

Effluent Quality Assessment

Progress Energy Florida Crystal River Plant Units 1, 2 and 3

Citrus County

NPDES #FL0000159

Sampled August 10, 2009

January 2010

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
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Progress Energy Florida Crystal River Plant Units 1, 2 and 3, 15760 West Powerline St., Crystal River, Citrus County, Florida, 34428. NPDES #FL0000159. Effluent grab samples for bioassay and chemical analyses for this facility were collected on August 10, 2009.

Introduction

Progress Energy Florida Crystal River Plant Units 1, 2 and 3 is an electric power generating plant consisting of two fossil fuel units (Units 1 and 2) and a nuclear fuel unit (unit 3). The facility has an industrial wastewater treatment and disposal system which treats cooling water and runoff water. (See Appendix F for detailed facility information provided by Jason Cohen of FDEP Southwest District)

Methods

Samples were collected from the EFF-1C, EFF-7 and EFF-10B NPDES sampling points, respectively, for Outfalls D-013, D-00F and D-072 and from screen wash-water Outfalls D-092 and D-094 by Jason Cohen, Peter Wenner and Chris Anastasiou (FDEP Southwest District) following DEP-SOP-001/01 FS 2400 Wastewater Sampling. All DEP SOPs are available on the web at: http://www.floridadep.org/labs/qa/sops.htm.

See Appendix A for the completed chain of custody form.

The 48-hour acute screening toxicity tests and the 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.

Results and Discussion

Toxicity Test Results

Tests were performed August 11 - 13, 2009.

Americamysis bahia 48-hour acute screening bioassay – LC_{50} > 100%, 0%* mortality in 100% sample at 48 hours

Menidia beryllina 48-hour acute screening bioassay – LC_{50} > 100%, 5%* mortality in 100% sample at 48 hours

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

*NOTE: In a 48-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 Algal Growth Potential (AGP) in the effluent samples from Outfalls D-00F, D-013, and D-072 and in the lab duplicate of D-072 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 ratios of total nitrogen to total phosphorus suggest that the effluent from Outfalls D-00F and Outfall D-013 is nitrogen-limited and that the effluent from Outfall D-072 is co-limited by both nitrogen and phosphorus (Maloney et al. 1978).

See Table 1 for AGP results.

Chemistry Results

Total residual chlorine and total ammonia were not detected in the bioassay sample in the laboratory. The total ammonia concentration in the samples collected and preserved for chemical analysis from Outfalls D-013, D-00F and D-072 were, respectively, 0.01 U (U - Material was analyzed for but not detected; the value reported is the minimum detection limit) mg N/L, 0.011 I (I -The reported value is between the laboratory method detection limit (MDL) and the laboratory practical quantitation limit (PQL) mg N/L, and 0.028 mg N/L. Based on the pH, salinity, and temperature of the effluents as collected, the calculated unionized ammonia concentration in each of the samples was < 0.02 mg N/L.

OUTFALL D-013

Aluminum, total alpha particles, and radium 226 +228 were detected in the effluent at levels that comply with Class III marine water quality criteria (62-302.530, F.A.C.). Arsenic, chromium, lead and zinc were detected between the laboratory MDL and PQL. Iron (1190 mg/L; limit ≤300 µg/L, 62-302.500 (38), F.AC.), and effluent turbidity (36 NTU; limit ≤29 NTU, 62-302.500 (69), F.AC.) exceeded the Class III criteria for marine water. Zinc and nitrate + nitrite were detected in the equipment blank.

OUTFALL D-00F

Aluminum, copper, total alpha particles, and radium 226 +228 were detected in the effluent at levels that comply with Class III marine water quality criteria (62-302.530, F.A.C.). Arsenic, chromium, lead and zinc were detected between the laboratory MDL and PQL. Iron (970 mg/L; limit ≤300 µg/L, 62-302.500 (38), F.AC.) and effluent turbidity (34 NTU; limit ≤29 NTU, 62-302.500 (69), F.AC.) exceeded the Class III criteria for marine water.

OUTFALL D-072

Aluminum, arsenic, chromium, iron and zinc were detected in the effluent between the laboratory MDL and PQL. Iron (320 mg/L; limit ≤300 µg/L, 62-302.500 (38), F.AC.) exceeded the Class III criteria for marine water.

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-7 NPDES sampling point for Outfall D-00F for this facility on August 10, 2009, was not acutely toxic to either test species during the 48-hour acute screening bioassays. The AGP results from each of the three effluent samples were less than the "problem” threshold for marine receiving waters. Effluent water quality samples collected on August 10, 2009, exceeded applicable water quality standards for iron in Outfalls D-013, D-00F and D-072 and effluent turbidity in Outfalls D-013 and D-00F.

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 Progress Energy Crystal River Plant Units 1, 2 and 3 facility on August 10, 2009.

Progress Energy Florida Crystal River Plant Units 1, 2 and 3. NPDES# FL0000159.				
Location	**AGP (measured)**		**Inorganic N:P ratio ***	**Total N:P ratio**
D-013	3.0	U	-	7.7
D-00F	3.0	U	-	7.8
D-072	3.0	AU	-	11.6

* - Ortho-phosphate was not measured in the analytical chemistry sample; therefore, inorganic N:P ratios could not be calculated.

A - Value reported is the mean of two or more determinations

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 Progress Energy Florida Crystal River Plant Units 1, 2 and 3 facility on August 10, 2009.

Progress Energy Florida Crystal River Plant Units 1, 2 and 3 NPDES# FL0000159	Class III Criteria	Effluent Limits	D-013	D-00F	D-072
Organic Constituents (µg/L)					
None Detected	-	-	None Detected		
Metals (µg/L unless otherwise noted)					
Aluminum	≤ 1500	-	1200	1040	490 I
Arsenic	≤ 50	-	3 I	3.3 I	2.4 I
Cadmium	≤ 8.8	-	0.12 U	0.12 U	0.12 U
Calcium (mg/L)	-	-	356	348	347
Chromium-III	-	-	4.5 I	4 I	1.8 I
Copper	≤ 3.7	Report	2 U	2.7	2 U
Iron	≤ 300	Report	1190	970	320 I
Lead	≤ 8.5	-	0.96 I	0.83 I	0.8 U
Magnesium (mg/L)	-	-	1100	1110	1110
Mercury	≤ 0.025	-	-	-	-
Nickel	≤ 8.3	-	1.4 U	1.4 U	1.4 U
Selenium	≤ 71	-	0.8 U	0.8 U	0.8 U
Silver	≤ 2.3	-	0.1 U	0.1 U	0.1 U
Zinc	≤ 86	-	21 I	20 I	24 I
Nutrients (mg/L)					
Total Phosphorus	-	-	0.089	0.093 AJ	0.048
Total Ammonia	-	-	0.01 U	0.011 I	0.028
Un-ionized Ammonia	-	-	≤ 0.02 c	≤ 0.02 c	≤ 0.02 c
Nitrate and Nitrite	-	-	0.006 I	0.004 U	0.005 I
Total Kjeldahl Nitrogen	-	-	0.68 J	0.72	0.55
Organic Nitrogen	-	-	0.675 c	0.709 c	0.522 c
Total Nitrogen	-	-	0.686 c	0.722 c	0.555 c
General Physical and Chemical Parameters					
Dissolved Oxygen (mg/L)	≥ 4.0	-	5.3	5.3	6.6
pH (SU)	6.5 - 8.5	-	8.0	8.1	8.1
Conductivity (µmhos/cm)	-	-	47868	47800	46443
Temperature (°C)	-	-	41.8	40.7	31.8
Salinity	-	-	30.6	30.6	26.1 c
Total Residual Chlorine (mg/L)	≤ 0.01	-	≤ 0.03 UQ£	0	0
Chlorophyll *a* (µg/L) - Corrected	-	-	4.5	2.2	1.9
Phaeophytin (µg/L)	-	-	4.1	1.9	1.8
Total Suspended Solids (mg/L)	-	-	70	78	40 A
Turbidity (NTU)	< 29 t	-	36 A	34	-
CBOD, 5 day (mg/L), N - inhibited	-	-	0.81 I	1.1 I	0.94 I
Oils and Greases (mg/L)	≤ 5.0	≤ 20.0	-	1.4 U	-
Alpha, Total (pCi/L)	≤ 15	-	3.1	1.8	-
Alpha-Counting Error (pCi/L)	-	-	1.1	0.9	-
Radium 226 (pCi/L)	-	-	1.8	1.4	-
Radium 226-Counting Error (pCi/L)	-	-	0.2	0.2	-
Radium 228 (pCi/L)	-	-	1	0.8	-
Radium 228-Counting Error (pCi/L)	-	-	0.6	0.5	-
Radium 226 + 228 (pCi/L)	≤ 5	-	2.8 c	2.2 c	-
Hardness (mg $CaCO_3$)	-	-	5418.73 c	5439.94 c	5437.44 c
Flow (MGD)	-	1898 a			218.98 a

Value exceeds the Class III Water Quality Criteria or permit limits

a - Annual average

c - Value is calculated

t - Shall not exceed 29 NTUs above background

A - Value reported is the mean of two or more determinations

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

J - Estimated value

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

Q - Sample held beyond normal holding time

£ - Measurement performed in bioassay laboratory

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2009-08-10-38
Progress Energy -Crystal River

Requester: Jennifer Paris
Field Report Prepared By:

Customer: SW-DIST
Collected By: P WENNER, J COHEN, C ANASTASIOU
Send Final Report To: Ilia Balcom

Project ID: FYI5
Sampling Agency: FDEP SWD

PMAS: 1143

Lab ID *	Location / Field ID	Collection (begin)	Collection (end)	Bottle Group(s)**
37897	D-013	☐ Comp ☑ Grab Date 8/10/09 Time 1145 (Eastern) Central	Date Time (Eastern) Central	A
	Matrix: SALT Temp (C): 41.93 pH: 8.04	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L): 5.31	Storet Station Number
	Latitude: 28° 57' 31.1" N Longitude: 82° 41' 54.3" W	Sample Depth: ☑ m ☐ ft 0.2	30.59 / 47868	☑ Salinity (PPTh) ☑ Sp Conductance (umho/cm) NPDES Number
		Comments		
37898	D-00F	☐ Comp ☑ Grab Date 8/10/09 Time 1205 (Eastern) Central	Date Time (Eastern) Central	A, B
	Matrix: SALT Temp (C): 40.67 pH: 8.06	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L): 5.33	Storet Station Number
	Latitude: 28° 57' 31.2" N Longitude: 82° 41' 56.6" W	Sample Depth: ☑ m ☐ ft 0.2	30.56 / 47800	☑ Salinity (PPTh) ☑ Sp Conductance (umho/cm) NPDES Number
		Comments		
37899	EQUIPMENT BLANK	☐ Comp ☑ Grab Date 8/10/09 Time 1140 (Eastern) Central	Date Time (Eastern) Central	C
	Matrix: DI WATER Temp (C): pH:	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L):	Storet Station Number
	Latitude: ° ' " Longitude: ° ' "	Sample Depth: ☐ m ☐ ft		☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm) NPDES Number
		Comments		
37900	D-092	☐ Comp ☑ Grab Date 8/10/09 Time 1730 (Eastern) Central	Date Time (Eastern) Central	D
	Matrix: SALT Temp (C): 31.31 pH: 8.03	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L): 6.15	Storet Station Number
	Latitude: 28° 57' 23.7" N Longitude: 82° 42' 02.7" W	Sample Depth: ☑ m ☐ ft 0.2	31.36 / 46351	☑ Salinity (PPTh) ☑ Sp Conductance (umho/cm) NPDES Number
		Comments: 2 biomass Rec'd in lab by SD 1045 8.11.09		

Relinquished By	Date/Time	Shipping Method	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
	8/10/09	FED EX						8-11-09/9:30

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information

last revised October 1, 2003

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2009-08-10-38
Progress Energy -Crystal River

Requester: Jennifer Paris
Field Report Prepared By:

Customer: SW-DIST
Collected By: P Wenner, J Cohen, C Anastasiou
Send Final Report To Ilia Balcom

Project ID: FYI5
Sampling Agency: FDEP SWD

PMAS: 1143

Lab ID *	Location D-094	37901		☐ Comp ☑ Grab	Collection (begin) Date 8/10/09 Time 1250	Eastern Central	Collection (end) Date Time	Eastern Central	Bottle Group(s)** D
	Field ID			Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L) 5.39		Storet Station Number		
	Matrix (Include type e.g. Salt, Fresh, etc) SALT	Temp (C) 40.21	pH 8.03	Sample Depth 0.2 ☑ m ☐ ft	30.52 / 47680		☑ Salinity (PPTh) ☑ Sp Conductance (umho/cm)	NPDES Number	
	Latitude 28° 57' 34.7" N	Longitude 82° 42' 30.9" W		Comments					
Lab ID *	Location D-072	37902		☐ Comp ☑ Grab	Collection (begin) Date 8/10/09 Time 1305	Eastern Central	Collection (end) Date Time	Eastern Central	Bottle Group(s)** E
	Field ID			Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L) 6.55		Storet Station Number		
	Matrix (Include type e.g. Salt, Fresh, etc) SALT	Temp (C) 31.83	pH 4.07	Sample Depth 0.2 ☑ m ☐ ft	29.86 / 46443		☑ Salinity (PPTh) ☑ Sp Conductance (umho/cm)	NPDES Number	
	Latitude 28° 57' 35.8" N	Longitude 82° 42' 48.6" W		Comments					
Lab ID *	Location			☐ Comp ☐ Grab	Collection (begin) Date Time	Eastern Central	Collection (end) Date Time	Eastern Central	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 ° ' "	Longitude ° ' "		Comments					
Lab ID *	Location			☐ Comp ☐ Grab	Collection (begin) Date Time	Eastern Central	Collection (end) Date Time	Eastern Central	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 ° ' "	Longitude ° ' "		Comments					

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
	8/10/09	FED Ex						8/11/09 0900

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

FDEP Biology Laboratory - Acute Screen Bioassay Bench Sheets

Facility: Crystal River Progress Energy

Address: 15760 West Powerline Street

City: Crystal River County: Citrus 34428

Contact/District: Jason Cohen / Pete Warner Southwest

NPDES Permit #: FL 0000159

LIMS Job # TLH-2009-05 ~~11-30~~ 11-31 MF 8.21.09

LIMS Sample #: ~~1209775~~ MF 8.21.09 1207889

Lims Data Entry: 8-21-09 MF

Data Entry Verification: BA 8.21.09

Sample Collection: Date: 8-10-09 Time: 1145

Hold Time Start: Date: 8-10-09 MF Time: 1145

Comments:

Instructions (for below): Circle appropriate wording. If yes is circled, complete blanks.

Test Type: (Screen)

(Static) / Static Renewal / Flow-through

Test Duration: (96) 96 Hours.

Test 1 validation:

Test 1: SOP TA 07 03

Control survival ≥90%: (Yes) No

Temperature Range ≤3°C: (Yes) No

Test 2 validation:

Test 2: SOP TA 07 04

Control survival ≥90%: (Yes) No

Temperature Range ≤3°C: (Yes) No

(√one)

Test 1 incubated in: ☑ Incubator #: 2 ☐ Waterbath #:

Test 2 incubated in: ☑ Incubator #: 2 ☐ Waterbath #:

Initial sample handling:

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: ____ Final Salinity: ____ Salts Hypersaline brine

Salinity adjusted (Test 2): yes (no) Initial Salinity: ____ Final Salinity: ____ Salts Hypersaline brine

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

Light Intensity : 50 - 100 ft. candles

Photoperiod : 16 light 8 dark

Temperature Range °C: (If used)

Incubator # 2 min 24.9 max 27.0 mean 26.0

Incubator # ____ min ____ max ____ mean ____

Waterbath # ____ min ____ max ____ mean ____

Room B246 min 25.2 max 25.8 mean 25.5

Sample Validation:

Temperature: Shipped ≤6°C (Yes) No — IF Hand Delivered: Cooling (received °C < collected °C) Yes No

Holding Time: ≤36 Hours (Yes) No (Composite-end of collection; grab-when collected; 4 in 24 - time last sample collected) 8.11.09 BA

Water Quality Parameters	20% DMW	Well Water	Moderately Hard Water	Batch # ~~8.11.09~~ Salt Water (ASW) NSW Test 1	Salt Water (ASW) NSW Test 2	Other:	Original Sample	Measured by	Verified by
Field Total Residual Cl_2 (mg/L):	N/A	N/A	N/A	N/A	N/A		NOT	Measured	BA
Lab Total Residual Cl_2 (mg/L):				<0.03	<0.03		<0.03	JD	BA
Alkalinity (mg/L as $CaCO_3$):				200	200		145	BA	JD
Hardness (mg/L as $CaCO_3$):				NA —	— NA		— NA	BA	JD
Total Ammonia (mg/L as N):				<0.034	<0.034		<0.034	BA	JD
Conductivity: µmhos (mmhos)				46.6	45.5		47.6	JD	BA
Salinity (ppth):				29.9	28.7		30.5	JD	BA

Investigators' Signatures

REVIEWER

V 1.6 7/8/08

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: ~~1209475~~ 1207889
Test #: 1/2 SOP#:TA 07 03 Test Started: Date 8/1/09 Time: 1300

Organism/Batch/Age: A. bahia / 8.11.09 / 5 days Test Ended: Date 8.13.09 Time: 1200

Chamber/Test Volume: 400 / 350 ml Diluent/ Batch: ASW / 8.4.09 Test Duration: 48 hr

Food/Batch: [ ] YCT ____ [ ] P.sub ____ 96 hr

[✓] Artemia Lot# 33435 Batch #: 0hr 107-09 24hr 108-09 48hr 109-09 72hr 110-09 (JD, JD)

Feeding: [X] Prior to Test [ ] Prior to Renewal [X] 0 hr [X] 24 hr [X] 48 hr [ ] 72 hr

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl	A	Tox 27	5	5	5			
	B	Tox 28	5	5	5			
	C	Tox 29	5	5	5			
	D	Tox 30	5	5	5			
100%	A	Tox 31	5	5	5			
	B	Tox 32	5	5	5			
	C	Tox 33	5	5	5			
	D	Tox 34	5	5	5			
Loaded/Verified by: JD / RD		Checked by:	JD	JD	JD			

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

Comments:

Test Results:

Screening Tests: Report LC50 as >100%, =100%, or <100%.

% mortality in 100% sample: 0 LC50: >100%

If Calculated: 95% CI ____ Method ____

V 2.3 7/15/2008

Substitue 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 Survival Bench Sheet

LIMS Sample #: ~~1208475~~ 1207889 BA Test #: 2/2 SOP#:TA 07 04 Test Started: Date 8.1.09 Time: ~~1100~~ 1300 JD

Organism/Batch/Age: M.beryllina / 8.11.09 / 13 days Test Ended: Date 8.13.09 Time: 1200

Chamber/Test Volume: 1000 / 500 ml Diluent/ Batch: ASW / 8.4.09 Test Duration: 48 hr

Food/Batch: [ ] YCT____ [ ] P.sub____ 96 hr

[X] Artemia Lot# 38438 Batch #: 0hr 10-7-09 24hr____ 48hr ~~10-9-09~~ JD 72hr____

Feeding: [X] Prior to Test [ ] Prior to Renewal [X] 0 hr [ ] 24 hr [ ] 48 hr [ ] 72 hr

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
ctrl	A	A1	5	5	5			
	B	A2	5	4/D	4			
	C	A3	5	5	5			
	D	A4	5	5	5			
100%	A	A5	5	5	5			
	B	A6	5	5	5			
	C	A7	5	5	5			
	D	A8	5	4 D	4			
Loaded/Verified by: JD / BA		Checked by:	JD	JD	JD			

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

Comments:

Test Results:

Screening Tests: Report LC50 as >100%, =100%, or <100%.

% mortality in 100% sample: 5% LC50: >100%

If Calculated: 95% CI________ Method________

V 2.3 7/15/2008

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

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FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : I207887 BA I209475 Test #: 1 of 2

TEST SOP #: TA07_C03 Test Species: ☐ Ceriodaphnia dubia ☐ Cyprinella leedsi ☐ Pimephales promelas

Test aerated: yes (no) (circle one) Check 1: [X] Americamysis bahia ☐ Menidia beryllina ☐ Other:_____

Concentration Ctrl	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	8.4	8.3	8.2			
Temperature °C	24.1	24.1	24.5			
Dissolved Oxygen mg/L aerate if < 4	6.9	6.8	6.2			
Conductivity µmhos (mmhos)	466	48.3	48.5			
Salinity ppth	29.9	31.40	31.27			
(initials) Measured by:	~~JD~~	gs	gs			
(initials) Recorded by:	~~JD~~	gs	gs			

Comments:

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	8.2	8.1	8.5			
Temperature °C	24.2	24.5	24.8			
Dissolved Oxygen mg/L aerate if < 4	6.9	6.3	6.2			
Conductivity µmhos (mmhos)	476	48.5	48.7			
Salinity ppth	30.5	31.41	31.60			
(initials) Measured by:	~~JD~~	gs	gs			
(initials) Recorded by:	~~JD~~	gs	gs			

Comments:

Salinity only needs measuring if saltwater.

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L aerate if < 4						
Conductivity µmhos mmhos						
Salinity ppth						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L aerate if < 4						
Conductivity µmhos mmhos						
Salinity ppth						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

000028

FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 1209475 1207889 BA Test #: 2 of 2

TEST SOP #: TA07_04 Test Species: ☐ *Ceriodaphnia dubia* ☐ *Cyprinella leedsi* ☐ *Pimephales promelas*

Test aerated: yes (no) (circle one) Check 1: ☐ *Americamysis bahia* ☒ *Menidia beryllina* ☐ Other:_____

Concentration Ctrl	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	8.4	8.3	8.2			
Temperature °C	24.0	24.1	25.1			
Dissolved Oxygen mg/L aerate if < 4	6.8	6.8	6.5			
Conductivity µmhos ~~mmhos~~	45.5	47.3	46.1			
Salinity ppth	28.7	30.52	29.52			
(initials) Measured by:	~~JS~~	gf	gf			
(initials) Recorded by:	~~JD~~	gf	gf			

Comments:

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	8.2	8.1	8.1			
Temperature °C	24.1	24.9	25.4			
Dissolved Oxygen mg/L aerate if < 4	6.8	6.5	6.5			
Conductivity µmhos ~~mmhos~~	426	47.6	46.6			
Salinity ppth	30.9	30.52	30.31			
(initials) Measured by:	~~JS~~	gf	gf			
(initials) Recorded by:	~~JD~~	gf	gf			

Comments:

Salinity only needs measuring if saltwater.

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L aerate if < 4						
Conductivity µmhos mmhos						
Salinity ppth						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

Concentration	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate						
pH (S.U.)						
Temperature °C						
Dissolved Oxygen mg/L aerate if < 4						
Conductivity µmhos mmhos						
Salinity ppth						
(initials) Measured by:						
(initials) Recorded by:		-				

Comments:

Appendix B. (continued)

Bioassay Instrument ID

Test ID: Progress Energy Crystal River Dates: 8.11.09 – 8.13.09

METER / DEVICE	ID	SOP	Parameter	Method	√used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H+	✓
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity	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)

FWS QA 8.11.09

V 1.1 6/12/08 MF

PAGE

000030

Appendix C. SRT Bench Sheets and Statistical Analysis

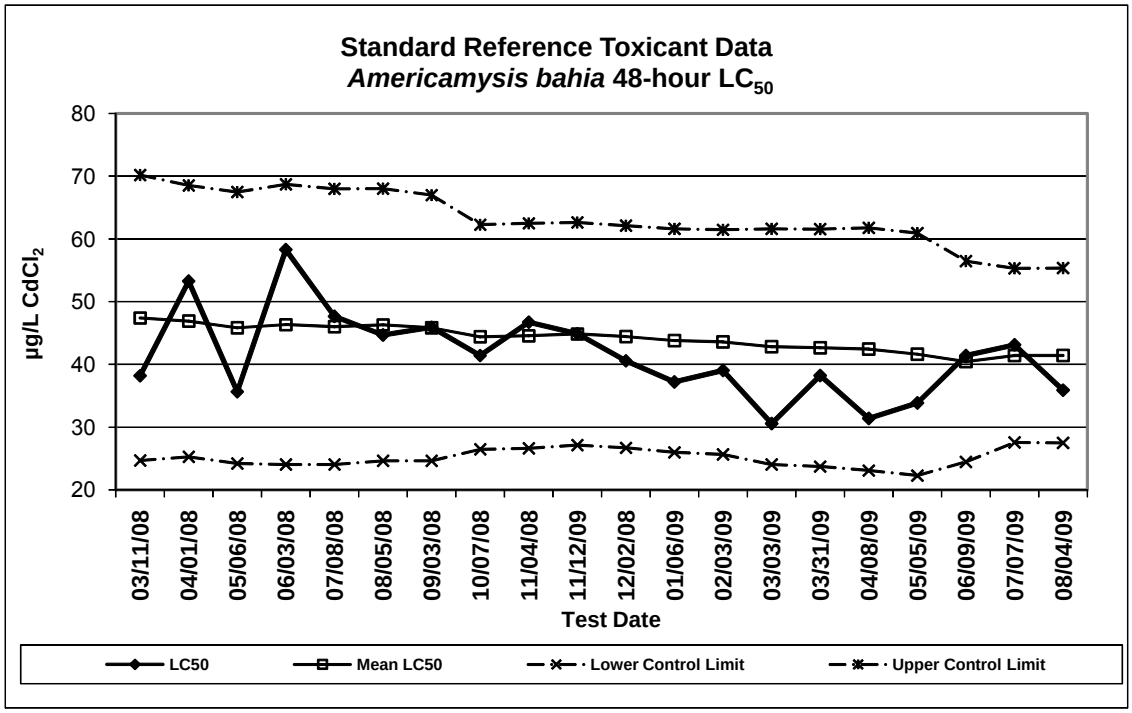
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 48-hour Acute Toxicity
Americamysis bahia (mysid shrimp) - Cadmium Chloride ($CdCl_2$)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
03/11/08	38.21	47.42	11.38	24.66	70.19
04/01/08	53.27	46.90	10.82	25.26	68.53
05/06/08	35.65	45.82	10.81	24.19	67.45
06/03/08	58.28	46.36	11.17	24.03	68.69
07/08/08	47.67	46.00	10.99	24.02	67.98
08/05/08	44.68	46.32	10.84	24.63	68.01
09/03/08	45.94	45.82	10.60	24.62	67.02
10/07/08	41.43	44.39	8.96	26.47	62.30
11/04/08	46.75	44.58	8.97	26.64	62.51
11/12/09	44.92	44.87	8.87	27.13	62.61
12/02/08	40.59	44.42	8.84	26.73	62.11
01/06/09	37.22	43.80	8.89	26.01	61.59
02/03/09	39.02	43.57	8.96	25.66	61.49
03/03/09	30.58	42.81	9.40	24.02	61.61
03/31/09	38.24	42.65	9.45	23.76	61.55
04/08/09	31.38	42.44	9.66	23.12	61.76
05/05/09	33.86	41.62	9.66	22.31	60.93
06/09/09	41.42	40.46	8.00	24.47	56.45
07/07/09	43.11	41.44	6.94	27.55	55.32
08/04/09	35.91	41.41	6.97	27.47	55.34

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

CV = 16.82
EPA reference 75th quartile CV = 26%



Appendix C. (continued)

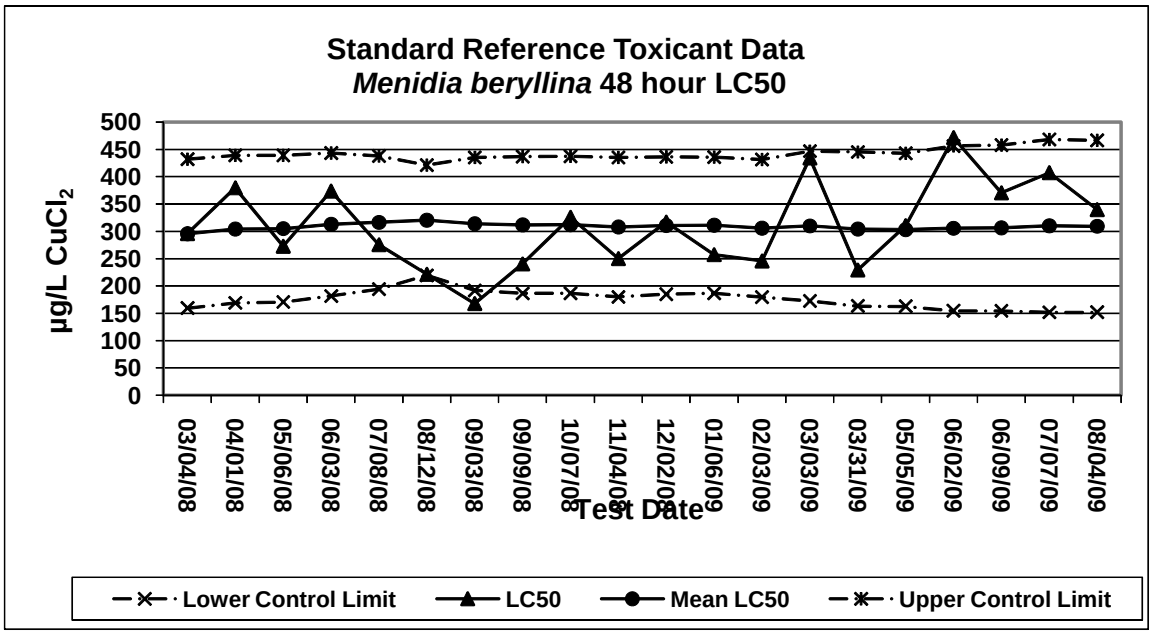
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - Acute Toxicity
Menidia beryllina (Inland silverside) - Copper Chloride ($CuCl_2$)

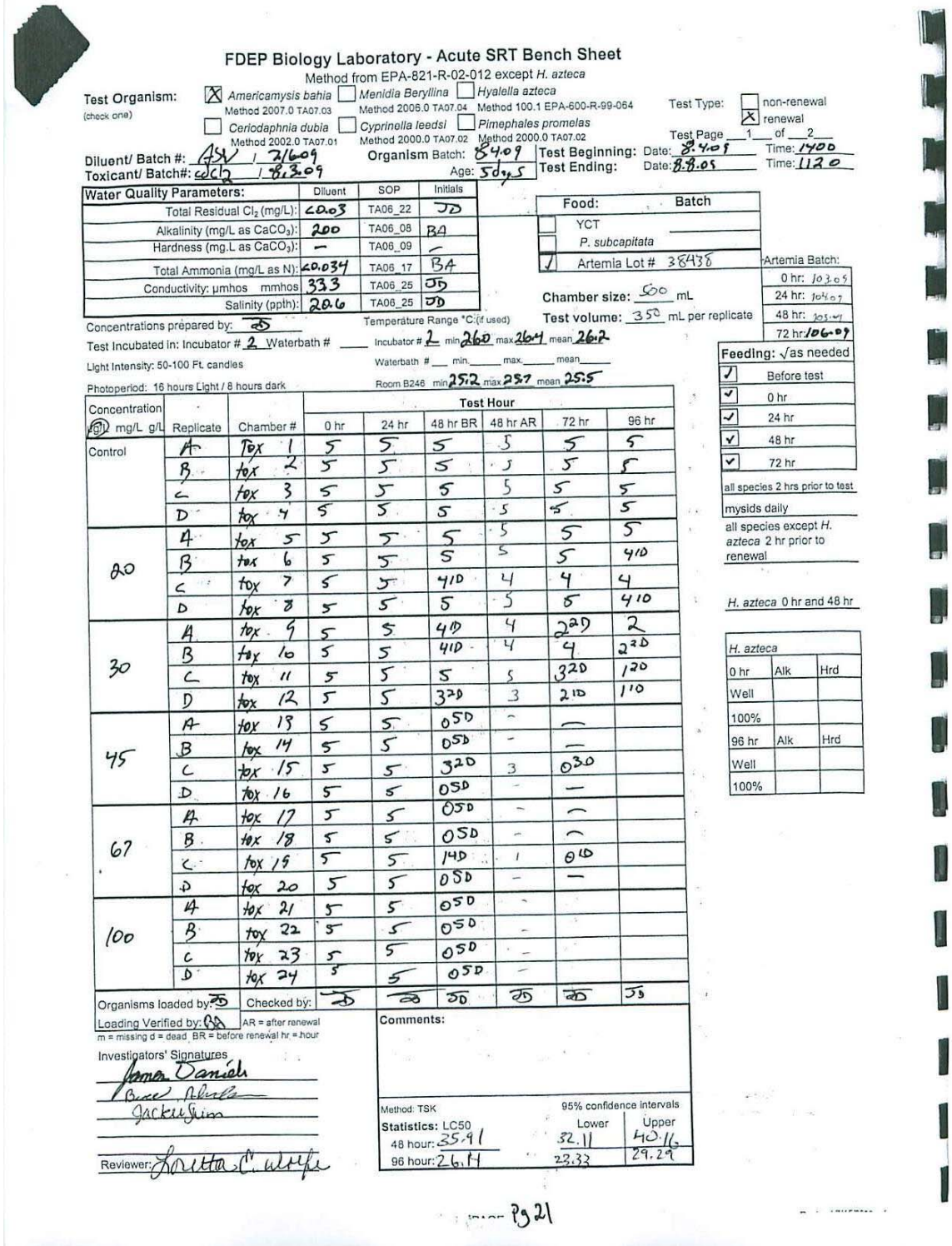
Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
03/04/08	295.52	295.31	68.1	159.3	431.9
04/01/08	379.50	304.05	67.5	169.0	439.1
05/06/08	272.50	304.73	67.1	170.5	438.9
06/03/08	373.47	312.52	65.5	181.5	443.5
07/08/08	275.20	316.13	61.0	194.2	438.1
08/12/08	221.17	320.17	50.5	219.2	421.1
09/03/08	167.46	313.48	60.9	191.7	435.3
09/09/08	240.07	311.58	62.6	186.3	436.9
10/07/08	325.55	312.05	62.7	186.6	437.5
11/04/08	249.81	307.63	63.9	179.9	435.4
12/02/08	316.79	310.59	62.8	185.0	436.2
01/06/09	257.04	311.08	62.3	186.5	435.7
02/03/09	245.51	305.47	62.9	179.6	431.4
03/03/09	433.98	309.64	68.6	172.5	446.8
03/31/09	228.94	304.17	70.5	163.1	445.2
05/05/09	310.12	302.74	70.1	162.6	442.9
06/02/09	471.25	305.32	75.4	154.6	456.0
06/09/09	370.27	306.03	75.9	154.2	457.9
07/07/09	407.17	309.94	79.1	151.7	468.2
08/04/09	339.47	309.04	78.7	151.7	466.3

Means are of the last 20 SRT tests.

EPA reference 75th quartile CV = 21% **CV = 25.45**



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 / 2/6.09

Toxicant/ Batch#: $CdCl_2$ / 8.3.09

Organism Batch: 8.4.09 Age: 5d, 5

Test Beginning: Date: 8.4.09 Time: 1400

Test Ending: Date: 8.8.09 Time: 1120

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	JD
Alkalinity (mg/L as $CaCO_3$):	200	TA06_08	BA
Hardness (mg.L as $CaCO_3$):	—	TA06_09	—
Total Ammonia (mg/L as N):	<0.034	TA06_17	BA
Conductivity: µmhos mmhos	333	TA06_25	JD
Salinity (ppth):	20.6	TA06_25	JD

Food:	Batch
[ ] YCT	
[ ] *P. subcapitata*	
[✓] Artemia Lot #	38438

Artemia Batch:

0 hr: 10.3.09

24 hr: 10.4.09

48 hr: 10.5.09

72 hr: 10.6.09

Chamber size: 600 mL

Test volume: 350 mL per replicate

Concentrations prepared by: JD

Test Incubated In: Incubator # 2 Waterbath # ____

Incubator # 2 min 26.0 max 26.4 mean 26.2

Waterbath # ____ min. ____ max. ____ mean ____

Temperature Range °C (if used)

Light Intensity: 50-100 Ft. candles

Photoperiod: 16 hours Light / 8 hours dark

Room B246 min 25.2 max 25.7 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 (circle) 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	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	5
	B	tox 6	5	5	5	5	5	4D
	C	tox 7	5	5	4D	4	4	4
	D	tox 8	5	5	5	5	5	4D
30	A	tox 9	5	5	4D	4	2D	2
	B	tox 10	5	5	4D	4	4	2D
	C	tox 11	5	5	5	5	3D	1D
	D	tox 12	5	5	3D	3	2D	1D
45	A	tox 13	5	5	0SD	-	—	
	B	tox 14	5	5	0SD	-	—	
	C	tox 15	5	5	3D	3	0SD	
	D	tox 16	5	5	0SD	-	—	
67	A	tox 17	5	5	0SD	-	—	
	B	tox 18	5	5	0SD	-	—	
	C	tox 19	5	5	1D	1	0D	
	D	tox 20	5	5	0SD	-	—	
100	A	tox 21	5	5	0SD	-		
	B	tox 22	5	5	0SD	-		
	C	tox 23	5	5	0SD	-		
	D	tox 24	5	5	0SD	-		
			JD	JD	JD	JD	JD	JD

Organisms loaded by: JD Checked by: JD

Loading Verified by: DA

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

Investigators' Signatures

James Daniels

Brad Alsop

Jackie Jim

Reviewer: Loretta C. Wolfe

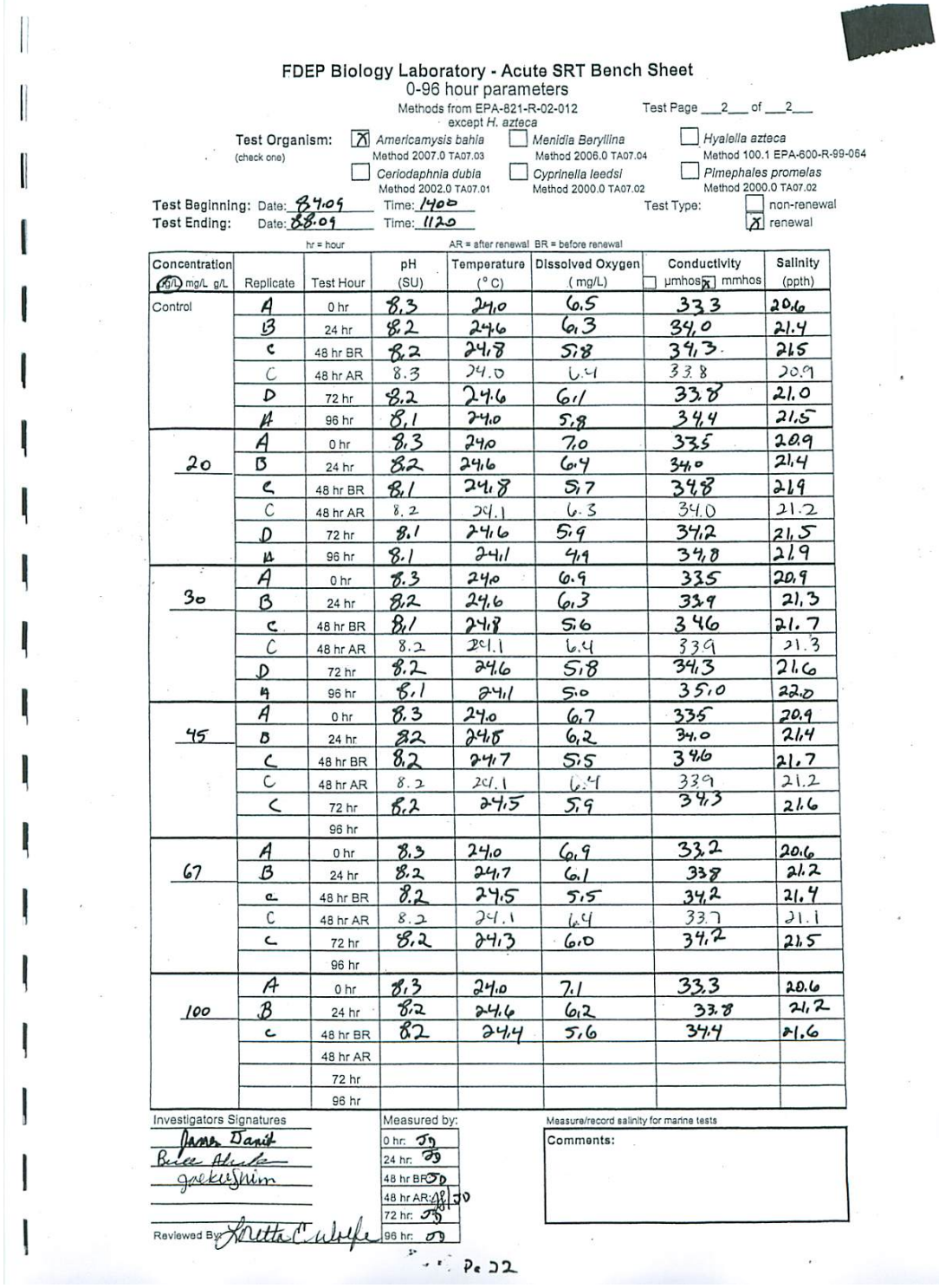
Comments:

Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour:	35.91	32.11	40.16
96 hour:	26.14	23.33	29.29

pg 21

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: 8.4.09 Time: 1400
Test Ending: Date: 8.8.09 Time: 1120

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

hr = hour AR = after renewal BR = before renewal

Concentration (%) 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	24.0	6.5	333	20.6
	B	24 hr	8.2	24.6	6.3	34.0	21.4
	C	48 hr BR	8.2	24.8	5.8	34.3	21.5
	C	48 hr AR	8.3	24.0	6.4	33.8	20.9
	D	72 hr	8.2	24.6	6.1	33.8	21.0
	A	96 hr	8.1	24.0	5.8	34.4	21.5
	A	0 hr	8.3	24.0	7.0	33.5	20.9
20	B	24 hr	8.2	24.6	6.4	34.0	21.4
	C	48 hr BR	8.1	24.8	5.7	34.8	21.9
	C	48 hr AR	8.2	24.1	6.3	34.0	21.2
	D	72 hr	8.1	24.6	5.9	34.2	21.5
	A	96 hr	8.1	24.1	4.9	34.8	21.9
	A	0 hr	8.3	24.0	6.9	33.5	20.9
30	B	24 hr	8.2	24.6	6.3	33.9	21.3
	C	48 hr BR	8.1	24.8	5.6	34.6	21.7
	C	48 hr AR	8.2	24.1	6.4	33.9	21.3
	D	72 hr	8.2	24.6	5.8	34.3	21.6
	A	96 hr	8.1	24.1	5.0	35.0	22.0
	A	0 hr	8.3	24.0	6.7	33.5	20.9
45	B	24 hr	8.2	24.8	6.2	34.0	21.4
	C	48 hr BR	8.2	24.7	5.5	34.6	21.7
	C	48 hr AR	8.2	24.1	6.4	33.9	21.2
	C	72 hr	8.2	24.5	5.9	34.3	21.6
		96 hr					
	A	0 hr	8.3	24.0	6.9	33.2	20.6
67	B	24 hr	8.2	24.7	6.1	33.8	21.2
	C	48 hr BR	8.2	24.5	5.5	34.2	21.4
	C	48 hr AR	8.2	24.1	6.4	33.7	21.1
	C	72 hr	8.2	24.3	6.0	34.2	21.5
		96 hr					
	A	0 hr	8.3	24.0	7.1	33.3	20.6
100	B	24 hr	8.2	24.6	6.2	33.8	21.2
	C	48 hr BR	8.2	24.4	5.6	34.4	21.6
		48 hr AR					
		72 hr					
		96 hr					

Investigators Signatures

Measured by:
0 hr: JD
24 hr: JD
48 hr BR: JD
48 hr AR: JD
72 hr: JD
96 hr: JD

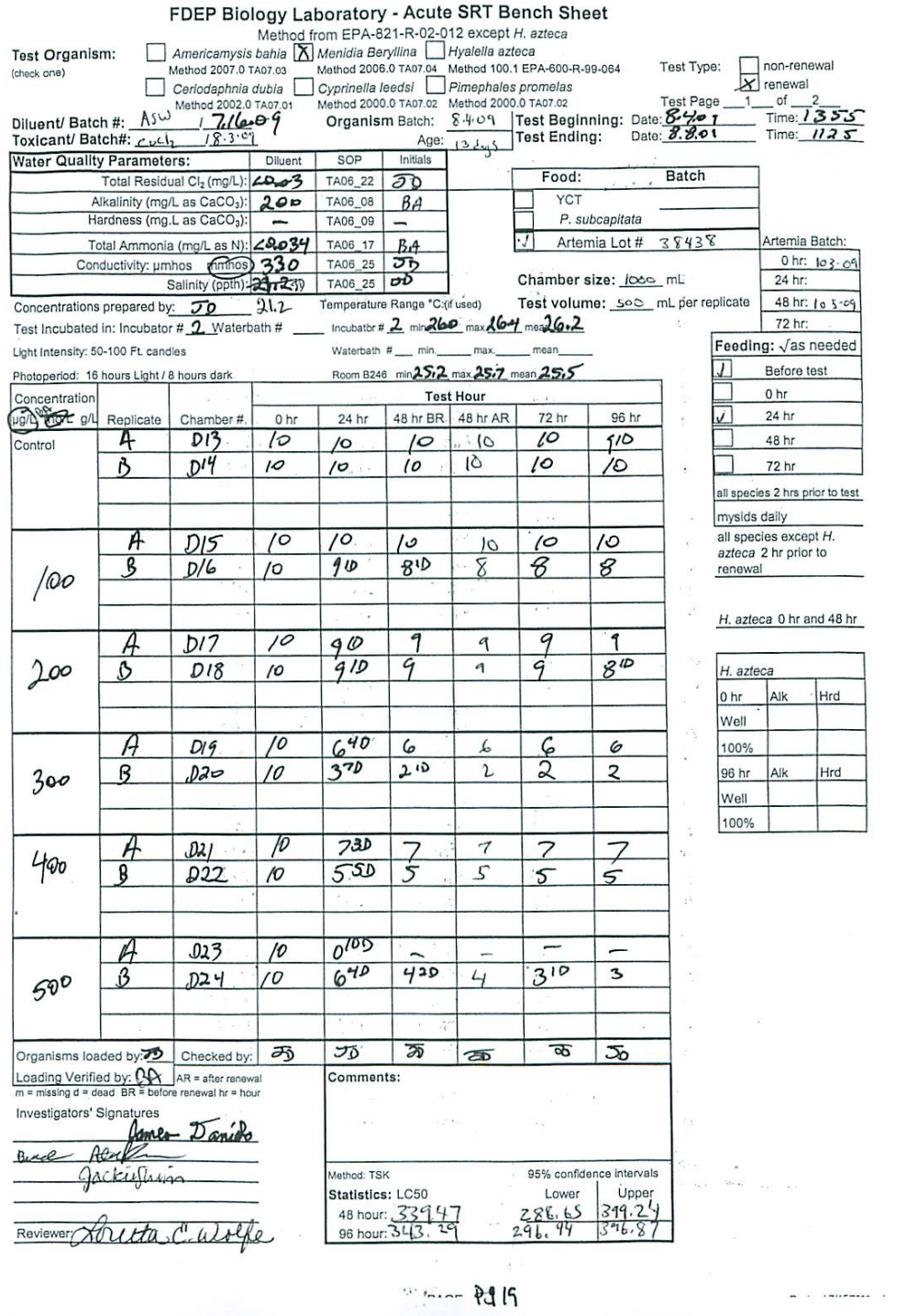
Measure/record salinity for marine tests

Comments:

Reviewed By:

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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 / 7/16.09

Toxicant/ Batch#: $CuCl_2$ / 18.3.09

Organism Batch: 8.4.09 Age: 13 days

Test Beginning: Date: 8.4.01 Time: 1355

Test Ending: Date: 8.8.01 Time: 1125

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	JD
Alkalinity (mg/L as $CaCO_3$):	200	TA06_08	BA
Hardness (mg.L as $CaCO_3$):	—	TA06_09	—
Total Ammonia (mg/L as N):	<0.034	TA06_17	BA
Conductivity: µmhos ~~mmhos~~	330	TA06_25	JD
Salinity (ppth): ~~23.2~~	23.2	TA06_25	DD

Food: Batch

☐ YCT

☐ *P. subcapitata*

☑ Artemia Lot # 38438

Artemia Batch:

0 hr: 10.3.09

24 hr:

48 hr: 10.3.09

72 hr:

Concentrations prepared by: JD 21.2 Temperature Range °C:(if used)

Chamber size: 1000 mL

Test volume: 500 mL per replicate

Test Incubated in: Incubator # 2 Waterbath # ____ Incubatbr # 2 min 26.0 max 26.4 mean 26.2

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

Photoperiod: 16 hours Light / 8 hours dark Room B246 min 25.2 max 25.7 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

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	D13	10	10	10	10	10	9D
	B	D14	10	10	10	10	10	10
100	A	D15	10	10	10	10	10	10
	B	D16	10	9D	8D	8	8	8
200	A	D17	10	9D	9	9	9	9
	B	D18	10	9D	9	9	9	8D
300	A	D19	10	6D	6	6	6	6
	B	D20	10	3D	2D	2	2	2
400	A	D21	10	7D	7	7	7	7
	B	D22	10	5D	5	5	5	5
500	A	D23	10	0D	—	—	—	—
	B	D24	10	6D	4D	4	3D	3
Organisms loaded by: ~~JD~~		Checked by:	JD	JD	JD	JD	JD	JD

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

Loading Verified by: DD AR = after renewal

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

Comments:

Investigators' Signatures

James Daniels

Bruce Alexander

Jackie Lewis

Reviewer: Loretta C. Wolfe

Method: TSK

Statistics: LC50 (95% confidence intervals)

		Lower	Upper
48 hour:	339.47	288.65	399.24
96 hour:	343.29	296.44	396.87

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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
- [X] *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: 8.4.09 Time: 1355
Test Ending: Date: 8.8.09 Time: 1125
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	24.0	6.5	33.0	20.6
	B	24 hr	8.2	24.3	6.0	33.8	21.2
	A	48 hr BR	8.2	24.9	5.9	34.1	21.3
	A	48 hr AR	8.2	24.1	6.5	33.5	20.9
	B	72 hr	8.2	24.6	6.1	33.7	21.0
	A	96 hr	8.2	24.0	5.8	34.1	21.0
100	A	0 hr	8.3	24.0	6.7	33.5	20.9
	B	24 hr	8.2	24.5	5.9	34.0	21.3
	A	48 hr BR	8.2	24.9	5.9	34.4	21.6
	A	48 hr AR	8.2	24.1	6.5	33.7	21.1
	B	72 hr	8.2	24.6	5.9	33.9	21.3
	A	96 hr	8.2	24.0	6.0	34.3	21.5
200	A	0 hr	8.3	24.0	6.9	33.4	20.5
	B	24 hr	8.2	24.8	5.9	34.0	21.3
	A	48 hr BR	8.2	24.8	5.8	34.3	21.5
	A	48 hr AR	8.2	24.2	6.5	33.6	21.1
	B	72 hr	8.2	24.5	5.8	33.8	21.2
		96 hr	8.2	24.1	6.1	34.3	21.5
300	A	0 hr	8.3	24.0	7.0	33.5	20.9
	B	24 hr	8.2	24.6	5.8	33.7	21.0
	A	48 hr BR	8.2	24.9	5.9	34.5	21.7
	A	48 hr AR	8.2	24.2	6.5	33.7	21.2
	B	72 hr	8.2	24.7	5.9	34.0	21.3
	A	96 hr	8.2	24.1	6.1	34.1	21.0
400	A	0 hr	8.3	24.0	7.0	33.1	20.7
	B	24 hr	8.2	24.7	5.8	33.6	21.0
	A	48 hr BR	8.2	24.8	6.0	34.0	21.0
	A	48 hr AR	8.3	24.1	6.6	33.3	20.9
	B	72 hr	8.2	24.9	6.0	33.7	21.0
		96 hr	8.2	24.0	6.2	33.8	20.9
500	A	0 hr	8.3	24.0	7.2	33.4	20.8
	B	24 hr	8.2	24.6	5.9	33.8	21.2
	B	48 hr BR	8.2	24.9	6.0	34.4	21.6
	B	48 hr AR	8.3	24.1	6.6	33.7	21.1
	B	72 hr	8.2	25.1	6.1	33.9	21.3
		96 hr	8.2	24.1	6.4	34.7	21.7

Investigators Signatures
James Davis
Brad Alford
Jackie Swim

Reviewed By: Loretta C. Wolfe

Measured by:
0 hr: JD
24 hr: JD
48 hr BR: JD
48 hr AR: JD
72 hr: JD
96 hr: JD

Measure/record salinity for marine tests

Comments:

Pg 20

Appendix C. (continued)

Americamysis bahia **Acute Standard Reference Toxicant Test**

DATE: 8-4-09 DURATION: 48 hr TOXICANT : CdCl2
SPECIES: *Americamysis bahia*

RAW DATA: Concentration (ug/L)	Number Exposed	Mortalities
.00	20	0
20.00	20	1
30.00	20	4
45.00	20	17
67.00	20	19
100.00	20	20

SPEARMAN-KARBER TRIM: 5.00%

SPEARMAN-KARBER ESTIMATES: LC50: 35.91
95% LOWER CONFIDENCE: 32.11
95% UPPER CONFIDENCE: 40.16

Menidia beryllina **Acute Standard Reference Toxicant Test**

DATE: 8-4-09 DURATION: 48 h TOXICANT : CuCl2
SPECIES: *Menidia beryllina*

RAW DATA: Concentration (ug/L)	Number Exposed	Mortalities
.00	20	0
100.00	20	2
200.00	20	2
300.00	20	12
400.00	20	8
500.00	20	16

SPEARMAN-KARBER TRIM: 20.00%

SPEARMAN-KARBER ESTIMATES: LC50: 339.47
95% LOWER CONFIDENCE: 288.65
95% UPPER CONFIDENCE: 399.24

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

Organism Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Date: 8/3/09

Shipped to: FDEP

P.O. No:

Species	Quantity	Age	Brood Number	Temp.	pH	Salinity
Mysidopsis bahia	150	4 DAYS	MS090730	25°C	7.9 s.u.	20‰
Menidia beryllina	150	12 DAYS	SS090722	25°C	7.9 s.u	20‰
						Hardness
Cyprinella leedsi	150	12 DAYS	CL090722	25°C	7.8 s.u	80 mg/L
Pimephales promelas	150	8 DAYS	FM090726	25°C	7.8 s.u	80 mg/L

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 D. (continued)

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Organism Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Date: 8/10/09

Shipped to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood Number	Temp.	pH	Salinity
Mysidopsis bahia	100	4 DAYS	MS090806	25°C	8.0 s.u.	20‰
Menidia beryllina	100	12 DAYS	SS090729	25°C	8.0 s.u.	20‰
						Hardness
Cyprinella leedsi	@ 8/10/09					
Pimephales promelas	4 $50	<24 hrs	FM090809-1530	25°C	7.8 s.u.	80 mg/L

Packed by: JC

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 Progress Energy Florida Crystal River Plant Units 1, 2, and 3 Plant Outfalls D-00F, D-013, D-092, D-094 and D-072, sampled on August 10, 2009.

Date	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
8/10/2009 11:45	D-013	AGP/LN	Algal Growth Potential	3	U	mg DryWt/L	3	3
8/10/2009 11:45	D-013	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	0.81	I	mg/L	0.2	2
8/10/2009 11:45	D-013	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	4.5		ug/L	1.1	3.4
8/10/2009 11:45	D-013	Chlorophyll/Grain Size/BOD	Phaeophytin-a	4.1		ug/L	0.8	2.4
8/10/2009 11:45	D-013	Metals	Zinc	21	I	ug/L	15	60
8/10/2009 11:45	D-013	Metals	Cadmium	0.12	U	ug/L	0.12	0.48
8/10/2009 11:45	D-013	Metals	Chromium	4.5	I	ug/L	1.2	4.8
8/10/2009 11:45	D-013	Metals	Lead	0.96	I	ug/L	0.8	3.2
8/10/2009 11:45	D-013	Metals	Silver	0.1	U	ug/L	0.1	0.4
8/10/2009 11:45	D-013	Metals	Calcium	356		mg/L	0.22	0.9
8/10/2009 11:45	D-013	Metals	Nickel	1.4	U	ug/L	1.4	5.6
8/10/2009 11:45	D-013	Metals	Iron	1190		ug/L	90	360
8/10/2009 11:45	D-013	Metals	Magnesium	1100		mg/L	0.8	3.2
8/10/2009 11:45	D-013	Metals	Aluminum	1200		ug/L	180	720
8/10/2009 11:45	D-013	Metals	Selenium	0.8	U	ug/L	0.8	3.2
8/10/2009 11:45	D-013	Metals	Copper	2	U	ug/L	2	2
8/10/2009 11:45	D-013	Metals	Arsenic	3	I	ug/L	1	4
8/10/2009 11:45	D-013	Nutrients	Turbidity	36	A	NTU	0.1	0.1
8/10/2009 11:45	D-013	Nutrients	Kjeldahl Nitrogen	0.68	J	mg N/L	0.16	0.4
8/10/2009 11:45	D-013	Nutrients	NO2NO3-N	0.006	I	mg N/L	0.004	0.01
8/10/2009 11:45	D-013	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
8/10/2009 11:45	D-013	Nutrients	TSS	70		mg/L	4	16
8/10/2009 11:45	D-013	Nutrients	Total-P	0.089		mg P/L	0.008	0.02
8/10/2009 11:45	D-013	Overflow	Radium 228	1		pCi/L		
8/10/2009 11:45	D-013	Overflow	Alpha, Total	3.1		pCi/L		
8/10/2009 11:45	D-013	Overflow	Radium 226	1.8		pCi/L		
8/10/2009 11:45	D-013	Overflow	Radium 226-Counting Error	0.2		pCi/L		
8/10/2009 11:45	D-013	Overflow	Alpha-Counting Error	1.1		pCi/L		
8/10/2009 11:45	D-013	Overflow	Radium 228-Counting Error	0.6		pCi/L		
8/10/2009 11:45	D-013	Pesticides	Azinphos Methyl	0.22	UJ	ug/L	0.22	0.88
8/10/2009 11:45	D-013	Pesticides	Butylate	0.22	UJ	ug/L	0.22	0.88
8/10/2009 11:45	D-013	Pesticides	Chlorpyrifos Methyl	0.11	U	ug/L	0.11	0.44
8/10/2009 11:45	D-013	Pesticides	Diazinon	0.056	UJ	ug/L	0.056	0.22

Appendix E. (continued)

Date	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
8/10/2009 11:45	D-013	Pesticides	Ethoprop	0.11	U	ug/L	0.11	0.44
8/10/2009 11:45	D-013	Pesticides	Fenamiphos	0.22	UJ	ug/L	0.22	0.88
8/10/2009 11:45	D-013	Pesticides	Mevinphos	0.22	U	ug/L	0.22	0.88
8/10/2009 11:45	D-013	Pesticides	Malathion	0.17	U	ug/L	0.17	0.68
8/10/2009 11:45	D-013	Pesticides	Metribuzin	0.11	U	ug/L	0.11	0.44
8/10/2009 11:45	D-013	Pesticides	Naled	0.9	U	ug/L	0.9	3.6
8/10/2009 11:45	D-013	Pesticides	Beta-BHC	0.011	U	ug/L	0.011	0.044
8/10/2009 11:45	D-013	Pesticides	Metalaxyl	0.28	UJ	ug/L	0.28	1.1
8/10/2009 11:45	D-013	Pesticides	Metolachlor	0.56	UJ	ug/L	0.56	2.2
8/10/2009 11:45	D-013	Pesticides	Endosulfan II	0.022	U	ug/L	0.022	0.088
8/10/2009 11:45	D-013	Pesticides	Atrazine	0.056	U	ug/L	0.056	0.22
8/10/2009 11:45	D-013	Pesticides	Parathion Ethyl	0.17	U	ug/L	0.17	0.68
8/10/2009 11:45	D-013	Pesticides	Parathion Methyl	0.11	U	ug/L	0.11	0.44
8/10/2009 11:45	D-013	Pesticides	Endrin	0.056	U	ug/L	0.056	0.22
8/10/2009 11:45	D-013	Pesticides	Heptachlor Epoxide	0.022	U	ug/L	0.022	0.088
8/10/2009 11:45	D-013	Pesticides	Chlorpyrifos Ethyl	0.056	U	ug/L	0.056	0.22
8/10/2009 11:45	D-013	Pesticides	Fonofos	0.11	UJ	ug/L	0.11	0.44
8/10/2009 11:45	D-013	Pesticides	DDD-p,p'	0.022	U	ug/L	0.022	0.088
8/10/2009 11:45	D-013	Pesticides	DDE-p,p'	0.022	U	ug/L	0.022	0.088
8/10/2009 11:45	D-013	Pesticides	Delta-BHC	0.011	U	ug/L	0.011	0.044
8/10/2009 11:45	D-013	Pesticides	Endrin Aldehyde	0.022	U	ug/L	0.022	0.088
8/10/2009 11:45	D-013	Pesticides	Gamma-BHC	0.011	U	ug/L	0.011	0.044
8/10/2009 11:45	D-013	Pesticides	Bromacil	0.22	U	ug/L	0.22	0.88
8/10/2009 11:45	D-013	Pesticides	Hexazinone	0.11	UJ	ug/L	0.11	0.44
8/10/2009 11:45	D-013	Pesticides	Norflurazon	0.17	UJ	ug/L	0.17	0.68
8/10/2009 11:45	D-013	Pesticides	Simazine	0.056	U	ug/L	0.056	0.22
8/10/2009 11:45	D-013	Pesticides	Alpha-BHC	0.011	U	ug/L	0.011	0.044
8/10/2009 11:45	D-013	Pesticides	Phorate	0.056	U	ug/L	0.056	0.22
8/10/2009 11:45	D-013	Pesticides	Chlordane	0.22	U	ug/L	0.22	0.88
8/10/2009 11:45	D-013	Pesticides	DDT-p,p'	0.034	U	ug/L	0.034	0.14
8/10/2009 11:45	D-013	Pesticides	Endosulfan I	0.022	U	ug/L	0.022	0.088
8/10/2009 11:45	D-013	Pesticides	Endosulfan Sulfate	0.022	U	ug/L	0.022	0.088
8/10/2009 11:45	D-013	Pesticides	Methoxychlor	0.056	U	ug/L	0.056	0.22
8/10/2009 11:45	D-013	Pesticides	Alachlor	0.67	UJ	ug/L	0.67	2.7

Appendix E. (continued)

Date	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
8/10/2009 11:45	D-013	Pesticides	Ametryn	0.056	U	ug/L	0.056	0.22
8/10/2009 11:45	D-013	Pesticides	Ethion	0.056	U	ug/L	0.056	0.22
8/10/2009 11:45	D-013	Pesticides	Prometryn	0.17	U	ug/L	0.17	0.68
8/10/2009 11:45	D-013	Pesticides	Aldrin	0.011	U	ug/L	0.011	0.044
8/10/2009 11:45	D-013	Pesticides	Dieldrin	0.022	U	ug/L	0.022	0.088
8/10/2009 11:45	D-013	Pesticides	Heptachlor	0.011	U	ug/L	0.011	0.044
8/10/2009 11:45	D-013	Pesticides	Toxaphene	0.84	U	ug/L	0.84	3.4
8/10/2009 11:45	D-013	Priority Organic Pollutants	4-Nitrophenol	17	U	ug/L	17	67
8/10/2009 11:45	D-013	Priority Organic Pollutants	Butyl benzyl phthalate	5.6	U	ug/L	5.6	22
8/10/2009 11:45	D-013	Priority Organic Pollutants	Phenanthrene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2.2	U	ug/L	2.2	8.9
8/10/2009 11:45	D-013	Priority Organic Pollutants	Acenaphthene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Acenaphthylene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Di-n-butyl phthalate	5.6	U	ug/L	5.6	22
8/10/2009 11:45	D-013	Priority Organic Pollutants	Hexachloroethane	3.4	U	ug/L	3.4	13
8/10/2009 11:45	D-013	Priority Organic Pollutants	2,4,6-Trichlorophenol	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	2,6-Dinitrotoluene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	17	U	ug/L	17	67
8/10/2009 11:45	D-013	Priority Organic Pollutants	Chrysene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Diethyl phthalate	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.4	U	ug/L	3.4	13
8/10/2009 11:45	D-013	Priority Organic Pollutants	Pentachlorophenol	3.4	U	ug/L	3.4	13
8/10/2009 11:45	D-013	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	2-Chloronaphthalene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	2-Chlorophenol	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	2-Nitrophenol	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	3,3'-Dichlorobenzidine	45	UJ	ug/L	45	180
8/10/2009 11:45	D-013	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Anthracene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Benzo(b)fluoranthene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Benzo(k)fluoranthene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.4	U	ug/L	3.4	13
8/10/2009 11:45	D-013	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2.2	U	ug/L	2.2	8.9
8/10/2009 11:45	D-013	Priority Organic Pollutants	Naphthalene	1.1	U	ug/L	1.1	4.5

Appendix E. (continued)

Date	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
8/10/2009 11:45	D-013	Priority Organic Pollutants	Phenol	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Pyrene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	2,4-Dimethylphenol	11	UJ	ug/L	11	45
8/10/2009 11:45	D-013	Priority Organic Pollutants	2,4-Dinitrotoluene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Benzidine	110	U	ug/L	110	450
8/10/2009 11:45	D-013	Priority Organic Pollutants	Benzo(a)pyrene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Dibenzo(a,h)anthracene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Dimethyl phthalate	11	U	ug/L	11	45
8/10/2009 11:45	D-013	Priority Organic Pollutants	Hexachlorobenzene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	2,4-Dichlorophenol	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Benzo(a)anthracene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Di-n-octyl phthalate	1.1	UJ	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Fluoranthene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.4	U	ug/L	3.4	13
8/10/2009 11:45	D-013	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Isophorone	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	N-Nitrosodimethylamine	2.2	U	ug/L	2.2	8.9
8/10/2009 11:45	D-013	Priority Organic Pollutants	Nitrobenzene	2.2	U	ug/L	2.2	8.9
8/10/2009 11:45	D-013	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.4	U	ug/L	3.4	13
8/10/2009 11:45	D-013	Priority Organic Pollutants	Fluorene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Hexachlorobutadiene	3.4	U	ug/L	3.4	13
8/10/2009 11:45	D-013	Priority Organic Pollutants	2,4-Dinitrophenol	17	U	ug/L	17	67
8/10/2009 11:45	D-013	Priority Organic Pollutants	4-Chloro-3-methylphenol	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Priority Organic Pollutants	Benzo(g,h,i)perylene	1.1	U	ug/L	1.1	4.5
8/10/2009 11:45	D-013	Field Parameter	pH	8.04				
8/10/2009 11:45	D-013	Field Parameter	Sample Depth	0.2		m		
8/10/2009 11:45	D-013	Field Parameter	Specific Conductance	47868		umhos/cm		
8/10/2009 11:45	D-013	Field Parameter	Dissolved Oxygen	5.31		mg/L		
8/10/2009 11:45	D-013	Field Parameter	Temperature	41.83		C		
8/10/2009 12:05	D-00F	AGP/LN	Algal Growth Potential	3	U	mg DryWt/L	3	3

Appendix E. (continued)

Date	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
8/10/2009 12:05	D-00F	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.1	I	mg/L	0.2	2
8/10/2009 12:05	D-00F	Chlorophyll/Grain Size/BOD	Phaeophytin-a	1.9		ug/L	0.4	1.2
8/10/2009 12:05	D-00F	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	2.2		ug/L	0.55	1.7
8/10/2009 12:05	D-00F	Toxicology	Bioassay-Acute-Screen-SW-Mysid, LC50	100	L	LC50		
8/10/2009 12:05	D-00F	Toxicology	Bioassay-Acute-Screen-SW-Fish, LC50	100	L	LC50		
8/10/2009 12:05	D-00F	Metals	Silver	0.1	U	ug/L	0.1	0.4
8/10/2009 12:05	D-00F	Metals	Cadmium	0.12	U	ug/L	0.12	0.48
8/10/2009 12:05	D-00F	Metals	Aluminum	1040		ug/L	180	720
8/10/2009 12:05	D-00F	Metals	Zinc	20	I	ug/L	15	60
8/10/2009 12:05	D-00F	Metals	Lead	0.83	I	ug/L	0.8	3.2
8/10/2009 12:05	D-00F	Metals	Iron	970		ug/L	90	360
8/10/2009 12:05	D-00F	Metals	Chromium	4	I	ug/L	1.2	4.8
8/10/2009 12:05	D-00F	Metals	Arsenic	3.3	I	ug/L	1	4
8/10/2009 12:05	D-00F	Metals	Nickel	1.4	U	ug/L	1.4	5.6
8/10/2009 12:05	D-00F	Metals	Copper	2.7		ug/L	2	2
8/10/2009 12:05	D-00F	Metals	Magnesium	1110		mg/L	0.8	3.2
8/10/2009 12:05	D-00F	Metals	Selenium	0.8	U	ug/L	0.8	3.2
8/10/2009 12:05	D-00F	Metals	Calcium	348		mg/L	0.22	0.9
8/10/2009 12:05	D-00F	Nutrients	Total-P	0.093	AJ	mg P/L	0.008	0.02
8/10/2009 12:05	D-00F	Nutrients	Turbidity	34		NTU	0.1	0.1
8/10/2009 12:05	D-00F	Nutrients	TSS	78		mg/L	4	16
8/10/2009 12:05	D-00F	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
8/10/2009 12:05	D-00F	Nutrients	Ammonia-N	0.011	I	mg N/L	0.01	0.02
8/10/2009 12:05	D-00F	Nutrients	Kjeldahl Nitrogen	0.72		mg N/L	0.16	0.4
8/10/2009 12:05	D-00F	Overflow	Radium 226-Counting Error	0.2		pCi/L		
8/10/2009 12:05	D-00F	Overflow	Radium 228-Counting Error	0.5		pCi/L		
8/10/2009 12:05	D-00F	Overflow	Alpha, Total	1.8		pCi/L		
8/10/2009 12:05	D-00F	Overflow	Oil and Grease	1.4	U	mg/L	1.4	5
8/10/2009 12:05	D-00F	Overflow	Radium 226	1.4		pCi/L		
8/10/2009 12:05	D-00F	Overflow	Alpha-Counting Error	0.9		pCi/L		
8/10/2009 12:05	D-00F	Overflow	Radium 228	0.8		pCi/L		
8/10/2009 12:05	D-00F	Pesticides	Ametryn	0.054	U	ug/L	0.054	0.22
8/10/2009 12:05	D-00F	Pesticides	Atrazine	0.054	U	ug/L	0.054	0.22
8/10/2009 12:05	D-00F	Pesticides	Fenamiphos	0.22	UJ	ug/L	0.22	0.88

Appendix E. (continued)

Date	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
8/10/2009 12:05	D-00F	Pesticides	Parathion Methyl	0.11	U	ug/L	0.11	0.44
8/10/2009 12:05	D-00F	Pesticides	Simazine	0.054	U	ug/L	0.054	0.22
8/10/2009 12:05	D-00F	Pesticides	DDT-p,p'	0.032	U	ug/L	0.032	0.13
8/10/2009 12:05	D-00F	Pesticides	Endrin Aldehyde	0.022	U	ug/L	0.022	0.088
8/10/2009 12:05	D-00F	Pesticides	Chlorpyrifos Ethyl	0.054	U	ug/L	0.054	0.22
8/10/2009 12:05	D-00F	Pesticides	Metalaxyl	0.27	UJ	ug/L	0.27	1.1
8/10/2009 12:05	D-00F	Pesticides	DDE-p,p'	0.022	U	ug/L	0.022	0.088
8/10/2009 12:05	D-00F	Pesticides	Metolachlor	0.54	UJ	ug/L	0.54	2.2
8/10/2009 12:05	D-00F	Pesticides	Parathion Ethyl	0.16	U	ug/L	0.16	0.64
8/10/2009 12:05	D-00F	Pesticides	DDD-p,p'	0.022	U	ug/L	0.022	0.088
8/10/2009 12:05	D-00F	Pesticides	Endosulfan II	0.022	U	ug/L	0.022	0.088
8/10/2009 12:05	D-00F	Pesticides	Endosulfan Sulfate	0.022	U	ug/L	0.022	0.088
8/10/2009 12:05	D-00F	Pesticides	Heptachlor Epoxide	0.022	U	ug/L	0.022	0.088
8/10/2009 12:05	D-00F	Pesticides	Bromacil	0.22	U	ug/L	0.22	0.88
8/10/2009 12:05	D-00F	Pesticides	Diazinon	0.054	UJ	ug/L	0.054	0.22
8/10/2009 12:05	D-00F	Pesticides	Alpha-BHC	0.011	U	ug/L	0.011	0.044
8/10/2009 12:05	D-00F	Pesticides	Delta-BHC	0.011	U	ug/L	0.011	0.044
8/10/2009 12:05	D-00F	Pesticides	Heptachlor	0.011	U	ug/L	0.011	0.044
8/10/2009 12:05	D-00F	Pesticides	Chlorpyrifos Methyl	0.11	U	ug/L	0.11	0.44
8/10/2009 12:05	D-00F	Pesticides	Fonofos	0.11	UJ	ug/L	0.11	0.44
8/10/2009 12:05	D-00F	Pesticides	Hexazinone	0.11	UJ	ug/L	0.11	0.44
8/10/2009 12:05	D-00F	Pesticides	Naled	0.86	U	ug/L	0.86	3.4
8/10/2009 12:05	D-00F	Pesticides	Norflurazon	0.16	UJ	ug/L	0.16	0.64
8/10/2009 12:05	D-00F	Pesticides	Aldrin	0.011	U	ug/L	0.011	0.044
8/10/2009 12:05	D-00F	Pesticides	Gamma-BHC	0.011	U	ug/L	0.011	0.044
8/10/2009 12:05	D-00F	Pesticides	Azinphos Methyl	0.22	UJ	ug/L	0.22	0.88
8/10/2009 12:05	D-00F	Pesticides	Metribuzin	0.11	U	ug/L	0.11	0.44
8/10/2009 12:05	D-00F	Pesticides	Mevinphos	0.22	U	ug/L	0.22	0.88
8/10/2009 12:05	D-00F	Pesticides	Phorate	0.054	U	ug/L	0.054	0.22
8/10/2009 12:05	D-00F	Pesticides	Beta-BHC	0.011	U	ug/L	0.011	0.044
8/10/2009 12:05	D-00F	Pesticides	Dieldrin	0.022	U	ug/L	0.022	0.088
8/10/2009 12:05	D-00F	Pesticides	Ethion	0.054	U	ug/L	0.054	0.22
8/10/2009 12:05	D-00F	Pesticides	Ethoprop	0.11	U	ug/L	0.11	0.44
8/10/2009 12:05	D-00F	Pesticides	Prometryn	0.16	U	ug/L	0.16	0.64

Appendix E. (continued)

Date	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
8/10/2009 12:05	D-00F	Pesticides	Chlordane	0.22	U	ug/L	0.22	0.88
8/10/2009 12:05	D-00F	Pesticides	Methoxychlor	0.054	U	ug/L	0.054	0.22
8/10/2009 12:05	D-00F	Pesticides	Toxaphene	0.81	U	ug/L	0.81	3.2
8/10/2009 12:05	D-00F	Pesticides	Alachlor	0.65	UJ	ug/L	0.65	2.6
8/10/2009 12:05	D-00F	Pesticides	Butylate	0.22	UJ	ug/L	0.22	0.88
8/10/2009 12:05	D-00F	Pesticides	Malathion	0.16	U	ug/L	0.16	0.64
8/10/2009 12:05	D-00F	Pesticides	Endosulfan I	0.022	U	ug/L	0.022	0.088
8/10/2009 12:05	D-00F	Pesticides	Endrin	0.054	U	ug/L	0.054	0.22
8/10/2009 12:05	D-00F	Priority Organic Pollutants	2,4-Dinitrophenol	16	U	ug/L	16	63
8/10/2009 12:05	D-00F	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2.1	U	ug/L	2.1	8.4
8/10/2009 12:05	D-00F	Priority Organic Pollutants	2-Nitrophenol	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	2,4-Dinitrotoluene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	2,6-Dinitrotoluene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	4-Chloro-3-methylphenol	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Acenaphthene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Anthracene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Benzo(a)anthracene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Di-n-butyl phthalate	5.2	U	ug/L	5.2	21
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Di-n-octyl phthalate	1	UJ	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Dimethyl phthalate	10	U	ug/L	10	42
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Isophorone	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Pentachlorophenol	3.1	U	ug/L	3.1	13
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Pyrene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	2-Chloronaphthalene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Benzo(b)fluoranthene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Benzo(k)fluoranthene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.1	U	ug/L	3.1	13
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2.1	U	ug/L	2.1	8.4
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Naphthalene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	2,4-Dimethylphenol	10	UJ	ug/L	10	42
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Benzo(g,h,i)perylene	1	U	ug/L	1	4.2

Appendix E. (continued)

Date	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Butyl benzyl phthalate	5.2	U	ug/L	5.2	21
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Dibenzo(a,h)anthracene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Hexachlorobenzene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.1	U	ug/L	3.1	13
8/10/2009 12:05	D-00F	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	16	U	ug/L	16	63
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Phenanthrene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Phenol	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Acenaphthylene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Benzidine	100	U	ug/L	100	420
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Chrysene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Fluoranthene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Fluorene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.1	U	ug/L	3.1	13
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Nitrobenzene	2.1	U	ug/L	2.1	8.4
8/10/2009 12:05	D-00F	Priority Organic Pollutants	2-Chlorophenol	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	3,3'-Dichlorobenzidine	42	UJ	ug/L	42	170
8/10/2009 12:05	D-00F	Priority Organic Pollutants	4-Nitrophenol	16	U	ug/L	16	63
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Benzo(a)pyrene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Diethyl phthalate	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Hexachlorobutadiene	3.1	U	ug/L	3.1	13
8/10/2009 12:05	D-00F	Priority Organic Pollutants	Hexachloroethane	3.1	U	ug/L	3.1	13
8/10/2009 12:05	D-00F	Priority Organic Pollutants	N-Nitrosodimethylamine	2.1	U	ug/L	2.1	8.4
8/10/2009 12:05	D-00F	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	2,4,6-Trichlorophenol	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	2,4-Dichlorophenol	1	U	ug/L	1	4.2
8/10/2009 12:05	D-00F	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.1	U	ug/L	3.1	13
8/10/2009 12:05	D-00F	Field Parameter	Sample Depth	0.2		m		
8/10/2009 12:05	D-00F	Field Parameter	Temperature	40.67		C		
8/10/2009 12:05	D-00F	Field Parameter	Temperature	40.67		C		
8/10/2009 12:05	D-00F	Field Parameter	Sample Depth	0.2		m		

Appendix E. (continued)

Date	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
8/10/2009 12:05	D-00F	Field Parameter	pH	8.06				
8/10/2009 12:05	D-00F	Field Parameter	Specific Conductance	47800		umhos/cm		
8/10/2009 12:05	D-00F	Field Parameter	Dissolved Oxygen	5.33		mg/L		
8/10/2009 11:40	Equipment Blank	Metals	Calcium	0.075	U	mg/L	0.075	0.3
8/10/2009 11:40	Equipment Blank	Metals	Silver	0.025	U	ug/L	0.025	0.1
8/10/2009 11:40	Equipment Blank	Metals	Nickel	0.25	U	ug/L	0.25	1
8/10/2009 11:40	Equipment Blank	Metals	Zinc	7.2	I	ug/L	5	20
8/10/2009 11:40	Equipment Blank	Metals	Selenium	0.2	U	ug/L	0.2	0.8
8/10/2009 11:40	Equipment Blank	Metals	Lead	0.2	U	ug/L	0.2	0.8
8/10/2009 11:40	Equipment Blank	Metals	Chromium	0.3	U	ug/L	0.3	1.2
8/10/2009 11:40	Equipment Blank	Metals	Iron	30	U	ug/L	30	120
8/10/2009 11:40	Equipment Blank	Metals	Aluminum	60	U	ug/L	60	240
8/10/2009 11:40	Equipment Blank	Metals	Copper	0.5	U	ug/L	0.5	0.5
8/10/2009 11:40	Equipment Blank	Metals	Arsenic	0.25	U	ug/L	0.25	1
8/10/2009 11:40	Equipment Blank	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
8/10/2009 11:40	Equipment Blank	Metals	Cadmium	0.03	U	ug/L	0.03	0.12
8/10/2009 11:40	Equipment Blank	Nutrients	NO2NO3-N	0.005	I	mg N/L	0.004	0.01
8/10/2009 11:40	Equipment Blank	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
8/10/2009 11:40	Equipment Blank	Nutrients	Total-P	0.004	U	mg P/L	0.004	0.01
8/10/2009 11:40	Equipment Blank	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
8/10/2009 12:30	D-092	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1	I	mg/L	0.2	2
8/10/2009 12:30	D-092	Overflow	COD	300		mg/L	32	100
8/10/2009 12:30	D-092	Field Parameter	Temperature	31.31		C		
8/10/2009 12:30	D-092	Field Parameter	Sample Depth	0.2		m		
8/10/2009 12:30	D-092	Field Parameter	pH	8.03				
8/10/2009 12:30	D-092	Field Parameter	Specific Conductance	48351		umhos/cm		
8/10/2009 12:30	D-092	Field Parameter	Dissolved Oxygen	6.15		mg/L		
8/10/2009 12:50	D-094	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	0.79	I	mg/L	0.2	2
8/10/2009 12:50	D-094	Overflow	COD	740		mg/L	32	100
8/10/2009 12:50	D-094	Field Parameter	Temperature	40.21		C		
8/10/2009 12:50	D-094	Field Parameter	Dissolved Oxygen	5.39		mg/L		
8/10/2009 12:50	D-094	Field Parameter	Specific Conductance	47600		umhos/cm		
8/10/2009 12:50	D-094	Field Parameter	Sample Depth	0.2		m		
8/10/2009 12:50	D-094	Field Parameter	pH	8.03				

Appendix E. (continued)

Date	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
8/10/2009 13:05	D-072	AGP/LN	Algal Growth Potential	3	AU	mg DryWt/L	3	3
8/10/2009 13:05	D-072	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	0.94	I	mg/L	0.2	2
8/10/2009 13:05	D-072	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	1.9		ug/L	0.55	1.7
8/10/2009 13:05	D-072	Chlorophyll/Grain Size/BOD	Phaeophytin-a	1.8		ug/L	0.4	1.2
8/10/2009 13:05	D-072	Metals	Copper	2	U	ug/L	2	2
8/10/2009 13:05	D-072	Metals	Zinc	24	I	ug/L	20	80
8/10/2009 13:05	D-072	Metals	Magnesium	1110		mg/L	0.8	3.2
8/10/2009 13:05	D-072	Metals	Cadmium	0.12	U	ug/L	0.12	0.48
8/10/2009 13:05	D-072	Metals	Nickel	1.4	U	ug/L	1.4	5.6
8/10/2009 13:05	D-072	Metals	Silver	0.1	U	ug/L	0.1	0.4
8/10/2009 13:05	D-072	Metals	Iron	320	I	ug/L	90	360
8/10/2009 13:05	D-072	Metals	Calcium	347		mg/L	0.22	0.9
8/10/2009 13:05	D-072	Metals	Arsenic	2.4	I	ug/L	1	4
8/10/2009 13:05	D-072	Metals	Aluminum	490	I	ug/L	180	720
8/10/2009 13:05	D-072	Metals	Selenium	0.8	U	ug/L	0.8	3.2
8/10/2009 13:05	D-072	Metals	Lead	0.8	U	ug/L	0.8	3.2
8/10/2009 13:05	D-072	Metals	Chromium	1.8	I	ug/L	1.2	4.8
8/10/2009 13:05	D-072	Nutrients	Total-P	0.048		mg P/L	0.008	0.02
8/10/2009 13:05	D-072	Nutrients	TSS	40	A	mg/L	4	16
8/10/2009 13:05	D-072	Nutrients	Ammonia-N	0.028		mg N/L	0.01	0.02
8/10/2009 13:05	D-072	Nutrients	NO2NO3-N	0.005	I	mg N/L	0.004	0.01
8/10/2009 13:05	D-072	Nutrients	Kjeldahl Nitrogen	0.55		mg N/L	0.16	0.4
8/10/2009 13:05	D-072	Pesticides	Endosulfan Sulfate	0.021	U	ug/L	0.021	0.084
8/10/2009 13:05	D-072	Pesticides	Endrin Aldehyde	0.021	U	ug/L	0.021	0.084
8/10/2009 13:05	D-072	Pesticides	Azinphos Methyl	0.21	UJ	ug/L	0.21	0.84
8/10/2009 13:05	D-072	Pesticides	Chlorpyrifos Methyl	0.11	U	ug/L	0.11	0.44
8/10/2009 13:05	D-072	Pesticides	Fenamiphos	0.21	UJ	ug/L	0.21	0.84
8/10/2009 13:05	D-072	Pesticides	Fonofos	0.11	UJ	ug/L	0.11	0.44
8/10/2009 13:05	D-072	Pesticides	Heptachlor	0.011	U	ug/L	0.011	0.044
8/10/2009 13:05	D-072	Pesticides	Heptachlor Epoxide	0.021	U	ug/L	0.021	0.084
8/10/2009 13:05	D-072	Pesticides	Methoxychlor	0.053	U	ug/L	0.053	0.21
8/10/2009 13:05	D-072	Pesticides	Ametryn	0.053	U	ug/L	0.053	0.21
8/10/2009 13:05	D-072	Pesticides	Metolachlor	0.53	UJ	ug/L	0.53	2.1
8/10/2009 13:05	D-072	Pesticides	Simazine	0.053	U	ug/L	0.053	0.21

Appendix E. (continued)

Date	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
8/10/2009 13:05	D-072	Pesticides	Delta-BHC	0.011	U	ug/L	0.011	0.044
8/10/2009 13:05	D-072	Pesticides	Beta-BHC	0.011	U	ug/L	0.011	0.044
8/10/2009 13:05	D-072	Pesticides	DDE-p,p'	0.021	U	ug/L	0.021	0.084
8/10/2009 13:05	D-072	Pesticides	DDT-p,p'	0.032	U	ug/L	0.032	0.13
8/10/2009 13:05	D-072	Pesticides	Toxaphene	0.79	U	ug/L	0.79	3.2
8/10/2009 13:05	D-072	Pesticides	Atrazine	0.053	U	ug/L	0.053	0.21
8/10/2009 13:05	D-072	Pesticides	Malathion	0.16	U	ug/L	0.16	0.64
8/10/2009 13:05	D-072	Pesticides	Metalaxyl	0.26	UJ	ug/L	0.26	1
8/10/2009 13:05	D-072	Pesticides	Alachlor	0.63	UJ	ug/L	0.63	2.5
8/10/2009 13:05	D-072	Pesticides	Chlorpyrifos Ethyl	0.053	U	ug/L	0.053	0.21
8/10/2009 13:05	D-072	Pesticides	Naled	0.84	U	ug/L	0.84	3.4
8/10/2009 13:05	D-072	Pesticides	Alpha-BHC	0.011	U	ug/L	0.011	0.044
8/10/2009 13:05	D-072	Pesticides	Dieldrin	0.021	U	ug/L	0.021	0.084
8/10/2009 13:05	D-072	Pesticides	Endosulfan II	0.021	U	ug/L	0.021	0.084
8/10/2009 13:05	D-072	Pesticides	Aldrin	0.011	U	ug/L	0.011	0.044
8/10/2009 13:05	D-072	Pesticides	Prometryn	0.16	U	ug/L	0.16	0.64
8/10/2009 13:05	D-072	Pesticides	Parathion Ethyl	0.16	U	ug/L	0.16	0.64
8/10/2009 13:05	D-072	Pesticides	Metribuzin	0.11	U	ug/L	0.11	0.44
8/10/2009 13:05	D-072	Pesticides	Endosulfan I	0.021	U	ug/L	0.021	0.084
8/10/2009 13:05	D-072	Pesticides	Phorate	0.053	U	ug/L	0.053	0.21
8/10/2009 13:05	D-072	Pesticides	Hexazinone	0.11	UJ	ug/L	0.11	0.44
8/10/2009 13:05	D-072	Pesticides	Diazinon	0.053	UJ	ug/L	0.053	0.21
8/10/2009 13:05	D-072	Pesticides	Butylate	0.21	UJ	ug/L	0.21	0.84
8/10/2009 13:05	D-072	Pesticides	Gamma-BHC	0.011	U	ug/L	0.011	0.044
8/10/2009 13:05	D-072	Pesticides	DDD-p,p'	0.021	U	ug/L	0.021	0.084
8/10/2009 13:05	D-072	Pesticides	Chlordane	0.21	U	ug/L	0.21	0.84
8/10/2009 13:05	D-072	Pesticides	Parathion Methyl	0.11	U	ug/L	0.11	0.44
8/10/2009 13:05	D-072	Pesticides	Norflurazon	0.16	UJ	ug/L	0.16	0.64
8/10/2009 13:05	D-072	Pesticides	Mevinphos	0.21	U	ug/L	0.21	0.84
8/10/2009 13:05	D-072	Pesticides	Ethoprop	0.11	U	ug/L	0.11	0.44
8/10/2009 13:05	D-072	Pesticides	Ethion	0.053	U	ug/L	0.053	0.21
8/10/2009 13:05	D-072	Pesticides	Endrin	0.053	U	ug/L	0.053	0.21
8/10/2009 13:05	D-072	Pesticides	Bromacil	0.21	U	ug/L	0.21	0.84

Appendix E. (continued)

Date	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
8/10/2009 13:05	D-072	Priority Organic Pollutants	2-Chloronaphthalene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	2-Nitrophenol	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Acenaphthene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Di-n-octyl phthalate	1.1	UJ	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Dibenzo(a,h)anthracene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Nitrobenzene	2.2	U	ug/L	2.2	8.7
8/10/2009 13:05	D-072	Priority Organic Pollutants	2,4-Dinitrophenol	16	U	ug/L	16	66
8/10/2009 13:05	D-072	Priority Organic Pollutants	Naphthalene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Pyrene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	4-Chloro-3-methylphenol	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Benzo(b)fluoranthene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Benzo(g,h,i)perylene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	16	U	ug/L	16	66
8/10/2009 13:05	D-072	Priority Organic Pollutants	Dimethyl phthalate	11	U	ug/L	11	44
8/10/2009 13:05	D-072	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2.2	U	ug/L	2.2	8.7
8/10/2009 13:05	D-072	Priority Organic Pollutants	N-Nitrosodimethylamine	2.2	U	ug/L	2.2	8.7
8/10/2009 13:05	D-072	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2.2	U	ug/L	2.2	8.7
8/10/2009 13:05	D-072	Priority Organic Pollutants	Di-n-butyl phthalate	5.5	U	ug/L	5.5	22
8/10/2009 13:05	D-072	Priority Organic Pollutants	Diethyl phthalate	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Isophorone	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	2,4-Dichlorophenol	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	2-Chlorophenol	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	4-Nitrophenol	16	U	ug/L	16	66
8/10/2009 13:05	D-072	Priority Organic Pollutants	Anthracene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Benzo(a)anthracene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Benzo(k)fluoranthene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.3	U	ug/L	3.3	13
8/10/2009 13:05	D-072	Priority Organic Pollutants	Fluoranthene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Hexachlorobenzene	1.1	U	ug/L	1.1	4.4

Appendix E. (continued)

Date	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
8/10/2009 13:05	D-072	Priority Organic Pollutants	Hexachlorobutadiene	3.3	U	ug/L	3.3	13
8/10/2009 13:05	D-072	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.3	U	ug/L	3.3	13
8/10/2009 13:05	D-072	Priority Organic Pollutants	Pentachlorophenol	3.3	U	ug/L	3.3	13
8/10/2009 13:05	D-072	Priority Organic Pollutants	2,4-Dimethylphenol	11	UJ	ug/L	11	44
8/10/2009 13:05	D-072	Priority Organic Pollutants	3,3'-Dichlorobenzidine	44	UJ	ug/L	44	170
8/10/2009 13:05	D-072	Priority Organic Pollutants	Phenol	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	2,4,6-Trichlorophenol	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Acenaphthylene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Butyl benzyl phthalate	5.5	U	ug/L	5.5	22
8/10/2009 13:05	D-072	Priority Organic Pollutants	Hexachloroethane	3.3	U	ug/L	3.3	13
8/10/2009 13:05	D-072	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Phenanthrene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	2,4-Dinitrotoluene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	2,6-Dinitrotoluene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.3	U	ug/L	3.3	13
8/10/2009 13:05	D-072	Priority Organic Pollutants	Benzidine	110	U	ug/L	110	440
8/10/2009 13:05	D-072	Priority Organic Pollutants	Benzo(a)pyrene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Chrysene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	Fluorene	1.1	U	ug/L	1.1	4.4
8/10/2009 13:05	D-072	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.3	U	ug/L	3.3	13
8/10/2009 13:05	D-072	Field Parameter	Dissolved Oxygen	6.55		mg/L		
8/10/2009 13:05	D-072	Field Parameter	Specific Conductance	46443		umhos/cm		
8/10/2009 13:05	D-072	Field Parameter	Sample Depth	0.2		m		
8/10/2009 13:05	D-072	Field Parameter	Temperature	31.83		C		
8/10/2009 13:05	D-072	Field Parameter	pH	8.07				

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: Jason Cohen Jason.Cohen@dep.state.fl.us	**Contact Number:** 813-632-7600 x429
Facility Name (as it appears on permit): Progress Energy Florida Crystal River Plant Units 1,2 and 3	**Former Names:**
NPDES Permit Number: **FL0000159**	**Permit Expiration Date:** **May 8, 2010**
Physical Address: **15760 West Powerline Street Crystal River, Fl 34428**	
District: Southwest	**County:** **Citrus County**
Function of Facility: Operation of an industrial wastewater treatment and disposal system to serve the referenced facility. The facility consists of two fossil fuel units (Units 1 and 2) and a nuclear fuel unit (Unit 3). These units have a combined maximum permitted daily discharge flow of 1,898 MGD and a total name plate rating of 1,854.8 MW. The facility discharge consists of once-through condenser cooling water, treated nuclear auxiliary cooling water, treated coal pile rainfall run off, intake screen washwater, and treated non-radioactive waste/radiation waste.	
Facility Type: **Major**	**Permitted Capacity (MGD):** **1898**
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): (8/2008-5/2009) (units in millions of gallons) D-011 48805.56 D-071 6763.45 D-072 4568.39 D-0C1 27 D-0C2 0 D-0FG 0.57 D-600 2.96 D0F-17 583.94 D0F-1P 0.07 D0F-1Q 0.11	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months):	
Description of type of Discharge: ☒**Continuous** ☐ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☐ **Other, please specify**	

Appendix F. (continued)

Description of Sampling Location(s) - actual permit designation of permitted sampling point(s):

Sample Point	Description of Monitoring Location
EFF-2	At combined circulating water pumps.
EFF-1A	Outlet corresponding to individual condenser for Unit 1
EFF-1B	Outlet corresponding to individual condenser for Unit 2
EFF-1C	Outlet corresponding to individual condenser for Unit 3

Sample Point	Description of Monitoring Location
INT-1	Intake at Unit 1, See item 7
EFF-3D	At the bulkhead line which is near the down stream end of the site discharge canal .

Sample Point	Description of Monitoring Location
EFF-4	The sample port from the laundry and shower sump tank treatment system, but prior to mixing with any other waste stream.

Sample Point	Description of Monitoring Location
INT-1	Intake at unit 1
EFF-5	Discharge from the ash pond prior to mixing with the receiving water.
EFF-6	Discharge from wastewater pond system prior to mixing with the receiving water.

Sample Point	Description of Monitoring Location
INT-7A	Intake flow at the combined water intake pumps.
EFF-3D	At the bulkhead line which is near the down stream end of the site discharge canal.
EFF-7	Prior to mixing with site discharge canal.
EFF-7B	Prior to discharge to outfall D-00F

Appendix F. (continued)

Description of Permitted Outfall(s):

EFFLUENT DISPOSAL:

Surface Water Discharge:

An existing discharge of OTCW to the site discharge canal and thence to the Gulf of Mexico, a Class III marine water, via **Outfall D-011,** located approximately at latitude 28° 57'30.8" N, longitude 82° 42' 00.7" W.

An existing discharge of OTCW to the site discharge canal and thence to the Gulf of Mexico, a Class III marine water, via **Outfall D-012,** located approximately at latitude 28° 57'31.2" N, longitude 82° 42' 03.0" W.

An existing discharge of OTCW to the site discharge canal and thence to the Gulf of Mexico, a Class III marine water, via **Outfall D-013,** located approximately at latitude 28° 57'30.9" N, longitude 82° 41' 54.9" W.

An existing discharge of intake screen washwater to the site intake canal and thence to the Gulf of Mexico, a Class III marine water, via **Outfall D-091,** located approximately at latitude 28° 57'24 " N, longitude 82°42 '0.4" W.

An existing discharge of intake screen washwater to the site intake canal thence to the Gulf of Mexico, a Class III marine water, via **Outfall D-092,** located approximately at latitude 28° 57'23.2 " N, longitude 82°42 '01.9" W.

An existing discharge of intake screen washwater to the site intake canal and thence to the Gulf of Mexico, a Class III marine water, via **Outfall D-093,** located approximately at latitude 28° 57'21.6 " N, longitude 82°41 '56.2" W.

An existing discharge from the ash pond to the site discharge canal and thence to the Gulf of Mexico, a Class III marine water, via **Outfall D-0C1,** located approximately at latitude 28° 57'34.7 " N, longitude 82°42 '28.8" W.

An existing discharge from the wastewater pond system to the site discharge canal and thence to the Gulf of Mexico, a Class III marine water, via **Outfall D-0C2,** located approximately at latitude 28° 57'31.0 " N, longitude 82°42 '32.4" W.

An existing discharge of Nuclear Services and Decay Heat Seawater System effluent to the site discharge canal and thence to the Gulf of Mexico, a Class III marine water, via **Outfall D-00F,** located approximately at latitude 28° 57'31.2 " N, longitude 82°41 '55.4" W.

An existing discharge of Coal Pile runoff (Units 1 and 2) to an adjacent salt marsh, a Class III marine water, via **Outfall D-0H,** located approximately at latitude 28° 57' 08.8 " N, longitude 82°42 '12.7" W.

Existing discharges of OTCW from the Helper Cooling Tower system to the site discharge canal and thence to the Gulf of Mexico, a Class III marine water, via **Outfalls D-071 and D-072,** located approximately at latitudes 28° 57' 34.5 " N, longitude 82° 42 '32.0" W, and 28° 57'35.8 " N, longitude 82° 42 '48.5" W, respectively.

An existing discharge of intake screen washwater to the site discharge canal and thence to the Gulf of Mexico, a Class III marine water, via **Outfall D-094,** located approximately at latitude 28° 57'34.4 " N, longitude 82°42 '30.4" W.

Internal Discharges

An existing discharge from internal outfall **I-FG** Regeneration Waste Neutralization Tank to **Outfall D-00F.**

An existing discharge from internal outfall **I-FE** Laundry and Shower Sump Tank effluent to **Outfall D-00F.**

Stormwater Discharges

Existing discharges of stormwater from plant areas to the site intake and discharge canal and thence to the Gulf of Mexico via **Outfalls D-100, D-200, D-300, D-400, D-500. and D-600.**

Appendix F. (continued)

Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility):

Wastewater treatment at the facility consists of the following: filtration and or other biocide treatment of once-through non-contact condenser cooling water (OTCW); neutralization, settling, filtration and/or oil/water separation for low volume wastes and metal cleaning wastes..

Appendix F. (continued)

Parameters (units)	Discharge Limitations			Monitoring Requirements		
	Daily Maximum	Daily Average	Daily Minimum	Monitoring Frequency	Sample Type	Sample Point
Flow (MGD)	See item I.A.3.	Report	--	Continuous	Pump logs [1,2]	EFF-2
Chlorination Duration (MINUTES)	See item I.A.5.	--	--	2/Week	Pump logs	EFF-1A EFF-1B EFF-1C
Oxidants, Total Residual (MG/L)	0.01 [3]	Report	--	2/Week	Multiple Grabs	EFF-1A EFF-1B EFF-1C
Temperature (F), Water [Intake] (DEG.F)	Report	Report	--	Continuous	Recorder	INT-1
Temperature (F), Water [Discharge] (DEG.F) [4]	96.5, See item I.A.4.	Report	--	Continuous	Recorder	EFF-3D
Temp. Diff. between Intake and Discharge (DEG.F)	Report	Report	--	Continuous	Recorder	INT 1, EFF 3D

Parameters (units)	Discharge Limitations			Monitoring Requirements		
	Daily Average	Daily Maximum	Daily Minimum	Monitoring Frequency	Sample Type	Sample Point
Flow (MGD)	Report	Report	--	1/Per Batch	Calculation	EFF-4
Oil and Grease (MG/L)	15.0	20.0	--	1/Per Batch	Grab	EFF-4
Solids, Total Suspended (MG/L)	30.0	100.0	--	1/Per Batch	Grab	EFF-4
pH (SU)	--	9.0	6.0	1/Per Batch	Grab	EFF-4
Number of Batches	Report	Report	--	Monthly	Log	EFF-4

Appendix F. (continued)

Parameters (units)	Discharge Limitations			Monitoring Requirements		
	Daily Average	Daily Maximum	Daily Minimum	Monitoring Frequency	Sample Type	Sample Point
Flow (MGD)	Report	Report	--	Daily, when discharging	Calculation	EFF-5 EFF-6
Oil and Grease (MG/L)	--	5.0	--	Weekly	Grab	EFF-5 EFF-6
Solids, Total Suspended (MG/L)	20.0	100.0	--	2/Week	Grab	EFF-5 EFF-6
Arsenic, Total Recoverable (UG/L)	--	20.0	--	Monthly	Grab	EFF-5 EFF-6
Cadmium, Total Recoverable (UG/L)	--	9.3	--	Monthly	Grab	EFF-5 EFF-6
Chromium, Total Recoverable (UG/L)	--	50.0	--	Monthly	Grab	EFF-5 EFF-6
Copper, Total Recoverable (UG/L)	--	3.7	--	Monthly	Grab	EFF-5 EFF-6
Lead, Total Recoverable (UG/L)	--	8.5	--	Monthly	Grab	EFF-5 EFF-6
Iron, Total Recoverable (MG/L)	--	0.3	--	Monthly	Grab	EFF-5 EFF-6
Mercury, Total Recoverable (UG/L)	--	0.025	--	Monthly	Grab	EFF-5 EFF-6
Nickel, Total Recoverable (UG/L)	--	83	--	Monthly	Grab	EFF-5 EFF-6
Selenium, Total Recoverable (UG/L)	--	71	--	Monthly	Grab	EFF-5 EFF-6
PH Standard Units		Report	Report	Monthly	Grab	EFF-5 EFF-6

Parameters (units)	Discharge Limitations			Monitoring Requirements		
	Daily Average	Daily Maximum	Daily Minimum	Monitoring Frequency	Sample Type	Sample Point
PH Standard Units		8.5	6.5	Monthly	Grab	EFF-5 EFF-6
Zinc, Total Recoverable (UG/L)	--	86.0	--	Monthly	Grab	EFF-5 EFF-6

Appendix F. (continued)

Parameters (units)	Discharge Limitations			Monitoring Requirements		
	Daily Maximum	Daily Average	Daily Minimum	Monitoring Frequency	Sample Type	Sample Point
Flow (MGD)	Report	Report	--	Hourly	Recorder or calculation	INT-7A
Oil and Grease (mg/l) (CD and ECST)	20	15	--	Weekly, when discharging	Grab	EFF-7B
Oil and Grease (mg/l) (CD and ECST)	5.0[1]	--	--	Weekly, when discharging	Grab	EFF-7
Flow [ECST] (MGD)	Report	Report	--	Daily, when discharging	Recorder or Calculation	EFF-7B
Flow [CD System] (MGD)	Report	Report	--	Daily, when discharging	Recorder or Calculation	EFF-7B

Parameters (units)	Discharge Limitations			Monitoring Requirements		
	Daily Maximum	Daily Average	Daily Minimum	Monitoring Frequency	Sample Type	Sample Point
Solids, Total Suspended (CD and ECST) (MG/L)	100.0	30.0	--	Weekly, when discharging	Grab	EFF-7B
Solids, Total Suspended (CD and ECST)[D-69F] (MG/L)	100.0[2]	30.0	--	Weekly, when discharging	Grab	EFF-7
Copper, Total Recoverable (UG/L)	3.7[3]	Repeat	--	Daily, when discharging	Grab	EFF-7
Iron, Total Recoverable (UG/L)	300.0[3]	Report	--	Daily, when discharging	Grab	EFF-7
Total Iron, LBS/MG of Metal Cleaning Waste generated	Report	8.345[3,4]	--	Daily, when discharging	Grab	EFF-7B
Total Copper, LBS/MG of Metal Cleaning Waste generated	Report	8.345[3,4]	--	Daily, when discharging	Grab	EFF-7B
Hydrazine, MG/L	------	Report[5]	----	Per Occurrence	Grab	EFF-7B
Hydrazine, MG/L	------	0.341[5,6]	----	Daily, when discharging	Calculation	EFF-7
Hydroquinone, MG/L	------	Report[5]		Per Occurrence	Grab	EFF-7B
Hydroquinone, MG/L	------	0.12[5,6]	----	Daily, when discharging	Calculation	EFF-7
Total Ammonia (as N), MG/L	------	Report[5]	----	Per Occurrence	Grab	EFF-7B
Total Ammonia (as N), MG/L	------	0.047[5,6]	----	Daily, when discharging	Calculation	EFF-7

	Discharge Limitations			Monitoring Requirements		
Parameters (units)	Daily Maximum	Daily Average	Daily Minimum	Monitoring Frequency	Sample Type	Sample Point
Morpholine, MG/L	-------	Report[5]	------	Per Occurence	Grab	EFF-7B
Morpholine, MG/L	-------	1.78[5,6]	------	Daily, when discharging	Calculation	EFF-7
PH, Standard Units	Report	--	Report	Daily, when discharging	Grab	INT-7A
PH , Standard Units	8.5	--	6.5	Daily, when discharging	Grab	EFF-7
Spectrus CT1300, MG/L	See item I.A.18					EFF-7
Spectrus CT 1300 (MG/L)	Report	Report	Report	1/Application	Grab	EFF-7
Whole Effluent Toxicity (ACUTE)	See item I.A.19					EFF-7

[1] Monitoring requirements are only applicable if the discharge from I-FE and I-FG, the CD discharge or the ECST (following adequate mixing) exceeds the daily maximum limitation of 20.0 mg/l or a minimal dilution rate of 4 to 1 is not achieved as determined by the operator and recorded in logs maintained onsite for inspection by the Department.

[2] Monitoring requirements only applicable if the discharge from I-FE and I-FG, the CD discharge or the ECST (following adequate mixing) exceeds the daily maximum limitation of 100.0 mg/l or a minimal dilution rate of 4 to 1 is not achieved as determined by the operator and recorded in logs maintained onsite for inspection by the Department.

[3] Limitations and monitoring requirements for total iron of MCW, total copper of MCW, total recoverable copper and total recoverable iron are applicable only on any calendar day in which metal cleaning waste is discharged in the effluent from I-FG the Evaporator Condensate Storage Tank and/or the Condensate System.

[4] Limitations apply to the effluents from outfall I-FG, ECST and the Condensate System.

[5] Limitations apply to the ESCT, CD or I-FG discharge. containing steam generator lay up chemicals. One grab sample shall be taken from any batch potentially containing ≥1.0 mg/l of hydrazine, based on the operator's knowledge of the process. The measured concentrations of hydrazine, hydroquinone, ammonia and morpholine shall be reported monthly on the DMR.

[6] The limitations apply at D-0F. Calculation shall be used to determine the concentration of hydroquinone, hydrazine, ammonia and morpholine at D-0F.

$$\text{D-0F concentration (mg/l)} = \frac{\text{(measured concentration (mg/l)) (discharge flow)*}}{\text{flow to D-0F}}$$

* The calculation could apply to any batch which potentially contains >1.0 mg/l of hydrazine.

Appendix F. (continued)

Parameters (units)	Discharge Limitations			Monitoring Requirements		
	Daily Average	Daily Maximum	Daily Minimum	Monitoring Frequency	Sample Type	Sample Point
Flow, (MGD)	Report	Report	--	1/Batch	Calculated	EFF-8
Copper, Total Recoverable lbs/MG	--	8.345[1]	--	1/Batch	Grab	EFF-8
Iron, Total Recoverable lbs/MG	--	8.345[1]	--	1/Batch	Grab	EFF-8
Oil and Grease, (MG/L)	15.0	20.0	--	1/Batch	Grab	EFF-8
Total Suspended Solids, MG/L	30.0	100.0	---	1/Batch	Grab	EFF-8
PH, Standard Units	--	9.0	6.0	1/Batch	Grab	EFF-8

Parameters (units)	Discharge Limitations			Monitoring Requirements		
	Monthly Average	Daily Maximum	Daily Minimum	Monitoring Frequency	Sample Type	Sample Point
Flow (MGD)	--	Report	--	Daily, when discharging	Calculated	EFF-9
Solids, Total Suspended (MG/L)	--	50.0 See cond. 24.	--	Daily, when discharging	Grab	EFF-9
Arsenic, Total Recoverable (UG/L)	--	50.	--	Daily, when discharging	Grab	EFF-9
Cadmium, Total Recoverable (UG/L)	--	9.30	--	Daily, when discharging	Grab	EFF-9
Chromium, Total Recoverable (UG/L)	--	50.0	--	Daily, when discharging	Grab	EFF-9

Parameters (units)	Discharge Limitations			Monitoring Requirements		
	Daily Maximum	Daily Average	Daily Minimum	Monitoring Frequency	Sample Type	Sample Point
Intake Flow (MGD)	Report	Report	--	Continuous	Pump logs	INT-10A
Oxidants, Total Residual (MG/L)	0.01[1]	Report	--	Continuous	Recorder	EFF-10B
TRO-Discharge Time (MIN/DAY)	60.0, see cond. I.A.28.	--	--	Continuous	Recorder	EFF-10B
pH (SU)	Report	--	Report	Quarterly	Grab	INT-10A
PH (SU)	8.5	--	6.5	Quarterly	Grab	EFF-10B

Appendix F. (continued)

Parameters (units)	Discharge Limitations			Monitoring Requirements		
	Monthly Average	Daily Maximum	Daily Minimum	Monitoring Frequency	Sample Type	Sample Point
Copper, Total Recoverable (UG/L)	--	3.7	--	Daily, when discharging	Grab	EFF-9
Iron, Total Recoverable (MG/L)	--	0.3	--	Daily, when discharging	Grab	EFF-9
Lead, Total Recoverable (UG/L)	--	8.5	--	Daily, when discharging	Grab	EFF-9
Mercury, Total Recoverable (UG/L)	--	0.025	--	Daily, when discharging	Grab	EFF-9
Nickel, Total Recoverable (UG/L)	--	8.30	--	Daily, when discharging	Grab	EFF-9
Selenium, Total Recoverable (UG/L)	--	71.0	--	Daily, when discharging	Grab	EFF-9
Zinc, Total Recoverable (UG/L)	--	86.0	--	Daily, when discharging	Grab	EFF-9
Vanadium, Total Recoverable (PPM)	--	Report	--	Daily, when discharging	Grab	EFF-9
PH (SU)		8.5	6.5	Daily, when discharging	Grab	INT-3B
PH (SU)		8.5	6.5	Daily, when discharging	Grab	EFF-9

Parameters (units)	Discharge Limitations			Monitoring Requirements		
	Daily Average	Daily Maximum	Daily Minimum	Monitoring Frequency	Sample Type	Sample Point
Flow (MGD)	--	Report	--	Monthly, when discharging	Calculated	EFF-600
Total recoverable iron (UG/L)	--	Report	--	Monthly, when discharging	Grab	EFF-600

Appendix F. (continued)

PART I: Continued	
Receiving Waters: Gulf of Mexico	**Classification (indicate whether fresh or marine):** Class III Marine

Appendix F. (continued)

Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.):

19. The permittee shall initiate the series of tests described below beginning within 60 days of the issuance of the permit to evaluate whole effluent toxicity of the discharge from Outfall D-00F. All test species, procedures and quality assurance criteria used shall be in accordance with Methods for Measuring Acute Toxicity of Effluents to Freshwater and Marine Organisms, 5th ed. EPA-821-R-02-012, or the most current edition.

The control water and the effluent used will be adjusted to an appropriate salinity using artificial sea salts as described in EPA-821-R-02-012, Section 7.4.2., or the most current edition. The appropriate tests salinity shall be determined as follows:

When the salinity of the effluent is between 1 and 7 parts per thousand (ppt), the following salinity adjustment shall be used in the test of 100% effluent. For the Americamysis (**Mysidopsis) bahia** bioassays, the effluent and the control (0% effluent) shall be adjusted to a salinity of 7+1 ppt for the 100% effluent test using artificial sea salts. No salinity adjustment shall be done for the **Menidia beryllina** bioassay test of the 100% effluent. When the salinity of the effluent is greater than 7 parts per thousand, no salinity adjustment shall be made and the test shall be run at the effluent's salinity for both species.

A standard reference toxicant quality assurance (QA) acute toxicity test shall be conducted concurrently or no greater than 30 days before the date of the "routine" test, with each species used in the toxicity tests. The results of all QA toxicity tests shall be submitted with the discharge monitoring report (DMR). Any deviation from the bioassay procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use.

a. (1) The permittee shall conduct 96-hour acute static renewal toxicity tests using the mysid shrimp, Americamysis (**Mysidopsis) bahia**, and the inland silverside, **Menidia beryllina**. All tests will be conducted on four separate grab samples collected at evenly-spaced (6-hr) intervals over a 24-hour period and used in four separate tests in order to catch any peaks of toxicity and to account for daily variations in effluent quality.

(2) If control mortality exceeds 10% for either species in any test, the test for that species (including the control) shall be repeated. A test will be considered valid only if control mortality does not exceed 10% for either species. If, in any separate grab sample test, 100% mortality occurs prior to the end of the test, and control mortality is less than 10% at that time, that test (including the control) shall be terminated with the conclusion that the sample demonstrates unacceptable acute toxicity.

b. (1) The toxicity tests specified above shall be conducted once every two months until 6 valid bimonthly tests are completed. These tests are referred to as "routine" tests. Upon the completion of six valid tests which demonstrate that no unacceptable toxicity (as defined in d.1.) has been identified, the permittee may petition the Department for a reduction in monitoring frequency.

(2) Results from "routine" tests shall be reported according to EPA-821-R-02-012, Section 12, Report Preparation (or the most current edition), and shall be submitted to:

Florida Department of Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619-8378

(3) Results from "routine" tests shall be reported on the Discharge Monitoring Report (DMR) as follows:

i. If greater than 50% mortality occurs in any of the four separate grab sample tests for the test species, "<100" (less than 100% effluent) should be entered on the DMR for that test species.

ii. If 50% or less mortality occurs in all four separate grab sample tests for the test species, ">100" (greater than 100% effluent) should be entered on the DMR for that test species.

iii. For each of the additional tests required, the calculated LC50 value should be entered on the DMR for that test species.

c. (1) All "routine" tests shall be conducted using a control (0% effluent) and one test concentration of 100% final effluent.

(2) Mortalities of greater than 50% in any sample of 100% effluent in any "routine" test or an LC50 of less than 100% effluent in any additional definitive test will constitute a violation of these permit conditions and Rule 62-4.244(3)(a), F.A.C.

d. (1) If unacceptable acute toxicity (greater than 20% mortality in any grab sample of 100% effluent) is determined in a "routine" test, the permittee shall conduct three additional tests on each species indicating acute toxicity. The first additional test will include four grab samples taken as described in a.1. and run as four separate definitive analyses. The second and third additional definitive tests will be run on a single grab sample collected on the day and time when the greatest toxicity was identified in the "routine" test. Results for each additional test will include the determination of LC50 values with 95% confidence limits.

(2) Each additional test shall be conducted using a control (0% effluent) and a minimum of five dilutions: 100%, 50%, 25%, 12.5% and 6.25% effluent and a control (0% effluent). The dilution series may be modified in the second and third test to more accurately identify the toxicity, such that at least two dilutions above and two dilutions below the target toxicity and a control (0% effluent) are run.

(3) For each additional test, the sample collection requirements and the test acceptability criteria specified in section a. above must be met for the test to be considered valid. The first test shall begin within two weeks of the end of the "routine" tests, and shall be conducted weekly thereafter until three additional, valid tests are completed. The additional tests will be used to determine if the toxicity found in the "routine" test is still present.

(4) Results from additional tests, required due to unacceptable toxicity in the "routine" tests, shall be submitted in a single report prepared according to EPA-821-R-02-012, Section 12, or the most current edition and submitted within 45 days of completion of the third additional, valid test. If the additional tests demonstrate unacceptable toxicity, the permittee will meet with the Department within 30 days of the report submittal to identify corrective actions necessary to remedy the unacceptable toxicity.

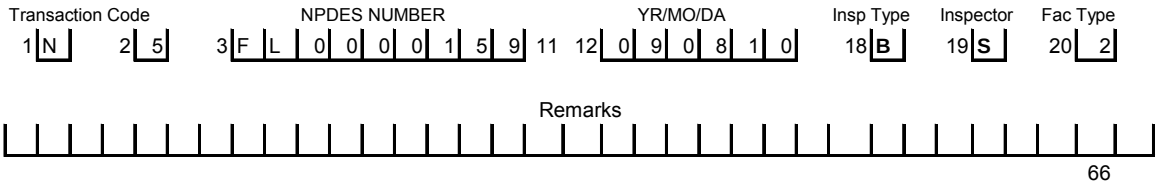
Appendix F. (continued)

Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.):			
Facility Mixing Zone Details (if applicable):			
List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year:			
Date	Parameter and Units	Limit	Result
9/30/08	**Arsenic (ug/L)**	**50.0**	**82.0**
9/30/08	**Iron (mg/L)**	**0.3**	**0.4**
Describe previous FYI and WQBEL study:			
Describe previous or current Enforcement Actions (including WLs):			
Describe any violations or problems noted in previous inspection:			
Discuss whether DMR trends within previous five years are improving or declining:			
Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):			

Appendix G. EPA End Sheet

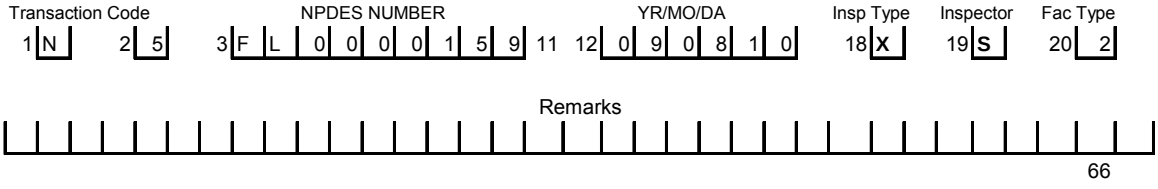
The Bioassay of Progress Energy Crystal River Plant units 1, 2, and 3 effluent sampled on August 10, 2009. NPDES #FL0000159.

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



The Priority Pollutants Analysis of Progress Energy Crystal River Plant units 1, 2, and 3 effluent sampled on August 10, 2009. NPDES #FL0000159.

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



Biological Analyses of Progress Energy Crystal River Plant units 1, 2, and 3 effluent sampled on August 10, 2009. NPDES # FL0000159.

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

