

Effluent Quality Assessment

Florida Power and Light Company
St. Lucie Plant

St. Lucie County

NPDES #FL0002208

Sampled April 5, 2010

June 2010

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
NELAC Certification No. E31780

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Florida Power & Light Company – St. Lucie Plant, 6501 S. Ocean Drive, Jensen Beach, St. Lucie County, Florida, 34957. NPDES #FL0002208. Effluent grab samples for bioassay and chemical analyses for this facility were collected on April 5, 2010.

Introduction

Florida Power & Light Company – St. Lucie Plant is a nuclear power plant which treats industrial wastewater through neutralization, settling, ion exchange, and microfiltration. (See Appendix F for detailed facility information provided by Terry Davis of FDEP Southeast District.)

Methods

Samples were collected from the EFF-2 NPDES sampling point for Outfall D-001 by Terry Davis and Danielle Melnick (FDEP Southeast District) according to permit requirements. Two five-gallon portions of the once-through cooling water (OTCW) were obtained from the discharge from Unit #2 and 8 mL of a chemical solution consisting of 30 ppm ETA, 25 ppm N_2H_4, and 20 ppm CH_2 was added to each to simulate normal discharge. The samples for all analyses were taken from the two five-gallon portions.

See Appendix A for the completed chain of custody form.

The 96-hour acute screening toxicity tests and algal growth potential test were performed following internal DEP SOPs TA07_03, TA07_04, 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 salinity of the sample was adjusted from an initial salinity of 36.4 ppt to a final salinity of 34.9 ppt by the addition of deionized water, in order to conform to the method requirements for saltwater test species.

Results and Discussion

Toxicity Test Results

Tests were performed April 6 -10, 2010.

Americamysis bahia 96-hour acute screening bioassay –	LC_{50} > 100%, 5%* mortality in 100% sample at 96 hours
Menidia beryllina 96-hour acute screening bioassay –	LC_{50} > 100%, 0%* mortality in 100% sample at 96 hours

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

*NOTE: In a 96-hour acute screening test of 100% effluent, mortality of <20% provides confidence that the effluent meets the acute toxicity criterion of Florida's Surface Water Quality Standards (Rule 62-302.500 (1) (a) 4, F.A.C.). Mortality between 20-50% indicates low to moderate levels of toxicity, and further action may be required. Mortality of >50% indicates that the effluent fails to meet the minimum requirement to discharge to waters of the state (Rule 62-4.244(3) (a), F.A.C.).

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 3.0 U (U - Material was analyzed for but not detected; the value reported is the minimum detection limit) mg dry wt/L of the saltwater species *Dunaliella tertiolecta.* Raschke and Schultz found that AGP values above 10.0 mg dry weight/L represent a “problem” threshold for marine receiving waters, implying nutrient enrichment (personal communication, Marshall Faircloth, et. al. FDEP, with Ron Raschke USEPA Region 4 1987). The ratio (17.0:1) of total nitrogen to total phosphorus suggests that the effluent is co-limited by both nitrogen and phosphorus. The ratio (2.9:1) of inorganic nitrogen and orthophosphate suggest that the effluent is nitrogen limited (Maloney et al. 1978).

See Table 1 for AGP results.

Chemistry Results

Total residual chlorine was not detected, and total ammonia was not measured in the bioassay sample in the laboratory. The total ammonia concentration in the composite sample collected and preserved for chemical analysis was 0.022 mg N/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was < 0.02 mg/L.

Aluminum was detected in the effluent at levels that comply with Class III marine water quality criteria (62-302.530, F.A.C.). Arsenic was detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL). Oils and Greases were detected in the equipment blank, but not in the effluent.

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

Conclusion

The effluent sample collected from the EFF-2 NPDES sampling point for Outfall D-001 for this facility on April 5, 2010, was not acutely toxic to either test species during the 96-hour acute screening bioassays. The effluent AGP result was less than the "problem” threshold for marine receiving waters. Effluent water quality samples collected on April 5, 2010, did not exceed any applicable water quality standards or violate any permit conditions.

Literature Cited

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

Table 1. Measured algal growth potential (AGP; mg dry weight/L) of the saltwater species *Dunaliella tertiolecta* and ratios of nitrogen to phosphorus for samples collected from the FPL - St. Lucie Plant Outfall on April 5, 2010.

FPL Co - St. Lucie Plant NPDES# FL0002208			
Location	AGP (measured)	Inorganic N:P ratio	Total N:P ratio
D-001	3.0 U	2.9	17.0

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

Table 2. Effluent limits, Class III Criteria for predominantly marine waters and chemical data for samples collected from the Florida Power & Light Company - St. Lucie Plant on April 5, 2010.

FPL Co - St. Lucie Plant NPDES# FL0002208	Class III Criteria	Effluent Limits	D-001	
Metals (µg/L unless otherwise noted)				
Aluminum	≤ 1500	-	1400	
Arsenic	≤ 50	-	1.6	I
Cadmium	≤ 8.8	-	0.09	U
Calcium (mg/L)	-	-	421	
Chromium-III	-	-	0.9	U
Copper	≤ 3.7	-	1.5	U
Iron	≤ 300	-	90	U
Lead	≤ 8.5	-	0.6	U
Magnesium (mg/L)	-	-	1380	
Nickel	≤ 8.3	-	0.75	U
Selenium	≤ 71	-	0.6	U
Silver	≤ 2.3	-	0.075	U
Zinc	≤ 86	-	15	U
Nutrients (mg/L)				
Ortho-phosphate	-	-	0.013	I
Total Phosphorus	-	-	0.021	
Total Ammonia	-	-	0.022	
Un-ionized Ammonia	-	-	≤ 0.02	c
Nitrate and Nitrite	-	-	0.016	
Total Kjeldahl Nitrogen	-	-	0.34	I
Organic Nitrogen	-	-	0.318	c
Total Nitrogen	-	-	0.356	c
General Physical and Chemical Parameters				
Dissolved Oxygen (mg/L)	≥ 4.0	-	6.6	£
pH (SU)	6.5 - 8.5	-	7.7	
Conductivity (µmhos/cm)	-	-	55580	
Temperature (°C)	-	≤ 45	34.3	
Salinity	-	-	30.4	c
Total Residual Chlorine (mg/L)	≤ 0.01	-	≤ 0.03	UQ£
Chlorophyll *a* (µg/L) - Corrected	-	-	0.55	U
Phaeophytin (µg/L)	-	-	0.4	U
Total Suspended Solids (mg/L)	-	-	13	I
Oils and Greases (mg/L)	≤ 5.0	-	1.4	UF
Flow (MGD)	-	Report	1,487	a
Hardness (mg $CaCO_3$)	-	-	6734.08	c

Value exceeds the Class III Water Quality Criteria or permit limits

a - Annual average

c - Value is calculated

F - Analyte was detected in the equipment blank (1.5 I mg/L)

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

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

Q - Sample held beyond normal holding time

£ - Measured in Central Laboratory Toxicity lab

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2010-04-05-39
FPL St. Lucie Nuclear

Requester: Michael Tanski
Field Report Prepared By: T Davis

Customer: SE-DIST
Collected By: T. Davis
Send Final Report To Terry Davis

Project ID: FYI3
Sampling Agency: SE District

PMAS: 1143

Lab ID *	Location: D001			☐ Comp ☒ Grab	Collection (begin) Eastern Central: Date 4/5/10 Time 12:20		Collection (end) Eastern Central: Date 4/5/10 Time			Bottle Group(s)**: A
	Field ID: SI-SLN-1			Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)		Storet Station Number			
	Matrix (Include type e.g. Salt, Fresh, etc): water, salt	Temp (C): 34.34°C	pH: 7.70	Sample Depth: 0.1 ☐ m ☐ ft	55.5%O		☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)		NPDES Number	
	Latitude o ' "	Longitude o ' "		Comments: 30ppm ETH, 25ppm N_2H_4, 20ppm CH_2 additive						
Lab ID *	Location: D001 Equip blank			☐ Comp ☒ Grab	Collection (begin) Eastern Central: Date 4/5/10 Time 12:10		Collection (end) Eastern Central: Date 4/5/10 Time			Bottle Group(s)**: B
	Field ID: SI-SLN-2			Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L): 127.5%O		Storet Station Number			
	Matrix (Include type e.g. Salt, Fresh, etc): ice del	Temp (C): 34.54°C	pH: 7.78	Sample Depth: 0.1 ☐ m ☐ ft	565%O		☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)		NPDES Number	
	Latitude o ' "	Longitude o ' "		Comments: 30ppm ETH, 25ppm N_2H_4, 20						
Lab ID *	Location			☐ Comp ☐ Grab	Collection (begin) Eastern Central: Date Time		Collection (end) Eastern Central: Date Time			Bottle Group(s)**
	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	
	Latitude o ' "	Longitude o ' "		Comments						
Lab ID *	Location			☐ Comp ☐ Grab	Collection (begin) Eastern Central: Date Time		Collection (end) Eastern Central: Date Time			Bottle Group(s)**
	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	
	Latitude o ' "	Longitude o ' "		Comments						

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
T Davis	5 April 10 1530	FedEx		4-6-10 0515			M. Faircloth	4-6-10 1042

2 Biscayne Bay mt 4-6-10

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

FDEP Biology Laboratory - Acute Bioassay Bench Sheets

Facility: FPL St. Lucie Nuclear

Address: 6501 S. Ocean Drive

City: Jensen Beach **County:** St. Lucie 34957

Contact/District: Terry Davis / Southeast

NPDES Permit #: FL 000 2208

LIMS Job #: TLH-2010-04-06-31 **LIMS Sample #:** 1261599

Lims Data Entry: MF 4-12-10 Data Entry Verification: JD 4.12.10

Sample Collection: Date: 4-5-10 Time: 12:20 PM

Hold Time Start: Date: 4-5-10 Time: 12:20 PM

Comments: (A) Sample Salinity adjusted with DI water to 35±1 ppth salinity to conform with method requirement for test species MF 4-12-10

Tested concentration = approximately 96% sample.

Initial sample handling:

Instructions: Check yes or no. If yes is checked, complete blanks

PH adjustment : ☐ yes ☑ no Initial pH: ____ NaOH ____N HCl ____N ____Drops mL Final pH: ____

Aeration : ☐ yes ☒ no Initial DO: ____mg/L Final DO: ____mg/L Duration: ____minutes Rate: ~____bubbles/min

Salinity adjusted (Test 1): ☑ yes ☐ no Initial Salinity: 36.4 Final Salinity: 34.9 Salts Hypersaline brine (DI water) (A)

Salinity adjusted (Test 2): ☑ yes ☐ no Initial Salinity: 36.4 Final Salinity: 34.9 Salts Hypersaline brine (DI water) (A)

Dechlorination: ☐ yes ☒ no ____mL of 0.025N Sodium Thiosulfate per liter of sample. Final TRC: ____

Sample Validation:

Instructions: Check yes or no. Fill in temperatures.

Temperature: Shipped ≤ 6°C ☑ Yes ☐ No — IF Hand Delivered: Cooling ☐ Yes ☐ No (received ____°C collected____°C)

Holding Time: ≤ 36 Hours ☑ Yes ☐ No (Composite-end of collection; grab-when collected; 4 in 24 - time last sample collected)

Investigators' Signatures:	Initials:
Marshall Faircloth	MF
Amelia Rankin	AGR
James Dimmitt	JD
Brent Alexander	BA

REVIEWER: Liz Miller

Diluent/Control Batch#:	MF 4-5-10			ASW 35ppth 4-5-10					
Water Quality Parameters	20% DMW	Well Water	Moderately Hard Water	Salt Water (ASW) NSW Test 1	Salt Water (ASW) NSW Test 2	Other: Salinity adjusted Sample	Original Sample	Measured by	Verified by
Field Total Residual Cl_2 (mg/L):	N/A	N/A	N/A	N/A	N/A	N/A	not measured	—	MF
Lab Total Residual Cl_2 (mg/L):				<0.03	<0.03		<0.03	JD	MF
Alkalinity (mg/L as $CaCO_3$):				218	218			AGR	MF
Hardness (mg/L as $CaCO_3$):				—	—		~~—~~	~~MF~~	MF
Total Ammonia (mg/L as N):				—	—		* —	—	—
Conductivity: ☐ µmhos ☑ mmhos				53.7	53.8	52.8	55.1	MF	JD
Salinity (ppth):				35.5	35.5	34.9	36.4	MF	JD

* ~~Repeated~~ sample value from Chemistry section - MF value from chemistry not entered on bioassay sheet MF 4-23-10

V 1.8 1/13/10

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample # 1261599 **SOP#: TA 07** 03 **Test #** 1 **of** 2

Test Species:
35ppt Batch #: 4-6-10 Age: 5days
- ☐ *Ceriodaphnia dubia*
- ☐ *Cyprinella leedsi*
- ☐ *Pimephales promelas*
- ☐ *Menidia beryllina*
- ☑ *Americamysis bahia*
- ☐ Other:____________

Test Validation
Control Survival ≥ 90%: ☑ Yes ☐ No
Temperature Range ≤ 3° C: ☑ Yes ☐ No

Diluent (Batch # 4-5-10 **)**
☑ ASW ☐ 20% DMW
☐ MHW ☐ Well

Test Type: ☑ Acute ☐ Definitive
☐ Static ☑ Static Renewal ☐ Flow-Through

Test Duration:
☐ 48 hr
☒ 96 hr
☐ ___hr

Chamber Size 1000 **ml**
Test Volume: 510 **ml**

Test Started: Date 4-6-10 Time 1330

Test Ended: Date 4-10-10 Time 1330

Concentration	Replicate	Chamber #	0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	A1	5	5	5	5	5	5
	B	A2	5	5	5	5	5	5
	C	A3	5	5	5	5	5	5
	D	A4	5	5	5	5	5	5
100%	A	A5	5	5	5	5	5	5
	B	A6	5	5	5	5	5	5
	C 1D MF	A7	5	4D	4	4	4	4
	D	A8	5	5	5	5	5	5
		Checked or Verified by:	MF	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Loaded/ Verified by: JD / MF
m = missing, d = dead, BR/AR Before/ After Renewal

Food
- ☐ YCT Batch#______
- ☐ P. subcapitata Batch#______
- ☑ Artemia Lot# 23613

Feeding and Artemia Batch #
- ☑ 0 hr 69-10 ☑ Prior to Test
- ☑ 24 hr 70-10
- ☑ 48 hr 71-10 ☑ Prior to Renewal
- ☑ 72 hr 72-10

Temperature Range (°C)

Incubator # 2
min. 25.3 max. 26.9 mean 26.1

Incubator #___
min.______max.______mean______

Waterbath #___
min.______max.______mean______

Room B246
min. 25.1 max. 25.9 mean 25.5

Light intensity (ft. candles): 50-100

Photoperiod (hours): 16 light, 8 dark

Test Results:
Screening Tests: Report LC50 as >100%, =100%, or <100%.
% mortality in 100% sample: ~~Ø~~ 5% LC50: >100%
Calculated LC50 (Definitive) 95% CI_______ Method_______

Comments:

V. 2.5 1-13-10

Pg 44

Substitute highest test concentration used if other than 100% (example: Ocean outfall tested at 30% concentration)

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample # 1261599 | SOP#: TA 07 04 | Test # 2 of 2

Test Species:
35ppt Batch #: 4-6-10 Age: 13 days
- ☐ Ceriodaphnia dubia
- ☐ Cyprinella leedsi
- ☐ Pimephales promelas
- ☑ Menidia beryllina
- ☐ Americamysis bahia
- ☐ Other:_____

Test Validation
Control Survival ≥ 90%: ☑ Yes ☐ No
Temperature Range ≤ 3° C: ☑ Yes ☐ No

Diluent (Batch # 4-5-10)
☑ ASW ☐ 20% DMW
☐ MHW ☐ Well

Test Type: ☑ Acute ☐ Definitive
☐ Static ☑ Static Renewal ☐ Flow-Through

Test Duration:
☐ 48 hr
☑ 96 hr
☐ __hr

Chamber Size 1000 ml
Test Volume: 500 ml

Test Started: Date 4-6-10 Time 1330

Test Ended: Date 4-10-10 Time 1350

Concentration	Replicate	Chamber #	0 hr*	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	A9	5 10mf	4 1D	4	4	4	4
	B	A10	5 10mf	4 1D	4	4	4	4
	C	A11	5 10mf	5	5	5	5	5
	D	A12	5 10mf	5	5	5	5	5
100%	A	A13	5 10mf	5	5	5	5	5
	B	A14	5 10mf	5	5	5	5	5
	C	A15	5 10mf	5	5	5	5	5
	D	A16	5 10mf	5	5	5	5	5
Checked or Verified by:			mf	JD	JD	JD	JD	BA

Loaded/ Verified by: JD / mF

m = missing, d = dead, BR/AR Before/ After Renewal

Food
- ☐ YCT Batch#____
- ☐ P. subcapitata Batch#____
- ☑ Artemia Lot# 23613

Feeding and Artemia Batch #
- ☑ 0 hr 6-9-10 ☑ Prior to Test
- ☐ 24 hr____
- ☑ 48 hr 7-1-10 ☑ Prior to Renewal
- ☐ 72 hr____

Temperature Range (°C)

Incubator # 2
min. 25.3 max. 26.9 mean 26.1

Incubator #___
min.____max.____mean____

Waterbath #___
min.____max.____mean____

Room B246
min. 25.1 max. 25.9 mean 25.5

Light intensity (ft. candles): 50-100

Photoperiod (hours): 16 light, 8 dark

Test Results:
Screening Tests: Report LC50 as >100%, =100%, or <100%.
% mortality in 100% sample: Ø % LC50: >100 %
Calculated LC50 (Definitive) 95% CI_____ Method_____

Comments: * mF recorded 10 incorrectly (looking at the chronic test). there were 5 organisms in each of the test chambers. mF 4-22-10

V. 2.5 1-13-10

Substitute highest test concentration used if other than 100% (example: Ocean outfall tested at 30% concentration)

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Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Parameter Sheet

LIMS Sample # 126159 Test # 1 of 2

Test Species:

☐ *Ceriodaphnia dubia* ☐ *Pimephales promelas* ☒ *Americamysis bahia*
☐ *Cyprinella leedsi* ☐ *Menidia beryllina* ☐ Other:_____

Test aerated: (if DO is < 4.0 mg/L) ☐ Yes ☒ No

Concentration	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☒ mmhos	Salinity* (ppth)
Control	A	0 hr	8.3	25.2	6.5	53.7	35.5
	B	24 hr	8.2	25.5	6.4	53.9	35.6
	C	48 hr BR	8.1	25.3	6.4	55.0	36.1
	C	48 hr AR	8.2	25.3	6.8	52.8	34.8
	D	72 hr	8.1	25.0	6.1	53.6	35.5
	A	96 hr	8.1	24.4	4.9	55.4	36.0
100%	A	0 hr	8.2	25.0	6.5	52.7	34.9
	B	24 hr	8.0	25.3	6.3	53.1	35.1
	C	48 hr BR	7.9	25.5	5.6	53.3	35.2
	C	48 hr AR	8.1	24.9	6.6	52.0	34.1
	D	72 hr	7.8	24.7	6.4	53.9	35.5
	A	96 hr	7.8	24.4	5.0	54.1	35.7
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

*Measure/ record salinity for marine tests

Comments:

Measured By:
0 hr: MK
24 hr: AMC
48 hr BR: AMC
48 hr AR: AMC
72 hr: AR
96 hr: BA

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Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Parameter Sheet

LIMS Sample # 1261599 Test # 2 of 2

Test Species:

☐ *Ceriodaphnia dubia* ☐ *Pimephales promelas* ☐ *Americamysis bahia*
☐ *Cyprinella leedsi* ☑ *Menidia beryllina* ☐ Other:_____

Test aerated: (if DO is < 4.0 mg/L)
☐ Yes ☑ No

Concentration	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☑ mmhos	Salinity* (ppth)
Control	A	0 hr	8.3	25.3	6.5	53.8	35.5
	B	24 hr	8.2	25.2	6.1	54.1	35.7
	C	48 hr BR	8.2	24.9	6.6	54.5	36.0
	C	48 hr AR	8.3	25.1	7.0	52.6	34.6
	D	72 hr	8.1	25.0	6.8	54.3	35.9
	A	96 hr	8.2	25.8	5.7	55.0	36.5
100%	A	0 hr	8.1	24.9	6.5	52.8	34.9
	B	24 hr	8.0	25.3	5.9	53.1	35.0
	C	48 hr BR	8.0	25.4	6.9	53.6	35.5
	C	48 hr AR	8.1	24.9	7.1	52.4	34.5
	D	72 hr	7.9	24.6	6.5	53.3	35.2
	A	96 hr	8.0	25.6	5.7	54.0	35.7
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
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		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

*Measure/ record salinity for marine tests

Comments:

Measured By:
0 hr: MF
24 hr: ATC
48 hr BR: ATC
48 hr AR: ATC
72 hr: ALR
96 hr: BA

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V. 2.3 1-13-10

Bioassay Instrument ID

Test ID: FPL St. Lucie Nuclear Dates: 4-6-10 — 4-10-10

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

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

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

entered 4-12-10 MF

V 1.1 6/12/08 MF

Appendix C. SRT Bench Sheets and Statistical Analysis

Florida Department of Environmental Protection
Bureau of Laboratories

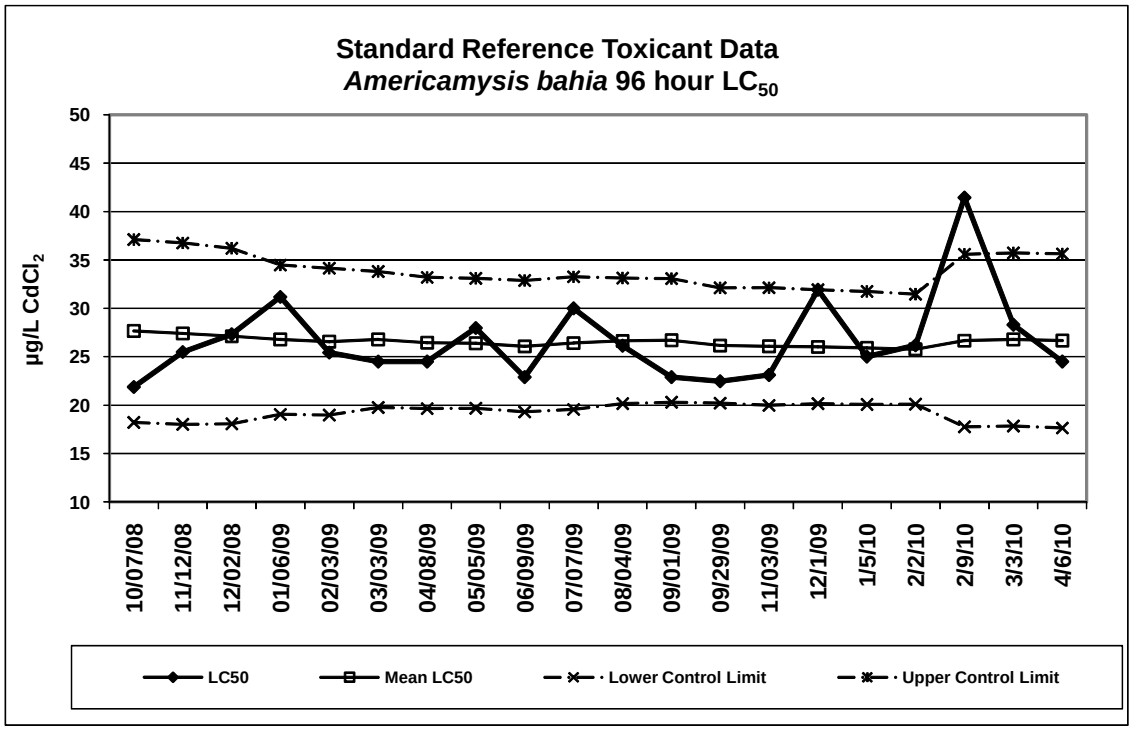
Standard Reference Toxicant (SRT) Test Data - 96-hour Acute Toxicity
Americamysis bahia (mysid shrimp) - Cadmium Chloride ($CdCl_2$)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
10/07/08	21.89	27.66	4.73	18.21	37.11
11/12/08	25.50	27.40	4.69	18.01	36.78
12/02/08	27.31	27.13	4.53	18.07	36.20
01/06/09	31.20	26.79	3.86	19.07	34.50
02/03/09	25.44	26.56	3.79	18.97	34.15
03/03/09	24.49	26.78	3.52	19.75	33.81
04/08/09	24.49	26.45	3.39	19.66	33.23
05/05/09	27.98	26.39	3.36	19.68	33.10
06/09/09	22.89	26.09	3.39	19.32	32.87
07/07/09	30.00	26.43	3.43	19.57	33.28
08/04/09	26.14	26.65	3.24	20.16	33.13
09/01/09	22.89	26.69	3.19	20.30	33.07
09/29/09	22.46	26.17	2.97	20.22	32.11
11/03/09	23.12	26.08	3.04	20.00	32.15
12/1/09	31.91	26.03	2.94	20.16	31.91
1/5/10	25.00	25.91	2.92	20.06	31.75
2/2/10	26.18	25.77	2.84	20.09	31.46
2/9/10	41.45	26.68	4.46	17.76	35.59
3/3/10	28.31	26.78	4.47	17.84	35.72
4/6/10	24.49	26.66	4.50	17.66	35.65

CV = 16.88

Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev

EPA reference 75th quartile CV = 26%



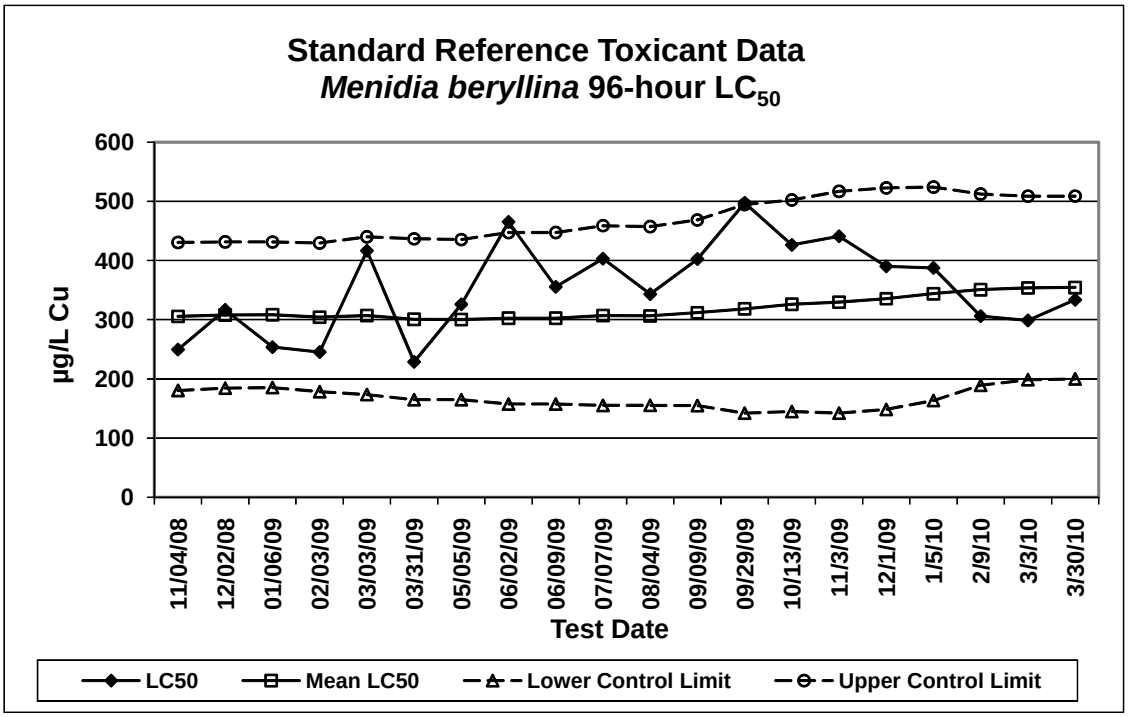
Appendix C. (continued)

Florida Department of Environmental Protection
Bureau of Laboratories

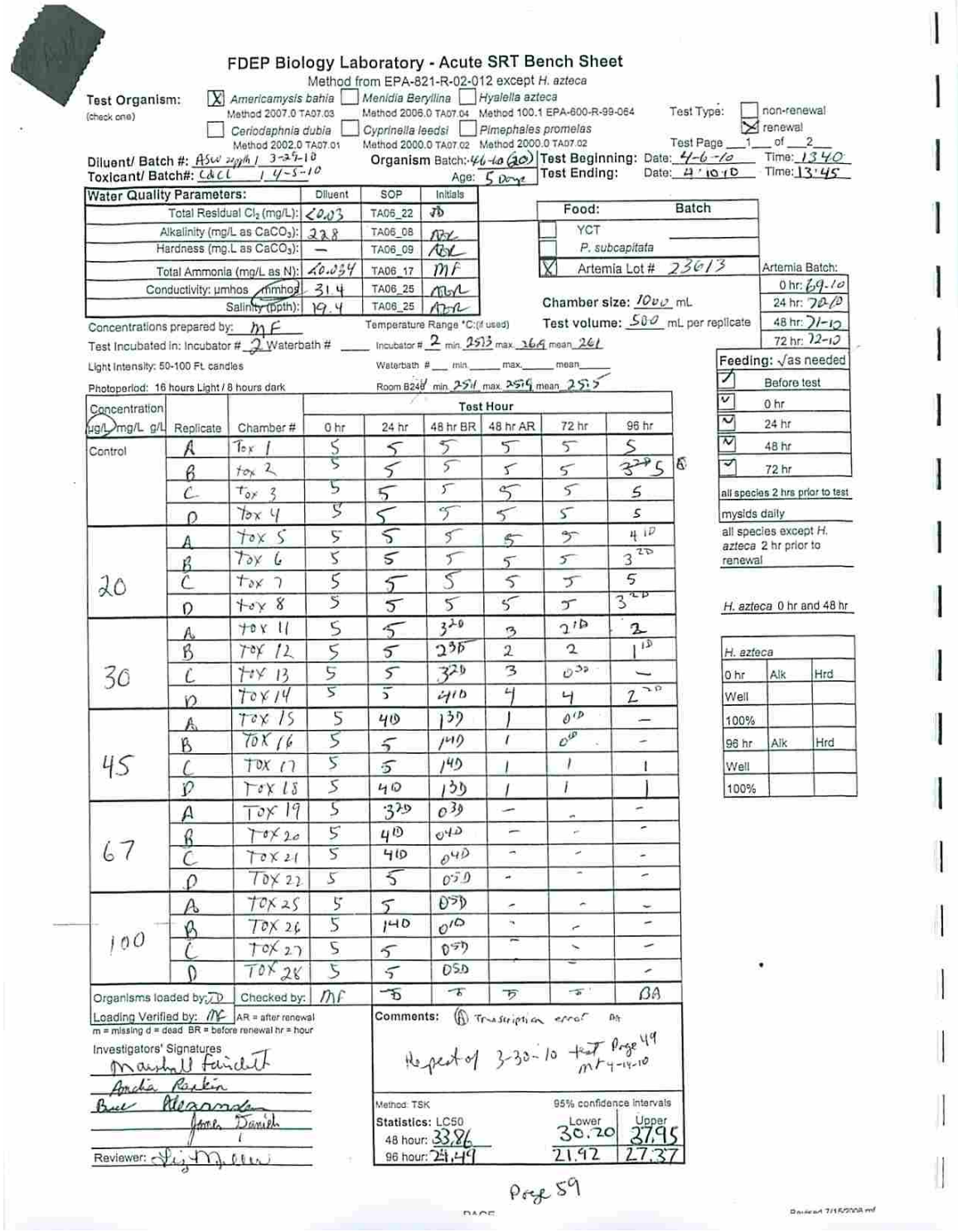
Standard Reference Toxicant (SRT) Test Data - 96-hour Acute Toxicity
Menidia beryllina (inland silverside) - Copper Chloride ($CuCl_2$) as Cu

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
11/04/08	249.81	305.57	62.50	180.57	430.57
12/02/08	316.79	308.13	61.82	184.48	431.78
01/06/09	253.83	308.45	61.51	185.44	431.46
02/03/09	245.51	304.15	62.80	178.55	429.74
03/03/09	416.64	307.01	66.63	173.74	440.27
03/31/09	228.94	300.89	67.96	164.97	436.80
05/05/09	326.07	300.24	67.64	164.97	435.52
06/02/09	465.39	302.54	72.50	157.54	447.53
06/09/09	355.67	302.52	72.48	157.55	447.48
07/07/09	403.35	307.19	75.91	155.37	459.02
08/04/09	343.29	306.49	75.48	155.52	457.45
09/09/09	402.57	311.84	78.40	155.03	468.65
09/29/09	497.5	318.42	88.10	142.21	494.62
10/13/09	426.5	326.12	90.57	144.97	502.27
11/3/09	441.06	329.60	93.69	142.22	516.99
12/1/09	390.28	335.59	93.54	148.51	522.68
1/5/10	387.66	343.92	90.17	163.57	524.26
2/9/10	306.1	350.85	80.73	189.39	512.30
3/3/10	298.9	353.79	77.48	198.82	508.76
3/30/10	333.83	354.48	77.23	200.03	508.94

CV = 21.79
EPA reference 75th quartile CV = 21%



Appendix C. (continued)



FDEP Biology Laboratory - Acute SRT Bench Sheet

Method from EPA-821-R-02-012 except *H. azteca*

Test Organism: (check one) [X] *Americamysis bahia* Method 2007.0 TA07.03; [ ] *Menidia Beryllina* Method 2006.0 TA07.04; [ ] *Hyalella azteca* Method 100.1 EPA-600-R-99-064; [ ] *Ceriodaphnia dubia* Method 2002.0 TA07.01; [ ] *Cyprinella leedsi* Method 2000.0 TA07.02; [ ] *Pimephales promelas* Method 2000.0 TA07.02

Test Type: [ ] non-renewal [X] renewal

Test Page 1 of 2

Diluent/ Batch #: ASW 29ppth / 3-29-10

Toxicant/ Batch#: CdCl / 4-5-10

Organism Batch: 46-10 (30) Age: 5 Days

Test Beginning: Date: 4-6-10 Time: 1340

Test Ending: Date: 4-10-10 Time: 1345

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	JD
Alkalinity (mg/L as $CaCO_3$):	228	TA06_08	MK
Hardness (mg.L as $CaCO_3$):	—	TA06_09	MK
Total Ammonia (mg/L as N):	<0.054	TA06_17	MF
Conductivity: µmhos (mmhos)	31.4	TA06_25	MK
Salinity (ppth):	19.4	TA06_25	MK

Food:	Batch
[ ] YCT	
[ ] *P. subcapitata*	
[X] Artemia Lot #	23613

Artemia Batch: 0 hr: 69-10; 24 hr: 70-10; 48 hr: 71-10; 72 hr: 72-10

Chamber size: 1000 mL

Test volume: 500 mL per replicate

Concentrations prepared by: MF

Temperature Range °C: (if used)

Test Incubated In: Incubator # 2 Waterbath # ____ Incubator # 2 min. 25.3 max. 26.4 mean 26.1

Light Intensity: 50-100 Ft. candles Waterbath # ___ min. ____ max. ____ mean ____

Photoperiod: 16 hours Light / 8 hours dark Room B248 min. 25.1 max. 25.9 mean 25.5

Feeding: √as needed

- [✓] Before test
- [✓] 0 hr
- [✓] 24 hr
- [✓] 48 hr
- [✓] 72 hr

all species 2 hrs prior to test

mysids daily

all species except *H. azteca* 2 hr prior to renewal

H. azteca 0 hr and 48 hr

H. azteca		
0 hr	Alk	Hrd
Well		
100%		
96 hr	Alk	Hrd
Well		
100%		

Concentration µg/L mg/L g/L	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	Tox 1	5	5	5	5	5	5
	B	Tox 2	5	5	5	5	5	3 2D 5
	C	Tox 3	5	5	5	5	5	5
	D	Tox 4	5	5	5	5	5	5
20	A	Tox 5	5	5	5	5	5	4 1D
	B	Tox 6	5	5	5	5	5	3 2D
	C	Tox 7	5	5	5	5	5	5
	D	Tox 8	5	5	5	5	5	3 2D
30	A	Tox 11	5	5	3 2D	3	2 1D	2
	B	Tox 12	5	5	2 3D	2	2	1 1D
	C	Tox 13	5	5	3 2D	3	0 3D	—
	D	Tox 14	5	5	4 1D	4	4	2 2D
45	A	Tox 15	5	4 1D	1 3D	1	0 1D	—
	B	Tox 16	5	5	1 4D	1	0 0D	—
	C	Tox 17	5	5	1 4D	1	1	1
	D	Tox 18	5	4 1D	1 3D	1	1	1
67	A	Tox 19	5	3 2D	0 3D	—	—	—
	B	Tox 20	5	4 1D	0 4D	—	—	—
	C	Tox 21	5	4 1D	0 4D	—	—	—
	D	Tox 22	5	5	0 5D	—	—	—
100	A	Tox 25	5	5	0 5D	—	—	—
	B	Tox 26	5	1 4D	0 1D	—	—	—
	C	Tox 27	5	5	0 5D	—	—	—
	D	Tox 28	5	5	0 5D	—	—	—
Organisms loaded by: JD		Checked by:	MF	~~D~~	~~D~~	~~D~~	~~D~~	BA

Loading Verified by: MF AR = after renewal

m = missing d = dead BR = before renewal hr = hour

Comments: (A) Transcription error DA

Repeat of 3-30-10 test Page 49 MF 4-14-10

Investigators' Signatures

Marshall Faircloth

Andria Rankin

Bree Alexander

Jason Daniels

Reviewer: Liz Miller

Method: TSK

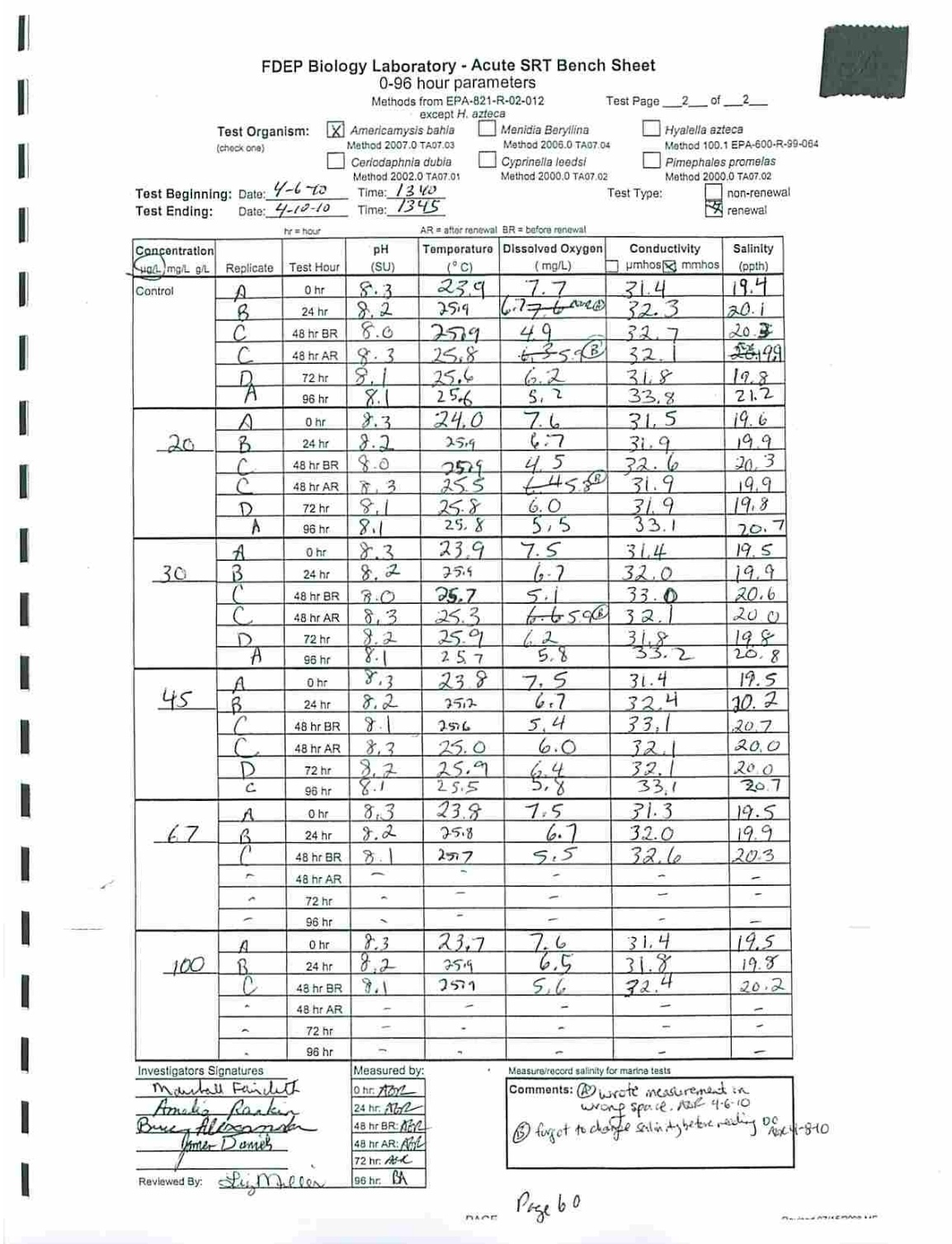
Statistics: LC50

	95% confidence intervals Lower	Upper
48 hour: 33.86	30.20	37.95
96 hour: 24.49	21.92	27.37

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Appendix C. (continued)



FDEP Biology Laboratory - Acute SRT Bench Sheet
0-96 hour parameters
Methods from EPA-821-R-02-012 except *H. azteca*
Test Page 2 of 2

Test Organism: (check one)
- [X] *Americamysis bahia* Method 2007.0 TA07.03
- [ ] *Menidia Beryllina* Method 2006.0 TA07.04
- [ ] *Hyalella azteca* Method 100.1 EPA-600-R-99-064
- [ ] *Ceriodaphnia dubia* Method 2002.0 TA07.01
- [ ] *Cyprinella leedsi* Method 2000.0 TA07.02
- [ ] *Pimephales promelas* Method 2000.0 TA07.02

Test Beginning: Date: 4-6-10 Time: 1340
Test Ending: Date: 4-10-10 Time: 1345
Test Type: [ ] non-renewal [X] renewal

hr = hour AR = after renewal BR = before renewal

Concentration µg/L mg/L g/L	Replicate	Test Hour	pH (SU)	Temperature (° C)	Dissolved Oxygen (mg/L)	Conductivity [ ] µmhos [X] mmhos	Salinity (ppth)
Control	A	0 hr	8.3	23.9	7.7	31.4	19.4
	B	24 hr	8.2	25.9	6.7 ~~6.6~~ (A)	32.3	20.1
	C	48 hr BR	8.0	25.9	4.9	32.7	20.3
	C	48 hr AR	8.3	25.8	~~6.35~~ (B)	32.1	~~20.19~~
	D	72 hr	8.1	25.6	6.2	31.8	19.8
	A	96 hr	8.1	25.6	5.2	33.8	21.2
20	A	0 hr	8.3	24.0	7.6	31.5	19.6
	B	24 hr	8.2	25.9	6.7	31.9	19.9
	C	48 hr BR	8.0	25.9	4.5	32.6	20.3
	C	48 hr AR	8.3	25.5	~~6.45~~ (B)	31.9	19.9
	D	72 hr	8.1	25.8	6.0	31.9	19.8
	A	96 hr	8.1	25.8	5.5	33.1	20.7
30	A	0 hr	8.3	23.9	7.5	31.4	19.5
	B	24 hr	8.2	25.9	6.7	32.0	19.9
	C	48 hr BR	8.0	25.7	5.1	33.0	20.6
	C	48 hr AR	8.3	25.3	~~6.65~~ (B)	32.1	20.0
	D	72 hr	8.2	25.9	6.2	31.8	19.8
	A	96 hr	8.1	25.7	5.8	33.2	20.8
45	A	0 hr	8.3	23.8	7.5	31.4	19.5
	B	24 hr	8.2	25.2	6.7	32.4	20.2
	C	48 hr BR	8.1	25.6	5.4	33.1	20.7
	C	48 hr AR	8.3	25.0	6.0	32.1	20.0
	D	72 hr	8.2	25.9	6.4	32.1	20.0
	C	96 hr	8.1	25.5	5.8	33.1	20.7
67	A	0 hr	8.3	23.8	7.5	31.3	19.5
	B	24 hr	8.2	25.8	6.7	32.0	19.9
	C	48 hr BR	8.1	25.7	5.5	32.6	20.3
	-	48 hr AR	-	-	-	-	-
	-	72 hr	-	-	-	-	-
	-	96 hr	-	-	-	-	-
100	A	0 hr	8.3	23.7	7.6	31.4	19.5
	B	24 hr	8.2	25.9	6.5	31.8	19.8
	C	48 hr BR	8.1	25.9	5.6	32.4	20.2
	-	48 hr AR	-	-	-	-	-
	-	72 hr	-	-	-	-	-
	-	96 hr	-	-	-	-	-

Investigators Signatures
Marshall Faircloth
Amelia Parker
Bruce Alexander
James Daniels

Reviewed By: Liz Miller

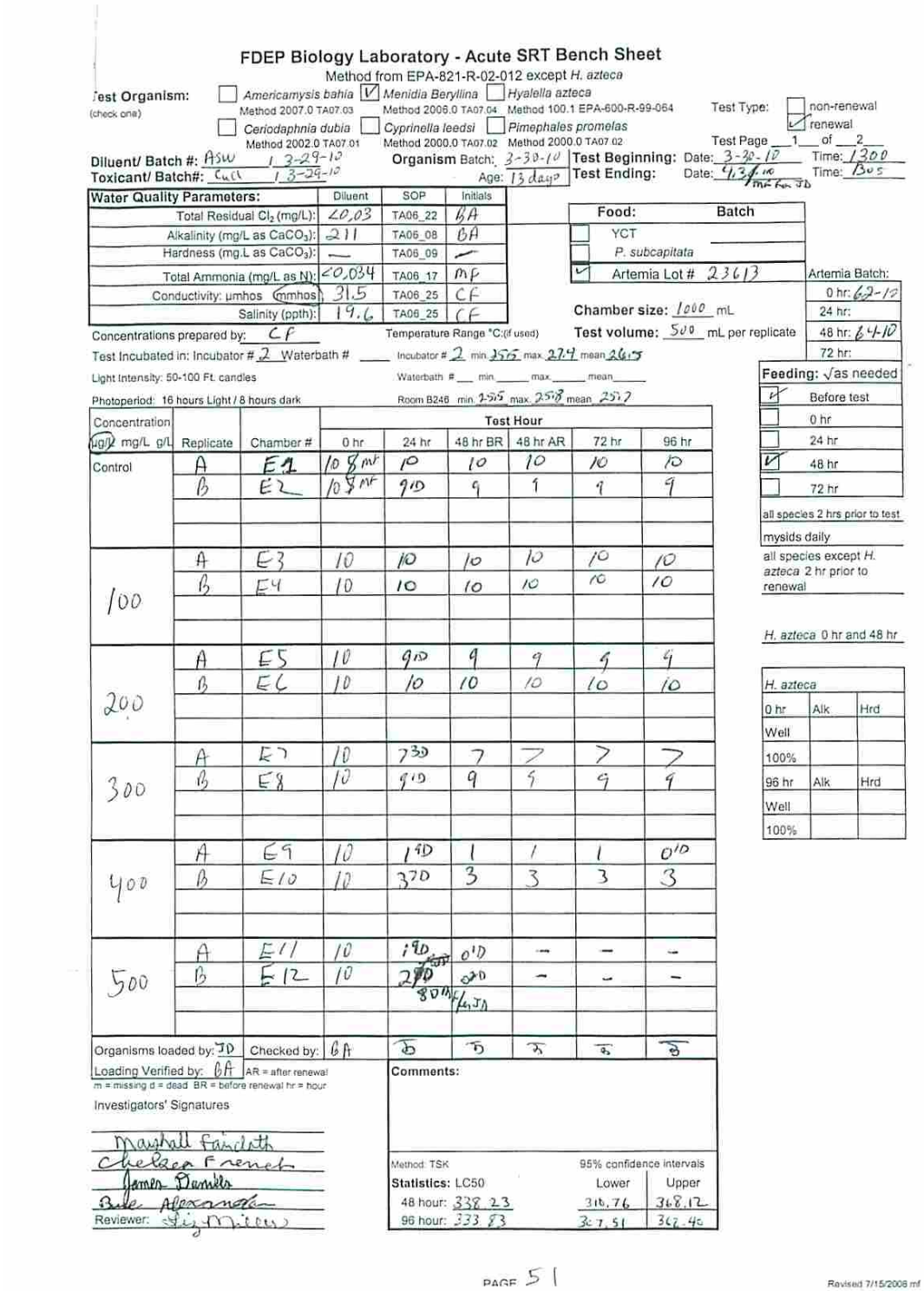
Measured by:
0 hr: AMP
24 hr: AMP
48 hr BR: AMP
48 hr AR: AMP
72 hr: AMP
96 hr: BA

Measure/record salinity for marine tests

Comments: (A) wrote measurement in wrong space. AMP 4-6-10
(B) forgot to change salinity before reading DO AMP 4-8-10

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Appendix C. (continued)



FDEP Biology Laboratory - Acute SRT Bench Sheet

Method from EPA-821-R-02-012 except *H. azteca*

Test Organism: (check one)
- ☐ *Americamysis bahia* Method 2007.0 TA07.03
- ☑ *Menidia Beryllina* Method 2006.0 TA07.04
- ☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
- ☐ *Ceriodaphnia dubia* Method 2002.0 TA07.01
- ☐ *Cyprinella leedsi* Method 2000.0 TA07.02
- ☐ *Pimephales promelas* Method 2000.0 TA07.02

Test Type: ☐ non-renewal ☑ renewal

Test Page 1 of 2

Diluent/ Batch #: ASW 13-29-10
Toxicant/ Batch#: CuCl 13-29-10
Organism Batch: 3-30-10 Age: 13 days
Test Beginning: Date: 3-30-10 Time: 1300
Test Ending: Date: 4/3/10 Time: 1305

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	BA
Alkalinity (mg/L as $CaCO_3$):	211	TA06_08	BA
Hardness (mg.L as $CaCO_3$):	—	TA06_09	—
Total Ammonia (mg/L as N):	<0.034	TA06_17	MF
Conductivity: µmhos (mmhos)	31.5	TA06_25	CF
Salinity (ppth):	19.6	TA06_25	CF

Food:	Batch
☐ YCT	
☐ *P. subcapitata*	
☑ Artemia Lot #	23613

Artemia Batch:
- 0 hr: 62-10
- 24 hr:
- 48 hr: 64-10
- 72 hr:

Chamber size: 1000 mL
Test volume: 500 mL per replicate

Concentrations prepared by: CF
Test Incubated in: Incubator # 2 Waterbath # ____ Temperature Range °C:(if used)
Incubator # 2 min 25.5 max 27.4 mean 26.5
Light Intensity: 50-100 Ft. candles
Waterbath # ___ min ____ max ____ mean ____
Photoperiod: 16 hours Light / 8 hours dark
Room B246 min 25.5 max 25.8 mean 25.7

Concentration µg/L mg/L g/L	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	E1	10 8 MF	10	10	10	10	10
	B	E2	10 8 MF	9 D	9	9	9	9
100	A	E3	10	10	10	10	10	10
	B	E4	10	10	10	10	10	10
200	A	E5	10	9 D	9	9	9	9
	B	E6	10	10	10	10	10	10
300	A	E7	10	7 D	7	7	7	7
	B	E8	10	9 D	9	9	9	9
400	A	E9	10	1 D	1	1	1	0 D
	B	E10	10	3 D	3	3	3	3
500	A	E11	10	1 D	0 D	—	—	—
	B	E12	10	2 D 8 D M	0 D	—	—	—

Organisms loaded by: JD Checked by: BA
Loading Verified by: BA
AR = after renewal
m = missing d = dead BR = before renewal hr = hour

Investigators' Signatures
Marshall Faircloth
Chelsea Frenelus
James Daniels
Bibi Alexander
Reviewer: Liz Mitchell

Comments:

Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour: 338.23	316.76	368.12
96 hour: 333.83	307.51	362.46

Feeding: √as needed	
☑	Before test
☐	0 hr
☐	24 hr
☑	48 hr
☐	72 hr

all species 2 hrs prior to test
mysids daily
all species except *H. azteca* 2 hr prior to renewal
H. azteca 0 hr and 48 hr

H. azteca		
0 hr	Alk	Hrd
Well		
100%		
96 hr	Alk	Hrd
Well		
100%		

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Appendix C. (continued)

FDEP Biology Laboratory - Acute SRT Bench Sheet
0-96 hour parameters

Methods from EPA-821-R-02-012 except *H. azteca*

Test Page 2 of 2

Test Organism: (check one)
- ☐ *Americamysis bahia* Method 2007.0 TA07.03
- ☒ *Menidia Beryllina* Method 2006.0 TA07.04
- ☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
- ☐ *Ceriodaphnia dubia* Method 2002.0 TA07.01
- ☐ *Cyprinella leedsi* Method 2000.0 TA07.02
- ☐ *Pimephales promelas* Method 2000.0 TA07.02

Test Beginning: Date: 3-30-10 Time: 1300
Test Ending: Date: 4.3.10 Time: 1305

Test Type: ☐ non-renewal ☑ renewal

hr = hour AR = after renewal BR = before renewal

Concentration µg/L mg/L g/L	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☒ mmhos	Salinity (ppth)
Control	A	0 hr	8.3	25.8	7.4	31.5	19.6
	B	24 hr	8.2	24.8	7.0	32.2	20.0
	A	48 hr BR	8.2	25.6	6.9	32.6	20.3
	A	48 hr AR	8.3	24.4	7.3	31.5	19.6
	B	72 hr	8.2	25.2	7.2	31.9	19.9
	A	96 hr	8.2	24.9	7.5	33.3	20.6
100	A	0 hr	8.3	25.6	7.4	31.8	19.8
	B	24 hr	8.2	24.7	6.6	32.3	20.2
	A	48 hr BR	8.2	25.6	6.6	32.9	20.5
	A	48 hr AR	8.3	24.3	7.2	31.9	19.9
	B	72 hr	8.2	25.3	7.2	31.9	19.9
	A	96 hr	8.2	24.8	7.4	32.9	20.5
200	A	0 hr	8.3	25.1	7.4	32.0	20.0
	B	24 hr	8.3	24.6	6.6	32.7	20.4
	A	48 hr BR	8.2	25.2	6.5	33.3	20.8
	A	48 hr AR	8.3	24.1	7.1	32.1	20.0
	B	72 hr	8.2	25.3	7.2	32.1	20.0
	A	96 hr	8.2	24.7	7.4	33.2	20.6
300	A	0 hr	8.3	25.8	7.4	32.3	20.1
	B	24 hr	8.3	24.5	6.7	32.9	20.5
	A	48 hr BR	8.2	25.1	6.6	33.7	21.0
	A	48 hr AR	8.3	24.0	7.1	mf 32.1 mf 32.3	20.0
	B	72 hr	8.2	25.5	7.2	32.3	20.1
	A	96 hr	8.2	24.7	7.4	33.4	20.9
400	A	0 hr	8.3	25.6	7.4	32.5	20.3
	B	24 hr	8.3	24.3	6.8	33.2	20.7
	A	48 hr BR	8.2	25.2	6.7	33.6	21.0
	A	48 hr AR	8.3	24.0	7.1	32.4	20.2
	B	72 hr	8.2	25.3	7.5	32.3	20.1
	A	96 hr	8.2	24.7	7.3	33.6	21.1
500	A	0 hr	8.3	25.5	7.4	32.7	20.4
	B	24 hr	8.2	24.1	6.9	33.7	21.1
	A	48 hr BR	8.2	25.2	6.8	34.2	21.4
	–	48 hr AR	–	–	–	–	–
	–	72 hr	–	–	–	–	–
	–	96 hr	–	–	–	–	–

Investigators Signatures
Marshall Frinkloth
Chelsea French
James Daniels
Blue Alexander

Reviewed By: Leigh Miller

Measured by:
0 hr: CF
24 hr: BA
48 hr BR: B
48 hr AR: B
72 hr: B
96 hr: B

Measure/record salinity for marine tests

Comments:

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Revised 07/15/2008 MF

Appendix C. (continued)

***Americamysis bahia* Acute Standard Reference Toxicant Test**

DATE: 4-6-10 DURATION: 96 hr TOXICANT: $CdCl_2$
SPECIES: *Americamysis bahia*

RAW DATA: Concentration (µg/L)	Number Exposed	Mortalities
.00	20	0
20.00	20	5
30.00	20	15
45.00	20	18
67.00	20	20
100.00	20	20

SPEARMAN-KARBER TRIM: 25.00%

SPEARMAN-KARBER ESTIMATES: LC50: **24.49**
95% LOWER CONFIDENCE: 21.92
95% UPPER CONFIDENCE: 27.37

***Menidia beryllina* Acute Standard Reference Toxicant Test**

DATE: 3-30-10 DURATION: 96 hr TOXICANT: $CuCl_2$
SPECIES: *Menidia beryllina*

RAW DATA: Concentration (µg/L)	Number Exposed	Mortalities
.00	20	1
100.00	20	0
200.00	20	1
300.00	20	4
400.00	20	17
500.00	20	20

SPEARMAN-KARBER TRIM: 0%

SPEARMAN-KARBER ESTIMATES: LC50: **333.83**
95% LOWER CONFIDENCE: 307.51
95% UPPER CONFIDENCE: 362.40

NOTE: MORTALITY PROPORTIONS WERE NOT MONOTONICALLY INCREASING. ADJUSTMENTS WERE MADE PRIOR TO SPEARMAN-KARBER ESTIMATION.

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: 3/29/10

Ship to: FDEP

P.O. No:

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia	250	6 DAYS	MS100323	25°C	8.0 S.U.	20 ‰
	150	4 DAYS	MS100325	25°C	8.0 S.U.	20 ‰
Menidia beryllina	250	10 DAYS	SS100319	25°C	8.0 S.U.	20 ‰
	150 ac	12 DAYS	SS100317	25°C	8.0 S.U.	20 ‰
						Hardness mg/L
Cyprinella leedsi						
Pimephales promelas	100 ac	12 DAYS	FM100317	25°C	7.8 S.U.	86 mg/L
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: PM

Shipped Via: FEDEX

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: 3/5/10

Ship to: FLDEP

P.O. No:

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia	100 ac	4 DAYS	MS100401	25	8.0	28‰ ✓
	150	4 DAYS	MS100401	25	8.0	20‰ ✓
Menidia beryllina	100 ac	12 DAYS	SS100324	25	8.0	28‰ ✓
						Hardness mg/L
Cyprinella leedsi	150	12/8 DAYS	CL100324	25	7.8	80 mg
		12 DAYS				
Pimephales promelas	150 ac	8 DAYS	FM100328	25	7.8	80
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by:

Shipped Via: FedEx

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 Florida Power & Light – St. Lucie Plant Outfall D-001, sampled on April 5, 2010.

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
4/5/2010 12:20	D-001	AGP/LN	Algal Growth Potential	3	U	mg DryWt/L	3	3
4/5/2010 12:20	D-001	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.4	U	ug/L	0.4	1.2
4/5/2010 12:20	D-001	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.55	U	ug/L	0.55	1.7
4/5/2010 12:20	D-001	Toxicology	BSY-AS-SW-Mysid, LC50	100	L	LC50		
4/5/2010 12:20	D-001	Toxicology	BSY-AS-SW-Fish, LC50	100	L	LC50		
4/5/2010 12:20	D-001	Metals	Selenium	0.6	U	ug/L	0.6	2.4
4/5/2010 12:20	D-001	Metals	Nickel	0.75	U	ug/L	0.75	3
4/5/2010 12:20	D-001	Metals	Magnesium	1380		mg/L	2	8
4/5/2010 12:20	D-001	Metals	Cadmium	0.09	U	ug/L	0.09	0.36
4/5/2010 12:20	D-001	Metals	Aluminum	1400		ug/L	180	720
4/5/2010 12:20	D-001	Metals	Iron	90	U	ug/L	90	360
4/5/2010 12:20	D-001	Metals	Chromium	0.9	U	ug/L	0.9	3.6
4/5/2010 12:20	D-001	Metals	Zinc	15	U	ug/L	15	60
4/5/2010 12:20	D-001	Metals	Calcium	421		mg/L	0.22	0.9
4/5/2010 12:20	D-001	Metals	Silver	0.075	U	ug/L	0.075	0.3
4/5/2010 12:20	D-001	Metals	Arsenic	1.6	I	ug/L	0.75	3
4/5/2010 12:20	D-001	Metals	Copper	1.5	U	ug/L	1.5	3
4/5/2010 12:20	D-001	Metals	Lead	0.6	U	ug/L	0.6	2.4
4/5/2010 12:20	D-001	Nutrients	Kjeldahl Nitrogen	0.34	I	mg N/L	0.16	0.4
4/5/2010 12:20	D-001	Nutrients	Total-P	0.021		mg P/L	0.008	0.02
4/5/2010 12:20	D-001	Nutrients	Ammonia-N	0.022		mg N/L	0.01	0.02
4/5/2010 12:20	D-001	Nutrients	NO2NO3-N	0.016		mg N/L	0.004	0.01
4/5/2010 12:20	D-001	Nutrients	O-Phosphate-P	0.013	I	mg P/L	0.008	0.02
4/5/2010 12:20	D-001	Nutrients	TSS	13	I	mg/L	4	16
4/5/2010 12:20	D-001	Overflow	Oil and Grease	1.4	U	mg/L	1.4	5
4/5/2010 12:20	D-001	Priority Organic Pollutants	Benzo(a)anthracene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Diethyl phthalate	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Benzo(k)fluoranthene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Hexachlorobenzene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Hexachloroethane	2.8	U	ug/L	2.8	11

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
4/5/2010 12:20	D-001	Priority Organic Pollutants	Naphthalene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	2-Chlorophenol	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	4-Nitrophenol	14	U	ug/L	14	56
4/5/2010 12:20	D-001	Priority Organic Pollutants	Benzo(b)fluoranthene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Phenanthrene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	2,4-Dinitrophenol	14	U	ug/L	14	56
4/5/2010 12:20	D-001	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.8	U	ug/L	2.8	11
4/5/2010 12:20	D-001	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	14	UJ	ug/L	14	56
4/5/2010 12:20	D-001	Priority Organic Pollutants	Dimethyl phthalate	9.3	U	ug/L	9.3	37
4/5/2010 12:20	D-001	Priority Organic Pollutants	Pentachlorophenol	2.8	U	ug/L	2.8	11
4/5/2010 12:20	D-001	Priority Organic Pollutants	2,4-Dinitrotoluene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	3,3'-Dichlorobenzidine	37	U	ug/L	37	150
4/5/2010 12:20	D-001	Priority Organic Pollutants	Acenaphthylene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Fluoranthene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Fluorene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Hexachlorobutadiene	2.8	U	ug/L	2.8	11
4/5/2010 12:20	D-001	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.4
4/5/2010 12:20	D-001	Priority Organic Pollutants	Pyrene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Benzo(a)pyrene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.8	U	ug/L	2.8	11
4/5/2010 12:20	D-001	Priority Organic Pollutants	Butyl benzyl phthalate	4.7	U	ug/L	4.7	19
4/5/2010 12:20	D-001	Priority Organic Pollutants	Di-n-butyl phthalate	4.7	U	ug/L	4.7	19
4/5/2010 12:20	D-001	Priority Organic Pollutants	Di-n-octyl phthalate	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.8	U	ug/L	2.8	11
4/5/2010 12:20	D-001	Priority Organic Pollutants	2,4-Dichlorophenol	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	2,4-Dimethylphenol	9.3	U	ug/L	9.3	37
4/5/2010 12:20	D-001	Priority Organic Pollutants	2-Chloronaphthalene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Benzidine	93	U	ug/L	93	370

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
4/5/2010 12:20	D-001	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.4
4/5/2010 12:20	D-001	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.4
4/5/2010 12:20	D-001	Priority Organic Pollutants	Phenol	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	2,6-Dinitrotoluene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	2-Nitrophenol	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.4
4/5/2010 12:20	D-001	Priority Organic Pollutants	Acenaphthene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Anthracene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Chrysene	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.8	U	ug/L	2.8	11
4/5/2010 12:20	D-001	Priority Organic Pollutants	Isophorone	0.93	U	ug/L	0.93	3.7
4/5/2010 12:20	D-001	Field Parameter	Temperature	34.34		C		
4/5/2010 12:20	D-001	Field Parameter	Sample Depth	0.1		m		
4/5/2010 12:20	D-001	Field Parameter	pH	7.7				
4/5/2010 12:20	D-001	Field Parameter	Specific Conductance	55580		umhos/cm		
4/5/2010 12:10	Blank	Metals	Aluminum	60	U	ug/L	60	240
4/5/2010 12:10	Blank	Metals	Cadmium	0.03	U	ug/L	0.03	0.12
4/5/2010 12:10	Blank	Metals	Nickel	0.25	U	ug/L	0.25	1
4/5/2010 12:10	Blank	Metals	Arsenic	0.25	U	ug/L	0.25	1
4/5/2010 12:10	Blank	Metals	Zinc	5	U	ug/L	5	20
4/5/2010 12:10	Blank	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
4/5/2010 12:10	Blank	Metals	Chromium	0.3	U	ug/L	0.3	1.2
4/5/2010 12:10	Blank	Metals	Lead	0.2	U	ug/L	0.2	0.8
4/5/2010 12:10	Blank	Metals	Copper	0.5	U	ug/L	0.5	1
4/5/2010 12:10	Blank	Metals	Silver	0.025	U	ug/L	0.025	0.1
4/5/2010 12:10	Blank	Metals	Calcium	0.075	U	mg/L	0.075	0.3
4/5/2010 12:10	Blank	Metals	Selenium	0.2	U	ug/L	0.2	0.8
4/5/2010 12:10	Blank	Metals	Iron	30	U	ug/L	30	120
4/5/2010 12:10	Blank	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
4/5/2010 12:10	Blank	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
4/5/2010 12:10	Blank	Nutrients	NO2NO3-N	0.012		mg N/L	0.004	0.01
4/5/2010 12:10	Blank	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
4/5/2010 12:10	Blank	Nutrients	Total-P	0.004	U	mg P/L	0.004	0.01
4/5/2010 12:10	Blank	Overflow	Oil and Grease	1.5	I	mg/L	1.4	5
4/5/2010 12:10	Blank	Priority Organic Pollutants	2,4-Dimethylphenol	9.7	U	ug/L	9.7	39
4/5/2010 12:10	Blank	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L	15	58
4/5/2010 12:10	Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	12
4/5/2010 12:10	Blank	Priority Organic Pollutants	Benzo(a)pyrene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	12
4/5/2010 12:10	Blank	Priority Organic Pollutants	Butyl benzyl phthalate	4.9	U	ug/L	4.9	19
4/5/2010 12:10	Blank	Priority Organic Pollutants	Chrysene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	12
4/5/2010 12:10	Blank	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	12
4/5/2010 12:10	Blank	Priority Organic Pollutants	Hexachlorobenzene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	U	ug/L	2.9	12
4/5/2010 12:10	Blank	Priority Organic Pollutants	Naphthalene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.8
4/5/2010 12:10	Blank	Priority Organic Pollutants	Phenol	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.8
4/5/2010 12:10	Blank	Priority Organic Pollutants	Di-n-butyl phthalate	4.9	U	ug/L	4.9	19
4/5/2010 12:10	Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	Diethyl phthalate	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.8
4/5/2010 12:10	Blank	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	12
4/5/2010 12:10	Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	Acenaphthene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	Anthracene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	Benzidine	97	U	ug/L	97	390
4/5/2010 12:10	Blank	Priority Organic Pollutants	Di-n-octyl phthalate	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	Dimethyl phthalate	9.7	U	ug/L	9.7	39
4/5/2010 12:10	Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.8
4/5/2010 12:10	Blank	Priority Organic Pollutants	Phenanthrene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	Pyrene	0.97	U	ug/L	0.97	3.9

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
4/5/2010 12:10	Blank	Priority Organic Pollutants	Acenaphthylene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	Isophorone	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	2-Chloronaphthalene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	2-Chlorophenol	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	2-Nitrophenol	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	39	U	ug/L	39	160
4/5/2010 12:10	Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	UJ	ug/L	15	58
4/5/2010 12:10	Blank	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	12
4/5/2010 12:10	Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	58
4/5/2010 12:10	Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	Fluoranthene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	Fluorene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	2,4-Dichlorophenol	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	Benzo(a)anthracene	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.97	U	ug/L	0.97	3.9
4/5/2010 12:10	Blank	Field Parameter	Sample Depth	0.1		m		

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

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Terry L. Davis	Contact Number: (772) 398-2806 X122
Facility Name (as it appears on permit): Florida Power & Light Company - St. Lucie Plant	Former Names:
NPDES Permit Number: FL0002208	Permit Expiration Date: 19 January, 2011
Physical Address: 6501 S. Ocean Drive, Jensen Beach, FL 34957	
District: Southeast	County: St. Lucie
Function of Facility: Electric power production	
Facility Type: Nuclear power plant – IW - Major	Permitted Capacity (MGD): Report
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): 2008-2009 D-001 (FLW-1)– Approx. 1,487 MGD once through cooling water,	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months): Zero	
Description of type of Discharge: ☒ Continuous ☐ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☐ Other, please specify	

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Appendix F. (continued)

Description of Sampling Location(s) - actual permit designation of permitted sampling point(s): Sample from I-005 (OUI-2) to be mixed with once through cooling water effluent sampled prior to receiving I-005 effluent to mimic the proportion of I-005 effluent in the D-001 effluent. There is a high probability that there will not be a discharge of ethanoamine at the time of sampling and the bioassay sample will be created by adding a volume of ethanoamine solution to a sample from the once through cooling water.
Description of Permitted Outfall(s): D-001 – Once through cooling water(OTCW) and auxiliary equipment cooling water(AECW) I-003 – Process wastewater discharged to the onsite discharge canal I-005 – Steam generator blowdown (boiler blowdown) discharged to onsite discharge canal I-06B – Former oil storage area discharged to onsite intake canal I-06C – Stormwater discharged to mangrove impoundment I-008 – Stormwater to onsite intake canal I-007 – Discharge of screen wash water at cooling water intake
Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility): D-001 – OTCW and AECW – chlorinated Low volume waste (water treatment system wastewater, steam generator/boiler blowdown, and equipment area floor drainage), non-radioactive wastes/radiation waste, and stormwater associated with industrial activity – neutralization, settling, ion exchange, and microfiltration. Non-industrial stormwater and intake screen wash water – not treated. All waters discharged through D-001 to the ocean – multi-port diffuser

Appendix F. (continued)

PART I: Continued

List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under (Leave cell blank if not applicable)

		Effluent Limitations					Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Monthly Average	Weekly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Temperature	Degrees F	113 max				30 differential	Continuous			
Tot Residual Oxidants	Mg/L	0.1 max					Continuous			
Free Avail Oxidants	Mg/L			0.2		0.5	Continuous			
Toxicity	LC50					30%	During use of ethanolamine			

Appendix F. (continued)

PART I: Continued	
Receiving Waters: Atlantic Ocean	**Classification (indicate whether fresh or marine):** Class III marine

Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.): "The permittee shall conduct the routine tests described below during 1)the first refueling outage after permit issuance and 2) during the first use of ethanolamine in the steam generator while steam generator blowdown is being discharged from Internal Outfall I-005. For both tests effluent from Internal Outfall I-005 will be collected and mixed with effluent from the once through cooling water discharged from either Unit 1 or Unit 2 to mimic the proportion of I-005 effluent in the Outfall D-001 effluent. The effluent mixture shall be termed "final" effluent." Routine tests – 100%, 50%, 30%, 12.5%, and 6.25% "final" effluent. "The permittee shall conduct 96-hour acute static renewal multi-concentration toxicity tests using the mysid shrimp, Americamysis (Mysidopsis) bahia, and the inland silverside, Menidia beryllina, concurrently."

Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.): None

Facility Mixing Zone Details (if applicable): 466,092 cubic feet thermal mixing zone in the receiving waters

List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year: None

Date	Parameter and Units	Limit	Result

Describe previous FYI and WQBEL study: FYI3 performed in April, 2004. Screening acute w/ mysid and saltwater fish – LC50 = >100%

Describe previous or current Enforcement Actions (including WLs): None

Describe any violations or problems noted in previous inspection: An April, 2009 CEI did not find any discrepancies.

Discuss whether DMR trends within previous five years are improving or declining: No trends

Appendix F. (continued)

Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse): Toxicity sample to be prepared using chemical sample prepared by FPL and from once through cooling water, very close to the requirement in the permit. There will be no discharge from the steam generator at the time and thus no possible variability in an effluent requiring the need to collect 4/24 samples. One sample will be synthesized for the bioassay and supporting analyses.

PART II: Sampling Event Information	
Date(s) sample collected: 5 April, 2010	**Sampler(s):Terry L. Davis & Danielle Melnick**
Temperature (Deg C):34.34 degrees	**pH (SU):7.70**
Dissolved Oxygen (% saturation):127.5%	**Conductivity (umhos/cm):55,520 umhos**
Total Residual Chlorine (mg/L):	**Total Residual Chlorine - after Disinfection (mg/L):**
Method of Chlorination:	**Method of De-chlorination:**
Flow During Sample Collection for each outfall(MGD): OTCW sample collected from discharge point of Unit 2 to the cooling water canal – flow rate – approximately 743.5 MGD. Unit 1 was down for refueling.	
Mean Flow for each outfall for previous 12 months based on sampling date (If samples are taken on more than one day, indicate Mean Flow for each day): Flow rate for Unit 1 during the last 12 months was approximately 743.5 MGD. The flow rate for Unit 2 during the last 12 months was approximately 681.5 MGD as the unit was down for refueling during one month.	
Describe Discharge during Sampling Event: **☒ Continuous ☐ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☒ Other, please specify – see Additional Comments section above.**	

Appendix F. (continued)

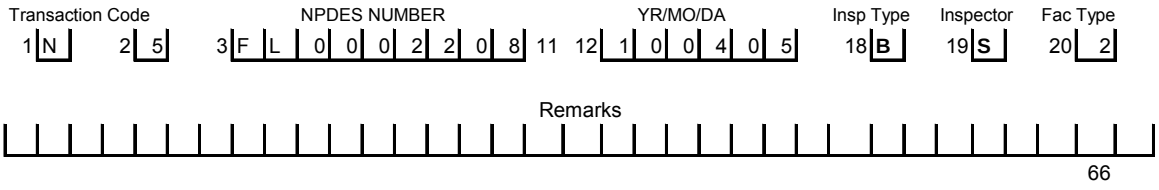
Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here: Delays due to plant security procedures delayed the placing of samples on ice. It was approximately an hour before samples were iced. Preservation with acids was normal.

Sample prepared by adding 8 ml of chemicals supplied by FPL to 5 gallons of OTCW. Chemical sample consisted of "30 ppm ETA, 25 ppm N2H2, 20 ppm CH2".

Appendix G. EPA End Sheet

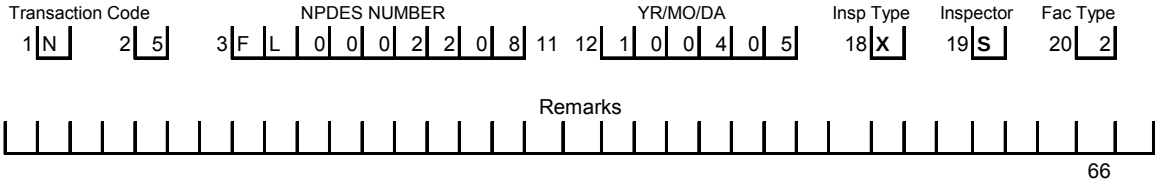
The Bioassay of FPL- St. Lucie Plant effluent sampled on April 5, 2010. NPDES #FL0002208.

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



The Priority Pollutants Analysis of FPL-St. Lucie Plant effluent sampled on April 5, 2010. NPDES #FL0002208.

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



Biological Analyses of FPL-St. Lucie Plant effluent sampled on April 5, 2010. NPDES #FL0002208.

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

