normal Distribution

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Receiving Water	5	0.5022	0.4381	0.5664	0.49	0.44	0.57	0.0231	10.28%	0.0%
25		5	0.601	0.5675	0.6345	0.6062	0.565	0.63	0.01208	4.5%	-19.66%
34		5	0.6095	0.5387	0.6803	0.605	0.5262	0.6738	0.0255	9.36%	-21.35%
45		5	0.6555	0.5536	0.7574	0.6438	0.5638	0.755	0.03668	12.51%	-30.51%
60		5	0.6845	0.5536	0.8154	0.6588	0.535	0.8025	0.04716	15.41%	-36.29%
80		5	0.7395	0.6593	0.8197	0.72	0.6888	0.8525	0.0289	8.74%	-47.24%

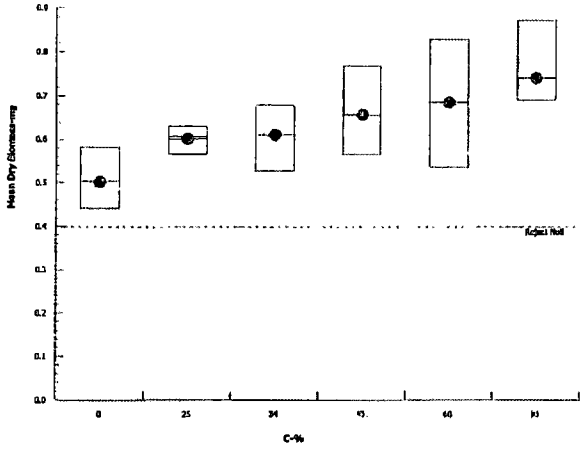
Fathead Minnow 7-d Larval Survival and Growth Test — **Ramboll Environ**

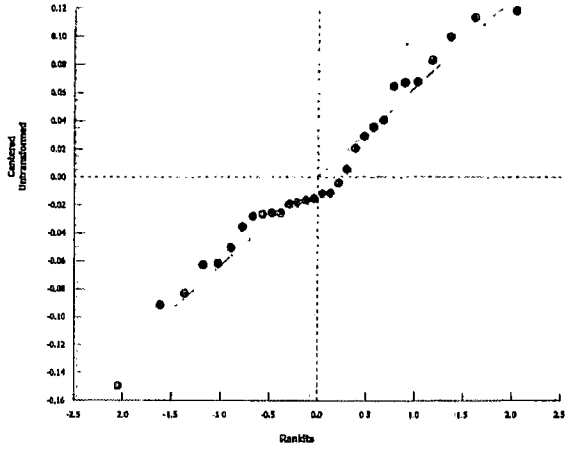
Analysis ID:	18-4820-5382	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.4
Analyzed:	20 Apr-16 17:37	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Receiving Water	0.57	0.5375	0.49	0.44	0.4738
25		0.565	0.6213	0.5825	0.6062	0.63
34		0.5262	0.605	0.5925	0.6738	0.65
45		0.5638	0.5925	0.6438	0.755	0.7225
60		0.6588	0.6588	0.535	0.7675	0.8025
80		0.7237	0.6888	0.72	0.7125	0.8525

Graphics





CETIS Analytical Report

Fathead Minnow 7-d Larval Survival and Growth Test — **Ramboll Environ**

Analysis ID:	17-5721-3812	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.4
Analyzed:	20 Apr-16 17:38	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes
Batch ID:	03-3996-4964	**Test Type:**	Growth-Survival (7d)	**Analyst:**	
Start Date:	12 Apr-16	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	19 Apr-16	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Environmental Consult & Test	**Age:**	
Sample ID:	10-0782-1817	**Code:**	3C1223F9	**Client:**	GPAC Crossett
Sample Date:	11 Apr-16	**Material:**	Industrial Effluent	**Project:**	WET Monthly Compliance Test (APR)
Receive Date:	12 Apr-16	**Source:**	Discharge Monitoring Report		
Sample Age:	24h	**Station:**	001		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	10941	1000	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	0.5022	0.25 - NL	Yes	Passes Acceptability Criteria

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value	2.377	2.908	0.3847	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	>80	N/A	N/A	<1.25	NA	NA

Mean Dry Biomass-mg Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Receiving Water	5	0.5022	0.44	0.57	0.0231	0.05165	10.28%	0.0%
25		5	0.601	0.565	0.63	0.01208	0.02701	4.5%	-19.66%
34		5	0.6095	0.5262	0.6738	0.0255	0.05703	9.36%	-21.35%
45		5	0.6555	0.5638	0.755	0.03668	0.08203	12.51%	-30.51%
60		5	0.6845	0.535	0.8025	0.04716	0.1055	15.41%	-36.29%
80		5	0.7395	0.6888	0.8525	0.0289	0.06462	8.74%	-47.24%

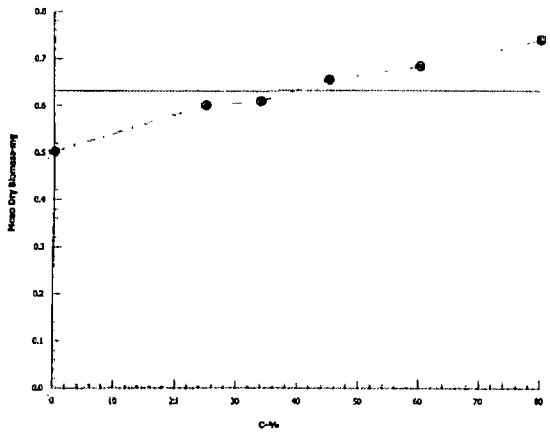
Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Receiving Water	0.57	0.5375	0.49	0.44	0.4738
25		0.565	0.6213	0.5825	0.6062	0.63
34		0.5262	0.605	0.5925	0.6738	0.65
45		0.5638	0.5925	0.6438	0.755	0.7225
60		0.6588	0.6588	0.535	0.7675	0.8025
80		0.7237	0.6888	0.72	0.7125	0.8525

Fathead Minnow 7-d Larval Survival and Growth Test — **Ramboll Environ**

Analysis ID:	17-5721-3812	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.4
Analyzed:	20 Apr-16 17:38	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



RAMBOLL ENVIRON FATHEAD MINNOW SURVIVAL AND GROWTH 7-DAY CHRONIC TOXICITY TEST
EPA-821-R-02-013 Method 1000.0

TEST LOG NO.: 18165
JOB NUMBER.: 20-19675I
INDUSTRY: Georgia Pacific Crossett
EFFLUENT: Outfall 001
DILUTION WATER: River Water
NPDES: Yes No
FOOD BATCH: 5440

BEGINNING: HRS: 1318 DATE: 4/12/16
ENDING: HRS: 1318 DATE: 4/19/16
TEST DILUTIONS: 25, 34, 45, 60, 80%
ORGANISM AGE (date): 4/11/16
ORGANISM SOURCE: ECT# 5522
SOURCE TEMP @ TEST START: 24.0
RANDOMIZED BY: LM

PHOTOPERIOD: 16 hr light/8 hr dark
FEEDING REGIME:
0.15 mL Artemia @ 2 times/day
TEST VESSEL CAPACITY: 450 mL
TEST SOLUTION VOLUME: 250 - 300 mL
NO. ORGANISMS/TREATMENT: 8
NO. REPLICATES: 5

CONC (%)	REP ID	SURVIVAL (#) START	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
RW	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	7
	E	8	8	8	8	8	8	8	8
	Temp(°C):old/new	24.0	24.0/24.0	24.8/24.0	24.1/24.2	25.1/24.1	24.6/24.3	24.3/24.2	24.6
25	A	8	8	8	8	8	7	7	7
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	8
	Temp(°C):old/new	24.0	24.0/24.0	24.1/24.3	24.3/24.2	25.3/24.9	24.8/24.3	24.1/24.1	24.5
34	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8	7
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	8
	Temp(°C):old/new	24.2	24.1/24.0	24.0/24.1	24.3/24.0	25.0/24.9	24.3/24.4	24.9/24.1	25.0
45	A	8	8	8	7	7	7	7	6
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	8
	Temp(°C):old/new	24.6	24.0/24.0	24.1/24.1	24.2/24.4	25.1/24.7	24.2/24.1	24.2/24.1	25.0
60	A	8	8	8	8	8	8	8	7
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	7	7	7
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	8
	Temp(°C):old/new	24.4	24.1/24.1	24.1/24.1	24.4/24.1	25.0/24.7	25.0/24.2	25.1/24.4	25.0
80	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	8
	Temp(°C):old/new	24.4	24.4/24.3	24.3/24	24.3/24.2	24.8/24.5	25.1/24.1	25.2/24.3	24.8
Test Renewal	Time	1318	1300	1319	1249	1254	1225	1208	1218
	Date	4/12/16	4/13/16	4/14/16	4/15/16	4/16/16	4/17/16	4/18/16	4/19/16
	Initials	LM	LM	LM	HM	AW	AW	AW	AW
morning feeding	Int/Time	[redacted]	LM0800	LM0800	LM0820	AW0800	AW0755	LM0820	[redacted]
afternoon feeding	Int/Time	AW1434	HM1400	LM1400	LM1400	HM1400	HM1355	AW1400	[redacted]

1) i e AW 4/16/16

RAMBOLL ENVIRON FATHEAD MINNOW SURVIVAL AND GROWTH 7-DAY CHRONIC TOXICITY TEST
EPA-821-R-02-013 Method 1000.0

TEST LOG NO.: 18165
JOB NUMBER.: 20-196751
INDUSTRY: Georgia Pacific Crossett
EFFLUENT: 001
DILUTION WATER: River Water
NPDES: Yes ______ No ______
FOOD BATCH: ______

BEGINNING: HRS: 1318 DATE: 4/12/16
ENDING: HRS: 1318 DATE: 4/19/16

PHOTOPERIOD: 16 hr light/8 hr dark
FEEDING REGIME:
0.15 mL Artemia @ 2 times/day
TEST VESSEL CAPACITY: 450 mL
TEST SOLUTION VOLUME: 250 - 300 mL
NO. ORGANISMS/TREATMENT: 8
NO. REPLICATES: 5

CONC (%)	REP ID	SURVIVAL (#)							
		START	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
MH	A	8	8	8	8	8	8	8	8
	B	8	8	8	8	8	8	8	8
	C	8	8	8	8	8	8	8	8
	D	8	8	8	8	8	8	8	8
	E	8	8	8	8	8	8	8	8
	Temp(°c):old/new	24.1	24.3/24.1	24.1/24.2	24.3/24.2	25.0/24.4	25.1/24.3	25.2/24.0	25.2
	A								
	B								
	C								
	D								
	E								
	Temp(°c):old/new								
	A								
	B								
	C								
	D								
	E								
	Temp(°c):old/new								
	A								
	B								
	C								
	D								
	E								
	Temp(°c):old/new								
	A								
	B								
	C								
	D								
	E								
	Temp(°c):old/new								
	A								
	B								
	C								
	D								
	E								
	Temp(°c):old/new								
Test Renewal	Time								
	Date								
	Initials								
morning feeding	Int/Time								
afternoon feeding	Int/Time								

RAMBOLL ENVIRON FATHEAD MINNOW SURVIVAL AND GROWTH 7-DAY CHRONIC TOXICITY TEST
EPA-821-R-02-013 Method 1000.0

TEST LOG NO.: 18165 BEGINNING: HRS: 1318 DATE: 4/12/16
JOB NO.: 20-19675I ENDING: HRS: 1218 DATE: 4/19/16
INDUSTRY: Georgia Pacific-Crossett
EFFLUENT: Outfall 001 NO. ORGANISMS/TREATMENT: 8
NPDES: Yes ____ No ____ NO. REPLICATES: 5

PHOTOPERIOD: 16 hr light
FEEDING REGIME:
0.15 mL Artemia @ 2 times/day
TEST VESSEL CAPACITY: 450 mL
TEST SOLUTION VOLUME: 250 mL

		GROWTH RESULTS						
CONC (%)	REP ID	Boat ID 352	Tare wt (g)	Combined wt (g)	Tot Fish wt (g)	# of Fish	Fish Wt (mg) Per Final # of Fish	
RW	A	1	1.00111	1.06567	0.00456	8	0.570	
	B	2	1.09181	1.09611	0.00430	8	0.538	AVG Control
	C	3	1.08752	1.09144	0.00392	8	0.490	Fish wt. 0.515
	D	4	1.11057	1.11409	0.00352	7	0.502	(using final #)
	E	5	1.09450	1.09829	0.00379	8	0.474	
25	A	6	1.01624	1.01094	0.00452	7		
	B	7	1.01245	1.01742	0.00497	8		
	C	8	1.05043	1.05509	0.00466	8		Oven ID: 2
	D	9	1.07987	1.08478	0.00485	8		
	E	10	1.01007	1.07131	0.00504	8		Tins In:
34	A	11	1.09517	1.09938	0.00421	8		Date: 4/19/16
	B	12	1.17500	1.17984	0.00484	7		Time: 1331
	C	13	1.12620	1.13094	0.00474	8		Temp (°C): 98
	D	14	1.13707	1.14246	0.00539	8		Initials: AW
	E	15	1.12471	1.12991	0.00520	8		
45	A	16	1.11807	1.12258	0.00451	6		Tins Out:
	B	17	1.09403	1.09877	0.00474	8		Date: 4/20/16
	C	18	1.06726	1.07243	0.00515	8		Time: 1421
	D	19	1.16551	1.17155	0.00604	8		Temp (°C): 100
	E	20	1.12357	1.12935	0.00578	8		Initials: LM
60	A	21	1.13600	1.14127	0.00527	7		
	B	22	1.16478	1.17005	0.00527	8		
	C	23	1.12253	1.12681	0.00428	7		
1.12193	D	24	1.1280	1.12807	0.00614	8		
	E	25	1.13344	1.13986	0.00642	8		
80	A	26	1.12029	1.12608	0.00579	8		FINAL WEIGHTS
	B	27	1.13954	1.14505	0.00551	8		
	C	28	1.10745	1.11321	0.00576	8		DATE: 4/20/16
	D	29	1.14654	1.15224	0.00570	8		INITIALS: LM
	E	30	1.12863	1.13545	0.00682	8		
MH	A	31	1.17318	1.17706	0.00388	8		
	B	32	1.10850	1.11325	0.00475	8		
	C	33	1.11864	1.12260	0.00396	8		
	D	34	1.13397	1.13945	0.00548	8		
	E	35	1.13732	1.14191	0.00459	8		
	Initials / Date:		AW 4/19/16					

① AW 12 4/19/16

TEST LOG NO. 18165 CLIENT/SAMPLE ID: Georgia Pacific Crossett

JOB NO. 20-19675I TEST ORGANISM: Fm DATE: 4/12/16

D.O. (mg/L)

Concentration (%)	Start	Day 1 Old	Day 1 New	Day 2 Old	Day 2 New	Day 3 Old	Day 3 New	Day 4 Old	Day 4 New	Day 5 Old	Day 5 New	Day 6 Old	Day 6 New	Day 7
RW	8.6	8.0	8.5	7.6	8.4	8.5	9.0	8.4	8.4	8.0	8.4	8.1	8.4	8.7
25	8.7	8.1	8.4	7.7	8.2	8.1	8.7	8.3	8.6	8.2	8.3	8.2	8.7	8.6
34	8.6	8.0	8.4	7.7	8.2	7.9	8.5	8.3	8.6	8.2	8.4	8.4	8.6	8.6
45	8.8	7.8	8.6	7.7	8.3	7.5	8.9	8.0	8.3	8.4	8.4	8.5	8.5	8.4
60	8.4	7.4	7.8	7.7	8.3	7.2	8.9	8.0	8.2	8.3	8.3	8.4	8.5	8.3
80	8.4	6.8	7.4/7.1 (C)	7.5	8.4	6.3	9.0	7.4	8.6	7.7	8.3	7.6	8.4	8.3
MH	8.5	8.0	8.6	7.6	8.4	7.9	9.1	8.0	8.4	8.0	8.2	7.8	8.4	8.1

pH (s.u.)

Concentration (%)	Start	Day 1 Old	Day 1 New	Day 2 Old	Day 2 New	Day 3 Old	Day 3 New	Day 4 Old	Day 4 New	Day 5 Old	Day 5 New	Day 6 Old	Day 6 New	Day 7
RW	6.45	7.25	7.02	7.50	7.16	7.40	7.20	7.53	7.22	7.22	6.96	7.31	7.30	7.20
25	~~6.48~~ (28)	7.59	7.41	7.56	7.26	7.60	7.24	7.69	7.30	7.34	6.94	7.36	7.39	7.30
34	7.50	7.79	7.50	7.66	7.34	7.75	7.38	7.69	7.30	7.34	7.14	7.35	7.53	7.46
45	7.65	7.87	7.62	7.81	7.34	7.83	7.40	7.76	7.44	7.40	7.29	7.39	7.59	7.50
60	7.76	8.00	7.78	7.90	7.38	7.91	7.53	7.95	7.80	7.56	7.43	7.44	7.75	7.66
80	7.84	8.10	8.06	7.94	7.91	8.06	7.82	8.04	7.86	7.63	7.57	7.52	7.82	7.74
MH	8.001	7.90	7.79	7.87	7.78	7.40	7.63	7.96	7.70	7.64	7.72	7.58	7.99	7.90

Conductivity (µmhos/cm)

Concentration (%)	Start	Day 1 Old	Day 1 New	Day 2 Old	Day 2 New	Day 3 Old	Day 3 New	Day 4 Old	Day 4 New	Day 5 Old	Day 5 New	Day 6 Old	Day 6 New	Day 7
RW	80	105	87	60	77	53	72	51	109	76	61	80	63	71
25	443	439	516	453	1169	404	471	394	491	422	432	426	435	427
34	618	603	1088	617	1041	1010	1088	603	1015	586	574	590	646	658
45	786	767	816	746	801	768	796	777	789	758	752	771	785	790
60	1019	987	1051	1034	999	983	1034	989	987	948	981	968	1038	1019
80	1336	1293	1339	1296	1339	1283	1296	1273	1439	1258	1302	1314	1324	1342
MH	209	218	212	203	215	215	221	214	230	238	234	217	228	218

Params Init/Time:	AW 0944	LH0652 HM1038		LH0638 HM1021		LH0642 HM1044		AW0516 HM1104		AW0810	AW0955	LH0658	AW 0929	LH0652
Dilutions Init/Time:	AW 0939	HM1035				HM1031		HM1024			AW0945		AW 0915	
Control Water Batch#:	RW 19042.16	19042.16		19060.16		19060.16		19060.16		19070.16	19070.16	19070.16		
Food Batch	MH 5440	5440		5440		5440		5440		5440	5440	5440		

1) ie AW 4/12/16 @HM 4/13/16 @HM LH0652

TEST LOG NO. 18165 CLIENT: Georgia Pacific Crossett DATE OF TEST: 4/18/16

JOB NO. 20-19675I TEST TYPE(S) PERFORMED: Fm & Cd Chronic

100% EFFLUENT

Batch #	Sample ID	Sample Date	1st Use Date	Hardness mg/L CaCO3	Alkalinity mg/L	TRC mg/L	NH_3N mg/L
19643	Outfall 001	4/10-11/16	4/12/16	264	370	<0.02	2.45
19661	Outfall 001	4/12-13/16	4/14/16	220	345	<0.02	1.67
19871	Outfall 001	4/14-15/16	4/16/16	228	360	<0.02	1.73

CONTROL / DILUTION WATER

Batch #	Sample ID	Sample Date	1st Use Date	Hardness mg/L CaCO3	Alkalinity mg/L	TRC mg/L	NH_3N mg/L	
19642	River Water	4/11/16	4/12/16	17.6	19	0.04	<0.1	
19660	River Water	4/11/16	4/14/16	23.2	18	0.03	<0.1	
19670	River Water	4/11/16	4/16/16	17.6	22	0.04	<0.1	
6195	MH	4/6/16	4/9/16	81.6	45	<0.02	~~<0.1~~	1) wp AW 4/17/16
6201	MH	4/11/16	4/13/16	81.6	49	<0.02	—	
6203	MH	4/14/16	4/16/16	81.6	46	<0.02	—	

Cladoceran 7-d Survival and Reproduction Test

Ramboll Environ

Analysis ID:	14-9477-9780	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.4
Analyzed:	20 Apr-16 14:11	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes
Batch ID:	01-8750-1314	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	12 Apr-16	**Protocol:**	EPA/600/4-91/002 (1994)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	18 Apr-16	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 0h	**Source:**	In-House Culture	**Age:**	
Sample ID:	10-0782-1817	**Code:**	3C1223F9	**Client:**	GPAC Crossett
Sample Date:	11 Apr-16	**Material:**	Industrial Effluent	**Project:**	WET Monthly Compliance Test (APR)
Receive Date:	12 Apr-16	**Source:**	Discharge Monitoring Report		
Sample Age:	24h	**Station:**	001		

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU
Untransformed		C > T	NA	NA	80	>80	NA	1.25

Fisher Exact/Bonferroni-Holm Test

Control	vs	C-%	Test Stat	P-Value	P-Type	Decision(α:5%)
Receiving Water		25	1	1.0000	Exact	Non-Significant Effect
		34	0.5	1.0000	Exact	Non-Significant Effect
		45	1	1.0000	Exact	Non-Significant Effect
		60	1	1.0000	Exact	Non-Significant Effect
		80	1	1.0000	Exact	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria

Data Summary

C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Receiving Wate	10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
34		9	1	10	0.9	0.1	10.0%
45		10	0	10	1	0	0.0%
60		9	0	9	1	0	0.0%
80		10	0	10	1	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	Receiving Water	1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
34		0	1	1	1	1	1	1	1	1	1
45		1	1	1	1	1	1	1	1	1	1
60		1	1	1	1	1	1	1	1	1	
80		1	1	1	1	1	1	1	1	1	1

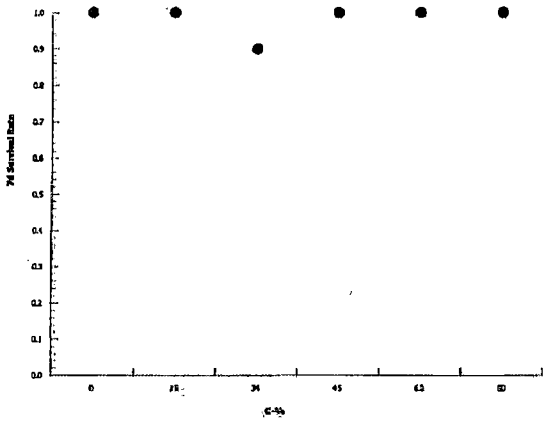
7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Receiving Water	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
34		0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
45		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
60		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	
80		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

Cladoceran 7-d Survival and Reproduction Test — **Ramboll Environ**

Analysis ID:	14-9477-9780	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.4
Analyzed:	20 Apr-16 14:11	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

Graphics



Cladoceran 7-d Survival and Reproduction Test — **Ramboll Environ**

Analysis ID:	10-6076-9107	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.4
Analyzed:	20 Apr-16 14:11	**Analysis:**	Nonparametric-Multiple Comparison	**Official Results:**	Yes
Batch ID:	01-8750-1314	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	12 Apr-16	**Protocol:**	EPA/600/4-91/002 (1994)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	18 Apr-16	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 0h	**Source:**	In-House Culture	**Age:**	
Sample ID:	10-0782-1817	**Code:**	3C1223F9	**Client:**	GPAC Crossett
Sample Date:	11 Apr-16	**Material:**	Industrial Effluent	**Project:**	WET Monthly Compliance Test (APR)
Receive Date:	12 Apr-16	**Source:**	Discharge Monitoring Report		
Sample Age:	24h	**Station:**	001		

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	NA	C > T	NA	NA	80	>80	NA	1.25	23.1%

Wilcoxon/Bonferroni Adj Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Receiving Water		25	141.5	NA	3	18	1.0000	Exact	Non-Significant Effect
		34	132	NA	2	18	1.0000	Exact	Non-Significant Effect
		45	141.5	NA	3	18	1.0000	Exact	Non-Significant Effect
		60	116	NA	2	17	1.0000	Exact	Non-Significant Effect
		80	129	NA	3	18	1.0000	Exact	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	28.5	15 - NL	Yes	Passes Acceptability Criteria

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value	4.091	3.193	0.0006	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	565.2676	113.0535	5	3.002	0.0185	Significant Effect
Error	1996.122	37.66268	53			
Total	2561.39		58			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	13.89	15.09	0.0163	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9295	0.9451	0.0021	Non-normal Distribution

Reproduction Summary

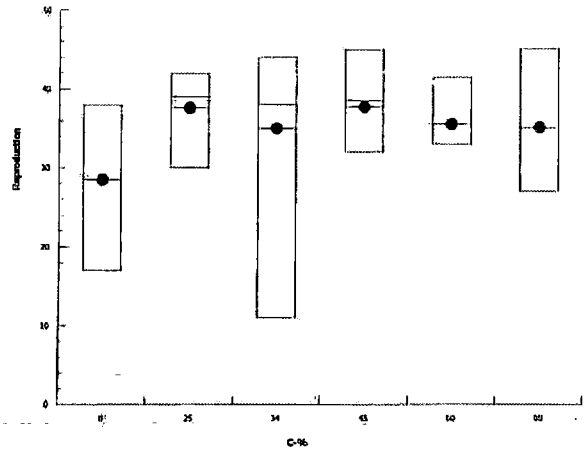
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Receiving Water	10	28.5	23.05	33.95	28.5	17	38	2.409	26.73%	0.0%
25		10	37.6	34.49	40.71	39	30	42	1.376	11.57%	-31.93%
34		10	35	28.41	41.59	38	11	44	2.914	26.32%	-22.81%
45		10	37.7	34.59	40.81	38.5	32	45	1.375	11.53%	-32.28%
60		9	35.56	33.38	37.73	35	33	41	0.9444	7.97%	-24.76%
80		10	35.1	30.94	39.26	34	27	44	1.841	16.58%	-23.16%

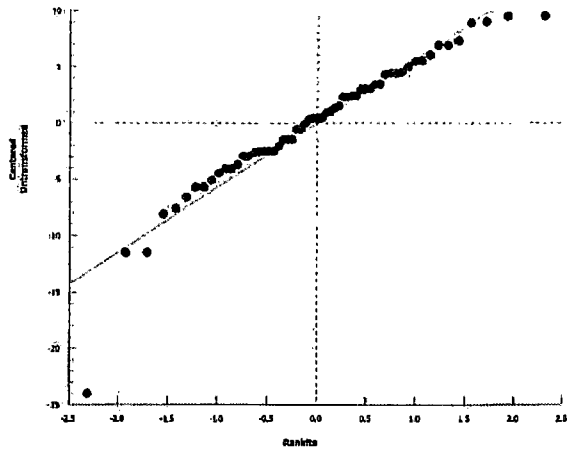
Reproduction Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Receiving Water	17	24	17	27	30	27	34	38	33	38
25		31	35	30	38	40	40	41	37	42	42
34		11	38	32	40	32	38	36	38	41	44
45		32	34	40	32	38	35	45	42	40	39
60		33	33	39	41	34	33	36	35	36	
80		30	36	42	33	35	31	31	42	44	27

Analysis ID:	10-6076-9107	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.4
Analyzed:	20 Apr-16 14:11	**Analysis:**	Nonparametric-Multiple Comparison	**Official Results:**	Yes

Graphics





CETIS Analytical Report

Cladoceran 7-d Survival and Reproduction Test — **Ramboll Environ**

Analysis ID:	04-3803-3455	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.4
Analyzed:	20 Apr-16 14:11	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes
Batch ID:	01-8750-1314	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	12 Apr-16	**Protocol:**	EPA/600/4-91/002 (1994)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	18 Apr-16	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 0h	**Source:**	In-House Culture	**Age:**	
Sample ID:	10-0782-1817	**Code:**	3C1223F9	**Client:**	GPAC Crossett
Sample Date:	11 Apr-16	**Material:**	Industrial Effluent	**Project:**	WET Monthly Compliance Test (APR)
Receive Date:	12 Apr-16	**Source:**	Discharge Monitoring Report		
Sample Age:	24h	**Station:**	001		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	68747	1000	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	28.5	15 - NL	Yes	Passes Acceptability Criteria

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	>80	N/A	N/A	<1.25	NA	NA

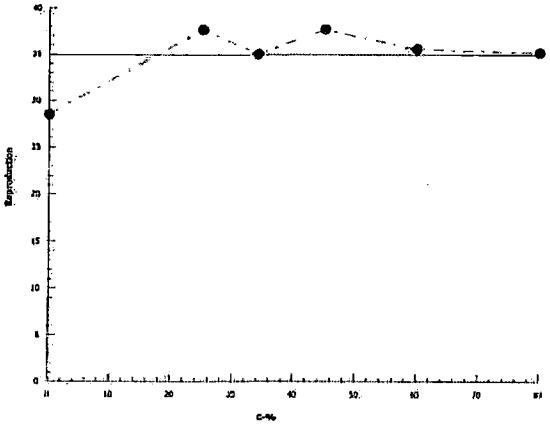
Reproduction Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Receiving Water	10	28.5	17	38	2.409	7.619	26.73%	0.0%
25		10	37.6	30	42	1.376	4.351	11.57%	-31.93%
34		10	35	11	44	2.914	9.214	26.32%	-22.81%
45		10	37.7	32	45	1.375	4.347	11.53%	-32.28%
60		9	35.56	33	41	0.9444	2.833	7.97%	-24.76%
80		10	35.1	27	44	1.841	5.82	16.58%	-23.16%

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	Receiving Water	17	24	17	27	30	27	34	38	33	38
25		31	35	30	38	40	40	41	37	42	42
34		11	38	32	40	32	38	36	38	41	44
45		32	34	40	32	38	35	45	42	40	39
60		33	33	39	41	34	33	36	35	36	
80		30	36	42	33	35	31	31	42	44	27

Graphics



RAMBOLL ENVIRON CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION 3-BROOD CHRONIC TOXICITY TEST

EPA-821-R-02-013 Method 1002.0

TEST LOG NO.: 18165

JOB NUMBER.: 3839396A

INDUSTRY: Georgia Pacific-Crossett

EFFLUENT: Outfall 001

DILUTION WATER: River Water

NPDES (Y/N) : Yes

PHOTOPERIOD: 16 hr light/8 hr dark

FEEDING REGIME: 0.1 mL YCT / 0.1 mL R. subcapitata per 15 mL

TEST VESSEL CAPACITY: 30 mL

TEST SOLUTION VOLUME: 15 mL

NO. ORGANISMS/REPLICATE: 1

NO. REPLICATES: 10

ORGANISM SOURCE INFORMATION:

AGE (date): 4/11/16

TEMP @ TEST START: 25.0

RANDOMIZED BY: AW

SOURCE ID:	AGE (time):
11337	1210-1511
11338	1211-1514

TEST START:

HOURS: 1047 DATE: 4/12/16

TEST END:

HOURS: 1242 DATE: 4/18/16

SURVIVAL AND REPRODUCTION DATA

Test Start & Feeding/ End Initials/ Time	Daily Renewal & Feeding Initials/ Time	Date	Control River Water Temp (°C)			REPLICATES 38 (37) 1	2	3	4	5	6	7	8	9	10	Notes
					Adult	20	18	14	6	5	1	9	2	7	10	
AW 1047		4/12	24.7		Day 0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1050	4/13	24.1	24.1	Day 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1140	4/14	24.6	24.9	Day 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1204	4/15	24.2	24.7	Day 3	✓	4	✓	4	5	4	4	5	5	4	
	AW 1135	4/16	24.3	24.5	Day 4	6	✓	2	✓	✓	✓	✓	✓	✓	✓	
	AW 1054	4/17	24.6	24.1	Day 5	11	7	✓	7	7	6	11	11	12	14	
AW 1242		4/18		24.6	Day 6	✓	13	15	16	18	17	19	22	16	20	80%
					Day 7											
					Day 8											
			Total			17	24	17	27	30	27	34	38	33	38	285

x.75 = 214

✓ = Test Organism Alive
D = Test Organism Dead
0 (-0) = Live neonates / Dead neonates
Miss = Lost or Missing
M = Male

TEST LOG # 18165 JOB # 3839396A

CLIENT/SAMPLE ID: Georgia Pacific - Crossett LAB/STATE: RAMBOLL ENVIRON / TN

SURVIVAL AND REPRODUCTION DATA

Test Start & Feeding/ End Initials/ Time	Daily Renewal & Feeding Initials/ Time	Date	Concentration 25% Temp (°C)			REPLICATES 1	2	3	4	5	6	7	8	9	10	Notes
					Adult											
AW 1047		4/12	24.6		Day 0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1050	4/13	24.1	24.0	Day 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1140	4/14	24.6	24.7	Day 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1204	4/15	24.9	25.1	Day 3	✓	✓	6	6	6	6	5	6	6	5	
	AW 1135	4/16	24.1	25.1	Day 4	5	6	✓	✓	12	✓	✓	✓	✓	✓	
	AW 1059	4/17	24.5	24.4	Day 5	8	12	13	12	✓	15	16	12	13	13	
AW 1242		4/18		24.8	Day 6	19	17	11	20	22	19	20	19	23	24	
					Day 7											
					Day 8											
			Total			31	35	30	38	40	40	41	37	42	42	

SURVIVIAL AND REPRODUCTION DATA

Test Start & Feeding/ End Initials/ Time	Daily Renewal & Feeding Initials/ Time	Date	Concentration 34% Temp (°C)			REPLICATES 1	2	3	4	5	6	7	8	9	10	Notes
AW 1047		4/12	24.3		Day 0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1050	4/13	24.0	24.0	Day 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1140	4/14	24.3	24.6	Day 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1204	4/15	24.8	25.2	Day 3	✓	6	5	6	✓	6	6	6	6	6	30 cm 4/17 i.e.
	AW 1135	4/16	24.1	25.2	Day 4	4	✓	✓	✓	4	✓	4	✓	14	✓	
	AW 1059	4/17	24.4	24.5	Day 5	7	13	10	15	11	14	8	13	✓	15	
AW 1242		4/18		24.6	Day 6	D/0	19	17	19	17	18	24	19	21	23	
					Day 7											
					Day 8											
			Total			D/11	38	32	40	32	38	36	38	41	44	

✓ = Test Organism Alive
D = Test Organism Dead
0 = Live neonates
(-0) = Dead neonates
Miss = Lost or Missing
M = Male

L/Ecotoxlab/Labforms/ToxTestSheets/7Dchron/cCD.doc

TEST LOG # 18165 JOB # 3839396A

CLIENT/SAMPLE ID: Georgia Pacific - Crossett LAB/STATE: RAMBOLL ENVIRON / TN

SURVIVAL AND REPRODUCTION DATA

Test Start & Feeding/ End Initials/ Time	Daily Renewal & Feeding Initials/ Time	Date	Concentration 45% Temp (°C)			REPLICATES 1	2	3	4	5	6	7	8	9	10	Notes
					Adult											
AW 1047		4/12	24.6		Day 0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1050	4/13	24.9	24.4	Day 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1140	4/14	24.8	24.6	Day 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1204	4/15	25.1	25.6	Day 3	✓	6	6	5	5	5	6	✓	6	7	
	AW 1135	4/16	24.3	24.4	Day 4	6	✓	✓	✓	✓	✓	✓	6	✓	9	
	AW 1059	4/17	24.1	24.5	Day 5	11	9	13	10	14	14	15	11	14	✓	
AW 1242		4/18		24.7	Day 6	15	19	21	17	19	16	24	25	20	23	
					Day 7											
					Day 8											
			Total			32	34	40	32	38	35	45	42	40	39	

SURVIVIAL AND REPRODUCTION DATA

Test Start & Feeding/ End Initials/ Time	Daily Renewal & Feeding Initials/ Time	Date	Concentration 60% Temp (°C)			REPLICATES 1	2	3	4	5	6	7	8	9	10	Notes
AW 1047		4/12	24.5		Day 0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1050	4/13	24.5	24.5	Day 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1140	4/14	24.6	24.3	Day 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1204	4/15	24.9	25.1	Day 3	✓	4	5	6	6	5	3	5	6	5	
	AW 1135	4/16	24.4	24.6	Day 4	Miss	✓	✓	✓	13	✓	✓	✓	✓	✓	
	AW 1059	4/17	24.2	24.1	Day 5		8	12	13	✓	11	8	14	8	12	
AW 1242		4/18		24.2	Day 6		21	16	20	22	18	22	17	21	19	
					Day 7											
					Day 8											
			Total			Miss	33	33	39	41	34	33	36	35	36	

✓ = Test Organism Alive
D = Test Organism Dead
0 = Live neonates
(-0) = Dead neonates
Miss = Lost or Missing
M = Male

L/Ecotoxlab/Labforms/ToxTestSheets/7DchronicCD.doc

TEST LOG # 18165 JOB # 3839396A

CLIENT/SAMPLE ID: Georgia Pacific - Crossett LAB/STATE: RAMBOLL ENVIRON / TN

SURVIVAL AND REPRODUCTION DATA

Test Start & Feeding/ End Initials/ Time	Daily Renewal & Feeding Initials/ Time	Date	Concentration 80% Temp (°C)			REPLICATES 1	2	3	4	5	6	7	8	9	10	Notes
					Adult											
AW 1047		4/12	24.5		Day 0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1050	4/13	24.6	24.7	Day 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1140	4/14	24.9	25.1	Day 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1204	4/15	25.0	24.8	Day 3	✓	5	6	4	6	✓	5	6	7	6	
	AW 1135	4/16	24.2	25.0	Day 4	7	✓	✓	✓	8	4	✓	✓	14	✓	
	AW 1059	4/17	24.2	24.2	Day 5	9	13	14	11	✓	9	14	15	✓	✓	
AW 1242		4/18		24.6	Day 6	14	18	22	18	21	18	18	21	23	21	
					Day 7											
					Day 8											
			Total			30	36	42	33	35	31	31	42	44	37	35

SURVIVIAL AND REPRODUCTION DATA

Test Start & Feeding/ End Initials/ Time	Daily Renewal & Feeding Initials/ Time	Date	Concentration MH Temp (°C)			REPLICATES 1	2	3	4	5	6	7	8	9	10	Notes
AW 1047		4/12	24.8		Day 0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1050	4/13	24.3	24.6	Day 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1140	4/14	24.0	24.4	Day 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	LM 1204	4/15	24.3	24.6	Day 3	✓	6	5	5	6	✓	3	4	5	✓	
	AW 1135	4/16	24.1	25.1	Day 4	3	✓	✓	✓	✓	4	✓	✓	✓	6	
	AW 1059	4/17	24.1	25.2	Day 5	11	13	12	14	12	11	11	11	13	15	
AW 1242		4/18		25.0	Day 6	8	11	13	15	12	14	16	14	16	17	
					Day 7											
					Day 8											
			Total			22	30	33	34	30	29	30	29	34	38	

✓ = Test Organism Alive
D = Test Organism Dead
0 = Live neonates
(-0) = Dead neonates
Miss = Lost or Missing
M = Male

L/Ecotox/lab/Labforms/ToxTestSheets/7Dchron/cCD.doc

TEST LOG NO. 18165

CLIENT/SAMPLE ID: Georgia Pacific Crossett

JOB NO. 20-19675I

TEST ORGANISM: Cd

DATE: 4/11/16

D.O. (mg/L)

Concentration (%)	Start	Day 1 Old	Day 1 New	Day 2 Old	Day 2 New	Day 3 Old	Day 3 New	Day 4 Old	Day 4 New	Day 5 Old	Day 5 New	Day 6 Old	Day 6 New	Day 7
RW	8.6	8.0	8.5	8.0	8.4	8.6	9.0	8.0	8.4	8.2	8.4	8.2		
25	8.7	7.9	8.4	7.9	8.2	8.6	8.7	8.3	8.6	8.3	8.3	8.4		
34	8.6	7.6	8.4	7.7	8.2	8.6	8.8	8.3	8.6	8.0	8.4	8.3		
45	8.6	7.7	8.0	7.7	8.5	8.7	8.9	8.3	8.7	8.1	8.4	8.3		
60	8.4	7.6	7.8	7.9	8.3	8.6	8.9	8.3	8.5	8.3	8.3	8.5		
80	8.2	7.7	8.1	8.0	8.4	8.5	9.0	8.1	8.6	8.3	8.3	8.4		
MH	8.5	7.8	8.6	8.2	8.4	8.6	9.1	8.1	8.4	8.0	8.2	8.3		

pH (s.u.)

Concentration (%)	Start	Day 1 Old	Day 1 New	Day 2 Old	Day 2 New	Day 3 Old	Day 3 New	Day 4 Old	Day 4 New	Day 5 Old	Day 5 New	Day 6 Old	Day 6 New	Day 7
RW	6.45	7.90	7.92	7.84	7.86	7.79	7.80	7.72	7.87	7.16	6.98	7.52		
25	7.29	8.11	7.91	7.98	7.96	7.73	7.84	8.03	7.89	7.79	6.94	8.08		
34	7.50	8.23	7.90	8.09	7.94	7.85	7.85	8.15	7.86	7.91	7.16	8.09		
45	7.65	8.33	7.92	8.22	7.94	8.06	7.90	8.38	7.84	8.05	7.89	8.28		
60	7.76	8.43	7.93	8.41	7.98	8.29	7.93	8.49	7.90	8.15	7.93	8.39		
80	7.84	8.62	7.84	8.49	7.81	8.50	7.81	8.58	7.96	8.29	7.97	8.51		
MH	8.00	7.97	7.79	7.84	7.78	8.00	7.87	8.02	7.80	7.99	7.73	8.02		

Conductivity (µmhos/cm)

Concentration (%)	Start	Day 1 Old	Day 1 New	Day 2 Old	Day 2 New	Day 3 Old	Day 3 New	Day 4 Old	Day 4 New	Day 5 Old	Day 5 New	Day 6 Old	Day 6 New	Day 7
RW	50	60	107	105	77	63	72	101	69	61	61	68		
25	473	453	516	489	469	403	471	464	491	470	432	494		
34	618	615	697	611	641	600	688	626	615	599	574	615		
45	780	760	816	710	801	746	716	798	789	765	752	800		
60	1019	1013	1051	1023	999	950	1034	1025	987	956	981	1054		
80	1338	1309	1339	1352	1336	1226	1290	1302	1303	1292	1302	1286		
MH	209	213	218	226	215	210	221	233	236	240	234	232		

Params Init/Time:	AW 0940	LM 1100	HM 0944	HM 1100	HM 1107	LM 1219	HM 1041	AW 1150	HM 1104	AW 1114	AW 0955	AW 1254		
Dilutions Init/Time:	AW 0930		HM 0935		HM 1041		HM 1031		HM 1052		AW 0945			
	RW	MH												
Control Water Batch#:	19042, 0195		19060, 1291		19060, 1220		19060, 1220		19070, 0201		19670, 0203			
Food Batch	54781520		5028550		78,259		78,26		78,216		78,238			

DHM 4/11/16

ATTACHMENT 2

CHAIN OF CUSTODY DOCUMENTATION AND REFERENCE TOXICANT DATA

Ramboll Environ Test Log No. 18165

28 of 37

Project Name: | Project Number:

Industry: Georgia Pacific Paper

Phone: 870-567-8170 FAX: 870-364-9076

County: Ashley City: Crossett State: AR

Sample Collected by (print): DANNY / JERRY / PAUL

NPDES Permit No.: AR0001210

Sample Collected by (signature):

NPDES Test: ☐ No ☑ Yes

CHAIN-OF-CUSTODY

ENVIRON

201 Summit View Drive, Suite 300
Brentwood, TN 37027
PHONE: (615) 277-7570
FAX: (615) 377-4976

Analysis Requested

Sample Location / ID	Comp/Grab	Container Type	Chilled During Collection (Y/N)	Start Date/Time	End Date/Time	No. of Cntrs	Total Volume in liters	Acute Fathead minnow	Acute Bannerfin shiner	Acute *Ceriodaphnia dubia*	Acute *Daphnia pulex*	Chronic Fathead minnow	Chronic *Ceriodaphnia dubia*	Continuous Batch Tests	Discrete Batch Tests	Other	Description Definitive or Screen	Sample B# (lab only)	Receipt Temp °C
River	G	Plastic	NA	4-11-16 11:15		2	10						✓	✓			Dilution Water		2.0
Outfall 001	C	Plastic	Yes	4-10-16 7:05	4-11-16 6:37	2	10					✓	✓						1.7

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - Wastewater **AW** - Ambient Water **ML** - Mixed Liquor **SL** - Sludge **SD** - Sediment **OT** - Other _____

Remarks:

Measured TRC (if applicable): 0.00 mg/L

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Samples shipped via: ☑ FedEx ☐ Other Courier ☐ UPS ☐ Hand Delivered	Condition: (lab use only)
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Containers/Volume Received: 4.12.16	
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/12/16	Time: 0845	pH upon arrival: 6.84, 7.79	DO upon arrival: 8.4, 9.3

Sample Receipt Checklist:

Client: GP Crossett

Date/Time received 4/12/16 0840 by HM

1. Cooler sealed and intact upon arrival? (Yes) No
2. Custody seals present? Yes (No)
3. Samples received below 6 degrees Celsius? (Yes) No
4. Was ice present? (Yes) No
5. Is the COC filled out correctly including the sample date/time and signed? (Yes) No
6. Was the sample received within 36 hours of collection? (Yes) No
7. Did the sample(s) arrive in good condition? (Yes) No
8. Was pH and DO measured and in range? (Yes) No
9. Was residual chlorine present? (Yes) in River No
   - 1.0 mg/L? (did dechlor occur) Yes (No)

Comments:

Batch #	Sample ID	Temp (C°)	pH	DO	TRC
191642	River	2.2	6.84	8.9	0.04
191643	001	1.7	7.79	9.3	<0.02

L:\Ecotox Lab\FORMS

CHAIN-OF-CUSTODY

ENVIRON
201 Summit View Drive, Suite 300
Brentwood, TN 37027
PHONE: (615) 277-7570
FAX: (615) 377-4976

Project Name: Project Number:

Industry: Georgia Pacific Paper

Phone: 870-567-8170 FAX: 870-364-9076

County: Ashley City: Crossett State: AR

Sample Collected by (print): Damon / Chris / Paul

Sample Collected by (signature): Chris Roan

NPDES Permit No.: AR0001210

NPDES Test: ☐ No ☑ Yes

Sample Location / ID	Comp/Grab	Container Type	Chilled During Collection (Y/N)	Start Date/Time	End Date/Time	No. of Cntrs	Total Volume in liters	Analysis Requested: Acute Fathead minnow	Acute Bannerfin shiner	Acute *Ceriodaphnia dubia*	Acute *Daphnia pulex*	Chronic Fathead minnow	Chronic *Ceriodaphnia dubia*	Continuous Batch Tests	Discrete Batch Tests	Other	Description Definitive or Screen	Sample B# (lab only)	Receipt Temp °C
River	C	Plastic	No	4-11-16 11:15 am		2	20										Dilution Water	191060	1.5, 1.3
																		191061	1.4, 2.0
Outfall 001	C	Plastic	Yes	4-12-16 6:30 am	4-13-16 6:32 am	2	20					✓	✓	✓					

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - Wastewater **AW** - Ambient Water **ML** - Mixed Liquor **SL** - Sludge **SD** - Sediment **OT** - Other _____

Remarks:

Measured TRC (if applicable): 0.00 mg/L

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Samples shipped via: ☑ FedEx ☐ Other Courier ☐ UPS ☐ Hand Delivered	Condition: (lab use only)
Chris Roan	4-11-16				
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Containers/Volume Received: 40L 4g	
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/14/16 Time: 0831	pH upon arrival: 7.29 7.73 DO upon arrival: 7.3 7.6

Sample Receipt Checklist:

Client: COP Crossett

Date/Time received 4/14/16 0831 by HM

1. Cooler sealed and intact upon arrival? (Yes) No
2. Custody seals present? Yes (No)
3. Samples received below 6 degrees Celsius? (Yes) No
4. Was ice present? ~~Yes~~ No
5. Is the COC filled out correctly including the sample date/time and signed? (Yes) No
6. Was the sample received within 36 hours of collection? (Yes) No
7. Did the sample(s) arrive in good condition? (Yes) No
8. Was pH and DO measured and in range? ~~Yes~~ No
9. Was residual chlorine present? (Yes) No
   - 1.0 mg/L? (did dechlor occur) Yes (No)

Comments:

Batch #	Sample ID	Temp (C°)	pH	DO	TRC
196160	River	1.5, 1.3	7.29	7.8	0.03
196161	outfall 001	1.4, 2.0	7.73	7.6	<0.02

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Project Name:	Project Number:
Industry: Georgia Pacific Paper	
Phone: 870-567-8170	FAX:
County: Ashley	City: Crossett
State: AR	
Sample Collected by (print): Danny / Brittney McCone	NPDES Permit No.: AR0001210
Sample Collected by (signature): Brittney McCone	NPDES Test: ☐ No ☑ Yes

CHAIN-OF-CUSTODY

RAMBOLL ENVIRON
201 Summit View Drive, Suite 300
Brentwood, TN 37027
PHONE: (615) 277-7570
FAX: (615) 377-4976

Sample Location / ID	Comp/Grab	Container Type	Chilled During Collection (Y/N)	Start Date/Time	End Date/Time	No. of Cntrs	Total Volume in liters	Analysis Requested: Acute Fathead minnow	Acute Bannerfin shiner	Acute *Ceriodaphnia dubia*	Acute *Daphnia pulex*	Chronic Fathead minnow	Chronic *Ceriodaphnia dubia*	Continuous Batch Tests	Discrete Batch Tests	Other	Description Definitive or Screen	Sample B# (lab only)	Receipt Temp °C
River	G	Plastic		4-11-16 11:15am													Dilution Water	19670	3.6
																		19671	4.2
Outfall 001	C	Plastic		4-14-16 6:28am	4-15-16 6:29am							✓	✓						

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - Wastewater **AW** - Ambient Water **ML** - Mixed Liquor **SL** - Sludge **SD** - Sediment **OT** - Other _____

Remarks:

Measured TRC (if applicable): 0.00 mg/L

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Samples shipped via: ☑ FedEx ☐ Other Courier ☐ UPS ☐ Hand Delivered	Condition: (lab use only)
Chris Lear	4-15-16	4:00pm			
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Containers/Volume Received: 2 0L of each	
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature) Anita Whitmore	Date: 4/16/16 Time: 0935	pH upon arrival: 6.94, 7.54 DO upon arrival: 8.7, 8.8

Sample Receipt Checklist:

Client: GP Crossett

Date/Time received 4/16/16 0835 by AW

1. Cooler sealed and intact upon arrival?	(Yes)	No
2. Custody seals present?	Yes	(No)
3. Samples received below 6 °C?	(Yes)	No
4. Was ice present?	(Yes)	No
5. Is the COC filled out correctly including the sample date/time and signed?	(Yes)	No
6. Was the sample received within 36 hours of collection?	(Yes)	No
7. Did the sample(s) arrive in good condition?	(Yes)	No
8. Was pH and DO measured and in range?	(Yes)	No
9. Was residual chlorine present? > 1.0 mg/L? (did dechlor occur)	(Yes) in Bag	(No)

Comments:

Batch #	Sample ID	Temp (C°)	pH	DO	TRC
19670	River	3.6	6.94	8.7	0.04
19671	Outfall001	4.2	7.54	8.8	< 0.02

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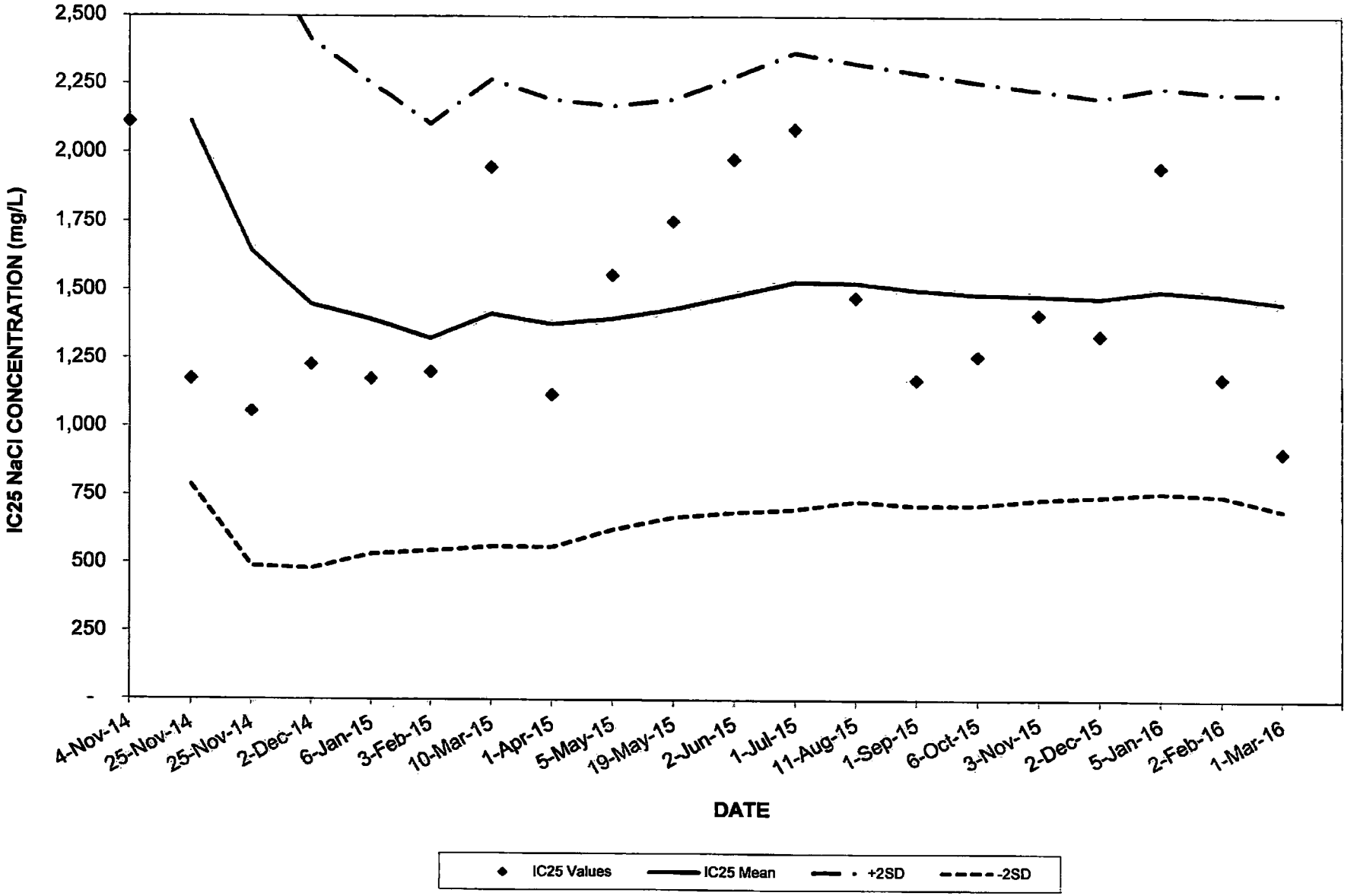
CHRONIC REFERENCE TOXICANT TEST (NaCl) 2014 - 2016
FATHEAD MINNOWS



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4/20/2016

Fathead Minnow CHRONIC REFERENCE TOXICANT TESTING-SODIUM CHLORIDE (NaCl) 2014 - 2016

Test Number	Log Number	Test Initiation Date	Control Survival (%) (*)	Control Mean Dry Weight (mg/fish) (*)	SURVIVAL		GROWTH		PMSD (%)	IC25 VALUE (mg/L)	IC25 CUMULATIVE MEAN (mg/L)	IC25 ST. DEV. (mg/L)	IC25 2+ STD. DEV.	IC25 2- STD. DEV.	Coefficient of Variation (%)
					NOEC (mg/L)	LOEC (mg/L)	NOEC (mg/L)	LOEC (mg/L)							
1	17193	04-Nov-14	100	0.400	750	1,500	1,500	3,000	31.3	2,111					
2	17242	25-Nov-14	100	0.433	750	1,500	750	1,500	17.4	1,175	2,111	662	3,435	787	28
3	17243	25-Nov-14	97.5	0.483	750	1,500	750	1,500	22.1	1,057	1,643	577	2,798	488	33
4	17258	02-Dec-14	100	0.317	750	1,500	750	1,500	27.7	1,228	1,448	484	2,416	479	30
5	17317	06-Jan-15	97.5	0.476	1,500	3,000	1,500	3,000	42.2	1,176	1,393	430	2,253	532	29
6	17379	03-Feb-15	100	0.515	750	1,500	750	1,500	25.3	1,200	1,325	390	2,104	545	27
7	17427	10-Mar-15	97.5	0.519	1,500	3,000	1,500	3,000	34.3	1,948	1,414	427	2,267	560	28
8	17504	01-Apr-15	90	0.316	750	1,500	750	1,500	39.1	1,117	1,377	409	2,194	559	28
9	17570	05-May-15	95	0.346	750	1,500	1,500	3,000	32.6	1,556	1,396	387	2,170	622	26
10	17604*	19-May-15	97.5	0.284	1,500	3,000	1,500	3,000	24.3	1,753	1,432	382	2,196	668	25
11	17621*	02-Jun-15	95	0.335	1,500	3,000	1,500	3,000	24.8	1,978	1,482	398	2,278	686	26
12	17676	01-Jul-15	95	0.452	1,500	3,000	1,500	3,000	23.4	2,087	1,532	418	2,368	697	26
13	17740	11-Aug-15	97.5	0.402	1,500	3,000	1,500	3,000	32.8	1,473	1,528	400	2,328	727	25
14	17790	01-Sep-15	100	0.524	750	1,500	750	1,500	18.4	1,171	1,502	396	2,295	710	25
15	17848	06-Oct-15	95	0.406	750	1,500	1,500	3,000	34.4	1,258	1,486	387	2,260	712	25
16	17903	03-Nov-15	100	0.269	750	1,500	1,500	3,000	30.0	1,411	1,481	374	2,230	733	24
17	17946	02-Dec-15	100	0.330	750	1,500	1,500	3,000	27.0	1,334	1,473	364	2,201	744	24
18	17994	05-Jan-16	100	0.339	750	1,500	1,500	3,000	19.8	1,948	1,499	371	2,240	758	24
19	18025	02-Feb-16	100	0.377	750	1,500	750	1,500	26.0	1,175	1,482	368	2,217	746	24
20	18074	01-Mar-16	100	0.672	750	1,500	750	1,500	22.0	904	1,453	381	2,214	692	26
Avg			98	0.410	975	1950	1200	2400	28	1453	1498	421	2340	655	

Notes:

Dilution series - 0.375 g/L - 6.0 g/L

NOEC - No Observable Effect Concentration (survival or growth)

LOEC - Lowest Observable Effect Concentration (survival or growth)

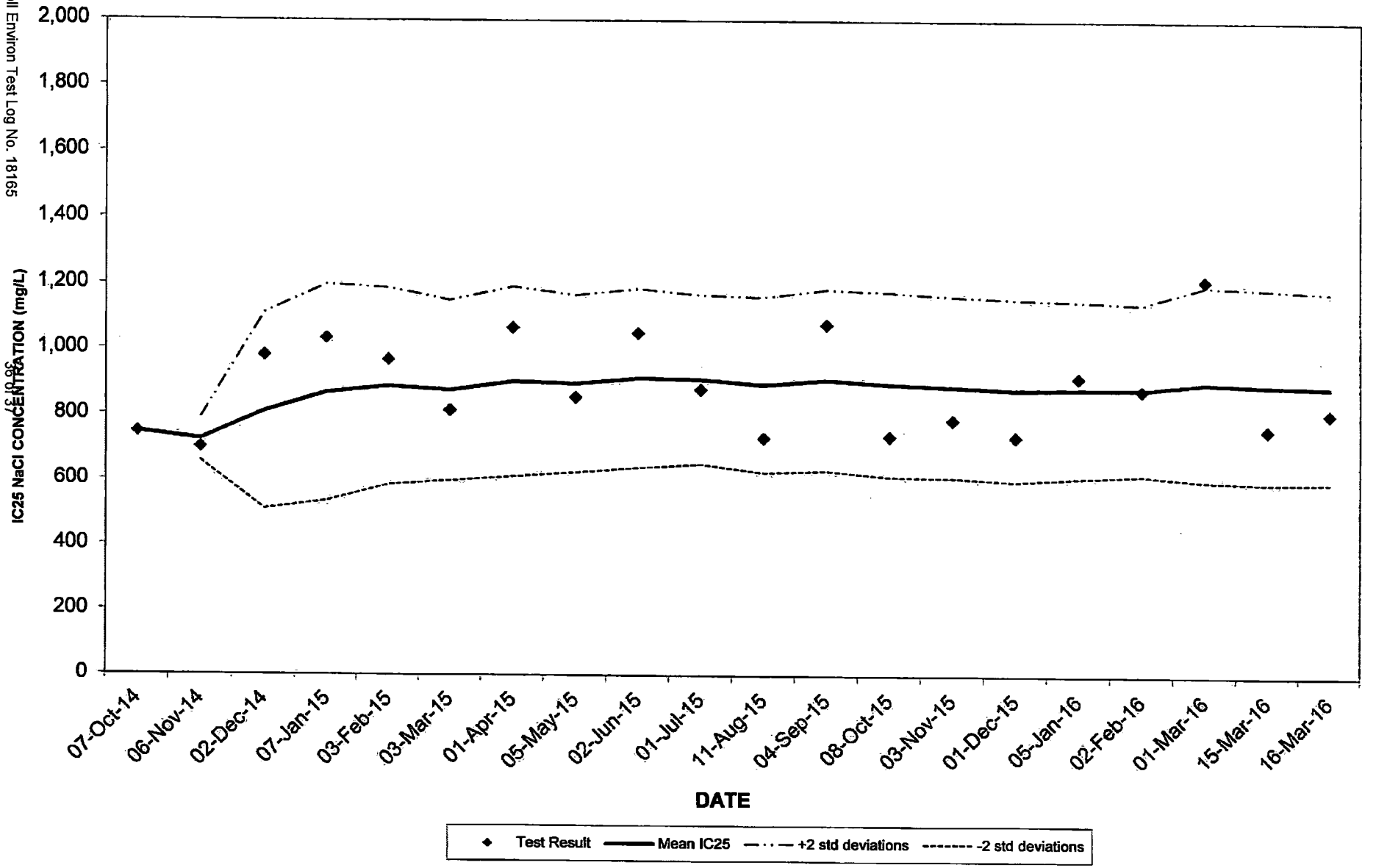
ACCEPTABLE TEST RESULTS - A growth NOEC ranging from 750 mg/L to 3,000 mg/L.

(*) used ABS fish

Minimum USEPA CONTROL CRITERIA - 80 percent survival and average dry weight of 0.25 mg (weight based on surviving number of fish).

Ramboll Environ Test Log No. 18165

CHRONIC REFERENCE TOXICANT (NaCl) 2014-2016
Ceriodaphnia dubia



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4/20/2016

Ceriodaphnia dubia **CHRONIC REFERENCE TOXICANT TESTING - SODIUM CHLORIDE (NaCl) 2014-2016**

Test Number	Log Number	Test Initiation Date	Control Survival (%) (*)	3 Brood Production (%) (*)	Control Average Repro (*)	Survival		Reproduction			IC25 VALUE (mg/L)	IC25 CUMULATIVE MEAN (mg/L)	IC25 ST. DEV. (mg/L)	IC25 2+ STD. DEV.	IC25 2- STD. DEV.	Coefficient of Variation (%)
						NOEC (mg/L)	LOEC (mg/L)	NOEC (mg/L)	LOEC (mg/L)	PMSD						
1	17124	07-Oct-14	100	100	29.7	1,000	2,000	500	1,000	26.8	747	747				
2	17201	06-Nov-14	100	80	23.8	1,000	2,000	500	1,000	21.5	700	724	33	790	657	3
3	17248	02-Dec-14	100	80	26.1	2,000	>2000	500	1,000	14.1	980	809	150	1,109	509	15
4	17316	07-Jan-15	100	90	28.2	2,000	>2000	500	1,000	17.8	1,032	865	166	1,196	534	17
5	17380	03-Feb-15	100	90	33.2	2,000	>2000	500	1,000	18.7	966	885	150	1,186	584	15
6	17427	03-Mar-15	100	90	26.7	1,000	2,000	500	1,000	21.4	811	873	138	1,148	597	14
7	17504	01-Apr-15	100	90	24.5	1,000	2,000	1,000	2,000	24.9	1,064	900	145	1,190	610	15
8	17571	05-May-15	100	80	22.9	2,000	>2000	500	1,000	22.0	851	894	135	1,165	623	14
9	17622	02-Jun-15	100	80	27.4	1,000	2,000	1,000	2,000	22.3	1,048	911	137	1,185	637	14
10	17675	01-Jul-15	100	100	26.4	2,000	>2000	500	1,000	16.0	875	907	129	1,166	649	14
11	17746	11-Aug-15	100	80	20.6	2,000	>2000	500	1,000	33.1	728	891	134	1,159	623	14
12	17798	04-Sep-15	100	100	27.7	2,000	>2000	500	1,000	13.4	1,075	906	139	1,183	629	15
13	17856	08-Oct-15	100	80	25.5	2,000	>2000	500	1,000	22.0	733	893	141	1,175	611	15
14	17904	03-Nov-15	100	100	27.8	1,000	2,000	500	1,000	12.4	783	885	139	1,163	608	15
15	17947	01-Dec-15	100	100	26.0	2,000	>2,000	500	1,000	19.8	732	875	139	1,154	596	15
16	17995	05-Jan-16	100	90	30.4	2,000	>2,000	500	1,000	19.1	912	877	135	1,147	607	15
17	18024	02-Feb-16	100	100	27.7	1,000	2,000	500	1,000	23.5	873	877	131	1,138	616	14
18	18073	01-Mar-16	100	100	35.0	2,000	>2,000	500	1,000	7.4	1,210	896	149	1,194	597	16
19	18107	15-Mar-16	90	90	32.7	2,000	>2,000	500	1,000	22.6	753	888	149	1,185	591	16
20	18112	16-Mar-16	100	90	31.9	2,000	>2,000	500	1,000	16.4	802	884	146	1,175	592	16
		Avg	100	91	27	1611	778	556	1111	20	884	867	135	1144	605	

Notes:
NOEC - No Observable Effect Concentration (survival or reproduction)
LOEC - Lowest Observable Effect Concentration (survival or reproduction)
(*) Minimum USEPA CONTROL CRITERIA - 80 percent survival, 80 percent with 3 broods, and average reproduction of 15 neonates/adult.

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