

Effluent Quality Assessment of

City of Sarasota Advanced Wastewater Treatment Facility

Sarasota County

NPDES # FL0040771

Sampled August 18, 2014

October 2014

Biology Section

Bureau of Laboratories

Division of Environmental Assessment and Restoration

2014 FDEP Bureau of Laboratories Quality Manual

NELAC Certification No. E31780

CONTENTS

Facility Overview

Methods

Results

Conclusion

Literature Cited

Tables

Table 1	Effluent limits, Class III Marine Criteria and field parameters
Table 2	Effluent limits, Class III Marine Criteria and analytical water chemistry data
Table 3	Effluent limits, Class III Marine Criteria and analytical metals data
Table 4	Measured and predicted algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN), ortho-phosphate (OP), total nitrogen (TN) and total phosphorus (TP) limitation and ratios of nitrogen to phosphorus.
Table 5	Effluent Limits, Class III Marine Criteria and organics and pesticides data

Appendices

Appendix A	Facility Summary
Appendix B	Explanation of measurements
Appendix C	Chemical Analyses of Effluent

EPA End Sheet

City of Sarasota Advanced Wastewater Facility (AWWTF), 1850 12th St., Sarasota, Sarasota County, Florida, 34236. NPDES #FL0040771.

Facility Overview

City of Sarasota AWWTF is a Type 1 advanced wastewater treatment facility which uses the Bardenpho Process to treat domestic wastewater. See Appendix A for a description of the facility, summary of permit limits, Administrative Order (AO) and Discharge Monitoring Report (DMR) information.

Methods

Effluent composite samples for toxicity testing were collected on August 18, 20, and 22, 2014. Effluent grab and composite samples for biological and chemical analyses for this facility were collected on August 18, 2014. All samples were collected from the EFD-01 NPDES sampling point for Outfall D-001 by Keith Kleinmann (FDEP South District) and Elizabeth Tromp (City of Sarasota) following DEP-SOP-001/01 FS 2400 Wastewater Sampling (see Appendix B).

The chronic definitive toxicity tests and algal growth potential tests were performed following internal DEP SOPs TA07_05, TA07_09, and TA08_01 through TA08_09 (see Appendix B).

Results

Chemistry Results (See Tables 1, 2, 3, 5 and Appendix C)

- The total ammonia concentration in the composite sample collected and preserved for chemical analysis was 0.05 mg N/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was < 0.02 mg/L.
- Total phosphorus, total nitrogen, turbidity, fluoride, aluminum, copper, nickel and bromodichloromethane were detected in the effluent at levels that comply with Class III Marine Water Quality Criteria (62-302.530, F.A.C.) and/or permitted limits. Carbonaceous biochemical oxygen demand (CBOD), iron, selenium and zinc were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL).
- Total ammonia and toluene were detected, respectively, in the field blank and the trip blank, between the laboratory method detection limits (MDL) and practical quantitation limits (PQL).

Algal Growth Potential (See Table 4 and Appendix C)

- The effluent Algal Growth Potential (AGP) was 22.0 mg dry wt/L of the unicellular green alga, *Pseudokirchneriella subcapitata*, formerly known as *Selenastrum capricornutum*. Raschke and Schultz (1987) determined that freshwater AGP values above 5.0 mg dry weight/L, which represents a "problem" threshold for fresh receiving waters, imply nutrient enrichment. The analytical chemistry suggests that the effluent is nitrogen limited (Miller et al. 1978).
- An aliquot of the AGP sample was salinity adjusted from an apparent salinity of approximately 1 part per thousand (ppth) to a salinity of approximately 7 ppth by the addition of artificial sea salts to meet the salinity requirements of the test species.
- The salinity adjusted effluent algal growth potential (AGP) was 15.7 mg dry wt/L of the saltwater species *Dunaliella tertiolecta.* Raschke and Schultz determined that marine AGP values above 10.0 mg dry weight/L, which represents a "problem" threshold for marine receiving waters, imply nutrient enrichment (personal communication, Marshall Faircloth, et. al. FDEP with Ron Raschke USEPA Region 4 1987).

Toxicity Test Results (See Appendix C)

- Tests were performed August 19 - 27, 2014

Ceriodaphnia dubia 7-day chronic definitive bioassay – IC25: 64.1%*
NOEC: 50%

Pimephales promelas 7-day chronic definitive bioassay – IC25: > 100%
NOEC: 100%

*NOTE: A 25% inhibition concentration (IC25) is the effluent concentration causing a 25% reduction in a biological response such as biomass or reproduction when compared to a control population. An IC25 of less than 100% in a chronic test may constitute exceedances of 62-302.530(20), 62-302.530(61) and/or facility permit limits. A no observed effect concentration (NOEC) less than 100% effluent in a chronic test may constitute an exceedance of 62-302.530(61) and/or facility permit limits. Standard reference toxicant (SRT) tests are conducted monthly to ensure quality in toxicity testing.

- The bioassay samples did not show chronic toxicity to the *Pimephales promelas* test organisms, but did show chronic toxicity for reproduction to the *Ceriodaphnia dubia* test organisms. The cause of toxicity was not determined.

Conclusion

The effluent sample collected from the EFD-01 NPDES sampling point for this facility on August 18, 2014, August 20, 2014, and August 22, 2014, was chronically toxic to the *Ceriodaphnia dubia* test organisms during the 7-day chronic definitive bioassays; but, did not show toxicity to the *Pimephales promelas* test organisms. The effluent AGP result and the salinity adjusted effluent AGP result were both greater than the "problem" threshold for, respectively, fresh and marine receiving waters suggesting that nutrient enrichment may be an issue. Effluent water quality samples collected on August 18, 2014, did not exceed any applicable water quality standards or permit conditions.

For additional information concerning this sampling event, including bioassay bench sheets and SRT data, please contact Diane.Power@dep.state.fl.us and/or Joseph.Faircloth@dep.state.fl.us.

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.

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.

Stevenson, R. J. and L. L. Bahls. 1999. Periphyton protocols. Pp. 6.1-6.22 in: Rapid bioassessment protocols for use in wadeable streams and rivers. 2nd edition. By: M. T. Barbour, J. Gerritsen, B. D. Snyder and J. B. Stribling. EPA 841-B-99-002. U. S. Environmental Protection Agency, Office of Water, Washington, D. C.

USEPA. 2002. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. 4th edition. EPA-821-R-02-013.

Table 1. Effluent limits, Class III Marine Criteria and field parameters.

City of Sarasota AWWTF	Units	Class III Criteria	Effluent Permit Limits	Composite 8/18/14	Grab 8/18/14	Composite 8/20/14	Composite 8/22/14
Temperature	°C	-	-	-	31.25	-	-
pH	SU	6.5 - 8.5 s	6.5 - 8.5 s	7.93	7.93	7.95	7.92
Specific Conductance	umhos/cm	-	-	-	1508	1472	1537
Salinity	ppth	-	-	-	-	1 c	-
Dissolved Oxygen	% saturation	≥ 42	-	-	89	49.6	50.6
Dissolved Oxygen	mg/L	-	≥ 6.0 s	-	6.56	6.45	6.57
Flow (8/1/13 - 7/31/14)	MGD	-	10.2 a	4.55 a	-	-	-
Total Residual Chlorine	mg/L	≤ 0.01	≤ 0.01	< 0.01	< 0.01	< 0.01	< 0.01

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.

e -Value exceeds the Class III Water Quality Criteria or permit limits

a - Annual average

c - Value is calculated

s - Single sample

Table 2. Effluent limits, Class III Marine Criteria and analytical water chemistry data

City of Sarasota AWWTF	Units	Class III Criteria	Effluent Permit Limits	Composite 8/18/14	Grab 8/18/14	Field Blank 8/18/14
Ortho-phosphate	mg P/L	-	-	-	0.74	0.004 U
Total Phosphorus	mg P/L	-	≤ 2.0 p	0.7	0.84	0.002 U
Total Ammonia	mg N/L	-	-	-	0.05	0.003 I
Un-ionized Ammonia (calculated salinity)	mg/L	-	-	-	< 0.02 c	-
Nitrate and Nitrite	mg N/L	-	-	0.37	0.44	0.004 U
Total Kjeldahl Nitrogen	mg N/L	-	-	0.85	0.81	0.080 U
Organic Nitrogen	mg N/L	-	-	-	0.76 c	0.04 c
Total Nitrogen	mg N/L	-	≤ 6.0 p	1.22 c	1.25 c	0.04 c
Total Organic Carbon	mg C/L	-	-	-	7.8 A	0.50 U
Chlorophyll *a* - Corrected	ug/L	-	-	-	0.55 U	-
Phaeophytin	ug/L	-	-	-	0.40 U	-
CBOD, 5 day, N - inhibited	mg/L	-	Report	1.2 I	-	-
Hardness	mg CaCO3/L	-	-	-	231 c	0.4 c
Total Residual Chlorine	mg/L	-	-	< 0.01	< 0.01	-
Total Suspended Solids	mg/L	-	≤ 10.0 p	2 U	-	-
Turbidity	NTU	< 29 t	-	-	0.65	0.10 U
Color (true)	PCU	-	-	-	7.2	2.5 U
Alkalinity	mg CaCO3/L	-	-	-	147 A	0.65 U
Chloride	mg Cl/L	-	-	-	240	0.20 U
Cyanide	ug/L	≤ 1.0	-	-	-	-
Fluoride	mg F/L	≤ 5.0	-	-	0.73	0.035 U
Sulfate	mg SO4/L		-	-	220	0.20 U
Microbiology						
Fecal Coliforms [1]	cfu/100 mL	≤ 800 s	≤ 25 s	-	2 U	-
Enterococci [1]	mpn/100ml	-	≤ 35 s	-	1U	-
Toxicity (Chronic Definitive Freshwater, 25% Inhibition Concentration (IC25))						
Bioassay - Water flea *(Ceriodaphnia dubia)*	% IC25	≥ 100	≥ 100	64.1 e	-	-
Bioassay - Fish (*Pimephales promelas*)	% IC25	≥ 100	≥ 100	> 100	-	-

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.

e - Value exceeds the Class III Water Quality Criteria or permit limits

c - Value is calculated

p - 24 hour flow proportioned composite

s - Single sample

t - Shall not exceed 29 NTUs above background

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

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

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

1 - Fecal coliform and Enterococci analyses performed by Sanders Laboratories, Inc., Nokomis, FL.

Table 3. Effluent limits, Class III Marine Criteria and analytical metals data

City of Sarasota AWWTF	Units	Class III Criteria	Effluent Permit Limits	Grab 8 18 14
Aluminum	ug/L	≤ 1500 s	-	35
Arsenic	ug/L	-	-	1.25
Cadmium	ug/L	≤ 8.8 s	-	0.050 U
Calcium	mg/L	-	-	53.2
Chromium, Total [2]	ug/L	≤ 50 s	-	0.30 U
Copper	ug/L	≤ 3.7 s	≤ 3.7 s	1.1
Iron	ug/L	≤ 300 s	-	43 I
Lead	ug/L	≤ 8.5 s	-	0.20 U
Magnesium	mg/L	-	-	23.8
Nickel	ug/L	≤ 8.3 s	-	1.42
Potassium	mg/L	-	-	16
Selenium	ug/L	≤ 71 s	-	0.25 I
Silver	ug/L	≤ 2.3 s	-	0.025 U
Sodium	mg/L	-	-	215
Zinc	ug/L	≤ 86 s	-	14 I

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.

e - Value exceeds the Class III Water Quality Criteria or permit limits

2 - Class III Marine Water Quality Criterion (62-302.530(19)(b), F.A.C.) is for chromium-VI

s - Single sample

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

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

Table 4. Measured and predicted algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN), ortho-phosphate (OP), total nitrogen (TN) and total phosphorus (TP) limitation and ratios of nitrogen to phosphorus

City of Sarasota AWWTF								
Location	**Test Species**	**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**
Grab 8/18/14	*Pseudokirchneriella subcapitata*	22.0	18.6 ± 3.7	318.2 ± 63.6	47.5 ± 9.5	361.2 ± 72.2	0.7	1.5
Grab 8/18/14	*Dunaliella tertiolecta*	15.7 [3]	not applicable [4]	not applicable [4]	not applicable [4]	not applicable [4]	0.7	1.5

Fresh - freshwater species *Pseudokirchneriella subcapitata*

Marine - saltwater species *Dunaliella tertiolecta*

3 - sample salinity adjusted to ~7 ppth

4 - predictions not applicable to marine matrix

Table 5. Effluent limits, Class III Marine Criteria and analytical organic and pesticide data

City of Sarasota AWWTF	Units	Class III Criteria	Effluent Permit Limits	Composite 8 18 14	Grab 8 18 14	Trip Blank 8 18 14
Bromodichloromethane	ug/L	≤ 22 a	≤ 22 a	-	11	0.20 U
Dibromochloromethane	ug/L	≤ 34 a	≤ 34 a	-	-	-
Toluene	ug/L	-	-	-	-	0.70 I

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.

a - Annual average

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

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

Appendix A

Facility Summary

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: **Keith Kleinmann**	**Contact Number:** **239 344 5656**
Facility Name (as it appears on permit): **City of Sarasota AWWTF**	**Former Names:**
NPDES Permit Number: **FL0040771**	**Permit Expiration Date:** **May 18, 2016**
Physical Address: **1850 12th St Sarasota FL 34236**	
District: **South**	**County:** **Sarasota**
Function of Facility: **Domestic Waste Water Treatment**	
Facility Type: **Type I Modified Bardenpho**	**Permitted Capacity (MGD):** **10.2 MGD**
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months):	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months):	
Description of type of Discharge: ☐ **Continuous** ☐ **Intermittent** ☐ **Seasonal** ☒ **Rainfall Dependent** ☐ **Other, please specify**	

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

FLW-04, EFD-01, EFA-01, EFB-01,

Description of Permitted Outfall(s):

D-001: Permitted discharge to Whitaker Bayou, Class III waters, (WIBD# 1936) then to Sarasota Bay, and Outstanding Florida Water. It is a 24-inch concrete pipe without a diffuser, is approximately five feet from shore and discharges at depth of approximately two feet below the water surface. Lat 27 21' 15" N long 82 32'50"W

D-002: intermittently Discharging Stormwater ponds used for Part III reclaimed water. The Facility is not using D-002 to discharge to surface waters.

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

An existing 10.2 MGD annual average daily flow (AADF), Type I Modified Bardenpho advanced domestic wastewater treatment facility consisting of: headwork (two mechanically cleaned bar screens and one vortex degritter), one 3.0 MG flow equalization basin, two 450,000 gallon fermentation tanks, two 500,000 gallon first anoxic basins, two 2.145 nitrification basins, two second anoxic basins of 500,000 gallons and 600,000 gallons, one 250,000 gallon reaeration basin, four clarifiers of 3.28 MG total volume and 29,000 square feet of total surface area with a combined weir length of 1,200 ft., one 200,000 gallon flash mix flocculator, five automatic backwash traveling bridge filters of 1,440 square feet each, and a 540,000 gallon dual basin chlorine contact chamber. Disinfection is provided by sodium hypochlorite with bisulfite for de-chlorination

PART I: Continued

List <u>current</u> 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 I.A.8 CBOD5; Copper; Dibromochloromethane; Dichlorobromomethane				Monitoring Requirements			
Parameter	Units	Max/Min					Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Flow to D-001	MGD	Max Max	10.2 13.0	Annual Average Monthly Average			Continuous	Recording Flow Meter with Totalizer	FLW-04	See I.A.4
BOD, Carbonaceous 5 day, 20C Q< 3.0 CFS	mg/L	Max Max Max Max	- 2.0 - Report	Annual Average Monthly Average Weekly Average Single Sample			5 Days/Week	24-hr FPC	EFD-01	See I.A.8
BOD, Carbonaceous 5 day, 20C Q ≥ 3.0 CFS	mg/L	Max Max Max Max	- 3.0 - Report	Annual Average Monthly Average Weekly Average Single Sample			5 Days/Week	24-hr FPC	EFD-01	See I.A.8
BOD, Carbonaceous 5 day, 20C Q≥ 5.0 CFS	mg/L	Max Max Max Max	- 5.0 - Report	Annual Average Monthly Average Weekly Average Single Sample			5 Days/Week	24-hr FPC	EFD-01	See I.A.8
Solids, Total Suspended	mg/L	Max Max Max Max	5.0 6.25 7.5 10	Annual Average Monthly Average Weekly Average Single Sample			5 Days/Week	24-hr FPC	EFD-01	
Solids, Total Suspended	mg/L	Max	5.0	Single Sample			5 Days/Week	Grab	EFD-01	
Coliform, Fecal	#/100mL	Max	25	Single Sample			5 Days/Week	Grab	EFD-01	
Coliform, Fecal, % less than detection	percent	Min	75	Monthly Total			Monthly	Calculated	EFD-01	See I.A.5
Enterococci	#/100mL	Max	35	Monthly Geometric Mean			5 Days/Month	Grab	EFD-01	See I.A.7
pH	s.u.	Min Max	6.5 8.5	Single Sample Single Sample			Continuous	Meter	EFD-01	See I.A.3
Chlorine, Total Residual (For Disinfection)	mg/L	Min	1.0	Single Sample			Continuous	Grab	EFA-01	See I.A.3 and I.A.6

Chlorine, Total Residual (For Dechlorination)	mg/L	Max	0.01	Single Sample	Daily; 24 hours	Grab	EFD-01	
Oxygen, Dissolved (DO)	mg/l	Min	6.0	Single Sample	7 Days/Week	Grab	EFD-01	
Dichlorobromomethane	UG/L	Max	22	Annual Average	Monthly	Grab	EFD-01	
Dibromochloromethane	UG/L	Max	34	Annual Average	Monthly	Grab	EFD-01	
Nitrogen, Total	mg/L	Max Max Max Max	3.0 3.75 4.5 6.0	Annual Average Monthly Average Weekly Average Single Sample	5 Days/Week	24-hr FPC	EFD-01	
Phosphorus, Total (as P)	mg/L	Max Max Max Max	1.0 1.25 1.5 2.0	Annual Average Monthly Average Weekly Average Single Sample	5 Days/Week	24-hr FPC	EFD-01	
Copper, Total Recoverable	UG/L	Max	3.7	Single Sample	Monthly	Grab	EFD-01	
Chronic Whole Effluent Toxicity, 7-Day IC25 (Ceriodaphnia dubia)	percent	Min	100	Single Sample	Quarterly	24-hr FPC	EFD-01	See I.A.11
Chronic Whole Effluent Toxicity, 7-Day IC25 (Pimephales promelas)	percent	Min	100	Single Sample	Quarterly	24-hr FPC	EFD-01	See I.A.11

PART I: Continued

Receiving Waters:	**Classification (indicate whether fresh or marine):**
Whitaker Bayou	**Class III waters**

Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.):
Chronic Whole Effluent Toxicity, 7-Day IC25 (Ceriodaphnia dubia); Chronic Whole Effluent Toxicity, 7-Day IC25 (Pimephales promelas)

All test species, procedures and quality assurance criteria used shall be in accordance with Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, 4th Edition, EPA-821-R-02-013. The control water and dilution water shall be moderately hard water as described in EPA-821-R-02-013, Section 7.2.3.

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

Facility Mixing Zone Details (if applicable):
NA

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

Date	Parameter and Units	Limit	Result

Describe previous FYI and WQBEL study:

Describe previous or current Enforcement Actions (including WLs):
NA

Describe any violations or problems noted in previous inspection:

NA

Discuss whether DMR trends within previous five years are improving or declining:
NA

Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):

The facility wants to become a 100% reclaimed water facility and is planning on finishing a Deep injection well this year and will only discharge in the future during extreme wet weather if the well cannot take the flow.

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 B

Explanation of Measurements

(1) Quality Assurance and Quality Control

FDEP's quality assurance requirements for analytical laboratories and field activities are codified in Chapter 62-160, F.A.C., Quality Assurance (QA Rule) and in internal Standard Operating Procedures (FDEP SOPs). Methods for all analyses are on file at the FDEP Central Laboratory in Tallahassee and may be viewed on the web at http://www.dep.state.fl.us/labs/library/lab_sops.htm and/or http://www.dep.state.fl.us/water/sas/sop/sops.htm.

(2) Chemical Analyses of the Effluent

The effluent was analyzed for nutrients, metals, organic constituents (base, neutral, and acid extractables) and pesticides following FDEP SOPs. The results from these analyses were compared with Water Quality Criteria (62-302, F.A.C.) and facility permit limits.

(3) Toxicity Bioassays

A 25% inhibition concentration (IC25) is the effluent concentration causing a 25% reduction in a biological response such as biomass or reproduction when compared to a control population. An IC25 of less than 100% in a chronic test may constitute exceedances of 62-302.530(20), 62-302.530(61) and/or facility permit limits. A no observed effect concentration (NOEC) less than 100% effluent in a chronic test may constitute an exceedance of 62-302.530(61) and/or facility permit limits. Standard reference toxicant (SRT) tests are conducted monthly to ensure quality in toxicity testing.

(4) Bacteriological Testing

High levels of fecal coliform bacteria may constitute an exceedance of 62-302.530(6) and/or facility permit limits. Fecal coliform and enterococci results often are based on colony counts outside the acceptable range (B-qualifier). The dilutions performed on the sample did not yield results within the method acceptable range of 20- 60 colony forming units per plate. The B-qualifier does not affect data quality.

(5) Chlorophyll *a* Content

Chlorophyll *a* content is an estimate algal biomass. High algal biomass implies nutrient stress (Stevenson and Bahls 1999) and may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C., and/or 62-302.530(47)(b), F.A.C..

(6) Algal Growth Potential (AGP)

The algal growth potential (AGP) value is the peak growth of the alga within that 14-day period, recorded as mg dry weight/L. Raschke and Shultz (1987) found that an AGP above 10.0 mg dry weight/L represents a "problem" threshold for marine receiving waters, implying nutrient enrichment. High AGP values may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C. and/or 62-302.530(47)(b), F.A.C..

The concentration of nutrients in a water sample may be used to calculate the expected yield of AGP in a low salinity sample under the assumption that other required nutrients (e.g. silicon, micronutrients) are present in excess (Miller *et al*. 1978). The expected amount of production is calculated as 38 times the total soluble inorganic nitrogen (nitrate and nitrite plus ammonia) under nitrogen limitation or 430 times the ortho-phosphate (OP) concentration under phosphorus limitation with an error of $\pm$ 20%. When the ratio of nitrogen to phosphorus (N:P) is less than 10:1, nitrogen limitation of algal production is likely. When the N:P ratio is 20:1 or greater, phosphorus limitation is likely (EPA-822-B-00-002). For ratios in-between, co-limitation may occur. Production of lower biomass than expected may be evidence of growth inhibition related to toxic compounds present in the water sample tested and may constitute an exceedance of 62-302.530(61) F.A.C. Expected AGP is not calculated for marine samples incubated with *Dunaliella*.

(7) Definition of Qualifiers

A - Value reported is the mean of two or more determinations
B - Results based on colony counts outside the acceptable range.

I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J - Estimated value
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
N - Presumptive evidence of presence of material.
O - Sampled, but analysis lost or not performed.
Q - Sample held beyond normal holding time.
T - Value reported is less than the criterion of detection.
U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
V - Analyte was detected in both sample and method blank.
X - Too few individuals to calculate SCI value.
Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate
Z - Colonies were too numerous to count (TNTC)

Appendix C

Chemical analysis of effluent

Date Sampled	Field ID	Analysis Group	Component	Result	Units	MDL	PQL
8/18/2014 7:00	Effluent D-001 Comp	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.2 I	mg/L	0.2	2
8/18/2014 7:00	Effluent D-001 Comp	Toxicology	Bioassay-Chron-Def-FW-Fish, NOEC	100 Q	NOEC		
8/18/2014 7:00	Effluent D-001 Comp	Toxicology	Bioassay-Chron-Def-FW-Fish, IC25	100 LQ	IC25		
8/18/2014 7:00	Effluent D-001 Comp	Toxicology	Bioassay-Chron-Def-FW-C.dubia, IC25	64.1	IC25		
8/18/2014 7:00	Effluent D-001 Comp	Toxicology	Bioassay-Chron-Def-FW-C.dubia, NOEC	50	NOEC		
8/18/2014 7:00	Effluent D-001 Comp	Nutrients	Kjeldahl Nitrogen	0.85	mg N/L	0.08	0.2
8/18/2014 7:00	Effluent D-001 Comp	Nutrients	Total-P	0.7	mg P/L	0.005	0.05
8/18/2014 7:00	Effluent D-001 Comp	Nutrients	TSS	2 U	mg/L	2	10
8/18/2014 7:00	Effluent D-001 Comp	Nutrients	NO2NO3-N	0.37	mg N/L	0.008	0.02
8/18/2014 7:00	Effluent D-001 Comp	Nutrients	Temperature	4	C		
8/18/2014 7:00	Effluent D-001 Comp	Nutrients	pH	7.93			
8/18/2014 7:00	Effluent D-001 Comp	Nutrients	Total Residual Chlorine	0.01	mg/L		
8/18/2014 11:00	Effluent D-001 Grab	AGP/LN	Algal Growth Potential-Salinity Adjusted	15.7	mg DryWt/L	3	3
8/18/2014 11:00	Effluent D-001 Grab	AGP/LN	Algal Growth Potential	22	mg DryWt/L	0.3	0.9
8/18/2014 11:00	Effluent D-001 Grab	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.40 U	ug/L	0.4	1.2
8/18/2014 11:00	Effluent D-001 Grab	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.55 U	ug/L	0.55	1.7
8/18/2014 11:00	Effluent D-001 Grab	Overflow	ENTEROCOCCI-ENTEROLERT	1 U	MPN/100 mL	1	1
8/18/2014 11:00	Effluent D-001 Grab	Overflow	Fecal Coliforms-Membrane Filter	2 U	cfu/100 mL	2	2
8/18/2014 11:00	Effluent D-001 Grab	Metals	Selenium	0.25 I	ug/L	0.2	0.8
8/18/2014 11:00	Effluent D-001 Grab	Metals	Nickel	1.42	ug/L	0.25	1
8/18/2014 11:00	Effluent D-001 Grab	Metals	Sodium	215	mg/L	2.5	10
8/18/2014 11:00	Effluent D-001 Grab	Metals	Aluminum	35	ug/L	5	20
8/18/2014 11:00	Effluent D-001 Grab	Metals	Copper	1.1	ug/L	0.5	1
8/18/2014 11:00	Effluent D-001 Grab	Metals	Chromium	0.30 U	ug/L	0.3	1.2
8/18/2014 11:00	Effluent D-001 Grab	Metals	Zinc	14 I	ug/L	5	20
8/18/2014 11:00	Effluent D-001 Grab	Metals	Silver	0.025 U	ug/L	0.025	0.1
8/18/2014 11:00	Effluent D-001 Grab	Metals	Lead	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	Effluent D-001 Grab	Metals	Cadmium	0.050 U	ug/L	0.05	0.2
8/18/2014 11:00	Effluent D-001 Grab	Metals	Arsenic	1.25	ug/L	0.25	1
8/18/2014 11:00	Effluent D-001 Grab	Metals	Calcium	53.2	mg/L	0.075	0.3
8/18/2014 11:00	Effluent D-001 Grab	Metals	Potassium	16	mg/L	0.3	1.2
8/18/2014 11:00	Effluent D-001 Grab	Metals	Magnesium	23.8	mg/L	0.04	0.16
8/18/2014 11:00	Effluent D-001 Grab	Metals	Iron	43 I	ug/L	30	120
8/18/2014 11:00	Effluent D-001 Grab	Nutrients	Chloride	240	mg Cl/L	2	5
8/18/2014 11:00	Effluent D-001 Grab	Nutrients	Turbidity	0.65	NTU	0.1	0.1
8/18/2014 11:00	Effluent D-001 Grab	Nutrients	Organic Carbon	7.8 A	mg C/L	0.5	1

Date Sampled	Field ID	Analysis Group	Component	Result	Units	MDL	PQL
8/18/2014 11:00	Effluent D-001 Grab	Nutrients	Alkalinity	147 A	mg CaCO3/L	0.65	2.5
8/18/2014 11:00	Effluent D-001 Grab	Nutrients	Total-P	0.84	mg P/L	0.005	0.05
8/18/2014 11:00	Effluent D-001 Grab	Nutrients	O-Phosphate-P	0.74	mg P/L	0.08	0.2
8/18/2014 11:00	Effluent D-001 Grab	Nutrients	NO2NO3-N	0.44	mg N/L	0.008	0.02
8/18/2014 11:00	Effluent D-001 Grab	Nutrients	Sulfate	220	mg SO4/L	2	5
8/18/2014 11:00	Effluent D-001 Grab	Nutrients	Kjeldahl Nitrogen	0.81	mg N/L	0.08	0.2
8/18/2014 11:00	Effluent D-001 Grab	Nutrients	Fluoride	0.73	mg F/L	0.035	0.1
8/18/2014 11:00	Effluent D-001 Grab	Nutrients	Ammonia-N	0.05	mg N/L	0.002	0.005
8/18/2014 11:00	Effluent D-001 Grab	Nutrients	Color (true)	7.2	PCU	2.5	6
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Ametryn	0.0096 U	ug/L	0.0096	0.039
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Atrazine Desethyl	0.0096 U	ug/L	0.0096	0.039
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Butylate	0.019 U	ug/L	0.019	0.077
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Ethoprop	0.0048 U	ug/L	0.0048	0.019
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Fonofos	0.0096 U	ug/L	0.0096	0.039
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Metalaxyl	0.039 U	ug/L	0.039	0.15
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Alachlor	0.058 U	ug/L	0.058	0.23
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Parathion Methyl	0.0096 U	ug/L	0.0096	0.039
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Simazine	0.0096 U	ug/L	0.0096	0.039
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Sucralose	28	ug/L	0.4	2
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Acetaminophen	0.0050 U	ug/L	0.005	0.025
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Atrazine	0.0096 U	ug/L	0.0096	0.039
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Azinphos Methyl	0.019 U	ug/L	0.019	0.077
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Ethion	0.0096 U	ug/L	0.0096	0.039
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Bromacil	0.039 U	ug/L	0.039	0.15
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Chlorpyrifos Ethyl	0.0096 U	ug/L	0.0096	0.039
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Fenamiphos	0.029 UJ	ug/L	0.029	0.12
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Metribuzin	0.019 U	ug/L	0.019	0.077
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Naled	0.039 U	ug/L	0.039	0.15
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Prometon	0.019 U	ug/L	0.019	0.077
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Carbamazepine	0.057	ug/L	0.0005	0.0025
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Atrazine Desisopropyl	0.0096 U	ug/L	0.0096	0.039
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Demeton	0.023 UJ	ug/L	0.023	0.093
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Diazinon	0.0096 U	ug/L	0.0096	0.039
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Disulfoton	0.0048 U	ug/L	0.0048	0.019
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Parathion Ethyl	0.019 U	ug/L	0.019	0.077
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Phorate	0.0048 U	ug/L	0.0048	0.019
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Norflurazon	0.029 U	ug/L	0.029	0.12
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Hexazinone	0.029 UJ	ug/L	0.029	0.12
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Malathion	0.0096 U	ug/L	0.0096	0.039

Date Sampled	Field ID	Analysis Group	Component	Result	Units	MDL	PQL
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Mevinphos	0.0096 U	ug/L	0.0096	0.039
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Prometryn	0.019 U	ug/L	0.019	0.077
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Chlorpyrifos Methyl	0.0096 U	ug/L	0.0096	0.039
8/18/2014 11:00	Effluent D-001 Grab	Pesticides	Metolachlor	0.058 U	ug/L	0.058	0.23
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	2,4-Dichlorophenol	0.95 U	ug/L	0.95	3.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Pentachlorophenol	2.9 U	ug/L	2.9	11
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19 U	ug/L	0.19	0.76
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Di-n-butyl phthalate	0.95 U	ug/L	0.95	3.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Hexachlorobutadiene	2.9 U	ug/L	2.9	11
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Benzidine	95 U	ug/L	95	380
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Acenaphthylene	0.19 U	ug/L	0.19	0.76
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.95 U	ug/L	0.95	3.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9 U	ug/L	2.9	11
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9 U	ug/L	1.9	7.6
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Naphthalene	0.19 U	ug/L	0.19	0.76
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9 U	ug/L	2.9	11
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	2-Chlorophenol	0.95 U	ug/L	0.95	3.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	2-Nitrophenol	0.95 U	ug/L	0.95	3.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19 U	ug/L	0.19	0.76
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9 U	ug/L	2.9	11
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Diethyl phthalate	0.95 UJ	ug/L	0.95	3.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19 U	ug/L	0.19	0.76
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Phenol	0.95 U	ug/L	0.95	3.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	2,4-Dinitrotoluene	0.95 U	ug/L	0.95	3.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38 U	ug/L	38	150
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9 U	ug/L	1.9	7.6
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Benzo(a)anthracene	0.19 U	ug/L	0.19	0.76
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Butyl benzyl phthalate	0.95 U	ug/L	0.95	3.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Chrysene	0.19 U	ug/L	0.19	0.76
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Nitrobenzene	1.9 U	ug/L	1.9	7.6
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.95 U	ug/L	0.95	3.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	2,6-Dinitrotoluene	0.95 U	ug/L	0.95	3.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Hexachlorobenzene	0.95 UJ	ug/L	0.95	3.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9 UJ	ug/L	1.9	7.6
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Phenanthrene	0.19 U	ug/L	0.19	0.76
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Bromodichloromethane	11	ug/L	0.2	0.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.38 U	ug/L	0.38	0.76
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	2,4-Dimethylphenol	9.5 U	ug/L	9.5	38
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	2-Chloronaphthalene	0.95 U	ug/L	0.95	3.8

Date Sampled	Field ID	Analysis Group	Component	Result	Units	MDL	PQL
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	4-Nitrophenol	14 UJ	ug/L	14	57
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Acenaphthene	0.19 U	ug/L	0.19	0.76
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19 U	ug/L	0.19	0.76
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Hexachloroethane	2.9 U	ug/L	2.9	11
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Isophorone	0.95 U	ug/L	0.95	3.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9 U	ug/L	2.9	11
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.95 U	ug/L	0.95	3.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Benzo(a)pyrene	0.19 U	ug/L	0.19	0.76
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.95 U	ug/L	0.95	3.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19 U	ug/L	0.19	0.76
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Dimethyl phthalate	0.95 U	ug/L	0.95	3.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Fluoranthene	0.19 U	ug/L	0.19	0.76
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Pyrene	0.19 U	ug/L	0.19	0.76
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	2,4-Dinitrophenol	14 UJ	ug/L	14	57
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Anthracene	0.19 U	ug/L	0.19	0.76
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.95 U	ug/L	0.95	3.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	1.9 U	ug/L	1.9	7.6
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Di-n-octyl phthalate	0.95 U	ug/L	0.95	3.8
8/18/2014 11:00	Effluent D-001 Grab	Priority Organic Pollutants	Fluorene	0.19 U	ug/L	0.19	0.76
8/18/2014 11:00	Effluent D-001 Grab	Nutrients	Temperature	31.25	C		
8/18/2014 11:00	Effluent D-001 Grab	Nutrients	Specific Conductance	1508	umhos/cm		
8/18/2014 11:00	Effluent D-001 Grab	Nutrients	Total Residual Chlorine	0.01	mg/L		
8/18/2014 11:00	Effluent D-001 Grab	Nutrients	Dissolved Oxygen	6.56	mg/L		
8/18/2014 11:00	Effluent D-001 Grab	Nutrients	pH	7.93			
8/18/2014 0:00	Field Blank	Metals	Magnesium	0.040 U	mg/L	0.04	0.16
8/18/2014 0:00	Field Blank	Metals	Potassium	0.30 U	mg/L	0.3	1.2
8/18/2014 0:00	Field Blank	Metals	Zinc	5.0 U	ug/L	5	20
8/18/2014 0:00	Field Blank	Metals	Cadmium	0.050 U	ug/L	0.05	0.2
8/18/2014 0:00	Field Blank	Metals	Copper	0.50 U	ug/L	0.5	1
8/18/2014 0:00	Field Blank	Metals	Aluminum	5.0 U	ug/L	5	20
8/18/2014 0:00	Field Blank	Metals	Calcium	0.075 U	mg/L	0.075	0.3
8/18/2014 0:00	Field Blank	Metals	Iron	30 U	ug/L	30	120
8/18/2014 0:00	Field Blank	Metals	Silver	0.025 U	ug/L	0.025	0.1
8/18/2014 0:00	Field Blank	Metals	Nickel	0.25 U	ug/L	0.25	1
8/18/2014 0:00	Field Blank	Metals	Chromium	0.30 U	ug/L	0.3	1.2
8/18/2014 0:00	Field Blank	Metals	Arsenic	0.25 U	ug/L	0.25	1
8/18/2014 0:00	Field Blank	Metals	Lead	0.20 U	ug/L	0.2	0.8
8/18/2014 0:00	Field Blank	Metals	Selenium	0.20 U	ug/L	0.2	0.8
8/18/2014 0:00	Field Blank	Metals	Sodium	0.50 U	mg/L	0.5	2

Date Sampled	Field ID	Analysis Group	Component	Result	Units	MDL	PQL
8/18/2014 0:00	Field Blank	Nutrients	Chloride	0.20 U	mg Cl/L	0.2	0.5
8/18/2014 0:00	Field Blank	Nutrients	Alkalinity	0.65 U	mg CaCO3/L	0.65	2.5
8/18/2014 0:00	Field Blank	Nutrients	Kjeldahl Nitrogen	0.080 U	mg N/L	0.08	0.2
8/18/2014 0:00	Field Blank	Nutrients	Total-P	0.002 U	mg P/L	0.002	0.005
8/18/2014 0:00	Field Blank	Nutrients	Sulfate	0.20 U	mg SO4/L	0.2	0.5
8/18/2014 0:00	Field Blank	Nutrients	Turbidity	0.10 U	NTU	0.1	0.1
8/18/2014 0:00	Field Blank	Nutrients	O-Phosphate-P	0.004 U	mg P/L	0.004	0.01
8/18/2014 0:00	Field Blank	Nutrients	Ammonia-N	0.003 I	mg N/L	0.002	0.005
8/18/2014 0:00	Field Blank	Nutrients	Color (true)	2.5 U	PCU	2.5	6
8/18/2014 0:00	Field Blank	Nutrients	Organic Carbon	0.50 U	mg C/L	0.5	1
8/18/2014 0:00	Field Blank	Nutrients	NO2NO3-N	0.004 U	mg N/L	0.004	0.01
8/18/2014 0:00	Field Blank	Nutrients	Fluoride	0.035 U	mg F/L	0.035	0.1
8/18/2014 0:00	Field Blank	Pesticides	Parathion Methyl	0.0095 U	ug/L	0.0095	0.038
8/18/2014 0:00	Field Blank	Pesticides	Carbamazepine	5.0E-04 U	ug/L	0.0005	0.0025
8/18/2014 0:00	Field Blank	Pesticides	Parathion Ethyl	0.019 U	ug/L	0.019	0.076
8/18/2014 0:00	Field Blank	Pesticides	Sucralose	0.010 U	ug/L	0.01	0.05
8/18/2014 0:00	Field Blank	Pesticides	Phorate	0.0048 U	ug/L	0.0048	0.019
8/18/2014 0:00	Field Blank	Pesticides	Prometryn	0.019 U	ug/L	0.019	0.076
8/18/2014 0:00	Field Blank	Pesticides	Mevinphos	0.0095 U	ug/L	0.0095	0.038
8/18/2014 0:00	Field Blank	Pesticides	Ethion	0.0095 U	ug/L	0.0095	0.038
8/18/2014 0:00	Field Blank	Pesticides	Hexazinone	0.029 UJ	ug/L	0.029	0.11
8/18/2014 0:00	Field Blank	Pesticides	Fenamiphos	0.029 UJ	ug/L	0.029	0.11
8/18/2014 0:00	Field Blank	Pesticides	Chlorpyrifos Methyl	0.0095 U	ug/L	0.0095	0.038
8/18/2014 0:00	Field Blank	Pesticides	Butylate	0.019 U	ug/L	0.019	0.076
8/18/2014 0:00	Field Blank	Pesticides	Bromacil	0.038 U	ug/L	0.038	0.15
8/18/2014 0:00	Field Blank	Pesticides	Atrazine	0.0095 U	ug/L	0.0095	0.038
8/18/2014 0:00	Field Blank	Pesticides	Demeton	0.023 UJ	ug/L	0.023	0.091
8/18/2014 0:00	Field Blank	Pesticides	Prometon	0.019 U	ug/L	0.019	0.076
8/18/2014 0:00	Field Blank	Pesticides	Atrazine Desethyl	0.0095 U	ug/L	0.0095	0.038
8/18/2014 0:00	Field Blank	Pesticides	Ethoprop	0.0048 U	ug/L	0.0048	0.019
8/18/2014 0:00	Field Blank	Pesticides	Alachlor	0.057 U	ug/L	0.057	0.23
8/18/2014 0:00	Field Blank	Pesticides	Azinphos Methyl	0.019 U	ug/L	0.019	0.076
8/18/2014 0:00	Field Blank	Pesticides	Diazinon	0.0095 U	ug/L	0.0095	0.038
8/18/2014 0:00	Field Blank	Pesticides	Fonofos	0.0095 U	ug/L	0.0095	0.038
8/18/2014 0:00	Field Blank	Pesticides	Malathion	0.0095 U	ug/L	0.0095	0.038
8/18/2014 0:00	Field Blank	Pesticides	Metolachlor	0.057 U	ug/L	0.057	0.23
8/18/2014 0:00	Field Blank	Pesticides	Naled	0.038 U	ug/L	0.038	0.15
8/18/2014 0:00	Field Blank	Pesticides	Metalaxyl	0.038 U	ug/L	0.038	0.15
8/18/2014 0:00	Field Blank	Pesticides	Atrazine Desisopropyl	0.0095 U	ug/L	0.0095	0.038

Date Sampled	Field ID	Analysis Group	Component	Result	Units	MDL	PQL
8/18/2014 0:00	Field Blank	Pesticides	Simazine	0.0095 U	ug/L	0.0095	0.038
8/18/2014 0:00	Field Blank	Pesticides	Norflurazon	0.029 U	ug/L	0.029	0.11
8/18/2014 0:00	Field Blank	Pesticides	Metribuzin	0.019 U	ug/L	0.019	0.076
8/18/2014 0:00	Field Blank	Pesticides	Disulfoton	0.0048 U	ug/L	0.0048	0.019
8/18/2014 0:00	Field Blank	Pesticides	Chlorpyrifos Ethyl	0.0095 U	ug/L	0.0095	0.038
8/18/2014 0:00	Field Blank	Pesticides	Ametryn	0.0095 U	ug/L	0.0095	0.038
8/18/2014 0:00	Field Blank	Pesticides	Acetaminophen	5.0E-04 U	ug/L	0.0005	0.0025
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	2,4-Dichlorophenol	0.97 U	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	2,4-Dinitrophenol	15 UJ	ug/L	15	58
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	0.97 U	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	2-Chlorophenol	0.97 U	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.97 U	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Acenaphthylene	0.19 U	ug/L	0.19	0.78
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Di-n-butyl phthalate	0.97 U	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19 U	ug/L	0.19	0.78
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Hexachlorobenzene	0.97 UJ	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19 U	ug/L	0.19	0.78
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Naphthalene	0.19 U	ug/L	0.19	0.78
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	0.97 U	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	2-Chloronaphthalene	0.97 U	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.97 U	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Acenaphthene	0.19 U	ug/L	0.19	0.78
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Benzidine	97 U	ug/L	97	390
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Benzo(a)anthracene	0.19 U	ug/L	0.19	0.78
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9 U	ug/L	2.9	12
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Butyl benzyl phthalate	0.97 U	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Fluorene	0.19 U	ug/L	0.19	0.78
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9 UJ	ug/L	1.9	7.8
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9 U	ug/L	2.9	12
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Phenol	0.97 U	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Benzo(a)pyrene	0.19 U	ug/L	0.19	0.78
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Isophorone	0.97 U	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9 U	ug/L	2.9	12
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	39 U	ug/L	39	160
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19 U	ug/L	0.19	0.78
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19 U	ug/L	0.19	0.78
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Diethyl phthalate	0.97 UJ	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Hexachlorobutadiene	2.9 U	ug/L	2.9	12
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Pentachlorophenol	2.9 U	ug/L	2.9	12

Date Sampled	Field ID	Analysis Group	Component	Result	Units	MDL	PQL
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	2,4-Dimethylphenol	9.7 U	ug/L	9.7	39
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	2-Nitrophenol	0.97 U	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19 U	ug/L	0.19	0.78
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Fluoranthene	0.19 U	ug/L	0.19	0.78
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9 U	ug/L	1.9	7.8
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Nitrobenzene	1.9 U	ug/L	1.9	7.8
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.39 U	ug/L	0.39	0.78
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	4-Nitrophenol	15 UJ	ug/L	15	58
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.97 U	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Chrysene	0.19 U	ug/L	0.19	0.78
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9 U	ug/L	2.9	12
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.97 U	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9 U	ug/L	1.9	7.8
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.97 U	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Phenanthrene	0.19 U	ug/L	0.19	0.78
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Pyrene	0.19 U	ug/L	0.19	0.78
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Anthracene	0.19 U	ug/L	0.19	0.78
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	1.9 U	ug/L	1.9	7.8
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Di-n-octyl phthalate	0.97 U	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Dimethyl phthalate	0.97 U	ug/L	0.97	3.9
8/18/2014 0:00	Field Blank	Priority Organic Pollutants	Hexachloroethane	2.9 U	ug/L	2.9	12
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	1,1,2-Trichloroethane	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Tetrachloroethene	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	1,2-Dichloropropane	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	4-Methyl-2-Pentanone	5.0 U	ug/L	5	20
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	1,2-Dichloroethane	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Chloroform	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	1,3-Dichlorobenzene	0.50 U	ug/L	0.5	2
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	trans-1,3-Dichloropropene	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Trichlorofluoromethane	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Toluene	0.70 I	ug/L	0.5	2
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Dibromochloromethane	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	1,2-Dichlorobenzene	0.50 U	ug/L	0.5	2
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	2-Hexanone	5.0 U	ug/L	5	20
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Carbon tetrachloride	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Chlorobenzene	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Chloroethane	0.50 U	ug/L	0.5	2
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	o-Xylene	0.50 U	ug/L	0.5	2
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	1,1-Dichloroethene	0.20 U	ug/L	0.2	0.8

Date Sampled	Field ID	Analysis Group	Component	Result	Units	MDL	PQL
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	2-Chloroethylvinyl ether	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Carbon disulfide	0.50 U	ug/L	0.5	2
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Styrene	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Vinyl chloride	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	cis-1,2-Dichloroethene	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	1,1,2,2-Tetrachloroethane	0.50 U	ug/L	0.5	2
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	1,4-Dichlorobenzene	0.50 U	ug/L	0.5	2
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Acetone	5.0 U	ug/L	5	20
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Methylene chloride	1.0 U	ug/L	1	4
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	1,1,1-Trichloroethane	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	1,1-Dichloroethane	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Bromodichloromethane	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Chloromethane	0.50 U	ug/L	0.5	2
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Trichloroethene	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	cis-1,3-Dichloropropene	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	m,p-Xylene	0.50 U	ug/L	0.5	2
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	trans-1,2-Dichloroethene	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	2-Butanone	5.0 U	ug/L	5	20
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Benzene	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Bromomethane	0.50 UJ	ug/L	0.5	2
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Ethylbenzene	0.20 U	ug/L	0.2	0.8
8/18/2014 11:00	TRIP BLANK	Priority Organic Pollutants	Bromoform	0.20 U	ug/L	0.2	0.8
8/20/2014 7:00	Effluent D-001 Comp	Nutrients	pH	7.95			
8/20/2014 7:00	Effluent D-001 Comp	Nutrients	Dissolved Oxygen	6.45	mg/L		
8/20/2014 7:00	Effluent D-001 Comp	Nutrients	Specific Conductance	1472	umhos/cm		
8/20/2014 7:00	Effluent D-001 Comp	Nutrients	Temperature	4	C		
8/22/2014 19:00	Effluent D-001 Comp	Nutrients	Dissolved Oxygen	6.57	mg/L		
8/22/2014 19:00	Effluent D-001 Comp	Nutrients	Temperature	4	C		
8/22/2014 19:00	Effluent D-001 Comp	Nutrients	pH	7.92			
8/22/2014 19:00	Effluent D-001 Comp	Nutrients	Specific Conductance	1537	umhos/cm		

EPA End Sheet

The Bioassay of City of Sarasota AWWTF effluent sampled on August 18, 20 and 22, 2014. NPDES #FL0040771.

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 FL0040771 11	12 140818	18 B	19 S	20 1

Remarks

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The Priority Pollutants Analysis of City of Sarasota AWWTF effluent sampled on August 18, 2014. NPDES #FL0040771.

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 FL0040771 11	12 140818	18 X	19 S	20 1

Remarks

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Biological Analyses of City of Sarasota AWWTF effluent sampled on August 18, 2014. NPDES #FL0040771.

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 FL0040771 11	12 140818	18 S	19 S	20 1

Remarks

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