

Effluent Quality Assessment

Anguilla Fish Farm

Putnam County

NPDES #FL0278076

Sampled October 3, 2011

BIOASSAYS NOT PERFORMED

May 2012

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
NELAC Certification No. E31780

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Anguilla Fish Farm, 181 School Road, Federal Point, East Palatka, Putnam County, Florida, 32131. NPDES #FL0278076. Effluent grab samples for biological and chemical analyses for this facility were collected on October 3, 2011.

Introduction

Anguilla Fish Farm is a fish farm having approximately 130 fish tanks. The facility is operating under Consent Order 10-1528, executed 11/08/10. (See Appendix C for detailed facility information provided by Heather Webber of FDEP Northeast District.)

Methods

Samples were collected from the EFF-1 NPDES sampling point for Outfall D-001 by Eesa Ali, Sharon Piltz, and Jann Gruentzel (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/bars/sas/sop/index.htm.

See Appendix A for the completed chain of custody form.

The algal growth potential test (AGP) was performed following internal DEP SOPs 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**
  Bioassay samples were not collected during this sampling event.

- **Algal Growth Potential**
  Due to the apparent salinity of the effluent (2.6 ppth), a freshwater Algal Growth Potential (AGP) test was not performed. The effluent AGP was 13.6 mg dry wt/L of the saltwater species *Dunaliella tertiolecta.* Raschke and Schultz determined 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); thus, by inference suggesting potential nutrient enrichment of freshwaters. The ratio (11.2:1) of inorganic nitrogen to ortho-phosphate suggests that the effluent is co-limited by both nitrogen and phosphorus; whereas, the ratio (7.6:1) of total nitrogen to total phosphorus suggests that the effluent is nitrogen limited. To determine actual nutrient limitation, a limiting-nutrient algal growth potential test with associated nutrient chemistry should be performed (Maloney et al. 1978).

  The algal growth potential (AGP) sample was salinity-adjusted with artificial sea salts from an apparent salinity of approximately 2.6 parts per thousand (ppth) to a salinity of approximately 7 ppth.

  See Table 1 for AGP results and qualifiers.

- **Chemistry Results**
  The total ammonia concentration in the grab sample collected and preserved for chemical analysis was 3.2 mg N/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was 0.04 mg/L. Consent Order 10-1528 granted the facility an interim limit for unionized ammonia of 0.25 mg/L; therefore, the effluent's unionized ammonia concentration, although greater than the Class III freshwater criterion of ≤ 0.02 mg/L (F.A.C. 62-302.530 (3)), was not in violation of the interim permitted limit.

The effluent's dissolved oxygen concentration (4.1 mg/L) was less than both the minimum dissolved oxygen concentration criterion for Class III freshwater (≥ 5.0 mg/L (F.A.C. 62-302.530 (30)) and the facility's NPDES permit limit (≥ 5.0).

It is not known if the effluent's conductivity (4,770 µmhos-cm) exceeded the Class III freshwater criterion (Shall not be increased more than 50% above background or to 1,275 µmhos-cm, whichever is greater), because a concurrent background value is not available.

The effluent's fecal coliforms (590 colony forming units (CFU)/100 ml) exceeded Class III freshwater criterion of ≤ 400 CFU/100 ml.

Copper and iron were detected in the effluent at levels that comply with Class III freshwater quality criteria (62-302.530, F.A.C.) and/or the facility's permitted limit. Chromium, nickel and zinc were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL). Aluminum, chloride, fluoride, sulfate, total suspended solids (TSS) and carbonaceous biochemical oxygen demand (CBOD) were also detected in the effluent.

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

Conclusion

Bioassay samples were not collected from this facility during the October 3, 2011 sampling event. Due to the apparent salinity of the effluent, a freshwater AGP test was not performed. The salinity-adjusted marine AGP result was greater than the "problem" threshold for marine receiving waters suggesting by inference that nutrient enrichment could be an issue in fresh receiving waters. The effluent's dissolved oxygen concentration (4.1 mg/L) was less than both the minimum dissolved oxygen concentration criterion for Class III freshwater (≥ 5.0 mg/L (F.A.C. 62-302.530 (30)) and the facility's NPDES permit limit (≥ 5.0). The effluent's fecal coliforms (590 colony forming units (CFU)/100 ml) exceeded Class III freshwater criterion of ≤ 400 CFU/100 ml. Due to the absence of a concurrent background conductivity value, it cannot be determined if the effluent's conductivity exceeded Class III freshwater criterion. Additional effluent water quality samples collected on October 3, 2011, did not exceed Class III water quality standards or permitted limits.

Literature Cited

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

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 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 Angilla Fish Farm on October 3, 2011.

Anguilla Fish Farm			
Location	AGP (measured)	Inorganic N:P ratio	Total N:P ratio
Effluent	13.6	11.4	7.6

Table 2. Effluent limits, Class III Freshwater Criteria and chemical and microbiological data for samples collected from the Anguilla Fish Farm on October 3, 2011.

Anguilla Fish Farm NPDES # FL0278076	Class III Criteria	Effluent Limits	Effluent	
Organic Constituents (µg/L)				
None Detected	-	-	None Detected	
Metals (µg/L unless otherwise noted)				
Aluminum	-	-	273	
Arsenic	≤ 50	-	0.25	U
Cadmium	≤ 0.8 b	-	0.05	U
Calcium (mg/L)	-	-	310	
Chromium-III	≤ 268.2 b	-	0.57	I
Copper	≤ 30.5 b	-	1.26	
Iron	≤ 1,000	-	260	
Lead	≤ 18.6 b	-	0.2	U
Magnesium (mg/L)	-	-	177	
Mercury	≤ 0.012	-	-	
Nickel	≤ 168.5 b	-	0.32	I
Selenium	≤ 5.0	-	0.2	U
Silver	≤ 0.07	-	0.025	U
Zinc	≤ 387.8 b	-	8.8	I
Nutrients (mg/L)				
Ortho-phosphate	-	-	0.29	
Total Phosphorus	-	Report	0.5	
Total Ammonia	-	Report	3.2	
Un-ionized Ammonia	≤ 0.02 s	≤ 0.25 s	0.04	c
Nitrate and Nitrite	-	Report	0.1	
Total Kjeldahl Nitrogen	-	Report	3.7	
Organic Nitrogen	-	-	0.5	c
Total Nitrogen	-	Report	3.8	c
General Physical and Chemical Parameters				
Dissolved Oxygen (mg/L)	≥ 5.0	≥ 5.0	4.1	
pH (SU)	6.0 - 8.5	6.0 - 8.5	7.3	
Conductivity (µmhos/cm)	≤ 1,275	-	4790	
Temperature (°C)	-	Report	24.6	
Salinity	-	-	2.6	c
Sample Depth (m)	-	-	0.2	
Chlorophyll *a* (µg/L) - Corrected	-	-	20	
Phaeophytin (µg/L)	-	-	7.6	
Total Suspended Solids (mg/L)	-	Report	19	
CBOD, 5 day (mg/L), N - inhibited	-	Report	4	
Chloride (mg/L)	-	-	1000	
Fluoride (mg/L)	≤ 10.0	-	0.44	
Sulfate (mg/L)	-	-	940	
Flow (MGD)	-	≤ 3.7 d	1.33	d
Hardness (mg $CaCO_3$)	-	-	1502.96	c
Microbiology (Number of colony forming units/100ml)				
Fecal Coliforms ¥	≤ 400s #	-	590	

Value exceeds the Class III Water Quality Criteria or permit limits

b - Value is calculated based on hardness

c - Value is calculated

d - Daily average

s - Single sample

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

¥ - Fecal coliform analysis performed by Columbia Analytical Services

- If 10 or fewer samples are taken within a month, the single sample limit is 400 CFU (62-302.530(6), F.A.C.)

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2011-10-03-47
FYI3 Anguilla Fish Farm Sampling Inspection

Requester: Michelle Fish
Field Report Prepared By: E. Ali

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

Collected By: E.Ali/S.Pitz/J.Gruentzel
Send Final Report To: Tom Rauth

Sampling Agency:

Lab ID *	Location	Comp / Grab	Collection (begin) Date	Time	Eastern Central	Collection (end) Date	Time	Eastern Central	Bottle Group(s)**
		☐ Comp ☒ Grab				10/3/11	1200		
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)		Storet Station Number				
			3.30						
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☐ m ☐ ft		☐ Salinity (PPTh) ☒ Sp Conductance (umho/cm)		NPDES Number	
		24.39	7.60		2.35 477				
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments						

Lab ID *	Location	Comp / Grab	Collection (begin) Date	Time	Eastern Central	Collection (end) Date	Time	Eastern Central	Bottle Group(s)**
	Anguilla	☐ Comp ☒ Grab				10/3/11	1200		
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)		Storet Station Number				
			4.19 mg/L 51.6%						
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☒ m ☐ ft		☒ Salinity (PPTh) ☒ Sp Conductance (umho/cm)		NPDES Number	
	Fresh	24.6 #1	7.30	0.2	2.56 4790				A
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments B						

Lab ID *	Location	Comp / Grab	Collection (begin) Date	Time	Eastern Central	Collection (end) Date	Time	Eastern Central	Bottle Group(s)**
	Blank	☐ Comp ☒ Grab				10/3/11	1200		
	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	B
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments						

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

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
	10/3/11	fed ex						10-4-11 9:30

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Appendix B. Chemical Analyses performed on the effluent from the Anguilla Fish Farm Outfall D-001, sampled on October 3, 2011.

Date	Field ID	Analysis	Component	Results	Remark	Units	MDL	PQL
10/3/2011 12:00	Effluent	AGP/LN	Algal Growth Potential	13.6		mg DryWt/L	3	3
10/3/2011 12:00	Effluent	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	20		ug/L	0.55	1.7
10/3/2011 12:00	Effluent	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	4		mg/L	0.2	2
10/3/2011 12:00	Effluent	Chlorophyll/Grain Size/BOD	Phaeophytin-a	7.6		ug/L	0.4	1.2
10/3/2011 12:00	Effluent	Overflow	Fecal Coliforms-Membrane Filter	590		cfu/100 mL	10	10
10/3/2011 12:00	Effluent	Metals	Iron	260		ug/L	30	120
10/3/2011 12:00	Effluent	Metals	Silver	0.025	U	ug/L	0.025	0.1
10/3/2011 12:00	Effluent	Metals	Selenium	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Effluent	Metals	Arsenic	0.25	U	ug/L	0.25	1
10/3/2011 12:00	Effluent	Metals	Calcium	310		mg/L	0.37	1.5
10/3/2011 12:00	Effluent	Metals	Zinc	8.8	I	ug/L	5	20
10/3/2011 12:00	Effluent	Metals	Sodium	497		mg/L	2.5	10
10/3/2011 12:00	Effluent	Metals	Lead	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Effluent	Metals	Chromium	0.57	I	ug/L	0.3	1.2
10/3/2011 12:00	Effluent	Metals	Magnesium	177		mg/L	0.2	0.8
10/3/2011 12:00	Effluent	Metals	Copper	1.26		ug/L	0.5	1
10/3/2011 12:00	Effluent	Metals	Cadmium	0.05	U	ug/L	0.05	0.2
10/3/2011 12:00	Effluent	Metals	Aluminum	273		ug/L	5	20
10/3/2011 12:00	Effluent	Metals	Nickel	0.32	I	ug/L	0.25	1
10/3/2011 12:00	Effluent	Nutrients	NO2NO3-N	0.1		mg N/L	0.004	0.01
10/3/2011 12:00	Effluent	Nutrients	Total-P	0.5		mg P/L	0.005	0.05
10/3/2011 12:00	Effluent	Nutrients	Fluoride	0.44		mg F/L	0.035	0.1
10/3/2011 12:00	Effluent	Nutrients	Kjeldahl Nitrogen	3.7		mg N/L	0.4	1
10/3/2011 12:00	Effluent	Nutrients	Alkalinity	101		mg CaCO3/L	0.65	2.5
10/3/2011 12:00	Effluent	Nutrients	Chloride	1000		mg Cl/L	4	10
10/3/2011 12:00	Effluent	Nutrients	Ammonia-N	3.2		mg N/L	0.05	0.1
10/3/2011 12:00	Effluent	Nutrients	O-Phosphate-P	0.29		mg P/L	0.004	0.01
10/3/2011 12:00	Effluent	Nutrients	TSS	19		mg/L	2	10
10/3/2011 12:00	Effluent	Nutrients	Organic Carbon	4.4	I	mg C/L	1	5
10/3/2011 12:00	Effluent	Nutrients	Sulfate	940		mg SO4/L	4	10
10/3/2011 12:00	Effluent	Pesticides	Malathion	0.15	U	ug/L	0.15	0.59

Appendix B. (continued)

Date	Field ID	Analysis	Component	Results	Remark	Units	MDL	PQL
10/3/2011 12:00	Effluent	Pesticides	Fonofos	0.099	U	ug/L	0.099	0.4
10/3/2011 12:00	Effluent	Pesticides	Phorate	0.05	U	ug/L	0.05	0.2
10/3/2011 12:00	Effluent	Pesticides	Metolachlor	0.5	U	ug/L	0.5	2
10/3/2011 12:00	Effluent	Pesticides	Simazine	0.05	U	ug/L	0.05	0.2
10/3/2011 12:00	Effluent	Pesticides	Azinphos Methyl	0.2	U	ug/L	0.2	0.79
10/3/2011 12:00	Effluent	Pesticides	Alachlor	0.59	U	ug/L	0.59	2.4
10/3/2011 12:00	Effluent	Pesticides	Atrazine	0.05	U	ug/L	0.05	0.2
10/3/2011 12:00	Effluent	Pesticides	Bromacil	0.2	U	ug/L	0.2	0.79
10/3/2011 12:00	Effluent	Pesticides	Chlorpyrifos Ethyl	0.05	U	ug/L	0.05	0.2
10/3/2011 12:00	Effluent	Pesticides	Ethoprop	0.099	U	ug/L	0.099	0.4
10/3/2011 12:00	Effluent	Pesticides	Naled	0.79	U	ug/L	0.79	3.2
10/3/2011 12:00	Effluent	Pesticides	Prometryn	0.15	U	ug/L	0.15	0.59
10/3/2011 12:00	Effluent	Pesticides	Chlorpyrifos Methyl	0.099	U	ug/L	0.099	0.4
10/3/2011 12:00	Effluent	Pesticides	Hexazinone	0.099	U	ug/L	0.099	0.4
10/3/2011 12:00	Effluent	Pesticides	Metribuzin	0.099	U	ug/L	0.099	0.4
10/3/2011 12:00	Effluent	Pesticides	Metalaxyl	0.25	U	ug/L	0.25	0.99
10/3/2011 12:00	Effluent	Pesticides	Mevinphos	0.2	U	ug/L	0.2	0.79
10/3/2011 12:00	Effluent	Pesticides	Norflurazon	0.15	U	ug/L	0.15	0.59
10/3/2011 12:00	Effluent	Pesticides	Parathion Methyl	0.099	U	ug/L	0.099	0.4
10/3/2011 12:00	Effluent	Pesticides	Ametryn	0.05	U	ug/L	0.05	0.2
10/3/2011 12:00	Effluent	Pesticides	Butylate	0.2	U	ug/L	0.2	0.79
10/3/2011 12:00	Effluent	Pesticides	Diazinon	0.05	U	ug/L	0.05	0.2
10/3/2011 12:00	Effluent	Pesticides	Ethion	0.05	U	ug/L	0.05	0.2
10/3/2011 12:00	Effluent	Pesticides	Fenamiphos	0.2	U	ug/L	0.2	0.79
10/3/2011 12:00	Effluent	Pesticides	Parathion Ethyl	0.15	U	ug/L	0.15	0.59
10/3/2011 12:00	Effluent	Priority Organic Pollutants	2,4-Dichlorophenol	0.97	U	ug/L	0.97	3.9
10/3/2011 12:00	Effluent	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.8
10/3/2011 12:00	Effluent	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.8
10/3/2011 12:00	Effluent	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	U	ug/L	2.9	12
10/3/2011 12:00	Effluent	Priority Organic Pollutants	2,6-Dinitrotoluene	0.97	U	ug/L	0.97	3.9
10/3/2011 12:00	Effluent	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.97	U	ug/L	0.97	3.9
10/3/2011 12:00	Effluent	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.97	U	ug/L	0.97	3.9
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	12
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Chrysene	0.19	U	ug/L	0.19	0.78

Appendix B. (continued)

Date	Field ID	Analysis	Component	Results	Remark	Units	MDL	PQL
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Dimethyl phthalate	9.7	U	ug/L	9.7	39
10/3/2011 12:00	Effluent	Priority Organic Pollutants	2-Chlorophenol	0.97	U	ug/L	0.97	3.9
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.97	U	ug/L	0.97	3.9
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Fluoranthene	0.19	U	ug/L	0.19	0.78
10/3/2011 12:00	Effluent	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.97	U	ug/L	0.97	3.9
10/3/2011 12:00	Effluent	Priority Organic Pollutants	2,4-Dinitrotoluene	0.97	U	ug/L	0.97	3.9
10/3/2011 12:00	Effluent	Priority Organic Pollutants	2-Nitrophenol	0.97	U	ug/L	0.97	3.9
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Benzidine	97	U	ug/L	97	390
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.8
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	12
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Pyrene	0.19	U	ug/L	0.19	0.78
10/3/2011 12:00	Effluent	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L	15	58
10/3/2011 12:00	Effluent	Priority Organic Pollutants	2-Chloronaphthalene	0.97	U	ug/L	0.97	3.9
10/3/2011 12:00	Effluent	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	12
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19	U	ug/L	0.19	0.78
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	12
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Phenanthrene	0.19	U	ug/L	0.19	0.78
10/3/2011 12:00	Effluent	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.97	U	ug/L	0.97	3.9
10/3/2011 12:00	Effluent	Priority Organic Pollutants	2,4-Dimethylphenol	9.7	U	ug/L	9.7	39
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Benzo(a)anthracene	0.19	U	ug/L	0.19	0.78
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Benzo(a)pyrene	0.19	U	ug/L	0.19	0.78
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19	U	ug/L	0.19	0.78
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.97	U	ug/L	0.97	3.9
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Fluorene	0.19	U	ug/L	0.19	0.78
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Diethyl phthalate	0.97	U	ug/L	0.97	3.9
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	12
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	12
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Isophorone	0.97	U	ug/L	0.97	3.9
10/3/2011 12:00	Effluent	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.8
10/3/2011 12:00	Effluent	Priority Organic Pollutants	3,3'-Dichlorobenzidine	39	U	ug/L	39	160
10/3/2011 12:00	Effluent	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	58
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Acenaphthene	0.19	U	ug/L	0.19	0.78
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19	U	ug/L	0.19	0.78
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Di-n-octyl phthalate	0.97	U	ug/L	0.97	3.9

Appendix B. (continued)

Date	Field ID	Analysis	Component	Results	Remark	Units	MDL	PQL
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19	U	ug/L	0.19	0.78
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Phenol	0.97	U	ug/L	0.97	3.9
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Acenaphthylene	0.19	U	ug/L	0.19	0.78
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Anthracene	0.19	U	ug/L	0.19	0.78
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19	U	ug/L	0.19	0.78
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	U	ug/L	15	58
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Butyl benzyl phthalate	4.9	U	ug/L	4.9	19
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Di-n-butyl phthalate	4.9	U	ug/L	4.9	19
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Hexachlorobenzene	0.97	U	ug/L	0.97	3.9
10/3/2011 12:00	Effluent	Priority Organic Pollutants	Naphthalene	0.19	U	ug/L	0.19	0.78
10/3/2011 12:00	Effluent	Field Parameter	Specific Conductance	4790		umhos/cm		
10/3/2011 12:00	Effluent	Field Parameter	pH	7.3				
10/3/2011 12:00	Effluent	Field Parameter	Sample Depth	0.2		m		
10/3/2011 12:00	Effluent	Field Parameter	Dissolved Oxygen	4.14		mg/L		
10/3/2011 12:00	Effluent	Field Parameter	Temperature	24.6		C		
10/3/2011 12:00	Blank	Metals	Selenium	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Metals	Chromium	0.3	U	ug/L	0.3	1.2
10/3/2011 12:00	Blank	Metals	Iron	30	U	ug/L	30	120
10/3/2011 12:00	Blank	Metals	Calcium	0.075	U	mg/L	0.075	0.3
10/3/2011 12:00	Blank	Metals	Arsenic	0.25	U	ug/L	0.25	1
10/3/2011 12:00	Blank	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
10/3/2011 12:00	Blank	Metals	Nickel	0.25	U	ug/L	0.25	1
10/3/2011 12:00	Blank	Metals	Cadmium	0.05	U	ug/L	0.05	0.2
10/3/2011 12:00	Blank	Metals	Zinc	5	U	ug/L	5	20
10/3/2011 12:00	Blank	Metals	Sodium	0.5	U	mg/L	0.5	2
10/3/2011 12:00	Blank	Metals	Silver	0.025	U	ug/L	0.025	0.1
10/3/2011 12:00	Blank	Metals	Aluminum	5	U	ug/L	5	20
10/3/2011 12:00	Blank	Metals	Copper	0.5	U	ug/L	0.5	1
10/3/2011 12:00	Blank	Metals	Lead	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
10/3/2011 12:00	Blank	Nutrients	Chloride	0.2	U	mg Cl/L	0.2	0.5
10/3/2011 12:00	Blank	Nutrients	TSS	2	U	mg/L	2	10
10/3/2011 12:00	Blank	Nutrients	Alkalinity	0.65	U	mg CaCO3/L	0.65	2.5
10/3/2011 12:00	Blank	Nutrients	Fluoride	0.035	U	mg F/L	0.035	0.1

Appendix B. (continued)

Date	Field ID	Analysis	Component	Results	Remark	Units	MDL	PQL
10/3/2011 12:00	Blank	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
10/3/2011 12:00	Blank	Nutrients	Total-P	0.004	U	mg P/L	0.004	0.01
10/3/2011 12:00	Blank	Nutrients	Sulfate	0.2	U	mg SO4/L	0.2	0.5
10/3/2011 12:00	Blank	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
10/3/2011 12:00	Blank	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
10/3/2011 12:00	Blank	Nutrients	Organic Carbon	1	U	mg C/L	1	5
10/3/2011 12:00	Blank	Pesticides	Alachlor	0.6	U	ug/L	0.6	2.4
10/3/2011 12:00	Blank	Pesticides	Bromacil	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Pesticides	Butylate	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Pesticides	Parathion Methyl	0.1	U	ug/L	0.1	0.4
10/3/2011 12:00	Blank	Pesticides	Prometryn	0.15	U	ug/L	0.15	0.6
10/3/2011 12:00	Blank	Pesticides	Simazine	0.05	U	ug/L	0.05	0.2
10/3/2011 12:00	Blank	Pesticides	Atrazine	0.05	U	ug/L	0.05	0.2
10/3/2011 12:00	Blank	Pesticides	Fonofos	0.1	U	ug/L	0.1	0.4
10/3/2011 12:00	Blank	Pesticides	Parathion Ethyl	0.15	U	ug/L	0.15	0.6
10/3/2011 12:00	Blank	Pesticides	Ethoprop	0.1	U	ug/L	0.1	0.4
10/3/2011 12:00	Blank	Pesticides	Hexazinone	0.1	U	ug/L	0.1	0.4
10/3/2011 12:00	Blank	Pesticides	Ametryn	0.05	U	ug/L	0.05	0.2
10/3/2011 12:00	Blank	Pesticides	Chlorpyrifos Methyl	0.1	U	ug/L	0.1	0.4
10/3/2011 12:00	Blank	Pesticides	Mevinphos	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Pesticides	Naled	0.8	U	ug/L	0.8	3.2
10/3/2011 12:00	Blank	Pesticides	Ethion	0.05	U	ug/L	0.05	0.2
10/3/2011 12:00	Blank	Pesticides	Malathion	0.15	U	ug/L	0.15	0.6
10/3/2011 12:00	Blank	Pesticides	Phorate	0.05	U	ug/L	0.05	0.2
10/3/2011 12:00	Blank	Pesticides	Diazinon	0.05	U	ug/L	0.05	0.2
10/3/2011 12:00	Blank	Pesticides	Metalaxyl	0.25	U	ug/L	0.25	1
10/3/2011 12:00	Blank	Pesticides	Metolachlor	0.5	U	ug/L	0.5	2
10/3/2011 12:00	Blank	Pesticides	Azinphos Methyl	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Pesticides	Chlorpyrifos Ethyl	0.05	U	ug/L	0.05	0.2
10/3/2011 12:00	Blank	Pesticides	Fenamiphos	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Pesticides	Metribuzin	0.1	U	ug/L	0.1	0.4
10/3/2011 12:00	Blank	Pesticides	Norflurazon	0.15	U	ug/L	0.15	0.6
10/3/2011 12:00	Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1	U	ug/L	1	4
10/3/2011 12:00	Blank	Priority Organic Pollutants	2-Chloronaphthalene	1	U	ug/L	1	4

Appendix B. (continued)

Date	Field ID	Analysis	Component	Results	Remark	Units	MDL	PQL
10/3/2011 12:00	Blank	Priority Organic Pollutants	Hexachlorobenzene	1	U	ug/L	1	4
10/3/2011 12:00	Blank	Priority Organic Pollutants	Chrysene	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	40	U	ug/L	40	160
10/3/2011 12:00	Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	1	U	ug/L	1	4
10/3/2011 12:00	Blank	Priority Organic Pollutants	Phenanthrene	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1	U	ug/L	1	4
10/3/2011 12:00	Blank	Priority Organic Pollutants	Benzidine	100	U	ug/L	100	400
10/3/2011 12:00	Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Priority Organic Pollutants	Butyl benzyl phthalate	5	U	ug/L	5	20
10/3/2011 12:00	Blank	Priority Organic Pollutants	Di-n-butyl phthalate	5	U	ug/L	5	20
10/3/2011 12:00	Blank	Priority Organic Pollutants	Hexachloroethane	3	U	ug/L	3	12
10/3/2011 12:00	Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	2	U	ug/L	2	8
10/3/2011 12:00	Blank	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L	15	60
10/3/2011 12:00	Blank	Priority Organic Pollutants	Anthracene	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Priority Organic Pollutants	Dimethyl phthalate	10	U	ug/L	10	40
10/3/2011 12:00	Blank	Priority Organic Pollutants	Fluorene	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2	U	ug/L	2	8
10/3/2011 12:00	Blank	Priority Organic Pollutants	2,4-Dimethylphenol	10	U	ug/L	10	40
10/3/2011 12:00	Blank	Priority Organic Pollutants	Acenaphthene	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Priority Organic Pollutants	Acenaphthylene	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Priority Organic Pollutants	Benzo(a)pyrene	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	U	ug/L	15	60
10/3/2011 12:00	Blank	Priority Organic Pollutants	Fluoranthene	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Priority Organic Pollutants	Hexachlorobutadiene	3	U	ug/L	3	12
10/3/2011 12:00	Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3	U	ug/L	3	12
10/3/2011 12:00	Blank	Priority Organic Pollutants	Naphthalene	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Priority Organic Pollutants	Nitrobenzene	2	U	ug/L	2	8
10/3/2011 12:00	Blank	Priority Organic Pollutants	Phenol	1	U	ug/L	1	4
10/3/2011 12:00	Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1	U	ug/L	1	4
10/3/2011 12:00	Blank	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	60
10/3/2011 12:00	Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Priority Organic Pollutants	Diethyl phthalate	1	U	ug/L	1	4
10/3/2011 12:00	Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	3	U	ug/L	3	12

Appendix B. (continued)

Date	Field ID	Analysis	Component	Results	Remark	Units	MDL	PQL
10/3/2011 12:00	Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	1	U	ug/L	1	4
10/3/2011 12:00	Blank	Priority Organic Pollutants	2-Chlorophenol	1	U	ug/L	1	4
10/3/2011 12:00	Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3	U	ug/L	3	12
10/3/2011 12:00	Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2	U	ug/L	2	8
10/3/2011 12:00	Blank	Priority Organic Pollutants	Di-n-octyl phthalate	1	U	ug/L	1	4
10/3/2011 12:00	Blank	Priority Organic Pollutants	Isophorone	1	U	ug/L	1	4
10/3/2011 12:00	Blank	Priority Organic Pollutants	Pentachlorophenol	3	U	ug/L	3	12
10/3/2011 12:00	Blank	Priority Organic Pollutants	2,4-Dichlorophenol	1	U	ug/L	1	4
10/3/2011 12:00	Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	1	U	ug/L	1	4
10/3/2011 12:00	Blank	Priority Organic Pollutants	Benzo(a)anthracene	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3	U	ug/L	3	12
10/3/2011 12:00	Blank	Priority Organic Pollutants	Pyrene	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	1	U	ug/L	1	4
10/3/2011 12:00	Blank	Priority Organic Pollutants	2-Nitrophenol	1	U	ug/L	1	4
10/3/2011 12:00	Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.2	U	ug/L	0.2	0.8
10/3/2011 12:00	Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1	U	ug/L	1	4

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

September 2011

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Heather Webber	**Contact Number:** 904-256-1622
Facility Name (as it appears on permit): Anguilla Fish Farm	**Former Names:** N/A
NPDES Permit Number: FL0278076	**Permit Expiration Date:** 10/15/12
Physical Address: 181 School Road, Federal Point, East Palatka, FL 32131	
District: Northeast	**County:** Putnam
Function of Facility: Fish farm	
Facility Type: Industrial	**Permitted Capacity (MGD):** 3.67
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): 1.305 MGD (August 2010 – July 2011)	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months): N/A	
Description of type of Discharge: ☒ **Continuous** ☐ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☐ **Other, please specify**	
Description of Sampling Location(s) - actual permit designation of permitted sampling point(s): EFF-1- 62' downstream from the discharge pipe of the "dug pond" in the discharge ditch	
Description of Permitted Outfall(s): D-001 – St. Johns River at 29° 45' 31" N 81° 31' 41" W	
Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility): Water is pumped from the Floridan Aquifer into the approximately 130 fish tanks. The tanks are arranged in two sections. The largest section of tanks discharges into an unlined pond. Wastewater from the pond gravity flows into an unlined ditch. The smaller second section of tanks discharges into a small ditch. Both waste streams combine at the end of the large unlined ditch. From this point the wastewater enters a swampy area with eventual discharge into the St. Johns River, a Class III Fresh Water.	

Appendix C. (continued)

September 2011

PART I: Continued

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

			Effluent Limitations				Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Monthly Average	Weekly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Flow	MGD	Max		Report		3.67	Monthly	Calculated	CAL-1	1
Nitrogen, Ammonia, Total (as N)	Mg/L	Max				Report	Monthly	Grab	EFF-1	
Temperature (C), Water	Deg. C	Max				Report	Monthly	Instrument	EFF-1	
Ammonia, unionized (as NH3)	Mg/L	Max				0.25	Monthly	Calculated	CAL-1	2
pH	SU	Min/Max				6.0/8.5	Monthly	Grab	EFF-1	3
Oxygen, Dissolved (DO)	Mg/L	Min				5.0	Weekly	Grab	EFF-1	
Nitrogen, Total (as N)	Mg/L	Max	Report			Report	Quarterly	Grab	EFF-1	
Nitrogen, Kjeldahl, Total (as N)	Mg/L	Max	Report			Report	Quarterly	Grab	EFF-1	
Nitrite plus Nitrate, Total 1 det. (as N)	Mg/L	Max	Report			Report	Quarterly	Grab	EFF-1	
BOD, Carbonaceous 5 day, 20C	Mg/L	Max	Report			Report	Quarterly	Grab	EFF-1	
Solids, Total Suspended	Mg/L	Max	Report			Report	Quarterly	Grab	EFF-1	
Phosphorus, Total (as P)	Mg/L	Max	Report			Report	Quarterly	Grab	EFF-1	

Note 1: Calculated as an estimate, based on the technique used to report water usage to the SJRWMD.

Note 2: Calculated based on a separate single grab sample for total ammonia. The pH and temperature at the time of the grab sample shall be used for the calculation. This limit is interim, provided by CO 10-1528.

Note 3: The pH shall not vary more than one unit above or below natural background provided that the pH is not lowered to less than 6 units or raised above 8.5 units. If natural background is less than 6 units, the pH shall not vary below natural background or vary more than one unit above natural background. If natural background is higher than 8.5 units, the pH shall not vary above natural background or vary more than one unit below natural background.

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v3.0 07/07/08

Appendix C. (continued)

September 2011

PART I: Continued	
Receiving Waters: St. Johns River	**Classification (indicate whether fresh or marine):** Class III Fresh Water

Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.):
none

Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.):
10-1528 executed 11/08/10 – Requirements include submitting a plan to come into compliance with all effluent limits before 10/14/12, quarterly progress reports, and $500 for Department costs. Interim limit given for unionized ammonia (0.25 mg/L).

Facility Mixing Zone Details (if applicable):
N/A

List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year:

Date	Parameter and Units	Limit	Result
09/30/10	Unionized ammonia	0.02 mg/L (prior to CO)	0.1697 mg/L
02/28/11	Dissolved oxygen	5 mg/L	4.7 mg/L
03/31/11	Dissolved oxygen	5 mg/L	4.5 mg/L

Describe previous FYI and WQBEL study:
2006 - All effluent metals, pH, and fecal and total coliforms complied with Class III Surface Water Quality Criteria. No organic pollutants were detected. The effluent conductivity and dissolved oxygen exceeded the Class III Water Quality Criteria. The effluent sample was not acutely toxic to the fish, *Cyprinella leedsi,* or to the water flea, *Ceriodaphnia dubia.* The AGP value of the effluent was 74.1 mg dry weight/L.

Describe previous or current Enforcement Actions (including WLs):
None besides CO 10-1528 noted above.

Describe any violations or problems noted in previous inspection:
None – 03/07/11 CEI was in compliance.

Discuss whether DMR trends within previous five years are improving or declining:
Effluent parameters don't appear to be trending one way or the other.

Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):
None

Appendix C. (continued)

September 2011

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

Appendix D. EPA End Sheet

The Bioassays of the Anguilla Fish Farm effluent sampled on October 3, 2011, were not performed. NPDES# FL0278076.

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 2 7 8 0 7 6	11	12 1 1 1 0 0 3	18 B	19 S	20 2

Remarks

B i o a s s a y s n o t r u n

66

The Priority Pollutants Analysis of the Anguilla Fish Farm effluent sampled on October 3, 2011. NPDES# FL0278076.

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 2 7 8 0 7 6	11	12 1 1 1 0 0 3	18 B	19 S	20 2

Remarks

66

Biological Analyses of the Anguilla Fish Farm effluent sampled on October 3, 2011. NPDES# FL0278076.

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 2 7 8 0 7 6	11	12 1 1 1 0 0 3	18 B	19 S	20 2

Remarks

66