

Effluent Quality Assessment

St. Lucie County Fairgrounds Water Treatment Plant

St. Lucie County

NPDES #FL0434698

Sampled February 28, 2011

May 2011

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
NELAC Certification No. E31780

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St. Lucie County Fairgrounds Water Treatment Plant (WTP), Intersection SR 70 and Midway Road, Fort Pierce, St. Lucie County, Florida 34982. NPDES #FL0434698. Effluent grab samples for biological and chemical analyses for this facility were collected on February 28, 2011.

Introduction

St. Lucie County Fairgrounds Water Treatment Plant uses the reverse osmosis (RO) process to produce potable water. It operates primarily during the county fair at the end of February and the beginning of March. (See Appendix F for detailed facility information provided by Terry Davis of FDEP Southeast District.)

Methods

Samples were collected from the OUI-01 NPDES sampling point for Outfall I-002 by Terry Davis and Dan Krinsky (FDEP Southeast District) following DEP-SOP-001/01 FS 2400 Wastewater Sampling. All DEP SOPs are available on the web at: http://www.floridadep.org/labs/bars/sas/sop/index.htm.

See Appendix A for the completed chain of custody form.

The 48-hour acute screening toxicity tests and algal growth potential test were performed following internal DEP SOPs TA07_01, TA07_02, 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 March 1 - 3, 2011.

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

  Cyprinella leedsi 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 effluent Algal Growth Potential (AGP) was 10.1 A (A – Value reported is the mean of two or more determinations) mg dry wt/L of the unicellular green alga, *Pseudokirchneriella subcapitata*, formerly known as *Selenastrum capricornutum*. Raschke and Schultz (1987) determined that AGP values above 5.0 mg dry weight/L represent a "problem" threshold for fresh receiving waters, implying nutrient enrichment. The analytical chemistry ratio (40.7:1) for inorganic nitrogen and orthophosphate suggests that the effluent is phosphorus-limited. The predicted AGPs based on the inorganic nitrogen concentration and the orthophosphate concentration were, respectively, 9.3 (±20%) and 2.6 (±20%) mg dry wt/L. The analytical chemistry ratio (3.0:1) for total nitrogen and total phosphorus suggests

that the effluent is nitrogen-limited. The predicted AGPs based on the total nitrogen concentration and the total phosphorus concentration were, respectively, 32.8 (±20%) and 124.7 (±20%) mg dry wt/L. (Table 1; Miller et al. 1978). To determine actual nutrient limitation, a limiting-nutrient algal growth potential test should be performed (Miller et al. 1978).

See Table 1 for AGP results.

- **Chemistry Results**
  The total residual chlorine (0.05 mg/L) detected in the bioassay sample in the bioassay laboratory was likely the result of interfering substances in the sample. Total ammonia (0.149 mg N/L) was detected in the bioassay sample in the bioassay laboratory. The total ammonia concentration in the composite sample collected and preserved for chemical analysis was 0.24 mg N/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was 0.02 mg/L.

  Aluminum, arsenic, copper and iron were detected in the effluent at levels that comply with Class III fresh water quality criteria (62-302.530, F.A.C.). Beryllium, chromium-III, lead, nickel and selenium were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL). Chlorophyll *a* was also detected in the effluent.

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

Conclusion

The effluent sample collected from the OUI-01 NPDES sampling point for Outfall I-002 for this facility on February 28, 2011, was not acutely toxic to either test species during the 48-hour acute screening bioassays. The effluent AGP result was greater than the "problem" threshold for fresh receiving waters suggesting that nutrient enrichment may be an issue. Effluent water quality samples collected on February 28, 2011, did not exceed any applicable water quality standards or violate any permit conditions.

Literature Cited

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

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

Table 1. Measured and predicted algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN), orthophosphate (OP), total nitrogen (TN) and total phosphorus (TP) limitation of the freshwater species *Pseudokirchneriella subcapitata f* or samples collected from the St. Lucie County Fairgrounds Water Treatment Plant facility on February 28, 2011.

St. Lucie County Fairgrounds Water Treatment Plant						
Sample	**AGP (measured)**	**Predicted AGP (TSIN) ± 20%**	**Predicted AGP (OP) ± 20%**	**Predicted AGP (TN) ± 20%**	**Predicted AGP (TP) ± 20%**	**Inorganic N:P ratio**	**Total N:P ratio**
Effluent	10.1 A	9.3 ± 1.9	2.6 ± 0.5	32.8 ± 6.6	124.7 ± 24.9	40.7	3.0

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

Table 2. Effluent limits, Class III Freshwater Criteria and chemical data for samples collected from the St. Lucie County Fairgrounds Water Treatment Plant facility on February 28, 2011.

St. Lucie County Fairgrounds Water Treatment Plant NPDES# FL0434698	Class III Criteria	Effluent Limits	Effluent	
Organic Constituents (µg/L)				
None Detected	-	-	None Detected	
Metals (µg/L unless otherwise noted)				
Aluminum	-	-	848	
Arsenic	≤ 50	-	1.22	
Beryllium	≤ 0.13 a	Report	0.031	I
Cadmium	≤ 0.5 b	-	0.05	U
Calcium (mg/L)	-	-	50.9	
Chromium-III	≤ 177.0 b	-	1.2	I
Copper	≤ 19.8 b	-	10.4	
Iron	≤ 1,000	-	350	
Lead	≤ 9.7 b	-	0.57	I
Magnesium (mg/L)	-	-	27.6	
Nickel	≤ 109.7 b	-	0.55	I
Selenium	≤ 5.0	-	0.24	I
Silver	≤ 0.07	-	0.025	U
Zinc	≤ 252.2 b	-	5	U
Nutrients (mg/L)				
Ortho-phosphate	-	-	0.006	I
Total Phosphorus	-	-	0.29	
Total Ammonia	-	-	0.24	
Un-ionized Ammonia	≤ 0.02 s	-	0.02	c
Nitrate and Nitrite	-	-	0.004	UF
Total Kjeldahl Nitrogen	-	-	0.86	
Organic Nitrogen	-	-	0.62	c
Total Nitrogen	-	-	0.862	c
General Physical and Chemical Parameters				
Dissolved Oxygen (mg/L)	≥ 5.0	-	5.6	
pH (SU)	6.0 - 8.5	Report	8.2	
Conductivity (µmhos/cm)	≤ 1,275	Report	1261	
Temperature (°C)	-	-	23.6	
Sample Depth (m)	-	-	0.01	
Total Residual Chlorine (mg/L)	≤ 0.01	-	0.05	Q£
Chlorophyll *a* (µg/L) - Corrected	-	-	4.3	
Phaeophytin (µg/L)	-	-	2	
Total Suspended Solids (mg/L)	-	-	13	I
Flow (MGD)	-	0.0134 a	0.0018	a
Hardness (mg $CaCO_3$)	-	-	240.75	c

Value exceeds the Class III Water Quality Criteria or permit limits

a - Annual average
b - Value is calculated based on hardness
c - Value is calculated
s - Single sample
F - Analyte was detected in both sample and blank (0.005 I mg/L)
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
Q - Sample held beyond normal holding time
U - Material analyzed for but not detected; value reported is the method detection limit
£ - measurement taken in the FDEP laboratory

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2011-02-28-15
St. Lucie Fairgrounds FYI3

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

Requester: Cari Butler
Collected By: Terry Davis, Dan Hranitzky
Sampling Agency: South East District

Field Report Prepared By: Terry Davis
Send Final Report To: Michael Hambor/Terry Davis

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	I 002 (OVI-01)	☐ Comp ☒ Grab Date 2/28/11 Time 1015 Eastern Central	Date Time Eastern Central	
	Field ID: 51-SLC-1	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L): 6.62a	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc): Water-blended salt	Temp (C): 23.59	pH: 8.17	Sample Depth ☐ m ☒ ft: .01
		Salinity (PPTh)	Sp Conductance (umho/cm): 12.61	NPDES Number: A
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments: Preservation as required pH <2	

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	Blank	☐ Comp ☒ Grab Date Time 1035 Eastern Central	Date Time Eastern Central	
	Field ID: 51-SLC-2	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc): D.I. water	Temp (C)	pH	Sample Depth ☐ m ☒ ft: .01
		Salinity (PPTh)	Sp Conductance (umho/cm)	NPDES Number: B
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments: Preservation as required pH <2	

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
		☐ Comp ☐ Grab Date Time Eastern Central	Date Time Eastern Central	
	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 ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments	

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
		☐ Comp ☐ Grab Date Time Eastern Central	Date Time Eastern Central	
	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 ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments	

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
T Davis	2/28/11/1400	Fedex						

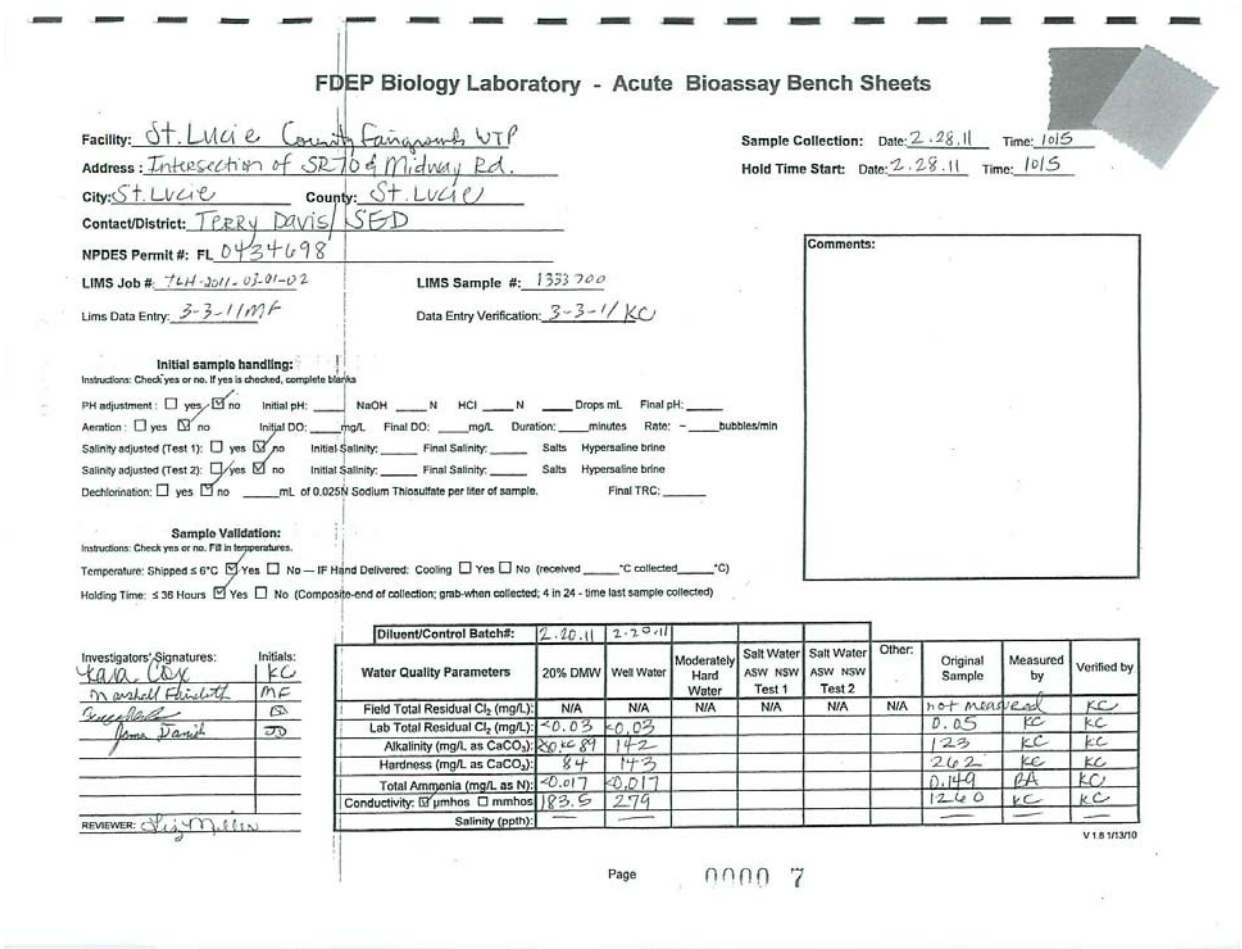
* Shaded Areas for Lab use only

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Took 1 Bioassay Jug 3-1-11 1044 M. Faircloth

Appendix B. Bench Sheets



FDEP Biology Laboratory - Acute Bioassay Bench Sheets

Facility: St. Lucie County Fairgrounds WTP
Address: Intersection of SR 70 & Midway Rd.
City: St. Lucie County: St. Lucie
Contact/District: Terry Davis / SFD
NPDES Permit #: FL 0134698
LIMS Job #: TLH-2011-03-01-02 LIMS Sample #: 1333700
Lims Data Entry: 3-3-11 MF Data Entry Verification: 3-3-11 KC

Sample Collection: Date: 2.28.11 Time: 1015
Hold Time Start: Date: 2.28.11 Time: 1015

Comments:

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

PH adjustment: ☐ yes ☑ no Initial pH: ____ NaOH ____ N HCl ____ N ____ Drops mL Final pH: ____
Aeration: ☐ yes ☑ no Initial DO: ____mg/L Final DO: ____mg/L Duration: ____minutes Rate: ~ ____bubbles/min
Salinity adjusted (Test 1): ☐ yes ☑ no Initial Salinity: ____ 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: ____

Sample Validation:
Instructions: Check yes or no. Fill in temperatures.
Temperature: Shipped ≤ 6°C ☑ Yes ☐ No — IF Hand Delivered: Cooling ☐ Yes ☐ No (received ____°C collected ____°C)
Holding Time: ≤ 36 Hours ☑ Yes ☐ No (Composite-end of collection; grab-when collected; 4 in 24 - time last sample collected)

Investigators' Signatures:	Initials:
Kara Cox	KC
Marshall Faircloth	MF
[illegible]	[illegible]
Jesse Daniels	JD
REVIEWER: Liz Miller	

Diluent/Control Batch#:	2.10.11	2.20.11							
Water Quality Parameters	20% DMW	Well Water	Moderately Hard Water	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	N/A	not measured	KC	KC
Lab Total Residual Cl_2 (mg/L):	<0.03	<0.03					0.05	KC	KC
Alkalinity (mg/L as $CaCO_3$):	20 KC 89	142					123	KC	KC
Hardness (mg/L as $CaCO_3$):	84	143					262	KC	KC
Total Ammonia (mg/L as N):	<0.017	<0.017					0.149	RA	KC
Conductivity: ☑ µmhos ☐ mmhos	183.5	279					1260	KC	KC
Salinity (ppth):	—	—					—	—	—

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Appendix B. continued

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1333700 SOP#: TA 07 D1 Test # 1 of 2

Test Species:
Batch #: 3.1.11 Age: <24 hrs.
- [x] *Ceriodaphnia dubia*
- [ ] *Cyprinella leedsi*
- [ ] *Pimephales promelas*
- [ ] *Menidia beryllina*
- [ ] *Americamysis bahia*
- [ ] Other:

Test Validation
Control Survival ≥ 90%: [x] Yes [ ] No
Temperature Range ≤ 3° C: [x] Yes [ ] No

Diluent (Batch # 2.20.11)
[ ] ASW [x] 20% DMW [ ] MHW [ ] Well

Test Type: [x] Acute [ ] Definitive [x] Static [ ] Static Renewal [ ] Flow-Through

Test Duration: [x] 48 hr [ ] 96 hr [ ] __hr

Chamber Size 30 ml
Test Volume: 20 ml

Test Started: Date 3.1.11 Time 1130

Test Ended: Date 3-3-11 Time 1000

Concentration	Replicate	Chamber #	0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl.	A	A	5	5	5			
	B	B	5	5	5			
	C	C	5	5	5			
	D	D	5	5	5			
100%	A	A	5	5	5			
	B	B	5	5	5			
	C	C	5	~~4~~ 5 Ⓐ	4 1D			
	D	D	5	5	5			
Checked or Verified by:			KC	KC	mF			

Food
- [x] YCT Batch# 2.11.11
- [x] P. subcapitata Batch# 10.22.10
- [ ] Artemia Lot#

Feeding and Artemia Batch #
[x] 0 hr [x] Prior to Test
[ ] 24 hr
[ ] 48 hr [ ] Prior to Renewal
[ ] 72 hr

Temperature Range (°C)

Incubator # 2
min. 26.4 max. 27.4 mean —

Incubator #___
min.___ max.___ mean___

Waterbath #___
min.___ max.___ mean___

Room B246
min 24.1 max. 23.0 mean —

Light intensity (ft. candles): 50-100

Photoperiod (hours): 16 light, 8 dark

Loaded/ Verified by: KC/BA

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

Test Results:

Screening Tests: Report LC50 as >100%, =100%, or <100%.
% mortality in 100% sample: 5% LC50: >100%
Calculated LC50 (Definitive) 95% CI_____ Method_____

Comments:
Ⓐ 5 - KC -

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

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Appendix B. continued

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample # 1333700 SOP#: TA 07 02 Test # 2 of 2

Test Species:
Batch #: 3.1.11 Age: 13days
☑ Ceriodaphnia dubia
☑ Cyprinella leedsi
☐ Pimephales promelas
☐ Menidia beryllina
☐ Americamysis bahia
☐ Other:

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

Diluent (Batch # 2-20.11)
☐ ASW ☑ ≤20% DMW
☐ MHW ☑ Well

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

Test Duration: ☑ 48 hr ☐ 96 hr ☐ __hr

Chamber Size 1000ml
Test Volume: 400ml

Test Started: Date 3.1.11 Time 1130

Test Ended: Date 3-3-11 Time 1000

Concentration	Replicate	Chamber #	0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl	A	KC A D17	5	5	5			
	B	KC B D18	5	5	5			
	C	KC C D19	5	5	5			
	D	KC D D20	5	5	5			
100%	A	KC A D21	5	5	5			
	B	KC B D22	5	5	5			
	C	KC C D23	5	4 1D	4			
	D	KC D B24	5	5	5			
Checked or Verified by:			KC	KC	mf			

Loaded/ Verified by: KC / PA

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

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

Comments:

Food
☑ YCT Batch# 2.11.11 KC
☑ P. subcapitata Batch# ~~10.22.10~~ KC
☑ Artemia Lot# 23613

Feeding and Artemia Batch #
☑ 0 hr 4-1-11 ☑ Prior to Test
☐ 24 hr
☐ 48 hr ☐ Prior to Renewal
☐ 72 hr

Temperature Range (°C)
Incubator # 2
min. 26.4 max. 27.4 mean —
Incubator #
min.______max.______mean______
Waterbath #
min.______max.______mean______
Room B246
min. ~~26.4~~ 24.1 max. 23.0 mean —

Light intensity (ft. candles): 50-100
Photoperiod (hours): 16 light, 8 dark

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

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Appendix B. continued

FDEP Biology Laboratory - Bioassay Parameter Sheet

LIMS Sample # 1333700 Test # 1 of 2

Test Species:

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

Test aerated: (if DO is < 4.0 mg/L)

☐ Yes ☑ No

Concentration	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☑ µmhos ☐ mmhos	Salinity* (ppth)
Ctrl.	MA KC	0 hr	8.0	24.7	8.2	183.5	
	B KC	24 hr	—	—	—	—	
	A C KC	48 hr BR	8.1	24.2	8.1	202	
	B KC	48 hr AR					
		72 hr					
		96 hr					
100%	MA KC	0 hr	8.0	25.5	7.8	1250	
	B KC	24 hr	—	—	—	—	
	A C KC	48 hr BR	8.3	24.2	8.2	1310	
	B KC	48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
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		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

*Measure/ record salinity for marine tests

Comments:

Measured By:
0 hr: KC
24 hr: —
48 hr BR: MA
48 hr AR:
72 hr:
96 hr:

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Appendix B. continued

FDEP Biology Laboratory - Bioassay Parameter Sheet

LIMS Sample # 1333700 Test # 2 of 2

Test Species:

☐ Ceriodaphnia dubia ☐ Pimephales promelas ☐ Americamysis bahia

☑ Cyprinella leedsi ☐ Menidia beryllina ☐ Other:_____

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

Concentration	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☑ µmhos ☐ mmhos	Salinity* (ppth)
Ctrl	A	0 hr	7.8	24.8	8.1	279	
	B	24 hr	8.2	24.0	7.1	286	
	C	48 hr BR	8.3	25.4	7.2	286	
		48 hr AR					
		72 hr					
		96 hr					
100%	A	0 hr	8.0	25.1	7.6	1260	
	B	24 hr	8.1	24.0	7.4	1304	
	C	48 hr BR	8.2	25.5	6.8	1321	
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
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		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

*Measure/ record salinity for marine tests

Comments:

Measured By:
0 hr: KC
24 hr: KC
48 hr BR: MF
48 hr AR:
72 hr:
96 hr:

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Appendix B. continued

Test ID: St. Mary's County Fairgrounds WTP Dates: 3/1-3/2011

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

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

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

entered by MFairclath 3-3-11

V 1.1 9/21/10 MF/jd

000012

Appendix C. SRT Bench Sheets and Statistical Analysis

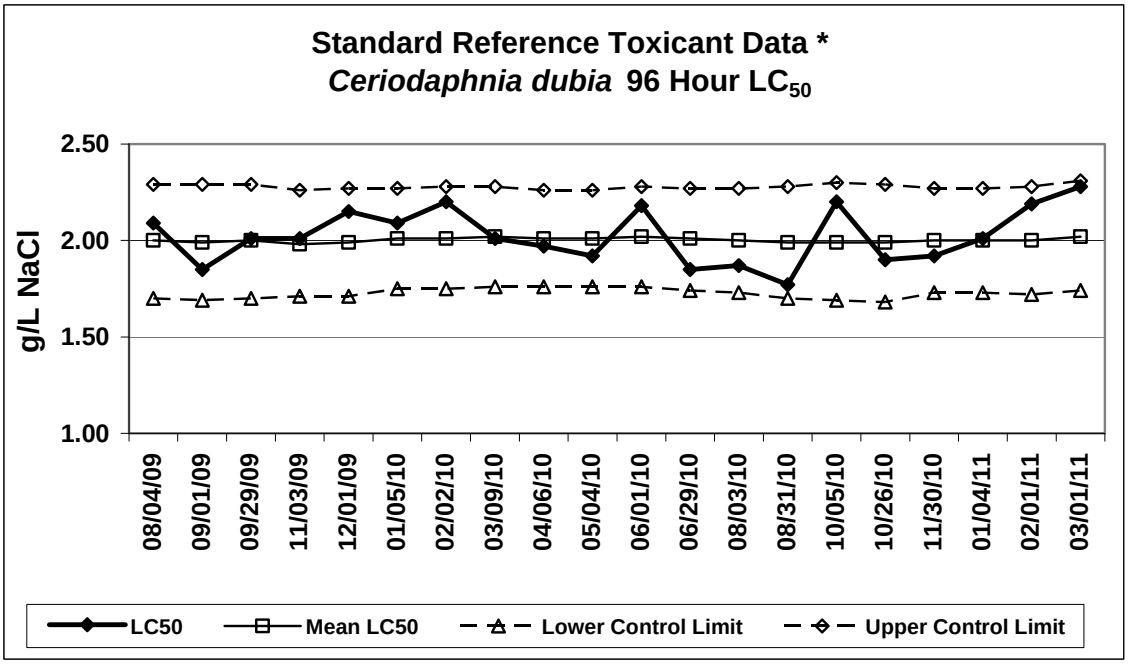
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 96-hour Acute Toxicity
Ceriodaphnia dubia (water flea) - Sodium Chloride (NaCl)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
08/04/09	2.09	2.00	0.15	1.70	2.29
09/01/09	1.85	1.99	0.15	1.69	2.29
09/29/09	2.01	2.00	0.15	1.70	2.29
11/03/09	2.01	1.98	0.14	1.71	2.26
12/01/09	2.15	1.99	0.14	1.71	2.27
01/05/10	2.09	2.01	0.13	1.75	2.27
02/02/10	2.20	2.01	0.13	1.75	2.28
03/09/10	2.01	2.02	0.13	1.76	2.28
04/06/10	1.97	2.01	0.12	1.76	2.26
05/04/10	1.92	2.01	0.12	1.76	2.26
06/01/10	2.18	2.02	0.13	1.76	2.28
06/29/10	1.85	2.01	0.13	1.74	2.27
08/03/10	1.87	2.00	0.14	1.73	2.27
08/31/10	1.77	1.99	0.14	1.70	2.28
10/05/10	2.20	1.99	0.15	1.69	2.30
10/26/10	1.90	1.99	0.15	1.68	2.29
11/30/10	1.92	2.00	0.14	1.73	2.27
01/04/11	2.01	2.00	0.14	1.73	2.27
02/01/11	2.19	2.00	0.14	1.72	2.28
03/01/11	2.28	2.02	0.14	1.74	2.31

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

CV = 7.11
EPA reference 75th quartile CV = 29%



Appendix C. (continued)

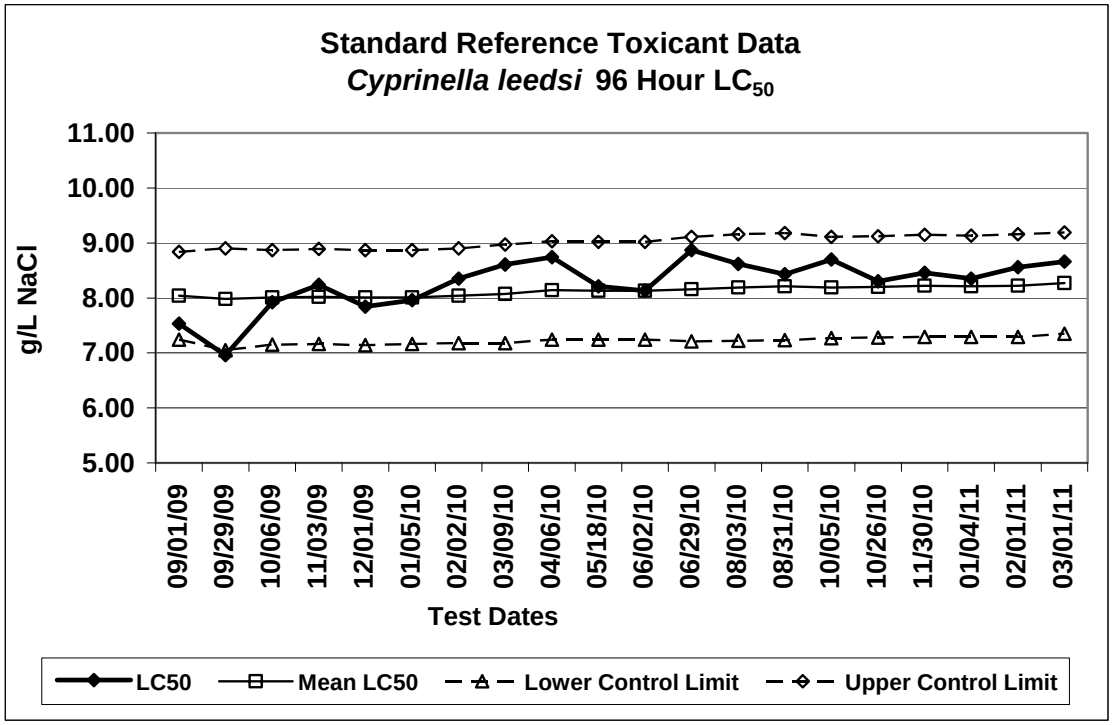
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 96-hour Acute Toxicity
Cyprinella leedsi (bannerfin shiner) - Sodium Chloride (NaCl)

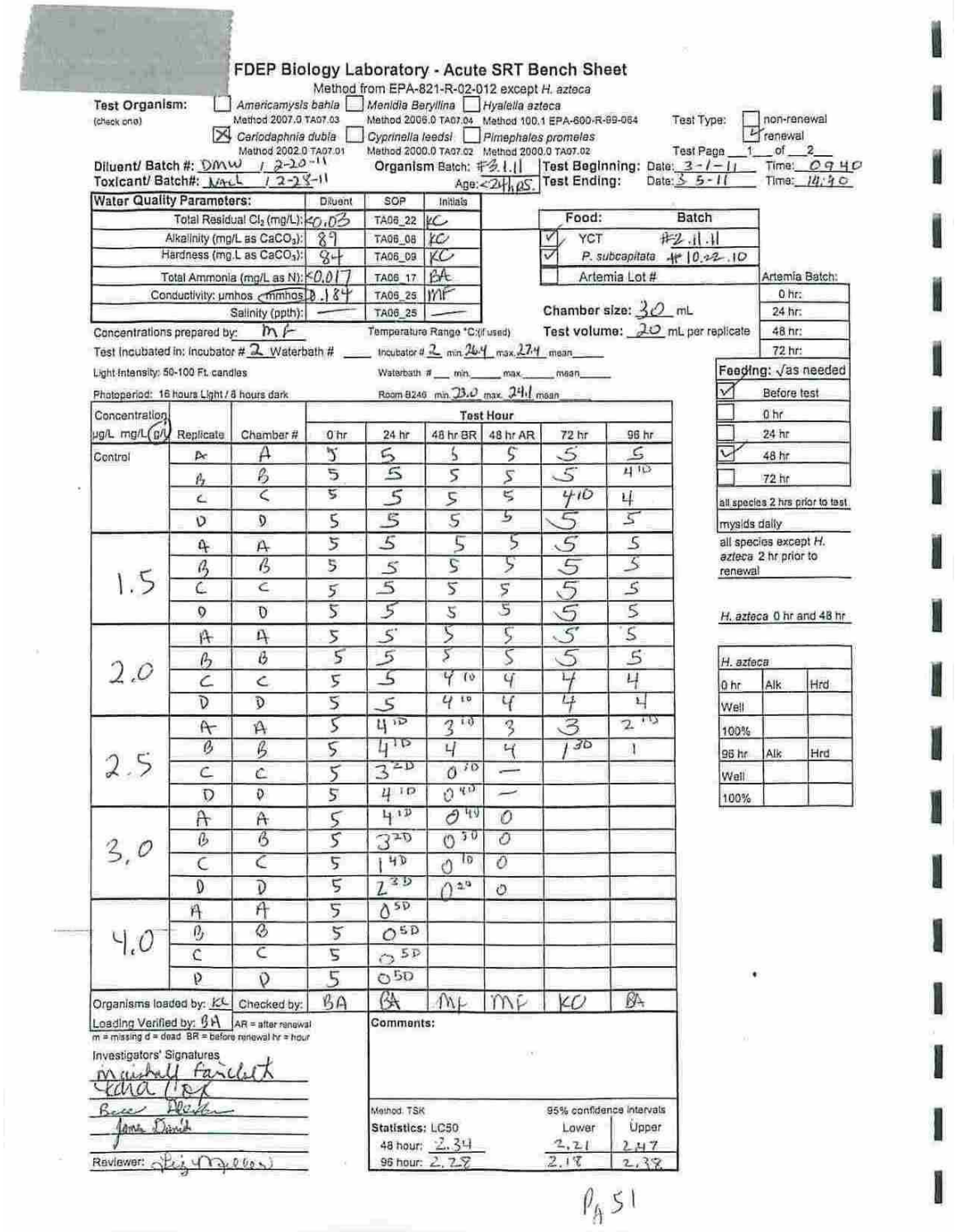
Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
09/01/09	7.53	8.04	0.40	7.24	8.84
09/29/09	6.96	7.98	0.46	7.05	8.90
10/06/09	7.92	8.01	0.43	7.15	8.87
11/03/09	8.24	8.02	0.43	7.16	8.89
12/01/09	7.84	8.01	0.43	7.14	8.87
01/05/10	7.96	8.01	0.43	7.16	8.87
02/02/10	8.35	8.04	0.43	7.18	8.90
03/09/10	8.61	8.07	0.45	7.18	8.97
04/06/10	8.74	8.14	0.45	7.24	9.03
05/18/10	8.21	8.13	0.45	7.24	9.02
06/02/10	8.13	8.13	0.45	7.24	9.02
06/29/10	8.87	8.16	0.47	7.21	9.11
08/03/10	8.62	8.19	0.48	7.22	9.16
08/31/10	8.43	8.21	0.49	7.23	9.18
10/05/10	8.70	8.19	0.46	7.27	9.11
10/26/10	8.30	8.20	0.46	7.28	9.12
11/30/10	8.46	8.22	0.46	7.29	9.15
01/04/11	8.35	8.21	0.46	7.29	9.13
02/01/11	8.56	8.22	0.47	7.29	9.16
03/01/11	8.66	8.27	0.46	7.35	9.19

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

CV = 5.55
EPA reference 75th quartile CV = 19%



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 #: DMW 1.2-20-11

Toxicant/ Batch#: NaCl 1.2-28-11

Organism Batch: #3.1.11 Age: <24hrs.

Test Beginning: Date: 3-1-11 Time: 0940

Test Ending: Date: 3-5-11 Time: 14:30

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	KC
Alkalinity (mg/L as $CaCO_3$):	89	TA06_08	KC
Hardness (mg.L as $CaCO_3$):	84	TA06_09	KC
Total Ammonia (mg/L as N):	<0.017	TA06_17	BA
Conductivity: µmhos ~~mmhos~~	0.184	TA06_25	MF
Salinity (ppth):	—	TA06_25	—

Food:	Batch
☑ YCT	#2.11.11
☑ *P. subcapitata*	#10.22.10
☐ Artemia Lot #	

Artemia Batch:

0 hr:

24 hr:

48 hr:

72 hr:

Chamber size: 30 mL

Test volume: 20 mL per replicate

Concentrations prepared by: MF

Temperature Range °C:(if used)

Test incubated in: Incubator # 2 Waterbath # ___ Incubator # 2 min 26.4 max 27.4 mean ___

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

Photoperiod: 16 hours Light / 8 hours dark Room B246 min 23.0 max 24.1 mean ___

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	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	4 1D
	C	C	5	5	5	5	4 1D	4
	D	D	5	5	5	5	5	5
1.5	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	5
	C	C	5	5	5	5	5	5
	D	D	5	5	5	5	5	5
2.0	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	5
	C	C	5	5	4 1D	4	4	4
	D	D	5	5	4 1D	4	4	4
2.5	A	A	5	4 1D	3 1D	3	3	2 1D
	B	B	5	4 1D	4	4	1 3D	1
	C	C	5	3 2D	0 1D	—		
	D	D	5	4 1D	0 4D	—		
3.0	A	A	5	4 1D	0 4D	0		
	B	B	5	3 2D	0 3D	0		
	C	C	5	1 4D	0 1D	0		
	D	D	5	2 3D	0 2D	0		
4.0	A	A	5	0 5D				
	B	B	5	0 5D				
	C	C	5	0 5D				
	D	D	5	0 5D				
Organisms loaded by: KC		Checked by:	BA	BA	MF	MF	KO	BA

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

Loading Verified by: BA AR = after renewal

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

Investigators' Signatures

Michael Faircloth

Kelly Rose

Bruce Parker

James Dinh

Reviewer: Liz Mayeux

Comments:

Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour: 2.34	2.21	2.47
96 hour: 2.28	2.18	2.38

PASS

Appendix C. (continued)

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

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

Test Beginning: Date: 3-1-11 Time: 0940
Test Ending: Date: 3-5-11 Time: 14:40
Test Type: ☐ non-renewal ☑ renewal

hr = hour AR = after renewal BR = before renewal

Concentration µg/L mg/L (g/L)	Replicate	Test Hour	pH (SU)	Temperature (° C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☑ mmhos	Salinity (ppth)
Control	M	0 hr	8.3	24.4	7.7	0.184	
		24 hr					
	A	48 hr BR	8.2	24.3	8.1	0.215	
	A	48 hr AR	8.0	25.7	7.6	0.185	
		72 hr					
	A	96 hr	8.3	24.8	6.8	0.198	
1.5	M	0 hr	8.2	24.7	7.9	2.84	
		24 hr					
	A	48 hr BR	8.2	24.5	8.2	3.11	
	A	48 hr AR	8.0	25.4	7.7	2.70	
		72 hr					
	A	96 hr	8.2	25.1	6.9	2.72	
2.0	M	0 hr	8.2	24.7	7.9	3.71	
		24 hr					
	A	48 hr BR	8.2	24.7	8.3	4.29	
	A	48 hr AR	8.1	25.5	7.7	3.86	
		72 hr					
	A	96 hr	8.2	25.0	7.0	3.89	
2.5	M	0 hr	8.2	24.7	7.9	4.56	
		24 hr					
	A	48 hr BR	8.2	24.7	8.2	5.18	
	A	48 hr AR	8.1	24.5	7.7	4.69	
		72 hr					
	A	96 hr	8.2	24.9	7.1	4.74	
3.0	M	0 hr	8.2	24.7	8.0	5.36	
		24 hr					
	A	48 hr BR	8.2	24.8	8.4	6.13	
	A	48 hr AR					
		72 hr					
		96 hr					
4.0	M	0 hr	8.2	24.5	8.1	7.16	
	A	24 hr	8.0	24.0	7.9	7.69	
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

Investigators Signatures
Marshall Faircloth
Ukara Cox
Bryce Neal
James Daniels

Reviewed By: Stig Miller

Measured by:
0 hr: MF
24 hr: BN
48 hr BR: KC
48 hr AR: KC
72 hr: KC
96 hr: BN

Measure/record salinity for marine tests

Comments:

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Appendix C. (continued)

[redacted]

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 #: well / 2-28-11
Toxicant/ Batch#: N.CL / 12-28-11
Organism Batch: #3.1.11 Age: 13days
Test Beginning: Date: 3-1-11 Time: 1300
Test Ending: Date: 3.5.11 Time: 1500

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	KC
Alkalinity (mg/L as $CaCO_3$):	142	TA06_08	KC
Hardness (mg.L as $CaCO_3$):	143	TA06_09	KC
Total Ammonia (mg/L as N):	<0.017	TA06_17	BA
Conductivity: µmhos (mmhos)	0.291	TA06_25	JD
Salinity (ppth):	—	TA06_25	—

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

Artemia Batch:
0 hr 11-11
24 hr:
48 hr: 13-11
72 hr:

Chamber size: 1000 mL
Test volume: ~~500~~ 400 mL per replicate

Concentrations prepared by: MF
Temperature Range °C: (if used)
Test Incubated in: Incubator # 2 Waterbath # ____ Incubator # 2 min 26.4 max 27.9 mean ____
Light Intensity: 50-100 Ft. candles Waterbath # ___ min. ____ max. ____ mean ____
Photoperiod: 16 hours Light / 8 hours dark Room B246 min 23.0 max 24.1 mean ____

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

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

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

Concentration µg/L mg/L g/L	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	A1	10	10	10	10	10	10
	B	A2	10	10	10	10	10	10
6	A	A3	10	10	10	10	10	9 1D
	B	A4	10	10	10	10	10	10
7	A	A5	10	10	10	10	10	10
	B	A6	10	10	10	10	10	10
8	A	A7	10	10	10	10	10	10
	B	A8	10	10	10	10	10	10
9	A	A9	10	4 6D	3 1D	3	2 1D	2
	B	A10	10	4 6D	4	4	4	2 2D
10	A	A11	10	D 10D				
	B	A12	10	D 10D				
Organisms loaded by: KC		Checked by:	BA	KC	KC	KC	KC	BA

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

Investigators' Signatures
Marshall Faircloth
Kara Cox
Jana Davis
Bruce Pruess
Reviewer: Liz Miller

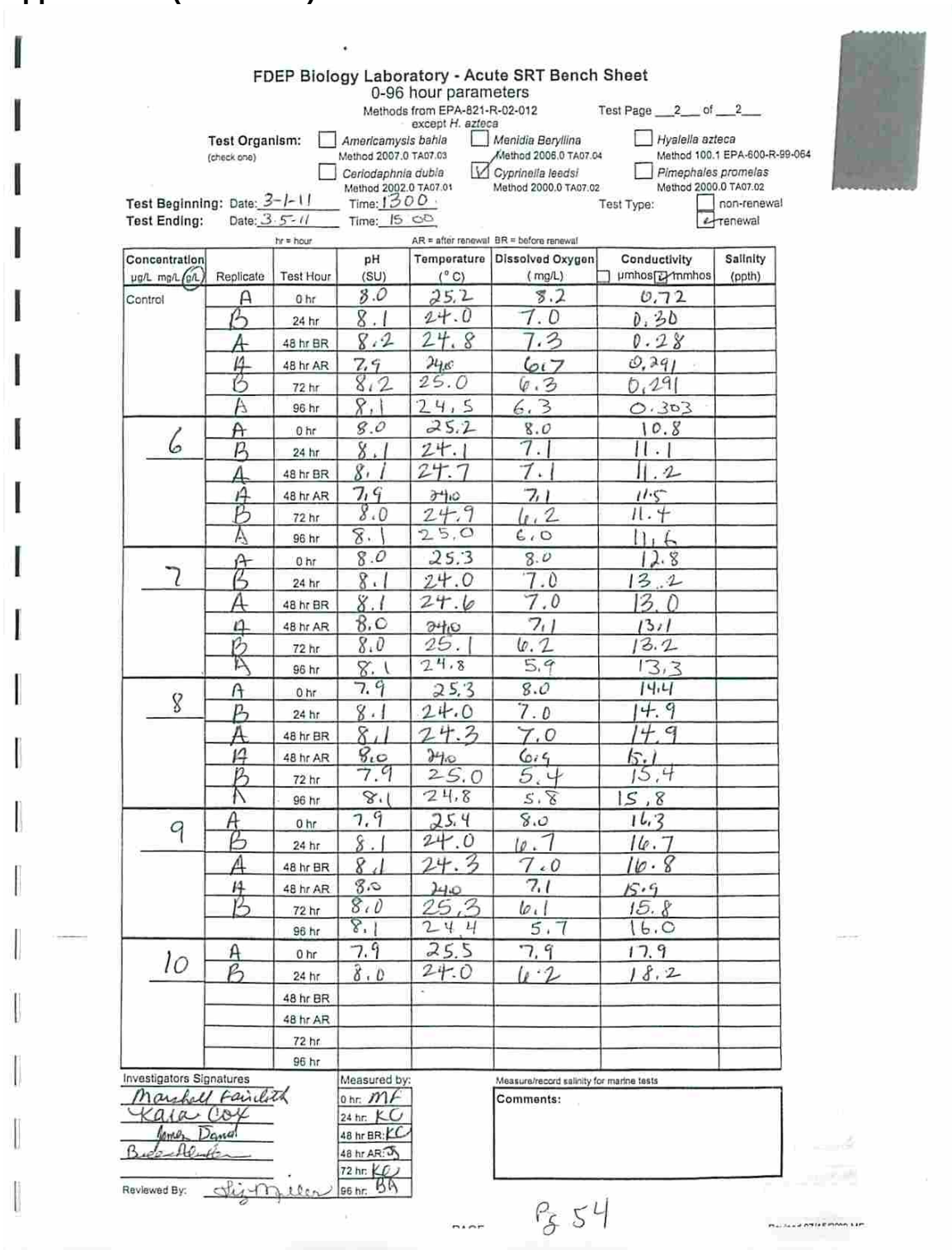
Comments:

Method: TSK

Statistics: LC50		95% confidence intervals Lower	Upper
48 hour:	5.82	8.62	9.04
96 hour:	8.66	8.48	8.84

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Appendix C. (continued)



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

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

Test Page 2 of 2

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

Test Beginning: Date: 3-1-11 Time: 1300
Test Ending: Date: 3-5-11 Time: 1500

Test Type: ☐ non-renewal ☑ renewal

hr = hour AR = after renewal BR = before renewal

Concentration µg/L mg/L (g/L)	Replicate	Test Hour	pH (SU)	Temperature (° C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☑ mmhos	Salinity (ppth)
Control	A	0 hr	8.0	25.2	8.2	0.72	
	B	24 hr	8.1	24.0	7.0	0.30	
	A	48 hr BR	8.2	24.8	7.3	0.28	
	A	48 hr AR	7.9	24.8	6.7	0.291	
	B	72 hr	8.2	25.0	6.3	0.291	
	A	96 hr	8.1	24.5	6.3	0.303	
6	A	0 hr	8.0	25.2	8.0	10.8	
	B	24 hr	8.1	24.1	7.1	11.1	
	A	48 hr BR	8.1	24.7	7.1	11.2	
	A	48 hr AR	7.9	24.0	7.1	11.5	
	B	72 hr	8.0	24.9	6.2	11.4	
	A	96 hr	8.1	25.0	6.0	11.6	
7	A	0 hr	8.0	25.3	8.0	12.8	
	B	24 hr	8.1	24.0	7.0	13.2	
	A	48 hr BR	8.1	24.6	7.0	13.0	
	A	48 hr AR	8.0	24.0	7.1	13.1	
	B	72 hr	8.0	25.1	6.2	13.2	
	A	96 hr	8.1	24.8	5.9	13.3	
8	A	0 hr	7.9	25.3	8.0	14.4	
	B	24 hr	8.1	24.0	7.0	14.9	
	A	48 hr BR	8.1	24.3	7.0	14.9	
	A	48 hr AR	8.0	24.0	6.9	15.1	
	B	72 hr	7.9	25.0	5.4	15.4	
	A	96 hr	8.1	24.8	5.8	15.8	
9	A	0 hr	7.9	25.4	8.0	16.3	
	B	24 hr	8.1	24.0	6.7	16.7	
	A	48 hr BR	8.1	24.3	7.0	16.8	
	A	48 hr AR	8.0	24.0	7.1	15.9	
	B	72 hr	8.0	25.3	6.1	15.8	
		96 hr	8.1	24.4	5.7	16.0	
10	A	0 hr	7.9	25.5	7.9	17.9	
	B	24 hr	8.0	24.0	6.2	18.2	
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

Investigators Signatures
Marshall Faircloth
Kasia Cox
James Dana
Bob Hamilton

Reviewed By: Liz Miller

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

Measure/record salinity for marine tests

Comments:

PAGE Pg 54

Appendix C. (continued)

DATE: 3-1-11 DURATION: 96 h TOXICANT : NaCl
SPECIES: ***Ceriodaphnia dubia***

RAW DATA: Concentration (g/L)	Number Exposed	Mortalities
.00	20	2
1.50	20	0
2.00	20	2
2.50	20	17
3.00	20	20
4.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: **LC50: 2.28**
95% LOWER CONFIDENCE: 2.18
95% UPPER CONFIDENCE: 2.38

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

-

DATE: 3-1-11 DURATION: 96 h TOXICANT : NaCl
SPECIES: ***Cyprinella leedsi***

RAW DATA: Concentration (g/L)	Number Exposed	Mortalities
.00	20	0
6.00	20	1
7.00	20	0
8.00	20	0
9.00	20	16
10.00	20	20

SPEARMAN-KARBER TRIM: 1.67%

SPEARMAN-KARBER ESTIMATES: **LC50: 8.66**
95% LOWER CONFIDENCE: 8.48
95% UPPER CONFIDENCE: 8.84

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

Appendix D. Test Organism Receipt

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: 2/28/11

Ship to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia	150 ac	4DAYS	MS 110224	25	~~7.8~~ 8.0	20
Menidia beryllina	150 ac	12DAYS	SS 110216	25	8.0	20
						Hardness mg/L
Cyprinella leedsi	200	12DAYS	CL 110216	25	7.8	80
Pimephales promelas	150 ac	7DAYS	FM 110221	25	7.8	80
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: PM

Shipped Via: Fed Ex

Notes: _____

Thank you for your order.

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

Appendix E. Chemical Analyses performed on the effluent from the St. Lucie County Fairgrounds Water Treatment Plant Outfall OUI-01, sampled on February 28, 2011.

Date Sampled	Field ID	Analysis	Component	Result	Qualifier	Units	MDL	PQL
2/28/2011 10:15	Effluent	AGP/LN	Algal Growth Potential	10.1	A	mg DryWt/L	0.3	0.9
2/28/2011 10:15	Effluent	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	4.3		ug/L	0.55	1.7
2/28/2011 10:15	Effluent	Chlorophyll/Grain Size/BOD	Phaeophytin-a	2		ug/L	0.4	1.2
2/28/2011 10:15	Effluent	Toxicology	Bioassay-Acute-Screen-FW-C.dubia, LC50	100	L	LC50		
2/28/2011 10:15	Effluent	Toxicology	Bioassay-Acute-Screen-FW-Fish, LC50	100	L	LC50		
2/28/2011 10:15	Effluent	Metals	Copper	10.4		ug/L	0.5	1
2/28/2011 10:15	Effluent	Metals	Nickel	0.55	I	ug/L	0.25	1
2/28/2011 10:15	Effluent	Metals	Cadmium	0.05	U	ug/L	0.05	0.2
2/28/2011 10:15	Effluent	Metals	Aluminum	848		ug/L	5	20
2/28/2011 10:15	Effluent	Metals	Silver	0.025	U	ug/L	0.025	0.1
2/28/2011 10:15	Effluent	Metals	Arsenic	1.22		ug/L	0.25	1
2/28/2011 10:15	Effluent	Metals	Selenium	0.24	I	ug/L	0.2	0.8
2/28/2011 10:15	Effluent	Metals	Beryllium	0.031	I	ug/L	0.025	0.1
2/28/2011 10:15	Effluent	Metals	Iron	350		ug/L	30	120
2/28/2011 10:15	Effluent	Metals	Calcium	50.9		mg/L	0.075	0.3
2/28/2011 10:15	Effluent	Metals	Magnesium	27.6		mg/L	0.04	0.16
2/28/2011 10:15	Effluent	Metals	Zinc	5	U	ug/L	5	20
2/28/2011 10:15	Effluent	Metals	Chromium	1.2	I	ug/L	0.3	1.2
2/28/2011 10:15	Effluent	Metals	Lead	0.57	I	ug/L	0.2	0.8
2/28/2011 10:15	Effluent	Nutrients	O-Phosphate-P	0.006	I	mg P/L	0.004	0.01
2/28/2011 10:15	Effluent	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
2/28/2011 10:15	Effluent	Nutrients	Ammonia-N	0.24		mg N/L	0.01	0.02
2/28/2011 10:15	Effluent	Nutrients	Kjeldahl Nitrogen	0.86		mg N/L	0.08	0.2
2/28/2011 10:15	Effluent	Nutrients	TSS	13	I	mg/L	4	16
2/28/2011 10:15	Effluent	Nutrients	Total-P	0.29		mg P/L	0.005	0.05
2/28/2011 10:15	Effluent	Pesticides	DDD-p,p'	0.02	U	ug/L	0.02	0.08
2/28/2011 10:15	Effluent	Pesticides	Azinphos Methyl	0.2	UJ	ug/L	0.2	0.8
2/28/2011 10:15	Effluent	Pesticides	Parathion Ethyl	0.15	U	ug/L	0.15	0.6
2/28/2011 10:15	Effluent	Pesticides	Heptachlor	0.01	U	ug/L	0.01	0.04
2/28/2011 10:15	Effluent	Pesticides	Methoxychlor	0.05	U	ug/L	0.05	0.2
2/28/2011 10:15	Effluent	Pesticides	Beta-BHC	0.01	U	ug/L	0.01	0.04
2/28/2011 10:15	Effluent	Pesticides	DDT-p,p'	0.03	U	ug/L	0.03	0.12
2/28/2011 10:15	Effluent	Pesticides	Endosulfan II	0.02	U	ug/L	0.02	0.08

Appendix E. continued

Date Sampled	Field ID	Analysis	Component	Result	Qualifier	Units	MDL	PQL
2/28/2011 10:15	Effluent	Pesticides	Endrin	0.05	U	ug/L	0.05	0.2
2/28/2011 10:15	Effluent	Pesticides	Toxaphene	0.75	U	ug/L	0.75	3
2/28/2011 10:15	Effluent	Pesticides	Chlorpyrifos Methyl	0.1	U	ug/L	0.1	0.4
2/28/2011 10:15	Effluent	Pesticides	Norflurazon	0.15	UJ	ug/L	0.15	0.6
2/28/2011 10:15	Effluent	Pesticides	Dieldrin	0.02	U	ug/L	0.02	0.08
2/28/2011 10:15	Effluent	Pesticides	Endosulfan Sulfate	0.02	U	ug/L	0.02	0.08
2/28/2011 10:15	Effluent	Pesticides	Gamma-BHC	0.01	U	ug/L	0.01	0.04
2/28/2011 10:15	Effluent	Pesticides	Fenamiphos	0.2	U	ug/L	0.2	0.8
2/28/2011 10:15	Effluent	Pesticides	Naled	0.8	UJ	ug/L	0.8	3.2
2/28/2011 10:15	Effluent	Pesticides	Heptachlor Epoxide	0.02	U	ug/L	0.02	0.08
2/28/2011 10:15	Effluent	Pesticides	Alachlor	0.6	U	ug/L	0.6	2.4
2/28/2011 10:15	Effluent	Pesticides	Ametryn	0.05	U	ug/L	0.05	0.2
2/28/2011 10:15	Effluent	Pesticides	Ethion	0.05	U	ug/L	0.05	0.2
2/28/2011 10:15	Effluent	Pesticides	Hexazinone	0.1	U	ug/L	0.1	0.4
2/28/2011 10:15	Effluent	Pesticides	Metolachlor	0.5	U	ug/L	0.5	2
2/28/2011 10:15	Effluent	Pesticides	Mevinphos	0.2	U	ug/L	0.2	0.8
2/28/2011 10:15	Effluent	Pesticides	Phorate	0.05	U	ug/L	0.05	0.2
2/28/2011 10:15	Effluent	Pesticides	Chlordane	0.2	U	ug/L	0.2	0.8
2/28/2011 10:15	Effluent	Pesticides	Endrin Aldehyde	0.02	U	ug/L	0.02	0.08
2/28/2011 10:15	Effluent	Pesticides	Bromacil	0.2	UJ	ug/L	0.2	0.8
2/28/2011 10:15	Effluent	Pesticides	Diazinon	0.05	U	ug/L	0.05	0.2
2/28/2011 10:15	Effluent	Pesticides	Fonofos	0.1	U	ug/L	0.1	0.4
2/28/2011 10:15	Effluent	Pesticides	Malathion	0.15	U	ug/L	0.15	0.6
2/28/2011 10:15	Effluent	Pesticides	Metalaxyl	0.25	U	ug/L	0.25	1
2/28/2011 10:15	Effluent	Pesticides	Metribuzin	0.1	U	ug/L	0.1	0.4
2/28/2011 10:15	Effluent	Pesticides	Simazine	0.05	U	ug/L	0.05	0.2
2/28/2011 10:15	Effluent	Pesticides	Alpha-BHC	0.01	U	ug/L	0.01	0.04
2/28/2011 10:15	Effluent	Pesticides	DDE-p,p'	0.02	U	ug/L	0.02	0.08
2/28/2011 10:15	Effluent	Pesticides	Delta-BHC	0.01	U	ug/L	0.01	0.04
2/28/2011 10:15	Effluent	Pesticides	Atrazine	0.05	U	ug/L	0.05	0.2
2/28/2011 10:15	Effluent	Pesticides	Chlorpyrifos Ethyl	0.05	U	ug/L	0.05	0.2
2/28/2011 10:15	Effluent	Pesticides	Ethoprop	0.1	U	ug/L	0.1	0.4
2/28/2011 10:15	Effluent	Pesticides	Parathion Methyl	0.1	U	ug/L	0.1	0.4
2/28/2011 10:15	Effluent	Pesticides	Prometryn	0.15	U	ug/L	0.15	0.6

Appendix E. continued

Date Sampled	Field ID	Analysis	Component	Result	Qualifier	Units	MDL	PQL
2/28/2011 10:15	Effluent	Pesticides	Endosulfan I	0.02	U	ug/L	0.02	0.08
2/28/2011 10:15	Effluent	Pesticides	Butylate	0.2	U	ug/L	0.2	0.8
2/28/2011 10:15	Effluent	Pesticides	Aldrin	0.01	U	ug/L	0.01	0.04
2/28/2011 10:15	Effluent	Priority Organic Pollutants	2,4-Dichlorophenol	0.95	U	ug/L	0.95	3.8
2/28/2011 10:15	Effluent	Priority Organic Pollutants	2-Chlorophenol	0.95	U	ug/L	0.95	3.8
2/28/2011 10:15	Effluent	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	11
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Benzo(a)anthracene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.95	U	ug/L	0.95	3.8
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Di-n-octyl phthalate	0.95	U	ug/L	0.95	3.8
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Isophorone	0.95	U	ug/L	0.95	3.8
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Phenol	0.95	U	ug/L	0.95	3.8
2/28/2011 10:15	Effluent	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.95	U	ug/L	0.95	3.8
2/28/2011 10:15	Effluent	Priority Organic Pollutants	2,4-Dinitrophenol	14	U	ug/L	14	57
2/28/2011 10:15	Effluent	Priority Organic Pollutants	2-Chloronaphthalene	0.95	U	ug/L	0.95	3.8
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Fluorene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	11
2/28/2011 10:15	Effluent	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.6
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	11
2/28/2011 10:15	Effluent	Priority Organic Pollutants	2,4-Dimethylphenol	9.5	U	ug/L	9.5	38
2/28/2011 10:15	Effluent	Priority Organic Pollutants	2,4-Dinitrotoluene	0.95	U	ug/L	0.95	3.8
2/28/2011 10:15	Effluent	Priority Organic Pollutants	2-Nitrophenol	0.95	U	ug/L	0.95	3.8
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:15	Effluent	Priority Organic Pollutants	2,6-Dinitrotoluene	0.95	U	ug/L	0.95	3.8
2/28/2011 10:15	Effluent	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.95	U	ug/L	0.95	3.8
2/28/2011 10:15	Effluent	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.95	U	ug/L	0.95	3.8
2/28/2011 10:15	Effluent	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.6
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Acenaphthene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Acenaphthylene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.6
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Anthracene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Benzidine	95	UJ	ug/L	95	380
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Diethyl phthalate	0.95	U	ug/L	0.95	3.8

Appendix E. continued

Date Sampled	Field ID	Analysis	Component	Result	Qualifier	Units	MDL	PQL
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Fluoranthene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:15	Effluent	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38	UJ	ug/L	38	150
2/28/2011 10:15	Effluent	Priority Organic Pollutants	4-Nitrophenol	14	U	ug/L	14	57
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.95	U	ug/L	0.95	3.8
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	11
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Hexachlorobenzene	0.95	U	ug/L	0.95	3.8
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	11
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Naphthalene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Phenanthrene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Pyrene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Benzo(a)pyrene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	11
2/28/2011 10:15	Effluent	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	U	ug/L	2.9	11
2/28/2011 10:15	Effluent	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.95	U	ug/L	0.95	3.8
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	14	U	ug/L	14	57
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Butyl benzyl phthalate	4.8	U	ug/L	4.8	19
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Chrysene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Di-n-butyl phthalate	4.8	U	ug/L	4.8	19
2/28/2011 10:15	Effluent	Priority Organic Pollutants	Dimethyl phthalate	9.5	UJ	ug/L	9.5	38
2/28/2011 10:15	Effluent	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.6
2/28/2011 10:15	Effluent	Field Parameter	Specific Conductance	1261		umhos/cm		
2/28/2011 10:15	Effluent	Field Parameter	Dissolved Oxygen	5.6		mg/L		
2/28/2011 10:15	Effluent	Field Parameter	Temperature	23.59		C		
2/28/2011 10:15	Effluent	Field Parameter	Sample Depth	0.01		ft		
2/28/2011 10:35	Blank	Metals	Iron	30	U	ug/L	30	120
2/28/2011 10:35	Blank	Metals	Zinc	5	U	ug/L	5	20
2/28/2011 10:35	Blank	Metals	Silver	0.025	U	ug/L	0.025	0.1
2/28/2011 10:35	Blank	Metals	Aluminum	9.8	I	ug/L	5	20
2/28/2011 10:35	Blank	Metals	Chromium	0.3	U	ug/L	0.3	1.2
2/28/2011 10:35	Blank	Metals	Arsenic	0.25	U	ug/L	0.25	1
2/28/2011 10:35	Blank	Metals	Beryllium	0.025	U	ug/L	0.025	0.1
2/28/2011 10:35	Blank	Metals	Selenium	0.2	U	ug/L	0.2	0.8

Appendix E. continued

Date Sampled	Field ID	Analysis	Component	Result	Qualifier	Units	MDL	PQL
2/28/2011 10:35	Blank	Metals	Cadmium	0.05	U	ug/L	0.05	0.2
2/28/2011 10:35	Blank	Metals	Calcium	0.075	U	mg/L	0.075	0.3
2/28/2011 10:35	Blank	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
2/28/2011 10:35	Blank	Metals	Lead	0.2	U	ug/L	0.2	0.8
2/28/2011 10:35	Blank	Metals	Nickel	0.25	U	ug/L	0.25	1
2/28/2011 10:35	Blank	Metals	Copper	0.5	U	ug/L	0.5	1
2/28/2011 10:35	Blank	Nutrients	NO2NO3-N	0.005	I	mg N/L	0.004	0.01
2/28/2011 10:35	Blank	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
2/28/2011 10:35	Blank	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
2/28/2011 10:35	Blank	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
2/28/2011 10:35	Blank	Nutrients	Total-P	0.004	U	mg P/L	0.004	0.01
2/28/2011 10:35	Blank	Pesticides	Endrin Aldehyde	0.019	U	ug/L	0.019	0.075
2/28/2011 10:35	Blank	Pesticides	Heptachlor	0.0094	U	ug/L	0.0094	0.038
2/28/2011 10:35	Blank	Pesticides	Alachlor	0.57	U	ug/L	0.57	2.3
2/28/2011 10:35	Blank	Pesticides	Atrazine	0.047	U	ug/L	0.047	0.19
2/28/2011 10:35	Blank	Pesticides	Bromacil	0.19	UJ	ug/L	0.19	0.75
2/28/2011 10:35	Blank	Pesticides	Butylate	0.19	U	ug/L	0.19	0.75
2/28/2011 10:35	Blank	Pesticides	Chlorpyrifos Methyl	0.094	U	ug/L	0.094	0.38
2/28/2011 10:35	Blank	Pesticides	Diazinon	0.047	U	ug/L	0.047	0.19
2/28/2011 10:35	Blank	Pesticides	Phorate	0.047	U	ug/L	0.047	0.19
2/28/2011 10:35	Blank	Pesticides	Toxaphene	0.71	U	ug/L	0.71	2.8
2/28/2011 10:35	Blank	Pesticides	Ethoprop	0.094	U	ug/L	0.094	0.38
2/28/2011 10:35	Blank	Pesticides	Fenamiphos	0.19	U	ug/L	0.19	0.75
2/28/2011 10:35	Blank	Pesticides	Metolachlor	0.47	U	ug/L	0.47	1.9
2/28/2011 10:35	Blank	Pesticides	Simazine	0.047	U	ug/L	0.047	0.19
2/28/2011 10:35	Blank	Pesticides	Alpha-BHC	0.0094	U	ug/L	0.0094	0.038
2/28/2011 10:35	Blank	Pesticides	Chlordane	0.19	U	ug/L	0.19	0.75
2/28/2011 10:35	Blank	Pesticides	DDT-p,p'	0.028	U	ug/L	0.028	0.11
2/28/2011 10:35	Blank	Pesticides	Azinphos Methyl	0.19	UJ	ug/L	0.19	0.75
2/28/2011 10:35	Blank	Pesticides	Ethion	0.047	U	ug/L	0.047	0.19
2/28/2011 10:35	Blank	Pesticides	Delta-BHC	0.0094	U	ug/L	0.0094	0.038
2/28/2011 10:35	Blank	Pesticides	Endosulfan Sulfate	0.019	U	ug/L	0.019	0.075
2/28/2011 10:35	Blank	Pesticides	Endrin	0.047	U	ug/L	0.047	0.19
2/28/2011 10:35	Blank	Pesticides	Methoxychlor	0.047	U	ug/L	0.047	0.19

Appendix E. continued

Date Sampled	Field ID	Analysis	Component	Result	Qualifier	Units	MDL	PQL
2/28/2011 10:35	Blank	Pesticides	Norflurazon	0.14	UJ	ug/L	0.14	0.57
2/28/2011 10:35	Blank	Pesticides	Parathion Ethyl	0.14	U	ug/L	0.14	0.57
2/28/2011 10:35	Blank	Pesticides	DDD-p,p'	0.019	U	ug/L	0.019	0.075
2/28/2011 10:35	Blank	Pesticides	Parathion Methyl	0.094	U	ug/L	0.094	0.38
2/28/2011 10:35	Blank	Pesticides	Mevinphos	0.19	U	ug/L	0.19	0.75
2/28/2011 10:35	Blank	Pesticides	Malathion	0.14	U	ug/L	0.14	0.57
2/28/2011 10:35	Blank	Pesticides	Fonofos	0.094	U	ug/L	0.094	0.38
2/28/2011 10:35	Blank	Pesticides	Chlorpyrifos Ethyl	0.047	U	ug/L	0.047	0.19
2/28/2011 10:35	Blank	Pesticides	Ametryn	0.047	U	ug/L	0.047	0.19
2/28/2011 10:35	Blank	Pesticides	Endosulfan I	0.019	U	ug/L	0.019	0.075
2/28/2011 10:35	Blank	Pesticides	Dieldrin	0.019	U	ug/L	0.019	0.075
2/28/2011 10:35	Blank	Pesticides	DDE-p,p'	0.019	U	ug/L	0.019	0.075
2/28/2011 10:35	Blank	Pesticides	Aldrin	0.0094	U	ug/L	0.0094	0.038
2/28/2011 10:35	Blank	Pesticides	Prometryn	0.14	U	ug/L	0.14	0.57
2/28/2011 10:35	Blank	Pesticides	Naled	0.75	UJ	ug/L	0.75	3
2/28/2011 10:35	Blank	Pesticides	Metribuzin	0.094	U	ug/L	0.094	0.38
2/28/2011 10:35	Blank	Pesticides	Beta-BHC	0.0094	U	ug/L	0.0094	0.038
2/28/2011 10:35	Blank	Pesticides	Metalaxyl	0.24	U	ug/L	0.24	0.94
2/28/2011 10:35	Blank	Pesticides	Gamma-BHC	0.0094	U	ug/L	0.0094	0.038
2/28/2011 10:35	Blank	Pesticides	Endosulfan II	0.019	U	ug/L	0.019	0.075
2/28/2011 10:35	Blank	Pesticides	Hexazinone	0.094	U	ug/L	0.094	0.38
2/28/2011 10:35	Blank	Pesticides	Heptachlor Epoxide	0.019	U	ug/L	0.019	0.075
2/28/2011 10:35	Blank	Priority Organic Pollutants	2-Nitrophenol	0.95	U	ug/L	0.95	3.8
2/28/2011 10:35	Blank	Priority Organic Pollutants	Di-n-octyl phthalate	0.95	U	ug/L	0.95	3.8
2/28/2011 10:35	Blank	Priority Organic Pollutants	Naphthalene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:35	Blank	Priority Organic Pollutants	Phenol	0.95	U	ug/L	0.95	3.8
2/28/2011 10:35	Blank	Priority Organic Pollutants	2,4-Dichlorophenol	0.95	U	ug/L	0.95	3.8
2/28/2011 10:35	Blank	Priority Organic Pollutants	2,4-Dinitrophenol	14	U	ug/L	14	57
2/28/2011 10:35	Blank	Priority Organic Pollutants	Benzidine	95	UJ	ug/L	95	380
2/28/2011 10:35	Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:35	Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	14	U	ug/L	14	57
2/28/2011 10:35	Blank	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	11
2/28/2011 10:35	Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.6
2/28/2011 10:35	Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	U	ug/L	2.9	11

Appendix E. continued

Date Sampled	Field ID	Analysis	Component	Result	Qualifier	Units	MDL	PQL
2/28/2011 10:35	Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.95	U	ug/L	0.95	3.8
2/28/2011 10:35	Blank	Priority Organic Pollutants	2-Chloronaphthalene	0.95	U	ug/L	0.95	3.8
2/28/2011 10:35	Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.6
2/28/2011 10:35	Blank	Priority Organic Pollutants	Anthracene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:35	Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.95	U	ug/L	0.95	3.8
2/28/2011 10:35	Blank	Priority Organic Pollutants	Di-n-butyl phthalate	4.8	U	ug/L	4.8	19
2/28/2011 10:35	Blank	Priority Organic Pollutants	Dimethyl phthalate	9.5	U	ug/L	9.5	38
2/28/2011 10:35	Blank	Priority Organic Pollutants	Hexachlorobenzene	0.95	U	ug/L	0.95	3.8
2/28/2011 10:35	Blank	Priority Organic Pollutants	2,4-Dimethylphenol	9.5	U	ug/L	9.5	38
2/28/2011 10:35	Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	0.95	U	ug/L	0.95	3.8
2/28/2011 10:35	Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.95	U	ug/L	0.95	3.8
2/28/2011 10:35	Blank	Priority Organic Pollutants	Benzo(a)pyrene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:35	Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:35	Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	11
2/28/2011 10:35	Blank	Priority Organic Pollutants	Diethyl phthalate	0.95	U	ug/L	0.95	3.8
2/28/2011 10:35	Blank	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.6
2/28/2011 10:35	Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.95	U	ug/L	0.95	3.8
2/28/2011 10:35	Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.95	U	ug/L	0.95	3.8
2/28/2011 10:35	Blank	Priority Organic Pollutants	Fluoranthene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:35	Blank	Priority Organic Pollutants	Isophorone	0.95	U	ug/L	0.95	3.8
2/28/2011 10:35	Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.95	U	ug/L	0.95	3.8
2/28/2011 10:35	Blank	Priority Organic Pollutants	4-Nitrophenol	14	U	ug/L	14	57
2/28/2011 10:35	Blank	Priority Organic Pollutants	Acenaphthene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:35	Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:35	Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	0.95	U	ug/L	0.95	3.8
2/28/2011 10:35	Blank	Priority Organic Pollutants	2-Chlorophenol	0.95	U	ug/L	0.95	3.8
2/28/2011 10:35	Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38	UJ	ug/L	38	150
2/28/2011 10:35	Blank	Priority Organic Pollutants	Benzo(a)anthracene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:35	Blank	Priority Organic Pollutants	Chrysene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:35	Blank	Priority Organic Pollutants	Fluorene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:35	Blank	Priority Organic Pollutants	Phenanthrene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:35	Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	11
2/28/2011 10:35	Blank	Priority Organic Pollutants	Acenaphthylene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:35	Blank	Priority Organic Pollutants	Butyl benzyl phthalate	4.8	U	ug/L	4.8	19

Appendix E. continued

Date Sampled	Field ID	Analysis	Component	Result	Qualifier	Units	MDL	PQL
2/28/2011 10:35	Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:35	Blank	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	11
2/28/2011 10:35	Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	11
2/28/2011 10:35	Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:35	Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.6
2/28/2011 10:35	Blank	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	11
2/28/2011 10:35	Blank	Priority Organic Pollutants	Pyrene	0.19	U	ug/L	0.19	0.76
2/28/2011 10:35	Blank	Field Parameter	Sample Depth	0.01		ft		

Appendix F. Facility Summary, Effluent Limits, and Permit Violations Recorded on Discharge Monitoring Report. Pages 1, 2 and 3 of facility permit #FL0434698.

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Terry Davis	**Contact Number:** (772)380-1269
Facility Name (as it appears on permit): St. Lucie County Fairgrounds Water Treatment Plant	**Former Names:**
NPDES Permit Number: FL0434698	**Permit Expiration Date:** 3 October, 2011
Physical Address: Intersection SR 70 and Midway Road	
District: Southeast District (Branch)	**County:** Daaa St. Lucie
Function of Facility: Produce potable water	
Facility Type: Reverse osmosis	**Permitted Capacity (MGD):** 0.04 MGD potable water, 0.013 MGD concentrate (brine)
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): December, 2009 thru November, 2010. D-001 - 0.0 MGD (No discharge). I-002 – 0.0018 MGD – values ranged from 0.001 MGD (7 times) to 0.0055 MGD.	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months): None	
Description of type of Discharge: ☐ **Continuous** ☐ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☒ **Other, please specify** Plant operates primarily during county fair at the end of February and the beginning of March. It is "exercised" monthly otherwise (approximately 1,000 gallons), unless there is an event at the fairgrounds.	

Appendix F. continued

Description of Sampling Location(s) - actual permit designation of permitted sampling point(s): D-001 (EFF-01) outfall structure from East Pond (Pond #2) of stormwater pond system to N. St. Lucie River Water Control District Canal #85. I-002 (OUI-01) – "from the 4" blended concentrate/stormwater discharge pipe, discharging to the head of a swale at 1,450 feet upstream of West Pond (Pond #1).
Description of Permitted Outfall(s): See above
Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility): Reverse osmosis concentrate (brine) is blended with water taken from West Pond of stormwater pond system at a ratio of 5:1 before it is discharged to "swale" (actually an arm of the West Pond) 1450 feet upstream of West Pond.

Appendix F. continued

PART I: Continued										
List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under (Leave cell blank if not applicable)										
			Effluent Limitations				Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Monthly Average	Weekly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Flow at FLW-01 Undiluted RO concentrate at RO skid	MGD		0.0134				Annually	Calculated	FLW-01	

Appendix F. continued

PART I: Continued	
Receiving Waters: D-001 - N. St. Lucie River Water Control District Canal #85. I-002 – West Pond of on-site stormwater pond system	**Classification (indicate whether fresh or marine):** Canal #85 – Class III Fresh
Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.): None	
Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.): None	
Facility Mixing Zone Details (if applicable): None	
List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year:	

Date	Parameter and Units	Limit	Result
None			

Describe previous FYI and WQBEL study: None
Describe previous or current Enforcement Actions (including WLs): None
Describe any violations or problems noted in previous inspection: Flow meter calibration indicated approximately 70% error.
Discuss whether DMR trends within previous five years are improving or declining: No trends
Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):

Appendix F. continued

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

Appendix F. continued

Department of
Environmental Protection

Jeb Bush
Governor

Colleen M. Castille
Secretary

STATE OF FLORIDA
INDUSTRIAL WASTEWATER FACILITY PERMIT

PERMITTEE:

St. Lucie County
2300 Virginia Avenue
Ft. Pierce, FL 34982

PERMIT NUMBER: FL0434698 (Minor)
PA FILE NUMBER: FL0434698-001-IW5C-NP
ISSUANCE DATE: October 4, 2006
EXPIRATION DATE: October 3, 2011

RESPONSIBLE AUTHORITY:

Ms. Leslie Smith
Utility Director

FACILITY:

St. Lucie County Fairgrounds WTP
Intersection of SR 70 and Midway Road
Ft. Pierce, FL 34982
St. Lucie County

Latitude: 27° 22' 13" N Longitude: 80° 28' 53" W

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

To discharge 0.0134 million gallons per day (MGD) brine ("concentrate") produced by a new 0.040 MGD reverse osmosis (RO) water treatment serving the St. Lucie County Fairgrounds.

WASTEWATER TREATMENT:

The existing treatment system is generating 0.010 MGD potable water using one 0.01 MG reverse osmosis (RO) system, six 0.005 million gallon (MG) storage tank, one degasfier tower, and four 120 gallon pressure tanks. An additional 0.04 MGD expansion to the existing capacity is proposed. The expansion includes an additional 0.04 MG RO system, an additional degasifier, and chemical feed systems (one anti-scalant, etc.).

The existing 0.01 MGD RO system produces a concentrate stream which is disposed to the onsite wastewater treatment plant via existing wastewater collection system. The additional 0.0134 MGD concentrate stream produced by the additional 0.04 MGD RO plant will be blended with the onsite stormwater prior to disposal to the head of a 1,450 foot swale and then to the onsite 15-acre dual stormwater pond system (approximately 38 MG of water in the dual stormwater pond system). The flow blending ratio of the stormwater to the concentrate is 5 to 1. The onsite stormwater used for blending is pumped to the 4-inch concentrate/stormwater forcemain for mixing with concentrate with a floating pump located in Stormwater Pond #1. A static mixer is provided beyond the point of connection between the 4-inch pond water intake forcemain and concentrate discharge pipe. The blended flow will be discharged at the head of the 1,450 foot swale then flows to pond#1 and #2 and finally to North St.

Appendix F. continued

PERMITTEE:
St. Lucie County Utility

PERMIT NUMBER: FL0434698

Lucie Water Control District Canal #85 via an outfall structure on the southeast of Pond #2. Pond #1 and #2 are 7.82 acres and 7.33 acres, respectively. From the outfall point the discharge travels through approximately 13.5 miles of canal network before ultimate discharge into the North St. Lucie River.

EFFLUENT DISPOSAL:

Surface Water Discharge:

Discharge of the blended RO membrane concentrate/brine and stormwater from Pond #2 via outfall structure (Outfall D-001) to North St. Lucie Water Control District Canal #85 via an outfall structure located at the southeast of Pond#2. The discharge is only authorized after rainfall events exceeding the 25-year 72-hour storm event as indicated by the Stormwater Management Permit.

Internal Outfalls:

This permit authorizes discharge from a 4-inch blended flow forcemain to the head of a 1,450 foot swale (outfall I-002) located on the Northwest of side of Pond#1.

IN ACCORDANCE WITH: The limitations, monitoring requirements and other conditions as set forth in Part I through Part VIII on pages 3 through 211 of this permit.

Appendix F. continued

PERMITTEE:
St. Lucie County Utility

PERMIT NUMBER: FL0434698

I. Effluent Limitations and Monitoring Requirements

A. Surface Water Discharges

1. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge from Outfall D-001 after rainfall events exceeding the 25-year 72-hour storm event as indicated in the stormwater management permit. Such discharge shall be limited and monitored by the permittee as specified below and reported in accordance with condition I.E.3.:

	Discharge Limitations			Monitoring Requirements		
Parameters (units)	Monthly Average	Daily Maximum	Daily Minimum	Monitoring Frequency	Sample Type	Sample Point
pH (SU)	--	6.0	8.5	Monthly	Grab	EFF-01
Specific Conductance (UMHO/CM)	--	Report	--	Monthly	Grab	EFF-01

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

Sample Point	Description of Monitoring Location
EFF-01	An outfall structure from the East Pond (Pond No. 2) to the North St. Lucie River Water Control District Canal #85.

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

	Discharge Limitations				Monitoring Requirements		
Parameters (units)	Annual Average	Monthly Average	Single Maximum	Single Minimum	Monitoring Frequency	Sample Type	Sample Point
Flow (MGD)	0.0134	--	--	--	Daily	Flowmeter/totalizer	SWI-01
pH (SU)	--	--	Report	Report	Monthly	Grab	SWI-01
Specific Conductance (UMHO/CM)	--	--	Report	--	Monthly	Grab	SWI-01
Beryllium (microgram/L)	--	--	Report	--	Annually	Grab	SWI-01
Mercury (microgram/L)	--	--	Report	--	Annually	Grab	SWI-01

4. Effluent samples shall be taken at the monitoring site locations listed in permit condition I.A.3 and as described below:

Sample Point	Description of Monitoring Location
SWI-01	From the 4-inch blended concentrate/stormwater discharge pipe discharges to the head of a swale 1,450' upstream of West Pond (Pond #1).

Appendix G. EPA End Sheet

The Bioassay of the St. Lucie County Fairgrounds Water Treatment Plant effluent sampled on February 28, 2011. NPDES# FL0434698.

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 4 3 4 6 9 8 11	12 1 1 0 2 2 8	18 B	19 S	20 2

Remarks

66

The Priority Pollutants Analysis of the St. Lucie County Fairgrounds Water Treatment Plant effluent sampled on February 28, 2011. NPDES# FL0434698.

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 4 3 4 6 9 8 11	12 1 1 0 2 2 8	18 B	19 S	20 2

Remarks

66

Biological Analyses of the St. Lucie County Fairgrounds Water Treatment Plant effluent sampled on February 28, 2011. NPDES# FL0434698.

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 4 3 4 6 9 8 11	12 1 1 0 2 2 8	18 B	19 S	20 2

Remarks

66