

Biological Assessment of

City of Mulberry WWTF

Polk County

NPDES #FL0020338

Sampled January 2004

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:	City of Mulberry WWTP
County:	Polk
NPDES Number:	FL0020338
Permit Expiration:	3/13/2005

Toxics Sampling Inspection **(XSI)**

Date Sampled: January 26, 2004

Results: Effluent metals complied with Class III Fresh Water Quality Criteria (62-302 F.A.C.). The metal aluminum was found in the effluent at a level above the method detection limit (MDL) and below the practical quantitation limit (PQL). Cadmium, copper, iron, lead and zinc were detected in the effluent at levels above their PQLs. The organic pollutant atrazine was detected in the effluent at a level above the MDL but below the PQL. The volatile organic pollutants dibromochloromethane (above the MDL but below the PQL), chloroform and bromodichloromethane (both above the PQL) were detected in the effluent.

Compliance Biomonitoring Inspection **(CBI)**

Date Sampled: January 26, 2004

Results: No toxicity results are available for this inspection. Effluent conductivity, pH and dissolved oxygen complied with Class III Water Quality Criteria (62-302 F.A.C.) and facility permit limits. Total residual chlorine results before and after dechlorination complied with facility permit limits and/or Class III Water Quality Criteria.

Water Quality Inspection **(WQI)**

Date Sampled: January 26, 2004

Results: Fecal and total coliforms were not detected in the effluent. Fecal and total coliforms were detected in the receiving water at levels that did not exceed Class III Water Quality Criteria (62-302.530(6) and (7) F.A.C.). Dissolved oxygen, pH and conductivity at the Test and Control Sites complied with Class III Water Quality Criteria (62-302.530 F.A.C.).

The effluent total nitrogen concentration was 3.5 mg/L and total phosphorus concentration was 3.2 mg/L. If the total nitrogen content of the effluent during this sampling event is typical of the facility's discharge, the facility would exceed the annual average permit limit for total nitrogen (3.0 mg/L). Addition of the effluent to the receiving water increased the concentration of nitrate+nitrite by approximately one-third at the Test Site compared to the Control Site. Total phosphorus was predominantly composed of ortho-phosphate in both the effluent and the receiving water. Total phosphorus levels at the Control Site were higher than those in the effluent; addition of the effluent did not increase the total phosphorus level of the receiving water.

Impact Bioassessment Inspection **(IBI)**

Date Sampled: January 26, 2004

Results: The AGP value from the downstream Test Site (71.2 mg dry weight/L) was almost double the value from the upstream Control Site (41.4 mg dry weight/L), reflecting nutrient inputs from the facility's effluent (AGP of 116 mg dry weight/L). AGP data exceeded the "problem" threshold by a factor of eight at the Control Site before the addition of the facility's effluent, and exceeded this threshold by a factor of 14 after the facility's effluent entered the river at the Test Site. This indicates there is nutrient enrichment related to the Mulberry WWTP discharge in this portion of the Alafia River. Data from periphytometers and dipnet samples did not indicate degradation related to the facility's effluent, but these methods were not designed to detect the effects of eutrophication.

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 City of Mulberry Wastewater Treatment Plant is located in Polk County, Florida (Appendix 1). This facility is a sequencing batch reactor domestic wastewater treatment plant (see Facility Summary in Appendix 2). The design flow of the wastewater system is 0.75 million gallons per day (MGD). The actual mean flow during this survey was 0.333 MGD. The treatment components consist of: three batch reactors of 0.900 million total gallons, one traveling bridge filter with a total area of 280 square feet, two chlorine contact chambers of 30,997 total gallons, a dechlorination system, one sludge digester tank, three sludge drying beds with a total area of 1,624 square feet, and one post aeration tank of 3,830 gallons. This facility is operated to achieve advanced treatment with high-level disinfection prior to discharge. The effluent is discharged into the Class III fresh waters of the North Prong of the Alafia River (introductory information provided by J. Squitieri, 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, the plant has not met the annual and monthly averages and single sample permit limits for total nitrogen, and has had intermittent excursions for total suspended solids, fecal coliforms, total residual chlorine after dechlorination, CBOD and pH (Appendix 2, data from 11/1999 to 1/2004). The City of Mulberry entered into a Consent Order, OGC File Number 02-0508, on April 23, 2003 to resolve the violations of permit limits. The order required the City to construct a headworks structure, implement a pretreatment program and enforce current City ordinances to regulate potential sources of pollutants that may pass through or otherwise interfere with the treatment process. The City was given an interim limit for the annual average Total Nitrogen of 4.0 mg/L, where the permit limit was 3.0 mg/L, through September 30, 2003. At the time of survey the Total Nitrogen limit was 3.0 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 North Prong of the Alafia River 10 m upstream of the outfall) and a test site (located in the North Prong of the Alafia River approximately 30 meters downstream of the outfall). Hester-Dendy blocks were disturbed during their 28-day deployment, preventing the evaluation of the Biological Integrity Criterion. 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: Nahir Cornwell, Lori Pillsbury and Peggy Morgan (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. Both grab and composite effluent samples were collected. Because no equipment blanks were collected with the composite effluent samples, grab results are reported here, where possible. Composite data are given in Appendix 4.
- Effluent metals in the grab sample complied with Class III Water Quality Criteria (FAC 62-302). Aluminum was found in the effluent at a level above the method detection limit (MDL) and below the practical quantitation limit (PQL). Cadmium, copper, iron, lead and zinc were detected in the effluent at levels above their PQLs. The organic pollutant atrazine was detected in the effluent at a level above the MDL but below the PQL (0.062 µg/L, composite sample result). The volatile organic pollutants dibromochloromethane (0.53 µg/L, above the MDL but below the PQL), chloroform (24 µg/L, above the PQL) and bromodichloromethane (4.1µg/L, above the PQL) were detected in the effluent. If values for the three volatile organic pollutants are typical of annual releases, levels comply with the requirements of F.A.C. 62-302.530 (36).
- Effluent conductivity, pH and dissolved oxygen complied with Class III Water Quality Criteria (62-302 F.A.C.) and facility permit limits. Total residual chlorine results before and after dechlorination complied with facility permit limits and/or Class III Water Quality Criteria. Effluent color was 60 Pt-Co, TSS was 2 mg/L and turbidity was 1.0 NTU.
- The effluent samples for toxicity testing were lost by the carrier; therefore the chronic toxicity tests could not be completed.

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

City of Mulberry WWTP	Class III Stds	Effluent Limits	Effluent Grab Sample	Effluent 24-hour composite	Control Site	Test Site
Organic Constituents (µg/L)						
Atrazine	-	-	-	0.062 I	-	-
Bromodichloromethane	≤22 a	-	4.1	-	-	-
Chloroform	≤470.8 a	-	24	-	-	-
Dibromochloromethane	≤34 a	-	0.53 I	-	-	-
Metals (µg/L unless otherwise noted)						
Aluminum	-	-	20 I	16 I	-	-
Arsenic	≤50	-	6 U	6 U	-	-
Cadmium	≤1.8 b	-	0.18	0.56	-	-
Calcium (mg/L)	-	-	49.2	47.1	-	-
Chromium-III	≤141.4 b	-	3 U	3 U	-	-
Copper	≤15.6 b	-	5.6	5.7	-	-
Iron	≤1000	-	98	92	-	-
Lead	≤6.9 b	-	0.93	1	-	-
Magnesium (mg/L)	-	-	14.6	14.2	-	-
Nickel	≤87 b	-	3 U	3 U	-	-
Selenium	≤5	-	1 U	1 U	-	-
Silver	≤0.07	-	0.02 U	0.02 U	-	-
Zinc	≤199.9 b	-	92	96	-	-
Nutrients (mg/L)						
Organic Carbon	-	-	6.4	-	-	-
Ortho-phosphate	-	-	3.4 Q	-	3.6	3.7
Total Phosphorus	-	-	3.2	3.4	4	4
Ammonia	-	-	0.039	0.19	0.061	0.066
Unionized Ammonia	≤0.02	-	≤0.02 c	-	≤0.02 c	≤0.02 c
Nitrate+Nitrite	-	-	2.4	2.5	0.67	0.85
Total Kjeldahl Nitrogen	-	-	1.1	1.5	0.93	0.99
Organic Nitrogen	-	-	1.06 c	1.31 c	0.87 c	0.92 c
Total Nitrogen	-	6.0 s	3.5 c	4.0 c	1.6 c	1.84 c
General Physical and Chemical Parameters						
Habitat Assessment	-	-	-	-	114	102
Temperature (°C)		-	22.4	-	14.3	15.3
pH (SU)	6.0-8.5 s	6.0-8.5 s	7.4	-	7.1	7.1
Dissolved Oxygen (mg/L)	≥5.0 s	5.5 s	10.6	-	8.5	9.3
Conductivity (µmhos/cm)	1275 s	-	989	-	804	820
BOD, 5 day (mg/L)	-	-	2 U	-	2 U	2.1
CBOD, 5 day (mg/L)	-	10.0 s	2.1	2 U	2 U	2 U
Color (Pt-Co)	-	-	60	-	60	60
Turbidity (NTU)	39.2	-	1.0	-	10.2	7.9
Residual Chlorine (mg/L) disinfection		1.0 s	1.91	-	-	-
Residual Chlorine (mg/L) dechlorination		0.01 s	< 0.02	-	-	-
Total Suspended Solids (mg/L)	-	10.0 s	2	2	8	8
Oil and Grease (mg/l)	≤5	-	0.78 I	-	-	-
Flow (MGD)	-	0.75 a	0.333	0.292	-	-
Hardness (mg/L)	-	-	183 c	176.1 c	-	-
Chlorophyll *a* (µg/L)	-	-	-	0.96 U	33 A	0.85 U
Phaeophytin (µg/L)	-	-	-	0.96 U	0 A	0.85 U
Microbiology (# counts/100ml)						
Fecal Coliforms-Membrane Filter	800 s	25 s	1 K	-	85 BK	90 BK
Total Coliforms	2400 s	-	1 K	-	130 BK	160 BK

a - Annual average
b - Value is calculated based on hardness
c - Value is calculated.
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
K - Actual value is known to be less than value given
Q - Sample held beyond normal holding time
U - Material analyzed for but not detected; value reported is the minimum detection limit
s - Single sample

Table 2. Measured and predicted algal growth potential (AGP) for total soluble nitrogen (TSIN) limitation (units of mg dry weight/L)

Location	AGP (measured)	Predicted AGP (TSIN) ± 20%	Inorganic N:P ratio
Effluent Samples (a)	116	92.7 ± 18.5	0.72
Control Site	41.4	27.8 ± 5.6	0.2
Test Site	71.2	34.8 ± 7.0	0.25

(a) Effluent sample is from a 24-hour composite sample.

- Habitat assessment scores were 114 at the Control Site and 102 at the Test Site, indicating suboptimal habitats at both sites (Table 1, data sheets in Appendix 7). The study sites were in an unshaded portion of the Alafia River near commercial and industrial facilities. The upstream Control Site was slightly narrower than the downstream Test Site. There was a concrete bridge structure located downstream of the outfall but upstream of the Test 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.). Turbidity at the Test (7.9 NTU) and Control (10.2 NTU) Sites ranked in the 80th percentile of typical values for Florida streams (Appendix 5), but complied with Class III Water Quality Criteria. Color at both the Test and Control Sites was 60 Pt-Co and TSS was 8 mg/L.
- Fecal and total coliforms were not detected in the effluent. Fecal and total coliforms were detected in the receiving waters at levels that did not exceed Class III Water Quality Criteria (See Table 1 for results and Appendix 6 for laboratory worksheets).
- The effluent total nitrogen concentration was 3.5 mg/L and total phosphorus concentration was 3.2 mg/L (Table 1). The total nitrogen was comprised of approximately two-thirds nitrate+nitrite and one-third total Kjeldahl nitrogen. If the total nitrogen content of the effluent during this sampling event is typical of the facility's discharge, the facility would exceed the annual average permit limit for total nitrogen (3.0 mg/L). Addition of the effluent to the receiving waters increased the concentration of nitrate+nitrite by approximately one-third at the Test Site compared with the Control Site. Test and Control Site levels of ammonia and TKN ranked in the 40th percentile of typical values for Florida streams while nitrate+nitrite levels ranked in the 90th percentile (Appendix 5). Total phosphorus was predominantly composed of ortho-phosphate in both the effluent and the receiving water. Total phosphorus levels upstream at the Control Site were higher than those in the effluent. Test and Control Site levels of ortho-phosphate and total phosphorus were more than double the levels of the 95th percentile of typical values for Florida streams (Appendix 5).
- Algal growth potential (AGP) is a measure of nutrients available for algal growth (Miller *et al.* 1978). Raschke and Shultz (1987) found that AGP above 5.0 mg dry wt/L represent a "problem" threshold for fresh receiving waters, implying nutrient enrichment. The AGP value at the upstream Control Site was 41.4 mg dry wt/L, suggesting that nutrient enrichment upstream of the facility was already high (Table 2). The AGP value at the downstream Test Site (71.2 mg dry wt/L) was almost double the value from upstream Control Site (41.4 mg dry wt/L), reflecting nutrient inputs from the facility's effluent (AGP of 116 mg dry wt/L). This indicates there is nutrient enrichment related to the Mulberry WWTP discharge in this portion of the Alafia River. Given the already high phosphorus loading upstream of the facility, nitrogen inputs from the effluent are of particular concern. There was no evidence of growth inhibition in AGP data (Table 2).
- Chlorophyll *a* was not detected in samples of the effluent or from the Test Site (Table 1). Chlorophyll *a* was detected in the Control Site sample (33 µg/L). Resampling is recommended for evaluation of this parameter. 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 plant production occurs in the form of periphyton or macrophyte production, while phytoplankton production is dominant in lakes (Dodds 2002). Thus it is not necessarily contradictory for ambient nutrient levels to be high and for no chlorophyll to be detected in water samples.

Table 3. Periphyton composition

City of Mulberry WWTP	Control Site	Test Site
Number of Taxa	32	47
Shannon-Weaver Diversity	3.6	4.8
Chlorophyll a (mg/m²)	26	20 A
Phaeophytin (mg/m²)	0 A	0 A
Algal Density (number/cm²)	1,672,570	1,351,174
Percent Dominant Taxon	31.4	12.9
Dominant Taxon (name)	*Achnanthes lanceolata*	*Achnanthes lanceolata*
Number of Algal Units Identified	306	309
Percentage Composition		
Blue-green algae	6.5	3.9
Diatoms	86.6	86.1
Green algae	6.9	10.0

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

- The algal community composition on periphytometers was similar between Control and Test Sites. Diatoms comprised ~85% of the two samples, with small percentages of blue-green and green algae (Table 3, Appendix 8). Periphyton chlorophyll *a* concentration was also similar at the Test (20 mg/m²) and Control (26 mg/m²) Sites, and algal density was high at both sites.
- Qualitative measures of benthic macroinvertebrate assemblages from dipnet samples are summarized in Tables 4 and 5 and in Appendix 9. The Control Site SCI score of 25 placed it in the "Good" category and the Test Site SCI score of 27 placed it in the "Excellent" category. The Stream Condition Index is not designed to detect eutrophication, which is a potentially important environmental effect of facilities with effluents that add nutrients to the Alafia River.

Summary

Effluent metals in the grab sample (aluminum, cadmium, copper, iron, lead and zinc) complied with Class III Water Quality Criteria (FAC 62-302). The organic pollutant atrazine was detected in the effluent. The volatile organic pollutants dibromochloromethane, chloroform and bromodichloromethane were detected in the effluent. If values for the three volatile organic pollutants are typical of annual releases, levels comply with the requirements of F.A.C. 62-302.530 (36). Effluent conductivity, pH, and dissolved oxygen complied with Class III Water Quality Criteria (62-302 F.A.C.) and facility permit limits. Fecal and total coliforms were not detected in the effluent.

The effluent total nitrogen concentration was 3.5 mg/L and total phosphorus concentration was 3.2 mg/L. If the total nitrogen content of the effluent during this sampling event is typical of the facility's discharge, the facility would exceed the annual average permit limit for total nitrogen (3.0 mg/L). Addition of the effluent to the receiving waters increased the concentration of nitrate+nitrite by approximately one-third at the Test Site compared to the Control Site. Phosphorus levels in the Alafia River were elevated above the facility's outfall and the facility's effluent did not change total phosphorus or orthophosphate levels in the receiving water. AGP data indicate there is nutrient enrichment related to the Mulberry WWTP discharge in this portion of the Alafia River. Given the already high phosphorus loading upstream of the facility, nitrogen inputs from the effluent are of particular concern. There were few differences between Test and Control Sites in algal community composition from periphytometers. The Control Site SCI score of 25 placed it in the "Good" category and the Test Site SCI score of 27 placed it in the "Excellent" category; however, the Stream Condition Index is not designed to detect impacts due specifically to eutrophication.

Literature Cited

Barbour, M. T. and J. B. Stribling. 1994. A technique for assessing stream habitat structure. In: Proceedings of Riparian Ecosystems in the Humid United States: Functions and Values. U. S. Dept. Agriculture. 15-18 March 1993, Atlanta, Ga. 22 pp.

Beck, W. M. Jr. 1954. Studies in stream pollution biology 1. A simplified ecological classification of organisms. Quart. J. Fla. Acad. Sci. 17(4): 211-227.

Dodds, W. K. 2002. Freshwater ecology: concepts and environmental applications. Academic Press, New York. 569 pp.

EA Engineering, Science, and Technology and Tetra Tech, Inc. 1994. Bioassessment for the nonpoint source program (draft). Prepared for the Florida Department of Environmental Protection. Unpaginated.

FDEP. 1994. Lake bioassessments for the determination of nonpoint source impairment in Florida. Florida Department of Environmental Protection, Biology Section, Tallahassee, Fla. 73 p.

Magurran, A. E. 1988. Ecological diversity and its measurement. Princeton University Press, Princeton, New Jersey.

Miller, W. E., T. E. Maloney, and J. C. Greene. 1978. The *Selenastrum capricornutum* Printz algal assay bottle test. EPA-600/9-78-018. U. S. EPA, Cincinnati, Ohio. 126 p.

Plafkin, J. L., M. T. Barbour, K. D. Porter, S. K. Gross and R. M. Hughes. 1989. Rapid bioassessment protocols for use in streams and rivers: Benthic macroinvertebrates and fish. U. S. EPA, Office of Water Regulations and Standards, Washington D.C., EPA 440-4-89-001.

Raschke, R. L. and D. A. Schultz. 1987. The use of the algal growth potential test for data assessment. J. Wat. Poll. Cont. Fed. 59(4): 222-227.

Ross, L. T. 1990. Methods for aquatic biology. Florida Department of Environmental Regulation Technical Series 10(1): 1-47.

Sokal, R. R. and F. J. Rohlf. 1995. Biometry, Third edition. W. H. Freeman and Company, New York.

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

Stevenson, R. J. and J. P. Smol. 2003. Use of algae in environmental assessments, pp. 775-803, in: Freshwater algae of North America, edited by J. D. Wehr and R. G. Sheath, Academic Press, San Diego. 918 pp.

Wallace, J. B., J. W. Grubaugh and M. R. Whiles. 1996. Biotic indices and stream ecosystem processes: results from an experimental study. Ecol. Appl. 6(1): 140-151.

USEPA. 2000. Nutrient Criteria Technical Guidance Manual – River and Streams. EPA-822-B-00-002.

USEPA. 2002. Short-term methods for estimating the chronic toxicity of effluents and receiving waters to freshwater organisms. 4th Edition. EPA-821-R-02-013.

Table 4. Macroinvertebrate Dipnet Samples - Qualitative

City of Mulberry WWTP	**Control Site**	**Test Site**
Stream Condition Index (value)	25	27
Stream Condition Index (word)	Good	Excellent
Stream Condition Index Metrics		
Number of Taxa	18	29
Florida Index	7	18
Number of EPT Taxa	5	6
Number of Chironomid Taxa	6	11
Percent Dominant Taxon	22.0	24.3
Percent Diptera	51.4	56.3
Percent Suspension Feeders and Filterers	7.8	5.3
Total Number of Individuals	109	103
Community Composition: Percent of total		
Dominant Taxon (name)	*Cricotopus bicinctus*	*Cricotopus bicinctus*
Dominant Taxon (group)	Diptera	Diptera
Amphipoda	3.7	7.8
Coleoptera	4.6	5.8
Decapoda	1.8	0
Diptera	51.4	56.3
Ephemeroptera	21.1	8.7
Gastropoda	5.5	5.8
Heteroptera	2.8	0
Odonata	0	2.9
Oligochaeta	0	3.9
Plecoptera	0	0
Trichoptera	8.3	6.8
Other	0.9	2.0
Functional Feeding Groups: Percent of total		
Burrowing Deposit Feeders	0	3.9
Predators	6.4	6.8
Surface Deposit Feeders	42.7	45.6
Suspension Feeders and Filterers	7.8	5.3
Scrapers	16.5	10.7
Shredders	24.8	26.7
Other	1.8	0.9

Table 5a. Stream Condition Index Metrics: Peninsula, Winter Index
City of Mulberry WWTP: Control Site

Metric:	Value	5	3	1	Score
Total Number of Taxa	18	≥27	26-14	< 14	3
Number of EPT Taxa	5	≥4	3-2	< 2	5
Number of Chironomid Taxa	6	≥9	8-5	< 5	3
Percent Contribution of Dominant Taxon	22.0	≤30	31-65	> 65	5
Percent Diptera	51.4	-	≤52	> 52	3
Florida Index	7	≥0	9-5	< 5	3
Percent Suspension Feeders and Filterers	7.8	≥5	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 5b. Stream Condition Index Metrics: Peninsula, Winter Index
City of Mulberry WWTF: Test Site

Metric:	Value	5	3	1	Score
Total Number of Taxa	29	≥27	26-14	< 14	5
Number of EPT Taxa	6	≥4	3-2	< 2	5
Number of Chironomid Taxa	11	≥9	8-5	< 5	5
Percent Contribution of Dominant Taxon	24.3	≤30	31-65	> 65	5
Percent Diptera	56.3	-	≤52	> 52	1
Florida Index	18	≥0	9-5	< 5	5
Percent Suspension Feeders and Filterers	5.3	≥5	14-8	< 8	1
Total Score		**Excellent**			**27**
Interpretation of Scores		Excellent			27-33
		Good			21-26
		Poor			14-20
		Very Poor			7-13

Appendices

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

Appendix 1

City of Mulberry WWTP FL#0020338

Polk County

City of Mulberry WWTP Location Map



STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENT PROECTION
FACILITY

Facility name: City of Mulberry WWTP

Date of Summary: Dec. 30, 2003
Updated April 13, 2004

Location (detailed ARC view map attached):
500 Southwest Second Street
Mulberry, FL 33860
N 27°53'35.39" W 081°58'41.84"

County: Polk

District: SWD

NPDES Permit: FL0020338

State GMS # and
State expiration date: 03/13/2005

Facility Type: Domestic Waste

Function of facility: The facility is a 0.750 MGD Annual Average Daily Flow (AADF) Sequencing Batch Reactor domestic wastewater plant.

Description of treatment process: The treatment components consist of: three (3) batch reactors of 0.900 million total gallons, one (1) traveling bridge filter with a total of 280 SF, two chlorine contact chambers of 30,997 total gallons, a dechlorination system, one (1) sludge digester tank of 451,126 total gallons, three sludge drying beds with a total of 1,624 SF, and one (1) post aeration tank of 3,830 gallons. This facility is operated to achieve advanced treatment with high-level disinfection prior to discharge.

Receiving waters: North Prong of the Alafia River

Classification of water: III Freshwater

Design Flow: 0.75 MGD

Discharge is: Batch (during recon discharge began at 1100)

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

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

Parameter	Annual Average	Monthly Average	Weekly Average	Single Sample
Flow	.75			
CBOD	5.0	6.25		10.0
TSS	5.0	6.25		10.0
PH				6.0-8.5
Fecal Coliform	*			
TRC-disinfection				1.0
TRC-dechlorination				.01
Total Nitrogen	3.0	3.75		6.0
DO				5.5

- *Any one sample shall not exceed 25 fecal coliform values per 100 ml. of sample. Any one sample shall not exceed 5.0 mg/L of total suspended solids (TSS) at a point before application of the disinfectant.
- The Consent Order allows for an interim limit of 4.0 mg/L of TN until September 30, 2003.

The City of Mulberry entered into a Consent Order, OGC File Number 02-0508, on April 23, 2003 to resolve the exceedances of the permit limits. The order required the City to construct a headworks structure, implement a pretreatment program and enforce current City ordinances to regulate potential sources of pollutants that may pass through or otherwise interfere with the treatment process. The City was given an interim limit for the annual average Total Nitrogen of 4.0 mg/L, where the permit limit is 3.0 mg/L, through September 30, 2003.

Description of permitted outfall(s):
Outfall D001 discharges into the North Prong of the Alafia River upstream of the bridge at Kiddschool Road. The permit states that the outfall discharges at a depth of approximately two feet, however, at time of recon water levels were very low and outfall was above surface of river.

List permit violations (form DMR data or other sources) and plant upsets that occurred within past year:
This facility is not meeting the annual and monthly averages and single sample permit limits of total nitrogen, and has had intermittent excursions for total suspended solids, fecal coliform, total residual chlorine after dechlorination, CBOD and pH. The table below shows the permit excursions for these parameters. The Department and the City entered into a consent order on April 28, 2003 to resolve the past effluent excursions. The order requires the City to install a new headworks, implement an industrial pretreatment program and provides an interim limit of 4.0 mg/L for TN on an annual average until September 30, 2003.

ATTACHMENT I

CITY OF MULBERRY - SYNOPSIS OF EFFLUENT VIOLATIONS

(see below)

Month/ Year	Total N An. Avg. 3 mg/L	Total N Mo. Avg. 3.75 mg/L	Total N Max. 6.0 mg/L	TSS Max. 5.0 mg/L	Fecal Coli. Mo. Avg. <1 #/100ml	Fecal Coli. Max. 25 #/100ml	Residual Cl2 Max. 0.01 mg/L	CBOD Max. 10.0 mg/L	pH Range 6.0 – 8.5 SU
12/02	3.05					28			
11/02	3.22								
10/02	No data								
9/02	3.49								
8/02	4.06				1				
7/02	4.13								
6/02	4.07			6.0					
5/02	4.42								
4/02	4.5								
3/02	4.6								
2/02	4.9	8.12	11.5, 7.39, 9.6						
1/02	4.57	5.1	6.48						
12/01	4.43								
11/01	No data			6.89					
10/01	4.6	4.87	7.43, 6.4		1				
9/01	4.06	8.8	13.3, 10.1, 6.6		1		0.05		
8/01	4.06			5.6	3				
7/01	4.04								
6/01	4.04	6.8	11.93, 7.48						
5/01	3.77				1	82			5.6, 5.9
4/01	3.76				7				
3/01	3.72	6.61	11.9, 8.8, 8.75						
2/01	3.44	4.14	7.31						
1/01	3.39								
12/00	3.33								
11/00	3.39								
10/00	3.52	4.53							
9/00	3.35								
8/00	3.34								
7/00	3.23	4.33	7.37, 6.58	32, 17					
6/00	3.23								
5/00	3.16						1.3		4.0
4/00	3.15			12				12.8	
3/00	3.17								
2/00	3.17			9		112, 79		10.3	
1/00	3.15								
12/99	3.08	3.96							
11/99	3.05	5.27	9.02, 8.6						

DMR Summary Results

01/01/2003 to 02/29/2004

Permit Number: FL0020338

Facility Name: MULBERRY STP

Outfall Indicator: 001-1

Monitoring Location Code: 1

Parameter Code	Description	Limit	Limit Effective Dates	Stat Base	Units	AVG	MAX	MIN
P 00300	OXYGEN, DISSOLVED (DO)	5.5	3/1/2000 to 2/28/2005	DAILY MN	MG/L	5.5	5.5	5.5
P 00300	OXYGEN, DISSOLVED (DO)	DELMON	3/1/2000 to 2/28/2005		MG/L	5.5	5.5	5.5
P 00400	PH	8.5	3/1/2000 to 2/28/2005	MAXIMUM	SU	7.4167	8.1	7
P 00400	PH	6	3/1/2000 to 2/28/2005	MINIMUM	SU	6.4417	6.7	6
P 00530	SOLIDS, TOTAL SUSPENDED	10	3/1/2000 to 2/28/2005	MAXIMUM	MG/L	1.985	2.9	1.11
P 00530	SOLIDS, TOTAL SUSPENDED	6.25	3/1/2000 to 2/28/2005	MO AVG	MG/L	0.645	1.53	0
P 00600	NITROGEN, TOTAL (AS N)	3.75	1/1/2003 to 2/28/2005	MO AVG	MG/L	2.4479	5.21	1.4
P 00600	NITROGEN, TOTAL (AS N)	6	1/1/2003 to 2/28/2005	SINGSAMP	MG/L	3.2964	5.97	1.6
P 00610	NITROGEN, AMMONIA TOTAL (AS N)	DELMON	3/1/2000 to 2/28/2005			4.4519	23.6	1.46
P 50050	FLOW	ADDMON	3/1/2000 to 2/28/2005	MO AVG	MGD	0.4828	0.777	0.344
P 50050	FLOW	ADDMON	3/1/2000 to 2/28/2005	MO TOTAL	MGD	0.5073	0.662	0.372
P 50060	CHLORINE, TOTAL RESIDUAL	0.01	3/1/2000 to 2/28/2005	DAILY MX	MG/L	0.0021	0.01	0
P 74055	COLIFORM, FECAL GENERAL	0	3/1/2000 to 2/28/2005	75TH %	#/ 100ML	0	0	0
P 74055	COLIFORM, FECAL GENERAL	25	3/1/2000 to 2/28/2005	MAXIMUM	#/ 100ML	3	3	3
P 80082	BOD, CARBONACEOUS 05 DAY, 20C	10	3/1/2000 to 2/28/2005	MAXIMUM	MG/L	3.0157	5	2.11
P 80082	BOD, CARBONACEOUS 05 DAY, 20C	6.25	3/1/2000 to 2/28/2005	MO AVG	MG/L	0.3	2.1	0

Outfall Indicator: 001-1

Monitoring Location Code: A

Parameter Code	Description	Limit	Limit Effective Dates	Stat Base	Units	AVG	MAX	MIN
P 50060	CHLORINE, TOTAL RESIDUAL	1	3/1/2000 to 2/28/2005	MINIMUM	MG/L	1.0347	1.2	1

Outfall Indicator: 001-1

Monitoring Location Code: B

Parameter Code	Description	Limit	Limit Effective Dates	Stat Base	Units	AVG	MAX	MIN
P 00530	SOLIDS, TOTAL SUSPENDED	5	3/1/2000 to 2/28/2005	MAXIMUM	MG/L	2.0957	4.44	1

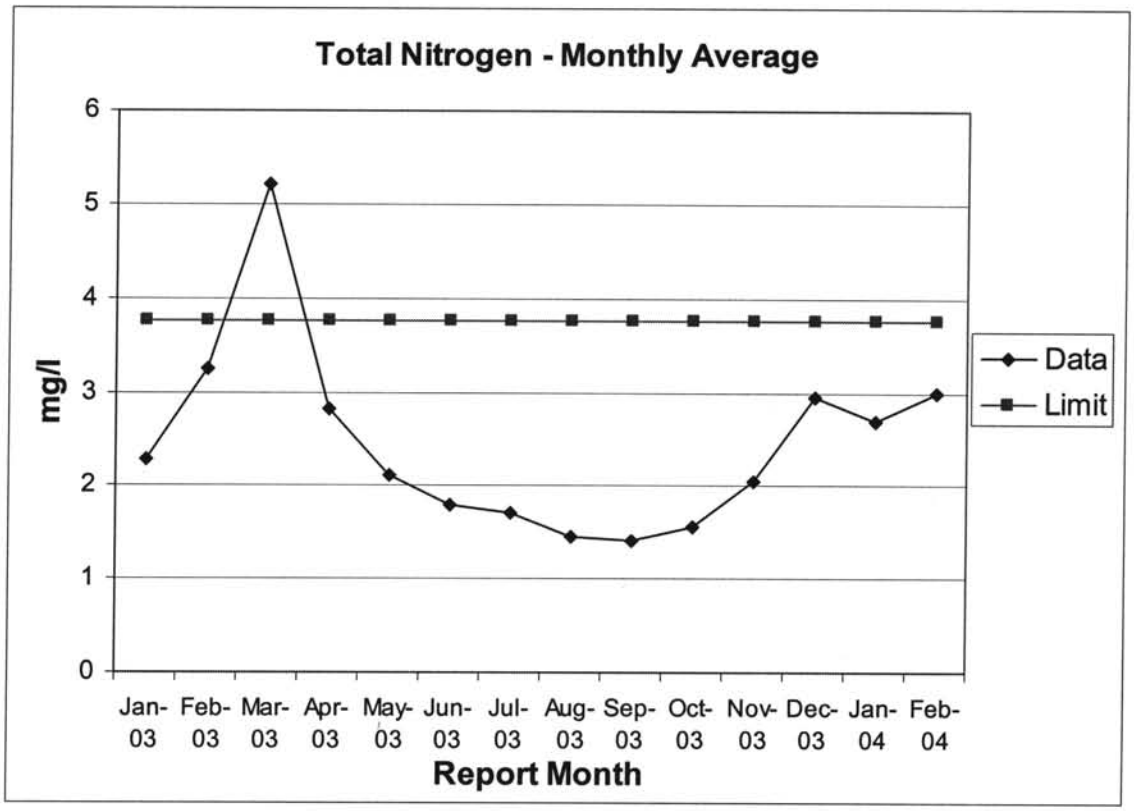
Outfall Indicator: 001-1

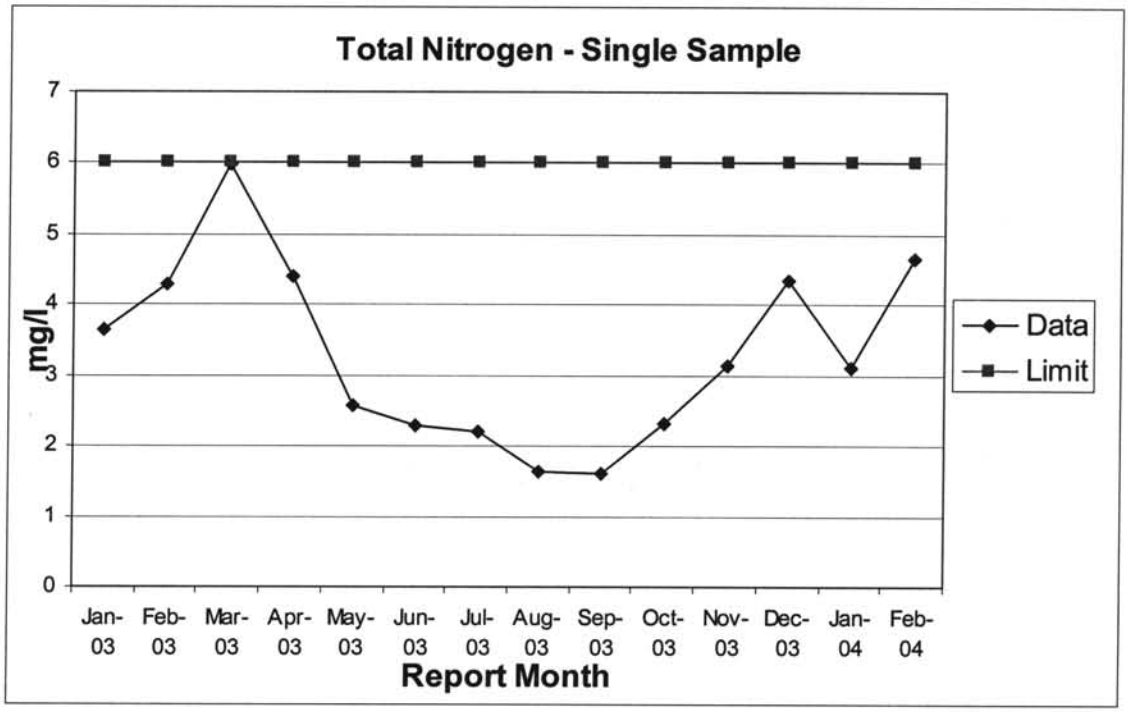
Monitoring Location Code: Y

Parameter Code	Description	Limit	Limit Effective Dates	Stat Base	Units	AVG	MAX	MIN
P 00530	SOLIDS, TOTAL SUSPENDED	5	3/1/2000 to 2/28/2005	ANNL AVG	MG/L	1.2314	1.4	0.9
P 00530	SOLIDS, TOTAL SUSPENDED	DELMON	3/1/2000 to 2/28/2005		MG/L	1.24	1.24	1.24
P 00600	NITROGEN, TOTAL (AS N)	3	1/1/2003 to 2/28/2005	ANNL AVG	MG/L	2.4093	2.81	2.17
P 00610	NITROGEN, AMMONIA TOTAL (AS N)	DELMON	3/1/2000 to 2/28/2005			2.4167	2.81	2.17
P 50050	FLOW	0.75	3/1/2000 to 2/28/2005	ANNL AVG	MGD	0.4683	0.519	0.407

DMR Effluent Exceedance

Monitoring Date	Outfall Indicator	Parameter Code	Parameter Description	Monitoring Location Code	Data	Limit	Stat Base	Units
3/31/2003	001-1	P 00600	NITROGEN, TOTAL (AS N)	1	5.21	3.75	MO AVG	MG/L


Total Nitrogen - Monthly Average
mg/l
0
1
2
3
4
5
6
Jan-03
Feb-03
Mar-03
Apr-03
May-03
Jun-03
Jul-03
Aug-03
Sep-03
Oct-03
Nov-03
Dec-03
Jan-04
Feb-04
Report Month
Data
Limit


Total Nitrogen - Single Sample
mg/l
0
1
2
3
4
5
6
7
Jan-03
Feb-03
Mar-03
Apr-03
May-03
Jun-03
Jul-03
Aug-03
Sep-03
Oct-03
Nov-03
Dec-03
Jan-04
Feb-04
Report Month
Data
Limit

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) 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.

(4) 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).

(5) 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..

(6) Algal Phytoplankton and Periphyton Assemblages

Methods: Periphyton were sampled at both control and test sites by incubating glass microscope slides in a standard periphytometer for 28 days (QA Rule SOP FS7210). Phytoplankton were sampled using a 1 L grab sample (QA Rule SOP FS7100). Periphyton and phytoplankton were subsampled and identified to the lowest practical level, usually species (FDEP SOPs AB03, AB03_1 and AB05).

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

Algal Density: Algal density is estimated as number of natural units/ml for phytoplankton samples and number of natural units/cm^2 for periphyton samples. Although algal density of a single site is highly variable and depends on a number of

factors, comparison of algal density at a control site to algal density at a related test site gives a partial comparison of algal biomass at the two sites (Stevenson and Smol 2003).

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

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

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

(7) Benthic Macroinvertebrate Assemblages

Methods: Benthic macroinvertebrates were collected 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..

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..

Appendix 4

Chemical analysis of effluent and receiving water

Date Sampled	SITE LOCATION	Analysis Group	Component	Result	Units	Remark	MDL	PQL
1/26/2004 9:15	NPC1 CONTROL SITE	Bio-AGP/LimNut	Algal Growth Potential	41.4	mg DryWt/L		0.1	0.3
1/26/2004 9:15	NPC1 CONTROL SITE	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton	26	mg/m2		1.1	3.4
1/26/2004 9:15	NPC1 CONTROL SITE	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	33	ug/L	A	0.85	2.6
1/26/2004 9:15	NPC1 CONTROL SITE	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton	0	mg/m2		1.1	3.4
1/26/2004 9:15	NPC1 CONTROL SITE	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0	ug/L	A	0.85	2.6
1/26/2004 9:15	NPC1 CONTROL SITE	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa	18	# Taxa			
1/26/2004 9:15	NPC1 CONTROL SITE	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa	23	#Taxa			
1/26/2004 9:15	NPC1 CONTROL SITE	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa	9	#Taxa			
1/26/2004 9:15	NPC1 CONTROL SITE	Nutrients-Liquid	Ammonia-N	0.061	mg N/L		0.01	0.02
1/26/2004 9:15	NPC1 CONTROL SITE	Nutrients-Liquid	NO2NO3-N	0.67	mg N/L		0.004	0.01
1/26/2004 9:15	NPC1 CONTROL SITE	Nutrients-Liquid	N_KJEL_TOT	0.93	mg N/L		0.06	0.2
1/26/2004 9:15	NPC1 CONTROL SITE	Nutrients-Liquid	O-Phosphate-P	3.6	mg P/L		0.16	0.4
1/26/2004 9:15	NPC1 CONTROL SITE	Nutrients-Liquid	Total-P	4	mg P/L		0.2	0.6
1/26/2004 10:00	NPT1 TEST SITE	Bio-AGP/LimNut	Algal Growth Potential	71.2	mg DryWt/L	A	0.1	0.3
1/26/2004 10:00	NPT1 TEST SITE	Bio-Chl-a	Chlorophyll-A, Monochromatic, Periphyton	20	mg/m2	A	0.46	1.4
1/26/2004 10:00	NPT1 TEST SITE	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
1/26/2004 10:00	NPT1 TEST SITE	Bio-Chl-a	Phaeophytin-A, Monochromatic, Periphyton	0	mg/m2	A	0.46	1.4
1/26/2004 10:00	NPT1 TEST SITE	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.85	ug/L	U	0.85	2.6
1/26/2004 10:00	NPT1 TEST SITE	Bio-Invertebrates	Macroinvert-FW-Qual-Dipnetx20-# Taxa	30	# Taxa			
1/26/2004 10:00	NPT1 TEST SITE	Bio-Peri/Phyto	Periphyton-Quantitative-# Diatom Taxa	34	#Taxa			
1/26/2004 10:00	NPT1 TEST SITE	Bio-Peri/Phyto	Periphyton-Quantitative-# Wet Taxa	13	#Taxa			
1/26/2004 10:00	NPT1 TEST SITE	Nutrients-Liquid	Ammonia-N	0.066	mg N/L		0.01	0.02
1/26/2004 10:00	NPT1 TEST SITE	Nutrients-Liquid	NO2NO3-N	0.85	mg N/L		0.008	0.02
1/26/2004 10:00	NPT1 TEST SITE	Nutrients-Liquid	N_KJEL_TOT	0.99	mg N/L		0.06	0.2
1/26/2004 10:00	NPT1 TEST SITE	Nutrients-Liquid	O-Phosphate-P	3.7	mg P/L		0.16	0.4
1/26/2004 10:00	NPT1 TEST SITE	Nutrients-Liquid	Total-P	4	mg P/L		0.2	0.6
1/26/2004 11:00	EFFLUENT OUTFALL D001	Bio-AGP/LimNut	Algal Growth Potential	116	mg DryWt/L		0.1	0.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	Bio-Chl-a	Chlorophyll-A, Monochromatic, Water	0.96	ug/L	U	0.96	2.9
1/26/2004 11:00	EFFLUENT OUTFALL D001	Bio-Chl-a	Phaeophytin-A, Monochromatic, Water	0.96	ug/L	U	0.96	2.9
1/26/2004 11:00	EFFLUENT OUTFALL D001	Bio-Toxicology	Bioassay-Chron-Def-FW-C.dubia, IC20	No Result	IC20			
1/26/2004 11:00	EFFLUENT OUTFALL D001	Bio-Toxicology	Bioassay-Chron-Def-FW-C.dubia, NOEC	No Result	NOEC			
1/26/2004 11:00	EFFLUENT OUTFALL D001	Bio-Toxicology	Bioassay-Chron-Def-FW-Fish, IC20	No Result	IC20			
1/26/2004 11:00	EFFLUENT OUTFALL D001	Bio-Toxicology	Bioassay-Chron-Def-FW-Fish, NOEC	No Result	NOEC			
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	1,2,4,5-Tetrachlorobenzene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	1,2,4-Trichlorobenzene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	1,2-Dichlorobenzene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	1,3,5-Trinitrobenzene	4.3	ug/L	U	4.3	17
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	1,3-Dichlorobenzene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	1,3-Dinitrobenzene	2.1	ug/L	U	2.1	8.5
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	1,4-Dichlorobenzene	1.1	ug/L	U	1.1	4.3

Date Sampled	SITE LOCATION	Analysis Group	Component	Result	Units	Remark	MDL	PQL
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	1,4-Naphthoquinone	21	ug/L	U	21	85
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	1-Naphthylamine	11	ug/L	UJ	11	43
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	2,3,4,6-Tetrachlorophenol	2.1	ug/L	U	2.1	8.5
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	2,4,5-Trichlorophenol	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	2,4,6-Trichlorophenol	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	2,4-Dichlorophenol	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	2,4-Dimethylphenol	53	ug/L	U	53	210
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	2,4-Dinitrophenol	16	ug/L	UJ	16	64
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	2,4-Dinitrotoluene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	2,6-Dichlorophenol	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	2,6-Dinitrotoluene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	2-Acetylaminofluorene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	2-Chloronaphthalene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	2-Chlorophenol	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	2-Methyl-4,6-dinitrophenol	3.2	ug/L	U	3.2	13
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	2-Methylnaphthalene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	2-Naphthylamine	11	ug/L	UJ	11	43
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	2-Nitroaniline	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	2-Nitrophenol	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	2-Picoline	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	3,3'-Dichlorobenzidine	43	ug/L	U	43	170
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	3,3'-Dimethylbenzidine	21	ug/L	UJ	21	85
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	3-Methylcholanthrene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	3-Nitroaniline	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	4,4'-DDD	1.6	ug/L	U	1.6	6.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	4,4'-DDE	1.6	ug/L	U	1.6	6.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	4,4'-DDT	1.6	ug/L	U	1.6	6.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	4-Aminobiphenyl	4.3	ug/L	U	4.3	17
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	4-Bromophenyl phenyl ether	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	4-Chloro-3-methylphenol	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	4-Chloroaniline	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	4-Chlorophenyl phenyl ether	2.1	ug/L	U	2.1	8.5
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	4-Nitroaniline	1.1	ug/L	UJ	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	4-Nitrophenol	16	ug/L	U	16	64
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	5-Nitro-o-toluidine	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	7,12-Dimethylbenz(a)anthracene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Acenaphthene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Acenaphthylene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Acetophenone	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Aldrin	1.6	ug/L	U	1.6	6.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Aniline	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Anthracene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Azobenzene/1,2-Diphenylhydrazine	1.1	ug/L	U	1.1	4.3

Date Sampled	SITE LOCATION	Analysis Group	Component	Result	Units	Remark	MDL	PQL
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Benzidine	110	ug/L	U	110	430
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Benzo(a)anthracene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Benzo(a)pyrene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Benzo(b)fluoranthene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Benzo(g,h,i)perylene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Benzo(k)fluoranthene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Benzyl alcohol	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Bis(2-chloroethoxy)methane	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Bis(2-chloroethyl)ether	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Bis(2-chloroisopropyl)ether	3.2	ug/L	U	3.2	13
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Bis(2-ethylhexyl)phthalate	16	ug/L	U	16	64
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Butyl benzyl phthalate	5.3	ug/L	U	5.3	21
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Chrysene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Di-n-butyl phthalate	5.3	ug/L	U	5.3	21
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Di-n-octyl phthalate	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Dibenzo(a,h)anthracene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Dibenzofuran	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Dieldrin	1.6	ug/L	U	1.6	6.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Diethyl phthalate	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Dimethyl phthalate	53	ug/L	U	53	210
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Dimethylaminoazobenzene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Dinoseb	4.3	ug/L	U	4.3	17
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Diphenylamine	3.2	ug/L	U	3.2	13
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Endosulfan I	4.3	ug/L	U	4.3	17
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Endosulfan II	4.3	ug/L	U	4.3	17
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Endosulfan sulfate	1.6	ug/L	U	1.6	6.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Endrin	1.6	ug/L	U	1.6	6.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Endrin aldehyde	4.3	ug/L	UJ	4.3	17
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Ethyl methanesulfonate	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Fluoranthene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Fluorene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Heptachlor	1.6	ug/L	U	1.6	6.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Heptachlor epoxide	1.6	ug/L	U	1.6	6.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Hexachlorobenzene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Hexachlorobutadiene	3.2	ug/L	U	3.2	13
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Hexachlorocyclopentadiene	3.2	ug/L	U	3.2	13
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Hexachloroethane	3.2	ug/L	U	3.2	13
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Hexachloropropene	2.1	ug/L	U	2.1	8.5
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Indeno(1,2,3-cd)pyrene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Isophorone	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Isosafrole	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Methapyrilene	4.3	ug/L	UJ	4.3	17
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Methyl methanesulfonate	1.1	ug/L	UJ	1.1	4.3

Date Sampled	SITE LOCATION	Analysis Group	Component	Result	Units	Remark	MDL	PQL
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	N-Nitrosodi-n-butylamine	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	N-Nitrosodi-n-propylamine	2.1	ug/L	U	2.1	8.5
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	N-Nitrosodiethylamine	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	N-Nitrosodimethylamine	2.1	ug/L	U	2.1	8.5
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	N-Nitrosodiphenylamine	3.2	ug/L	U	3.2	13
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	N-Nitrosomethylethylamine	2.1	ug/L	U	2.1	8.5
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	N-Nitrosomorpholine	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	N-Nitrosopiperidine	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	N-Nitrosopyrrolidine	2.1	ug/L	U	2.1	8.5
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Naphthalene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Nitrobenzene	2.1	ug/L	U	2.1	8.5
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Nitroquinoline-1-oxide	21	ug/L	UJ	21	85
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Pentachlorobenzene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Pentachloroethane	53	ug/L	U	53	210
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Pentachloronitrobenzene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Pentachlorophenol	3.2	ug/L	U	3.2	13
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Phenacetin	4.3	ug/L	U	4.3	13
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Phenanthrene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Phenol	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Pyrene	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Pyridine	4.3	ug/L	U	4.3	17
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	Safrole	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	alpha-BHC	1.6	ug/L	U	1.6	6.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	beta-BHC	1.6	ug/L	U	1.6	6.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	delta-BHC	1.6	ug/L	U	1.6	6.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	gamma-BHC	1.6	ug/L	U	1.6	6.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	m,p-Cresols	2.1	ug/L	U	2.1	8.5
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	o-Cresol	2.1	ug/L	U	2.1	8.5
1/26/2004 11:00	EFFLUENT OUTFALL D001	BNA-Water	o-Toluidine	1.1	ug/L	U	1.1	4.3
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Alachlor	0.61	ug/L	U	0.61	2.44
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Ametryn	0.05	ug/L	U	0.05	0.2
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Atrazine	0.062	ug/L	I	0.05	0.2
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Azinphos Methyl	0.05	ug/L	U	0.05	0.2
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Bromacil	0.2	ug/L	U	0.2	0.8
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Butylate	0.2	ug/L	U	0.2	0.8
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Chlorpyrifos Ethyl	0.05	ug/L	U	0.05	0.2
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Chlorpyrifos Methyl	0.1	ug/L	U	0.1	0.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Diazinon	0.05	ug/L	U	0.05	0.2
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Ethion	0.05	ug/L	U	0.05	0.2
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Ethoprop	0.1	ug/L	U	0.1	0.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Fenamiphos	0.2	ug/L	U	0.2	0.8
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Fonofos	0.1	ug/L	U	0.1	0.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Hexazinone	0.1	ug/L	U	0.1	0.4

Date Sampled	SITE LOCATION	Analysis Group	Component	Result	Units	Remark	MDL	PQL
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Malathion	0.15	ug/L	U	0.15	0.6
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Metalaxyl	0.25	ug/L	U	0.25	1
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Metolachlor	0.5	ug/L	U	0.5	2
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Metribuzin	0.1	ug/L	U	0.1	0.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Mevinphos	0.23	ug/L	U	0.2	0.8
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Naled	0.81	ug/L	U	0.81	3.24
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Norflurazon	0.1	ug/L	U	0.1	0.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Parathion Ethyl	0.15	ug/L	U	0.15	0.6
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Parathion Methyl	0.1	ug/L	U	0.1	0.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Phorate	0.05	ug/L	U	0.05	0.2
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Prometryn	0.15	ug/L	U	0.15	0.6
1/26/2004 11:00	EFFLUENT OUTFALL D001	GC-Water	Simazine	0.05	ug/L	U	0.05	0.2
1/26/2004 11:00	EFFLUENT OUTFALL D001	Metals-Water	Aluminum	20	ug/L	I	7	28
1/26/2004 11:00	EFFLUENT OUTFALL D001	Metals-Water	Arsenic	6	ug/L	U	6	24
1/26/2004 11:00	EFFLUENT OUTFALL D001	Metals-Water	Cadmium	0.18	ug/L		0.025	0.1
1/26/2004 11:00	EFFLUENT OUTFALL D001	Metals-Water	Calcium	49.2	mg/L		0.05	0.2
1/26/2004 11:00	EFFLUENT OUTFALL D001	Metals-Water	Chromium	3	ug/L	U	3	12
1/26/2004 11:00	EFFLUENT OUTFALL D001	Metals-Water	Copper	5.6	ug/L		1	4
1/26/2004 11:00	EFFLUENT OUTFALL D001	Metals-Water	Iron	98	ug/L		15	60
1/26/2004 11:00	EFFLUENT OUTFALL D001	Metals-Water	Lead	0.93	ug/L		0.05	0.2
1/26/2004 11:00	EFFLUENT OUTFALL D001	Metals-Water	Magnesium	14.6	mg/L		0.02	0.08
1/26/2004 11:00	EFFLUENT OUTFALL D001	Metals-Water	Nickel	3	ug/L	U	3	12
1/26/2004 11:00	EFFLUENT OUTFALL D001	Metals-Water	Selenium	1	ug/L	U	1	4
1/26/2004 11:00	EFFLUENT OUTFALL D001	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
1/26/2004 11:00	EFFLUENT OUTFALL D001	Metals-Water	Zinc	92	ug/L		4	16
1/26/2004 11:00	EFFLUENT OUTFALL D001	Nutrients-Liquid	Ammonia-N	0.039	mg N/L		0.01	0.02
1/26/2004 11:00	EFFLUENT OUTFALL D001	Nutrients-Liquid	NO2NO3-N	2.4	mg N/L		0.04	0.1
1/26/2004 11:00	EFFLUENT OUTFALL D001	Nutrients-Liquid	N_KJEL_TOT	1.1	mg N/L		0.06	0.2
1/26/2004 11:00	EFFLUENT OUTFALL D001	Nutrients-Liquid	O-Phosphate-P	3.4	mg P/L	Q	0.16	0.4
1/26/2004 11:00	EFFLUENT OUTFALL D001	Nutrients-Liquid	Organic Carbon	6.4	mg C/L		1	5
1/26/2004 11:00	EFFLUENT OUTFALL D001	Nutrients-Liquid	Total-P	3.2	mg P/L		0.2	0.6
1/26/2004 11:00	EFFLUENT OUTFALL D001	Overflow	Oil and Grease	0.78	mg/l	I		
1/26/2004 11:00	EFFLUENT OUTFALL D001	VOC-Water	Bromodichloromethane	4.1	ug/L		0.2	1
1/26/2004 11:00	EFFLUENT OUTFALL D001	VOC-Water	Bromoform	0.2	ug/L	U	0.2	1
1/26/2004 11:00	EFFLUENT OUTFALL D001	VOC-Water	Chloroform	24	ug/L		0.2	1
1/26/2004 11:00	EFFLUENT OUTFALL D001	VOC-Water	Dibromochloromethane	0.53	ug/L	I	0.2	1
1/26/2004 10:30	FIELD BLANK	BNA-Water	1,2,4,5-Tetrachlorobenzene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	1,2,4-Trichlorobenzene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	1,2-Dichlorobenzene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	1,3,5-Trinitrobenzene	4.3	ug/L	U	4.3	17
1/26/2004 10:30	FIELD BLANK	BNA-Water	1,3-Dichlorobenzene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	1,3-Dinitrobenzene	2.2	ug/L	U	2.2	8.6
1/26/2004 10:30	FIELD BLANK	BNA-Water	1,4-Dichlorobenzene	1.1	ug/L	U	1.1	4.3

Date Sampled	SITE LOCATION	Analysis Group	Component	Result	Units	Remark	MDL	PQL
1/26/2004 10:30	FIELD BLANK	BNA-Water	1,4-Naphthoquinone	22	ug/L	U	22	86
1/26/2004 10:30	FIELD BLANK	BNA-Water	1-Naphthylamine	11	ug/L	UJ	11	43
1/26/2004 10:30	FIELD BLANK	BNA-Water	2,3,4,6-Tetrachlorophenol	2.2	ug/L	U	2.2	8.6
1/26/2004 10:30	FIELD BLANK	BNA-Water	2,4,5-Trichlorophenol	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	2,4,6-Trichlorophenol	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	2,4-Dichlorophenol	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	2,4-Dimethylphenol	54	ug/L	U	54	220
1/26/2004 10:30	FIELD BLANK	BNA-Water	2,4-Dinitrophenol	16	ug/L	UJ	16	65
1/26/2004 10:30	FIELD BLANK	BNA-Water	2,4-Dinitrotoluene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	2,6-Dichlorophenol	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	2,6-Dinitrotoluene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	2-Acetylaminofluorene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	2-Chloronaphthalene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	2-Chlorophenol	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	2-Methyl-4,6-dinitrophenol	3.2	ug/L	U	3.2	13
1/26/2004 10:30	FIELD BLANK	BNA-Water	2-Methylnaphthalene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	2-Naphthylamine	11	ug/L	UJ	11	43
1/26/2004 10:30	FIELD BLANK	BNA-Water	2-Nitroaniline	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	2-Nitrophenol	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	2-Picoline	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	3,3'-Dichlorobenzidine	43	ug/L	U	43	170
1/26/2004 10:30	FIELD BLANK	BNA-Water	3,3'-Dimethylbenzidine	22	ug/L	UJ	22	86
1/26/2004 10:30	FIELD BLANK	BNA-Water	3-Methylcholanthrene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	3-Nitroaniline	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	4,4'-DDD	1.6	ug/L	U	1.6	6.5
1/26/2004 10:30	FIELD BLANK	BNA-Water	4,4'-DDE	1.6	ug/L	U	1.6	6.5
1/26/2004 10:30	FIELD BLANK	BNA-Water	4,4'-DDT	1.6	ug/L	U	1.6	6.5
1/26/2004 10:30	FIELD BLANK	BNA-Water	4-Aminobiphenyl	4.3	ug/L	U	4.3	17
1/26/2004 10:30	FIELD BLANK	BNA-Water	4-Bromophenyl phenyl ether	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	4-Chloro-3-methylphenol	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	4-Chloroaniline	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	4-Chlorophenyl phenyl ether	2.2	ug/L	U	2.2	8.6
1/26/2004 10:30	FIELD BLANK	BNA-Water	4-Nitroaniline	1.1	ug/L	UJ	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	4-Nitrophenol	16	ug/L	U	16	65
1/26/2004 10:30	FIELD BLANK	BNA-Water	5-Nitro-o-toluidine	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	7,12-Dimethylbenz(a)anthracene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Acenaphthene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Acenaphthylene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Acetophenone	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Aldrin	1.6	ug/L	U	1.6	6.5
1/26/2004 10:30	FIELD BLANK	BNA-Water	Aniline	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Anthracene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Azobenzene/1,2-Diphenylhydrazine	1.1	ug/L	U	1.1	4.3

Date Sampled	SITE LOCATION	Analysis Group	Component	Result	Units	Remark	MDL	PQL
1/26/2004 10:30	FIELD BLANK	BNA-Water	Benzidine	110	ug/L	U	110	430
1/26/2004 10:30	FIELD BLANK	BNA-Water	Benzo(a)anthracene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Benzo(a)pyrene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Benzo(b)fluoranthene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Benzo(g,h,i)perylene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Benzo(k)fluoranthene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Benzyl alcohol	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Bis(2-chloroethoxy)methane	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Bis(2-chloroethyl)ether	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Bis(2-chloroisopropyl)ether	3.2	ug/L	U	3.2	13
1/26/2004 10:30	FIELD BLANK	BNA-Water	Bis(2-ethylhexyl)phthalate	16	ug/L	U	16	65
1/26/2004 10:30	FIELD BLANK	BNA-Water	Butyl benzyl phthalate	5.4	ug/L	U	5.4	22
1/26/2004 10:30	FIELD BLANK	BNA-Water	Chrysene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Di-n-butyl phthalate	5.4	ug/L	U	5.4	22
1/26/2004 10:30	FIELD BLANK	BNA-Water	Di-n-octyl phthalate	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Dibenzo(a,h)anthracene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Dibenzofuran	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Dieldrin	1.6	ug/L	U	1.6	6.5
1/26/2004 10:30	FIELD BLANK	BNA-Water	Diethyl phthalate	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Dimethyl phthalate	54	ug/L	U	54	220
1/26/2004 10:30	FIELD BLANK	BNA-Water	Dimethylaminoazobenzene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Dinoseb	4.3	ug/L	U	4.3	17
1/26/2004 10:30	FIELD BLANK	BNA-Water	Diphenylamine	3.2	ug/L	U	3.2	13
1/26/2004 10:30	FIELD BLANK	BNA-Water	Endosulfan I	4.3	ug/L	U	4.3	17
1/26/2004 10:30	FIELD BLANK	BNA-Water	Endosulfan II	4.3	ug/L	U	4.3	17
1/26/2004 10:30	FIELD BLANK	BNA-Water	Endosulfan sulfate	1.6	ug/L	U	1.6	6.5
1/26/2004 10:30	FIELD BLANK	BNA-Water	Endrin	1.6	ug/L	U	1.6	6.5
1/26/2004 10:30	FIELD BLANK	BNA-Water	Endrin aldehyde	4.3	ug/L	UJ	4.3	17
1/26/2004 10:30	FIELD BLANK	BNA-Water	Ethyl methanesulfonate	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Fluoranthene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Fluorene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Heptachlor	1.6	ug/L	U	1.6	6.5
1/26/2004 10:30	FIELD BLANK	BNA-Water	Heptachlor epoxide	1.6	ug/L	U	1.6	6.5
1/26/2004 10:30	FIELD BLANK	BNA-Water	Hexachlorobenzene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Hexachlorobutadiene	3.2	ug/L	U	3.2	13
1/26/2004 10:30	FIELD BLANK	BNA-Water	Hexachlorocyclopentadiene	3.2	ug/L	U	3.2	13
1/26/2004 10:30	FIELD BLANK	BNA-Water	Hexachloroethane	3.2	ug/L	U	3.2	13
1/26/2004 10:30	FIELD BLANK	BNA-Water	Hexachloropropene	2.2	ug/L	U	2.2	8.6
1/26/2004 10:30	FIELD BLANK	BNA-Water	Indeno(1,2,3-cd)pyrene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Isophorone	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Isosafrole	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Methapyrilene	4.3	ug/L	UJ	4.3	17
1/26/2004 10:30	FIELD BLANK	BNA-Water	Methyl methanesulfonate	1.1	ug/L	UJ	1.1	4.3

Date Sampled	SITE LOCATION	Analysis Group	Component	Result	Units	Remark	MDL	PQL
1/26/2004 10:30	FIELD BLANK	BNA-Water	N-Nitrosodi-n-butylamine	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	N-Nitrosodi-n-propylamine	2.2	ug/L	U	2.2	8.6
1/26/2004 10:30	FIELD BLANK	BNA-Water	N-Nitrosodiethylamine	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	N-Nitrosodimethylamine	2.2	ug/L	U	2.2	8.6
1/26/2004 10:30	FIELD BLANK	BNA-Water	N-Nitrosodiphenylamine	3.2	ug/L	U	3.2	13
1/26/2004 10:30	FIELD BLANK	BNA-Water	N-Nitrosomethylethylamine	2.2	ug/L	U	2.2	8.6
1/26/2004 10:30	FIELD BLANK	BNA-Water	N-Nitrosomorpholine	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	N-Nitrosopiperidine	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	N-Nitrosopyrrolidine	2.2	ug/L	U	2.2	8.6
1/26/2004 10:30	FIELD BLANK	BNA-Water	Naphthalene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Nitrobenzene	2.2	ug/L	U	2.2	8.6
1/26/2004 10:30	FIELD BLANK	BNA-Water	Nitroquinoline-1-oxide	22	ug/L	UJ	22	86
1/26/2004 10:30	FIELD BLANK	BNA-Water	Pentachlorobenzene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Pentachloroethane	54	ug/L	U	54	220
1/26/2004 10:30	FIELD BLANK	BNA-Water	Pentachloronitrobenzene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Pentachlorophenol	3.2	ug/L	U	3.2	13
1/26/2004 10:30	FIELD BLANK	BNA-Water	Phenacetin	4.3	ug/L	U	4.3	13
1/26/2004 10:30	FIELD BLANK	BNA-Water	Phenanthrene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Phenol	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Pyrene	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	Pyridine	4.3	ug/L	U	4.3	17
1/26/2004 10:30	FIELD BLANK	BNA-Water	Safrole	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	BNA-Water	alpha-BHC	1.6	ug/L	U	1.6	6.5
1/26/2004 10:30	FIELD BLANK	BNA-Water	beta-BHC	1.6	ug/L	U	1.6	6.5
1/26/2004 10:30	FIELD BLANK	BNA-Water	delta-BHC	1.6	ug/L	U	1.6	6.5
1/26/2004 10:30	FIELD BLANK	BNA-Water	gamma-BHC	1.6	ug/L	U	1.6	6.5
1/26/2004 10:30	FIELD BLANK	BNA-Water	m,p-Cresols	2.2	ug/L	U	2.2	8.6
1/26/2004 10:30	FIELD BLANK	BNA-Water	o-Cresol	2.2	ug/L	U	2.2	8.6
1/26/2004 10:30	FIELD BLANK	BNA-Water	o-Toluidine	1.1	ug/L	U	1.1	4.3
1/26/2004 10:30	FIELD BLANK	GC-Water	Alachlor	0.67	ug/L	U	0.67	2.68
1/26/2004 10:30	FIELD BLANK	GC-Water	Ametryn	0.056	ug/L	U	0.056	0.224
1/26/2004 10:30	FIELD BLANK	GC-Water	Atrazine	0.056	ug/L	U	0.056	0.224
1/26/2004 10:30	FIELD BLANK	GC-Water	Azinphos Methyl	0.056	ug/L	U	0.056	0.224
1/26/2004 10:30	FIELD BLANK	GC-Water	Bromacil	0.22	ug/L	U	0.22	0.88
1/26/2004 10:30	FIELD BLANK	GC-Water	Butylate	0.22	ug/L	U	0.22	0.88
1/26/2004 10:30	FIELD BLANK	GC-Water	Chlorpyrifos Ethyl	0.056	ug/L	U	0.056	0.224
1/26/2004 10:30	FIELD BLANK	GC-Water	Chlorpyrifos Methyl	0.11	ug/L	U	0.11	0.44
1/26/2004 10:30	FIELD BLANK	GC-Water	Diazinon	0.056	ug/L	U	0.056	0.224
1/26/2004 10:30	FIELD BLANK	GC-Water	Ethion	0.056	ug/L	U	0.056	0.224
1/26/2004 10:30	FIELD BLANK	GC-Water	Ethoprop	0.11	ug/L	U	0.11	0.44
1/26/2004 10:30	FIELD BLANK	GC-Water	Fenamiphos	0.22	ug/L	U	0.22	0.88
1/26/2004 10:30	FIELD BLANK	GC-Water	Fonofos	0.11	ug/L	U	0.11	0.44
1/26/2004 10:30	FIELD BLANK	GC-Water	Hexazinone	0.11	ug/L	U	0.11	0.44

Date Sampled	SITE LOCATION	Analysis Group	Component	Result	Units	Remark	MDL	PQL
1/26/2004 10:30	FIELD BLANK	GC-Water	Malathion	0.17	ug/L	U	0.17	0.68
1/26/2004 10:30	FIELD BLANK	GC-Water	Metalaxyl	0.28	ug/L	U	0.28	1.12
1/26/2004 10:30	FIELD BLANK	GC-Water	Metolachlor	0.56	ug/L	U	0.56	2.24
1/26/2004 10:30	FIELD BLANK	GC-Water	Metribuzin	0.11	ug/L	U	0.11	0.44
1/26/2004 10:30	FIELD BLANK	GC-Water	Mevinphos	0.22	ug/L	U	0.22	0.88
1/26/2004 10:30	FIELD BLANK	GC-Water	Naled	0.9	ug/L	U	0.9	3.6
1/26/2004 10:30	FIELD BLANK	GC-Water	Norflurazon	0.11	ug/L	U	0.11	0.44
1/26/2004 10:30	FIELD BLANK	GC-Water	Parathion Ethyl	0.17	ug/L	U	0.17	0.68
1/26/2004 10:30	FIELD BLANK	GC-Water	Parathion Methyl	0.11	ug/L	U	0.11	0.44
1/26/2004 10:30	FIELD BLANK	GC-Water	Phorate	0.056	ug/L	U	0.056	0.224
1/26/2004 10:30	FIELD BLANK	GC-Water	Prometryn	0.17	ug/L	U	0.17	0.68
1/26/2004 10:30	FIELD BLANK	GC-Water	Simazine	0.056	ug/L	U	0.056	0.224
1/26/2004 10:30	FIELD BLANK	Metals-Water	Aluminum	7	ug/L	U	7	28
1/26/2004 10:30	FIELD BLANK	Metals-Water	Arsenic	6	ug/L	U	6	24
1/26/2004 10:30	FIELD BLANK	Metals-Water	Cadmium	0.025	ug/L	U	0.025	0.1
1/26/2004 10:30	FIELD BLANK	Metals-Water	Calcium	0.05	mg/L	U	0.05	0.2
1/26/2004 10:30	FIELD BLANK	Metals-Water	Chromium	3	ug/L	U	3	12
1/26/2004 10:30	FIELD BLANK	Metals-Water	Copper	1	ug/L	U	1	4
1/26/2004 10:30	FIELD BLANK	Metals-Water	Iron	15	ug/L	U	15	60
1/26/2004 10:30	FIELD BLANK	Metals-Water	Lead	0.05	ug/L	U	0.05	0.2
1/26/2004 10:30	FIELD BLANK	Metals-Water	Magnesium	0.02	mg/L	U	0.02	0.08
1/26/2004 10:30	FIELD BLANK	Metals-Water	Nickel	3	ug/L	U	3	12
1/26/2004 10:30	FIELD BLANK	Metals-Water	Selenium	1	ug/L	U	1	4
1/26/2004 10:30	FIELD BLANK	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
1/26/2004 10:30	FIELD BLANK	Metals-Water	Zinc	4	ug/L	U	4	16
1/26/2004 10:30	FIELD BLANK	Nutrients-Liquid	Ammonia-N	0.01	mg N/L	U	0.01	0.02
1/26/2004 10:30	FIELD BLANK	Nutrients-Liquid	NO2NO3-N	0.004	mg N/L	U	0.004	0.01
1/26/2004 10:30	FIELD BLANK	Nutrients-Liquid	N_KJEL_TOT	0.06	mg N/L	U	0.06	0.2
1/26/2004 10:30	FIELD BLANK	Nutrients-Liquid	O-Phosphate-P	0.004	mg P/L	U	0.004	0.01
1/26/2004 10:30	FIELD BLANK	Nutrients-Liquid	Total-P	0.02	mg P/L	U	0.02	0.06
1/26/2004 10:30	FIELD BLANK	Overflow	Oil and Grease	0.55	mg/l	U		
1/26/2004 10:30	FIELD BLANK	VOC-Water	Bromodichloromethane	0.2	ug/L	U	0.2	1
1/26/2004 10:30	FIELD BLANK	VOC-Water	Bromoform	0.2	ug/L	U	0.2	1
1/26/2004 10:30	FIELD BLANK	VOC-Water	Chloroform	0.2	ug/L	U	0.2	1
1/26/2004 10:30	FIELD BLANK	VOC-Water	Dibromochloromethane	0.2	ug/L	U	0.2	1
1/26/2004 10:15	EFFLUENT	Metals-Water	Aluminum	16	ug/L	I	7	28
1/26/2004 10:15	EFFLUENT	Metals-Water	Arsenic	6	ug/L	U	6	24
1/26/2004 10:15	EFFLUENT	Metals-Water	Cadmium	0.56	ug/L		0.025	0.1
1/26/2004 10:15	EFFLUENT	Metals-Water	Calcium	47.1	mg/L		0.05	0.2
1/26/2004 10:15	EFFLUENT	Metals-Water	Chromium	3	ug/L	U	3	12
1/26/2004 10:15	EFFLUENT	Metals-Water	Copper	5.7	ug/L		1	4
1/26/2004 10:15	EFFLUENT	Metals-Water	Iron	92	ug/L		15	60
1/26/2004 10:15	EFFLUENT	Metals-Water	Lead	1	ug/L		0.05	0.2

Date Sampled	SITE LOCATION	Analysis Group	Component	Result	Units	Remark	MDL	PQL
1/26/2004 10:15	EFFLUENT	Metals-Water	Magnesium	14.2	mg/L		0.02	0.08
1/26/2004 10:15	EFFLUENT	Metals-Water	Nickel	3	ug/L	U	3	12
1/26/2004 10:15	EFFLUENT	Metals-Water	Selenium	1	ug/L	U	1	4
1/26/2004 10:15	EFFLUENT	Metals-Water	Silver	0.02	ug/L	U	0.02	0.08
1/26/2004 10:15	EFFLUENT	Metals-Water	Zinc	96	ug/L		4	16
1/26/2004 10:15	EFFLUENT	Nutrients-Liquid	Ammonia-N	0.19	mg N/L		0.01	0.02
1/26/2004 10:15	EFFLUENT	Nutrients-Liquid	NO2NO3-N	2.5	mg N/L		0.04	0.1
1/26/2004 10:15	EFFLUENT	Nutrients-Liquid	N_KJEL_TOT	1.5	mg N/L		0.06	0.2
1/26/2004 10:15	EFFLUENT	Nutrients-Liquid	Total-P	3.4	mg P/L		0.2	0.6
1/28/2004	CITY OF MULBERRY	Bio-Toxicology	Bioassay-Chron-Def-FW-C.dubia, IC20		IC20			
1/28/2004	CITY OF MULBERRY	Bio-Toxicology	Bioassay-Chron-Def-FW-C.dubia, NOEC		NOEC			
1/28/2004	CITY OF MULBERRY	Bio-Toxicology	Bioassay-Chron-Def-FW-Fish, IC20		IC20			
1/28/2004	CITY OF MULBERRY	Bio-Toxicology	Bioassay-Chron-Def-FW-Fish, NOEC		NOEC			
1/26/2004 9:15	TRIP BLANK	VOC-Water	Bromodichloromethane	0.2	ug/L	U	0.2	1
1/26/2004 9:15	TRIP BLANK	VOC-Water	Bromoform	0.2	ug/L	U	0.2	1
1/26/2004 9:15	TRIP BLANK	VOC-Water	Chloroform	0.2	ug/L	U	0.2	1
1/26/2004 9:15	TRIP BLANK	VOC-Water	Dibromochloromethane	0.2	ug/L	U	0.2	1

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	**26**
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	**ND**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	15	17	21.5	26	29	32	**ND**
Dipnet Taxa Richness	9	12	17	20	22	24.5	26	28	31	37	53	**18**
Total Kjeldahl Nitrogen	0.30	0.39	0.56	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80	**0.93**
Total Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60	**0.061**
Nitrate plus Nitrite	0.01	0.01	0.03	0.05	0.07	0.10	0.14	0.20	0.32	0.64	1.05	**0.67**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.51	**4**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	1.37	**3.6**
Turbidity (NTU)	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30	**10.2**

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	**20**
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	**ND**
Hester-Dendy Taxa Richness	6	6.5	9	11.5	13	15	17	21.5	26	29	32	**ND**
Dipnet Taxa Richness	9	12	17	20	22	24.5	26	28	31	37	53	**29**
Total Kjeldahl Nitrogen	0.30	0.39	0.56	0.73	0.87	1.00	1.11	1.26	1.49	1.93	2.80	**0.99**
Total Ammonia	0.02	0.02	0.04	0.05	0.06	0.08	0.11	0.14	0.20	0.34	0.60	**0.066**
Nitrate plus Nitrite	0.01	0.01	0.03	0.05	0.07	0.10	0.14	0.20	0.32	0.64	1.05	**0.85**
Total Phosphorus	0.02	0.03	0.05	0.06	0.10	0.13	0.18	0.25	0.39	0.74	1.51	**4**
Orthophosphate	0.01	0.01	0.03	0.04	0.05	0.08	0.11	0.17	0.27	0.59	1.37	**3.7**
Turbidity (NTU)	0.60	0.90	1.20	1.45	2.10	2.80	3.60	4.50	6.65	10.45	16.30	**7.9**

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.

Appendix 6

Additional physical, chemical, toxicological and microbiological results

FL DEP SW District Chemistry Laboratory Report
Phone # 813-744-6100 DEP Comp/QAP # 850078 NELAP # E34886

3804 Coconut Palm Dr.
Tampa, FL 33619

Project:	FY15	Type: CITY OF MULBERRY		Requested by:	CORNWELL			
Site	Time	Date	Lag	Samplers		RQF	Notes	
NPC1- CONTROL SITE	0915	1/16/2004	29760	CORNWELL		2004-01-26-16		
NPT1- TEST SITE	1000	1/16/2004	29761	CORNWELL		2004-01-26-16		
EFFLUENT-OUTFALL	1100	1/16/2004	29762	CORNWELL		2004-01-26-16		
FIELD BLANK	1030	1/16/2004	29763	CORNWELL		2004-01-26-16		
NPC1- CONTROL SITE	1010	1/16/2004	29764	CORNWELL		2004-01-26-16		
NPT1- TEST SITE	1015	1/16/2004	29765	CORNWELL		2004-01-26-16		
FIELD BLANK	1030	1/16/2004	29766	CORNWELL		2004-01-26-16		
Code	parameter	units	site: NPC1	site: NPT1	site: EFFLU	site: FB	site: NPC1	site: NPT1	site: FB
29 logit	log	deg C	29760	29761	29762	29763	29764	29765	29766
10 water temp.	meters								
78 secchi	Pt-Co		60	60	60				<5
80 color	umho/cm								
94 conductivity	mg/l								
299 diss.Oxygen	%								
301 diss.Oxygen	mg/l		2U	2U	2.1				2U
314 cbod5	mg/l		2U	2.1	2U				2U
314 bod	units								
406 pH	mg/l								
410 alkalinity	0/00								
480 salinity	mg/l								
530 tss	meters		8	8	2				1U
4192 sample depth	#/100ml								
31501 f-coliforms	#/100ml				1K	1K	130BK	160BK	
31616 f-coliforms	NTU				1K	1K	85BK	90BK	
82079 turbidity	meters		10.2	7.9	1.0				1U
82903 total depth									

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.

FL DEP SW Disctrict Chemistry Laboratory Report
Phone # 813-744-6100 DEP CompQAP # 880078 NELAP # E34686

3804 Coconut Palm Dr.
Tampa, FL 33619

Project:		Type:		Requested by:		
Site	Time	Date	Log	Samplers	EQ#	Notes
EFFLUENT	1000	1/16/2004	29767	CORNWELL	2004-01-26-16	COMP

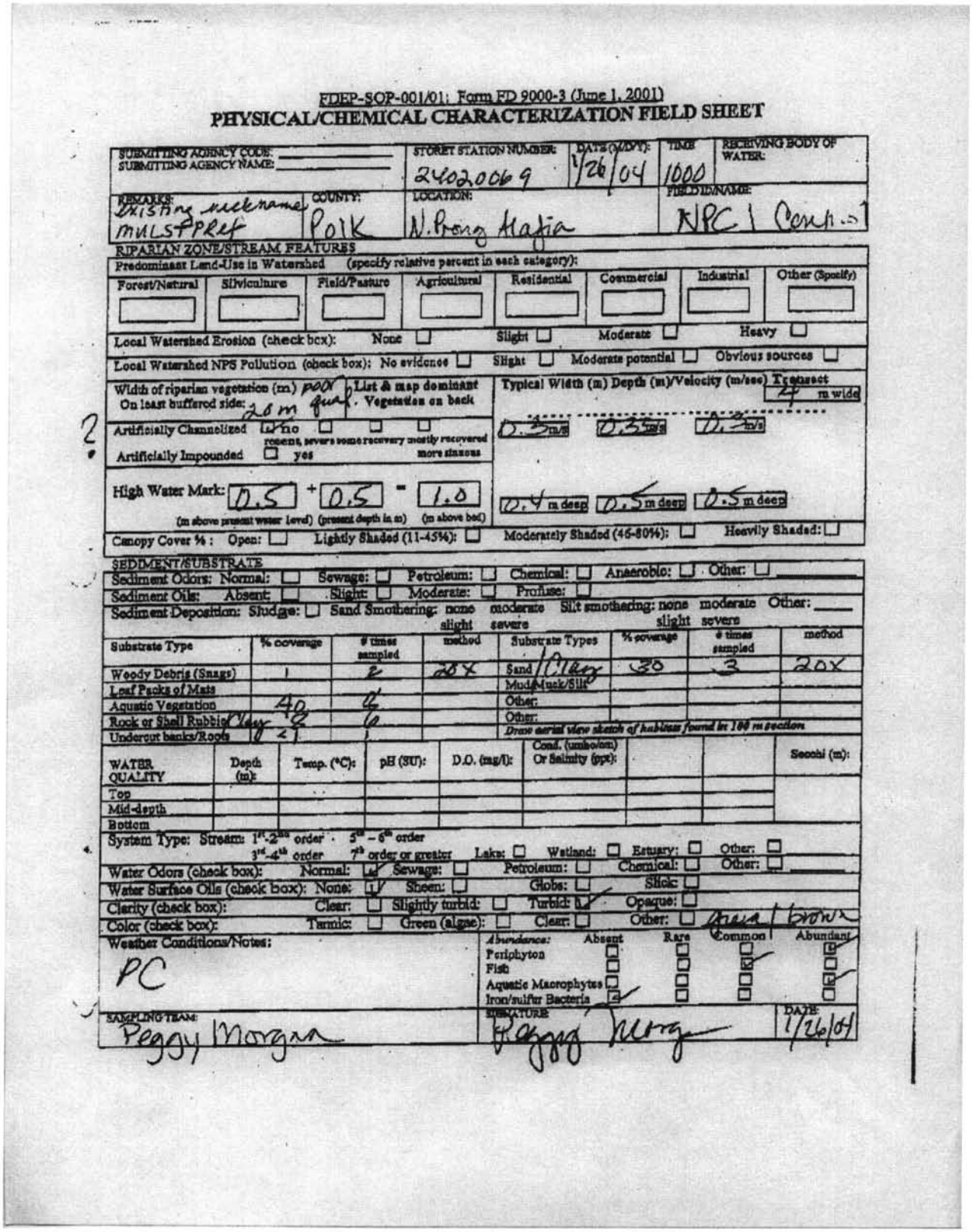
Code	parameter	units	site: EFFLU	site:	site:	site:	site:	site:	site:
29	log#	log	29767						
10	water temp.	deg C							
78	secchi	meters							
80	color	Pt-Co							
94	conductivity	umho/cm							
299	diss.Oxygen	mg/l							
301	diss.Oxygen	%							
314	cbod5	mg/l	2U						
406	pH	units							
410	alkalinity	mg/l							
480	salinity	0/00							
530	tss	mg/l	2						
4192	sample depth	meters							
31501	f-coliforms	#/100ml							
31616	f-colifoms	#/100ml							
82079	turbidity	NTU							
82903	total depth	meters							

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.

Appendix 7

Habitat Assessment Field Sheets.



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

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER: 24020069	DATE (M/D/Y): 1/26/04	TIME: 1000	RECEIVING BODY OF WATER:
REMARKS: Existing nickname MULSTPRef	COUNTY: Polk	LOCATION: N. Prong Alafia		FIELD ID/NAME: NPC 1 Comp. 1

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: 20 m — poor / good. List & map dominant vegetation on back

Typical Width (m) Depth (m)/Velocity (m/sec) Transect: 4 m wide

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

Artificially Impounded ☐ yes

	0.3 m/s	0.35 m/s	0.2 m/s
High Water Mark: 0.5 + 0.5 = 1.0 (m above present water level) (present depth in m) (m above bed)	0.4 m deep	0.5 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 moderate slight severe Silt smothering: none moderate slight severe Other:

Substrate Type	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	1	2	20X	Sand / Clay	30	3	20X
Leaf Packs of Mats				Mud/Muck/Silt			
Aquatic Vegetation	40	6		Other:			
Rock or Shell Rubble / Clay	2	1		Other:			
Undercut banks/Roots				*Draw aerial view sketch of habitats found in 100 m section*			

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

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

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

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

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

Color (check box): Tannic: ☐ Green (algae): ☐ Clear: ☐ Other: ☐ grey / brown

Weather Conditions/Notes: PC

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

SAMPLING TEAM: Peggy Morgan

SIGNATURE: Peggy Morgan

DATE: 1/26/04

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

STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER: 24020069	DATE (M/D/Y): 1/26/04	RECEIVING BODY OF WATER:

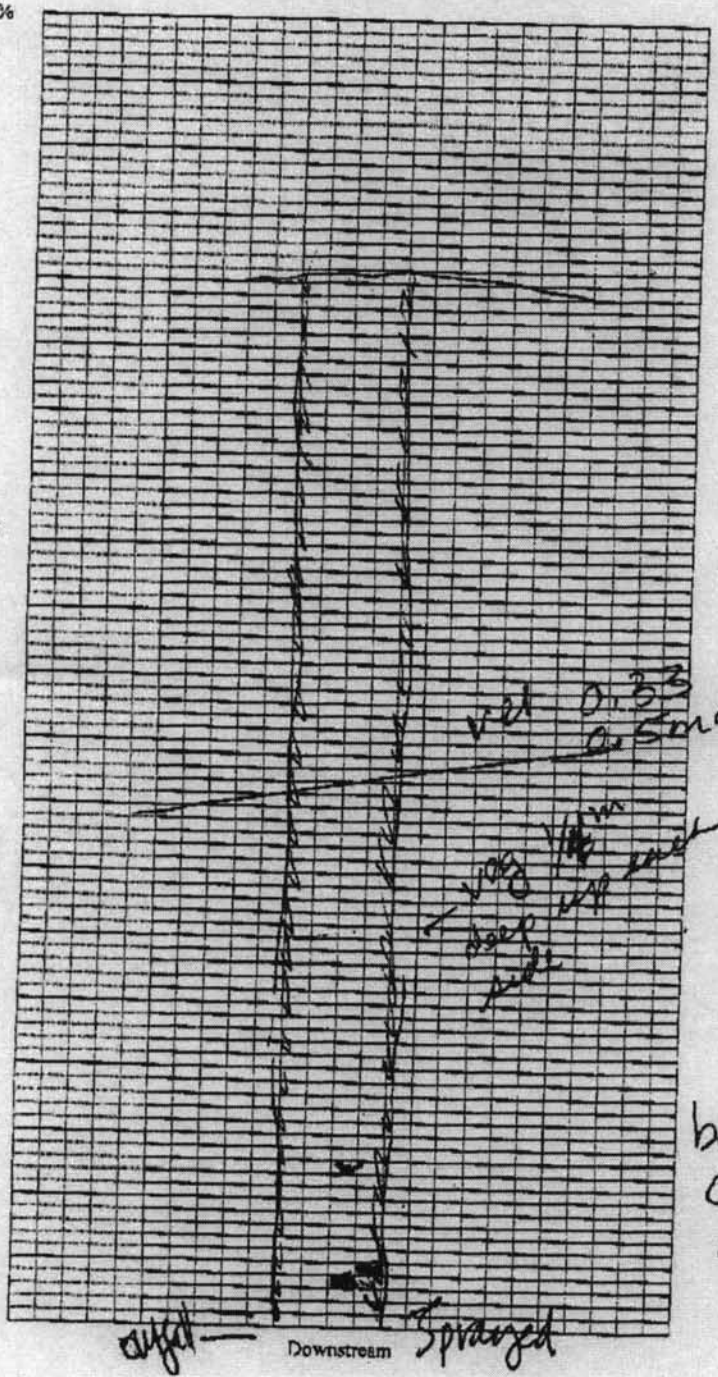
REMARKS:	COUNTY: Polk	LOCATION: N Prong Alafia / Kidd's Branch Ck	FIELD ID/NAME: RIPC1 Control

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components Substrate Diversity 16	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 20	Greater than 30% productive habitat present at site. 20 19 18 17 16	16% to 30% productive habitat, by areial 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 19	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 sparo occurring: > 1 m/sec 5 4 3 2 1
Habitat Smothering 9 Primary Score 64	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 14	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	Many have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Bank Stability Right Bank 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 5 Left Bank 5	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12m to 18 m 8 7 6	Width of native vegetation 6 to 12 m. human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 4 Left Bank 4 Secondary Score 50	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian zone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (e.g. grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1

TOTAL SCORE 114

ANALYSIS DATE: 1-26-04	ANALYST: Peggy Morgan	SIGNATURE: Peggy Morgan

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



Substrates: Code key, draw proportionate habitat abundance.

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

Velocity:
Note where velocity measures were taken.

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

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

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

Plants observed/other notes:

Scoleopis or para

bottom is mix of clay, rubble + debris/leaves

P. Morgan NPC1 Control

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

PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER: 24020068	DATE (M/D/Y): 1/26/04	TIME: 0950	RECEIVING BODY OF WATER:
REMARKS: 2990	COUNTY: Polk	LOCATION: N.P. Alafia / Kidd School Rd		FIELD ID/NAME: NPT 1 test

RIPARIAN ZONE/STREAM FEATURES

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

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

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

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

Width of riparian vegetation (m) On least buffered side: 1 - 10

List & map dominant Vegetation on back

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

Artificially Impounded ☐ yes

Typical Width (m) Depth (m)/Velocity (m/sec) Transect 1 m wide

0.25 m/s | 0.28 m/s | 0.2 m/s

0.7 m deep | 0.8 m deep | 0.4 m deep

High Water Mark: 0.6 (m above present water level) + 0.8 (present depth in m) = 1.4 (m above bed)

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

SEDIMENT/SUBSTRATE

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

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

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

Substrate Type	% coverage	# times sampled	method	Substrate Types	% coverage	# times sampled	method
Woody Debris (Snags)	1	1	22	Sand GRV	60	2	2
Leaf Packs of Mats				Mud/Muck/Silt			
Aquatic Vegetation	15	1		Other:			
Rock or Shell Rubble	30	1		Other:			
Undercut banks/Roots	—			*Draw aerial view sketch of habitats found in 100 m section*			

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

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

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

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

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

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

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

Weather Conditions/Notes: PC

SAMPLING TEAM:

SIGNATURE:

DATE: 1/26/04

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

STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER: 24020068	DATE (M/D/Y): 1/26/04	RECEIVING BODY OF WATER:

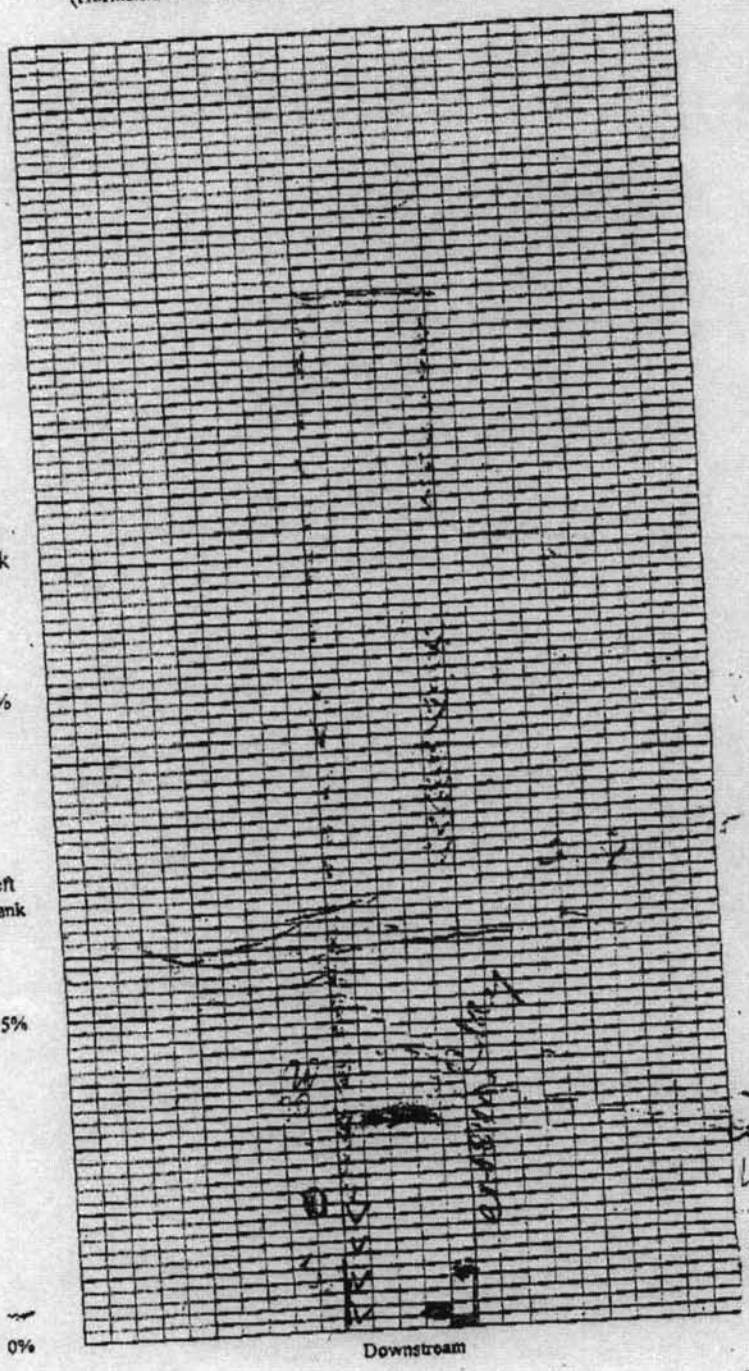
REMARKS:	COUNTY: Polk	LOCATION: N. Prong	FIELD ID/NAME: MPT1 Test

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components Substrate Diversity 12	Four or more productive habitats present (snags, tree roots/undercut banks, aquatic vegetation, leaf packs (partially decayed), rock). 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags). 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed. 10 9 8 7 6	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered. 5 4 3 2 1
Substrate Availability 17	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	5% to 15% productive habitat 10 9 8 7 6	Less than 5% productive habitat. 5 4 3 2 1
Water Velocity 17	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec 20 19 18 17 16	Max. observed at typical transect: 0.1 to 0.25 m/sec 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec. Or spate occurring: > 1 m/sec 5 4 3 2 1
Habitat Smothering 17 Primary Score 58	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 15	No artificial channelization or dredging. Stream with normal, sinuous pattern 20 19 18 17 16	Many have been channelized in the past (>20 yrs), but mostly recovered, fairly good sinuous pattern 15 14 13 12 11	Channelized, somewhat recovered, but > 80% of area affected 10 9 8 7 6	Artificially channelized, box-cut banks, straight, instream habitat highly altered 5 4 3 2 1
Bank Stability Right Bank 5 Left Bank 5	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 5 Left Bank 5	Width of native vegetation (least buffered side) greater than 18 m 10 9	Width of native vegetation (least buffered side) 12m to 18 m 8 7 6	Width of native vegetation 6 to 12 m, human activities still close to system 5 4	Less than 6 m of native buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 3 Left Bank 3 Secondary Score 46	Over 80% of riparian surfaces consist of native plants, including trees, understory shrubs, or non-woody macrophytes. Normal, expected plant community for given sunlight & habitat conditions. 10 9	50% to 80% of riparian zone is vegetated, and/or one class of plants normally expected for the sunlight & habitat conditions is not represented. Some disruption in community evident. 8 7 6	25% to 50% of riparian ozone is vegetated, and/or one or two expected classes of plants are not represented. Patches of bare soil or closely cropped vegetation, disruption obvious. 5 4	Less than 25% of streambank surfaces are vegetated and/or poor plant community (e.g. grass monoculture or exotics) present. Vegetation removed to stubble height of 2 inches or less. 3 2 1

TOTAL SCORE 104

ANALYSIS DATE: 1-26-04	ANALYST: Peggy Morgan	SIGNATURE: Peggy Morgan

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



Substrates: Code key, draw proportionate habitat abundance.

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

Velocity:
Note where velocity measures were taken.

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

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

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

Plants observed/other notes:

Appendix 8a

Taxa list and density (number/cm^2) for periphyton collected from glass microscope slides incubated for 28 days upstream and downstream of the City of Mulberry WWTP facility discharge, January 26, 2004.

	Control Site	Test Site
Bacillariophyta		
Achnanthes exigua	5,466	21,864
Achnanthes hungarica	81,989	17,491
Achnanthes lanceolata	524,728	174,909
Amphora sp.	-	8,745
Aulacoseira sp.	-	13,118
Bacillaria paxillifer	5,466	4,373
Capartogramma crucicula	-	8,745
Cocconeis sp.	114,784	17,491
Cocconeis placentula	38,261	-
Cyclotella sp.	-	26,236
Cyclotella meneghiniana	-	8,745
Diadesmis confervacea	-	30,609
Encyonema silesiacum	-	61,218
Eunotia sp.	38,261	34,982
Fragilaria sp.	-	17,491
Fragilaria delicatissima	10,932	-
Fragilariaceae	65,591	17,491
Gomphonema sp.	16,398	74,336
Gomphonema affine	5,466	-
Gomphonema parvulum	27,330	96,200
Hippodonta capitata	-	17,491
Melosira sp.	245,966	74,336
Navicula sp.	27,330	96,200
Navicula clementis	-	4,373
Navicula cryptocephala	-	8,745
Navicula cryptotenella	5,466	-
Navicula minima	-	39,355
Naviculaceae	-	8,745
Nitzschia sp.	5,466	91,827
Nitzschia amphibia	-	48,100
Nitzschia nana	-	8,745
Nitzschia palea	-	4,373
Planothidium delicatulum	5,466	4,373
Rhopalodia sp.	5,466	-
Sellaphora sp.	5,466	-
Stauroneis sp.	-	4,373
Surirella sp.	10,932	26,236
Synedra acus	16,398	56,846
Synedra fasciculata	49,193	21,864
Synedra ulna	136,648	13,118

Appendix 8a cont'd

Taxa list and density (number/cm^2) for periphyton collected from glass microscope slides incubated for 28 days upstream and downstream of the City of Mulberry WWTP facility discharge, January 26, 2004.

	Control Site	Test Site
Chlorophycota		
Characium sp.	-	8,745
Chlamydomonas sp.	-	4,373
Chlorella sp.	5,466	8,745
Chlorococcum sp.	5,466	8,745
Gloeocystis gigas	-	17,491
Nannochloris sp.	60,125	-
Oedogonium sp.	-	4,373
Scenedesmus quadricauda	-	4,373
Staurastrum lativenter	5,466	-
Stigeoclonium sp.	32,795	69,964
Ulothrix sp.	-	8,745
Undetermined Chlorophyceae	5,466	-
Cyanophycota		
Chamaesiphon sp.	87,455	13,118
Cyanobium parvum	-	13,118
Cyanobium plancticum	16,398	8,745
Jaaginema sp.	-	17,491
Pseudanabaena sp.	5,466	-

Appendix 8b

Taxa list and number of individuals counted for periphyton collected from glass microscope slides incubated for 28 days upstream and downstream of City of Mulberry WWTP facility discharge, January 26, 2004.

	Control Site	Test Site
Bacillariophyta		
Achnanthes exigua	1	5
Achnanthes hungarica	15	4
Achnanthes lanceolata	96	40
Amphora sp.	-	2
Aulacoseira sp.	-	3
Bacillaria paxillifer	1	1
Capartogramma crucicula	-	2
Cocconeis sp.	21	4
Cocconeis placentula	7	-
Cyclotella sp.	-	6
Cyclotella meneghiniana	-	2
Diadesmis confervacea	-	7
Encyonema silesiacum	-	14
Eunotia sp.	7	8
Fragilaria sp.	-	4
Fragilaria delicatissima	2	-
Fragilariaceae	12	4
Gomphonema sp.	3	17
Gomphonema affine	1	-
Gomphonema parvulum	5	22
Hippodonta capitata	-	4
Melosira sp.	45	17
Navicula sp.	5	22
Navicula clementis	-	1
Navicula cryptocephala	-	2
Navicula cryptotenella	1	-
Navicula minima	-	9
Naviculaceae	-	2
Nitzschia sp.	1	21
Nitzschia amphibia	-	11
Nitzschia nana	-	2
Nitzschia palea	-	1
Planothidium delicatulum	1	1
Rhopalodia sp.	1	-
Sellaphora sp.	1	-
Stauroneis sp.	-	1
Surirella sp.	2	6
Synedra acus	3	13
Synedra fasciculata	9	5
Synedra ulna	25	3

Appendix 8b cont'd

Taxa list and number of individuals counted for periphyton collected from glass microscope slides incubated for 28 days upstream and downstream of City of Mulberry WWTP facility discharge, January 26, 2004.

	Control Site	Test Site
Chlorophycota		
Characium sp.	-	2
Chlamydomonas sp.	-	1
Chlorella sp.	1	2
Chlorococcum sp.	1	2
Gloeocystis gigas	-	4
Nannochloris sp.	11	-
Oedogonium sp.	-	1
Scenedesmus quadricauda	-	1
Staurastrum lativenter	1	-
Stigeoclonium sp.	6	16
Ulothrix sp.	-	2
Undetermined Chlorophyceae	1	-
Cyanophycota		
Chamaesiphon sp.	16	3
Cyanobium parvum	-	3
Cyanobium plancticum	3	2
Jaaginema sp.	-	4
Pseudanabaena sp.	1	-

Appendix 9a

Qualitative benthic macroinvertebrate collections (n = 20 discrete dipnet sweeps) upstream and downstream of City of Mulberry WWTP (January 26, 2004). Taxa list and number of individuals counted (collapsed). See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

	Control Site	Test Site
Annelida		
Oligochaeta		
Limnodrilus hoffmeisteri	-	1
Nais communis complex	-	3
Arthropoda		
Crustacea		
Amphipoda		
Hyalella azteca	4	8
Decapoda		
Palaemonetes sp.	2	-
Insecta		
Coleoptera		
Dubiraphia vittata	2	2
Stenelmis sp.	3	4
Collembola		
Undetermined Collembola	-	1
Diptera		
Ceratopogonidae	-	1
Cricotopus bicinctus	24	25
Empididae	-	1
Endotribelos hesperium	1	1
Pentaneura inconspicua	4	2
Polypedilum flavum	22	17
Polypedilum illinoense grp.	4	1
Polypedilum scalaenum grp.	-	2
Rheotanytarsus exiguus grp.	-	1
Stenochironomus sp.	-	1
Tanytarsus sp. A Epler	-	1
Tanytarsus sp. L Epler	1	1
Thienemanniella xena	-	4
Ephemeroptera		
Baetis intercalaris	14	-
Caenis sp.	1	-
Tricorythodes albilineatus	8	9
Heteroptera		
Undetermined Heteroptera	3	-
Odonata		
Argia sp.	-	1
Calopterygidae	-	2
Trichoptera		
Cheumatopsyche sp.	7	2
Hydroptila sp.	-	1
Neotrichia sp.	2	2
Oecetis sp.	-	1
Polycentropodidae	-	1
Mollusca		
Bivalvia		
Corbicula fluminea	1	-
Undetermined Bivalvia	-	1
Gastropoda		
Pyrgophorus platyrachis	6	6

Appendix 9b

Qualitative benthic macroinvertebrate collections (n = 20 discrete dipnet sweeps) upstream and downstream of City of Mulberry WWTP (January 26, 2004). Taxa list and number of individuals counted.

	Control Site	Test Site
Annelida		
Oligochaeta		
Limnodrilus hoffmeisteri	-	1
Nais communis complex	-	3
Arthropoda		
Crustacea		
Amphipoda		
Hyalella azteca	4	8
Decapoda		
Palaemonetes sp.	2	-
Insecta		
Coleoptera		
Dubiraphia vittata	1	2
Elmidae	2	-
Stenelmis sp.	2	4
Collembola		
Undetermined Collembola	-	1
Diptera		
Ceratopogonidae	-	1
Chironomidae	11	4
Cricotopus sp.	-	1
Cricotopus bicinctus	19	21
Empididae	-	1
Endotribelos hesperium	1	1
Pentaneura inconspicua	3	2
Polypedilum sp.	2	-
Polypedilum flavum	16	16
Polypedilum illinoense grp.	3	1
Polypedilum scalaenum grp.	-	2
Rheotanytarsus exiguus grp.	-	1
Stenochironomus sp.	-	1
Tanytarsus sp. A Epler	-	1
Tanytarsus sp. L Epler	1	1
Thienemanniella sp.	-	3
Thienemanniella xena	-	1
Ephemeroptera		
Baetidae	7	-
Baetis intercalaris	7	-
Caenis sp.	1	-
Tricorythodes albilineatus	8	9
Heteroptera		
Undetermined Heteroptera	3	-
Odonata		
Argia sp.	-	1
Calopterygidae	-	2
Trichoptera		
Cheumatopsyche sp.	6	1
Hydropsychidae	1	1
Hydroptila sp.	-	1
Hydroptilidae	-	1
Neotrichia sp.	2	1
Oecetis sp.	-	1
Polycentropodidae	-	1
Mollusca		
Bivalvia		
Corbicula fluminea	1	-
Undetermined Bivalvia	-	1
Gastropoda		
Hydrobiidae	2	-
Pyrgophorus platyrachis	4	4
Undetermined Gastropoda	-	2

The Priority Pollutants Analysis for Bioassay of City of Mulberry WWTP effluent sampled on January 26, 2004, NPDES #FL0020338.

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

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 0 2 0 3 3 8 11	12 0 4 0 1 2 6	18 X	19 S	20 1

Remarks

66