

Effluent Quality Assessment

Beverly Beach Wastewater Treatment Facility

Flagler County

NPDES #FL0039756

Sampled November 16, 2009

January 2010

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
NELAC Certification No. E31780

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Beverly Beach Wastewater Treatment Facility, 217 Starboard Drive, Beverly Beach, Flagler County, Florida, 32136. NPDES #FL0039756. Effluent samples for algal growth potential, bioassay, chemical and microbiological analyses for this facility were collected on November 16, 2009.

Introduction

Beverly Beach Wastewater Treatment Facility is a 0.085 million gallon per day average annual daily flow domestic wastewater treatment plant. The facility had an Administrative Order (AO-86-NE) which expired in 2007. The AO covered interim limits for copper and zinc. The facility was issued a warning letter on July 2, 2008, in regards to non-compliance with the construction schedule for the upgraded wastewater treatment plant. The facility currently has a Consent Order in draft form concerning the construction schedule. The facility has no mixing zones. The facility has had a number of permit violations within the past year. (See Appendix F for detailed facility information provided by Ed Jamro of FDEP Northeast District.)

Methods

Samples for bioassay, algal growth potential (AGP), microbiological and chemical analyses were collected from the EFD-1 NPDES sampling point for Outfall D-001 by Eesa Ali (FDEP Northeast 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 forms.

The freshwater acute screening toxicity tests and the algal growth potential test were performed following internal DEP SOPs TA07_05, TA07_09, and TA08_01 through TA08_09. All internal DEP SOPs are available on the web at: http://www.floridadep.org/labs/cgi-bin/sop/biosop.asp.

An aliquot of the AGP sample was salinity adjusted to meet the minimum salinity requirement of the test species for the marine AGP test.

Results and Discussion

Toxicity Test Results

Tests performed November 17 - 21, 2009.

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

Cyprinella leedsi 96-hour acute screening bioassay – LC_{50} > 100%, 0% mortality in 100% sample at 96 hours

The bioassay samples were not acutely toxic to the bioassay 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 229 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 648 (±20%) mg dry wt/L (Table 1a; Miller et al., 1978). To determine actual nutrient limitation, a limiting-nutrient algal growth potential test should be performed.

The salinity-adjusted effluent AGP was 443 mg dry wt/L of the saltwater species *Dunaliella tertiolecta.* Raschke and Schultz found that AGP values above 10.0 mg dry weight/L represent a “problem” threshold for marine receiving waters, implying nutrient enrichment (personal communication, Marshall Faircloth, et. al., FDEP, with Ron Raschke USEPA Region 4 1987).

See Table 1 for AGP results.

Chemistry Results

Total residual chlorine and total ammonia were not detected in the bioassay sample in the bioassay laboratory. The total ammonia concentration in the sample collected and preserved for chemical analysis was 0.029 J (J – Estimated value) mg N/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was < 0.02 mg N/L.

Copper, chloride, fluoride, sulfate and zinc were detected in the effluent at levels that comply with Class III marine water quality criteria (62-302.530, F.A.C.). Arsenic and nickel were detected between the laboratory method detection limits (MDL) and the laboratory practical quantification limits (PQL). Fecal coliforms were not detected in the effluent.

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

Conclusion

The effluent samples collected from the EFD-1 NPDES sampling point for Outfall D-001 for this facility on November 16, 2009, were not acutely toxic to either test species. The AGP results for both the effluent and the salinity adjusted effluent were much greater than the "problem” thresholds for fresh and marine receiving waters, suggesting that nutrient enrichment may be an issue. Effluent water quality samples did not violate water quality criteria or permit limits.

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 1a. Measured and predicted algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN), orthophosphate (OP), total nitrogen (TN) and total phosphorus (TP) limitation of the freshwater species *Pseudokirchneriella subcapitata* and ratios of nitrogen to phosphorus for samples collected from the Beverly Beach Wastewater Treatment Facility on November 16, 2009.

Beverly Beach Wastewater Treatment Facility							
Location	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (OP) ± 20%	Predicted AGP (TN) ± 20%	Predicted AGP (TP) ± 20%	Inorganic N:P ratio	Total N:P ratio
Effluent	229	647.7 ± 129.5	1505.0 ± 301.0	682.5 ± 136.5	1505.0 ± 301.0	4.9	5.1

Table 1b. Measured algal growth potential (AGP; mg dry weight/L) of the saltwater species *Dunaliella tertiolecta* and ratios of nitrogen to phosphorus for samples collected from the Beverly Beach Wastewater Treatment Facility on November 16, 2009.

Beverly Beach Wastewater Treatment Facility			
Location	AGP (measured)	Inorganic N:P ratio	Total N:P ratio
Effluent*	443	4.9	5.1

* - sample salinity adjusted to 7ppt

Table 2. Effluent limits, Class III Criteria for predominantly marine waters and chemical and microbiological data for samples collected from the Beverly Beach Wastewater Treatment Facility on November 16, 2009.

Beverly Beach Wastewater Treatment Facility NPDES #FL0039756	Class III Criteria	Effluent Limits	Effluent	
Organic Constituents (µg/L)				
None Detected	-	-	None Detected	
Metals (µg/L unless otherwise noted)				
Aluminum	≤ 1500	-	60	U
Arsenic	≤ 50	-	0.78	I
Cadmium	≤ 8.8	-	0.03	U
Calcium (mg/L)	-	-	54.6	
Chromium-III	-	-	0.3	U
Copper	≤ 3.7	≤ 3.7 s	1.81	
Iron	≤ 300	-	30	U
Lead	≤ 8.5	-	0.2	U
Magnesium (mg/L)	-	-	10.5	
Mercury	≤ 0.025	Report	0.12	U
Nickel	≤ 8.3	-	0.94	I
Selenium	≤ 71	-	0.2	U
Silver	≤ 2.3	-	0.025	U
Zinc	≤ 86	≤ 86 s	35	
Nutrients (mg/L)				
Ortho-phosphate	-	Report	3.5	
Total Phosphorus	-	Report	3.5	A
Total Ammonia	-	Report	0.046	
Un-ionized Ammonia	-	-	≤ 0.02	c
Nitrate and Nitrite	-	Report	17	
Total Kjeldahl Nitrogen	-	Report	0.96	J
Organic Nitrogen	-	Report	0.914	c
Total Nitrogen	-	Report	17.96	c
General Physical and Chemical Parameters				
Dissolved Oxygen (mg/L)	≥ 4.0	≥ 6.0 s	6.3	
pH (SU)	6.5 - 8.5	6.5 - 8.5 s	6.6	
Conductivity (µmhos/cm)	-	-	954	
Temperature (°C)	-	-	23.4	
Total Residual Chlorine (mg/L)	≤ 0.01	≤ 0.01 s	0.01	
Chlorophyll *a* (µg/L) - Corrected	-	-	0.55	U
Phaeophytin (µg/L)	-	-	0.4	U
Total Suspended Solids (mg/L)	-	-	4	U
CBOD, 5 day (mg/L), N - inhibited	-	≤ 20 s	1.5	I
Chloride (mg/L)	-	-	150	A
Fluoride (mg/L)	≤ 5.0	-	0.11	
Sulfate (mg/L)	-	-	84	A
Flow (MGD)	-	≤ 0.215 a	0.0303	a
Hardness (mg $CaCO_3$)	-	-	179.58	c
Microbiology (Number of colony forming units/100ml)				
Fecal Coliforms @	≤ 400 s #	≤ 800 s	2	U

Value exceeds the Class III Water Quality Criteria or permit limits

a - Annual average
c - Value is calculated
s - Single sample
A - Value reported is the mean of two or more determinations
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
J - Estimated value
U - Material analyzed for but not detected; value reported is the method detection limit
@ - Fecal coliform analysis performed by Advanced Environmental, Jacksonville
# - If 10 or fewer samples are taken within a month, the single sample limit is 400 CFU (62-302.530(6), F.A.C.)

11-16-32

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Request Number: RQ-2009-~~10-12-46~~

~~Aramark Uniform & Career Apparel, LLC~~ Beverly Beach

Customer: NE-DIST

Project ID: FYI3

PMAS: 1143

Event ID *

Requester: Jennifer Paris

Collected By: EA

Sampling Agency: DEP

Field Report Prepared By: EA

Send Final Report To Tom Kallemeyn

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth m / ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number
	Latitude o ' "	Longitude o ' "	Comments		
Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth m / ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number
	Latitude o ' "	Longitude o ' "	Comments		
Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth m / ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number
	Latitude o ' "	Longitude o ' "	Comments		
Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth m / ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number
	Latitude o ' "	Longitude o ' "	Comments		

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth m / ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number
	Latitude o ' "	Longitude o ' "	Comments		

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth m / ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number
	Latitude o ' "	Longitude o ' "	Comments		

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
EA	11/16/09	Fed ex		11-17-09 0935				

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Final eff. Beverly Beach WWTP (EFD-1)	☐ Comp ☑ Grab	Date 11/16/09 Time 1320	Date Time	A
	Field ID		Tot Res Chlorine (mg/L) 0.01 *	Diss Oxygen (mg/L) 6.25	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C) 23.37	pH 6.55	Sample Depth * ☐ m ☐ ft	0.47 ppth Salinity (PPTh) 954 ☑ Sp Conductance (umho/cm)	NPDES Number FL 0039756
	Latitude o ' "	Longitude o ' "	Comments meter reading out of acup Tox 95%		
Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Blank	☐ Comp ☑ Grab	Date 11/16/09 Time 1340	Date Time	B
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☐ m ☐ ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number
	Latitude o ' "	Longitude o ' "	Comments		
Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☐ m ☐ ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number
	Latitude o ' "	Longitude o ' "	Comments		
Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☐ m ☐ ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number
	Latitude o ' "	Longitude o ' "	Comments 2 Dieassay Acid 1, Tox by JD 11.17.09 10:12		

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
EA	11/16/09	Fed ex		11-17-09 0935				

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

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FC sent to AEL Lab.

Appendix B. Bench Sheets

FDEP Biology Laboratory - Acute Screen Bioassay Bench Sheets

Facility: Delray Beach WWTP
Address: 217 Strickland Drive
City: Delray Beach County: Flagler
Contact/District: Eesa Ali / NED
NPDES Permit #: FL0039756
LIMS Job #: TH- 2009-11-17-67
LIMS Sample #: 1230227
Lims Data Entry: MK 11-25-09
Data Entry Verification: DP 11/25/09

Sample Collection: Date: 11-16-09 Time: 13:20
Hold Time Start: Date: 11.16.09 Time: 13:20

Comments:

Instructions (for below): Circle appropriate wording. If yes is circled, complete blanks.
Test Type: Screen
Static / Static Renewal / Flow-through
Test Duration: 48 (96) Hours.

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

(✓one)
Test 1 incubated in: ☑ Incubator # 2 ☐ Waterbath #:
Test 2 incubated in: ☑ Incubator # 2 ☐ Waterbath #:

Initial sample handling:
PH adjustment: yes (no) Initial pH: ____ NaOH N HCl N ____Drops mL Final pH: ____
Aeration: yes no Initial DO: ____mg/L Final DO: ____mg/L Duration: ____minutes Rate: ~____bubbles/min
Salinity adjusted (Test 1): yes (no) Initial Salinity: _____ Final Salinity: _____ Salts Hypersaline brine
Salinity adjusted (Test 2): yes (no) Initial Salinity: _____ Final Salinity: _____ Salts Hypersaline brine
Dechlorination: yes (no) ____mL of 0.025N Sodium Thiosulfate per liter of sample. Final TRC: _____

Light Intensity: 50 - 100 ft. candles
Photoperiod: 16 light 8 dark
Temperature Range °C: (If used)
Incubator # 2 min 20.2 max 22.8 mean 22.0
Incubator # ___ min ___ max ___ mean ___
Waterbath # ___ min ___ max ___ mean ___
Room B246 min 24.4 max 25.8 mean 25.1

Sample Validation:
Temperature: Shipped ≤6°C (Yes) No — IF Hand Delivered: Cooling (received °C < collected °C) Yes No
Holding Time: ≤36 Hours (Yes) No (Composite-end of collection; grab-when collected; 4 in 24 - time last sample collected)

Investigators' Signatures	Batch #	11-16-09	11-16-09								
Jamie Dimel	Water Quality Parameters	20% DMW	Well Water	Moderately Hard Water	Salt Water ASW NSW Test 1	Salt Water ASW NSW Test 2	Other:	Original Sample	Measured by	Verified by
Brian Kloeber	Field Total Residual Cl_2 (mg/L):	N/A	NA mL	N/A	N/A	N/A		0.05	Jamie	MF
Bruce Alexander	Lab Total Residual Cl_2 (mg/L):	<0.020	<0.020 (A)					<0.03	AM	JD
	Alkalinity (mg/L as $CaCO_3$):	90	165					104	BA	MF
	Hardness (mg/L as $CaCO_3$):	88	157					199	BA	MF
	Total Ammonia (mg/L as N):	<0.07	<0.07					<0.07	MF	JD
	Conductivity (mmhos):	180	307					992	BA/JD	MF
	Salinity (ppth):	—	—					—	—	—

REVIEWER

(A) Remained anti-chlor @ <0.03 mg/L MF
(B) Values <0.020 reported as 0.005 mg/L per Bruce Alexander 11/25/09 MF
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V1.6.7/2008

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1230227 Test #: 1 SOP#:TA 07 01 Test Started: Date 11.17.09 Time: 13:10

Organism/Batch/Age: C. dubia / 140-09 / <24 hr Test Ended: Date 11.21.09 Time: 10:00

Chamber/Test Volume: 30 / 120 ml Diluent/ Batch: DMW / 11.16.09 Test Duration: 48 hr / (96) hr

Food/Batch: [✓] YCT 7.15.09 [✓] P.sub 7.23.09

[ ] Artemia Lot#____ Batch #: 0hr____ 24hr____ 48hr____ 72hr____

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

Concentration	Replicate	Chamber #	Test Hour: 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl	A	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: MF / BA		Checked by:	JD	JD	BA	BA	BA	[illegible]

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

Comments:

Test Results:

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

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

If Calculated: 95% CI____ Method____

V 2.3 7/15/2008

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

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Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1230227 **Test #:** 2/2 **SOP#:TA 07** 02 **Test Started: Date** 11.17.09 **Time:** 12:45
Organism/Batch/Age: [illegible] / 11.17.09 / 13days **Test Ended: Date** 11.21.09 **Time:** 10.15
Chamber/Test Volume: 1000 / 500 **ml** **Diluent/ Batch:** Well / 11.16.09 **Test Duration:** 48 hr (96) hr

Food/Batch: [ ] YCT — [ ] P.sub —
[X] Artemia Lot# 23613 **Batch #:** 0hr 146-09 24hr ____ 48hr 148-09 72hr ____
Feeding: [✓] Prior to Test [✓] Prior to Renewal [✓] 0 hr [ ] 24 hr [-] 48 hr [ ] 72 hr

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl	A	F9	5	5	5	5	5	5
	B	F10	5	5	5	5	5	5
	C	F11	5	5	5	5	5	5
	D	F12	5	5	5	5	5	5
100%	A	F13	5	5	5	5	5	5
	B	F14	5	5	5	5	5	5
	C	F15	5	5	5	5	5	5
	D	F16	5	5	5	5	5	5
Checked by:			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Loaded/Verified by: [illegible] / BA

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

Test Results:

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

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

If Calculated: 95% CI ____ Method ____

Comments:

V 2.3 7/15/2008

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

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Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 230227 Test #: 1 of 2

TEST SOP #: TA07_01 Test Species: [X] *Ceriodaphnia dubia* [ ] *Cyprinella leedsi* [ ] *Pimephales promelas*

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

Concentration Ctrl	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	M		A	M		M
pH (S.U.)	8.0		7.9	8.0		7.9
Temperature °C	24.0		24.0	24.0		24.0
Dissolved Oxygen mg/L aerate if < 4	7.7		7.5	7.5		7.7
Conductivity ~~µmhos~~ mmhos	180		K13	181		204
Salinity ppth	-		-	-		
(initials) Measured by:	BA		BA	BA		BS
(initials) Recorded by:	BA		BA	BA		BS

Comments:

Salinity only needs measuring if saltwater.

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

Comments:

Concentration 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.)	7.2		8.0	7.12		7.4
Temperature °C	24.0		24.0	24.0		24.1
Dissolved Oxygen mg/L aerate if < 4	7.7		7.4	7.3		7.7
Conductivity ~~µmhos~~ mmhos	992		1015	994		1051
Salinity ppth	-		-	-		
(initials) Measured by:	BA		BA	BA		BS
(initials) Recorded by:	BA		BA	BA		BS

Comments:

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

Comments:

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Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 130227 Test #: 2 of 2

TEST SOP #: TA07_02 Test Species: ☐ *Ceriodaphnia dubia* ☒ *Cyprinella leedsi* ☐ *Pimephales promelas*

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

Concentration Ctrl	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C	C	D	A
pH (S.U.)	8.0	8.1	8.2	8.1	8.0 8.0	8.0
Temperature °C	24.7	25.2	24.7	24.0	25.7	24.0
Dissolved Oxygen mg/L aerate if < 4	8.0	7.1	7.1	7.4	7.0	6.6
Conductivity (µmhos) mmhos	307	284	288	284	288	303
Salinity ppth	—	—				
(initials) Measured by:	AR	AR	ABR	ABR	ADR	AR
(initials) Recorded by:	AR	ABR	ABR	ABR	ADR	AR

Comments:

Salinity only needs measuring if saltwater.

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C	C	D	A
pH (S.U.)	7.1	7.5	7.8	7.3	7.6 7.6	7.7
Temperature °C	25.9	25.2	24.7	25.3	25.3	24.4
Dissolved Oxygen mg/L aerate if < 4	8.1	6.2	7.0	7.4	6.6	6.1
Conductivity (µmhos) mmhos	961	1005	1017	1000	1011	1035
Salinity ppth	1	—				
(initials) Measured by:	AR	ABR	ABR	ABR	ADR	AR
(initials) Recorded by:	AR	ABR	ABR	ABR	ADR	AR

Comments:

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

Comments:

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

Comments: (A) transcription error 11-19-09 ABR 11-20-09 ADR

000059

Page

Appendix B. (continued)

Bioassay Instrument ID

Test ID: Beverly Beach WWTF Dates: 11.17.09 – 11.21.09

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

Insert other device information in blank spaces(if used). Filled BVT: BA 12.1.09 Test ID = Facility or SRTs (acute SRT–Chronic SRT)

V 1.1 6/12/08 MF

000060

PAGE

Appendix C. SRT Bench Sheets and Statistical Analysis

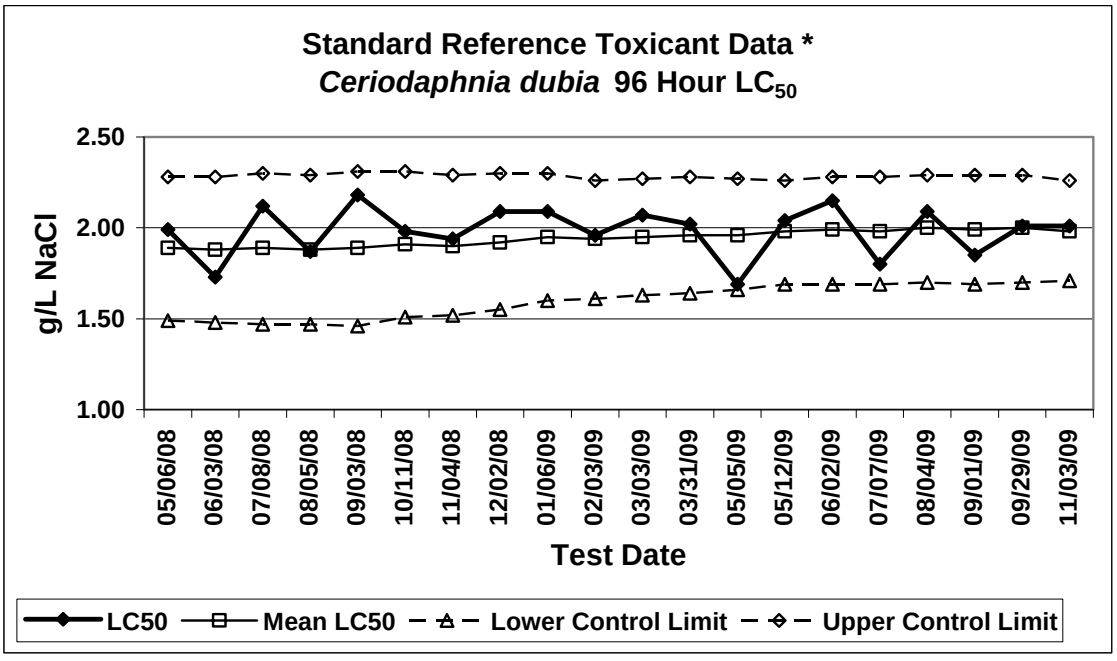
Florida Department of Environmental Protection
Bureau of Laboratories

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
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
05/05/09	1.69	1.96	0.15	1.66	2.27
05/12/09	2.04	1.98	0.14	1.69	2.26
06/02/09	2.15	1.99	0.15	1.69	2.28
07/07/09	1.80	1.98	0.15	1.69	2.28
08/04/09	2.09	2.00	0.15	1.70	2.29
09/01/09	1.85	1.99	0.15	1.69	2.29
09/29/09	2.01	2.00	0.15	1.70	2.29
11/03/09	2.01	1.98	0.14	1.71	2.26

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

CV = 6.84
EPA reference 75th quartile CV = 29%



Appendix C. (continued)

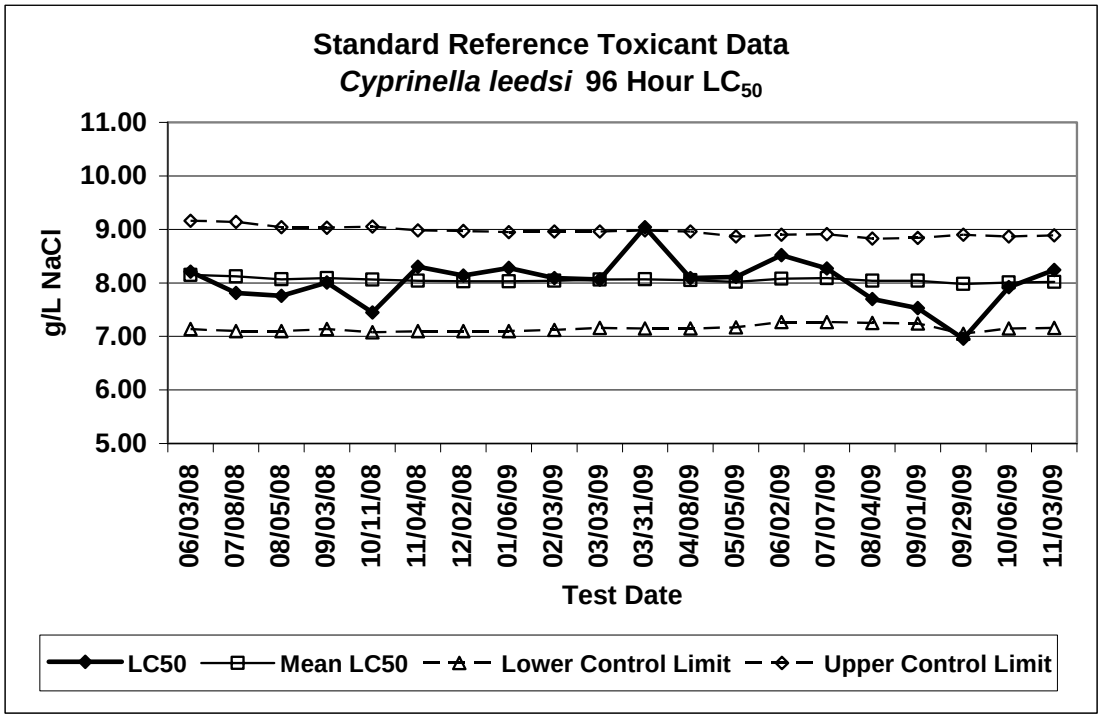
Florida Department of Environmental Protection
Bureau of Laboratories

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

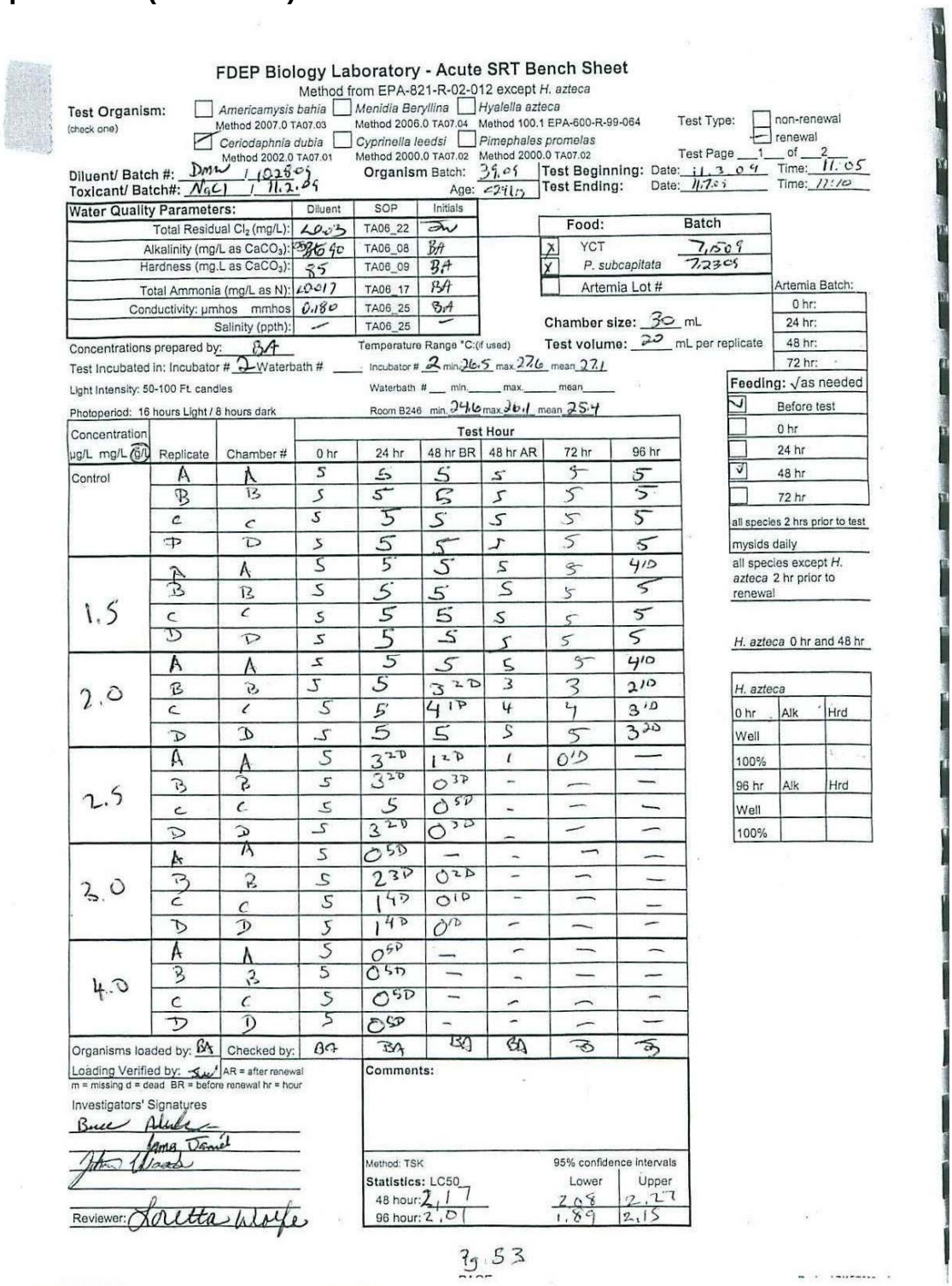
Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
06/03/08	8.21	8.15	0.51	7.14	9.16
07/08/08	7.81	8.12	0.51	7.10	9.14
08/05/08	7.76	8.07	0.48	7.10	9.04
09/03/08	8.01	8.09	0.47	7.14	9.03
10/11/08	7.45	8.06	0.49	7.08	9.05
11/04/08	8.30	8.04	0.47	7.10	8.98
12/02/08	8.14	8.03	0.47	7.10	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
05/05/09	8.11	8.02	0.43	7.17	8.87
06/02/09	8.52	8.08	0.41	7.27	8.90
07/07/09	8.27	8.09	0.41	7.27	8.91
08/04/09	7.70	8.04	0.40	7.25	8.83
09/01/09	7.53	8.04	0.40	7.24	8.84
09/29/09	6.96	7.98	0.46	7.05	8.90
10/06/09	7.92	8.01	0.43	7.15	8.87
11/03/09	8.24	8.02	0.43	7.16	8.89

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

CV = 5.37
EPA reference 75th quartile CV = 19%



Appendix C. (continued)



FDEP Biology Laboratory - Acute SRT Bench Sheet

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

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

Test Type: ☐ non-renewal ☒ renewal

Test Page 1 of 2

Diluent/ Batch #: DMW / 102505 Toxicant/ Batch#: NaCl / 11.2.05

Organism Batch: 39.05 Age: <24hr

Test Beginning: Date: 11.3.05 Time: 11.05

Test Ending: Date: 11.7.05 Time: 11:10

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	20.03	TA06_22	DW
Alkalinity (mg/L as $CaCO_3$):	86 40	TA06_08	BA
Hardness (mg.L as $CaCO_3$):	85	TA06_09	BA
Total Ammonia (mg/L as N):	20017	TA06_17	BA
Conductivity: µmhos mmhos	0.180	TA06_25	BA
Salinity (ppth):	—	TA06_25	—

Food:	Batch
X YCT	7,509
X *P. subcapitata*	7,230
☐ 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 26.5 max 27.6 mean 27.1

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

Photoperiod: 16 hours Light / 8 hours dark Room B246 min 24.6 max 26.1 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

Concentration µg/L mg/L (S/U)	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	4D
	B	B	5	5	5	5	5	5
	C	C	5	5	5	5	5	5
	D	D	5	5	5	5	5	5
2.0	A	A	5	5	5	5	5	4D
	B	B	5	5	3 2D	3	3	2D
	C	C	5	5	4 1D	4	4	3D
	D	D	5	5	5	5	5	3 2D
2.5	A	A	5	3 2D	1 2D	1	0D	—
	B	B	5	3 2D	0 3D	-	—	—
	C	C	5	5	0 5D	-	—	—
	D	D	5	3 2D	0 3D	-	—	—
3.0	A	A	5	0 5D	—	-	—	—
	B	B	5	2 3D	0 2D	-	—	—
	C	C	5	1 4D	0 1D	-	—	—
	D	D	5	1 4D	0 4D	-	—	—
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	BA

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

Loading Verified by: DW AR = after renewal

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

Investigators' Signatures

Bruce Ahlde

Anna Daniel

John Woods

Reviewer: Loretta Wolfe

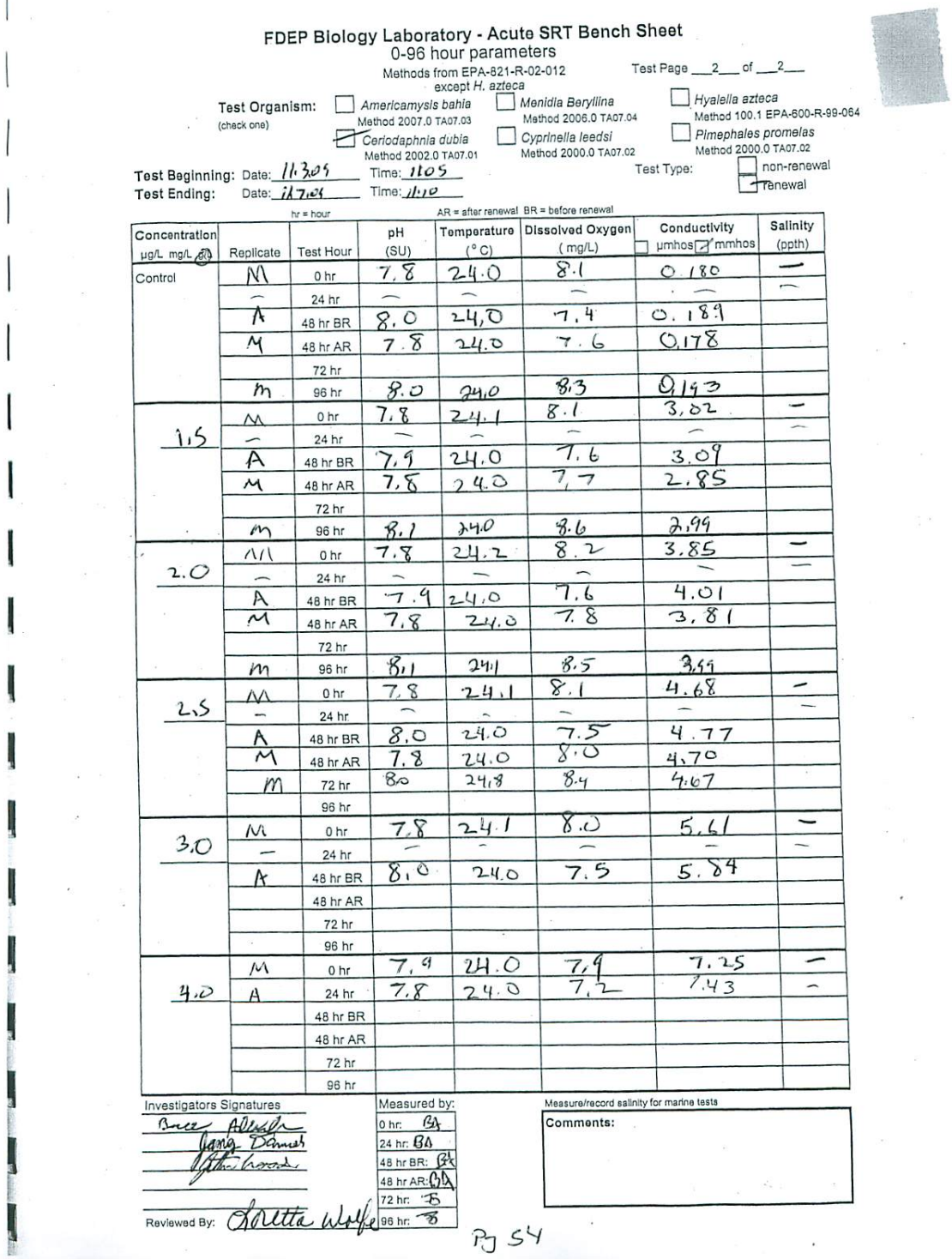
Comments:

Method: TSK

Statistics: LC50	95% confidence Intervals Lower	Upper
48 hour: 2.17	2.08	2.27
96 hour: 2.01	1.89	2.15

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Appendix C. (continued)



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

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

Test Beginning: Date: 11.3.09 Time: 1105
Test Ending: Date: 11.7.09 Time: 1110
Test Type: ☐ non-renewal ☒ renewal

hr = hour
AR = after renewal BR = before renewal

Concentration µg/L mg/L (circle)	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☑ mmhos	Salinity (ppth)
Control	M	0 hr	7.8	24.0	8.1	0.180	—
	—	24 hr	—	—	—	—	—
	A	48 hr BR	8.0	24.0	7.4	0.189	
	M	48 hr AR	7.8	24.0	7.6	0.178	
		72 hr					
	M	96 hr	8.0	24.0	8.3	0.193	
1.5	M	0 hr	7.8	24.1	8.1	3.02	—
	—	24 hr	—	—	—	—	—
	A	48 hr BR	7.9	24.0	7.6	3.09	
	M	48 hr AR	7.8	24.0	7.7	2.85	
		72 hr					
	M	96 hr	8.1	24.0	8.6	2.99	
2.0	M	0 hr	7.8	24.2	8.2	3.85	—
	—	24 hr	—	—	—	—	—
	A	48 hr BR	7.9	24.0	7.6	4.01	
	M	48 hr AR	7.8	24.0	7.8	3.81	
		72 hr					
	M	96 hr	8.1	24.1	8.5	3.99	
2.5	M	0 hr	7.8	24.1	8.1	4.68	—
	—	24 hr	—	—	—	—	—
	A	48 hr BR	8.0	24.0	7.5	4.77	
	M	48 hr AR	7.8	24.0	8.0	4.70	
	M	72 hr	8.0	24.8	8.4	4.67	
		96 hr					
3.0	M	0 hr	7.8	24.1	8.0	5.61	—
	—	24 hr	—	—	—	—	—
	A	48 hr BR	8.0	24.0	7.5	5.84	
		48 hr AR					
		72 hr					
		96 hr					
4.0	M	0 hr	7.9	24.0	7.9	7.25	—
	A	24 hr	7.8	24.0	7.2	7.43	—
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

Investigators Signatures
Brian Allen
Jamie Daniels
Lyle Crowder

Reviewed By: Loretta Wolfe

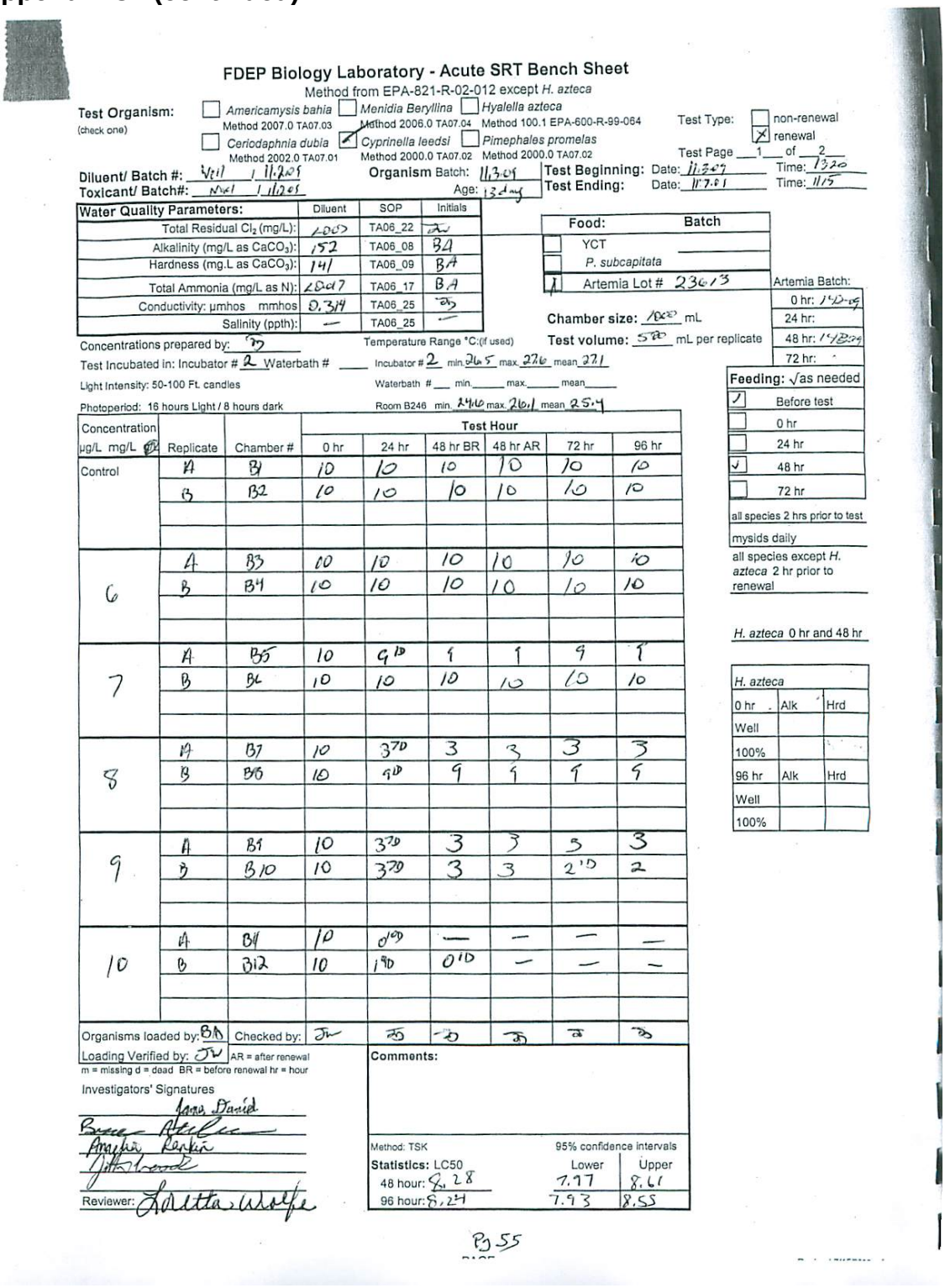
Measured by:
0 hr: BA
24 hr: BA
48 hr BR: BA
48 hr AR: BA
72 hr: B
96 hr: B

Measure/record salinity for marine tests

Comments:

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Appendix C. (continued)



FDEP Biology Laboratory - Acute SRT Bench Sheet

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

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

Test Type: ☐ non-renewal ☒ renewal

Test Page 1 of 2

Diluent/ Batch #: Well / 11.2005
Toxicant/ Batch#: NaCl / 11.2005
Organism Batch: 11.3.05 Age: 13 day
Test Beginning: Date: 11.3.05 Time: 1320
Test Ending: Date: 11.7.05 Time: 1115

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<.05	TA06_22	JW
Alkalinity (mg/L as $CaCO_3$):	152	TA06_08	BA
Hardness (mg.L as $CaCO_3$):	141	TA06_09	BA
Total Ammonia (mg/L as N):	<0.07	TA06_17	BA
Conductivity: µmhos mmhos	0.314	TA06_25	JW
Salinity (ppth):	—	TA06_25	—

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

Chamber size: 100 mL
Test volume: 500 mL per replicate

Artemia Batch:
- 0 hr: 11.2.05
- 24 hr:
- 48 hr: 11.3.05
- 72 hr:

Concentrations prepared by: BA
Test Incubated in: Incubator # 2 Waterbath # ___
Light Intensity: 50-100 Ft. candles
Photoperiod: 16 hours Light / 8 hours dark
Temperature Range °C:(if used)
Incubator # 2 min. 26.5 max. 27.6 mean 27.1
Waterbath # ___ min. ___ max. ___ mean ___
Room B246 min. 24.6 max. 26.1 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	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	B1	10	10	10	10	10	10
	B	B2	10	10	10	10	10	10
6	A	B3	10	10	10	10	10	10
	B	B4	10	10	10	10	10	10
7	A	B5	10	9 D	9	9	9	9
	B	B6	10	10	10	10	10	10
8	A	B7	10	3 D	3	3	3	3
	B	B8	10	9 D	9	9	9	9
9	A	B9	10	3 D	3	3	3	3
	B	B10	10	3 D	3	3	2 D	2
10	A	B11	10	0 D	—	—	—	—
	B	B12	10	1 D	0 D	—	—	—
Organisms loaded by: BA		Checked by: JW		25	25	25	25	25

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

Investigators' Signatures
Jane Daniel
Brian Atchison
Angela Perkin
John Woodward
Reviewer: Loretta Wolfe

Comments:

Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour: 8.28	7.97	8.61
96 hour: 8.24	7.93	8.55

BJ 55

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
- ☐ *Ceriodaphnia dubia* Method 2002.0 TA07.01
- ☐ *Menidia Beryllina* Method 2006.0 TA07.04
- ☑ *Cyprinella leedsi* Method 2000.0 TA07.02
- ☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
- ☐ *Pimephales promelas* Method 2000.0 TA07.02

Test Beginning: Date: 11.3.09 Time: 1320

Test Ending: Date: 11.7.09 Time: 1115

Test Type: ☐ non-renewal ☒ renewal

hr = hour AR = after renewal BR = before renewal

Concentration µg/L mg/L (circle)	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☒ mmhos	Salinity (ppth)
Control	A	0 hr	7.8	24.3	7.6	0.314	
	B	24 hr	8.1	24.0	6.4	0.296	
	A	48 hr BR	8.1	25.4	7.2	0.289	
	A	48 hr AR	8.0	24.4	7.6	0.285	
	B	72 hr	8.0	24.8	7.0	0.293	
	A	96 hr	8.1	25.0	8.2	0.304	
6	A	0 hr	7.9	24.3	8.2	10.9	
	B	24 hr	7.9	24.0	6.1	11.2	
	A	48 hr BR	7.9	25.3	6.2	11.3	
	A	48 hr AR	8.0	24.4	7.8	10.2	
	B	72 hr	7.9	24.6	7.0	10.4	
	A	96 hr	8.1	24.9	7.7	10.6	
7	A	0 hr	8.0	24.3	7.8	12.9	
	B	24 hr	7.9	24.0	5.9	13.2	
	A	48 hr BR	7.9	25.3	6.2	13.2	
	A	48 hr AR	8.0	24.4	7.5	12.9	
	B	72 hr	7.9	24.7	7.1	12.2	
		96 hr	8.1	24.7	7.5	12.1	
8	A	0 hr	8.0	24.2	8.0	14.9	
	B	24 hr	7.9	24.0	5.7	15.1	
	A	48 hr BR	8.0	24.7	6.8	15.1	
	A	48 hr AR	8.0	24.4	7.5	14.8	
	B	72 hr	7.9	24.3	6.9	14.9	
		96 hr	8.0	24.6	7.4	15.3	
9	A	0 hr	8.0	24.2	8.0	16.7	
	B	24 hr	7.9	24.0	5.7	16.9	
	A	48 hr BR	8.0	24.5	6.9	17.1	
	A	48 hr AR	8.0	24.4	7.5	16.6	
	B	72 hr	8.0	24.3	7.2	16.9	
		96 hr	8.0	24.6		17.2	
10	A	0 hr	7.9	24.3	7.9	18.2	
	B	24 hr	7.9	24.0	5.8	18.4	
	B	48 hr BR	8.1	24.4	6.9	18.3	
	–	48 hr AR	–	–	–	–	
	–	72 hr	–	–	–	–	
	–	96 hr	–	–	–	–	

Investigators Signatures

Measured by:
0 hr: JS
24 hr: SD
48 hr BR: JS
48 hr AR:
72 hr: JS
96 hr: JS

Measure/record salinity for marine tests

Comments:

Reviewed By: Loretta Wolfe

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Appendix C. (continued)

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

DATE: 11-03-09 DURATION: 96 h TOXICANT : NaCl
SPECIES: *Ceriodaphnia dubia*

RAW DATA: Concentration (g/L)	Number Exposed	Mortalities
.00	20	0
1.50	20	1
2.00	20	8
2.50	20	20
3.00	20	20
4.00	20	20

SPEARMAN-KARBER TRIM: 5.00%

SPEARMAN-KARBER ESTIMATES: LC50: 2.01
95% LOWER CONFIDENCE: 1.89
95% UPPER CONFIDENCE: 2.15

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

DATE: 11-03-09 DURATION: 96 h TOXICANT : NaCl
SPECIES: *Cyprinella leedsi*

RAW DATA: Concentration (g/L)	Number Exposed	Mortalities
.00	20	0
6.00	20	0
7.00	20	1
8.00	20	8
9.00	20	15
10.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: LC50: 8.24
95% LOWER CONFIDENCE: 7.93
95% UPPER CONFIDENCE: 8.55

Appendix D. Test Organism Receipts

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Organism Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Date: 11/2/09

Shipped to: FDEP

P.O. No: N/A

Species	Quantity	Age	Brood Number	Temp.	pH	Salinity
Mysidopsis bahia	150	4 DAYS	MS091029	25°C	8.0 s.u	20‰
Menidia beryllina	150	12 DAYS	SS091021	25°C	8.0 s.u	20‰
						Hardness
Cyprinella leedsi	200	12 DAYS	CL091021	25°C	7.8 s.u	80 mg/L
Pimephales promelas	150	8 DAYS	FM091025	25°C	7.8 s.u	80 mg/L

Packed by: PM

Shipped Via: FED EX

Notes:

Thank you for your order.

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

Appendix D. (continued)

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Date: 11/16/09

Shipped to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia						
Menidia beryllina						
						Hardness (mg/L)
Cyprinella leedsi	100	12 DAYS	CL091104	25	7.8	80
Pimephales promelas	350	<24HRS	FM091115-1615	25	7.8	80
Ceriodaphnia dubia						
YCT						
P. subcapitata						

Packed by: _____

Shipped Via: FedEx

Notes: _____

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DEPT ENVIRON PROTECTION
BIOLOGY SECTION

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 Beverly Beach Wastewater Treatment Facility Outfall D-001, sampled on November 16, 2009.

Date Sampled	Field ID	Analysis	Component	Result	Remark	Unit	MDL	PQL
11/16/2009 13:20	Effluent	AGP/LN	Algal Growth Potential	229		mg DryWt/L	0.3	0.9
11/16/2009 13:20	Effluent	AGP/LN	Algal Growth Potential Saltwater	443		mg DryWt/L	3	3
11/16/2009 13:20	Effluent	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.55	U	ug/L	0.55	1.7
11/16/2009 13:20	Effluent	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.4	U	ug/L	0.4	1.2
11/16/2009 13:20	Effluent	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.5	I	mg/L	0.2	2
11/16/2009 13:20	Effluent	Overflow	Fecal Coliforms-Membrane Filter	2	U	#/100 mL	2	
11/16/2009 13:20	Effluent	Toxicology	Bioassay-Acute-Screen-FW-Fish, LC50	100	L	LC50		
11/16/2009 13:20	Effluent	Toxicology	Bioassay-Acute-Screen-FW-C.dubia, LC50	100	L	LC50		
11/16/2009 13:20	Effluent	Metals	Calcium	54.6		mg/L	0.075	0.3
11/16/2009 13:20	Effluent	Metals	Mercury	0.12	U	ug/L	0.12	0.5
11/16/2009 13:20	Effluent	Metals	Arsenic	0.78	I	ug/L	0.25	1
11/16/2009 13:20	Effluent	Metals	Aluminum	60	U	ug/L	60	240
11/16/2009 13:20	Effluent	Metals	Silver	0.025	U	ug/L	0.025	0.1
11/16/2009 13:20	Effluent	Metals	Zinc	35		ug/L	5	20
11/16/2009 13:20	Effluent	Metals	Magnesium	10.5		mg/L	0.04	0.16
11/16/2009 13:20	Effluent	Metals	Selenium	0.2	U	ug/L	0.2	0.8
11/16/2009 13:20	Effluent	Metals	Lead	0.2	U	ug/L	0.2	0.8
11/16/2009 13:20	Effluent	Metals	Iron	30	U	ug/L	30	120
11/16/2009 13:20	Effluent	Metals	Sodium	112		mg/L	0.5	2
11/16/2009 13:20	Effluent	Metals	Nickel	0.94	I	ug/L	0.25	1
11/16/2009 13:20	Effluent	Metals	Cadmium	0.03	U	ug/L	0.03	0.12
11/16/2009 13:20	Effluent	Metals	Copper	1.81		ug/L	0.5	0.5
11/16/2009 13:20	Effluent	Metals	Chromium	0.3	U	ug/L	0.3	1.2
11/16/2009 13:20	Effluent	Nutrients	Alkalinity	70		mg CaCO3/L	0.65	2.5
11/16/2009 13:20	Effluent	Nutrients	Ammonia-N	0.046		mg N/L	0.01	0.02
11/16/2009 13:20	Effluent	Nutrients	O-Phosphate-P	3.5		mg P/L	0.16	0.4
11/16/2009 13:20	Effluent	Nutrients	Sulfate	84	A	mg SO4/L	2	5
11/16/2009 13:20	Effluent	Nutrients	Color (true)	15		PCU	5	5
11/16/2009 13:20	Effluent	Nutrients	Total-P	3.5	A	mg P/L	0.1	0.25
11/16/2009 13:20	Effluent	Nutrients	NO2NO3-N	17		mg N/L	0.4	1
11/16/2009 13:20	Effluent	Nutrients	Fluoride	0.11		mg F/L	0.05	0.1
11/16/2009 13:20	Effluent	Nutrients	Kjeldahl Nitrogen	0.96	J	mg N/L	0.16	0.4
11/16/2009 13:20	Effluent	Nutrients	Chloride	150	A	mg Cl/L	2	5

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Unit	MDL	PQL
11/16/2009 13:20	Effluent	Nutrients	Organic Carbon	8.9		mg C/L	1	5
11/16/2009 13:20	Effluent	Nutrients	TSS	4	U	mg/L	4	16
11/16/2009 13:20	Effluent	Pesticides	Endosulfan Sulfate	0.02	U	ug/L	0.02	0.08
11/16/2009 13:20	Effluent	Pesticides	Heptachlor	0.01	U	ug/L	0.01	0.04
11/16/2009 13:20	Effluent	Pesticides	Heptachlor Epoxide	0.02	U	ug/L	0.02	0.08
11/16/2009 13:20	Effluent	Pesticides	Bromacil	0.2	UJ	ug/L	0.2	0.8
11/16/2009 13:20	Effluent	Pesticides	Hexazinone	0.1	U	ug/L	0.1	0.4
11/16/2009 13:20	Effluent	Pesticides	Malathion	0.15	U	ug/L	0.15	0.6
11/16/2009 13:20	Effluent	Pesticides	Naled	0.8	UJ	ug/L	0.8	3.2
11/16/2009 13:20	Effluent	Pesticides	Chlordane	0.2	U	ug/L	0.2	0.8
11/16/2009 13:20	Effluent	Pesticides	DDE-p,p'	0.02	U	ug/L	0.02	0.08
11/16/2009 13:20	Effluent	Pesticides	Toxaphene	0.75	U	ug/L	0.75	3
11/16/2009 13:20	Effluent	Pesticides	Chlorpyrifos Ethyl	0.05	U	ug/L	0.05	0.2
11/16/2009 13:20	Effluent	Pesticides	Ethoprop	0.1	U	ug/L	0.1	0.4
11/16/2009 13:20	Effluent	Pesticides	Fonofos	0.1	U	ug/L	0.1	0.4
11/16/2009 13:20	Effluent	Pesticides	Metalaxyl	0.25	U	ug/L	0.25	1
11/16/2009 13:20	Effluent	Pesticides	Phorate	0.05	UJ	ug/L	0.05	0.2
11/16/2009 13:20	Effluent	Pesticides	Dieldrin	0.02	U	ug/L	0.02	0.08
11/16/2009 13:20	Effluent	Pesticides	Endosulfan II	0.02	U	ug/L	0.02	0.08
11/16/2009 13:20	Effluent	Pesticides	Gamma-BHC	0.01	U	ug/L	0.01	0.04
11/16/2009 13:20	Effluent	Pesticides	Ametryn	0.05	U	ug/L	0.05	0.2
11/16/2009 13:20	Effluent	Pesticides	Chlorpyrifos Methyl	0.1	U	ug/L	0.1	0.4
11/16/2009 13:20	Effluent	Pesticides	Diazinon	0.05	U	ug/L	0.05	0.2
11/16/2009 13:20	Effluent	Pesticides	Ethion	0.05	U	ug/L	0.05	0.2
11/16/2009 13:20	Effluent	Pesticides	Metribuzin	0.1	U	ug/L	0.1	0.4
11/16/2009 13:20	Effluent	Pesticides	Mevinphos	0.2	U	ug/L	0.2	0.8
11/16/2009 13:20	Effluent	Pesticides	Parathion Ethyl	0.15	U	ug/L	0.15	0.6
11/16/2009 13:20	Effluent	Pesticides	Parathion Methyl	0.1	U	ug/L	0.1	0.4
11/16/2009 13:20	Effluent	Pesticides	Alpha-BHC	0.01	U	ug/L	0.01	0.04
11/16/2009 13:20	Effluent	Pesticides	DDT-p,p'	0.03	U	ug/L	0.03	0.12
11/16/2009 13:20	Effluent	Pesticides	Alachlor	0.6	UJ	ug/L	0.6	2.4
11/16/2009 13:20	Effluent	Pesticides	Atrazine	0.05	UJ	ug/L	0.05	0.2
11/16/2009 13:20	Effluent	Pesticides	Prometryn	0.15	U	ug/L	0.15	0.6
11/16/2009 13:20	Effluent	Pesticides	Simazine	0.05	U	ug/L	0.05	0.2

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Unit	MDL	PQL
11/16/2009 13:20	Effluent	Pesticides	Methoxychlor	0.05	U	ug/L	0.05	0.2
11/16/2009 13:20	Effluent	Pesticides	Butylate	0.2	UJ	ug/L	0.2	0.8
11/16/2009 13:20	Effluent	Pesticides	Norflurazon	0.15	U	ug/L	0.15	0.6
11/16/2009 13:20	Effluent	Pesticides	Delta-BHC	0.01	U	ug/L	0.01	0.04
11/16/2009 13:20	Effluent	Pesticides	Endosulfan I	0.02	U	ug/L	0.02	0.08
11/16/2009 13:20	Effluent	Pesticides	Endrin Aldehyde	0.02	U	ug/L	0.02	0.08
11/16/2009 13:20	Effluent	Pesticides	Fenamiphos	0.2	U	ug/L	0.2	0.8
11/16/2009 13:20	Effluent	Pesticides	Beta-BHC	0.01	U	ug/L	0.01	0.04
11/16/2009 13:20	Effluent	Pesticides	Endrin	0.05	U	ug/L	0.05	0.2
11/16/2009 13:20	Effluent	Pesticides	Azinphos Methyl	0.2	U	ug/L	0.2	0.8
11/16/2009 13:20	Effluent	Pesticides	Metolachlor	0.5	UJ	ug/L	0.5	2
11/16/2009 13:20	Effluent	Pesticides	Aldrin	0.01	U	ug/L	0.01	0.04
11/16/2009 13:20	Effluent	Pesticides	DDD-p,p'	0.02	U	ug/L	0.02	0.08
11/16/2009 13:20	Effluent	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.3	U	ug/L	3.3	13
11/16/2009 13:20	Effluent	Priority Organic Pollutants	3,3'-Dichlorobenzidine	44	U	ug/L	44	180
11/16/2009 13:20	Effluent	Priority Organic Pollutants	4-Chloro-3-methylphenol	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Acenaphthene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Benzo(a)anthracene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Diethyl phthalate	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Fluorene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	2,4-Dinitrotoluene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Anthracene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Benzidine	110	U	ug/L	110	440
11/16/2009 13:20	Effluent	Priority Organic Pollutants	2,4-Dimethylphenol	11	U	ug/L	11	44
11/16/2009 13:20	Effluent	Priority Organic Pollutants	2,4-Dinitrophenol	16	U	ug/L	16	66
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Benzo(g,h,i)perylene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Di-n-octyl phthalate	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Fluoranthene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Hexachloroethane	3.3	U	ug/L	3.3	13
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Pentachlorophenol	3.3	U	ug/L	3.3	13
11/16/2009 13:20	Effluent	Priority Organic Pollutants	2-Chloronaphthalene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2.2	U	ug/L	2.2	8.8

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Unit	MDL	PQL
11/16/2009 13:20	Effluent	Priority Organic Pollutants	4-Nitrophenol	16	U	ug/L	16	66
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.3	U	ug/L	3.3	13
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	16	U	ug/L	16	66
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Butyl benzyl phthalate	5.5	U	ug/L	5.5	22
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Chrysene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	2-Nitrophenol	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Nitrobenzene	2.2	U	ug/L	2.2	8.8
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Phenanthrene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Phenol	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Pyrene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	2,4,6-Trichlorophenol	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Acenaphthylene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Dibenzo(a,h)anthracene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.3	UJ	ug/L	3.3	13
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Isophorone	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	2,4-Dichlorophenol	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	2-Chlorophenol	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Benzo(a)pyrene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Benzo(b)fluoranthene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Benzo(k)fluoranthene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Di-n-butyl phthalate	5.5	U	ug/L	5.5	22
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Dimethyl phthalate	11	U	ug/L	11	44
11/16/2009 13:20	Effluent	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2.2	U	ug/L	2.2	8.8
11/16/2009 13:20	Effluent	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.3	U	ug/L	3.3	13
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Naphthalene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	2,6-Dinitrotoluene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Hexachlorobenzene	1.1	U	ug/L	1.1	4.4
11/16/2009 13:20	Effluent	Priority Organic Pollutants	Hexachlorobutadiene	3.3	U	ug/L	3.3	13
11/16/2009 13:20	Effluent	Priority Organic Pollutants	N-Nitrosodimethylamine	2.2	U	ug/L	2.2	8.8
11/16/2009 13:20	Effluent	Field Parameter	Specific Conductance	954		umhos/cm		
11/16/2009 13:20	Effluent	Field Parameter	Temperature	23.37		C		

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Unit	MDL	PQL
11/16/2009 13:20	Effluent	Field Parameter	Dissolved Oxygen	6.25		mg/L		
11/16/2009 13:20	Effluent	Field Parameter	pH	6.55				
11/16/2009 13:20	Effluent	Field Parameter	Sample Depth	0.01		m		
11/16/2009 13:40	Equipment Blank	Metals	Copper	0.5	U	ug/L	0.5	0.5
11/16/2009 13:40	Equipment Blank	Metals	Cadmium	0.03	U	ug/L	0.03	0.12
11/16/2009 13:40	Equipment Blank	Metals	Zinc	5	U	ug/L	5	20
11/16/2009 13:40	Equipment Blank	Metals	Iron	30	U	ug/L	30	120
11/16/2009 13:40	Equipment Blank	Metals	Aluminum	60	U	ug/L	60	240
11/16/2009 13:40	Equipment Blank	Metals	Nickel	0.25	U	ug/L	0.25	1
11/16/2009 13:40	Equipment Blank	Metals	Arsenic	0.25	U	ug/L	0.25	1
11/16/2009 13:40	Equipment Blank	Metals	Sodium	0.5	U	mg/L	0.5	2
11/16/2009 13:40	Equipment Blank	Metals	Lead	0.2	U	ug/L	0.2	0.8
11/16/2009 13:40	Equipment Blank	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
11/16/2009 13:40	Equipment Blank	Metals	Calcium	0.075	U	mg/L	0.075	0.3
11/16/2009 13:40	Equipment Blank	Metals	Mercury	0.12	U	ug/L	0.12	0.5
11/16/2009 13:40	Equipment Blank	Metals	Silver	0.025	U	ug/L	0.025	0.1
11/16/2009 13:40	Equipment Blank	Metals	Selenium	0.2	U	ug/L	0.2	0.8
11/16/2009 13:40	Equipment Blank	Metals	Chromium	0.3	U	ug/L	0.3	1.2
11/16/2009 13:40	Equipment Blank	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
11/16/2009 13:40	Equipment Blank	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
11/16/2009 13:40	Equipment Blank	Nutrients	Fluoride	0.05	U	mg F/L	0.05	0.1
11/16/2009 13:40	Equipment Blank	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
11/16/2009 13:40	Equipment Blank	Nutrients	Chloride	0.2	U	mg Cl/L	0.2	0.5
11/16/2009 13:40	Equipment Blank	Nutrients	Total-P	0.004	U	mg P/L	0.004	0.01
11/16/2009 13:40	Equipment Blank	Nutrients	Sulfate	0.2	U	mg SO4/L	0.2	0.5
11/16/2009 13:40	Equipment Blank	Nutrients	Alkalinity	0.65	U	mg CaCO3/L	0.65	2.5
11/16/2009 13:40	Equipment Blank	Nutrients	Organic Carbon	1	U	mg C/L	1	5
11/16/2009 13:40	Equipment Blank	Nutrients	Color (true)	5	U	PCU	5	5
11/16/2009 13:40	Equipment Blank	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
11/16/2009 13:40	Equipment Blank	Pesticides	Ethion	0.053	U	ug/L	0.053	0.21
11/16/2009 13:40	Equipment Blank	Pesticides	Methoxychlor	0.053	U	ug/L	0.053	0.21
11/16/2009 13:40	Equipment Blank	Pesticides	Butylate	0.21	UJ	ug/L	0.21	0.84
11/16/2009 13:40	Equipment Blank	Pesticides	Metalaxyl	0.27	U	ug/L	0.27	1.1
11/16/2009 13:40	Equipment Blank	Pesticides	Parathion Methyl	0.11	U	ug/L	0.11	0.44

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Unit	MDL	PQL
11/16/2009 13:40	Equipment Blank	Pesticides	Prometryn	0.16	U	ug/L	0.16	0.64
11/16/2009 13:40	Equipment Blank	Pesticides	Simazine	0.053	U	ug/L	0.053	0.21
11/16/2009 13:40	Equipment Blank	Pesticides	Alpha-BHC	0.011	U	ug/L	0.011	0.044
11/16/2009 13:40	Equipment Blank	Pesticides	DDD-p,p'	0.021	U	ug/L	0.021	0.084
11/16/2009 13:40	Equipment Blank	Pesticides	Toxaphene	0.8	U	ug/L	0.8	3.2
11/16/2009 13:40	Equipment Blank	Pesticides	Alachlor	0.64	UJ	ug/L	0.64	2.6
11/16/2009 13:40	Equipment Blank	Pesticides	Fonofos	0.11	U	ug/L	0.11	0.44
11/16/2009 13:40	Equipment Blank	Pesticides	Malathion	0.16	U	ug/L	0.16	0.64
11/16/2009 13:40	Equipment Blank	Pesticides	Metolachlor	0.53	UJ	ug/L	0.53	2.1
11/16/2009 13:40	Equipment Blank	Pesticides	Parathion Ethyl	0.16	U	ug/L	0.16	0.64
11/16/2009 13:40	Equipment Blank	Pesticides	Beta-BHC	0.011	U	ug/L	0.011	0.044
11/16/2009 13:40	Equipment Blank	Pesticides	Heptachlor	0.011	U	ug/L	0.011	0.044
11/16/2009 13:40	Equipment Blank	Pesticides	Hexazinone	0.11	U	ug/L	0.11	0.44
11/16/2009 13:40	Equipment Blank	Pesticides	Aldrin	0.011	U	ug/L	0.011	0.044
11/16/2009 13:40	Equipment Blank	Pesticides	DDE-p,p'	0.021	U	ug/L	0.021	0.084
11/16/2009 13:40	Equipment Blank	Pesticides	Dieldrin	0.021	U	ug/L	0.021	0.084
11/16/2009 13:40	Equipment Blank	Pesticides	Endosulfan I	0.021	U	ug/L	0.021	0.084
11/16/2009 13:40	Equipment Blank	Pesticides	Endosulfan II	0.021	U	ug/L	0.021	0.084
11/16/2009 13:40	Equipment Blank	Pesticides	Atrazine	0.053	UJ	ug/L	0.053	0.21
11/16/2009 13:40	Equipment Blank	Pesticides	Azinphos Methyl	0.21	U	ug/L	0.21	0.84
11/16/2009 13:40	Equipment Blank	Pesticides	Bromacil	0.21	UJ	ug/L	0.21	0.84
11/16/2009 13:40	Equipment Blank	Pesticides	Chlorpyrifos Ethyl	0.053	U	ug/L	0.053	0.21
11/16/2009 13:40	Equipment Blank	Pesticides	Diazinon	0.053	U	ug/L	0.053	0.21
11/16/2009 13:40	Equipment Blank	Pesticides	Metribuzin	0.11	U	ug/L	0.11	0.44
11/16/2009 13:40	Equipment Blank	Pesticides	Norflurazon	0.16	U	ug/L	0.16	0.64
11/16/2009 13:40	Equipment Blank	Pesticides	Endosulfan Sulfate	0.021	U	ug/L	0.021	0.084
11/16/2009 13:40	Equipment Blank	Pesticides	Endrin Aldehyde	0.021	U	ug/L	0.021	0.084
11/16/2009 13:40	Equipment Blank	Pesticides	Chlorpyrifos Methyl	0.11	U	ug/L	0.11	0.44
11/16/2009 13:40	Equipment Blank	Pesticides	Ethoprop	0.11	U	ug/L	0.11	0.44
11/16/2009 13:40	Equipment Blank	Pesticides	Naled	0.85	UJ	ug/L	0.85	3.4
11/16/2009 13:40	Equipment Blank	Pesticides	Phorate	0.053	UJ	ug/L	0.053	0.21
11/16/2009 13:40	Equipment Blank	Pesticides	Chlordane	0.21	U	ug/L	0.21	0.84
11/16/2009 13:40	Equipment Blank	Pesticides	DDT-p,p'	0.032	U	ug/L	0.032	0.13
11/16/2009 13:40	Equipment Blank	Pesticides	Delta-BHC	0.011	U	ug/L	0.011	0.044

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Unit	MDL	PQL
11/16/2009 13:40	Equipment Blank	Pesticides	Endrin	0.053	U	ug/L	0.053	0.21
11/16/2009 13:40	Equipment Blank	Pesticides	Gamma-BHC	0.011	U	ug/L	0.011	0.044
11/16/2009 13:40	Equipment Blank	Pesticides	Ametryn	0.053	U	ug/L	0.053	0.21
11/16/2009 13:40	Equipment Blank	Pesticides	Fenamiphos	0.21	U	ug/L	0.21	0.84
11/16/2009 13:40	Equipment Blank	Pesticides	Mevinphos	0.21	U	ug/L	0.21	0.84
11/16/2009 13:40	Equipment Blank	Pesticides	Heptachlor Epoxide	0.021	U	ug/L	0.021	0.084
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2	U	ug/L	2	8.2
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Acenaphthene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Phenanthrene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Hexachloroethane	3.1	U	ug/L	3.1	12
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Hexachlorobutadiene	3.1	U	ug/L	3.1	12
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Hexachlorobenzene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	2-Nitrophenol	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Anthracene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Di-n-butyl phthalate	5.1	U	ug/L	5.1	20
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Fluoranthene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	2,4-Dimethylphenol	10	U	ug/L	10	41
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	41	U	ug/L	41	160
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Benzo(a)pyrene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	2	U	ug/L	2	8.2
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.1	U	ug/L	3.1	12
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Butyl benzyl phthalate	5.1	U	ug/L	5.1	20
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Dimethyl phthalate	10	U	ug/L	10	41
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Pentachlorophenol	3.1	U	ug/L	3.1	12
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	2,4-Dichlorophenol	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L	15	61
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	61

Appendix E. (continued)

Date Sampled	Field ID	Analysis	Component	Result	Remark	Unit	MDL	PQL
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Benzidine	100	U	ug/L	100	410
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.1	U	ug/L	3.1	12
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Di-n-octyl phthalate	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Phenol	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	U	ug/L	15	61
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.1	U	ug/L	3.1	12
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Acenaphthylene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Benzo(a)anthracene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Chrysene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Fluorene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2	U	ug/L	2	8.2
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Naphthalene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	2-Chloronaphthalene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	2-Chlorophenol	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Diethyl phthalate	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.1	UJ	ug/L	3.1	12
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Isophorone	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Nitrobenzene	2	U	ug/L	2	8.2
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	Pyrene	1	U	ug/L	1	4.1
11/16/2009 13:40	Equipment Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	1	U	ug/L	1	4.1

Appendix F. Facility Summary

BEVERLY BEACH WWTP – FL0039756 – APRIL-2009

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Ed Jamro	**Contact Number:** 904-807-3264
Facility Name (as it appears on permit): Beverly Beach WWTF	**Current Name:** same
NPDES Permit Number: FL0 039756	**Permit Expiration Date:** August 28, 2010
Physical Address: 217 Starboard Drive Beverly Beach, FL 32136	
District: Northeast	**County:** Flagler
Function of Facility: Facility treats domestic wastewater.	
Facility Type: Domestic Wastewater	**Permitted Capacity (MGD):** 0.085
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): **January 2008 through December 2008 mean flows @ 0.03_ MGD** **0.036 MGD in March 2008; 0.024 MGD in May, June & December 2008.**	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months): **NA**	
Description of type of Discharge: ☒ **Continuous** ☐ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☐ **Other, please specify**	

Appendix F. (continued)

BEVERLY BEACH WWTP – FL0039756 – APRIL-2009

Description of Sampling Location(s) - actual permit designation of permitted sampling point(s):
EFA-1 – Sample point immediately after disinfection and prior to dechlorination.
EFD-1 – Sample point after dechlorination and post aeration but prior to discharge to the ICWW.

SWU-1 –North of discharge – channel marker #3
SWD-1 –South of discharge – channel marker #7.

INF-1 – Influent, prior to biological treatment (cannot contain internal recycled streams)

Description of Permitted Outfall(s): (excerpted from current permit)

Surface Water Discharge:

An existing 0.085 MGD annual average daily flow (AADF) permitted discharge to the Intracoastal Waterway (Class III marine waters) at Discharge Location (D-001) which is approximately 15 feet in length and discharges at a depth of approximately 2.5 feet.

The point of discharge is located approximately at latitude 29 ° 31' 08" N, longitude 81 ° 09' 00" W.

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

An existing 0.085 million gallon per day (MGD) annual average daily flow permitted capacity wastewater treatment facility (WWTF) consisting of two plants that operate in parallel.

Plant Number One is an extended aeration activated sludge domestic wastewater treatment plant consisting of one pre-aeration tank (5,000 gallons), five aeration tanks (5,000 gallons each), two secondary clarifiers (6,200 gallons each), and two aerobic digesters (5,000 gallons each).

Plant Number Two is an extended aeration activated sludge plant consisting of one aeration basin (35,000 gallons), one secondary clarifier (10,100 gallons with 132 square feet surface area), and one aerobic digester (9,450 gallons).

The supernatant from the three (3) secondary clarifiers of the two plants are combined and sent to a two-cell sand filter (36 sq.ft. filtration media), one chlorine contact chamber (2,700 gallons), one dechlorination chamber, and a duplex effluent pump station with post aeration.

The final effluent is discharged to the Intracoastal Waterway.

Appendix F. (continued)

BEVERLY BEACH WWTP – FL0039756 – APRIL-2009

PART I: Continued

List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under

1. **During the period beginning on the issuance date and lasting through the completion and placing into service the new WWTF, the permittee is authorized to discharge effluent from Outfall D-001 to Intracoastal Waterway. Such discharge shall be limited and monitored by the permittee as specified below and reported in accordance with condition I.C.8: The permittee is required to conduct in stream monitoring at SWU-1 and SWD-1 as shown below.**

			Effluent Limitations			Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Monthly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Flow to surface water	**MGD**	**Maximum**	**0.215**	**Report**	--	**5 Days/Week**	**Meter**	**EFD-1**	**See Cond.I.A.3**
BOD, Carbonaceous 5 day, 20C	**MG/L**	**Maximum**	**10.0**	**10.0**	**20.0**	**Every Two Weeks**	**8-hr flow proportioned composite**	**EFD-1**	
Solids, Total Suspended	**MG/L**	**Maximum**	**5.0**	**5.0**	**10.0**	**Every Two Weeks**	**8-hr flow proportioned composite**	**EFD-1**	
Coliform, Fecal	**#/100ML**	**Maximum**	**See Permit Condition I.A.4.**	**Every Two Weeks**	**Grab**	**EFD-1**			
pH	**SU**	**Range**			**6.5 to 8.5**	**5 Days/Week**	**Grab or Meter**	**EFA-1**	
Total Residual Chlorine (For Disinfection)	**MG/L**	**Minimum**			**0.5**	**5 Days/Week**	**Grab**	**EFA-1**	**See Cond.I.A.5**
Total Residual Chlorine (For Dechlorination)	**MG/L**	**Maximum**			**0.01**	**Every Two Weeks**	**Grab**	**EFD-1**	
Oxygen, Dissolved (DO)	**MG/L**	**Minimum**			**6.0**	**5 Days/Week**	**Grab**	**EFD-1**	
Total Recoverable Copper	**µG/L**	**Maximum**			**3.7**	**Quarterly**	**8-hr flow proportioned composite**	**EFD-1**	**See Cond. VI.1**
Total Recoverable Zinc	**µG/L**	**Maximum**			**86.0**	**Quarterly**	**8-hr flow proportioned composite**	**EFD-1**	**See Cond. VI.1**

Appendix F. (continued)

BEVERLY BEACH WWTP – FL0039756 – APRIL-2009

PART I: Continued

List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under

1. **During the period beginning on the issuance date and lasting through the completion and placing into service the new WWTF, the permittee is authorized to discharge effluent from Outfall D-001 to Intracoastal Waterway. Such discharge shall be limited and monitored by the permittee as specified below and reported in accordance with condition I.C.8: The permittee is required to conduct in stream monitoring at SWU-1 and SWD-1 as shown below.**

			Effluent Limitations			Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Monthly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Mercury, Total Recoverable	µG/L	Maximum			Report	Quarterly	8-hr flow proportioned composite	EFD-1	
Nitrogen, Total	MG/L	Maximum			Report	Quarterly	8-hr flow proportioned composite	EFD-1	
Nitrogen, Organic, Total (as N)	MG/L	Maximum			Report	Quarterly	8-hr flow proportioned composite	EFD-1	
Nitrogen, Total	LBS/DAY	Maximum			Report	Quarterly	Calculate	CAL-1	
Nitrite plus Nitrate, (as N)	MG/L	Maximum			Report	Quarterly	8-hr flow proportioned composite	EFD-1	
Nitrogen, Ammonia, Total (as N)	MG/L	Maximum			Report	Quarterly	8-hr flow proportioned composite	EFD-1	
Nitrogen, Kjeldahl, Total (as N)	MG/L	Maximum			Report	Quarterly	8-hr flow proportioned composite	EFD-1	
Salinity	PPT	Maximum			Report	Quarterly	8-hr flow proportioned composite	EFD-1	
Phosphorus, Total (as P)	MG/L	Maximum			Report	Quarterly	8-hr flow proportioned composite	EFD-1	
Phosphorus, Total (as P)	LBS/DAY	Maximum			Report	Quarterly	Calculated	CAL-1	

Appendix F. (continued)

BEVERLY BEACH WWTP – FL0039756 – APRIL-2009

PART I: Continued

List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under

1. **During the period beginning on the issuance date and lasting through the completion and placing into service the new WWTF, the permittee is authorized to discharge effluent from Outfall D-001 to Intracoastal Waterway. Such discharge shall be limited and monitored by the permittee as specified below and reported in accordance with condition I.C.8: The permittee is required to conduct in stream monitoring at SWU-1 and SWD-1 as shown below.**

			Effluent Limitations			Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Monthly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Phosphate, Ortho (as P)	**MG/L**	**Maximum**			**Report**	**Quarterly**	**Grab and filtered immediately**	**EFD-1**	
Flow through the WWTF before placing the new WWTF into service	**MGD**	**Maximum**	**0.085**	**Report**		**5 Days/Week**	**Meter**	**INF-1**	**See Note 1 below**
BOD, Carbonaceous 5 day, 20C before placing the new WWTF into service	**MG/L**	**Maximum**		**Report**		**Every Two Weeks**	**Grab**	**INF-1**	**See Note 1 below**
Solids, Total Suspended before placing the new WWTF into service	**MG/L**	**Maximum**		**Report**		**Every Two Weeks**	**Grab**	**INF-1**	**See Note 1 below**
Whole Effluent Toxicity	**See Note 2 below**							**EFD-1**	
Stream monitoring	**See Note 3 below**							**SWU-1 SWD-1**	

NOTES: **1. - Influent samples shall be collected so that they do not contain digester supernatant or return activated sludge, or any other plant process recycled waters. *[62-601.500(4)]***

2. **Acute Whole Effluent Toxicity Testing Program**
The permittee shall comply with the following requirements to evaluate acute whole effluent toxicity

Appendix F. (continued)

a. **Effluent limitation**

(1) Mortality less than or equal to 20% in the 100% effluent test concentration in any routine test shall constitute compliance with these permit conditions and Rules 62-302.200(1) and 62-302.500(1)(a) 4, F.A.C. Mortality of greater than 20% in the 100% effluent concentration in any test shall constitute unacceptable toxicity. The permittee shall conduct additional follow-up tests as described in I.A.9.c. below for any routine test for which unacceptable toxicity has been observed.

(2) Whole effluent acute toxicity shall not exceed, in any routine test, mortality of greater than 50% in the 100% effluent concentration or an LC50 less than 100% effluent in any additional follow-up test [Rule 62-302.200(1), Rule 62-302.500(1)(a) 4 and Rule 62-4.244(3)(a), F.A.C.]

b. **Monitoring frequency**

(1) Routine toxicity tests shall be conducted once every two months, the first starting within 60 days of permit issuance, and lasting for the duration of this permit unless a reduction in the frequency of monitoring is granted in writing by the Department.

(2) Upon completion of six consecutive, valid routine tests that demonstrate compliance with the effluent limitation specified in 9.a. (1) and (2) above, the permittee may send a written request to the Department for a reduction in testing frequency. The Department shall review this request within 45 days of receipt and approve or deny the request in writing. Materials submitted to the Department for review should include a summary of the data and the complete bioassay reports for all tests being considered. In no case shall the frequency of monitoring be reduced to less than annually. Requested reductions in monitoring frequency shall only become effective upon Department approval.

(3) If a test within the sequence of the six is deemed invalid, but is replaced by a repeat valid test initiated within seven days of the invalidation, the invalid test will not be counted against the requirement for six consecutive valid tests for the purpose of evaluating the reduction of monitoring frequency. If two or more invalidations occur, this provision does not apply.

c. **Test Requirements**

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

(2) Additional Follow-up Tests, if required:

(a) If a routine test does not meet the acute toxicity limitation in I.A.9.a. (1) and (2) above, the permittee shall conduct three additional follow-up tests on each species that failed the test.

(b) The first additional follow-up test shall be conducted using a control (0% effluent) and a minimum of five dilutions: 100%, 50%, 25%, 12.5% and 6.25% effluent. The dilution series may be modified in the second and third 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-02-012.

(c) The first test shall be initiated within two weeks of the end of the failed routine test. The remaining additional follow-up tests shall be conducted weekly thereafter until a total of three valid additional follow-up tests are completed.

(3) The permittee shall conduct 96-hour acute static renewal toxicity tests using the freshwater daphnid, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*, concurrently.

(4) 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. Any deviation of the bioassay procedures outlined

Appendix F. (continued)

herein shall be submitted in writing to the Department for review and approval prior to use. In the event the above method is revised, the permittee shall conduct acute toxicity testing in accordance with the revised method.

(5) The control water and dilution water used will be moderately hard water as described in EPA-821-R-02-012, Table 7.

d. Sampling Requirements

(1) For routine and additional follow-up tests, an 8-hr flow-proportioned composite sample shall be collected at location EFD-1. The composite duration and the collection times of effluent sample shall be documented on the chain of custody sheet.

(2) Results for each additional test shall include the determination of LC50 values with 95% confidence limits.

e. Quality Assurance Requirements

(1) A standard reference toxicant (SRT) quality assurance (QA) acute toxicity test shall be conducted with each species used in the required toxicity tests either concurrently or no more than 30 days before the date of each routine or additional follow-up test conducted. The SRT-QA data shall be included in the bioassay reports for each companion routine or additional follow-up tests required.

(2) If the mortality in the control (0% effluent) exceeds 10% for either species in any test, the test for that species (including the control) shall invalidated and the test repeated.

(3) If 100% mortality occurs prior to the end of any test and control mortality is less than 10% at that time, that test (including the control) shall be terminated with the conclusion that the test fails and constitutes non-compliance.

(4) Additional follow-up tests shall be evaluated for acceptability based on the concentration-response relationship, as required by EPA-821-R-02-012, Section 12.2.6.2. and included in the bioassay reports.

f. Reporting Requirements

(1) Results from <u>all</u> required toxicity tests shall be entered on the Discharge Monitoring Report (DMR) as follows:

(a) Routine Test Results: If 50% or less mortality occurs for the test species, then " > 100%" should be entered on the DMR for that test species. If more than 50% mortality occurs for the test species, then " < 100%" should be entered.

(b) Additional Follow-up Test Results: Report the calculated LC50 value for that test species and the 95% confidence limits.

(2) A bioassay laboratory report for the routine test shall be prepared according to EPA-821-R-02-012, Section 12, Report Preparation and Test Review and mailed to the Department at the address below within 30 days of the completion of the test.

(3) For additional follow-up tests, a *single* bioassay laboratory report shall be prepared according to EPA-821-R-02-012, Section 12, and mailed within 45 days of completion of the third valid additional follow-up test. If any additional follow-up tests, or two consecutive routine tests, do not meet either the 20% or 50% mortality imitation specified in I.A.9.a. (1) and (2) above, the permittee shall contact the

Appendix F. (continued)

Department within 30 days of the laboratory report submittal to discuss the corrective actions necessary to remedy the observed acute toxicity.

(4) All bioassay laboratory reports shall be mailed to:

Florida Department of Environmental Protection
Northeast District - Domestic Wastewater Section
7825 Baymeadows Way, Suite B-200
Jacksonville, Florida 32256-7590

3. The Permittee shall continue regular monitoring of the segment of the Intracoastal Waterway near the outfall, D-001, for maintaining data on the impact of the discharge to the water quality of the surface water body. The monitoring sites are described as follows:

Site Location	Describe Site
SWU-1	North of discharge - channel marker # 3
SWD-1	South of discharge - channel marker # 7

The permittee shall coordinate the specific site locations with the FDEP, Northeast District office. The parameters to be measured shall include the following:

1) DO, pH, temperature, specific conductivity, salinity
2) $CBOD_5$, NH_3, TKN, $NO_2 + NO_3$, Alkalinity, Total Phosphorous, Ortho-Phosphorus, chlorophyll-a
3) Tide stage, stream velocity

Metered parameters (DO, pH, temperature, conductivity, salinity) shall be sampled at the surface, mid-depth and at the bottom. Grab samples shall be taken at mid-depth at the specified locations. Ortho-phosphorous samples shall be filtered immediately after collection. Monitoring shall occur on a semi-annual basis. The sample shall be taken at the same time as a normal sampling event, as defined in I.A.1 above. The results of instream sampling shall be reported to on the discharge monitoring report (DMR) corresponding to the months in which the samples were taken. *[62-4.240(3)(c)]*

Appendix F. (continued)

BEVERLY BEACH WWTP – FL0039756 – APRIL-2009

PART I: Continued

Receiving Waters:	Classification (indicate whether fresh or marine):
Intracoastal Waterway	Class III Marine Waters

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

See Note 2 on previous pages.

Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.):

N/A – old AO has expired. A new Consent Order has been drafted but not yet issued. The new CO addresses effluent copper and zinc concentrations and the schedule for rebuilding the WWTP.

Facility Mixing Zone Details (if applicable): NA

List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year: For January 1, 2008 to February 28, 2009 (from PCS)

Date	Parameter and Units	Limit	Result
03-08	Total Copper, ug/l	3.7 ug/l (max)	5.77
04-08	Dissolved Oxygen, mg/l	6.0 mg/l (min)	5.0
04-08	Total Suspended Solids, mg/l	5.0 mg/l (max) month avg.	7.15
04-08	Total Suspended Solids, mg/l	10.0 mg/l (max)	12.3
04-08	Total Residual Chlorine, mg/l	0.01 mg/l (max)	0.09
04-08	Total Residual Chlorine, mg/l	0.5 mg/l (min)	0.44
04-08	pH – SU	6.5 SU (min)	6.0
05-08	pH – SU	6.5 SU (min)	6.0
05-08	Total Suspended Solids, mg/l	5.0 mg/l (max) monthly avg.	6.5
05-08	Total Suspended Solids, mg/l	10.0 mg/l (max)	12
05-08	C-BOD-5-day, mg/l	10.0 mg/l(max) monthly avg.	13.63
05-08	C-BOD-5-day, mg/l	20.0 mg/l (max)	22.45
09-08	Total Suspended Solids, mg/l	5.0 mg/l (max) monthly avg.	13.9
09-08	Total Suspended Solids, mg/l	10.0 mg/l (max)	26.8
09-08	Total Copper, ug/l	3.7 ug/l (max)	5.8
12-08	C-BOD-5-day, mg/l	20.0 mg/l (max)	23
12-08	Total Zinc, ug/l	86 ug/l	92
12-08	Total Copper, ug/l	3.7 ug/l (max)	4.7

Appendix F. (continued)

BEVERLY BEACH WWTP – FL0039756 – APRIL-2009

Describe previous FYI and WQBEL study:
Last Biological Assessment sampling was done by FDEP on April 12, 1999.

Water Quality Based Effluent Limitation (WQBEL) – Permit Fact Sheet dated – 5/9/05 & Revised – 09/06.

- Monitoring frequencies and limitations are retained from the previous permit for "conventional" pollutants parameters (TSS, pH, and TRC(Chlorination and Dechlorination)).
- Comparisons of the water quality north (upstream) and south (downstream) of the discharge indicate no significant changes to water quality in terms of DO, CBOD5, and pH. The monitoring frequencies and limitations of CBOD5, DO, and pH will be retained as they are in the existing permit.
- Annual average and monthly Geo. Mean of fecal coliform from June 30, 2004 through March 31, 2005 were 26.6 and 45.0 / 100 mL, respectively. Although the total coliform of Intracoastal Waterway at Beverly Beach is on the planning list, based on the fecal coliform data reported, there is no evidence to show that the coliform in the effluent contributed to the total coliform of the waterbody. Therefore, the facility is not required to increase disinfection treatment level of the effluent before discharge to the Intracoastal Waterway. The limit of fecal coliform in the permit is established in accordance with Rule 62-600.440(4)(c), FAC.
- Although nutrients are on the planning list, the ambient water quality data upstream and downstream of the discharge indicates no significant change to water quality in term of nitrogen. In addition, even though the data suggests an increase in the amount of total phosphorus in the downstream sampling location, this has not been reflected in higher primary productivity in the receiving water as evidenced from the Chlorophyll a data. Moreover, the permittee plans to construct an AWT plant and cease discharge to the Intracoastal Waterway in favor of reuse of reclaimed water for irrigation of public-access areas. Nutrient limits are not recommended in the interim period.
- Results of the five sampling inspections at the facility between 2000 and 2003 showed that silver, lead, cadmium, and selenium did not exceed water quality standards.
- Department sampling inspection reports indicated that the concentrations of copper and zinc in the effluent samples exceeded the Class III marine water quality standards. An administrative order (AO 86 NE) is issued in conjunction with the permit to allow time for the facility to evaluate and consider options concerning the exceedances for total copper and zinc. The Department used the Reasonable Assurance Verification Workbook to establish the interims limits for total recoverable copper and total zinc in the AO 86. (Appendix A)
- The permittee shall continue testing for total recoverable mercury. Upon the completion of six (6) valid tests and the analytical results show that concentrations of the mercury in the effluent has not exceeded the surface water quality criteria limits, the permittee may petition the Department to reduce the monitoring frequency or remove the monitoring requirement of this parameter. *[62-4.240(3)(c),FAC]*
- Due to the fact that the discharge of Reverse Osmosis (RO) concentrate to the treatment facility was discontinued in 1999 when the RO water treatment facility serving the area was connected to the Palm Coast Utilities water distribution system, the facility is receiving 100% domestic wastewater (No industrial wastewater contributions). Monitoring for parameters such as total alpha, dissolved alpha, gross particle activity alpha, and radium 226 plus radium 228 are not necessary. Therefore, they are not required to be monitored in the new permit.
- The Permittee is required to conduct regular monitoring of the segment of the Intracoastal Waterway near the outfall for maintaining data on the impact of the discharge to the water quality of the surface water body which is a part of an on-going Water Quality Based Effluent Limitation (WQBEL) study for the Intracoastal Waterway . If a new WQBEL is developed for the facility which requires the effluent limit to be revised, the permittee shall be informed in writing by administrative notice.
- **In order to provide reasonable assurance that the discharge will not adversely affect the designated use of the receiving water, whole effluent toxicity testing is required.**

Appendix F. (continued)

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Describe previous or current Enforcement Actions (including WLs): **The current permit had an Administrative Order (AO-86-NE) that covered interim limits for copper and zinc. The Order "expired" in late 2007 and the system still does not consistently meet copper and zinc limits.** **A Warning Letter was issued on July 2, 2008 regarding non-compliance with the construction schedule for the upgraded WWTP.** **A Consent Order is currently in draft form to address the construction schedule, copper, and zinc issues.**
Describe any violations or problems noted in previous inspection: **Inspected on 8/18/08 and a Non-compliance letter was issued on 9/3/08 for security, backflow prevention, residuals, and compliance schedule issues.** .
Discuss whether DMR trends within previous five years are improving or declining: - **No comments**
Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse): **Permit modification was issued 12/29/08. The WWTP expansion is supposed to include a reuse system. Construction is scheduled to start by May 31, 2009.**

Appendix F. (continued)

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PART II: Sampling Event Information	
Date(s) sample collected: May 18, 2009 (planned)	Sampler(s):
Temperature (Deg C):	pH (SU):
Dissolved Oxygen (mg/L):	Conductivity (umhos/cm):
Total Residual Chlorine (mg/L):	Total Residual Chlorine - after Disinfection (mg/L):
Method of Chlorination: Sodium Hypochlorite liquid	Method of De-chlorination: Sodium Bisulfite
Flow During Sample Collection for each outfall(MGD):	
Mean Flow for each outfall for previous 12 months based on sampling date (If samples are taken on more than one day, indicate Mean Flow for each day): Mean flow in past year is 0.03MGD.	
Describe Discharge during Sampling Event: ☐ Continuous ☐ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☐ Other, please specify	
Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here: Describe appearance of final effluent ---	

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Appendix G. EPA End Sheet

The Bioassay of the Beverly Beach Wastewater Treatment Facility effluent sampled on November 16, 2009. NPDES #FL0039756.

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 0 3 9 7 5 6 11	12 0 9 1 1 1 6	18 B	19 S	20 1

Remarks

66

The Priority Pollutants Analysis of the Beverly Beach Wastewater Treatment Facility effluent sampled on November 16, 2009. NPDES #FL0039756.

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 0 3 9 7 5 6 11	12 0 9 1 1 1 6	18 B	19 S	20 1

Remarks

66

Biological Analyses of the Beverly Beach Wastewater Treatment Facility effluent sampled on November 16, 2009. NPDES #FL0039756.

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 0 3 9 7 5 6 11	12 0 9 1 1 1 6	18 B	19 S	20 1

Remarks

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