

Biological Assessment of

Town of Callahan WWTF

Nassau County

NPDES #FL0038407

Sampled May 21, 2007

February 2008

Biology Section

Bureau of Laboratories

Division of Environmental Assessment and Restoration

Quality Manual No. 870346G

NELAC Certification No. E31780

Florida Department of Environmental Protection

Fifth Year Inspection Summary

Discharger:	Callahan WWTF
Physical Address:	Brandies Ave East, Callahan, Florida
County:	Nassau
NPDES Number:	FL0038407
Permit Expiration:	March 30, 2008

Toxics Sampling Inspection **(XSI)**

Date Sampled: May 21, 2007

Results: Silver was detected in the effluent (5.3 µg/L) and at both the Control and Test Sites (0.42 and 4.8 µg/L, respectively) at levels that exceeded Class III Water Quality Standards (≤ 0.07 µg/L). Copper, iron, lead, nickel, and zinc were detected in the effluent at levels that complied with Class III Surface Water Criteria. Copper, iron, lead, nickel, silver, and zinc were found to be higher at the Test Site than the Control Site and were above the method detection limits (MDL) and practical quantitation limits (PQL) at both sites, with the exception of zinc which was between the MDL and PQL at the Control Site. Cadmium and Chromium III were detected in the effluent and at the Control and Test Sites between the MDL and PQL. No organic priority pollutants were detected in the effluent. We note that the receiving stream was barely flowing on the sampling day, and field personnel indicated that Control Site grab samples were influenced by the effluent to an unknown degree.

Compliance Biomonitoring Inspection **(CBI)**

Date Sampled: May 21, 2007

Results: The effluent sample was not acutely toxic to the fish, *Cyprinella leedsi,* nor to the water flea, *Ceriodaphnia dubia,* during the 48-hour acute screening bioassays.

Water Quality Inspection **(WQI)**

Date Sampled: May 21 and 24, 2007 and June 5 and 19, 2007

Results: Fecal coliform counts in the effluent did not exceed Class III Water Quality Criteria during the initial inspection, but counts at the Control and Test Sites exceeded the criteria. Effluent total phosphorus (6.2 mg/L), ortho-phosphate (3.4 mg/L), TKN (10 mg/L), nitrate-nitrite (1.4 mg/L) and organic nitrogen (8.9 mg/L) levels were very high and contributed to elevated nutrient levels measured at the Test Site compared to the Control Site. The Control Site total phosphorus (2.8 mg/L), ortho-phosphate (2.2 mg/L), TKN (4.4 mg/L) and nitrate-nitrite (0.4 mg/L) were also quite

high, which either indicates that the effluent is contributing to greater nutrient enrichment in an already enriched section of Alligator Creek, or that the Control Site results were influenced by the effluent. The AGP values from the effluent (226 mg dry wt/L), Test Site (170 mg dry wt/L) and Control Site (98.3 mg dry wt/L) all greatly exceeded the "problem" threshold of 5.0 mg dry wt/L. The effluent dissolved oxygen (5.6 mg/L) did not meet the permit limit of ≥ 6.0 mg/L. Dissolved oxygen concentrations at the Control (1.2 mg/L) and Test Sites (1.8 mg/L) violated Class III Water Quality Standard (≥ 5.0 mg/L). The lack of flow in the creek due to drought conditions may have been a factor in the low dissolved oxygen conditions. The effluent also exceeded the facility's permit limit for Total Suspended Solids (41 mg/L).

Additional sampling was conducted to collect additional permit-related information for turbidity, fecal coliforms, total suspended solids, and BOD. Sampling circumstances and results are listed in Appendix B. Fecal coliform counts exceeded water quality criteria at the Test Site and at the site 100m downstream on all of the additional sampling events, and also exceeded permit limits in the effluent for both sampling events conducted in June. TSS levels in the effluent violated permit limits on both dates in June. Dissolved oxygen levels were below the minimum the water quality criterion at the Control Site and the 100m downstream site on all additional sampling dates, and all but the June 19, 2007 sampling at the Test Site.

Impact Bioassessment Inspection **(IBI)**

Date Sampled: May 21, 2007

Results: Stream Condition Index (SCI) samples were not collected due to unsafe conditions for samplers at the Test Site. Hester-Dendy samples of benthic macroinvertebrates indicated a 98% reduction in the Shannon-Weaver diversity scores at the Test Site compared to the Control Site. This reduction is an exceedance of the Class III Surface Water Quality Biological Integrity Criterion (62-302.503(11), F.A.C). The most notable community changes from the Control Site to the Test Site were decreases in the number of taxa and the diversity, and the increase in the percent dominant taxon and the density of individuals. Habitat assessment scores indicated slightly better habitat at the Control Site (80; "suboptimal") than at the Test Site (69; "marginal"). Periphyton samples were not collected at the Test Site.

Biological assessments are prepared by FDEP staff to provide information for review of NPDES permit renewal applications. Biological assessments, in conjunction with other information concerning the subject facility and its receiving-water body, are used to determine appropriate permit conditions

Introduction

The Town of Callahan WWTF is located in Nassau County, Florida (see map in Appendix A) and treats domestic wastewater. The treatment consists of a comunitor system, a primary screening and grit removal unit, a flow equalization tank, a secondary clarifier, a chlorine contact chamber, and an aerobic digester (see Facility Summary in Appendix B). The effluent is then discharged into the Class III fresh waters of Alligator Creek. The design flow of the wastewater system is 0.3 million gallons per day (MGD). The average annual flow from January 2006 to February 2007 was 0.2 MGD.

Surface Water Quality Criteria and facility permit limits are listed in Table 1. According to the facility's monthly discharge monitoring reports, the plant has had no violations within the year prior to this sampling event (Appendix B). The facility is currently operating under a Consent Order, OGC File Number 06-0024, executed on March 21, 2006, due to previous violations of total ammonia, total suspended solids (TSS), and carbonaceous biochemical oxygen demand (CBOD 5-day) levels. The Consent Order requires the Town of Callahan WWTF to construct modifications to the facility and the effluent disposal system by March 21, 2009. The Consent Order requires that total ammonia levels be under a monthly average limit of 14.0 mg/L, an annual average limit of 9.0 mg/L, and a maximum limit of 20.0 mg/L. The CBOD 5-day levels must be under a monthly average limit of 25.0 mg/L and an annual average limit of 20.0 mg/L, and the TSS must be under a monthly average of 25.0 mg/L and an annual average of 20.0 mg/L.

During the inspection on May 21, 2007, the samplers were not able to complete the Stream Condition Index (SCI) test or the periphyton sample collection at the Test Site. The samplers were overwhelmed by the strength of the hydrogen sulfide fumes released from the sediment while stepping in the creek. At the time of sampling the stream had very low flow due to drought conditions, which likely contributed to the buildup of gas in the soil. Additional sampling for turbidity, fecal coliforms, TSS, and BOD was conducted at the initial and additional sites in late May and early June to provide more information related to the Consent Order. The additional sampling locations and results are listed in Table 2 and Appendix B, and shown in Appendix A.

Methods

The purpose of this investigation was to determine the potential effects of the facility's effluent on the biota of the receiving waters. Chemical and biological comparisons were made between a Control Site (located in Alligator Creek approximately 100 meters upstream of the discharge) and a Test Site (located in Alligator Creek approximately 10 meters downstream of the discharge). Field samplers noted that the effluent had backed up into the Control Site area on the day of the initial sampling, so the Control Site was influenced by the effluent to an unknown degree. This was evident by the turbidity plume coming from the effluent up into the Control Site. When Hester-Dendy samplers were deployed on April 12, 2007, the effluent was not backed up into the Control Site.

A description of the field and laboratory measurements and their relationship to Florida Administrative Code are given in Appendix C. All field and laboratory biological methods followed Biology Section Standard Operating Procedures (SOPs, see http://www.floridadep.org/labs/qa/2002sops.htm for details) and met FDEP quality assurance/quality control standards (see http://www.floridadep.org/labs/qa/index.htm).

The following were involved in this investigation: Tom Kallemeyn and Joseph Emery of the FDEP Northeast District in Jacksonville (District) and the FDEP Central Laboratory in Tallahassee. Appendix D provides the chain of custody information (sample submittal form). The report was reviewed by District representatives and the Point Source Studies Review Committee (Michael Tanski, Nancy Ross and Jennifer Paris).

Results and Discussion

- Specific chemical results are reported in Tables 1 and 3, and a complete list of chemical analytes can be reviewed in Appendix E. Effluent conductivity and pH complied with Class III Water Quality Criteria and facility permit limits. However, dissolved oxygen in the effluent (5.6 mg/L) was below the permit limit of 6.0 mg/L, and the levels at the Control (1.2 mg/L) and Test Site (1.8 mg/L) were both below the Class III Water Quality Criterion of ≥ 5.0 mg/L, which is a violation of 62-302.530(31), F.A.C. These values may be due in part to the low flow conditions at the time of sampling. Conductivity and pH at the Control and Test Sites complied with Class III Water Quality Criteria (Table 1; 62-302.530, F.A.C.). Although the conductivity was elevated at both receiving water sites, the upstream site level was lower than the downstream site on the day of the initial inspection and on the May 24, 2007 sampling. The upstream conductivity levels measured in May were approximately two times higher than levels measured the following month, while the effluent levels remained fairly constant. This suggests the effluent influenced the upstream portion of the stream in May. The samplers noted that the June sampling event occurred after rainfall events in the area which may have helped the stream to flow normally.
- Total ammonia levels were the same at the Control and Test sites during the initial inspection (1.5 mg/L; Table 1). Total ammonia in the

Table 1. Effluent limits, Class III Freshwater Criteria and chemical, microbiological and toxicological data for initial sampling conducted on May 21, 2007.

Callahan WWTF	Class III Criteria	Effluent Limits	Effluent	Control Site	Test Site 10m
Organic Constituents (µg/L)					
None Detected	-	-	-	-	-
Nutrients (mg/L)					
Ortho-phosphate	-	Report	3.4	2.2	3.7
Total Phosphorus	-	Report	6.2	2.8	5.1
Total Ammonia	-	20.0 sΔ	1.1	1.5	1.5
Un-ionized Ammonia	≤ 0.02 s	Report	≤ 0.02 c	0.06 c	≤ 0.02 c
Nitrate and Nitrite	-	Report	1.4	0.4	0.6
Total Kjeldahl Nitrogen	-	Report	10	4.4	8.2
Organic Nitrogen	-	Report	8.9 c	2.9 c	6.7 c
Total Nitrogen	-	20.0 s	11.4 c	4.8 c	8.8 c
General Physical and Chemical Parameters					
Habitat Assessment	-	-	-	80	69
Dissolved Oxygen (mg/L)	≥ 5.0	≥ 6.0 s	5.6	1.2	1.8
pH (SU)	6.0 - 8.5	6.0 - 8.5 s	7.3	8.0	6.9
Conductivity (µmhos/cm)	≤ 1,275	-	807	666	820
Alkalinity mg CaCO3/L	≥ 20.0	-	166	-	-
Temperature °C	-	Report	23.6	16.9	21.1
Sample Depth (m)	-	-	-	0.4	1.2
Total Residual Chlorine (mg/L)	≤ 0.01	≤ 0.01 s	≤ 0.03 *	-	-
Chlorophyll a (µg/L)	-	-	1.7 U	1.7 U	1.7 U
Phaeophytin (µg/L)	-	-	3 U	3 U	3 U
CBOD 5-day N-inhibited (mg/L)	-	30.0 s	7.8 AL	-	-
Total Suspended Solids (mg/L)	-	30.0 s	41	-	-
Hardness (mg $CaCO_3$)	-	Report	265.37 c	282.30 c	267.47 c
Toxicity (48-hour acute screening bioassay, percent mortality in 100% effluent)					
Bioassay - Water flea *(Ceriodaphnia dubia)*	-	-	0	-	-
Bioassay - Fish *(Cyprinella leedsi)*	-	-	0	-	-
Microbiology (colony forming units/100ml)					
Fecal Coliforms	≤ 400 s	≤ 800 s	70 B	545 AB	909 AB

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

B - Results based on colony counts outside the acceptance range

K - Actual value is known to be less than value given

L - Actual value is known to be greater than value given

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

* - based on chlorine measured in the lab during toxicity testing

Δ - Interim Limit under Consent Order

Table 2. Supplemental Data Results from additional sampling events of Callahan WWTF and receiving waters. The Upstream 100m site corresponds to the Control Site on Table 1, POD 10m Downstream site corresponds to the Test Site, and Callahan CCC corresponds to the effluent.

		Upstream of Stormwater Discharge	Downstream of Stormwater Discharge	Upstream 100m	POD Pipe	Pod 10m Downstream	Downstream 100 m	Callahan CCC
5/21/2007 (initial inspection)	Turbidity (NTU)							
	BOD (mg/L)							7.8 AL
	TSS (mg/L)							41.0
	Fecal Coliforms(#/100mL)			545 AB		909 AB		70 B
	Conductivity(µmhos/cm)			666		820		807
	pH (s.u.)			8.0		6.9		7.3
	DO (mg/L)			1.2		1.8		5.6
	Salinity (ppt)							
	Water Temp (°C)			16.9		21.1		23.6
5/24/2007	Turbidity (NTU)			1.2		24.0	6.0	
	BOD (mg/L)			2 K		41.4	16.4	
	TSS (mg/L)			2.0		46.0	12.0	
	Fecal Coliforms(#/100mL)			100AB		4300.0	520B	
	Conductivity(µmhos/cm)			623		762	723	
	pH (s.u.)			7.45		7.13	7.19	
	DO (mg/L)			2.22		0.44	0.35	
	Salinity (ppt)			0.3		0.38	0.35	
	Water Temp (°C)			19.41		22.53	20.91	
6/5/2007	Turbidity (NTU)	7.0	26.0	14.5	20.0	23.0	13.7	23.0
	BOD (mg/L)	2.2	2.6	2.1	27.1	17.9	8.0	31.0
	TSS (mg/L)	4.0	25.0	4.0	27.0	36.0	6.0	39.0
	Fecal Coliforms(#/100mL)	800.0	400B	300AB	33U	1500B	1000B	1200
	Conductivity(µmhos/cm)	341	233	250	577	352	349	651
	pH (s.u.)	7.7	7.75	7.56	7.43	7.45	7.35	7.47
	DO (mg/L)	3.69	6.72	4.51	7.62	4.29	3.16	9.0
	Salinity (ppt)	0.16	0.11	0.12	0.28	0.17	0.17	0.32
	Water Temp (°C)	24.16	25.98	24.15	25.29	24.22	24.12	25.55
6/19/2007	Turbidity (NTU)			2.1		26.0	6.3	32.0
	BOD (mg/L)			2K		31.0	23.2	31.0
	TSS (mg/L)			3.0		46.0	20.0	46.0
	Fecal Coliforms(#/100mL)			325AB		4200	675AB	TNTC
	Conductivity(µmhos/cm)			312		682	622	762
	pH (s.u.)			7.03		7.23	7.16	7.14
	DO (mg/L)			2.20		5.12	0.66	7.13
	Salinity (ppt)			0.15		0.33	0.3	0.37
	Water Temp (°C)			23.25		25.49	24.59	26.59

value exceeds the water quality criteria or permit limits

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

B - Results based on colony counts outside the acceptable range.

K - Actual value is known to be less than value given

L- -Actual value is known to be greater than value given

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

TNTC - Too numerous to count

Consent Order Limits

	Monthly Av	Annual Av
TSS	25.0	20.0
CBOD5	25.0	20.0

effluent was 1.1 mg/L, which met the single sample maximum interim limit of the Consent Order of 20.0 mg/L. Effluent total phosphorus (6.2 mg/L), ortho-phosphate (3.4 mg/L), total nitrogen (11.4 mg/L), nitrate-nitrite (1.4 mg/L), and TKN concentrations (10 mg/L, Table 1) all contributed to comparatively higher levels at the Test Site than at the Control Site. Ortho-phosphate was 2.2 mg/L at the Control Site and 3.7 mg/L at the Test Site, and total phosphorus was 2.8 mg/L at the Control Site and 5.1 mg/L at the Test Site. The Control Site values for TKN and total nitrogen (4.4 mg/L and 4.8 mg/L, respectively) were nearly doubled at the Test Site (8.2 and 8.8 mg/L, respectively). The high nutrient levels at the Control Site could be due to the effluent flowing upstream through the Control Site at the time of sampling. Samplers also noted that there was moderate potential for non-point source pollution in the area. Un-ionized ammonia was 0.06 µg/L at the Control Site, which is a violation of the Class III Water Quality criterion (≤ 0.02 mg/L; 62-302.530(3), F.A.C.).

- Chlorophyll-*a* was not detected in

Table 3. Effluent limits, Class III Freshwater Criteria, and metals data for samples collected on May 21, 2007.

Callahan WWTF	Effluent Class III Criteria	Effluent Limits	Effluent	Control Site Class III Criteria	Control Site	Test Site Class III Criteria	Test Site
Metals (µg/L unless otherwise noted)							
Aluminum	-	-	382 J	-	551 A	-	380 J
Arsenic	≤ 50	-	0.5 U	≤ 50	0.5 U	≤ 50	0.51 I
Cadmium	≤ 0.56 b	-	0.061 I	≤ 0.6 b	0.055 I	≤ 0.56 b	0.078 I
Calcium (mg/L)	-	-	60.1	-	71 A	-	61.6
Chromium-III	≤ 191.67 b	-	1.1 I	≤ 201.6 b	1.2 I	≤ 192.91 b	1.2 I
Copper	≤ 21.48 b	-	19.8	≤ 22.6 b	3.69 A	≤ 21.62 b	20.4
Iron	≤ 1,000	-	952	≤ 1,000	680 A	≤ 1,000	867
Lead	≤ 11.02 b	-	1.42	≤ 11.9 b	1.18 A	≤ 11.13 b	1.31
Magnesium (mg/L)	-	-	28	-	25.5 A	-	27.6
Nickel	≤ 119.11 b	-	2.45	≤ 125.5 b	1.15 A	≤ 119.91 b	2.34
Selenium	≤ 5.0	-	0.5 U	≤ 5.0	0.5 U	≤ 5.0	0.5 U
Silver	≤ 0.07	-	5.3	≤ 0.07	0.42 A	≤ 0.07	4.8
Zinc	≤ 273.94 b	-	51	≤ 288.7 b	15 I	≤ 275.77 b	56

Value exceeds the Class III Water Quality Criteria or permit limits

b - Value is calculated based on hardness
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

the effluent, Control Site, or the Test Site water samples (Table 1). It is important to note that high levels of nutrients in the water column may or may not fuel immediate algal production. Algal growth at a site is affected by a complex interaction of various environmental conditions such as pH, shading, and turbidity, as well as nutrients. Thus it is not contradictory for ambient nutrient levels to be high and for no chlorophyll-*a* to be detected in water samples.

- Fecal coliform counts in the effluent met Class III Water Quality Criteria and facility permit limits during the initial inspection (See Table 1 for results and Appendix F for laboratory worksheets). However, levels at the Control Site (545 colony forming units (CFU)/100ml) and the Test Site (909 CFU/100 ml) exceeded Class III Water Quality Criteria for fecal coliform counts (≤ 400 CFU, single sample maximum; 62-302.530(6), F.A.C). On May 24, 2007, and June 5 and 19, 2007, fecal coliform counts exceeded Class III Water Quality Criteria (≤ 400 CFU, single sample maximum; 62-302.530 (6), F.A.C) at the Test Site 10m downstream of the effluent (4300, 1500 and 4200 CFU/100mL, respectively) (see Table 2). Fecal coliform counts at the effluent also exceeded permit limits and Class III Water Quality Criteria on June 5, 2007 (1200 CFU/100ml) and on June 19, 2007 (Too Numerous To Count (TNTC)). Samples taken at the Control Site were within normal limits during the additional sampling events con-ducted on May 24, and June 5 and 19, 2007 (100, 300, and 325 CFU/100ml respectively). The additional Test Site located 100m downstream of the effluent also showed elevated fecal counts on May 24, 2007 (520 CFU/100ml), June 5, 2007 (1000 CFU/100ml), and June 19, 2007 (675 CFU/100ml), which all exceed Class III Water Quality Criteria (≤ 400 CFU, single sample maximum; 62-302.530(6), F.A.C). These results give strong evidence that the effluent is contributing to high fecal coliform counts in Alligator Creek.

- Turbidity was not sampled during the initial inspection. Turbidity samples taken during the additional sampling indicated that levels are within normal limits with the exception of the sample taken June 19, 2007 at the Chlorine Contact Chamber (32.0 NTUs) which was more than 29 NTUs above background (2.1 NTUs), a violation of Class III Water Quality Criterion (62-302.530(70), F.A.C.). The TSS results at the effluent were out of compliance with the facility's single sample permit limit of 30 mg/L at the initial sampling on May 21, 2007 (41.0 mg/L) and the two additional samplings in June (39 mg/L on June 5, 2007 and 46 mg/L on June 19, 2007). TSS levels at the

Table 4. Measured and predicted algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN) and total nitrogen (TN) limitation of the freshwater species *Pseudokirchneriella subcapitata*.

Callahan WWTF					
Location	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (TN) ± 20%	Inorganic N:P ratio	Total N:P ratio
Control Site	98.3	72.2 ± 14.4	182.4 ± 36.5	0.9	1.7
Test Site	170.0 A	79.8 ± 16.0	334.4 ± 66.9	0.6	1.7
Effluent	226.0	95.0 ± 19.0	433.2 ± 86.6	0.7	1.8

Test Site (46 mg/L on May 24, 2007, 36 mg/L on June 5, 2007 and 46 mg/L on June 19, 2007) were also above permit limit. The Control Site levels of TSS on both of the June samplings (4.0 mg/L on June 5, 2007 and 3.0 mg/L on June 19, 2007) were very low compared to the Test Site (Tables 1 and 2).

- The CBOD levels (7.8 mg/L) during the initial inspection at the effluent were in compliance with the permit limit of 30 mg/L. On June 5, 2007, BOD was 2.1 mg/L at the Control Site, 17.9 mg/L at the Test Site, and 31.0 mg/L in the effluent. Similarly on June 19, 2007 the Control Site BOD value (2.0 K mg/L) was significantly lower than Test Site and the effluent values (both 31.0 mg/L). There is no permit limit for BOD, but the permit limit for CBOD is ≤30.0 mg/L for a single sample (Tables 1 and 2).
- The effluent sample was not acutely toxic to the fish, *Cyprinella leedsi,* or to the water flea, *Ceriodaphnia dubia,* during 48-hour acute screening bioassays (See Table 1 for percent mortality, Appendix F for bioassay bench sheets, and Appendix G for supporting standard reference toxicant data).
- Most of the effluent metal measurements complied with Class III Water Quality Criteria (62-302.530, F.A.C.; Table 3) and facility permit limits. Silver was detected in the effluent sample (5.3 µg/L), at the Control Site (0.42 µg/L), and at the Test site (4.8 µg/L) at levels that exceeded the Class III Water Quality Criterion (62-302.530(60), F.A.C.). Iron (952 µg/L) and copper (19.8 µg/L) nearly exceeded their respective Class III Water Quality Criteria (iron: ≤1000 µg/L, copper: ≤21.48 µg/L) in the effluent. Chromium III (1.1 µg/L) and cadmium (0.061 µg/L) were detected in the effluent at levels between the method detection limit (MDL) and practical quantitation limit (PQL). Lead (1.42 µg/L), nickel (2.45 µg/L) and zinc (51 µg/L) were detected in the effluent above the MDL and PQL but below the effluent Class III Criteria. The copper value at the Test Site (20.4 µg/L) was much higher than at the Control Site (3.69 µg/L). Iron was elevated at both the Control Site (680 µg/L) and the Test Site (867 µg/L). Nickel and zinc values measured at the Test Site were also higher than at the Control Site. Organic pollutants were not detected in the effluent.
- Algal growth potential (AGP) is a measure of nutrients available for algal growth (Miller *et al.* 1978). Raschke and Shultz (1987) found that AGP of 5.0 mg dry weight/L represents a "problem" threshold for fresh receiving waters, implying nutrient enrichment. Effluent AGP was 226 mg dry weight/L (Table 4). This value is 45 times higher than the problem threshold. The AGP values at the upstream Control Site and downstream Test Site were 98.3 and 170 mg dry weight/L, respectively, also above the problem threshold. The Test Site AGP was twice as high as the Control Site value, indicating further nutrient enrichment related to the Callahan WWTF discharge in this portion of Alligator Creek. The analytical chemistry suggests that the effluent is nitrogen-limited. There was no evidence of growth inhibition in AGP data (Table 4).
- Qualitative periphyton samples taken from the Control Site were comprised of 63% diatoms, 30.5% blue-greens, 3.3% greens, and 2.6% euglenophytes (Table 5). Periphyton samples were not taken at the Test Site and therefore no comparison can be made between sites.
- Quantitative measures of benthic macroinvertebrate assemblages from

Table 5. Periphyton Composition - Qualitative.

Callahan WWTF	Control Site*
Number of Wet Taxa	20
Number of Taxa (incl. Diatom Taxa)	64
Number of Wet Algal Units Identified	305
Number of Algal Units Identified (incl. Diatom count)	806
Percent Dominant Taxon	63.0
Percentage Composition	
Blue-green algae	30.5
Green algae	3.3
Diatoms	63.0
Cryptophytes	0.7
Euglenophytes	2.6

* Periphyton was only collected at Control Site

Hester-Dendy samplers showed significantly reduced taxa richness and diversity at the Test Site compared to the Control Site (Table 6, Appendix J). The number of taxa was 18 at the Control Site and 5 at the Test Site. Shannon-Weaver diversity fell from 2.39 at the Control Site to 0.04 at the Test Site. This 98% reduction in diversity violates the <25% reduction biological criterion (62-302.530(11) F.A.C). There were approximately four times as many individuals per unit area on the Test Site Hester-Dendy samplers and one-third less taxa than on the Control Site's. Both the Control Site and the Test Site were dominated by the pollution-tolerant dipteran *Chironomus* sp., which is common in nutrient-enriched environments. *Chironomus* sp. comprised 99.7% of the Test Site's macroinvertebrate community and 45.4% of the Control Site's community.

- Qualitative benthic macroinvertebrate samples were not collected at the Test Site due to the overwhelming hydrogen sulfide gases released as the sampler stepped in the creek. The sample was collected at the Control Site, but was not analyzed since no comparison could be made.
- Habitat assessment scores placed the Control Site (80) in the "sub-optimal" category and the Test Site (69) the "marginal" category. The lower scores at the Test Site were mainly due to less substrate diversity and increased habitat smothering. Low flow and little substrate availability lowered the habitat assessment scores at both sites.

Summary

The FDEP data from this inspection indicate Class III Water Quality Criteria or permit limit exceedances for TSS, silver, turbidity, biological effects, dissolved oxygen and fecal coliforms by this facility. The Town of Callahan WWTF is currently operating under a Consent Order intended to address problems with TSS, total ammonia, and CBOD. This portion of Alligator Creek appears to be nutrient enriched, and the effluent is contributing additional nutrients. Concentrations of ortho-phosphate, total phosphorus, and TKN were higher at the Test Site compared to the Control Site. However, the full extent of the effluent's influence was not seen due to the backflow of the effluent into the Control Site. Biological community data show that there is a substantial degradation in diversity at the Test Site compared to the Control Site. Shannon-Weaver diversity decreased by 98% at the Test Site from the Control Site, and the number of taxa decreased from 18 at the Control Site to 5 at the Test Site. Both the Control Site and the Test Site were dominated by the pollution-tolerant dipteran *Chironomus* sp.; however this organism comprised 99.7% of the Test Site's population and 45.4% of the Control Site's population. Previous inspections in 1996 and 2001, and the current inspection, indicate high levels of TKN, ortho-phosphate and total phosphorus in the effluent, as well as extremely high AGP levels due to these high nutrient levels. The current inspection showed that additional monitoring may be warranted and corrective action is still needed to address these issues.

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Table 6. Macroinvertebrate Hester-Dendy Samples - Quantitative.

Callahan WWTF	Control Site	Test Site
Summary Statistics		
Shannon-Weaver Diversity	2.39	0.04
Number of Taxa	18	5
Florida Index	2	0
Number of EPT Taxa	1	0
Percent Dominant Taxon	45.4	99.7
Dominant Taxon Name	*Chironomus* sp. (Diptera)	*Chironomus* sp. (Diptera)
Total Number of Individuals (counted)	809	3,243
Total Number of Individuals (#/m^2)	2,141	8,579
Community Composition: Percent of total		
Bivalvia	0.8	0.0
Coleoptera	0.1	0.0
Diptera	50.4	99.7
Ephemeroptera	0.1	0.0
Gastropoda	11.5	0.3
Odonata	0.1	0.0
Oligochaeta	36.8	0.0
Plecoptera	0.0	0.0
Trichoptera	0.0	0.0
Other	0.9	0.0
Functional Feeding Groups: Percent of total		
Burrowing Deposit Feeders	36.8	0.0
Predators	0.4	0.0
Scrapers	9.7	0.3
Surface Deposit Feeders	50.6	99.7
Suspension Feeders	2.5	0.0

Appendices

- Appendix A. Map of facility
- Appendix B. Facility summary
- Appendix C. Explanation of measurements
- Appendix D. Chain of Custody form
- Appendix E. Chemical analyses of effluent and receiving water.
- Appendix F. Additional physical, chemical, toxicological and microbiological results
- Appendix G. Standard Reference Toxicant test data
- Appendix H. Habitat Assessment field sheets
- Appendix I1. Periphyton: Wet Taxa list and number of individuals counted
- Appendix I2. Periphyton: Diatom taxa list and number of individuals counted
- Appendix J1. Hester-Dendy multi-plate samplers: Taxa list and macroinvertebrate density (average number of individuals per m^2)
- Appendix J2. Hester-Dendy multi-plate samplers: Taxa list and total number of macroinvertebrates counted

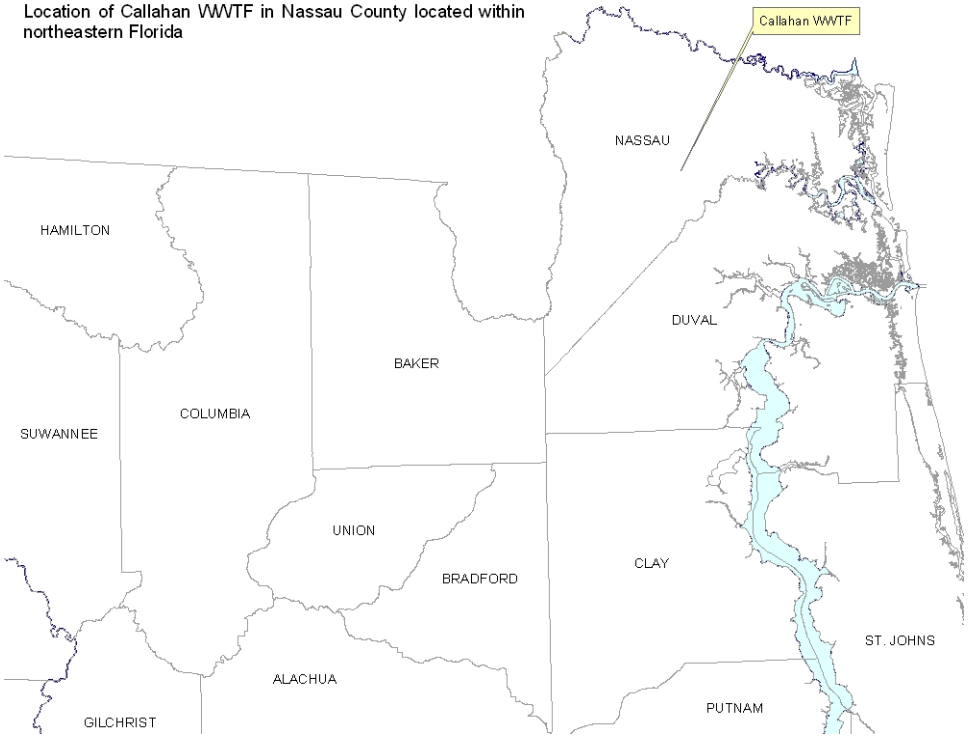
Appendix A

Map of Facility

Alligator Creek Sample Sites @ Callahan WWTF



Location of Callahan WWTF in Nassau County located within northeastern Florida



Appendix B

Facility Summary

State of Florida
Department of Environmental Protection
Facility Introduction

Town of Callahan wastewater treatment facility (WWTF) is a 0.30 MGD annual average daily flow (AADF) permitted capacity domestic WWTF consisting of a communitor system. a primary screening and grit removal unit, a flow equalization tank, a RBC unit which consists of one row with three conventional shafts, a secondary clarifier, a chlorine contact chamber and an aerobic digester that treats domestic wastewater prior to discharge to Alligator Creek (Class III fresh water). The average annual flow to the WWTF for January 2006 till February 2007 was 0.2 MGD. They are in the process of replacing and upgrading the current facility with an oxidation ditch, clarifiers, filters, chlorine contact chamber, and digester in the current permit modification.

State of Florida

Department of Environmental Protection
Facility Introduction & Summary

Facility Name (as it appears on permit): Town of Callahan		**Former Names:** N/A
Physical Address: Brandies Avenue East Callahan, Florida 32011	**NPDES Permit No.:** FL0038407 **Expiration Date:** March 30. 2008	**Prepared By:** Joseph Emery
County: Nassau	**District:** Northeast	**Facility Type:** Domestic Wastewater
Function of Facility: Treats domestic wastewater to secondary standards prior to discharge to Alligator Creek (Class III fresh waters)		
Sampling Location (actual permit designation of permitted sampling point): Sampling locations are located approximately at latitude 30 ° 24' 27" N, longitude 81 ° 49' 39" W. EFA-1 - Sample point immediately after disinfection, EFD-1 - Sample point after dechlorination and prior discharge to the Creek, CAL-1 - Calculated value, SWU-1 - Upstream Alligator Creek at U.S. 1 (upstream from the bridge), SWU-2 - Upstream Little Mills Creek at U.S.1, SWD-1 – Little Mills at State Road 200 (A1A/200), and INF-1 - Sample point to the treatment train prior the any biological, chemical, physical treatment or dilution.		
Description of permitted outfall: An 0.3 MGD annual average daily flow (AADF) permitted discharge to Alligator Creek (Class III fresh waters) at Discharge Location (D-001) which is approximately 4 feet in length and discharges at a depth of approximately 1 foot.		
Description of treatment process (if multiple discharge points, include a map or diagram of facility): An existing 0.3 MGD annual average daily flow (AADF) permitted capacity rotating biological contactor (RBC) WWTF consisting of a communitor system, a primary screening and grit removal unit, a flow equalization tank, a RBC unit which consists of one row with three conventional shafts, a secondary clarifier, a chlorine contact chamber and an aerobic digester.		
Receiving Waters: Alligator Creek	**Classification (indicate whether fresh or marine):** (Class III fresh waters)	
Temperature (C):	**Design Flow:** 0.3 MGD	
pH (SU):	**Mean Flow (for previous 12 months):** 0.2MGD	
Conductivity (umhos/cm):	**Flow During Survey:**	
Method of Chlorination	**Method of Dechlorination**	
Dissolved Oxygen (mg/L):	**Total Residual Chlorine (mg/L) (after disinfection):**	
Discharge is: Continuous Intermittent Seasonal Rainfall Dependent Other		
Toxicity Test Requirements (routine and/or additional test language test species, salinity adjustment, etc.): N/A		
Administrative or Consent Orders: OGC FILE NO: 06-0024		
Facility Mixing Zone Details: N/A		
List permit violations (DMR data) and plant upsets that occurred at the plant within the last year: None		
Describe previous impact bioassessments, WQBEL's, and previous or current enforcement actions: OGC Case No. 06-0024 found the Town of Callahan was operating the facility in a manner that is inconsistent with the terms of the permit for Total Ammonia, Total Suspend Solids, and BOD Carbonacous 5 day. The town had to to construct modifications to the facility and the effluent disposal system to ensure that the facility and the effluent disposal system will function in full and consistent compliance with all applicable rules of the Department.		
Discuss MOR trends to prior data; is trend improving or declining: No Noticeable Trends		
List Effluent Limits (include additional sheets as necessary):		

Parameters for D-001 for sample location EFD-1		
Parameter and Units	**Limit**	**Describe special permit conditions and permit modifications:**
Flow (MGD)	Report 0.3	Monthly Average Annual Average
BOD, Carbonaceous 5 day, 20C (MG/L)	20.0* 25.0* 30.0	Annual Average Monthly Average Single Sample Max.
Solids, Total Suspended (MG/L)	20.0* 25.0* 30.0	Annual Average Monthly Average Single Sample Max.
pH (SU)	6.0 to 8.5	Minimum and Maximum
Coliform, Fecal (#/100ML)	200 200 800	Annual Average Monthly Geo. Mean Single Sample Max.
Oxygen, Dissolved (DO) (MG/L)	6.0	Single Sample Min.
Nitrogen, Ammonia, Total (as N) (MG/L)	9.0 * 14.0* 16.0 20.0*	Annual Average Monthly Average Weekly Average Single Sample Max.
Total Residual Chlorine (For Dechlorination) (MG/L)	0.01	Single Sample Max.
Nitrogen, Total (as N) (MG/L)	9.0 14.0 20.0	Annual Average Monthly Average Single Sample Max.
Parameters for D-001 for sample location EFA-1		
Parameter and Units	**Limit**	**Describe special permit conditions and permit modifications:**
Total Residual Chlorine (For Disinfection) (MG/L)	0.5	Minimum
Parameters for D-001 for sample location CAL-1		
Parameter and Units	**Limit**	**Describe special permit conditions and permit modifications:**
Percent Capacity, (TMADF/Permitted Capacity) x 100 (PERCENT)	Report	Monthly Average
Parameters for D-001 quarterly effluent samples at EFD-1		
Parameter and Units	**Limit**	**Describe special permit conditions and permit modifications:**
Nitrate Nitrogen (NO3-N) and Nitrite Nitrogen (NO2-N)	Report	Quarterly
Total Kjeldahl Nitrogen (TKN) (as N)	Report	Quarterly
Total Organic Nitrogen (as N)	Report	Quarterly
Unionized Ammonia (as N) ⊕	Report	Quarterly
Temperature, C	Report	Quarterly
Total nitrogen (as N)	Report	Quarterly
Total phosphorus (as P)	Report	Quarterly
Ortho-phosphorous (as P)	Report	Quarterly
Hardness (as $CaCO_3$)	Report	Quarterly

Parameters for D-001 quarterly effluent samples at SWU-1, SWU-2, and SWD-1		
DO	Report	Quarterly
pH	Report	Quarterly
Temperature	Report	Quarterly
Fecal Coliform	Report	Quarterly
$CBOD_5$	Report	Quarterly
TSS	Report	Quarterly
NH_3-N	Report	Quarterly
TKN	Report	Quarterly
NO_2-N plus NO_3-N	Report	Quarterly
Total Phosphorous	Report	Quarterly
Ortho-Phosphorus	Report	Quarterly

*** Limits under Consent Order**

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT
7825 Baymeadows Way, Suite B200
Jacksonville, FL 32256-7590

Interoffice Memorandum

TO: File
Wastewater Compliance/Correspondent folder

TGROUGH: Melissa M. Long, P. E.
WRM Administrator

Tom Kallemeyn
Wastewater Compliance

Jennifer Paris
Enforcement Coordinator

FROM: Joseph Emery
Wastewater Compliance

DATE: September 5, 2007

SUBJECT: July 9, 2007 Callahan WWTF Meeting to Discuss Sample Summary
Facility ID FL0038407
Nassau County

A fifth year sampling event occurred on May 21, 2007 and with low flow of Alligator Creek due to the drought conditions caused the creek to degrade. The degradation of the creek was evident at 100 meters upstream of POD to 100 meters downstream of the POD and it was observed that the creek had an odor and a very turbid appearance. Department staff sampled the creek for water quality violations on four different occasions (Table 1). On July 9, 2007 a meeting was held to discuss the matter with facility personal, Mike William lead operator and Town Manger for Callahan and Tim Norman from Mittauer Engineering, the town's engineer firm were present. Mike gave influent and effluent data that showed high organic loading at the influent to the plant but normal loading to the effluent discharge (Table 2). Some reasons Mike gave for these conditions could have been due to lab error, the old clay terra cotta collection system pipe, lack of flow to the lift station when school is not in session which cause the lift station pump cycle to extend to 45 minutes, or some one illegally dumping into the collection system.

Plan of Actions:

Due to the high organic loading Callahan WWTF and the Department will grab effluent samples and split influent samples. Mike sent in the lab bench sheet from ENCO, the plant's NELAC certified lab. After review of the bench sheets the Department has concerns and will be investigating further.

Table 1

Alligator Creek Near Callahan WWTF

		Upstream of Stormwater Discharge	Downstream of Stormwater Discharge	Upstream 100m	POD Pipe	Pod 10m Downstream	Downstream 100 m	Callahan CCC
5/21/2007	Turb (NTU)							
	BOD (mg/L)							7.8
	TSS (mg/L)							41.0
	Fecal (#/100mL)							
5/24/2007	Turb (NTU)			1.2		24.0	6.0	
	BOD (mg/L)			1.8		41.1	16.4	
	TSS (mg/L)			2.0		46.0	12.0	
	Fecal (#/100mL)			100AB		4300.0	520B	
6/5/2007	Turb (NTU)	7.0	26.0	14.5	20.0	23.0	13.7	23.0
	BOD (mg/L)	2.2	2.6	2.1	27.1	17.9	8.0	31.0
	TSS (mg/L)	4.0	25.0	4.0	27.0	36.0	6.0	39.0
	Fecal (#/100mL)	800.0	400B	300AB	33U	1500B	1000B	1200.0
6/19/2007	Turb (NTU)			2.1		26.0	6.3	32.0
	BOD (mg/L)			2K		31.0	23.2	31.0
	TSS (mg/L)			3.0		46.0	20.0	46.0
	Fecal (#/100mL)			325AB		4200.0	675AB	TNTC

A - Value reported is the mean of two or more determinations.
B - Results based on colony counts outside the acceptable range.
U - Material was analyzed for but not detected; the value reported

	CO Limits	
	Monthly Avg	Annual Avg
TSS	25.0	20.0
BOD	25.0	20.0

Table 2

	Influent BOD	Effluent BOD	Influent TSS	Effluent TSS
Apr-07	534	18	780	13
May-07	1400		840	
26-Jun-07	259	14	84	8
6-Jun-07	98	75		33

Appendix C

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.floridadep.org/labs/sop/index.htm and/or http://www.floridadep.org/labs/qa/index.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. A list of the analytes tested for, results, data qualifiers, the minimum detection limit and the practical quantitation limit are given in Appendix D. The results from these analyses were compared with Water Quality Criteria (62-302 F.A.C.) and facility permit limits (Table 1, Appendix B). Exceedances of Water Quality Criteria may be violations of specific provisions of Chapter 62-302 (F.A.C.) and/ or facility permit limits.

(3) Toxicity Bioassays

Acute screening toxicity bioassays were performed on the effluent sample using the water flea, *Ceriodaphnia dubia,* and the fish, *Cyprinella leedsi* following FDEP SOPs TA07_01 and TA07_02. Failure of toxicity testing may constitute a violation of 62-302.520(21), 62-302.530(62) and/or facility permit limits. Standard reference toxicant tests are conducted monthly to ensure quality in toxicity testing.

(4) Bacteriological Testing

The effluent and water from control and test sites were analyzed for the presence and concentration of total and fecal coliform bacteria following FDEP SOPs MB1_0 and MB1_1. High levels of fecal or total coliform bacteria may constitute violation of 62-302.530(6), 62-302.530(7) and/or facility permit limits.

(5) Habitat Assessment

Habitat assessment is used to evaluate the physical structure and extent of disturbance in a waterbody. Eight aspects are ranked, with 20 possible points for each aspect (QA Rule SOP FT 3100). The Habitat Assessment score includes types and amounts of benthic substrates, water velocity, amount of sand or silt accumulation, extent of artificial channelization, bank stability, and riparian zone width and vegetation type. All scores are summed to yield an overall Habitat Assessment score. Habitat Assessment score ranges from 11-160 and overall habitat quality is assigned to one of four categories: Optimal (120-160 points), Suboptimal (80-119 points), Marginal (40-79 points), and Poor (11-39 points).

(6) Algal Growth Potential (AGP)

The effluent and water from control and test sites are autoclaved, filtered (0.45μm), inoculated with the unicellular green alga, *Pseudokirchneriella subcapitata* (formerly *Selenastrum capricornutum,* USEPA 2002*),* and incubated for 14 days (FDEP SOP TA08_05). 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 5.0 mg dry weight/L represents a "problem" threshold for fresh receiving waters, implying nutrient enrichment. High AGP values may constitute one line of evidence for violation of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C. and/or 62-302.530(48)(b) F.A.C..

The concentration of nutrients in a water sample may be used to calculate the expected yield of AGP 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 ± 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 (USEPA 2000). 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 be a violation of 62-302.530(62) F.A.C..

(7) Algal Phytoplankton and Periphyton Assemblages

Methods: Qualitative periphyton were sampled at both control and test sites by taking subsamples of algae from natural substrates throughout the sample reach (QA Rule FS7220). Phytoplankton were sampled using a 1 L grab sample (QA Rule SOP FS7100). Periphyton were subsampled and identified to the lowest practical level, usually species (FDEP SOPs AB03, AB03_1 and AB05).

Chlorophyll *a* Content: Chlorophyll *a* content is measured in phytoplankton samples to estimate algal biomass (FDEP SOP BB05). High algal biomass implies nutrient stress (Stevenson and Bahls 1999) and may be a violation of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C. and/or 62-302.530(48)(b) F.A.C..

Algal Density: Algal density is estimated as number of natural units/ml for phytoplankton samples and number of natural units/cm^2 for periphyton samples. Although algal density of a single site is highly variable and depends on a number of factors, comparison of algal density at a control site to algal density at a related test site gives a partial comparison of algal biomass at the two sites (Stevenson and Smol 2003).

Taxa richness: Taxa richness is the number of distinct algal taxa present in a sample. Extreme nutrient enrichment tends to reduce the number of different types of algae present in a sample because a few tolerant taxa tend to reproduce rapidly and constitute the majority of the cells present. However, moderate nutrient enrichment of nutrient poor waters may sometimes be correlated with increased algal taxa richness (Stevenson and Bahls 1999) as the algal community begins to respond to the increased input of nutrients.

Community Composition: Shifts in relative proportions of major groups of algae downstream of a point source, compared to upstream, control conditions, may indicate negative effects of a discharge (Stevenson and Bahls 1999) and may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

Shannon-Weaver Diversity Index: This index is specified in the Florida Administrative Code 62-302 as a measure of biological integrity. Low diversity scores are undesirable. Where diversity is low, only a few taxa are abundant as compared to an area where many taxa are present with more equitable abundance among taxa (Magurran 1988). Low diversity scores related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

(8) Benthic Macroinvertebrate Assemblages

Methods: Benthic macroinvertebrates were collected using two methods. Quantitative samples were collected from Hester-Dendy multi-plate samplers incubated for 28 days (QA Rule SOP FS7430). Qualitative collections are made using 20 dipnet sweeps (QA Rule SOP FS7420). Benthic macroinvertebrates were sorted and identified to the lowest practical taxonomic level, usually species (FDEP SOP IZ06).

Taxa richness: Taxa richness is the number of distinct macroinvertebrate taxa present in a sample. Stress, habitat destruction and pollution tend to reduce the number of different types of organisms present (Karr and Chu 1998). Decreases in taxa richness related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

Percent Contribution of Dominant Taxon: Percent contribution of the dominant taxon is calculated by dividing the number of individuals in the most abundant taxa by the total number of individuals counted. Percent contribution of the dominant taxon tends to increase with increasing perturbation (Plafkin *et al*., 1989). Increases in the percent contribution of the dominant taxon related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C. and/or 62-302.530(48)(b) F.A.C..

Shannon-Weaver Diversity Index: This index is specified in the Florida Administrative Code 62-302 as a measure of biological integrity. Low diversity scores are undesirable. Where diversity is low, only a few taxa are abundant as compared to an area where many taxa are present in equitable abundance among taxa (Magurran 1988). A difference of 25% in Shannon-Weaver diversity between results from Hester-Dendy multiplate samplers incubated for 28 days at test and control sites constitutes a violation of 62-302.530(11) F.A.C..

Community Composition: Shifts in proportions of major groups of organisms downstream of a point source, compared to upstream, control conditions, may indicate negative effects of a discharge (Karr and Chu 1998). Shifts in community composition related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

Functional Feeding Groups: Environmental degradation may differentially affect groups of invertebrates based on how the group feeds (e.g. predators, deposit feeders, etc.). In Florida, pollution may be responsible for reducing the numbers of filter feeders (FDEP 1994) and shredders (EA Engineering 1994). Changes in the proportions of functional feeding groups related to a facility's effluent may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

The Stream Condition Index (SCI): The SCI is a composite macroinvertebrate metric developed for Florida. This Index was revised in 2007 using data from qualitative dipnet samples. The SCI now assigns points to ten parameters; depending on how closely each parameter approaches an expected value (QA Rule SOP LT 7200). Points are assigned according to in

which bioregion (Panhandle, Northeast, or Peninsula) the sampling location exists -and summed to yield a final SCI score (range 0-100). Included in the calculation of SCI are taxa richness, number of Ephemeroptera taxa, number of Trichoptera taxa, percent contribution of the dominant taxon, number of sensitive taxa, number of clinger taxa, number of long-lived taxa, percent contribution of Tanytarsini, percent contribution of very tolerant, and the percent contribution of suspension and filter feeders. Scores are broken into three categories (I, II, and III). SCI 2007 categories are from Table LT 7200-2 of Draft DEP-SOP-002/01 as referenced in Draft Quality Assurance Rule (62-160 F.A.C.), September 17, 2007. A decrease in ordinal SCI score from the Control to the Test site may be evidence of degradation related to a facility's effluent. An SCI score in Category I, if it is shown to be related to a facility's effluent, may constitute violations of 62-302.530(47) F.A.C., 62-302.530(48)(a) F.A.C., 62-302.530(48)(b) F.A.C. and/or 62-302.530(62) F.A.C..

(9) Statistical Comparisons

Statistical comparisons of the proportions of taxa, major groups or feeding groups were made using 95% confidence intervals on proportions. A 95% confidence interval is the range of values above and below a given proportion that has a 95% chance of containing the true proportion (Sokal and Rohlf 1995). If the 95% confidence intervals for two proportions do not overlap, then the proportion of X in sample 1 is significantly different from the proportion of X in sample 2 at $p<0.05$. A "$p<0.05$" level of significance means that there is less than a 5% chance that the true proportions in the two samples are the same. All comparisons that are labeled as significant in the text have a probability <0.05 that the proportions are the same.

Appendix D

Chain of Custody

form

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2007-05-21-23
Callahan WWTF

Requester: Shannan Bogdanov

Field Report Prepared By: Tom Kallam

Customer: NE-DIST

Collected By: Tom Kallam

Send Final Report To: Melissa Long

Project ID: FYI5

Sampling Agency: DEP NED

PMAS: 1143

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) Effluent; Temp (C); pH	Sample Depth m / ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number	A
	Latitude o ' " ; Longitude o ' "	Comments	Same as effluent Tox		
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
Kallam	5/21/07	DHL	Tom E	5/22/07 9:10				

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

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Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2007-05-21-23
Callahan WWTF

Requester: Shannan Bogdanov

Field Report Prepared By: Tom Kallemeyn

Customer: NE-DIST

Collected By: Tom Kallemeyn

Send Final Report To Melissa Long

Project ID: FYI5

Sampling Agency: DEP NED

PMAS: 1143

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
✓	Alligator Cr 75m upstream of POD Callahan	☐ Comp ☒ Grab Date 5/21/07 Time 0845 Eastern Central	Date Time Eastern Central	B, C
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L) 1.24	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc) fresh	Temp (C) 16.79 pH 8.00	Sample Depth 0.4 ☒ m ☐ ft	666 ☐ Salinity (PPTh) ☒ Sp Conductance (umho/cm) NPDES Number
	Latitude o ' "	Longitude o ' "	Comments SCI	

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
✓	Alligator Cr 25m Dam stream POD Callahan	☐ Comp ☒ Grab Date 5/21/07 Time 10:00 Eastern Central	Date Time Eastern Central	B, C
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L) 1.9	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc) fresh	Temp (C) 21.1 pH 6.9	Sample Depth ☒ m ☐ ft	820 ☐ Salinity (PPTh) ☒ Sp Conductance (umho/cm) NPDES Number
	Latitude o ' "	Longitude o ' "	Comments	

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	Calhan WWTP final Effluent Dechlor Chamber	☐ Comp ☒ Grab Date 5/21/07 Time 10:30 Eastern Central	Date Time Eastern Central	A
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L) 5.6	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc) Effluent	Temp (C) 23.58 pH 7.33	Sample Depth ☒ m ☐ ft	807 ☐ Salinity (PPTh) ☒ Sp Conductance (umho/cm) NPDES Number
	Latitude o ' "	Longitude o ' "	Comments	

Lab ID *	Location	Collection (begin)	Collection (end)	Bottle Group(s)**
	Equipment Blank	☐ Comp ☒ Grab Date 5/21/07 Time 10:45 Eastern Central	Date Time Eastern Central	D
	Field ID	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (Include type e.g. Salt, Fresh, etc) DI	Temp (C) pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm) NPDES Number
	Latitude o ' "	Longitude o ' "	Comments Triplicate 11:07 5.22.07 TK	

Relinquished By:	Date/Time	Shipping Method	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
Tom Kallemeyn	5/21/07 1300	DHL	Tom E.	05/22/07 9:15				

* Shaded Areas for Lab use only

** Please see reverse side for Bottle Group information

last revised October 1, 2003

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Appendix E

Chemical analysis of effluent and receiving water

Date_Sampled	UDL	SCH_Group	Name	Result	Units_Word_Result	MDL	PQL
5/21/2007	Control Site	AGP/LN	Algal Growth Potential	98.3	mg DryWt/L	0.3	0.9
5/21/2007	Control Site	Chlorophyll/Grain Size/BOD	Chlorophyll-A, Monochromatic, Water	1.7 U	ug/L	1.7	5.2
5/21/2007	Control Site	Chlorophyll/Grain Size/BOD	Phaeophytin-A, Monochromatic, Water	3 U	ug/L	3	9
5/21/2007	Control Site	Metals	Aluminum	551 A	ug/L	20	80
5/21/2007	Control Site	Metals	Calcium	71.0 A	mg/L	0.05	0.2
5/21/2007	Control Site	Metals	Iron	680 A	ug/L	10	40
5/21/2007	Control Site	Metals	Magnesium	25.5 A	mg/L	0.03	0.12
5/21/2007	Control Site	Metals	Arsenic	0.50 U	ug/L	0.5	2
5/21/2007	Control Site	Metals	Cadmium	0.055 I	ug/L	0.02	0.08
5/21/2007	Control Site	Metals	Chromium	1.2 I	ug/L	1	4
5/21/2007	Control Site	Metals	Copper	3.69 A	ug/L	0.25	1
5/21/2007	Control Site	Metals	Lead	1.18 A	ug/L	0.2	0.8
5/21/2007	Control Site	Metals	Nickel	1.15 A	ug/L	0.25	1
5/21/2007	Control Site	Metals	Selenium	0.50 U	ug/L	0.5	2
5/21/2007	Control Site	Metals	Silver	0.42 A	ug/L	0.025	0.1
5/21/2007	Control Site	Metals	Zinc	15 I	ug/L	5	20
5/21/2007	Control Site	Nutrients	Ammonia-N	1.5	mg N/L	0.05	0.1
5/21/2007	Control Site	Nutrients	NO2NO3-N	0.4	mg N/L	0.004	0.01
5/21/2007	Control Site	Nutrients	O-Phosphate-P	2.2	mg P/L	0.08	0.2
5/21/2007	Control Site	Nutrients	Kjeldahl Nitrogen	4.4	mg N/L	0.16	0.4
5/21/2007	Control Site	Nutrients	Total-P	2.8	mg P/L	0.1	0.3
5/21/2007	Control Site	FIELDPARMS	Dissolved Oxygen	1.24	mg/L		
5/21/2007	Control Site	FIELDPARMS	Sample Depth	0.4	m		
5/21/2007	Control Site	FIELDPARMS	Specific Conductance	666	umhos/cm		
5/21/2007	Control Site	FIELDPARMS	Temperature	16.89	C		
5/21/2007	Control Site	FIELDPARMS	pH	8			
5/21/2007	Test Site	AGP/LN	Algal Growth Potential	170 A	mg DryWt/L	0.3	0.9
5/21/2007	Test Site	Chlorophyll/Grain Size/BOD	Chlorophyll-A, Monochromatic, Water	1.7 U	ug/L	1.7	5.2
5/21/2007	Test Site	Chlorophyll/Grain Size/BOD	Phaeophytin-A, Monochromatic, Water	3.0 U	ug/L	3	9
5/21/2007	Test Site	Metals	Aluminum	380 J	ug/L	80	320
5/21/2007	Test Site	Metals	Calcium	61.6	mg/L	0.05	0.2
5/21/2007	Test Site	Metals	Iron	867	ug/L	10	40
5/21/2007	Test Site	Metals	Magnesium	27.6	mg/L	0.03	0.12
5/21/2007	Test Site	Metals	Arsenic	0.51 I	ug/L	0.5	2
5/21/2007	Test Site	Metals	Cadmium	0.078 I	ug/L	0.02	0.08
5/21/2007	Test Site	Metals	Chromium	1.2 I	ug/L	1	4
5/21/2007	Test Site	Metals	Copper	20.4	ug/L	0.25	1

Date_Sampled	UDL	SCH_Group	Name	Result	Units_Word_Result	MDL	PQL
5/21/2007	Test Site	Metals	Lead	1.31	ug/L	0.2	0.8
5/21/2007	Test Site	Metals	Nickel	2.34	ug/L	0.25	1
5/21/2007	Test Site	Metals	Selenium	0.50 U	ug/L	0.5	2
5/21/2007	Test Site	Metals	Silver	4.8	ug/L	0.025	0.1
5/21/2007	Test Site	Metals	Zinc	56	ug/L	5	20
5/21/2007	Test Site	Nutrients	Ammonia-N	1.5	mg N/L	0.05	0.1
5/21/2007	Test Site	Nutrients	NO2NO3-N	0.6	mg N/L	0.004	0.01
5/21/2007	Test Site	Nutrients	O-Phosphate-P	3.7	mg P/L	0.08	0.2
5/21/2007	Test Site	Nutrients	Kjeldahl Nitrogen	8.2	mg N/L	0.4	1
5/21/2007	Test Site	Nutrients	Total-P	5.1	mg P/L	0.2	0.6
5/21/2007	Test Site	FIELDPARMS	Dissolved Oxygen	1.8	mg/L		
5/21/2007	Test Site	FIELDPARMS	Specific Conductance	820	umhos/cm		
5/21/2007	Test Site	FIELDPARMS	Temperature	21.1	C		
5/21/2007	Test Site	FIELDPARMS	pH	6.9			
5/21/2007	Test Site	FIELDPARMS	Dissolved Oxygen	1.8	mg/L		
5/21/2007	Effluent	AGP/LN	Algal Growth Potential	226	mg DryWt/L	0.3	0.9
5/21/2007	Effluent	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	7.8 AL	mg/L	0.2	2
5/21/2007	Effluent	Chlorophyll/Grain Size/BOD	Chlorophyll-A, Monochromatic, Water	1.7 U	ug/L	1.7	5.2
5/21/2007	Effluent	Chlorophyll/Grain Size/BOD	Phaeophytin-A, Monochromatic, Water	3 U	ug/L	3	9
5/21/2007	Effluent	Toxicology	Bioassay-Acute-Screen-FW-C.dubia, LC50	100 L	LC50		
5/21/2007	Effluent	Toxicology	Bioassay-Acute-Screen-FW-Fish, LC50	100 L	LC50		
5/21/2007	Effluent	Metals	Aluminum	382 J	ug/L	80	320
5/21/2007	Effluent	Metals	Calcium	60.1	mg/L	0.05	0.2
5/21/2007	Effluent	Metals	Iron	952	ug/L	10	40
5/21/2007	Effluent	Metals	Magnesium	28	mg/L	0.03	0.12
5/21/2007	Effluent	Metals	Arsenic	0.50 U	ug/L	0.5	2
5/21/2007	Effluent	Metals	Cadmium	0.061 I	ug/L	0.02	0.08
5/21/2007	Effluent	Metals	Chromium	1.1 I	ug/L	1	4
5/21/2007	Effluent	Metals	Copper	19.8	ug/L	0.25	1
5/21/2007	Effluent	Metals	Lead	1.42	ug/L	0.2	0.8
5/21/2007	Effluent	Metals	Nickel	2.45	ug/L	0.25	1
5/21/2007	Effluent	Metals	Selenium	0.50 U	ug/L	0.5	2
5/21/2007	Effluent	Metals	Silver	5.3	ug/L	0.025	0.1
5/21/2007	Effluent	Metals	Zinc	51	ug/L	5	20
5/21/2007	Effluent	Nutrients	Alkalinity	166	mg CaCO3/L	0.65	2.5
5/21/2007	Effluent	Nutrients	Ammonia-N	1.1	mg N/L	0.1	0.2
5/21/2007	Effluent	Nutrients	NO2NO3-N	1.4	mg N/L	0.04	0.1
5/21/2007	Effluent	Nutrients	O-Phosphate-P	3.4	mg P/L	0.4	1
5/21/2007	Effluent	Nutrients	Kjeldahl Nitrogen	10	mg N/L	0.4	1
5/21/2007	Effluent	Nutrients	Total-P	6.2	mg P/L	0.2	0.6

Date_Sampled	UDL	SCH_Group	Name	Result	Units_Word_Result	MDL	PQL
5/21/2007	Effluent	Nutrients	TSS	41	mg/L	7.8	31
5/21/2007	Effluent	Pesticides	Alachlor	0.60 U	ug/L	0.6	2.4
5/21/2007	Effluent	Pesticides	Ametryn	0.050 U	ug/L	0.05	0.2
5/21/2007	Effluent	Pesticides	Atrazine	0.050 U	ug/L	0.05	0.2
5/21/2007	Effluent	Pesticides	Azinphos Methyl	0.20 U	ug/L	0.2	0.8
5/21/2007	Effluent	Pesticides	Bromacil	0.20 U	ug/L	0.2	0.8
5/21/2007	Effluent	Pesticides	Butylate	0.20 U	ug/L	0.2	0.8
5/21/2007	Effluent	Pesticides	Chlorpyrifos Ethyl	0.050 U	ug/L	0.05	0.2
5/21/2007	Effluent	Pesticides	Chlorpyrifos Methyl	0.10 U	ug/L	0.1	0.4
5/21/2007	Effluent	Pesticides	Diazinon	0.050 U	ug/L	0.05	0.2
5/21/2007	Effluent	Pesticides	Ethion	0.050 U	ug/L	0.05	0.2
5/21/2007	Effluent	Pesticides	Ethoprop	0.10 U	ug/L	0.1	0.4
5/21/2007	Effluent	Pesticides	Fenamiphos	0.20 U	ug/L	0.2	0.8
5/21/2007	Effluent	Pesticides	Fonofos	0.10 U	ug/L	0.1	0.4
5/21/2007	Effluent	Pesticides	Hexazinone	0.10 U	ug/L	0.1	0.4
5/21/2007	Effluent	Pesticides	Malathion	0.15 U	ug/L	0.15	0.6
5/21/2007	Effluent	Pesticides	Metalaxyl	0.25 U	ug/L	0.25	1
5/21/2007	Effluent	Pesticides	Metolachlor	0.50 U	ug/L	0.5	2
5/21/2007	Effluent	Pesticides	Metribuzin	0.10 U	ug/L	0.1	0.4
5/21/2007	Effluent	Pesticides	Mevinphos	0.20 U	ug/L	0.2	0.8
5/21/2007	Effluent	Pesticides	Naled	0.80 U	ug/L	0.8	3.2
5/21/2007	Effluent	Pesticides	Norflurazon	0.15 U	ug/L	0.15	0.6
5/21/2007	Effluent	Pesticides	Parathion Ethyl	0.15 U	ug/L	0.15	0.6
5/21/2007	Effluent	Pesticides	Parathion Methyl	0.10 U	ug/L	0.1	0.4
5/21/2007	Effluent	Pesticides	Phorate	0.050 U	ug/L	0.05	0.2
5/21/2007	Effluent	Pesticides	Prometryn	0.15 U	ug/L	0.15	0.6
5/21/2007	Effluent	Pesticides	Simazine	0.050 U	ug/L	0.05	0.2
5/21/2007	Effluent	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	1,2-Dichlorobenzene	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	1,3-Dichlorobenzene	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	1,4-Dichlorobenzene	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	2,4-Dichlorophenol	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	2,4-Dimethylphenol	9.9 U	ug/L	9.9	40
5/21/2007	Effluent	Priority Organic Pollutants	2,4-Dinitrophenol	15 U	ug/L	15	59
5/21/2007	Effluent	Priority Organic Pollutants	2,4-Dinitrotoluene	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	2,6-Dinitrotoluene	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	2-Chloronaphthalene	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	2-Chlorophenol	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.0 U	ug/L	3	12

Date_Sampled	UDL	SCH_Group	Name	Result	Units_Word_Result	MDL	PQL
5/21/2007	Effluent	Priority Organic Pollutants	2-Nitrophenol	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	3,3'-Dichlorobenzidine	40 UJ	ug/L	40	160
5/21/2007	Effluent	Priority Organic Pollutants	4,4'-DDD	1.5 UJ	ug/L	1.5	5.9
5/21/2007	Effluent	Priority Organic Pollutants	4,4'-DDE	1.5 UJ	ug/L	1.5	5.9
5/21/2007	Effluent	Priority Organic Pollutants	4,4'-DDT	1.5 UJ	ug/L	1.5	5.9
5/21/2007	Effluent	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.99 UJ	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2.0 U	ug/L	2	7.9
5/21/2007	Effluent	Priority Organic Pollutants	4-Nitrophenol	15 U	ug/L	15	59
5/21/2007	Effluent	Priority Organic Pollutants	Acenaphthene	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Acenaphthylene	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Aldrin	1.5 UJ	ug/L	1.5	5.9
5/21/2007	Effluent	Priority Organic Pollutants	Anthracene	0.99 UJ	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Benzidine	99 UJ	ug/L	99	400
5/21/2007	Effluent	Priority Organic Pollutants	Benzo(a)anthracene	0.99 UJ	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Benzo(a)pyrene	0.99 UJ	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Benzo(b)fluoranthene	0.99 UJ	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.99 UJ	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Benzo(k)fluoranthene	0.99 UJ	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.0 U	ug/L	3	12
5/21/2007	Effluent	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15 UJ	ug/L	15	59
5/21/2007	Effluent	Priority Organic Pollutants	Butyl benzyl phthalate	5.0 UJ	ug/L	5	20
5/21/2007	Effluent	Priority Organic Pollutants	Chrysene	0.99 UJ	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Di-n-butyl phthalate	5.0 UJ	ug/L	5	20
5/21/2007	Effluent	Priority Organic Pollutants	Di-n-octyl phthalate	0.99 UJ	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.99 UJ	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Dieldrin	1.5 UJ	ug/L	1.5	5.9
5/21/2007	Effluent	Priority Organic Pollutants	Diethyl phthalate	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Dimethyl phthalate	50 U	ug/L	50	200
5/21/2007	Effluent	Priority Organic Pollutants	Endosulfan I	4.0 UJ	ug/L	4	16
5/21/2007	Effluent	Priority Organic Pollutants	Endosulfan II	4.0 UJ	ug/L	4	16
5/21/2007	Effluent	Priority Organic Pollutants	Endosulfan sulfate	1.5 UJ	ug/L	1.5	5.9
5/21/2007	Effluent	Priority Organic Pollutants	Endrin	1.5 UJ	ug/L	1.5	5.9
5/21/2007	Effluent	Priority Organic Pollutants	Endrin aldehyde	4.0 UJ	ug/L	4	16
5/21/2007	Effluent	Priority Organic Pollutants	Fluoranthene	0.99 UJ	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Fluorene	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Heptachlor	1.5 UJ	ug/L	1.5	5.9
5/21/2007	Effluent	Priority Organic Pollutants	Heptachlor epoxide	1.5 UJ	ug/L	1.5	5.9

Date_Sampled	UDL	SCH_Group	Name	Result	Units_Word_Result	MDL	PQL
5/21/2007	Effluent	Priority Organic Pollutants	Hexachlorobenzene	0.99 UJ	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Hexachlorobutadiene	3.0 U	ug/L	3	12
5/21/2007	Effluent	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.0 UJ	ug/L	3	12
5/21/2007	Effluent	Priority Organic Pollutants	Hexachloroethane	3.0 U	ug/L	3	12
5/21/2007	Effluent	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.99 UJ	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Isophorone	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2.0 U	ug/L	2	7.9
5/21/2007	Effluent	Priority Organic Pollutants	N-Nitrosodimethylamine	2.0 U	ug/L	2	7.9
5/21/2007	Effluent	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.0 UJ	ug/L	3	12
5/21/2007	Effluent	Priority Organic Pollutants	Naphthalene	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Nitrobenzene	2.0 U	ug/L	2	7.9
5/21/2007	Effluent	Priority Organic Pollutants	Pentachlorophenol	3.0 U	ug/L	3	12
5/21/2007	Effluent	Priority Organic Pollutants	Phenanthrene	0.99 UJ	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Phenol	0.99 U	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	Pyrene	0.99 UJ	ug/L	0.99	4
5/21/2007	Effluent	Priority Organic Pollutants	alpha-BHC	1.5 UJ	ug/L	1.5	5.9
5/21/2007	Effluent	Priority Organic Pollutants	beta-BHC	1.5 UJ	ug/L	1.5	5.9
5/21/2007	Effluent	Priority Organic Pollutants	delta-BHC	1.5 UJ	ug/L	1.5	5.9
5/21/2007	Effluent	Priority Organic Pollutants	gamma-BHC	1.5 UJ	ug/L	1.5	5.9
5/21/2007	Effluent	Nutrients	Dissolved Oxygen	5.6	mg/L		
5/21/2007	Effluent	Nutrients	Specific Conductance	807	umhos/cm		
5/21/2007	Effluent	Nutrients	Temperature	23.58	C		
5/21/2007	Effluent	Nutrients	pH	7.33			
5/21/2007	Blank	Metals	Aluminum	80 U	ug/L	80	320
5/21/2007	Blank	Metals	Calcium	0.050 U	mg/L	0.05	0.2
5/21/2007	Blank	Metals	Iron	10 U	ug/L	10	40
5/21/2007	Blank	Metals	Magnesium	0.030 U	mg/L	0.03	0.12
5/21/2007	Blank	Metals	Arsenic	0.50 U	ug/L	0.5	2
5/21/2007	Blank	Metals	Cadmium	0.020 U	ug/L	0.02	0.08
5/21/2007	Blank	Metals	Chromium	1.0 U	ug/L	1	4
5/21/2007	Blank	Metals	Copper	0.25 U	ug/L	0.25	1
5/21/2007	Blank	Metals	Lead	0.20 U	ug/L	0.2	0.8
5/21/2007	Blank	Metals	Nickel	0.25 U	ug/L	0.25	1
5/21/2007	Blank	Metals	Selenium	0.50 U	ug/L	0.5	2
5/21/2007	Blank	Metals	Silver	0.025 U	ug/L	0.025	0.1
5/21/2007	Blank	Metals	Zinc	5.0 U	ug/L	5	20
5/21/2007	Blank	Nutrients	Ammonia-N	0.010 U	mg N/L	0.01	0.02
5/21/2007	Blank	Nutrients	NO2NO3-N	0.004 U	mg N/L	0.004	0.01
5/21/2007	Blank	Nutrients	O-Phosphate-P	0.004 U	mg P/L	0.004	0.01
5/21/2007	Blank	Nutrients	Kjeldahl Nitrogen	0.080 U	mg N/L	0.08	0.2

Date_Sampled	UDL	SCH_Group	Name	Result	Units_Word_Result	MDL	PQL
5/21/2007	Blank	Nutrients	Total-P	0.020 U	mg P/L	0.02	0.06
5/21/2007	Blank	Pesticides	Alachlor	0.58 U	ug/L	0.58	2.3
5/21/2007	Blank	Pesticides	Ametryn	0.048 U	ug/L	0.048	0.19
5/21/2007	Blank	Pesticides	Atrazine	0.048 U	ug/L	0.048	0.19
5/21/2007	Blank	Pesticides	Azinphos Methyl	0.19 U	ug/L	0.19	0.76
5/21/2007	Blank	Pesticides	Bromacil	0.19 U	ug/L	0.19	0.76
5/21/2007	Blank	Pesticides	Butylate	0.19 U	ug/L	0.19	0.76
5/21/2007	Blank	Pesticides	Chlorpyrifos Ethyl	0.048 U	ug/L	0.048	0.19
5/21/2007	Blank	Pesticides	Chlorpyrifos Methyl	0.096 U	ug/L	0.096	0.38
5/21/2007	Blank	Pesticides	Diazinon	0.048 U	ug/L	0.048	0.19
5/21/2007	Blank	Pesticides	Ethion	0.048 U	ug/L	0.048	0.19
5/21/2007	Blank	Pesticides	Ethoprop	0.096 U	ug/L	0.096	0.38
5/21/2007	Blank	Pesticides	Fenamiphos	0.19 U	ug/L	0.19	0.76
5/21/2007	Blank	Pesticides	Fonofos	0.096 U	ug/L	0.096	0.38
5/21/2007	Blank	Pesticides	Hexazinone	0.096 U	ug/L	0.096	0.38
5/21/2007	Blank	Pesticides	Malathion	0.14 U	ug/L	0.14	0.56
5/21/2007	Blank	Pesticides	Metalaxyl	0.24 U	ug/L	0.24	0.96
5/21/2007	Blank	Pesticides	Metolachlor	0.48 U	ug/L	0.48	1.9
5/21/2007	Blank	Pesticides	Metribuzin	0.096 U	ug/L	0.096	0.38
5/21/2007	Blank	Pesticides	Mevinphos	0.19 U	ug/L	0.19	0.76
5/21/2007	Blank	Pesticides	Naled	0.77 U	ug/L	0.77	3.1
5/21/2007	Blank	Pesticides	Norflurazon	0.14 U	ug/L	0.14	0.56
5/21/2007	Blank	Pesticides	Parathion Ethyl	0.14 U	ug/L	0.14	0.56
5/21/2007	Blank	Pesticides	Parathion Methyl	0.096 U	ug/L	0.096	0.38
5/21/2007	Blank	Pesticides	Phorate	0.048 U	ug/L	0.048	0.19
5/21/2007	Blank	Pesticides	Prometryn	0.14 U	ug/L	0.14	0.56
5/21/2007	Blank	Pesticides	Simazine	0.048 U	ug/L	0.048	0.19
5/21/2007	Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	1,2-Dichlorobenzene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	1,3-Dichlorobenzene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	1,4-Dichlorobenzene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	2,4-Dichlorophenol	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	2,4-Dimethylphenol	9.7 U	ug/L	9.7	39
5/21/2007	Blank	Priority Organic Pollutants	2,4-Dinitrophenol	15 U	ug/L	15	58
5/21/2007	Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	2-Chloronaphthalene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	2-Chlorophenol	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9 U	ug/L	2.9	12

Date_Sampled	UDL	SCH_Group	Name	Result	Units_Word_Result	MDL	PQL
5/21/2007	Blank	Priority Organic Pollutants	2-Nitrophenol	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	39 UJ	ug/L	39	160
5/21/2007	Blank	Priority Organic Pollutants	4,4'-DDD	1.5 UJ	ug/L	1.5	5.8
5/21/2007	Blank	Priority Organic Pollutants	4,4'-DDE	1.5 UJ	ug/L	1.5	5.8
5/21/2007	Blank	Priority Organic Pollutants	4,4'-DDT	1.5 UJ	ug/L	1.5	5.8
5/21/2007	Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9 U	ug/L	1.9	7.8
5/21/2007	Blank	Priority Organic Pollutants	4-Nitrophenol	15 U	ug/L	15	58
5/21/2007	Blank	Priority Organic Pollutants	Acenaphthene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Acenaphthylene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Aldrin	1.5 UJ	ug/L	1.5	5.8
5/21/2007	Blank	Priority Organic Pollutants	Anthracene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Benzidine	97 U	ug/L	97	390
5/21/2007	Blank	Priority Organic Pollutants	Benzo(a)anthracene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Benzo(a)pyrene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9 U	ug/L	2.9	12
5/21/2007	Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15 U	ug/L	15	58
5/21/2007	Blank	Priority Organic Pollutants	Butyl benzyl phthalate	4.9 U	ug/L	4.9	19
5/21/2007	Blank	Priority Organic Pollutants	Chrysene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Di-n-butyl phthalate	4.9 U	ug/L	4.9	19
5/21/2007	Blank	Priority Organic Pollutants	Di-n-octyl phthalate	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Dieldrin	1.5 UJ	ug/L	1.5	5.8
5/21/2007	Blank	Priority Organic Pollutants	Diethyl phthalate	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Dimethyl phthalate	49 U	ug/L	49	190
5/21/2007	Blank	Priority Organic Pollutants	Endosulfan I	3.9 UJ	ug/L	3.9	16
5/21/2007	Blank	Priority Organic Pollutants	Endosulfan II	3.9 UJ	ug/L	3.9	16
5/21/2007	Blank	Priority Organic Pollutants	Endosulfan sulfate	1.5 UJ	ug/L	1.5	5.8
5/21/2007	Blank	Priority Organic Pollutants	Endrin	1.5 UJ	ug/L	1.5	5.8
5/21/2007	Blank	Priority Organic Pollutants	Endrin aldehyde	3.9 UJ	ug/L	3.9	16
5/21/2007	Blank	Priority Organic Pollutants	Fluoranthene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Fluorene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Heptachlor	1.5 UJ	ug/L	1.5	5.8
5/21/2007	Blank	Priority Organic Pollutants	Heptachlor epoxide	1.5 UJ	ug/L	1.5	5.8

Date_Sampled	UDL	SCH_Group	Name	Result	Units_Word_Result	MDL	PQL
5/21/2007	Blank	Priority Organic Pollutants	Hexachlorobenzene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Hexachlorobutadiene	2.9 U	ug/L	2.9	12
5/21/2007	Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9 U	ug/L	2.9	12
5/21/2007	Blank	Priority Organic Pollutants	Hexachloroethane	2.9 U	ug/L	2.9	12
5/21/2007	Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Isophorone	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9 U	ug/L	1.9	7.8
5/21/2007	Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9 U	ug/L	1.9	7.8
5/21/2007	Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9 U	ug/L	2.9	12
5/21/2007	Blank	Priority Organic Pollutants	Naphthalene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Nitrobenzene	1.9 U	ug/L	1.9	7.8
5/21/2007	Blank	Priority Organic Pollutants	Pentachlorophenol	2.9 U	ug/L	2.9	12
5/21/2007	Blank	Priority Organic Pollutants	Phenanthrene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Phenol	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	Pyrene	0.97 U	ug/L	0.97	3.9
5/21/2007	Blank	Priority Organic Pollutants	alpha-BHC	1.5 UJ	ug/L	1.5	5.8
5/21/2007	Blank	Priority Organic Pollutants	beta-BHC	1.5 UJ	ug/L	1.5	5.8
5/21/2007	Blank	Priority Organic Pollutants	delta-BHC	1.5 UJ	ug/L	1.5	5.8
5/21/2007	Blank	Priority Organic Pollutants	gamma-BHC	1.5 UJ	ug/L	1.5	5.8

FDEP Biology Laboratory - Acute Screen Bioassay Bench Sheets

Facility: Callahan WWTF

Address: Brandies Avenue East

City: Callahan County: Nassau

Contact/District: Tom Kallemeyn / Northeast

NPDES Permit #: FL0036407

LIMS Job #: TLH-2007-05-22-69-01 LIMS Sample #: 1012009

Lims Data Entry: 6-1-07 MF Data Entry Verification: 6-1-07 BA

Sample Collection: Date: 5/21/07 Time: 1030

Hold Time Start: Date: 5/21/07 Time: 1030

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

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: ____

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

Light Intensity: 50 - 100 ft. candles
Photoperiod: 16 light 8 dark
Temperature Range °C:
Incubator # 2 min 25.9 max 26.2 mean 26.0
Incubator # ____ min ____ max ____ mean ____
Room B246 min 24.9 max 26.4 mean 25.7

Investigators' Signatures
James Dennis
Peter Nicholas
Marshall Faircloth
Nigel Wellendorf
REVIEWER

Water Quality Parameters	20% DMW 5-14-07	Moderately Hard Water/ (Well Water)	Salt Water ASW NSW Test 1	Salt Water ASW NSW Test 2	Other:	Original Sample	Method	Measured by	Verified by
Field Total Residual Cl_2 (mg/L):	N/A	N/A	N/A	N/A		NOT measur		ed	MF
Lab Total Residual Cl_2 (mg/L):	<0.03	<0.03				<0.03	HACH	~~PDV~~	MF
Alkalinity (mg/L as $CaCO_3$):	83	143	165 2 MF			165	HACH	~~PDV~~	MF
Hardness (mg/L as $CaCO_3$):	92	144				270	HACH	~~PDV~~	MF
Total Ammonia (mg/L as N):	<0.017	<0.017				1.105	DENVER	MF	~~PDV~~
Salinity (ppth):	<1	<1				<1	YSI / (Mettler)	MF	~~PDV~~

V 1.4 9/12/05

060011

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1012007 **Test #:** 1/2 **SOP#:TA 07** 01 **Test Started:** Date 5/22/07 Time: 1215
Organism/Batch/Age: C.dubia / 20-07 / <24 hours **Test Ended:** Date 5.24.07 Time: 1200
Chamber/Test Volume: 30 / 20 ml **Diluent/ Batch:** 20% DMW / 5-14-07
Food/Batch: YCT 1-7-07 **P.sub** 1-07 **Artemia 0hr** — **24hr** — **48hr** — **72hr** — **Artemia Lot#** —
Feeding: Prior to Test (circled) Prior to Renewal Daily

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

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 ______

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

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000012

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample #: 1612007 Test #: 2/2 SOP#:TA 07 02 Test Started: Date 5/22/07 Time: 1210
Organism/Batch/Age: C. leedsi / 5-22-07 / 10 days Test Ended: Date 5.24.07 Time: 1215
Chamber/Test Volume: 1000 / 500 ml Diluent/ Batch: WELL / 5/4/07
Food/Batch: YCT — P.sub — Artemia 0hr 74077 24hr____ 48hr____ 72hr____ Artemia Lot# ESL S3456 OF
Feeding: Prior to Test (circled) Prior to Renewal Daily

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl	A	D13	5	5	5			
	B	D14	5	5	5			
	C	D15	5	5	5			
	D	D16	5	5	5			
100%	A	D17	5	5	5			
	B	D18	5	5	5			
	C	D19	5	5	5			
	D	D20	5	5	5			
Loaded/Verified by: JD / MF		Checked by:	MF	JD	JD			

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________

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

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000013

FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 1012007 **Test #:** 1 of 2

TEST SOP #: TA07_01 **Test Species:** ~~Ceriodaphnia dubia~~ *Cyprinella leedsi* *Pimephales promelas* *Americamysis bahia* *Menidia beryllina* Other:_____

Concentration Ctrl	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	M		M			
pH (S.U.)	8.1		8.2			
Temperature °C	25.5		24.4			
Dissolved Oxygen mg/L	7.7		7.5			
Conductivity (µmhos) mmhos	175		201			
(initials) Measured by:	MF		JD			
(initials) Recorded by:	MF		JD			

Comments:

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	M		M			
pH (S.U.)	7.4		8.4			
Temperature °C	25.9		24.0			
Dissolved Oxygen mg/L	7.2		7.3			
Conductivity (µmhos) mmhos	799		834			
(initials) Measured by:	MF		JD			
(initials) Recorded by:	MF		JD			

Comments:

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

Comments:

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

Comments:

000014

V 2.0 2/24/04

FDEP Biology Laboratory - Bioassay Parameter Bench Sheet

LIMS Sample # : 1012007 **Test #:** 2 of 2

TEST SOP #: TA07_02 **Test Species:** *Ceriodaphnia dubia* (*Cyprinella leedsi*) *Pimephales promelas* *Americamysis bahia* *Menidia beryllina* Other:_____

Concentration: Ctrl	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	8.2	8.3	8.4			
Temperature °C	25.1	24.8	24.9			
Dissolved Oxygen mg/L	7.6	7.0	7.5			
Conductivity (µmhos) mmhos	263	271	276			
(initials) Measured by:	JD	JD	JD			
(initials) Recorded by:	JD	JD	JD			

Comments:

Concentration: 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A	B	C			
pH (S.U.)	7.5	7.9	7.9			
Temperature °C	25.6	24.4	24.8			
Dissolved Oxygen mg/L	7.2	5.0	4.3			
Conductivity (µmhos) mmhos	768	772	809			
(initials) Measured by:	JD	JD	JD			
(initials) Recorded by:	JD	JD	JD			

Comments:

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

Comments:

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

Comments:

MBL Aquaculture
4569 Samuel Street
Sarasota, Florida 34233
TEL: (800) 889-0384
FAX: (941) 922-3874
EMAIL: sales@mblaquaculture.com
WEB: www.MBLAquaculture.com

NELAC Accredited

Organism Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Date: 5/21/07

Shipped to: Florida DEP

P.O. No: N/A

Species	Quantity	Age	Brood Number	Temperature	Salinity
Mysidopsis bahia					
Menidia beryllina	150	12 days	SS070509	25°C	19.5‰
Cyprinella leedsi	50	9 days	CL070512	25°C	
Pimephales promelas					

Packed by: [signature]

Shipped Via: Fed Ex

Notes: _____

Thank you for your order.

STATE OF FLORIDA

DEPT. OF ENVIRONMENTAL PROTECTION

NORTHEAST DISTRICT

Division of Water Facilities
Technical Support
7825 Baymeadows Way,suite 200B
Jacksonville, Florida 32256

Microbiology Report

Name: Callahan wwtp **Survey type:** FYI5
Sample: Effluent and surf.water **Sample date:** 05/21/07

D.O.H.accred.#E32890

Lab I.D.#	Site Name	Analysis Date	Time of Sample	Time of Analysis	S.M.9222B Total colif. #cfu/100ml	code	S.M.9222D Fecal colif. #cfu/100ml	code
071180jm	Alligator crk upst. Pod	5/21/2007	8:50	13:23			545	AB
071181jm	Alligator crk.down pod	5/21/2007	9:45	13:23			909	AB
071182jm	Callahan wwtp effluent	5/21/2007	10:30	13:23			70	B

Results for NELAP accredited tests contained in this report meet the requirements for the National Environmental Accredidation Program.

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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 value reported is the minimum detection limit.
V - Analyte was detected in both sample and method blank.
Z - Colonies were too numerous to count (TNTC). # represents amnt.filtered.

SURVEY TYPE: Ambient Monitoring--Trend,Reference Stream,Reference Lake,BioReconn,Special project
Permit Compliance--5th Year,3rd Year,CSI,CEI,PAI,RI,Complaint Potable Water--Sanitary Survey,Facility Inspection
SAMPLE TYPE: Suface Water,Ground Water,Potable Water,Treated Effluent,Untreated Effluent,Sediment,Sludge,Soil

Signature Sample Results: Jeremy Parrish Date: 5/23/2007

STATE OF FLORIDA

DEPT. OF ENVIRONMENTAL PROTECTION

NORTHEAST DISTRICT

Division of Water Facilities
Technical Support
7825 Baymeadows Way,suite 200B
Jacksonville, Florida 32256

Microbiology Report

Name: Callahan wwtp **Survey type:** Inspection
Sample: effluent/surface water **Sample date:** 05/24/07

D.O.H.accred.#E32890

Lab I.D.#	Site Name	Analysis Date	Time of Sample	Time of Analysis	S.M.9222B Total colif. #cfu/100ml	code	S.M.9222D Fecal colif. #cfu/100ml	code
071225jm	Alligator crk upst.pod	5/24/2007	9:30	13:40			100	AB
071226jm	Callahan wwtp efflu.pod	5/24/2007	9:46	13:40			4,300	
071227jm	Alligator crk. Down pod	5/24/2007	10:06	13:40			520	B

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SURVEY TYPE: Ambient Monitoring--Trend,Reference Stream,Reference Lake,BioReconn,Special project Permit Compliance--5th Year,3rd Year,CSI,CEI,PAI,RI,Complaint Potable Water--Sanitary Survey,Facility Inspection

SAMPLE TYPE: Suface Water,Ground Water,Potable Water,Treated Effluent,Untreated Effluent,Sediment,Sludge,Soil

Signature Sample Results: Jeremy Parrish Date: 5/25/2007

STATE OF FLORIDA

DEPT. OF ENVIRONMENTAL PROTECTION

NORTHEAST DISTRICT

Division of Water Facilities
Technical Support
7825 Baymeadows Way,suite 200B
Jacksonville, Florida 32256

Microbiology Report

Name: Callahan wwtp/Alligator creek **Survey type:** Inspection
Sample: effluent/surface water **Sample date:** 06/05/07

D.O.H.accred.#E32890 S.M.9222B S.M.9222D

Lab I.D.#	Site Name	Analysis Date	Time of Sample	Time of Analysis	Total colif. #cfu/100ml	code	Fecal colif. #cfu/100ml	code
71286jm	Pod pipe	6/5/2007	9:10	15:00			33	U
071291jm	50m downstream	6/5/2007	9:20	15:00			1,500	B
071292jm	100m downstream	6/5/2007	9:30	15:00			1000	B
071288jm	100m upstream	6/5/2007	9:40	15:00			300	AB
071290jm	callahan wwtp C.C.	6/5/2007	10:10	15:00			1200	
071286jm	Construction upstream	6/5/2007	10:45	15:00			800	
071287jm	Construction downstr.	6/5/2007	10:46	15:00			400	B

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SURVEY TYPE: Ambient Monitoring--Trend,Reference Stream,Reference Lake,BioReconn,Special project Permit Compliance--5th Year,3rd Year,CSI,CEI,PAI,RI,Complaint Potable Water--Sanitary Survey,Facility Inspection

SAMPLE TYPE: Suface Water,Ground Water,Potable Water,Treated Effluent,Untreated Effluent,Sediment,Sludge,Soil

Signature Sample Results: Jeremy Parrish Date: 6/7/2007

STATE OF FLORIDA

DEPT. OF ENVIRONMENTAL PROTECTION

NORTHEAST DISTRICT

Division of Water Facilities
Technical Support
7825 Baymeadows Way,suite 200B
Jacksonville, Florida 32256

Microbiology Report

Name: Callahan wwtf **Survey type:** Inspection
Sample: surf.water/effluent **Sample date:** 06/19/07

D.O.H.accred.#E32890

					S.M.9222B		S.M.9222D	
Lab I.D.#	**Site Name**	**Analysis Date**	**Time of Sample**	**Time of Analysis**	**Total colif. #cfu/100ml**	**code**	**Fecal colif. #cfu/100ml**	**code**
071408jm	50m downstream effl.	6/19/2007	9:10	14:15			4,200	
071409jm	100m downstream effl.	6/19/2007	9:20	14:15			675	AB
071410jm	100m upstream effl.	6/19/2007	9:30	14:15			325	AB
071411jm	Chl.contact chamber	6/19/2007	9:40	14:15			1	Z

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Permit Compliance--5th Year,3rd Year,CSI,CEI,PAI,RI,Complaint Potable Water--Sanitary Survey,Facility Inspection
SAMPLE TYPE: Suface Water,Ground Water,Potable Water,Treatec Effluent,Untreated Effluent,Sediment,Sludge,Soil

Signature Sample Results: Jeremy Parrish Date: 6/22/2007

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT
7825 BAYMEADOWS WAY. SUIT B-200 **DOH Accreditation # E32890**
JACKSONVILLE, FL 32256-7577

SAMPLE ID: 71411JC STATION: DATE: 06/19/07 TIME: 09:40
SAMPLE SOURCE Alligator Creek/ Callahan WWTF SAMPLER: Joseph Emery/Max Schwartz
STATION Callahan CCC
LOCATION:
PROGRAM MOD: DW COMPLIANCE: ☒ ENFORCEMENT: ☐
FIELD MEASUREMENTS

Tot. Depth (meters)		Sample Depth (meters)		W.Temp. °C:	26.59
Conductivity: µmoh/cm (EPA 120.1) :	762	Diss. Oxygen (EPA 360.1)	7.13	EPA 170.1	
Stream Velocity (ft/sec)		Salinity (ppt)	0.37	T.R.C.:	
pH:(EPA 150.1)	7.14	Secchi (meters)		EPA 330.5	

WEATHER CONDITIONS:

LABORATORY MEASUREMENTS

		Unit	Analysis Date/Time	Analyst	Remarks
Turbidity: EPA 180.1	32.0	NTU	06/20/2007 - 14:00	BA	
Color: EPA 110.2		Pt-Co			
BOD: SM 5210-B. 20th Edn.	31.0	mg/L	06/20/2007 - 09:15	BA/JOW	
CBOD: SM 5210-B. 20th Edn		mg/L			
Tot. Suspended Solids: EPA 160.2	46	mg/L	06/21/2007 - 07:45	BA	
Vol. Suspended Solids: EPA 160.4		mg/L			
Fix Suspended Solids:		mg/L			

COMMENTS:

Sample Custody
Sample Released to: Bipin Adhyaru Date: 06/19/2007

Preservation: On Ice <6 °C Time: 13:00

Reported by: Bipin Adhyaru Ext. 3224 Date:: 06/29/2007

A = Value is the mean of two or more determinations.
J = Estimated value; value not accurate.
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T = Value reported is less than the laboratory method detection limit.
U = Indicates that the compound was analyzed for but not detected.
Y = The laboratory analysis was from an unpreserved or improperly preserved sample.
Results for NELAP accredited tests contained in this report meet the requirement specified for the National Environmental Accreditation Program.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT
7825 BAYMEADOWS WAY, SUIT B-200 **DOH Accreditation # E32890**
JACKSONVILLE, FL 32256-7577

SAMPLE ID: 71225JC STATION: DATE: 05/24/07 TIME: 09:30
SAMPLE SOURCE Callahan WWTF SAMPLER: Joseph Emery
STATION Callahan WWTF upstream
LOCATION:
PROGRAM MOD: DW COMPLIANCE: ☒ ENFORCEMENT: ☐
FIELD MEASUREMENTS

Tot. Depth (meters)	0.2	Sample Depth (meters)	0.1	W.Temp. °C:	19.41
Conductivity: µmoh/cm (EPA 120.1) :	623	Diss. Oxygen (EPA 360.1)	2.22	EPA 170.1	
Stream Velocity (ft/sec)		Salinity (ppt)	0.30	T.R.C.:	
pH:(EPA 150.1)	7.45	Secchi (meters)		EPA 330.5	

WEATHER CONDITIONS:

LABORATORY MEASUREMENTS

		Unit	Analysis Date/Time	Analyst	Remarks
Turbidity: EPA 180.1	1.2	NTU	05/25/2007 - 09:00	BA	
Color: EPA 110.2		Pt-Co			
BOD: SM 5210-B, 20th Edn.	2 K	mg/L	05/25/2007 - 08:30	BA	
CBOD: SM 5210-B, 20th Edn		mg/L			
Tot. Suspended Solids: EPA 160.2	2	mg/L	05/25/2007 - 08:00	BA	
Vol. Suspended Solids: EPA 160.4		mg/L			
Fix Suspended Solids:		mg/L			

COMMENTS: 30°34'30.5" N 81° 49' 45.8" W 3.6m accuracy

Sample Custody
Sample Released to: Bipin Adhyaru Date: 05/24/2007

Preservation: On Ice <6°C Time: 13:30

Reported by: Bipin Adhyaru Ext. 3224 Date:: 05/30/2007

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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT
7825 BAYMEADOWS WAY, SUIT B-200 **DOH Accreditation # E32890**
JACKSONVILLE, FL 32256-7577

SAMPLE ID: 71226JC STATION: DATE: 05/24/07 TIME: 09:46
SAMPLE SOURCE Callahan WWTF SAMPLER: Joseph Emery
STATION Callahan 10m Downstream
LOCATION:
PROGRAM MOD: DW COMPLIANCE: ☒ ENFORCEMENT: ☐
FIELD MEASUREMENTS

Tot. Depth (meters)	0.5	Sample Depth (meters)	0.5	W.Temp. °C:	22.53
Conductivity: µmoh/cm (EPA 120.1) :	762	Diss. Oxygen (EPA 360.1)	0.44	EPA 170.1	
Stream Velocity (ft/sec)		Salinity (ppt)	0.38	T.R.C.:	
pH:(EPA 150.1)	7.13	Secchi (meters)		EPA 330.5	

WEATHER CONDITIONS:

LABORATORY MEASUREMENTS

		Unit	Analysis Date/Time	Analyst	Remarks
Turbidity: EPA 180.1	24.0	NTU	05/25/2007 - 09:00	BA	
Color: EPA 110.2		Pt-Co			
BOD: SM 5210-B, 20th Edn.	41.4	mg/L	05/25/2007 - 08:30	BA	
CBOD: SM 5210-B, 20th Edn		mg/L			
Tot. Suspended Solids: EPA 160.2	46	mg/L	05/25/2007 - 08:00	BA	
Vol. Suspended Solids: EPA 160.4		mg/L			
Fix Suspended Solids:		mg/L			

COMMENTS: 30°34'30.9" N 81° 49' 42.6" 8.3m accuracy

Sample Custody
Sample Released to: Bipin Adhyaru Date: 05/24/2007

Preservation: On Ice <6°C Time: 13:30

Reported by: Bipin Adhyaru Ext. 3224 Date:: 05/30/2007

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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT
7825 BAYMEADOWS WAY. SUIT B-200 **DOH Accreditation # E32890**
JACKSONVILLE. FL 32256-7577

SAMPLE ID: 71227JC STATION: DATE: 05/24/07 TIME: 10:06
SAMPLE SOURCE: Callahan WWTF SAMPLER: Joseph Emery
STATION Downstream
LOCATION:
PROGRAM MOD: DW COMPLIANCE: ☒ ENFORCEMENT: ☐
FIELD MEASUREMENTS

Tot. Depth (meters)	0.458	Sample Depth (meters)	0.458	W.Temp. °C:	20.91
Conductivity: µmoh/cm (EPA 120.1) :	723	Diss. Oxygen (EPA 360.1)	0.35	EPA 170.1	
Stream Velocity (ft/sec)		Salinity (ppt)	0.35	T.R.C.:	
pH:(EPA 150.1)	7.19	Secchi (meters)		EPA 330.5	

WEATHER CONDITIONS:

LABORATORY MEASUREMENTS

		Unit	Analysis Date/Time	Analyst	Remarks
Turbidity: EPA 180.1	6.0	NTU	05/25/2007 - 09:00	BA	
Color: EPA 110.2		Pt-Co			
BOD: SM 5210-B. 20th Edn.	16.4	mg/L	05/25/2007 - 08:30	BA	
CBOD: SM 5210-B. 20th Edn		mg/L			
Tot. Suspended Solids: EPA 160.2	12	mg/L	05/25/2007 - 08:00	BA	
Vol. Suspended Solids: EPA 160.4		mg/L			
Fix Suspended Solids:		mg/L			

COMMENTS: 30°34'31.7" N 81° 49' 39.3" W 7.4m accuracy

Sample Custody

Sample Released to:	Bipin Adhyaru	Date:	05/24/2007
Preservation:	On Ice <6°C	Time:	13:30
Reported by:	Bipin Adhyaru Ext. 3224	Date::	05/30/2007

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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT
7825 BAYMEADOWS WAY, SUIT B-200 **DOH Accreditation # E32890**
JACKSONVILLE, FL 32256-7577

SAMPLE ID: 71286JC STATION: DATE: 06/05/07 TIME: 10:45
SAMPLE SOURCE Alligator Creek/ Callahan WWTF SAMPLER: Joseph Emery/Max Schwartz
STATION Upstream of stormwater discharge.
LOCATION:
PROGRAM MOD: DW COMPLIANCE: ☒ ENFORCEMENT: ☐
FIELD MEASUREMENTS

Tot. Depth (meters)		Sample Depth (meters)		W.Temp. °C:	24.16
Conductivity: µmoh/cm (EPA 120.1) :	341	Diss. Oxygen (EPA 360.1)	3.69	EPA 170.1	
Stream Velocity (ft/sec)		Salinity (ppt)	0.16	T.R.C.:	
pH:(EPA 150.1)	7.7	Secchi (meters)		EPA 330.5	

WEATHER CONDITIONS:

LABORATORY MEASUREMENTS

		Unit	Analysis Date/Time	Analyst	Remarks
Turbidity: EPA 180.1	7.0	NTU	06/05/2007 - 14:00	BA	
Color: EPA 110.2		Pt-Co			
BOD: SM 5210-B. 20th Edn.	2.2	mg/L	06/06/2007 - 08:30	BA	
CBOD: SM 5210-B. 20th Edn		mg/L			
Tot. Suspended Solids: EPA 160.2	4	mg/L	06/07/2007 - 07:45	BA	
Vol. Suspended Solids: EPA 160.4		mg/L			
Fix Suspended Solids:		mg/L			

COMMENTS:

Sample Custody

Sample Released to:	Bipin Adhyaru	Date:	06/05/2007
Preservation:	On Ice <6 °C	Time:	13:24
Reported by:	Bipin Adhyaru Ext. 3224	Date::	06/11/2007

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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT
7825 BAYMEADOWS WAY, SUIT B-200 **DOH Accreditation # E32890**
JACKSONVILLE, FL 32256-7577

SAMPLE ID: 71287JC STATION: DATE: 06/05/07 TIME: 10:46
SAMPLE SOURCE Alligator Creek/ Callahan WWTF SAMPLER: Joseph Emery/Max Schwartz
STATION LOCATION: Downstream of Stormwater Discharge.
PROGRAM MOD: DW COMPLIANCE: ☒ ENFORCEMENT: ☐
FIELD MEASUREMENTS

Tot. Depth (meters)		Sample Depth (meters)		W.Temp. °C:	25.98
Conductivity: µmoh/cm (EPA 120.1) :	233	Diss. Oxygen (EPA 360.1)	6.72	EPA 170.1	
Stream Velocity (ft/sec)		Salinity (ppt)	0.11	T.R.C.:	
pH:(EPA 150.1)	7.75	Secchi (meters)		EPA 330.5	

WEATHER CONDITIONS:

LABORATORY MEASUREMENTS

		Unit	Analysis Date/Time	Analyst	Remarks
Turbidity: EPA 180.1	26.0	NTU	06/05/2007 - 14:00	BA	
Color: EPA 110.2		Pt-Co			
BOD: SM 5210-B. 20th Edn.	2.6	mg/L	06/06/2007 - 08:30	BA	
CBOD: SM 5210-B. 20th Edn		mg/L			
Tot. Suspended Solids: EPA 160.2	25	mg/L	06/07/2007 - 07:45	BA	
Vol. Suspended Solids: EPA 160.4		mg/L			
Fix Suspended Solids:		mg/L			

COMMENTS:

Sample Custody
Sample Released to: Bipin Adhyaru Date: 06/05/2007

Preservation: On Ice <6 °C Time: 13:24

Reported by: Bipin Adhyaru Ext. 3224 Date:: 06/11/2007

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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT
7825 BAYMEADOWS WAY, SUIT B-200 **DOH Accreditation # E32890**
JACKSONVILLE, FL 32256-7577

SAMPLE ID: 71288JC STATION: DATE: 06/05/07 TIME: 09:40
SAMPLE SOURCE Alligator Creek/ Callahan WWTF SAMPLER: Joseph Emery/Max Schwartz
STATION Callahan 100 m upstream.
LOCATION:
PROGRAM MOD: DW COMPLIANCE: ☒ ENFORCEMENT: ☐
FIELD MEASUREMENTS

Tot. Depth (meters)		Sample Depth (meters)		W.Temp. °C:	24.15
Conductivity: µmoh/cm (EPA 120.1) :	250	Diss. Oxygen (EPA 360.1)	4.51	EPA 170.1	
Stream Velocity (ft/sec)		Salinity (ppt)	0.12	T.R.C.:	
pH:(EPA 150.1)	7.56	Secchi (meters)		EPA 330.5	

WEATHER CONDITIONS:

LABORATORY MEASUREMENTS

		Unit	Analysis Date/Time	Analyst	Remarks
Turbidity: EPA 180.1	14.5	NTU	06/05/2007 - 14:00	BA	
Color: EPA 110.2		Pt-Co			
BOD: SM 5210-B, 20th Edn.	2.1	mg/L	06/06/2007 - 08:30	BA	
CBOD: SM 5210-B, 20th Edn		mg/L			
Tot. Suspended Solids: EPA 160.2	4	mg/L	06/07/2007 - 07:45	BA	
Vol. Suspended Solids: EPA 160.4		mg/L			
Fix Suspended Solids:		mg/L			

COMMENTS:

Sample Custody
Sample Released to: Bipin Adhyaru Date: 06/05/2007

Preservation: On Ice <6 °C Time: 13:24

Reported by: Bipin Adhyaru Ext. 3224 Date:: 06/11/2007

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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT
7825 BAYMEADOWS WAY, SUIT B-200 **DOH Accreditation # E32890**
JACKSONVILLE, FL 32256-7577

SAMPLE ID: 71289JC STATION: DATE: 06/05/07 TIME: 09:10
SAMPLE SOURCE Alligator Creek/ Callahan WWTF SAMPLER: Joseph Emery/Max Schwartz
STATION Callahan WWTF POD Pipe.
LOCATION:
PROGRAM MOD: DW COMPLIANCE: ☒ ENFORCEMENT: ☐
FIELD MEASUREMENTS

Tot. Depth (meters)		Sample Depth (meters)		W.Temp. °C:	25.29
Conductivity: µmoh/cm (EPA 120.1) :	577	Diss. Oxygen (EPA 360.1)	7.62	EPA 170.1	
Stream Velocity (ft/sec)		Salinity (ppt)	0.28	T.R.C.:	
pH:(EPA 150.1)	7.43	Secchi (meters)	0.097	EPA 330.5	

WEATHER CONDITIONS:

LABORATORY MEASUREMENTS

		Unit	Analysis Date/Time	Analyst	Remarks
Turbidity: EPA 180.1	20.0	NTU	06/05/2007 - 14:00	BA	
Color: EPA 110.2		Pt-Co			
BOD: SM 5210-B. 20th Edn.	27.1	mg/L	06/06/2007 - 08:30	BA	
CBOD: SM 5210-B. 20th Edn		mg/L			
Tot. Suspended Solids: EPA 160.2	27	mg/L	06/07/2007 - 07:45	BA	
Vol. Suspended Solids: EPA 160.4		mg/L			
Fix Suspended Solids:		mg/L			

COMMENTS:

Sample Custody
Sample Released to: Bipin Adhyaru Date: 06/05/2007

Preservation: On Ice <6 °C Time: 13:24

Reported by: Bipin Adhyaru Ext. 3224 Date:: 06/11/2007

A = Value is the mean of two or more determinations.
J = Estimated value: value not accurate.
K = Actual value is known to be less than the value given
L = Off - scale high. Actual value is known to be greater than value given
O = Sampled, but analysis lost or not performed.
PQL = The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
Q = Sample held beyond the accepted holding time.
REJ = Data is rejected and should not be used.
T = Value reported is less than the laboratory method detection limit.
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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT
7825 BAYMEADOWS WAY, SUIT B-200 **DOH Accreditation # E32890**
JACKSONVILLE, FL 32256-7577

SAMPLE ID: 71290JC STATION: DATE: 06/05/07 TIME: 10:10
SAMPLE SOURCE Alligator Creek/ Callahan WWTF SAMPLER: Joseph Emery/Max Schwartz
STATION Callahan WWTP CCC
LOCATION:
PROGRAM MOD: DW COMPLIANCE: ☒ ENFORCEMENT: ☐
FIELD MEASUREMENTS

Tot. Depth (meters)		Sample Depth (meters)		W.Temp. °C:	25.55
Conductivity: µmoh/cm (EPA 120.1) :	651	Diss. Oxygen (EPA 360.1)	9.0	EPA 170.1	
Stream Velocity (ft/sec)		Salinity (ppt)	0.32	T.R.C.:	
pH:(EPA 150.1)	7.47	Secchi (meters)		EPA 330.5	

WEATHER CONDITIONS:

LABORATORY MEASUREMENTS

		Unit	Analysis Date/Time	Analyst	Remarks
Turbidity: EPA 180.1	23.0	NTU	06/05/2007 - 14:00	BA	
Color: EPA 110.2		Pt-Co			
BOD: SM 5210-B, 20th Edn.	31.0	mg/L	06/06/2007 - 08:30	BA	
CBOD: SM 5210-B, 20th Edn		mg/L			
Tot. Suspended Solids: EPA 160.2	39	mg/L	06/07/2007 - 07:45	BA	
Vol. Suspended Solids: EPA 160.4		mg/L			
Fix Suspended Solids:		mg/L			

COMMENTS:

Sample Custody
Sample Released to: Bipin Adhyaru Date: 06/05/2007

Preservation: On Ice <6 °C Time: 13:24

Reported by: Bipin Adhyaru Ext. 3224 Date:: 06/11/2007

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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT
7825 BAYMEADOWS WAY, SUIT B-200 **DOH Accreditation # E32890**
JACKSONVILLE, FL 32256-7577

SAMPLE ID: 71291JC STATION: DATE: 06/05/07 TIME: 09:20
SAMPLE SOURCE Alligator Creek/ Callahan WWTF SAMPLER: Joseph Emery/Max Schwartz
STATION 10 m downstream of POD.
LOCATION:
PROGRAM MOD: DW COMPLIANCE: ☒ ENFORCEMENT: ☐
FIELD MEASUREMENTS

Tot. Depth (meters)		Sample Depth (meters)		W.Temp. °C:	24.22
Conductivity: µmoh/cm (EPA 120.1) :	352	Diss. Oxygen (EPA 360.1)	4.29	EPA 170.1	
Stream Velocity (ft/sec)		Salinity (ppt)	0.17	T.R.C.:	
pH:(EPA 150.1)	7.45	Secchi (meters)		EPA 330.5	

WEATHER CONDITIONS:

LABORATORY MEASUREMENTS

		Unit	Analysis Date/Time	Analyst	Remarks
Turbidity: EPA 180.1	23.0	NTU	06/05/2007 - 14:00	BA	
Color: EPA 110.2		Pt-Co			
BOD: SM 5210-B, 20th Edn.	17.9	mg/L	06/06/2007 - 08:30	BA	
CBOD: SM 5210-B, 20th Edn		mg/L			
Tot. Suspended Solids: EPA 160.2	36	mg/L	06/07/2007 - 07:45	BA	
Vol. Suspended Solids: EPA 160.4		mg/L			
Fix Suspended Solids:		mg/L			

COMMENTS:

Sample Custody
Sample Released to: Bipin Adhyaru Date: 06/05/2007

Preservation: On Ice <6 °C Time: 13:24

Reported by: Bipin Adhyaru Ext. 3224 Date:: 06/11/2007

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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT
7825 BAYMEADOWS WAY, SUIT B-200 **DOH Accreditation # E32890**
JACKSONVILLE, FL 32256-7577

SAMPLE ID: 71292JC STATION: DATE: 06/05/07 TIME: 09:30
SAMPLE SOURCE Alligator Creek/ Callahan WWTF SAMPLER: Joseph Emery/Max Schwartz
STATION Callahan 100 m downstream.
LOCATION:
PROGRAM MOD: DW COMPLIANCE: ☒ ENFORCEMENT: ☐
FIELD MEASUREMENTS

Tot. Depth (meters)		Sample Depth (meters)		W.Temp. °C:	24.12
Conductivity: µmoh/cm (EPA 120.1) :	349	Diss. Oxygen (EPA 360.1)	3.16	EPA 170.1	
Stream Velocity (ft/sec)		Salinity (ppt)	0.17	T.R.C.:	
pH:(EPA 150.1)	7.35	Secchi (meters)		EPA 330.5	

WEATHER CONDITIONS:

LABORATORY MEASUREMENTS

		Unit	Analysis Date/Time	Analyst	Remarks
Turbidity: EPA 180.1	13.7	NTU	06/05/2007 - 14:00	BA	
Color: EPA 110.2		Pt-Co			
BOD: SM 5210-B, 20th Edn.	8.0	mg/L	06/06/2007 - 08:30	BA	
CBOD: SM 5210-B. 20th Edn		mg/L			
Tot. Suspended Solids: EPA 160.2	6	mg/L	06/07/2007 - 07:45	BA	
Vol. Suspended Solids: EPA 160.4		mg/L			
Fix Suspended Solids:		mg/L			

COMMENTS:

Sample Custody
Sample Released to: Bipin Adhyaru Date: 06/05/2007

Preservation: On Ice <6 °C Time: 13:24

Reported by: Bipin Adhyaru Ext. 3224 Date:: 06/11/2007

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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT
7825 BAYMEADOWS WAY, SUIT B-200 **DOH Accreditation # E32890**
JACKSONVILLE, FL 32256-7577

SAMPLE ID: 71408JC STATION: DATE: 06/19/07 TIME: 09:07
SAMPLE SOURCE Alligator Creek/ Callahan WWTF SAMPLER: Joseph Emery/Max Schwartz
STATION 10 m downstream of POD.
LOCATION:
PROGRAM MOD: DW COMPLIANCE: ☒ ENFORCEMENT: ☐
FIELD MEASUREMENTS

Tot. Depth (meters)		Sample Depth (meters)		W.Temp. °C:	25.49
Conductivity: µmoh/cm (EPA 120.1) :	682	Diss. Oxygen (EPA 360.1)	5.12	EPA 170.1	
Stream Velocity (ft/sec)		Salinity (ppt)	0.33	T.R.C.:	
pH:(EPA 150.1)	7.23	Secchi (meters)		EPA 330.5	

WEATHER CONDITIONS:

LABORATORY MEASUREMENTS

		Unit	Analysis Date/Time	Analyst	Remarks
Turbidity: EPA 180.1	26.0	NTU	06/20/2007 - 14:00	BA	
Color: EPA 110.2		Pt-Co			
BOD: SM 5210-B, 20th Edn.	31.0	mg/L	06/20/2007 - 09:15	BA/JOW	
CBOD: SM 5210-B, 20th Edn		mg/L			
Tot. Suspended Solids: EPA 160.2	46	mg/L	06/21/2007 - 07:45	BA	
Vol. Suspended Solids: EPA 160.4		mg/L			
Fix Suspended Solids:		mg/L			

COMMENTS:

Sample Custody
Sample Released to: Bipin Adhyaru Date: 06/19/2007

Preservation: On Ice <6 °C Time: 13:00

Reported by: Bipin Adhyaru Ext. 3224 Date:: 06/29/2007

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PQL = The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
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STATE OF FLORIDA
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NORTHEAST DISTRICT
7825 BAYMEADOWS WAY, SUIT B-200 **DOH Accreditation # E32890**
JACKSONVILLE, FL 32256-7577

SAMPLE ID: 71409JC STATION: DATE: 06/19/07 TIME: 09:17
SAMPLE SOURCE Alligator Creek/ Callahan WWTF SAMPLER: Joseph Emery/Max Schwartz
STATION 100 m downstream of POD.
LOCATION:
PROGRAM MOD: DW COMPLIANCE: ☒ ENFORCEMENT: ☐
FIELD MEASUREMENTS

Tot. Depth (meters)		Sample Depth (meters)		W.Temp. °C:	24.59
Conductivity: µmoh/cm (EPA 120.1) :	622	Diss. Oxygen (EPA 360.1)	0.66	EPA 170.1	
Stream Velocity (ft/sec)		Salinity (ppt)	0.30	T.R.C.:	
pH:(EPA 150.1)	7.16	Secchi (meters)		EPA 330.5	

WEATHER CONDITIONS:

LABORATORY MEASUREMENTS

		Unit	Analysis Date/Time	Analyst	Remarks
Turbidity: EPA 180.1	6.3	NTU	06/20/2007 - 14:00	BA	
Color: EPA 110.2		Pt-Co			
BOD: SM 5210-B. 20th Edn.	23.2	mg/L	06/20/2007 - 09:15	BA/JOW	
CBOD: SM 5210-B. 20th Edn		mg/L			
Tot. Suspended Solids: EPA 160.2	20	mg/L	06/21/2007 - 07:45	BA	
Vol. Suspended Solids: EPA 160.4		mg/L			
Fix Suspended Solids:		mg/L			

COMMENTS:

Sample Custody
Sample Released to: Bipin Adhyaru Date: 06/19/2007

Preservation: On Ice <6 °C Time: 13:00

Reported by: Bipin Adhyaru Ext. 3224 Date:: 06/29/2007

A = Value is the mean of two or more determinations.
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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT
7825 BAYMEADOWS WAY, SUIT B-200 **DOH Accreditation # E32890**
JACKSONVILLE, FL 32256-7577

SAMPLE ID: 71410JC STATION: DATE: 06/19/07 TIME: 09:28
SAMPLE SOURCE Alligator Creek/ Callahan WWTF SAMPLER: Joseph Emery/Max Schwartz
STATION 100 m upstream of POD.
LOCATION:
PROGRAM MOD: DW COMPLIANCE: ☒ ENFORCEMENT: ☐
FIELD MEASUREMENTS

Tot. Depth (meters)		Sample Depth (meters)		W.Temp. °C:	23.25
Conductivity: µmoh/cm (EPA 120.1) :	312	Diss. Oxygen (EPA 360.1)	2.20	EPA 170.1	
Stream Velocity (ft/sec)		Salinity (ppt)	0.15	T.R.C.:	
pH:(EPA 150.1)	7.03	Secchi (meters)		EPA 330.5	

WEATHER CONDITIONS:

LABORATORY MEASUREMENTS

		Unit	Analysis Date/Time	Analyst	Remarks
Turbidity: EPA 180.1	2.1	NTU	06/20/2007 - 14:00	BA	
Color: EPA 110.2		Pt-Co			
BOD: SM 5210-B, 20th Edn.	2 K	mg/L	06/20/2007 - 09:15	BA/JOW	
CBOD: SM 5210-B. 20th Edn		mg/L			
Tot. Suspended Solids: EPA 160.2	3	mg/L	06/21/2007 - 07:45	BA	
Vol. Suspended Solids: EPA 160.4		mg/L			
Fix Suspended Solids:		mg/L			

COMMENTS:

Sample Custody
Sample Released to: Bipin Adhyaru Date: 06/19/2007

Preservation: On Ice <6 °C Time: 13:00

Reported by: Bipin Adhyaru Ext. 3224 Date:: 06/29/2007

A = Value is the mean of two or more determinations.
J = Estimated value; value not accurate.
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Appendix G

Standard Reference Toxicant data

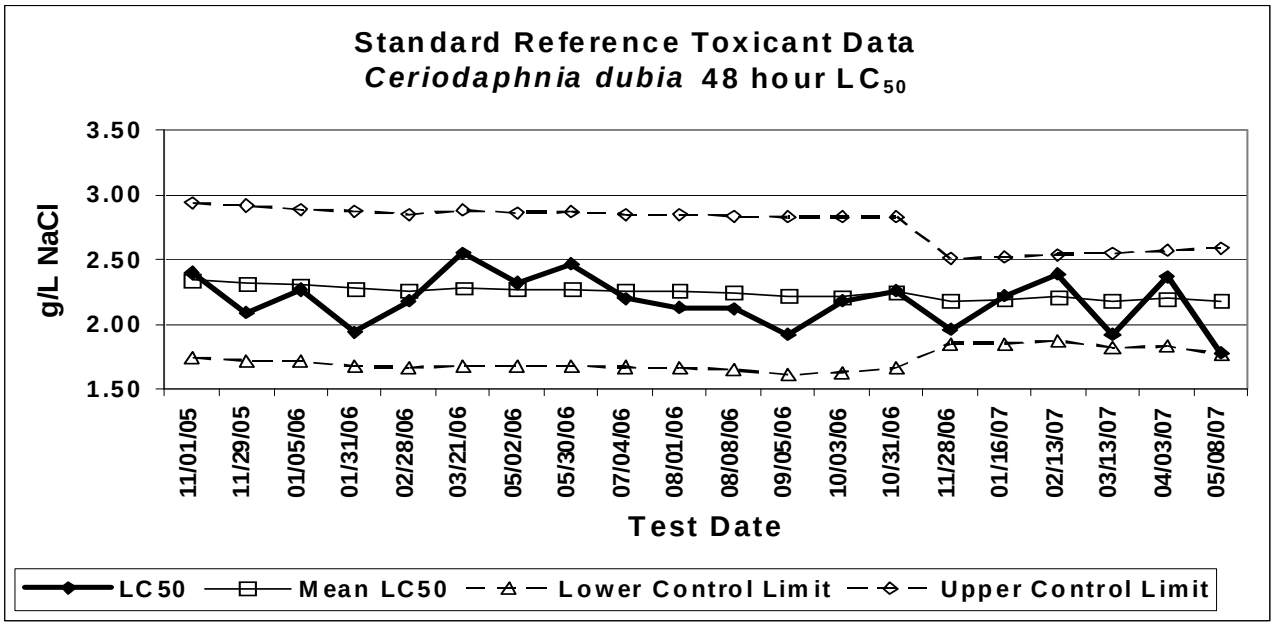
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 48-hour Acute Toxicity
Ceriodaphnia dubia (water flea) - Sodium Chloride (NaCl)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
11/01/05	2.40	2.34	0.30	1.74	2.94
11/29/05	2.09	2.32	0.30	1.72	2.92
01/05/06	2.27	2.30	0.29	1.72	2.89
01/31/06	1.94	2.28	0.30	1.67	2.88
02/28/06	2.18	2.26	0.30	1.67	2.85
03/21/06	2.55	2.28	0.30	1.68	2.88
05/02/06	2.32	2.27	0.30	1.68	2.87
05/30/06	2.47	2.27	0.30	1.68	2.87
07/04/06	2.20	2.26	0.30	1.67	2.85
08/01/06	2.13	2.26	0.30	1.66	2.85
08/08/06	2.12	2.24	0.30	1.65	2.84
09/05/06	1.92	2.22	0.30	1.61	2.83
10/03/06	2.18	2.21	0.30	1.63	2.83
10/31/06	2.26	2.25	0.29	1.66	2.83
11/28/06	1.96	2.18	0.17	1.85	2.51
01/16/07	2.22	2.19	0.17	1.85	2.52
02/13/07	2.39	2.21	0.17	1.87	2.54
03/13/07	1.92	2.18	0.18	1.82	2.55
04/03/07	2.37	2.20	0.18	1.83	2.57
05/08/07	1.78	2.18	0.21	1.77	2.59

Means are of the last 20 SRT tests.
Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev

CV = 9.63
EPA reference 75th quartile CV = 29%



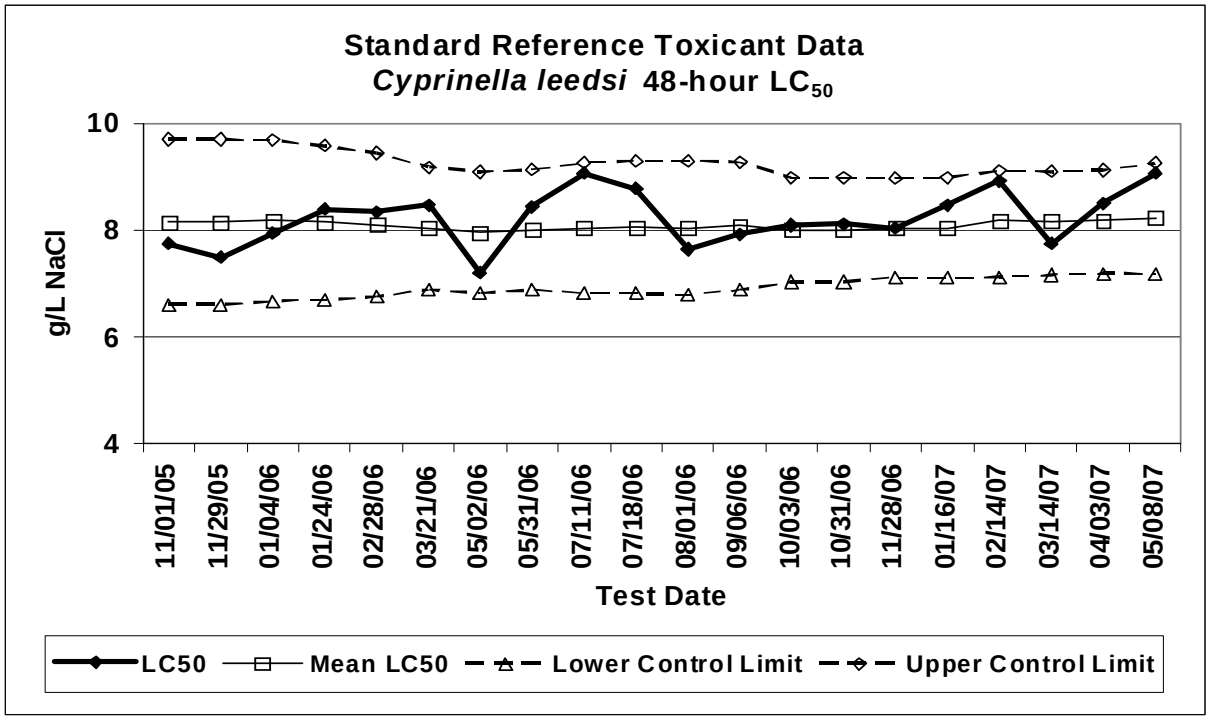
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 48-hour Acute Toxicity
Cyprinella leedsi (bannerfin shiner) - Sodium Chloride (NaCl)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
11/01/05	7.74	8.15	0.77	6.61	9.69
11/29/05	7.49	8.15	0.77	6.61	9.69
01/04/06	7.94	8.18	0.75	6.67	9.68
01/24/06	8.39	8.14	0.72	6.71	9.57
02/28/06	8.34	8.09	0.67	6.75	9.44
03/21/06	8.46	8.04	0.57	6.89	9.18
05/02/06	7.2	7.95	0.57	6.82	9.09
05/31/06	8.44	8.00	0.56	6.88	9.13
07/11/06	9.06	8.04	0.61	6.82	9.26
07/18/06	8.77	8.05	0.62	6.81	9.29
08/01/06	7.64	8.04	0.63	6.79	9.29
09/06/06	7.93	8.08	0.60	6.88	9.27
10/03/06	8.09	8.00	0.49	7.03	8.98
10/31/06	8.12	8.01	0.49	7.03	8.98
11/28/06	8.04	8.04	0.46	7.11	8.97
01/16/07	8.47	8.04	0.48	7.11	8.98
02/14/07	8.92	8.18	0.50	7.12	9.10
03/14/07	7.75	8.16	0.50	7.16	9.09
04/03/07	8.50	8.17	0.49	7.19	9.12
05/08/07	9.07	8.22	0.52	7.18	9.25

Means are of the last 20 SRT tests.
Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev

CV = 6.33
EPA reference 75th quartile CV = 19%



FDEP Biology Laboratory - Acute SRT Bench Sheet

Test Organism: *Americamysis bahia* Method 2007.0 | *Menidia beryllina* Method 2006.0 | *Hyalella azteca* Method 100.1 EPA-600-R-99-064
Ceriodaphnia dubia Method 2002.0 | *Cyprinella leedsi* Method 2000.0 | *Pimephales promelas* Method 2000.0 | Other: _____

Method from EPA-821-R-02-012
Test Type: 48 hour non-renewal / 96 hour renewal
Test Page 1 of 2

Diluent/ Batch #: DMW 14-30-07
Toxicant/ Batch#: NaCl 15-8-07

Test Beginning: Date: 5-9-07 Time: 13:40
Test Ending: Date: 5-12-07 Time: 1030

Water Quality Parameters	Diluent	Method	Initials
Total Residual Cl_2 (mg/L):	<0.03	Hach	~~PPV~~
Alkalinity (mg/L as $CaCO_3$):	89	Hach	PPV
Hardness (mg.L as $CaCO_3$):	95	Hach	~~PPV~~
Total Ammonia (mg/L as N):	<0.017	Denver	~~PPV~~
Salinity (ppth):	<1	Mettler	BA

Organism Batch #/ Age: 18-07 / < 24 HR.
Feeding: ~~Prior to test~~ / ~~Prior to renewal~~ / Daily
Food: YCT / ~~S subcapitata~~ Artemia: Lot # —
Food Batch: 2-7-07 1-7-07 0hr — 24hr — 48hr — 72hr —
Chamber size: 30 mL
Test volume: 20 mL per replicate

Conc. µg/L (mg/L)	Rep.	Chamber #	Number Live 0 hr ~~48 hr~~	Number Live 24 hr ~~72 hr~~	Number Live 48 hr ~~96 hr~~	pH (SU) 0 hr ~~48 hr~~	pH (SU) 24 hr ~~72 hr~~	pH (SU) 48 hr ~~96 hr~~	Temperature (°C) 0 hr ~~48 hr~~	Temperature (°C) 24 hr ~~72 hr~~	Temperature (°C) 48 hr ~~96 hr~~	D.O. (mg/L) 0 hr ~~48 hr~~	D.O. (mg/L) 24 hr ~~72 hr~~	D.O. (mg/L) 48 hr ~~96 hr~~	Uncorrected Conductivity µmhom/cm (mmhos/cm) 0 hr ~~48 hr~~	Uncorrected Conductivity 24 hr ~~72 hr~~	Uncorrected Conductivity 48 hr ~~96 hr~~
Control	A	A	A5	5	5	8.2		8.1	24.4		24.7	7.7		7.5	0.175		0.195
	B	B	B5	5	5												
	C	C	C5	5	5												
	D	D	D5	5	5												
1.5g/L	A	A	A5	5	4 1D	8.1		8.1	24.6		24.6	7.4		7.5	2.93		3.23
	B	B	B5	5	3 2D												
	C	C	C5	4 1D	5												
	D	D	D5	5	5												
2.0	A	A	A5	5	1 4D	8.1		8.1	24.8		24.3	7.3		7.5	3.86		4.12
	B	B	B5	5	1 4D												
	C	C	C5	4 1D	2 2D												
	D	D	D5	4 1D	1 3D												
2.5	A	A	A5	3 2D	1 2D	8.1		8.1	24.8		24.2	7.3		7.6	4.74		5.05
	B	B	B5	5	0 5D												
	C	C	C5	5	0 5D												
	D	D	D5	3 2D	0 5D												
3.0	A	A	A5	0 5D	—	8.0		—	24.8		—	7.4		—	5.54		5.48 MF
	B	B	B5	1 4D	0 1D			8.1			24.0			7.5			5.93
	C	C	C5	1 4D	0 1D												
	D	D	D5	1 4D	0 1D												
4.0	A	A	5	1 4D	0 1D	8.1		8.1	24.7		23.9	7.4		7.3	7.28		7.73
	B	B	5	0 5D													
	C	C	5	0 5D													
	D	D	5	0 5D													
	A		Chamber ID written in														
	B		Survival Column in error														
	C			MF for BA 5/21/07													
	D																
Loaded / measured by:			BA	BA	MF	BA		MF	BA		MF	BA		MF	BA		MF
Recorded by:			BA	BA	MF	BA		MF	BA		MF	BA		MF	BA		MF

Investigators' Signatures
Jason Daniels
Tabby VicHaikul
Brent Bowen
Marshall Faircloth
Nicole Wellendorf
REVIEWER

Concentrations prepared by: BA
Loading verified by: PPV
Light Intensity: 50-100 Ft. candles
Photoperiod: 16 hours Light / 8 hours dark
Temperature Range °C:
Incubator # 2 min 25.5 max 25.9 mean 25.7
Incubator # ___ min. ___ max. ___ mean ___
Room B246 min. 24.6 max. 26.1 mean 25.2

Comments:

Statistics: Method: Spearman-Karber
(48) 96 hour LC_{50}: 1.78
95% Confidence Interval: lower 1.60 upper 1.91

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revised 08/24/06 SP

FDEP Biology Laboratory - Acute SRT Bench Sheet

Test Organism: *Americamysis bahia* Method 2007.0 | *Menidia beryllina* Method 2006.0 | *Hyalella azteca* Method 100.1 EPA-600-R-99-064
Ceriodaphnia dubia ~~Method 2002.0~~ | *Cyprinella leedsi* Method 2000.0 | *Pimephales promelas* Method 2000.0 | Other: _____

Method from EPA-821-R-02-012
Test Type: 48 hour non-renewal / 96 hour renewal
Test Page 2 of 2

Diluent/ Batch #: DMW 14-30-07
Toxicant/ Batch#: NaCl 15-807

Test Beginning: Date: 5/8/07 Time: 1340
Test Ending: Date: 5-12-07 Time: 1030

Water Quality Parameters	Diluent	Method	Initials
Total Residual Cl_2 (mg/L):	0.03	Hach	PPV
Alkalinity (mg/L as $CaCO_3$):	89	Hach	PPV
Hardness (mg.L as $CaCO_3$):	95	Hach	PPV
Total Ammonia (mg/L as N):	0.07	Denver	PPV
Salinity (ppth):	<1	Mettler	BA

Organism Batch #/ Age: 18-07 / <24 HR.
Feeding: Prior to test / Prior to renewal / Daily
Food: YCT / *P. subcapitata* Artemia: Lot # —
Food Batch: 2-7-07 1-7-07 0hr — 24hr — 48hr — 72hr —
Chamber size: 30 mL
Test volume: 20 mL per replicate

48hrs → After Renewal at 48 hours MF 5-10-07

Conc. µg/L mg/L	Rep.	Chamber #	Number Live 0 hr / 24 hr / 48 hr			pH (SU) 0 hr / 24 hr / 48 hr			Temperature (°C) 0 hr / 24 hr / 48 hr			D.O. (mg/L) 0 hr / 24 hr / 48 hr			Uncorrected Conductivity µmhom/cm / mmhos/cm 0 hr / 24 hr / 48 hr		
			48 hr	72 hr	96 hr	48 hr	72 hr	96 hr	48 hr	72 hr	96 hr	48 hr	72 hr	96 hr	48 hr	72 hr	96 hr
Control	A	A	5	5	5	8.3	—	8.1	24.3	—	24.4	7.8	—		0.180	—	0.182
	B	B	5	5	5												
	C	C	5	5	5												
	D	D	5	5	5												
1.5	A	A	4	4	4	8.1	—	7.7	24.6	—	24.1	7.5	—		2.90	—	3.11
	B	B	3	2 ID	2												
	C	C	5	4 ID	4												
	D	D	5	5	5												
2.0	A	A	1	0 ID		8.1	8.1		24.6	25.3		7.5	7.5		3.85	3.91	
	B	B	1	0 ID													
	C	C	2	0 2D													
	D	D	1	0 ID													
2.5	A	A	1	0 ID		8.1	8.1		24.5	25.0		7.6	7.7		4.62	4.68	
	B	B	—														
	C	C	—														
	D	D	—														
3.0	A	A															
	B	B															
	C	C															
	D	D															
4.0	A	A															
	B	B															
	C	C															
	D	D															
	A																
	B																
	C																
	D																
Loaded / measured by:			MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF
Recorded by:			MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF

Investigators' Signatures
James Daniels
Rashi V. Crain
Bruce Rogers
Marshall Faircloth
Nigel Wellendorf
REVIEWER

Concentrations prepared by: BR
Loading verified by: —
Light Intensity: 50-100 Ft. candles
Photoperiod: 16 hours Light / 8 hours dark
Temperature Range °C:
Incubator # 2 min. 25.5 max. 25.8 mean 25.7
Incubator # ___ min. _____ max. _____ mean _____
Room B246 min. 24.0 max. 24.1 mean 25.3

Comments:
PERCHEM SAID CONFIDENCE LEVELS ARE NOT RELIABLE. PPV 5/14/07

Statistics: Method: Spearman-Karber
48 (96) hour LC_{50}: 1.65
95% Confidence Interval: lower — upper —

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FDEP Biology Laboratory - Acute SRT Bench Sheet

Test Organism: *Americamysis bahia* Method 2007.0 | *Menidia beryllina* Method 2006.0 | *Hyalella azteca* Method 100.1 EPA-600-R-99-064
Ceriodaphnia dubia Method 2002.0 | *Cyprinella leedsi* ~~Method 2000.0~~ | *Pimephales promelas* Method 2000.0 | *Other:* _____

Method from EPA-821-R-02-012
Test Type: 48 hour non-renewal ~~96 hour renewal~~
Test Page 1 of 2

Diluent/ Batch #: Well 1.5.7.07
Toxicant/ Batch#: NaCl 1.5.7.07

Test Beginning: Date: 5.8.07 Time: 1235
Test Ending: Date: 5-12-07 Time: 0950

Water Quality Parameters	Diluent	Method	Initials
Total Residual Cl_2 (mg/L):	<0.03	Hach	~~PPV~~
Alkalinity (mg/L as $CaCO_3$):	136	Hach	BA
Hardness (mg.L as $CaCO_3$):	138	Hach	BA
Total Ammonia (mg/L as N):	<0.07	Denver	~~PPV~~
Salinity (ppth):	<1	Mettler	BA

Organism Batch #/ Age: 5-8-07/13 DAYS
Feeding: ~~Prior to test?~~ ~~Prior to renewal?~~ Daily
Food: YCT *P.subcapitata* Artemia: Lot # ESL-S36 90
Food Batch: _____ _____ 0hr 03-07 24hr ____ 48hr 05-07 72hr ____
Chamber size: 1000 mL
Test volume: 500 mL per replicate

Conc. µg/L ~~mg/L~~	Rep.	Chamber #	Number Live 0 hr ~~48 hr~~	Number Live 24 hr ~~72 hr~~	Number Live 48 hr ~~96 hr~~	pH (SU) 0 hr ~~48 hr~~	pH (SU) 24 hr ~~72 hr~~	pH (SU) 48 hr ~~96 hr~~	Temperature (°C) 0 hr ~~48 hr~~	Temperature (°C) 24 hr ~~72 hr~~	Temperature (°C) 48 hr ~~96 hr~~	D.O. (mg/L) 0 hr ~~48 hr~~	D.O. (mg/L) 24 hr ~~72 hr~~	D.O. (mg/L) 48 hr ~~96 hr~~	Uncorrected Conductivity µmhos/cm (mmhos/cm) 0 hr ~~48 hr~~	Uncorrected Conductivity 24 hr ~~72 hr~~	Uncorrected Conductivity 48 hr ~~96 hr~~
Control	A	E13	10	10	10	7.8		8.3	24.0		25.0	7.0		7.2	0.273		0.299
	B	E14	10	10	10		8.2			24.6			7.1			0.327	
	C																
	D																
6 g/L	A	E15	10	10	10	7.7		8.1	24.4		25.0	6.7		6.7	10.4		10.1
	B	E16	10	10	10		8.1			24.5			6.7			10.2	
	C																
	D																
7 g/L	A	E17	10	10	10	7.7		8.1	24.6		24.5	6.8		6.8	12.0		11.5
	B	E18	10	10	9[10]		8.0			24.1			6.7			11.9	
	C																
	D																
8 g/L	A	E19	10	9[10]	9	7.7		8.3	24.6		24.8	6.9		6.9	13.7		13.6
	B	E20	10	8[30]	8		8.1			24.4			6.8			13.6	
	C																
	D																
9 g/L	A	E21	10	8[30]	7[10]	7.7		8.1	24.7		24.9	6.9		7.0	15.0		14.6
	B	E22	10	7[30]	7		8.0			24.5			6.7			14.7	
	C																
	D																
10 g/L	A	E23	10	1[30]	0[10]	7.7		8.2	24.8		24.9	7.0		6.9	17.1		16.8
	B	E24	10	2[30]	1[10]		8.0			24.5			6.5			16.8	
	C																
	D																
	A																
	B																
	C																
	D																
Loaded / measured by:			JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD
Recorded by:			JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD	JD

Investigators' Signatures
Jason Daniels
Patsy Vicravitz
Bruce McKenzie
Marshall Faircloth
_____
Nicole Wilkerson
REVIEWER

Concentrations prepared by: JD
Loading verified by: BA
Light Intensity: 50-100 Ft. candles
Photoperiod: 16 hours Light / 8 hours dark
Temperature Range °C:
Incubator # 2 min 25.5 max 25.9 mean 25.7
Incubator # ___ min ____ max ____ mean ____
Room B246 min 24.6 max 26.1 mean 25.3

Comments:

Statistics: Method: Spearman-Karber
(48) 96 hour LC_{50}: 9.07
95% Confidence Interval: lower 8.76 upper 9.39

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FDEP Biology Laboratory - Acute SRT Bench Sheet

Test Organism: *Americamysis bahia* Method 2007.0 | *Menidia beryllina* Method 2006.0 | *Hyalella azteca* Method 100.1 EPA-600-R-99-064
Ceriodaphnia dubia Method 2002.0 | ~~*Cyprinella leedsi*~~ Method 2000.0 | *Pimephales promelas* Method 2000.0 | Other: _____

Method from EPA-821-R-02-012
Test Type: 48 hour non-renewal / ~~96 hour renewal~~
Test Page 2 of 2

Diluent/ Batch #: H2O / 5.7.07
Toxicant/ Batch#: NaCl / 5.7.07

Test Beginning: Date: 5.8.07 Time: 1235
Test Ending: Date: 5-12-07 Time: 0950

Water Quality Parameters	Diluent	Method	Initials
Total Residual Cl_2 (mg/L):	40.03	Hach	PPV
Alkalinity (mg/L as $CaCO_3$):	136	Hach	BA
Hardness (mg.L as $CaCO_3$):	138	Hach	BA
Total Ammonia (mg/L as N):	40.017	Denver	PPV
Salinity (ppth):	<1	Mettler	BA

Organism Batch #/ Age: 5-8-07 / 15 DAYS
Feeding: ~~Prior to test~~ / ~~Prior to renewal~~ / Daily
Food: YCT *P.subcapitata* Artemia: Lot # GSL 536 90
Food Batch: — _____ 0hr 6.8.07 24hr ____ 48hr 6.10.07 72hr ____
Chamber size: 1000 mL
Test volume: 500 mL per replicate

Conc. µg/L mg/L	Rep.	Chamber #	Number Live ~~0 hr~~ 48 hr	~~24 hr~~ 72 hr	~~48 hr~~ 96 hr	pH (SU) ~~0 hr~~ 48 hr	~~24 hr~~ 72 hr	~~48 hr~~ 96 hr	Temperature (°C) ~~0 hr~~ 48 hr	~~24 hr~~ 72 hr	~~48 hr~~ 96 hr	D.O. (mg/L) ~~0 hr~~ 48 hr	~~24 hr~~ 72 hr	~~48 hr~~ 96 hr	Uncorrected Conductivity µmhom/cm ~~mmhos/cm~~ ~~0 hr~~ 48 hr	~~24 hr~~ 72 hr	~~48 hr~~ 96 hr
Control	A	E13	10	10	10	8.1		8.1	24.0		25.5	7.7		7.4	.273		0.282
	B	E14	10	10	10		8.1			24.5			6.7			0.288	
	C																
	D																
6 g/L	A	E15	10	10	10	8.0		8.0	24.0		25.2	7.4		7.2	10.5		10.8
	B	E16	10	10	10		8.0			24.6			6.5			10.6	
	C																
	D																
7 g/L	A	E17	10	10	10	8.0		8.0	24.1		25.1	7.4		7.1	12.4		12.7
	B	E18	9	9	9		8.0			24.4			6.3			12.5	
	C																
	D																
8 g/L	A	E19	9	9	8 1D	8.0		8.1	24.1		25.4	7.4		7.1	13.8		14.1
	B	E20	8	8	7 1D		8.0			24.6			6.5			13.4	
	C																
	D																
9 g/L	A	E21	~~8~~ 7	7	7	8.0		8.1	24.0		25.4	7.5		7.0	15.3		15.6
	B	E22	7	6 1D	5 1D		8.0			24.5			6.6			15.4	
	C																
	D																
10 g/L	A	E23	—	—	—	7.9 (A)			24.1 (A)			7.6 (A)			17.0 (A)		
	B	E24	1	1	0 1D		8.1	8.1		24.9	25.6		6.8	7.1		17.2	17.4
	C																
	D																
	A																
	B																
	C																
	D																
Loaded / measured by:			JD	JD	MF	PPV	JD	MF	PPV	JD	MF	PPV	JD	MF	PPV	JD	MF
Recorded by:			JD	JD	MF	PPV	JD	MF	PPV	JD	MF	PPV	JD	MF	PPV	JD	MF

Investigators' Signatures
James Daniels
Patel Vi Crailsak
Bruce Atwood
Marshall Faircloth
Nicole Wellendorf
REVIEWER

Concentrations prepared by: JD
Loading verified by: BA
Light Intensity: 50-100 Ft. candles
Photoperiod: 16 hours Light / 8 hours dark
Temperature Range °C:
Incubator # 2 min 23.5 max 23.9 mean 23.7
Incubator # ___ min _____ max _____ mean _____
Room B246 min 24.6 max 26.1 mean 25.3

Comments: (A) 48 hour parameters for the 10g/L concentration should be in the B replicate. Test chamber E24 spaces, not in the E23 vessel spaces. MF 5-21-07

Statistics: Method: Spearman-Karber
48 / (96) hour LC_{50}: 8.73
95% Confidence Interval: lower 8.41 upper 9.06

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MBL Aquaculture
4569 Samuel Street
Sarasota, Florida 34233
TEL: (800) 889-0384
FAX: (941) 922-3874
EMAIL: sales@mblaquaculture.com
WEB: www.MBLAquaculture.com

NELAC Accredited

Organism Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Date: 5/7/07

Shipped to: F-DEP

P.O. No: _____

Species	Quantity	Age	Brood Number	Temperature	Salinity
Mysidopsis bahia	150+	4 Days	MS070503	25°C	20 ppt
Menidia beryllina	150+	12 DAYS	SS070425	25°C	20 ppt
Cyprinella leedsi	150+	12 DAYS	CL070425	25°C	
Pimephales promelas	150+	7 days	FM070430	25°C	

Packed by: JLL

Shipped Via: Fed Ex.

Notes: _____

Thank you for your order.

Appendix H

Habitat Assessment Field Sheets

Control

FDEP-SOP-001/01: Form FD 9000-3 (June 1, 2001)

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		5/21/07	0900	

REMARKS:	COUNTY:	LOCATION: Alligator Cr 75m upstream of POD	FIELD ID/NAME:

RIPARIAN ZONE/STREAM FEATURES

Predominant Land-Use in Watershed (specify relative percent in each category):

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)

Local Watershed Erosion (check box): None ☐ Slight ☐ Moderate ☒ Heavy ☐

Local Watershed NPS Pollution (check box): No evidence ☐ Slight ☐ Moderate potential ☑ Obvious sources ☐

Width of riparian vegetation (m) On least buffered side: 12

List & map dominant Vegetation on back

Artificially Channelized ☐ no ☐ ☒ ☐ recent, severe some recovery mostly recovered

Artificially Impounded ☐ yes more sinuous

High Water Mark: 1.0 (m above present water level) + 0.4 (present depth in m) = 1.4 (m above bed)

Typical Width (m) Depth (m)/Velocity (m/sec) Transect

m wide

m/s m/s m/s

m deep m deep m deep

Canopy Cover % : Open: ☐ Lightly Shaded (11-45%): ☐ Moderately Shaded (46-80%): ☒ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☐ Sewage: ☒ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☐

Sediment Oils: Absent: ☐ Slight: ☐ Moderate: ☐ Profuse: ☐

Sediment Deposition: Sludge: ☒ Sand Smothering: none moderate slight severe Silt smothering: none moderate slight severe Other: ____

Substrate Type	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs of Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubbie				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (umho/cm) Or Salinity (ppt):			Secchi (m):
Top								
Mid-depth	0.4	16.9	8.00	1.24	666	12.9%		0.4
Bottom								

System Type: Stream: 1st-2nd order 5th – 6th order 3rd-4th order 7th order or greater Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

Water Odors (check box): Normal: ☐ Sewage: ☒ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils (check box): None: ☒ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity (check box): Clear: ☐ Slightly turbid: ☐ Turbid: ☒ Opaque: ☐

Color (check box): Tannic: ☑ Green (algae): ☐ Clear: ☐ Other: ☐

Weather Conditions/Notes:

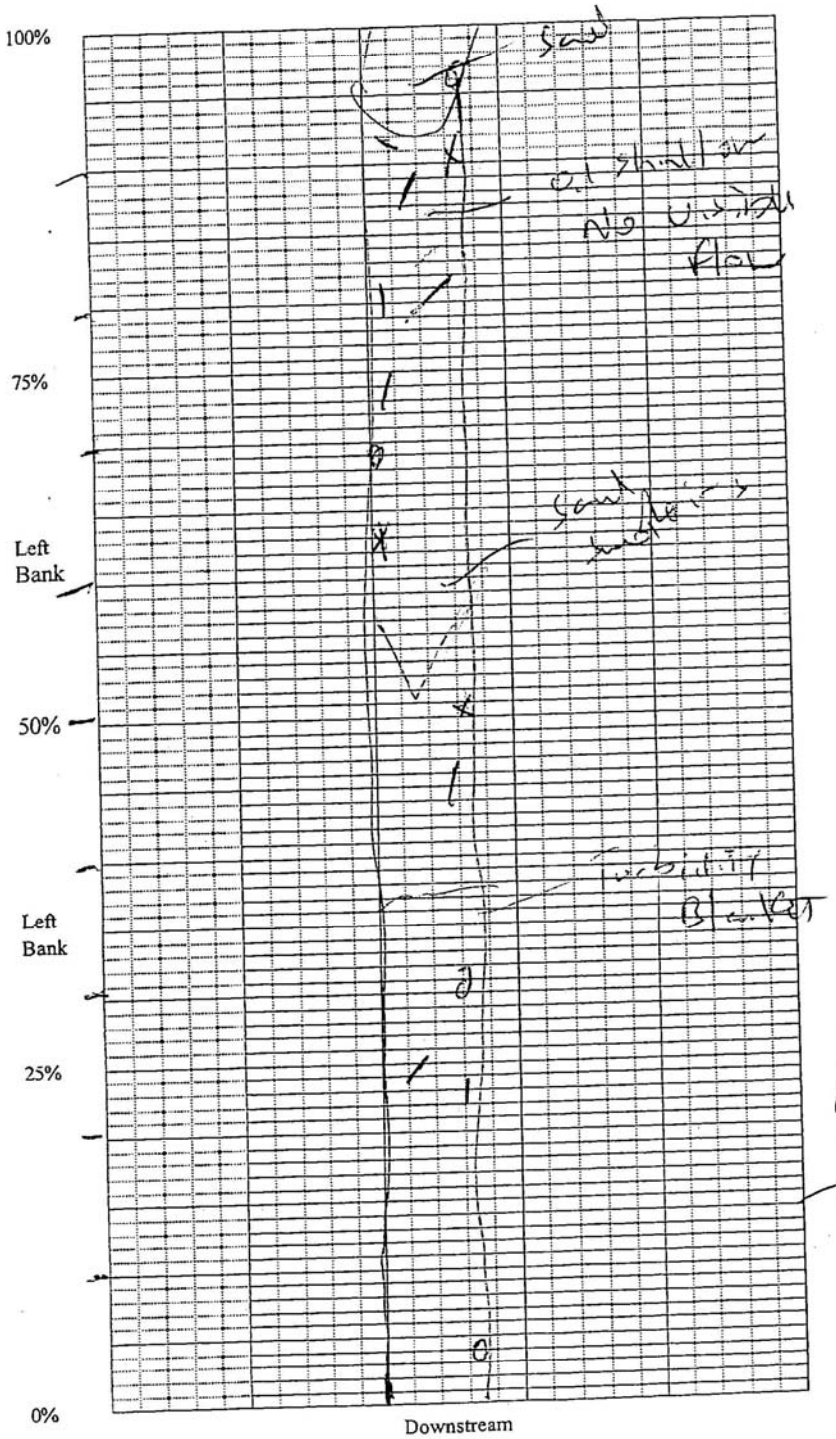
Abundance:	Absent	Rare	Common	Abundant
Periphyton	☐	☐	☒	☐
Fish	☒	☐	☐	☐
Aquatic Macrophytes	☑	☐	☐	☐
Iron/sulfur Bacteria	☑	☐	☐	☐

SAMPLING TEAM: Kallemeyn

SIGNATURE: RGK

DATE: 5/21/07

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (June 1, 2001)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).



Substrates: Code key, draw proportionate habitat abundance.

- ☐ Snags
- ☐ Roots/undercut banks
- ☐ Leaf Packs (or mats)
- ☐ Macrophytes
- ☐ _____
- ☐ _____
- ☐ _____

Velocity:
Note where velocity measures were taken.

Habitat Smothering:
Note areas (on map) where sand or silt is something substrates, limiting habitability.

Bank Stability:
Note areas (on map) with unstable, eroding banks.

Riparian Buffer Width:
Note areas (on map) where natural vegetation is altered or eliminated.

Plants observed/other notes:

5 Leaf
12 Snag
3 Root
20 6%

06
300/20.0
180
20

FDEP-SOP-001/01: Form FD 9000-5 (June 1, 2001)

STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

Control

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y): 5/21/07	RECEIVING BODY OF WATER:

REMARKS:	COUNTY:	LOCATION: Alligator Cr 75m upstream of Culvert	FIELD ID/NAME: POO

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components Substrate Diversity 11	Four or more productive habitats present (snags, tree roots/undercut banks, aquatic vegetation, leaf packs (partially decayed), rock). 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Substrate Availability 6	Greater than 30% productive habitat present at site. 20 19 18 17 16	16% to 30% productive habitat, by aerial extent. 15 14 13 12 11	6% to 15% productive habitat 10 9 8 7 6	Less than 5% productive habitat. 5 4 3 2 1
Water Velocity 2	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec. Or spate occurring: > 1 m/sec 5 4 3 2 1
Habitat Smothering 10 Primary Score 29	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 11	Smothering of 50%-80% of the habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, as severe problem, pools absent 5 4 3 2 1
Secondary Habitat Components Artificial Channelization 9	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	Many have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Bank Stability Right Bank 6 Left Bank 6+2	Stable. No evidence of erosion or bank failure. Little potential for future problems. 10 9	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 8 7 6	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 5 4	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 3 2 1
Riparian Buffer Zone Width Right Bank 6 Left Bank 10	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12m to 18 m 8 7 6	Width of native vegetation 6 to 12 m. human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 7 Left Bank 7+4 Secondary Score 51	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody machrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian ozone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (e.g. grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1

80 TOTAL SCORE

ANALYSIS DATE: 5/21/07	ANALYST: Kallemeyn	SIGNATURE:

FDEP-SOP-001/01: Form FD 9000-3 (June 1, 2001) Tesp

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		5/21/07	1000	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Flagler	Alligator Cr Calcha 50m Downstream from pipe	

RIPARIAN ZONE/STREAM FEATURES

Predominant Land-Use in Watershed (specify relative percent in each category):

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)

Local Watershed Erosion (check box): None ☐ Slight ☐ Moderate ☒ Heavy ☐

Local Watershed NPS Pollution (check box): No evidence ☐ Slight ☐ Moderate potential ☒ Obvious sources ☐

Width of riparian vegetation (m) On least buffered side: 10

List & map dominant Vegetation on back

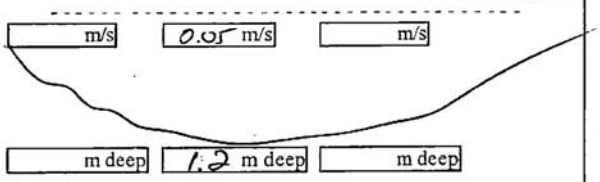
Artificially Channelized ☐ no ☐ recent, severe ☒ some recovery ☐ mostly recovered more sinuous

Artificially Impounded ☐ yes

High Water Mark: 1.0 (m above present water level) + 1.2 (present depth in m) = 2.2 (m above bed)

Typical Width (m) Depth (m)/Velocity (m/sec) Transect

m wide



Canopy Cover %: Open: ☐ Lightly Shaded (11-45%): ☐ Moderately Shaded (46-80%): ☒ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☐ Sewage: ☒ Petroleum: ☐ Chemical: ☐ Anaerobic: ☒ Other: ☐

Sediment Oils: Absent: ☐ Slight: ☐ Moderate: ☐ Profuse: ☐

Sediment Deposition: Sludge: ☒ Sand Smothering: none slight moderate severe Silt smothering: none slight moderate severe Other:

Substrate Type	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs of Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubble				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (umho/cm) Or Salinity (ppt):			Secchi (m):
Top								
Mid-depth	1.2	21.1	6.9	1.8	820	21.1 %		—
Bottom								

System Type: Stream: 1st-2nd order ☐ 3rd-4th order ☐ 5th – 6th order ☐ 7th order or greater ☐ Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

Water Odors (check box): Normal: ☐ Sewage: ☒ Petroleum: ☐ Chemical: ☐ Other: ☐

Water Surface Oils (check box): None: ☐ Sheen: ☐ Globs: ☒ Slick: ☐

Clarity (check box): Clear: ☐ Slightly turbid: ☐ Turbid: ☒ Opaque: ☐

Color (check box): Tannic: ☐ Green (algae): ☐ Clear: ☒ Other: ☐

Weather Conditions/Notes:

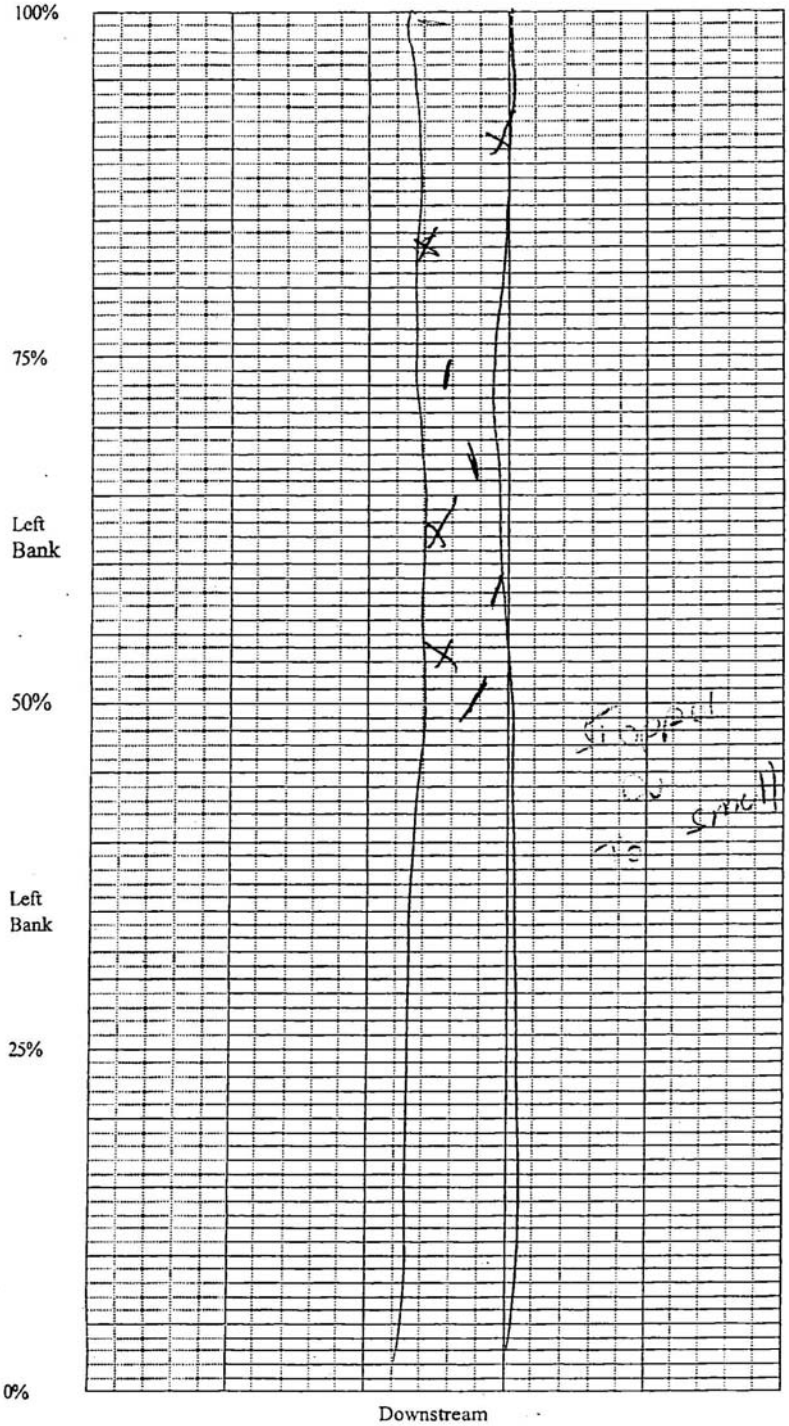
Abundance:	Absent	Rare	Common	Abundant
Periphyton	☐	☐	☒	☐
Fish	☒	☐	☐	☐
Aquatic Macrophytes	☑	☐	☐	☐
Iron/sulfur Bacteria	☒	☐	☐	☐

SAMPLING TEAM: Kellemy, Parrish, Emery

SIGNATURE: Kellemy

DATE: 5/21/07

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (June 1, 2001)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).



Substrates: Code key, draw proportionate habitat abundance.

- ☐ Snags
- ☐ Roots/undercut banks
- ☐ Leaf Packs (or mats)
- ☐ Macrophytes
- ☐ _____
- ☐ _____
- ☐ _____

Velocity:
Note where velocity measures were taken.

Habitat Smothering:
Note areas (on map) where sand or silt is something substrates, limiting habitability.

Bank Stability:
Note areas (on map) with unstable, eroding banks.

Riparian Buffer Width:
Note areas (on map) where natural vegetation is altered or eliminated.

Plants observed/other notes:

$300 \overline{)80} .02$

$302 \quad 16$

FDEP-SOP-001/01: Form FD 9000-5 (June 1, 2001)

Test

STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y): 5/21/07	RECEIVING BODY OF WATER:

REMARKS:	COUNTY:	LOCATION: All. Spring Cr 350 m DS Fr Callahan Rd	FIELD ID/NAME:

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components Substrate Diversity 6	Four or more productive habitats present (snags, tree roots/undercut banks, aquatic vegetation, leaf packs (partially decayed), rock). 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Substrate Availability 4	Greater than 30% productive habitat present at site. 20 19 18 17 16	16% to 30% productive habitat, by aerial extent. 15 14 13 12 11	6% to 15% productive habitat 10 9 8 7 6	Less than 5% productive habitat. 5 4 3 2 1
Water Velocity 2	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec. Or spate occurring: > 1 m/sec 5 4 3 2 1
Habitat Smothering 2 Primary Score 14	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 11	Smothering of 50%-80% of the habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, as severe problem, pools absent 5 4 3 2 1
Secondary Habitat Components Artificial Channelization 9	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	Many have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Bank Stability Right Bank 6 Left Bank 6	Stable. No evidence of erosion or bank failure. Little potential for future problems. 10 9	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 8 7 6	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 5 4	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 3 2 1
Riparian Buffer Zone Width Right Bank 10 Left Bank 6	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12m to 18 m 8 7 6	Width of native vegetation 6 to 12 m. human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 7 Left Bank 7 Secondary Score 55	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody machrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian ozone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (e.g. grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1

69 **TOTAL SCORE**

ANALYSIS DATE: 5/21/07	ANALYST: Kallemeyn	SIGNATURE:

FDEP-SOP-001/01: Form FD 9000-3 (June 1, 2001)

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SUBMITTING AGENCY CODE: _____ SUBMITTING AGENCY NAME: _____	STORET STATION NUMBER:	DATE (M/D/Y): 4/12/07	TIME 1050	RECEIVING BODY OF WATER:
REMARKS:	COUNTY: Nassau	LOCATION: Alligator Cr 50 m upstream from Colchester Rd		FIELD ID/NAME:

RIPARIAN ZONE/STREAM FEATURES

Predominant Land-Use in Watershed (specify relative percent in each category):

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)

Local Watershed Erosion (check box): None ☐ Slight ☐ Moderate ☐ Heavy ☐

Local Watershed NPS Pollution (check box): No evidence ☐ Slight ☐ Moderate potential ☐ Obvious sources ☐

Width of riparian vegetation (m) On least buffered side: ____

List & map dominant Vegetation on back

Artificially Channelized ☐ no ☐ recent, severe ☐ some recovery ☐ mostly recovered

Artificially Impounded ☐ yes more sinuous

High Water Mark: 1.1 (m above present water level) + 0.2 (present depth in m) = 1.2 (m above bed)

Typical Width (m) Depth (m)/Velocity (m/sec) Transect

m wide ____

m/s ____ m/s ____ m/s ____

m deep ____ m deep ____ m deep ____

Canopy Cover %: Open: ☐ Lightly Shaded (11-45%): ☐ Moderately Shaded (46-80%): ☑ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☐ _____

Sediment Oils: Absent: ☑ Slight: ☐ Moderate: ☐ Profuse: ☐

Sediment Deposition: Sludge: ☒ Sand Smothering: none moderate slight severe Silt smothering: none moderate slight severe Other: _____

Substrate Type	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs of Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubbie				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (umho/cm) Or Salinity (ppt):			Secchi (m):
Top								
Mid-depth								
Bottom								

System Type: Stream: 1st-2nd order ☐ 3rd-4th order ☐ 5th – 6th order ☐ 7th order or greater ☐ Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐ _____

Water Odors (check box): Normal: ☑ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Other: ☐ _____

Water Surface Oils (check box): None: ☑ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity (check box): Clear: ☐ Slightly turbid: ☐ Turbid: ☐ Opaque: ☐

Color (check box): Tannic: ☑ Green (algae): ☐ Clear: ☐ Other: ☐ _____

Weather Conditions/Notes:

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☐	☐	☐	☑
Fish	☐	☐	☑	☐
Aquatic Macrophytes	☑	☐	☐	☐
Iron/sulfur Bacteria	☑	☐	☐	☐

SAMPLING TEAM:	SIGNATURE:	DATE:

DEP-SOP-001/01: Form FD 9000-5 (December 11, 2001)

STATE OF FLORIDA, DEPARTMENT OF ENVIRONMENTAL PROTECTION
STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (MM/DD/YY): 4/12/07	RECEIVING BODY OF WATER: Nassau
REMARKS:	COUNTY: Nassau	LOCATION: All gator Cr. Sam Upstream fro Colchester	FIELD ID/NAME:

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components Substrate Diversity 12	Four or more productive habitats present [snags, tree roots/undercut banks, aquatic vegetation, leaf packs (partially decayed), rock] 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags) 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed 10 9 8 7 6	One or less productive habitat. Lack of habitat is obvious, substrates unst or smothered 5 4 3 2 1
Substrate Availability 3	Greater than 30% productive habitat present at site 20 19 18 17 16	16% to 30% productive habitat, by aerial extent 15 14 13 12 11	6% to 15% productive habitat 10 9 8 7 6	Less than 5% productive habitat 5 4 3 2 1
Water Velocity 6	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec; or spate occurring: > 1 m/sec 5 4 3 2 1
Habitat Smothering 7 Primary Score 33	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 11	Smothering of 50%-80% of the habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools abs 5 4 3 2 1
Secondary Habitat Components Artificial Channelization 7	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box cut banks, straight, instrean habitat highly altered 5 4 3 2 1
Bank Stability Right Bank 9 Left Bank 9	Stable. No evidence of erosion or bank failure. Little potential for future problems. 10 9	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 8 7 6	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 5 4	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 3 2 1
Riparian Buffer Zone Width Right Bank 10 Left Bank 10	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12 to 18 m 8 7 6	Width of native vegetation 6 to 12 m. human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 7 Left Bank 9 15 Secondary Score 57	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of stream bank surfaces are vegetated and/or poor plant community (e.g. grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less 3 2 1

91 TOTAL SCORE

YSIS DATE: 4.12.07	ANALYST: Kellemeyer	SIGNATURE:

100
90
80
70
60
50
40
30
20
10
0
Pri. ph 7.0
Pri. phys
0.3 ~ dk
0.05 ~
measures Tuk
Pri. ph 7.0 - slows
7 low
19 sings
5 feet
31
.19y
3sofg1.0
3s-0
600
50=
10u

FDEP-SOP-001/01: Form FD 9000-3 (June 1, 2001)

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		4/12/07	11:30	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
		All	

RIPARIAN ZONE/STREAM FEATURES

Predominant Land-Use in Watershed (specify relative percent in each category):

Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)

Local Watershed Erosion (check box): None ☐ Slight ☐ Moderate ☐ Heavy ☐

Local Watershed NPS Pollution (check box): No evidence ☐ Slight ☐ Moderate potential ☐ Obvious sources ☐

Width of riparian vegetation (m) On least buffered side:

List & map dominant Vegetation on back

Typical Width (m) Depth (m)/Velocity (m/sec) Transect

m wide

m/s m/s m/s

m deep m deep m deep

Artificially Channelized ☐ no ☐ recent, severe ☐ some recovery ☐ mostly recovered

Artificially Impounded ☐ yes more sinuous

High Water Mark: 1 0 + 0 2 5 = ____

(m above present water level) (present depth in m) (m above bed)

Canopy Cover %: Open: ☐ Lightly Shaded (11-45%): ☐ Moderately Shaded (46-80%): ☒ Heavily Shaded: ☐

SEDIMENT/SUBSTRATE

Sediment Odors: Normal: ☒ Sewage: ☐ Petroleum: ☐ Chemical: ☐ Anaerobic: ☐ Other: ☐ _____

Sediment Oils: Absent: ☒ Slight: ☐ Moderate: ☐ Profuse: ☐

Sediment Deposition: Sludge: ☐ Sand Smothering: none moderate slight severe Silt smothering: none moderate slight severe Other: ____

Substrate Type	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)				Sand			
Leaf Packs of Mats				Mud/Muck/Silt			
Aquatic Vegetation				Other:			
Rock or Shell Rubbie				Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

WATER QUALITY	Depth (m):	Temp. (°C):	pH (SU):	D.O. (mg/l):	Cond. (umho/cm) Or Salinity (ppt):			Secchi (m):
Top								
Mid-depth								
Bottom								

System Type: Stream: 1st-2nd order 5th – 6th order 3rd-4th order 7th order or greater Lake: ☐ Wetland: ☐ Estuary: ☐ Other: ☐

Water Odors (check box): Normal: ☐ Sewage: ☒ Petroleum: ☐ Chemical: ☐ Other: ☐ _____

Water Surface Oils (check box): None: ☒ Sheen: ☐ Globs: ☐ Slick: ☐

Clarity (check box): Clear: ☐ Slightly turbid: ☒ Turbid: ☐ Opaque: ☐

Color (check box): Tannic: ☒ Green (algae): ☐ Clear: ☐ Other: ☐ _____

Weather Conditions/Notes:

Abundance:	Absent	Rare	Common	Abundant
Periphyton	☐	☒	☐	☐
Fish	☐	☐	☒	☐
Aquatic Macrophytes	☒	☐	☐	☐
Iron/sulfur Bacteria	☒	☐	☐	☐

SAMPLING TEAM:	SIGNATURE:	DATE:
Tom Kellam	Kellam	

DEP-SOP-001/01: Form FD 9000-5 (December 11, 2001)

~~STATE OF FLORIDA, DEPARTMENT OF ENVIRONMENTAL PROTECTION~~
STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

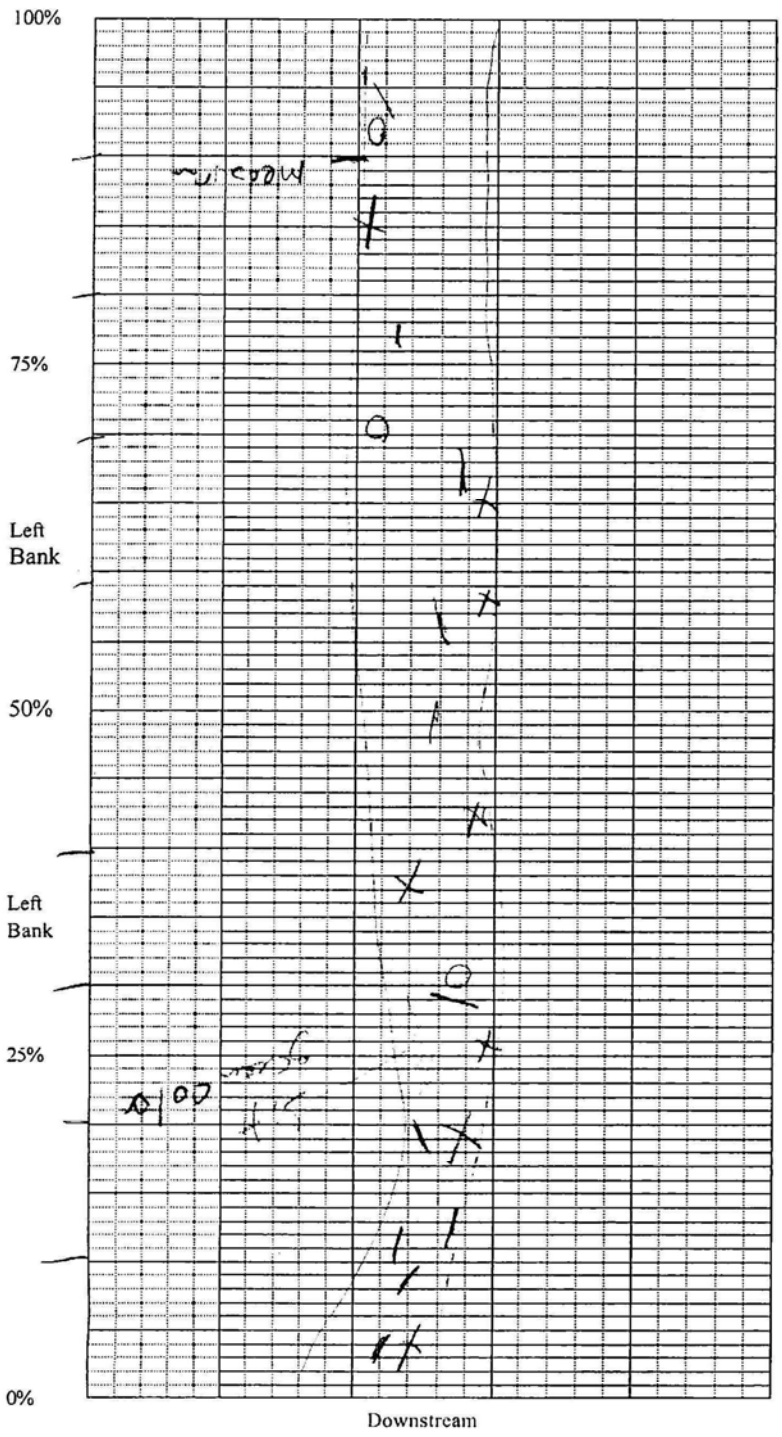
SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (MM/DD/YY): 4/12/07	RECEIVING BODY OF WATER:
REMARKS:	COUNTY:	LOCATION: 50m DS of Calcha	FIELD ID/NAME:

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components Substrate Diversity 11	Four or more productive habitats present [snags, tree roots/undercut banks, aquatic vegetation, leaf packs (partially decayed), rock] 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags) 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed 10 9 8 7 6	One or less productive habitat. Lack of habitat i obvious, substrates unst or smothered 5 4 3 2 1
Substrate Availability 7	Greater than 30% productive habitat present at site 20 19 18 17 16	16% to 30% productive habitat, by aerial extent 15 14 13 12 11	6% to 15% productive habitat 10 9 8 7 6	Less than 5% productive habitat 5 4 3 2 1
Water Velocity 7	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec; or spate occurring: > 1 m/sec 5 4 3 2 1
Habitat Smothering 5 Primary Score 30	Less than 20% of habitats affected by sand or silt accumulation 20 19 18 17 16	20%-50% of habitats affected by sand or silt accumulation 15 14 13 12 11	Smothering of 50%-80% of the habitats with sand or silt, pools shallow, frequent sediment movement 10 9 8 7 6	Smothering of >80% of habitats with sand or silt, a severe problem, pools abs 5 4 3 2 1
Secondary Habitat Components Artificial Channelization 7	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	May have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box cut banks, straight, instrean habitat highly altered 5 4 3 2 1
Bank Stability Right Bank 8 Left Bank 8 16	Stable. No evidence of erosion or bank failure. Little potential for future problems. 10 9	Moderately stable. Infrequent or small areas of erosion, mostly healed over. 8 7 6	Moderately unstable. Moderate areas of erosion, high erosion potential during floods. 5 4	Unstable. Many (60%-80%) raw, eroded areas. Obvious bank sloughing. 3 2 1
Riparian Buffer Zone Width Right Bank 10 Left Bank 10 20	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12 to 18 m 8 7 6	Width of native vegetation 6 to 12 m. human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 9 16 Left Bank 8 Secondary Score 59	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of stream bank surfaces are vegetated and/or poor plant community (e.g. grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less 3 2 1

79 TOTAL SCORE

ANALYSIS DATE: 4-12-07	ANALYST: Kallemeyn	SIGNATURE: [signature]

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (June 1, 2001)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).



Substrates: Code key, draw proportionate habitat abundance.

- ☐ Snags
- ☐ Roots/undercut banks
- ☐ Leaf Packs (or mats)
- ☐ Macrophytes
- ☐ _____
- ☐ _____
- ☐ _____

Velocity:
Note where velocity measures were taken.

Habitat Smothering:
Note areas (on map) where sand or silt is something substrates, limiting habitability.

Bank Stability:
Note areas (on map) with unstable, eroding banks.

Riparian Buffer Width:
Note areas (on map) where natural vegetation is altered or eliminated.

Plants observed/other notes:

11 Snags
1 root
3 leaf
21

Appendix I-1

Taxa list and number of individuals counted for qualitative natural periphyton collections made from upstream of the Callahan WWTF discharge, May 21, 2007.

.

	Control Site
Bacillariophyta	
Bacillariophyta	192
Chlorophycota	
Chlamydomonas sp.	2
Chlorella sp.	6
Protococcus sp.	1
Scenedesmus quadricauda	1
Cryptophycophyta	
Cryptomonas sp.	2
Cyanophycota	
Anabaena sp.	1
Aphanocapsa sp.	1
Cyanobium parvum	2
Heteroleibleinia sp.	6
Jaaginema sp.	47
Merismopedia punctata	1
Merismopedia warmingiana	1
Oscillatoria princeps	1
Planktolyngbya sp.	8
Planktothrix sp.	6
Pseudanabaena sp.	2
Synechocystis sp.	17
Euglenophycota	
Euglena sp.	3
Phacus sp.	5

Appendix I-2

Diatom taxa list and number of individuals counted for qualitative natural periphyton collections made from upstream of the Callahan WWTF discharge, May 21, 2007.

	Control Site
Bacillariophyceae	
Achnanthes clevei	4
Achnanthes exigua	26
Achnanthes lanceolata	27
Achnanthes lanceolata apiculata	7
Achnanthes sp.	11
Amphora sp.	7
Amphora veneta	1
Cocconeis fluviatilis	57
Cocconeis neodiminuta	3
Cocconeis placentula	1
Cocconeis sp.	2
Diadesmis confervacea	7
Diadesmis contenta	6
Diploneis sp.	12
Encyonema silesiacum	2
Eunotia formica	6
Eunotia pectinalis	1
Eunotia sp.	58
Frustulia sp.	1
Gomphonema gracile	1
Gomphonema parvulum	1
Gomphonema sp.	14
Gomphonema subclavatum	2
Gyrosigma sp.	2
Hippodonta capitata	2
Hippodonta hungarica	1
Hippodonta sp.	2
Meridion sp.	8
Navicula constans	4
Navicula cryptocephala	3
Navicula gastrum	5
Navicula germainii	2
Navicula minima	7
Navicula sp.	74
Navicula symmetrica	2
Naviculaceae	27
Nitzschia sp.	26
Pinnularia sp.	4
Rhopalodia gibba	2
Sellaphora pupula	5
Stauroneis sp.	2
Surirella sp.	4
Undetermined Bacillariophyceae	22
Coscinodiscophyceae	
Aulacoseira sp.	2
Melosira sp.	25
Fragilariophyceae	
Fragilaria sp.	1
Fragilariaceae	8
Synedra ulna	4

Appendix J-1

Benthic macroinvertebrates collapsed taxa list and density (average number of individuals/m^2 rounded to the nearest individual, n = 3 samples) from Hester-Dendy artificial substrates incubated for 28 days upstream and downstream of the Callahan WWTF and collected May 21,2007. See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

	Control Site	Test Site
Annelida		
Hirudinea		
Helobdella stagnalis	3	-
Oligochaeta		
Dero digitata complex	445	-
Stylaria lacustris	344	-
Arthropoda		
Insecta		
Coleoptera		
Carabidae	-	3
Stenelmis sp.	3	-
Collembola		
Isotomidae	-	3
Diptera		
Ablabesmyia mallochi	5	-
Chironomus sp.	973	8,550
Dicrotendipes modestus	5	-
Dicrotendipes simpsoni	64	-
Goeldichironomus holoprasinus	27	-
Tanytarsus sp. L Epler	5	-
Ephemeroptera		
Caenis sp.	3	-
Odonata		
Epicordulia princeps regina	3	-
Mollusca		
Bivalvia		
Sphaeriidae	16	-
Gastropoda		
Ancylidae	-	3
Amnicola sp.	5	-
Floridobia sp.	86	-
Haitia sp.	83	-
Laevapex sp.	27	-
Micromenetus sp.	45	-
Physidae	-	21

Appendix J-2

Benthic macroinvertebrates taxa list and counts (number of individuals counted) collected from Hester-Dendy artificial substrates (n= 3 samples) incubated upstream and downstream of the Callahan WWTF for 28 days and collected May 21, 2007.

	Control Site	Test Site
Annelida		
Hirudinea		
Helobdella stagnalis	1	-
Oligochaeta		
Dero digitata complex	149	-
Naididae	34	-
Stylaria lacustris	115	-
Arthropoda		
Insecta		
Coleoptera		
Carabidae	-	1
Stenelmis sp.	1	-
Collembola		
Isotomidae	-	1
Diptera		
Ablabesmyia mallochi	2	-
Chironomidae	3	430
Chironomus sp.	365	2802
Dicrotendipes modestus	2	-
Dicrotendipes simpsoni	24	-
Goeldichironomus holoprasinus	10	-
Tanytarsus sp. L Epler	2	-
Ephemeroptera		
Caenis sp.	1	-
Odonata		
Epicordulia princeps regina	1	-
Mollusca		
Bivalvia		
Sphaeriidae	6	-
Gastropoda		
Ancylidae	8	1
Amnicola sp.	2	-
Floridobia sp.	7	-
Haitia sp.	28	-
Hydrobiidae	25	-
Laevapex sp.	2	-
Micromenetus sp.	3	-
Physidae	3	8
Planorbidae	14	-
Undetermined Gastropoda	1	-

The Bioassay of the Town of Callahan WWTF effluent sampled on May 21, 2007, NPDES #FL0038407

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 2 7 7 3 1 11	12 0 7 0 5 2 1	18 B	19 S	20 1

Remarks

66

The Priority Pollutants Analysis for Bioassay of the Town of Callahan WWTF effluent sampled on May 21, 2007, NPDES #FL0038407

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 8 4 0 7 11	12 0 7 0 5 2 1	18 X	19 S	20 1

Remarks

66

Biological Analyses of the Town of Callahan WWTF effluent sampled on May 21, 2007, NPDES #FL0038407

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 8 4 0 7 11	12 0 7 0 5 2 1	18 S	19 S	20 1

Remarks

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