

Biological Assessment of

Florida State Hospital WWTP

Gadsden County

NPDES #FL0031402

Sampled August 30, 2004

April 2005

Biology Section

Bureau of Laboratories

Division of Resource Assessment and Management

Quality Manual No. 870346G

NELAC Certification No. E31780

Florida Department of Environmental Protection

Fifth Year Inspection Summary

Discharger: Florida State Hospital WWTP

County: Gadsden

NPDES Number: FL0031402

Permit Expiration: April 16, 2006

Toxics Sampling Inspection **(XSI)**

Date Sampled: August 30, 2004

Results: The metals cadmium, nickel and silver were detected at levels above the method detection limits (MDLs) and below the practical quantitation limits (PQLs). Aluminum, copper, iron, and zinc were detected at levels above the PQLs. All metals detected complied with Class III Freshwater Quality Criteria (62-302.530 F.A.C.).

The organic pollutant bis(2-ethylhexyl)phthalate was detected in the effluent at a level above the MDL and below the PQL.

Compliance Biomonitoring Inspection **(CBI)**

Date Sampled: August 30, 2004

Results: The effluent sample was not acutely toxic to the fish, *Cyprinella leedsi,* or to the water flea, *Ceriodaphnia dubia,* during the 48-hour acute screening bioassays.

Water Quality Inspection **(WQI)**

Date Sampled: August 30, 2004

Results: Effluent dissolved oxygen (4.0 mg/L) was below the Class III Freshwater Quality Criterion (5.0 mg/L, 62-302.530(31) F.A.C.) and facility permit limits. Fecal and total coliforms were detected in the effluent at levels that complied with Class III Freshwater Quality Criteria and the facility permit limits. Effluent total phosphorus (0.87 mg/L), ammonia (0.026 mg/L), unionized ammonia (≤ 0.02 mg/L), total nitrogen (2.5 mg/L), BOD (0.48 mg/L) and TSS (4 mg/L) complied with permit limits (Table 1). Total Kjeldahl nitrogen (TKN 0.6 mg/L) and nitrate+nitrite (1.9 mg/L) concentrations did not differ appreciably between the downstream Test Site and the upstream Control Site. Ortho-phosphate was the only nutrient that was greater at the Test Site (0.056 mg/L) than at the Control Site (0.028 mg/L).

Impact Bioassessment Inspection **(IBI)**

Date Sampled: August 30, 2004

Results: The algal growth potential (AGP) value (19.2 mg dry weight/L) at the upstream Control Site was above the "problem" threshold of 5.0 mg dry weight/ L. The AGP values of the downstream Test Site (30.5 mg dry weight/L) and the effluent (39.9 mg dry weight/L) were even higher, indicating there is nutrient enrichment in this portion of North Mosquito Creek. Quantitative and qualitative measures of benthic macroinvertebrate assemblages from Hester-Dendy and dipnet samples indicated little or no differences between the Control and Test sites. The Control Site SCI_2004 score of 56 and the Test Site SCI_2004 score of 64 placed them both in the "Fair" category.

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 Florida State Hospital WWTP is located in the northwest corner of Gadsden County, in the City of Chattahoochee (see locus map in Appendix 1). The facility is permitted to operate a domestic wastewater treatment facility featuring an influent pump station, influent screening, primary settling, denitrification, aeration, secondary clarification, aerobic and anaerobic digestion of residuals, chlorine gas disinfection, and sulfur dioxide gas dechlorination. Residuals are treated by aerobic digestion, placed on drying beds and hauled to the Springhill Regional Sanitary Landfill. Treated effluent is discharged into an unnamed tributary of North Mosquito Creek via Discharge Location D-001 (See Appendix 2). At the point of discharge the effluent flows through a concrete lined culvert adjacent to the facility, which continues under US Highway 90. Once south of the highway, the effluent exits the culvert and continues southeast approximately 0.65 kilometers, until reaching the confluence with North Mosquito Creek, a Class III freshwater stream. The permitted point of discharge (D-001) is located approximately at latitude 30º 42' 05" N and longitude 84º 49' 59" W (see map in Appendix 1). This facility does not have any mixing zones. The design flow of the Florida State Hospital wastewater system is 1.30 million gallons per day (MGD) and the preceding annual average flow was 0.394 MGD (January to July 2004).

State permit and Surface Water Quality Criteria limits for the effluent are listed in Table 1. The permit the facility is presently working under, FL00031402 (Major), PA File Number FL0031402-003, incorporates the results from the 2001 renewal re-authorization process and includes the recommendations made in the 1999 Level 1 WQBEL and administrative order (A0009NW). The Florida Department of Environmental Protection (FDEP) review of the discharge monitoring reports (DMRs) from the Florida State Hospital WWTP indicate that except for a single minimum pH violation in April 2004, the facility has maintained satisfactory compliance with the permit limits and Rule 62-302, F.A.C. (see Facility Summary in Appendix 2).

Methods

The purpose of this investigation was to determine the potential effects of the Florida State Hospital WWTP effluent on the biota in North Mosquito Creek. To establish discharge effects, chemical and biological comparisons were made between a Control Site (SWB-02), located in North Mosquito Creek, approximately 100 meters upstream of the confluence with the unnamed creek, and a Test Site (SWA-01), located in North Mosquito Creek 100 meters downstream of the confluence (see map in Appendix 1). Detailed methods and their relationship to Florida Administrative Code are given in Appendix 3.

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: Johnny Richardson, Todd Risk and Jonathan Ray (FDEP Central Laboratory in Tallahassee). The report was reviewed by District representatives and the Point Source Studies Review Committee (Wayne Magley, Shannan Gunnoe and Michael Tanski).

Results and Discussion

- Specific chemical results are reported in Table 1 and a complete list of chemical analytes can be reviewed in Appendix 4. The metals cadmium, nickel and silver were detected at levels above the method detection limits (MDLs) and below the practical quantitation limits (PQLs). Aluminum, copper, iron, and zinc were detected at levels above the PQLs. All metals detected complied with Class III Freshwater Quality Criteria (62-302, F.A.C.).
- Effluent dissolved oxygen (4.0 mg/L) did not comply with the Class III Freshwater Quality Criterion (5.0 mg/L, 62-302.530(31) F.A.C.) or the facility permit limit (5.0 mg/L). Effluent pH (Standard Units) complied with Class III Water Quality Criteria (62-302 F. A. C.). Effluent conductivity (µmhos/cm) was not measured.
- The organic pollutant bis(2-ethylhexyl)phthalate (19 µg/L) was detected in the effluent at levels above the MDL and below the PQL. Bis(2-ethylhexyl)phthalate is a manufactured chemical that makes plastic more flexible. It is also called DEHP. DEHP is a colorless liquid with almost no odor. DEHP is in polyvinyl chloride (PVC) plastic products like toys, vinyl upholstery, shower curtains, adhesives, and coatings. Vinyl plastic may contain up to 40% DEHP. DEHP is also used in inks, pesticides, cosmetics, and vacuum pump oil. It is used to detect leaks in protective face gear, and as a test material for filtration systems. The Environmental Protection Agency (EPA) proposed a limit of 6 mg/L DEHP for drinking water.
- Dissolved oxygen, pH and conductivity at the Control and Test Sites

Table 1. Effluent limits, Class III Criteria and chemical, microbiological, and toxicological data.

Florida State Hospital WWTP	Class III Stds	Effluent Limits	Effluent Samples	Control Site	Test Site
Organic Constituents (µg/L)					
Bis(2-ethylhexyl)phthalate	-	-	19 I	-	-
Metals (µg/L unless otherwise noted)					
Aluminum	≤ 1500	-	27	-	-
Arsenic	≤ 50	-	6 U	-	-
Cadmium	≤ 1.3 b	-	0.078 I	-	-
Calcium (mg/L)	-	-	37.5	-	-
Chromium-III	≤ 103.1 b	-	2 U	-	-
Copper	≤ 11.3 b	-	10.3	-	-
Iron	≤ 1000	-	71	-	-
Lead	≤ 4.2 b	-	0.4 U	-	-
Magnesium (mg/L)	-	-	7.5	-	-
Nickel	≤ 62.8 b	-	3.3 I	-	-
Selenium	≤ 5	-	0.5 U	-	-
Silver	≤ 0.07	-	0.028 I	-	-
Zinc	≤ 144.3 b	-	39	-	-
Nutrients (mg/L)					
TSS	-	≤ 40	4 UQ	-	-
Ortho-phosphate	-	-	0.87	0.028	0.056
Total Phosphorus	-	≤ 16	0.87	0.033 I	0.045 I
Ammonia	-	≤ 4	0.026 A	0.062	0.062
Unionized Ammonia	≤ 0.02	≤ 0.02 s	0 c	0 c	0 c
Nitrate+Nitrite	-	-	1.9	0.56	0.56
Total Kjeldahl Nitrogen	-	-	0.6	0.42	0.42
Organic Nitrogen	-	-	0.57 c	0.36 c	0.36 c
Total Nitrogen	-	≤ 25	2.5 c	0.98 c	0.98 c
General Physical and Chemical Parameters					
Habitat Assessment	-	-	-	124	129
Dissolved Oxygen (mg/L)	≥ 5	≥ 5	4	5.9	6.3
pH (S.U.)	6.0-8.5	6.0-8.5	7.3	6.7	6.8
Conductivity (umhos/cm)	≤ 1275	-	-	67	68
Temperature (C)	-	-	28	26.4	26.4
BOD (mg/L)	-	-	0.48 IK	0.28 IK	0.36 IK
Flow					
Hardness (mg/L)	-	-	124.5 c	-	-
AGP (mg DryWt/L)	-	-	39.9 J	19.2 J	30.5 J
Total Residual Chlorine (mg/L)	≤ 0.01	= 0.01	0.0 **	-	-
Microbiology (# counts/100ml)					
Fecal Coliforms-Membrane Filter	≤ 800	≤ 800 s	2 K	-	-
Total Coliforms-Membrane Filter	≤ 2400		106	-	-
Toxicology Bioassays					
Fish (% mortality)	0.5	NOEC =100	0%	-	-
Water flea (% mortality)	0.5	NOEC =100	0%	-	-

Value exceeds Freshwater Class III Water Quality Criteria or Permit Limits or Both

- Analyte not measured

** Measured in the field

b - Value is calculated based on hardness

c - Calculated value

s - Single sample

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

I - Value reported is < the practical quantitation limit (PQL), and = the minimum detection limit (MDL)

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

Q - Sample held beyond normal holding time

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

NOEC - A no observed effect concentration less than 100% effluent will constitute a violation of this permit

Table 2. Measured and predicted algal growth potential (AGP) of Pseudokirchneriella subcapitata *for total soluble nitrogen (TSIN) and ortho phosphate (OP) limitation*

Location	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (OP) ± 20%	Predicted AGP (TN) ± 20%	Predicted AGP (TP) ± 20%	Inorganic N:P ratio	Total N:P ratio
Effluent Samples	39.9 J	73.19 ± 14.638	374.1 ± 74.82	72.2 ± 14.44	374.1 ± 74.82	2.21	2.18
Control Site	19.2 J	23.64 ± 4.728	12.04 ± 2.408	21.28 ± 4.256	14.19 ± 2.838	22.21	16.97
Test Site	30.5 J	23.64 ± 4.728	24.08 ± 4.816	21.28 ± 4.256	19.35 ± 3.87	11.11	12.44

J – Estimated value, a power outage resulted in sample lighting being off for approximately 3 hours and the temperature being out of range for 11 hours

complied with Class III Freshwater Quality Criteria (Table 1, 62-302.530 F.A.C.).

- 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 and Appendix 6 for bioassay bench sheets). While the 48-hour acute screening toxicity tests do not provide chronic toxicity data which is requested in the facility permit, the Department uses it to provide reasonable assurance that the facility does not adversely affect waters of the state.
- Fecal and total coliforms were detected in the effluent at levels that complied with Class III Freshwater Quality Criteria and facility permit limit (See Table 1 for results). Fecal and total coliforms samples were not taken at the Control and Test Sites.
- Effluent concentrations of total phosphorus (0.87 mg/L), unionized ammonia (= 0.02 mg/L), and total nitrogen (2.5 mg/L) complied with permit limits (Table 1).
- Nutrient levels at the Control and Test Sites were essentially the same, with ortho-phosphate being the only exception (Table 1). Ortho-phosphate concentration at the Test Site (0.056 mg/L) was nearly double that at the Control Site (0.028 mg/L). The Control Site ortho-phosphate concentration approached the 20th percentile and the Test Site ortho-phosphate concentration was above the 40th percentile of typical values for Florida streams respectively. (Appendix 5). Total phosphorus was detected in the Control and Test Sites at levels above the MDL and below the PQL. In-stream ammonia, nitrate+nitrite, total Kjeldahl nitrogen (TKN) and organic nitrogen concentrations were essentially the same at the Control and Test Sites, indicating that effluent concentrations of these nutrients are having little or no effect on their downstream concentrations (Table 1).
- Algal growth potential (AGP) is a measure of nutrients available for algal growth (Miller *et al*. 1978). Raschke and Shultz (1987) found that AGP above 5.0 mg dry wt/L represent a "problem" threshold for fresh receiving waters, implying nutrient enrichment. The AGP value at the upstream Control Site, 19.2 mg dry wt/L, was almost four times this level, (Table 2). The AGP values of the downstream Test Site (30.5 mg dry wt/L) and the effluent (39.9 mg dry wt/L) were six and eight times the "problem" threshold, respectively, indicating there are more nutrients available downstream at the Test Site. This increase indicates nutrient enrichment, which may be related to the increase in

Table 3. Periphyton composition at Control and Test Sites

	Control Site	Test Site
Number of Taxa	43	50
Shannon-Weaver Diversity	3.77	5.17
Chlorophyll a (mg/m²)	30 A	0.65 I
Phaeophytin (mg/m²)	0	0 J
Algal Density (number/cm²)	338905	22502
Percent Dominant Taxon	27.3	8.6
Dominant Taxon (name)	*Cocconeis placentula*	*Fragilariaceae*
Number of Algal Units Identified	311	105
Percentage Composition		
Blue-green algae	4.8	8.6
Diatoms	88.1	76.2
Green algae	7.1	12.4
Other	0	2.9

Table 4. Macroinvertebrate Hester-Dendy Samples - Quantitative

Florida State Hospital WWTP	Control Site	Test Site
Summary Statisics		
Shannon-Weaver Diversity	3.89	3.97
Number of Taxa	42	46
Florida Index	27	35
Number of EPT Taxa	14	15
Percent Dominant Taxon	17.8	14.9
Dominant Taxon (name)	*Hydropsyche*	*Polypedilum flavum*
Total Number of Individuals	1738	1751
Community Composition: Percent of total		
Diptera	40.2	37.2
Ephemeroptera	18.4	22.9
Oligochaeta	0	0
Plecoptera	0	0
Trichoptera	29	28.9
Other	12.3	11
Functional Feeding Groups: Percent of total		
Predators	8.4	8
Surface Deposit Feeders	28.7	31.2
Suspension Feeders	40.5	38.4
Scrapers	11	10.8
Shredders	9.8	8.9
Unknown	1.4	2.6

available phosphate from the effluent in this portion of North Mosquito Creek. There was no evidence of growth inhibition in AGP data (Table 2).

- Chlorophyll-*a* was not detected in the effluent or in the Control and Test Site water samples (Table 1). We note that algal production may or may not be fueled by the presence of nutrients in the water column, but instead, is the sum of a wide array of environmental conditions at a site (e.g. pH, shading, turbidity). Thus it is not necessarily contradictory for ambient nutrient levels to be high and for no chlorophyll to be detected in water samples.
- There were differences between Control and Test Sites periphyton abundance and community composition (Table 3, Appendix 8). Periphyton density decreased by 93% at the downstream Test Site compared to the upstream Control Site, while Shannon-Weaver Diversity increased 30.2% over the background levels (Table 3). Periphytometers have been shown to be adversely effected by such factors as grazer abundance, shading, and sloughing of algal cells.
- Habitat assessment scores were 124 at the Control Site and 129 at the Test Site, placing them both in the "Optimal" category (Table 1, data sheets in Appendix 7). Of the parameters used in the Habitat Assessment, most did not differ between sites, or were slightly higher at the downstream Test Site, when compared to the Control Site.
- Quantitative measures of benthic macroinvertebrate assemblages from Hester-Dendy samplers showed little or no difference at the Test Site compared to the Control Site (Table 4, Appendices 9a and9 b). Both sites had nearly equal values for Shannon-Weaver diversity, taxa richness, EPT taxa, percent dominant taxon, suspension feeders, shredders, and predators. Diptera, Ephemeroptera and Trichoptera, together comprised nearly 90 percent of the organisms collected at each site.
- Qualitative measures of benthic macroinvertebrate assemblages from dipnet samples showed little or no difference at the Test Site compared to the Control Site (Table 5, Appendices 10a and 10b). Stream Condition Index (SCI_2004) metrics were very similar, with nearly equal values for taxa richness, number of Ephemeroptera and Trichoptera taxa, number of very tolerant individuals, and percent dominant taxon. Community composition differed between the two sites, primarily due to an increase in the number of suspension feeders and filterers at the downstream Test Site (Tables 5 and 6, Appendix 10). The Control and Test Site SCI_2004 score of 56 and 64, respectively placed both in the "Fair" Category (Table 6).

Summary

FDEP data from this inspection indicate effluent dissolved oxygen was below the Class III Freshwater Quality Criterion (62-302 530(31), F.A.C.) and the facility permit limit. AGP and periphyton abundance data for the Control Site indicate there are upstream sources of nutrients contributing to the enrichment

of the stream. Test Site and effluent AGP and ortho-phosphate concentrations indicate some additional nutrient enrichment from facility, however Test Site periphyton and macroinvertebrate data indicate little or no effect from the additional nutrients. Periphytometer data have been shown to be influenced by many environmental factors including shading, turbidity, sloughing of cells and grazer abundance. Differences that were observed in the macroinvertebrate data may be the result of differences in microhabitat availability within each of the sample areas, or the result of community instability resulting from the reduced water quality within the entire watershed.

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Table 5. Macroinvertebrate Dipnet Samples - Qualitative

Florida State Hospital WWTP	Control Site	Test Site
Stream Condition Index (value)	56	64
Stream Condition Index (word)	Fair	Fair
Stream Condition Index Metrics		
Number of Total Taxa	32	29
Number of Ephemeroptera Taxa	4	6
Number of Trichoptera Taxa	4	5
Number of Clinger Taxa	7	8
Number of Long-lived Taxa	1.0	1.0
Number of Sensitive Taxa	5.0	6.0
Percent of Dominant Taxon	15.9	12.4
Percent Suspension Feeders and Filterers	18.2	35.7
Percent of Tanytarsini individuals	7.5	1.9
Percent of Very Tolerant individuals	3.7	2.9
Total Number of Individuals	107	105
Community Composition: Percent of total		
Dominant Taxon (name)	*Tricorythodes albilineatus*	*Microcylloepus pusillus*
Dominant Taxon (group)	Ephemeroptera	Coleoptera
Amphipoda	3.7	7.6
Pelecypoda	1.9	16.2
Diptera	29.9	15.2
Gastropoda	3.7	1.9
Oligochaeta	3.7	2.9
Functional Feeding Groups: Percent of total		
Burrowing Deposit Feeders	3.7	2.9
Predators	18.2	3.8
Surface Deposit Feeders	31.8	29.0
Suspension Feeders and Filterers	18.2	35.7
Scrapers	19.6	17.6
Shredders	5.1	10.5
Unknown	2.8	0.0

Table 6a. Stream Condition Index Metrics – Panhandle Bioregion

Florida State Hospital - Control Site			
Metric:	Value	Raw metric Score	Fix Score 0-10
Total Taxa	32	4.85	4.85
Ephemeroptera taxa	4	6.67	6.67
Tricoptera Taxa	4	5.71	5.71
Clinger Taxa	7	4.52	4.52
Long-Lived taxa	1	2.00	2.00
Sensitive Taxa	5	2.63	2.63
Percent Contribution of Dominance Taxon	15.89	8.22	8.22
Percent Suspension Feeders and Filterers	18.22	3.91	3.91
Percent of Tanytarsini individuals	7.48	6.48	6.48
Percent of Very Tolerant individuals	3.74	5.68	5.68
Total Score			56
Interpretation of Scores		Good	73-100
		Fair	46-72
		Poor	19-45
		Very Poor	0-18

Table 6b. Stream Condition Index Metrics – Panhandle Bioregion

Florida State Hospital - Test Site			
Metric:	Value	Raw metric Score	Fix Score 0-10
Total Taxa	29	3.94	3.94
Ephemeroptera taxa	6	10.00	10.00
Tricoptera Taxa	5	7.14	7.14
Clinger Taxa	8	5.16	5.16
Long-Lived taxa	1	2.00	2.00
Sensitive Taxa	6	3.16	3.16
Percent Contribution of Dominance Taxon	12.38	9.28	9.28
Percent Suspension Feeders and Filterers	35.71	7.89	7.89
Percent of Tanytarsini individuals	1.9	3.23	3.23
Percent of Very Tolerant individuals	2.86	6.25	6.25
Total Score			64
Interpretation of Scores		Good	73-100
		Fair	46-72
		Poor	19-45
		Very Poor	0-18

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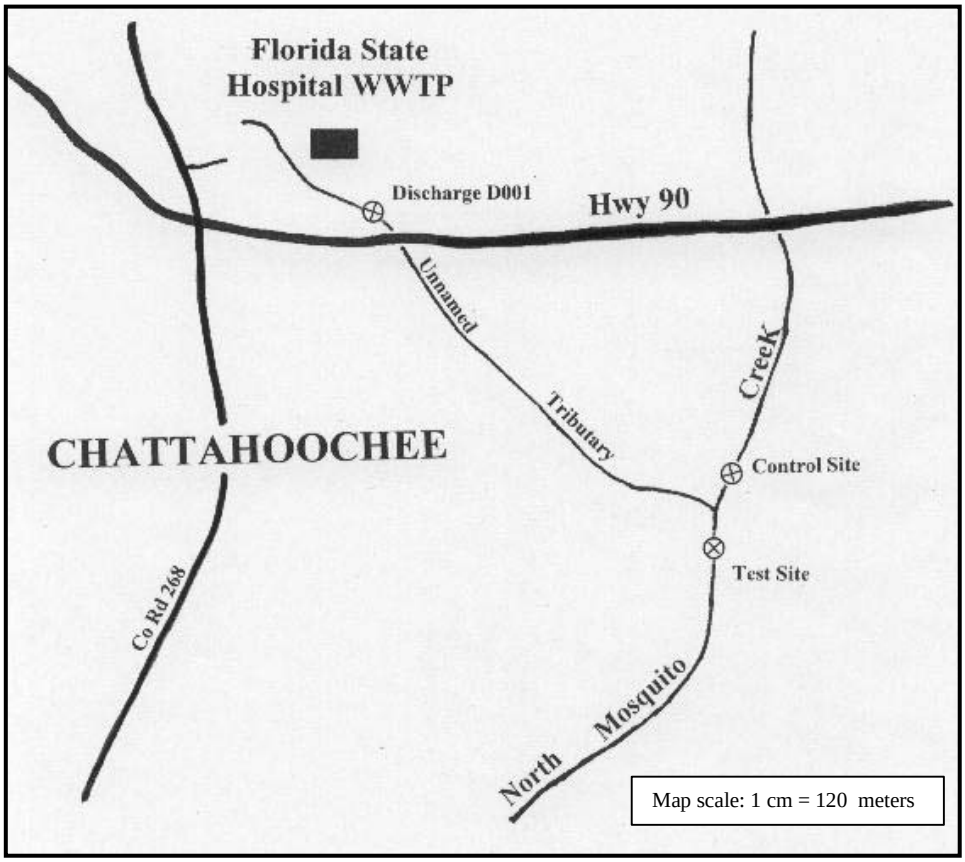
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Appendices

- Appendix 1. Map of facility
- Appendix 2. Facility summary
- Appendix 3. Explanation of measurements
- Appendix 4. Chemical analyses of effluent and receiving water.
- Appendix 5. Typical values for selected parameters in Florida waters
- Appendix 6. Additional physical, chemical, and toxicological results
- Appendix 7. Habitat Assessment field sheets
- Appendix 8a. Periphyton: Taxa list and density (number of individuals per cm^2)
- Appendix 8b. Periphyton: Taxa list and number of individuals counted
- Appendix 9a. Hester-Dendy multi-plate samplers: Taxa list and macroinvertebrate density (average number of individuals per m^2)
- Appendix 9b. Hester-Dendy multi-plate samplers: Taxa list and total number of macroinvertebrates counted
- Appendix 10a. Dipnet samples: Taxa list and number of macroinvertebrates counted (collapsed)
- Appendix 10b. Dipnet samples: Taxa list and number of macroinvertebrates counted

Appendix 1. Map of facility



Appendix 2

Facility Summary

Facility Name (as it appears on permit): **Florida State Hospital WWTP**		**Former Names:**
Physical Address: **Blackberry Lane** **Chattahoochee, FL 32324**	**NPDES Permit No.:FL0031402-003-DW1P** **Expiration Date: 4/17/2006**	**Prepared By:**
County: Gadsden **District: Northwest**	**State Permit No.:** **Expiration Date:**	**Facility Type: Domestic Wastewater Treatment**
Function of Facility: Provides secondary treatment of sewage for the Florida State Hospital		
Sampling Location (specify lat/longs of NPDES point): Latitude 30º 42' 05" N Longitude 84º 49' 59" W		
Description of treatment process: Raw sewage is received from onsite collection system and passes through a bar screen. It is then sent to primary settling tanks, followed by flow into an anoxic tank. From there, the wastewater flows into aeration tanks, after which it proceeds to parallel clarifiers. The supernatant flows from the clarifiers to the Chlorine Contact Chamber (CCC), where it is chlorinated for disinfection, and dechlorinated with SO_2 gas as it exits the CCC. From the CCC, it flows via gravity to Outfall D001.		
Receiving Waters: North Mosquito Creek		**Classification: III Freshwater**
Temperature (C): 24.4ºC	**Design Flow: 1.3 MGD AADF**	
pH (SU): 7.34	**Mean Flow: 0.378 MGD AADF (6/04-8/04)**	
Conductivity (umhos/cm):	**Flow During Survey:**	
Dissolved Oxygen (mg/L): 4.0 mg/l	**Total Residual Chlorine (mg/L): 1.4 (dis)/0.0 (dechl)**	
Discharge is: Continuous		
Facility Mixing Zone Details:		
List Effluent Limits:		

Parameter and Units	Limit	Describe special permit conditions and permit modifications:
Flow	**1.3 MGD**	**Continuous monitoring**
CBOD5	**40.0 mg/l single sample** **30.0 mg/l weekly average** **25.0 mg/l monthly average** **20.0 mg/l annual average**	**Weekly sampling 16-hour FPC**
Total Suspended Solids	**40.0 mg/l single sample** **30.0mg/l weekly average** **25.0 mg/l monthly average** **20.0 mg/l annual average**	**Weekly sampling 16-hour FPC**
Total Nitrogen	**25.0 mg/l single sample** **18.8 mg/l weekly average** **16.0 mg/l monthly average** **12.5 mg/l annual average**	**Weekly sampling 16-hour FPC**
Total Ammonia-Nitrogen	**4.0 mg/l single sample** **3.0 mg/l weekly average** **2.5 mg/l monthly average** **2.0 mg/l annual average**	**Grab**

Parameter and Units	Limit	Describe special permit conditions and permit modifications:
Flow	**1.3 MGD**	**Continuous monitoring**
CBOD5	**40.0 mg/l single sample** **30.0 mg/l weekly average** **25.0 mg/l monthly average** **20.0 mg/l annual average**	**Weekly sampling 16-hour FPC**
Total Suspended Solids	**40.0 mg/l single sample** **30.0mg/l weekly average** **25.0 mg/l monthly average** **20.0 mg/l annual average**	**Weekly sampling 16-hour FPC**
Total Nitrogen	**25.0 mg/l single sample** **18.8 mg/l weekly average** **16.0 mg/l monthly average** **12.5 mg/l annual average**	**Weekly sampling 16-hour FPC**
Total Ammonia-Nitrogen	**4.0 mg/l single sample** **3.0 mg/l weekly average** **2.5 mg/l monthly average** **2.0 mg/l annual average**	**Grab**
Total Phosphorus	**16.0 mg/l single sample** **12.0 mg/l weekly average** **10.0 mg/l monthly average** **8.0 mg/l annual average**	**Weekly sampling 16-hour FPC**
pH	**6.0 to 8.5**	**Daily grab**
Dissolved Oxygen	**5.0 mg/l minimum** **6.0 mg/l mo. ave. minimum**	**Daily grab**
Total Residual Chlorine (Disinfection)	**0.5 mg/l minimum**	**Daily grab**
Total Residual Chlorine (Dechlorination)	**0.1 mg/l maximum**	**Daily grab**
Fecal Coliform	**800/100 ml single sample** **Report monthly geom. mean** **200/100 ml annual average**	**Weekly Grab**
Whole Effluent Toxicity		

DMR Summary Results

The date range you specified is: 08/01/2003 to 12/31/2004

Permit Number: FL0031402
Facility Name: FL STATE HOSPITAL
Outfall Indicator: 001-1
Monitoring Location Code: 1

Parameter Code	Description	Limit	Limit Effective Dates	Statistical Base	Units	Average	Maximum	Minimum
P 00010	TEMPERATURE, WATER DEG CENTRIGRADE	ADDMON	5/1/2001 to 4/30/2006	MAXIMUM	DEG.C	24.9533	29.1	19.1
P 00300	OXYGEN, DISSOLVED (DO)	5	5/1/2001 to 4/30/2006	MINIMUM	MG/L	5.8267	6.4	5.1
P 00300	OXYGEN, DISSOLVED (DO)	6	5/1/2001 to 4/30/2006	MO AV MN	MG/L	6.34	6.9	6
P 00400	PH	8.5	5/1/2001 to 4/30/2006	MAXIMUM	SU	7.5733	7.9	7.5
P 00400	PH	6	5/1/2001 to 4/30/2006	MINIMUM	SU	7.1533	7.2	6.9
P 00530	SOLIDS, TOTAL SUSPENDED	40	5/1/2001 to 4/30/2006	MAXIMUM	MG/L	3.2933	5.7	1.9
P 00530	SOLIDS, TOTAL SUSPENDED	25	5/1/2001 to 4/30/2006	MO AVG	MG/L	2.0133	3.4	1
P 00530	SOLIDS, TOTAL SUSPENDED	30	5/1/2001 to 4/30/2006	WKLY AVG	MG/L	2.78	4.9	1.3
P 00600	NITROGEN, TOTAL (AS N)	25	5/1/2001 to 4/30/2006	MAXIMUM	MG/L	8.5533	12.7	4.9
P 00600	NITROGEN, TOTAL (AS N)	16	5/1/2001 to 4/30/2006	MO AVG	MG/L	5.9467	8.3	3.6
P 00600	NITROGEN, TOTAL (AS N)	18.75	5/1/2001 to 4/30/2006	WKLY AVG	MG/L	8.46	12.7	4.9
P 00610	NITROGEN, AMMONIA TOTAL (AS N)	4	5/1/2001 to 4/30/2006	MAXIMUM	MG/L	0.12	0.2	0.1
P 00610	NITROGEN, AMMONIA TOTAL (AS N)	2.5	5/1/2001 to 4/30/2006	MO AVG	MG/L	0.104	0.12	0.1
P 00610	NITROGEN, AMMONIA TOTAL (AS N)	3	5/1/2001 to 4/30/2006	WKLY AVG	MG/L	0.12	0.2	0.1
P 00612	NITROGEN, AMMONIA, TOT UNIONIZED (AS N)	0.02	5/1/2001 to 4/30/2006	MAXIMUM	MG/L	0.0004	0.00155	0.000001
P 00665	PHOSPHORUS, TOTAL (AS P)	16	5/1/2001 to 4/30/2006	MAXIMUM	MG/L	3.0067	4.1	1.8
P 00665	PHOSPHORUS, TOTAL (AS P)	10	5/1/2001 to 4/30/2006	MO AVG	MG/L	2.2	3	1.1
P 00665	PHOSPHORUS, TOTAL (AS P)	12	5/1/2001 to 4/30/2006	WKLY AVG	MG/L	2.9933	4.1	1.8
P 74055	COLIFORM, FECAL GENERAL	800	5/1/2001 to 4/30/2006	MAXIMUM	#/ 100ML	8.8667	30	2
P 74055	COLIFORM, FECAL GENERAL	ADDMON	5/1/2001 to 4/30/2006	MO GEOMN	#/ 100ML	3.0133	8.6	1.3
P 80082	BOD, CARBONACEOUS 05 DAY, 20C	30	5/1/2001 to 4/30/2006	7 DA AVG	MG/L	1.46	2	1
P 80082	BOD, CARBONACEOUS 05 DAY, 20C	40	5/1/2001 to 4/30/2006	MAXIMUM	MG/L	1.5933	2.4	1.1
P 80082	BOD, CARBONACEOUS 05 DAY, 20C	25	5/1/2001 to 4/30/2006	MO AVG	MG/L	1.18	1.5	0.9

Permit Number: FL0031402
Facility Name: FL STATE HOSPITAL
Outfall Indicator: 001-1
Monitoring Location Code: A

Parameter Code	Description	Limit	Limit Effective Dates	Statistical Base	Units	Average	Maximum	Minimum
P 50060	CHLORINE, TOTAL RESIDUAL	0.5	5/1/2001 to 4/30/2006	MINIMUM	MG/L	0.5	0.5	0.5

Permit Number: FL0031402
Facility Name: FL STATE HOSPITAL
Outfall Indicator: 001-1
Monitoring Location Code: G

Parameter Code	Description	Limit	Limit Effective Dates	Statistical Base	Units	Average	Maximum	Minimum
P 00530	SOLIDS, TOTAL SUSPENDED	ADDMON	5/1/2001 to 4/30/2006	MO AVG	MG/L	154.1867	185	99.5
P 80082	BOD, CARBONACEOUS 05 DAY, 20C	ADDMON	5/1/2001 to 4/30/2006	MO AVG	MG/L	159.4714	208.1	98.4

Permit Number: FL0031402
Facility Name: FL STATE HOSPITAL
Outfall Indicator: 001-1
Monitoring Location Code: Y

Parameter Code	Description	Limit	Limit Effective Dates	Statistical Base	Units	Average	Maximum	Minimum
P 00530	SOLIDS, TOTAL SUSPENDED	20	5/1/2001 to 4/30/2006	ANNL AVG	MG/L	2.0333	2.3	1.7
P 00600	NITROGEN, TOTAL (AS N)	12.5	5/1/2001 to 4/30/2006	ANNL AVG	MG/L	6.172	6.51	5.88
P 00610	NITROGEN, AMMONIA TOTAL (AS N)	2	5/1/2001 to 4/30/2006	ANNL AVG	MG/L	0.1067	0.11	0.1
P 00665	PHOSPHORUS, TOTAL (AS P)	8	5/1/2001 to 4/30/2006	ANNL AVG	MG/L	2.1467	2.3	1.9
P 50050	FLOW	1.3	5/1/2001 to 4/30/2006	ANNL AVG	MGD	0.3937	0.411	0.369
P 74055	COLIFORM, FECAL GENERAL	200	5/1/2001 to 4/30/2006	ANNL AVG	#/ 100ML	4.2267	5	3.3
P 80082	BOD, CARBONACEOUS 05 DAY, 20C	20	5/1/2001 to 4/30/2006	ANNL AVG	MG/L	1.1533	1.2	1.1

Permit Number: FL0031402
Facility Name: FL STATE HOSPITAL
Outfall Indicator: 001-T
Monitoring Location Code: P

Parameter Code	Description	Limit	Limit Effective Dates	Statistical Base	Units	Average	Maximum	Minimum
P TBP3B	NOEL STATRE 7DAY CHR CERIODAPHNIA	100	5/1/2001 to 4/30/2006	MINIMUM	PER- CENT	100	100	100

Appendix 3

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 4. The results from these analyses were compared with Water Quality Criteria (62-302 F.A.C.) and facility permit limits (Table 1, Appendix 2). 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.

(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: Periphyton were sampled at both control and test sites by incubating glass microscope slides in a standard periphytometer for 28 days (QA Rule SOP FS7210). 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 both phytoplankton and periphyton 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 2004 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 depending on which bioregion (Panhandle, Northeast, or Peninsula) the sampling location exists in 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 four ordinal groups: Good, Fair, Poor, and Very Poor. 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 of "Poor" or "Very Poor" 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 4

Chemical Analysis of Effluent and Receiving Water

DATE SAMPLED	FIELD ID	ANALYSIS GROUP	COMPONENT	RESULT	UNITS	REMARK	MDL	PQL
8/30/2004 11:20	EFFLUENT	BNA-Water	1,2,4-Trichlorobenzene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	1,2-Dichlorobenzene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	1,3-Dichlorobenzene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	1,4-Dichlorobenzene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	2,4,6-Trichlorophenol	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	2,4-Dichlorophenol	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	2,4-Dimethylphenol	49	ug/L	U	49	190
8/30/2004 11:20	EFFLUENT	BNA-Water	2,4-Dinitrophenol	15	ug/L	U	15	58
8/30/2004 11:20	EFFLUENT	BNA-Water	2,4-Dinitrotoluene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	2,6-Dinitrotoluene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	2-Chloronaphthalene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	2-Chlorophenol	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	12
8/30/2004 11:20	EFFLUENT	BNA-Water	2-Nitrophenol	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	3,3'-Dichlorobenzidine	39	ug/L	U	39	160
8/30/2004 11:20	EFFLUENT	BNA-Water	4,4'-DDD	1.5	ug/L	U	1.5	5.8
8/30/2004 11:20	EFFLUENT	BNA-Water	4,4'-DDE	1.5	ug/L	U	1.5	5.8
8/30/2004 11:20	EFFLUENT	BNA-Water	4,4'-DDT	1.5	ug/L	U	1.5	5.8
8/30/2004 11:20	EFFLUENT	BNA-Water	4-Bromophenyl phenyl ether	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	4-Chloro-3-methylphenol	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.8
8/30/2004 11:20	EFFLUENT	BNA-Water	4-Nitrophenol	15	ug/L	U	15	58
8/30/2004 11:20	EFFLUENT	BNA-Water	Acenaphthene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Acenaphthylene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Aldrin	1.5	ug/L	U	1.5	5.8
8/30/2004 11:20	EFFLUENT	BNA-Water	Anthracene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Benzidine	97	ug/L	U	97	390
8/30/2004 11:20	EFFLUENT	BNA-Water	Benzo(a)anthracene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Benzo(a)pyrene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Benzo(b)fluoranthene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Benzo(g,h,i)perylene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Benzo(k)fluoranthene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Bis(2-chloroethoxy)methane	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Bis(2-chloroethyl)ether	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	12
8/30/2004 11:20	EFFLUENT	BNA-Water	Bis(2-ethylhexyl)phthalate	19	ug/L	I	15	58
8/30/2004 11:20	EFFLUENT	BNA-Water	Butyl benzyl phthalate	4.9	ug/L	U	4.9	19
8/30/2004 11:20	EFFLUENT	BNA-Water	Chrysene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Di-n-butyl phthalate	4.9	ug/L	U	4.9	19
8/30/2004 11:20	EFFLUENT	BNA-Water	Di-n-octyl phthalate	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Dibenzo(a,h)anthracene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Dieldrin	1.5	ug/L	U	1.5	5.8
8/30/2004 11:20	EFFLUENT	BNA-Water	Diethyl phthalate	18	ug/L	UJ	18	74
8/30/2004 11:20	EFFLUENT	BNA-Water	Dimethyl phthalate	49	ug/L	U	49	190
8/30/2004 11:20	EFFLUENT	BNA-Water	Endosulfan I	3.9	ug/L	U	3.9	16
8/30/2004 11:20	EFFLUENT	BNA-Water	Endosulfan II	3.9	ug/L	U	3.9	16
8/30/2004 11:20	EFFLUENT	BNA-Water	Endosulfan sulfate	1.5	ug/L	U	1.5	5.8
8/30/2004 11:20	EFFLUENT	BNA-Water	Endrin	1.5	ug/L	U	1.5	5.8

8/30/2004 11:20	EFFLUENT	BNA-Water	Endrin aldehyde	3.9	ug/L	U	3.9	16
8/30/2004 11:20	EFFLUENT	BNA-Water	Fluoranthene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Fluorene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Heptachlor	1.5	ug/L	U	1.5	5.8
8/30/2004 11:20	EFFLUENT	BNA-Water	Heptachlor epoxide	1.5	ug/L	U	1.5	5.8
8/30/2004 11:20	EFFLUENT	BNA-Water	Hexachlorobenzene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	12
8/30/2004 11:20	EFFLUENT	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	U	2.9	12
8/30/2004 11:20	EFFLUENT	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	12
8/30/2004 11:20	EFFLUENT	BNA-Water	Indeno(1,2,3-cd)pyrene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Isophorone	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.8
8/30/2004 11:20	EFFLUENT	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.8
8/30/2004 11:20	EFFLUENT	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	U	2.9	12
8/30/2004 11:20	EFFLUENT	BNA-Water	Naphthalene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.8
8/30/2004 11:20	EFFLUENT	BNA-Water	Pentachlorophenol	2.9	ug/L	U	2.9	12
8/30/2004 11:20	EFFLUENT	BNA-Water	Phenanthrene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Phenol	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	Pyrene	0.97	ug/L	U	0.97	3.9
8/30/2004 11:20	EFFLUENT	BNA-Water	alpha-BHC	1.5	ug/L	U	1.5	5.8
8/30/2004 11:20	EFFLUENT	BNA-Water	beta-BHC	1.5	ug/L	U	1.5	5.8
8/30/2004 11:20	EFFLUENT	BNA-Water	delta-BHC	1.5	ug/L	U	1.5	5.8
8/30/2004 11:20	EFFLUENT	BNA-Water	gamma-BHC	1.5	ug/L	U	1.5	5.8
8/30/2004 11:20	EFFLUENT	Bio-AGP/LimNut	Algal Growth Potential	39.9	mg DryWt/L	J	0.3	0.9
8/30/2004 11:20	EFFLUENT	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
8/30/2004 11:20	EFFLUENT	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
8/30/2004 11:20	EFFLUENT	Bio-Microbiology	Fecal Coliforms-Membrane Filter	2	#/100 mL	K		
8/30/2004 11:20	EFFLUENT	Bio-Microbiology	Total Coliforms-Membrane Filter	106	#/100 mL			
8/30/2004 11:20	EFFLUENT	GC-Water	Alachlor	0.6	ug/L	U	0.6	2.4
8/30/2004 11:20	EFFLUENT	GC-Water	Ametryn	0.05	ug/L	U	0.05	0.2
8/30/2004 11:20	EFFLUENT	GC-Water	Atrazine	0.05	ug/L	U	0.05	0.2
8/30/2004 11:20	EFFLUENT	GC-Water	Azinphos Methyl	0.05	ug/L	U	0.05	0.2
8/30/2004 11:20	EFFLUENT	GC-Water	Bromacil	0.2	ug/L	U	0.2	0.8
8/30/2004 11:20	EFFLUENT	GC-Water	Butylate	0.2	ug/L	U	0.2	0.8
8/30/2004 11:20	EFFLUENT	GC-Water	Chlorpyrifos Ethyl	0.05	ug/L	U	0.05	0.2
8/30/2004 11:20	EFFLUENT	GC-Water	Chlorpyrifos Methyl	0.1	ug/L	U	0.1	0.4
8/30/2004 11:20	EFFLUENT	GC-Water	Diazinon	0.05	ug/L	U	0.05	0.2
8/30/2004 11:20	EFFLUENT	GC-Water	Ethion	0.05	ug/L	U	0.05	0.2
8/30/2004 11:20	EFFLUENT	GC-Water	Ethoprop	0.1	ug/L	U	0.1	0.4
8/30/2004 11:20	EFFLUENT	GC-Water	Fenamiphos	0.2	ug/L	U	0.2	0.8
8/30/2004 11:20	EFFLUENT	GC-Water	Fonofos	0.1	ug/L	U	0.1	0.4
8/30/2004 11:20	EFFLUENT	GC-Water	Hexazinone	0.1	ug/L	U	0.1	0.4
8/30/2004 11:20	EFFLUENT	GC-Water	Malathion	0.15	ug/L	U	0.15	0.6
8/30/2004 11:20	EFFLUENT	GC-Water	Metalaxyl	0.25	ug/L	U	0.25	1
8/30/2004 11:20	EFFLUENT	GC-Water	Metolachlor	0.5	ug/L	U	0.5	2
8/30/2004 11:20	EFFLUENT	GC-Water	Metribuzin	0.1	ug/L	U	0.1	0.4
8/30/2004 11:20	EFFLUENT	GC-Water	Mevinphos	0.2	ug/L	U	0.2	0.8
8/30/2004 11:20	EFFLUENT	GC-Water	Naled	0.8	ug/L	UJ	0.8	3.2
8/30/2004 11:20	EFFLUENT	GC-Water	Norflurazon	0.1	ug/L	U	0.1	0.4
8/30/2004 11:20	EFFLUENT	GC-Water	Parathion Ethyl	0.15	ug/L	UJ	0.15	0.6
8/30/2004 11:20	EFFLUENT	GC-Water	Parathion Methyl	0.1	ug/L	U	0.1	0.4
8/30/2004 11:20	EFFLUENT	GC-Water	Phorate	0.05	ug/L	U	0.05	0.2
8/30/2004 11:20	EFFLUENT	GC-Water	Prometryn	0.15	ug/L	U	0.15	0.6

8/30/2004 11:20	EFFLUENT	GC-Water	Simazine	0.05	ug/L	U	0.05	0.2
8/30/2004 11:20	EFFLUENT	Metals-Water	Aluminum	27	ug/L		5	20
8/30/2004 11:20	EFFLUENT	Metals-Water	Arsenic	6	ug/L	U	6	24
8/30/2004 11:20	EFFLUENT	Metals-Water	Cadmium	0.078	ug/L	I	0.025	0.1
8/30/2004 11:20	EFFLUENT	Metals-Water	Calcium	37.5	mg/L		0.05	0.2
8/30/2004 11:20	EFFLUENT	Metals-Water	Chromium	2	ug/L	U	2	8
8/30/2004 11:20	EFFLUENT	Metals-Water	Copper	10.3	ug/L		1	4
8/30/2004 11:20	EFFLUENT	Metals-Water	Iron	71	ug/L		10	40
8/30/2004 11:20	EFFLUENT	Metals-Water	Lead	0.4	ug/L	U	0.4	1.6
8/30/2004 11:20	EFFLUENT	Metals-Water	Magnesium	7.5	mg/L		0.02	0.08
8/30/2004 11:20	EFFLUENT	Metals-Water	Nickel	3.3	ug/L	I	2	8
8/30/2004 11:20	EFFLUENT	Metals-Water	Selenium	0.5	ug/L	U	0.5	2
8/30/2004 11:20	EFFLUENT	Metals-Water	Silver	0.028	ug/L	I	0.01	0.04
8/30/2004 11:20	EFFLUENT	Metals-Water	Zinc	39	ug/L		3	12
8/30/2004 11:20	EFFLUENT	Nutrients-Liquid	Ammonia-N	0.026	mg N/L	A	0.01	0.02
8/30/2004 11:20	EFFLUENT	Nutrients-Liquid	O-Phosphate-P	0.87	mg P/L		0.04	0.1
8/30/2004 11:50	EFFLUENT	Bio-BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	0.48	mg/L	IK		
8/30/2004 11:50	EFFLUENT	Bio-Toxicology	Bioassay-Acute-Screen-FW-C.dubia, LC50	100	LC50	L		
8/30/2004 11:50	EFFLUENT	Bio-Toxicology	Bioassay-Acute-Screen-FW-Fish, LC50	100	LC50	L		
8/30/2004 11:50	EFFLUENT	Nutrients-Liquid	Kjeldahl Nitrogen	0.6	mg N/L		0.06	0.2
8/30/2004 11:50	EFFLUENT	Nutrients-Liquid	NO2NO3-N	1.9	mg N/L		0.02	0.05
8/30/2004 11:50	EFFLUENT	Nutrients-Liquid	TSS	4	mg/L	UQ	4	16
8/30/2004 11:50	EFFLUENT	Nutrients-Liquid	Total-P	0.87	mg P/L		0.02	0.06
8/30/2004 11:50	EQUIP BLANK	BNA-Water	1,2,4-Trichlorobenzene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	1,2-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	1,3-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	1,4-Dichlorobenzene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	2,4,6-Trichlorophenol	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	2,4-Dichlorophenol	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
8/30/2004 11:50	EQUIP BLANK	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	57
8/30/2004 11:50	EQUIP BLANK	BNA-Water	2,4-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	2,6-Dinitrotoluene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	2-Chloronaphthalene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	2-Chlorophenol	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	11
8/30/2004 11:50	EQUIP BLANK	BNA-Water	2-Nitrophenol	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
8/30/2004 11:50	EQUIP BLANK	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.7
8/30/2004 11:50	EQUIP BLANK	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.7
8/30/2004 11:50	EQUIP BLANK	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.7
8/30/2004 11:50	EQUIP BLANK	BNA-Water	4-Bromophenyl phenyl ether	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	4-Chloro-3-methylphenol	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.6
8/30/2004 11:50	EQUIP BLANK	BNA-Water	4-Nitrophenol	14	ug/L	U	14	57
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Acenaphthene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Acenaphthylene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Aldrin	1.4	ug/L	U	1.4	5.7
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Anthracene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Benzidine	95	ug/L	U	95	380
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Benzo(a)anthracene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Benzo(a)pyrene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Benzo(b)fluoranthene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Benzo(g,h,i)perylene	0.95	ug/L	U	0.95	3.8

8/30/2004 11:50	EQUIP BLANK	BNA-Water	Benzo(k)fluoranthene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Bis(2-chloroethoxy)methane	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Bis(2-chloroethyl)ether	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	11
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Bis(2-ethylhexyl)phthalate	14	ug/L	U	14	57
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Chrysene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Di-n-octyl phthalate	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Dibenzo(a,h)anthracene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.7
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Diethyl phthalate	18	ug/L	UJ	18	72
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.7
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Endrin	1.4	ug/L	U	1.4	5.7
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Fluoranthene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Fluorene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.7
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.7
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Hexachlorobenzene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	11
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	U	2.9	11
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	11
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Indeno(1,2,3-cd)pyrene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Isophorone	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	U	1.9	7.6
8/30/2004 11:50	EQUIP BLANK	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	U	1.9	7.6
8/30/2004 11:50	EQUIP BLANK	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	U	2.9	11
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Naphthalene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.6
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Pentachlorophenol	2.9	ug/L	U	2.9	11
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Phenanthrene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Phenol	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	Pyrene	0.95	ug/L	U	0.95	3.8
8/30/2004 11:50	EQUIP BLANK	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.7
8/30/2004 11:50	EQUIP BLANK	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.7
8/30/2004 11:50	EQUIP BLANK	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.7
8/30/2004 11:50	EQUIP BLANK	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.7
8/30/2004 11:50	EQUIP BLANK	GC-Water	Alachlor	0.67	ug/L	U	0.67	2.7
8/30/2004 11:50	EQUIP BLANK	GC-Water	Ametryn	0.056	ug/L	U	0.056	0.22
8/30/2004 11:50	EQUIP BLANK	GC-Water	Atrazine	0.056	ug/L	U	0.056	0.22
8/30/2004 11:50	EQUIP BLANK	GC-Water	Azinphos Methyl	0.056	ug/L	U	0.056	0.22
8/30/2004 11:50	EQUIP BLANK	GC-Water	Bromacil	0.22	ug/L	U	0.22	0.88
8/30/2004 11:50	EQUIP BLANK	GC-Water	Butylate	0.22	ug/L	U	0.22	0.88
8/30/2004 11:50	EQUIP BLANK	GC-Water	Chlorpyrifos Ethyl	0.056	ug/L	U	0.056	0.22
8/30/2004 11:50	EQUIP BLANK	GC-Water	Chlorpyrifos Methyl	0.11	ug/L	U	0.11	0.44
8/30/2004 11:50	EQUIP BLANK	GC-Water	Diazinon	0.056	ug/L	U	0.056	0.22
8/30/2004 11:50	EQUIP BLANK	GC-Water	Ethion	0.056	ug/L	U	0.056	0.22
8/30/2004 11:50	EQUIP BLANK	GC-Water	Ethoprop	0.11	ug/L	U	0.11	0.44
8/30/2004 11:50	EQUIP BLANK	GC-Water	Fenamiphos	0.22	ug/L	U	0.22	0.88
8/30/2004 11:50	EQUIP BLANK	GC-Water	Fonofos	0.11	ug/L	U	0.11	0.44
8/30/2004 11:50	EQUIP BLANK	GC-Water	Hexazinone	0.11	ug/L	U	0.11	0.44

8/30/2004 11:50	EQUIP BLANK	GC-Water	Malathion	0.17	ug/L	U	0.17	0.68
8/30/2004 11:50	EQUIP BLANK	GC-Water	Metalaxyl	0.28	ug/L	U	0.28	1.1
8/30/2004 11:50	EQUIP BLANK	GC-Water	Metolachlor	0.56	ug/L	U	0.56	2.2
8/30/2004 11:50	EQUIP BLANK	GC-Water	Metribuzin	0.11	ug/L	U	0.11	0.44
8/30/2004 11:50	EQUIP BLANK	GC-Water	Mevinphos	0.22	ug/L	U	0.22	0.88
8/30/2004 11:50	EQUIP BLANK	GC-Water	Naled	0.9	ug/L	UJ	0.9	3.6
8/30/2004 11:50	EQUIP BLANK	GC-Water	Norflurazon	0.11	ug/L	U	0.11	0.44
8/30/2004 11:50	EQUIP BLANK	GC-Water	Parathion Ethyl	0.17	ug/L	UJ	0.17	0.68
8/30/2004 11:50	EQUIP BLANK	GC-Water	Parathion Methyl	0.11	ug/L	U	0.11	0.44
8/30/2004 11:50	EQUIP BLANK	GC-Water	Phorate	0.056	ug/L	U	0.056	0.22
8/30/2004 11:50	EQUIP BLANK	GC-Water	Prometryn	0.17	ug/L	U	0.17	0.68
8/30/2004 11:50	EQUIP BLANK	GC-Water	Simazine	0.056	ug/L	U	0.056	0.22
8/30/2004 11:50	EQUIP BLANK	Metals-Water	Aluminum	5	ug/L	U	5	20
8/30/2004 11:50	EQUIP BLANK	Metals-Water	Arsenic	6	ug/L	U	6	24
8/30/2004 11:50	EQUIP BLANK	Metals-Water	Cadmium	0.025	ug/L	U	0.025	0.1
8/30/2004 11:50	EQUIP BLANK	Metals-Water	Calcium	0.05	mg/L	U	0.05	0.2
8/30/2004 11:50	EQUIP BLANK	Metals-Water	Chromium	2	ug/L	U	2	8
8/30/2004 11:50	EQUIP BLANK	Metals-Water	Copper	1	ug/L	U	1	4
8/30/2004 11:50	EQUIP BLANK	Metals-Water	Iron	10	ug/L	U	10	40
8/30/2004 11:50	EQUIP BLANK	Metals-Water	Lead	0.05	ug/L	U	0.05	0.2
8/30/2004 11:50	EQUIP BLANK	Metals-Water	Magnesium	0.02	mg/L	U	0.02	0.08
8/30/2004 11:50	EQUIP BLANK	Metals-Water	Nickel	2	ug/L	U	2	8
8/30/2004 11:50	EQUIP BLANK	Metals-Water	Selenium	0.5	ug/L	U	0.5	2
8/30/2004 11:50	EQUIP BLANK	Metals-Water	Silver	0.01	ug/L	U	0.01	0.04
8/30/2004 11:50	EQUIP BLANK	Metals-Water	Zinc	3	ug/L	U	3	12
8/30/2004 11:50	EQUIP BLANK	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
8/30/2004 11:50	EQUIP BLANK	Nutrients-Liquid	Kjeldahl Nitrogen	0.06	mg N/L	U	0.06	0.2
8/30/2004 11:50	EQUIP BLANK	Nutrients-Liquid	NO2NO3-N	0.004	mg N/L	U	0.004	0.01
8/30/2004 11:50	EQUIP BLANK	Nutrients-Liquid	O-Phosphate-P	0.004	mg P/L	U	0.004	0.01
8/30/2004 11:50	EQUIP BLANK	Nutrients-Liquid	Total-P	0.02	mg P/L	U	0.02	0.06
8/30/2004	CONTROL	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton	30	mg/m2	A	0.69	2.1
8/30/2004	CONTROL	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton	0	mg/m2	A	0.69	2.1
8/30/2004	CONTROL	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa	34	# Taxa			
8/30/2004	CONTROL	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa	29	#Taxa			
8/30/2004	CONTROL	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa	14	#Taxa			
8/30/2004 13:00	CONTROL	Bio-AGP/LimNut	Algal Growth Potential	19.2	mg DryWt/L	J	0.3	0.9
8/30/2004 13:00	CONTROL	Bio-BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	0.28	mg/L	IK		
8/30/2004 13:00	CONTROL	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
8/30/2004 13:00	CONTROL	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
8/30/2004 13:00	CONTROL	Nutrients-Liquid	Ammonia-N	0.062	mg N/L		0.01	0.02
8/30/2004 13:00	CONTROL	Nutrients-Liquid	Kjeldahl Nitrogen	0.42	mg N/L		0.06	0.2
8/30/2004 13:00	CONTROL	Nutrients-Liquid	NO2NO3-N	0.56	mg N/L		0.004	0.01
8/30/2004 13:00	CONTROL	Nutrients-Liquid	O-Phosphate-P	0.028	mg P/L		0.004	0.01
8/30/2004 13:00	CONTROL	Nutrients-Liquid	Total-P	0.033	mg P/L	I	0.02	0.06
8/30/2004	CONTROL REP 2	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton		mg/m2			
8/30/2004	CONTROL REP 2	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton		mg/m2			
8/30/2004	CONTROL REP 2	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	25	# Taxa			
8/30/2004	CONTROL REP 2	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa		#Taxa			
8/30/2004	CONTROL REP 2	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa		#Taxa			
8/30/2004	CONTROL REP 3	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton		mg/m2			
8/30/2004	CONTROL REP 3	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton		mg/m2			
8/30/2004	CONTROL REP 3	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	28	# Taxa			
8/30/2004	CONTROL REP 3	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa		#Taxa			

8/30/2004	CONTROL REP 3	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa		#Taxa			
8/30/2004	CONTROL REP 4	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton		mg/m2			
8/30/2004	CONTROL REP 4	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton		mg/m2			
8/30/2004	CONTROL REP 4	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	32	# Taxa			
8/30/2004	CONTROL REP 4	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa		#Taxa			
8/30/2004	CONTROL REP 4	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa		#Taxa			
8/30/2004	CONTROL REP1	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton		mg/m2			
8/30/2004	CONTROL REP1	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton		mg/m2			
8/30/2004	CONTROL REP1	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	29	# Taxa			
8/30/2004	CONTROL REP1	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa		#Taxa			
8/30/2004	CONTROL REP1	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa		#Taxa			
8/30/2004	TEST	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton	0.65	mg/m2	I	0.35	1
8/30/2004	TEST	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton	0	mg/m2	J	0.35	1
8/30/2004	TEST	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa	29	# Taxa			
8/30/2004	TEST	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa	42	#Taxa			
8/30/2004	TEST	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa	8	#Taxa			
8/30/2004 12:30	TEST	Bio-AGP/LimNut	Algal Growth Potential	30.5	mg DryWt/L	J	0.3	0.9
8/30/2004 12:30	TEST	Bio-BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	0.36	mg/L	IK		
8/30/2004 12:30	TEST	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
8/30/2004 12:30	TEST	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
8/30/2004 12:30	TEST	Nutrients-Liquid	Ammonia-N	0.062	mg N/L		0.01	0.02
8/30/2004 12:30	TEST	Nutrients-Liquid	Kjeldahl Nitrogen	0.42	mg N/L		0.06	0.2
8/30/2004 12:30	TEST	Nutrients-Liquid	NO2NO3-N	0.56	mg N/L		0.004	0.01
8/30/2004 12:30	TEST	Nutrients-Liquid	O-Phosphate-P	0.056	mg P/L		0.004	0.01
8/30/2004 12:30	TEST	Nutrients-Liquid	Total-P	0.045	mg P/L	I	0.02	0.06
8/30/2004	TEST REP 1	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton		mg/m2			
8/30/2004	TEST REP 1	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton		mg/m2			
8/30/2004	TEST REP 1	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	30	# Taxa			
8/30/2004	TEST REP 1	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa		#Taxa			
8/30/2004	TEST REP 1	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa		#Taxa			
8/30/2004	TEST REP 2	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton		mg/m2			
8/30/2004	TEST REP 2	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton		mg/m2			
8/30/2004	TEST REP 2	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	30	# Taxa			
8/30/2004	TEST REP 2	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa		#Taxa			
8/30/2004	TEST REP 2	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa		#Taxa			
8/30/2004	TEST REP 3	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton		mg/m2			
8/30/2004	TEST REP 3	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton		mg/m2			
8/30/2004	TEST REP 3	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	33	# Taxa			
8/30/2004	TEST REP 3	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa		#Taxa			
8/30/2004	TEST REP 3	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa		#Taxa			
8/30/2004	TEST REP 4	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton		mg/m2			
8/30/2004	TEST REP 4	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton		mg/m2			
8/30/2004	TEST REP 4	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	27	# Taxa			
8/30/2004	TEST REP 4	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa		#Taxa			
8/30/2004	TEST REP 4	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa		#Taxa			

Appendix 5

Typical Values for Selected Parameters in Florida Waters

Percentile Distribution (1617 stations)

CONTROL SITE

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%	Measured
Periphyton Chlorophyll *a* (mg/m^2)	0.31	0.43	0.77	1.04	2.16	2.94	6.45	10.51	17.00	39.51	60.85	**30**
Hester-Dendy Diversity	0.84	2.12	2.48	2.74	2.88	3.09	3.25	3.40	3.52	3.76	3.90	**3.89**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	15	17	21.5	26	29	32	**42**
Dipnet Taxa Richness	9	12	17	20	22	24.5	26	28	31	37	53	**32**
Total Kjeldahl Nitrogen	0.30	0.39	0.56	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80	**0.42**
Total Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60	**0.062**
Nitrate plus Nitrite	0.01	0.01	0.03	0.05	0.07	0.10	0.14	0.20	0.32	0.64	1.05	**0.56**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.51	**0.033 I**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	1.37	**0.028**

TEST SITE

Parameter	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%	Measured
Periphyton Chlorophyll *a* (mg/m^2)	0.31	0.43	0.77	1.04	2.16	2.94	6.45	10.51	17.00	39.51	60.85	**0.65**
Hester-Dendy Diversity	0.84	2.12	2.48	2.74	2.88	3.09	3.25	3.40	3.52	3.76	3.90	**3.97**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	15	17	21.5	26	29	32	**46**
Dipnet Taxa Richness	9	12	17	20	22	24.5	26	28	31	37	53	**29**
Total Kjeldahl Nitrogen	0.30	0.39	0.56	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80	**0.42**
Total Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60	**0.062**
Nitrate plus Nitrite	0.01	0.01	0.03	0.05	0.07	0.10	0.14	0.20	0.32	0.64	1.05	**0.56**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.51	**0.045 I**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	1.37	**0.056**

Taxa richness and diversity values are for benthic macroinvertebrates. Hester-Dendy sample= benthic macroinvertebrates collected from a standardized multi-plate sampler. Dipnet taxa richness = number of taxa collected in standardized dipnet sweep samples. Diversity = Shannon-Weaver H'. NTU = Nephelometric turbidity units. Adapted from Joe Hand, FDER, personal communication, 1991 (data collected 1980-1989). ND = No data.

FDEP Biology Section - Acute
Bioassay Bench Sheets

Facility: Florida State Hospital WWTP
Address: Blackburn Lane
City: Chattahoochee County: Gadsden
Contact/District: David Kriger
NPDES Permit #: FL 0031402
LIMS Job #: TLH-2004-08-30-16-01 LIMS Sample #: 779311

Sample Collection: Date: 8/30/04 Time: 1120
Hold time Start: Date: 8/30/04 Time: 1120

Comments:

Lims Data Entry: M E 8/31/04 Data Entry Verification: 9/2/04 KM

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

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

Test 1 validation:
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No
Test 2 validation:
Control survival ≥90%: (Yes) No
Temperature Range ≤3°C: (Yes) No

PH adjustment : yes (no) Initial pH NaOH N HCl N Drops mL Final pH
Aeration : (yes) no Initial DO: 9.5 mg/L Final DO: 8.3 mg/L Duration: 20 minutes Rate: ~100 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

Temperature Range °C
Incubator # 3 Range 24.0 - 25.0°C 8/31/04
Room B248: 23.8°C - 24.0°C
Waterbath: NA

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

Investigators' Signatures
Reina Nicholson
Mandy Faircloth
Sarah Pritchard
Jessica Davis

Nicki Wellendorf
REVIEWER

Water Quality Parameters	20% DMW	Well Water	Salt Water ASW NSW Test 1	Salt Water ASW NSW Test 2	Moderately Hard Water	Original Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):	N/A	N/A	N/A	N/A	N/A	1.4	HACH	David Kriger	DN
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03				<0.03	HACH	RP	DN
Alkalinity (mg/L as $CaCO_3$):	95	157				162	HACH	RP	DN
Hardness (mg/L as $CaCO_3$):	88	137				132	HACH	RP	DN
Total Ammonia (mg/L as N):	<0.017	<0.017				<0.017	DENVER	MA	DN
Salinity (ppt):	<1	<1				<1	YSI	DN	88

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[redacted]

FDEP Biology Section - - Bioassay Bench Sheet

Survival

LIMS Sample #: 778311 **Test #:** 1 **Test Started: Date** 8/31/04 **Time:** 1300

Organism: C dubia **Test Ended: Date** 9/2/04 **Time:** 1240

Organism Batch: 34 **Diluent/ Batch:** 20% DMW 31

Organism Age: 24hr **Food:** YCT / R.subcapitata / Artemia

Chamber Size 30 mL **Batch:** 5 35 _____

Test Volume 20 mL **Feeding:** Prior to test - Prior to renewal - Daily

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
CTRL	A	A	5	5	5			
	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			

Organisms loaded by: DN Checked by: DN DN DN

Loading Verified by: BE (Initials)

Comments:

m = missing d = dead BR = before renewal AR = after renewal

Test Results:

% mortality in 100% sample 0

LC_{50}: >100 If Calculated: 95% CI _____ Method: _____

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

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

FDEP Biology Section - - Bioassay Bench Sheet
Survival

LIMS Sample #: 778311 Test #: 2 Test Started: Date 8/31/04 Time: 1330
Organism: C. tentsi Test Ended: Date 09/04/04 Time: 1240
Organism Batch: 21 Diluent/ Batch: Well H2O N/A
Organism Age: 12 d/s Food: YCT P. subcapitata Artemia
Chamber Size 1000 mL Batch: — — 04125425G
Test Volume 500 mL Feeding: Prior to test - Prior to renewal - Daily

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
CTRL	A	F1	5	5	5			
	B	F2	5	5	5			
	C	F3	5	5	5			
	D	F4	5	5	5			
100%	A	F5	5	5	5			
	B	F6	5	5	5			
	C	F7	5	5	5			
	D	F8	5	5	5			
Organisms loaded by: JD		Checked by: JD (initials)	JD	JD	JD			
Loading Verified by: DH								

m = missing d = dead BR = before renewal AR = after renewal
Comments:

Test Results:
% mortality in 100% sample 0
LC_{50}: >100 If Calculated: 95% CI _____ Method: _____
Screening Tests: Report LC50 as >100%, =100%, or <100%.
Substitue highest test concentration used if other than 100% (example: Ocean outfall tested at 30% concentration).

Bioassay Parameters

LIMS Sample # : 778311 **Test # :** 1 **of** 2

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

V.1 2/24/04

Concentration CTRL	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A		B			
pH (S.U.)	8.3		8.1			
Temperature °C	24.0		24.5			
Dissolved Oxygen mg/L	8.1		8.1			
Conductivity (µmhos mmhos	195		250			
(initials) Measured by:	VH		DN			
(initials) Recorded by:	DN		DN			

Comments:

Concentration 100%	0 Hr.	24 Hr.	48 Hr. before renewal	48 Hr. after renewal	72 Hr.	96 Hr.
Replicate	A		B			
pH (S.U.)	8.1		8.4			
Temperature °C	24.3		24.4			
Dissolved Oxygen mg/L	8.2		8.2			
Conductivity (µmhos mmhos	340		470			
(initials) Measured by:	DN		DN			
(initials) Recorded by:	DN		DN			

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:

Bioassay Parameters

LIMS Sample # : 778311 Test # : 2 of 2

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

V.1 2/24/04

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.)	8.1	8.3	8.4			
Temperature °C	24.2	24.8	24.8			
Dissolved Oxygen mg/L	8.7	7.8	7.6			
Conductivity µmhos mmhos	265	270	290			
(initials) Measured by:	DN	DN	DN			
(initials) Recorded by:	DN	DN	DN			

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.)	8.1	8.3	8.3			
Temperature °C	24.2	24.9	24.6			
Dissolved Oxygen mg/L	8.4	7.8	7.5			
Conductivity µmhos mmhos	390	405	435			
(initials) Measured by:	DN	DN	DN			
(initials) Recorded by:	DN	DN	DN			

Comments:

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

Comments:

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

Comments:

V.1 2/24/04

Appendix 7

Habitat Assessment Field Sheets.

Control p.1 of 3

DEP-SOP-001/01: Form FD 9000-3 (December 11, 2001)

31010144 **PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET**

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y): 8/30/04	TIME	RECEIVING BODY OF WATER
REMARKS:	COUNTY: Gordon	LOCATION: Mosquito Creek		FIELD ID/NAME: Control

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 — 7 m wide

ARTIFICIALLY CHANNELIZED ☐ no ☐ recent, ☐ severe ☐ some recovery ☐ mostly recovered

ARTIFICIALLY IMPOUNDED ☐ yes more sinuous

.25 m/s	.25 m/s	.25 m/s
.5 m deep	.5 m deep	.4 m deep

HIGH WATER MARK ____ + ____ = ____
(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 ☐ 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)	8	5		SAND			
LEAF PACKS OR MATS	1	5		MUD/MUCK/SILT			
AQUATIC VEGETATION				OTHER: Sand Bedrock	89	5	
ROCK OR SHELL RUBBLE				OTHER:			
UNDERCUT BANKS/ROOTS	2	5		DRAW AERIAL VIEW SKETCH OF HABITATS FOUND IN 100 M SECTION			

WATER QUALITY	DEPTH (M):	TEMP. (°C):	PH (SU):	D.O. (MG/L):	COND. (UMHOS/CM) OR SALINITY (PPT):			SECCHI (M):
TOP	.4	26.4	6.91	5.86	67			
MID-DEPTH	.4	26.4	6.78	5.75	67			NOB
BOTTOM	.4	27.4	6.78	5.63	67			

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: ☑ slightly brown tea

WEATHER CONDITIONS/NOTES:

ABUNDANCE:	ABSENT	RARE	COMMON	ABUNDANT
PERIPHYTON	☐	☐	☑	☐
FISH	☐	☐	☑	☐
AQUATIC MACROPHYTES	☑	☐	☐	☐
IRON/SULFUR BACTERIA	☑	☐	☐	☐

SAMPLING TEAM: S. Wedsand, T. Ryt, J. Ray

SIGNATURE:

DATE: 8/30/04

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

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

Control p. 2 of 3

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (MM/DD/YY): 8/30/04	RECEIVING BODY OF WATER:
REMARKS:	COUNTY: Gadsden	LOCATION: N. Mosquito Creek	FIELD ID/NAME: Control

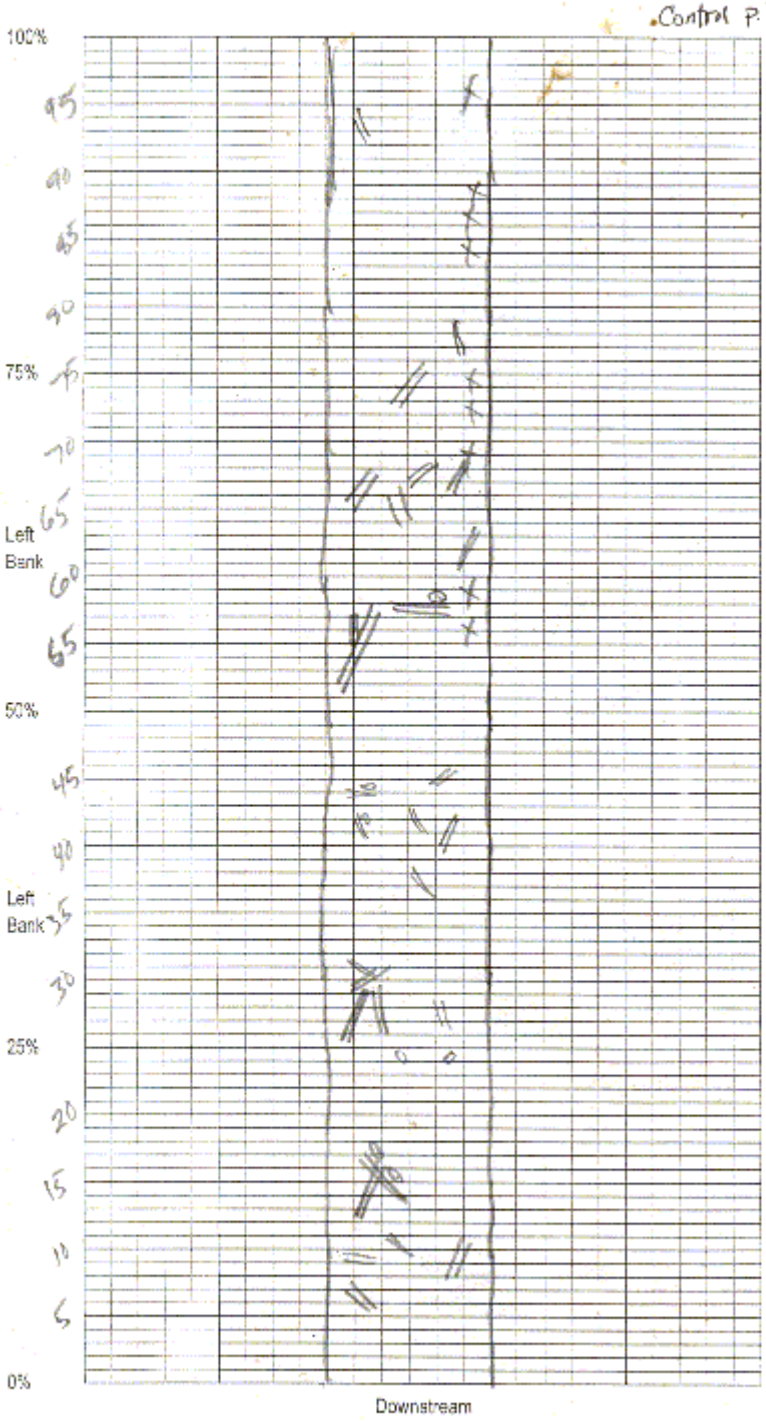
Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components Substrate Diversity 12	Four or more productive habitats present (snags, tree roots/undercut banks, aquatic vegetation, leaf packs (partially decayed), rock) 20 19 18 17 16	Three productive habitats present. Adequate habitat. 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 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 6% productive habitat 5 4 3 2 1
Water Velocity 16 (96 / 22)	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 12 Primary Score 46	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 20	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, instream 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 9 Left Bank 9 Secondary Score 76	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

124 TOTAL SCORE

ANALYSIS DATE: 8/30/04	ANALYST: J. Richardson, T. Rist	SIGNATURE: J. RAS

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (December 11, 2001)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).

Control P.3 of 3



Substrates: Code key, draw proportionate habitat abundance.

- = Snags
- X = Roots/undercut banks
- LP = Leaf Packs (or mats)
- Macrophytes
- _____
- _____
- _____

Velocity:
Note where velocity measures were taken.

Habitat Smothering:
Note areas (on map) where sand or silt is smothering 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:

Control
N Mosquito Creek
8/30/04

3101145

DEP-SOP-001/01: Form FD 9000-3 (June 20 2001)

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

Test p.1 of 3

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (M/D/Y):	TIME	RECEIVING BODY OF WATER:
		8/30/04	10:00	

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Gadsden	N. Mosquito Creek	Test

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) Or least buffered side:

LIST & MAP DOMINANT VEGETATION ON BACK

TYPICAL WIDTH (M) DEPTH (M)/VELOCITY (M/SEC) TRANSECT — 6 m wide

.33 m/s	.53 m/s	.33 m/s
.2 m deep	.3 m deep	.4 m deep

ARTIFICIALLY CHANNELIZED ☐ no ☐ recent, ☐ severe ☐ some recovery ☐ mostly recovered

ARTIFICIALLY IMPOUNDED ☐ yes more sinuous

HIGH WATER MARK 1.0 (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 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)	5.0	5		SAND			
LEAF PACKS OR MATS	1.0	5		MUD/MUCK/SILT			
AQUATIC VEGETATION				OTHER: sand/rock gravel	90	5	
ROCK OR SHELL RUBBLE				OTHER:			
UNDERCUT BANKS/ROOTS	4.00	5		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	.3	26.43	6.85	6.87	607			VOB
MID-DEPTH	.3	26.43	6.85	6.87	570			
BOTTOM	.3	26.43	6.86	6.51e	609			

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: ☑ slightly tannic

WEATHER CONDITIONS/NOTES:

ABUNDANCE:	ABSENT	RARE	COMMON	ABUNDANT
PERIPHYTON	☐	☐	☐	☑
FISH	☐	☐	☐	☑
AQUATIC MACROPHYTES	☑	☐	☐	☐
IRON/SULFUR BACTERIA	☐	☑	☐	☐

SAMPLING TEAM: [illegible]

SIGNATURE:

DATE: 8/30/04

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

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

Test p. 2 of 3

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (MM/DD/YY): 4/30/04	RECEIVING BODY OF WATER:
REMARKS:	COUNTY: Gadsden	LOCATION: N. Mosquito Creek	FIELD ID/NAME: Test

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 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 16	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 15 Primary Score 53	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 20	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, instream 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 9 Left Bank 9 Secondary Score 76	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

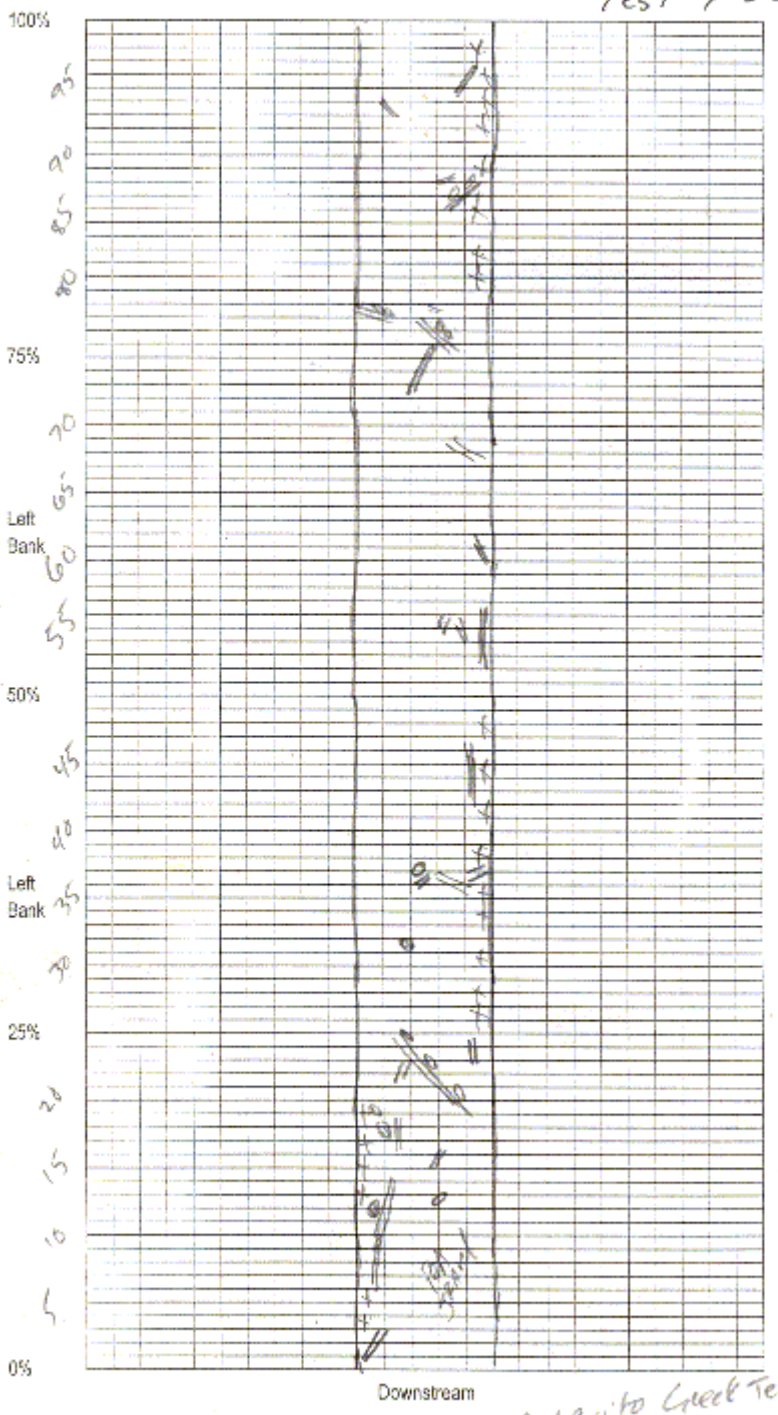
129 TOTAL SCORE

ANALYSIS DATE: 8/30/04	ANALYST: J. Richardson, Tetra Tech	SIGNATURE:

J. Richardson

Stream/River Habitat Sketch Sheet, Form FD 9000-4 (December 11, 2001)
Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).

Test p 3 of 3



Substrates: Code key, draw proportionate habitat abundance.

- [//] Snags
- [X] 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 smothering 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:

600
2 trees 3.5"
30 snags 5
15 leaf pack 2

N. Prong Mosquito Creek Test
8/30/04

Appendix 8a

Taxa list and density (number/cm^2) for periphyton collected from glass microscope slides incubated for 28 days upstream and downstream of the Florida State Hospital facility discharge, August 30, 2004.

	Control Site	Test Site
Bacillariophyta	-	
Achnanthes sp.	-	429
Achnanthes exigua	-	214
Achnanthes hungarica	-	214
Achnanthes lanceolata	2,179	429
Achnanthes lanceolata apiculata	7,628	-
Achnanthes lanceolata rostrata	18,525	-
Achnanthes minutissima	1,090	-
Amphora sp.	-	214
Aulacoseira sp.	-	643
Aulacoseira granulata	-	214
Bacillariophyceae	8,718	3,002
Bacillariophyta	-	214
Brachysira vitrea	-	214
Capartogramma crucicula	-	214
Cocconeis placentula	92,626	858
Cocconeis scutellum	-	214
Coscinodiscophyceae	-	214
Cyclotella sp.	6,538	-
Cyclotella atomus	1,090	-
Cyclotella meneghiniana	1,090	-
Cymbella sp.	-	214
Cymbella affinis	1,090	-
Cymbellaceae	1,090	-
Cymbellaceae	-	214
Diadesmis confervacea	4,359	214
Encyonema evergladianum	-	214
Encyonema silesiacum	3,269	-
Eunotia sp.	90,447	643
Fragilaria sp.	-	214
Fragilaria capucina	1,090	214
Fragilaria pinnata	-	214
Fragilariaceae	2,179	1,930
Fragilariophyceae	-	214
Frustulia sp.	-	214
Frustulia rhomboides	8,718	-
Geissleria decussis	1,090	-
Gomphonema sp.	7,628	643
Gomphonema affine	-	214
Gomphonema parvulum	8,718	214
Gyrosigma sp.	1,090	214
Hippodonta capitata	1,090	214
Hippodonta hungarica	1,090	214
Melosira sp.	2,179	214
Navicula sp.	4,359	1,287
Navicula cryptocephala	-	214

Navicula minima	13,077	429
Nitzschia sp.	5,449	1,716
Nitzschia serpentiraphe	-	214
Nitzschia sinuata	-	214
Pinnularia sp.	-	214
Stauroneis sp.	-	214
Synedra ulna	3,269	214
Terpsinoe musica	2,179	-
Tryblionella sp.	-	214
Chlorophycota		
Chlorella sp.	3,269	1,501
Chlorococcum sp.	1,090	-
Closterium gracile	1,090	-
Closterium parvulum	1,090	-
Coleochaete sp.	3,269	-
Cosmarium sp.	1,090	-
Gloeocystis gigas	2,179	-
Protococcus sp.	4,359	-
Scenedesmus bijuga	1,090	-
Scenedesmus dimorphus	-	643
Selenastrum sp.	-	643
Stigeoclonium sp.	5,449	-
Cyanophycota		
Anabaena sp.	-	429
Cyanobium parvum	2,179	-
Jaaginema sp.	4,359	643
Pseudanabaena sp.	3,269	-
Synechocystis sp.	6,538	858
Euglenophycota		
Strombomonas urceolata	-	214
Trachelomonas sp.	-	429

Appendix 8b

Taxa list and number of individuals counted for periphyton collected from glass microscope slides incubated for 28 days upstream and downstream of the Florida State Hospital facility discharge, August 30, 2004.

	Control Site	Test Site
Bacillariophyta		
Achnanthes sp.	-	2
Achnanthes exigua	-	1
Achnanthes hungarica	-	1
Achnanthes lanceolata	2	2
Achnanthes lanceolata apiculata	7	-
Achnanthes lanceolata rostrata	17	-
Achnanthes minutissima	1	-
Amphora sp.	-	1
Aulacoseira sp.	-	3
Aulacoseira granulata	-	1
Bacillariophyceae	283	87
Bacillariophyta	-	1
Brachysira vitrea	-	1
Capartogramma crucicula	-	1
Cocconeis placentula	85	4
Cocconeis scutellum	-	1
Coscinodiscophyceae	-	1
Cyclotella sp.	6	-
Cyclotella atomus	1	-
Cyclotella meneghiniana	1	-
Cymbella sp.	-	1
Cymbella affinis	1	-
Cymbellaceae	1	-
Cymbellaceae	-	1
Diadesmis confervacea	4	1
Encyonema evergladianum	-	1
Encyonema silesiacum	3	-
Eunotia sp.	83	3
Fragilaria sp.	-	1
Fragilaria capucina	1	1
Fragilaria pinnata	-	1
Fragilariaceae	2	9
Fragilariophyceae	-	1
Frustulia sp.	-	1
Frustulia rhomboides	8	-
Geissleria decussis	1	-
Gomphonema sp.	7	3
Gomphonema affine	-	1
Gomphonema parvulum	8	1
Gyrosigma sp.	1	1
Hippodonta capitata	1	1
Hippodonta hungarica	1	1
Melosira sp.	2	1
Navicula sp.	4	6
Navicula cryptocephala	-	1

Navicula minima	12	2
Nitzschia sp.	5	8
Nitzschia serpentiraphe	-	1
Nitzschia sinuata	-	1
Pinnularia sp.	-	1
Stauroneis sp.	-	1
Synedra ulna	3	1
Terpsinoe musica	2	-
Tryblionella sp.	-	1
Chlorophycota		
Chlorella sp.	3	7
Chlorococcum sp.	1	-
Closterium gracile	1	-
Closterium parvulum	1	-
Coleochaete sp.	3	-
Cosmarium sp.	1	-
Gloeocystis gigas	2	-
Protococcus sp.	4	-
Scenedesmus bijuga	1	-
Scenedesmus dimorphus	-	3
Selenastrum sp.	-	3
Stigeoclonium sp.	5	-
Cyanophycota		
Anabaena sp.	-	2
Cyanobium parvum	2	-
Jaaginema sp.	4	3
Pseudanabaena sp.	3	-
Synechocystis sp.	6	4
Euglenophycota		
Strombomonas urceolata	-	1
Trachelomonas sp.	-	2

Appendix 9a

Benthic macroinvertebrates collected from Hester-Dendy artificial substrates incubated upstream and downstream of the Florida State Hospital facility for 28 days (August 30, 2004). Taxa collected and density (average number of individuals/m^2) rounded to the nearest individual (n = 4 samples). See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

	Control Site	Test Site
Arthropoda		
Arachnida		
Acariformes		
Clathrosperchon sp.	-	4
Hygrobates sp.	6	-
Insecta		
Coleoptera		
Ancyronyx variegatus	-	6
Dineutus sp.	12	8
Macronychus glabratus	102	126
Microcylloepus pusillus	10	61
Stenelmis sp.	62	29
Diptera		
Ablabesmyia rhamphe grp.	8	8
Atrichopogon sp.	2	-
Corynoneura sp.	-	6
Cricotopus or *Orthocladius* sp.	4	-
Dicrotendipes neomodestus	6	2
Nanocladius sp.	-	16
Nilotanypus fimbriatus	10	-
Pentaneura inconspicua	203	198
Polypedilum flavum	519	520
Polypedilum illinoense grp.	-	4
Polypedilum scalaenum grp.	10	6
Polypedilum sp. A Epler	-	6
Rheocricotopus robacki	14	23
Rheotanytarsus exiguus grp.	359	277
Rheotanytarsus pellucidus	2	-
Simulium sp.	6	8
Stelechomyia perpulchra	31	8
Stenochironomus sp.	107	45
Tanytarsus sp. A Epler	9	6
Tanytarsus sp. C Epler	14	4
Thienemanniella lobapodema	27	12
Thienemanniella similis	-	2
Thienemanniella xena	-	6
Thienemannimyia grp.	-	20
Tribelos fuscicorne	6	25
Tvetenia vitracies	50	91
Ephemeroptera	-	-
Baetis intercalaris	29	45
Caenis sp.	20	94
Ephemerellidae	-	2
Isonychia sp.	44	54
Pseudocloeon sp.	23	7

Stenacron interpunctatum	25	28
Stenonema exiguum	84	121
Stenonema smithae	16	16
Tricorythodes albilineatus	395	431
Megaloptera		
Corydalus cornutus	46	40
Odonata		
Macromia taeniolata	-	2
Trichoptera		
Cheumatopsyche sp.	351	504
Cyrnellus fraternus	2	4
Hydropsyche sp.	615	477
Macrostemum carolina	3	5
Neotrichia sp.	8	2
Oecetis persimilis	24	12
Mollusca		
Bivalvia		
Undetermined Bivalvia	2	-
Gastropoda		
Ferrissia sp.	183	107
Physidae	2	-

Appendix 9b

Benthic macroinvertebrates collected from Hester-Dendy artificial substrates incubated upstream and downstream of the Florida State Hospital facility for 28 days (August 30, 2004). Taxa collected and total number of individuals counted (n = 4 samples).

	Control Site	Test Site
Arthropoda		
Arachnida		
Acariformes		
Acariformes	-	1
Clathrosperchon	-	1
Hygrobates sp	3	-
Insecta		
Coleoptera		
Ancyronyx variegatus	-	3
Dineutus sp.	6	4
Elmidae	1	2
Macronychus glabratus	51	62
Microcylloepus pusillus	5	30
Stenelmis sp.	31	14
Diptera		
Ablabesmyia rhamphe grp.	4	4
Atrichopogon sp.	1	-
Chironomidae	23	22
Corynoneura sp.	-	3
Cricotopus or *Orthocladius* sp.	2	-
Dicrotendipes neomodestus	3	1
Nanocladius sp.	-	8
Nilotanypus sp.	4	-
Nilotanypus fimbriatus	1	-
Pentaneura inconspicua	99	96
Polypedilum sp.	-	3
Polypedilum flavum	253	250
Polypedilum illinoense grp.	-	2
Polypedilum scalaenum grp.	5	3
Polypedilum sp. A Epler	-	3
Rheocricotopus robacki	7	11
Rheotanytarsus exiguus grp.	175	135
Rheotanytarsus pellucidus	1	-
Simulium sp.	3	4
Stelechomyia perpulchra	15	4
Stenochironomus sp.	52	22
Tanytarsus sp.	3	-
Tanytarsus sp. A Epler	3	3
Tanytarsus sp. C Epler	5	2
Thienemanniella sp.	8	-
Thienemanniella lobapodema	5	6
Thienemanniella similis	-	1
Thienemanniella xena	-	3
Thienemannimyia grp.	-	10
Tribelos fuscicorne	3	12
Tvetenia sp.	2	-

Tvetenia vitracies	22	44
Ephemeroptera		
Baetidae	10	11
Baetis intercalaris	9	13
Caenis sp.	10	47
Ephemerellidae	-	1
Ephemeroptera	2	-
Heptageniidae	22	18
Isonychia sp.	22	27
Pseudocloeon sp.	7	2
Stenacron sp.	7	11
Stenacron interpunctatum	1	-
Stenonema sp.	13	10
Stenonema exiguum	16	39
Stenonema smithae	3	5
Tricorythodes albilineatus	198	217
Megaloptera		
Corydalus cornutus	23	20
Odonata		
Macromia taeniolata	-	1
Trichoptera		
Cheumatopsyche sp.	114	195
Cyrnellus fraternus	1	2
Hydropsyche sp.	200	185
Hydropsychidae	173	113
Macrostemum carolina	1	2
Neotrichia sp.	4	1
Oecetis sp.	8	6
Oecetis persimilis	4	-
Undetermined Trichoptera	-	2
Mollusca		
Bivalvia		
Undetermined Bivalvia	1	-
Gastropoda		
Ancylidae	89	54
Ferrissia sp.	2	-
Physidae	1	-
Undetermined Gastropoda	1	-

Appendix 10a

Qualitative benthic macroinvertebrate collections (n = 20 discrete dipnet sweeps) upstream and downstream of Florida State Hospital facility (August 30, 2004). Taxa list and number of individuals counted (collapsed). See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

	Control Site	Test Site
Annelida		
Oligochaeta		
Dero digitata complex	3	-
Limnodrilus hoffmeisteri	-	3
Slavina appendiculata	1	-
Arthropoda		
Crustacea		
Amphipoda		
Hyalella azteca	4	8
Insecta		
Coleoptera		
Ancyronyx variegatus	1	-
Dineutus sp.	1	1
Macronychus glabratus	4	-
Microcylloepus pusillus	10	13
Stenelmis sp.	1	2
Diptera		
Ablabesmyia rhamphe grp.	1	-
Atrichopogon sp.	2	-
Cladotanytarsus sp.	-	1
Dicrotendipes neomodestus	1	-
Labrundinia pilosella	2	-
Nanocladius sp.	1	-
Parachironomus carinatus	1	-
Pentaneura inconspicua	11	1
Polypedilum flavum	2	8
Rheotanytarsus exiguus grp.	8	1
Simulium sp.	-	3
Stelechomyia perpulchra	-	1
Stenochironomus sp.	1	1
Tvetenia vitracies	2	-
Ephemeroptera		
Caenis sp.	4	9
Isonychia sp.	2	1
Pseudocloeon sp.	-	2
Serratella deficiens	-	1
Stenonema sp.	2	2
Tricorythodes albilineatus	17	6
Odonata		
Argia sp.	-	1
Hetaerina titia	1	-
Libellulidae	-	1
Trichoptera		
Cheumatopsyche sp.	2	8
Hydropsyche sp.	5	7
Neotrichia sp.	6	2

Oecetis persimilis	4	1
Triaenodes perna/helo	-	2
Mollusca		
Bivalvia		
Corbicula fluminea	2	8
Eupera cubensis	-	9
Gastropoda		
Ancylidae	3	1
Elimia sp.	1	1
Platyhelminthes		
Undetermined Platyhelminthes	1	-

Appendix 10b

Qualitative benthic macroinvertebrate collections (n = 20 discrete dipnet sweeps) upstream and downstream of Florida State Hospital facility (August 30, 2004). Taxa list and number of individuals counted.

	Control Site	Test Site
Annelida		
Oligochaeta		
Dero digitata complex	3	-
Slavina appendiculata	1	-
Limnodrilus hoffmeisteri	-	1
Tubificidae	-	2
Arthropoda		
Crustacea		
Amphipoda		
Hyalella azteca	4	8
Insecta		
Coleoptera		
Ancyronyx variegatus	1	-
Dineutus sp.	1	-
Macronychus glabratus	4	-
Microcylloepus pusillus	10	13
Stenelmis sp.	1	2
Dineutus sp.	-	1
Diptera		
Ablabesmyia rhamphe grp.	1	-
Atrichopogon sp.	1	-
Ceratopogonidae	1	-
Chironomidae	2	-
Cladotanytarsus sp.	-	1
Dicrotendipes neomodestus	1	-
Labrundinia sp.	1	-
Labrundinia pilosella	1	-
Nanocladius sp.	1	-
Parachironomus carinatus	1	-
Pentaneura inconspicua	10	1
Polypedilum sp.	-	1
Polypedilum flavum	2	7
Rheotanytarsus exiguus grp.	7	1
Simulium sp.	-	3
Stelechomyia perpulchra	-	1
Stenochironomus sp.	1	1
Tvetenia vitracies	2	-
Ephemeroptera		
Caenis sp.	4	8
Ephemeroptera	-	2
Isonychia sp.	2	1
*Pseudocloeo*n sp.	-	2
Serratella deficiens	-	1
Stenonema sp.	2	2
Tricorythodes albilineatus	17	5
Odonata		

Argia sp.	-	1
Hetaerina titia	1	-
Libellulidae	-	1
Trichoptera		
Cheumatopsyche sp.	2	6
Hydropsyche sp.	5	5
Hydropsychidae	-	4
Neotrichia sp.	6	2
Oecetis sp.	3	1
Oecetis persimilis	1	
Triaenodes perna/helo	-	2
Mollusca		
Bivalvia		
Corbicula fluminea	2	8
Eupera cubensis	-	9
Gastropoda		
Ancylidae	3	1
Elimia sp.	1	1
Platyhelminthes		
Undetermined Platyhelminthes	1	1

The Bioassay of Florida State Hospital effluent sampled on August 30, 2004, NPDES #FL00.

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 1 4 0 2	11 12	0 4 0 8 3 0		18 B	19 S	20 1

Remarks

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The Priority Pollutants Analysis for Bioassay of Florida State Hospital effluent sampled on August, 30, 2004, NPDES #FL00.

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 1 4 0 2	11 12	0 4 0 8 3 0		18 X	19 S	20 1

Remarks

66