

Effluent Quality Assessment

Buckeye Florida

Taylor County

NPDES #FL0000876

Sampled February 14, 16, and 18, 2011

May 2011

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
NELAC Certification No. E31780

CONTENTS

Introduction

Methods

Results and Discussion

Literature Cited

Tables

Table 1 Measured algal growth potential (AGP)

Table 2 Effluent limits, Class III Freshwater Criteria and chemical data

Appendices

Appendix A Chain of Custody

Appendix B Bioassay Bench Sheets

Appendix C SRT Bench Sheets and Statistical Analyses

Appendix D Organism Receipt

Appendix E Chemical Analyses of Effluent

Appendix F Facility Summary, Effluent Limits, and Permit Violations Recorded on Discharge Monitoring Report

Appendix G EPA End Sheet

Buckeye Florida, 1 Buckeye Dr., Perry, Taylor County, Florida, 32348. NPDES #FL0000876. Effluent grab samples for biological and chemical analyses for this facility were collected on February 14, 2011. Additional samples for bioassay analyses were collected on February 16 and 18, 2011.

Introduction

Buckeye Florida is a pulp and paper mill. The facility has an industrial wastewater treatment system which treats wastewater from the pulp and paper mill. (See Appendix F for detailed facility information provided by Brian Kirts of FDEP Northeast District.)

Methods

Samples were collected from the EFF-1 NPDES sampling point for Outfall D-001 by Eesa Ali and Jake Mast (FDEP Northeast District) following DEP-SOP-001/01 FS 2400 Wastewater Sampling. All DEP SOPs are available on the web at: http://www.floridadep.org/labs/bars/sas/sop/index.htm.

See Appendix A for the completed chain of custody forms. (Note: The third chain of custody form has 2/17/11 as the sampling date. The correct date is 2/18/11. The correction was initiated by the sampling team and verified by email.)

The chronic definitive toxicity tests and algal growth potential test were performed following internal DEP SOPs TA07_05, TA07_09, and TA08_01 through TA08_09. All internal DEP SOPs are available on the web at: http://www.floridadep.org/labs/cgi-bin/sop/biosop.asp.

Due to a communication error within the laboratory, a freshwater algal growth potential (AGP) test was not performed. The AGP sample was salinity-adjusted with artificial sea salts from an apparent salinity of approximately 1.4 parts per thousand (ppth) to a salinity of approximately 7.1 ppth to meet the minimal salinity requirements of the marine AGP test.

Results and Discussion

- **Toxicity Test Results**
  Tests were performed February 15 - 22, 2011.

Ceriodaphnia dubia chronic definitive bioassay*–	NOEC = 100% for survival; LOEC = 100% for reproduction IC25 = 52.8% for reproduction
Pimephales promelas 7-day chronic definitive bioassay –	NOEC = 100% for survival; LOEC = > 100% for growth IC25 = > 100% for growth

The bioassay samples were chronically toxic for reproduction to the *Ceriodaphnia dubia* test organisms.

* The *Ceriodaphnia dubia* test met the requirements for termination on test day 6.

The cause of the toxicity noted in the bioassays was not determined.

See Appendix B for bioassay bench sheets. See Appendix C for results of the last 20 standard reference toxicant (SRT) tests and the bench sheets and statistical analyses of the SRT tests that correspond to these facility tests. See Appendix D for test organism receipts.

- **Algal Growth Potential**
  The effluent Algal Growth Potential (AGP) was 9.17 mg dry wt/L of the saltwater species *Dunaliella tertiolecta.* The ratio (4.0:1) of total nitrogen to total phosphorus suggests that the effluent is nitrogen limited (Maloney et al. 1978).

  See Table 1 for AGP results.

- **Chemistry Results**
  Total residual chlorine (TRC) detected in sample 1 (0.04 mg/L) of the bioassay was most likely due to interference in the sample. Total ammonia was detected in bioassay samples 1, 2, and 3 (3.89, 3.66, and 3.90 mg N/L, respectively) in the bioassay laboratory. The total ammonia concentration in the composite sample collected for chemical analysis was 4.0 Y mg N/L (Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.). Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration in the sample submitted for chemical analysis was ≤ 0.02 mg/L.

  Cadmium, chromium–III, copper, iron, nickel, and zinc were detected in the effluent at levels that comply with Class III fresh water quality criteria (62-302.530, F.A.C.). Arsenic, lead, and silver were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL). Dissolved oxygen (DO) (4.8 mg/L; class III freshwater limit ≥ 5.0 mg/L, 62-302.500 (30), F.A.C.; permit FL0000876 limit ≥ 0.3 mg/L**) and specific conductance (2,664 µmhos-cm; class III freshwater limit***, 62-302.500 (22), F.A.C.; permit FL0000876 limit ≤ 4,000 µmhos) although not in compliance with Class III freshwater criteria, were in compliance with permit limits. Aluminum was also detected in the effluent.

  ** DO criteria for the Fenhollowway River at the SR 356 bridge shall be 0.3 mg/L or greater 50% of the time on an annual basis when the flow at the bridge is 250 cfs or greater. The DO is required to be 0.1 mg/L 99% of the time on an annual basis regardless of flow.

  *** Shall not be increased more than 50% above background or to 1,275 µmhos-cm, whichever is greater. Background specific conductance not available.

  See Table 2 for results of analytes detected in the effluent, and corresponding limits. See Appendix E for a complete list of chemical analyses performed. See Appendix B for bioassay lab equipment.

Conclusion

The effluent samples collected from the EFF-1 sampling point for this facility on February 14, 16, and 18, 2011, were chronically toxic to the *Ceriodaphnia dubia* test species during the chronic definitive bioassays. The cause of toxicity was not determined. The salinity adjusted effluent AGP result was less than the "problem" threshold for marine receiving waters. Due to a communication error, a freshwater AGP analysis was not performed. Effluent water quality samples collected on February 14, 2011, although not in compliance with Class III freshwater criteria for dissolved oxygen and specific conductance did not exceed applicable NPDES permit FL0000876 conditions. Additional water quality samples were in compliance with Class III freshwater criterion and permit conditions.

Literature Cited

Maloney, T. E., W. E. Miller, and D. T. Specht. 1974. The Marine Algal Assay Procedure: Bottle Test. National Environmental Research Center Office of Research and Development. U. S. EPA, Corvallis, Oregon. 43 p

Table 1. Measured algal growth potential (AGP; mg dry weight/L) of the saltwater species *Dunaliella tertiolecta* and ratios of nitrogen to phosphorus for samples collected from the Buckeye Florida facility on February 14, 2011.

Buckeye Florida NPDES# FL0000876			
Location	**AGP (measured)**	**Inorganic N:P ratio**	**Total N:P ratio**
Effluent*	9.17	3.0	4.0

* - sample salinity adjusted to ~ 7.1 ppt

Table 2. Effluent limits, Class III Freshwater Criteria and chemical data for samples collected from the Buckeye Florida facility on February 14, 2011.

Buckeye Florida NPDES# FL0000876	Class III Criteria	Effluent Limits	Effluent	
Metals (µg/L unless otherwise noted)				
Aluminum	-	-	443	
Arsenic	≤ 50	-	0.47	I
Cadmium	≤ 0.5 b	-	0.31	
Calcium (mg/L)	-	-	50.2	
Chromium-III	≤ 157.1 b	-	4.3	
Copper	≤ 17.5 b	-	5.13	
Iron	≤ 1,000	-	350	
Lead	≤ 8.1 b	-	0.37	I
Magnesium (mg/L)	-	-	20.1	
Nickel	≤ 97.0 b	-	6.99	
Selenium	≤ 5.0	-	0.2	U
Silver	≤ 0.07	-	0.081	I
Zinc	≤ 223.0 b	-	27	
Nutrients (mg/L)				
Ortho-phosphate	-	-	1.4	
Total Phosphorus	-	-	1.9	Y
Total Ammonia	-	-	4	Y
Un-ionized Ammonia	≤ 0.02 s	-	≤ 0.02	c
Nitrate and Nitrite	-	-	0.17	Y
Total Kjeldahl Nitrogen	-	-	7.5	Y
Organic Nitrogen	-	-	3.5	c
Total Nitrogen	-	-	7.67	c
General Physical and Chemical Parameters				
Dissolved Oxygen (mg/L)	≥ 5.0	≥ 0.3*	4.8	
pH (SU)	6.0 - 8.5	6.0 - 8.5 s	7.1	
Conductivity (µmhos/cm)	≤ 1,275	≤ 4,000 s	2664	
Temperature (°C)	-	-	20.2	
Salinity	-	-	≤ 1.53	c
Total Residual Chlorine (mg/L)	≤ 0.01	-	0.04	£KQ
Chlorophyll *a* (µg/L) - Corrected	-	-	1.4	U
Phaeophytin (µg/L)	-	-	1	U
Total Suspended Solids (mg/L)	-	103.3 d	16	
BOD, 5 day (mg/L), N - uninhibited	-	40.9 d	14	
Oils and Greases (mg/L)	≤ 5.0	≤ 10.0 s	1.4	U
Flow (MGD)	-	58	42.6	†
Hardness (mg $CaCO_3$)	-	-	208.12	c

Value exceeds the Class III Water Quality Criteria or permit limits

b - Value is calculated based on hardness

c - Value is calculated

d - daily maximum

s - Single sample

I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

K - Actual value is known to be less than value given

Q - Sample held beyond normal holding time

U - Material analyzed for but not detected; value reported is the method detection limit

Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.

£ - measurement taken in the FDEP laboratory

* - 50% of the time, annually, when flow is ≥ 250 CFS at SR356 bridge over Fenholloway River

† - Annual average daily flow measured from 2/28/10 - 1/31/11

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Request Number: RQ-2011-01-24-18
FYI3 for Buckeye Florida

Event ID *

Requester: Cari Butler
Field Report Prepared By: Eesa Ali
Collected By: Jake Mast / Eesa Ali
Send Final Report To: Tom Kallemeyn
Sampling Agency: DEP

Customer: NE-DIST
Project ID: FYI3
PMAS: 1143

Lab ID *	Location	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Latitude	Longitude	Collection (begin) Date / Time	Collection (end) Date / Time	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Sample Depth	Salinity (PPTh) / Sp Conductance (umho/cm)	Storet Station Number	NPDES Number	Bottle Group(s)**	Comments
	Buckeye Final effluent		20.2	7.06 7.55 (EPA)	dd / dms	dd / dms	Grab 2-14-11 1222 Central			4.82	0.28 m / ft	1.38 / 2664			A	
	Blank				dd / dms	dd / dms	Grab 2-14-11 1248 Central				m / ft				B	
	Outfall 0001 End of Pipe	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C) 20.37	pH 7.28	dd / dms	dd / dms	Grab 2/14/11 1306 Central			8.61	0.1 m / ft	1.39 / 2669				DO compliance point
					dd / dms	dd / dms					m / ft					2 Biocassy Reid ; for B, J.D. 10'20 2.15.11

Relinquished By:	Date/Time	Shipping Method:	Received By	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
CESAAZ	2/14/11	fedex					CAC	2/15/11 915A

* Shaded Areas for Lab use only

** Please see reverse side for Bottle Group information

last revised October 1, 2003

Appendix A. (continued)

NED FD0108 **Florida Department of Environmental Protection *North East District* Field sheet**

Sample Project BUCKEYE 34R LabRequest number RQ 2011-01-24-18

Collected By: PA/SM Date Collected: 2/16/11

Lab ID #	Store# buckeye final effluent									Matrix: Water ~~Surface Fresh~~ Surface Salt Effluent	Comments Air Temp ___ Wind Sp ___ Wind Dir ___	
Time	Total depth(m)	Sample depth(m)	Temp (C)	Conductivity (µmhos)	Salinity (%)	pH s.u.	D.O. mg/l	D.O. (%)	Secchi meters	Velocity ft/sec	Tide Ebb/Flood/Slack	Turb. NTU
1030		0.2	21.19	2631	1.36	6.85	~~36.5~~ 5.20	38.3	—	0.7		

Grab/Comp Not applicable	Parameter/Method	Preservation	Bottle/Suite *A/B/C,etc	Initials
G / C / Na	Nutrients: NH_3, NO_2+ NO_3, TKN, TOC, TP	Ice& H_2SO_4 less than 2 pH*		
G / C / Na	Ortho Phosphorous	Ice & .45µm filtered		
G / C / Na	BOD/CBOD	Ice		
G / C / Na	Chlorophyll,Phaeophytin	Ice		
G / C / Na	Physical Aggregate:TSS,TDS,Turb.,Color,Alk.,Cl-,F-,SO_4-	Ice		
G / C / Na	Metals: ICP,ICPMS	HNO_3 less than 2 pH*		
G / C / Na	Other: Tox	Ice/	A	EA
G / C / Na	Microbiology: Fecal Coliform	Ice		

Lab ID #	Storet# Site Name: End of pipe 001									Matrix: Water ~~Surface Fresh~~ Surface Salt Effluent	Comments No samples taken	
Time	Total depth(m)	Sample depth(m)	Temp (C)	Conductivity (µmhos)	Salinity (%)	pH s.u.	D.O. mg/l	D.O. (%)	Secchi meters	Velocity ft/sec	Tide Ebb/Flood/Slack	Turb NTU
1037		0.1	21.19	2629	1.36	7.26	8.02	91.0	—	1.0	—	

Grab/Comp Not applicable	Parameter/Method	Preservation	Bottle/Suite *A/B/C,etc	Initials
G / C / Na	Nutrients: NH_3, NO_2+ NO_3, TKN, TOC, TP	Ice& H_2SO_4 less than 2 pH*		
G / C / Na	Ortho Phosphorous	Ice & .45µm filtered		
G / C / Na	BOD/CBOD	Ice		
G / C / Na	Chlorophyll,Phaeophytin	Ice		
G / C / Na	Physical Aggregate:TSS,TDS,Turb.,Color,Alk.,Cl-,F-,SO_4-	Ice		
G / C / Na	Metals: ICP,ICPMS	HNO_3 less than 2 pH*		
G / C / Na	Other:	Ice/		
G / C / Na	Microbiology: Fecal Coliform	Ice		

Lab ID #	Storet# Site Name									Matrix: Water Surface Fresh Surface Salt Effluent	Comments	
Time	Total depth(m)	Sample depth(m)	Temp (C)	Conductivity (µmhos)	Salinity (%)	pH s.u.	D.O. mg/l	D.O. (%)	Secchi meters	Velocity ft/sec	Tide Ebb/Flood/Slack	Turb NTU

Grab/Comp Not applicable	Parameter/Method	Preservation	Bottle/Suite *A/B/C,etc	Initials
G / C / Na	Nutrients: NH_3, NO_2+ NO_3, TKN, TOC, TP	Ice& H_2SO_4 less than 2 pH*		
G / C / Na	Ortho Phosphorous	Ice & .45µm filtered		
G / C / Na	BOD/CBOD	Ice		
G / C / Na	Chlorophyll,Phaeophytin	Ice		
G / C / Na	Physical Aggregate:TSS,TDS,Turb.,Color,Alk.,Cl-,F-,SO_4-	Ice		
G / C / Na	Metals: ICP,ICPMS	HNO_3 lesss than 2 pH*		
G / C / Na	Other:	Ice/		
G / C / Na	Microbiology: Fecal Coliform	Ice		

*All acid preserved samples are with 2ml of (1to1 acid)

Relinquished	Date	Time	Shipping	Received	Date/Time
[illegible]	2-16-11	1201	~~FEDEX~~ self	Arrived Bench	02-16-11 12:01

2 bioassay Rec'd in tox by JD 1210 2/16/11

Appendix A. (continued)

NED FD0108 **Florida Department of Environmental Protection *North East District* Field sheet** 1 of 1

Sample Project Buckeye F413 LabRequest number 2011-01-24-18

Collected By: EA/JM Date Collected: 2/17/11

Lab ID #	Storet#	Site Name	Matrix: Water / Surface Fresh / Surface Salt / Effluent	Comments: Air Temp ___ Wind Sp ___ Wind Dir ___
	Final Effluent	Buckeye	Surface Fresh	

Time	Total depth(m)	Sample depth(m)	Temp (C)	Conductivity (µmhos)	Salinity (%)	pH s.u.	D.O. mg/l	D.O. (%)	Secchi meters	Velocity ft./sec.	Tide Ebb/Flood/Slack	Turb. NTU
1105		0.2	23.0	2633	1.36	7.1	3.3	38.7	–	0.8	–	–

Grab/Composite Not applicable	Parameter/Method	Preservation	Bottle/Suite #A/B/C,etc.	Initials
G / C / Na	Nutrients: NH_3, NO_2+ NO_3, TKN, TOC, TP	Ice& H_2SO_4 less than 2 pH*		
G / C / Na	Ortho Phosphorous	Ice & .45µm filtered		
G / C / Na	BOD/CBOD	Ice		
G / C / Na	Chlorophyll,Phaeophytin ½ secchi ½ total depth	Ice		
G / C / Na	Physical Aggregate:TSS,TDS,Turb.,Color,Alk.,Cl-,F-,SO_4-	Ice		
G / C / Na	Metals: ICP,ICPMS	HNO_3 less than 2 pH*		
G / C / Na	Other: TOX	Ice/	A	EA
G / C / Na	Microbiology: Fecal Coliform	Ice		

Lab ID #	Storet#	Site Name	Matrix: Water / Surface Fresh / Surface Salt / Effluent	Comments
	End of pipe 001		Surface Fresh	No samples taken

Time	Total depth(m)	Sample depth(m)	Temp (C)	Conductivity (µmhos)	Salinity (%)	pH s.u.	D.O. mg/l	D.O. (%)	Secchi meters	Velocity ft./sec	Tide Ebb/Flood/Slack	Turb NTU
1110		0.2	23.0	2633	1.36	7.43	3.04	34.6	–	2.0	–	–

Grab/Composite Not applicable	Parameter/Method	Preservation	Bottle/Suite #A/B/C,etc.	Initials
G / C / Na	Nutrients: NH_3, NO_2+ NO_3, TKN, TOC, TP	Ice& H_2SO_4 less than 2 pH*		
G / C / Na	Ortho Phosphorous	Ice & .45µm filtered		
G / C / Na	BOD/CBOD	Ice		
G / C / Na	Chlorophyll,Phaeophytin ½ secchi ½ total depth	Ice		
G / C / Na	Physical Aggregate:TSS,TDS,Turb.,Color,Alk.,Cl-,F-,SO_4-	Ice		
G / C / Na	Metals: ICP,ICPMS	HNO_3 less than 2 pH*		
G / C / Na	Other:	Ice/		
G / C / Na	Microbiology: Fecal Coliform	Ice		

Lab ID #	Storet#	Site Name	Matrix: Water / Surface Fresh / Surface Salt / Effluent	Comments

Time	Total depth(m)	Sample depth(m)	Temp (C)	Conductivity (µmhos)	Salinity (%)	pH s.u.	D.O. mg/l	D.O. (%)	Secchi meters	Velocity ft./sec	Tide Ebb/Flood/Slack	Turb NTU

Grab/Composite Not applicable	Parameter/Method	Preservation	Bottle/Suite #A/B/C,etc.	Initials
G / C / Na	Nutrients: NH_3, NO_2+ NO_3, TKN, TOC, TP	Ice& H_2SO_4 less than 2 pH*		
G / C / Na	Ortho Phosphorous	Ice & .45µm filtered		
G / C / Na	BOD/CBOD	Ice		
G / C / Na	Chlorophyll,Phaeophytin ½ secchi ½ total depth	Ice		
G / C / Na	Physical Aggregate:TSS,TDS,Turb.,Color,Alk.,Cl-,F-,SO_4-	Ice		
G / C / Na	Metals: ICP,ICPMS	HNO_3 lesss than 2 pH*		
G / C / Na	Other:	Ice/		
G / C / Na	Microbiology: Fecal Coliform	Ice		

Relinquished	Date	Time	Shipping	Received	Date/Time
			FEDEX	A Brickey	02/18/11 1344

*All acid preserved samples are with 2ml of (1to1 acid)

Patrick O'Connor (PWO) / Jeremy Parrish (JP) / Chuck Plank (CP) / Jann Gruentzel (JG) / Sharon Piltz (SP) / Eesa Ali (EA) / Jake Mast (JM) / Bipin Adhyaru (BA) / Stephany Birkholz (SB)

2 Bicassy Read in for b, J.D. 1343 2.18.11

Appendix B. Bench Sheets

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia

Facility: Buckeye Florida
Address: One Buckeye Drive, Perry, FL 32348
County: Taylor
NPDES Permit #: FL 0000876
Contact/District: Brian Kirts / Northeast

LIMS entry: 3-8-11 MF verified: BK 3-8-11

Diluent/ Batch: 20% DMW / 2-12-11 Test Days Used: 0-6
20% DMW /_____ Test Days Used: _____

SOP#: TA07_05 EPA 821-R-02-013 Method 1002.0

Organism: *Ceriodaphnia dubia*
Organism Batch #: 2-15-11
Organism age : 22hr hours
Feeding: Prior to Test and Daily
Food: ☑ YCT ☑ *P. subcapitata*
Food Batch: 11-17-10 10-22-10
Chamber size : 30 ml
Sample volume : 20 ml

Sample Received	LAB Sample #	LIMS JOB #	LIMS SAMPLE #	Collection Date/Time	Received Date/Time
Test Day 0	1	TLH-2011-02-15-18	1329522	02.14.11 / 12:22	02.15.11 / 0915
Test Day 2	2	TLH-2011-02-16-55	1330239	02.16.11 / 1030	02.16.11 / 1201
Test Day 4	3	TLH-2011-02-18-45	1331099	02.18.11 / 1105	02.18.11 / 1341

Batch #	2.12.11		NA	NA	NA			
Water Quality Parameters	20% DMW	20% DMW	Sample 1	Sample 2	Sample 3	Other:	Measured By:	Verified by:
Field Total Residual Cl_2 (mg/L):	NA	NA	Not measured	not measured			—	MF
Lab Total Residual Cl_2 (mg/L):	<0.03		0.04	<0.03	<0.03		KC / JD	KC
Alkalinity (mg/L as $CaCO_3$):	87		223	209	214		KC	KC
Hardness (mg/L as $CaCO_3$):	84		196	200	210		KC	KC
Total Ammonia (mg/L as N):	<0.07		3.89	3.84(K)	3.90		BA	KC
Conductivity: (µmhos) mmhos:	193		2750	2660	2620		MF	KC
Salinity (ppth):	—		—	—	—		—	—

Test Incubated in: Incubator #: 2

Temperature Shipped ≤ 6° C (all samples) (yes) no
Holding Time ≤ 36 hours (yes) no
Light Intensity : 50 - 100 ft. candles
Photoperiod : 16 light 8 dark
Temperature Range °C:
Incubator # 2 min. 26.1 max. 27.7 mean_____
Room B246 min. 22.9 max. 26.0 mean_____
Test min._____ max._____ mean_____

Loaded by:

Test Replicates	Loaded from culture vial
1	A24
2	B11
3	A3
4	A16
5	B19
6	A1
7	A5
8	A7
9	B5
10	B17

Results	
Control % CV:	26.4
Dunnetts PMSD:	18.7%
Reproduction NOEC:	50%
Reproduction LOEC:	100%
Survival NOEC:	100%
Survival LOEC:	NA
ICP_{20}:	46.9%
ICP_{25}:	53.9%

Investigators' signatures
Marshall Faircloth (MF)
Kaitlyn
Bec Abella
James Daniels
Liz Miller
REVIEWER

loaded by: MF checked by: KC

Comments: (K) 3.66 - KC -

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Survival and Reproduction

SOP TA07_05

Facility: Buckeye Florida

LIMS Sample #: 1329522 for lab sample #1

Start Date: 2-15-11 Time: 1115

End Date: 2.21.11 Time: 1130

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving adults	Neonates per adult
Control	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	5	4	5	3	4	1	0	5	2	3	32	10	3.2
	4	12	11	9	0	10	11	2	0	0	0	55	10	5.5
	5	13	13	0	10	12	0	11	2	12	11	84	10	8.4
	6	0	0	12	13	0	10	12	0	12	13	72	10	7.2
	7													
	8													
	Total	30	28	26	26	26	22	25	7	26	27	243	10+	24.3

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving adults	Neonates per adult
6.25%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	4	6	4	6	5	5	0	6	5	6	47	10	4.7
	4	8	11	10	10	10	8	5	0	0	0	~~46~~ 62	10	~~6.3~~ 6.2
	5	11	13	13	11	14	15	14	13	12	12	128	10	12.8
	6	0	0	0	0	0	0	16	15	17	14	102	10	6.2
	7													
	8													
	Total	23	30	27	27	29	28	35	34	28	32	299	10+	29.9

Organisms loaded by: MF

Day	Counted/ verified by:	Concentrations prepared by:
0	MF/KC	MF
1	MF	MF
2	MF	KC
3	KC	KC
4	MF	MF
5	MF	MF
6	KC	N/A
7		
8		

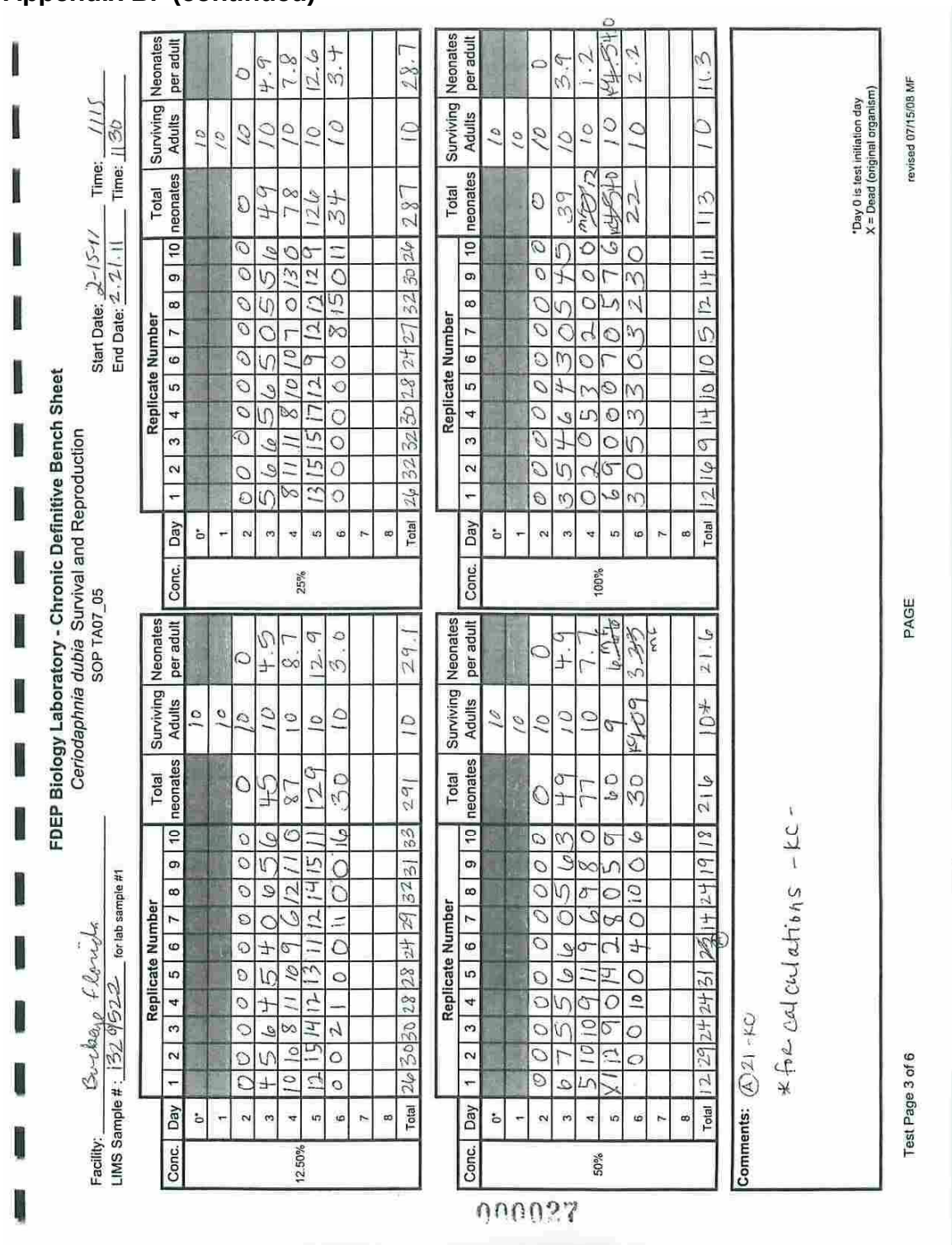
Concentration	Mean neonates /adult	% survival
Control	24.3	100
6.25%	29.9	100
12.50%	29.1	100
25%	28.7	100
50%	21.6	90
100%	11.3	100

Test acceptability	
Mean control reproduction 15/female	(yes) no
3rd brood in 60% of surviving females	(yes) no
Control survival ≥ 80%:	(yes) no

Comments: (A) 34 KC 2 for calculations - KC -

*Day 0 is test initiation day
X = Dead (original organism)

Appendix B. (continued)



FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Survival and Reproduction

SOP TA07_05

Facility: Bradenton Florida

LIMS Sample #: 132-96222 for lab sample #1

Start Date: 2-15-11 Time: 1115

End Date: 2.21.11 Time: 1130

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving Adults	Neonates per adult
12.50%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	4	5	6	4	5	4	0	6	5	6	45	10	4.5
	4	10	10	8	11	10	9	6	12	11	6	87	10	8.7
	5	12	15	14	12	13	11	12	14	15	11	129	10	12.9
	6	0	0	2	1	0	0	11	0	0	16	30	10	3.0
	7													
	8													
	Total	26	30	30	28	28	24	29	32	31	33	291	10	29.1
25%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	5	6	6	5	6	5	0	5	5	6	49	10	4.9
	4	8	11	11	8	10	10	7	0	13	6	78	10	7.8
	5	13	15	15	17	12	9	12	12	12	9	126	10	12.6
	6	0	0	0	0	0	0	8	15	0	11	34	10	3.4
	7													
	8													
	Total	26	32	32	30	28	24	27	32	30	26	287	10	28.7
50%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	6	7	5	5	6	6	0	5	6	3	49	10	4.9
	4	5	10	10	9	11	9	6	9	8	0	77	10	7.7
	5	X	12	9	0	14	2	8	0	5	9	60	9	6.67
	6		0	0	10	0	4	0	10	0	6	30	10	3.33
	7													
	8													
	Total	12	29	24	24	31	25	14	24	19	18	216	10*	21.6
100%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	3	5	4	6	4	3	0	5	4	5	39	10	3.9
	4	0	2	0	5	3	0	2	0	0	0	12	10	1.2
	5	6	9	9	0	0	0	7	0	5	7	43	10	4.3
	6	3	0	0	5	3	3	0	3	2	3	22	10	2.2
	7													
	8													
	Total	12	16	9	14	10	10	5	8	11	15	113	10	11.3

Comments: (A) 21 - KC

* for calculations - KC -

*Day 0 is test initiation day
X = Dead (original organism)

Test Page 3 of 6

PAGE

revised 07/15/08 MF

000027

Appendix B. (continued)

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Parameters

Facility: Buckeye Florida SOP TA07_05

LIMS Sample #: 1329522 for lab sample 1

Circle µmhos-cm or mmhos-cm

Test Day ↓		Concentration	New Sample					Old Sample				
			Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)	Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)
Day 0	sample	Control	M	7.9	25.1	8.4	193					
	1	6.25%	M	7.9	25.2	8.3	MF 255 370					
	1	12.5%	M	7.9	25.0	8.2	534					
	1	25%	M	7.9	24.9	8.2	849					
	1	50%	M	7.8	25.0	8.3	1494					
	1	100%	M	7.6	25.3	8.3	2750					
	Measured by:			MF	MF	MF	MF					
	Recorded by:			MF	MF	MF	MF					
Day 1	sample:	Control	M	8.0	24.4	7.7	191	M	7.9	25.0	8.0	206
	1	6.25%	M	8.0	24.3	7.7	365	M	8.2	25.1	7.5	389
	1	12.5%	M	8.0	24.5	7.7	527	M	8.1	25.2	7.3	556
	1	25%	M	8.0	24.4	7.6	869	M	8.1	25.4	7.3	877
	1	50%	M	8.1	24.5	7.5	1473	M	8.0	25.7	7.0	1523
	1	100%	M	8.1	24.8	6.9	2690	M	7.7	25.8	6.8	2840
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 2	sample:	Control	M	7.9	24.7	7.9	192	M	8.1	25.4	6.5	208
	2	6.25%	M	8.0	24.7	8.1	360	M	8.1	25.6	6.4	374
	2	12.5%	M	8.0	25.1	8.1	519	M	8.1	25.6	6.7	534
	2	25%	M	7.9	25.0	8.1	840	M	8.1	25.6	6.7	863
	2	50%	M	7.8	25.0	7.8	1447	M	8.2	25.7	6.6	1486
	2	100%	M	7.6	25.0	7.0	2660	M	8.2	25.6	6.3	2760
	Measured by:			KC	MF	KC	KC		KC	KC	KC	KC
	Recorded by:			KC	KC	KC	KC		KC	KC	KC	KC
Day 3	sample:	Control	M	7.9	25.2	7.4	213	M	7.8	25.6	7.6	221
	2	6.25%	M	8.0	25.1	7.3	358	M	8.2	25.0	7.7	372
	2	12.5%	M	8.0	25.1	7.4	521	M	8.2	25.1	7.8	540
	2	25%	M	7.9	25.1	7.4	842	M	8.2	25.2	7.4	863
	2	50%	M	7.7	25.0	7.3	1461	M	8.2	25.6	7.3	1460
	2	100%	M	7.5	25.2	6.3	2650	M	8.2	25.7	7.1	2650
	Measured by:			KC	KC	KC	KC		KC	KC	KC	KC
	Recorded by:			KC	KC	KC	KC		KC	KC	KC	KC

Comments:

Replicate M= "Metered" vial, a surrogate vial for parameters

Test Page 4 of 6 PAGE 000028 revised 07/15/08 MF

Appendix B. (continued)

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Parameters

Facility: Buckeye Florida SOP TA07_05

LIMS Sample #: 1329522 for lab sample 1

Circle µmhos-cm or mmhos-cm

Test Day ↓		Concentration	New Sample: Test Replicate	pH (su)	Temp (°C)	DO	Conductivity (µmhos/cm) (mmhos/cm)	Old Sample: Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)
Day 4	sample:	Control	M	8.0	24.3	7.7	180	MF M A	8.1	25.4	7.8	205
	3	6.25%	M	8.2	24.6	7.8	377	MF M A	8.2	25.5	7.9	377
	3	12.5%	M	8.2	24.6	7.8	515	MF M A	8.2	25.5	7.9	540
	3	25%	M	8.2	24.7	7.8	815	MF M A	8.2	25.7	8.0	865
	3	50%	M	8.0	24.5	7.7	1413	MF M A	8.1	25.7	7.9	1500
	3	100%	M	7.8	24.7	7.6	2620	MF M A	8.1	25.7	7.8	2700
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 5	sample:	Control	M	8.1	25.0	7.8	190	MF M A	8.1	25.0	7.8	205
	3	6.25%	M	8.1	25.2	7.7	363	MF M A	8.2	24.9	7.9	401
	3	12.5%	M	8.1	25.3	7.7	516	MF M A	8.2	25.2	8.1	552
	3	25%	M	8.1	25.6	7.6	830	MF M A	8.2	25.3	8.2	874
	3	50%	M	8.0	25.7	7.3	1425	MF M A	8.1	25.4	8.1	1499
	3	100%	M	7.7	25.7	6.5	2640	MF M A	8.1	25.4	7.7	2700
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 6	sample:	Control	M					MF M A	8.1	24.5	7.6	226
	3	6.25%	M					MF M A	8.2	24.5	7.6	408
	3	12.5%	M					MF M A	8.1	24.7	7.5	547
	3	25%	M					MF M A	8.2	24.8	7.4	872
	3	50%	M					MF M A	8.2	24.8	7.2	1461
	3	100%	M					MF M A	8.2	24.7	7.0	2790
	Measured by:								KC	MF	KC	KC
	Recorded by:								KC	MF	KC	KC
Day 7	sample:	Control	M					M				
	3	6.25%	M					M				
	3	12.5%	M					M				
	3	25%	M					M				
	3	50%	M					M				
	3	100%	M					M				
	Measured by:											
	Recorded by:											

Not renewed

Comments:

Replicate M= "Metered" vial, a surrogate vial for parameters

Test Page 5 of 6

PAGE 29

revised 07/15/08 MF

Appendix B. (continued)

Test ID: Bucky C Dates: 2/15-2/21/11

METER / DEVICE	ID	SOP	Parameter	Method	√ used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
YSI DO Probe	5905	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H+	✓
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity Salinity	SM 2510 B SM 2520 B	✓
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	✓
Traceable Thermometer	#1-SN101666412 #2-SN221295527 #3-SN240116020 #4-SN80361795 (#5 SN61990624)	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	✓ EC #5
Hach Pocket Colorimeter II	05050C026378	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	✓ ✓
Alkalinity (Hach Kit)	No SN	TA06_08	Alkalinity	SM 2320 B	✓
Hardness (Hach Kit)	No SN	TA06_09	Hardness	SM 2340 C	✓
OHAUS Balance 250D	1125481084	TA06_21 TA06_27	Weight	-	✓ ✓
S-Weights	BIO-S-WEIGHTS-01	NA	Balance check	-	✓ ✓

SM-2530B modified to allow use of electronic and non-mercury filled thermometers.

Insert other device information in blank spaces(if used). Test ID = Facility or SRTs (acute SRT--Chronic SRT)

Entered By: KO 2/21/11

V 1.1 9/21/10 MF/jd

Pg 30

FDEP Biology Laboratory - Chronic Bioassay Bench Sheet

Pimphales promelas or Menidia beryllina

Facility: Buckeye
Address: One Buckeye Drive, Perry, FL 32348
County: Taylor
NPDES Permit #: FL 0000876
Contact/District: Brian Kirts / Northeast

Test Species (circle one)
(*P. promelas*) SOP#: TA07_09 EPA-821-R-02-013 Method 1000.0
M. beryllina SOP#: TA07_14 EPA-821-R-02-014 Method 1006.0

Start Date: 2.15.11 Time: 1315
End Date: 2.22.11 Time: 1315

Diluent/ Batch:
MHW / 2.12.11 Test Days Used: 0-7
MHW / _____ Test Days Used: _____
ASW / _____ Test Days Used: _____
ASW / _____ Test Days Used: _____

Organism Batch # : 2.15.11
Organism age : <24 hours ~~days~~
Feeding Prior to Test and Daily
Artemia Lot # : 23013
Chamber size : 1000 ml
Test volume : 400 ml

Artemia Batch #			
Day 0	27-11	Day 4	31-11
Day 1	28-11	Day 5	32-11
Day 2	29-11	Day 6	33-11
Day 3	30-11		

LIMS:	Date	Initials
Entry:	3-8-11	MF
Verification:	3-8-11	BA

Sample Received	Lab Sample #	LIMS Job #	LIMS Sample #	Collection Date/Time	Received Date/Time
Test Day 0	1	TLH-2011-02-15-18	1329522	02.14.11 / 12:22	02.15.11 / 0915
Test Day 2	2	TLH-2011-02-16-55	1330239	02.16.11 / 1030	02.16.11 / 1201
Test Day 4	3	TLH-2011-02-18-45	1331099	02.18.11 / 1105	02.18.11 / 1341

Water Quality Parameters	Batch # 2.12.11 [X] MHW [ ] ASW	[ ] MHW [ ] ASW	NA Sample 1	NA Sample 2	NA Sample 3	Other:	Measured by:	Verified by:
Field Total Residual Cl_2 (mg/L):	NA	NA	Not measured	not measured			—	MF
Lab Total Residual Cl_2 (mg/L):	<0.03		0.04	<0.03	<0.03		JD/KC	KC
Alkalinity (mg/L as $CaCO_3$):	75		223	209	214		KC	KC
Hardness (mg/L as $CaCO_3$):	95		196	200	210		KC	KC
Total Ammonia (mg/L as N):	<0.017		3.89	3.66	3.90		BA	KC
Conductivity: µmhos mmhos:	343		2750	2660	2650		JD	KC
Salinity (ppth):	—		—	—	—		—	—

Temperature Shipped ≤6° C (all samples) (yes) no
Holding Time ≤36 hours (yes) no
Light Intensity : 50 - 100 ft. candles
Photoperiod : 16 light 8 dark

Temperature Range °C: (if used)
Incubator # 2 min. 26.1 max. 27.7 mean _____
Water bath # ____ min. _____ max. _____ mean _____
Room B246 min. 22.9 max. 24.0 mean _____

Test Incubated in: [ ] Incubator #: _____ [ ] Waterbath #: ____

Investigators' signatures
James Daniels
Kara Cox
Marshall Faircloth
Brian Kirts

REVIEWER Greg Mines

Statistics	
Control %cv:	16.8%
Dunnetts PMSD:	25.5%
Survival NOEC:	NF 100%
Survival LOEC:	>100%
Growth NOEC:	100%
Growth LOEC:	>100%

growth IC20 >100%
growth IC25 >100%

Comments:

PAGE 43

revised 7/15/08 MF

Appendix B. (continued)

Chronic Bioassay Survival Benchsheet

Facility: Buckeye

LIMS Sample Number: 1329522
(for Lab Sample # 1)

Department of Environmental Protection
Biology Laboratory Chronic Screening Bioassay
***P. promelas* SOP TA07_09 *M. beryllina* SOP TA07_14**

Organism: (*P. promelas*) *M.beryllina* (circle one)

		TEST DAY							
Concentration	Replicate	0	1	2	3	4	5	6	7
Control	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
Sample 6.25 %	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
Sample 12.5 %	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
Sample 25 %	A	10	10	10	10	10	10	10	9/10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
Sample 50 %	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	9/10	9
	D	10	10	10	10	10	10	10	10
Sample 100 %	A	10	10	10	10	10	9/10	9	9
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	9/10	9	9	9
	D	10	10	10	10	10	10	10	10
Sample %	A	10							
	B	10							
	C	10							
	D	10							
Loaded by: JS	Checked by:		JS	JB	JS	JB	JB	JS	JB
Verified by: KCV									

Comments:

Page 44

Appendix B. (continued)

Chronic Bioassay Parameters Benchsheet

P. promelas and M. beryllina SOP TA07_09 and TA-07_15 parameter pg. 1

Sample Source: Buckeye
LIMS Sample #: 1329522 (for Lab sample #1)
Start Date: 2.15.11 End Date: 2.22.11
Start Time: 1315 End Time: 1315

conc = concentration rep = replicate circle umhos or mmhos

Test Day ↓		Conc.	New Sample Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos/mmhos	Salinity ppth	Old Sample Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos/mmhos	Salinity ppth
Day 0	sample:	Control	A	7.7	25.8	8.6	343							
	1	6.25	A	7.8	24.3	8.0	454							
	1	12.5	A	7.8	25.3	8.2	655							
	1	25	A	7.8	25.4	8.1	974							
	1	50	A	7.8	24.9	8.1	1576							
	1	100%	A	7.6	24.4	7.7	2750							
	1		A											
	Measured by:			JD	JD	JD	JD							
	Recorded by:			JD	JD	JD	JD							
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 1	sample:	Control	B	7.8	24.0	7.0	337		B	7.7	25.7	7.2	340	
	1	6.25%	B	7.8	24.1	7.2	490		B	7.8	25.9	6.5	494	
	1	12.5%	B	7.9	24.2	7.4	641		B	7.9	25.6	6.9	631	
	1	25%	B	7.9	24.2	7.7	930		B	8.0	25.5	7.1	942	
	1	50%	B	7.9	24.2	7.4	1557		B	8.0	25.3	6.9	1553	
	1	100%	B	7.7	24.7	6.1	2720		B	7.9	25.9	6.1	2710	
	1		B						B					
	Measured by:			JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by:			JD	JD	JD	JD			JD	JD	JD	JD	
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 2	sample:	Control	C	7.5	25.1	7.1	324		C	7.5	25.9	5.5	344	
	2	6.25%	C	7.6	25.1	6.8	476		C	7.6	25.4	5.5	511	
	2	12.5%	C	7.6	25.0	6.9	631		C	7.6	25.5	5.5	643	
	2	25%	C	7.6	24.8	6.9	925		C	7.7	25.6	5.5	934	
	2	50%	C	7.7	24.5	6.9	1454		C	7.7	25.9	5.8	1560	
	2	100%	C	7.6	24.0	5.5	2650		C	7.8	25.5	5.0	2660	
	2		C						C					
	Measured by:			JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by:			JD	JD	JD	JD			JD	JD	JD	JD	
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 3	sample:	Control	D	7.6	25.3	6.9	336		D	7.4	25.3	5.2	351	
	2	6.25%	D	7.6	25.3	6.5	469		D	7.4	25.3	4.2	492	
	2	12.5%	D	7.7	25.4	6.5	630		D	7.5	25.4	4.5	663	
	2	25%	D	7.7	25.3	6.7	903		D	7.5	25.3	5.0	948	
	2	50%	D	7.8	24.5	6.8	1450		D	7.5	25.5	5.2	1527	
	2	100%	D	7.6	25.2	5.6	2600		D	7.7	25.1	4.9	2590	
	2		D						D					
	Measured by:			JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by:			JD	JD	JD	JD			JD	JD	JD	JD	

Comments:

For salinity <1 ppth insert <1. For salinity > 1 ppth, conductivity measurement is not required if salinity probe is functional.

Page 45

Appendix B. (continued)

Chronic Bioassay Parameters Benchsheet

P. promelas and M. beryllina SOP TA07_09 and TA-07_15 parameter pg. 2

Sample Source: Buckeye
LIMS Sample #: 1329522 (for Lab sample #1)
Start Date: 2/15/11 End Date: 2/22/11
Start Time: 1315 End Time: 1315

conc = concentration rep = replicate

Test Day ↓		Conc.	New Sample: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth	Old Sample: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth
Day 4	sample:	Control	A	7.7	24.0	7.3	320		A	7.6	25.4	6.2	333	
	3	6.25%	A	7.8	24.2	7.2	477		A	7.6	25.2	5.9	482	
	3	12.5%	A	7.8	24.2	7.1	619		A	7.6	24.8	5.9	669	
	3	25%	A	7.8	24.2	7.1	913		A	7.7	25.4	6.1	938	
	3	50%	A	7.8	24.5	7.2	1495		A	7.6	25.3	6.0	1491	
	3	100%	A	7.6	25.4	5.6	2650		A	7.7	25.3	5.0	2720	
	3		A						A					
	Measured by:			JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by:			JD	JD	JD	JD			JD	JD	JD	JD	
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 5	sample:	Control	B	7.6	24.0	6.7	326		B	7.4	24.8	5.2	339	
	3	6.25%	B	7.7	24.0	6.5	488		B	7.4	24.5	5.3	491	
	3	12.5%	B	7.7	24.0	6.4	653		B	7.4	24.3	5.5	645	
	3	25%	B	7.7	24.0	6.5	937		B	7.4	24.9	5.5	951	
	3	50%	B	7.7	24.2	6.5	1532		B	7.4	25.4	5.5	1552	
	3	100%	B	7.6	24.4	6.4	2680		B	7.6	26.0 (R 30)	4.5	2720	
	3		B						B					
	Measured by:			BA	BA	BA	BA			BA	BA	BA	BA	
	Recorded by:			BA	BA	BA	BA			BA	BA	BA	BA	
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 6	sample:	Control	C	7.7	24.1	6.8	325		C	7.6	24.0	6.2	328	
	3	6.25%	C	7.8	24.1	6.9	466		C	7.6	24.3	6.1	487	
	3	12.5%	C	7.8	24.1	6.9	627		C	7.6	24.2	6.0	651	
	3	25%	C	7.8	24.2	6.9	894		C	7.6	24.4	5.7	945	
	3	50%	C	7.8	24.3	7.0	1476		C	7.6	24.6	5.6	1511	
	3	100%	C	7.6	24.7	6.8	2660		C	7.7	24.6	4.6	2660	
	3		C						C					
	Measured by:			JD	JD	JD	JD			JD	JD	JD	JD	
	Recorded by:			JD	JD	JD	JD			JD	JD	JD	JD	
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 7	sample:	Control							D	7.3	25.5	4.3	334	
	3	6.25%							D	7.3	25.8	4.3	474	
	3	12.5%							D	7.3	25.4	4.3	642	
	3	25%							D	7.3	25.8	4.4	898	
	3	50%							D	7.3	25.8	4.4	1480	
	3	100%							D	7.4	25.9	4.2	2620	
	3								D					
	Measured by:									JD	JD	JD	JD	
	Recorded by:									JD	JD	JD	JD	

Comments:

For salinity <1 ppth insert <1. For salinity > 1 ppth, conductivity measurement is not required if salinity probe is functional.

Page 7/6

Appendix B. (continued)

Chronic Definitive Bioassay Weighing Benchsheet

Facility: Buckeye

LIMS Sample Number: 1329522
(for Lab Sample # 1)

***P. promelas* and *M. beryllina* Bench Sheet**
SOP TA06_21

Concentration	Replicate	Pan #	Pan wt. g (mean wt = fish wt divided by 10; convert g to mg: move decimal 3 places to right)	Pan + Fish g	Fish wt. g	Original # Fish	Mean wt. mg
Control	A	17	0.02246	0.02912	0.00666	10	.666
	B	18	0.02339	0.02864	0.00525	10	.525
	C	19	0.02229	0.02768	0.00539	10	.539
	D	20	0.02129	0.02574	0.00445	10	.445
sample 6.25 %	A	21	0.02760	0.03350	0.00590	10	.590
	B	22	0.02230	0.02908	0.00678	10	.678
	C	23	0.02278	0.02941	0.00663	10	.663
	D	24	0.02112	0.02826	0.00714	10	.714
sample 12.5 %	A	25	0.02251	0.02732	0.00481	10	.481
	B	26	0.02327	0.03048	0.00721	10	.721
	C	27	0.02098	0.02802	0.00704	10	.704
	D	28	0.02619	0.03252	0.00633	10	.633
sample 25 %	A	29	0.02272	0.02765	0.00493	10	.493
	B	30	0.02251	0.02817	0.00566	10	.566
	C	31	0.02208	0.02856	0.00648	10	.648
	D	32	0.02291	0.02922	0.00631	10	.631
sample 50 %	A	33	0.02241	0.02950	0.00709	10	.709
	B	34	0.02200	0.02767	0.00567	10	.567
	C	35	0.02522	0.03117	0.00595	10	.595
	D	36	0.02374	0.03084	0.00705	10	.705
sample 100 %	A	37	0.02213	0.02793	0.00580	10	.580
	B	38	0.02256	0.02765	0.00569	10	.569
	C	39	0.02247	0.02778	0.00431	10	.431
	D	40	0.02354	0.02815	0.00461	10	.461
sample %	A					10	
	B					10	
	C					10	
	D					10	
	Weighed by initials:		DD	JB		revised 7/16/08 mf	

mean 0.5431

Comments:

Balance: Ohaus 250D Ser# 1125481084
S-Weights: BIO-S-Weights-01

Note: Pan number (#) refers to actual Pan number.

Page 47

Appendix B. (continued)

Chronic Bioassay Weighing Benchsheet

Quality Control

Facility: Buckeye

LIMS Sample Number: 132952
(for Lab Sample # 1)

***P. promelas and M. beryllina* Bench sheet**
SOPs TA07_09, TA07_14 and TA06_21

Drying Oven ID:	VWR2	Tare weighed by:	SJ
Temperature °C:	95	Final weighed by:	SB
Hours:	8		
Tare Weighing Date:	2.21.11	Final Weighing Date:	2.25.11

			Measured Value (g)		S-weight Value (g)
Tare Pan 1 after Pan 5 (g)	0.02248	@ 0.02246	S-weights	@	0.001
Tare Pan 1 after Pan 10 (g)	0.02247	@ 0.02246	at tare	@	0.003
Tare Pan 1 after Pan 15 (g)	0.02247	@ 0.02246	S-weights	@	0.01
Tare Pan 1 after Pan 20 (g)	0.02246	@ 0.02246	at final	@	0.05
Tare Pan 1 after Pan 25 (g)		@			
Tare Pan 1 after Pan 30 (g)		@			
Tare Pan 1 after Pan 35 (g)		@			
Tare Pan 1 after Pan 40 (g)		@			
Tare Pan 1 after Pan 45 (g)		@			
Tare Pan 1 after Pan 48 (g)		@			
Final Pan 1 after Pan 5 (g)	0.02912	@ 0.02912			
Final Pan 1 after Pan 10 (g)	0.02914	@ 0.02912			
Final Pan 1 after Pan 15 (g)	0.02916	@ 0.02912			
Final Pan 1 after Pan 20 (g)	0.02914	@ 0.02912			
Final Pan 1 after Pan 25 (g)		@			
Final Pan 1 after Pan 30 (g)		@			
Final Pan 1 after Pan 35 (g)		@			
Final Pan 1 after Pan 40 (g)		@			
Final Pan 1 after Pan 45 (g)		@			
Final Pan 1 after Pan 48 (g)		@			

Balance: Ohaus 250D Ser# 1125481084
S-Weights: BIO-S-Weights-01

Note: Pan numbers (5, 10, etc.) for Tare and Final refers to sequence of weighing as actual Pan #s may differ.

Comments:

revised 7/16/08 MF

Page 49

Appendix B. (continued)

Test ID: Bioassay

Dates: 2.15 – 2.22.2011

METER / DEVICE	ID	SOP	Parameter	Method	v used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
YSI DO Probe	5905	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H+	✓
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity Salinity	SM 2510 B SM 2520 B	✓
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	✓
Traceable Thermometer	#1-SN1016686412 #2-SN221295527 #3-SN240116020 #4-SN80361795 #5-SN61990624	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	✓ 45
Hach Pocket Colorimeter II	05050C026378	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	✓
Alkalinity (Hach Kit)	No SN	TA06_08	Alkalinity	SM 2320 B	✓
Hardness (Hach Kit)	No SN	TA06_09	Hardness	SM 2340 C	✓
OHAUS Balance 250D	1125481084	TA06_21 TA06_27	Weight	-	✓
S-Weights	BIO-S-WEIGHTS-01	NA	Balance check	-	✓

SM-2530B modified to allow use of electronic and non-mercury filled thermometers.

Insert other device information in blank spaces(if used). Test ID = Facility or SRTs (acute SRT–Chronic SRT)

BA

V 1.1 9/21/10 MF/jd

49

Appendix C. SRT Bench Sheets and Statistical Analysis

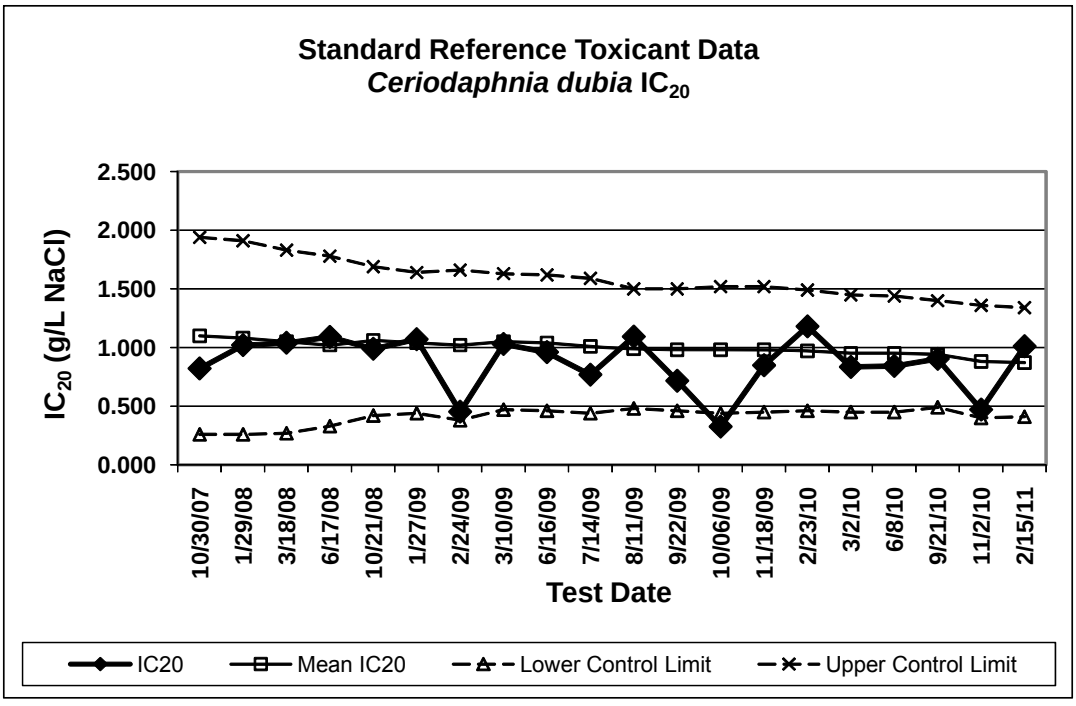
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 7-Day Chronic Toxicity
Ceriodaphnia dubia (water flea) - Sodium Chloride (NaCl)

Date	IC20	Mean IC20	Std Dev	Lower Control Limit	Upper Control Limit
10/30/07	0.821	1.10	0.42	0.26	1.94
1/29/08	1.020	1.08	0.41	0.26	1.91
3/18/08	1.040	1.05	0.39	0.27	1.83
6/17/08	1.090	1.02	0.36	0.33	1.78
10/21/08	0.989	1.06	0.32	0.42	1.69
1/27/09	1.070	1.04	0.30	0.44	1.64
2/24/09	0.452	1.02	0.32	0.38	1.66
3/10/09	1.030	1.05	0.29	0.47	1.63
6/16/09	0.960	1.04	0.29	0.46	1.62
7/14/09	0.768	1.01	0.29	0.44	1.59
8/11/09	1.093	0.99	0.26	0.48	1.50
9/22/09	0.716	0.98	0.26	0.46	1.50
10/06/09	0.325	0.98	0.27	0.44	1.52
11/18/09	0.848	0.98	0.27	0.45	1.52
2/23/10	1.180	0.97	0.26	0.46	1.49
3/2/10	0.834	0.95	0.25	0.45	1.45
6/8/10	0.843	0.95	0.25	0.45	1.44
9/21/10	0.903	0.94	0.23	0.49	1.40
11/2/10	0.470	0.88	0.24	0.40	1.36
2/15/11	1.010	0.87	0.23	0.41	1.34

Means are of the last 20 SRT tests.
Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev

EPA 75th Percentile %CV for Reproduction **45%**
Lab %CV Reproduction **26.6%**

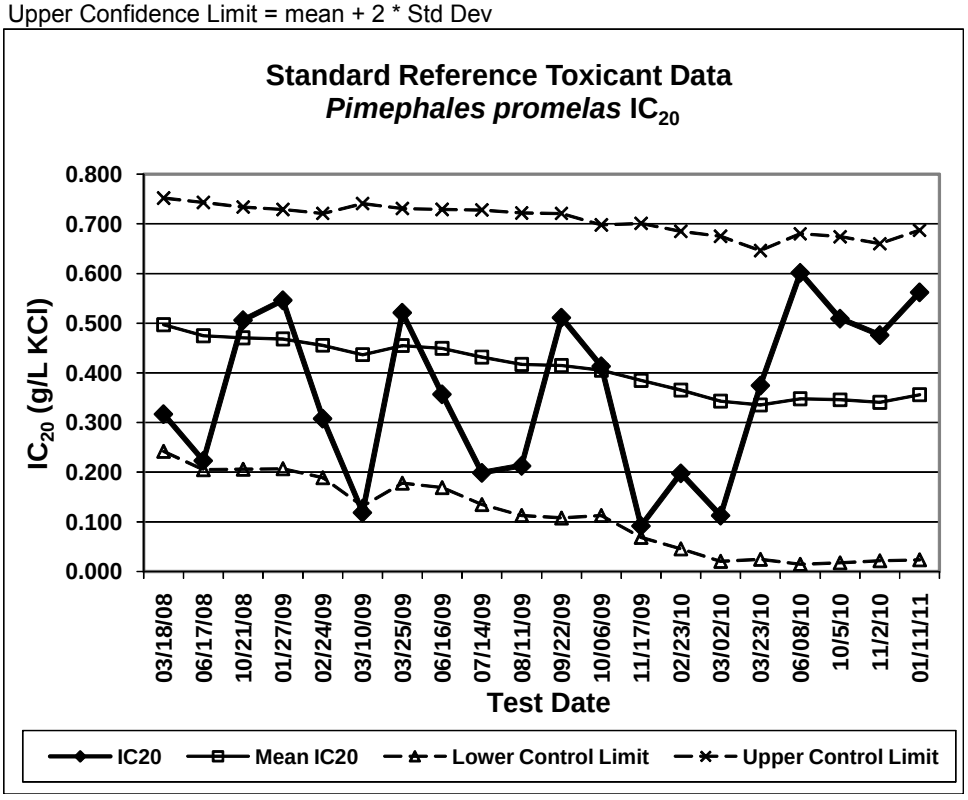


Appendix C. (continued)

Florida Department of Environmental Protection
Bureau of Laboratories
Standard Reference Toxicant (SRT) Test Data - 7-Day Chronic Toxicity
Pimephales promelas (fathead minnow) - Potassium Chloride (KCl)

Date	IC20	Mean IC20	Std Dev	Lower Control Limit	Upper Control Limit
03/18/08	0.317	0.497	0.13	0.242	0.752
06/17/08	0.223	0.474	0.13	0.205	0.743
10/21/08	0.506	0.470	0.13	0.206	0.734
01/27/09	0.546	0.468	0.13	0.207	0.729
02/24/09	0.308	0.455	0.13	0.189	0.721
03/10/09	0.119	0.437	0.15	0.132	0.741
03/25/09	0.521	0.455	0.14	0.178	0.731
06/16/09	0.357	0.449	0.14	0.169	0.729
07/14/09	0.199	0.432	0.15	0.135	0.728
08/11/09	0.213	0.417	0.15	0.113	0.722
09/22/09	0.511	0.415	0.15	0.108	0.721
10/06/09	0.413	0.405	0.15	0.113	0.698
11/17/09	0.092	0.385	0.16	0.069	0.701
02/23/10	0.198	0.365	0.16	0.046	0.685
03/02/10	0.113	0.343	0.16	0.021	0.675
03/23/10	0.375	0.336	0.16	0.025	0.646
06/08/10	0.601	0.348	0.17	0.015	0.680
10/05/10	0.509	0.346	0.16	0.018	0.674
11/02/10	0.476	0.341	0.16	0.022	0.660
01/11/11	0.562	0.356	0.17	0.024	0.687

Means are from all SRT tests, up to 20 tests..
Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev



FDEP Biology Laboratory - Chronic SRT Bench Sheet

Ceriodaphnia dubia

Diluent/ Batch: 20% DMW / 2-12-11 Test Days Used: 0-6
20% DMW / _____ Test Days Used: _____
Toxicant/ Batch: NaCl / 2-14-11

SOP # : TA 07_05
EPA-821-R-02-013 Method 1002.0

Organism: *Ceriodaphnia dubia*
Organism Batch #/ Age: 2-15-11 / <24 hr.
Feeding: Prior to Test and Daily
Food: [✓] YCT [✓] *P. subcapitata*
Food Batch: 11-17-10 10-22-10
Chamber size: 30 mL
Test Volume: 20 mL

Start Date: 2-15-11 Time: 0900
End Date: 2.21.11 Time: 1100

Batch:	2-12-11				
Water Quality Parameters	20% DMW	20% DMW	Other	Measured by:	Verified by:
Lab Total Residual Cl_2 (mg/L):	<0.03			KC	KC
Alkalinity (mg/L as $CaCO_3$):	87			KC	KC
Hardness (mg/L as $CaCO_3$):	84			KC	KC
Total Ammonia (mg/L as N):	<0.017			BA	KC
Conductivity ~~µmhos-cm~~ mmhos-cm :	192			MF	KC

Results	
Control % CV:	14.8 %
Dunnetts PMSD:	23.2 %
Reproduction NOEC:	0.89 g/L
Reproduction LOEC:	1.3 g/L
Survival NOEC:	2 g/L
Survival LOEC:	3 g/L
ICP_{20}:	1.01 g/L
ICP_{25}:	1.1 g/L

Day	Concentrations prepared by	Counted by
0	MF	MF/KC
1	MF	MF
2	MF	KC
3	KC	KC
4	MF	MF
5	MF	MF
6	KC	KC/MF
7		
8		

Loaded by:

Test Replicate	Loaded from culture vial
1	A22
2	A13
3	A24
4	B16
5	B11
6	B24
7	A3
8	A16
9	B19
10	B21

Comments:

Investigators' signatures

Marshall Faircloth
Kristin (KC) Brice Newsom
James Davis
Bill Miller
REVIEWER

Test Incubated in: Incubator: # 2
Light Intensity : 50 - 100 ft. candles
Photoperiod : 16 light 8 dark
Temperature Range °C:
Incubator # 2 min. 26.1 max. 27.7 mean —
Room B246 ___ min. ~~20.9~~ 23.2 max. 26.0 mean —
Test min. _____ max. _____ mean _____

AAAA37

Appendix C. (continued)

Ceriodaphnia dubia Survival and Reproduction

Start Date: 2-15-11 Time: 0900 Loaded by: MF
End Date: 2.21.11 Time: 1100 Verified by: KC

Concentration	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Live adults	Neonates per adult
Control	0												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	6	6	0	0	6	5	4	5	5	5	42	10	4.2
	4	13	0	~~M~~8	4	9	0	0	0	0	10	44	10	4.4
	5	12	0	15	0	0	9	9	11	9	0	65	10	6.5
	6	0	12	0	13	8	15	15	13	15	15	106	10	10.6
	7													
	8													
	Total	31	18	23	17	23	29	28	29	29	30	257	10*	25.7
0.5%	0												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	4	0	4	0	4	0	4	5	0	5	26	10	2.6
	4	10	9	8	9	6	7	0	0	0	9	58	10	5.8
	5	0	~~1~~	0	0	11	0	11	X2	6M	=13	44	9	~~4.8~~ 4.4
	6	13	13	15	11	0	15	14	1	12	0	93	9	~~10.33~~ 9.3
	7								1					
	8													
	Total	27	23	27	20	21	22	29	7	18	27	221	10*	22.1
0.8%	0												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	6	5	4	4	3	4	3	3	4	0	36	10	3.6
	4	8	0	8	0	6	7	0	0	0	8	37	10	3.7
	5	8	10	4	8	0	0	10	10	8	0	58	10	5.8
	6	0	12	0	11	15	13	8	10	11	12	92	10	9.2
	7													
	8													
	Total	22	27	16	23	24	24	21	23	23	20	223	10*	22.3

Comments: * for Calculations KC 2/21/11

Test Page 2 of 6 PAGE 41 ~~38~~ 07/15/08 MF

Appendix C. (continued)

FDEP Biology Laboratory - Chronic SRT Bench Sheet

Ceriodaphnia dubia Survival and Reproduction

Concentration	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Live adults	Neonates per adult
1.3	0												10	
	1												10	
	2	X	0	0	0	0	0	0	0	0	X	0	8	0
	3		~~4~~ 1	~~4~~ 4	4	3	2	4	5	4		27	8	~~3.375~~ 2.7
	4		5	8	7	7	0	0	0	8		35	8	~~4.375~~ 3.5
	5		6	0	0	0	10	9	7	0		26	8	~~3.25~~ 2.6
	6		7	10	7	13	13	9	7	11		77	8	~~9.625~~ 7.7
	7		8											
	8													
	Total	0	13	22	18	23	25	22	19	23	0	165	10*	16.5
2.0	0												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	1	2	0	0	3	0	0	3	0	9	10	0.9
	4	0	0	0	0	5	0	X0	0	0	X0	5	8	~~.625~~ 0.5
	5	0	0	1	2	5	5		0	0		13	8	~~1.625~~ 1.3
	6	X3	1	3	6	0	3		0	0		16	8	~~2.0~~ 1.6
	7													
	8													
	Total	3	2	6	8	10	11	0	0	3	0	43	10*	4.3
3.0	0												10	
	1		X		X		X	X		X			5	
	2	X		0		X			X		X	0	1	0
	3			X								0 X mf	0	0
	4													
	5													
	6													
	7													
	8													
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments: * for calculations KC 2/21/11

~~AAAA.79~~

Appendix C. (continued)

FDEP Biology Laboratory - Chronic SRT Bench Sheet

Ceriodaphnia dubia Parameters

Test Day	Conc.	New Sample Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)	Old Sample Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)
Day 0	Control	M	7.0	25.1	8.2	192					
	0.59	M	7.0	25.1	8.2	1390					
	0.89	M	7.0	25.0	8.1	1984					
	1.3	M	7.0	24.8	8.2	2850					
	2.0	M	6.9	24.6	8.0	4120					
	3.0	M	6.9	24.5	8.0	5960					
	Measured by:		MF	MF	MF	MF					
	Recorded by:		MF	MF	MF	MF					
Day 1	Control	M	7.7	24.3	8.2	192	A	8.1	25.2	7.5	198
	0.59	M	7.9	24.3	8.1	1293	A	8.0	25.2	7.4	1440
	0.89	M	8.0	24.2	8.1	1816	A	8.0	25.1	7.5	1945
	1.3	M	8.1	24.2	8.2	2600	A	8.0	25.1	7.5	2800
	2.0	M	8.1	24.3	8.1	3760	A	8.0	25.1	7.5	4060
	3.0	M	8.1	24.7	8.1	5490	A	8.0	24.8	7.5	5960
	Measured by:		MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:		MF	MF	MF	MF		MF	MF	MF	MF
Day 2	Control	M	7.9	24.7	7.9	191	A	7.9	24.6	6.4	201
	0.59	M	7.9	25.1	7.8	1267	A	8.0	24.8	6.5	1271
	0.89	M	8.0	25.2	7.8	1817	A	7.9	24.9	6.6	1815
	1.3	M	8.0	24.9	7.7	2580	A	8.0	24.9	6.7	2610
	2.0	M	8.0	25.2	7.8	3740	A	8.0	24.9	6.8	3780
	3.0	M	8.0	25.7	7.9	5460	A	8.0	24.9	6.8	5460
	Measured by:		KC	MF	KC	KC		KC	KC	KC	KC
	Recorded by:		KC	KC	KC	KC		KC	KC	KC	KC
Day 3	Control	M	7.9	24.5	6.9	220	A	7.9	24.5	7.4	220
	0.59	M	8.0	24.2	6.8	1271	A	8.0	24.4	7.2	1344
	0.89	M	8.0	24.3	6.8	1806	A	8.1	24.5	7.4	1814
	1.3	M	8.1	24.7	6.9	2580	A	8.1	24.3	7.4	2790
	2.0	M	8.1	27.7	7.0	3720	A	8.1	24.6	7.6	3730
		M									
	Measured by:		KC	KC	KC	KC		KC	KC	KC	KC
	Recorded by:		KC	KC	KC	KC		KC	KC	KC	KC

Comments:

M= "Metered" vial, a surrogate vial for parameters

~~AAAA10~~

Test Page 4 of 6 PAGE 46 07/15/08 MF

Appendix C. (continued)

FDEP Biology Laboratory - Chronic SRT Bench Sheet

Ceriodaphnia dubia Parameters

Test Day ↓	Conc.	New Sample Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)	Old Sample Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)
Day 4	Control	M	8.0	24.3	7.3	185	A	8.0	25.0	7.6	204
	0.59	M	8.1	24.4	7.4	1283	A	8.1	24.6	7.5	1302
	0.89	M	8.1	24.3	7.5	1798	A	8.2	24.8	7.6	1851
	1.3	M	8.1	24.5	7.6	2560	B	8.1	24.7	7.7	2610
	2.0	M	8.1	24.6	7.6	3720	A	8.1	24.7	7.7	3840
		M									
	Measured by:		MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:		MF	MF	MF	MF		MF	MF	MF	MF
Day 5	Control	M	8.1	25.0	7.3	188	A	8.1	24.7	7.7	192
	0.59	M	8.2	25.1	7.3	1256	A	8.1	24.3	7.7	1400
	0.89	M	8.2	25.0	7.4	1818	A	8.2	24.6	7.8	1831
	1.3	M	8.2	25.0	7.4	2580	B	8.2	24.4	7.8	2780
	2.0	M	8.2	25.1	7.3	3730	A	8.2	24.3	7.8	3820
		M									
	Measured by:		MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:		MF	MF	MF	MF		MF	MF	MF	MF
Day 6	Control	M					A	8.0	24.7	7.4	222
	0.59	M					A	8.1	24.7	7.4	1303
	0.89	M					A	8.1	24.7	7.5	1848
	1.3	M					B	8.1	24.8	7.7	2610
	2.0	M					A	8.1	24.6	7.6	3940
		M									
	Measured by:							KC	MF	KC	KC
	Recorded by:							KC	MF	KC	KC
Day 7	Control	M									
		M									
		M									
		M									
		M									
		M									
	Measured by:										
	Recorded by:										
Day 8	Control	M									
		M									
		M									
		M									
		M									
		M									
	Measured by:										
	Recorded by:										

Replicate M= "Metered" vial, a surrogate vial for parameters

AAA041

Test Page 5 of 6

PAGE 47

07/15/08 MF

Bioassay Instrument ID

Test ID: SRT - Feb 15, 2011 Dates: Feb 15–21, 2011

METER / DEVICE	ID	SOP	Parameter	Method	√used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	√
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H+	√
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity Salinity	SM 2510 B SM 2520 B	√
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	√
Thermometer (DO probe)	EC#5 ~~YSI 5750 SN 05J1720~~	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	√
Hach Pocket Colorimeter II	05050C026378	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	√
Alkalinity (Hach Kit)	No SN	TA06_08	Alkalinity	SM 2320 B	√
Hardness (Hach Kit)	No SN	TA06_09	Hardness	SM 2340 C	√
OHAUS Balance 250D	1125481084	TA06_21 TA06_27	Weight	-	—
S-Weights	BIO-S-WEIGHTS-01	NA	Balance check	-	—

SM-2530B modified to allow use of electronic and non-mercury filled thermometers.

Insert other device information in blank spaces(if used). Test ID = Facility or SRTs (acute SRT–Chronic SRT)

entered by M. Fairchild 2-15 and 2- , 2011

V 1.1 6/12/08 MF ~~000042~~

PAGE 4 of

Appendix C. (continued)

FDEP Biology Laboratory - Chronic SRT Benchsheet
Pimephales promelas or *Menidia beryllina*

Test Species (circle one)

(P. promelas)	SOP#: TA07_09	EPA-821-R-02-013	Method 1000.0
M. beryllina	SOP#: TA07_14	EPA-821-R-02-014	Method 1006.0

Diluent/ Batch: MHW/2.2.11 Test Days Used: 0-7
Diluent/ Batch: _____ Test Days Used: _____
Toxicant/ Batch # : KCl / 2.14.11
Artemia Lot # : 23613

Start Date: 2.15.11 Time: 1305
End Date: 2.22.11 Time: 1315
Organism Batch #/ Age: #2.15.11 / < 24hrs.

Artemia Batch #	Day 2 29-11	Day 5 32-11
Day 0 27-11	Day 3 30-11	Day 6 33-11
Day1 28-11	Day 4 31-11	

Chamber size : 1000 ml
Test volume : 500 ml

Feeding: *P. promelas* 0.15 g wet wt. 2X day 6 hour interval
M. beryllina 0.10 g wet wt days 0-2 0.15g wet wt. days 3-7

Water Quality Parameters	Diluent	Diluent (or other)	Method	Measured by	Verified by
Total Residual Cl_2 (mg/L):	<0.03		HACH	JBK KC	KC
Alkalinity (mg/L as $CaCO_3$):	75		HACH	KC	KC
Hardness (mg/L as $CaCO_3$):	95		HACH	KC	KC
Total Ammonia (mg/L as N):	<0.017		DENVER	BA	KC
Conductivity ~~umhos-cm~~ mmhos-cm:	336		METTLER	KC	KC

Statistics	
Growth NOEC:	0.5g
Growth LOEC:	1.0g
Growth IC_{20}:	0.594
Growth IC_{25}:	0.62
Ctrl % CV:	8.6%
Dunnetts PMSD:	16.5%
Survival NOEC:	0.5
Survival LOEC:	1.0

Test incubated in : [X] Incubator # 2
[ ] Waterbath #_____
Light Intensity : 50 - 100 ft. candles
Photoperiod : 16 light 8 dark
Temperature Range °C:
Incubator # 2 min. 26.1 max. 27.7 mean_____
Water bath # ____ min._____ max._____ mean_____
Room B246 min. 22.9 max. 26.0 mean_____

P. promelas PMSD Bounds for Growth: Lower 12 Upper 30
M. beryllina PMSD Bounds for Growth: Lower 11 Upper 28

Investigators' signatures
Kara Cox
Marshall Faircloth
James Daniel
Bruce Ambler
Liz Miller
REVIEWER

Comments:

PAGE 000029 revised 7/16/08 MF

Appendix C. (continued)

FDEP Biology Laboratory - Chronic SRT Benchsheet

Pimephales promelas or Menidia beryllina Survival

Organism: (*P. promelas*) *M.beryllina* (circle one) D = dead M = missing

Concentration: µg/L (g/L) (circle one)

			TEST DAY							
Concentration	Replicate	Chamber	0	1	2	3	4	5	6	7
Control	A	E1	10	10	10	10	10	10	10	10
	B	E2	10	10	10	10	10	10	10	10
	C	E3	10	10	10	10	10	10	10	10
	D	E4	10	10	10	10	10	10	10	10
.125	A	E5	10	10	10	10	10	10	10	10
	B	E6	10	10	10	10	10	10	10	10
	C	E 7	10	10	10	10	10	10	10	10
	D	E 8	10	10	10	10	10	10	10	10
.25	A	E 9	10	10	10	10	10	10	10	10
	B	E 10	10	10	10	10	10	10	10	10
	C	E 11	10	10	10	10	10	10	10	10
	D	E 12	10	10	10	10	10	10	10	10
.5	A	E 13	10	10	9 D	9	9	9	9	9
	B	E 14	10	10	9 D	9	9	9	9	9
	C	E 15	10	10	10	10	10	10	10	10
	D	E 16	10	9 D	9	9	9	9	9	8
1	A	E 17	10	2 SD	1 D	~~SD~~ 1	1	1	0 D	
	B	E 18	10	4 SD	2 SD	2	2	2	0 SD	
	C	E 11	10	1 SD	1	0 D	–	–	–	
	D	E 20	10	0 100	–	–	–	–	–	
2	A	E 21	10	0 100						
	B	E 22	10	0 100						
	C	E 23	10	0 100						
	D	E 24	10	0 100						
	A		10							
	B		10							
	C		10							
	D		10							
Loaded by (0 hr): JD		Checked by:	KC	JD	JD	JD	BA	JD	JD	
Verified by (0 hr): KC										
Concentrations prepared by:			JD	JD	JD	JD	BA	JD	JD	

Comments:

PAGE 000030 revised 7/16/08 MF

Appendix C. (continued)

FDEP Biology Laboratory - Chronic SRT Benchsheet

Pimephales promelas or *Menidia beryllina* Parameters

Start Date: 2.15.11 Time: 1305

End Date: 2.22.11 Time: 1315

Organism: (*P. promelas*) *M. beryllina* (circle one)

Concentration: µg/L (g/L) (circle one)

circle µmhos or mmhos

Test Day		Before Renewal					Test Start and After Renewal				
	Concentration	Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity µmhos mmhos	Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity µmhos mmhos
Day 0	Control						A	7.8	24.2	9.0	336
	.125						A	7.8	25.7	8.9	577
	.25						A	7.8	26.3	8.9	821
	.5						A	7.8	26.2	8.3	1290
	1						A	7.9	26.1	8.9	2230
	2						A	8.0	26.5	8.8	4040
							A				
	Measured by:							KC	KC	KC	KC
	Recorded by:							KC	KC	KC	KC
	Concentration	Replicate	pH	Temp	DO	Conductivity	Replicate	pH	Temp	DO	Conductivity
Day 1	Control	B	7.8	24.6	7.7	342	B	7.2	24.0	6.9	337
	.125	B	7.9	24.1	7.6	574	B	7.8	24.1	6.9	580
	.25	B	7.9	23.8	7.5	817	B	7.9	23.9	6.9	808
	.5	B	7.9	23.8	7.6	1288	B	8.0	24.0	7.0	1275
	1	B	8.0	24.7	7.9	2210	B	8.0	24.0	7.0	2180
	2	B	8.0	24.6	7.5	3990	B		24.0 KC		
		B					B				
	Measured by:		KC	KC	KC	KC		KC	KC	KC	KC
	Recorded by:		KC	KC	KC	KC		KC	KC	KC	KC
	Concentration	Replicate	pH	Temp	DO	Conductivity	Replicate	pH	Temp	DO	Conductivity
Day 2	Control	C	7.6	24.6	5.5	336	C	7.6	25.1	6.8	329
	.125	C	7.7	24.5	6.2	580	C	7.6	24.9	6.8	571
	.25	C	7.7	24.7	6.4	922	C	7.7	25.4	7.0	807
	.5	C	7.7	24.5	6.2	1269	C	7.7	25.7	7.2	1277
	1	C	7.8	24.7	6.4	2180	C	7.8	24.7	7.4	2120
	2	C					C				
		C					C				
	Measured by:		JD	JD	JD	JD		KC	JD	KC	KC
	Recorded by:		JD	JD	JD	JD		KC	KC	KC	KC
	Concentration	Replicate	pH	Temp	DO	Conductivity	Replicate	pH	Temp	DO	Conductivity
Day 3	Control	D	7.7	24.2	6.0	360	D	7.8	24.0	7.1	312
	.125	D	7.7	24.5	6.0	585	D	7.8	24.9	7.2	569
	.25	D	7.6	24.8	5.1	827	D	7.8	25.7	6.7	815
	.5	D	7.6	24.0	5.3	1438	D	7.8	25.4	6.8	1285
	1	DC	7.6	25.5 JD	5.9	2200	B JD DC	7.8	24.3	7.0	2110
		D					D				
		D					D				
	Measured by:		JD	JD	JD	JD		JD	JD	JD	JD
	Recorded by:		JD	JD	JD	JD		JD	JD	JD	JD

Comments:

Appendix C. (continued)

FDEP Biology Laboratory - Chronic SRT Benchsheet

Pimephales promelas or *Menidia beryllina* Parameters

Organism: (*P. promelas*) *M.beryllina* (circle one)

Concentration: µg/L (g/L) (circle one)

circle µmhos or mmhos

Test Day		Before Renewal					After Renewal					
↓	Concentration	Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos) mmhos	Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos) mmhos
Day 4	Control	A	7.7	24.7	6.0	333	A	7.2	24.1	6.7	321
	.125	A	7.6	24.6	5.9	593	A	7.3	25.4	7.0	575
	.25	A	7.6	24.6	5.8	837	A	7.7	25.5	7.2	826
	.5	A	7.6	24.4	5.7	1318	A	7.7	25.9	7.2	1274
	1	A	7.7	24.5	5.9	2140	A	7.9	24.4	6.9	2080
		A					A				
		A					A				
	Measured by:		JD	JD	JD	JD		JD	JD	JD	JD
	Recorded by:		JD	JD	JD	JD		JD	JD	JD	JD
↓	Concentration	Replicate	pH	Temp	DO	Conductivity	Replicate	pH	Temp	DO	Conductivity
Day 5	Control	B	7.6	25.1	6.4	334	B	7.7	24.1	6.5	328
	.125	B	7.6	24.4	6.3	580	B	7.7	25.5	6.9	577
	.25	B	7.6	24.6	5.7	833	B	7.8	25.2	6.9	828
	.5	B	7.6	24.8	5.7	1331	B	7.8	26.0	6.8	1312
	1	B	7.6	24.7	5.7	2190	B	7.8	25.4	7.3	2190
		B					B				
		B					B				
	Measured by:		BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:		BA	BA	BA	BA		BA	BA	BA	BA
↓	Concentration	Replicate	pH	Temp	DO	Conductivity	Replicate	pH	Temp	DO	Conductivity
Day 6	Control	C	7.6	25.1	5.9	325	C	~~7.8~~ 7.8	24.0	6.8	323
	.125	C	7.6	25.2	6.0	573	C	7.8	25.5	7.3	578
	.25	C	7.6	24.7	6.1	827	C	7.9	25.5	7.0	814
	.5	C	7.7	24.9	6.1	1309	C	7.8	25.8	7.1	1293
	1.0	~~B~~ C	7.7	25.3	6.3	2180	C				
		C					C				
		C					C				
	Measured by:		JD	JD	JD	JD		JD	JD	JD	JD
	Recorded by:		JD	JD	JD	JD		JD	JD	JD	JD
↓	Concentration	Replicate	pH	Temp	DO	Conductivity	Replicate	pH	Temp	DO	Conductivity
Day 7	Control	D	7.5	25.4	4.3	335	D				
	.125	D	7.4	25.4	4.3	572	D				
	.25	D	7.4	25.5	4.3	821	D				
	.5	D	7.5	25.5	4.9	1286	D				
		D					D				
		D					D				
		D					D				
	Measured by:		JD	JD	JD	JD					
	Recorded by:		JD	JD	JD	JD					

Comments:

Test Page 4 of 6 PAGE 000032 revised 8/24/06 MF/SP

Appendix C. (continued)

FDEP Biology Laboratory - Chronic SRT Benchsheet

Pimephales promelas or *Menidia beryllina* Weights

SOP TA06_21

Organism: ~~*P. promelas*~~ *M.beryllina* (circle one)

Concentration: µg/L g/L (circle one)

mean wt = fish wt divided by 10

convert g to mg: move decimal 3 places to right

Concentration	Replicate	Pan #	Pan wt. (g)	Pan + Fish (g)	Fish wt. (g)	Original # of fish	Mean wt. (mg)	
Control	A	~~JD 1 0.02326~~	0.02326	0.02917	0.00591	10	.591	
	B	~~00~~ 2	0.02116	0.02623	0.00507	10	.507	
	C	~~00~~ 3	0.02266	0.02783	0.00517	10	.517	
	D	~~00~~ 4	0.02213	0.02810	0.00597	10	.597	mean 0.553
.125	A	~~00~~ 5	0.02103	0.02543	0.00440	10	.440	
	B	~~00~~ 6	0.02226	0.02800	0.00574	10	.574	
	C	~~00~~ 7	0.02613	0.03199	0.00586	10	.586	
	D	~~00~~ 8	0.02198	0.02742	0.00544	10	.544	0.536
.25	A	~~00~~ 9	0.02069	0.02574	0.00505	10	.505	
	B	~~00~~ 10	0.02291	0.02922	0.00631	10	.631	
	C	~~00~~ 11	0.02226	0.02890	0.00664	10	.664	
	D	~~00~~ 12	0.02199	0.02768	0.00569	10	.569	0.5823
.5	A	~~00~~ 13	0.02160	0.02686	0.00526	10	.526	
	B	~~00~~ 14	0.02683	0.03216	0.00533	10	.533	
	C	~~00~~ 15	0.02298	0.02899	0.00601	10	.601	
	D	~~00~~ 16	0.02312	0.02863	0.00551	10	.551	0.5528
	A					10		
	B					10		
	C					10		
	D					10		
	A					10		
	B					10		
	C					10		
	D					10		
	A					10		
	B					10		
	C					10		
	D					10		
		Weighed by:	JD	JD				

Comments:

Note: Pan number (#) refers to actual Pan number.

PAGE 000073

revised 8/24/06 MF/SP

Appendix C. (continued)

FDEP Biology Laboratory - Chronic SRT Benchsheet

Pimephales promelas or *Menidia beryllina* QC

SOPs TA07_09, TA07_14 and TA06_21

all weights in grams

Empty Pan Weights Date: 2.24.11 Weighed by: JD

	Pan 1 wt.	Pan 1 initial wt.
after Pan 5	0.02328	@ 0.02326
after Pan 10	0.02326	@ 0.02326
after Pan 15	0.02329	@ 0.02326
after Pan 20	0.02329	@ 0.02326
after Pan 25		@
after Pan 30		@
after Pan 35		@
after Pan 40		@
after Pan 45		@
after Pan 48		@

	Measured Value	S-weight Value
S-weights	0.00101	@ 0.001
	0.03003	@ 0.03

Balance: Ohaus 250D Ser# 1125481084

S-Weights: BIO-S-Weights-01

Fish + Pan Weights Date: 2.25.11 Weighed by: JD

	Pan 1 wt.	Pan 1 initial wt.
after Pan 5	0.02920	@ 0.02917
after Pan 10	0.02920	@ 0.02917
after Pan 15	0.02921	@ 0.02917
after Pan 20	0.02921	@ 0.02917
after Pan 25		@
after Pan 30		@
after Pan 35		@
after Pan 40		@
after Pan 45		@
after Pan 48		@

	Measured Value	S-weight Value
S-weights	0.01	@ 0.01
	0.05004	@ 0.05

VWR ID.

Drying Oven ID: ~~HR2~~

Temperature °C: 95

Drying Hours: 8

Note: Pan number (5, 10, etc.) refers to sequence of weighing as actual Pan #s may differ.

Comments:

PAGE 000034

revised 7/16/08 MF

Appendix C. (continued)

Test ID: Brooks Chronic SRT Dates: 2.15.11 – 2.22.11

METER / DEVICE	ID	SOP	Parameter	Method	v used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
YSI DO Probe	5905	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H+	✓
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity Salinity	SM 2510 B SM 2520 B	✓
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	✓
Traceable Thermometer	#1-SN101686412 #2-SN221295527 #3-SN240116020 #4-SN80361795 #5 SN61990624	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	✓ 45
Hach Pocket Colorimeter II	05050C026378	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	✓
Alkalinity (Hach Kit)	No SN	TA06_08	Alkalinity	SM 2320 B	✓
Hardness (Hach Kit)	No SN	TA06_09	Hardness	SM 2340 C	✓
OHAUS Balance 250D	1125481084	TA06_21 TA06_27	Weight	-	✓
S-Weights	BIO-S-WEIGHTS-01	NA	Balance check	-	✓
					✓

SM-2530B modified to allow use of electronic and non-mercury filled thermometers.

Insert other device information in blank spaces(if used). Test ID = Facility or SRTs (acute SRT--Chronic SRT)

2.25.11 DD

V 1.1 9/21/10 MF/jd

000035

Appendix C. (continued)

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	2/15/2011 09:00	Test ID:	211cdsrt	Sample ID:	REF-Ref Toxicant
End Date:	2/21/2011 11:00	Lab ID:	DEP TOXLAB-FDEP Biology To	Sample Type:	NACL-Sodium chloride
Sample Date:		Protocol:	EPAFW02-EPA/821/R-02-013	Test Species:	CD-Ceriodaphnia dubia
Comments:	C. dubia chronic srt for february 2011				

Conc-gm/L	1	2	3	4	5	6	7	8	9	10
D-Control	31.000	18.000	23.000	17.000	23.000	29.000	28.000	29.000	29.000	30.000
0.59	27.000	23.000	27.000	20.000	21.000	22.000	29.000	7.000	18.000	27.000
0.89	22.000	27.000	16.000	23.000	24.000	24.000	21.000	23.000	23.000	20.000
1.3	0.000	13.000	22.000	18.000	23.000	25.000	22.000	19.000	23.000	0.000
2	3.000	2.000	6.000	8.000	10.000	11.000	0.000	0.000	3.000	0.000
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

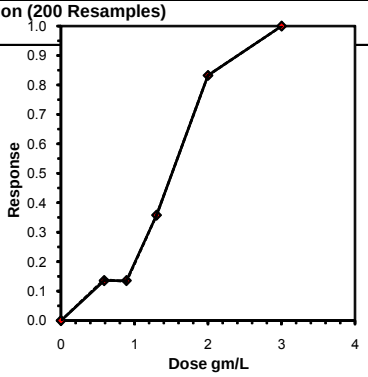
			Transform: Untransformed					Isotonic	
Conc-gm/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	25.700	1.0000	25.700	17.000	31.000	19.845	10	25.700	1.0000
0.59	22.100	0.8599	22.100	7.000	29.000	29.048	10	22.200	0.8638
0.89	22.300	0.8677	22.300	16.000	27.000	13.040	10	22.200	0.8638
1.3	16.500	0.6420	16.500	0.000	25.000	56.512	10	16.500	0.6420
2	4.300	0.1673	4.300	0.000	11.000	97.471	10	4.300	0.1673
3	0.000	0.0000	0.000	0.000	0.000	0.000	10	0.000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.89498	0.93	-1.2306	1.70668
Bartlett's Test indicates equal variances (p = 0.01)	12.749	13.2767		

Linear Interpolation (200 Resamples)

Point	gm/L	SD	95% CL		Skew
IC05*	0.2166	0.2753	0.1159	0.9843	0.9882
IC10*	0.4332	0.2861	0.2319	1.1698	0.3415
IC15	0.9155	0.2663	0.3478	1.3060	-0.1828
IC20	1.0080	0.2097	0.4638	1.3638	-0.7884
IC25	1.1004	0.1781	0.5797	1.4112	-0.8412
IC40	1.3620	0.1243	1.1174	1.5843	-0.2957
IC50	1.5094	0.1167	1.2205	1.6878	-0.7115

* indicates IC estimate less than the lowest concentration



Appendix C. (continued)

Larval Fish Growth and Survival Test-7 Day Growth

Start Date:	2/15/2011 13:05	Test ID:	ppcsrt2151	Sample ID:	REF-Ref Toxicant
End Date:	2/22/2011 13:15	Lab ID:	DEP TOXLAB-FDEP Biology To	Sample Type:	KCL-Potassium chloride
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	PP-Pimephales promelas
Comments:	P. promelas chronic srt for February 2011				

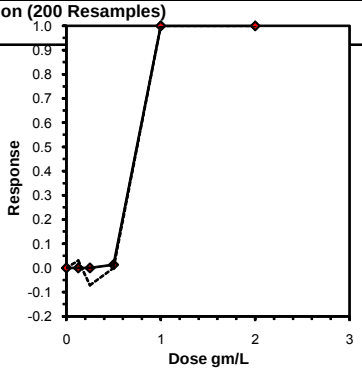
Conc-gm/L	1	2	3	4
D-Control	0.5910	0.5070	0.5170	0.5970
0.125	0.4400	0.5740	0.5860	0.5440
0.25	0.5050	0.6310	0.6640	0.5690
0.5	0.5260	0.5330	0.6010	0.5510
1	0.0000	0.0000	0.0000	0.0000
2	0.0000	0.0000	0.0000	0.0000

			Transform: Untransformed					Isotonic	
Conc-gm/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	0.5530	1.0000	0.5530	0.5070	0.5970	8.604	4	0.5604	1.0000
0.125	0.5360	0.9693	0.5360	0.4400	0.5860	12.387	4	0.5604	1.0000
0.25	0.5923	1.0710	0.5923	0.5050	0.6640	11.861	4	0.5604	1.0000
0.5	0.5528	0.9995	0.5528	0.5260	0.6010	6.123	4	0.5528	0.9863
1	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	4	0.0000	0.0000
2	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	4	0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.92873	0.844	-0.51585	-0.67049
Bartlett's Test indicates equal variances (p = 0.66)	1.59327	11.3449		

Linear Interpolation (200 Resamples)

Point	gm/L	SD	95% CL(Exp)		Skew
IC05	0.5184	0.1286	0.0000	0.5290	-2.2299
IC10	0.5438	0.0341	0.4839	0.5537	-10.5436
IC15	0.5691	0.0134	0.5126	0.5785	-0.7611
IC20	0.5945	0.0126	0.5412	0.6033	-0.7611
IC25	0.6198	0.0118	0.5699	0.6281	-0.7611
IC40	0.6958	0.0095	0.6559	0.7025	-0.7611
IC50	0.7465	0.0079	0.7133	0.7521	-0.7611



Appendix C. (continued)

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	2/15/2011 11:15	Test ID:	211buckeye	Sample ID:	FL0000876-NPDES Permit #
End Date:	2/21/2011 11:30	Lab ID:	DEP TOXLAB-FDEP Biology To	Sample Type:	EFF2-Industrial
Sample Date:		Protocol:	EPAFW02-EPA/821/R-02-013	Test Species:	CD-Ceriodaphnia dubia
Comments:	C. dubia chronic bioassay for Buckeye Florida February 2011				

Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	30.000	28.000	26.000	26.000	26.000	22.000	25.000	7.000	26.000	27.000
6.25	23.000	30.000	27.000	27.000	29.000	28.000	35.000	34.000	34.000	32.000
12.5	26.000	30.000	30.000	28.000	28.000	24.000	29.000	32.000	31.000	33.000
25	26.000	32.000	32.000	30.000	28.000	24.000	27.000	32.000	30.000	26.000
50	12.000	29.000	24.000	24.000	31.000	21.000	14.000	24.000	19.000	18.000
100	12.000	16.000	9.000	14.000	10.000	10.000	5.000	12.000	14.000	11.000

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	24.300	1.0000	24.300	7.000	30.000	26.390	10			
6.25	29.900	1.2305	29.900	23.000	35.000	12.852	10	-2.823	2.287	4.536
12.5	29.100	1.1975	29.100	24.000	33.000	9.369	10	-2.420	2.287	4.536
25	28.700	1.1811	28.700	24.000	32.000	10.132	10	-2.218	2.287	4.536
50	21.600	0.8889	21.600	12.000	31.000	28.051	10	1.361	2.287	4.536
*100	11.300	0.4650	11.300	5.000	16.000	27.372	10	6.553	2.287	4.536

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.77835	1.035	-1.23032	3.88965
Bartlett's Test indicates equal variances (p = 0.03)	12.6414	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	50	100	70.7107	2	4.53613	0.18667	499.83	19.6759	4.4E-13	5, 54
Treatments vs D-Control										

Appendix C. (continued)

Larval Fish Growth and Survival Test-7 Day Growth

Start Date:	2/15/2011 13:15	Test ID:	Bucfeb2011	Sample ID:	Buckeye Florida
End Date:	2/22/2011 13:15	Lab ID:	DEP TOXLAB-FDEP Biology To	Sample Type:	EFF2-Industrial
Sample Date:		Protocol:	EPAF 94-EPA/600/4-91/002	Test Species:	PP-Pimephales promelas
Comments:	Chronic P. promelas bioassay for Buckeye Florida Feb. 2011				

Conc-%	1	2	3	4
D-Control	0.6660	0.5250	0.5390	0.4450
6.25	0.5900	0.6780	0.6630	0.7140
12.5	0.4810	0.7210	0.7040	0.6330
25	0.4930	0.5660	0.6480	0.6310
50	0.7090	0.5670	0.5950	0.7050
100	0.5800	0.5690	0.4310	0.4610

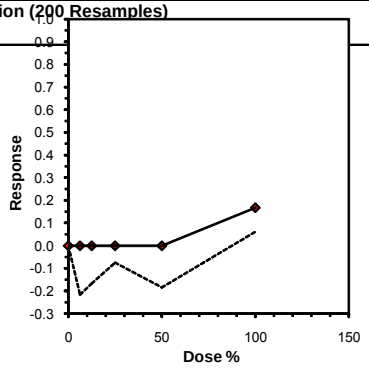
			Transform: Untransformed					1-Tailed			Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
D-Control	0.5438	1.0000	0.5438	0.4450	0.6660	16.812	4				0.6137	1.0000
6.25	0.6613	1.2161	0.6613	0.5900	0.7140	7.879	4	-2.058	2.410	0.1376	0.6137	1.0000
12.5	0.6348	1.1674	0.6348	0.4810	0.7210	17.228	4	-1.594	2.410	0.1376	0.6137	1.0000
25	0.5845	1.0749	0.5845	0.4930	0.6480	12.061	4	-0.714	2.410	0.1376	0.6137	1.0000
50	0.6440	1.1844	0.6440	0.5670	0.7090	11.437	4	-1.756	2.410	0.1376	0.6137	1.0000
100	0.5103	0.9384	0.5103	0.4310	0.5800	14.763	4	0.587	2.410	0.1376	0.5103	0.8315

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.9542	0.884	-0.33562	-0.75612
Bartlett's Test indicates equal variances (p = 0.90)	1.62697	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs D-Control	100	>100		1	0.13757	0.25299	0.01462	0.00652	0.09428	5, 18

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05	64.837			
IC10	79.674			
IC15	94.510			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			



Appendix D. Test Organism Receipt

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: ~~FDEP~~ 2/14/11

Ship to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia	150 ac	4 days	MS110210	25	8.0	20
Menidia beryllina						
						Hardness mg/L
Cyprinella leedsi						
Pimephales promelas	600	< 24hrs	FM 110213-1630	25	7.8	80
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: PM

Shipped Via: Fed Ex

Notes: Split fatheads into 2 bags of 300

Thank you for your order.

4569 Samuel Street · Sarasota, FL 34233 · Tel: 941-925-3594 · Fax: 941-922-3874 · Web: www.biologylab.com

Appendix E. Chemical Analyses performed on the effluent from the Buckeye Florida facility Outfall D-001, sampled on February 14, 2011.

Date Sampled	Field ID	Analysis Group	Components	Results	Remark	Units	MDL	PQL
2/14/2011 12:22	Effluent	AGP/LN	Algal Growth Potential	9.17		mg DryWt/L	3	3
2/14/2011 12:22	Effluent	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	1.4	U	ug/L	1.4	4.2
2/14/2011 12:22	Effluent	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	14		mg/L	0.2	2
2/14/2011 12:22	Effluent	Chlorophyll/Grain Size/BOD	Phaeophytin-a	1	U	ug/L	1	3
2/14/2011 12:22	Effluent	Toxicology	Bioassay-Chron-Def-FW-Fish, NOEC	100		NOEC		
2/14/2011 12:22	Effluent	Toxicology	Bioassay-Chron-Def-FW-C.dubia, NOEC	50		NOEC		
2/14/2011 12:22	Effluent	Toxicology	Bioassay-Chron-Def-FW-Fish, IC25	100	L	IC25		
2/14/2011 12:22	Effluent	Toxicology	Bioassay-Chron-Def-FW-C.dubia, IC25	52.9		IC25		
2/14/2011 12:22	Effluent	Metals	Lead	0.37	I	ug/L	0.2	0.8
2/14/2011 12:22	Effluent	Metals	Silver	0.081	I	ug/L	0.025	0.1
2/14/2011 12:22	Effluent	Metals	Arsenic	0.47	I	ug/L	0.25	1
2/14/2011 12:22	Effluent	Metals	Magnesium	20.1		mg/L	0.04	0.16
2/14/2011 12:22	Effluent	Metals	Iron	350		ug/L	30	120
2/14/2011 12:22	Effluent	Metals	Copper	5.13		ug/L	0.5	1
2/14/2011 12:22	Effluent	Metals	Aluminum	443		ug/L	5	20
2/14/2011 12:22	Effluent	Metals	Zinc	27		ug/L	5	20
2/14/2011 12:22	Effluent	Metals	Sodium	531		mg/L	2.5	10
2/14/2011 12:22	Effluent	Metals	Calcium	50.2		mg/L	0.075	0.3
2/14/2011 12:22	Effluent	Metals	Selenium	0.2	U	ug/L	0.2	0.8
2/14/2011 12:22	Effluent	Metals	Nickel	6.99		ug/L	0.25	1
2/14/2011 12:22	Effluent	Metals	Chromium	4.3		ug/L	0.3	1.2
2/14/2011 12:22	Effluent	Metals	Cadmium	0.31		ug/L	0.05	0.2
2/14/2011 12:22	Effluent	Nutrients	Alkalinity	199		mg CaCO3/L	0.65	2.5
2/14/2011 12:22	Effluent	Nutrients	Color (true)	1100		PCU	20	60
2/14/2011 12:22	Effluent	Nutrients	NO2NO3-N	0.17	Y	mg N/L	0.004	0.01
2/14/2011 12:22	Effluent	Nutrients	O-Phosphate-P	1.4		mg P/L	0.04	0.1
2/14/2011 12:22	Effluent	Nutrients	Kjeldahl Nitrogen	7.5	Y	mg N/L	0.4	1
2/14/2011 12:22	Effluent	Nutrients	Ammonia-N	4	Y	mg N/L	0.05	0.1
2/14/2011 12:22	Effluent	Nutrients	Total-P	1.9	Y	mg P/L	0.025	0.25
2/14/2011 12:22	Effluent	Nutrients	TSS	16		mg/L	4	16
2/14/2011 12:22	Effluent	Overflow	Oil and Grease	1.4	U	mg/L	1.4	5

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Results	Remark	Units	MDL	PQL
2/14/2011 12:22	Effluent	Pesticides	Chlorpyrifos Methyl	0.1	UJ	ug/L	0.1	0.4
2/14/2011 12:22	Effluent	Pesticides	Ethion	0.05	UJ	ug/L	0.05	0.2
2/14/2011 12:22	Effluent	Pesticides	Parathion Ethyl	0.15	U	ug/L	0.15	0.6
2/14/2011 12:22	Effluent	Pesticides	Butylate	0.2	U	ug/L	0.2	0.8
2/14/2011 12:22	Effluent	Pesticides	Fonofos	0.1	U	ug/L	0.1	0.4
2/14/2011 12:22	Effluent	Pesticides	Endosulfan I	0.02	U	ug/L	0.02	0.08
2/14/2011 12:22	Effluent	Pesticides	Endosulfan Sulfate	0.02	U	ug/L	0.02	0.08
2/14/2011 12:22	Effluent	Pesticides	Gamma-BHC	0.01	U	ug/L	0.01	0.04
2/14/2011 12:22	Effluent	Pesticides	Toxaphene	0.75	U	ug/L	0.75	3
2/14/2011 12:22	Effluent	Pesticides	Atrazine	0.05	U	ug/L	0.05	0.2
2/14/2011 12:22	Effluent	Pesticides	Metolachlor	0.5	U	ug/L	0.5	2
2/14/2011 12:22	Effluent	Pesticides	Mevinphos	0.2	U	ug/L	0.2	0.8
2/14/2011 12:22	Effluent	Pesticides	DDT-p,p'	0.03	U	ug/L	0.03	0.12
2/14/2011 12:22	Effluent	Pesticides	Endrin Aldehyde	0.02	U	ug/L	0.02	0.08
2/14/2011 12:22	Effluent	Pesticides	Dieldrin	0.02	U	ug/L	0.02	0.08
2/14/2011 12:22	Effluent	Pesticides	Endrin	0.05	U	ug/L	0.05	0.2
2/14/2011 12:22	Effluent	Pesticides	Alachlor	0.6	U	ug/L	0.6	2.4
2/14/2011 12:22	Effluent	Pesticides	Ametryn	0.05	U	ug/L	0.05	0.2
2/14/2011 12:22	Effluent	Pesticides	Bromacil	0.2	U	ug/L	0.2	0.8
2/14/2011 12:22	Effluent	Pesticides	Fenamiphos	0.2	U	ug/L	0.2	0.8
2/14/2011 12:22	Effluent	Pesticides	Hexazinone	0.1	U	ug/L	0.1	0.4
2/14/2011 12:22	Effluent	Pesticides	Metalaxyl	0.25	U	ug/L	0.25	1
2/14/2011 12:22	Effluent	Pesticides	Naled	0.8	U	ug/L	0.8	3.2
2/14/2011 12:22	Effluent	Pesticides	Aldrin	0.01	U	ug/L	0.01	0.04
2/14/2011 12:22	Effluent	Pesticides	Beta-BHC	0.01	U	ug/L	0.01	0.04
2/14/2011 12:22	Effluent	Pesticides	Chlordane	0.2	U	ug/L	0.2	0.8
2/14/2011 12:22	Effluent	Pesticides	DDE-p,p'	0.02	U	ug/L	0.02	0.08
2/14/2011 12:22	Effluent	Pesticides	Azinphos Methyl	0.2	U	ug/L	0.2	0.8
2/14/2011 12:22	Effluent	Pesticides	Diazinon	0.05	UJ	ug/L	0.05	0.2
2/14/2011 12:22	Effluent	Pesticides	Ethoprop	0.1	U	ug/L	0.1	0.4
2/14/2011 12:22	Effluent	Pesticides	Metribuzin	0.1	U	ug/L	0.1	0.4
2/14/2011 12:22	Effluent	Pesticides	Norflurazon	0.15	U	ug/L	0.15	0.6
2/14/2011 12:22	Effluent	Pesticides	Prometryn	0.15	U	ug/L	0.15	0.6
2/14/2011 12:22	Effluent	Pesticides	Alpha-BHC	0.01	U	ug/L	0.01	0.04

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Results	Remark	Units	MDL	PQL
2/14/2011 12:22	Effluent	Pesticides	DDD-p,p'	0.02	U	ug/L	0.02	0.08
2/14/2011 12:22	Effluent	Pesticides	Heptachlor	0.01	U	ug/L	0.01	0.04
2/14/2011 12:22	Effluent	Pesticides	Chlorpyrifos Ethyl	0.05	UJ	ug/L	0.05	0.2
2/14/2011 12:22	Effluent	Pesticides	Parathion Methyl	0.1	U	ug/L	0.1	0.4
2/14/2011 12:22	Effluent	Pesticides	Simazine	0.05	U	ug/L	0.05	0.2
2/14/2011 12:22	Effluent	Pesticides	Delta-BHC	0.01	U	ug/L	0.01	0.04
2/14/2011 12:22	Effluent	Pesticides	Endosulfan II	0.02	U	ug/L	0.02	0.08
2/14/2011 12:22	Effluent	Pesticides	Heptachlor Epoxide	0.02	U	ug/L	0.02	0.08
2/14/2011 12:22	Effluent	Pesticides	Methoxychlor	0.05	U	ug/L	0.05	0.2
2/14/2011 12:22	Effluent	Pesticides	Malathion	0.15	U	ug/L	0.15	0.6
2/14/2011 12:22	Effluent	Pesticides	Phorate	0.05	U	ug/L	0.05	0.2
2/14/2011 12:22	Effluent	Priority Organic Pollutants	2,4-Dinitrotoluene	1	U	ug/L	1	4.2
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Benzo(a)anthracene	0.21	U	ug/L	0.21	0.83
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Dimethyl phthalate	10	U	ug/L	10	42
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	16	U	ug/L	16	63
2/14/2011 12:22	Effluent	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2.1	U	ug/L	2.1	8.3
2/14/2011 12:22	Effluent	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1	U	ug/L	1	4.2
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Pentachlorophenol	3.1	U	ug/L	3.1	13
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Fluorene	0.21	U	ug/L	0.21	0.83
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1	U	ug/L	1	4.2
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.1	U	ug/L	3.1	13
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Phenol	1	U	ug/L	1	4.2
2/14/2011 12:22	Effluent	Priority Organic Pollutants	2,4-Dimethylphenol	10	U	ug/L	10	42
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Hexachlorobutadiene	3.1	U	ug/L	3.1	13
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Naphthalene	0.21	U	ug/L	0.21	0.83
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Nitrobenzene	2.1	U	ug/L	2.1	8.3
2/14/2011 12:22	Effluent	Priority Organic Pollutants	2,4,6-Trichlorophenol	1	U	ug/L	1	4.2
2/14/2011 12:22	Effluent	Priority Organic Pollutants	2,4-Dichlorophenol	1	U	ug/L	1	4.2
2/14/2011 12:22	Effluent	Priority Organic Pollutants	2,6-Dinitrotoluene	1	U	ug/L	1	4.2
2/14/2011 12:22	Effluent	Priority Organic Pollutants	2-Chlorophenol	1	U	ug/L	1	4.2
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Benzo(k)fluoranthene	0.21	U	ug/L	0.21	0.83
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Chrysene	0.21	U	ug/L	0.21	0.83
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Di-n-octyl phthalate	1	U	ug/L	1	4.2
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Diethyl phthalate	1	U	ug/L	1	4.2

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Results	Remark	Units	MDL	PQL
2/14/2011 12:22	Effluent	Priority Organic Pollutants	N-Nitrosodimethylamine	2.1	U	ug/L	2.1	8.3
2/14/2011 12:22	Effluent	Priority Organic Pollutants	2-Nitrophenol	1	U	ug/L	1	4.2
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Butyl benzyl phthalate	5.2	U	ug/L	5.2	21
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Hexachloroethane	3.1	U	ug/L	3.1	13
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.21	U	ug/L	0.21	0.83
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Isophorone	1	U	ug/L	1	4.2
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Phenanthrene	0.21	U	ug/L	0.21	0.83
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Anthracene	0.21	U	ug/L	0.21	0.83
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.21	U	ug/L	0.21	0.83
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Fluoranthene	0.21	U	ug/L	0.21	0.83
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Hexachlorobenzene	1	U	ug/L	1	4.2
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.1	U	ug/L	3.1	13
2/14/2011 12:22	Effluent	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.1	U	ug/L	3.1	13
2/14/2011 12:22	Effluent	Priority Organic Pollutants	2,4-Dinitrophenol	16	UJ	ug/L	16	63
2/14/2011 12:22	Effluent	Priority Organic Pollutants	2-Chloronaphthalene	1	U	ug/L	1	4.2
2/14/2011 12:22	Effluent	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.1	U	ug/L	3.1	13
2/14/2011 12:22	Effluent	Priority Organic Pollutants	3,3'-Dichlorobenzidine	42	UJ	ug/L	42	170
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Acenaphthene	0.21	U	ug/L	0.21	0.83
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Acenaphthylene	0.21	U	ug/L	0.21	0.83
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Benzo(a)pyrene	0.21	U	ug/L	0.21	0.83
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Benzo(b)fluoranthene	0.21	U	ug/L	0.21	0.83
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1	U	ug/L	1	4.2
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.21	U	ug/L	0.21	0.83
2/14/2011 12:22	Effluent	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2.1	U	ug/L	2.1	8.3
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Pyrene	0.21	U	ug/L	0.21	0.83
2/14/2011 12:22	Effluent	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1	U	ug/L	1	4.2
2/14/2011 12:22	Effluent	Priority Organic Pollutants	4-Chloro-3-methylphenol	1	U	ug/L	1	4.2
2/14/2011 12:22	Effluent	Priority Organic Pollutants	4-Nitrophenol	16	U	ug/L	16	63
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Benzidine	100	UJ	ug/L	100	420
2/14/2011 12:22	Effluent	Priority Organic Pollutants	Di-n-butyl phthalate	5.2	U	ug/L	5.2	21
2/14/2011 12:22	Effluent	Field Parameter	Temperature	20.2		C		
2/14/2011 12:22	Effluent	Field Parameter	Sample Depth	0.28		m		
2/14/2011 12:22	Effluent	Field Parameter	Dissolved Oxygen	4.82		mg/L		
2/14/2011 12:22	Effluent	Field Parameter	Specific Conductance	2664		umhos/cm		

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Results	Remark	Units	MDL	PQL
2/14/2011 12:22	Effluent	Field Parameter	pH	7.06				
2/14/2011 12:48	Blank	Metals	Iron	30	U	ug/L	30	120
2/14/2011 12:48	Blank	Metals	Cadmium	0.05	U	ug/L	0.05	0.2
2/14/2011 12:48	Blank	Metals	Calcium	0.075	U	mg/L	0.075	0.3
2/14/2011 12:48	Blank	Metals	Nickel	0.25	U	ug/L	0.25	1
2/14/2011 12:48	Blank	Metals	Sodium	0.5	U	mg/L	0.5	2
2/14/2011 12:48	Blank	Metals	Lead	0.2	U	ug/L	0.2	0.8
2/14/2011 12:48	Blank	Metals	Copper	0.5	U	ug/L	0.5	1
2/14/2011 12:48	Blank	Metals	Aluminum	5	U	ug/L	5	20
2/14/2011 12:48	Blank	Metals	Zinc	5	U	ug/L	5	20
2/14/2011 12:48	Blank	Metals	Chromium	0.3	U	ug/L	0.3	1.2
2/14/2011 12:48	Blank	Metals	Selenium	0.2	U	ug/L	0.2	0.8
2/14/2011 12:48	Blank	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
2/14/2011 12:48	Blank	Metals	Arsenic	0.25	U	ug/L	0.25	1
2/14/2011 12:48	Blank	Metals	Silver	0.025	U	ug/L	0.025	0.1
2/14/2011 12:48	Blank	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
2/14/2011 12:48	Blank	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
2/14/2011 12:48	Blank	Nutrients	Color (true)	2	U	PCU	2	6
2/14/2011 12:48	Blank	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
2/14/2011 12:48	Blank	Nutrients	Alkalinity	0.65	U	mg CaCO3/L	0.65	2.5
2/14/2011 12:48	Blank	Nutrients	Total-P	0.004	U	mg P/L	0.004	0.01
2/14/2011 12:48	Blank	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
2/14/2011 12:48	Blank	Overflow	Oil and Grease	1.4	U	mg/L	1.4	5
2/14/2011 12:48	Blank	Pesticides	Simazine	0.047	U	ug/L	0.047	0.19
2/14/2011 12:48	Blank	Pesticides	Aldrin	0.0094	U	ug/L	0.0094	0.038
2/14/2011 12:48	Blank	Pesticides	DDD-p,p'	0.019	U	ug/L	0.019	0.076
2/14/2011 12:48	Blank	Pesticides	DDE-p,p'	0.019	U	ug/L	0.019	0.076
2/14/2011 12:48	Blank	Pesticides	Heptachlor Epoxide	0.019	U	ug/L	0.019	0.076
2/14/2011 12:48	Blank	Pesticides	Ametryn	0.047	U	ug/L	0.047	0.19
2/14/2011 12:48	Blank	Pesticides	Azinphos Methyl	0.19	U	ug/L	0.19	0.76
2/14/2011 12:48	Blank	Pesticides	Chlorpyrifos Methyl	0.094	U	ug/L	0.094	0.38
2/14/2011 12:48	Blank	Pesticides	Mevinphos	0.19	U	ug/L	0.19	0.76
2/14/2011 12:48	Blank	Pesticides	Prometryn	0.14	U	ug/L	0.14	0.56
2/14/2011 12:48	Blank	Pesticides	Chlordane	0.19	U	ug/L	0.19	0.76

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Results	Remark	Units	MDL	PQL
2/14/2011 12:48	Blank	Pesticides	Toxaphene	0.71	U	ug/L	0.71	2.8
2/14/2011 12:48	Blank	Pesticides	Alachlor	0.57	U	ug/L	0.57	2.3
2/14/2011 12:48	Blank	Pesticides	Bromacil	0.19	U	ug/L	0.19	0.76
2/14/2011 12:48	Blank	Pesticides	Malathion	0.14	U	ug/L	0.14	0.56
2/14/2011 12:48	Blank	Pesticides	Norflurazon	0.14	U	ug/L	0.14	0.56
2/14/2011 12:48	Blank	Pesticides	Parathion Ethyl	0.14	U	ug/L	0.14	0.56
2/14/2011 12:48	Blank	Pesticides	Endosulfan Sulfate	0.019	U	ug/L	0.019	0.076
2/14/2011 12:48	Blank	Pesticides	Endrin Aldehyde	0.019	U	ug/L	0.019	0.076
2/14/2011 12:48	Blank	Pesticides	Gamma-BHC	0.0094	U	ug/L	0.0094	0.038
2/14/2011 12:48	Blank	Pesticides	Chlorpyrifos Ethyl	0.047	U	ug/L	0.047	0.19
2/14/2011 12:48	Blank	Pesticides	Naled	0.75	U	ug/L	0.75	3
2/14/2011 12:48	Blank	Pesticides	Alpha-BHC	0.0094	U	ug/L	0.0094	0.038
2/14/2011 12:48	Blank	Pesticides	Dieldrin	0.019	U	ug/L	0.019	0.076
2/14/2011 12:48	Blank	Pesticides	Endosulfan II	0.019	U	ug/L	0.019	0.076
2/14/2011 12:48	Blank	Pesticides	Ethion	0.047	U	ug/L	0.047	0.19
2/14/2011 12:48	Blank	Pesticides	Fenamiphos	0.19	U	ug/L	0.19	0.76
2/14/2011 12:48	Blank	Pesticides	Metolachlor	0.47	U	ug/L	0.47	1.9
2/14/2011 12:48	Blank	Pesticides	Delta-BHC	0.0094	U	ug/L	0.0094	0.038
2/14/2011 12:48	Blank	Pesticides	Endrin	0.047	U	ug/L	0.047	0.19
2/14/2011 12:48	Blank	Pesticides	Methoxychlor	0.047	U	ug/L	0.047	0.19
2/14/2011 12:48	Blank	Pesticides	Diazinon	0.047	UJ	ug/L	0.047	0.19
2/14/2011 12:48	Blank	Pesticides	Hexazinone	0.094	U	ug/L	0.094	0.38
2/14/2011 12:48	Blank	Pesticides	Parathion Methyl	0.094	U	ug/L	0.094	0.38
2/14/2011 12:48	Blank	Pesticides	Beta-BHC	0.0094	U	ug/L	0.0094	0.038
2/14/2011 12:48	Blank	Pesticides	DDT-p,p'	0.028	U	ug/L	0.028	0.11
2/14/2011 12:48	Blank	Pesticides	Atrazine	0.047	U	ug/L	0.047	0.19
2/14/2011 12:48	Blank	Pesticides	Ethoprop	0.094	U	ug/L	0.094	0.38
2/14/2011 12:48	Blank	Pesticides	Phorate	0.047	U	ug/L	0.047	0.19
2/14/2011 12:48	Blank	Pesticides	Endosulfan I	0.019	U	ug/L	0.019	0.076
2/14/2011 12:48	Blank	Pesticides	Heptachlor	0.0094	U	ug/L	0.0094	0.038
2/14/2011 12:48	Blank	Pesticides	Butylate	0.19	U	ug/L	0.19	0.76
2/14/2011 12:48	Blank	Pesticides	Fonofos	0.094	U	ug/L	0.094	0.38
2/14/2011 12:48	Blank	Pesticides	Metalaxyl	0.24	U	ug/L	0.24	0.96
2/14/2011 12:48	Blank	Pesticides	Metribuzin	0.094	U	ug/L	0.094	0.38

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Results	Remark	Units	MDL	PQL
2/14/2011 12:48	Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1	U	ug/L	1	4
2/14/2011 12:48	Blank	Priority Organic Pollutants	Pyrene	0.2	U	ug/L	0.2	0.8
2/14/2011 12:48	Blank	Priority Organic Pollutants	Hexachlorobenzene	1	U	ug/L	1	4
2/14/2011 12:48	Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3	U	ug/L	3	12
2/14/2011 12:48	Blank	Priority Organic Pollutants	Fluoranthene	0.2	U	ug/L	0.2	0.8
2/14/2011 12:48	Blank	Priority Organic Pollutants	Naphthalene	0.2	U	ug/L	0.2	0.8
2/14/2011 12:48	Blank	Priority Organic Pollutants	Hexachloroethane	3	U	ug/L	3	12
2/14/2011 12:48	Blank	Priority Organic Pollutants	Diethyl phthalate	1	U	ug/L	1	4
2/14/2011 12:48	Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.2	U	ug/L	0.2	0.8
2/14/2011 12:48	Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.2	U	ug/L	0.2	0.8
2/14/2011 12:48	Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2	U	ug/L	2	8
2/14/2011 12:48	Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1	U	ug/L	1	4
2/14/2011 12:48	Blank	Priority Organic Pollutants	2,4-Dimethylphenol	10	U	ug/L	10	40
2/14/2011 12:48	Blank	Priority Organic Pollutants	2,4-Dinitrophenol	15	UJ	ug/L	15	60
2/14/2011 12:48	Blank	Priority Organic Pollutants	Acenaphthylene	0.2	U	ug/L	0.2	0.8
2/14/2011 12:48	Blank	Priority Organic Pollutants	Anthracene	0.2	U	ug/L	0.2	0.8
2/14/2011 12:48	Blank	Priority Organic Pollutants	Benzo(a)pyrene	0.2	U	ug/L	0.2	0.8
2/14/2011 12:48	Blank	Priority Organic Pollutants	Chrysene	0.2	U	ug/L	0.2	0.8
2/14/2011 12:48	Blank	Priority Organic Pollutants	Di-n-octyl phthalate	1	U	ug/L	1	4
2/14/2011 12:48	Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2	U	ug/L	2	8
2/14/2011 12:48	Blank	Priority Organic Pollutants	2-Chlorophenol	1	U	ug/L	1	4
2/14/2011 12:48	Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1	U	ug/L	1	4
2/14/2011 12:48	Blank	Priority Organic Pollutants	Benzo(a)anthracene	0.2	U	ug/L	0.2	0.8
2/14/2011 12:48	Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.2	U	ug/L	0.2	0.8
2/14/2011 12:48	Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3	U	ug/L	3	12
2/14/2011 12:48	Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	3	U	ug/L	3	12
2/14/2011 12:48	Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	1	U	ug/L	1	4
2/14/2011 12:48	Blank	Priority Organic Pollutants	2-Nitrophenol	1	U	ug/L	1	4
2/14/2011 12:48	Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	1	U	ug/L	1	4
2/14/2011 12:48	Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.2	U	ug/L	0.2	0.8
2/14/2011 12:48	Blank	Priority Organic Pollutants	Fluorene	0.2	U	ug/L	0.2	0.8
2/14/2011 12:48	Blank	Priority Organic Pollutants	Nitrobenzene	2	U	ug/L	2	8
2/14/2011 12:48	Blank	Priority Organic Pollutants	Pentachlorophenol	3	U	ug/L	3	12
2/14/2011 12:48	Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	1	U	ug/L	1	4

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Results	Remark	Units	MDL	PQL
2/14/2011 12:48	Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	U	ug/L	15	60
2/14/2011 12:48	Blank	Priority Organic Pollutants	Isophorone	1	U	ug/L	1	4
2/14/2011 12:48	Blank	Priority Organic Pollutants	Acenaphthene	0.2	U	ug/L	0.2	0.8
2/14/2011 12:48	Blank	Priority Organic Pollutants	Butyl benzyl phthalate	5	U	ug/L	5	20
2/14/2011 12:48	Blank	Priority Organic Pollutants	Di-n-butyl phthalate	5	U	ug/L	5	20
2/14/2011 12:48	Blank	Priority Organic Pollutants	Hexachlorobutadiene	3	U	ug/L	3	12
2/14/2011 12:48	Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.2	U	ug/L	0.2	0.8
2/14/2011 12:48	Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	2	U	ug/L	2	8
2/14/2011 12:48	Blank	Priority Organic Pollutants	Phenanthrene	0.2	U	ug/L	0.2	0.8
2/14/2011 12:48	Blank	Priority Organic Pollutants	Phenol	1	U	ug/L	1	4
2/14/2011 12:48	Blank	Priority Organic Pollutants	2,4-Dichlorophenol	1	U	ug/L	1	4
2/14/2011 12:48	Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	1	U	ug/L	1	4
2/14/2011 12:48	Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3	U	ug/L	3	12
2/14/2011 12:48	Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	40	UJ	ug/L	40	160
2/14/2011 12:48	Blank	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	60
2/14/2011 12:48	Blank	Priority Organic Pollutants	Benzidine	100	UJ	ug/L	100	400
2/14/2011 12:48	Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1	U	ug/L	1	4
2/14/2011 12:48	Blank	Priority Organic Pollutants	Dimethyl phthalate	10	U	ug/L	10	40
2/14/2011 12:48	Blank	Priority Organic Pollutants	2-Chloronaphthalene	1	U	ug/L	1	4
2/16/2011 10:30	Effluent 2	Field Parameter	Temperature	21.19		C		
2/16/2011 10:30	Effluent 2	Field Parameter	Specific Conductance	2631		umhos/cm		
2/16/2011 10:30	Effluent 2	Field Parameter	Sample Depth	0.2		m		
2/16/2011 10:30	Effluent 2	Field Parameter	pH	6.85				
2/16/2011 10:30	Effluent 2	Field Parameter	Dissolved Oxygen	3.2		mg/L		
2/18/2011 11:05	Effluent 3	Field Parameter	pH	7.1				
2/18/2011 11:05	Effluent 3	Field Parameter	Dissolved Oxygen	3.3		mg/L		
2/18/2011 11:05	Effluent 3	Field Parameter	Specific Conductance	2633		umhos/cm		
2/18/2011 11:05	Effluent 3	Field Parameter	Sample Depth	0.2		m		
2/18/2011 11:05	Effluent 3	Field Parameter	Temperature	23		C		

Appendix F. Facility Summary, Effluent Limits, and Permit Violations Recorded on Discharge Monitoring Report

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Brian Kirts	Contact Number:904-256-1700 Ext 21627
Facility Name (as it appears on permit):Buckeye	Former Names: NA
NPDES Permit Number:FL0000876	Permit Expiration Date:7/27/1995
Physical Address: One Buckeye Drive Perry Florida32348	
District: NED	County: Taylor
Function of Facility: Pulp and paper mill	
Facility Type: Industrial wastewater	Permitted Capacity (MGD): 58 MGD
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): 41MGD	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months): NA	
Description of type of Discharge: ☒ Continuous ☐ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☐ Other, please specify	

Page 1 of 5 v3.0 07/07/08

Appendix F. (continued)

Description of Sampling Location(s) - actual permit designation of permitted sampling point(s): **Nearest accessable point after treatment but prior to actual discharge or mixing with the receiving waters.**
Description of Permitted Outfall(s): **Fenholloway River at milepoint 24.6 upstream of the River mouth, Class III freshwaters**
Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility): **Operation of a 58 million gallon per day (design) industrial wastewater treatment system serving a dissolved kraft pulp mill that includes a lift station, bar racks, a 320 foot diameter primary clarifier with skimming pond, sludge pumps, 225 acres of sludge storage lagoons with conveyance structures, and a 30 acre aerated lagoon followed by a 120 acre aerated lagoon.**

PART I: Continued										
List <u>current</u> Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under (Leave cell blank if not applicable)										
			Effluent Limitations				Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Daily Average	Weekly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Flow	MGD						continuous	recorder		
BOD	Lbs/day	19800		13200			2/week	24 hr composite		
TSS	Lbs/day	50000		2500			2/week	24 hour composite		
pH	S.U.	6/8.5					2/week	grab		
Oil and Grease	mg/L	10					1/month	grab		
Specific Conductance	umhos/cm	4000					1/month	grab		
Temperature	Degrees F						1/month	grab		
Phenolic Compounds	mg/L	.2					2/week	grab		
Acute Toxicity	NA	100					1/month	grab		
Dissolved Oxygen	mg/L	State road 356 bridge					Daily (5 per week)	grab		

The DO criteria for the Fenholloway River at the state road 356 bridge shall be .3mg/L or greater 50 percent of the time on an annual basis when the flow at the bridge is 250cfs or greater. The DO is required to be 0.1 mg/L 99% of the time on an annual basis regardless of flow.

The temperature of the RBW shall not be increased

Appendix F. (continued)

PART I: Continued	
Receiving Waters: **Fenholloway River**	**Classification (indicate whether fresh or marine):** **Class 3 fresh water**
Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.): **Semiannual Toxicity Testing using the daphnid and flathead minnows**	
Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.): **Not any**	
Facility Mixing Zone Details (if applicable): **22.1 mile mixing zone the entire length of the Fenholloway River before effluent reached the Gulf**	
List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year:	

Date	Parameter and Units	Limit	Result
Not any			

Describe previous FYI and WQBEL study: Sampled 8/7/2009 **The inspection was found to be in compliance**
Describe previous or current Enforcement Actions (including WLs): **NA**
Describe any violations or problems noted in previous inspection: **NA**
Discuss whether DMR trends within previous five years are improving or declining: **Data over the past few years has remained consistnt**
Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):

Appendix F. (continued)

PART II: Sampling Event Information	
Date(s) sample collected:	**Sampler(s):**
Temperature (Deg C):	**pH (SU):**
Dissolved Oxygen (mg/L):	**Conductivity (umhos/cm):**
Total Residual Chlorine (mg/L):	**Total Residual Chlorine - after Disinfection (mg/L):**
Method of Chlorination:	**Method of De-chlorination:**
Flow During Sample Collection for each outfall(MGD):	
Mean Flow for each outfall for previous 12 months based on sampling date (If samples are taken on more than one day, indicate Mean Flow for each day):	
Describe Discharge during Sampling Event: ☐ **Continuous** ☐ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☐ **Other, please specify**	
Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here:	

Appendix G. EPA End Sheet

The Bioassay of Buckeye Florida Plant effluent sampled on February 14, 16, and 18, 2011. NPDES# FL0000876.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 0 0 0 8 7 6 11	12 1 1 0 2 1 4	18 B	19 S	20 2

Remarks

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The Priority Pollutants Analysis of Buckeye Florida Plant effluent sampled on February 14, 2011. NPDES# FL0000876.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 0 0 0 8 7 6 11	12 1 1 0 2 1 4	18 X	19 S	20 2

Remarks

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Biological Analyses of Buckeye Florida Plant effluent sampled on February 14, 2011. NPDES# FL0000876.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 0 0 0 8 7 6 11	12 1 1 0 2 1 4	18 S	19 S	20 2

Remarks

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