

Effluent Quality Assessment

Packaging Corporation of America

Hamilton County

NPDES #FL0000281

Sampled August 22, 24, and 26, 2011

February 2012

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
NELAC Certification No. E31780

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Packaging Corporation of America, 5495 Lake Park-Clyattville Road, Clyattville, Lowndes County, Georgia, 31601. NPDES #FL0000281 discharge is located in Hamilton County, Florida. Effluent grab samples for biological and chemical analyses for this facility and in-stream grab samples for chemical analysis were collected on August 24, 2011, and effluent composite samples for toxicological analysis were collected on August 22, 24, and 26, 2011.

Introduction

The Packaging Corporation of America facility at Clyattville manufactures unbleached kraft liner board. The facility operates a 14 million gallon per day (MGD) design flow industrial wastewater treatment system. The wastewater treatment system provides treatment for process and non-process wastewater and storm water prior to discharge into the Class III freshwaters of the Withlacoochee River. (See Appendix F for an excerpt from the permit.)

Methods

Samples were collected from the EFF-01 NPDES sampling point for Outfall D-001 by Eesa Ali, Sharon Piltz and Jake Mast (FDEP Northeast District) following DEP-SOP-001/01 FS 2400 Wastewater Sampling. Samples for metals and nutrients were collected from sites in the Withlacoochee River approximately 330 meters above and approximately 360 meters below Outfall D-001 following DEP-SOP-001/01 FS 2100 Surface Water 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 form.

The 7-day 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.

The bioassay samples (1-3) were aerated in the bioassay laboratory for 30 minutes at a rate of approximately 100 bubbles per minute to decrease the dissolved oxygen (DO) from 10.2, 11.5, and 9.5 mg/L to 7.1, 7.4, and 7.2 mg/L, respectively.

Results and Discussion

- **Toxicity Test Results**

  Tests were performed August 23 - 30, 2011.

Ceriodaphnia dubia 7-day chronic definitive bioassay –	NOEC: 100%* IC25: >100%
Pimephales promelas 7-day chronic definitive bioassay –	NOEC: 100% IC25: >100%

  The bioassay samples were not chronically toxic to the test organisms.

  *The *Ceriodaphnia dubia* test showed an interrupted dose response for reproduction in the 6.25% and 12.5% concentration. A cause for this response was not determined and is thought to be a Type I error (assuming that the treatment is significantly different from the control when it is not (the treatment is considered anomalous)).

  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 25.5 A mg dry wt/L of the unicellular green alga, *Pseudokirchneriella subcapitata*, formerly known as *Selenastrum capricornutum*. Raschke and Schultz (1987) determined that AGP values above 5.0 mg dry weight/L represent a “problem” threshold for fresh receiving waters, implying nutrient enrichment. The analytical chemistry suggests that the effluent is nitrogen-limited. To determine actual nutrient limitation, a limiting-nutrient algal growth potential test with associated nutrient chemistry should be performed (Miller et al. 1978).

  See Table 1 for AGP results and qualifiers.

- **Chemistry Results**
  The total residual chlorine (TRC) concentration (0.07 mg/L) detected in bioassay sample # 1, (LIMS sample #1372309) in the bioassay laboratory was most likely due to interference in the sample since the effluent is not chlorinated. TRC was not detected in the other two bioassay samples. The total ammonia concentration in the composite sample collected and preserved for chemical analysis was 0.33 mg N/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was 0.03 mg/L. The unionized ammonia concentration, although exceeding the Class III freshwater criterion (≤ 0.02 mg/L), is less than the permitted limit of ≤ 0.134 mg/L.

  Arsenic, chromium – III, copper, iron, lead, and nickel were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL). The effluent conductivity, (2,622 µmhos-cm) exceeded the Class III freshwater criterion (the greater of ≤1,275 µmhos/cm or 50% above background (62-302.530 (22), F.A.C.)) but did not exceed the permitted limit of 3,300 µmhos-cm. The effluent Chlorophyll *a* concentration (110 µg/L) is considered high and suggests potential nutrient enrichment.

  In-stream samples for metals and nutrients were also collected in the Withlacoochee River approximately 330 meters above and approximately 360 m below the PCA outfall. Iron was detected above and below the outfall at a level higher than that detected in the effluent, indicating input from another source. Arsenic, chromium – III, nickel and selenium were detected above and below the effluent at levels between the MDL and PQL. Copper was detected above the outfall between the MDL and PQL, at a level similar to that of the effluent. Copper below the outfall was approximately 4 times higher than the effluent, indicating input from another source. Likewise, cadmium and zinc, which were not detected above the outfall or in the effluent, were detected below the outfall. Lead, which was detected at a very low level in the outfall and not detected above the outfall, was detected below the outfall. All metals detected above and below the outfall complied with Class III freshwater criteria.

  With the exception of nitrate-nitrite, in-stream nutrient levels were lower than levels measured in the effluent. Nitrate-nitrite above and below the outfall was similar and approximately 40 times that of the effluent, suggesting input from another source. Dissolved oxygen levels at both the above and below outfall sites in the Withlacoochee (4.7 and 4.3 mg/L, respectively) exceeded the Class III freshwater criterion (62-302.530(30) F.A.C.).

  See Table 2 for results of analytes detected in the effluent, corresponding limits, and qualifiers. 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-01 NPDES sampling point for this facility on August 22, 24, and 26, 2011, were not chronically toxic to either test species during the 7-day chronic definitive bioassays. The effluent AGP result was greater than the "problem” threshold for fresh receiving waters suggesting that nutrient enrichment may be an issue. Effluent water quality samples collected on August 24, 2011, did not exceed applicable Class III freshwater quality criterion and/or permitted limits. In-stream metals and nutrients results above and below the outfall did not exceed applicable Class III freshwater

quality criteria but did indicate inputs from sources other than the PCA effluent. Dissolved oxygen at both in-stream sites exceeded the Class III freshwater criterion (62-302.530(30) F.A.C.).

Literature Cited

Miller, W. E., T. E. Maloney, and J. C. Greene. 1978. The *Selenastrum capricornutum* Printz algal assay bottle test. EPA-600/9-78-018. U. S. EPA, Cincinnati, Ohio. 126 p.

Raschke, R. L. and D. A. Schultz. 1987. The use of the algal growth potential test for data assessment. J. Wat. Poll. Cont. Fed. 59(4): 222-227.

Table 1. Measured and predicted algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN) and total nitrogen (TN) limitation of the freshwater species *Pseudokirchneriella subcapitata* and ratios of nitrogen to phosphorus for samples collected from the Packaging Corporation of America outfall on August 24, 2011.

Packaging Corporation of America
NPDES# FL0000281

Location	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (TN) ± 20%	Inorganic N:P ratio	Total N:P ratio
Outfall	25.5 A	12.9 ± 2.6	110.5 ± 22.1	0.7	4.0

Table 2. Effluent limits, Class III Freshwater Criteria, chemical data, and qualifiers for samples collected from the EFF-1 NPDES sampling point for Outfall D-001 of the Packaging Corporation of America facility and also collected from above and below Outfall D-001 on August 24, 2011.

Packaging Corporation of America NPDES# FL0000281	Class III Criteria	Effluent Limits	Outfall		Above Outfall		Below Outfall	
Metals (µg/L unless otherwise noted)								
Aluminum	-	-	387		91		118	
Arsenic	≤ 50	-	0.69	I	0.8	I	0.89	I
Cadmium	≤ 0.4 b	-	0.05	U	0.05	U	0.27	
Calcium (mg/L)	-	-	35		35.6		35.6	
Chromium-III	≤ 125.2 b	-	1.1	I	0.77	I	0.79	I
Copper	≤ 13.8 b	-	0.52	I	0.63	I	2.05	
Iron	≤ 1,000	-	86	I	300		300	
Lead	≤ 5.7 b	≤ 9.6	0.22	I	0.2	U	3.45	
Magnesium (mg/L)	-	-	17.1		5.23		5.99	
Nickel	≤ 76.7 b	-	0.58	I	0.32	I	0.65	I
Selenium	≤ 5.0	-	0.2	U	0.23	I	0.24	I
Silver	≤ 0.07	-	0.025	U	0.025	U	0.025	U
Zinc	≤ 176.4 b	≤ 250	5	U	5	U	14	I
Nutrients (mg/L)								
Ortho-phosphate	-	-	0.48		-		-	
Total Phosphorus	-	Report	0.73		0.14		0.19	
Total Ammonia	-	Report	0.33		0.018	I	0.045	
Un-ionized Ammonia	≤ 0.02 s	≤ 0.134	0.03	c	0.00	c	0.00	c
Nitrate and Nitrite	-	-	0.009	I	0.38		0.36	
Total Kjeldahl Nitrogen	-	Report	2.9		0.36		0.58	
Organic Nitrogen	-	-	2.57	c	0.342	c	0.535	c
Total Nitrogen	-	Report	2.909	c	0.74	c	0.94	c
General Physical and Chemical Parameters								
Dissolved Oxygen (mg/L)	≥ 5.0	≥ 1.5	7.5		4.7		4.3	
pH (SU)	6.0 - 8.5	6.0 - 9.0	8.0		7.4		7.5	
Conductivity (µmhos/cm)	≤ 1,275	3,300	2,622		236		526	
Temperature (°C)	-	Report	28.3		26.7		27.0	
Salinity	-	-	≤ 1.26	c	0.11		0.25	
Total Residual Chlorine (mg/L)	≤ 0.01	-	0.07	£Q	-		-	
Chlorophyll *a* (µg/L) - Corrected	-	-	110		-		-	
Phaeophytin (µg/L)	-	-	13		-		-	
Turbidity (NTU)	< 29 t	≤ 80	-		2.3		3.3	
Color (pt-Co)	-	*	-		44		66	
CBOD, 5 day (mg/L), N - inhibited	-	*	9.8	AQ	-		-	
Oils and Greases (mg/L)	≤ 5.0	≤ 5.9	0.7	U	-		-	
Chloride (mg/L)	-	-	-		7.7		8.6	
Fluoride (mg/L)	≤ 10.0	-	-		0.15		0.16	
Sulfate (mg/L)	-	-	-		13		66	
Flow (MGD)	-	Report	55.0	a	9.42	a†	-	
Hardness (mg $CaCO_3$)	-	Report	157.81	c	-		-	

Value exceeds the Class III Water Quality Criteria or permit limits

a - Annual average
b - Value is calculated based on hardness
c - Value is calculated
s - Single sample
t - Shall not exceed 29 NTUs above background
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
Q - Sample held beyond normal holding time
U - Material analyzed for but not detected; value reported is the method detection limit
£ - measurement taken in the FDEP laboratory
* - See permit page 6
† - Measured from 8/31/2010 - 7/31/2011

Appendix A. Chain of Custody Form

NED FD0933 **Florida Department of Environmental Protection *North East District* Field sheet**

Sample Project PCA 3YT LabRequest number 20110822 45

Collected By: SP / EA Date Collected: Aug 22, 2003

Lab ID #	Storet#	Site Name PCA Effluent						Matrix:Water Surface Fresh Surface Salt Effluent		Comments Air Temp ____ Wind Sp ____ Wind Dir ____ 3.4°C Ran sampler 0806/21/11 ~0941/ 8/22/11		
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
1000	1.67		27.64	2677	1.38	8.03	7.62	97.4		0.2	—	—

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

Relinquished	Date	Time	Shipping	Received	Date/Time
	8/22/11	1214	~~FEDEX~~ Self	CxC	8/22/11 1214

*All acid preserved samples are with 2ml of (1to1 acid) H_2SO_4 Lot #_____ HNO_3 Lot #_____

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)

Temp 1.0c

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2011-08-22-45
~~IFP~~ PCA

Requester: Bipin Adhyaru
Field Report Prepared By: E. AR.

Customer: NE-DIST
Project ID: FYI3
PMAS:

Collected By: Status JM/EA/SP
Send Final Report To: Eesa Ali

Sampling Agency: OEP

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	EFF-1 PCA	☑ Comp ☐ Grab; Date 8.23.11 Time 900 Eastern Central	Date 8.24.11 Time 740 Eastern Central	A
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☐ m ☐ ft; ☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm); NPDES Number FL0000251
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments: Tox, BOD, Physical parameters	

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	EFF-1 PCA	☐ Comp ☑ Grab; Date 8.24 Time 1101 Eastern Central	Date Time Eastern Central	A
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L) 7.54	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C) 28.25	pH 7.96	Sample Depth ☑ m 1.1 ☐ ft; 1.55 ☐ Salinity (PPTh) 2422 ☑ Sp Conductance (umho/cm); NPDES Number FL0000281
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments	

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	with brood chase 360 m below outfall	☐ Comp ☑ Grab; Date 8.24.11 Time 1253 Eastern Central	Date Time Eastern Central	C
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L) 4.31	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C) 26.96	pH 7.49	Sample Depth ☑ m 1.1 ☐ ft; 0.25 ☐ Salinity (PPTh) 526 ☐ Sp Conductance (umho/cm); NPDES Number
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments	

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	with brood chase 100' above outfall	☐ Comp ☑ Grab; Date 8.24.11 Time 1250 Eastern Central	Date Time Eastern Central	C
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L) 4.7	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C) 28.71	pH 7.40	Sample Depth ☐ m 1.1 ☐ ft; 0.11 ☐ Salinity (PPTh) 236 ☐ Sp Conductance (umho/cm); NPDES Number
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments: 2 bossy Red tide top 1000 8.25.11	

Relinquished By	Date/Time	Shipping Method:	Received By	Date/Time	Relinquished By:	Date/Time	Received By	Date/Time
	8.24.11	FedEx	ATB	8/25/11 09:35				

* Shaded Areas for Lab use only

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

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Blanks collected and prepared @ 1100 hrs 8.24.11, site B

Appendix A. (continued)

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

Sample Project: PCA 341 LabRequest number: 20H 0822245

Collected By: EA/JM Date Collected: 8/26/11

Lab ID #	Store#	Site Name	Matrix: Water / Surface Fresh / Surface Salt / ~~Effluent~~	Comments
		PCA EFF-1 collected @ 3.2°C		Air Temp ____ Wind Sp ____ Wind Dir ____ 8.25 - 8.26 YOMP - 7MIRR

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
1005		1.4	27.52	2684	1.38	7.55	7.37	94.3	0.2	0.2	—	—

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

Lab ID #	Store#	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 Horizontal Sampler(HS), Grab(G), Pole(P)		Preservation	Bottle/Suite #A/B/C,etc.	Initials
G / C / Na	Nutrients: NH_3, NO_2+ NO_3, TKN, TOC, TP	☐HS ☐G ☐P	Ice& H_2SO_4 less than 2 pH*		
G / C / Na	Ortho Phosphorous	☐HS ☐G ☐P	Ice & .45µm filtered		
G / C / Na	BOD/CBOD	☐HS ☐G ☐P	Ice		
G / C / Na	Chlorophyll,Phaeophytin ½ secchi ½ tot depth	☐HS ☐G ☐P	Ice		
G / C / Na	Physical Aggregate:TSS,TDS,Turb.,Color,Alk,Cl,F,SO_4	☐HS ☐G ☐P	Ice		
G / C / Na	Metals: ICP,ICPMS	☐HS ☐G ☐P	HNO_3 less than 2 pH*		
G / C / Na	Other:	☐HS ☐G ☐P	Ice/		
G / C / Na	Microbiology: Fecal Coliform	☐HS ☐G ☐P	Ice		

Lab ID #	Store#	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

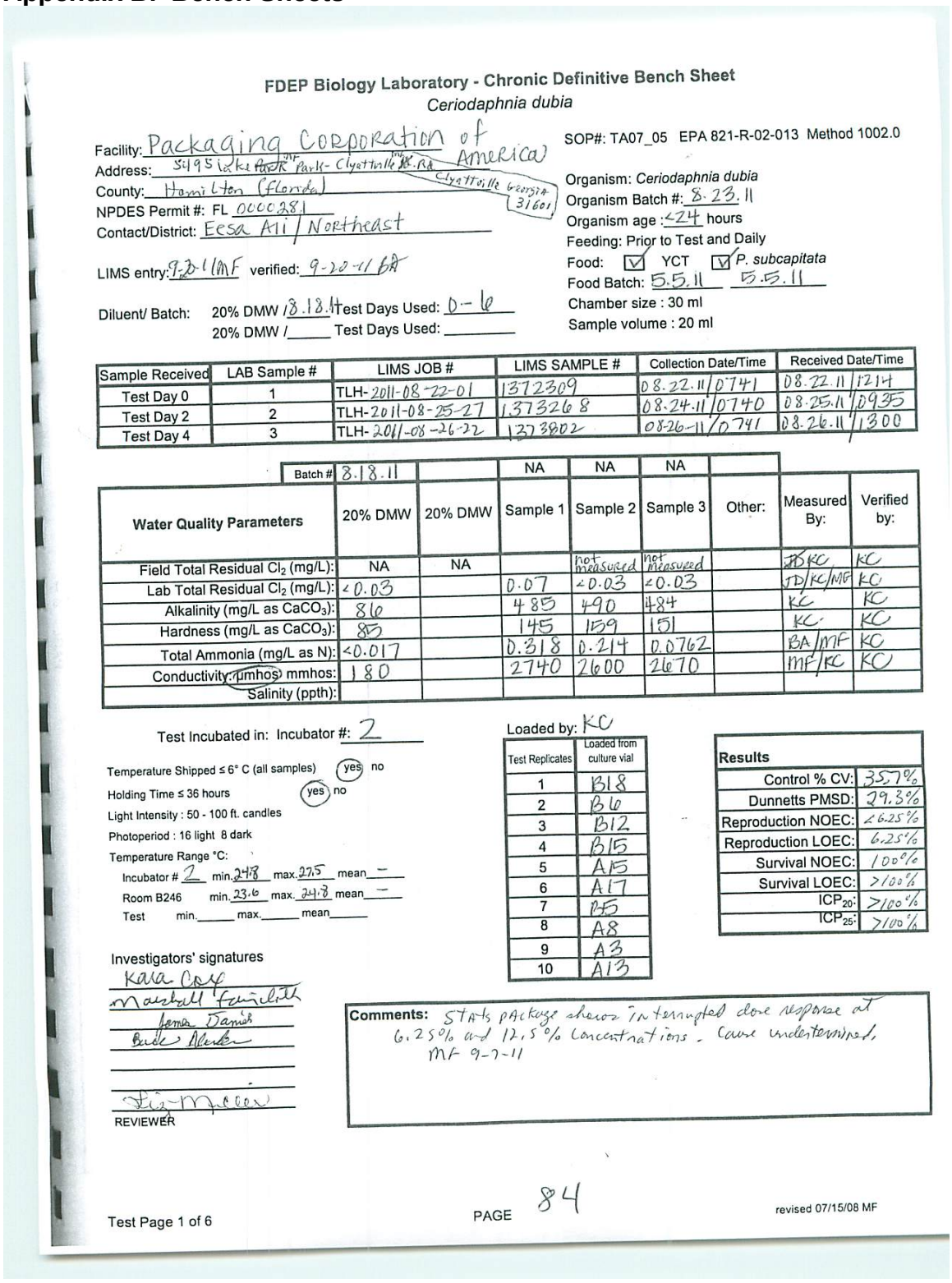
Grab/Composite Not applicable	Parameter/Method Horizontal Sampler(HS), Grab(G), Pole(P)		Preservation	Bottle/Suite #A/B/C,etc.	Initials
G / C / Na	Nutrients: NH_3, NO_2+ NO_3, TKN, TOC, TP	☐HS ☐G ☐P	Ice& H_2SO_4 less than 2 pH*		
G / C / Na	Ortho Phosphorous	☐HS ☐G ☐P	Ice & .45µm filtered		
G / C / Na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

Relinquished	Date	Time	Shipping	Received	Date/Time
[signature]	8 26 11	1237 ~~1800~~	FEDEX	ASheirk	08/26/11 12:37

*All acid preserved samples are with 2ml of (1to1 acid) H_2SO_4 Lot #_____ HNO_3 Lot #_____

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

Appendix B. Bench Sheets



FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia

Facility: Packaging Corporation of America
Address: 5495 Lake Park- Clyattville Rd. Clyattville Georgia 31601
County: Hamilton (Florida)
NPDES Permit #: FL 0000281
Contact/District: Eesa Ali / Northeast

LIMS entry: 9-20-11 MF verified: 9-20-11 BA

Diluent/ Batch: 20% DMW / 8.18.11 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 #: 8.23.11
Organism age : <24 hours
Feeding: Prior to Test and Daily
Food: ☑ YCT ☑ *P. subcapitata*
Food Batch: 5.5.11 5.5.11
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-2011-08-22-01	1372309	08.22.11/0741	08.22.11/1214
Test Day 2	2	TLH-2011-08-25-27	1373268	08.24.11/0740	08.25.11/0935
Test Day 4	3	TLH-2011-08-26-22	1373802	08-26-11/0741	08.26.11/1300

Batch #	8.18.11		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		JD KC	KC
Lab Total Residual Cl_2 (mg/L):	<0.03		0.07	<0.03	<0.03		JD/KC/MF	KC
Alkalinity (mg/L as $CaCO_3$):	86		485	490	484		KC	KC
Hardness (mg/L as $CaCO_3$):	85		145	139	151		KC	KC
Total Ammonia (mg/L as N):	<0.017		0.318	0.214	0.0762		BA/MF	KC
Conductivity: µmhos mmhos:	180		2740	2600	2670		MF/KC	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. 24.8 max. 27.5 mean —
Room B246 min. 23.6 max. 24.8 mean —
Test min. _____ max. _____ mean _____

Loaded by: KC

Test Replicates	Loaded from culture vial
1	B18
2	B16
3	B12
4	B15
5	A15
6	A17
7	B5
8	A8
9	A3
10	A13

Results	
Control % CV:	3.57%
Dunnetts PMSD:	29.3%
Reproduction NOEC:	<6.25%
Reproduction LOEC:	6.25%
Survival NOEC:	100%
Survival LOEC:	>100%
ICP_{20}:	>100%
ICP_{25}:	>100%

Investigators' signatures
Kara Coy
Marshall Faircloth
Jenna Daniels
Bude Aldrich
Liz Mccoy
REVIEWER

Comments: STATS package shows interrupted dose response at 6.25% and 12.5% concentrations. Cause undetermined, MF 9-7-11

Test Page 1 of 6 PAGE 84 revised 07/15/08 MF

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Survival and Reproduction

SOP TA07_05

Facility: Packaging Corporation of America

LIMS Sample #: 137-2309 for lab sample #1

Start Date: 8.23.11 Time: 1020

End Date: 8-29-11 Time: 1400

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	4	5	4	3	4	0	0	2	5	5	32	10	3.2
	4	0	0	0	0	10	0	4	0	0	7	21	10	2.1
	5	8	6	5	8	0	8	0	8	4	0	47	10	4.7
	6	2	7	5	12	14	12	1	8	6	11	78	10	7.8
	7													
	8													
	Total	14	18	14	23	28	20	5	18	15	23	178	10	17.8

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	0	5	5	2	4	4	0	0	0	4	24	10	2.4
	4	10	0	0	5	6	0	0	3	0	3	27	10	2.7
	5	0	6	0	0	0	0	0	0	0	0	6	10	0.6
	6	1	0	0	7	14	2	7	5	5	8	49	10	4.9
	7													
	8											106 BA		10.6 BA
	Total	11	11	5	14	24	6	7	8	5	15	HH	10	HH

Organisms loaded by: KC

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

Concentration	Mean neonates /adult	% survival
Control	17.8	100
6.25%	HH 10.6 BA	100
12.50%	MF 5.88	100
25%	14.9	100
50%	21.3	100
100%	~~20.9~~ 21.9 BA	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:

*Day 0 is test initiation day

X = Dead (original organism)

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Survival and Reproduction

SOP TA07_05

Facility: Packaging Corp. of America

LIMS Sample # : 137-2309 for lab sample #1

Start Date: 8.23.11 Time: 1020

End Date: 8-29-11 Time: 1400

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(9)	
	1												10(9)	
	2	0	0	0	0	0	0	0	0	0	0	0	10(9)	0
	3	0	4	0	2	0	4	3	5	1	3	23	10(9)	2.3 2.6 BA 2.4
	4	4	3	3	0	0	10	0	0	0	0	10	10(9)	1.1
	5	0	0	0	0	0	0	0	0	0	0	0	10(9)	0
	6	3	5	0	0	0	2	0	5	1	4	20	10(9)	2.2
	7					♂								
	8											5/5.88 MF 9		5.88
	Total	7	12	3	2	NA	7	3	10	2	7	178 MF 10		17.8

→ Total Neonates

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving Adults	Neonates per adult
25%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	7	5	4	3	0	4	2	5	5	5	41	10	4.1
	4	9	6	4	5	0	7	10	6	3	8	48	10	4.8
	5	0	0	0	0	0	6	5	0	0	0	11	10	1.1
	6	0	2	9	5	0	8	0	8	6	9	49	10	4.9
	7					10*								
	8													
	Total	16	13	17	13	10	17	8	19	14	22	149	10	14.9

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving Adults	Neonates per adult
50%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	4	7	2	2	4	6	0	1/10	4	2	32	10	3.2
	4	9	11	12	5	7	11	9	10	6	9	89	10	8.9
	5	0	0	0	0	0	0	0	0	0	0	0	10	0
	6	13	3	15	13	9	8	13	13	4	1	92	10	9.2
	7													
	8													
	Total	26	21	29	20	20	25	22	24	14	12	213	10	21.3

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving Adults	Neonates per adult
100%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	4	4	3	5	2	3	1	5	3	1	31	10	3.1
	4	8	7	9	7	7	5	5	9	6	8	72	10	7.2
	5	0	0	10	0	0	0	0	0	0	10	MF 10	10	1.0
	6	14	12	12	9	11	13	12	9	14	0	106	10	
	7													
	8	26										219	BA 10	21.9
	Total	~~16~~ BA	23	25	21	20	21	18	23	23	19	~~209~~	~~10~~	~~20.9~~

MF Stray Mark 9-1-11

Comments:

② - Split brood MF 8-27-11 12.5% Rep6 MF

⑤ - Split brood MF 8-28-11 100% Rep13 MF

♂ male 12.5% Rep5 M. Hagan 8-28-11 MF MF

* 25% Rep5 had neonates as being saved 8-28-11 MF

(#) 25% Day 6 not counted 4th brood MF 9-1-11

*Day 0 is test initiation day

X = Dead (original organism)

Appendix B. (continued)

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Parameters

Facility: Packaging Corporation of America SOP TA07_05

LIMS Sample #: 137309 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	8.0	25.4	9.0	180					
	1	6.25%	M	8.3	25.3	8.7	357					
	1	12.5%	M	8.3	25.1	8.9	530					
	1	25%	M	8.5	24.9	8.7	867					
	1	50%	M	8.6	24.7	8.7	1513					
	1	100%	M	8.6	24.6	8.4	2740					
	Measured by:			KC	KC	KC	KC					
	Recorded by:			KC	KC	KC	KC					
Day 1	sample:	Control	M	8.1	25.4	8.0	180	M	8.0	24.2	8.2	199
	1	6.25%	M	8.3	24.6	8.0	348	M	8.2	24.3	8.1	373
	1	12.5%	M	8.4	24.3	7.9	513	M	8.3	24.2	8.1	538
	1	25%	M	8.5	24.0	8.0	833	M	8.5	24.2	8.0	864
	1	50%	M	8.5	24.0	8.0	1437	M	8.7	24.2	7.8	1511
	1	100%	M	8.5	24.0	7.9	2620	M	8.9	24.1	7.7	2850
	Measured by:			KC	KC	KC	KC		KC	KC	KC	KC
	Recorded by:			KC	KC	KC	KC		KC	KC	KC	KC
Day 2	sample:	Control	M	8.0	25.2	8.3	180	M	8.1	24.0	8.1	194
	2	6.25%	M	8.2	24.6	8.1	348	M	8.2	24.0	8.3	372
	2	12.5%	M	8.3	24.1	8.3	509	M	8.3	24.0	8.3	546
	2	25%	M	8.4	24.0	8.2	809	M	8.5	24.0	8.3	885
	2	50%	M	8.4	24.0	8.1	1393	M	8.6	24.0	8.3	1524
	2	100%	M	8.4	24.0	8.0	2600	M	8.8	24.0	8.1	2800
	Measured by:			KC	KC	KC	KC		KC	KC	KC	KC
	Recorded by:			KC	KC	KC	KC		KC	KC	KC	KC
Day 3	sample:	Control	M	8.0	24.0	6.5	180	M	7.9	24.0	6.6	190
	2	6.25%	M	8.2	24.0	7.3	370	M	8.0	24.0	6.8	357
	2	12.5%	M	8.4	24.2	6.9	540	M	8.2	24.0	6.8	537
	2	25%	M	8.6	24.1	7.1	861	M	8.4	24.0	6.9	854
	2	50%	M	8.7	24.0	7.0	1461	M	8.6	24.0	6.9	1501
	2	100%	M	8.7	24.0	7.2	2600 BA 2660	M	8.8	24.0	7.0	2780
	Measured by:			BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:			BA	BA	BA	BA		BA	BA	BA	BA

Comments:

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

Test Page 4 of 6 PAGE 87 revised 07/15/08 MF

Appendix B. (continued)

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Parameters

Facility: Packaging Corp. of America SOP TA07_05

LIMS Sample #: 1372309 for lab sample 1

Circle µmhos-cm or mmhos-cm

Test Day		Concentration	New Sample: Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	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	8.2	24.6	7.4	178	M	8.2	24.2	7.6	195
	3	6.25%	M	8.3	24.6	7.5	350	M	8.4	24.0	7.8	380
	3	12.5%	M	8.3	24.6	7.6	512	M	8.5	24.1	7.9	550
	3	25%	M	8.4	24.5	7.8	833	M	8.6	24.2	7.9	875
	3	50%	M	8.5	24.3	7.8	1460	M	8.8	24.4	8.1	1510
	3	100%	M	8.5	24.2	7.8	2670	M	8.9	24.5	8.1	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	8.0	25.3	7.8	185	M	8.3	24.3	7.7	200
	3	6.25%	M	8.1	25.4	8.0	376	M	8.3	24.5	7.6	361
	3	12.5%	M	8.3	25.3	8.0	552	M	8.4	24.7	7.6	502
	3	25%	M	8.4	25.5	8.1	875	M	8.5	24.8	7.7	850
	3	50%	M	8.5	25.5	8.1	1501	M	8.6	24.7	7.8	1485
	3	100%	M	8.5	25.7	8.3	2810	M	8.8	24.5	7.5	2850
	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					M	8.1	24.0	8.1	197
	3	6.25%	M					M	8.3	24.0	8.2	384
	3	12.5%	M					M	8.4	24.0	8.1	547
	3	25%	M					M	8.5	24.0	8.1	865
	3	50%	M					M	8.7	24.0	8.0	1519
	3	100%	M					M	8.9	24.0	7.9	2930
	Measured by:								KC	KC	KC	KC
	Recorded by:								KC	KC	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 7-11 MF

Comments:

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

Test Page 5 of 6

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revised 07/15/08 MF

Appendix B. (continued)

Test ID: Packaging Corp. of America Dates: 8.23.11 - 8-29-11 MC

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	✓ #5 #4 ✓
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 Kara Cap 9/2/11.

V 1.1 9/21/10 MF/jd

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Appendix B. (continued)

FDEP Biology Laboratory - Chronic Bioassay Bench Sheet

Pimphales promelas or Menidia beryllina

Facility: Packaging Corp of America
Address: 5495 Lake Park-Clyattville Rd. Clyattville, Ga
County: Hamilton (FL) Zip 31601
NPDES Permit #: FL 1000281
Contact/District: Esa Ali / 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: 8.23.11 Time: 1230
End Date: 8.30.11 Time: 0900

Diluent/ Batch:
MHW / 8.8.11 Test Days Used: 0-7
MHW /_____ Test Days Used: _____
ASW /_____ Test Days Used: _____
ASW /_____ Test Days Used: _____

Organism age : <24 ~~days~~ hours
Feeding Prior to Test and Daily
Artemia Lot # : 23613
Chamber size : 1000 ml
Test volume : 500 ml

Artemia Batch #	Day 3	148-11
Day 0	145-11	Day 4 149-11
Day 1	146-11	Day 5 150-11
Day 2	147-11	Day 6 151-11

Sample Received	Lab Sample #	LIMS Job #	LIMS Sample #	Collection Date/Time	Received Date/Time
Test Day 0	1	TLH-2011-08-22-01	1372309	08.22.11/0741	08.22.11@1214
Test Day 2	2	TLH-2011-08-25-27	1373268	08.24.11/0740	08/25/11@0935
Test Day 4	3	TLH-2011-08-26-22	1373802	08.26.11/0741	08/26/11@1300

Water Quality Parameters	Field Chlorine (mg/L)			Lab Chlorine (mg/L)			Alkalinity (mg/L as $CaCO_3$)			Hardness (mg/L as $CaCO_3$)		
Lab Sample #:	1	2	3	1	2	3	1	2	3	1	2	3
Sample:		not measured	not measured	0.07	<0.03	<0.03	485	490	484	175	159	151
Diluent/Control:				<0.03	<0.03	<0.03	76	76	76	91	91	91
Method:		—	—	Hach	Hach	Hach	Hach	Hach	Hach	Hach	Hach	Hach
Measured by:		—	—	JD/KC	KC	MF/KC	KC	KC	KC	KC	KC	KC
Verified by:		KC	KC	JD KC	KC	MF KC	KC	KC	KC	KC	KC	KC

	Conductivity (circle one) (umhos-cm) mmhos-cm)			KC Ammonia (mg/L)		KC	Salinity (ppth)		
Lab Sample#:	1	2	3	1	2	3	1	2	3
Sample:	2730	2750	2730	0.318	0.214	0.0762			
Diluent/Control:	340	338	328	<0.017	<0.017	<0.017			
Method:	Mettler	Mettler	Mettler	Denver	Denver	Denver	Mettler	Mettler	Mettler
Measured by:	BA	JD	BA	BA	BA/MF	BA/MF			
Verified by:	KC	KC	KC	KC	KC	KC			

Lims entry 9-20-11 MF
Lims verification 9-20-11 BA

Statistics	
Growth NOEC:	100 %
Growth LOEC:	>100 %
Growth IC_{20}:	>100 %
Growth IC_{25}:	>100 %
Ctrl % CV:	19.6%
Dunnetts PMSD:	29.8%
Survival NOEC:	100%
Survival LOEC:	>100%

Light Intensity : 50 - 100 ft. candles
Photoperiod : 16 light 8 dark
Temperature Range °C:
Incubator # 3 min. 24.6 max. 26.7 mean. —
Water bath # ____ min. _____ max. _____ mean. _____
Room B246 min. 23.6 max. 24.8 mean. —

Investigators' signatures
Bruce Neal
Kara Cox
Marshall Faircloth
James Daniels
Liz Miller
REVIEWER

Comments:

revised 08/24/06 MF/SP

Appendix B. (continued)

Chronic Bioassay Survival Benchsheet

Facility: Packaging Corp of America

LIMS Sample Number: 1372309
(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	9 ID	9	9	9
	B	10	10	10	10	10	10	10	10
	C	10	10	10	9 10	9	9	9	9
	D	10	10	10	10	9 ID	9	9	8 ID
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	9 ID	9	8 ID	8
	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	10	10
	D	10	10	10	10	10	10	10	10
Sample 100 %	A	10	10	10	10	9 ID	9	9	9
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	9 ID	9	9
Sample %	A	10							
	B	10							
	C	10							
	D	10							
Loaded by:	Checked by:		JD	JD	JD	BA	BA	JD	JD
Verified by:									

Comments:

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Appendix B. (continued)

Chronic Bioassay Parameters Benchsheet

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

Sample Source: Pacific Corp of America — Start Date: 8.23.11 End Date: 8.30.11

LIMS Sample #: 13123869 (for Lab sample #1) — Start Time: 1230 End Time: 0900

conc = concentration — rep = replicate — circle umhos or mmhos

Test Day			Before Renewal							After Renewal						
		Conc.	Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth		Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth	
Day 0	sample:	Control	A	7.9	26.0	6.4	340	–								
	1	6.25%	A	8.1	26.0	7.3	460	–								
	1	12.5%	A	8.3	25.9	6.9	639	–								
	1	25%	A	8.5	25.8	7.3	1015	–								
	1	50%	A	8.6	25.7	7.1	1608	–								
	1	100%	A	8.6	25.4	7.1	2730	–								
	1		A		~~24.4~~ BA			–								
	Measured by:			BA	BA	BA	BA									
	Recorded by:			BA	BA	BA	BA	–								
			Rep	pH	Temp	DO	Conductivity	Salinity		Rep	pH	Temp	DO	Conductivity	Salinity	
Day 1	sample:	Control	B	7.8	25.7	7.6	339			B	7.9	24.7	7.7	333		
	1	6.25%	B	8.0	25.4	7.2	451			B	8.1	25.1	7.8	464		
	1	12.5%	B	8.1	25.3	7.1	627			B	8.2	25.1	7.6	616		
	1	25%	B	8.3	25.9	7.1	1012			B	8.4	25.0	7.4	971		
	1	50%	B	8.5	25.0	6.6	1543			B	8.5	24.7	7.4	1549		
	1	100%	B	8.7	25.9	6.7	2690			B	8.6	24.5	7.4	2670		
	1		B							B						
	Measured by:			JD	~~JD~~	JD	JD				KC	~~KC~~	~~KC~~ KC	KC		
	Recorded by:			JD	~~JD~~	JD	JD				KC	KC	KC	KC		
			Rep	pH	Temp	DO	Conductivity	Salinity		Rep	pH	Temp	DO	Conductivity	Salinity	
Day 2	sample:	Control	C	7.6	25.7	6.4	338			C	7.8	25.1	7.9	315		
	2	6.25%	C	7.6	25.3	6.7	474			C	7.9	25.1	7.8	462		
	2	12.5%	C	7.8	25.2	6.3	673			C	8.1	25.2	7.9	640		
	2	25%	C	7.9	24.9	6.4	984			C	8.2	25.2	8.1	902		
	2	50%	C	8.2	24.8	6.3	1600			C	8.4	24.9	8.0	1482		
	2	100%	C	8.6	24.9	6.7	2750			C	8.5	25.0	7.4	2580		
	2		C							C						
	Measured by:			~~JD~~	~~JD~~	~~JD~~	~~JD~~				~~JD~~ JD	~~JD~~	~~JD~~	~~JD~~		
	Recorded by:			~~JD~~	~~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	7.5	25.1	5.0	330			D	7.8	25.1	6.9	313		
	2	6.25%	D	7.6	25.0	5.2	487			D JD	~~7.9~~ 8.1	25.0	6.9	444		
	2	12.5%	D	7.6	25.2	5.2	679			D JD	~~7.8~~ 8.2	24.9	6.9	605		
	2	25%	D	8.0	25.1	5.3	948			D JD	~~8.4~~ 8.4	24.8	7.0	887		
	2	50%	D	8.2	25.0	5.3	1564			D	8.6	24.5	6.6	1469		
	2	100%	D	8.5	25.0	5.4	2730			D	8.7	24.0	6.8	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

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Appendix B. (continued)

Chronic Bioassay Parameters Benchsheet

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

Sample Source: Packaging Corp. of America Start Date: 8.23.11 End Date: 8.30.11

LIMS Sample #: 13723409 (for Lab sample #1) Start Time: 1230 End Time: 0900

conc = concentration rep = replicate

Test Day		Conc.	Before Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth	After Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth
Day 4	sample:	Control	A	7.8	25.5	5.9	333	–	A	7.8	25.0	7.0	328	–
	3	6.25%	A	7.8	25.5	6.1	478	–	A	8.0	25.0	7.3	493	–
	3	12.5%	A	7.9	25.6	6.1	654	–	A	8.0	24.7	7.3	641	–
	3	25%	A	8.0	25.7	6.0	971	–	A	8.2	24.7	7.3	961	–
	3	50%	A	8.3	25.4	6.1	1578	–	A	8.3	24.5	7.2	1521	–
	3	100%	A	8.6	25.8	5.6	2770	–	A	8.4	24.4	7.2	2730	–
	3	–	A	–	–	–	–	–	A	–	–	–	–	–
	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 5	sample:	Control	B	7.6	26.0	5.5	335	–	B	7.8	25.3	7.4	322	–
	3	6.25%	B	7.6	26.0	5.8	505	–	B	8.1	25.5	6.9	478	–
	3	12.5%	B	7.9	25.4	5.8	647	–	B	8.2	25.6	7.2	635	–
	3	25%	B	7.9	25.8	5.7	965	–	B	8.4	25.9	7.2	926	–
	3	50%	B	8.2	25.4	5.3	1527	–	B	8.5	26.0	7.0	1548	–
	3	100%	B	8.5	25.6	5.3	2690	–	B	8.6	26.0	7.1	2700	–
	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	7.5	25.4	6.2	329		C	7.7	24.5	7.2	317	
	3	6.25%	C	7.8	25.2	7.0	484		C	7.9	24.6	7.2	468	
	3	12.5%	C	8.0	25.5	7.3	641		C	8.1	24.6	7.5	616	
	3	25%	C	8.2	25.2	7.1	943		C	8.2	24.6	7.5	913	
	3	50%	C	8.2	25.0	5.8	1558		C	8.3	24.5	7.2	1512	
	3	100%	C	8.5	25.0	5.7	2680		C	8.4	24.5	7.1	2620	
	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	7.7	25.1	6.4	324		D					
	3	6.25%	D	7.6	25.5	5.6	486		D					
	3	12.5%	D	7.7	25.6	6.0	640		D					
	3	25%	D	7.9	25.6	6.1	955		D					
	3	50%	D	8.1	25.6	5.3	1564		D					
	3	100%	D	8.4	25.7	4.8	2710		D					
	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.

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Appendix B. (continued)

Chronic Bioassay Weighing Benchsheet

Facility: Packaging Corp. of America

LIMS Sample Number: 1372309

(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	1	0.02516	0.03100	0.00584	10	.584	
	B	2	0.02604	0.03278	0.00674	10	.674	0.598
	C	3	0.02515	0.03212	0.00697	10	.697	
	D	4	0.02658	0.03096	0.00438	10	.438	
sample 6.25 %	A	5	0.02626	0.03223	0.00597	10	.597	
	B	6	0.02595	0.03282	0.00687	10	.687	.615
	C	7	0.02441	0.03057	0.00616	10	.616	
	D	8	0.02603	0.03163	0.00560	10	.560	
sample 12.5 %	A	9	0.02617	0.03110	0.00493	10	.493	
	B	10	0.02549	0.03237	0.00688	10	.688	.682
	C	11	0.02647	0.03328	0.00681	10	.681	
	D	12	0.02621	0.03488	0.00867	10	.867	
sample 25 %	A	13	0.02523	0.03327	0.00804	10	.804	
	B	14	0.02615	0.03401	0.00786	10	.786	.777
	C	15	0.02561	0.03221	0.00660	10	.660	
	D	16	0.02727	0.03584	0.00857	10	.857	
sample 50 %	A	17	0.02636	0.03554	0.00918	10	.918	
	B	18	0.02643	0.03559	0.00916	10	.916	.974
	C	19	0.02646	0.03599	0.00953	10	.953	
	D	20	0.02559	0.03668	0.01109	10	1.109	
sample 100 %	A	21	0.02645	0.03464	0.00819	10	.819	
	B	22	0.02708	0.03654	0.00946	10	.946	
	C	23	0.02778	0.03607	0.00829	10	.829	.907
	D	24	0.02797	0.03831	0.01034	10	1.034	
sample %	A					10		
	B					10		
	C					10		
	D					10		
	Weighed by initials:		JD	JD	revised 7/16/08 mf			

Comments:

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

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

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Appendix B. (continued)

Chronic Bioassay Weighing Benchsheet

Quality Control

Facility: Packaging Corp. of America

LIMS Sample Number: 1372309 (for Lab Sample # 1)

P. promelas and M. beryllina Bench sheet

SOPs TA07_09, TA07_14 and TA06_21

Drying Oven ID:	ERO 34000	Tare weighed by:	JD
Temperature °C:	100	Final weighed by:	JD
Hours:	8		
Tare Weighing Date:	8.29.11	Final Weighing Date:	8.31.11

				Measured Value (g)		S-weight Value (g)
Tare Pan 1 after Pan 5 (g)	0.02517	@	0.02516	S-weights	0.00101	@ 0.01
Tare Pan 1 after Pan 10 (g)	0.02519	@	0.02516	at tare	0.030003	@ 0.03
Tare Pan 1 after Pan 15 (g)	0.02517	@	0.02516	S-weights	0.01	@ 0.01
Tare Pan 1 after Pan 20 (g)	0.02516	@	0.02516	at final	0.05004	@ 0.05
Tare Pan 1 after Pan 25 (g)	0.02519	@	0.02516			
Tare Pan 1 after Pan 30 (g)		@		Balance: Ohaus 250D Ser# 1125481084		
Tare Pan 1 after Pan 35 (g)		@		S-Weights: BIO-S-Weights-01		
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)	0.03102	@	0.03100			
Final Pan 1 after Pan 10 (g)	0.03102	@	0.03100			
Final Pan 1 after Pan 15 (g)	0.03103	@	0.03100			
Final Pan 1 after Pan 20 (g)	0.03101	@	0.03100			
Final Pan 1 after Pan 25 (g)	0.03104	@	0.03100			
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)		@				

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

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Appendix B. (continued)

Test ID: PCA

Dates: 8-23-11 — 8-30-11

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	✓ #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)

JD 9/19/11

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V 1.1 9/21/10 MF/jd

Appendix C. SRT Bench Sheets and Statistical Analysis

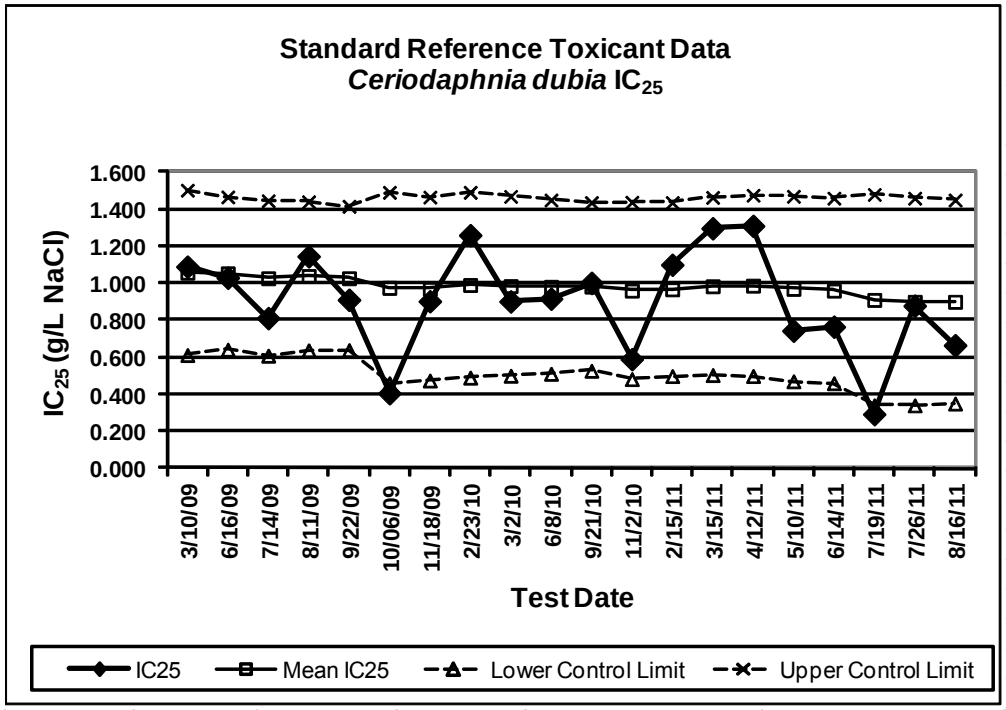
Florida Department of Environmental Protection
Bureau of Laboratories

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

Date	IC25	Mean IC25	Std Dev	Lower Control Limit	Upper Control Limit
3/10/09	1.090	1.06	0.22	0.61	1.50
6/16/09	1.030	1.05	0.21	0.64	1.47
7/14/09	0.812	1.03	0.21	0.61	1.45
8/11/09	1.146	1.04	0.20	0.64	1.44
9/22/09	0.911	1.03	0.19	0.64	1.42
10/06/09	0.406	0.98	0.26	0.46	1.49
11/18/09	0.903	0.97	0.25	0.47	1.47
2/23/10	1.260	0.99	0.25	0.49	1.49
3/2/10	0.902	0.98	0.24	0.50	1.47
6/8/10	0.917	0.98	0.23	0.51	1.45
9/21/10	1.002	0.98	0.23	0.53	1.44
11/2/10	0.590	0.96	0.24	0.48	1.44
2/15/11	1.100	0.97	0.23	0.50	1.44
3/15/11	1.297	0.98	0.24	0.50	1.46
4/12/11	1.310	0.99	0.24	0.50	1.48
5/10/11	0.744	0.97	0.25	0.47	1.47
6/14/11	0.765	0.96	0.25	0.46	1.46
7/19/11	0.293	0.91	0.28	0.34	1.48
7/26/11	0.879	0.90	0.28	0.34	1.46
8/16/11	0.665	0.90	0.27	0.35	1.45

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 : **30.50%**

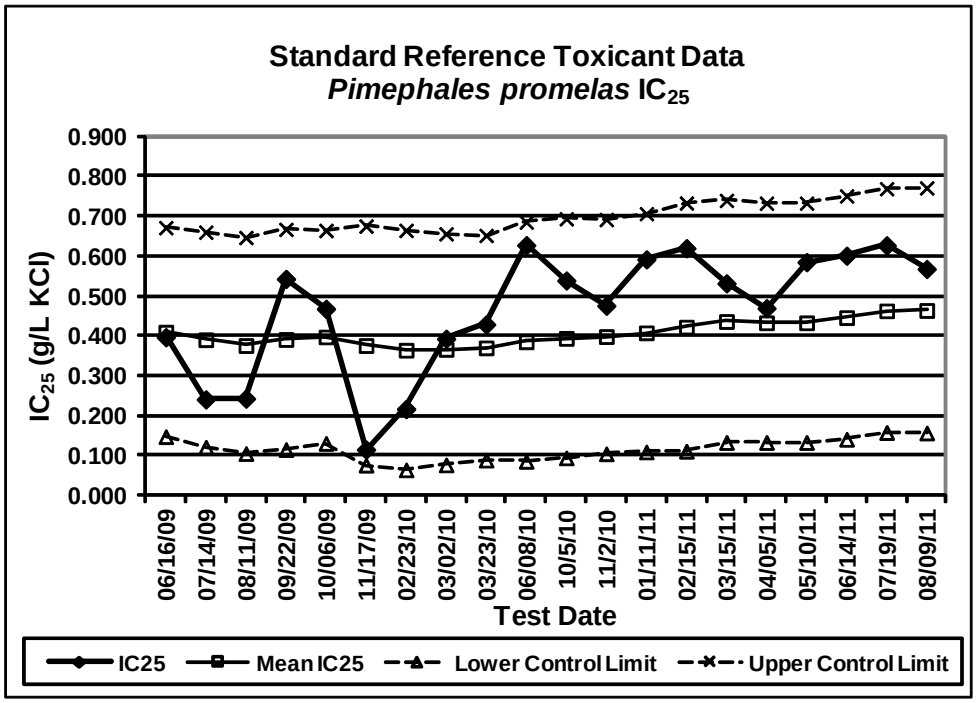


Appendix C. (continued)

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	IC25	Mean IC25	Std Dev	Lower Control Limit	Upper Control Limit
06/16/09	0.397	0.410	0.13	0.148	0.671
07/14/09	0.241	0.391	0.13	0.121	0.660
08/11/09	0.243	0.376	0.14	0.105	0.647
09/22/09	0.543	0.391	0.14	0.115	0.667
10/06/09	0.468	0.398	0.13	0.131	0.664
11/17/09	0.115	0.376	0.15	0.076	0.676
02/23/10	0.217	0.365	0.15	0.064	0.665
03/02/10	0.393	0.366	0.14	0.077	0.656
03/23/10	0.429	0.370	0.14	0.089	0.652
06/08/10	0.628	0.385	0.15	0.086	0.685
10/05/10	0.539	0.394	0.15	0.094	0.694
11/02/10	0.476	0.398	0.15	0.105	0.692
01/11/11	0.592	0.408	0.15	0.109	0.707
02/15/11	0.620	0.422	0.16	0.111	0.733
03/15/11	0.532	0.436	0.15	0.133	0.740
04/05/11	0.470	0.433	0.15	0.133	0.733
05/10/11	0.585	0.433	0.15	0.133	0.733
06/14/11	0.601	0.446	0.15	0.141	0.751
07/19/11	0.627	0.463	0.15	0.158	0.769
08/09/11	0.568	0.464	0.15	0.157	0.771

Means are from the last 20 SRTs.
Lower Confidence Limit = mean - 2 * Std Dev IC25 CV 33.04%
Upper Confidence Limit = mean + 2 * Std Dev EPA 75th percentile 38%



FDEP Biology Laboratory - Chronic SRT Bench Sheet

Ceriodaphnia dubia

Diluent/ Batch: 20% DMW / 8.9.11 Test Days Used: 0 – 6
20% DMW / _____ Test Days Used: _____
Toxicant/ Batch: NaCl / 8.16.11

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

Organism: *Ceriodaphnia dubia*
Organism Batch #/ Age: 8.16.11 / <24 hr.
Feeding: Prior to Test and Daily
Food: ☑ YCT ☑ *P. subcapitata*
Food Batch: 5.5.11 KC5.1 5.5.11
Chamber size: 30 mL
Test Volume: 20 mL

Start Date: 8.16.11 Time: 12:30
End Date: 8.22.11 Time: 1430

	Batch:	8.9.11			
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 $CaCO_3$):	82			KC	KC
Hardness (mg/L as $CaCO_3$):	83			KC	KC
Total Ammonia (mg/L as N):	<0.017			BA	KC
Conductivity ~~µmhos-cm~~ mmhos-cm :	176			BA	KC

Results	
Control % CV:	37.1 %
Dunnetts PMSD:	36.1 %
Reproduction NOEC:	0.59 g/L
Reproduction LOEC:	0.89 g/L
Survival NOEC:	1.3 g/L
Survival LOEC:	2 g/L
ICP_{20}:	0.628 g/L
ICP_{25}:	0.665 g/L

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

Loaded by: BA

Test Replicate	Loaded from culture vial
1	B 24
2	A 7
3	A 4
4	A 3
5	A 1
6	A 23
7	A 22
8	A 21
9	A 7
10	A 21

Comments:

Investigators' signatures

Alice Mendez
Kasia Kot
Marshall Faircloth
James Daniel

Test Incubated in: Incubator: # 2
Light Intensity : 50 - 100 ft. candles
Photoperiod : 16 light 8 dark
Temperature Range °C:
Incubator # 2 min. 23.9 max. 27.4 mean –
Room B246 ___ min. 23.3 max. 25.0 mean –
Test min. _____ max. _____ mean _____

REVIEWER

Appendix C. (continued)

Ceriodaphnia dubia Survival and Reproduction

Start Date: 8.16.11 Time: 12:30 Loaded by: BA
End Date: 8.22.11 Time: 14:30 Verified by: KCB MF

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	7	4	5	3	1	4	3	5	4	4	40	10	4.0
	4	0	5	0	0	0	8	0	0	0	0	13	10	1.3
	5	11	0	9	5	9	0	6	9	8	0	57	10	5.7
	6	5	5	9	3	10	8	4	7	6	0	58	10	5.8
	7													
	8													
	Total	24	14	23	11	20	20	13	21	18	4	168	10	16.8
0.59	0												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	10	4	4	0	4	4	4	5	4	3	38	10	3.8
	4	0	8	6	0	8	7	6	6	0	0	43	10	4.3
	5	8	1(5)	0	0	0	1(6)	0	7	0	0	15	10	1.5
	6	9	11	4	0	8	5	4	6*	6	0	47	10	4.7
	7													
	8													
	Total	23	24	14	0	20	17	14	18	10	3	143	10	14.3
0.89	0												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	6	4	2	3	3	2	4	4	4	34	10	3.4
	4	0	8	2(5)	0	0	0	2*	X0	0	0	10	9	1.0
	5	0	0	0	0	0	0	1		0	8	9	9	0.9
	6	0	6	1	X=	0	0	0		7	8	22	9	2.2
	7													
	8													
	Total	0	20	7	2	3	3	5	4	11	20	75	10	7.5

Comments: (5) = split brood MF 8-20-11
* Day 4 0.89 g/L Rep 7 - 2 alive 6 aborted MF 8-20-11
** - Not counted MF 8-23-11

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	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0 2L[a]	2B[c]	3	0	2	0	1	0	0	0	8	10	0.8
	4	0	0	0	0	0	0	0	0	0	0X	0	9	0
	5	0	0	0	0	0	0	0	0	0	|	0	9	0
	6	7	3	0	X	X	0	0	0	0	|	10	7	1.0
	7				|	|					|		
	8				|	|					|		
	Total	7	5	3	0	2	0	1	0	0	0	18[a] 18	7	1.8
2.0	0												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	0	1	0	0	0	0	0	0	0	1	10	0.1
	4	0	0	X0	0	0	0	0	X0	0	X0	0	7	0
	5	0	0	|	X	X	X	X	|	X	|	0	2	0
	6	0	0	|	|	|	|	|	|	|	|	0	2	0
	7			|	|	|	|	|	|	|	|	0 mf		
	8			|	|	|	|	|	|	|	|	0		
	Total	0	0	1	0	0	0	0	0	0	0	mf 0 1	2	0.1
3.0	0												10	
	1	X	X	X		X	X		X		X		4	
	2	|	X	|	X	|	|	X	|	X	|	0	0	0
	3	|	|	|	|	|	|	|	|	|	|	0	0	0
	4	|	|	|	|	|	|	|	|	|	|	0	0	0
	5	|	|	|	|	|	|	|	|	|	|	0	0	0
	6	|	|	|	|	|	|	|	|	|	|	0	0	-
	7	|	|	|	|	|	|	|	|	|	|	0 mf	0 mf	0
	8	|	|	|	|	|	|	|	|	|	|	0	0	
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments:

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Appendix C. (continued)

FDEP Biology Laboratory - Chronic SRT Bench Sheet

Ceriodaphnia dubia Parameters

Test Day ↓	Conc.	New Sample Replicate	New Sample pH (su)	New Sample Temp (°C)	New Sample DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)	Old Sample Replicate	Old Sample pH (su)	Old Sample Temp (°C)	Old Sample DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)
Day 0	Control	M	7.9	26.0	7.6	(A) BA L85-176					
	0.59	M	8.0	25.1	7.6	1709					
	0.89	M	8.0	24.9	7.6	1861					
	1.3	M	8.0	24.6	7.6	2610					
	2.0	M	8.0	24.3	7.5	3800					
	3.0	M	8.0	24.1	7.6	5450					
	Measured by:		BA	BA	BA	BA					
	Recorded by:		BA	BA	BA	BA					
Day 1	Control	M	8.0	24.5	7.3	179	A	8.0	24.0	6.8	195
	0.59	M	7.9	24.3	7.3	1355	A	8.0	24.0	7.1	1355
	0.89	M	8.0	24.6	7.1	1873	A	8.0	24.0	7.3	1889
	1.3	M	8.0	24.6	7.5	2660	A	8.0	24.0	7.4	2720
	2.0	M	8.0	24.5	6.8	3850	A	8.0	24.0	7.0	3930
	3.0	M	8.0	24.4	7.1	5590	A	8.0	24.0	7.2	5560
	Measured by:		BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:		BA	BA	BA	BA		BA	BA	BA	BA
Day 2	Control	M	7.9	25.0	6.5	178	A	8.0	24.2	7.6	193
	0.59	M	7.9	25.7	6.6	1289	A	8.0	24.2	7.0	1381
	0.89	M	7.9	25.5	6.6	1829	A	8.1	24.3	6.9	1966
	1.3	M	8.0	25.6	6.4	2610	A	8.1	24.4	7.0	2760
	2.0	M	8.0	25.3	6.8	3750	A	8.1	24.4	7.1	3910
		M					B	8.1	24.5	7.0	5610
	Measured by:		BA	BA	BA	BA		TA	BA	BA	BA
	Recorded by:		BA	BA	BA	BA		BA	BA	BA	BA
Day 3	Control	M	8.0	25.4	7.7	180	A	8.3	24.0	7.9	180
	0.59	M	8.1	25.0	7.5	1269	A	8.3	24.0	7.9	1293
	0.89	M	8.1	24.5	7.5	1782	A	8.3	24.0	8.0	1833
	1.3	M	8.1	24.2	7.7	2560	A	8.2	24.0	8.1	2700
	2.0	M	8.1	24.1	7.6	3730	A	8.3	24.0	8.1	3960
		M									
	Measured by:		KC	KC	KC	KC		KC	KC	KC	KC
	Recorded by:		KC	KC	KC	KC		KC	KC	KC	KC

Comments: (A) New sub sample measured

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

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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	8.2	24.8	7.6	183	A	8.2	24.3	7.8	200
	0.59	M	8.1	25.0	7.6	1283	A	8.1	24.4	7.8	1380
	0.89	M	8.1	24.8	7.7	1875	A	8.1	24.3	7.9	1891
	1.3	M	8.1	25.2	7.7	2670	A	8.1	24.2	7.9	2710
	2.0	M	8.1	25.1	7.8	3820	A	8.0	24.2	8.0	3900
		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	8.0	25.3	6.8	180	A	8.1	24.0	6.2	208
	0.59	M	8.0	26.0	7.5	1282	A	8.0	24.0	6.5	1351
	0.89	M	8.0	25.8	7.5	1819	A	8.0	24.0	7.3	1875
	1.3	M	8.0	25.6	7.6	2610	A	8.1	24.0	6.8	2800
	2.0	M	8.0	25.7	7.5	3760	A	8.1	24.0	6.3	3840
		M									
	Measured by:		BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:		BA	BA	BA	BA		BA	BA	BA	BA
Day 6	Control	M		~~24.3~~ BA		+ BA	A	8.1	24.3	7.4	189
	0.59	M					A	8.2	24.1	7.6	1333
	0.89	M					A	8.3	24.0	7.7	1928
	1.3	M					A	8.3	24.0	7.5	2790
	2.0	M					A	8.3	24.0	7.6	4030
		M									
	Measured by:							BA	BA	BA	BA
	Recorded by:							BA	BA	BA	BA
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

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Appendix C. (continued)

Test ID: August SRT Dates: 8.16.11 – 8.22.11

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	✓ #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 Kara Dey 8/24/11

V 1.1 9/21/10 MF/jd

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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 8.8.11 Test Days Used: 0-7 Start Date: 8-9-11 Time: 1310

Diluent/ Batch: _____ Test Days Used: _____ End Date: 8-16-11 Time: 1030

Toxicant/ Batch # : KCl 8.8.11 Organism Batch #/ Age: 8.9.11 / <24hrs

Artemia Lot # : 23613

Artemia Batch # ~~23613~~	Day 2 137-11	Day 5 140-11
Day 0 135-11	Day 3 138-11	Day 6 141-11
Day1 136-11	Day 4 139-11	

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	KC	JD
Alkalinity (mg/L as $CaCO_3$):	76		HACH	KC	JD
Hardness (mg/L as $CaCO_3$):	91		HACH	KC	JD
Total Ammonia (mg/L as N):	<0.017		DENVER	BA	JD
Conductivity ~~µmhos-cm~~ mmhos-cm:	327		METTLER	JD	KC

Statistics	
Growth NOEC:	0.5 g/L
Growth LOEC:	1 g/L
Growth IC_{20}:	0.5362 g/L
Growth IC_{25}:	0.5683 g/L
Ctrl % CV:	24.2 %
Dunnetts PMSD:	25.6 %
Survival NOEC:	0.5 g/L
Survival LOEC:	1 g/L

Test incubated in : ☑ Incubator # 3

☐ Waterbath #____

Light Intensity : 50 - 100 ft. candles

Photoperiod : 16 light 8 dark

Temperature Range °C:

Incubator # 3 min. 24.7 max. 27.0 mean —

Water bath # ____ min.____ max.____ mean____

Room B246 min. 24.4 max. 26.7 mean —

P. promelas PMSD Bounds for Growth: Lower 12 Upper 30

M. beryllina PMSD Bounds for Growth: Lower 11 Upper 28

Investigators' signatures

James Daniels

Kara Cox

Marshall Faircloth

Bruce Alexander

Liz Miller

REVIEWER

Comments:

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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)

Concentration	Replicate	Chamber	TEST DAY 0	1	2	3	4	5	6	7
Control	A	C1	10	10	10	10	10	10	10	10
	B	C 2	10	10	10	10	10	10	10	10
	C	C 3	10	10	10	10	10	10	10	10
	D	C 4	10	10	10	10	10	10	10	10
.125	A	C 5	10	10	10	10	10	10	10	10
	B	C 6	10	10	10	10	10	10	10	10
	C	C 7	10	10	10	10	10	10	10	10
	D	C 8	10	10	10	10	10	10	10	10
.25	A	C 9	10	10	10	10	10	10	10	10
	B	C 10	10	10	10	10	10	10	10	10
	C	C 11	10	10	10	10	10	10	10	10
	D	C 12	10	10	10	10	10	10	10	10
.5	A	C 13	10	10	10	10	10	10	10	10
	B	C 14	10	10	10	10	10	10	10	10
	C	C 15	10	10	10	10	10	10	10	10
	D	C 16	10	10	10	10	10	10	10	10
1	A	C 17	10	JD 1 98 0 JD	—	—	—	—	—	—
	B	C 18	10	4 JD 8 6 0	3 10	3	3	3	3	3
	C	C 19	10	1 90	0 10	— 10	—	—	—	—
	D	C 20	10	370	3	JD 2 JD	2	2	0 2D	—
2	A	C 21	10	0 JD						
	B	C 22 JD	10	0 JD						
	C	C 23	10	0 JD						
	D	C24	10	0 JD						
	A		10							
	B		10							
	C		10							
	D		10							

Loaded by (0 hr): JD Checked by: JD/KO JD JD JD JD JD JD

Verified by (0 hr): BA

Concentrations prepared by: JD JD JD JD JD JD JD

Comments:

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Appendix C. (continued)

Chronic SRT Parameters Benchsheet

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

Start Date: 8.9.11 End Date: 8.16.11

Start Time: 1310 End Time: 1030

conc = concentration rep = replicate circle umhos or mmhos

Test Day	Conc.	Before Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (umhos) mmhos	Salinity ppth	After Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (umhos) mmhos	Salinity ppth
Day 0	Control	A	7.6	25.9	7.8	327							
	.125	A	7.7	25.9	7.3	532							
	.25	A	7.8	25.9	7.6	772							
	.5	A	7.9	25.9	7.7	1275							
	1	A	8.0	25.9	7.6	2220							
	2	A	8.0	25.9	7.7	4070							
		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	Control	B	7.7	25.4	7.8	332		B	8.0	25.1	8.0	322	
	.125	B	7.7	25.3	7.5	526		B	8.0	25.0	7.8	523	
	.25	B	7.8	25.2	7.6	753		B	8.0	24.8	7.9	749	
	.5	B	7.9	25.4	7.6	1220		B	8.0	25.0	7.5	1237	
	1	B	7.9	25.0	7.0	2130		B	8.1	24.9	7.6	2180	
	2	B	7.9	24.8	7.7	3920		B					
		B						B					
	Measured by		JD	JD	JD	JD			KC	KC	KC	KC	
	Recorded by		JD	JD	JD	JD			KC	KC	KC	KC	
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 2	Control	C	7.9	24.0	6.7	325		C	7.8	24.1	7.2	325	
	.125	C	7.9	24.1	6.2	521		C	7.9	24.5	7.3	579	
	.25	C	7.9	24.0	6.6	742		C	7.9	24.4	7.3	752	
	.5	C	7.9	24.0	6.0	1227		C	7.9	24.5	7.2	1229	
	1	C	7.9	24.1	6.3	2190		D KC	8.0	24.8	7.4	2200	
		C						C					
		C						C					
	Measured by		JD	JD	JD	JD			KC	JD	KC	KC	
	Recorded by		JD	JD	JD	JD			KC	JD	KC	KC	
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 3	Control	D	8.0	24.0	6.5	331		D	7.9	24.0	7.7	324	
	.125	D	7.9	24.1	6.8	582		D	7.9	24.5	7.5	522	
	.25	D	7.9	24.0	7.0	751		D	8.0	24.5	7.6	786	
	.5	D	7.8	24.1	6.5	1228		D	7.9	24.8	7.5	1227	
	1	D	7.9	24.1	6.9	2240		D	8.0	24.4	7.5	2140	
		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:

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

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Appendix C. (continued)

Chronic SRT Parameters Benchsheet

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

Start Date: 8.9.11 End Date: 8.10.11

Start Time: 1310 End Time: 1030

conc = concentration rep = replicate

Test Day	Conc.	Before Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity µmhos mmhos	Salinity ppth	After Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity µmhos mmhos	Salinity ppth
1 Day 4	Control	A	7.9	24.0	6.1	329		A	8.0	25.7	7.3	324	
	.125	A	7.8	24.2	6.2	575		A	7.9	25.6	7.4	579	
	.25	A	7.7	24.1	5.8	783		A	7.9	25.3	7.1	798	
	.5	A	7.7	24.0	6.2	1236		A	7.9	25.6	7.2	1251	
	1	A/B	7.8	24.0	6.5	2140		B/A	8.0	25.4	7.5	2190	
		A						A					
		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
2 Day 5	Control	B	7.7	24.7	6.2	335		B	7.9	25.1	8.0	336	
	.125	B	7.7	24.0	7.5	577		B	7.8	24.9	7.9	578	
	.25	B	7.8	24.0	7.3	819		B	7.9	25.2	8.1	818	
	.5	B	7.7	24.1	6.8	1250		B	7.9	25.1	8.0	1257	
	1	B	7.8	24.0	8.3	2190		B	8.0	24.9	8.0	2180	
		B						B					
		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
3 Day 6	Control	C	7.7	24.2	7.0	339		C	8.0	24.6	8.1	336	
	.125	C	7.6	24.4	6.0	591		C	7.9	24.9	8.1	577	
	.25	C	7.6	24.4	6.5	824		C	7.9	24.8	8.0	808	
	.5	C	7.6	24.3	7.3	1287		C	8.0	25.4	8.2	1265	
	1	D/C JD	7.6	24.4	6.7	2210		D/B	8.0	25.5	8.6	2190	
		C						C					
		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
4 Day 7	Control	D	7.7	24.1	5.3	335		D					
	.125	D	7.6	24.2	5.6	584		D					
	.25	D	7.6	24.3	5.2	821		D					
	.5	D	7.6	24.3	6.3	1260		D					
	1	B	7.7	24.4	7.7	2190		D					
								D					
								D					
	Measured by		JD	JD	JD	JD							
	Recorded by		JD	JD	JD	JD							

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

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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	80	0.02249	0.02832	0.00583	10	.583
	B	81	0.02340	0.02792	0.00452	10	.452
	C	82	0.02246	0.03043	0.00797	10	.797
	D	83	0.02345	0.03081	0.00736	10	.736
.125	A	84	0.02313	0.02858	0.00545	10	.545
	B	85	0.02218	0.02753	0.00535	10	.535
	C	86	0.02379	0.02987	0.00608	10	.608
	D	87	0.02278	0.02737	0.00459	10	.459
.25	A	88	0.02340	0.02837	0.00497	10	.497
	B	89	0.02380	0.02950	0.00570	10	.570
	C	90	0.02234	0.02777	0.00543	10	.543
	D	91	0.02255	0.02837	0.00582	10	.582
.5	A	92	0.02247	0.02916	0.00669	10	.669
	B	93	0.02390	0.02840	0.00450	10	.450
	C	94	0.02261 / 0.02733 JD	0.02794	0.00533	10	.533
	D	95	0.02290	0.02891	0.00601	10	.601
1	A	—	—	—	—	10	—
	B	96	0.02295	0.02496	0.00201	10	.201
	C	—	—	—	—	10	—
	D	—	—	—	—	10	—
	A					10	
	B					10	
	C					10	
	D					10	
	A					10	
	B					10	
	C					10	
	D					10	
		Weighed by:	JD	JD			

0.642

Comments:

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

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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: 8.15.11 Weighed by: JD

	Pan 1 wt.	Pan 1 initial wt.
after Pan 5	0.02248	@ 0.02249
after Pan 10	0.02246	@ 0.02249
after Pan 15	0.02248	@ 0.02249
after Pan 20	0.02247	@ 0.02249
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
	0.03003	@ 0.03

Balance: Ohaus 250D Ser# 1125481084

S-Weights: BIO-S-Weights-01

Fish + Pan Weights Date: 8.17.11 Weighed by: JD

	Pan 1 wt.	Pan 1 initial wt.
after Pan 5	0.02830	@ 0.02832
after Pan 10	0.02833	@ 0.02832
after Pan 15	0.02830	@ 0.02832
after Pan 20	0.02831	@ 0.02832
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	0.00998	@ 0.01
	0.05005	@ 0.05

Drying Oven ID: ER034000

Temperature °C: 100

Drying Hours: 8

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

Comments:

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revised 7/16/08 MF

Appendix C. (continued)

Test ID: Chronic SRT P. Promelas Dates: 7-19-11 — 7-26-11

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	✓ #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)

8.24.11 M.D.

V 1.1 9/21/10 MF/jd

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Appendix D. Test Organism Receipts

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: 8/15/11

Ship to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia						
Menidia beryllina						
						Hardness mg/L
Cyprinella leedsi	100 ac	11 DAYS	CL110804	25	7.8	80
Pimephales promelas						
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: PM

Shipped Via: Fed Ex

Notes: _____

Thank you for your order.

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

Appendix D. (continued)

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: 8/22/11

Ship to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia						
Menidia beryllina						
						Hardness mg/L
Cyprinella leedsi	150 ac	12 DAYS	CL 110810	25	7.8	80
Pimephales promelas	300	<24 HRS	FM 110821-1830	25	7.8	80
	150 ac	7 DAYS	FM 110815	25	7.8	80
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: PM

Shipped Via: Fed Ex

Notes: _____

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 Packaging Corporation of America Plant Outfall D-001, sampled on August 24, 2011.

Date Sampled	Field ID	Analysis Group	Component	Result	Remark	Units	MDL	PQL
8/24/2011 11:01	EFF-1 PCA	AGP/LN	Algal Growth Potential	25.5	A	mg DryWt/L	0.3	0.9
8/24/2011 11:01	EFF-1 PCA	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	110		ug/L	1.6	5
8/24/2011 11:01	EFF-1 PCA	Chlorophyll/Grain Size/BOD	Phaeophytin-a	13		ug/L	1.2	3.5
8/24/2011 11:01	EFF-1 PCA	Metals	Chromium	1.1	I	ug/L	0.3	1.2
8/24/2011 11:01	EFF-1 PCA	Metals	Copper	0.52	I	ug/L	0.5	1
8/24/2011 11:01	EFF-1 PCA	Metals	Arsenic	0.69	I	ug/L	0.25	1
8/24/2011 11:01	EFF-1 PCA	Metals	Aluminum	387		ug/L	5	20
8/24/2011 11:01	EFF-1 PCA	Metals	Lead	0.22	I	ug/L	0.2	0.8
8/24/2011 11:01	EFF-1 PCA	Metals	Cadmium	0.05	U	ug/L	0.05	0.2
8/24/2011 11:01	EFF-1 PCA	Metals	Zinc	5	U	ug/L	5	20
8/24/2011 11:01	EFF-1 PCA	Metals	Sodium	562		mg/L	2.5	10
8/24/2011 11:01	EFF-1 PCA	Metals	Nickel	0.58	I	ug/L	0.25	1
8/24/2011 11:01	EFF-1 PCA	Metals	Calcium	35		mg/L	0.075	0.3
8/24/2011 11:01	EFF-1 PCA	Metals	Silver	0.025	U	ug/L	0.025	0.1
8/24/2011 11:01	EFF-1 PCA	Metals	Selenium	0.2	U	ug/L	0.2	0.8
8/24/2011 11:01	EFF-1 PCA	Metals	Magnesium	17.1		mg/L	0.04	0.16
8/24/2011 11:01	EFF-1 PCA	Metals	Iron	86	I	ug/L	30	120
8/24/2011 11:01	EFF-1 PCA	Nutrients	Ammonia-N	0.33		mg N/L	0.01	0.02
8/24/2011 11:01	EFF-1 PCA	Nutrients	Organic Carbon	28		mg C/L	1	5
8/24/2011 11:01	EFF-1 PCA	Nutrients	Total-P	0.73		mg P/L	0.005	0.05
8/24/2011 11:01	EFF-1 PCA	Nutrients	O-Phosphate-P	0.48		mg P/L	0.02	0.05
8/24/2011 11:01	EFF-1 PCA	Nutrients	Kjeldahl Nitrogen	2.9		mg N/L	0.08	0.2
8/24/2011 11:01	EFF-1 PCA	Nutrients	NO2NO3-N	0.009	I	mg N/L	0.004	0.01
8/24/2011 11:01	EFF-1 PCA	Overflow	Oil and Grease	0.7	U	mg/L	0.7	2.5
8/24/2011 11:01	EFF-1 PCA	Pesticides	Parathion Ethyl	0.15	U	ug/L	0.15	0.6
8/24/2011 11:01	EFF-1 PCA	Pesticides	Norflurazon	0.15	U	ug/L	0.15	0.6
8/24/2011 11:01	EFF-1 PCA	Pesticides	Diazinon	0.05	U	ug/L	0.05	0.2
8/24/2011 11:01	EFF-1 PCA	Pesticides	Hexazinone	0.1	U	ug/L	0.1	0.4
8/24/2011 11:01	EFF-1 PCA	Pesticides	Metalaxyl	0.25	U	ug/L	0.25	1
8/24/2011 11:01	EFF-1 PCA	Pesticides	Mevinphos	0.2	U	ug/L	0.2	0.8
8/24/2011 11:01	EFF-1 PCA	Pesticides	Parathion Methyl	0.1	U	ug/L	0.1	0.4
8/24/2011 11:01	EFF-1 PCA	Pesticides	Prometryn	0.15	U	ug/L	0.15	0.6
8/24/2011 11:01	EFF-1 PCA	Pesticides	Alachlor	0.6	U	ug/L	0.6	2.4

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Component	Result	Remark	Units	MDL	PQL
8/24/2011 11:01	EFF-1 PCA	Pesticides	Ametryn	0.05	U	ug/L	0.05	0.2
8/24/2011 11:01	EFF-1 PCA	Pesticides	Fenamiphos	0.2	UJ	ug/L	0.2	0.8
8/24/2011 11:01	EFF-1 PCA	Pesticides	Malathion	0.15	U	ug/L	0.15	0.6
8/24/2011 11:01	EFF-1 PCA	Pesticides	Phorate	0.05	U	ug/L	0.05	0.2
8/24/2011 11:01	EFF-1 PCA	Pesticides	Ethoprop	0.1	UJ	ug/L	0.1	0.4
8/24/2011 11:01	EFF-1 PCA	Pesticides	Metolachlor	0.5	U	ug/L	0.5	2
8/24/2011 11:01	EFF-1 PCA	Pesticides	Metribuzin	0.1	U	ug/L	0.1	0.4
8/24/2011 11:01	EFF-1 PCA	Pesticides	Simazine	0.05	U	ug/L	0.05	0.2
8/24/2011 11:01	EFF-1 PCA	Pesticides	Chlorpyrifos Ethyl	0.05	U	ug/L	0.05	0.2
8/24/2011 11:01	EFF-1 PCA	Pesticides	Chlorpyrifos Methyl	0.1	U	ug/L	0.1	0.4
8/24/2011 11:01	EFF-1 PCA	Pesticides	Ethion	0.05	U	ug/L	0.05	0.2
8/24/2011 11:01	EFF-1 PCA	Pesticides	Azinphos Methyl	0.2	U	ug/L	0.2	0.8
8/24/2011 11:01	EFF-1 PCA	Pesticides	Naled	0.8	U	ug/L	0.8	3.2
8/24/2011 11:01	EFF-1 PCA	Pesticides	Atrazine	0.05	U	ug/L	0.05	0.2
8/24/2011 11:01	EFF-1 PCA	Pesticides	Bromacil	0.2	UJ	ug/L	0.2	0.8
8/24/2011 11:01	EFF-1 PCA	Pesticides	Butylate	0.2	U	ug/L	0.2	0.8
8/24/2011 11:01	EFF-1 PCA	Pesticides	Fonofos	0.1	U	ug/L	0.1	0.4
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	2,6-Dinitrotoluene	1	U	ug/L	1	4.1
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Naphthalene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	4-Chloro-3-methylphenol	1	U	ug/L	1	4.1
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Acenaphthylene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Chrysene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Fluoranthene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.1	U	ug/L	3.1	12
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	61
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Acenaphthene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Benzo(k)fluoranthene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Hexachlorobenzene	1	U	ug/L	1	4.1
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Pentachlorophenol	3.1	U	ug/L	3.1	12
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Phenol	1	U	ug/L	1	4.1
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	2,4-Dimethylphenol	10	U	ug/L	10	41
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.1	U	ug/L	3.1	12
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	3,3'-Dichlorobenzidine	41	UJ	ug/L	41	160
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1	U	ug/L	1	4.1

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Component	Result	Remark	Units	MDL	PQL
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Benzidine	100	U	ug/L	100	410
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Benzo(b)fluoranthene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Di-n-butyl phthalate	5.1	U	ug/L	5.1	20
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Di-n-octyl phthalate	1	U	ug/L	1	4.1
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Diethyl phthalate	1	U	ug/L	1	4.1
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Isophorone	1	U	ug/L	1	4.1
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Phenanthrene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Pyrene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L	15	61
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2	U	ug/L	2	8.2
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Anthracene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1	U	ug/L	1	4.1
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.1	U	ug/L	3.1	12
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.1	U	ug/L	3.1	12
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Hexachloroethane	3.1	U	ug/L	3.1	12
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Nitrobenzene	2	U	ug/L	2	8.2
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	2,4,6-Trichlorophenol	1	U	ug/L	1	4.1
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	2-Chloronaphthalene	1	U	ug/L	1	4.1
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Benzo(a)pyrene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1	U	ug/L	1	4.1
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Dimethyl phthalate	10	U	ug/L	10	41
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2	U	ug/L	2	8.2
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1	U	ug/L	1	4.1
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	2,4-Dichlorophenol	1	U	ug/L	1	4.1
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	2-Chlorophenol	1	U	ug/L	1	4.1
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Benzo(a)anthracene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Butyl benzyl phthalate	5.1	U	ug/L	5.1	20
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Fluorene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	N-Nitrosodimethylamine	2	U	ug/L	2	8.2
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	2,4-Dinitrotoluene	1	U	ug/L	1	4.1
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	U	ug/L	15	61

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Component	Result	Remark	Units	MDL	PQL
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	Hexachlorobutadiene	3.1	U	ug/L	3.1	12
8/24/2011 11:01	EFF-1 PCA	Priority Organic Pollutants	2-Nitrophenol	1	U	ug/L	1	4.1
8/24/2011 11:01	EFF-1 PCA	Field Parameter	Specific Conductance	2622		umhos/cm		
8/24/2011 11:01	EFF-1 PCA	Field Parameter	Dissolved Oxygen	7.54		mg/L		
8/24/2011 11:01	EFF-1 PCA	Field Parameter	Sample Depth	1.1		m		
8/24/2011 11:01	EFF-1 PCA	Field Parameter	Temperature	28.25		C		
8/22/2011 7:41	PCA EFFLUENT	Toxicology	Bioassay-Chron-Def-FW-C.dubia, IC25	100	L	IC25		
8/22/2011 7:41	PCA EFFLUENT	Toxicology	Bioassay-Chron-Def-FW-Fish, NOEC	100		NOEC		
8/22/2011 7:41	PCA EFFLUENT	Toxicology	Bioassay-Chron-Def-FW-Fish, IC25	100	L	IC25		
8/22/2011 7:41	PCA EFFLUENT	Toxicology	Bioassay-Chron-Def-FW-C.dubia, NOEC	100		NOEC		
8/22/2011 7:41	PCA EFFLUENT	Field Parameter	pH	8.03				
8/22/2011 7:41	PCA EFFLUENT	Field Parameter	Temperature	27.64		C		
8/22/2011 7:41	PCA EFFLUENT	Field Parameter	Specific Conductance	2764		umhos/cm		
8/22/2011 7:41	PCA EFFLUENT	Field Parameter	Dissolved Oxygen	7.62		mg/L		
8/24/2011 11:01	EFF-1 PCA	Field Parameter	pH	7.96				
8/24/2011 7:40	EFF-1 PCA	Chlorophyll/Grain Size/BOD	BOD-5 Day,N-Inhib	9.8	AQ	mg/L	0.2	2
8/24/2011 7:40	EFF-1 PCA	Nutrients	Alkalinity	478		mg CaCO3/L	0.65	2.5
8/24/2011 7:40	EFF-1 PCA	Nutrients	Chloride	23		mg Cl/L	2	5
8/24/2011 7:40	EFF-1 PCA	Nutrients	Sulfate	800		mg SO4/L	4	10
8/24/2011 7:40	EFF-1 PCA	Nutrients	Fluoride	0.25		mg F/L	0.035	0.1
8/24/2011 7:40	EFF-1 PCA	Nutrients	Color (true)	390		PCU	12	30
8/24/2011 7:40	EFF-1 PCA	Nutrients	TSS	17	A	mg/L	2	10
8/24/2011 7:40	EFF-1 PCA	Nutrients	Turbidity	29		NTU	0.1	0.1
8/26/2011 7:41	PCA EFF-1 (Collected @ 3.2' c)	Field Parameter	Dissolved Oxygen	7.39		mg/L		
8/26/2011 7:41	PCA EFF-1 (Collected @ 3.2' c)	Field Parameter	Specific Conductance	2684		umhos/cm		
8/26/2011 7:41	PCA EFF-1 (Collected @ 3.2' c)	Field Parameter	pH	7.95				
8/26/2011 7:41	PCA EFF-1 (Collected @ 3.2' c)	Field Parameter	Temperature	27.52		C		
8/26/2011 7:41	PCA EFF-1 (Collected @ 3.2' c)	Field Parameter	Sample Depth	1.4		m		
8/24/2011 11:00	EQUIPMENT BLANK	Metals	Nickel	0.25	U	ug/L	0.25	1
8/24/2011 11:00	EQUIPMENT BLANK	Metals	Aluminum	5	U	ug/L	5	20
8/24/2011 11:00	EQUIPMENT BLANK	Metals	Iron	30	U	ug/L	30	120
8/24/2011 11:00	EQUIPMENT BLANK	Metals	Arsenic	0.25	U	ug/L	0.25	1
8/24/2011 11:00	EQUIPMENT BLANK	Metals	Zinc	5	U	ug/L	5	20
8/24/2011 11:00	EQUIPMENT BLANK	Metals	Copper	0.5	U	ug/L	0.5	1

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Component	Result	Remark	Units	MDL	PQL
8/24/2011 11:00	EQUIPMENT BLANK	Metals	Chromium	0.3	U	ug/L	0.3	1.2
8/24/2011 11:00	EQUIPMENT BLANK	Metals	Cadmium	0.05	U	ug/L	0.05	0.2
8/24/2011 11:00	EQUIPMENT BLANK	Metals	Calcium	0.075	U	mg/L	0.075	0.3
8/24/2011 11:00	EQUIPMENT BLANK	Metals	Sodium	0.5	U	mg/L	0.5	2
8/24/2011 11:00	EQUIPMENT BLANK	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
8/24/2011 11:00	EQUIPMENT BLANK	Metals	Silver	0.025	U	ug/L	0.025	0.1
8/24/2011 11:00	EQUIPMENT BLANK	Metals	Selenium	0.2	U	ug/L	0.2	0.8
8/24/2011 11:00	EQUIPMENT BLANK	Metals	Lead	0.2	U	ug/L	0.2	0.8
8/24/2011 11:00	EQUIPMENT BLANK	Nutrients	Chloride	0.2	U	mg Cl/L	0.2	0.5
8/24/2011 11:00	EQUIPMENT BLANK	Nutrients	Alkalinity	0.65	U	mg CaCO3/L	0.65	2.5
8/24/2011 11:00	EQUIPMENT BLANK	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
8/24/2011 11:00	EQUIPMENT BLANK	Nutrients	Color (true)	2.5	U	PCU	2.5	6
8/24/2011 11:00	EQUIPMENT BLANK	Nutrients	Total-P	0.004	U	mg P/L	0.004	0.01
8/24/2011 11:00	EQUIPMENT BLANK	Nutrients	Sulfate	0.2	U	mg SO4/L	0.2	0.5
8/24/2011 11:00	EQUIPMENT BLANK	Nutrients	Fluoride	0.035	U	mg F/L	0.035	0.1
8/24/2011 11:00	EQUIPMENT BLANK	Nutrients	Turbidity	0.1	U	NTU	0.1	0.1
8/24/2011 11:00	EQUIPMENT BLANK	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
8/24/2011 11:00	EQUIPMENT BLANK	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
8/24/2011 11:00	EQUIPMENT BLANK	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
8/24/2011 11:00	EQUIPMENT BLANK	Nutrients	Organic Carbon	1	U	mg C/L	1	5
8/24/2011 11:00	EQUIPMENT BLANK	Overflow	Oil and Grease	0.88	U	mg/L	0.88	3.1
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Alachlor	0.63	U	ug/L	0.63	2.5
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Azinphos Methyl	0.21	U	ug/L	0.21	0.83
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Hexazinone	0.1	U	ug/L	0.1	0.42
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Malathion	0.16	U	ug/L	0.16	0.63
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Ametryn	0.052	U	ug/L	0.052	0.21
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Chlorpyrifos Ethyl	0.052	U	ug/L	0.052	0.21
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Metolachlor	0.52	U	ug/L	0.52	2.1
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Parathion Ethyl	0.16	U	ug/L	0.16	0.63
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Parathion Methyl	0.1	U	ug/L	0.1	0.42
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Phorate	0.052	U	ug/L	0.052	0.21
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Simazine	0.052	U	ug/L	0.052	0.21
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Atrazine	0.052	U	ug/L	0.052	0.21
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Naled	0.83	U	ug/L	0.83	3.3

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Component	Result	Remark	Units	MDL	PQL
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Bromacil	0.21	UJ	ug/L	0.21	0.83
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Ethion	0.052	U	ug/L	0.052	0.21
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Fonofos	0.1	U	ug/L	0.1	0.42
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Metalaxyl	0.26	U	ug/L	0.26	1
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Chlorpyrifos Methyl	0.1	U	ug/L	0.1	0.42
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Fenamiphos	0.21	UJ	ug/L	0.21	0.83
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Norflurazon	0.16	U	ug/L	0.16	0.63
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Prometryn	0.16	U	ug/L	0.16	0.63
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Butylate	0.21	U	ug/L	0.21	0.83
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Diazinon	0.052	U	ug/L	0.052	0.21
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Ethoprop	0.1	UJ	ug/L	0.1	0.42
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Metribuzin	0.1	U	ug/L	0.1	0.42
8/24/2011 11:00	EQUIPMENT BLANK	Pesticides	Mevinphos	0.21	U	ug/L	0.21	0.83
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Benzo(k)fluoranthene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Di-n-octyl phthalate	1	U	ug/L	1	4.1
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.1	U	ug/L	3.1	12
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Isophorone	1	U	ug/L	1	4.1
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.1	U	ug/L	3.1	12
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Fluorene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Di-n-butyl phthalate	5.1	U	ug/L	5.1	20
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Fluoranthene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Hexachlorobutadiene	3.1	U	ug/L	3.1	12
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Naphthalene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	2,4-Dichlorophenol	1	U	ug/L	1	4.1
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1	U	ug/L	1	4.1
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Benzo(a)anthracene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1	U	ug/L	1	4.1
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.1	U	ug/L	3.1	12
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Chrysene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	2,4-Dimethylphenol	10	U	ug/L	10	41
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	2,6-Dinitrotoluene	1	U	ug/L	1	4.1
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2	U	ug/L	2	8.2

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Component	Result	Remark	Units	MDL	PQL
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Phenanthrene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	2,4-Dinitrotoluene	1	U	ug/L	1	4.1
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Acenaphthylene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Benzo(a)pyrene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Benzo(b)fluoranthene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Diethyl phthalate	1	U	ug/L	1	4.1
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Hexachloroethane	3.1	U	ug/L	3.1	12
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Nitrobenzene	2	U	ug/L	2	8.2
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Phenol	1	U	ug/L	1	4.1
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	2,4,6-Trichlorophenol	1	U	ug/L	1	4.1
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.1	U	ug/L	3.1	12
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Acenaphthene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Anthracene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Benzidine	100	U	ug/L	100	410
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Dimethyl phthalate	10	U	ug/L	10	41
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Hexachlorobenzene	1	U	ug/L	1	4.1
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Pyrene	0.2	U	ug/L	0.2	0.82
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1	U	ug/L	1	4.1
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	2-Chlorophenol	1	U	ug/L	1	4.1
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1	U	ug/L	1	4.1
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	U	ug/L	15	61
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2	U	ug/L	2	8.2
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	2-Nitrophenol	1	U	ug/L	1	4.1
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	4-Chloro-3-methylphenol	1	U	ug/L	1	4.1
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Butyl benzyl phthalate	5.1	U	ug/L	5.1	20
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	N-Nitrosodimethylamine	2	U	ug/L	2	8.2
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	Pentachlorophenol	3.1	U	ug/L	3.1	12
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L	15	61
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	2-Chloronaphthalene	1	U	ug/L	1	4.1
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	3,3'-Dichlorobenzidine	41	UJ	ug/L	41	160
8/24/2011 11:00	EQUIPMENT BLANK	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	61
8/24/2011 12:50	ABOVE OUT FALL	Metals	Sodium	5.1		mg/L	0.5	2
8/24/2011 12:50	ABOVE OUT FALL	Metals	Cadmium	0.05	U	ug/L	0.05	0.2

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Component	Result	Remark	Units	MDL	PQL
8/24/2011 12:50	ABOVE OUT FALL	Metals	Nickel	0.32	I	ug/L	0.25	1
8/24/2011 12:50	ABOVE OUT FALL	Metals	Iron	300		ug/L	30	120
8/24/2011 12:50	ABOVE OUT FALL	Metals	Aluminum	91		ug/L	5	20
8/24/2011 12:50	ABOVE OUT FALL	Metals	Calcium	35.6		mg/L	0.075	0.3
8/24/2011 12:50	ABOVE OUT FALL	Metals	Zinc	5	U	ug/L	5	20
8/24/2011 12:50	ABOVE OUT FALL	Metals	Silver	0.025	U	ug/L	0.025	0.1
8/24/2011 12:50	ABOVE OUT FALL	Metals	Chromium	0.77	I	ug/L	0.3	1.2
8/24/2011 12:50	ABOVE OUT FALL	Metals	Copper	0.63	I	ug/L	0.5	1
8/24/2011 12:50	ABOVE OUT FALL	Metals	Magnesium	5.23		mg/L	0.04	0.16
8/24/2011 12:50	ABOVE OUT FALL	Metals	Selenium	0.23	I	ug/L	0.2	0.8
8/24/2011 12:50	ABOVE OUT FALL	Metals	Lead	0.2	U	ug/L	0.2	0.8
8/24/2011 12:50	ABOVE OUT FALL	Metals	Arsenic	0.8	I	ug/L	0.25	1
8/24/2011 12:50	ABOVE OUT FALL	Nutrients	Total-P	0.14		mg P/L	0.005	0.05
8/24/2011 12:50	ABOVE OUT FALL	Nutrients	Color (true)	44		PCU	2.5	6
8/24/2011 12:50	ABOVE OUT FALL	Nutrients	Chloride	7.7		mg Cl/L	0.2	0.5
8/24/2011 12:50	ABOVE OUT FALL	Nutrients	Kjeldahl Nitrogen	0.36		mg N/L	0.08	0.2
8/24/2011 12:50	ABOVE OUT FALL	Nutrients	NO2NO3-N	0.38		mg N/L	0.004	0.01
8/24/2011 12:50	ABOVE OUT FALL	Nutrients	Sulfate	13		mg SO4/L	0.2	0.5
8/24/2011 12:50	ABOVE OUT FALL	Nutrients	Ammonia-N	0.018	I	mg N/L	0.01	0.02
8/24/2011 12:50	ABOVE OUT FALL	Nutrients	Fluoride	0.15		mg F/L	0.035	0.1
8/24/2011 12:50	ABOVE OUT FALL	Nutrients	Alkalinity	92		mg CaCO3/L	0.65	2.5
8/24/2011 12:50	ABOVE OUT FALL	Nutrients	Turbidity	2.3		NTU	0.1	0.1
8/24/2011 12:50	ABOVE OUT FALL	Nutrients	Organic Carbon	5.7		mg C/L	1	5
8/24/2011 12:50	ABOVE OUT FALL	Field Parameter	Sample Depth	1.1		m		
8/24/2011 12:50	ABOVE OUT FALL	Field Parameter	Temperature	26.71		C		
8/24/2011 12:50	ABOVE OUT FALL	Field Parameter	pH	7.4				
8/24/2011 12:50	ABOVE OUT FALL	Field Parameter	Dissolved Oxygen	4.7		mg/L		
8/24/2011 12:50	ABOVE OUT FALL	Field Parameter	Specific Conductance	236		umhos/cm		
8/24/2011 12:33	BELOW OUT FALL	Metals	Calcium	35.6		mg/L	0.075	0.3
8/24/2011 12:33	BELOW OUT FALL	Metals	Cadmium	0.27		ug/L	0.05	0.2
8/24/2011 12:33	BELOW OUT FALL	Metals	Lead	3.45		ug/L	0.2	0.8
8/24/2011 12:33	BELOW OUT FALL	Metals	Aluminum	118		ug/L	5	20
8/24/2011 12:33	BELOW OUT FALL	Metals	Copper	2.05		ug/L	0.5	1
8/24/2011 12:33	BELOW OUT FALL	Metals	Sodium	43.4		mg/L	0.5	2

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Component	Result	Remark	Units	MDL	PQL
8/24/2011 12:33	BELOW OUT FALL	Metals	Selenium	0.24	I	ug/L	0.2	0.8
8/24/2011 12:33	BELOW OUT FALL	Metals	Magnesium	5.99		mg/L	0.04	0.16
8/24/2011 12:33	BELOW OUT FALL	Metals	Chromium	0.79	I	ug/L	0.3	1.2
8/24/2011 12:33	BELOW OUT FALL	Metals	Silver	0.025	U	ug/L	0.025	0.1
8/24/2011 12:33	BELOW OUT FALL	Metals	Zinc	14	I	ug/L	5	20
8/24/2011 12:33	BELOW OUT FALL	Metals	Nickel	0.65	I	ug/L	0.25	1
8/24/2011 12:33	BELOW OUT FALL	Metals	Arsenic	0.89	I	ug/L	0.25	1
8/24/2011 12:33	BELOW OUT FALL	Metals	Iron	300		ug/L	30	120
8/24/2011 12:33	BELOW OUT FALL	Nutrients	Kjeldahl Nitrogen	0.58		mg N/L	0.08	0.2
8/24/2011 12:33	BELOW OUT FALL	Nutrients	Sulfate	66		mg SO4/L	1	2.5
8/24/2011 12:33	BELOW OUT FALL	Nutrients	Alkalinity	117		mg CaCO3/L	0.65	2.5
8/24/2011 12:33	BELOW OUT FALL	Nutrients	Chloride	8.6		mg Cl/L	1	2.5
8/24/2011 12:33	BELOW OUT FALL	Nutrients	NO2NO3-N	0.36		mg N/L	0.004	0.01
8/24/2011 12:33	BELOW OUT FALL	Nutrients	Color (true)	66		PCU	2.5	6
8/24/2011 12:33	BELOW OUT FALL	Nutrients	Ammonia-N	0.045		mg N/L	0.01	0.02
8/24/2011 12:33	BELOW OUT FALL	Nutrients	Organic Carbon	7.1		mg C/L	1	5
8/24/2011 12:33	BELOW OUT FALL	Nutrients	Total-P	0.19		mg P/L	0.005	0.05
8/24/2011 12:33	BELOW OUT FALL	Nutrients	Turbidity	3.3		NTU	0.1	0.1
8/24/2011 12:33	BELOW OUT FALL	Nutrients	Fluoride	0.16		mg F/L	0.035	0.1
8/24/2011 12:33	BELOW OUT FALL	Field Parameter	pH	7.49				
8/24/2011 12:33	BELOW OUT FALL	Field Parameter	Specific Conductance	526		umhos/cm		
8/24/2011 12:33	BELOW OUT FALL	Field Parameter	Sample Depth	1.1		m		
8/24/2011 12:33	BELOW OUT FALL	Field Parameter	Dissolved Oxygen	4.31		mg/L		
8/24/2011 12:33	BELOW OUT FALL	Field Parameter	Temperature	26.96		C		

Appendix F. Excerpt from permit

Florida Department of
Environmental Protection
Northeast District
7825 Baymeadows Way, Suite B200
Jacksonville, Florida 32256-7590
Phone: 904/807-3300 ♦ Fax: 904/448-4366

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

STATE OF FLORIDA
INDUSTRIAL WASTEWATER FACILITY PERMIT

PERMITTEE:

Packaging Corporation of America
Post Office Box 1048
Valdosta, GA 31603

PERMIT NUMBER: FL0000281 (Major)
PA FILE NUMBER: FL0000281-004-IW1S
ISSUANCE DATE: February 18, 2008
EXPIRATION DATE: February 17, 2013

RESPONSIBLE AUTHORITY:

Mr. David W. Carmon
Mill Manager, Valdosta Operation

FACILITY:

Packaging Corporation of America
5495 Lake Park-Clyattville Road
Clyattville, GA 31601
Hamilton County

Latitude: 30° 37' 21" N Longitude: 83° 16' 11" W

This permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.) and applicable rules of the Florida Administrative Code (F.A.C.), and constitutes authorization to discharge to waters of the state under the National Pollutant Discharge Elimination System (NPDES). The above named permittee is hereby authorized to operate the facilities shown on the application and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

Manufacturing of unbleached kraft liner board - SIC Code 2631.

Operation renewal is authorized for the 14 MGD average (design) industrial wastewater treatment system for an unbleached kraft liner board production facility.

WASTEWATER TREATMENT:

Treatment consists of a mechanical bar screen at the influent to the wastewater lift station prior to the primary clarifier, a manual bar screen for the auxiliary wastewater lift station bypass line, and a back-up manual bar screen in the channel downstream from the mechanical bar screen. The wastewater lift station pumps wastewater consisting of process and non-process wastewater from the mill manufacturing operations, and storm water, to a primary clarifier and associated sludge ponds for treatment for settleable solids removal. Secondary treatment is accomplished in a series of seven ponds covering approximately 850 acres, with nutrient addition to the first and fourth ponds, and coagulant/precipitant at the discharge from pond 6 for incremental emergency color reduction. There are four anaerobic facultative ponds, followed by an aerated

Appendix F. (continued)

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stabilization basin, a 350 acre facultative impoundment, and a final polishing pond (pond 7), prior to a final effluent pumping station and associated conveyance system which discharges final treated effluent from outfall D-001 to the Withlacoochee River, a class III fresh surface water of the state. The pump station is designed to convey 55 MGD maximum of effluent to outfall D-001. The pump station includes bar screens, a post aeration chamber, parshall flume for effluent flow monitoring, and effluent pumps which convey the effluent to a final concrete control splitter structure identified as station 001B and then to outfall D-001. Approximately 13,000 L.F. of 48 inch HDPE transmission pipe conveys the effluent from EFF-1 to station 001B. The effluent gravity flows into the Withlacoochee River through outfall D-001.Under high river stage the control structure splits the flow to a 5th port in order to prevent overflow of effluent from the control structure and damage from backpressure to the diffuser system and associated effluent conveyance system. A culvert with a minimum 8-square foot opening in the control dam of Jumping Gully Creek is provided to allow normal flow from Jumping Gully Creek to pass unrestricted to the Withlacoochee River. Outfall D-001 discharges into a segment of the Withlacoochee wherein a site-specific alternative water quality criterion (SSAC) for dissolved oxygen (DO) have been established and continued beginning since 1990.

EFFLUENT DISPOSAL:

Surface Water Discharge:

An existing 55.0 MGD maximum daily discharge to Withlacoochee River (Class III Fresh waters), D-001. The D-001, discharge to Withlacoochee River outfall line is approximately 150 feet in length, discharges at a depth that varies with river stage, generally ranging between a depth of approximately 10 feet to a depth of approximately 30 feet and the point of discharge is located approximately at latitude 30° 37' 21" N, longitude 83° 16' 11" W.

IN ACCORDANCE WITH: The limitations, monitoring requirements and other conditions as set forth in Part I through Part VIII on pages 3 through 20 of this permit.

Appendix F. (continued)

PERMITTEE:

Packaging Corporation of America
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Issuance date: February 18, 2008
Expiration date: February 17, 2013

I. Effluent Limitations and Monitoring Requirements

A. Surface Water Discharges

1. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge process wastewater, non process wastewater, and stormwater from Outfall D-001. Such discharge shall be limited and monitored by the permittee as specified below and reported in accordance with condition I.E.3.

	Discharge Limitations			Monitoring Requirements		
Parameters (units)	**Monthly Average**	**Daily Maximum**	**Daily Minimum**	**Monitoring Frequency**	**Sample Type**	**Sample Point**
Flow (MGD)	--	Report	--	Continuous	PLC	EFF-1
Upstream River Flow (CFS)	--	See Note 1 and I.A.12	--	Daily	Calculated	CAL-1 See Note 1 and I.A.12
Downstream River Flow (CFS)	--	Report	--	Daily	Grab See Note I.A.11	SWD-2
Flow (RWC)	--	20% RWC See I.A.5	--	Daily	Calculated	CAL-1 See I.A.5
pH (SU)	--	9.0	6.0	Daily	Grab	EFF-1
Oxygen, Dissolved (DO) (MG/L)	--	--	1.5	Daily	Grab	EFF-1
Biochemical Oxygen Demand-5 (LBS/D)	--	Note 1	--	Daily	24-hour time proportioned composite	EFF-1
Solids, Total Suspended (LBS/D)	--	Note 1	--	3/week	24-hour time proportioned composite	EFF-1
Color (PCU)	--	Note 2	--	Daily	Grab	EFF-1
Turbidity (NTU)	--	80	--	Weekly	Grab	EFF-1
Specific Conductance (UMHO/CM)	--	3,300	--	Weekly	Grab	EFF-1
Temperature (F), Water (DEG.F)	--	Report	--	Weekly	Grab	EFF-1
Nitrogen, Total (MG/L)	--	Report	--	Quarterly	Grab	EFF-1
Nitrogen, Total (LBS/D)	--	Report	--	Quarterly	Calculated	CAL-1
Nitrogen, Kjeldahl, Total (as N) (MG/L)	--	Report	--	Quarterly	Grab	EFF-1
Nitrogen, Ammonia, Total (as N) (MG/L)	--	Report	--	Quarterly	Grab	EFF-1

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	Discharge Limitations			Monitoring Requirements		
Parameters (units)	Monthly Average	Daily Maximum	Daily Minimum	Monitoring Frequency	Sample Type	Sample Point
Ammonia, Unionized (as NH3) (MG/L)	--	0.134	--	Quarterly	Calculated	CAL-1 See I.A.8
Phosphorus, Total (MG/L)		Report		Quarterly	Grab	EFF-1
Phosphorus, Total (LBS/D)		Report		Quarterly	Calculated	CAL-1
Oil and Grease (MG/L)	--	5.9	--	Quarterly	Grab	EFF-1
Lead, Total Recoverable (UG/L)	--	9.6	--	Quarterly	Grab	EFF-1
Zinc, Total Recoverable (UG/L)	--	250	--	Quarterly	Grab	EFF-1
Hardness, as CaCO3 (MG/L)	--	Report	--	Quarterly	Grab	EFF-1
Whole Effluent Toxicity (Chronic)	See Permit Condition I.A.3					EFF-1
Oxygen, Dissolved (DO) (MG/L)	--	--	Report	Daily	Grab	SWU-1
pH (SU)	--	Report	Report	Weekly	Grab	SWU-1
Temperature (F), Water (DEG.F)	--	Report	--	Weekly	Grab	SWU-1
Specific Conductance (UMHO/CM)	--	Report	--	Weekly	Grab	SWU-1
Color (PCU)	--	Report	--	Daily	Grab	SWU-1
Turbidity (NTU)	--	Report	--	Weekly	Grab	SWU-1
Nitrogen, Total (MG/L)	--	Report	--	Quarterly	Grab	SWU-1
Nitrogen, Ammonia, Total (as N) (MG/L)	--	Report	--	Quarterly	Grab	SWU-1
Ammonia, Unionized (as NH3) (MG/L)	--	Report	--	Quarterly	Calculated	SWU-1
Phosphorus, Total (MG/L)		Report		Quarterly	Grab	SWU-1
Oil and Grease (MG/L)	--	Report	--	Quarterly	Grab	SWU-1
Lead, Total Recoverable (UG/L)	--	Report	--	Quarterly	Grab	SWU-1
Zinc, Total Recoverable (UG/L)	--	Report	--	Quarterly	Grab	SWU-1
Hardness, Total (as CaCO3) (MG/L)	--	Report	--	Quarterly	Grab	SWU-1

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	Discharge Limitations			Monitoring Requirements		
Parameters (units)	Monthly Average	Daily Maximum	Daily Minimum	Monitoring Frequency	Sample Type	Sample Point
Oxygen, Dissolved (DO) (MG/L)	--	Report	--	Daily	Grab	SWD-1
pH (SU)	--	Report	--	Weekly	Grab	SWD-1
Temperature (F), Water (DEG.F)	--	Report	--	Weekly	Grab	SWD-1
Specific Conductance (UMHO/CM)	--	Report	--	Weekly	Grab	SWD-1
Color (PCU)	--	Report	--	Weekly	Grab	SWD-1
Turbidity (NTU)	--	Report	--	Weekly	Grab	SWD-1
Nitrogen, Total (MG/L)	--	Report	--	Quarterly	Grab	SWD-1
Nitrogen, Ammonia, Total (as N) (MG/L)	--	Report	--	Quarterly	Grab	SWD-1
Ammonia, Unionized (as NH3) (MG/L)	--	Report	--	Quarterly	Calculated	SWD-1
Phosphorus, Total (MG/L)		Report		Quarterly	Grab	SWD-1
Oil and Grease (MG/L)	--	Report	--	Quarterly	Grab	SWD-1
Lead, Total Recoverable (UG/L)	--	Report	--	Quarterly	Grab	SWD-1
Zinc, Total Recoverable (UG/L)	--	Report	--	Quarterly	Grab	SWD-1
Hardness, Total (as CaCO3) (MG/L)	--	Report	--	Quarterly	Grab	SWD-1

2. Effluent samples shall be taken at the monitoring site locations listed in permit condition I.A.1 and as described below:

Sample Point	Description of Monitoring Location
EFF-1	Effluent control structure following the parshall flume flow meter. No chemical addition, including defoamers, shall occur after the sampling location.
SWD-2	In the Withlacoochee River at the USGS Gaging Station at Pinetta, Florida as reported as the USGS gaging station value at 07:00 am on the USGS website when that data is available online. If the website data is not available, the Permittee may obtain a USGS reading via telephone if available, or the Permittee shall take a manual stage reading at the USGS gaging station before 12:00 noon, and use the corresponding USGS flow rating to report the daily river flow that day.
CAL-1	Calculated Value.
SWU-1	In the Withlacoochee River, located approximately 100 feet up stream (north) of outfall D-001 (located near the confluence of Jumping Gully Creek and the Withlacoochee River). Streamside samples will be taken from the east riverbank, approximately four to five feet out from the

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Sample Point	Description of Monitoring Location
	water's edge.
SWD-1	In the Withlacoochee River, near Florida Highway 150 Bridge. Streamside samples will be taken approximately four to five feet out from the water's edge or mid-river from the bridge, as appropriate.

Note 1: The following discharge limitations shall apply at EFF-1:

	Discharge Limitation		
Parameter	Monthly Average	Daily Maximum*	Annual Average **
BOD_5*	6,434 lbs/day	12,869 lbs/day	5,550 lbs/day
TSS	10,760 lbs/day	16,140 lbs/day	

* The maximum allowable loading of BOD_5 (lb/day) discharged in any one day at EFF-1 shall not exceed 12.0 lb/day of BOD_5 for each cubic foot/second (cfs) of river flow.

If the upstream dissolved oxygen is less than 4.6 mg/l, then the following loading will apply:

Upstream D.O. (mg/l)	Loading lb/Day/River cfs
4.5	10
4.4	8
4.3	6
4.2	4
<4.1	2

Effluent BOD_5, upstream river flow, BOD_5 lb/day/river cfs and appropriate BOD_5/cfs limits shall be tabulated for each month and submitted with the monthly discharge monitoring report (DMR). The upstream river flow value is used to calculate the pounds per day of BOD5 for each cubic foot/second of stream flow.

** The annual average BOD_5 shall be a 12-month moving average.

Note 2: Color limits were established to meet the transparency standard of FAC Rule 62-302.530(68), in the receiving water based upon full mixing. Full mixing was determined to be a length of 1,171 feet from outfall structure D-001 in conjunction with the mixing zones established in Part I.A.4. Therefore, full mixing length is recognized for demonstrating compliance with the transparency standard in the receiving water.

From the effective date of this permit the permittee shall sample EFF-1 daily and discharge shall comply with the following effluent limitation:

The discharge shall not cause a greater than 50 color unit (PCU) increase in true color from natural background conditions: The maximum allowable effluent color limit is to be calculated as follows:

$$Ce = (50/RWC) + Cu$$

where:

Appendix F. (continued)

Ce = effluent color limitation, PCU
Cu = upstream color, PCU, monitored per Part I.A.1.
RWC = receiving water concentration, calculated per Part I.A.5.

The permittee shall calculate the maximum allowable effluent color for each day based on the RWC and upstream color, and shall prepare a table of the daily calculated RWC, maximum effluent color limit, and the measured effluent color value. This table shall be submitted as an attachment to the DMR

3. The permittee shall comply with the following requirements to evaluate chronic whole effluent toxicity of the discharge from outfall D-001.

   a. Effluent Limitation
      (1) Whole effluent chronic toxicity shall not result in a No Observed Effect Concentration (NOEC) of less than 20% effluent in any test. [Rule 62-302.530(61), F.A.C.]

   b. Monitoring Frequency
      (1) "Routine" toxicity tests shall be conducted annually, the first starting within one year from last test, and lasting for the duration of this permit unless a reduction in the frequency of monitoring is granted in writing by the Department.

   c. Test Requirements
      (1) Routine Tests: All routine tests shall be conducted using a control (0% effluent) and one test concentration of **20%** final effluent. The Permittee may opt to run a series of dilutions that include a 20% concentration.
      (2) Additional Follow-up Tests, if required:
         (a) If a routine test does not meet the chronic toxicity limitation in 3.a.(1) above, the permittee shall conduct three additional follow-up tests on each species that failed the test.
         (b) The first additional follow-up test shall be conducted using a control (0% effluent) and a minimum of five dilutions. The dilution series should bracket the target concentration such that at least two dilutions above (not to exceed 100% effluent) and two dilutions below the target concentration (20%) and a control (0% effluent) are run. All test results shall be statistically analyzed according to the Appendices in EPA-821-R-02-013.
         (c) The first test shall be initiated within two weeks of the end of the failed routine test. The remaining additional follow-up tests shall be conducted weekly thereafter until a total of three valid additional follow-up tests are completed.
      (3) The permittee shall conduct a daphnid, **Ceriodaphnia dubia**, Survival and Reproduction Test and a fathead minnow, **Pimephales promelas**, Larval Survival and Growth Test, concurrently.
      (4) All test species, procedures and quality assurance criteria used shall be in accordance with **Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms**, 4th ed., EPA-821-R-02-013. Any deviation of the bioassay procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use. In the event the above method is revised, the permittee shall conduct chronic toxicity testing in accordance with the revised method.
      (5) The control water and dilution water used shall be moderately hard water as described in EPA-821-R-02-013, Section 7.

   d. Sampling Requirements
      (1) For each routine or additional follow-up test required, a total of three 24-hour composite samples of final effluent shall be collected and used per the sampling protocol discussed in EPA-821-R-02-013, Section 8.

Appendix F. (continued)

(2) The first composite sample shall be used to initiate the test. The remaining two composite samples shall be collected according to the protocol and used as renewal solutions on Day 3 (48 hours) and Day 5 (96 hours) of the test.

e. Quality Assurance Requirements
(1) A standard reference toxicant (SRT) quality assurance (QA) chronic toxicity test shall be conducted with each species used in the required toxicity tests either concurrently or started no more than 30 days before the date of each routine or additional follow-up test conducted. The SRT-QA data shall be included in the reports for each companion routine or additional follow-up test required.
(2) If the mortality in the control (0% effluent) exceeds 20% for either species in any test or does not meet "test acceptability criteria", the test for that species (including the control) shall be invalidated and the test repeated. Test acceptability criteria for each species are defined in EPA-821-R-02-013, Section 13.12 (C. dubia) and Section 11.12 (P. promelas).
(3) If, during any test, 100% mortality occurs in the 100% effluent concentration prior to the end of the test and control mortality is less than 20% at that time, that test (including the control) shall be terminated with the conclusion that the test fails and constitutes non-compliance.
(4) Additional follow-up tests shall be evaluated for acceptability based on the observed dose-response relationship and the percent minimum significant difference (PMSD), as required by EPA-821-R-02-013, Sections 10.2.6 and 10.2.8, respectively. Results from these evaluations shall be included with the bioassay reports.
(5) The laboratory shall be certified by the Department of Health Environmental Laboratory Certification Program (DOH ELCP) for the matrix, test and analyte (organism) being measured to comply with this permit.

f. Reporting Requirements
(1) Results from all required tests shall be reported on the Discharge Monitoring Report (DMR) in the following manner:
(a) Routine Test Results: If the NOEC of a test species is greater than or equal to 20% effluent, ">20%" should be entered on the DMR for that species. If the NOEC of a test species is less than 20% effluent, "<20%" should be entered. If a dilution series bioassay test is run for the routine test, the % effluent determined to be the NOEC concentration may be entered.
(b) Additional Test Results: Report the % effluent determined to be the NOEC endpoint of the test.
(2) A bioassay laboratory report for each routine test shall be prepared according to EPA-821-R-02-013, Section 10, Report Preparation and Test Review, and mailed to the Department at the address below within 30 days of the completion of the test.
(3) For additional follow-up tests, a single bioassay laboratory report shall be prepared according to EPA-821-R-02-013, Section 10, and mailed within 45 days of completion of the third valid additional follow-up test. If any additional follow-up test or two consecutive routine tests do not meet the effluent limitation specified in 3.a.(1) above, the permittee shall contact the Department within 30 days of the report submittal to discuss the appropriate corrective actions necessary to remedy the observed chronic toxicity.
(4) All bioassay reports shall be sent to:
Florida Department of Environmental Protection
Northeast District Office
7825 Baymeadows Way Suite 200B
Jacksonville, Florida 32256-7590

4. Mixing zones are hereby established for the following effluent parameters based on the Maximum instream waste concentration of the permittee's discharge into the Withlacoochee River. The Permittee's discharge shall not cause an exceedance of Rule 62-302.530, F.A.C., Class III fresh water quality criteria

Appendix F. (continued)

outside the described mixing zones for each parameter identified below with the exception of dissolved oxygen in accordance with the Department approved site-specific alternative criteria (SSAC). The SSAC approved on February 14, 1990 (DEP File No. VE-24-334), allows the dissolved oxygen outside of the mixing zone to not be lowered to any less than 4.0 mg/l during the months of June through October. The receiving water shall at no time have in excess of 20 percent mill effluent as calculated pursuant to Part I.A.5:

		Length Downstream from Outfall D001
a.	Dissolved Oxygen	1,171 ft
b.	Specific Conductance	721 ft.
c.	Total Recoverable Zinc	459 ft.
d.	Chronic Whole Effluent Toxicity	1,171 ft.
e.	pH	1,171 ft.
f.	Turbidity	723 ft.
g.	Unionized Ammonia as NH_3	1,171 ft.
h.	Total Recoverable Lead	639 ft.
i.	Transparency	1,171 ft.
j	Oil & Grease	1,145 ft

5. The Receiving Water Concentration (RWC) shall be calculated daily and reported monthly on the DMR. The RWC shall be calculated as the average daily effluent flow rate at EFF-1 divided by the daily downstream river flow rate as measured in the Withlacoochee River at the U.S.G.S. Gaging Station at Pinetta, Florida per Note I.A.11. The daily RWC shall not exceed 20 percent after mixing.

6. Cadmium and corresponding hardness shall be monitored quarterly at EFF-1 for a period of 24 months to ensure Water Quality Standards are not exceeded and to verify no mixing zone is needed. A report of the results will be due within 60 days following the final sample. If the report shows that the cadmium criterion has been exceeded, the permit shall be re-opened to include Cadmium in section I.A.1., and I.A.4 as allowable.

7. The Permittee shall conduct the Department approved bioassessment Plan of Study (POS) every other year. Based upon the results of the required bioassessment sampling, or any Department bioassessments of the Withlacoochee River, the permit may be reopened (in accordance with Part VI.D of the permit) to include biointegrity monitoring, reporting and limitations in accordance with FAC Rule 62-302.530(11).

8. Un-ionized ammonia shall be calculated based on a separate single grab sample for total ammonia. The pH and temperature at the time of the grab sample shall be used for the calculation and reported on the DMR. [62-302.530(3)]

9. There shall be no discharge of floating solids or visible foam in other than trace amounts.

10. The discharge shall not cause a visible sheen on the receiving water.

11. The daily downstream river flow at SWD-2 shall be reported as the USGS gaging station value at 07:00 am, as published at the USGS website when the data is available online. If the website data is not available, the Permittee may obtain a USGS reading via telephone if available, or the Permittee shall take a manual stage reading at the USGS gaging station before 12:00 noon, and shall use the corresponding USGS flow rating to report the daily river flow that day.

Appendix F. (continued)

12. The daily upstream river flow shall be calculated using the downstream flow reading and subtracting the 24-hour effluent discharge flow. The upstream river flow value is used to calculate the pounds per day of BOD5 for each cubic foot/second (cfs) of river flow, in accordance with Note 1.

B. Underground Injection Control Systems

1. This section is not applicable to this facility.

C. Land Application Systems

1. This section is not applicable to this facility.

D. Other Methods of Disposal or Recycling

1. There shall be no discharge of industrial wastewater from this facility to ground or surface waters of the State of Florida, except as authorized by this permit.

E. Other Limitations and Monitoring and Reporting Requirements

1. The sample collection, analytical test methods and method detection limits (MDLs) applicable to this permit shall be in accordance with Rule 62-4.246, Chapters 62-160 and 62-601, F.A.C., and 40 CFR 136, as appropriate. The list of Department established analytical methods, and corresponding MDLs (method detection limits) and PQLs (practical quantification limits), which is titled "Florida Department of Environmental Protection Table as Required By Rule 62-4.246(4) Testing Methods for Discharges to Surface Water" is available at http://www.dep.state.fl.us/labs/guidance/index.htm. The MDLs and PQLs as described in this list shall constitute the minimum acceptable MDL/PQL values and the Department shall not accept results for which the laboratory's MDLs or PQLs are greater than those described above unless alternate MDLs and/or PQLs have been specifically approved by the Department for this permit. Any method included in the list may be used for reporting as long as it meets the following requirements:

   a. The laboratory's reported MDL and/or PQL values for the particular method must be equal or less than the corresponding method values specified in the Department's approved MDL and PQL list;

   b. The laboratory reported MDL and/or PQL for the specific parameter is less than or equal to the permit limit or the applicable water quality criteria, if any, stated in Chapter 62-302, F.A.C. Parameters that are listed as "report only" in the permit shall use methods that provide a MDL, which is equal to or less than the applicable water quality criteria stated in 62-302, F.A.C.; and

   c. If the MDLs and/or PQLs for all methods available in the approved list are above the stated permit limit or applicable water quality criteria for that parameter, then the method with the lowest stated MDL and/or PQL shall be used.

   The permittee shall always report the laboratory MDL and/or PQL values for the analyses for that were performed.

   Where necessary, the permittee may request approval of alternate methods or for alternative MDLs or PQLs for any approved analytical method. Approval of alternate laboratory MDLs and PQLs are not necessary if the laboratory reported MDLs and PQLs are less than or equal to the permit limit or the applicable water quality criteria, if any, stated in Chapter 62-302, F.A.C. Approval of an analytical method not included in the above-referenced list is not necessary if the analytical method is in accordance with 40 CFR 136 and 62-160.330, F.A.C.

Appendix G. EPA End Sheet

The Bioassay of Packaging Corporation of America effluent sampled on August 22, 24, and 26, 2011. NPDES #FL0000281.

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	2	8	1 11 12	1	1	0	8	2	2	18 **B**	19 **S**	20 2

Remarks

66

The Priority Pollutants Analysis of Packaging Corporation of America effluent sampled on August 24, 2011. NPDES #FL0000281.

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	2	8	1 11 12	1	1	0	8	2	4	18 **X**	19 **S**	20 2

Remarks

66

Biological Analyses of Packaging Corporation of America effluent sampled on August 24, 2011. NPDES #FL0000281.

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	2	8	1 11 12	1	1	0	8	2	4	18 **S**	19 **S**	20 2

Remarks

66