

Effluent Quality Assessment

Northwest Regional Water Reclamation Facility

Hillsborough County

NPDES #FL0041670

Sampled April 20, 2009

July 2009

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
NELAC Certification No. E31780

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Northwest Regional Water Reclamation Facility, 10890 South Mobley Road, Odessa, Hillsborough County, Florida, 33626. NPDES #FL0041670. Effluent grab samples for bioassay and chemical analyses for this facility were collected on April 20, 2009. Effluent composite samples for chemical analyses were collected on April 21, 2009.

Introduction

Northwest Regional Water Reclamation Facility (WRF) is a Type 1 advanced wastewater treatment facility which uses the Bardenpho Process to treat domestic wastewater. (See Appendixes G, H, I and J for detailed facility information provided by Jason Cohen of FDEP Southwest District.)

Methods

Samples were collected from the EFA-01 NPDES sampling point for Outfall D-001 by Jason Cohen, Peter Wenner and Joe Squitieri (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 96-hour acute definitive 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 April 21 - 25, 2009.

  Ceriodaphnia dubia 96-hour acute definitive bioassay – LC_{50} > 100%, 0% mortality in 100% sample at 96 hours

  Cyprinella leedsi 96-hour acute definitive bioassay – LC_{50} > 100%, 5% mortality in 100% sample at 96 hours

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

  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 1 mg dry wt/L of the unicellular green alga, *Pseudokirchneriella subcapitata*, formerly known as *Selenastrum capricornutum*. Raschke and Schultz (1987) found that AGP values above 5.0 mg dry weight/L represent a “problem” threshold for fresh receiving waters, implying nutrient enrichment. The analytical chemistry suggests that the effluent is nitrogen-limited. The predicted AGP based on inorganic nitrogen concentrations was 15.0 (±20%) mg dry wt/L (Table 1; Miller et al. 1978). Differences greater than an order of magnitude between actual and predicted AGP values warrant follow up testing with the algal growth inhibition bioassay. True algal growth inhibition can only be determined by performing this test which should be requested by the district as a follow-up to the inspection.

  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 composite sample collected and preserved for chemical analysis was 0.014 mg N/L I (I – Reported value is between the laboratory method detection limit (MDL) and the laboratory practical quantitation limit (PQL)). Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was < 0.02 mg/L.

  Atrazine, copper, nickel and zinc were detected in the effluent at levels that comply with Class III fresh water quality criteria (62-302.530, F.A.C.). Aluminum, arsenic, cadmium, iron and selenium were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL). Copper was detected in the field blank and total ammonia was detected in the equipment blank.

  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 F for bioassay lab equipment.

- ## Conclusion

  The effluent sample collected from the EFA-01 for this facility on April 20, 2009, was not acutely toxic to either test species during the 96-hour acute definitive bioassays. The effluent AGP result, although, less than the "problem" threshold for fresh receiving waters suggests algal growth inhibition may be an issue. Effluent water quality samples collected on April 20 and 21, 2009, 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) and total nitrogen (TN) limitation of the freshwater species *Pseudokirchneriella subcapitata* and ratios of nitrogen to phosphorus for samples collected from the Northwest Regional Wastewater Reclamation Facility on April 20 and 21, 2009.

Northwest Regional Water Reclamation Facility					
Location	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (TN) ± 20%	Inorganic N:P ratio	Total N:P ratio
Effluent	1.0	15.0 ± 3.0	60.0 ± 12.0	6.6	6.9

Table 2. Effluent limits, Class III Freshwater Criteria and chemical data for samples collected from the Northwest Regional Wastewater Reclamation Facility on April 20 and 21, 2009.

Northwest Regional Water Reclamation Facility NPDES# FL0041670	Class III Criteria	Effluent Limits	Effluent Grab April 20, 2009	Effluent Composite April 21, 2009
Organic Constituents (µg/L)				
Atrazine	-	-	0.22	-
Metals (µg/L unless otherwise noted)				
Aluminum	-	-	83 I	-
Arsenic	≤ 50	-	0.37 I	-
Cadmium	≤ 0.4 b	-	0.032 I	-
Calcium (mg/L)	-	-	71.3	-
Chromium-III	≤ 149.9 b	-	0.3 U	-
Copper	≤ 16.6 b	-	2.73 F	-
Iron	≤ 1,000	-	31 I	-
Lead	≤ 7.5 b	-	0.2 U	-
Magnesium (mg/L)	-	-	4.51	-
Mercury	≤ 0.012	≤ 0.012	0.12 U	-
Nickel	≤ 92.4 b	-	1.23	-
Selenium	≤ 5.0	-	0.23 I	-
Silver	≤ 0.07	-	0.025 U	-
Zinc	≤ 212.5 b	-	50	-
Nutrients (mg/L)				
Ortho-phosphate	-	-	0.06	-
Total Phosphorus	-	≤ 2.0 sp	-	0.23
Total Ammonia	-	-	-	0.014 IF*
Un-ionized Ammonia	≤ 0.02 s	-	-	< 0.02 c
Nitrate and Nitrite	-	-	-	0.38 F*
Total Kjeldahl Nitrogen	-	-	-	1.2
Organic Nitrogen	-	-	-	1.186 c
Total Nitrogen	-	≤ 6.0 sp	-	1.58 c
General Physical and Chemical Parameters				
Dissolved Oxygen (mg/L)	≥ 5.0	≥ 5.0 s	11.7	-
pH (SU)	6.0 - 8.5	6.0 - 8.5 s	6.6	-
Conductivity (µmhos/cm)	≤ 1,275	-	891	-
Temperature (°C)	-	-	26.5	-
Total Residual Chlorine (mg/L)	≤ 0.01	≤ 0.01 s	≤ 0.02 U	-
Chlorophyll *a* (µg/L) - Corrected	-	-	0.73 I	-
Phaeophytin (µg/L)	-	-	0.4 U	-
Total Suspended Solids (mg/L)	-	≤ 10.0 sp	4 U	4 U
CBOD, 5 day (mg/L), N - inhibited	-	≤ 10.0 sp	-	2.2
Flow (MGD) to D-001 (Mar. 2008 - Feb. 2009)	-	≤ 5.0 a	0.49 a	-
Flow (MGD) to Reuse (Mar. 2008 - Feb. 2009)		-	10.39 a	-
Hardness (mg $CaCO_3$)	-	-	196.61 c	- 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 field blank (copper 0.83 mg/L)

F* - Analyte was detected in both sample and equipment blank (ammonia 0.018 mg/L I; nitrate/nitrite 0.005 mg/L I)

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

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Request Number: RQ-2009-04-20-39
Northwest Regional WRF

Event ID *

Requester: Jennifer Paris
Field Report Prepared By:

Customer: SW-DIST
Collected By: P WENNER, J COHEN
Send Final Report To Tom Gucciardo

Project ID: FYI3
Sampling Agency: FDEP SW DISTRICT

PMAS: 1143

Lab ID *	Location / Field ID / Matrix / Temp (C) / pH / Latitude / Longitude	Collection (begin) / (end) / Tot Res Chlorine (mg/L) / Diss Oxygen (mg/L) / Storet Station Number / Sample Depth / Salinity (PPTh) / Sp Conductance (umho/cm) / NPDES Number / Comments	Bottle Group(s)**
37388	Location: R001 Field ID: Matrix: FRESH Temp (C): 26.49 pH: 6.60 Latitude: N 28 ° 04. 239 ' Longitude: W 82 ° 36.659 '	☐ Comp ☑ Grab Collection (begin) Date 4/20/09 Time 930 Eastern Central Collection (end) Date Time Eastern Central Tot Res Chlorine (mg/L): ≤ 0.02 Diss Oxygen (mg/L): 11.69 Storet Station Number: Sample Depth ☐ m ☐ ft: 0.44 / 891 ☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm) NPDES Number: Comments: DO% 145.8	A
37390	Location: FIELD BLANK Field ID: Matrix: DI WATER Temp (C): pH: Latitude: ~~82 ° 36.659 '~~ X 4/20/09 Longitude ° ' "	☐ Comp ☑ Grab Collection (begin) Date 4/20/09 Time 910 Eastern Central Collection (end) Date Time Eastern Central Tot Res Chlorine (mg/L): Diss Oxygen (mg/L): Storet Station Number: Sample Depth ☐ m ☐ ft: ☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm) NPDES Number: Comments:	B
37391	Location: EQUIPMENT BLANK Field ID: Matrix: DI WATER Temp (C): pH: Latitude ° ' " Longitude ° ' "	☑ Comp ☐ Grab Collection (begin) Date 4/20/09 Time 800 Eastern Central Collection (end) Date Time Eastern Central Tot Res Chlorine (mg/L): Diss Oxygen (mg/L): Storet Station Number: Sample Depth ☐ m ☐ ft: ☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm) NPDES Number: Comments:	B
	Location: Field ID: Matrix: Temp (C): pH: Latitude ° ' " Longitude ° ' "	☐ Comp ☐ Grab Collection (begin) Date Time Eastern Central Collection (end) Date Time Eastern Central Tot Res Chlorine (mg/L): Diss Oxygen (mg/L): Storet Station Number: Sample Depth ☐ m ☐ ft: ☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm) NPDES Number: Comments: 3 Bottles/ Rec'd in box by JD 1045 4.21.09	

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	4/20/09 1130	FED EX	[signature]	4/21/09 0935				

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

State of Florida Department of Environmental Protection
Southwest District

CHAIN OF CUSTODY RECORD

FILL OUT ONE FORM OR SET OF FORMS PER PROJECT, PER TEAM, PER DAY

Page 1 of 1

SUBMITTING AGENCY / CUSTOMER: FDEP SW-DIST

SAMPLE EVENT: NORTHWEST REGIONAL WRF COUNTY(S): Hillsborough

PROJECT ID:

RQ #: 2009-04-20-39

MODULE #: 10609 GRANT #:

SAMPLER SIGNATURE(S): Joe Squitieri

Field ID Number	Site Name	WBID	Date	Time	Comp/ Grab	Acid Time	Amt (ml) H_2SO_4*	Amt (ml) HNO_3#	District Labs: Total Coliform (SM 9222B)	District Labs: Fecal Coliform (SM 9222D)	Central Labs: W-TKN, W-NO2NO3, W-NH3, W-TP, W-TOC	Central Labs: TURBIDITY, W-TSS, W- ALK, W-COLOR, W-CL-ICW-TDS, W-SO4-IC,W-F	Central Labs: CHL-PPTN-W	Central Labs: W-ICP#	Central Labs: W-PO4-F	Central Labs: BOD-UNINHB	Central Labs: TSS
37389	Effluent		4/21/09	1015	Comp	1020	ZmL				X					X	X
37388	Effluent		4/21/09	1015	Comp											X	

Preservatives used IN ADDITION to ice: H_2SO_4*; HNO_3#

District Labs in Tampa

Sealed and Relinquished By: Joe Squitieri	Temp: 4°C	Method of Dispatch: ~~Hand to Hand~~	
Date: 4/21/09	Time: 1305		
Accepted and Opened By: Tahmoores Ebrahimi	Temp: 1°C		
Date: 04/22/09	Time: 8:55		
Sealed and Relinquished By:	Temp:	Method of Dispatch: Hand to Hand	
Date:	Time:		
Accepted and Opened By:	Temp:		
Date:	Time:		

Central Labs in Tallahassee

Sealed and Relinquished By: JOE SQUITIERI	Method of Dispatch:	
Date: 4/20/09 Time: 1305		
Accepted and Opened By:	DHL ~~FED-X~~	
Date: Time:		
Sealed and Relinquished By:	Method of Dispatch:	
Date: Time:		
Accepted and Opened By:	DHL	
Date: Time:		

Send Final Report To: Chief Chemist SWDistrict JOE SQUITIERI Southwest District Office, 13051 N. Telecom Pkwy., Temple Terrace, Florida 33637, Phone (813) 632-7600

Comments:

FDEP Biology Laboratory - Acute Definitive Bioassay Bench Sheets

Facility: Northwest Regional WRF

Address: 10890 South Mobley Rd.

City: Odessa County: Hillsborough

Contact/District: Pete Wenner/ SWD

NPDES Permit #: FL0041670

LIMS Job #: TLH-2009-04-21-18 LIMS Sample #: 118821

Lims Data Entry: 4-30-09 MF Data Entry Verification: 4-30-09 BA

Sample Collection: Date: 4-2009 Time: 9:30

Hold Time Start: Date: 4-2009 Time: 9:30

Comments:

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

Test Type: Definitive
Static / (Static Renewal) / Flow-through
Test Duration: 48 (96) Hours.
Light Intensity : 50 - 100 ft. candles.
Photoperiod : 16 hours light 8 hours dark.

Test 1 validation: **Test 1:** SOP TA 07_ 01
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No

Test 2 validation: **Test 2:** SOP TA 07_ 02
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No

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: ____

Temperatures.
Incubator 2': 26.1 – 26.5
Culture Room: 24.9 – 25.9

Sample Validation:

Temperature: Shipped ≤6°C (Yes) No 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)

Investigators' Signatures
James Daniels
Bruce Ackerman
Marshall Faircloth
Chelsea Finch

Loretta C. Wolfe
REVIEWER

Water Quality Parameters	20% DMW 4-13-09	Moderately Hard Water/ 4-21-09 Well Water	Salt Water ASW NSW Test 1	Salt Water ASW NSW Test 2	Other:	Original Sample	Method	Measured by	Verified by
Field Total Residual Cl_2 (mg/L):	N/A	N/A	N/A	N/A		<0.02	Hach DR/850	PWenner/ J.Cobb	MF
Lab Total Residual Cl_2 (mg/L):	<0.03	—				<0.03	HACH	JD	BA
Alkalinity (mg/L as $CaCO_3$):	83	161				249	HACH	BA / CF	MF
Hardness (mg/L as $CaCO_3$):	81	138				200	HACH	BA / CF	MF
Total Ammonia (mg/L as N):	<0.017	<0.017				<0.017	DENVER	MF	BA
Salinity (ppth):	0.0	0.0				0.4	YSI (Mettler)	CF	BA

V 1.4 9/12/05

Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 118082I Test #: 1/2 SOP#:TA 07 01 Test Started: Date 4/21/09 Time: 1335
Organism/Batch/Age: C.dubia /15-09 /<24hrs Test Ended: Date 4-25-09 Time: 1015
Chamber/Test Volume: 30 / 20 ml Diluent/ Batch: DMW / 4-13-09
Food/Batch: YCT 1-22-09 P.sub 2-13-09 Artemia 0hr ✓ 24hr ____ 48hr ✓ 72hr ____ Artemia Lot#____
Feeding: Prior to Test (Prior to Renewal) Daily

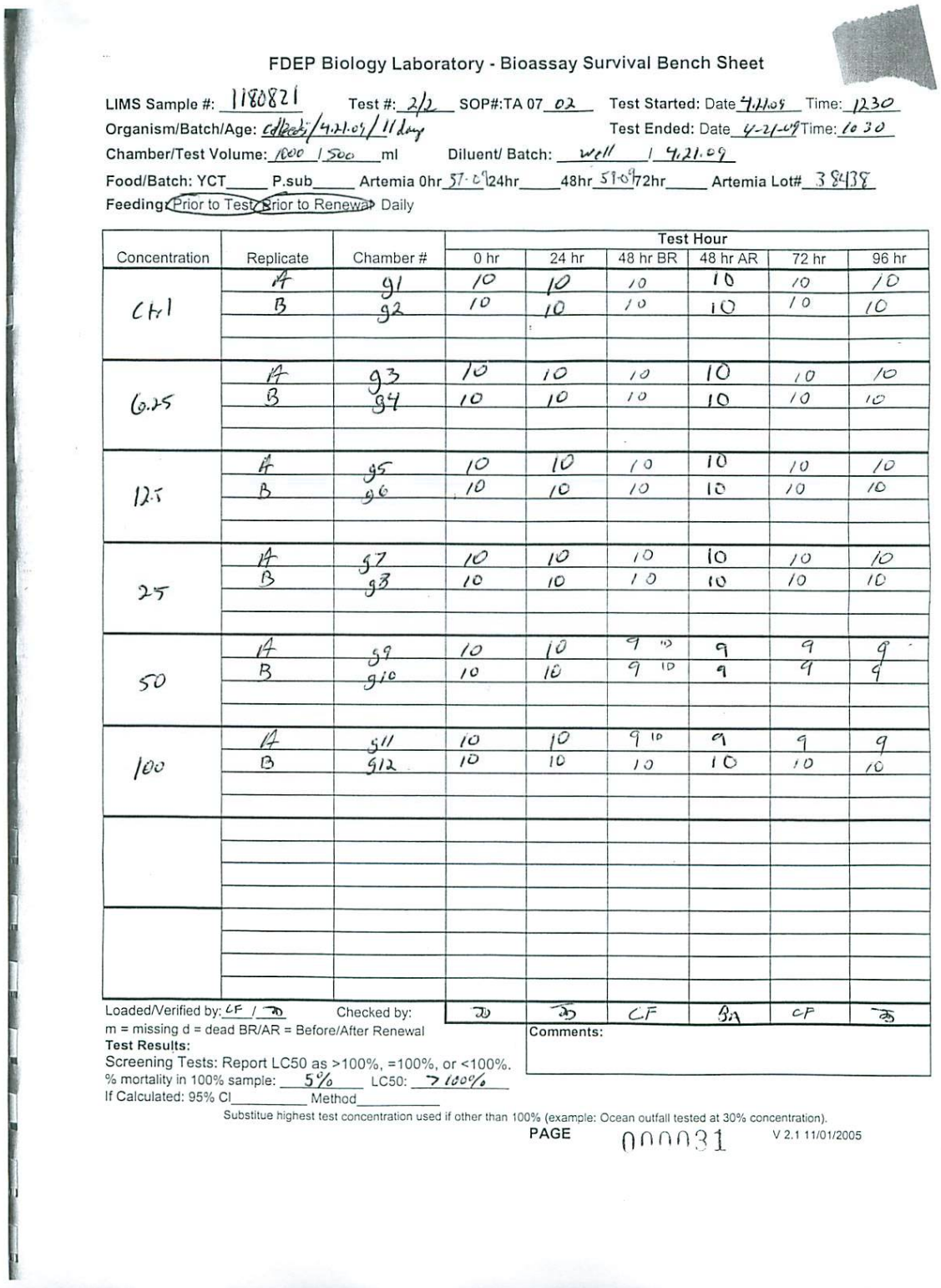
Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	5
	C	C	5	5	5	5	5	5
	D	D	5	5	5	5	5	5
6.25%	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	5
	C	C	5	5	5	5	5	5
	D	D	5	5	5	5	5	5
12.5 %	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	5
	C	C	5	5	5	5	5	5
	D	D	5	5	5	5	5	5
25%	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
50%	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
100 %	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
Loaded/Verified by: CF / BA	Checked by:		BA	BA	BA	BA	MF	

m = missing d = dead BR/AR = Before/After Renewal
Test Results:
Screening Tests: Report LC50 as >100%, =100%, or <100%.
% mortality in 100% sample: 0 LC50: >100%
If Calculated: 95% CI_____ Method_____
Substitue highest test concentration used if other than 100% (example: Ocean outfall tested at 30% concentration).

Comments:

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Appendix B. (continued)



FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1180821 Test #: 2/2 SOP#:TA 07 02 Test Started: Date 4.11.09 Time: 1230

Organism/Batch/Age: Cdubia/4.21.09/11 day Test Ended: Date 4-21-09 Time: 1030

Chamber/Test Volume: 1000 / 500 ml Diluent/ Batch: well / 4.21.09

Food/Batch: YCT ____ P.sub ____ Artemia 0hr 57-09 24hr ____ 48hr 51-09 72hr ____ Artemia Lot# 38438

Feeding: Prior to Test / Prior to Renewal / Daily

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl	A	g1	10	10	10	10	10	10
	B	g2	10	10	10	10	10	10
6.25	A	g3	10	10	10	10	10	10
	B	g4	10	10	10	10	10	10
12.5	A	g5	10	10	10	10	10	10
	B	g6	10	10	10	10	10	10
25	A	g7	10	10	10	10	10	10
	B	g8	10	10	10	10	10	10
50	A	g9	10	10	9 m	9	9	9
	B	g10	10	10	9 m	9	9	9
100	A	g11	10	10	9 m	9	9	9
	B	g12	10	10	10	10	10	10
Loaded/Verified by: CF / JD		Checked by:	JD	JD	CF	BA	CP	JD

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%

If Calculated: 95% CI ____ Method ____

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

Comments:

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FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 1180 824 Test #: 1 of 2

TEST SOP #: TA07_ 01 Test Species: (Ceriodaphnia dubia) Cyprinella leedsi Pimephales promelas Americamysis bahia Menidia beryllina Other:_____

Concentration Ctrl	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	M		A	M		M
pH (S.U.)	8.2		8.1	7.9		7.9
Temperature °C	23.6		24.0	24.2		24.7
Dissolved Oxygen mg/L	8.1		7.9	7.9		8.3
Conductivity µmhos mmhos	236		228	211		219
(initials) Measured by:	CF		BA	BA		
(initials) Recorded by:	CF		BA	BA		

Comments:

Concentration 6.25%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	M		A	M		M
pH (S.U.)	8.0		8.3	8.0		8.0
Temperature °C	23.6		24.0	24.4		24.4
Dissolved Oxygen mg/L	8.1		7.6	7.8		8.1
Conductivity µmhos mmhos	256		267	243		251
(initials) Measured by:	CF		BA	BA		
(initials) Recorded by:	CF		BA	BA		

Comments:

Concentration 12.5%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	M		A	M		M
pH (S.U.)	8.0		8.4	8.0		8.2
Temperature °C	23.3		24.0	24.4		25.2
Dissolved Oxygen mg/L	8.1	BA	8.4	7.7		8.1
Conductivity µmhos mmhos	308		310	284		295
(initials) Measured by:	CF		BA	BA		
(initials) Recorded by:	CF		BA	BA		

Comments:

Concentration 25%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	M		A	M		M
pH (S.U.)	8.0		8.5	8.0		8.3
Temperature °C	23.3		24.0	24.3		25.2
Dissolved Oxygen mg/L	8.0		7.6	7.6		8.1
Conductivity µmhos mmhos	393	395 CF	410	356		368
(initials) Measured by:	CF		BA	BA		
(initials) Recorded by:	CF		BA	BA		

Comments:

V 2.0 2/24/04

FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 1180821 **Test #:** 1 of 2

TEST SOP #: TA07_ 01 **Test Species:** (*Ceriodaphnia dubia*) *Cyprinella leedsi* *Pimephales promelas* *Americamysis bahia* *Menidia beryllina* Other:_____

Concentration 50%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	M		A	M		M
pH (S.U.)	8.1		8.7	8.0		8.4
Temperature °C	22.9		24.0	24.4		25.3
Dissolved Oxygen mg/L	8.2		7.5	7.6		8.1
Conductivity (µmhos) mmhos	553		590	541		536
(initials) Measured by:	CF		BA	BA		JD
(initials) Recorded by:	CF		BA	BA		JD

Comments: Test temperature range 22.7-24.4 mk 5/7/09

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	M		A	M		M
pH (S.U.)	8.0		8.8	7.9		8.6
Temperature °C	22.7		24.0	24.3		25.4
Dissolved Oxygen mg/L	8.2		7.6	7.7		8.3
Conductivity (µmhos) mmhos	920		957	910		896
(initials) Measured by:	CF		BA	BA		JD
(initials) Recorded by:	CF		BA	BA		JD

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						
Conductivity µmhos mmhos						
(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						
Conductivity µmhos mmhos						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 1180821 **Test #:** 2 of 2

TEST SOP #: TA07_02 **Test Species:** *Ceriodaphnia dubia* (*Cyprinella leedsi*) *Pimephales promelas* *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	A	A	B	A
pH (S.U.)	7.7	7.1	8.1	8.2	7.9	8.0
Temperature °C	24.0	25.2	24.2	24.0	24.2	25.7
Dissolved Oxygen mg/L	7.8	7.8	7.4	7.7	6.7	7.1
Conductivity (umhos) mmhos	282	287	286	256	284	294
(initials) Measured by:	[illegible]	[illegible]	[illegible]	JD	[illegible]	[illegible]
(initials) Recorded by:	[illegible]	[illegible]	[illegible]	CF	[illegible]	[illegible]

Comments:

Concentration 6.25 %	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	A	A	B	A
pH (S.U.)	7.8	7.1	8.2	8.3	7.9	8.1
Temperature °C	24.0	25.1	24.2	24.0	24.3	25.4
Dissolved Oxygen mg/L	7.9	8.0	7.3	7.6	6.4	7.0
Conductivity (umhos) mmhos	324	331	316	313	328	332
(initials) Measured by:	[illegible]	[illegible]	[illegible]	JD	[illegible]	[illegible]
(initials) Recorded by:	[illegible]	[illegible]	[illegible]	CF	[illegible]	[illegible]

Comments:

Concentration 12.5 %	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	A	A	B	A
pH (S.U.)	7.9	7.1	8.2	8.3	7.9	8.1
Temperature °C	24.1	24.8	24.1	24.1	24.2	25.0
Dissolved Oxygen mg/L	8.0	8.1	7.4	7.6	6.2	6.9
Conductivity (umhos) mmhos	373	374	375	358	372	378
(initials) Measured by:	[illegible]	[illegible]	[illegible]	JD	[illegible]	[illegible]
(initials) Recorded by:	[illegible]	[illegible]	[illegible]	CF	[illegible]	[illegible]

Comments:

Concentration 25 %	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	A	A	B	A
pH (S.U.)	7.9	7.1	8.3	8.3	7.9	8.1
Temperature °C	24.2	24.9	24.1	24.2	24.2	24.9
Dissolved Oxygen mg/L	8.1	8.1	7.4	7.7	6.1	6.9
Conductivity (umhos) mmhos	431	434	439	435	454	460
(initials) Measured by:	[illegible]	[illegible]	[illegible]	JD	[illegible]	[illegible]
(initials) Recorded by:	[illegible]	[illegible]	[illegible]	CF	[illegible]	[illegible]

Comments:

V 2.0 2/24/04

FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 1180821 **Test #:** 2 of 2

TEST SOP #: TA07_02_ **Test Species:** *Ceriodaphnia dubia* (*Cyprinella leedsi*) *Pimephales promelas*
Americamysis bahia *Menidia beryllina* Other:_____

Concentration 50%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	A	A	B	A
pH (S.U.)	7.9	7.1	8.3	8.2	8.0	8.2
Temperature °C	24.0	24.9	24.3	24.3	24.1	25.0
Dissolved Oxygen mg/L	8.1	8.2	7.4	7.7	6.1	6.9
Conductivity (µmhos) mmhos	602	601	612	591	607	613
(initials) Measured by:	[illegible]	[illegible]	[illegible]	JD	[illegible]	[illegible]
(initials) Recorded by:	[illegible]	[illegible]	[illegible]	CF	[illegible]	[illegible]

Comments:

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	A	A	B	A
pH (S.U.)	7.9	7.2	8.4	8.0	8.1	8.3
Temperature °C	24.6	25.2	24.1	25.0	24.1	25.1
Dissolved Oxygen mg/L	8.1	8.3	7.2	7.8	6.2	6.9
Conductivity (µmhos) mmhos	924	904	929	915	927	945
(initials) Measured by:	[illegible]	[illegible]	[illegible]	JD	[illegible]	[illegible]
(initials) Recorded by:	[illegible]	[illegible]	[illegible]	CF	[illegible]	[illegible]

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						
Conductivity µmhos mmhos						
(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						
Conductivity µmhos mmhos						
(initials) Measured by:						
(initials) Recorded by:						

Comments:

V 2.0 2/24/04

Appendix C. SRT Bench Sheets and Statistical Analysis

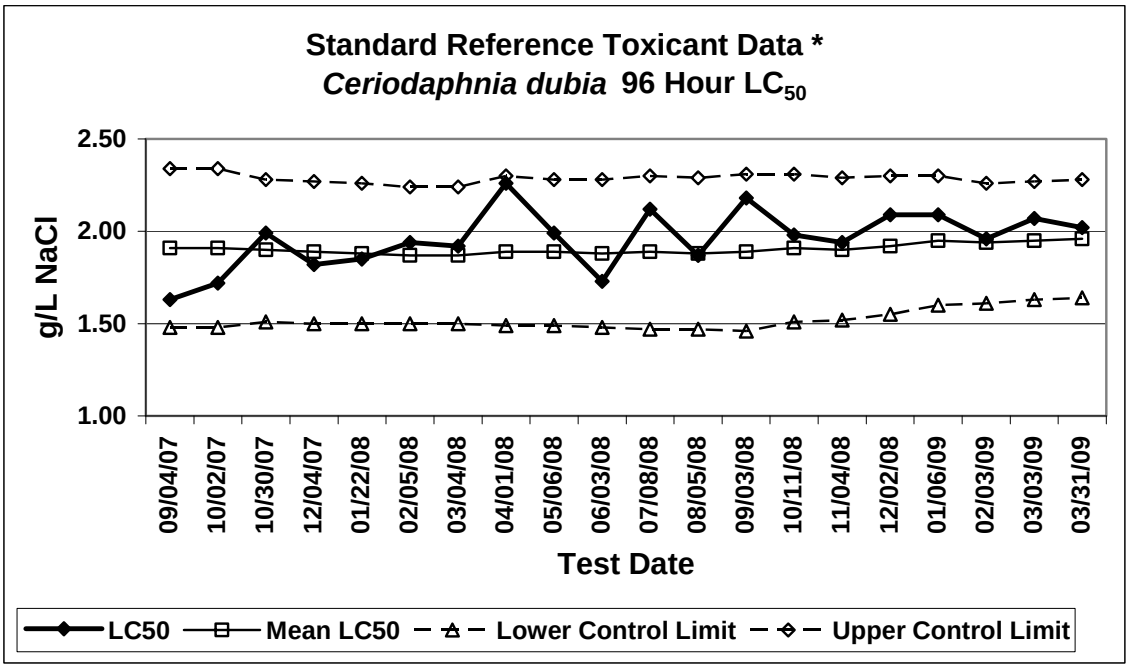
Florida Department of Environmental Protection
Bureau of Laboratories

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
09/04/07	1.63	1.91	0.22	1.48	2.34
10/02/07	1.72	1.91	0.21	1.48	2.34
10/30/07	1.99	1.90	0.19	1.51	2.28
12/04/07	1.82	1.89	0.19	1.50	2.27
01/22/08	1.85	1.88	0.19	1.50	2.26
02/05/08	1.94	1.87	0.18	1.50	2.24
03/04/08	1.92	1.87	0.18	1.50	2.24
04/01/08	2.26	1.89	0.20	1.49	2.30
05/06/08	1.99	1.89	0.20	1.49	2.28
06/03/08	1.73	1.88	0.20	1.48	2.28
07/08/08	2.12	1.89	0.21	1.47	2.30
08/05/08	1.87	1.88	0.20	1.47	2.29
09/03/08	2.18	1.89	0.21	1.46	2.31
10/11/08	1.98	1.91	0.20	1.51	2.31
11/04/08	1.94	1.90	0.19	1.52	2.29
12/02/08	2.09	1.92	0.19	1.55	2.30
01/06/09	2.09	1.95	0.17	1.60	2.30
02/03/09	1.96	1.94	0.16	1.61	2.26
03/03/09	2.07	1.95	0.16	1.63	2.27
03/31/09	2.02	1.96	0.16	1.64	2.28

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

CV = 8.09
EPA reference 75th quartile CV = 29%



Appendix C. (continued)

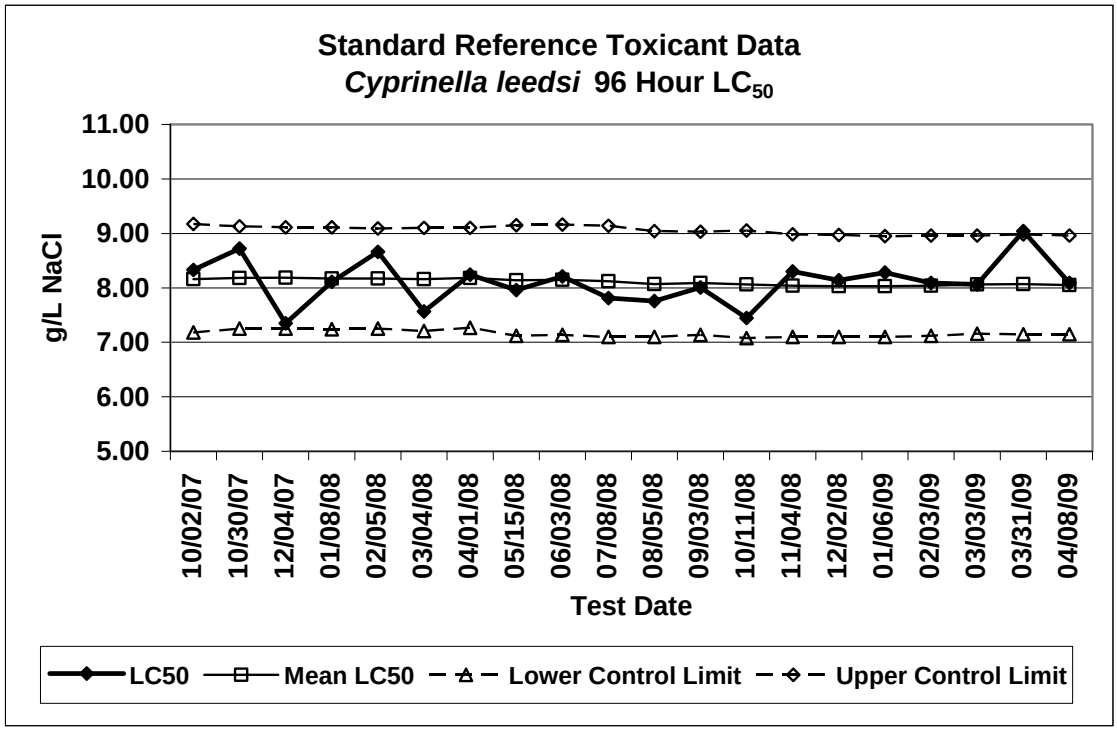
Florida Department of Environmental Protection
Bureau of Laboratories

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
10/02/07	8.33	8.16	0.50	7.18	9.17
10/30/07	8.72	8.18	0.47	7.25	9.13
12/04/07	7.35	8.19	0.47	7.25	9.11
01/08/08	8.11	8.17	0.47	7.24	9.11
02/05/08	8.66	8.17	0.47	7.25	9.09
03/04/08	7.57	8.16	0.47	7.21	9.10
04/01/08	8.24	8.18	0.46	7.27	9.10
05/15/08	7.96	8.14	0.51	7.12	9.15
06/03/08	8.21	8.15	0.51	7.14	9.16
07/08/08	7.81	8.12	0.51	7.10	9.14
08/05/08	7.76	8.07	0.48	7.10	9.04
09/03/08	8.01	8.09	0.47	7.14	9.03
10/11/08	7.45	8.06	0.49	7.08	9.05
11/04/08	8.30	8.04	0.47	7.10	8.98
12/02/08	8.14	8.03	0.47	7.10	8.97
01/06/09	8.28	8.03	0.46	7.10	8.95
02/03/09	8.09	8.04	0.46	7.12	8.96
03/03/09	8.06	8.06	0.45	7.16	8.96
03/31/09	9.04	8.07	0.46	7.15	8.98
04/08/09	8.09	8.05	0.45	7.15	8.96

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

CV = 5.62
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 2008.0 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 #: 3-20-01 / DMW
Toxicant/ Batch#: NaCl 13-32-01

Organism Batch: 13-09 Age: <24hr

Test Beginning: Date: 5.31.09 Time: 12:50
Test Ending: Date: 6.4.09 Time: 1120

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	QS
Alkalinity (mg/L as $CaCO_3$):	95	TA06_08	BA
Hardness (mg/L as $CaCO_3$):	87	TA06_09	BA
Total Ammonia (mg/L as N):	<0.07	TA06_17	MF
Conductivity: ~~µmhos~~ mmhos	178	TA06_25	BA
Salinity (ppth):	—	TA06_25	—

Food:	Batch
☑ YCT	1-22-09
☑ *P. subcapitata*	2-13-09
☐ 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: BA
Temperature Range °C:(if used)
Test Incubated in: Incubator # 2 Waterbath # ____ Incubator # 2 min 25.7 max 26.5 mean 26.1
Light Intensity: 50-100 Ft. candles Waterbath # ___ min ____ max ____ mean ____
Photoperiod: 16 hours Light / 8 hours dark Room B246 min 24.9 max 25.9 mean 25.7

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	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	5
		C	C	5	5	5	5	5	5
		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	4 1D	4	4	4	~~3 1D~~ @
		B	B	5	4 1D	4	4	3 1D	3
		C	C	5	5	3 2D	3	3	2 1D
		D	D	5	5	4 1D	4	4	4
2.5		A	A	5	2 3D	0 2D	-	—	—
		B	B	5	4 1D	2 2D	2	0 2D	—
		C	C	5	3 2D	0 3D	-	-	-
		D	D	5	3 2D	0 3D	-	-	-
3.0		A	A	5	2 3D	0 2D	-	—	-
		B	B	5	0 5D	—	-	—	-
		C	C	5	0 5D	—	-	-	-
		D	D	5	14D	0D	-	-	-
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: BA			Checked by:	BA	BA	BA	BA	BA	B

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

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

Investigators' Signatures
Jackie Winn
Brent Alexander
Marshall Faircloth
Jenna Daniel
Reviewer: Loretta C. Wolfe

Comments:
① 3:1D - Transcription error 4.4.09 - JD.

Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour: 2.01	2.02	2.27
96 hour: 2.02	1.91	2.14

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Revised 7/15/2008 mf

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: 3-31-07 Time: 12:50
Test Ending: Date: 4-4-07 Time: 1120

Test Type: ☐ non-renewal ☑ renewal

hr = hour AR = after renewal BR = before renewal

Concentration µg/L mg/L (%)	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☒ mmhos	Salinity (ppth)
Control	M	0 hr	7.7	24.1	7.3	0.178	—
	—	24 hr	—	—	—	—	—
	A	48 hr BR	8.0	24.0	7.5	0.196	—
	M	48 hr AR	7.8	24.2	24.2 7.2	0.178	—
	—	72 hr	—	—	—	—	—
	M	96 hr	8.2	24.2	7.1	0.190	—
1.5	M	0 hr	7.7	24.3	7.0	3.03	—
	—	24 hr	—	—	—	—	—
	A	48 hr BR	7.9	24.0	7.3	3.19	—
	M	48 hr AR	7.8	24.3	7.2	3.06	—
	—	72 hr	—	—	—	—	—
	M	96 hr	8.1	24.3	7.5	3.21	—
2.0	M	0 hr	7.8	24.4	7.1	4.07	—
	—	24 hr	—	—	—	—	—
	A	48 hr BR	8.0	24.0	7.1	4.27	—
	M	48 hr AR	7.9	24.2	7.2	4.02	—
	—	72 hr	—	—	—	—	—
	M	96 hr	8.1	24.3	7.7	4.24	—
2.5	M	0 hr	7.8	24.5	7.1	4.99	—
	—	24 hr	—	—	—	—	—
	A	48 hr BR	8.1	24.0	7.2	5.18	—
	M	48 hr AR	7.9	24.2	7.1	4.85	—
	B	72 hr	7.9	24.6	6.6	4.97	—
	—	96 hr	—	—	—	—	—
3.0	M	0 hr	7.9	24.5	7.1	5.87	—
	—	24 hr	—	—	—	—	—
	A	48 hr BR	8.1	24.0	7.2	6.11	—
	—	48 hr AR	—	—	—	—	—
	—	72 hr	—	—	—	—	—
	M	96 hr	—	—	—	—	—
4.0	M	0 hr	7.9	24.5	7.0	7.67	—
		24 hr	7.6	24.0	7.1	7.63	—
	—	48 hr BR	—	—	—	—	—
	—	48 hr AR	—	—	—	—	—
	—	72 hr	—	—	—	—	—
	—	96 hr	—	—	—	—	—

Investigators Signatures
Bill Alexander
Jackie Shim
Marshall Faircloth
James David

Reviewed By: Krista C Wolfe

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

Measure/record salinity for marine tests

Comments:

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Revised 07/15/2008 MF

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 #: well / 3-30-09 **Organism Batch:** 3-31-09 **Test Beginning:** Date: 3-31-09 Time: 13:00

Toxicant/ Batch#: NaCl / 3-30-09 Age: 13 days **Test Ending:** Date: 4.4.09 Time: 1100

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	JD JB
Alkalinity (mg/L as $CaCO_3$):	1495	TA06_08	~~BA~~ BA
Hardness (mg.L as $CaCO_3$):	130	TA06_09	BA
Total Ammonia (mg/L as N):	<0.017	TA06_17	MF
Conductivity (µmhos) mmhos	280	TA06_25	JD
Salinity (ppth):	—	TA06_25	—

1495 diluent

Food:	Batch
☐ YCT	
☐ *P. subcapitata*	
☑ Artemia Lot # 38438	

Artemia Batch:

0 hr: 47.09

24 hr: ~~48.09~~ RA 47.09

48 hr: 49.09

72 hr:

Chamber size: 1000 mL

Test volume: 500 mL per replicate

Concentrations prepared by: JD

Temperature Range °C:(if used)

Test Incubated in: Incubator # 2 Waterbath # ___ Incubator # 2 min. 25.7 max. 26.5 mean 26.1

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

Photoperiod: 16 hours Light / 8 hours dark Room B248 min. 24.1 max. 25.5 mean 25.4

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 (1)	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(D)
	B	A4	10	10	10	10	10	10
7	A	A5	10	10	10	10	10	10
	B	A6	10	10	10	10	10	9(D) 10/10
8	A	A7	10	10	10	10	10	9(D)
	B	A8	10	10	10	10	10	10
9	A	A9	10	6(4D)	5(1D)	5	5	5
	B	A10	10	10	7(3D)	7	7	7
10	A	A11	10	0(1D)	—	—	—	—
	B	A12	10	0(1D)	—	—	—	—
Organisms loaded by: JD		Checked by:	JD	4	4	4	4	JD

Loading Verified by: MF AR = after renewal

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

Investigators' Signatures

Jackie Shinn

Brian Albritton

James Daniels

Chelsea Prentice

Marshall Faircloth

Reviewer: Martha C Wolfe

Comments:

JD Transcription error 4.4.09

96 hour result exceeded 2X STD Deviation, Test repeated 4-8-09 → Passed MF 4/13/09

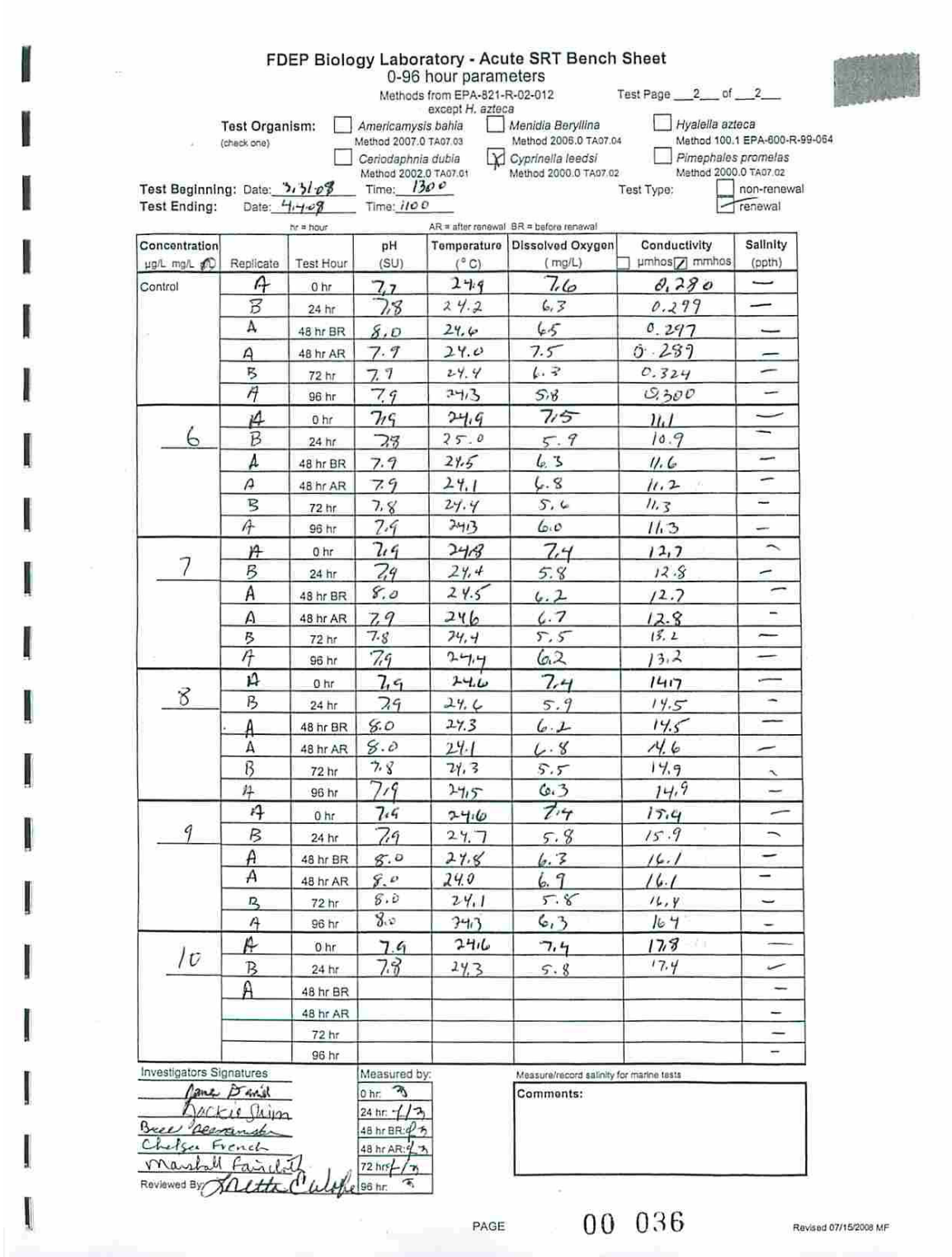
Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour: 9.07	8.85	9.30
96 hour: 9.04	8.78	9.30

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Revised 7/15/2008 mf

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: 3/31/08 Time: 1300
Test Ending: Date: 4/4/08 Time: 1100
Test Type: ☐ non-renewal ☑ renewal

hr = hour AR = after renewal BR = before renewal

Concentration µg/L mg/L ☐D	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☑ mmhos	Salinity (ppth)
Control	A	0 hr	7.7	24.9	7.6	0.280	—
	B	24 hr	7.8	24.2	6.3	0.299	—
	A	48 hr BR	8.0	24.6	6.5	0.297	—
	A	48 hr AR	7.9	24.0	7.5	0.289	—
	B	72 hr	7.9	24.4	6.3	0.324	—
	A	96 hr	7.9	24.3	5.8	0.300	—
6	A	0 hr	7.9	24.9	7.5	11.1	—
	B	24 hr	7.8	25.0	5.9	10.9	—
	A	48 hr BR	7.9	24.5	6.3	11.6	—
	A	48 hr AR	7.9	24.1	6.8	11.2	—
	B	72 hr	7.8	24.4	5.6	11.3	—
	A	96 hr	7.9	24.3	6.0	11.3	—
7	A	0 hr	7.9	24.8	7.4	12.7	—
	B	24 hr	7.9	24.4	5.8	12.8	—
	A	48 hr BR	8.0	24.5	6.2	12.7	—
	A	48 hr AR	7.9	24.6	6.7	12.8	—
	B	72 hr	7.8	24.4	5.5	13.2	—
	A	96 hr	7.9	24.4	6.2	13.2	—
8	A	0 hr	7.9	24.6	7.4	14.7	—
	B	24 hr	7.9	24.6	5.9	14.5	—
	A	48 hr BR	8.0	24.3	6.2	14.5	—
	A	48 hr AR	8.0	24.1	6.8	14.6	—
	B	72 hr	7.8	24.3	5.5	14.9	—
	A	96 hr	7.9	24.5	6.3	14.9	—
9	A	0 hr	7.9	24.6	7.4	15.4	—
	B	24 hr	7.9	24.7	5.8	15.9	—
	A	48 hr BR	8.0	24.8	6.3	16.1	—
	A	48 hr AR	8.0	24.0	6.9	16.1	—
	B	72 hr	8.0	24.1	5.8	16.4	—
	A	96 hr	8.0	24.3	6.3	16.4	—
10	A	0 hr	7.9	24.6	7.4	17.8	—
	B	24 hr	7.8	24.3	5.8	17.4	—
	A	48 hr BR					—
		48 hr AR					—
		72 hr					—
		96 hr					—

Investigators Signatures
Jane Daniel
Jackie Shinn
Brett Beaumont
Chelsea French
Marshall Faircloth
Reviewed By Dalette Colville

Measured by:
0 hr: JS
24 hr: CF
48 hr BR: BB
48 hr AR: JS
72 hrs: CF
96 hr: JS

Measure/record salinity for marine tests

Comments:

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Revised 07/15/2008 MF

Appendix C. (continued)

***Ceriodaphnia dubia* Acute Standard Reference Toxicant Test**

DATE: 3-3-09 DURATION: 96 hr TOXICANT: NaCl
SPECIES: *Ceriodaphnia dubia*

RAW DATA: Concentration (g/L)	Number Exposed	Mortalities
.00	20	0
1.50	20	0
2.00	20	8
2.50	20	20
3.00	20	20
4.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: **LC50: 2.02**
95% LOWER CONFIDENCE: 1.91
95% UPPER CONFIDENCE: 2.14

***Cyprinella leedsi* Acute Standard Reference Toxicant Test**

DATE: 3-3-09 DURATION: 96 hr 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	1
9.00	20	8
10.00	20	20

SPEARMAN-KARBER TRIM: 2.50%

SPEARMAN-KARBER ESTIMATES: **LC50: 9.04**
95% LOWER CONFIDENCE: 8.78
95% UPPER CONFIDENCE: 9.30

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

Appendix D. Test Organism Receipt(s)

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Organism Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Date: 3/30/05

Shipped to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood Number	Temp.	pH	Salinity
Mysidopsis bahia	150	4 DAYS	M5090326	25°C	7.9	20‰
Menidia beryllina						
						Hardness
Cyprinella leedsi	150	12DAYS	CL090328	25°C	7.8	80mg/L
Pimephales promelas	150	8DAYS	FM090322	25°C	7.8	80mg/L

Packed by: [signature]

Shipped Via: Fed Ex

Notes: _____

Thank you for your order.

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

Appendix D. (continued)

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Organism Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Date: 4/20/09

Shipped to: FDEP

P.O. No:

Species	Quantity	Age	Brood Number	Temp.	pH	Salinity
Mysidopsis bahia	200	4 DAYS	MS090416	25°C	8.0	20‰
Menidia beryllina	200	12 DAYS	SS090408	25°C	8.0	20‰
						Hardness
Cyprinella leedsi	150	10 DAYS	CL090410	25°C	7.8	80mg/L
Pimephales promelas						

Packed by:

Shipped Via: FedEx

Notes:

Thank you for your order.

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

Appendix E. Chemical Analyses performed on the effluent from the Northwest Regional Water Reclamation Facility Plant Outfall D-001, sampled on April 20 and 21, 2009.

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
4/20/2009 9:30	Effluent	AGP/LN	Algal Growth Potential	0.977		mg DryWt/L	0.3	0.9
4/20/2009 9:30	Effluent	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.4	U	ug/L	0.4	1.2
4/20/2009 9:30	Effluent	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.73	I	ug/L	0.55	1.7
4/20/2009 9:30	Effluent	Toxicology	Bioassay-Acute-Def-FW-Fish, LC50	100	L	LC50		
4/20/2009 9:30	Effluent	Toxicology	Bioassay-Acute-Def-FW-C.dubia, LC50	100	L	LC50		
4/20/2009 9:30	Effluent	Metals	Selenium	0.23	I	ug/L	0.2	0.8
4/20/2009 9:30	Effluent	Metals	Calcium	71.3		mg/L	0.075	0.3
4/20/2009 9:30	Effluent	Metals	Arsenic	0.37	I	ug/L	0.25	1
4/20/2009 9:30	Effluent	Metals	Chromium	0.3	U	ug/L	0.3	1.2
4/20/2009 9:30	Effluent	Metals	Silver	0.025	U	ug/L	0.025	0.1
4/20/2009 9:30	Effluent	Metals	Magnesium	4.51		mg/L	0.04	0.16
4/20/2009 9:30	Effluent	Metals	Cadmium	0.032	I	ug/L	0.03	0.12
4/20/2009 9:30	Effluent	Metals	Mercury	0.12	U	ug/L	0.12	0.5
4/20/2009 9:30	Effluent	Metals	Aluminum	83	I	ug/L	60	240
4/20/2009 9:30	Effluent	Metals	Zinc	50		ug/L	5	20
4/20/2009 9:30	Effluent	Metals	Lead	0.2	U	ug/L	0.2	0.8
4/20/2009 9:30	Effluent	Metals	Nickel	1.23		ug/L	0.25	1
4/20/2009 9:30	Effluent	Metals	Iron	31	I	ug/L	30	120
4/20/2009 9:30	Effluent	Metals	Copper	2.73		ug/L	0.5	0.5
4/20/2009 9:30	Effluent	Nutrients	O-Phosphate-P	0.06		mg P/L	0.004	0.01
4/20/2009 9:30	Effluent	Nutrients	TSS	4	U	mg/L	4	16
4/20/2009 9:30	Effluent	Pesticides	Endrin Aldehyde	0.02	U	ug/L	0.02	0.08
4/20/2009 9:30	Effluent	Pesticides	Ametryn	0.05	U	ug/L	0.05	0.2
4/20/2009 9:30	Effluent	Pesticides	Atrazine	0.22		ug/L	0.05	0.2
4/20/2009 9:30	Effluent	Pesticides	DDT-p,p'	0.03	U	ug/L	0.03	0.12
4/20/2009 9:30	Effluent	Pesticides	Azinphos Methyl	0.2	UJ	ug/L	0.2	0.8
4/20/2009 9:30	Effluent	Pesticides	Naled	0.8	U	ug/L	0.8	3.2
4/20/2009 9:30	Effluent	Pesticides	DDD-p,p'	0.02	U	ug/L	0.02	0.08
4/20/2009 9:30	Effluent	Pesticides	Endosulfan I	0.02	U	ug/L	0.02	0.08
4/20/2009 9:30	Effluent	Pesticides	Endosulfan Sulfate	0.02	U	ug/L	0.02	0.08
4/20/2009 9:30	Effluent	Pesticides	Butylate	0.2	UJ	ug/L	0.2	0.8
4/20/2009 9:30	Effluent	Pesticides	Malathion	0.15	U	ug/L	0.15	0.6
4/20/2009 9:30	Effluent	Pesticides	Prometryn	0.15	U	ug/L	0.15	0.6

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
4/20/2009 9:30	Effluent	Pesticides	Delta-BHC	0.01	U	ug/L	0.01	0.04
4/20/2009 9:30	Effluent	Pesticides	Chlorpyrifos Ethyl	0.05	U	ug/L	0.05	0.2
4/20/2009 9:30	Effluent	Pesticides	Heptachlor	0.01	U	ug/L	0.01	0.04
4/20/2009 9:30	Effluent	Pesticides	Toxaphene	0.75	U	ug/L	0.75	3
4/20/2009 9:30	Effluent	Pesticides	Hexazinone	0.1	U	ug/L	0.1	0.4
4/20/2009 9:30	Effluent	Pesticides	Norflurazon	0.15	U	ug/L	0.15	0.6
4/20/2009 9:30	Effluent	Pesticides	DDE-p,p'	0.02	U	ug/L	0.02	0.08
4/20/2009 9:30	Effluent	Pesticides	Gamma-BHC	0.01	U	ug/L	0.01	0.04
4/20/2009 9:30	Effluent	Pesticides	Heptachlor Epoxide	0.02	U	ug/L	0.02	0.08
4/20/2009 9:30	Effluent	Pesticides	Methoxychlor	0.05	UJ	ug/L	0.05	0.2
4/20/2009 9:30	Effluent	Pesticides	Alachlor	0.6	U	ug/L	0.6	2.4
4/20/2009 9:30	Effluent	Pesticides	Bromacil	0.2	U	ug/L	0.2	0.8
4/20/2009 9:30	Effluent	Pesticides	Fonofos	0.1	U	ug/L	0.1	0.4
4/20/2009 9:30	Effluent	Pesticides	Simazine	0.05	U	ug/L	0.05	0.2
4/20/2009 9:30	Effluent	Pesticides	Aldrin	0.01	U	ug/L	0.01	0.04
4/20/2009 9:30	Effluent	Pesticides	Dieldrin	0.02	U	ug/L	0.02	0.08
4/20/2009 9:30	Effluent	Pesticides	Endosulfan II	0.02	U	ug/L	0.02	0.08
4/20/2009 9:30	Effluent	Pesticides	Diazinon	0.05	U	ug/L	0.05	0.2
4/20/2009 9:30	Effluent	Pesticides	Metalaxyl	0.25	U	ug/L	0.25	1
4/20/2009 9:30	Effluent	Pesticides	Metribuzin	0.1	U	ug/L	0.1	0.4
4/20/2009 9:30	Effluent	Pesticides	Alpha-BHC	0.01	U	ug/L	0.01	0.04
4/20/2009 9:30	Effluent	Pesticides	Beta-BHC	0.01	U	ug/L	0.01	0.04
4/20/2009 9:30	Effluent	Pesticides	Chlorpyrifos Methyl	0.1	U	ug/L	0.1	0.4
4/20/2009 9:30	Effluent	Pesticides	Ethion	0.05	U	ug/L	0.05	0.2
4/20/2009 9:30	Effluent	Pesticides	Ethoprop	0.1	U	ug/L	0.1	0.4
4/20/2009 9:30	Effluent	Pesticides	Fenamiphos	0.2	UJ	ug/L	0.2	0.8
4/20/2009 9:30	Effluent	Pesticides	Metolachlor	0.5	U	ug/L	0.5	2
4/20/2009 9:30	Effluent	Pesticides	Mevinphos	0.2	U	ug/L	0.2	0.8
4/20/2009 9:30	Effluent	Pesticides	Parathion Ethyl	0.15	U	ug/L	0.15	0.6
4/20/2009 9:30	Effluent	Pesticides	Parathion Methyl	0.1	U	ug/L	0.1	0.4
4/20/2009 9:30	Effluent	Pesticides	Phorate	0.05	U	ug/L	0.05	0.2
4/20/2009 9:30	Effluent	Pesticides	Chlordane	0.2	U	ug/L	0.2	0.8
4/20/2009 9:30	Effluent	Pesticides	Endrin	0.05	U	ug/L	0.05	0.2
4/20/2009 9:30	Effluent	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.96	U	ug/L	0.96	3.8

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.7
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Benzo(a)pyrene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Chrysene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Diethyl phthalate	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	12
4/20/2009 9:30	Effluent	Priority Organic Pollutants	2,4-Dinitrotoluene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38	U	ug/L	38	150
4/20/2009 9:30	Effluent	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.7
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Acenaphthylene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Phenanthrene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Pyrene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Hexachlorobenzene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Isophorone	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.7
4/20/2009 9:30	Effluent	Priority Organic Pollutants	2-Chlorophenol	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Di-n-butyl phthalate	4.8	U	ug/L	4.8	19
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Di-n-octyl phthalate	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.7
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	12
4/20/2009 9:30	Effluent	Priority Organic Pollutants	2,4-Dichlorophenol	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	2,4-Dimethylphenol	9.6	U	ug/L	9.6	38
4/20/2009 9:30	Effluent	Priority Organic Pollutants	2,4-Dinitrophenol	14	U	ug/L	14	58
4/20/2009 9:30	Effluent	Priority Organic Pollutants	2-Chloronaphthalene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	12
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Acenaphthene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Benzidine	96	U	ug/L	96	380
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Benzo(b)fluoranthene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	14	U	ug/L	14	58
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Dimethyl phthalate	9.6	U	ug/L	9.6	38
4/20/2009 9:30	Effluent	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	U	ug/L	2.9	12
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Benzo(a)anthracene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Benzo(k)fluoranthene	0.96	U	ug/L	0.96	3.8

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Butyl benzyl phthalate	4.8	U	ug/L	4.8	19
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Fluoranthene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	12
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Phenol	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Anthracene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	12
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Fluorene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	2,6-Dinitrotoluene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	2-Nitrophenol	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	12
4/20/2009 9:30	Effluent	Priority Organic Pollutants	Naphthalene	0.96	U	ug/L	0.96	3.8
4/20/2009 9:30	Effluent	Priority Organic Pollutants	4-Nitrophenol	14	U	ug/L	14	58
4/20/2009 9:30	Effluent	Field Parameter	Specific Conductance	891		umhos/cm		
4/20/2009 9:30	Effluent	Field Parameter	Temperature	26.49		C		
4/20/2009 9:30	Effluent	Field Parameter	pH	6.6				
4/20/2009 9:30	Effluent	Field Parameter	Dissolved Oxygen	11.69		mg/L		
4/20/2009 9:30	Effluent	Field Parameter	Total Residual Chlorine	0.02	U	mg/L		
4/20/2009 9:10	Field Blank	Metals	Copper	0.83		ug/L	0.5	0.5
4/20/2009 9:10	Field Blank	Metals	Lead	0.2	U	ug/L	0.2	0.8
4/20/2009 9:10	Field Blank	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
4/20/2009 9:10	Field Blank	Metals	Arsenic	0.25	U	ug/L	0.25	1
4/20/2009 9:10	Field Blank	Metals	Chromium	0.3	U	ug/L	0.3	1.2
4/20/2009 9:10	Field Blank	Metals	Mercury	0.12	U	ug/L	0.12	0.5
4/20/2009 9:10	Field Blank	Metals	Cadmium	0.03	U	ug/L	0.03	0.12
4/20/2009 9:10	Field Blank	Metals	Silver	0.025	U	ug/L	0.025	0.1
4/20/2009 9:10	Field Blank	Metals	Calcium	0.075	U	mg/L	0.075	0.3
4/20/2009 9:10	Field Blank	Metals	Aluminum	60	U	ug/L	60	240
4/20/2009 9:10	Field Blank	Metals	Iron	30	U	ug/L	30	120

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
4/20/2009 9:10	Field Blank	Metals	Zinc	5	U	ug/L	5	20
4/20/2009 9:10	Field Blank	Metals	Selenium	0.2	U	ug/L	0.2	0.8
4/20/2009 9:10	Field Blank	Metals	Nickel	0.25	U	ug/L	0.25	1
4/20/2009 9:10	Field Blank	Nutrients	O-Phosphate-P	0.016		mg P/L	0.004	0.01
4/20/2009 9:10	Field Blank	Pesticides	Chlorpyrifos Methyl	0.1	U	ug/L	0.1	0.4
4/20/2009 9:10	Field Blank	Pesticides	DDE-p,p'	0.02	U	ug/L	0.02	0.08
4/20/2009 9:10	Field Blank	Pesticides	Gamma-BHC	0.01	U	ug/L	0.01	0.04
4/20/2009 9:10	Field Blank	Pesticides	Atrazine	0.05	U	ug/L	0.05	0.2
4/20/2009 9:10	Field Blank	Pesticides	Ethion	0.05	U	ug/L	0.05	0.2
4/20/2009 9:10	Field Blank	Pesticides	Hexazinone	0.1	U	ug/L	0.1	0.4
4/20/2009 9:10	Field Blank	Pesticides	Metolachlor	0.5	U	ug/L	0.5	2
4/20/2009 9:10	Field Blank	Pesticides	Metribuzin	0.1	U	ug/L	0.1	0.4
4/20/2009 9:10	Field Blank	Pesticides	Norflurazon	0.15	U	ug/L	0.15	0.6
4/20/2009 9:10	Field Blank	Pesticides	Parathion Ethyl	0.15	U	ug/L	0.15	0.6
4/20/2009 9:10	Field Blank	Pesticides	Methoxychlor	0.05	UJ	ug/L	0.05	0.2
4/20/2009 9:10	Field Blank	Pesticides	Ethoprop	0.1	U	ug/L	0.1	0.4
4/20/2009 9:10	Field Blank	Pesticides	Alpha-BHC	0.01	U	ug/L	0.01	0.04
4/20/2009 9:10	Field Blank	Pesticides	Heptachlor	0.01	U	ug/L	0.01	0.04
4/20/2009 9:10	Field Blank	Pesticides	Alachlor	0.6	U	ug/L	0.6	2.4
4/20/2009 9:10	Field Blank	Pesticides	Fonofos	0.1	U	ug/L	0.1	0.4
4/20/2009 9:10	Field Blank	Pesticides	Mevinphos	0.2	U	ug/L	0.2	0.8
4/20/2009 9:10	Field Blank	Pesticides	Parathion Methyl	0.1	U	ug/L	0.1	0.4
4/20/2009 9:10	Field Blank	Pesticides	Phorate	0.05	U	ug/L	0.05	0.2
4/20/2009 9:10	Field Blank	Pesticides	DDD-p,p'	0.02	U	ug/L	0.02	0.08
4/20/2009 9:10	Field Blank	Pesticides	DDT-p,p'	0.03	U	ug/L	0.03	0.12
4/20/2009 9:10	Field Blank	Pesticides	Endosulfan II	0.02	U	ug/L	0.02	0.08
4/20/2009 9:10	Field Blank	Pesticides	Endrin	0.05	U	ug/L	0.05	0.2
4/20/2009 9:10	Field Blank	Pesticides	Toxaphene	0.75	U	ug/L	0.75	3
4/20/2009 9:10	Field Blank	Pesticides	Bromacil	0.2	U	ug/L	0.2	0.8
4/20/2009 9:10	Field Blank	Pesticides	Fenamiphos	0.2	UJ	ug/L	0.2	0.8
4/20/2009 9:10	Field Blank	Pesticides	Metalaxyl	0.25	U	ug/L	0.25	1
4/20/2009 9:10	Field Blank	Pesticides	Naled	0.8	U	ug/L	0.8	3.2
4/20/2009 9:10	Field Blank	Pesticides	Prometryn	0.15	U	ug/L	0.15	0.6
4/20/2009 9:10	Field Blank	Pesticides	Aldrin	0.01	U	ug/L	0.01	0.04

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
4/20/2009 9:10	Field Blank	Pesticides	Delta-BHC	0.01	U	ug/L	0.01	0.04
4/20/2009 9:10	Field Blank	Pesticides	Endrin Aldehyde	0.02	U	ug/L	0.02	0.08
4/20/2009 9:10	Field Blank	Pesticides	Ametryn	0.05	U	ug/L	0.05	0.2
4/20/2009 9:10	Field Blank	Pesticides	Simazine	0.05	U	ug/L	0.05	0.2
4/20/2009 9:10	Field Blank	Pesticides	Chlordane	0.2	U	ug/L	0.2	0.8
4/20/2009 9:10	Field Blank	Pesticides	Dieldrin	0.02	U	ug/L	0.02	0.08
4/20/2009 9:10	Field Blank	Pesticides	Chlorpyrifos Ethyl	0.05	U	ug/L	0.05	0.2
4/20/2009 9:10	Field Blank	Pesticides	Diazinon	0.05	U	ug/L	0.05	0.2
4/20/2009 9:10	Field Blank	Pesticides	Malathion	0.15	U	ug/L	0.15	0.6
4/20/2009 9:10	Field Blank	Pesticides	Endosulfan I	0.02	U	ug/L	0.02	0.08
4/20/2009 9:10	Field Blank	Pesticides	Azinphos Methyl	0.2	UJ	ug/L	0.2	0.8
4/20/2009 9:10	Field Blank	Pesticides	Butylate	0.2	UJ	ug/L	0.2	0.8
4/20/2009 9:10	Field Blank	Pesticides	Beta-BHC	0.01	U	ug/L	0.01	0.04
4/20/2009 9:10	Field Blank	Pesticides	Endosulfan Sulfate	0.02	U	ug/L	0.02	0.08
4/20/2009 9:10	Field Blank	Pesticides	Heptachlor Epoxide	0.02	U	ug/L	0.02	0.08
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	2-Chlorophenol	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Fluoranthene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	14	U	ug/L	14	57
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Diethyl phthalate	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Isophorone	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.6
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Pyrene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Di-n-octyl phthalate	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Naphthalene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Fluorene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Di-n-butyl phthalate	4.8	U	ug/L	4.8	19
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	2,4-Dimethylphenol	9.5	U	ug/L	9.5	38
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	2,4-Dinitrophenol	14	U	ug/L	14	57
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	0.95	U	ug/L	0.95	3.8

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Benzo(a)anthracene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Benzo(a)pyrene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Chrysene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Hexachlorobenzene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	11
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	U	ug/L	2.9	11
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	11
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	2-Chloronaphthalene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	2-Nitrophenol	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Acenaphthylene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Benzidine	95	U	ug/L	95	380
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Butyl benzyl phthalate	4.8	U	ug/L	4.8	19
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	2,4-Dichlorophenol	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	11
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	11
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38	U	ug/L	38	150
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Acenaphthene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	11
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	11
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.6
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.6
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Phenanthrene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.6
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	4-Nitrophenol	14	U	ug/L	14	57
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Anthracene	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Dimethyl phthalate	9.5	U	ug/L	9.5	38
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	Phenol	0.95	U	ug/L	0.95	3.8
4/20/2009 9:10	Field Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.95	U	ug/L	0.95	3.8

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Units	MDL	PQL
4/20/2009 8:00	Equipment Blank	Nutrients	Ammonia-N	0.018	I	mg N/L	0.01	0.02
4/20/2009 8:00	Equipment Blank	Nutrients	NO2NO3-N	0.005	I	mg N/L	0.004	0.01
4/21/2009 10:15	Effluent Composite April 21	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	2.2		mg/L	0.2	2
4/21/2009 10:15	Effluent Composite April 21	Nutrients	Ammonia-N	0.014	I	mg N/L	0.01	0.02
4/21/2009 10:15	Effluent Composite April 21	Nutrients	Kjeldahl Nitrogen	1.2		mg N/L	0.08	0.2
4/21/2009 10:15	Effluent Composite April 21	Nutrients	TSS	4	U	mg/L	4	16
4/21/2009 10:15	Effluent Composite April 21	Nutrients	NO2NO3-N	0.38		mg N/L	0.004	0.01
4/21/2009 10:15	Effluent Composite April 21	Nutrients	Total-P	0.23		mg P/L	0.004	0.01

Appendix F. Laboratory Instruments

FDEP Biology Laboratory - Bioassay Instrument Identification

Test ID: Northwest Regional WRF Test Dates: April 21 - 25, 2009

METER / DEVICE	ID	SOP	Parameter	Method	√ used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	√
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H^+	√
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity Salinity	SM 2510 B SM 2520 B	√ √
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	√
Thermometer (DO probe)	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 electronic and non-mercury filled thermometers.
Insert other device information in blank spaces(if used). Test ID = Facility or SRTs (acute SRT--Chronic SRT)

Comments: Prepared by M. Faircloth

V 1.4 8/21/08 BA

Appendix G. Facility Summary

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): Northwest Regional Water Reclamation Facility	**Former Names:**
NPDES Permit Number: FL0041670	**Permit Expiration Date:** 4/27/2010
Physical Address: 10890 South Mobley Road Odessa, Fl 33626	
District: Southwest	**County:** Hillsborough
Function of Facility: Type I Badenpho Process advanced domestic wastewater treatment plant	
Facility Type: Major	**Permitted Capacity (MGD):** 6.0 MGD AADF
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months):	
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 G. (continued)

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

Monitoring Location	Description of Monitoring Location
FLW-04	Flow meter at the Cascade Aerator.
EFA-01	After disinfection and prior to discharge to reuse system R-001 or dechlorination facility to D-001.
EFB-01	After filtration and prior to disinfection.
EFD-01	After dechlorination and prior to surface water discharge to Channel A D-001.
FLW-10	Flow rate through the UV system.
PPI-01	UV system monitoring location.
STM-01	Stormwater discharge monitoring location, D-002 Eagles Golf Course Lake.
STM-02	Stormwater discharge monitoring location, D-003 Emerald Golf Course Lake.

Description of Permitted Outfall(s):

DISPOSAL:

Surface Water Discharge:

D-001: An existing 5.0 MGD annual average daily flow (AADF) permitted discharge to Channel A (Class III surface waters) which flows to Rocky Creek then to Old Tampa Bay. The outfall structure is approximately 1.0 feet in length and discharges at a depth of approximately 2.0 feet. The point of discharge is located approximately at latitude 28 ° 01' 26" N, longitude 82 ° 35' 54" W.

Item of significance: The primary source of this discharge D-001 will normally be this permitted facility, the Northwest Regional Water Reclamation Facility. However, effluent generated by the River Oaks Advanced Wastewater Treatment Plant (FL0027821), is also approved for discharge into this water body through this same discharge location so long as the combined discharge does not exceed the permitted 5.0 mgd AADF flow limit. Any contribution from the River Oaks facility will also be reported by that facility.

D-002: A golf course irrigation reclaimed water storage lake system which may intermittently discharge through the stormwater management and control system during storm events at the Eagles Golf Course Storage Pond "D". The golf course will carry the additional NPDES outfall designation as shown, and the lake discharge location will be monitored in accordance with Permit Conditions I.A.2. for number of occurrences and duration of discharges.

D-003: A golf course irrigation reclaimed water storage lake system which may intermittently discharge through the stormwater management and control system during storm events at the Emerald Greens Golf Course Storage Pond #5. The golf course will carry the additional NPDES outfall designation as shown, and the lake discharge location will be monitored in accordance with Permit Conditions I.A.2. for number of occurrences and duration of discharges.

Appendix G. (continued)

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

Existing: An existing 6.0 mgd annual average daily flow (AADF) Type I Bardenpho Process advanced domestic wastewater treatment plant consisting of: a headworks with a mechanical bar screen and back-up manual bar screen, a Pista grit removal system with fine Hydrosieve screening, and odor control; dual Bardenpho® Biological Nutrient Removal (BNR) treatment trains consisting of two fermentation basins of 552,000 gallons total volume, two first anoxic basins of 648,000 gallons total volume, two oxidation ditches of 2,355,000 gallons total volume, two second anoxic basins of 515,000 gallons total volume, and two reaeration basins of 103,000 gallons total volume; two final clarifiers of 19,000 square feet total area and 1,885,000 gallons total volume; five dual-media deep-bed denitrification filters of 1,800 square feet total surface area; a single spent backwash basin of 397,000 gallons volume; two chlorine contact chambers of 432,000 gallons total volume using gaseous chlorine disinfection; and an in-line transfer pumping station basin.

Appendix G. (continued)

Domestic residuals from this Northwest Regional Wastewater Reclamation facility are transferred by pumping directly from the clarifiers to a sludge holding basin of 254,000 gallons then by pumping to the Northwest Residuals Management Facility (NWRMF) (previously FLA012119) located immediately adjacent for treatment and disposal. The operation of the NWRMF is a part of this operation permit. The NWRMF is an existing 25 dry tons/day type I facility consisting of: two holding tanks with 500,000 gallons total capacity, four gravity belt thickeners with 600 gpm/m total capacity, four aerobic digesters with 6.0 million gallons of total capacity and six belt filter press dewatering units with 300 gpm/m total capacity. The residuals are stabilized to achieve Class B requirements by aerobic digestion. The stabilized residuals are removed by truck for land application.

Previously approved ongoing modifications to the residuals management system include improvements/modification to the facility as approved by a substantial permit revision (see FL0041670-008) to upgrade the NWRMF into a Class AA Sludge Processing Facility. The modification will include the addition of: a thermal drying facility with direct rotary drum dryers, odor control, sludge cake receiving station, recycle pumping and conveyance systems, pellet loading/storage and weigh scale facility, associated piping, valving, electrical and switchgear systems. Centrifuges will be added for enhanced dewatering prior to the thermal drying.

Effluent in excess of the reclaimed water demands or, effluent failing to meet Part III public access quality standards is discharged at outfall D001 as described below and is dechlorinated by the use of sodium bisulfite at a remotely located dechlorination facility with cascade aerator in a basin located at the outfall site. Reclaimed water failing to meet public access quality standards is sent to the lined reject storage pond for re-treatment if necessary.

Effluent which meets Part III public access quality standards for the Master Urban Reuse System (R001) within western Hillsborough County, as described below, is pumped from the transfer pumping station to an above ground reuse system reclaimed water storage tank of 3.0 mg; thence by means of a four pump high service reuse distribution system to R001. The on-site storage tank, pumping system and the reject system are controlled, sequenced and operated according to procedures set forth in the plant Operating Protocol in order to assure maximum reliability and safeguards on the quality of the reclaimed water. Reclaimed water is provided from the high service reclaimed water pumps to the Ed Radice Park sports complex, also a part of R001. Reclaimed water is also transferred from the transfer pumping station to the adjacent Northwest Residuals Management facility for industrial usage (process water and blower cooling) under Part VII of Chapter 62-610, FAC.

Filter backwash, post-filtration reject water and water from the 4.5 acre lined reject storage pond, is returned to the waste stream via the spent backwash basin for re-treatment. From there, it is returned, along with plant drainage, to the front of the headworks for re-treatment. Methanol injection is available in the BNR process first anoxic basins for nitrogen control. Alum coagulant feed is available for injection prior to the clarifiers for solids control. Polymer is available for injection prior to the clarifers. Effluent quality is continuously monitored for turbidity as a measure of TSS and chlorine residual as a measure of disinfection effectiveness.

This revision (012) allows for the construction of the Trojan Technologies Model UV3000Plus disinfection system. The UV disinfection system will include two channels with each channel having five banks of lamp modules for a total of 10 banks. There are 9 modules of bulbs within each of the ten banks. There are 8 bulbs in each of the modules. There are 72 bulbs per bank. There are a total of 720 bulbs in the system (72 bulbs in ten banks). The system is designed to produce 100mJ/cm^2 at maximum day flow per the MWRI guidelines using six banks of lamp modules (two per channel). To meet Class I Reliability, if a channel is down, all three of the banks in the remaining two channels can then operate to provide 100% of the design capacity. The system is designed to produce 100 mJ/cm2 at maximum day flow per the NWRI guidelines using four banks of lamp modules (four per channel). To meet Class I Reliability, a redundant bank is provided in each channel such that the system can provide 100% of the design capacity with one bank in each train out of service. The system will include uninterrupted power supply units to provide a continuous, uninterrupted supply of power during transition from normal to emergency power and back. Upon completion of the UV disinfection system the gas chlorination system will be demolished.

Appendix G. (continued)

SUBSTANTIAL REVISION: FACILITY AFTER CONSTRUCTION and MODIFICATION:

After Expansion: A 10.0 mgd annual average daily flow (AADF) Type I Bardenpho® Process advanced domestic wastewater treatment plant consisting of: a headworks with two mechanical bar screens and back-up manual bar screen, a forced-vortex grit removal system with a grit washing and classifying, and odor control; four parallel Bardenpho® Biological Nutrient Removal (BNR) treatment trains consisting of eight covered fermentation basins of 1,104,000 gallons total volume, four first anoxic basins of 1,296,000 gallons total volume, two oxidation ditches of 4,710,000 gallons total volume, two second anoxic basins of 1,030,000 gallons total volume, and two reaeration basins of 206,000 gallons total volume; four final clarifiers of 38,000 square feet total area and 3,770,000 gallons total volume; ten dual-media deep-bed denitrification filters of 3,600 square feet total surface area; a single spent backwash basin of 397,000 gallons volume; disinfection will be achieved using the Trojan Technologies Model UV 3000Plus UV system, and an in-line transfer pumping station..

Domestic residuals from this Northwest Regional Wastewater Reclamation facility are transferred, by pumping directly from the clarifiers to a sludge holding basin of 253,800 gallons then by pumping to the Northwest Residuals Management Facility (NWRMF) (previously FLA012119) located immediately adjacent for treatment and disposal. The operation of the NWRMF is a part of this operation permit. The NWRMF is an existing 25 dry tons/day type I facility consisting of: two holding tanks with 500,000 gallons total capacity, four gravity belt thickeners with 600 gpm/m total capacity, four aerobic digesters with 6.0 million gallons of total capacity and six belt filter press dewatering units with 300 gpm/m total capacity. The residuals are stabilized to achieve Class B requirements by aerobic digestion. The stabilized residuals are removed by truck for land application.

Previously approved ongoing modifications to the residuals management system include improvements/modification to the facility as approved by a substantial permit revision (see FL0041670-008) to upgrade the NWRMF into a Class AA Sludge Processing Facility. The modification will include the addition of: a thermal drying facility with direct rotary drum dryers, odor control, sludge cake receiving station, recycle pumping and conveyance systems, pellet loading/storage and weigh scale facility, associated piping, valving, electrical and switchgear systems. Centrifuges will be added for enhanced dewatering prior to the thermal drying.

Effluent in excess of the reclaimed water demands or, effluent failing to meet Part III public access quality standards is discharged at outfall D001 as described below and is dechlorinated by the use of sodium bisulfite at a remotely located dechlorination facility with cascade aerator in a basin located at the outfall site. Reclaimed water failing to meet public access quality standards is sent to the two lined reject ponds with a total storage capacity of 10.0 mg for re-treatment, if necessary.

Effluent which meets Part III public access quality standards for the Master Urban Reuse System (R001) within western Hillsborough County, as described below, is pumped from the transfer pumping station to three above ground reuse system reclaimed water storage tanks of 3.0 mg, 5.0 mg and 5.0 mg; thence by means of a six pump high service reuse distribution system to R001. The on-site storage tank, pumping system and the reject system are controlled, sequenced and operated according to procedures set forth in the plant Operating Protocol in order to assure maximum reliability and safeguards on the quality of the reclaimed water. Reclaimed water is provided from the high-service reclaimed water pumps to the Ed Radice Park sports complex, also a part of R001. Reclaimed water is also transferred from the transfer pumping station to the adjacent Northwest Residuals Management facility for industrial usage (process water and blower cooling) under Part VII of Chapter 62-610, FAC.

Filter backwash, post-filtration reject water and water from the 10 mg lined reject storage ponds, is returned to the waste stream via the spent backwash basin for re-treatment. From there, it is returned, along with plant drainage, to the front of the headworks for re-treatment. Methanol injection is available in the BNR process first anoxic basins for nitrogen control. Alum coagulant feed is available on a standby status for injection prior to the clarifiers for solids control. Polymer is available for injection prior to the clarifers. Effluent quality is continuously monitored for turbidity as a measure of TSS. Two standby engine generators are housed on-site for backup electric power sources with fuel oil storage of 30,000 gallons. Standby power is not provided to the six high service reclaimed water pumps.

After expansion, biosolids handling and treatment will continue to be at the adjacent NWRMF thermal drying facility.

Appendix G. (continued)

PART I: Continued	
Receiving Waters: Channel A which flows to Rocky Creek and then to Old Tampa Bat	**Classification (indicate whether fresh or marine):** Channel A is Class III Fresh

Appendix G. (continued)

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

9. Acute Whole Effluent Toxicity Testing

The permittee shall comply with the following whole effluent toxicity testing requirements and initiate the series of tests described below during October through May following permit issuance, unless otherwise directed by the Department in writing, to evaluate acute whole effluent toxicity of the discharge from outfall D-001 into Rocky Creek then to Old Tampa Bay. If there is no discharge from outfall D-001 during the test period, a bioassay will not be required; a value of NODI = 9 should be recorded on the DMR.

a. Effluent limitation

1. Mortality of less than or equal to 50% in a 100% effluent, or a calculated LC50 of greater than 100% effluent, in any "routine" test or in any additional follow-up test, shall constitute compliance with these permit conditions, and Rule 62-302.500(1)(a)4 and Rule 62-4.244(3)(a), F.A.C.

2. Mortality of greater than 50% in a 100% effluent in any "routine" test, or an LC50 of less than 100% effluent, in any additional test, shall constitute non-compliance with these permit conditions, and Rule 62-302.500(1)(a)4 and Rule 62-4.244(3)(a), F.A.C. The permittee shall notify the Department via telephone or e-mail within 24 hours of notification that a routine or additional test failed.

b. Monitoring frequency
The "routine" toxicity tests specified shall be conducted once every two months, during October through May.

c. Routine Test Requirements

1. The permittee shall conduct 96-hour acute static renewal, multi-concentration toxicity tests using the daphnid, Ceriodaphnia dubia, and the bannerfin shiner, Cyprinella leedsi, concurrently. All test species, procedures and quality assurance criteria used shall be in accordance with Methods for Measuring Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, EPA-821-R-02-012, or the most current edition. Any deviation of the toxicity procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use.
2. The control water and dilution water used will be moderately hard water as described in EPA-821-R-02-012, Table 7, or the most current edition.
3. All "routine" tests shall be conducted using a control (0% effluent) and the following test concentrations: 100%, 50%, 25%, 12.5% and 6.25% final effluent.

d. Sampling Requirements

1. All routine tests will be conducted on four separate grab samples collected at evenly-spaced 6-hour 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. Each sample shall be analyzed for total residual chlorine and pH at the time of sample collection.

e. Additional, Follow-up Testing Requirements, if required

1. If acute toxicity (greater than 50% mortality of either test species in any grab sample test) is found in a routine test, the permittee shall conduct two valid additional tests on each species indicating greater than 50% mortality in any of the test concentrations. The permittee shall notify the Department via telephone or e-mail within 24 hours of notification that a routine or additional test failed.
2. The two valid additional tests shall be conducted using a control (0% effluent) and a minimum of five dilutions: 100%, 50%, 25%, 12.5% and 6.25% effluent.
3. For each additional test, the sample collection requirements, the quality assurance criteria, and the test acceptability criteria must be met for the test to be considered valid.
4. The first valid additional test shall begin within two weeks of the end of the routine test failure. The second valid additional test shall be conducted one week thereafter. The valid additional tests will be used to evaluate the persistence of the observed toxicity.

Appendix G. (continued)

10. Chronic Whole Effluent Toxicity Testing

The permittee shall comply with the following whole effluent toxicity testing requirements and initiate the series of tests described below during June through September following permit issuance, unless otherwise directed by the Department in writing, to evaluate chronic whole effluent toxicity of the discharge from outfall D-001 into Rocky Creek then to Old Tampa Bay. If there is no discharge from outfall D-001 during this test period, a bioassay will not be required; a value of NODI = 9 should be reported on the DMR.

a. Effluent Limitation

1. A No Observed Effect Concentration (NOEC) of greater than or equal to 100% effluent in any routine test or any additional test shall constitute compliance with these permit conditions and Rule 62-302.530(62), F.A.C.
2. A NOEC of less than 100% effluent in any routine test or additional test shall constitute non-compliance with these permit conditions and Rule 62-302.530(62), F.A.C. The permittee shall notify the Department via telephone or e-mail within 24 hours of notification that a routine or additional test failed.

b. Monitoring Frequency

The "routine" toxicity tests specified shall be conducted once every two months, during June through September.

c. Routine Test Requirements

1. The permittee shall conduct a daphnid, Ceriodaphnia dubia, Survival and Reproduction Test and a fathead minnow, Pimephales promelas, Larval Survival and Growth Test, concurrently.
2. All test species, procedures and quality assurance criteria used shall be in accordance with Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, 4th ed., EPA-821-R-02-013, or the most current edition. Any deviation of the toxicity procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use.
3. The control water and dilution water used shall be moderately hard water as described in EPA-821-R-02-013, Section 7, or the most current edition.
4. All routine tests shall be conducted using a control (0% effluent) and a minimum of five test concentrations: 100%, 50%, 25%, 12.5%, and 6.25% final effluent.

d. Sampling Requirements

1. For each routine test or additional test required, a total of three 24-hour, flow-proportioned composite samples of final effluent shall be collected and used per the sampling protocol discussed in EPA-821-R-02-013, Section 8, or the most current edition. The first sample shall be used to initiate the test. The remaining two composite samples shall be collected according to the protocol and used as renewal solutions on Day 3 (48 hours) and Day 5 (96 hours) of the test. If the duration of the discharge is less than 24-hours, the duration of discharge shall be documented on the chain of custody. Each sample shall be analyzed for total residual chlorine and pH at the time of sample collection.

e. Additional Testing Requirements, if required

1. If chronic toxicity (an NOEC of less than 100% effluent) is found in any routine test, the permittee shall conduct two valid additional definitive tests on each species indicating an NOEC of less than 100% effluent.
2. Each valid 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. The dilution series may be modified in the second test to more accurately bracket the toxicity, such that at least two dilutions above (not to exceed 100% effluent) and two dilutions below the target concentration and a control (0% effluent) are run. All test results shall be statistically analyzed according to the Appendices in EPA-821-R-02-013, or the most current edition.

FACILITY: Northwest Regional WRF PERMIT NUMBER: FL0041670
PERMITTEE: Hillsborough County Water Resource Services

I. RECLAIMED WATER AND 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 effluent from Outfall D-001 to Channel A then to Rocky Creek to Old Tampa Bay. Such discharge shall be limited and monitored by the permittee as specified below:

			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 (to D-001)	MGD	Maximum	5.0	Report	-	-	Continuous	Recording flow meters and totalizers	FLW-04	See Cond.I.A.4 & 6
BOD, Carbonaceous 5 day, 20C	MG/L	Maximum	5.0	6.25	7.5	10.0	7 Days/Week	24-hour FPC	EFA-01	
Solids, Total Suspended	MG/L	Maximum	5.0	6.25	7.5	10.0	7 Days/Week	24-hour FPC	EFA-01	
Solids, Total Suspended	MG/L	Maximum	-	-	-	5.0	7 Days/Week	Grab	EFB-01	
pH	SU	Range	-	-	-	6.0 to 8.5	Continuous	Meter	EFA-01	See Cond.I.A.5
Coliform, Fecal, % less than detection	PERCENT	Minimum	See Permit Condition I.A.7.				7 Days/Week	Grab	EFA-01	
Coliform, Fecal	#/100ML	Maximum	-	-	-	25	7 Days/Week	Grab	EFA-01	See Cond.I.A.7
Total Residual Chlorine (For Disinfection)	MG/L	Minimum	-	-	-	1.0	Continuous	Meter	EFA-01	See Cond.I.A.5 & 8
Total Residual Chlorine (For Dechlorination)	MG/L	Maximum	-	-	-	0.01	Daily	Grab	EFD-01	See Cond.I.A.8
Nitrogen, Total (as N)	MG/L	Maximum	3.0	3.75	4.5	6.0	7 Days/Week	24-hour FPC	EFA-01	
Nitrogen, Total (as N)	Tons/Yr	Maximum	23.0 (Max.)	-	-	-	Monthly	Calculation	EFA-01	See Cond.I.A.11
Phosphorus, Total (as P)	MG/L	Maximum	1.0	1.25	1.5	2.0	7 Days/Week	24-hour FPC	EFA-01	
Acute Whole Effluent Toxicity	PERCENT	Minimum	-	-	-	100	See Cond. I.A.9.	Grab	EFD-01	See Cond. I.A.9.
Chronic Whole Effluent Toxicity	PERCENT	Minimum	-	-	-	100	See Cond. I.A.10.	24-hour FPC	EFD-01	See Cond. I.A.10.
Oxygen, Dissolved (DO)	MG/L	Minimum	-	-	-	5.0	Daily	Grab	EFD-01	
Mercury	UG/L	Maximum	-	-	-	0.012	Quarterly	Grab	EFA-01	

FACILITY: Northwest Regional WRF PERMIT NUMBER: FL0041670
PERMITTEE: Hillsborough County Water Resource Services

A. Surface Water Discharges, Continued

			Reclaimed Water Limitations				Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Monthly Average	Weekly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Flowrate (Flow through the UV system)	GPM	Record	-	-	-	Report (Daily Maximum)	Continuous	Meter	FLW-10	
Ultraviolet Light Operational Dosage	mJ/cm^2	Minimum	-	-	-	100	Continuous	Meter	PPI-01	See Cond.I.B.19
Ultraviolet Light Transmittance	%	Minimum	-	-	-	55	Continuous	Meter	PPI-01	See Cond.I.B.18
Ultraviolet Light Intensity	mW/cm^2	Report	-	-	-	Report (Min)	Continuous	Meter	PPI-01	See Cond.I.B.17
Turbidity	NTU	Maximum	-	-	-	Report (Max)	Continuous	Meter	PPI-01	See Cond.I.B.8
Water Level in Reactors	Ft	Range	-	-	-	Report (Daily Maximum)	Continuous			See Cond.I.B.21
Reactor Status[1]	On/off	Record	-	-	-	-	Continuous			See Cond.I.B.12
Lamp Status[1]	On/off	Record	-	-	-	-	Continuous			See Cond.I.B.13
Lamp Age[1]	Hrs	Record	-	-	-	-	Continuous			See Cond.I.B.14
Reactor On/Off Cycles[1]	Total Number	Record	-	-	-	-	Continuous			See Cond.I.B.12
Reactor Power Setpoint[1]	Setting level	Record	-	-	-	-	Continuous			See Cond.I.B.15
Ground Fault Interrupt Status[1]	Yes/No	Record	-	-	-	-	Continuous			See Cond.I.B.16

[1]These parameters are not included in the DMR, but are to be monitored and operated as described in the approved operating protocol.

FACILITY: Northwest Regional WRF PERMIT NUMBER: FL0041670
PERMITTEE: Hillsborough County Water Resource Services

A. Surface Water Discharges, Continued

2. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to intermittently discharge effluent in response to rain events from Outfall D-002 (Eagles Golf Course Storage Lake) and Outfall D-003 (Emerald Greens Golf Course Storage Lake) to stormwater management systems ultimately leading to various surface waters of the State. Such discharge shall be limited and monitored by the permittee as specified below: *[62-610.830(4), 08-08-99]*

			Effluent Limitations				Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Monthly Average	Weekly Averag	Monthly Total	Monitoring Frequency	Sample Type	Monitoring Location	Notes
Overflow Use, Occurrences Eagles Golf Course Pond "D" (D-002)	Occ/Mo.[1]	Report	-	-	-	Report	Daily Above Control Elev.[2]	Telemetry or Observation[3]	STM-01	
Duration of Discharge, Eagles Golf Course Pond "D" (D-002)	Hours/Mo.	Report	-	-	-	Report	Daily Above Control Elev.[2]	Telemetry or Observation[3]	STM-01	
Overflow Use, Occurrences Emerald Lakes Golf Course Pond #5 (D-003)	Occ/Mo.[1]	Report	-	-	-	Report	Daily Above Control Elev.[2]	Telemetry or Observation[3]	STM-02	
Duration of Discharge, Emerald Lakes Golf Course Pond #5 (D-003)	Hours/Mo.	Report	-	-	-	Report	Daily Above Control Elev.[2]	Telemetry or Observation[3]	STM-02	

[1] Occ/Mo. = An occurrence is any day during the month in which one or more lake discharges occur within the 24 hour surveillance period.
[2] Daily Above Control Elev = Daily surveillance of lakes required when water level is above control elevation established by permittee.
[3] Telemet.or Observation = Daily surveillance may be accomplished by automated telemetry or visual observation at a frequency sufficient to obtain accurate discharge data.

Appendix I. Northwest Regional Water Reclamation Facility Permit Violations as Recorded on the Discharge Monitoring Report.

Monitoring Date	Parameter Description	Concentration (1)	Concentration Limit (1)	Concentration Statistical Base (1)	Concentration (2)	Concentration Limit (2)	Concentration Statistical Base (2)	Concentration (3)	Concentration Limit (3)	Concentration Statistical Base (3)	Concentration Units
4/30/2005	SOLIDS, TOTAL SUSPENDED		DELMON			DELMON		7.3	5.0	DAILY MX	MG/L
4/30/2005	NITROGEN, TOTAL	7.7	3.8	MO AVG	17.9	4.5	WKLY AVG	21.7	6.0	DAILY MX	MG/L
4/30/2005	NITROGEN, TOTAL		DELMON		3.6	3.0	ANNL AVG		DELMON		MG/L
4/30/2005	PHOSPHORUS, TOTAL (AS P)	1.0	1.25	MO AVG	2.9	1.50	WKLY AVG	3.3	2.0	MAXIMUM	MG/L
5/31/2005	NITROGEN, TOTAL		DELMON		3.6	3.0	ANNL AVG		DELMON		MG/L
6/30/2005	NITROGEN, TOTAL	3.71	3	ANNL AVG		DELMON			DELMON		MG/L
7/31/2005	NITROGEN, TOTAL	3.86	3	ANNL AVG		DELMON			DELMON		MG/L
8/31/2005	SOLIDS, TOTAL SUSPENDED	1.21	6.25	MO AVG	1.10	7.5	WKLY AVG	15.20	10	MAXIMUM	MG/L
8/31/2005	NITROGEN, TOTAL	3.92	3	ANNL AVG		DELMON			DELMON		MG/L

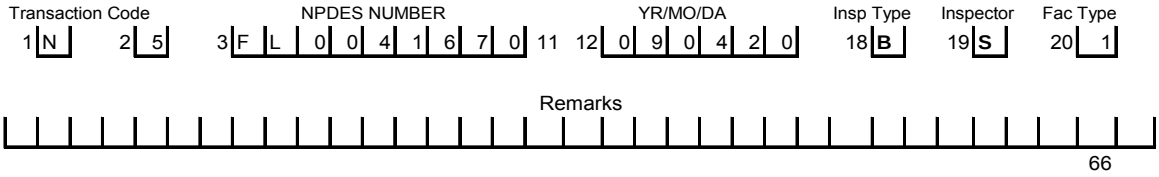
Appendix I. (continued)

Monitoring Date	Parameter Description	Concentration (1)	Concentration Limit (1)	Concentration Statistical Base (1)	Concentration (2)	Concentration Limit (2)	Concentration Statistical Base (2)	Concentration (3)	Concentration Limit (3)	Concentration Statistical Base (3)	Concentration Units
9/30/2005	NITROGEN, TOTAL	3.97	3	ANNL AVG		DELMON			DELMON		MG/L
10/31/2005	NITROGEN, TOTAL	4.00	3	ANNL AVG		DELMON			DELMON		MG/L
11/30/2005	NITROGEN, TOTAL	3.91	3	ANNL AVG		DELMON			DELMON		MG/L
12/31/2005	NITROGEN, TOTAL	3.80	3	ANNL AVG		DELMON			DELMON		MG/L
1/31/2006	NITROGEN, TOTAL	3.50	3	ANNL AVG		DELMON			DELMON		MG/L
2/28/2006	NITROGEN, TOTAL	3.19	3	ANNL AVG		DELMON			DELMON		MG/L
11/30/2006	CHLORINE, TOTAL RESIDUAL		DELMON			DELMON		0.09	.01	MAXIMUM	MG/L
2/28/2007	CHLORINE, TOTAL RESIDUAL		DELMON			DELMON		0.12	.01	MAXIMUM	MG/L
2/28/2007	MERCURY, TOTAL RECOVERABLE		DELMON			DELMON		0.0550	.012	MAXIMUM	UG/L
2/29/2008	MERCURY, TOTAL RECOVERABLE		DELMON			DELMON		0.0250	.012	MAXIMUM	UG/L
6/30/2008	NOEL STATRE 7DAY CHR PIMEPHALES	6.25	100	MINIMUM		DELMON			DELMON		PER- CENT
9/30/2008	NOEL STATRE 7DAY CHR CERIODAPHNIA	25	100	MINIMUM		DELMON			DELMON		PER- CENT
11/30/2008	NOEL STATRE 7DAY CHR CERIODAPHNIA	50	100	MINIMUM		DELMON			DELMON		PER- CENT

Appendix J. EPA Page

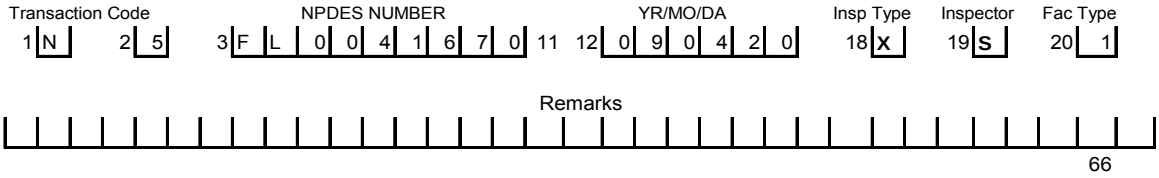
The Bioassay of Northwest Regional Water Reclamation Facility effluent sampled on April 20, 2009. NPDES #FL0041670.

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



The Priority Pollutants Analysis of Northwest Regional Water Reclamation Facility effluent sampled on April 20, 2009. NPDES #FL0041670.

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



Biological Analyses of Northwest Regional Water Reclamation Facility effluent sampled on April 20, 2009. NPDES #FL0041670.

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

