

Biological Assessment of

Avon Park Correctional Institute, WWTP

Polk County

NPDES #FL0040029

Sampled December 8, 2003

May 2004

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:	Avon Park Correctional Institute WWTP
County:	Polk
NPDES Number:	FL0040029
Permit Expiration:	10/6/04

Toxics Sampling Inspection **(XSI)**

Date Sampled: 12/8/03

Results: Chloroform (4.5 µg/L) was detected in the effluent grab sample at a level that complied with the Class III Water Quality Criterion. Copper (10.2 µg/L) was detected in the effluent grab sample at a level that exceeded the Class III Water Quality Criterion (62-302.530(24) F.A.C.). Silver (0.098 µg/L in the grab and 0.1 µg/L in the composite) was detected in the effluent at levels that exceeded the Class III Water Quality Criterion (62-302.530(60) F.A.C.) Levels of aluminum, iron, nickel and zinc detected in the effluent complied with Class III Water Quality Criteria and facility permit limits. The metals cadmium, chromium and lead were found in the effluent at levels above the method detection limit and below the practical quantitation limit.

Compliance Biomonitoring Inspection **(CBI)**

Date Sampled: 12/8/03

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 bioassays.

Water Quality Inspection **(WQI)**

Date Sampled: 12/8/03, 12/9/03 & 12/15/03

Results: Coliforms were detected in the effluent and at the Test Site at levels that did not exceed Class III Water Quality Criteria or the facility's permit limits. Total and fecal coliforms were detected at the Control Site, and the fecal coliform level (830 CFU) exceeded the Class III Water Quality Criterion (62-302.530(6) F.A.C.). Nutrient levels in the effluent and at both Test and Control Sites were elevated compared to typical values for Florida waters (Appendix 5). Ortho-phosphate ranged from 1.7 to 2.5 mg/L, and nitrate+nitrite ranged from 12 to 18 mg/L, with the effluent having the highest levels for both nutrients. Dissolved oxygen, pH, and conductivity of the effluent and at both Control and Test Sites complied with Class III Water Quality Criteria and facility permit limits.

Impact Bioassessment Inspection **(IBI)**

Date Sampled: 12/8/03

Results: Results from Hester-Dendy and dipnet samples and from periphytometers indicate similar macroinvertebrate and algal communities at both study sites. The Control Site SCI score of 25 and the Test Site SCI score of 23 placed them both in the "Good" category. The facility's effluent does not appear to be contributing to degradation of macroinvertebrate communities in the receiving waters. AGP results from the effluent and the Control and Test Sites were above the "problem" threshold, yet there may have been inhibition of algal growth in all three water samples, but further testing would be required to make that determination. The facility's effluent does not appear to be contributing to alteration of the algal community composition in the receiving waters.

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 Avon Park Correctional Institute Wastewater Treatment Plant is located in Polk County, Florida (Appendix 1). This facility is a Type I activated-sludge domestic wastewater treatment plant. Activities at this plant include: one flow equalization basin of 144,900 gallons, one aeration basin of 474,000 gallons, two clarifier basins with a total volume of 85,000 gallons and a total surface area of 1,121 square feet, one chlorine contact chamber of 14,000 gallons and one digester of 60,100 gallons (see Facility Summary in Appendix 2). After treatment, the wastewater is discharged into a rim canal that flows to the Class III fresh waters of Arbuckle Creek and ultimately into the Kissimmee River. The design flow of the wastewater system is 0.5 million gallons per day (MGD). The actual mean flow during this survey was 0.468 MGD (personal communication, Nahir Cornwell, FDEP Southwest District).

Surface Water Quality Criteria and facility permit limits are listed in Table 1. According to the facility's monthly discharge monitoring reports for January through December 2003, the plant has had one violation of its permit limits. The effluent exceeded the limit for CBOD in February 2003 (Appendix 2). During the December 8, 2003 facility inspection, the level of total residual chlorine (0.02 mg/L, personal communication from Joe Squitieri) measured for the facility's wastewater was below the minimum permit limit for disinfection (0.5 mg/L).

Methods

The purpose of this investigation was to determine the potential effects of the facility's effluent on the biota of the receiving waters. Chemical and biological comparisons were made between a control site (located in the rim canal approximately 150 meters upstream of the discharge) and a test site (located in the rim canal approximately 100 meters downstream of the discharge). Effluent grab samples were collected on 12/8/03 and composite samples were collected on 12/9/03. Effluent samples for fecal and total coliforms were recollected on 12/15/03 due to problems with culture media in the laboratory. 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 DEP quality assurance/quality control standards (see http://www.floridadep.org/labs/qa/index.htm).

The following were involved in this investigation: Peggy Morgan, Mary Szafraneic, Lori Pillsbury, Todd Falkner and Nahir Cornwell (FDEP Southwest District), and FDEP Central Laboratory in Tallahassee. The report was reviewed by District representatives and the Point Source Studies Review Committee (Wayne Magley, Chuck Ziegmont 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. Copper (10.2 µg/L) was detected in the effluent grab sample at a level that exceeded the Class III Water Quality Criterion (62-302.530(24) F.A.C.). Copper was also detected in the effluent composite sample (12.4 µg/L), but the equipment blank collected in conjunction with the composite sample contained copper (1.7 µg/L). Silver (0.098 in the grab and 0.1 µg/L in the composite) was detected in the effluent at levels that exceeded the Class III Water Quality Criterion (62-302.530(60) F.A.C.). Aluminum, iron, and zinc were also detected in both effluent grab and composite samples at levels that complied with Class III Water Quality Criteria. Nickel (28 µg/L) was detected in the effluent composite sample only, but complied with the Class III Criterion. However, it should be noted that the equipment blank collected in connection with the composite sample also contained nickel (43 µg/L) and iron (103 µg/L). Other metals that were detected in at least one of the effluent samples (cadmium, chromium and lead) were detected at levels above the minimum detection limit but below the practical quantitation limit. Chloroform (4.5 µg/L) was detected in the effluent grab sample at a level that complied with the Class III Water Quality Criterion. Effluent conductivity, pH and dissolved oxygen complied with Class III Water Quality Criteria (FAC 62-302.) and facility permit limits.
- Habitat assessment scores were 69 at the Control Site and 77 at the Test Site (Table 1, data sheets in Appendix 7) placing them both in the marginal category. Both sites lacked any measurable flow and lost points in all Primary Habitat components. The Control Site lost additional points due to lower substrate diversity and more habitat smothering from a large periphyton algal bloom that was occurring at the site.
- Dissolved oxygen, pH and conductivity at the Test and Control Sites complied with Class III Water Quality Criteria (Table 1, 62-302.530 F.A.C.)
- The effluent sample was not acutely toxic to the fish, *Cyprinella leedsi,*

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

Avon Park Correctional Institute WWTP	Class III Stds	Effluent Limits	Effluent Samples	Effluent Composite	Control Site	Test Site
Organic Constituents (µg/L)						
Chloroform	≤470.8	-	4.5	-	-	-
Metals (µg/L unless otherwise noted)						
Aluminum	-	-	40 A	46	-	-
Arsenic	≤50	-	6 U	6 U	-	-
Cadmium	≤1 b	≤1 b	0.062 I	0.094 I	-	-
Calcium (mg/L)	-	-	22.7 A	22	-	-
Chromium-III	≤75.8 b	≤75.8 b	3 U	8.9 I	-	-
Copper	≤8.2 b	≤8.2 b	10.2 A	12.4 e	-	-
Iron	≤1000	-	90 A	170 e	-	-
Lead	≤2.6 b	≤2.6 b	0.16 I	0.21 I	-	-
Magnesium (mg/L)	-	-	7 A	6.9	-	-
Nickel	≤45.7 b	≤45.7 b	3 U	28 e	-	-
Selenium	≤5	-	1 U	1 U	-	-
Silver	≤0.07	-	0.098 A	0.1	-	-
Zinc	≤104.9 b	≤104.9 b	53 AJ	46	-	-
Nutrients (mg/L)						
Organic Carbon	-	-	5.2 A	-	-	-
Ortho-phosphate	-	-	2.5	-	1.7	1.9
Total Phosphorus	-	-	2.5	2.8	1.7 A	2.1
Ammonia	-	Report	0.02 I	0.031 A	0.043	0.038
Unionized Ammonia	≤0.02	≤0.02	< 0.02 c	-	< 0.02 c	< 0.02 c
Nitrate+Nitrite	-	-	18	18 A	12	14
Total Kjeldahl Nitrogen	-	-	1.3 J	1.3	1.1 JA	1.2 J
Organic Nitrogen	-	-	1.28 c	-	1.06 c	1.16 c
Total Nitrogen	-	-	19.3 c	-	13.1 c	15.2 c
General Physical and Chemical Parameters						
Habitat Assessment	-	-	-	-	69	77
Dissolved Oxygen (mg/L)	≥5.0	≥6 s	9.0	-	5.5	6.0
pH (S.U.)	-	6.0-8.5 s	7.8	-	7.2	7.4
Conductivity (umhos/cm)	≤1275	-	476	-	374	402
Temperature (C)	-	Report	24.2	-	16.6	19.8
BOD	-	-	2.1	-	2 U	2 U
cBOD (mg/L)	-	≤8 s	2 U	-	2 U	2 U
TSS	-	≤60.0 s	5 I	-	-	-
Turbidity	-	-	3	-	-	-
Color	-	-	15	-	-	-
Oil and Grease (mg/L)	≤5	-	1.2 It	-	-	-
Chlorophyll a (µg/L)	-	-	-	-	0.85 U	0.85 U
Phaeophytin (µg/L)	-	-	-	-	0.85 U	0.85 U
Flow (MGD)	-	-	0.468	-	-	-
Hardness (mg/L)	-	-	85.5 c	-	-	-
Microbiology (# counts/100ml)						
Fecal Coliforms-Membrane Filter (Repeat 12/15/03)	< 800 s	-	1 K	-	830 BL	110 BL
Total Coliforms-Membrane Filter (Repeat 12/15/03)	< 2400 s	-	60 K	-	840 BL	1080
Toxicology Bioassays (48-hour static, screening bioassay, percent mortality in 100% effluent)						
Fish	LC50 > 100%	-	0%	-	-	-
Water flea	LC50 > 100%	-	0%	-	-	-

Value exceeds the Class III Water Quality Criteria

b - Value is calculated based on hardness
c - Value is calculated.
e -Analyte detected in sample and equipment blank
t - Analyte detected in sample and trip blank
A - Value reported is the mean of two or more determinations
B - Results based on colony counts outside the acceptable range
I - Value reported is < the minimum quantitation limit, and ≥ the minimum detection limit
J - Estimated value
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
U - Material analyzed for but not detected; value reported is the minimum detection limit
s - Single sample

Table 2. Measured and predicted algal growth potential (AGP) for total soluble nitrogen (TSIN) and total nitrogen (TN) limitation

Avon Park Correctional Institute WWTP

Location	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (TN) ± 20%	Inorganic N:P ratio	Total N:P ratio
Effluent Samples	109 A	684.76 ± 136.952	733.4 ± 146.68	7.21	7.72
Control Site	226	457.63 ± 91.526	497.8 ± 99.56	7.08	7.71
Test Site	155	533.44 ± 106.688	577.6 ± 115.52	7.39	7.24

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

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).

- Total coliforms were detected in the effluent and fecal and total coliforms were detected at the Test Site. These levels that did not exceed Class III Water Quality Criteria or the facility's permit limits. Levels of total and fecal coliform at the Control Site were almost the same, indicating that most of the coliforms present were in the fecal coliform group; and the fecal coliform level (830 CFU) exceeded the Class III Water Quality Criterion (62-302.530 (6) F.A.C.; See Table 1 for results and Appendix 6 for laboratory worksheets).

- The effluent total nitrogen concentration was 19.3 mg/L (Table 1). Effluent total phosphorus (2.5 mg/L), ortho-phosphate (2.5 mg/L) and nitrate+nitrite concentrations (18 mg/L, Table 1) may have contributed to slightly higher nutrient levels at the Test Site compared to the Control Site. Nitrate+nitrite levels at both Control and Test Sites (12 and 14 mg/L, respectively) were ~12 and 14 times higher than 95th percentile values for Florida Streams (Appendix 5). It should be noted that if there is any groundwater influenced by the effluent or receiving water, the levels of nitrate+nitrite detected in the effluent and at the Control and Test Sites exceed the groundwater criterion. Ortho-phosphate and total phosphorus at the Control and Test Sites were slightly higher than 95th percentile values for Florida Streams (Appendix 5).

- Chlorophyll *a* was not detected in water samples collected at the Control and Test Sites (Table 1). We note that nutrients in the water column may or may not fuel algal production immediately, depending upon the sum of environmental conditions that limit algal growth at the site (e.g. pH, shading, turbidity, flow). In flowing streams, most algal production occurs in the form of benthic algal production, while phytoplankton production is dominant in lakes (Dodds 2002). Thus it is not necessarily contradictory for ambient nutrient levels in streams to be high and for no chlorophyll *a* to be detected in water samples.

- 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. AGP values at the upstream Control Site (226 mg dry wt/L), the downstream Test Site (155 mg dry weight/L), and of the effluent (109 mg dry wt/L) all exceeded this threshold (Table 2). Although all AGP values were much higher than the "problem" threshold, values were approximately 2-6 times lower than predicted. However, with the elevated nutrient levels at all sites, growth may be limited by other micronutrients.

- Periphyton chlorophyll *a* samples were received beyond the acceptable holding time, and therefore, were not analyzed (Table 1).

Table 3. Periphyton composition

Avon Park Correctional Institute WWTP	Control Site	Test Site
Number of Taxa	45	36
Shannon-Weaver Diversity	4.49	3.53
Chlorophyll a (mg/m²)	OQ	OQ
Phaeophytin (mg/m²)	OQ	OQ
Algal Density (number/cm²)	385,156	51,755
Percent Dominant Taxon	19.8	38.0
Dominant Taxon (name)	*Eunotia*	*Eunotia*
Number of Algal Units Identified	303	303
Percentage Composition		
Blue-green algae	3.6	2.3
Diatoms	90.8	95.7
Green algae	5.6	2.0

O - Sampled, but analysis lost or not performed
Q - Sample held beyond normal holding time

Table 4. Macroinvertebrate Hester-Dendy Samples - Quantitative

Avon Park Correctional Institute WWTP	Control Site	Test Site
Summary Statisics		
Shannon-Weaver Diversity	1.61	2.27
Number of Taxa	12	15
Florida Index	2	0
Number of EPT Taxa	1	2
Percent Dominant Taxon	64.7	45.8
Dominant Taxon (name)	*Kiefferulus*	*Dicrotendipes simpsoni*
Dominant Taxon (group)	Diptera	Diptera
Total Number of Individuals Counted	234	225
Total Density of Individuals (#/m^2)	619	595
Community Composition: Percent of total		
Amphipoda	0.4	0.0
Diptera	97.4	98.7
Ephemeroptera	0.8	0.4
Gastropoda	1.3	0.0
Plecoptera	0.0	0.0
Trichoptera	0.0	0.9
Other	0.0	0.0
Functional Feeding Groups: Percent of total		
Burrowing Deposit Feeders	0.0	0.0
Predators	0.4	2.1
Surface Deposit Feeders	85.0	71.3
Suspension Feeders	12.4	23.9
Scrapers	1.7	0.2
Shredders	0.4	0.7
Unknown	0.0	1.9

- There were no major differences between the Test and Control Sites in algal community composition (Table 3, Appendix 8). Periphyton algal communities at both Control and Test Sites were dominated by the diatom *Eunotia* sp. Algal density was seven times greater at the Control Site than at the Test Site. It is noted in the field sheets that an algal bloom was present at the Control Site that created an algal film on the water (Appendix 7).

- Quantitative measures of benthic macroinvertebrate assemblages from Hester-Dendy samplers showed higher diversity at the Test Site compared to the Control Site (Table 4, Appendix 9). Macroinvertebrate assemblages at both sites were dominated by dipterans, had low numbers of taxa, no or low numbers of Florida Index taxa and few EPT taxa.

- Qualitative measures of benthic macroinvertebrate assemblages from dipnet samples are summarized in Tables 5 and 6 and in Appendix 10. The Control Site SCI score of 25 and the Test Site SCI score of 23 placed them both in the "Good" category. Both sites were similar with respect to overall taxa richness, number of EPT and Florida Index taxa; and both sites were dominated at about the same percentage by the mayfly, *Caenis* sp.

Summary

Chloroform (4.5 µg/L) was detected in the effluent grab sample. Copper (10.2 µg/L) was detected in the effluent grab sample at a level that exceeded the Class III Water Quality Criterion (62-302.530(24) F.A.C.). Copper in the effluent composite sample (12.4 µg/L) could not be con-sidered a violation due to detection of copper in the composite sampler equipment blank. Silver (0.098 and 0.1 µg/L) was detected in both the effluent grab and composite samples at levels that exceeded the Class III Water Quality Criterion (62-302.530(60) F.A.C.). The effluent sample was not acutely toxic to the fish, *Cyprinella leedsi,* or to the water flea, *Ceriodaphnia dubia,* during the 48-hour acute bioassays. Although total and fecal coliform levels in the effluent and at the Test Site complied with Class III Water Quality Criteria and/or facility permit limits, fecal coliform levels at the Control Site (830 CFU) exceeded the Class III Water Quality Criterion (62-302.530 (6) F.A.C).

AGP results indicated that the effluent and water samples from both the Control and Test Sites exceeded the "problem" threshold. Although the effluent does not appear to be causing a significant increase in the nutrient levels in an already nutrient enriched system, the high levels of nutrients in the effluent are cause for concern. It is noted in the field sheets that a severe algal bloom was present at the Control Site during this survey. In the 1997 Fifth Year Bioassessment performed for this facility, AGP values ranged from 5 mg dry wt/L at the Control Site to 10.6 mg dry wt/L at the Test Site, while AGP of the effluent was 118 mg dry wt/L. Although ortho-phosphate and total phosphorus levels in the effluent are similar to those detected in 1997, the level of nitrate+nitrite in the effluent has increased from 4.3 mg/L in 1997 to 18 mg/L in the current assessment. Nutrient levels at the Control and Test Sites have also increased dramatically. Nitrate+ nitrite levels in the 1997 sampling were low to undetected, but were 12 and 14 mg/L at Control and Test Sites in the

Table 5. Macroinvertebrate Dipnet Samples - Qualitative

Avon Park Correctional Institute WWTP	Control Site	Test Site
Stream Condition Index (value)	25	23
Stream Condition Index (word)	Good	Good
Stream Condition Index Metrics		
Number of Taxa	29	31
Florida Index	7	6
Number of EPT Taxa	1	1
Number of Chironomid Taxa	15	17
Percent Dominant Taxon	24.5	26.8
Percent Diptera	33.3	38.0
Percent Suspension Feeders and Filterers	7.8	4.6
Total Number of Individuals	102	108
Community Composition: Percent of total		
Dominant Taxon (name)	*Caenis*	*Caenis*
Dominant Taxon (group)	Ephemeroptera	Ephemeroptera
Amphipoda	1.0	9.3
Coleoptera	22.6	5.6
Diptera	33.3	38.0
Ephemeroptera	24.5	26.9
Gastropoda	5.9	2.8
Odonata	5.9	4.6
Oligochaeta	3.9	9.3
Plecoptera	0.0	0.0
Trichoptera	0.0	0.0
Other	2.9	3.5
Functional Feeding Groups: Percent of total		
Burrowing Deposit Feeders	3.9	9.3
Predators	9.8	6.9
Surface Deposit Feeders	42.2	40.7
Suspension Feeders and Filterers	7.8	4.6
Scrapers	29.4	19.0
Shredders	4.9	12.0
Unknown	2.0	7.4

current assessment. Flow conditions for both the 1997 and 2003 surveys was similar, both scoring in the "Poor" category. Further investigation is warranted to determine where the additional nutrient load is coming from, and measures should be taken to decrease nutrients in the Avon Park Correctional Institute WWTP discharge.

Results from Hester-Dendy and dipnet samples and from periphytometers indicate similar macroinvertebrate and algal communities at both sites. The facility's effluent does not appear to be contributing to measurable degradation of the macroinvertebrate community in the rim canal. Lower than expected diversities on Hester-Dendy samples were likely related to the lack of flow in the rim canal rather than from any effect of the effluent. Diversity at the Test Site was higher than that of the Control Site. The Control Site SCI score of 25 and the Test Site SCI score of 23 placed them both in the "Good" category. The facility's effluent does not appear to be contributing to alteration of the algal community composition in the receiving waters.

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Table 6. Stream Condition Index Metrics: Peninsula, Winter Index
Control Site Avon Park Correctional Institute WWTP

Metric:	Value	5	3	1	Score
Total Number of Taxa	29	≥27	26-14	<14	5
Number of EPT Taxa	1	≥4	3-2	<2	1
Number of Chironomid Taxa	15	≥9	8-5	<5	5
Percent Contribution of Dominant Taxon	24.5	≤30	31-65	>65	5
Percent Diptera	33.3	-	≤52	>52	3
Florida Index	7	≥10	9-5	<5	3
Percent Suspension Feeders and Filterers	7.8	≥15	14-8	<8	3
Total Score		**Good**			**25**
Interpretation of Scores		Excellent			27-33
		Good			**21-26**
		Poor			14-20
		Very Poor			7-13

Table 6. Stream Condition Index Metrics: Peninsula, Winter Index
Test Site Avon Park Correctional Institute WWTP

Metric:	Value	5	3	1	Score
Total Number of Taxa	31	≥27	26-14	<14	5
Number of EPT Taxa	1	≥4	3-2	<2	1
Number of Chironomid Taxa	17	≥9	8-5	<5	5
Percent Contribution of Dominant Taxon	26.9	≤30	31-65	>65	5
Percent Diptera	38.0	-	≤52	>52	3
Florida Index	6	≥10	9-5	<5	3
Percent Suspension Feeders and Filterers	4.6	≥15	14-8	<8	1
Total Score		**Good**			**23**
Interpretation of Scores		Excellent			27-33
		Good			**21-26**
		Poor			14-20
		Very Poor			7-13

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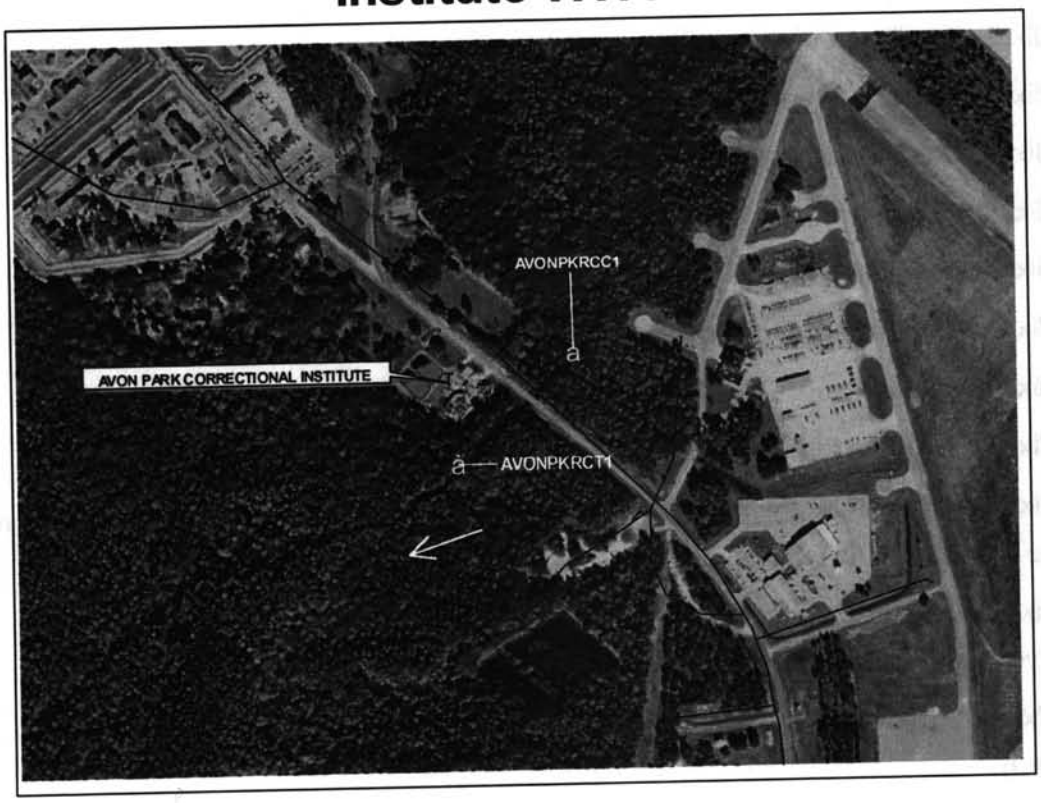
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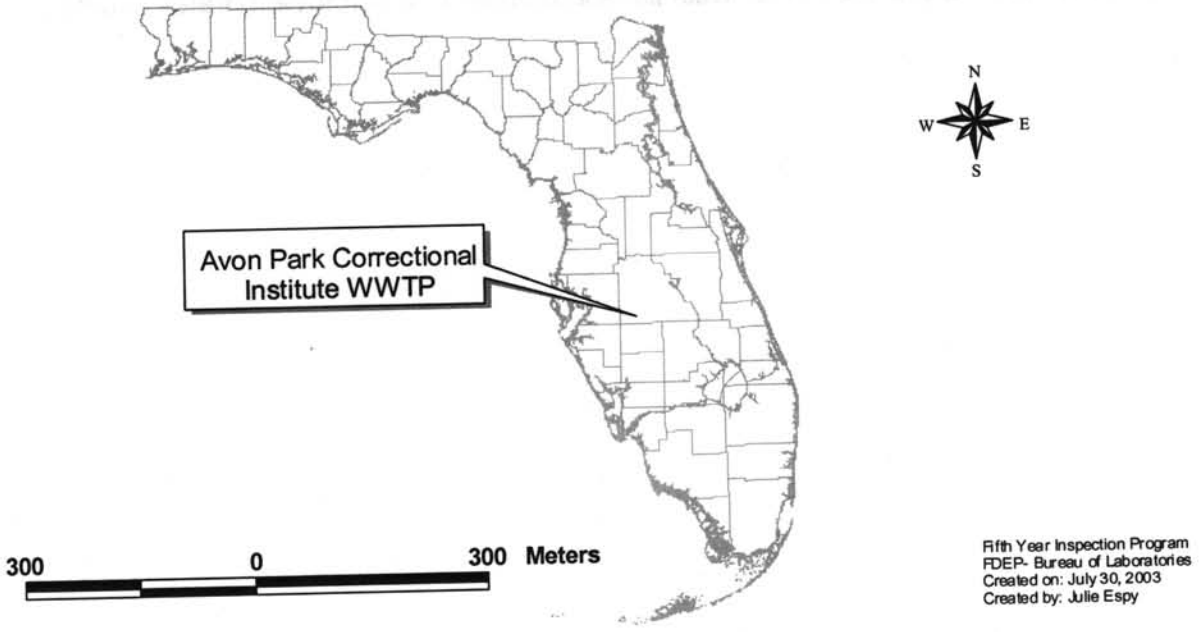
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- Appendix 9b. Hester-Dendy multi-plate samplers: Taxa list and total number of macroinvertebrates counted
- Appendix 10a. Dipnet samples: Taxa list and number of macroinvertebrates counted (collapsed)
- Appendix 10b. Dipnet samples: Taxa list and number of macroinvertebrates counted

Appendix 1

Avon Park Correctional Institute WWTP





Fifth Year Inspection Program
FDEP- Bureau of Laboratories
Created on: July 30, 2003
Created by: Julie Espy

Appendix 2

Facility Summary for Avon Park Correctional Institute WWTP

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENT PROECTION
FACILITY

Facility name: Avon Park Correctional Institute

Date of Summary: November 04, 2003

Location (detailed ARC view map attached):
10 miles East of State Road 64
Avon Park, FL 33880
Latitude 27° 39' 23" N Longitude 81° 21' 15" W

County: Hardee County

District: SWD

NPDES Permit: FL0040029

State GMS # and
State expiration date: 10/06/04

Facility Type: Domestic Waste

Function of facility: The facility is a .5 MGD Annual Average Daily Flow (AADF) Type I activate sludge Domestic Wastewater Treatment plant which discharges effluent into a rim canal discharging to Arbuckle Creek, a Class III freshwater body, and ultimately into the Kissimmee River.

Description of treatment process: The WWTP consists of: one (1) flow equalization basin of 144, 900 gallons, one 91) aeration basin of 474, 000 gallons, two (2) clarifier basins with a total volume of 85,000 gallons with a total surface area of 1,121 SF, one (1) chlorine contact chamber of 14,000 gallons and one (1) digester of 60, 100 gallons.

The following permit modifications will be accomplished with the issuance of the permit: replace influent splitter box, install an influent static screen and install a valved bypass line to return wastewater from the surge tank to the influent splitter box. Mr. Joseph Squitieri (Domestic Wastewater Compliance/Enforcement Inspector) indicated that the facility has accomplished the above-mentioned permit-required modifications.

Receiving waters: Rim canal and ultimately the Kissimmee River

Classification of water: III Freshwater

Design Flow: .5 MGD Annual ADF

Mean Flow (12 month average): 0.330 MGD (01-12/2002)

Flow during survey: <.05 m/s

Discharge is: Continuous
Therefore, the best time to sample the outfall is: Sample during business hours.

If facility has a mixing zone proved details (size and parameters): No mixing zone

List effluent limits (add or remove rows and columns):

Parameter	Units	AnnAvg	MoAvg	WklyAvg	Single sample	Max/min	Frequency
CBOD5	mg/L	-	5.0	-	8.0	max	weekly
TSS	mg/L	20.0	30.0	45.0	60.0	max	weekly
Organic Nitrogen (as N)	mg/L	-	1.4	-	-	max	weekly
Ammonia, as N	mg/L	-	.2	-	-	max	weekly
Chlorine, Total Residual (For Dechlorination)	mg/L	-	-	-	.01	max	5 days/week
Dissolved Oxygen	mg/L	-	-	-	6.0	min	5 days/week
Coliform, Fecal	#/100 mL	See permit condition I.A.5				max	weekly
Chlorine, Total Residual (For Disinfection)	mg/L	-	-	-	.5	min	5 days/week
pH	SU	-	-	-	6.0-8.5	range	5 days/week
Total Ammonia N (NH_3)	mg/L	-	report	-	report	report	grab
Temperature	°C	-	report	-	report	report	weekly
Un-ionized Ammonia (NH_3), as N	mg/L	-	-	-	.02	max	weekly
Flow	mgd	.5	report	-	-	max	continuous

Describe special permit conditions and permit modifications:
Per Minor Revision notice dated October 13, 2000: Beginning October 31, 2001, the facility shall conduct a Surface Water Monitoring Program to evaluate the impacts of the Avon Park Correction's WWTP discharge on the water quality of the canal. By September 2001, the permittee must submit a Plan of Study (POS) or an updated plan of study for the monitoring and a QAPP for field collection and lab analysis to the Department for approval. The monitoring shall be conducted on a quarterly basis for the first year of the permit and may be reduced, upon approval, to semi-annually for the life of the permit, if the Department determines that first year's data warrants a reduction in frequency.

The Department received the Avon Park Quality Assurance Plan on July 3, 2002.

Description of permitted outfall(s):
Permitted discharge of .5 mgd annual average daily flow from Discharge point D001 is collected in a rim canal discharging into Arbuckle Creek, a Class III freshwater body, and ultimately into the Kissimmee River. The point of discharge is located at approximately latitude 27° 39′ 23″ N, longitude 81° 21′ 15″ W.

List permit violations (form DMR data or other sources) and plant upsets that occurred within past year:

- The reviewed 2002 DMRs did not show exceedances on any of the permit-required monitoring parameters.

Describe previous impact bioassessments, WQBELs, and previous or current enforcement actions:

The Department conducted an FYI-5 at the facility on August and October 1997. The report was generated on May 1998. The results indicated that the facility's effluent was providing slight to moderate increases in nutrients (ortho-phosphate, total phosphorus and nitrate-nitrite) at the test site at rim canal. Algal Growth Potential (AGP) increased from 5 mg dry wt/L at the control site to 10.6 mg dry wt/L at the test site, exceeding the "threshold" of 5 mg wt/L due to the discharge.

No organic pollutants were detected in the effluent. Metals were detected below Class II Water Quality Standards.

The Stream Condition Index placed both sites in the "good" category. The macroinvertebrates were similar at both sites and were fairly healthy despite low flow. The discharge did not appear to adversely affect the benthic or algal communities in the stream.

The effluent characterization indicated aluminum, copper, iron and lead were present at levels below surface water quality standards. The effluent was chronically toxic to *Ceriodaphnia dubia*. The effluent was not chronically toxic to *Cyprenella leedsi*.

Additional information

Staff contributing to this review:

Biologist: Nahir Cornwell/Lori Pillsbury

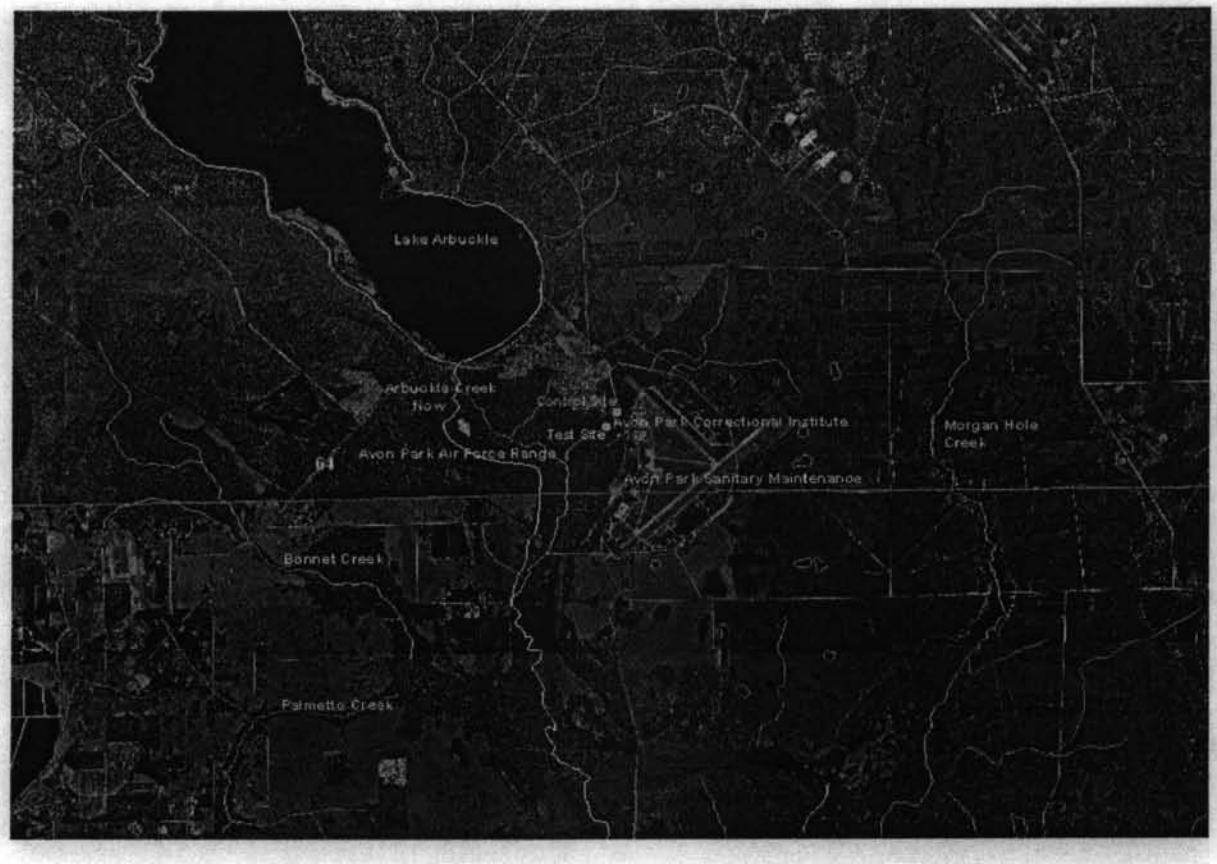
Inspector: Joseph Squitieri

Engineer:

Grey line denotes that biologist should know data

Black line denotes that inspector or engineer should know data

Avon Park Correctional Facility WWTP outfall, control and test site locations.
The outfall location has been designated as Avon Park Correctional Institute due to its proximity to the facility.



Avon Park Correctional Facility FYI-5 Test and Control Site Comparability Discussion

Table 1 shows the physical and chemical comparability between the test and control sites collected by DEP Southwest District Watershed Management on October 10 and 14, 2003, at the rim canal where the outfall for Avon Park Correctional Facility WWTP discharges.

Table 1.

Parameter	Control Site (10/14/03)			Test Site 1 (10/10/03)		
	Top	Mid	Bottom	Top	Mid	Bottom
Depth (m)[1]		1.5			1.3	
Dissolved oxygen (mg/L)[1]					3.73	
Specific conductance (uS/cm)[1]					234	
Temperature (C)[1]					26.17	
pH (SU)[1]					6.92	
Latitude/longitude	27° 39' 27.78" / 81° 21' 13.01"			27° 39' 21.8" / 81° 21' 15.8"		
Least wide riparian side	12 to 18 m			6 to 12 m		
Artificially channelized	Severe, with some recovery			Severe, with some recovery		
Artificially impounded	No			No		
High water mark	2.0 m			2.05 m		
Canopy cover %	Moderately Shaded			Moderately Shaded		
Sediment odor	Normal			Normal		
Sediment oils	None			None		
Sediment deposition	Sand is moderate; Silt is slight			Sand Slight to Moderate; Silt Slight		
System type	3rd order			3rd Order		

Water odors	None	Normal
Water surface oils	None	None
Clarity	Turbid	Turbid
Color	Tannic	Tannic
Periphyton	Absent	Absent
Fish	Common	Common
Aquatic macrophytes	Rare	Absent
Iron/sulfur bacteria	Absent	Absent

The receiving body of water (Rim Canal) is approximately 6 to 6.5 m wide. Stream flow was almost none existent. This stream is severely channelized, with some recovery. Both locations (control and test sites) were classified within the suboptimal category.

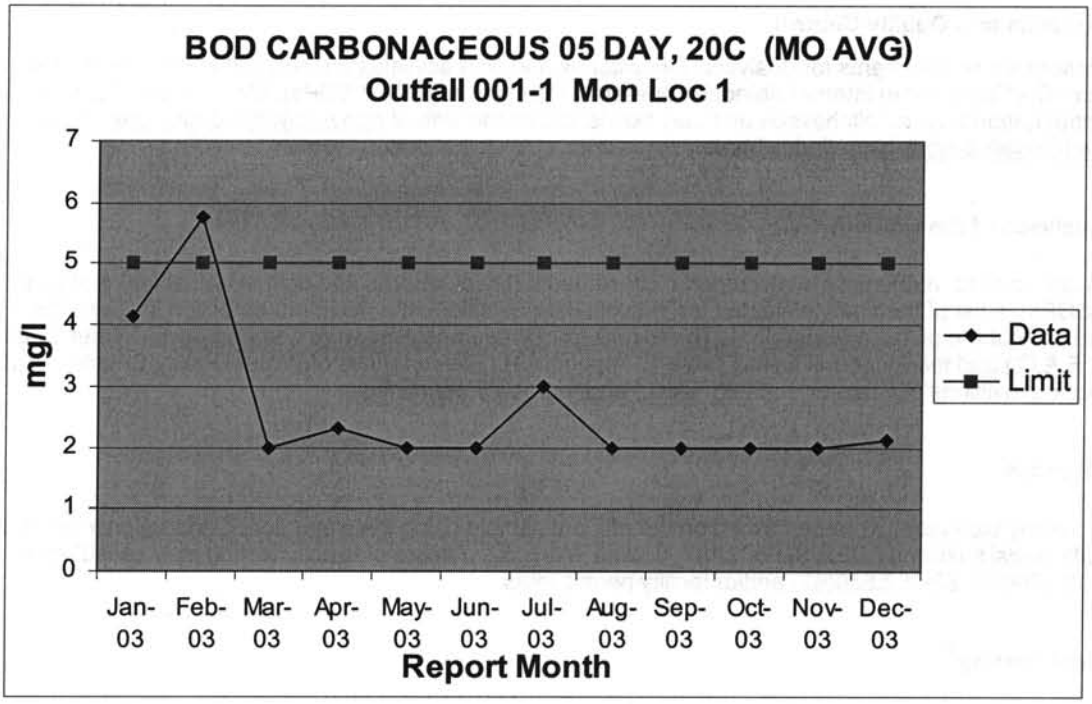
The control site (upstream) was located within an adequate distance away from the bridge crossing located upstream of the outfall. The upstream included roots and snags. The depth of the stream increased towards the center (approximately 1.5 m) as you moved farther downstream and decreased towards the stream banks. Sand deposition was moderate along the center of the 100 m. transect at the upstream location. However, closer to the stream bank, the bottom is mostly leaf/pine needle mats and roots. The water was very dark making it difficult to see the bottom. Some deep pools were present. The right bank had approximately greater than 18 m. of riparian vegetation. The left bank had approximately 12 to 18 m. of riparian vegetation.

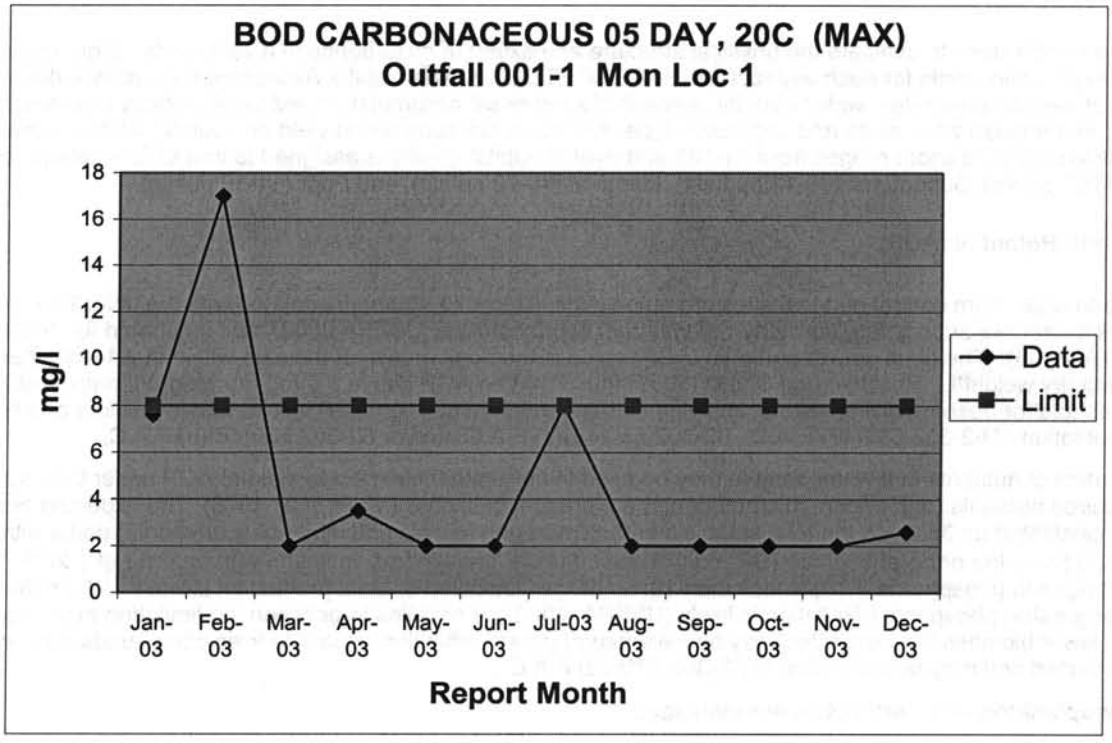
The test site (100 m. downstream of the outfall) included roots and snags. Some leaf packs were observed along the banks. The bottom was mainly the same depth (1.3 m.) along the stream. The bottom was mainly the same way as the upstream location (muck) along the stream bank, and sandy towards the center of the stream. Aquatic vegetation was not observed at any point along the 100 m. transect. The water was also very dark making it difficult to see the bottom. The right bank had approximately 6 to 12 m. of riparian vegetation due to a man made pathway located between the stream and the wastewater treatment plant. The left bank had approximately greater than 18 m. of riparian vegetation. No pools were present.

Both sites were determined to be comparable for sampling purposes.

Hester-Dendys will be placed at the control and test sites November 11, 2003.

DMR DATA FROM JANUARY TO DECEMBER 2003





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). Periphyton and was subsampled and identified to the lowest practical level, usually species (FDEP SOPs AB03, AB03_1).

Chlorophyll *a* Content: Chlorophyll *a* content can be 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..

The Florida Index: Some organisms become rare or absent as the intensity or duration of disturbance increases. The Florida Index assigns points to stream-dwelling macroinvertebrates based on their ranked sensitivity to pollution (Beck 1954). A site with a high Florida Index score is considered healthy (Ross 1990). Decreases in Florida Index points 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..

Ephemeroptera/Plecoptera/Trichoptera (EPT) Taxa: This value is the number of EPT taxa present. More EPT taxa are usually present in unpolluted waters (Plafkin *et al.*, 1989, Wallace *et al.*, 1996). Decreases in the number of EPT taxa 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..

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. Using data from qualitative dipnet samples, the SCI assigns points to seven parameters, depending on how closely each parameter approaches an expected reference condition (QA Rule SOP LT 7200). Points are summed to yield a final SCI score (range 7-33, depending on region and index period). Included in the calculation of SCI are taxa richness, number of EPT taxa, number of Chironomid taxa, percent contribution of the dominant taxon, the Florida Index, percent contribution of Diptera, and the percent contribution of suspension and filter feeders. Scores are broken into four ordinal groups: Excellent, Good, 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
12/8/2003 11:00	29429	Bio-AGP/LimNut	Algal Growth Potential	226	mg DryWt/L		0.1	0.3
12/8/2003 11:00	29429	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
12/8/2003 11:00	29429	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
12/8/2003 11:00	29429	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	11	# Taxa			
12/8/2003 11:00	29429	Nutrients-Liquid	Ammonia-N	0.043	mg N/L		0.01	0.02
12/8/2003 11:00	29429	Nutrients-Liquid	NO2NO3-N	12	mg N/L		0.4	1
12/8/2003 11:00	29429	Nutrients-Liquid	N_KJEL_TOT	1.1	mg N/L	JA	0.06	0.2
12/8/2003 11:00	29429	Nutrients-Liquid	O-Phosphate-P	1.7	mg P/L		0.08	0.2
12/8/2003 11:00	29429	Nutrients-Liquid	Total-P	1.7	mg P/L	A	0.2	0.6
12/8/2003 11:00	29429-REP 2	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	6	# Taxa			
12/8/2003 11:00	29429-REP 3	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	9	# Taxa			
12/8/2003 11:00	29429	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton	No Result	mg/m2			
12/8/2003 11:00	29429	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton	No Result	mg/m2			
12/8/2003 11:00	29429	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa	30	# Taxa			
12/8/2003 11:00	29429	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa	34	#Taxa			
12/8/2003 11:00	29429	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa	13	#Taxa			
12/8/2003 11:10	EQUIPMENT BLANK	Metals-Water	Aluminum	7	ug/L	U	7	28
12/8/2003 11:10	EQUIPMENT BLANK	Metals-Water	Arsenic	6	ug/L	U	6	24
12/8/2003 11:10	EQUIPMENT BLANK	Metals-Water	Cadmium	0.025	ug/L	U	0.025	0.1
12/8/2003 11:10	EQUIPMENT BLANK	Metals-Water	Calcium	0.05	mg/L	U	0.05	0.2
12/8/2003 11:10	EQUIPMENT BLANK	Metals-Water	Chromium	3	ug/L	U	3	12
12/8/2003 11:10	EQUIPMENT BLANK	Metals-Water	Copper	1.7	ug/L	I	1	4
12/8/2003 11:10	EQUIPMENT BLANK	Metals-Water	Iron	103	ug/L		15	60
12/8/2003 11:10	EQUIPMENT BLANK	Metals-Water	Lead	0.12	ug/L	U	0.12	0.48
12/8/2003 11:10	EQUIPMENT BLANK	Metals-Water	Magnesium	0.02	mg/L	U	0.02	0.08
12/8/2003 11:10	EQUIPMENT BLANK	Metals-Water	Nickel	43	ug/L		3	12
12/8/2003 11:10	EQUIPMENT BLANK	Metals-Water	Selenium	1	ug/L	U	1	4
12/8/2003 11:10	EQUIPMENT BLANK	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
12/8/2003 11:10	EQUIPMENT BLANK	Metals-Water	Zinc	4	ug/L	U	4	16
12/8/2003 11:10	EQUIPMENT BLANK	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
12/8/2003 11:10	EQUIPMENT BLANK	Nutrients-Liquid	NO2NO3-N	0.004	mg N/L	U	0.004	0.01
12/8/2003 11:10	EQUIPMENT BLANK	Nutrients-Liquid	N_KJEL_TOT	0.06	mg N/L	UQ	0.06	0.2
12/8/2003 11:10	EQUIPMENT BLANK	Nutrients-Liquid	Total-P	0.02	mg P/L	UQ	0.02	0.06
12/8/2003 11:45	29430 TB	BNA-Water	1,2,4,5-Tetrachlorobenzene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	1,2,4-Trichlorobenzene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	1,2-Dichlorobenzene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	1,3,5-Trinitrobenzene	3.8	ug/L	UJ	3.8	15
12/8/2003 11:45	29430 TB	BNA-Water	1,3-Dichlorobenzene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	1,3-Dinitrobenzene	1.9	ug/L	U	1.9	7.7
12/8/2003 11:45	29430 TB	BNA-Water	1,4-Dichlorobenzene	0.96	ug/L	U	0.96	3.8

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
12/8/2003 11:45	29430 TB	BNA-Water	1,4-Naphthoquinone	19	ug/L	U	19	77
12/8/2003 11:45	29430 TB	BNA-Water	1-Naphthylamine	9.6	ug/L	UJ	9.6	38
12/8/2003 11:45	29430 TB	BNA-Water	2,3,4,6-Tetrachlorophenol	1.9	ug/L	UJ	1.9	7.7
12/8/2003 11:45	29430 TB	BNA-Water	2,4,5-Trichlorophenol	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	2,4,6-Trichlorophenol	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	2,4-Dichlorophenol	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
12/8/2003 11:45	29430 TB	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	58
12/8/2003 11:45	29430 TB	BNA-Water	2,4-Dinitrotoluene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	2,6-Dichlorophenol	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	2,6-Dinitrotoluene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	2-Acetylaminofluorene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	2-Chloronaphthalene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	2-Chlorophenol	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	12
12/8/2003 11:45	29430 TB	BNA-Water	2-Methylnaphthalene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	2-Naphthylamine	9.6	ug/L	UJ	9.6	38
12/8/2003 11:45	29430 TB	BNA-Water	2-Nitroaniline	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	2-Nitrophenol	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	2-Picoline	0.96	ug/L	UJ	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
12/8/2003 11:45	29430 TB	BNA-Water	3,3'-Dimethylbenzidine	19	ug/L	UJ	19	77
12/8/2003 11:45	29430 TB	BNA-Water	3-Methylcholanthrene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	3-Nitroaniline	0.96	ug/L	UJ	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.8
12/8/2003 11:45	29430 TB	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.8
12/8/2003 11:45	29430 TB	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.8
12/8/2003 11:45	29430 TB	BNA-Water	4-Aminobiphenyl	3.8	ug/L	UJ	3.8	15
12/8/2003 11:45	29430 TB	BNA-Water	4-Bromophenyl phenyl ether	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	4-Chloro-3-methylphenol	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	4-Chloroaniline	0.96	ug/L	UJ	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.7
12/8/2003 11:45	29430 TB	BNA-Water	4-Nitroaniline	0.96	ug/L	UJ	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	4-Nitrophenol	14	ug/L	U	14	58
12/8/2003 11:45	29430 TB	BNA-Water	5-Nitro-o-toluidine	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	7,12-Dimethylbenz(a)anthracene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Acenaphthene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Acenaphthylene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Acetophenone	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Aldrin	1.4	ug/L	UJ	1.4	5.8
12/8/2003 11:45	29430 TB	BNA-Water	Aniline	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Anthracene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Azobenzene/1,2-Diphenylhydrazine	0.96	ug/L	U	0.96	3.8

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
12/8/2003 11:45	29430 TB	BNA-Water	Benzidine	96	ug/L	U	96	380
12/8/2003 11:45	29430 TB	BNA-Water	Benzo(a)anthracene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Benzo(a)pyrene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Benzo(b)fluoranthene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Benzo(g,h,i)perylene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Benzo(k)fluoranthene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Benzyl alcohol	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Bis(2-chloroethoxy)methane	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Bis(2-chloroethyl)ether	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	12
12/8/2003 11:45	29430 TB	BNA-Water	Bis(2-ethylhexyl)phthalate	320	ug/L	UJ	320	1300
12/8/2003 11:45	29430 TB	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19
12/8/2003 11:45	29430 TB	BNA-Water	Chrysene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
12/8/2003 11:45	29430 TB	BNA-Water	Di-n-octyl phthalate	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Dibenzo(a,h)anthracene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Dibenzofuran	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.8
12/8/2003 11:45	29430 TB	BNA-Water	Diethyl phthalate	2.2	ug/L	U	2.2	8.7
12/8/2003 11:45	29430 TB	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
12/8/2003 11:45	29430 TB	BNA-Water	Dimethylaminoazobenzene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Dinoseb	3.8	ug/L	UJ	3.8	15
12/8/2003 11:45	29430 TB	BNA-Water	Diphenylamine	2.9	ug/L	U	2.9	12
12/8/2003 11:45	29430 TB	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
12/8/2003 11:45	29430 TB	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
12/8/2003 11:45	29430 TB	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.8
12/8/2003 11:45	29430 TB	BNA-Water	Endrin	1.4	ug/L	UJ	1.4	5.8
12/8/2003 11:45	29430 TB	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15
12/8/2003 11:45	29430 TB	BNA-Water	Ethyl methanesulfonate	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Fluoranthene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Fluorene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.8
12/8/2003 11:45	29430 TB	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.8
12/8/2003 11:45	29430 TB	BNA-Water	Hexachlorobenzene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	12
12/8/2003 11:45	29430 TB	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	UJ	2.9	12
12/8/2003 11:45	29430 TB	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	12
12/8/2003 11:45	29430 TB	BNA-Water	Hexachloropropene	1.9	ug/L	UJ	1.9	7.7
12/8/2003 11:45	29430 TB	BNA-Water	Indeno(1,2,3-cd)pyrene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Isophorone	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Isosafrole	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Methapyrilene	3.8	ug/L	U	3.8	15
12/8/2003 11:45	29430 TB	BNA-Water	Methyl methanesulfonate	0.96	ug/L	UJ	0.96	3.8

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
12/8/2003 11:45	29430 TB	BNA-Water	N-Nitrosodi-n-butylamine	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	UJ	1.9	7.7
12/8/2003 11:45	29430 TB	BNA-Water	N-Nitrosodiethylamine	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	UJ	1.9	7.7
12/8/2003 11:45	29430 TB	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	UJ	2.9	12
12/8/2003 11:45	29430 TB	BNA-Water	N-Nitrosomethylethylamine	1.9	ug/L	U	1.9	7.7
12/8/2003 11:45	29430 TB	BNA-Water	N-Nitrosomorpholine	0.96	ug/L	UJ	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	N-Nitrosopiperidine	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	N-Nitrosopyrrolidine	1.9	ug/L	U	1.9	7.7
12/8/2003 11:45	29430 TB	BNA-Water	Naphthalene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.7
12/8/2003 11:45	29430 TB	BNA-Water	Nitroquinoline-1-oxide	19	ug/L	UJ	19	77
12/8/2003 11:45	29430 TB	BNA-Water	Pentachlorobenzene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Pentachloroethane	48	ug/L	U	48	190
12/8/2003 11:45	29430 TB	BNA-Water	Pentachloronitrobenzene	0.96	ug/L	UJ	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Pentachlorophenol	2.9	ug/L	UJ	2.9	12
12/8/2003 11:45	29430 TB	BNA-Water	Phenacetin	3.8	ug/L	U	3.8	12
12/8/2003 11:45	29430 TB	BNA-Water	Phenanthrene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Phenol	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Pyrene	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	Pyridine	3.8	ug/L	UJ	3.8	15
12/8/2003 11:45	29430 TB	BNA-Water	Safrole	0.96	ug/L	U	0.96	3.8
12/8/2003 11:45	29430 TB	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.8
12/8/2003 11:45	29430 TB	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.8
12/8/2003 11:45	29430 TB	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.8
12/8/2003 11:45	29430 TB	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.8
12/8/2003 11:45	29430 TB	BNA-Water	m,p-Cresols	1.9	ug/L	U	1.9	7.7
12/8/2003 11:45	29430 TB	BNA-Water	o-Cresol	1.9	ug/L	U	1.9	7.7
12/8/2003 11:45	29430 TB	BNA-Water	o-Toluidine	0.96	ug/L	UJ	0.96	3.8
12/8/2003 11:45	29430 TB	GC-Water	Alachlor	0.58	ug/L	U	0.58	2.32
12/8/2003 11:45	29430 TB	GC-Water	Ametryn	0.048	ug/L	U	0.048	0.192
12/8/2003 11:45	29430 TB	GC-Water	Atrazine	0.048	ug/L	U	0.048	0.192
12/8/2003 11:45	29430 TB	GC-Water	Azinphos Methyl	0.048	ug/L	U	0.048	0.192
12/8/2003 11:45	29430 TB	GC-Water	Bromacil	0.19	ug/L	U	0.19	0.76
12/8/2003 11:45	29430 TB	GC-Water	Butylate	0.19	ug/L	UJ	0.19	0.76
12/8/2003 11:45	29430 TB	GC-Water	Chlorpyrifos Ethyl	0.048	ug/L	U	0.048	0.192
12/8/2003 11:45	29430 TB	GC-Water	Chlorpyrifos Methyl	0.097	ug/L	U	0.097	0.388
12/8/2003 11:45	29430 TB	GC-Water	Diazinon	0.048	ug/L	UJ	0.048	0.192
12/8/2003 11:45	29430 TB	GC-Water	Ethion	0.048	ug/L	U	0.048	0.192
12/8/2003 11:45	29430 TB	GC-Water	Ethoprop	0.097	ug/L	U	0.097	0.388
12/8/2003 11:45	29430 TB	GC-Water	Fenamiphos	0.19	ug/L	U	0.19	0.76
12/8/2003 11:45	29430 TB	GC-Water	Fonofos	0.097	ug/L	U	0.097	0.388
12/8/2003 11:45	29430 TB	GC-Water	Hexazinone	0.097	ug/L	U	0.097	0.388

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
12/8/2003 11:45	29430 TB	GC-Water	Malathion	0.14	ug/L	U	0.14	0.56
12/8/2003 11:45	29430 TB	GC-Water	Metalaxyl	0.24	ug/L	U	0.24	0.96
12/8/2003 11:45	29430 TB	GC-Water	Metolachlor	0.48	ug/L	U	0.48	1.92
12/8/2003 11:45	29430 TB	GC-Water	Metribuzin	0.097	ug/L	UJ	0.097	0.388
12/8/2003 11:45	29430 TB	GC-Water	Mevinphos	0.19	ug/L	UJ	0.19	0.76
12/8/2003 11:45	29430 TB	GC-Water	Naled	0.78	ug/L	U	0.78	3.12
12/8/2003 11:45	29430 TB	GC-Water	Norflurazon	0.097	ug/L	U	0.097	0.388
12/8/2003 11:45	29430 TB	GC-Water	Parathion Ethyl	0.14	ug/L	U	0.14	0.56
12/8/2003 11:45	29430 TB	GC-Water	Parathion Methyl	0.097	ug/L	U	0.097	0.388
12/8/2003 11:45	29430 TB	GC-Water	Phorate	0.048	ug/L	U	0.048	0.192
12/8/2003 11:45	29430 TB	GC-Water	Prometryn	0.14	ug/L	U	0.14	0.56
12/8/2003 11:45	29430 TB	GC-Water	Simazine	0.048	ug/L	U	0.048	0.192
12/8/2003 11:45	29430 TB	Metals-Water	Aluminum	7	ug/L	U	7	28
12/8/2003 11:45	29430 TB	Metals-Water	Arsenic	6	ug/L	U	6	24
12/8/2003 11:45	29430 TB	Metals-Water	Cadmium	0.025	ug/L	U	0.025	0.1
12/8/2003 11:45	29430 TB	Metals-Water	Calcium	0.05	mg/L	U	0.05	0.2
12/8/2003 11:45	29430 TB	Metals-Water	Chromium	3	ug/L	U	3	12
12/8/2003 11:45	29430 TB	Metals-Water	Copper	1	ug/L	U	1	4
12/8/2003 11:45	29430 TB	Metals-Water	Iron	15	ug/L	U	15	60
12/8/2003 11:45	29430 TB	Metals-Water	Lead	0.05	ug/L	U	0.05	0.2
12/8/2003 11:45	29430 TB	Metals-Water	Magnesium	0.02	mg/L	U	0.02	0.08
12/8/2003 11:45	29430 TB	Metals-Water	Nickel	3	ug/L	U	3	12
12/8/2003 11:45	29430 TB	Metals-Water	Selenium	1	ug/L	U	1	4
12/8/2003 11:45	29430 TB	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
12/8/2003 11:45	29430 TB	Metals-Water	Zinc	4	ug/L	U	4	16
12/8/2003 11:45	29430 TB	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
12/8/2003 11:45	29430 TB	Nutrients-Liquid	NO2NO3-N	0.004	mg N/L	U	0.004	0.01
12/8/2003 11:45	29430 TB	Nutrients-Liquid	N_KJEL_TOT	0.06	mg N/L	U	0.06	0.2
12/8/2003 11:45	29430 TB	Nutrients-Liquid	O-Phosphate-P	0.004	mg P/L	U	0.004	0.01
12/8/2003 11:45	29430 TB	Nutrients-Liquid	Total-P	0.02	mg P/L	U	0.02	0.06
12/8/2003 11:45	29430 TB	Overflow	Oil and Grease	1.9	mg/l	I		
12/8/2003 11:45	29430 TB	VOC-Water	Bromodichloromethane	0.2	ug/L	U	0.2	1
12/8/2003 11:45	29430 TB	VOC-Water	Bromoform	0.2	ug/L	U	0.2	1
12/8/2003 11:45	29430 TB	VOC-Water	Chloroform	0.2	ug/L	U	0.2	1
12/8/2003 11:45	29430 TB	VOC-Water	Dibromochloromethane	0.2	ug/L	U	0.2	1
12/8/2003 12:05	29431	Bio-AGP/LimNut	Algal Growth Potential	155	mg DryWt/L		0.1	0.3
12/8/2003 12:05	29431	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
12/8/2003 12:05	29431	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
12/8/2003 12:05	29431	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	12	# Taxa			
12/8/2003 12:05	29431	Nutrients-Liquid	Ammonia-N	0.038	mg N/L		0.01	0.02
12/8/2003 12:05	29431	Nutrients-Liquid	NO2NO3-N	14	mg N/L		0.4	1
12/8/2003 12:05	29431	Nutrients-Liquid	N_KJEL_TOT	1.2	mg N/L	J	0.06	0.2
12/8/2003 12:05	29431	Nutrients-Liquid	O-Phosphate-P	1.9	mg P/L		0.04	0.1

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
12/8/2003 12:05	29431	Nutrients-Liquid	Total-P	2.1	mg P/L		0.2	0.6
12/8/2003 12:05	29431-REP 2	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	8	# Taxa			
12/8/2003 12:05	29431-REP 3	Bio-Invertebrates	Macroinvert-FW-Quan-ArtSubstr-# Taxa	7	# Taxa			
12/8/2003 12:05	29431	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton	No Result	mg/m2			
12/8/2003 12:05	29431	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton	No Result	mg/m2			
12/8/2003 12:05	29431	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa	32	# Taxa			
12/8/2003 12:05	29431	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa	29	#Taxa			
12/8/2003 12:05	29431	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa	7	#Taxa			
12/8/2003 12:45	29432	BNA-Water	1,2,4,5-Tetrachlorobenzene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	1,2,4-Trichlorobenzene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	1,2-Dichlorobenzene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	1,3,5-Trinitrobenzene	3.8	ug/L	UJ	3.8	15
12/8/2003 12:45	29432	BNA-Water	1,3-Dichlorobenzene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	1,3-Dinitrobenzene	1.9	ug/L	U	1.9	7.7
12/8/2003 12:45	29432	BNA-Water	1,4-Dichlorobenzene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	1,4-Naphthoquinone	19	ug/L	U	19	77
12/8/2003 12:45	29432	BNA-Water	1-Naphthylamine	9.6	ug/L	UJ	9.6	38
12/8/2003 12:45	29432	BNA-Water	2,3,4,6-Tetrachlorophenol	1.9	ug/L	UJ	1.9	7.7
12/8/2003 12:45	29432	BNA-Water	2,4,5-Trichlorophenol	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	2,4,6-Trichlorophenol	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	2,4-Dichlorophenol	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	2,4-Dimethylphenol	48	ug/L	U	48	190
12/8/2003 12:45	29432	BNA-Water	2,4-Dinitrophenol	14	ug/L	U	14	58
12/8/2003 12:45	29432	BNA-Water	2,4-Dinitrotoluene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	2,6-Dichlorophenol	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	2,6-Dinitrotoluene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	2-Acetylaminofluorene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	2-Chloronaphthalene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	2-Chlorophenol	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	2-Methyl-4,6-dinitrophenol	2.9	ug/L	U	2.9	12
12/8/2003 12:45	29432	BNA-Water	2-Methylnaphthalene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	2-Naphthylamine	9.6	ug/L	UJ	9.6	38
12/8/2003 12:45	29432	BNA-Water	2-Nitroaniline	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	2-Nitrophenol	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	2-Picoline	0.96	ug/L	UJ	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	3,3'-Dichlorobenzidine	38	ug/L	U	38	150
12/8/2003 12:45	29432	BNA-Water	3,3'-Dimethylbenzidine	19	ug/L	UJ	19	77
12/8/2003 12:45	29432	BNA-Water	3-Methylcholanthrene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	3-Nitroaniline	0.96	ug/L	UJ	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	4,4'-DDD	1.4	ug/L	U	1.4	5.8
12/8/2003 12:45	29432	BNA-Water	4,4'-DDE	1.4	ug/L	U	1.4	5.8
12/8/2003 12:45	29432	BNA-Water	4,4'-DDT	1.4	ug/L	U	1.4	5.8
12/8/2003 12:45	29432	BNA-Water	4-Aminobiphenyl	3.8	ug/L	UJ	3.8	15

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
12/8/2003 12:45	29432	BNA-Water	4-Bromophenyl phenyl ether	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	4-Chloro-3-methylphenol	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	4-Chloroaniline	0.96	ug/L	UJ	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	4-Chlorophenyl phenyl ether	1.9	ug/L	U	1.9	7.7
12/8/2003 12:45	29432	BNA-Water	4-Nitroaniline	0.96	ug/L	UJ	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	4-Nitrophenol	14	ug/L	U	14	58
12/8/2003 12:45	29432	BNA-Water	5-Nitro-o-toluidine	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	7,12-Dimethylbenz(a)anthracene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Acenaphthene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Acenaphthylene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Acetophenone	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Aldrin	1.4	ug/L	UJ	1.4	5.8
12/8/2003 12:45	29432	BNA-Water	Aniline	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Anthracene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Azobenzene/1,2-Diphenylhydrazine	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Benzidine	96	ug/L	U	96	380
12/8/2003 12:45	29432	BNA-Water	Benzo(a)anthracene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Benzo(a)pyrene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Benzo(b)fluoranthene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Benzo(g,h,i)perylene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Benzo(k)fluoranthene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Benzyl alcohol	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Bis(2-chloroethoxy)methane	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Bis(2-chloroethyl)ether	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Bis(2-chloroisopropyl)ether	2.9	ug/L	U	2.9	12
12/8/2003 12:45	29432	BNA-Water	Bis(2-ethylhexyl)phthalate	320	ug/L	UJ	320	1300
12/8/2003 12:45	29432	BNA-Water	Butyl benzyl phthalate	4.8	ug/L	U	4.8	19
12/8/2003 12:45	29432	BNA-Water	Chrysene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Di-n-butyl phthalate	4.8	ug/L	U	4.8	19
12/8/2003 12:45	29432	BNA-Water	Di-n-octyl phthalate	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Dibenzo(a,h)anthracene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Dibenzofuran	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Dieldrin	1.4	ug/L	U	1.4	5.8
12/8/2003 12:45	29432	BNA-Water	Diethyl phthalate	2.2	ug/L	U	2.2	8.7
12/8/2003 12:45	29432	BNA-Water	Dimethyl phthalate	48	ug/L	U	48	190
12/8/2003 12:45	29432	BNA-Water	Dimethylaminoazobenzene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Dinoseb	3.8	ug/L	UJ	3.8	15
12/8/2003 12:45	29432	BNA-Water	Diphenylamine	2.9	ug/L	U	2.9	12
12/8/2003 12:45	29432	BNA-Water	Endosulfan I	3.8	ug/L	U	3.8	15
12/8/2003 12:45	29432	BNA-Water	Endosulfan II	3.8	ug/L	U	3.8	15
12/8/2003 12:45	29432	BNA-Water	Endosulfan sulfate	1.4	ug/L	U	1.4	5.8
12/8/2003 12:45	29432	BNA-Water	Endrin	1.4	ug/L	UJ	1.4	5.8
12/8/2003 12:45	29432	BNA-Water	Endrin aldehyde	3.8	ug/L	U	3.8	15

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
12/8/2003 12:45	29432	BNA-Water	Ethyl methanesulfonate	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Fluoranthene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Fluorene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Heptachlor	1.4	ug/L	U	1.4	5.8
12/8/2003 12:45	29432	BNA-Water	Heptachlor epoxide	1.4	ug/L	U	1.4	5.8
12/8/2003 12:45	29432	BNA-Water	Hexachlorobenzene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Hexachlorobutadiene	2.9	ug/L	U	2.9	12
12/8/2003 12:45	29432	BNA-Water	Hexachlorocyclopentadiene	2.9	ug/L	UJ	2.9	12
12/8/2003 12:45	29432	BNA-Water	Hexachloroethane	2.9	ug/L	U	2.9	12
12/8/2003 12:45	29432	BNA-Water	Hexachloropropene	1.9	ug/L	UJ	1.9	7.7
12/8/2003 12:45	29432	BNA-Water	Indeno(1,2,3-cd)pyrene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Isophorone	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Isosafrole	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Methapyrilene	3.8	ug/L	U	3.8	15
12/8/2003 12:45	29432	BNA-Water	Methyl methanesulfonate	0.96	ug/L	UJ	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	N-Nitrosodi-n-butylamine	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	N-Nitrosodi-n-propylamine	1.9	ug/L	UJ	1.9	7.7
12/8/2003 12:45	29432	BNA-Water	N-Nitrosodiethylamine	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	N-Nitrosodimethylamine	1.9	ug/L	UJ	1.9	7.7
12/8/2003 12:45	29432	BNA-Water	N-Nitrosodiphenylamine	2.9	ug/L	UJ	2.9	12
12/8/2003 12:45	29432	BNA-Water	N-Nitrosomethylethylamine	1.9	ug/L	U	1.9	7.7
12/8/2003 12:45	29432	BNA-Water	N-Nitrosomorpholine	0.96	ug/L	UJ	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	N-Nitrosopiperidine	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	N-Nitrosopyrrolidine	1.9	ug/L	U	1.9	7.7
12/8/2003 12:45	29432	BNA-Water	Naphthalene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Nitrobenzene	1.9	ug/L	U	1.9	7.7
12/8/2003 12:45	29432	BNA-Water	Nitroquinoline-1-oxide	19	ug/L	UJ	19	77
12/8/2003 12:45	29432	BNA-Water	Pentachlorobenzene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Pentachloroethane	48	ug/L	U	48	190
12/8/2003 12:45	29432	BNA-Water	Pentachloronitrobenzene	0.96	ug/L	UJ	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Pentachlorophenol	2.9	ug/L	UJ	2.9	12
12/8/2003 12:45	29432	BNA-Water	Phenacetin	3.8	ug/L	U	3.8	12
12/8/2003 12:45	29432	BNA-Water	Phenanthrene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Phenol	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Pyrene	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	Pyridine	3.8	ug/L	UJ	3.8	15
12/8/2003 12:45	29432	BNA-Water	Safrole	0.96	ug/L	U	0.96	3.8
12/8/2003 12:45	29432	BNA-Water	alpha-BHC	1.4	ug/L	U	1.4	5.8
12/8/2003 12:45	29432	BNA-Water	beta-BHC	1.4	ug/L	U	1.4	5.8
12/8/2003 12:45	29432	BNA-Water	delta-BHC	1.4	ug/L	U	1.4	5.8
12/8/2003 12:45	29432	BNA-Water	gamma-BHC	1.4	ug/L	U	1.4	5.8
12/8/2003 12:45	29432	BNA-Water	m,p-Cresols	1.9	ug/L	U	1.9	7.7
12/8/2003 12:45	29432	BNA-Water	o-Cresol	1.9	ug/L	U	1.9	7.7

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
12/8/2003 12:45	29432	BNA-Water	o-Toluidine	0.96	ug/L	UJ	0.96	3.8
12/8/2003 12:45	29432	Bio-AGP/LimNut	Algal Growth Potential	109	mg DryWt/L	A	0.1	0.3
12/8/2003 12:45	29432	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
12/8/2003 12:45	29432	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
12/8/2003 12:45	29432	Bio-Toxicology	Bioassay-Acute-Screen-FW-C.dubia, LC50	100	LC50	L		
12/8/2003 12:45	29432	Bio-Toxicology	Bioassay-Acute-Screen-FW-Fish, LC50	100	LC50	L		
12/8/2003 12:45	29432	GC-Water	Alachlor	0.6	ug/L	U	0.6	2.4
12/8/2003 12:45	29432	GC-Water	Ametryn	0.05	ug/L	U	0.05	0.2
12/8/2003 12:45	29432	GC-Water	Atrazine	0.05	ug/L	U	0.05	0.2
12/8/2003 12:45	29432	GC-Water	Azinphos Methyl	0.05	ug/L	U	0.05	0.2
12/8/2003 12:45	29432	GC-Water	Bromacil	0.2	ug/L	U	0.2	0.8
12/8/2003 12:45	29432	GC-Water	Butylate	0.2	ug/L	UJ	0.2	0.8
12/8/2003 12:45	29432	GC-Water	Chlorpyrifos Ethyl	0.05	ug/L	U	0.05	0.2
12/8/2003 12:45	29432	GC-Water	Chlorpyrifos Methyl	0.1	ug/L	U	0.1	0.4
12/8/2003 12:45	29432	GC-Water	Diazinon	0.05	ug/L	UJ	0.05	0.2
12/8/2003 12:45	29432	GC-Water	Ethion	0.05	ug/L	U	0.05	0.2
12/8/2003 12:45	29432	GC-Water	Ethoprop	0.1	ug/L	U	0.1	0.4
12/8/2003 12:45	29432	GC-Water	Fenamiphos	0.2	ug/L	U	0.2	0.8
12/8/2003 12:45	29432	GC-Water	Fonofos	0.1	ug/L	U	0.1	0.4
12/8/2003 12:45	29432	GC-Water	Hexazinone	0.1	ug/L	U	0.1	0.4
12/8/2003 12:45	29432	GC-Water	Malathion	0.15	ug/L	U	0.15	0.6
12/8/2003 12:45	29432	GC-Water	Metalaxyl	0.25	ug/L	U	0.25	1
12/8/2003 12:45	29432	GC-Water	Metolachlor	0.5	ug/L	U	0.5	2
12/8/2003 12:45	29432	GC-Water	Metribuzin	0.1	ug/L	UJ	0.1	0.4
12/8/2003 12:45	29432	GC-Water	Mevinphos	0.2	ug/L	UJ	0.2	0.8
12/8/2003 12:45	29432	GC-Water	Naled	0.8	ug/L	U	0.8	3.2
12/8/2003 12:45	29432	GC-Water	Norflurazon	0.1	ug/L	U	0.1	0.4
12/8/2003 12:45	29432	GC-Water	Parathion Ethyl	0.15	ug/L	U	0.15	0.6
12/8/2003 12:45	29432	GC-Water	Parathion Methyl	0.1	ug/L	U	0.1	0.4
12/8/2003 12:45	29432	GC-Water	Phorate	0.05	ug/L	U	0.05	0.2
12/8/2003 12:45	29432	GC-Water	Prometryn	0.15	ug/L	U	0.15	0.6
12/8/2003 12:45	29432	GC-Water	Simazine	0.05	ug/L	U	0.05	0.2
12/8/2003 12:45	29432	Metals-Water	Aluminum	40	ug/L	A	7	28
12/8/2003 12:45	29432	Metals-Water	Arsenic	6	ug/L	U	6	24
12/8/2003 12:45	29432	Metals-Water	Cadmium	0.062	ug/L	I	0.025	0.1
12/8/2003 12:45	29432	Metals-Water	Calcium	22.7	mg/L	A	0.05	0.2
12/8/2003 12:45	29432	Metals-Water	Chromium	3	ug/L	U	3	12
12/8/2003 12:45	29432	Metals-Water	Copper	10.2	ug/L	A	1	4
12/8/2003 12:45	29432	Metals-Water	Iron	90	ug/L	A	15	60
12/8/2003 12:45	29432	Metals-Water	Lead	0.16	ug/L	I	0.05	0.2
12/8/2003 12:45	29432	Metals-Water	Magnesium	7	mg/L	A	0.02	0.08
12/8/2003 12:45	29432	Metals-Water	Nickel	3	ug/L	U	3	12
12/8/2003 12:45	29432	Metals-Water	Selenium	1	ug/L	U	1	4

Date Sampled	Field ID	Analysis Group	Component	Result	Units	Remark	MDL	PQL
12/8/2003 12:45	29432	Metals-Water	Silver	0.098	ug/L	A	0.02	0.08
12/8/2003 12:45	29432	Metals-Water	Zinc	53	ug/L	AJ	4	16
12/8/2003 12:45	29432	Nutrients-Liquid	Ammonia-N	0.02	mg N/L	I	0.01	0.02
12/8/2003 12:45	29432	Nutrients-Liquid	Color	15	PCU		5	5
12/8/2003 12:45	29432	Nutrients-Liquid	NO2NO3-N	18	mg N/L		0.4	1
12/8/2003 12:45	29432	Nutrients-Liquid	N_KJEL_TOT	1.3	mg N/L	J	0.06	0.2
12/8/2003 12:45	29432	Nutrients-Liquid	O-Phosphate-P	2.5	mg P/L		0.04	0.1
12/8/2003 12:45	29432	Nutrients-Liquid	Organic Carbon	5.2	mg C/L	A	1	5
12/8/2003 12:45	29432	Nutrients-Liquid	TSS	5	mg/L	I	4	16
12/8/2003 12:45	29432	Nutrients-Liquid	Total-P	2.5	mg P/L		0.2	0.6
12/8/2003 12:45	29432	Nutrients-Liquid	Turbidity	3	NTU		0.05	0.05
12/8/2003 12:45	29432	Overflow	Oil and Grease	1.2	mg/l	I		
12/8/2003 12:45	29432	VOC-Water	Bromodichloromethane	0.2	ug/L	U	0.2	1
12/8/2003 12:45	29432	VOC-Water	Bromoform	0.2	ug/L	U	0.2	1
12/8/2003 12:45	29432	VOC-Water	Chloroform	4.5	ug/L		0.2	1
12/8/2003 12:45	29432	VOC-Water	Dibromochloromethane	0.2	ug/L	U	0.2	1
12/9/2003 13:22	EFFLUENT	Metals-Water	Aluminum	46	ug/L		7	28
12/9/2003 13:22	EFFLUENT	Metals-Water	Arsenic	6	ug/L	U	6	24
12/9/2003 13:22	EFFLUENT	Metals-Water	Cadmium	0.094	ug/L	I	0.025	0.1
12/9/2003 13:22	EFFLUENT	Metals-Water	Calcium	22	mg/L		0.05	0.2
12/9/2003 13:22	EFFLUENT	Metals-Water	Chromium	8.9	ug/L	I	3	12
12/9/2003 13:22	EFFLUENT	Metals-Water	Copper	12.4	ug/L		1	4
12/9/2003 13:22	EFFLUENT	Metals-Water	Iron	170	ug/L		15	60
12/9/2003 13:22	EFFLUENT	Metals-Water	Lead	0.21	ug/L	I	0.21	0.84
12/9/2003 13:22	EFFLUENT	Metals-Water	Magnesium	6.9	mg/L		0.02	0.08
12/9/2003 13:22	EFFLUENT	Metals-Water	Nickel	28	ug/L		3	12
12/9/2003 13:22	EFFLUENT	Metals-Water	Selenium	1	ug/L	U	1	4
12/9/2003 13:22	EFFLUENT	Metals-Water	Silver	0.1	ug/L		0.02	0.08
12/9/2003 13:22	EFFLUENT	Metals-Water	Zinc	46	ug/L		4	16
12/9/2003 13:22	EFFLUENT	Nutrients-Liquid	Ammonia-N	0.031	mg N/L	A	0.01	0.02
12/9/2003 13:22	EFFLUENT	Nutrients-Liquid	NO2NO3-N	18	mg N/L	A	0.4	1
12/9/2003 13:22	EFFLUENT	Nutrients-Liquid	N_KJEL_TOT	1.3	mg N/L		0.06	0.2
12/9/2003 13:22	EFFLUENT	Nutrients-Liquid	Total-P	2.8	mg P/L		0.1	0.3

Explanation of Field ID's in Appendix 4

Field ID	Site Location
29429	Control Site
29430	Trip Blank
29431	Test Site
29432	Outfall – Effluent grab samples
29296	Outfall – Effluent composite samples

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	**OQ**
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	**1.61**
Hester-Dendy Taxa Richness	6	6.5	9	**11.5**	13	15	17	21.5	26	29	32	**12**
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	**1.1 JA**
Total Ammonia	0.02	0.02	**0.04**	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60	**0.043**
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**	**12**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	**1.51**	**1.7 A**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	**1.37**	**1.7**
Turbidity (NTU)	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30	**ND**

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	**OQ**
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	**2.27**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	**15**	17	21.5	26	29	32	**15**
Dipnet Taxa Richness	9	12	17	20	22	24.5	26	28	**31**	37	53	**31**
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	**1.2 J**
Total Ammonia	0.02	**0.02**	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60	**0.038**
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**	**14**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	**1.51**	**2.1**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	**1.37**	**1.9**
Turbidity (NTU)	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30	**ND**

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. A - Value reported is the mean of two or more determinations. J - Estimated value. O - Sampled, but analysis lost or not performed. Q - Sample held beyond normal holding time.

Appendix 6

Additional physical, chemical, toxicological and microbiological results

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Avon Park Correctional Institute, 10 miles East of State Road 64, Avon Park, Polk County, Avon Park, Florida, NPDES# FL0040029, performed from 9 to 11 December, 2003.

Facility:	**Avon Park Correctional Institute**		**NPDES #:**	**FL0040029**	Facility Type:	**Domestic WWTP**	**Analysts:** Christa Pierini
Location:	10 miles East of State Road 64, Avon Park		Contact/District:	Todd Falkner/SW			Sarah Prichard
County:	Polk		Test type:	static acute screen			Josh Ayres
Sample Collection Date:	12/8/2003	Time: 1245	# tests:	2	Receiving Water:	Class III freshwater	James Daniels
Test Beginning Date:	12/9/2003	Time: 1400	Chlorination Type:	chlorinated		Arbuckle Creek to Kissimmee River	
Test Ending Date:	12/11/2003	Time: 1130	FDEP SOP#:	TA07_01 / 02		**Page 1 of 1**	**Reviewer:** Julie Espy

Organism: ***Ceriodaphnia dubia*** (water flea) Life stage: <24 hours Chamber size: 30 mL [A]Feeding: YCT/Algae Food Batch #: YCT #3/P. sub. #20

	Sample/Diluen	SURVIVAL # Alive			pH			[B]Temperature (C)			Diss. Oxygen (mg/L)			[C]Conductivity	
Concentrations	Volume(mL)	0 hr	24 hr	48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control A	0/20	5	5	5	8.0	-	8.4	24.3	-	24.0	8.1	-	7.4	170	330
Control B	0/20	5	5	5	-	-	8.4	-	-	24.1	-	-	7.4	-	220
Control C	0/20	5	5	5	-	-	8.4	-	-	24.3	-	-	7.2	-	210
Control D	0/20	5	5	5	-	-	8.4	-	-	24.2	-	-	7.3	-	210
100% A	20/0	5	5	5	7.9	-	8.4	24.7	-	24.0	7.3	-	7.4	465	555
100% B	20/0	5	5	5	-	-	8.5	-	-	24.6	-	-	7.3	-	495
100% C	20/0	5	5	5	-	-	8.5	-	-	24.1	-	-	7.4	-	530
100% D	20/0	5	5	5	-	-	8.5	-	-	24.1	-	-	7.4	-	520

[A] Organisms fed prior to testing.
[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
[C] Conductivity value is uncorrected mmhos/cm.
Room Temperature range for the test period was 24.0 - 25.5°C.
Incubator #3 temperature range for the test period was 23.0 - 24.0 °C.
Light Intensity during the test was 50-100 foot candles.
Photoperiod during the test was 16 hours of light : 8 hours of dark.

LIMS	
Job number:	TLH-2003-12-09-16
sample number:	721871

Data Transcription Verification
date: 1/30/04
by: James Daniels/Josh Ayres

Total Residual CL2	mg/L	Method
Field 100% sample:	-	-
Lab 100% sample:	0.01	Hach
Control water (water flea):	0.01	Hach
Control water: (fish):	0.01	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
Control water: (water flea):	<0.017	<0.017
Control water (fish):	<0.017	<0.017
100% Sample:	<0.017	<0.017

Organism: ***Pimephales promelas*** (fish) Life stage: 8 days Chamber size: 1000 mL [D]Feeding: *Artemia* Food Batch #: 0194025G

	Sample/Diluen	SURVIVAL # Alive			pH			[E]Temperature (C)			Diss. Oxygen (mg/L)			[F]Conductivity	
Concentrations	Volume(mL)	0 hr	24 hr	48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control A	0/500	5	5	5	8.1	7.8	8.1	24.1	24.1	25.0	7.8	7.2	7.0	290	320
Control B	0/500	5	5	5	8.1	7.8	8.1	24.0	24.1	24.0	7.9	7.2	7.1	285	325
Control C	0/500	5	5	5	8.1	7.8	8.1	24.0	24.2	24.4	7.9	7.2	7.2	285	340
Control D	0/500	5	5	5	8.1	7.8	8.1	24.0	24.4	24.2	7.9	7.2	7.1	285	340
100% A	500/0	5	5	5	7.9	7.9	8.2	24.9	24.5	24.7	7.9	7.4	7.1	445	530
100% B	500/0	5	5	5	7.9	7.9	8.2	25.1	24.4	25.5	7.4	7.4	7.1	465	560
100 % C	500/0	5	5	5	7.9	8.0	8.2	25.3	24.2	24.4	7.5	7.4	7.0	470	490
100% D	500/0	5	5	5	7.9	8.0	8.2	25.3	24.1	24.7	7.5	7.3	6.9	470	490

[D] Organisms fed prior to testing.
[E] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
[F] Conductivity value is uncorrected mmhos/cm.
Room Temperature range for the test period was 24.0 - 25.5°C.
Incubator #3 temperature range for the test period was 23.0 - 24.0 °C.
Light Intensity during the test was 50-100 foot candles.
Photoperiod during the test was 16 hours of light : 8 hours of dark.

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water: (water flea):	85	94
Control water: (fish)	65	82
100% Sample:	233	114

Mortality	Percent
Control water (water flea):	0%
100% (water flea):	0%
Control water (fish):	0%
100 % (fish):	0%

[G]Salinity	ppt
100% sample:	0
Control water (water flea):	0
Control water (fish):	0

[G] Salinity based on conductivity and temperature.

FL DEP SW Diactrict Chemistry Laboratory Report
Phone # 813-744-6100 DEP CompQAP # 880078 NELAP # E34886

3804 Coconut Palm Dr.
Tampa, FL 33619

Project:	AVON PARK		Type:	DW	Requested by:				
Site		Time	Date	Log	Samplers		RQ#	Notes	
RCC1		1100	12/8/2003	29429	FALKNER		2003-12-08-11		
FIELD BLANK		1145	12/8/2003	29430	FALKNER		2003-12-08-11		
RCT1		1205	12/8/2003	29431	FALKNER		2003-12-08-11		
EFFLUENT		1245	12/8/2003	29432	FALKNER		2003-12-08-11		
EQUIP BLANK		1110	12/8/2003	29442	SQUITIERI		2003-12-08-11		
EFFLUENT		1322	12/8/2003	29443	SQUITIERI		2003-12-08-11		
RCC1		1105	12/15/2003	29455	PILLSBURY, FALKNER		2003-12-08-11	FYI5	
Code	parameter	units	site: RCC1	site: FB	site: RCT1	site: EFFLU	site: EQU BL	site: EFFLU	site: RCC1
29	log#	log	29429	29430	29431	29432	29442	29443	29455
10	water temp.	deg C	16.60D		19.78D	24.18D			15.91D
78	secchi	meters	0.4		0.4				
80	color	Pt-Co							
94	conductivity	umho/cm	374		402	476			104
299	diss.Oxygen	mg/l	5.49D		5.96D	8.97D			6.71D
301	diss.Oxygen	%	56.9		65.4	107.1			67.8
310	bod5	mg/l	2U	2U	2U	2.1			
314	cbod5	mg/l	2U	2U	2U	2U	2U	2U	
406	pH	units	7.24		7.35	7.8			7
410	alkalinity	mg/l							
480	salinity	0/00	0.17D		0.19D	0.23D			.05D
530	tss	mg/l							
4192	sample depth	meters	0.2		0.2	0.2			0.2
31501	f-coliforms	#/100ml							840BL
31616	f-coliforms	#/100ml	1350B	1K	1070B	810B			830BL
82079	turbidity	NTU							
82903	total depth	meters	1		0.8				

A denotes mean, B counts unacceptable, J estimate, K less than, L greater than, O data lost, Q out of holding time, T value is less than MDL, U not detected, V analyte detected in blank, Y improperly preserved, Z too numerous to count, D field measurement

Results for NELAP accredited tests contained in this report meet the requirements specified for the National Environmental Laboratory Accreditation Program. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published test performance acceptance criteria.

3904 Coconut Palm Dr.
Tampa, FL 33619

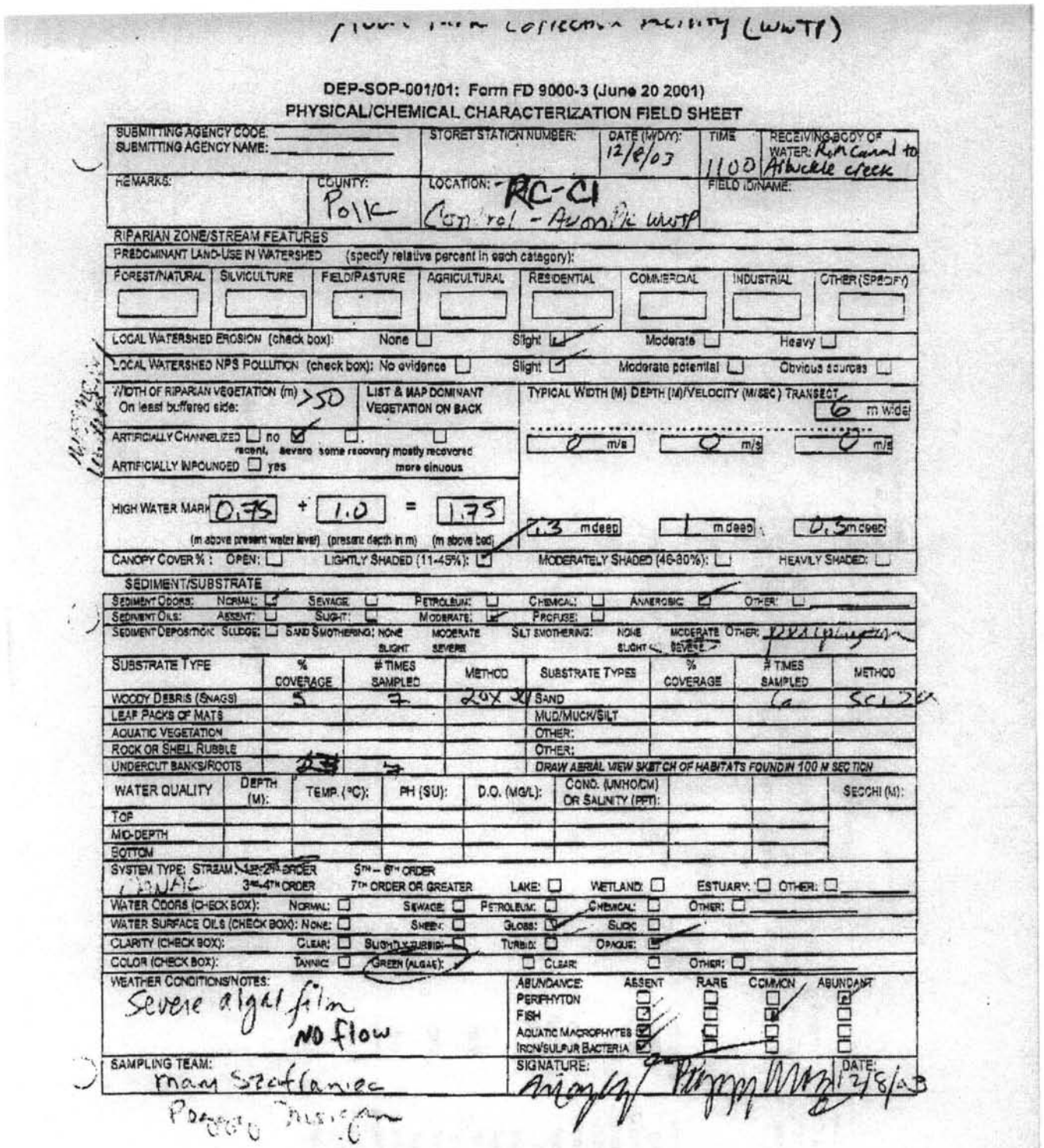
Project:		Type:		Requested by:		
Site	Time	Date	Log	Samplers	BQ#	Notes
RCT1	1120	12/15/2003	29456	PILLSBURY, FALKNER	2003-12-08-11	FYI5
EFFLUENT	1130	12/15/2003	29457	PILLSBURY, FALKNER	2003-12-08-11	FYI5
FIELD BLANK	1140	12/15/2003	29458	PILLSBURY, FALKNER	2003-12-08-11	FYI5

parameter	units	site: RCT1	site: EFFLU	site: FB	site:	site:	site:	site:
log#	log	29456	29457	29458				
water temp.	deg C	18.05D	23.95D					
secchi	meters							
color	Pt-Co							
conductivity	umho/cm	175	440					
diss.Oxygen	mg/l	6.76D	9.00D					
diss.Oxygen	%	73.2	106.6					
bod5	mg/l							
cbod5	mg/l							
pH	units	7.01	7.3					
alkalinity	mg/l							
salinity	0/00	.08D	.20D					
tss	mg/l							
sample depth	meters	0.2	0.2					
t-coliforms	#/100ml	1080	60K	1K				
f-coliforms	#/100ml	110BL	1K	1K				
turbidity	NTU							
total depth	meters							

Results for NELAP accredited tests contained

Appendix 7

Habitat Assessment Field Sheets.



Flow from Correction Facility (WWTF)

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

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (MM/DD/YY): 12/8/03	TIME: 1100	RECEIVING BODY OF WATER: Rich Canal to Arbuckle Creek	
REMARKS:	COUNTY: Polk	LOCATION: RC-C1 Control - Avon Park WWTP		FIELD ID/NAME:	

RIPARIAN ZONE/STREAM FEATURES

PREDOMINANT LAND-USE IN WATERSHED (specify relative percent in each category):

FOREST/NATURAL	SILVICULTURE	FIELD/PASTURE	AGRICULTURAL	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	OTHER (SPECIFY)

LOCAL WATERSHED EROSION (check box): None ☐ Slight ☑ Moderate ☐ Heavy ☐

LOCAL WATERSHED NPS POLLUTION (check box): No evidence ☐ Slight ☑ Moderate potential ☐ Obvious sources ☐

WIDTH OF RIPARIAN VEGETATION (m) On least buffered side: >50

LIST & MAP DOMINANT VEGETATION ON BACK

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

0 m/s | 0 m/s | 0 m/s

ARTIFICIALLY CHANNELIZED ☐ no ☑ recent, severe ☐ some recovery ☐ mostly recovered ☐ more sinuous

ARTIFICIALLY IMPOUNDED ☐ yes

HIGH WATER MARK: 0.75 + 1.0 = 1.75 (m above present water level) + (present depth in m) = (m above bed)

1.3 m deep | 1 m deep | 0.5 m deep

CANOPY COVER %: OPEN: ☐ LIGHTLY SHADED (11-45%): ☑ MODERATELY SHADED (46-80%): ☐ HEAVILY SHADED: ☐

SEDIMENT/SUBSTRATE

SEDIMENT ODORS: NORMAL: ☑ SEWAGE: ☐ PETROLEUM: ☐ CHEMICAL: ☐ ANAEROBIC: ☑ OTHER: ☐

SEDIMENT OILS: ABSENT: ☐ SLIGHT: ☐ MODERATE: ☑ PROFUSE: ☐

SEDIMENT DEPOSITION: SLUDGE: ☐ SAND SMOTHERING: NONE SLIGHT MODERATE SEVERE SILT SMOTHERING: NONE SLIGHT MODERATE SEVERE OTHER: Phosphogypsum

SUBSTRATE TYPE	% COVERAGE	# TIMES SAMPLED	METHOD	SUBSTRATE TYPES	% COVERAGE	# TIMES SAMPLED	METHOD
WOODY DEBRIS (SNAGS)	5	2	20X 2	SAND		6	SCI 2
LEAF PACKS OF MATS				MUD/MUCK/SILT			
AQUATIC VEGETATION				OTHER:			
ROCK OR SHELL RUBBLE				OTHER:			
UNDERCUT BANKS/ROOTS	25	2		DRAW AERIAL VIEW SKETCH OF HABITATS FOUND IN 100 M SECTION			

WATER QUALITY	DEPTH (M):	TEMP. (°C):	PH (SU):	D.O. (MG/L):	COND. (UMHO/CM) OR SALINITY (PPT):			SECCHI (M):
TOP								
MID-DEPTH								
BOTTOM								

SYSTEM TYPE: STREAM: 1ST-2ND ORDER ☐ 3RD-4TH ORDER ☐ 5TH – 6TH ORDER ☐ 7TH ORDER OR GREATER ☐ LAKE: ☐ WETLAND: ☐ ESTUARY: ☐ OTHER: ☐

CANAL

WATER ODORS (CHECK BOX): NORMAL: ☐ SEWAGE: ☐ PETROLEUM: ☐ CHEMICAL: ☐ OTHER: ☐

WATER SURFACE OILS (CHECK BOX): NONE: ☐ SHEEN: ☐ GLOBS: ☐ SLICK: ☐

CLARITY (CHECK BOX): CLEAR: ☐ SLIGHTLY TURBID: ☐ TURBID: ☐ OPAQUE: ☑

COLOR (CHECK BOX): TANNIC: ☐ GREEN (ALGAE): ☑ CLEAR: ☐ OTHER: ☐

WEATHER CONDITIONS/NOTES: Severe algal film NO flow

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

SAMPLING TEAM: Mary Stauffacher Pamela Mulligan

SIGNATURE: Mary Stauffacher Pamela Mulligan DATE: 12/8/03

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

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

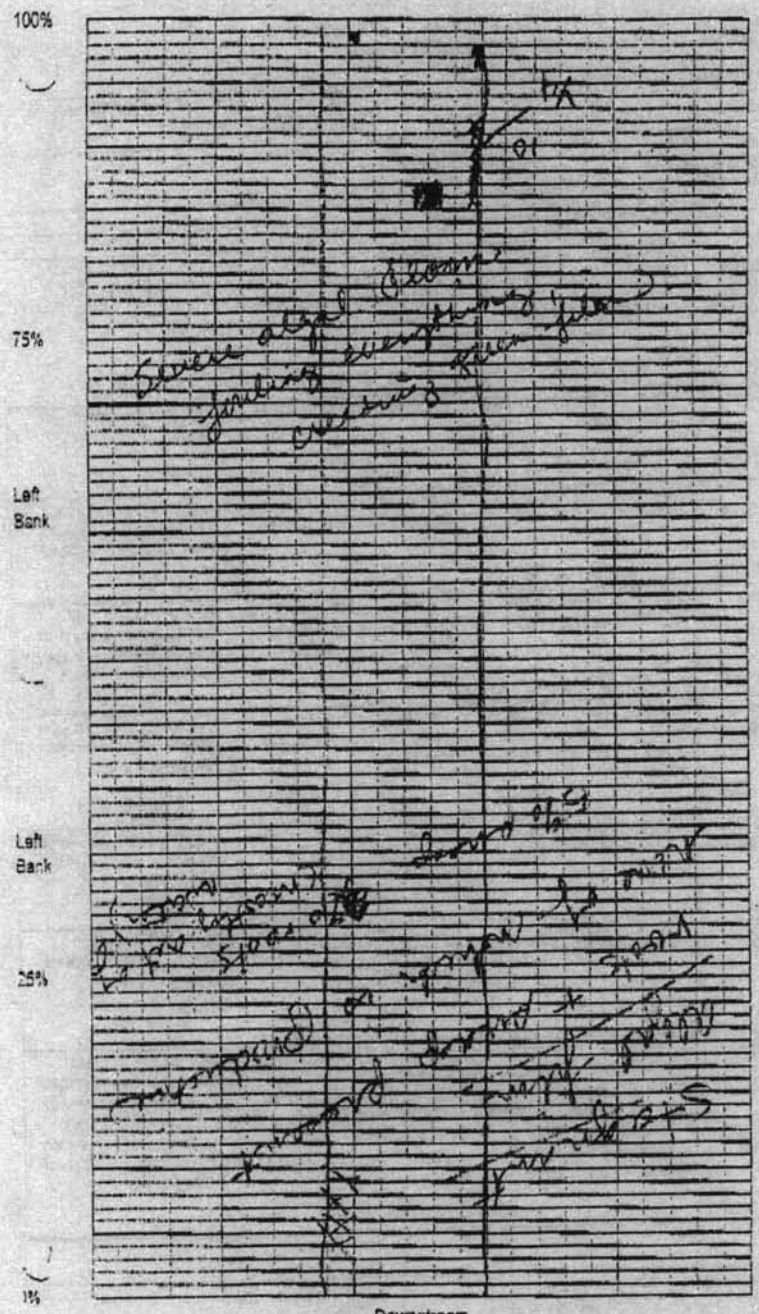
SUBMITTING AGENCY CODE: SUBMITTING AGENCY NAME:		STORET STATION NUMBER:	DATE mm/dd/yy:	RECEIVING BODY OF WATER: Rim Canal / Arbuckle Creek
REMARKS:	COUNTY: Polk	LOCATION: AC-01 Avon Park Airport Control		FIELD ID/NAME:

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components Substrate Diversity 6	Four or more productive habitats present [snags, tree roots/undercut banks, aquatic vegetation, leaf packs (partially decayed), rock] 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags) 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed 10 9 8 7 6	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered 5 4 3 2 1
Substrate Availability 7	Greater than 30% productive habitat present at site 20 19 18 17 16	16% to 30% productive habitat, by aerial extent 15 14 13 12 11	6% to 15% productive habitat 10 9 8 7 6	Less than 5% productive habitat 5 4 3 2 1
Water Velocity 1	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 pools occurring: > 1 m/sec 5 4 3 2 1
Habitat Smothering 2 Primary Score 16	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 peripheral 5 4 3 2 1
Secondary Habitat Components Artificial Channelization 5	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 > 50% 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 8 Left Bank 8	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 (50%-60%) 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 6 Left Bank 6 Secondary Score 53	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	60% 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 60% 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

69 TOTAL SCORE

ANALYSIS DATE:	ANALYST:	SIGNATURE:
12-8-03	Mary Szafraniec Peggy Morgan	Peggy Morgan

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).



Substrates: Code key, draw proportionate habitat abundance.

- [x] 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:

T= 6:00
beauty berry
exotic red berry
Cocoa
pines
RC-C1 12/8/03

Avon Park Correctional Facility (WWTP)

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

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (MO/DY): 12-8-03	TIME: 1200	RECEIVING BODY OF WATER: Ridge canal to Arbuckle creek
REMARKS:	COUNTY: Polk	LOCATION: RCTest+1 RCT1	FIELD ID/NAME:	

RIPARIAN ZONE/STREAM FEATURES

PREDOMINANT LAND-USE IN WATERSHED (specify relative percent in each category):

FOREST/NATURAL	SILVICULTURE	FIELD/PASTURE	AGRICULTURAL	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	OTHER (SPECIFY)
						✓	

LOCAL WATERSHED EROSION (check box): None ☐ Slight ☑ Moderate ☐ Heavy ☐

LOCAL WATERSHED NPS POLLUTION (check box): No evidence ☐ Slight ☐ Moderate potential ☐ Obvious sources ☑

WIDTH OF RIPARIAN VEGETATION (m) On least buffered side: 8

LIST & MAP DOMINANT VEGETATION ON BACK

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

ARTIFICIALLY IMPOUNDED ☑ yes ☐ more sinuous

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

m/s | m/s | m/s

0 flow

HIGH WATER MARK: 0.5 + 0.6 = 1.1 (m above present water level) + (present depth in m) = (m above bed)

0.3 m deep | 0.0 m deep | 0.5 m deep

CANOPY COVER %: OPEN: ☐ LIGHTLY SHADED (11-45%): ☐ MODERATELY SHADED (46-80%): ☑ HEAVILY SHADED: ☐

SEDIMENT/SUBSTRATE

SEDIMENT ODORS: NORMAL: ☑ SEWAGE: ☐ PETROLEUM: ☐ CHEMICAL: ☐ ANAEROBIC: ☐ OTHER: ☐

SEDIMENT OILS: ABSENT: ☐ SLIGHT: ☐ MODERATE: ☐ PROFUSE: ☐

SEDIMENT DEPOSITION: SLUDGE: ☐ SAND SMOTHERING: NONE 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)		6	SC1	SAND		6	SC1
LEAF PACKS OR MATS				MUD/MUCK/SILT			
AQUATIC VEGETATION				OTHER:			
ROCK OR SHELL RUBBLE				OTHER:			
UNDERCUT BANKS/ROOTS		3	SC1	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		see	chem	data	sheet			
MID-DEPTH								
BOTTOM								

SYSTEM TYPE: STREAM: 1ST-2ND ORDER ☐ 3RD-4TH ORDER ☐ 5TH – 6TH ORDER ☐ 7TH ORDER OR GREATER ☐ LAKE: ☐ WETLAND: ☐ ESTUARY: ☐ OTHER: canal

WATER ODORS (CHECK BOX): NORMAL: ☑ SEWAGE: ☐ PETROLEUM: ☐ CHEMICAL: ☐ OTHER: ☐

WATER SURFACE OILS (CHECK BOX): NONE: ☑ SHEEN: ☐ GLOBS: ☐ SLICK: ☐

CLARITY (CHECK BOX): CLEAR: ☐ SLIGHTLY TURBID: ☐ TURBID: ☐ OPAQUE: ☑

COLOR (CHECK BOX): TANNIC: ☐ GREEN (ALGAE): ☐ CLEAR: ☐ OTHER: ☐

WEATHER CONDITIONS/NOTES: NO flow.

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

SAMPLING TEAM: Mary Stefaniec, Peggy Morgan

SIGNATURE: Mary Stefaniec, Peggy Morgan

DATE: 12-8-03

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

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

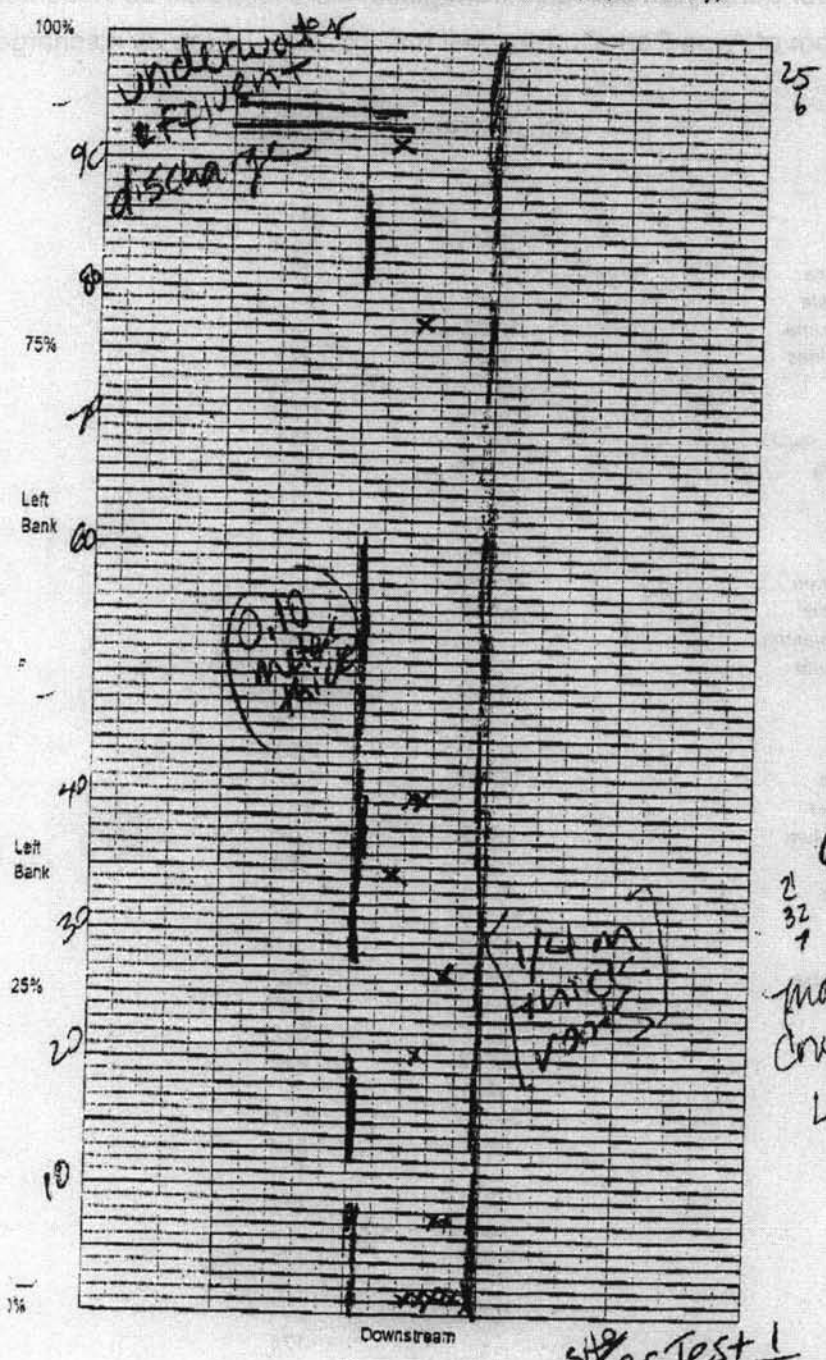
SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (mm/dd/yy): 12-9-03	RECEIVING BODY OF WATER: Rim Can to Arbuckle Creek
REMARKS:	COUNTY: POLK	LOCATION: RC Test 1 RCT1	FIELD ID/NAME:

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components Substrate Diversity 8	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 8	Greater than 30% productive habitat present at site 20 19 18 17 16	18% to 30% productive habitat, by areal 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 1	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 space occurring: > 1 m/sec 5 4 3 2 1
Habitat Smothering 7 Primary Score 24	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 3	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 9 Left Bank 9	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12 to 18 m 8 7 6	Width of native vegetation 6 to 12 m, human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 7 Left Bank 7 Secondary Score 54	Over 60% 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 60% 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

Esm 77 78 TOTAL SCORE

ANALYSIS DATE:	ANALYST:	SIGNATURE:
12-8-03	Mary Scarbrough Peggy Morgan	Mary Scarbrough Peggy Morgan

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).



Substrates: Code key, draw proportionate habitat abundance.

- [x] Snags 8 (27%)
- [ ] Roots/undercut banks 31 (7%)
- [ ] Leaf Packs (or mats)
- [ ] Macrophytes
- [ ] total = 97%
- [ ] _____
- [ ] _____

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:

6m across

more habitat at downstream site.
Less algal bloom

12-8-03

Avon Park site RC Test 1 May 4

Appendix 8a

Taxa list and density (number/cm^2) for periphyton collected from glass microscope slides incubated for 28 days upstream and downstream of Avon Park Correctional Institute WWTP facility discharge, 12/8/03.

	Control Site	Test Site
Bacillariophyta		
Achnanthes sp.	-	342
Achnanthes exigua	16,525	7,516
Achnanthes hungarica	-	171
Achnanthes lanceolata	1,271	-
Achnanthes minutissima	1,271	-
Achnanthes rupestoides	8,898	171
Bacillariophyceae	3,813	1,879
Brachysira vitrea	12,711	1,196
Capartogramma crucicula	3,813	171
Cocconeis placentula	16,525	683
Cyclotella sp.	1,271	171
Cymbella aspera	1,271	171
Cymbellaceae	3,813	-
Diadesmis confervacea	26,694	-
Encyonema neogracile	5,085	-
Encyonema neomesianum	-	342
Encyonema silesiacum	1,271	-
Eunotia sp.	76,269	19,643
Frustulia sp.	6,356	171
Gomphonema sp.	16,525	2,904
Gomphonema augur	13,983	3,075
Gomphonema gracile	-	512
Gomphonema parvulum	3,813	1,025
Hippodonta sp.	1,271	854
Hippodonta capitata	1,271	-
Melosira sp.	38,134	-
Navicula sp.	5,085	1,879
Navicula cryptocephala	3,813	512
Navicula minima	6,356	1,879
Navicula radiosa	19,067	342
Naviculaceae	2,542	512
Neidium sp.	1,271	-
Nitzschia sp.	30,507	2,221
Nitzschia amphibia	1,271	512
Nitzschia frustulum	-	171
Nitzschia nana	1,271	171
Pinnularia sp.	8,898	171
Synedra ulna	7,627	171
Chlorophycota		
Characium sp.	1,271	-
Chlorella sp.	-	171
Mougeotia sp.	2,542	-
Oedogonium sp.	1,271	512
Planktosphaeria sp.	1,271	-
Scenedesmus bijuga	1,271	-
Scenedesmus quadricauda	3,813	-
Selenastrum sp.	3,813	-
Stigeoclonium sp.	6,356	171
Ulothrix sp.	-	171
Cyanophycota		
Jaaginema sp.	5,085	512
Oscillatoria acutissima	3,813	512
Oscillatoria tenuis	3,813	-
Planktothrix sp.	1,271	171

Appendix 8b

Taxa list and number of individuals counted for periphyton collected from glass microscope slides incubated for 28 days upstream and downstream of Avon Park Correctional Institute WWTP facility discharge, 12/8/03.

	Control Site	Test Site
Bacillariophyta		
Achnanthes sp.	-	2
Achnanthes exigua	13	44
Achnanthes hungarica	-	1
Achnanthes lanceolata	1	-
Achnanthes minutissima	1	-
Achnanthes rupestoides	7	1
Bacillariophyceae	3	11
Brachysira vitrea	10	7
Capartogramma crucicula	3	1
Cocconeis placentula	13	4
Cyclotella sp.	1	1
Cymbella aspera	1	1
Cymbellaceae	3	-
Diadesmis confervacea	21	-
Encyonema neogracile	4	-
Encyonema neomesianum	-	2
Encyonema silesiacum	1	-
Eunotia sp.	60	115
Frustulia sp.	5	1
Gomphonema sp.	13	17
Gomphonema augur	11	18
Gomphonema gracile	-	3
Gomphonema parvulum	3	6
Hippodonta sp.	1	5
Hippodonta capitata	1	-
Melosira sp.	30	-
Navicula sp.	4	11
Navicula cryptocephala	3	3
Navicula minima	5	11
Navicula radiosa	15	2
Naviculaceae	2	3
Neidium sp.	1	-
Nitzschia sp.	24	13
Nitzschia amphibia	1	3
Nitzschia frustulum	-	1
Nitzschia nana	1	1
Pinnularia sp.	7	1
Synedra ulna	6	1
Chlorophycota		
Characium sp.	1	-
Chlorella sp.	-	1
Mougeotia sp.	2	-
Oedogonium sp.	1	3
Planktosphaeria sp.	1	-
Scenedesmus bijuga	1	-
Scenedesmus quadricauda	3	-
Selenastrum sp.	3	-
Stigeoclonium sp.	5	1
Ulothrix sp.	-	1
Cyanophycota		
Jaaginema sp.	4	3
Oscillatoria acutissima	3	3
Oscillatoria tenuis	3	-
Planktothrix sp.	1	1

Appendix 9a

Benthic macroinvertebrates collected from Hester-Dendy artificial substrates incubated upstream and downstream of the Avon Park Correctional Institute WWTP facility for 28 days (12/8/03). Taxa collected and density (average number of individuals/m^2) rounded to the nearest individual (n = 3 samples). See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

	Control Site	Test Site
Arthropoda		
Crustacea		
Amphipoda		
Hyalella azteca	3	-
Insecta		
Diptera		
Ablabesmyia mallochi	5	-
Chironomus sp.	16	52
Dicrotendipes modestus	-	3
Dicrotendipes simpsoni	143	273
Glyptotendipes sp.	3	8
Kiefferulus sp.	400	69
Microtendipes pedellus grp.	-	8
Parachironomus carinatus	-	14
Polypedilum beckae	3	3
Tanytarsus limneticus	-	3
Tanytarsus sp. e epler	-	3
Tanytarsus sp. l epler	5	3
Tanytarsus sp. t epler	5	-
Tribelos fuscicornis	22	146
Zavreliella marmorata	-	3
Ephemeroptera		
Caenis sp.	5	3
Trichoptera		
Cernotina sp.	-	5
Mollusca		
Gastropoda		
Ferrissia sp.	8	-

Appendix 9b

Benthic macroinvertebrates collected from Hester-Dendy artificial substrates incubated upstream and downstream of the Avon Park Correctional Institute WWTP facility for 28 days (12/8/03). Taxa collected and total number of individuals counted (n = 3 samples).

	Control Site	Test Site
Arthropoda		
Crustacea		
Amphipoda		
Hyalella azteca	1	-
Insecta		
Diptera		
Ablabesmyia mallochi	2	-
Chironomidae	8	9
Chironomus sp.	6	19
Dicrotendipes sp.	5	5
Dicrotendipes modestus	-	1
Dicrotendipes simpsoni	47	94
Glyptotendipes sp.	1	3
Kiefferulus sp.	146	25
Microtendipes pedellus grp.	-	3
Parachironomus carinatus	-	5
Polypedilum beckae	1	1
Tanytarsus limneticus	-	1
Tanytarsus sp. E Epler	-	1
Tanytarsus sp. L Epler	2	1
Tanytarsus sp. T Epler	2	-
Tribelos fuscicornis	8	53
Zavreliella marmorata	-	1
Ephemeroptera		
Caenis sp.	2	1
Trichoptera		
Cernotina sp.	-	2
Mollusca		
Gastropoda		
Ancylidae	2	-
Ferrissia sp.	1	-

Appendix 10a

Qualitative benthic macroinvertebrate collections (n = 20 discrete dipnet sweeps) upstream and downstream of Avon Park Correctional Institute WWTP facility (12/8/03). 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		
Aulodrilus pigueti	2	-
Bratislavia unidentata	-	1
Dero digitata complex	4	3
Dero furcata	-	1
Dero pectinata	2	-
Limnodrilus sp.	-	5
Arthropoda		
Arachnida		
Acariformes		
Geayia sp.	2	-
Neumania sp.	2	-
Piona sp.	2	-
Crustacea		
Amphipoda		
Hyalella azteca	2	10
Insecta		
Coleoptera		
Dubiraphia vittata	46	6
Diptera		
Ablabesmyia mallochi	2	-
Ablabesmyia rhamphe grp.	2	-
Chaoborus sp.	-	1
Chironomus sp.	2	4
Dicrotendipes modestus	10	-
Dicrotendipes simpsoni	16	4
Goeldichironomus carus	2	-
Goeldichironomus holoprasinus	-	1
Kiefferulus sp.	-	1
Labrundinia johannseni	-	1
Microtendipes pedellus grp.	2	4
Parachironomus supparilis	4	1
Paratanytarsus sp.	-	1
Polypedilum beckae	-	1
Polypedilum halterale grp.	4	1
Polypedilum illinoense grp.	4	9
Polypedilum tritum	8	5
Stenochironomus sp.	2	1
Tanytarsus sp. L Epler	2	2
Tanytarsus sp. T Epler	4	1
Tribelos fuscicornis	4	2
Zavreliella marmorata	-	1
Ephemeroptera		
Caenis sp.	50	29

(continued on next page)

Appendix 10a (continued)

	Control Site	Test Site
Odonata		
Enallagma sp.	8	4
Epicordulia princeps regina	4	-
Libellulidae	-	1
Mollusca		
Bivalvia		
Undetermined Bivalvia	-	1
Gastropoda		
Ancylidae	2	2
Physa sp.	2	-
Planorbidae	8	1
Platyhelminthes		
Undetermined Platyhelminthes	-	3

Appendix 10b

Qualitative benthic macroinvertebrate collections (n = 20 discrete dipnet sweeps) upstream and downstream of Avon Park Correctional Institute WWTP facility (12/8/03). Taxa list and number of individuals counted.

	Control Site	Test Site
Annelida		
Aulodrilus pigueti	1	-
Bratislavia unidentata	-	1
Dero digitata complex	2	2
Dero furcata	-	1
Dero pectinata	1	-
Limnodrilus sp.	-	4
Naididae	-	1
Undetermined Oligochaeta	-	1
Arthropoda		
Arachnida		
Acariformes		
Geayia sp.	1	-
Neumania sp.	1	-
Piona sp.	1	-
Crustacea		
Amphipoda		
Hyalella azteca	1	10
Insecta		
Coleoptera		
Dubiraphia vittata	23	6
Diptera		
Ablabesmyia mallochi	1	-
Ablabesmyia rhamphe grp.	1	-
Chaoborus sp.	-	1
Chironomidae	1	-
Chironomus sp.	1	4
Dicrotendipes modestus	5	-
Dicrotendipes simpsoni	7	4
Goeldichironomus carus	1	-
Goeldichironomus holoprasinus	-	1
Kiefferulus sp.	-	1
Labrundinia johannseni	-	1
Microtendipes pedellus grp.	1	4
Parachironomus supparilis	2	1
Paratanytarsus sp.	-	1
Polypedilum beckae	-	1
Polypedilum halterale grp.	2	1
Polypedilum illinoense grp.	2	9
Polypedilum tritum	4	5
Stenochironomus sp.	1	1
Tanytarsus sp. L Epler	1	2
Tanytarsus sp. T Epler	2	1
Tribelos sp.	1	-
Tribelos fuscicornis	1	2
Zavreliella marmorata	-	1
Ephemeroptera		
Caenis sp.	25	29

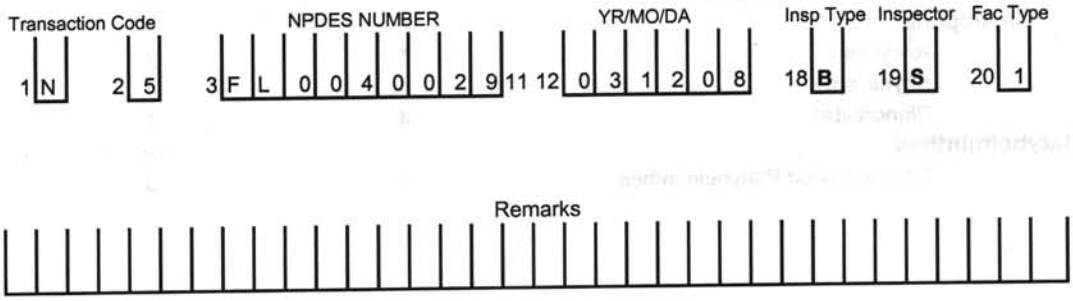
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Appendix 10b (continued)

	Control Site	Test Site
Odonata		
Coenagrionidae	-	3
Enallagma sp.	4	1
Epicordulia princeps regina	1	-
Libellulidae	1	1
Mollusca		
Bivalvia		
Undetermined Bivalvia	-	1
Gastropoda		
Ancylidae	1	2
Physa sp.	1	-
Planorbidae	4	1
Platyhelminthes		
Undetermined Platyhelminthes	-	3

The Bioassay of Avon Park Correctional Institute effluent sampled on December 8, 2003, NPDES #FL0040029.

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



The Priority Pollutants Analysis for Bioassay of Avon Park Correctional Institute effluent sampled on December 8, 2003, NPDES #FL0040029.

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



