

Biological Assessment of

Mulberry Wastewater Treatment Plant

Polk County

NPDES # FL0020338

Sampled February 21-22, 2010

And April 12, 2010

September 2010

Biology Section

Bureau of Laboratories

Division of Environmental Assessment and Restoration

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EPA End Sheet

Fifth Year Inspection Summary

The Fifth Year Inspection of Mulberry WWTP conducted February 21-22, 2010 and April 12, 2010 produced the following notable results:

Atrazine was detected in the effluent composite sample collected on 02/21/10 and the effluent grab sample collected on 02/22/10. Effluent metals were all within permit limits and Class III Freshwater Quality Criteria (62-302.530 F.A.C.). Metals detected at both the Control and Test Sites were within Class III Freshwater Quality Criteria.

The No Observed Effect Concentration (NOEC) for the water flea, *Ceriodaphnia dubia*, was 100% which complies with Class III Freshwater Quality Criterion (62-302.530(61) F.A.C.) and permit limits. The initial chronic screen for the fathead minnow, *Pimephales promelas*, could not be completed due to sample shipping errors. These errors prompted a second sampling on 04/12/10 to collect samples for a 96 hour acute screen. The 96 hour acute screen determined that the effluent sampled on 04/12/10 was not acutely toxic to *Pimephales promelas.* It should be noted that the effluent sample from 04/12/10 did show acute toxicity to *Ceriodaphnia dubia,* with 65% mortality. This toxicity constitutes an exceedance of Class III Freshwater Quality (Rule 62-302.500 (1) (a) 4, F.A.C & Rule 62-4.244(3) (a), F.A.C) and further testing is needed.

Effluent temperature, dissolved oxygen, and conductivity were all within Class III Freshwater Quality Criteria and/or permit limits. Temperature, dissolved oxygen, and conductivity for the Control and Test Sites were all lower than those of the effluent and were almost identical to each other. It was noted on the habitat assessment sheets that Test Site samples were collected before effluent discharge commenced from the sequencing batch reactor (Appendix H), so it cannot be determined what impact, if any, the effluent may have on the physical/chemical parameters at the Test Site from this inspection. The pH was below the Class III criteria and effluent limit in the effluent grab sample, and at both the Control and Test Sites; however these values are qualified as estimated values (J qualifier) because the pH probe failed post sampling verification. The determination that the pH exceeds Class III criteria cannot be made. Algal Growth Potential (AGP) values of the effluent composite, effluent grab, Control Site and Test Site samples were all above the “problem” threshold of 5.0 mg dry weight/L for fresh water (Raschke & Schulz, 1987). Both the grab and the composite samples taken from the effluent have higher AGP values than the Control and Test Sites. In stream samples were collected before the discharge commenced from the sequencing batch reactor. It cannot be determined what impact, if any, the effluent may have on nutrient levels and AGP at the Test Site. An indicator of potential effluent impacts at the Test Site may be chlorophyll-a. Although levels were not high at the Control and Test Sites, chlorophyll-a at the Test Site was double that at the Control Site. Nutrients for the effluent, Control Site, and Test Site complied with Class III Water Quality Criteria and permit limits. Total nitrogen and nitrate/nitrite values were at least two times higher in the effluent composite than in the effluent grab sample. This suggests some variability in the nitrogen content of the effluent.

The Shannon-Weaver Diversity score derived from the Hester Dendy samplers was higher at the Test Site than at the Control Site but the Test Site macroinvertebrates still appear to be affected by the effluent. The larger number of individuals collected on the Test Site Hester Dendy samplers and the abundance of pollution tolerant oligochaetes indicate nutrient enrichment at the Test Site. Although the Test Site scored higher than the Control Site for the Stream Condition Index (SCI), the difference was within the method detection limit. The Test Site had a much higher percentage of very tolerant individuals than did the Control Site. Both sites scored in Category 2 (see Appendix C for an explanation of SCI Categories). Periphyton samples from both the Control Site and the Test Site consisted mostly of diatoms. The dominant diatom for the Test Site was a tolerant species. The Control Site had slightly more blue-green and green wet algae than the Test Site. Samplers noted that both the Control Site and Test Site had extensive periphyton smothering which may indicate nutrient enrichment of both sites.

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.

Facility Overview

The Mulberry Wastewater Treatment Plant is a domestic wastewater treatment plant that discharges into the north prong of the Alafia River, a Class III Fresh Water (see map Appendix A). The facility utilizes a Type I Sequencing Batch Reactor to treat wastewater by disinfection, followed by dechlorination, prior to discharge. The design flow of the wastewater treatment facility is 0.750 million gallons per day (MGD) annual average daily flow (AADF). The mean flow for the previous 12 months for all external outfalls was 0.275 MGD, and the monthly average flow for February 2010 was 0.282 MGD.

See the Facility Summary (Appendix 2) for a description of the facility, summary of permit limits, and discharge monitoring report (DMR) information.

Methods

The purpose of this investigation was to determine the discharge's effects 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 starting approximately 30 meters above of the point of discharge and ending approximately 130 meters above the point of discharge) and a Test Site (located in the North Prong of the Alafia River starting approximately 176 meters below the point of discharge and ending approximately 76 meters below the point of discharge). Effluent samples for toxicity were taken as 24-hour composite samples from outfall D-001. Samples for TSS, AGP, BOD, nutrients, and metals were taken as composite and grab samples from outfall D-001. Effluent samples for all other analyses we were taken as grab samples. Follow-up toxicity sampling for the 96-hour acute screen was taken as effluent grab sample on April 12, 2010.

All field and laboratory biological methods followed Bureau of Laboratories and Biology Section Standard Operating Procedures (see http://www.floridadep.org/labs/sop/index.htm for details) and met DEP quality assurance/quality control standards (see http://www.floridadep.org/labs/qa/index.htm). Explanations of specific methods and measurements can be found in Appendix C.

The following were involved in this investigation: Jason Cohen, Peggy Morgan, Gitta Schmitt, and Peter Wenner (FDEP Southwest District) and DEP Central Laboratory in Tallahassee. The report was reviewed by District representatives and the Point Source Studies Review Committee (Michael Tanski, Cari Butler and Nancy Ross).

Results and Discussion

Organic Constituents (See Table 1 and Appendix E)

- Atrazine was detected in the effluent composite and grab samples.
- No organic constituents were detected in the field blank.

Metals (See Table 2 and Appendix E)

- All metals detected in effluent composite and grab samples and in Control and Test Site samples were present at levels that complied with Class III Fresh Water Quality Criteria (62-302.530 F.A.C.).
- All metals present at levels between the minimum detection limit (MDL) and practical quantitation limit (PQL) in the effluent composite and grab samples and in Control and Test Site samples complied with the water quality criteria.
- No metals were detected in the field blank.

Toxicity Whole Effluent Test (See Table 1 and Appendices F and G)

Chronic Tests were performed February 23 through March 1, 2010.

- The NOEC for the water flea, *Ceriodaphnia dubia*, during the chronic screen bioassay was 100%, and therefore complied with effluent permit limits.
- The third sample required for the completion of the *Pimephales promelas* chronic bioassay was not received. As a result, the test was invalidated.

Acute Tests were performed April 13 through April 17, 2010.

- The effluent sample was toxic to the water flea, *Ceriodaphnia dubia,* during the 96 hour acute screen bioassays with a mortality of 65%. There is no permit limit for acute screenings; however this mortality exceeds Class III Freshwater Quality Criteria (Rule 62-302.500 (1) (a) 4, F.A.C & Rule 62-4.244(3) (a), F.A.C). This result is contrary to the chronic definitive bioassay for the *C. dubia* and consequently further testing is needed. During the April sampling event, in which the failed acute screen was collected, no samples for chemistry analyses were taken; therefore potential causes of toxicity cannot be determined.
- The effluent sample was not toxic to the fish, *Pimephales promelas*, during the 96 hour acute screen bioassays.

Physical and Chemical Parameters (See Table 1 and Appendices D, E and H)

- Habitat Assessment scores were similar at the Control Site (101) and Test Site (109), which places both sites in the Suboptimal category (category from Appendix C). While the Control Site had more substrate diversity, both sites had low substrate availability due to habitat smothering by periphyton. The water velocity and artificial channelization scored similarly at both Control and Test Sites, with scores in the optimal category and suboptimal categories respectively. The Control Site scored distinctly lower than the Test Site in the riparian zone vegetation quality. The riparian buffer zone width for the right and left bank at the Control Site were at the junction of the Suboptimal and Marginal categories. The right and left banks of the Test Site were distinctly different, with the right bank scoring the in Poor category and the left bank in the Optimal category.
- Dissolved oxygen (mg/L) of the effluent, Control, and Test Sites complies with Class III Fresh Water Quality Criteria (62-302.530 F.A.C.) and effluent permit limits.
- The pH (Standard Units) measurements for the effluent grab (4.8), Control (4.9), and Test (4.8) sites taken on February 22 were below the Class III criteria and effluent limit. However, these values are qualified as estimated values (J qualifier) so the determination that they exceed Class III criteria is inconclusive. The pH for the effluent sample collected on April 12 complies with Class III criteria and permit limits.
- Specific conductance (µmhos/cm) of the effluent, Control, and Test Sites complies with Class III Fresh Water Quality Criteria (62-302.530 F.A.C.) and effluent permit limits.
- The field measurement for Total Residual Chlorine was reported as 0.01 mg/L and complies with Class III Fresh Water Quality Criteria (62-302.530 F.A.C.) and effluent permit limits.
- Chlorophyll *a* content estimates algal biomass, and high algal biomass implies nutrient stress (Stevenson and Bahls, 1999). Chlorophyll *a* (µg/L) was undetected in the effluent sample and was detected at a low level at both the Control (2.1 µg/L) and Test Sites (4.8 µg/L). However, the fact that chlorophyll *a* at the Test Site was double that of the Control Site may be indicative of nutrient enrichment at the Test Site as a result of the effluent.
- Total suspended solids (mg/L) and Carbonaceous Biological Oxygen Demand (CBOD; mg/L) of the effluent complied with permit limits.

Microbiology (See Table 1 and Appendix E)

- Fecal coliform analysis was performed by Advanced Environmental Laboratories, Inc., Tampa, FL.
- Fecal coliforms were detected in the effluent and at both the Control and Test Sites at levels which complied with Class III Fresh Water Quality Criterion (62-302.530(6) F.A.C.).

Nutrients (See Table 1 and Appendix E)

- Effluent nutrient levels complied with permit limits and the Class III Fresh Water Quality Criterion.
- Nitrate and Nitrite measured in the effluent composite sample was approximately 4 times that measured in the effluent grab sample. This suggests some variability in the nitrogen content of the effluent.

- Nutrient measurements at the Control and Test Sites were similar to each other. There was no detectable nutrient enrichment from the effluent at the Test Site; however, notes on the habitat assessment sheets indicate that Test Site samples were collected prior to discharge commencing from the sequencing batch reactor (Appendix H).
- No nutrients were detected in the field blank.

Algal Growth Potential (See Table 3 and Appendix E)

- Algal growth potential (AGP) is a measure of nutrients available for algal growth (Miller et al. 1978). Raschke and Shultz (1987) determined that AGP values above 5.0 mg dry weight/L represent a "problem" threshold for fresh receiving waters, implying nutrient enrichment. The AGP values for all samples using the freshwater species, *Pseudokirchneriella subcapitata,* were far greater than the "problem" threshold value.
- The AGP value for the effluent composite sample (116.0 mg dry wt/L) is approximately 23 times greater than the "problem" threshold, but the value is qualified as being held beyond the normal holding time.
- The AGP values of the Control and Test Sites (34.0 and 33.9 mg dry weight/L, respectively) were similar and lower than the effluent grab AGP value (50.8 mg dry weight/L). However, since the Test Site samples were collected prior to discharge commencing, the AGP value of the Test Site may not reflect the potential nutrient enrichment from the effluent. The analytical chemistry suggests that the effluent Control Site, Test Site and are all likely nitrogen limited.

Bioassessment

Periphyton (See Table 4 and Appendices I-1 and I-2)

Periphyton communities at both the Control and Test Sites consisted mostly of diatoms. The diatom community at the Control Site was dominated by *Synedra ulna.* The Test Site's dominant species was *Melosira varians* which is a known pollution tolerant species (Stoermer and Julius, 2003). There were more blue-green and green algae at the Control Site than there were at the Test Site. There were no adverse affects apparent on the periphyton community from the effluent. However, it was noted on the habitat assessment sheets that both sites were smothered with attached algae, which is may be indicative of high nutrients at both sites.

Macroinvertebrates (See Tables 5 and 6 and Appendices J-1, J-2, K-1 and K-2)

- Quantitative macroinvertebrate data were collected from Hester Dendy samplers at the Control and Test Sites. The number of individuals counted for the Test Site was 2,892, which was markedly higher than the 961 individuals counted for the Control Site. Both sites were heavily dominated by dipterans (66-75%). The Control and Test Sites had similar levels of trichopterans, and were mainly of the genus *Cheumatopsyche*, a group geographically widespread, found in a variety of stream sizes, and known to be pollution tolerant. There were a higher percentage of oligochaetes, a pollution tolerant group, at the Test Site (15.9%) than the Control Site (0.5%). The Shannon-Weaver Diversity Index score was higher at the Test Site (3.14) than the Control Site (2.93).
- Qualitative macroinvertebrate data from dipnet samples indicated that the macroinvertebrate community was slightly different at the Control and Test Sites. The Control Site had a higher percent of suspension feeders and filterers and the Test Site had a higher percentage of very tolerant individuals. Both sites had similar numbers of ephemeroptera, but the Control Site had more trichoptera. The Test Site had a large percentage of oligochaetes, while the Control Site had none. This difference is reflected in the increased percentage of burrowing deposit feeders in the Test Site. Both the Control Site and Test Site placed in Category 2 of Stream Condition Index (SCI), scoring 39 A and 44 A, respectively (see Appendix C for an explanation of SCI Categories). The difference in SCI scores was within the minimal detectable difference of the SCI calculation indicating that the biological communities are not considered to be significantly different.

Conclusion

The test results for the chronic bioassay screen of *Ceriodaphnia dubia* and the acute screen for *Pimephales promelas* showed no indication of toxicity, but the acute screen of *C. dubia* did. The AGP values for the effluent, Control, and Test sited were all above the "problem" threshold, and the habitat assessment indicates high levels of nutrients. However, sampling was done prior to discharge commencing and therefore the potential nutrient enrichment from the effluent may not be reflected in the AGP and nutrient test results. The dominant composition of the macroinvertebrate communities at the sites was similar, but the Test Site had a markedly higher number of individuals and an increase in pollution tolerant species compared to the Control Site.

Literature Cited

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

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

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.

Stoermer,E. F. and Julius, M. L. 2003. Centric Diatoms, pp.559-594 in: Freshwater algae of North America, edited by J. D. Wehr and R. G. Sheath, Academic Press, San Diego. 918 pp.

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

Mulberry WWTP	Class III Criteria	Effluent Limits	Effluent Composite 02/21/2010	Effluent Grab 02/22/2010	Effluent 04/12/2010	Control Site	Test Site
Organic Constituents (µg/L)							
Atrazine	-	-	0.37	0.35	-	-	-
Nutrients (mg/L)							
Ortho-phosphate	-	-	0.33 Q	0.65	-	2.2	2.2
Total Phosphorus	-	-	0.41	0.75	-	2.6	2.6
Total Ammonia	-	-	0.043	0.054 J	-	0.022	0.026
Un-ionized Ammonia	≤ 0.02 s	-	-	≤ 0.02 c	-	≤ 0.02 c	≤ 0.02 c
Nitrate and Nitrite	-	-	2.8	0.65	-	0.51	0.51
Total Kjeldahl Nitrogen	-	-	1	1	-	0.78	0.81
Organic Nitrogen	-	-	0.957 c	0.946 c	-	0.758 c	0.784 c
Total Nitrogen	-	≤ 6.0 s,p	3.8 c	1.65 c	-	1.29 c	1.32 c
General Physical and Chemical Parameters							
Habitat Assessment	-	-	-	-	-	101	109
Dissolved Oxygen (mg/L)	≥ 5.0	≥ 5.0 s	-	8.9	8.9	7.6	7.6
pH (SU)	6.0 - 8.5	6.0-8.5 s	-	4.8 J	6.5	4.9 J	4.8 J
Conductivity (µmhos/cm)	≤ 1,275	-	-	799	990	671	671
Temperature (°C)	-	-	-	20.4	24.5	16.1	16.0
Sample Depth (m)	-	-	-	-	0.2	-	-
Total Residual Chlorine (mg/L)	≤ 0.01	≤ 0.01 s	-	0.01	-	-	-
Chlorophyll *a* (µg/L) - Corrected	-	-	-	0.55 U	-	2.1	4.8
Phaeophytin (µg/L)	-	-	-	0.4 U	-	1.7	5.6
Total Suspended Solids (mg/L)	-	≤10 s,p	4 U	4 U	-	6 I	5 I
Turbidity (NTU)	< 29 t		-	1	-	4.3	3.7 A
CBOD, 5 day (mg/L), N - inhibited	-	≤ 10 s,p	1.4 IQ	1.8 I	-	1.2 I	1.1 I
Flow (MGD)	-	0.75	0.282	-	-	-	-
Hardness (mg $CaCO_3$)	-	-	174.55 c	173.30 c	-	184.52 c	184.27 c
Toxicity							
Chronic screen, NOEC, % effluent							
Bioassay - Water flea *(Ceriodaphnia dubia)*	-	100	100	-	-	-	-
Bioassay - Fish *(Pimephales promelas)*	-	100	No Result *O	-	-	-	-
96 hour acute screen, % mortality							
Bioassay - Water flea *(Ceriodaphnia dubia)*	≤50	-	-	-	65	-	-
Bioassay - Fish *(Pimephales promelas)*	≤50	-	-	-	5	-	-
Microbiology (Number of colony forming units/100ml)							
Fecal Coliforms ¥	≤ 400s #	-	-	3 B	-	23 B	24 B

Value exceeds the Class III Water Quality Criteria or permit limits

* - The third of three samples required for the completion of the *Pimephales promelas* chronic bioassay was not received. See NCR 3337.
c - Value is calculated
p - 16 hour flow proportioned composite
s - Single sample
t - Shall not exceed 29 NTUs above background
A - Value reported is the mean of two or more determinations
B - Results based on colony counts outside the acceptance range
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
J - Estimated value
O - Sampled, but analysis lost or not performed
Q - Sample held beyond normal holding time
U - Material analyzed for but not detected; value reported is the method detection limit
NOEC - A no observed effect concentration less than 100% effluent will constitute a violation of this permit
¥ - Fecal coliform analysis performed by Advanced Environmental Laboratories, Inc.
- If 10 or fewer samples are taken within a month, the single sample limit is 400 CFU (62-302.530(6), F.A.C.)

Table 2. Effluent limits, Class III Freshwater Criteria and metals data. Class III Criteria based on hardness are presented individually for each site based on hardness at that site.

Mulberry WWTP	Effluent Composite Class III Criteria	Effluent Limits	Effluent Composite	Effluent Grab Class III Criteria	Effluent Grab	Control Site Class III Criteria	Control Site	Test Site Class III Criteria	Test Site
Metals (µg/L unless otherwise noted)									
Aluminum	-	-	70 I	-	64 I	-	270	-	230 I
Arsenic	≤ 50	-	0.31 I	≤ 50	0.38 I	≤ 50	2.62	≤ 50	2.6
Cadmium	≤ 0.4 b	-	0.03 U	≤ 0.41 b	0.03 U	≤ 0.43 b	0.045 I	≤ 0.43 b	0.056 I
Calcium (mg/L)	-	-	48.3	-	47.8	-	48.5	-	48.4
Chromium-III	≤ 136.0 b	-	0.3 U	≤ 135.20 b	0.3 U	≤ 142.33 b	0.68 I	≤ 142.17 b	0.63 I
Copper	≤ 15.0 b	-	1.83	≤ 14.92 b	2.83	≤ 15.75 b	0.5 U	≤ 15.73 b	0.5 U
Iron	≤ 1,000	-	90 I	≤ 1,000	94 I	≤ 1,000	250	≤ 1,000	240
Lead	≤ 6.5 b	-	0.2 U	≤ 6.41 b	0.26 I	≤ 6.94 b	0.2 U	≤ 6.93 b	0.2 U
Magnesium (mg/L)	-	-	13.1	-	13.1	-	15.4	-	15.4
Mercury	≤ 0.012	-	-	≤ 0.012	-	≤ 0.012	-	≤ 0.012	-
Nickel	≤ 83.6 b	-	1.01	≤ 83.06 b	0.87 I	≤ 87.59 b	3.21	≤ 87.49 b	3.17
Selenium	≤ 5.0	-	0.2 U	≤ 5.0	0.2 U	≤ 5.0	0.21 I	≤ 5.0	0.22 I
Silver	≤ 0.07	-	0.025 U	≤ 0.07	0.025 U	≤ 0.07	0.025 U	≤ 0.07	0.025 U
Zinc	≤ 192.1 b	-	63	≤ 190.92 b	70	≤ 201.34 b	5 U	≤ 201.11 b	5 U

See Table 1 for calculated hardness.

b - Value is calculated based on hardness

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

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

Table 3. Measured and predicted algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN) and total nitrogen (TN) limitation of the freshwater species *Pseudokirchneriella subcapitata* and ratios of nitrogen to phosphorus.

Mulberry WWTP					
Location	**AGP (measured)**	**Predicted AGP (TSIN) ± 20%**	**Predicted AGP (TN) ± 20%**	**Inorganic N:P ratio**	**Total N:P ratio**
Effluent Composite	116.0 Q	108.0 ± 21.6	144.4 ± 28.9	8.6	9.3
Effluent Grab	50.8	26.8 ± 5.4	62.7 ± 12.5	1.1	2.2
Control Site	34.0	20.2 ± 4.0	49.0 ± 9.8	0.2	0.5
Test Site	33.9	20.4 ± 4.1	50.2 ± 10.0	0.2	0.5

Q - Sample held beyond normal holding time

Table 4. Periphyton Composition - Qualitative.

Mulberry WWTP	**Control Site**	**Test Site**
Number of Wet Taxa	12	7
Number of Wet Algal Units Identified	302	304
Percent Dominant Wet Taxon	88.1	92.4
Dominant Wet Taxon Name	Bacillariophyta (Diatoms)	Bacillariophyta (Diatoms)
Number of Diatom Taxa	50	57
Number of Diatom Algal Units Identified	500	500
Percent Dominant Diatom Taxon	25.0	38.4
Dominant Diatom Taxon Name	*Synedra ulna*	*Melosira varians*
Percentage Composition for Wet Algae		
Blue-green algae	9.3	6.6
Green algae	2.7	1.0
Diatoms	88.1	92.4

Table 5. Macroinvertebrate Hester-Dendy Samples - Quantitative.

Mulberry WWTP	Control Site	Test Site
Summary Statistics		
Shannon-Weaver Diversity	2.93	3.14
Number of Taxa	26	29
Number of EPT Taxa	4	7
Percent Dominant Taxon	29.3	21.6
Dominant Taxon Name	*Polypedilum flavum* (Diptera)	*Polypedilum flavum* (Diptera)
Total Number of Individuals (counted)	961	2,892
Total Number of Individuals (#/m^2)	2,543	7,651
Community Composition: Percent of total		
Acariformes	0.1	0.0
Amphipoda	0.1	0.0
Coleoptera	0.4	0.2
Diptera	74.3	66.9
Ephemeroptera	4.6	2.4
Gastropoda	0.2	0.2
Isopoda	0.0	0.1
Odonata	0.0	0.1
Oligochaeta	0.5	15.9
Plecoptera	0.0	0.0
Trichoptera	19.6	14.3
Other	0.2	0.0
Functional Feeding Groups: Percent of total		
Burrowing Deposit Feeders	0.5	15.9
Piercers	0.7	0.5
Predators	3.5	2.9
Scrapers	2.7	1.5
Shredders	23.0	19.0
Surface Deposit Feeders	45.7	42.4
Suspension Feeders	23.9	17.8

Table 6. Macroinvertebrate Dipnet Samples - Qualitative.

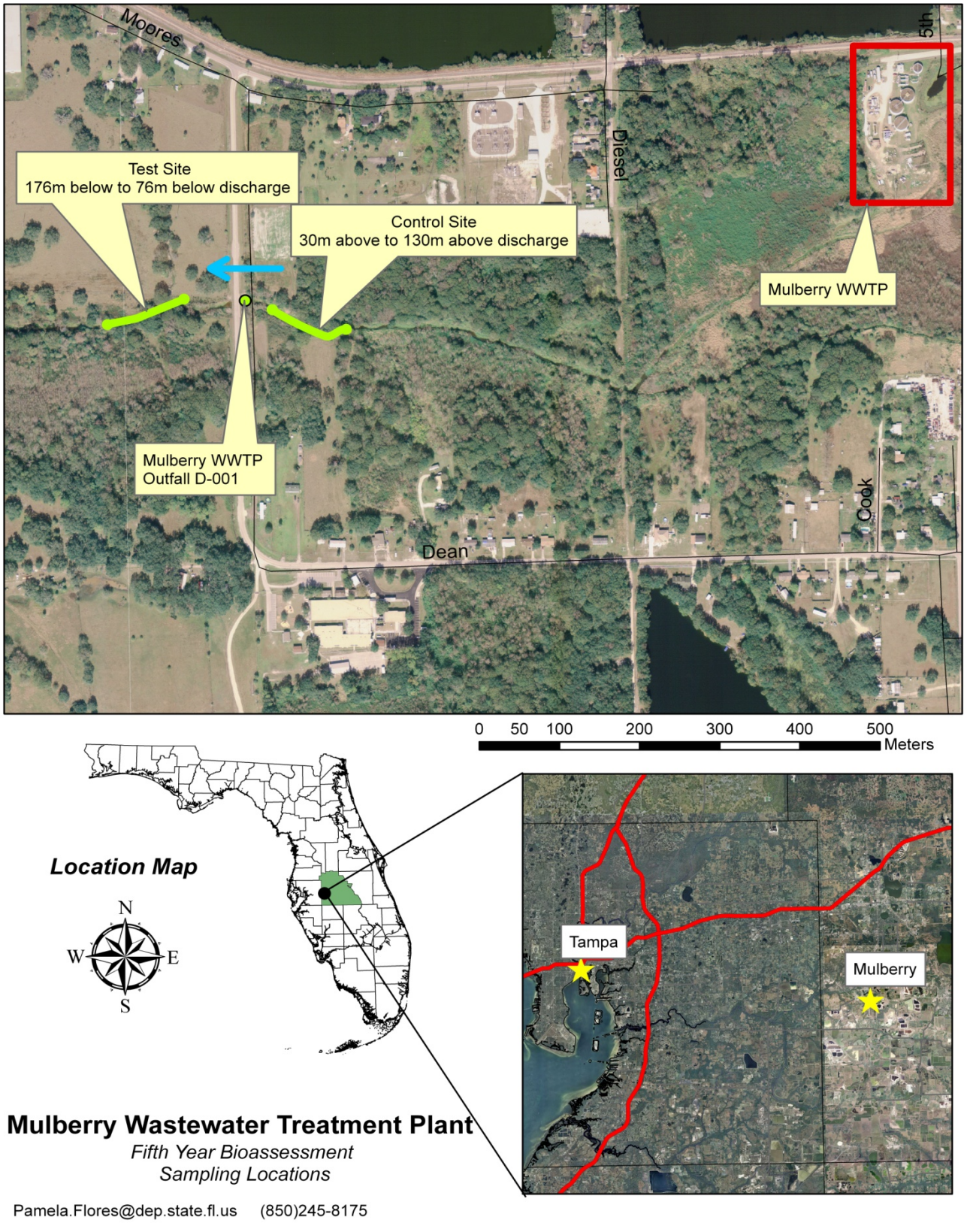
Mulberry WWTP	Control Site		Test Site	
Summary Statistics				
Stream Condition Index 2007 (value)	39 A		44 A	
Stream Condition Index 2007 (category) *	Category 2		Category 2	
Stream Condition Index Metrics	Rep 1	Rep 2	Rep 1	Rep 2
Number of Total Taxa	16	18	27	27
Number of Ephemeroptera Taxa	1	2	2	2
Number of Trichoptera Taxa	2	2	1	2
Number of Clinger Taxa	5	5	3	3
Number of Long-lived Taxa	0	1	2	3
Number of Sensitive Taxa	1	1	2	1
Percent of Dominant Taxon	31.4	31.7	20.6	35.2
Percent Suspension Feeders and Filterers	24.6	27.6	12.8	12.0
Percent of Tanytarsini Individuals	2.9	0.7	6.9	6.9
Percent of Very Tolerant Individuals	3.6	5.5	23.8	22.0
Total Number of Individuals	140	145	160	159
Community Composition: Percent of total				
Dominant Taxon Name	*Polypedilum flavum* (Diptera)	*Polypedilum flavum* (Diptera)	*Slavina appendiculata* (Oligochaeta)	*Slavina appendiculata* (Oligochaeta)
Acariformes	1.4	1.4	0.0	0.0
Amphipoda	14.3	7.6	1.3	1.3
Bivalvia	0.0	0.0	0.0	0.6
Coleoptera	6.4	5.5	6.3	6.9
Decapoda	0.0	0.0	3.1	1.9
Diptera	45.7	46.2	33.8	22.6
Ephemeroptera	10.0	9.0	7.5	2.5
Gastropoda	0.7	1.4	3.1	0.6
Isopoda	0.0	0.0	0.6	0.0
Odonata	0.0	2.8	2.5	1.3
Oligochaeta	0.0	0.0	35.0	54.7
Plecoptera	0.0	0.0	0.0	0.0
Trichoptera	21.4	26.2	6.9	6.9
Other	0	0	0	0.61
Functional Feeding Groups: Percent of total				
Browser-Grazers	0.0	0.0	1.6	0.6
Burrowing Deposit Feeders	0.0	0.0	35.0	54.7
Piercers	2.1	2.1	0.0	0.0
Predators	5.4	9.7	10.0	4.4
Scavengers	0.0	0.0	1.9	0.9
Scrapers	8.2	8.6	10.0	5.4
Shredders	24.6	22.4	9.1	7.2
Surface Deposit Feeders	35.0	29.7	19.7	14.8
Suspension Feeders	24.6	27.6	12.8	12.0
Unknown	0.0	0.0	0.0	0.0

A - Value reported is the mean of two determinations

* SCI_2007 categories from Table LT 7200-2 of DEP-SOP-002/01 as referenced in Quality Assurance Rule (62-160 F.A.C.),

December 3, 2008: Values 0 ≤ 34 are Category 3; Values 35 < 67 are Category 2; Values 68 ≤ 100 are Category 1

Appendix A
Map of Facility



Appendix B

Facility Summary

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Jason Cohen Jason.Cohen@dep.state.fl.us	**Contact Number:** 813-632-7600 x429
Facility Name (as it appears on permit): Mulberry WWTP	**Former Names:**
NPDES Permit Number: **FL0020338**	**Permit Expiration Date:** **October 30, 2010**
Physical Address: **500 Southwest Second Street Mulberry, Fl 33860**	
District: Southwest	**County:** **Polk**
Function of Facility: **Type I Sequencing Batch Reactor domestic wastewater treatment plant**	
Facility Type: Minor	**Permitted Capacity (MGD):** 0.750 - 3 Month AADF
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): **(11/08-10/09)** **D-001: 0.275 MGD**	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months):	
Description of type of Discharge: ☒**Continuous** ☐ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☐ **Other, please specify**	

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

Monitoring Location	Description of Monitoring Location
EFA-01	After disinfection.
EFB-01	Effluent after the filters before disinfection.
EFF-01	Effluent before discharge to receiving stream.
FLW-01	After the CCC

Description of Permitted Outfall(s):

Surface Water Discharge: An existing 0.75 MGD annual average daily flow (AADF) permitted discharge to the North Prong of the Alafia River (Class III fresh waters) at Discharge Location (D-001) which is approximately 3 feet in length and discharges at a depth of approximately 2 feet. The point of discharge is located approximately at latitude 27° 53' 35" N, longitude 81° 58' 42" W.

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

An existing 0.750 mgd Three Month Average Daily Flow (AADF) Type I Sequencing Batch Reactor domestic wastewater treatment plant consisting of: one fine screen with manual bar screen bypass and a velocity-controlled grit chamber with a mechanical grit removal system, three batch reactors of 0.900 million gallons total, one traveling bridge filter with a total of 280 square feet of filter surface area, two chlorine contact chambers of 30,997 total gallons, a dechlorination system, one sludge digester of 137,000 gallons, three sludge drying beds with a total of 1,624 square feet of bed area and one post aeration tank of 3,830 gallons. This facility is operated to achieve advanced wastewater treatment with high-level disinfection provided by sodium hypochlorite with dechlorination provided by a sodium bisulfate system.

PART I: Continued
List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under (Leave cell blank if not applicable)

			Effluent Limitations				Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Monthly Average	Weekly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Flow	MGD	Maximum	0.75	-	-	-	Continuous	Recording flow meters and totalizers	FLW-01	See Cond.I.A.3
BOD, Carbonaceous 5 day, 20C	MG/L	Maximum	5.0	6.25	7.5	10.0	Weekly	16-hour FPC	EFF-01	
Solids, Total Suspended	MG/L	Maximum	5.0	6.25	7.5	10.0	Weekly	16-hour FPC	EFF-01	
Solids, Total Suspended	MG/L	Maximum	-	-	-	5.0	Weekly	Grab	EFB-01	
pH	SU	Range	-	-	-	6.0 to 8.5	Continuous[1]	Meter	EFF-01	
Coliform, Fecal, % less than detection	PERCENT	Minimum	-	75	-	-	Weekly	Grab	EFF-01	See Cond.I.A.4
Coliform, Fecal	#/100ML	Maximum	-	-	-	25	Weekly	Grab	EFF-01	See Cond.I.A.4
Total Residual Chlorine (For Disinfection)	MG/L	Minimum	-	-	-	1.0	Continuous	Meter	EFA-01	See Cond.I.A.5
Total Residual Chlorine (For Dechlorination)	MG/L	Maximum	-	-	-	0.01	Daily	Grab	EFF-01	
Nitrogen, Total (as N)	MG/L	Maximum	3.0	3.75	4.5	6.0	Weekly	16-hour FPC	EFF-01	
Nitrogen, Total (as N)	Tons/Yr	Maximum	3.43	-	-	-	Monthly	Calculation	EFF-01	See Cond.I.A.11
Dissolved Oxygen (DO)	MG/L	Minimum	-	-	-	5.0	Daily	Grab	EFF-01	
Whole Effluent Toxicity	See Permit Condition I.A.7								EFF-01	

PART I: Continued PART I: Continued	
Receiving Waters: North Prong of the Alafia River	**Classification (indicate whether fresh or marine):** **Class III Fresh**

Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.):

7. **Chronic Whole Effluent Toxicity Testing** : The permittee shall comply with the following whole effluent toxicity testing requirements and initiate the series of tests described below within six months following permit issuance, unless otherwise directed by the Department in writing, to evaluate chronic whole effluent toxicity of the discharge from outfall D-001 into the North Prong of the Alafia River. If there is no discharge from outfall D-001 during this test period, a bioassay will not be required; a value of NODI = 9 should be reported on the DMR.

   a. Effluent Limitation
      1. A No Observed Effect Concentration (NOEC) of greater than or equal to 100% effluent in any routine test or any additional test shall constitute compliance with these permit conditions and Rule 62-302.530(62), F.A.C.
      2. A NOEC of less than 100% effluent in any routine test or additional test shall constitute non-compliance with these permit conditions and Rule 62-302.530(62), F.A.C. The permittee shall notify the Department via telephone or e-mail within 24 hours of notification that a routine or additional test failed.

   b. Monitoring Frequency
      The "routine" toxicity tests specified shall be conducted once every six months.

   c. Routine Test Requirements
      1. The permittee shall conduct a daphnid, Ceriodaphnia dubia, Survival and Reproduction Test and a fathead minnow, Pimephales promelas, Larval Survival and Growth Test, concurrently.
      2. All test species, procedures and quality assurance criteria used shall be in accordance with Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, 4th ed., EPA-821-R-02-013, or the most current edition. Any deviation of the toxicity procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use.
      3. The control water and dilution water used shall be moderately hard water as described in EPA-821-R-02-013, Section 7, or the most current edition.
      4. All routine tests shall be conducted using a control (0% effluent) and a minimum of five test concentrations: 100%, 50%, 25%, 12.5%, and 6.25% final effluent.

   d. Sampling Requirements
      1. For each routine test or additional test required, a total of three 24-hour, flow-proportioned composite samples of final effluent shall be collected and used per the sampling protocol discussed in EPA-821-R-02-013, Section 8, or the most current edition. The first sample shall be used to initiate the test. The remaining two composite samples shall be collected according to the protocol and used as renewal solutions on Day 3 (48 hours) and Day 5 (96 hours) of the test. If the duration of the discharge is less than 24-hours, the duration of discharge shall be documented on the chain of custody. Each sample shall be analyzed for total residual chlorine and pH at the time of sample collection.

   e. Additional Testing Requirements, if required

      1. If chronic toxicity (an NOEC of less than 100% effluent) is found in any routine test, the permittee shall conduc three valid additional definitive tests on each species indicating an NOEC of less than 100% effluent.
      2. Each valid additional test shall be conducted using a control (0% effluent) and a minimum of five dilutions: 100%, 50%, 25%, 12.5% and 6.25% effluent. The dilution series may be modified in the second test to more accurately bracket the toxicity, such that at least two dilutions above (not to exceed 100% effluent) and two dilutions below the target concentration and a control (0% effluent) are run. All test results shall be statistically analyzed according to the Appendices in EPA-821-R-02-013, or the most current edition.
      3. The first valid additional test shall be initiated within two weeks of the end of the failed routine test. The two additional tests shall be conducted one week thereafter. The additional tests will be used to evaluate the persistence of the observed toxicity.

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

Facility Mixing Zone Details (if applicable):

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

Date	Parameter and Units	Limit	Result

11/30/2008	NOEL Statre 7day Chr Ceriodaphnia, %	>100	<100
12/31/2008	Nitrogen, Total mg/L	AA: 3.0 SS: 6.0	5.3 9.9
1/31/2009	Nitrogen, Total mg/L	AA: 3.0	3.1
2/28/2009	Nitrogen, Total mg/L	AA: 3.0	3.2
3/31/2009	Nitrogen, Total mg/L	AA: 3.0 SS: 6.0	4.6 6.4
3/31/2009	Nitrogen, Total mg/L	AA: 3.0	3.4
4/30/2009	Nitrogen, Total mg/L	AA: 3.0 SS: 6.0	4.6 6.7
4/30/2009	Nitrogen, Total mg/L	AA: 3.0	3.5
4/30/2009	BOD, Carbonaceous 5 day, 20C mg/L	SS: 10.0	18.3
5/31/2009	Nitrogen, Total mg/L	AA: 3.0	3.5
6/30/2009	Nitrogen, Total mg/L	AA: 3.0	3.3
7/31/2009	Nitrogen, Total mg/L	AA: 3.0	3.3
8/31/2009	Nitrogen, Total mg/L	AA: 3.0	3.2
9/30/2009	Nitrogen, Total mg/L	AA: 3.0	3.2
10/31/2009	Nitrogen, Total mg/L	AA: 3.0	3.2

Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):
Describe previous FYI and WQBEL study:
Describe previous or current Enforcement Actions (including WLs):
Describe any violations or problems noted in previous inspection:
Discuss whether DMR trends within previous five years are improving or declining:

PART I: Continued

PART I: Continued

Receiving Waters:	**Classification (indicate whether fresh or marine):**
North Prong of the Alafia River	**Class III Fresh**

Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.):

7. **Chronic Whole Effluent Toxicity Testing** : The permittee shall comply with the following whole effluent toxicity testing requirements and initiate the series of tests described below within six months following permit issuance, unless otherwise directed by the Department in writing, to evaluate chronic whole effluent toxicity of the discharge from outfall D-001 into the North Prong of the Alafia River. If there is no discharge from outfall D-001 during this test period, a bioassay will not be required; a value of NODI = 9 should be reported on the DMR.

   a. Effluent Limitation
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      2. A NOEC of less than 100% effluent in any routine test or additional test shall constitute non-compliance with these permit conditions and Rule 62-302.530(62), F.A.C. The permittee shall notify the Department via telephone or e-mail within 24 hours of notification that a routine or additional test failed.

   b. Monitoring Frequency
      The "routine" toxicity tests specified shall be conducted once every six months.

   c. Routine Test Requirements
      1. The permittee shall conduct a daphnid, Ceriodaphnia dubia, Survival and Reproduction Test and a fathead minnow, Pimephales promelas, Larval Survival and Growth Test, concurrently.
      2. All test species, procedures and quality assurance criteria used shall be in accordance with Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, 4th ed., EPA-821-R-02-013, or the most current edition. Any deviation of the toxicity procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use.
      3. The control water and dilution water used shall be moderately hard water as described in EPA-821-R-02-013, Section 7, or the most current edition.
      4. All routine tests shall be conducted using a control (0% effluent) and a minimum of five test concentrations: 100%, 50%, 25%, 12.5%, and 6.25% final effluent.

   d. Sampling Requirements
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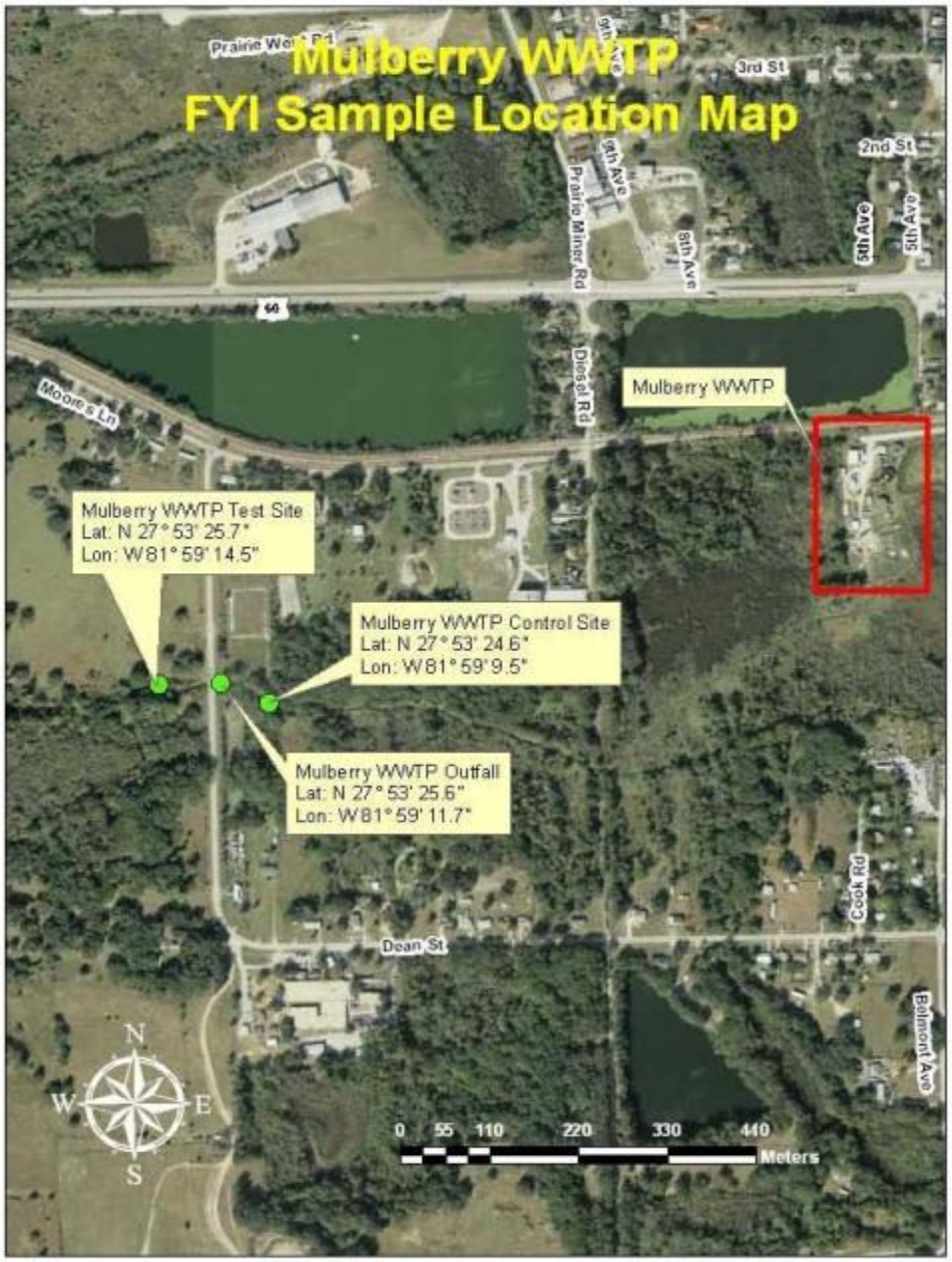
   e. Additional Testing Requirements, if required

      1. If chronic toxicity (an NOEC of less than 100% effluent) is found in any routine test, the permittee shall conduc three valid additional definitive tests on each species indicating an NOEC of less than 100% effluent.
      2. Each valid additional test shall be conducted using a control (0% effluent) and a minimum of five dilutions: 100%, 50%, 25%, 12.5% and 6.25% effluent. The dilution series may be modified in the second test to more accurately bracket the toxicity, such that at least two dilutions above (not to exceed 100% effluent) and two dilutions below the target concentration and a control (0% effluent) are run. All test results shall be statistically analyzed according to the Appendices in EPA-821-R-02-013, or the most current edition.
      3. The first valid additional test shall be initiated within two weeks of the end of the failed routine test. The two additional tests shall be conducted one week thereafter. The additional tests will be used to evaluate the persistence of the observed toxicity.

Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.):			
Facility Mixing Zone Details (if applicable):			
List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year:			
Date	Parameter and Units	Limit	Result

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2/28/2009	Nitrogen, Total mg/L	AA: 3.0	3.2
3/31/2009	Nitrogen, Total mg/L	AA: 3.0 SS: 6.0	4.6 6.4
3/31/2009	Nitrogen, Total mg/L	AA: 3.0	3.4
4/30/2009	Nitrogen, Total mg/L	AA: 3.0 SS: 6.0	4.6 6.7
4/30/2009	Nitrogen, Total mg/L	AA: 3.0	3.5
4/30/2009	BOD, Carbonaceous 5 day, 20C mg/L	SS: 10.0	18.3
5/31/2009	Nitrogen, Total mg/L	AA: 3.0	3.5
6/30/2009	Nitrogen, Total mg/L	AA: 3.0	3.3
7/31/2009	Nitrogen, Total mg/L	AA: 3.0	3.3
8/31/2009	Nitrogen, Total mg/L	AA: 3.0	3.2
9/30/2009	Nitrogen, Total mg/L	AA: 3.0	3.2
10/31/2009	Nitrogen, Total mg/L	AA: 3.0	3.2

Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):
Describe previous FYI and WQBEL study:
Describe previous or current Enforcement Actions (including WLs):
Describe any violations or problems noted in previous inspection:
Discuss whether DMR trends within previous five years are improving or declining:


Mulberry WWTP
FYI Sample Location Map
Prairie Wor
3rd St
2nd St
9th Ave
Prairie Miner Rd
8th Ave
5th Ave
60
Moore's Ln
Diesel Rd
Mulberry WWTP
Mulberry WWTP Test Site
Lat: N 27° 53' 25.7"
Lon: W81° 59' 14.5"
Mulberry WWTP Control Site
Lat: N 27° 53' 24.6"
Lon: W81° 59' 9.5"
Mulberry WWTP Outfall
Lat: N 27° 53' 25.6"
Lon: W81° 59' 11.7"
Cook Rd
Dean St
Belmont Ave
N
W
E
S
0 55 110 220 330 440
Meters



View of the North Prong of the Alafia River looking downstream (south) of the Mulberry WWTP outfall.



View of the Mulberry WWTP Outfall.



View of the North Prong of the Alafia River looking upstream (north) of the Mulberry WWTP outfall.

PART II: Sampling Event Information	
Date(s) sample collected: 22 February 2010	**Sampler(s):** Pete Wenner, Jason Cohen
Temperature (Deg C): 20.36° C	**pH (SU):** 4.81 (pH probe failed post calibration, pH data should be qualified with a "J" qualifier)
Dissolved Oxygen (mg/L): 8.85	**Conductivity (umhos/cm):** 799
Total Residual Chlorine (mg/L): 0.01	**Total Residual Chlorine - after Disinfection (mg/L):**
Method of Chlorination: Sodium hypochlorite	**Method of De-chlorination:** Sodium bisulfite
Flow During Sample Collection for each outfall(MGD): D-001: 0.279 MGD on 22 February 2010	
Mean Flow for each outfall for previous 12 months based on sampling date (If samples are taken on more than one day, indicate Mean Flow for each day): D-001: monthly average flow from 2/01/2009-2/28/2010: 0.282 MGD	
Describe Discharge during Sampling Event: ☐ **Continuous** ☒ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☐ **Other, please specify**	
Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here:	

Additional DMR DATA

Facility ID	Facility Name	Outfall Type	Monitoring Date	Outfall Indicator	Parameter Description	Data	Limit	Statistical Base	Units
FL0020338	MULBERRY STP	EFFLUENT	11/30/2009	001-1	NITROGEN, TOTAL	3.1	3	ANNL AVG	MG/L
FL0020338	MULBERRY STP	EFFLUENT	12/31/2009	001-1	SOLIDS, TOTAL SUSPENDED	2.8	6.25	MO AVG	MG/L
FL0020338	MULBERRY STP	EFFLUENT	12/31/2009	001-1	SOLIDS, TOTAL SUSPENDED	10.8	10	MAXIMUM	MG/L
FL0020338	MULBERRY STP	EFFLUENT	3/31/2010	001-1	SOLIDS, TOTAL SUSPENDED	6.4	5	MAXIMUM	MG/L

Appendix C
Explanation of Measurements

(1) Quality Assurance and Quality Control

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

(2) Chemical Analyses of the Effluent

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

(3) Toxicity Bioassays

Greater than 50% mortality in an acute toxicity test may constitute an exceedence of 62-302.500(1)a and/or a violation of facility permit limits. An inhibition concentration greater than 25% in a chronic test may constitute exceedences of 62-302.530(20), 62-302.530(61) and/or a violation of facility permit limits. Standard reference toxicant (SRT) tests are conducted monthly to ensure quality in toxicity testing.

(4) Bacteriological Testing

High levels of fecal coliform bacteria may constitute an exceedence of 62-302.530(6) and/or a violation of facility permit limits.

(5) Habitat Assessment

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

(6) Algal Growth Potential (AGP)

The 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 exceedences of 62-302.530(46) F.A.C., 62-302.530(47)(a) F.A.C. and/or 62-302.530(47)(b) F.A.C..

The concentration of nutrients in a water sample may be used to calculate the expected yield of AGP under the assumption that other required nutrients (e.g. silicon, micronutrients) are present in excess (Miller *et al*. 1978). The expected amount of production is calculated as 38 times the total soluble inorganic nitrogen (nitrate and nitrite plus ammonia) under nitrogen limitation or 430 times the ortho-phosphate (OP) concentration under phosphorus limitation with an error of $\pm$ 20%. When the ratio of nitrogen to phosphorus (N: P) is less than 10:1, nitrogen limitation of algal production is likely. When the N: P ratio is 20:1 or greater, phosphorus limitation is likely (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 constitute an exceedence of 62-302.530(61) F.A.C.

(7) Algal Phytoplankton and Periphyton Assemblages

Qualitative periphyton are sampled by taking subsamples of algae from natural substrates throughout the sample reach. Phytoplankton were sampled from the water column using a 1 L grab sample. Periphyton were subsampled and identified to the lowest practical level, usually species. Wet taxa and diatoms are identified separately. In the wet taxa analysis, soft algae are identified to the lowest practical level, and diatoms are identified only to order level (diatom). In the diatom analysis, diatoms are identified to the lowest practical level.

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

Algal Density: Algal density is estimated as number of natural units/ml for phytoplankton 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 exceedences of 62-302.530(46) F.A.C., 62-302.530(47)(a) F.A.C., 62-302.530(47)(b) F.A.C. and/or 62-302.530(61) F.A.C.

(8) Benthic Macroinvertebrate Assemblages

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

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 exceedences of 62-302.530(46) F.A.C., 62-302.530(47)(a) F.A.C., 62-302.530(47)(b) F.A.C. and/or 62-302.530(61) 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 exceedences of 62-302.530(46) F.A.C., 62-302.530(47)(a) F.A.C. and/or 62-302.530(47)(b) F.A.C..

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 (Fore et. al. 2007, Karr and Chu 1998). Shifts in community composition related to a facility's effluent may constitute exceedences of 62-302.530(46) F.A.C., 62-302.530(47)(a) F.A.C., 62-302.530(47)(b) F.A.C. and/or 62-302.530(61) 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 and shredders (Fore et. al. 2007). Changes in the proportions of functional feeding groups related to a facility's effluent may constitute exceedences of 62-302.530(46) F.A.C., 62-302.530(47)(a) F.A.C., 62-302.530(47)(b) F.A.C. and/or 62-302.530(61) F.A.C..

Shannon-Weaver Diversity Index: This index is specified in the Florida Administrative Code 62-302 as a measure of biological integrity. Low diversity scores are undesirable. Where diversity is low, only a few taxa are abundant as compared to an area where many taxa are present in equitable abundance among taxa (Magurran 1988). A difference of 25% in Shannon-Weaver diversity between results from Hester-Dendy multiplate samplers incubated for 28 days at test and control sites constitute exceedences of 62-302.530(10) F.A.C..

The Stream Condition Index (SCI): The SCI is a composite macroinvertebrate metric developed for Florida (Fore et. al. 2007). This Index was revised in 2007 using data from qualitative dipnet samples. The SCI now assigns points to ten parameters;

depending on how closely each parameter approaches an expected value (QA Rule SOP LT 7200). Points are assigned according to in which bioregion (Panhandle, Northeast, or Peninsula) the sampling location exists -and summed to yield a final SCI score (range 0-100). Included in the calculation of SCI are taxa richness, number of Ephemeroptera taxa, number of Trichoptera taxa, percent contribution of the dominant taxon, number of sensitive taxa, number of clinger taxa, number of long-lived taxa, percent contribution of Tanytarsini, percent contribution of very tolerant, and the percent contribution of suspension and filter feeders. As human disturbance increases, it is expected that taxa richness, the number of Ephemeroptera taxa, Trichoptera taxa, sensitive taxa, clinger taxa, long-lived taxa, and the percent contribution of Tanytarsini and suspension and filter feeders will decrease while percent contribution of dominant taxon, and percent contribution of very tolerant taxa will increase.

Scores are broken into three categories (1, 2, and 3). Sites in Category 1 are described as having higher diversity than Category 2 sites, particularly for Ephemeroptera and Trichoptera. A Category 1 site may have several more clinger and sensitive taxa, a higher proportion of Tanytarsini, and a lower percent of a dominant taxon than a site in Category 2. The site will also have a very small percentage of very tolerant individuals, if any.

Sites in Category 2 are described as having an average of 30 species with several different taxa of Ephemeroptera and Trichoptera. A Category 2 site also has several different long-lived taxa and, on average, 5 clinger and 6 sensitive taxa. There is a slight increase in dominance by a single taxon relative to sites in Category 1. Very tolerant taxa represent a small percentage of individuals but are noticeably increased as compared to sites in Category 1.

Sites in Category 3 are described as having a notable loss in taxonomic diversity, and Ephemeroptera, Trichoptera, long-lived, clinger and sensitive taxa are uncommon or rare. Filter feeders are reduced by at least 50%. The site is dominated by a tolerant taxon, and very tolerant individuals represent a large proportion of the individuals collected.

SCI 2007 categories are from Table LT 7200-2 of DEP-SOP-002/01 as referenced in Draft Quality Assurance Rule (62-160 F.A.C.), December 3, 2008. A decrease in ordinal SCI score from the Control to the Test site may be evidence of degradation related to a facility's effluent. An SCI score in Category 3, if it is shown to be related to a facility's effluent, may constitute exceedences of 62-302.530(46) F.A.C., 62-302.530(47)(a) F.A.C., 62-302.530(47)(b) F.A.C. and/or a violation of 62-302.530(61).

Appendix D

Chain of Custody

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2010-02-22-22
City of Mulberry WWTP

Requester: Michael Tanski
Field Report Prepared By:

Customer: SW-DIST
Collected By: P. WENNER ; J. COHEN
Send Final Report To Tom Gucciardo

Project ID: FYI5
Sampling Agency: FDEP SWD

PMAS: 1143

Lab ID *	Location / Field ID / Matrix / Temp (C) / pH / Latitude / Longitude	Collection (begin) / Collection (end) / Tot Res Chlorine (mg/L) / Diss Oxygen (mg/L) / Storet Station Number / Sample Depth / Salinity (PPTh) / Sp Conductance (umho/cm) / NPDES Number / Comments	Bottle Group(s)**
37378	Location: D-001 Matrix: FRESH Temp (C): 20.36 pH: 4.81	Grab; Collection (begin) Date 2/22/10 Time 960 Eastern Central Tot Res Chlorine (mg/L): 0.01 Diss Oxygen (mg/L): 8.85 Sample Depth: 0.31 / 799 Salinity (PPTh); Sp Conductance (umho/cm)	A
37379	Location: SCI CONTROL SITE Matrix: FRESH Temp (C): 16.06 pH: 4.85	Grab; Collection (begin) Date 2/22/10 Time 1100 Eastern Central Diss Oxygen (mg/L): 7.59 Storet Station Number: 24020069 Sample Depth: 0.33 / 671 Salinity (PPTh); Sp Conductance (umho/cm) Comments: MUL STPREF	B, C
37380	Location: SCI TEST SITE Matrix: FRESH Temp (C): 16.60 pH: 4.75	Grab; Collection (begin) Date 2/22/10 Time 1020 Eastern Central Diss Oxygen (mg/L): 7.55 Storet Station Number: 24020068 Sample Depth: 0.33 / 671 Salinity (PPTh); Sp Conductance (umho/cm) Comments: MULSTPTST	B, C
37381	Location: FIELD BLANKS Matrix: DI WATER Temp (C): pH:	Grab; Collection (begin) Date 2/22/10 Time 940 Eastern Central Tot Res Chlorine (mg/L): Diss Oxygen (mg/L): Sample Depth: Salinity (PPTh); Sp Conductance (umho/cm) Comments: 2 bottles ; ed in TSK by JD. 10:09 2.23.10	D

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
	2/22/10	FED EX	ABB	2-23-10 09.30				

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

A. Watten 2-23-2010 QNAC

Page 1 of 4

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2010-02-22-22
City of Mulberry WWTP

Customer: SW-DIST

Project ID: FYI5

PMAS: 1143

Requester: Michael Tanski

Collected By: P. WENNER ; J. COHEN

Sampling Agency: FDEP SWD

Field Report Prepared By:

Send Final Report To Tom Gucciardo

Lab ID *	Location / Field ID	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	Sample Depth m / ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number	Latitude	Longitude	Comments	Bottle Group(s)**
	D-001	FRESH			☑ Comp ☐ Grab	Date 2/21/10 Time 830 Eastern 900 Central	Date 2/21/10 Time 830 Eastern 900 Central										E
					☐ Comp ☐ Grab	Date Time Eastern Central	Date Time Eastern Central										
					☐ Comp ☐ Grab	Date Time Eastern Central	Date Time Eastern Central										
					☐ Comp ☐ Grab	Date Time Eastern Central	Date Time Eastern Central										

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
	2/22/10 1500	FED EX		2-23-10 09:30				

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Advanced Environmental Laboratories, Inc.

- ☐ 6601 Southpoint Pkwy • Jacksonville, FL 32216 • 904 363 9350 • Fax 904 363 9354 • E82574
- ☑ 9610 Princess Palm Ave • Tampa, FL 33619 • 813 630 9616 • Fax 813 630 4327 • E84589
- ☐ 2106 NW 67th Place, Ste. 7 • Gainesville, FL 32606 • 352 367 1500 • Fax 352 367 0050 • E82620
- ☐ 528 S. North Lake Blvd., Ste. 1016 • Altamonte Springs, FL 32701 • 407 937 1594 • Fax 407 937 1597 • E53076

LAB NUMBER:

Page _____ of _____

CLIENT NAME	FDEP - SW District	PROJECT NAME	**CITY OF MULBERRY WWTP**
ADDRESS	13051 N. Telecom Pkwy	PO NUMBER/PROJECT NUMBER	RQ 2010-02-22-22
	Temple Terrace, FL 33637	PROJECT LOCATION	POLK
PHONE	813-632-7600	FAX	
CONTACT	Jason Cohen	SAMPLED BY	P. Wenner, J. Cohen

TURN AROUND TIME

☑ STANDARD

☐ RUSH _____

REMARKS/SPECIAL INSTRUCTIONS:

Please run in 3 dilution volumes : 10, 20, 50

WW=waste water SW=surface water GW=ground water DW=drinking water OIL A=air SO=soil SL=sludge

Field ID	SITE NAME	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO COUNT	BOTTLE SIZE & TYPE: Sterile Plastic Bottle — Fecal Coliforms — Preserv: Ice, T	LAB NUMBER
37378	D-001	Grab	2/22/2010	9:00	WW	1	X	
37379	SCI CONTROL SITE	Grab	2/22/2010	11:00 ~~10:20~~ 2-21-22/10	WW	1	X	
37380	SCI TEST SITE	Grab	2/22/2010	10:20 ~~11:00~~ 2-21-22/10	WW	1	X	

I-Ice H=(HCl) S=(H_2SO_4) N=(HNO_3) T=(Sodium Thiosulfate)

Shipment	Method	Sample Kit	Cooler #
Out: _____	Via: _____	RB _____	D/T _____
		AB _____	D/T _____
Ret: _____	Via: _____	Trip Bl.	

	Relinquish by:	Date	Time	Received by:	Date	Time
1		2/22/10	1320		2/22/10	13:20
2						
3						
4						

Received on Ic ☐ Yes ☐ No QC ☐ sent ☐ received

revised 3/08

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2010-02-22-22
City of Mulberry WWTP

Requester: Michael Tanski

Field Report Prepared By:

Customer: SW-DIST

Collected By: P WENNER, J COHEN

Send Final Report To Tom Gucciardo

Project ID: FYI5

Sampling Agency: FDEP SWD

PMAS: 1143

Lab ID *	Location		Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	D-001	37478	Grab	4/12/10 1050 Central		A
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L) 8.86	Storet Station Number	
	Matrix (Include type e.g. Salt, Fresh, etc) FRESH	Temp (C) 24.49 / pH 6.51	Sample Depth 0.2 m / ft	0.49 / 990 Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number	
	Latitude o ' "	Longitude o ' "	Comments			

Lab ID *	Location		Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C) / pH	Sample Depth m / ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number	
	Latitude o ' "	Longitude o ' "	Comments			

Lab ID *	Location		Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C) / pH	Sample Depth m / ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number	
	Latitude o ' "	Longitude o ' "	Comments			

Lab ID *	Location		Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (Include type e.g. Salt, Fresh, etc)	Temp (C) / pH	Sample Depth m / ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number	
	Latitude o ' "	Longitude o ' "	Comments 2 Discrete Recd in Tox by JD 4/13/10 10:43			

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
	4/12/10 1300	FED EX						4-13-10/9:30

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Appendix E

Chemical analysis of effluent and receiving water

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/21/2010 8:30	Effluent Composite	AGP/LN	Algal Growth Potential	116	Q	mg DryWt/L	0.3	0.9
2/21/2010 8:30	Effluent Composite	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.4	IQ	mg/L	0.2	2
2/21/2010 8:30	Effluent Composite	Metals	Selenium	0.2	U	ug/L	0.2	0.8
2/21/2010 8:30	Effluent Composite	Metals	Silver	0.025	U	ug/L	0.025	0.1
2/21/2010 8:30	Effluent Composite	Metals	Chromium	0.3	U	ug/L	0.3	1.2
2/21/2010 8:30	Effluent Composite	Metals	Iron	90	I	ug/L	30	120
2/21/2010 8:30	Effluent Composite	Metals	Calcium	48.3		mg/L	0.075	0.3
2/21/2010 8:30	Effluent Composite	Metals	Copper	1.83		ug/L	0.5	0.5
2/21/2010 8:30	Effluent Composite	Metals	Cadmium	0.03	U	ug/L	0.03	0.12
2/21/2010 8:30	Effluent Composite	Metals	Nickel	1.01		ug/L	0.25	1
2/21/2010 8:30	Effluent Composite	Metals	Lead	0.2	U	ug/L	0.2	0.8
2/21/2010 8:30	Effluent Composite	Metals	Zinc	63		ug/L	5	20
2/21/2010 8:30	Effluent Composite	Metals	Arsenic	0.31	I	ug/L	0.25	1
2/21/2010 8:30	Effluent Composite	Metals	Aluminum	70	I	ug/L	60	240
2/21/2010 8:30	Effluent Composite	Metals	Magnesium	13.1		mg/L	0.04	0.16
2/21/2010 8:30	Effluent Composite	Nutrients	Kjeldahl Nitrogen	1		mg N/L	0.08	0.2
2/21/2010 8:30	Effluent Composite	Nutrients	TSS	4	U	mg/L	4	16
2/21/2010 8:30	Effluent Composite	Nutrients	Ammonia-N	0.043		mg N/L	0.01	0.02
2/21/2010 8:30	Effluent Composite	Nutrients	NO2NO3-N	2.8		mg N/L	0.04	0.1
2/21/2010 8:30	Effluent Composite	Nutrients	O-Phosphate-P	0.33	Q	mg P/L	0.04	0.1
2/21/2010 8:30	Effluent Composite	Nutrients	Total-P	0.41		mg P/L	0.005	0.05
2/21/2010 8:30	Effluent Composite	Pesticides	Azinphos Methyl	0.19	U	ug/L	0.19	0.76
2/21/2010 8:30	Effluent Composite	Pesticides	Malathion	0.14	U	ug/L	0.14	0.56
2/21/2010 8:30	Effluent Composite	Pesticides	Parathion Ethyl	0.14	UJ	ug/L	0.14	0.56
2/21/2010 8:30	Effluent Composite	Pesticides	Phorate	0.048	UJ	ug/L	0.048	0.19
2/21/2010 8:30	Effluent Composite	Pesticides	Fonofos	0.095	U	ug/L	0.095	0.38
2/21/2010 8:30	Effluent Composite	Pesticides	Norflurazon	0.14	U	ug/L	0.14	0.56
2/21/2010 8:30	Effluent Composite	Pesticides	Diazinon	0.048	U	ug/L	0.048	0.19
2/21/2010 8:30	Effluent Composite	Pesticides	Metalaxyl	0.24	U	ug/L	0.24	0.96
2/21/2010 8:30	Effluent Composite	Pesticides	Mevinphos	0.19	UJ	ug/L	0.19	0.76
2/21/2010 8:30	Effluent Composite	Pesticides	Naled	0.76	UJ	ug/L	0.76	3
2/21/2010 8:30	Effluent Composite	Pesticides	Prometryn	0.14	U	ug/L	0.14	0.56
2/21/2010 8:30	Effluent Composite	Pesticides	Ethion	0.048	U	ug/L	0.048	0.19
2/21/2010 8:30	Effluent Composite	Pesticides	Hexazinone	0.095	U	ug/L	0.095	0.38
2/21/2010 8:30	Effluent Composite	Pesticides	Chlorpyrifos Methyl	0.095	U	ug/L	0.095	0.38

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/21/2010 8:30	Effluent Composite	Pesticides	Fenamiphos	0.19	UJ	ug/L	0.19	0.76
2/21/2010 8:30	Effluent Composite	Pesticides	Alachlor	0.57	U	ug/L	0.57	2.3
2/21/2010 8:30	Effluent Composite	Pesticides	Ametryn	0.048	U	ug/L	0.048	0.19
2/21/2010 8:30	Effluent Composite	Pesticides	Parathion Methyl	0.095	U	ug/L	0.095	0.38
2/21/2010 8:30	Effluent Composite	Pesticides	Atrazine	0.37		ug/L	0.048	0.19
2/21/2010 8:30	Effluent Composite	Pesticides	Butylate	0.19	UJ	ug/L	0.19	0.76
2/21/2010 8:30	Effluent Composite	Pesticides	Metribuzin	0.095	U	ug/L	0.095	0.38
2/21/2010 8:30	Effluent Composite	Pesticides	Simazine	0.048	U	ug/L	0.048	0.19
2/21/2010 8:30	Effluent Composite	Pesticides	Bromacil	0.19	U	ug/L	0.19	0.76
2/21/2010 8:30	Effluent Composite	Pesticides	Chlorpyrifos Ethyl	0.048	U	ug/L	0.048	0.19
2/21/2010 8:30	Effluent Composite	Pesticides	Ethoprop	0.095	UJ	ug/L	0.095	0.38
2/21/2010 8:30	Effluent Composite	Pesticides	Metolachlor	0.48	U	ug/L	0.48	1.9
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	2,6-Dinitrotoluene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Acenaphthene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Fluorene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	U	ug/L	15	59
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L	15	59
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Pyrene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3	U	ug/L	3	12
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Benzo(b)fluoranthene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Benzo(k)fluoranthene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Chrysene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Hexachlorobutadiene	3	U	ug/L	3	12
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2	U	ug/L	2	7.9
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	2,4-Dichlorophenol	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3	U	ug/L	3	12
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	3,3'-Dichlorobenzidine	40	U	ug/L	40	160
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	59
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Benzo(a)pyrene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Butyl benzyl phthalate	4.9	U	ug/L	4.9	20
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Di-n-octyl phthalate	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Fluoranthene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Hexachlorocyclopentadiene	3	UJ	ug/L	3	12
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Hexachloroethane	3	U	ug/L	3	12
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	N-Nitrosodimethylamine	2	U	ug/L	2	7.9
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Phenol	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	2,4-Dimethylphenol	9.9	U	ug/L	9.9	40

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	2,4-Dinitrotoluene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Benzo(a)anthracene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Naphthalene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Nitrobenzene	2	U	ug/L	2	7.9
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Phenanthrene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	2-Chlorophenol	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Benzidine	99	U	ug/L	99	400
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Di-n-butyl phthalate	4.9	UJ	ug/L	4.9	20
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Diethyl phthalate	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Pentachlorophenol	3	U	ug/L	3	12
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	2-Chloronaphthalene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	2-Nitrophenol	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Acenaphthylene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3	U	ug/L	3	12
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Hexachlorobenzene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2	U	ug/L	2	7.9
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Anthracene	0.99	U	ug/L	0.99	4
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Dimethyl phthalate	9.9	U	ug/L	9.9	40
2/21/2010 8:30	Effluent Composite	Priority Organic Pollutants	Isophorone	0.99	U	ug/L	0.99	4
2/22/2010 9:00	Effluent Grab	AGP/LN	Algal Growth Potential	50.8		mg DryWt/L	0.3	0.9
2/22/2010 9:00	Effluent Grab	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.4	U	ug/L	0.4	1.2
2/22/2010 9:00	Effluent Grab	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.8	I	mg/L	0.2	2
2/22/2010 9:00	Effluent Grab	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.55	U	ug/L	0.55	1.7
2/22/2010 9:00	Effluent Grab	Overflow	Fecal Coliforms-Membrane Filter	3	B	#/100 mL		
2/22/2010 9:00	Effluent Grab	Toxicology	Bioassay-Chronic-Scrn-FW-C.dubia, NOEC	100		NOEC		
2/22/2010 9:00	Effluent Grab	Toxicology	Bioassay-Chronic-Scrn-FW-Fish, NOEC	No Result	O	NOEC		
2/22/2010 9:00	Effluent Grab	Metals	Iron	94	I	ug/L	30	120
2/22/2010 9:00	Effluent Grab	Metals	Lead	0.26	I	ug/L	0.2	0.8
2/22/2010 9:00	Effluent Grab	Metals	Aluminum	64	I	ug/L	60	240
2/22/2010 9:00	Effluent Grab	Metals	Zinc	70		ug/L	5	20
2/22/2010 9:00	Effluent Grab	Metals	Copper	2.83		ug/L	0.5	0.5
2/22/2010 9:00	Effluent Grab	Metals	Calcium	47.8		mg/L	0.075	0.3
2/22/2010 9:00	Effluent Grab	Metals	Arsenic	0.38	I	ug/L	0.25	1

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/22/2010 9:00	Effluent Grab	Metals	Silver	0.025	U	ug/L	0.025	0.1
2/22/2010 9:00	Effluent Grab	Metals	Nickel	0.87	I	ug/L	0.25	1
2/22/2010 9:00	Effluent Grab	Metals	Chromium	0.3	U	ug/L	0.3	1.2
2/22/2010 9:00	Effluent Grab	Metals	Cadmium	0.03	U	ug/L	0.03	0.12
2/22/2010 9:00	Effluent Grab	Metals	Magnesium	13.1		mg/L	0.04	0.16
2/22/2010 9:00	Effluent Grab	Metals	Selenium	0.2	U	ug/L	0.2	0.8
2/22/2010 9:00	Effluent Grab	Nutrients	TSS	4	U	mg/L	4	16
2/22/2010 9:00	Effluent Grab	Nutrients	Ammonia-N	0.054	J	mg N/L	0.01	0.02
2/22/2010 9:00	Effluent Grab	Nutrients	Kjeldahl Nitrogen	1		mg N/L	0.08	0.2
2/22/2010 9:00	Effluent Grab	Nutrients	Total-P	0.75		mg P/L	0.005	0.05
2/22/2010 9:00	Effluent Grab	Nutrients	O-Phosphate-P	0.65		mg P/L	0.04	0.1
2/22/2010 9:00	Effluent Grab	Nutrients	Turbidity	1		NTU	0.1	0.1
2/22/2010 9:00	Effluent Grab	Nutrients	NO2NO3-N	0.65		mg N/L	0.004	0.01
2/22/2010 9:00	Effluent Grab	Pesticides	Norflurazon	0.15	U	ug/L	0.15	0.6
2/22/2010 9:00	Effluent Grab	Pesticides	Ametryn	0.049	U	ug/L	0.049	0.2
2/22/2010 9:00	Effluent Grab	Pesticides	Fenamiphos	0.19	UJ	ug/L	0.19	0.76
2/22/2010 9:00	Effluent Grab	Pesticides	Chlorpyrifos Ethyl	0.049	U	ug/L	0.049	0.2
2/22/2010 9:00	Effluent Grab	Pesticides	Butylate	0.19	UJ	ug/L	0.19	0.76
2/22/2010 9:00	Effluent Grab	Pesticides	Parathion Methyl	0.097	U	ug/L	0.097	0.39
2/22/2010 9:00	Effluent Grab	Pesticides	Azinphos Methyl	0.19	U	ug/L	0.19	0.76
2/22/2010 9:00	Effluent Grab	Pesticides	Hexazinone	0.097	U	ug/L	0.097	0.39
2/22/2010 9:00	Effluent Grab	Pesticides	Metolachlor	0.49	U	ug/L	0.49	2
2/22/2010 9:00	Effluent Grab	Pesticides	Mevinphos	0.19	UJ	ug/L	0.19	0.76
2/22/2010 9:00	Effluent Grab	Pesticides	Ethoprop	0.097	UJ	ug/L	0.097	0.39
2/22/2010 9:00	Effluent Grab	Pesticides	Alachlor	0.58	U	ug/L	0.58	2.3
2/22/2010 9:00	Effluent Grab	Pesticides	Atrazine	0.35		ug/L	0.049	0.2
2/22/2010 9:00	Effluent Grab	Pesticides	Parathion Ethyl	0.15	UJ	ug/L	0.15	0.6
2/22/2010 9:00	Effluent Grab	Pesticides	Naled	0.78	UJ	ug/L	0.78	3.1
2/22/2010 9:00	Effluent Grab	Pesticides	Metribuzin	0.097	U	ug/L	0.097	0.39
2/22/2010 9:00	Effluent Grab	Pesticides	Bromacil	0.19	U	ug/L	0.19	0.76
2/22/2010 9:00	Effluent Grab	Pesticides	Diazinon	0.049	U	ug/L	0.049	0.2
2/22/2010 9:00	Effluent Grab	Pesticides	Malathion	0.15	U	ug/L	0.15	0.6
2/22/2010 9:00	Effluent Grab	Pesticides	Phorate	0.049	UJ	ug/L	0.049	0.2
2/22/2010 9:00	Effluent Grab	Pesticides	Simazine	0.049	U	ug/L	0.049	0.2
2/22/2010 9:00	Effluent Grab	Pesticides	Metalaxyl	0.24	U	ug/L	0.24	0.96
2/22/2010 9:00	Effluent Grab	Pesticides	Fonofos	0.097	U	ug/L	0.097	0.39
2/22/2010 9:00	Effluent Grab	Pesticides	Prometryn	0.15	U	ug/L	0.15	0.6
2/22/2010 9:00	Effluent Grab	Pesticides	Chlorpyrifos Methyl	0.097	U	ug/L	0.097	0.39
2/22/2010 9:00	Effluent Grab	Pesticides	Ethion	0.049	U	ug/L	0.049	0.2

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Acenaphthylene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Anthracene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Diethyl phthalate	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	11
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.6
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Phenanthrene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	2,4-Dimethylphenol	9.6	U	ug/L	9.6	38
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	2-Chlorophenol	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	11
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	2-Nitrophenol	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	11
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Dimethyl phthalate	9.6	U	ug/L	9.6	38
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Fluorene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	UJ	ug/L	2.9	11
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.6
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	2,4-Dinitrotoluene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	2,6-Dinitrotoluene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	2-Chloronaphthalene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38	U	ug/L	38	150
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Benzidine	96	U	ug/L	96	380
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Pyrene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	4-Nitrophenol	14	U	ug/L	14	57
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Benzo(k)fluoranthene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Butyl benzyl phthalate	4.8	U	ug/L	4.8	19
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	11
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Naphthalene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	11
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Hexachlorobenzene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Phenol	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	2,4-Dinitrophenol	14	U	ug/L	14	57
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.6
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Benzo(a)anthracene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Benzo(b)fluoranthene	0.96	U	ug/L	0.96	3.8

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	14	U	ug/L	14	57
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Fluoranthene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Isophorone	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	2,4-Dichlorophenol	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Acenaphthene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Benzo(a)pyrene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Di-n-butyl phthalate	4.8	UJ	ug/L	4.8	19
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.6
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Chrysene	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	Di-n-octyl phthalate	0.96	U	ug/L	0.96	3.8
2/22/2010 9:00	Effluent Grab	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	U	ug/L	2.9	11
2/22/2010 9:00	Effluent Grab	Field Parameter	Specific Conductance	799		umhos/cm		
2/22/2010 9:00	Effluent Grab	Field Parameter	Dissolved Oxygen	8.85		mg/L		
2/22/2010 9:00	Effluent Grab	Field Parameter	Temperature	20.36		C		
2/22/2010 9:00	Effluent Grab	Field Parameter	Total Residual Chlorine	0.01		mg/L		
2/22/2010 9:00	Effluent Grab	Field Parameter	pH	4.81				
4/12/2010 10:50	Effluent	Toxicology	Bioassay-Acute-Screen-FW-Fish, LC50	100	L	LC50		
4/12/2010 10:50	Effluent	Toxicology	Bioassay-Acute-Screen-FW-C.dubia, LC50	100	K	LC50		
4/12/2010 10:50	Effluent	Field Parameter	Specific Conductance	990		umhos/cm		
4/12/2010 10:50	Effluent	Field Parameter	Sample Depth	0.2		m		
4/12/2010 10:50	Effluent	Field Parameter	Temperature	24.49		C		
4/12/2010 10:50	Effluent	Field Parameter	pH	6.51				
4/12/2010 10:50	Effluent	Field Parameter	Dissolved Oxygen	8.86		mg/L		
2/22/2010 11:00	Control Site	AGP/LN	Algal Growth Potential	34		mg DryWt/L	0.3	0.9
2/22/2010 11:00	Control Site	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.2	I	mg/L	0.2	2
2/22/2010 11:00	Control Site	Chlorophyll/Grain Size/BOD	Phaeophytin-a	1.7		ug/L	0.4	1.2
2/22/2010 11:00	Control Site	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	2.1		ug/L	0.55	1.7
2/22/2010 11:00	Control Site	Overflow	Fecal Coliforms-Membrane Filter	23	B	#/100 mL		
2/22/2010 11:00	Control Site	Metals	Aluminum	270		ug/L	60	240
2/22/2010 11:00	Control Site	Metals	Arsenic	2.62		ug/L	0.25	1
2/22/2010 11:00	Control Site	Metals	Cadmium	0.045	I	ug/L	0.03	0.12
2/22/2010 11:00	Control Site	Metals	Zinc	5	U	ug/L	5	20
2/22/2010 11:00	Control Site	Metals	Lead	0.2	U	ug/L	0.2	0.8
2/22/2010 11:00	Control Site	Metals	Iron	250		ug/L	30	120
2/22/2010 11:00	Control Site	Metals	Calcium	48.5		mg/L	0.075	0.3
2/22/2010 11:00	Control Site	Metals	Silver	0.025	U	ug/L	0.025	0.1
2/22/2010 11:00	Control Site	Metals	Nickel	3.21		ug/L	0.25	1

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/22/2010 11:00	Control Site	Metals	Magnesium	15.4		mg/L	0.04	0.16
2/22/2010 11:00	Control Site	Metals	Selenium	0.21	I	ug/L	0.2	0.8
2/22/2010 11:00	Control Site	Metals	Copper	0.5	U	ug/L	0.5	0.5
2/22/2010 11:00	Control Site	Metals	Chromium	0.68	I	ug/L	0.3	1.2
2/22/2010 11:00	Control Site	Nutrients	NO2NO3-N	0.51		mg N/L	0.004	0.01
2/22/2010 11:00	Control Site	Nutrients	O-Phosphate-P	2.2		mg P/L	0.08	0.2
2/22/2010 11:00	Control Site	Nutrients	Kjeldahl Nitrogen	0.78		mg N/L	0.08	0.2
2/22/2010 11:00	Control Site	Nutrients	Ammonia-N	0.022		mg N/L	0.01	0.02
2/22/2010 11:00	Control Site	Nutrients	Total-P	2.6		mg P/L	0.025	0.25
2/22/2010 11:00	Control Site	Nutrients	Turbidity	4.3		NTU	0.1	0.1
2/22/2010 11:00	Control Site	Nutrients	TSS	6	I	mg/L	4	16
2/22/2010 11:00	Control Site	Field Parameter	Specific Conductance	671		umhos/cm		
2/22/2010 11:00	Control Site	Field Parameter	Temperature	16.06		C		
2/22/2010 11:00	Control Site	Field Parameter	Dissolved Oxygen	7.59		mg/L		
2/22/2010 11:00	Control Site	Field Parameter	pH	4.85				
2/22/2010 10:20	Test Site	AGP/LN	Algal Growth Potential	33.9		mg DryWt/L	0.3	0.9
2/22/2010 10:20	Test Site	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	4.8		ug/L	0.55	1.7
2/22/2010 10:20	Test Site	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.1	I	mg/L	0.2	2
2/22/2010 10:20	Test Site	Chlorophyll/Grain Size/BOD	Phaeophytin-a	5.6		ug/L	0.4	1.2
2/22/2010 10:20	Test Site	Overflow	Fecal Coliforms-Membrane Filter	24	B	#/100 mL		
2/22/2010 10:20	Test Site	Metals	Lead	0.2	U	ug/L	0.2	0.8
2/22/2010 10:20	Test Site	Metals	Cadmium	0.056	I	ug/L	0.03	0.12
2/22/2010 10:20	Test Site	Metals	Magnesium	15.4		mg/L	0.04	0.16
2/22/2010 10:20	Test Site	Metals	Iron	240		ug/L	30	120
2/22/2010 10:20	Test Site	Metals	Chromium	0.63	I	ug/L	0.3	1.2
2/22/2010 10:20	Test Site	Metals	Arsenic	2.6		ug/L	0.25	1
2/22/2010 10:20	Test Site	Metals	Silver	0.025	U	ug/L	0.025	0.1
2/22/2010 10:20	Test Site	Metals	Selenium	0.22	I	ug/L	0.2	0.8
2/22/2010 10:20	Test Site	Metals	Nickel	3.17		ug/L	0.25	1
2/22/2010 10:20	Test Site	Metals	Copper	0.5	U	ug/L	0.5	0.5
2/22/2010 10:20	Test Site	Metals	Zinc	5	U	ug/L	5	20
2/22/2010 10:20	Test Site	Metals	Aluminum	230	I	ug/L	60	240
2/22/2010 10:20	Test Site	Metals	Calcium	48.4		mg/L	0.075	0.3
2/22/2010 10:20	Test Site	Nutrients	TSS	5	I	mg/L	4	16
2/22/2010 10:20	Test Site	Nutrients	NO2NO3-N	0.51		mg N/L	0.004	0.01
2/22/2010 10:20	Test Site	Nutrients	Ammonia-N	0.026		mg N/L	0.01	0.02
2/22/2010 10:20	Test Site	Nutrients	Total-P	2.6		mg P/L	0.025	0.25
2/22/2010 10:20	Test Site	Nutrients	Kjeldahl Nitrogen	0.81		mg N/L	0.08	0.2
2/22/2010 10:20	Test Site	Nutrients	Turbidity	3.7	A	NTU	0.1	0.1
2/22/2010 10:20	Test Site	Nutrients	O-Phosphate-P	2.2		mg P/L	0.08	0.2

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/22/2010 10:20	Test Site	Field Parameter	Temperature	16		C		
2/22/2010 10:20	Test Site	Field Parameter	Specific Conductance	671		umhos/cm		
2/22/2010 10:20	Test Site	Field Parameter	pH	4.78				
2/22/2010 10:20	Test Site	Field Parameter	Dissolved Oxygen	7.55		mg/L		
2/22/2010 9:40	Field Blank	Metals	Aluminum	60	U	ug/L	60	240
2/22/2010 9:40	Field Blank	Metals	Calcium	0.075	U	mg/L	0.075	0.3
2/22/2010 9:40	Field Blank	Metals	Silver	0.025	U	ug/L	0.025	0.1
2/22/2010 9:40	Field Blank	Metals	Arsenic	0.25	U	ug/L	0.25	1
2/22/2010 9:40	Field Blank	Metals	Copper	0.5	U	ug/L	0.5	0.5
2/22/2010 9:40	Field Blank	Metals	Zinc	5	U	ug/L	5	20
2/22/2010 9:40	Field Blank	Metals	Selenium	0.2	U	ug/L	0.2	0.8
2/22/2010 9:40	Field Blank	Metals	Chromium	0.3	U	ug/L	0.3	1.2
2/22/2010 9:40	Field Blank	Metals	Iron	30	U	ug/L	30	120
2/22/2010 9:40	Field Blank	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
2/22/2010 9:40	Field Blank	Metals	Cadmium	0.03	U	ug/L	0.03	0.12
2/22/2010 9:40	Field Blank	Metals	Lead	0.2	U	ug/L	0.2	0.8
2/22/2010 9:40	Field Blank	Metals	Nickel	0.25	U	ug/L	0.25	1
2/22/2010 9:40	Field Blank	Nutrients	Total-P	0.004	U	mg P/L	0.004	0.01
2/22/2010 9:40	Field Blank	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
2/22/2010 9:40	Field Blank	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
2/22/2010 9:40	Field Blank	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
2/22/2010 9:40	Field Blank	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
2/22/2010 9:40	Field Blank	Pesticides	Ethion	0.053	U	ug/L	0.053	0.21
2/22/2010 9:40	Field Blank	Pesticides	Ametryn	0.053	U	ug/L	0.053	0.21
2/22/2010 9:40	Field Blank	Pesticides	Chlorpyrifos Ethyl	0.053	U	ug/L	0.053	0.21
2/22/2010 9:40	Field Blank	Pesticides	Chlorpyrifos Methyl	0.11	U	ug/L	0.11	0.44
2/22/2010 9:40	Field Blank	Pesticides	Ethoprop	0.11	UJ	ug/L	0.11	0.44
2/22/2010 9:40	Field Blank	Pesticides	Parathion Ethyl	0.16	UJ	ug/L	0.16	0.64
2/22/2010 9:40	Field Blank	Pesticides	Bromacil	0.21	U	ug/L	0.21	0.84
2/22/2010 9:40	Field Blank	Pesticides	Alachlor	0.63	U	ug/L	0.63	2.5
2/22/2010 9:40	Field Blank	Pesticides	Metalaxyl	0.26	U	ug/L	0.26	1
2/22/2010 9:40	Field Blank	Pesticides	Metribuzin	0.11	U	ug/L	0.11	0.44
2/22/2010 9:40	Field Blank	Pesticides	Fenamiphos	0.21	UJ	ug/L	0.21	0.84
2/22/2010 9:40	Field Blank	Pesticides	Fonofos	0.11	U	ug/L	0.11	0.44
2/22/2010 9:40	Field Blank	Pesticides	Mevinphos	0.21	UJ	ug/L	0.21	0.84
2/22/2010 9:40	Field Blank	Pesticides	Hexazinone	0.11	U	ug/L	0.11	0.44
2/22/2010 9:40	Field Blank	Pesticides	Malathion	0.16	U	ug/L	0.16	0.64
2/22/2010 9:40	Field Blank	Pesticides	Naled	0.85	UJ	ug/L	0.85	3.4
2/22/2010 9:40	Field Blank	Pesticides	Prometryn	0.16	U	ug/L	0.16	0.64
2/22/2010 9:40	Field Blank	Pesticides	Atrazine	0.053	U	ug/L	0.053	0.21

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/22/2010 9:40	Field Blank	Pesticides	Diazinon	0.053	U	ug/L	0.053	0.21
2/22/2010 9:40	Field Blank	Pesticides	Metolachlor	0.53	U	ug/L	0.53	2.1
2/22/2010 9:40	Field Blank	Pesticides	Norflurazon	0.16	U	ug/L	0.16	0.64
2/22/2010 9:40	Field Blank	Pesticides	Parathion Methyl	0.11	U	ug/L	0.11	0.44
2/22/2010 9:40	Field Blank	Pesticides	Phorate	0.053	UJ	ug/L	0.053	0.21
2/22/2010 9:40	Field Blank	Pesticides	Simazine	0.053	U	ug/L	0.053	0.21
2/22/2010 9:40	Field Blank	Pesticides	Azinphos Methyl	0.21	U	ug/L	0.21	0.84
2/22/2010 9:40	Field Blank	Pesticides	Butylate	0.21	UJ	ug/L	0.21	0.84
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.8
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	12
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Benzo(a)pyrene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Di-n-octyl phthalate	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Fluoranthene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	12
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.8
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	2,4-Dichlorophenol	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Acenaphthene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Di-n-butyl phthalate	4.9	UJ	ug/L	4.9	19
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Hexachlorobenzene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.8
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	U	ug/L	2.9	12
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Phenol	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	2-Chlorophenol	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.8
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	58
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	U	ug/L	15	58
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Butyl benzyl phthalate	4.9	U	ug/L	4.9	19
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Fluorene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	39	U	ug/L	39	160
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Benzo(a)anthracene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	12
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	12
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Isophorone	0.97	U	ug/L	0.97	3.9

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Pyrene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Diethyl phthalate	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Dimethyl phthalate	9.7	U	ug/L	9.7	39
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	UJ	ug/L	2.9	12
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Naphthalene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	2-Nitrophenol	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	2,4-Dimethylphenol	9.7	U	ug/L	9.7	39
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Acenaphthylene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Chrysene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	12
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Phenanthrene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	2-Chloronaphthalene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Anthracene	0.97	U	ug/L	0.97	3.9
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	Benzidine	97	U	ug/L	97	390
2/22/2010 9:40	Field Blank	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L	15	58

Appendix F

Toxicological results

FDEP Biology Laboratory - Chronic Screen Bench Sheet

Ceriodaphnia dubia Parameters

Facility: Milton WWTP SOP TA07_05

LIMS Sample #: 1251281 for lab sample 1

Circle µmhos-cm or mmhos-cm

Test Day ↓		Concentration	New Sample: Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)	Old Sample: Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)
Day 0	sample: Control		M	8.0	24.3	8.2	182					
	1	100%	M	8.0	25.7	7.9	838					
	Measured by:			MF	MF	MF	MF					
	Recorded by:			MF	MF	MF	MF					
Day 1	sample: Control		M	8.1	24.0	7.8	182	M	7.8	24.0	7.6	193
	1	100%	M	8.4	24.0	7.6	835	M	8.1	24.0	7.4	839
	Measured by:			BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:			BA	BA	BA	BA		BA	BA	BA	BA
Day 2	sample: Control		M	7.9	24.0	7.3	180	M	7.9	24.0	6.6	190
	2	100%	M	7.9	24.0	6.9	790	M	8.5	24.0	6.8	880
	Measured by:			BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:			BA	BA	BA	BA		BA	BA	BA	BA
Day 3	sample: Control		M	7.9	24.1	7.4	185	M	7.9	24.0	7.4	195
	2	100	M	8.0	24.9	7.3	823	M	8.4	24.2	7.3	813
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 4	sample: Control		M	8.0	24.7	8.2	182	M	8.0	24.5	8.1	195
	3	100%	M	7.7	25.2	8.4	808	M	8.4	24.2	8.2	861
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 5	sample: Control		M	8.2	24.7	7.9	185	M	8.1	24.7	7.9	MF 199
	3	100%	M	8.2	24.6	7.9	812	M	8.4	24.3	7.9	806
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 6	sample: Control		M	7.8	24.4	6.8	185	M	7.7	24.0	7.0	195
	3		M	7.6	24.1	8.0	863	M	8.5	24.0	7.0	830
	Measured by:			CF	CF	CF	CF		CF	CF	CF	CF
	Recorded by:			CF	CF	CF	CF		CF	CF	CF	CF
Day 7	sample: Control		M					M				
	3		M					M				
	Measured by:											
	Recorded by:											
Day 8	sample: Control							M				
	3							M				
	Measured by:											
	Recorded by:											

Comments:

Replicate M= "Metered" vial, a surrogate vial for parameters

Test Page 3 of 4

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revised 07/15/08 MF

FDEP Biology Laboratory - Chronic Screen Bench Sheet

Ceriodaphnia dubia Survival and Reproduction

SOP TA07_05

Facility: Mulberry WWTP

LIMS Sample # 125128 1 for lab sample 1

Stray Made MF for QA 7-21-10

Start Date: 2-23-10 Time: 1400

End Date: 3-1-10 Time: 1615

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total Neonates	Surviving adults	Neonates per adult
Control	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	6	0	0	0	0	0	0	0	5	11	10	1.1
	4	4	0	4	6	5	6	6	6	7	0	44(5)	10	4.4
	5	3	9	9	9	4	10	12	7	1	7	61	10	6.1
	6	8	12	10	12	17	17	15	12	0	16	109	10	10.9
	7													
	8													
	Total	15	27	23	27	26	33	33	25	8	28	226	10	22.6

Organisms loaded by: MF	
Day	Counted/ verified by:
0	BA
1	BA
2	BA
3	MF
4	MF
5	MF
6	MF/CF
7	
8	

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total Neonates	Surviving adults	Neonates per adult
100% sample	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	4	0	0	0	0	0	0	0	0	1	10	10	1.0
	4	0	6	5	6	6	3	6	4	2	0	38	10	3.8
	5	8	12	8	13	9	4	10	8	11	11	94	10	9.4
	6	12	16	0	12	12	13	9	11	15	16	116	10	11.6
	7													
	8													
	Total	24	34	13 (8)	31	27	20	25	23	28	33	258	10	25.8

Concentration	Mean neonates /adult	% survival
Control	22.6	100%
100%	25.8	100%

Test acceptability		
Mean control reproduction 15/female	(yes)	no
3rd brood in 60% of surviving females	(yes)	no
Control survival = 80%:	(yes)	no

revised 7/15/2008 MF

Comments: (5): split brood

(A) Transcription error BA 7-21-10

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Test Page 2 of 3 PAGE

*Day 0 is test initiation day
X = Dead (original organism)

FDEP Biology Laboratory - Chronic Screen Bench Sheet

Ceriodaphnia dubia Parameters

Facility: Milton WWTP SOP TA07_05

LIMS Sample #: 1251281 for lab sample 1

Circle µmhos-cm or mmhos-cm

Test Day ↓		Concentration	New Sample: Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)	Old Sample: Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)
Day 0	sample: Control		M	8.0	24.3	8.2	182					
	1	100%	M	8.0	25.7	7.9	838					
	Measured by:			MF	MF	MF	MF					
	Recorded by:			MF	MF	MF	MF					
Day 1	sample: Control		M	8.1	24.0	7.8	182	M	7.8	24.0	7.6	193
	1	100%	M	8.4	24.0	7.6	835	M	8.1	24.0	7.4	839
	Measured by:			BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:			BA	BA	BA	BA		BA	BA	BA	BA
Day 2	sample: Control		M	7.9	24.0	7.3	180	M	7.9	24.0	6.6	190
	2	100%	M	7.9	24.0	6.9	790	M	8.5	24.0	6.8	880
	Measured by:			BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:			BA	BA	BA	BA		BA	BA	BA	BA
Day 3	sample: Control		M	7.9	24.1	7.4	185	M	7.9	24.0	7.4	195
	2	100	M	8.0	24.9	7.3	823	M	8.4	24.2	7.3	813
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 4	sample: Control		M	8.0	24.7	8.2	182	M	8.0	24.5	8.1	195
	3	100%	M	7.7	25.2	8.4	808	M	8.4	24.2	8.2	861
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 5	sample: Control		M	8.2	24.7	7.9	185	M	8.1	24.7	7.9	199
	3	100%	M	8.2	24.6	7.9	812	M	8.4	24.3	7.9	806
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 6	sample: Control		M	7.8	24.4	6.8	185	M	7.7	24.0	7.0	195
	3		M	7.6	24.1	8.0	863	M	8.5	24.0	7.0	830
	Measured by:			CF	CF	CF	CF		CF	CF	CF	CF
	Recorded by:			CF	CF	CF	CF		CF	CF	CF	CF
Day 7	sample: Control		M					M				
	3		M					M				
	Measured by:											
	Recorded by:											
Day 8	sample: Control							M				
	3							M				
	Measured by:											
	Recorded by:											

Comments:

Replicate M= "Metered" vial, a surrogate vial for parameters

FDEP Biology Laboratory - Acute Bioassay Bench Sheets

Facility: Mulberry WWTP

Address: 500 Southwest Second Street

City: Mulberry County: Polk 33860

Contact/District: Pete Wenner / Southwest

NPDES Permit #: FL 0020338

LIMS Job #: TLH-2010-04-13-01 LIMS Sample #: 1263427

Lims Data Entry: 4-21-10 MF Data Entry Verification: BA 4-22-10

Sample Collection: Date: 4-12-10 Time: 1050

Hold Time Start: Date: 4-12-10 Time: 1050

Comments:

Initial sample handling:

Instructions: Check yes or no. If yes is checked, complete blanks

PH adjustment: ☐ yes ☒ no Initial pH: ____ NaOH ____ N HCl ____ N ____ Drops mL Final pH: ____

Aeration: ☐ yes ☒ no Initial DO: ____mg/L Final DO: ____mg/L Duration: ____minutes Rate: ~____bubbles/min

Salinity adjusted (Test 1): ☐ yes ☒ no Initial Salinity: ____ Final Salinity: ____ Salts Hypersaline brine

Salinity adjusted (Test 2): ☐ yes ☒ no Initial Salinity: ____ Final Salinity: ____ Salts Hypersaline brine

Dechlorination: ☐ yes ☒ no ____mL of 0.025N Sodium Thiosulfate per liter of sample. Final TRC: ____

Sample Validation:

Instructions: Check yes or no. Fill in temperatures.

Temperature: Shipped ≤ 6°C ☑ Yes ☐ No — IF Hand Delivered: Cooling ☐ Yes ☐ No (received ____°C collected____°C)

Holding Time: ≤ 36 Hours ☑ Yes ☐ No (Composite-end of collection; grab-when collected; 4 in 24 - time last sample collected)

Investigators' Signatures:	Initials:
Bill Alexander	BA
Marshall Faircloth	MF
Amelia Rankin	ABR
Jana Daniels	JD
REVIEWER: Peg Miller	

Diluent/Control Batch#:	3-30-10		4-5-10						
Water Quality Parameters	20% DMW	Well Water	Moderately Hard Water	Salt Water ASW NSW Test 1	Salt Water ASW NSW Test 2	Other:	Original Sample	Measured by	Verified by
Field Total Residual Cl_2 (mg/L):	N/A	N/A	N/A	N/A	N/A	N/A	Not measured		MF
Lab Total Residual Cl_2 (mg/L):	<0.03		<0.03				<0.03	BA/JD/ABR	MF
Alkalinity (mg/L as $CaCO_3$):	85		84				179	BA/ABR	MF
Hardness (mg/L as $CaCO_3$):	87		97				177	BA/ABR	MF
Total Ammonia (mg/L as N):	<0.017		— *				— *	MF	BA
Conductivity: ☑ µmhos ☐ mmhos	178		357				895	BA/JD	MF
Salinity (ppth):	—		—				—	—	—

* Lab meter out of service MF-4-13-10

V 1.8 1/13/10

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample # 1263927 | SOP#: TA 07 01 | Test # 1 of 2

Test Species:
Batch #: 10-10 Age: <24hr
- [x] *Ceriodaphnia dubia*
- [ ] *Cyprinella leedsi*
- [ ] *Pimephales promelas*
- [ ] *Menidia beryllina*
- [ ] *Americamysis bahia*
- [ ] Other:_____

Test Validation
Control Survival ≥ 90%: [x] Yes [ ] No
Temperature Range ≤ 3° C: [x] Yes [ ] No

Diluent (Batch # 3-30-10)
[ ] ASW [x] 20% DMW
[ ] MHW [ ] Well

Test Type: [x] Acute [ ] Definitive
[ ] Static [x] Static Renewal [ ] Flow-Through

Test Duration:
[ ] 48 hr
[x] 96 hr
[ ] ___hr

Test Started: Date 4.13.10 Time 13:00

Test Ended: Date 4-17-10 Time 1320

Chamber Size 30 ml
Test Volume: 20 ml

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
CTRL	A	A1	5	5	5	5	5	5
	B	B1	5	5	5	5	5	5
	C	C1	5	5	5	5	5	5
	D	D1	5	5	5	5	5	5
100%	A	A2	5	5	5	5	0	-
	B	B2	5	5	5	5	4	4
	C	C2	5	5	5	5	1	1
	D	D2	5	5	5	5	3	2
Checked or Verified by:			BH	BH	MF	MF	DH	DS

Loaded/ Verified by: BH DS MF
m = missing, d = dead, BR/AR Before/ After Renewal

Food
- [x] YCT Batch# 12-30-09
- [x] P. subcapitata Batch# 12-23-09
- [ ] Artemia Lot#_____

Feeding and Artemia Batch #
- [x] 0 hr ___ [x] Prior to Test
- [ ] 24 hr___
- [x] 48 hr___ [x] Prior to Renewal
- [ ] 72 hr___

Temperature Range (°C)
Incubator # 2
min. 23.9 max. 27.2 mean 25.6

Incubator #___
min.___ max.___ mean___

Waterbath #___
min.___ max.___ mean___

Room B246
min. 25.0 max. 26.9 mean 25.5

Light intensity (ft. candles): 50-100

Photoperiod (hours): 16 light, 8 dark

Test Results:
Screening Tests: Report LC50 as >100%, =100%, or <100%.
% mortality in 100% sample: 65% LC50: >100%
Calculated LC50 (Definitive) 95% CI_____ Method_____

Comments:

V. 2.5 1-13-10

PJ 50

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

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample # 1263427 **SOP#: TA 0702** **Test #** 2 **of** 2

Test Species:
Batch #: 4.13.10 Age: 9 Jays
- ☐ *Ceriodaphnia dubia*
- ☐ *Cyprinella leedsi*
- ☒ *Pimephales promelas*
- ☐ *Menidia beryllina*
- ☐ *Americamysis bahia*
- ☐ Other:

Test Validation
Control Survival ≥ 90%: ☒ Yes ☐ No
Temperature Range ≤ 3° C: ☒ Yes ☐ No

Diluent (Batch # 4-5-10 **)**
☐ ASW ☐ 20% DMW
☒ MHW ☐ Well

Test Type: ☒ Acute ☐ Definitive
☐ Static ☒ Static Renewal ☐ Flow-Through

Test Duration:
☐ 48 hr
☒ 96 hr
☐ __hr

Chamber Size 1000 ml
Test Volume: 500 ml

Test Started: Date 4.13.10 Time 13:30

Test Ended: Date 4-17-10 Time 1310

Concentration	Replicate	Chamber #	0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl	A	E9	5	5	5	5	5	5
	B	E10	5	5	5	5	5	5
	C	E11	5	5	5	5	5	5
	D	E12	5	5	5	5	5	5
100%	A	E13	5	5	5	5	4(1D)	4
	B	E14	5	5	5	5	5	5
	C	E15	5	5	5	5	5	5
	D	E16	5	5	5	5	5	5
Checked or Verified by:			BA	J	J	J	J	J

Loaded/ Verified by: BA / MF
m = missing, d = dead, BR/AR Before/ After Renewal

Food
- ☐ YCT Batch#
- ☐ P. subcapitata Batch#
- ☒ Artemia Lot# 23613

Feeding and Artemia Batch #
- ☒ 0 hr 13.10 ☒ Prior to Test
- ☐ 24 hr
- ☒ 48 hr 15.10 ☒ Prior to Renewal
- ☐ 72 hr

Temperature Range (°C)

Incubator # 2
min. 23.9 max. 27.2 mean 25.6

Incubator #
min. max. mean

Waterbath #
min. max. mean

Room B246
min. 25.0 max. 25.9 mean 25.5

Light Intensity (ft. candles): 50-100

Photoperiod (hours): 16 light, 8 dark

Test Results:
Screening Tests: Report LC50 as >100%, =100%, or <100%.
% mortality in 100% sample: 5% LC50: >100%
Calculated LC50 (Definitive) 95% CI______ Method______

Comments:

V. 2.5 1-13-10

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

FDEP Biology Laboratory - Bioassay Parameter Sheet

LIMS Sample # 1263427 Test # 1 of 2

Test Species:

☑ *Ceriodaphnia dubia* ☐ *Pimephales promelas* ☐ *Americamysis bahia*
☐ *Cyprinella leedsi* ☐ *Menidia beryllina* ☐ Other:_____

Test aerated: (if DO is < 4.0 mg/L)
☐ Yes ☒ No

Concentration	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☑ µmhos ☐ mmhos	Salinity* (ppth)
	M	0 hr	8.1	24.2	7.6	178	
		24 hr					
ctrl	A	48 hr BR	8.0	24.6	7.5	190	
	m/nF	48 hr AR	8.2	24.2	7.5	179	
		72 hr					
	A	96 hr	8.3	24.0	7.8	199	
	M	0 hr	8.1	24.0	7.4	774	
		24 hr					
100%	A	48 hr BR	8.3	24.7	7.3	793	
	M	48 hr AR	7.7	24.9	7.9	766	
		72 hr					
	BB	96 hr	8.6	24.1	8.0	785	
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
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		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

*Measure/ record salinity for marine tests

Comments:

Measured By:
0 hr: BA
24 hr:
48 hr BR: MF
48 hr AR: MF
72 hr:
96 hr: TS

FDEP Biology Laboratory - Bioassay Parameter Sheet

LIMS Sample # 126427 Test # 2 of 2

Test Species:

☐ *Ceriodaphnia dubia* ☑ *Pimephales promelas* ☐ *Americamysis bahia*
☐ *Cyprinella leedsi* ☐ *Menidia beryllina* ☐ Other:_____

Test aerated: (if DO is < 4.0 mg/L)
☐ Yes ☒ No

Concentration	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☑ µmhos ☐ mmhos	Salinity* (ppth)
	A	0 hr	8.2	24.0	7.5	357	—
	B	24 hr	7.9	25.8	7.5	365	—
Ctrl	C	48 hr BR	8.0	26.2	7.8	375	—
	C	48 hr AR	8.2	25.1	7.7	349	—
	D	72 hr	7.9	25.0	6.7	358	
	A	96 hr	8.2	25.0	7.6	353	
	A	0 hr	8.2	24.0	7.6	799	—
	B	24 hr	8.3	25.6	7.4	798	—
100%	C	48 hr BR	8.3	26.1	7.1	801	—
	C	48 hr AR	7.8	25.4	7.6	776	—
	D	72 hr	8.1	25.2	6.6	797	—
	A	96 hr	8.4	25.3	7.6	821	
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
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		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

*Measure/ record salinity for marine tests

Comments:

Measured By:
0 hr: BA
24 hr: ATR
48 hr BR: MF
48 hr AR: MF
72 hr: [illegible]
96 hr: [illegible]

Bioassay Instrument ID

Test ID: Mulberry WWTP Dates: April 13–17, 2010

METER / DEVICE	ID	SOP	Parameter	Method	v used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H+	✓
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity	SM 2510 B	✓
			Salinity	SM 2520 B	✓
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	✓
Thermometer (DO probe)	YSI 5750 SN 05J1720	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	✓
Hach Pocket Colorimeter II	05050C026378	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	✓
Alkalinity (Hach Kit)	No SN	TA06_08	Alkalinity	SM 2320 B	✓
Hardness (Hach Kit)	No SN	TA06_09	Hardness	SM 2340 C	✓
OHAUS Balance 250D	1125481084	TA06_21 TA06_27	Weight	-	
S-Weights	BIO-S-WEIGHTS-01	NA	Balance check	-	

SM-2530B modified to allow use of electronic and non-mercury filled thermometers.

Insert other device information in blank spaces(if used). Test ID = Facility or SRTs (acute SRT--Chronic SRT)

entered by MF 4-14-10

V 1.1 6/12/08 MF

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Date: JDY 3/12/10

Shipped to: FDEP

P.O. No: N/A

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia	250	4 DAYS	MS1004 08	25	8.0	20
Menidia beryllina	250	12 DAYS	SS100331	25	8.0	20
						Hardness (mg/L)
Cyprinella leedsi						
Pimephales promelas	100	8 DAYS	FM100404	25	7.8	80
Ceriodaphnia dubia						
YCT						
P. subcapitata						

Packed by: PM

Shipped Via: FEDEX

Notes:

Thank you for your order.

4569 Samuel Street · Sarasota, FL 34233 · Tel: 941-925-3594 · Fax: 941-922-3874 · Web: www.biologylab.com

Appendix G

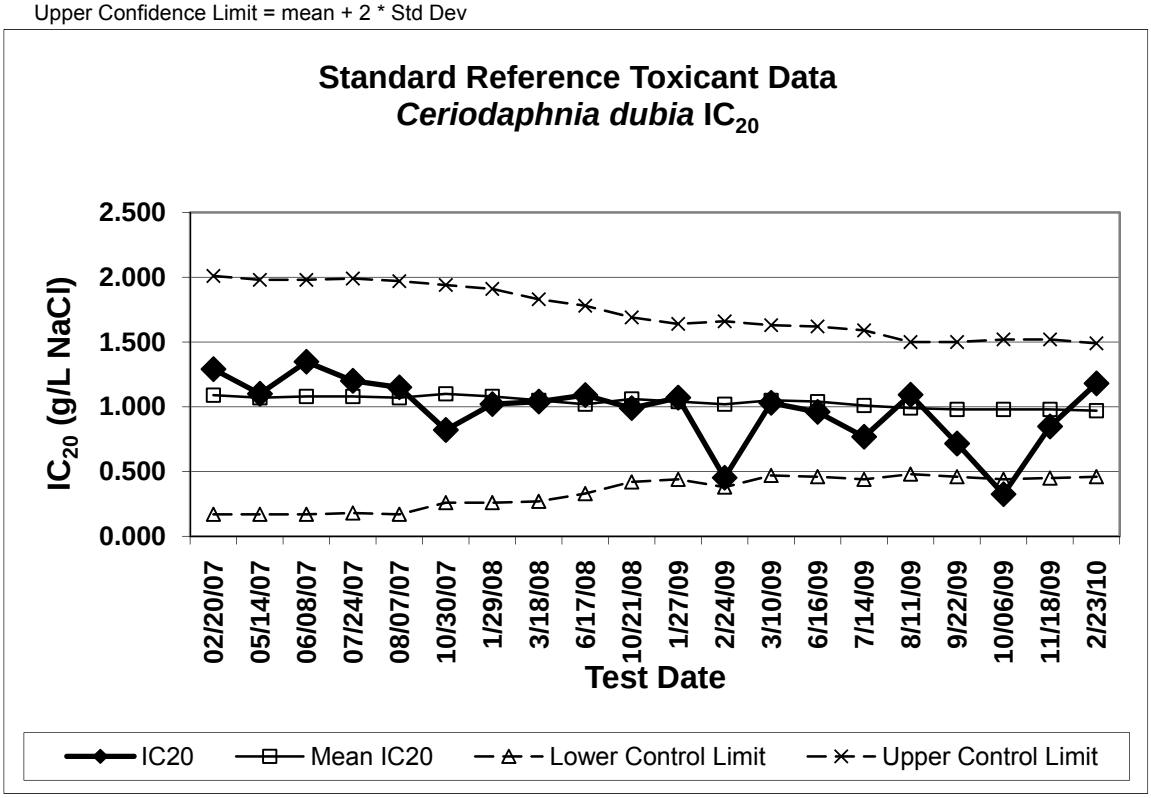
Standard Reference Toxicant Data

Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 7-Day Chronic Toxicity
Ceriodaphnia dubia (water flea) - Sodium Chloride (NaCl)

Date	IC20	Mean IC20	Std Dev	Lower Control Limit	Upper Control Limit
02/20/07	1.290	1.09	0.46	0.17	2.01
05/14/07	1.100	1.07	0.45	0.17	1.98
06/08/07	1.347	1.08	0.45	0.17	1.98
07/24/07	1.200	1.08	0.45	0.18	1.99
08/07/07	1.150	1.07	0.45	0.17	1.97
10/30/07	0.821	1.10	0.42	0.26	1.94
1/29/08	1.020	1.08	0.41	0.26	1.91
3/18/08	1.040	1.05	0.39	0.27	1.83
6/17/08	1.090	1.02	0.36	0.33	1.78
10/21/08	0.989	1.06	0.32	0.42	1.69
1/27/09	1.070	1.04	0.30	0.44	1.64
2/24/09	0.452	1.02	0.32	0.38	1.66
3/10/09	1.030	1.05	0.29	0.47	1.63
6/16/09	0.960	1.04	0.29	0.46	1.62
7/14/09	0.768	1.01	0.29	0.44	1.59
8/11/09	1.093	0.99	0.26	0.48	1.50
9/22/09	0.716	0.98	0.26	0.46	1.50
10/06/09	0.325	0.98	0.27	0.44	1.52
11/18/09	0.848	0.98	0.27	0.45	1.52
2/23/10	1.180	0.97	0.26	0.46	1.49

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



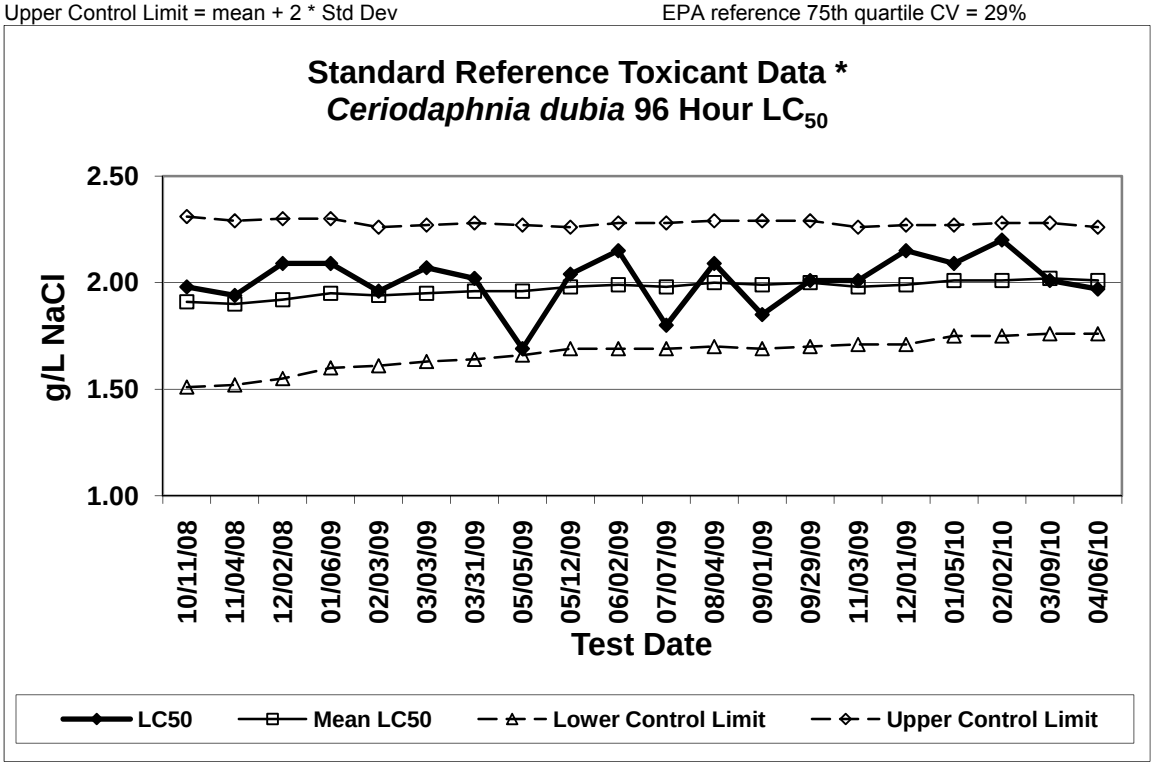
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 96-hour Acute Toxicity
Ceriodaphnia dubia (water flea) - Sodium Chloride (NaCl)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
10/11/08	1.98	1.91	0.20	1.51	2.31
11/04/08	1.94	1.90	0.19	1.52	2.29
12/02/08	2.09	1.92	0.19	1.55	2.30
01/06/09	2.09	1.95	0.17	1.60	2.30
02/03/09	1.96	1.94	0.16	1.61	2.26
03/03/09	2.07	1.95	0.16	1.63	2.27
03/31/09	2.02	1.96	0.16	1.64	2.28
05/05/09	1.69	1.96	0.15	1.66	2.27
05/12/09	2.04	1.98	0.14	1.69	2.26
06/02/09	2.15	1.99	0.15	1.69	2.28
07/07/09	1.80	1.98	0.15	1.69	2.28
08/04/09	2.09	2.00	0.15	1.70	2.29
09/01/09	1.85	1.99	0.15	1.69	2.29
09/29/09	2.01	2.00	0.15	1.70	2.29
11/03/09	2.01	1.98	0.14	1.71	2.26
12/01/09	2.15	1.99	0.14	1.71	2.27
01/05/10	2.09	2.01	0.13	1.75	2.27
02/02/10	2.20	2.01	0.13	1.75	2.28
03/09/10	2.01	2.02	0.13	1.76	2.28
04/06/10	1.97	2.01	0.12	1.76	2.26

Lower Control Limit = mean - 2 * Std Dev
Upper Control Limit = mean + 2 * Std Dev

CV = 6.12
EPA reference 75th quartile CV = 29%



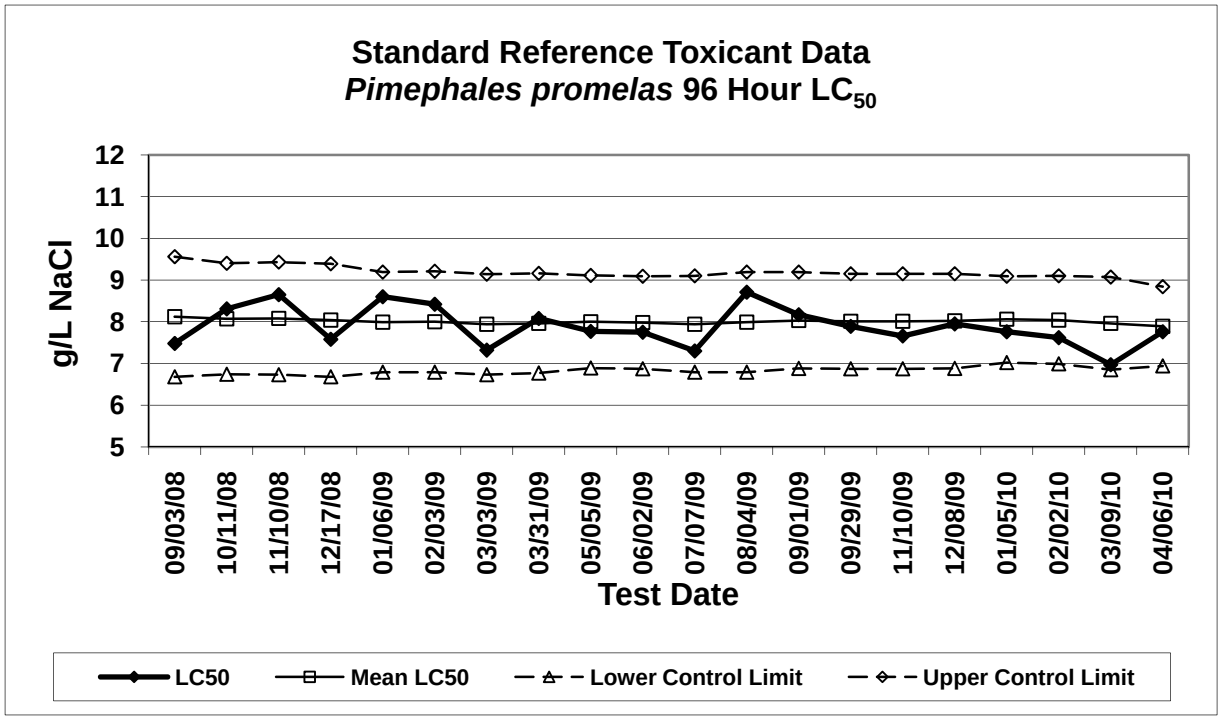
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 96-hour Acute Toxicity
Pimephales promelas (fathead minnow) - Sodium Chloride (NaCl)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
09/03/08	7.48	8.12	0.72	6.68	9.56
10/11/08	8.31	8.07	0.67	6.74	9.4
11/10/08	8.65	8.08	0.67	6.73	9.43
12/17/08	7.58	8.04	0.68	6.68	9.39
01/06/09	8.60	7.99	0.6	6.79	9.19
02/03/09	8.42	8	0.6	6.79	9.21
03/03/09	7.32	7.94	0.6	6.73	9.14
03/31/09	8.08	7.96	0.6	6.77	9.16
05/05/09	7.77	8	0.55	6.89	9.11
06/02/09	7.75	7.98	0.56	6.87	9.09
07/07/09	7.30	7.94	0.58	6.79	9.10
08/04/09	8.71	7.99	0.60	6.79	9.19
09/01/09	8.17	8.03	0.58	6.88	9.19
09/29/09	7.89	8.01	0.57	6.87	9.15
11/10/09	7.66	8.01	0.57	6.87	9.15
12/08/09	7.95	8.02	0.57	6.88	9.15
01/05/10	7.76	8.06	0.52	7.02	9.09
02/02/10	7.62	8.04	0.53	6.99	9.10
03/09/10	6.97	7.96	0.56	6.85	9.07
04/06/10	7.76	7.89	0.48	6.94	8.84

Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev

CV = 6.04
EPA reference 75th quartile CV = 19%



Appendix H

Physical/Chemical and Habitat Assessment field sheets

DEP-SOP-001/01: Form FD 9000-3

PHYSICAL/CHEMICAL CHARACTERIZATION ELECTRONIC FIELD SHEET

EFS

SAMPLE ID : _____ ORG ID : _____

COUNTY : Polk STORET # : [illegible] 24020069

DATE : 2-22-16 TIME : 1100

Latitude : (degrees) (minutes) (seconds) Longitude : (degrees) (minutes) (seconds)

SITE NAME : N Prong Alafia Mulberry WTTP Control Str SAMPLE COMPLETE ? yes

FIELD ID/NAME : MUL-STP CON RECEIVING BODY OF WATER : N. Prong Alafia

RIPARIAN ZONE / STREAM FEATURES

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

Forest/Natural	silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industry	Other (Specify)
✓		✓			✓	✓	

Local Watershed Erosion (select one) : ☐ None ☑ Slight ☐ Moderate ☐ Heavy

Local Watershed NPS Pollution : ☐ No evidence ☐ Slight ☐ Moderate ☐ Heavy

Width of Riparian Vegetation (m) on Each Buffer Side

Left Bank : _____ Right Bank : _____

High Water Mark: 1.0 (m) + 0.6 (above present water level) = 1.6 (above bed) (present depth)

Artificially Impounded ☐ Yes ☒ No

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

(3.5) 3-4 m wide

.3 m/s .33 m/s .33 m/s

.4 m deep .5 m deep .4 m deep

Artificially Channelized : ☐ NO ☒ Mostly recovered, more sinuous ☐ Some recovery ☐ Recent, severe

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

1/3 is open

SEDIMENT / SUBSTRATE

Sediment Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Sediment Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ Other (Specify) :

Sediment Deposition ☐ Sludge Sand Smothering : None Slight Moderate Severe Silt Smothering : None Slight Moderate Severe ☐ Other (Specify) : Algae/fen severe

SUBSTRATE TYPE

Assessment Tool: ☒ SCI ☐ BioRecon ☐ LCI ☐ LVI

	% Coverage	INVERT # Times Sampled	PERI # Times Sampled
Woody Debris (Snags)	1	3½	4
Undercut Banks / Roots	1	4	4
Leaf Packs or Mat	<2	½	
Aquatic Vegetation	1	5	5
Rock or Shell Rubble	99	4	2
Sand			
Mud / Muck / Silt	SW	3	1
Other			
Other			

WATER QUALITY

	Depth (M)	Temp (°C)	pH (SU)	D.O. (MG/L)	Cond. (UMHO/CM)	Salinity (PPT)	SECCHI (M)
Top :							0.6
Mid-Depth :							☐ VOB
Bottom :							0.6m

Water Surface Oils : ☒ None ☐ Sheen ☐ Globs ☐ Slick foam

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

Water Sample Taken ? ☒ Yes ☐ No Pete + Jason

Algae Sample Taken ? ☒ Yes ☐ No

Clarity ☐ Clear ☐ Slightly Turbid ☒ Turbid ☐ Opaque

SYSTEM TYPE ☒ Stream ☐ Lake ☐ Wetland ☐ Estuary ☐ Other (Specify) :

Color ☐ Tannic ☒ Green (Algae) green/brown ☐ Clear ☐ Other (Specify) :

WEATHER CONDITIONS / NOTES :

PC warming trends 70

ABUNDANCE

	Absent	Rare	Common	Abundant
Periphyton :	☐	☐	☐	☒
Fish : (pan fish)	☐	☐	☐	☐
Aquatic Macrophytes :	☐	☒	☐	☐
Iron/Sulfur Bacteria :	☒	☐	☐	☐

☒ The antecedent hydrologic conditions have been met to my best knowledge.

Water samples preserved ? ☒ Yes ☐ pH<2 ☐ No Algae samples preserved ? ☒ Yes ☐ No

SAMPLING TEAM : Pete Thom Peyton Morgan Jr Tia Schmitt **SIGNATURE :** [signature] **DATE :** 2-22-16

Revision Date: September 5, 2008

Comments - OVER

Both test + control have periphyton covering all substrate - particularly on submerged dead paragrass on edges (>> 20 mm) Lyngbya? All habitat fouled both upstream + dsmn

Discharge commenced after we collected at the test site. Also, Pete had already got the water chem as well.

Chemical smell downstream only

water velocity a little faster at control (stream is narrower) and limestone out cropping upstream - actually "rapids"

Control site - no pools ∴ 70% was channelized long time ago. Sinuosity well recovered, pool no pools probably because of water vel. Channelization ends below rapids / out cropping

test	control
Corydalus	Corydalus
Baetidae	Baetidae - more than test
Chemmatopsyche	Chemmatopsyche
Hydelella	Hydelella - more than test
Dugesia	Caleoptteridae
crayfish	crayfish
Shrimp	Shrimps
Hydrobids	

DEP-SOP-001/01: Form FD 9000-5
STATE OF FLORIDA, DEPARTMENT OF ENVIRONMENTAL PROTECTION
STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (MM/DD/YY): 2/22/10	RECEIVING BODY OF WATER: N Prong Alafia
REMARKS:	COUNTY: Polk	LOCATION: N Prong Alafia	FIELD ID/NAME: Mulberry WTTP Control

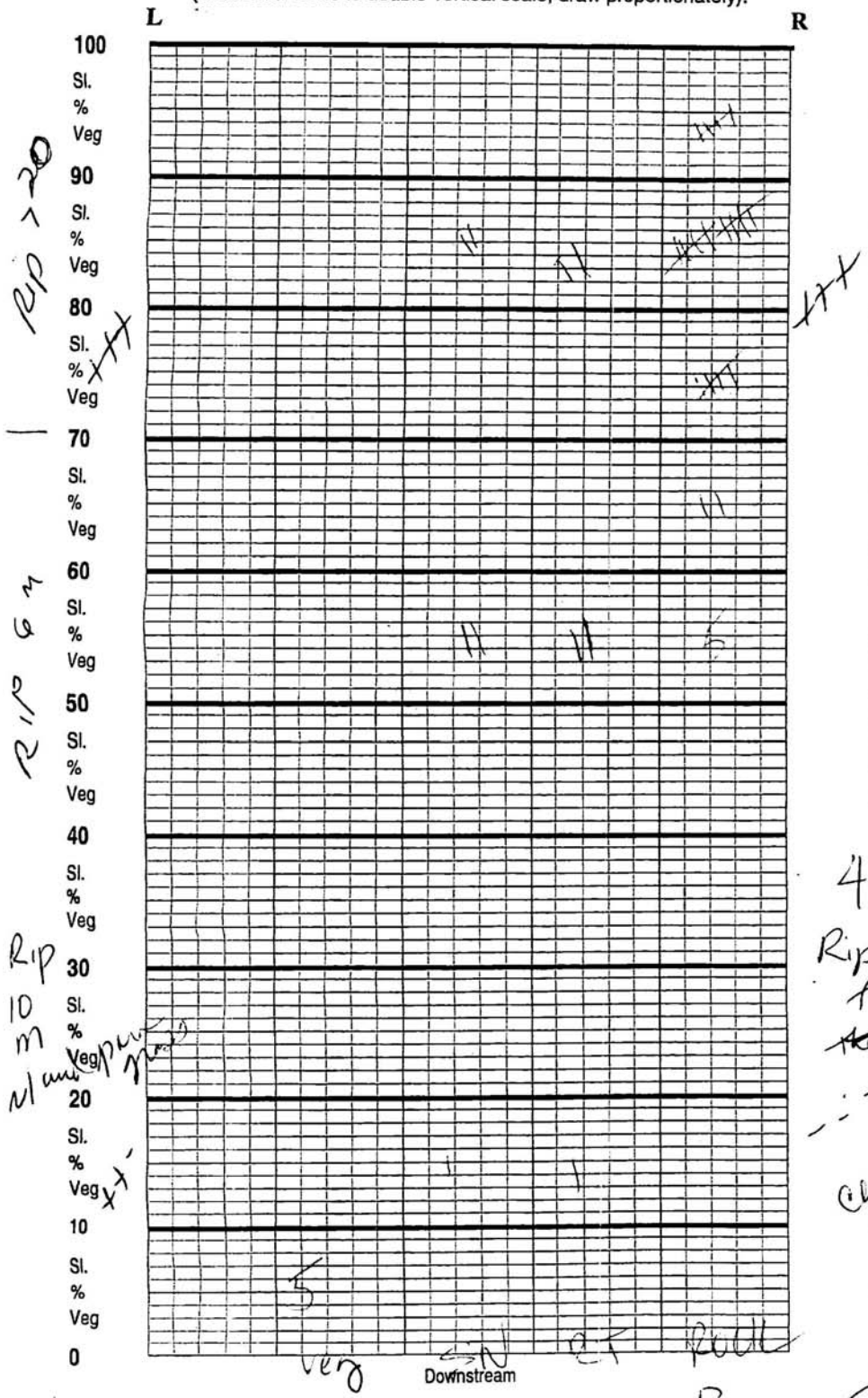
Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components Substrate Diversity 16	Four or more productive habitats present (snags, tree roots, aquatic vegetation, leaf packs (partially decayed), rock) 20 19 18 17 16	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags) 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed 10 9 8 7 6	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered 5 4 3 2 1
Substrate Availability 7	Greater than 30% productive habitat present at site 20 19 18 17 16	16% to 30% productive habitat, by aerial extent 15 14 13 12 11	6% to 15% productive habitat lotta peri fouling 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 spate occurring: > 1 m/sec 5 4 3 2 1
Habitat Smothering 10 Primary Score 52	Adequate number of pools (1-2 per 12 times width) and <25% of habitats affected by sand or silt accumulation. 20 19 18 17 16	Adequate number of pools (1-2 per 12 times width) and >25% of habitats affected by sand or silt accumulation. 15 14 13 12 11	Does not have required number of pools (1-2 per 12 times width) and/or has shallow pools (<2 times prevailing depth). 10 9 8 7 6	Pools are absent. Most habitats affected by sand or silt accumulation. 5 4 3 2 1
Secondary Habitat Components Artificial Channelization pm 13 ~~10~~ 11	Good sinuosity. No evidence of dredging or artificial straightening. No spoil banks. Diversity of depths. 20 19 18 17 16	Good sinuosity within old channelized area and a diversity of depths. Evidence of dredging in the past (>10 yrs) but mostly recovered. NO DIV of D 15 14 13 12 11	Some sinuosity developed within channelized area or some diversity of depth, but typically no pools (>2 times prevailing depth) present. 10 9 8 7 6	Straightened with spoil banks. Box-cut, monotypic depth. 5 4 3 2 1
Bank Stability Right Bank 9 Left Bank 9	Bankfull > 60% of bank height. Slope of bank ≤ 60°. Bankfull is within or above the root zone with few raw, eroded areas. 10 9	Only meets 2 of the 3 requirements for optimal bank stability. 8 7 6	Only meets 1 of the 3 requirements for optimal bank stability. 5 4	Bankfull < 60% of bank height. Slope of bank > 60°. Bankfull is below the root zone with raw, eroded areas. 3 2 1
Riparian Buffer Zone Width Right Bank 6 Left Bank 6	Width of vegetation greater than 18 m 10 9	Width of vegetation >12 to 18m 8 7 6	Width of vegetation 6 to 12 m. human activities still close to system 5 4	Less than 6 m of buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality pm ~~4~~ 3 Right Bank Left Bank 3 Secondary Score 47	Over 80% of riparian surfaces consist of normal, expected plant community for given sunlight & habitat conditions (e.g., native plants, trees, understory shrubs, or non-woody macrophytes). Minimal disturbance. 10 9	>50% to 80% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Some disruption in community observed. 8 7 6	25% to 50% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Disruption obvious. 5 4	Less than 25% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). 3 2 1

~~99~~ 101 pm **TOTAL SCORE**

Date: 2-22-10	Analyst: Peggy Morgan	Signature: Peggy Morgan

RP 1m for 10m 3
6m for 60 30 10
=7.16

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



Substrates: Code key, draw proportionate habitat abundance.

- [x] 1% Snags
- [x] 1% Roots/undercut banks
- [ ] Leaf Packs (or mats)
- [x] 1% Macrophytes
- [x] ~~5~~ 1% Rock
- [ ] _____
- [ ] _____

Velocity:
Note where velocity measures were taken.

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

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

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

Plants observed/other notes:

4 m wide

Rip 10 and paragrass for 90 m

channelized OLD 154 m

Prod. hab	1	2	3	4
Sweeps (Maj)	10	7	5	4
Sweeps (Min)	10	6	5	/

Mulberry WTP control Alafia N Prong 2-22-11 Peggy Mora

DEP-SOP-001/01: Form FD 9000-3

PHYSICAL/CHEMICAL CHARACTERIZATION ELECTRONIC FIELD SHEET

SAMPLE ID :
ORG ID : 24020068
COUNTY : Polk
STORET # :
DATE : 2-22-09
TIME : 0915
Latitude : (degrees) (minutes) (seconds)
Longitude : (degrees) (minutes) (second
SITE NAME : Mulberry test site City of Mulberry WWTP
SAMPLE COMPLETE ? ✓
FIELD ID/NAME : MULSTPREF TST Pm
RECEIVING BODY OF WATER :

RIPARIAN ZONE / STREAM FEATURES

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

Forest/Natural	silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industry	Other (Specify)
		✓					

Intermittent discharge NOT DO'n now

Local Watershed Erosion (select one) : ☐ None ☒ Slight ☐ Moderate ☐ Heavy
Local Watershed NPS Pollution : ☐ No evidence ☐ Slight ☑ Moderate ☐ Heavy

Width of Riparian Vegetation (m) on Each Buffer Side
Left Bank : 1-3 Right Bank : 720

High Water Mark: 0.5 (m) + 1.0 (above present water level) = 1.5 (present depth) (above bed)

Artificially Impounded ☐ Yes ☐ No

Typical Width (m) Depth (m)/Velocity (m/sec) Transect
m wide
0.29 m/s 0.29 m/s 0.2 m/s
0.5 m deep 0.5 m deep 0.3 m deep

Artificially Channelized : ☐ No ☒ Some recovery ☒ Mostly recovered, more sinuous ☐ Recent, severe

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

SEDIMENT / SUBSTRATE

Sediment Oils : ☑ Absent ☐ Slight ☐ Moderate ☐ Profuse

Sediment Odors : ☑ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ Other (Specify) :

Sediment Deposition : ☐ Sludge ☐ Other (Specify) : Periphyton
Sand Smothering : None Slight Moderate Severe
Silt Smothering : None Slight Moderate Severe

SUBSTRATE TYPE
Assessment Tool: ☒ SCI ☐ BioRecon ☐ LCI ☐ LVI

	% Coverage	INVERT # Times Sampled	PERI # Times Sampled
Woody Debris (Snags)	2	4½	5
Undercut Banks / Roots	4	5	5
Leaf Packs or Mat	<2m	½	
Aquatic Vegetation			
Rock or Shell Rubble	3	5	5
Sand			
Mud / Muck / Silt	91	5	5
Other			
Other			

WATER QUALITY Pete + Jason

	Depth (M)	Temp. (°C)	pH (SU)	D.O. (MG/L)	Cond. (UMHO/CM)	Salinity (PPT)	SECCHI (M)
Top :							0.5
Mid-Depth :							☐ VOB
Bottom :							D=1.0

Water Surface Oils : ☐ None ☐ Sheen ☐ Globs ☐ Slick
Water Odors : ☐ Normal ☐ Sewage ☐ Petroleum ☑ Chemical ☐ Other (Specify) :
Water Sample Taken ? ☒ Yes ☐ No by Pete + Jason
Algae Sample Taken ? ☑ Yes ☐ No

SYSTEM TYPE ☑ Stream ☐ Lake ☐ Wetland ☐ Estuary ☐ Other (Specify) :

Clarity : ☐ Clear ☐ Slightly Turbid ☑ Turbid ☐ Opaque

Color : ☐ Tannic ☑ Green (Algae) Green/brown ☐ Clear ☐ Other (Specify) :

WEATHER CONDITIONS / NOTES :
Cloudy hi 60s Pete + Jason

ABUNDANCE

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

a little sulphur

☒ The antecedent hydrologic conditions have been met to my best knowledge.
Water samples preserved ? ☒ Yes ☐ pH<2 ☐ No Algae samples preserved ? ☒ Yes ☐ No

SAMPLING TEAM : Peggy Morgan Gitta Schmitt
SIGNATURE : Peggy Morgan
DATE : 2-22-10

Revision Date: September 5, 2008

DEP-SOP-001/01: Form FD 9000-5
STATE OF FLORIDA, DEPARTMENT OF ENVIRONMENTAL PROTECTION
STREAM/RIVER HABITAT ASSESSMENT FIELD SHEET

SUBMITTING AGENCY CODE: / SUBMITTING AGENCY NAME:	STORET STATION NUMBER:	DATE (MM/DD/YY):	RECEIVING BODY OF WATER:
		2/22/10	Alafia N. Prong

REMARKS:	COUNTY:	LOCATION:	FIELD ID/NAME:
	Polk	N. Prong Alafia Mulberry WWTP test site	

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components Substrate Diversity 11	Four or more productive habitats present [snags, tree roots, 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) all covered w/ peri 15 14 13 12 11	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed 10 9 8 7 6	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered 5 4 3 2 1
Substrate Availability 7	Greater than 30% productive habitat present at site 20 19 18 17 16	16% to 30% productive habitat, by aerial extent 15 14 13 12 11	6% to 15% productive habitat all covered w/ peri exc. bottoms of snag 10 9 8 7 6 Trace	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 16 Primary Score 51	Adequate number of pools (1-2 per 12 times width) and <25% of habitats affected by sand or silt accumulation. 20 19 18 17 16	Adequate number of pools (1-2 per 12 times width) and >25% of habitats affected by sand or silt accumulation. 15 14 13 12 11	Does not have required number of pools (1-2 per 12 times width) and/or has shallow pools (<2 times prevailing depth). 10 9 8 7 6	Pools are absent. Most habitats affected by sand or silt accumulation. 5 4 3 2 1
Secondary Habitat Components Artificial Channelization ~~3~~ 15	Good sinuosity. No evidence of dredging or artificial straightening. No spoil banks. Diversity of depths. 20 19 18 17 16	Good sinuosity within old channelized area and a diversity of depths. Evidence of dredging in the past (>10 yrs) but mostly recovered. 15 14 13 12 11	Some sinuosity developed within channelized area or some diversity of depth, but typically no pools (>2 times prevailing depth) present. 10 9 8 7 6	Straightened with spoil banks. Box-cut, monotypic depth. 5 4 3 2 1
Bank Stability Right Bank 7 Left Bank 8	Bankfull > 60% of bank height. Slope of bank ≤ 60°. Bankfull is within or above the root zone with few raw, eroded areas. 10 9	Only meets 2 of the 3 requirements for optimal bank stability. 8 7 6	Only meets 1 of the 3 requirements for optimal bank stability. 5 4	Bankfull < 60% of bank height. Slope of bank > 60°. Bankfull is below the root zone with raw, eroded areas. 3 2 1
Riparian Buffer Zone Width Right Bank 2 Left Bank 9	Width of vegetation greater than 18 m 10 9	Width of vegetation >12 to 18m 8 7 6	Width of vegetation 6 to 12 m. human activities still close to system 5 4	Less than 6 m of buffer zone due to intensive human activities 3 2 1
Riparian Zone Vegetation Quality Right Bank 8 Left Bank 9 Secondary Score 58	Over 80% of riparian surfaces consist of normal, expected plant community for given sunlight & habitat conditions (e.g., native plants, trees, understory shrubs, or non-woody macrophytes). Minimal disturbance. 10 9	>50% to 80% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Some disruption in community observed. 8 7 6	25% to 50% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Disruption obvious. 5 4	Less than 25% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). 3 2 1

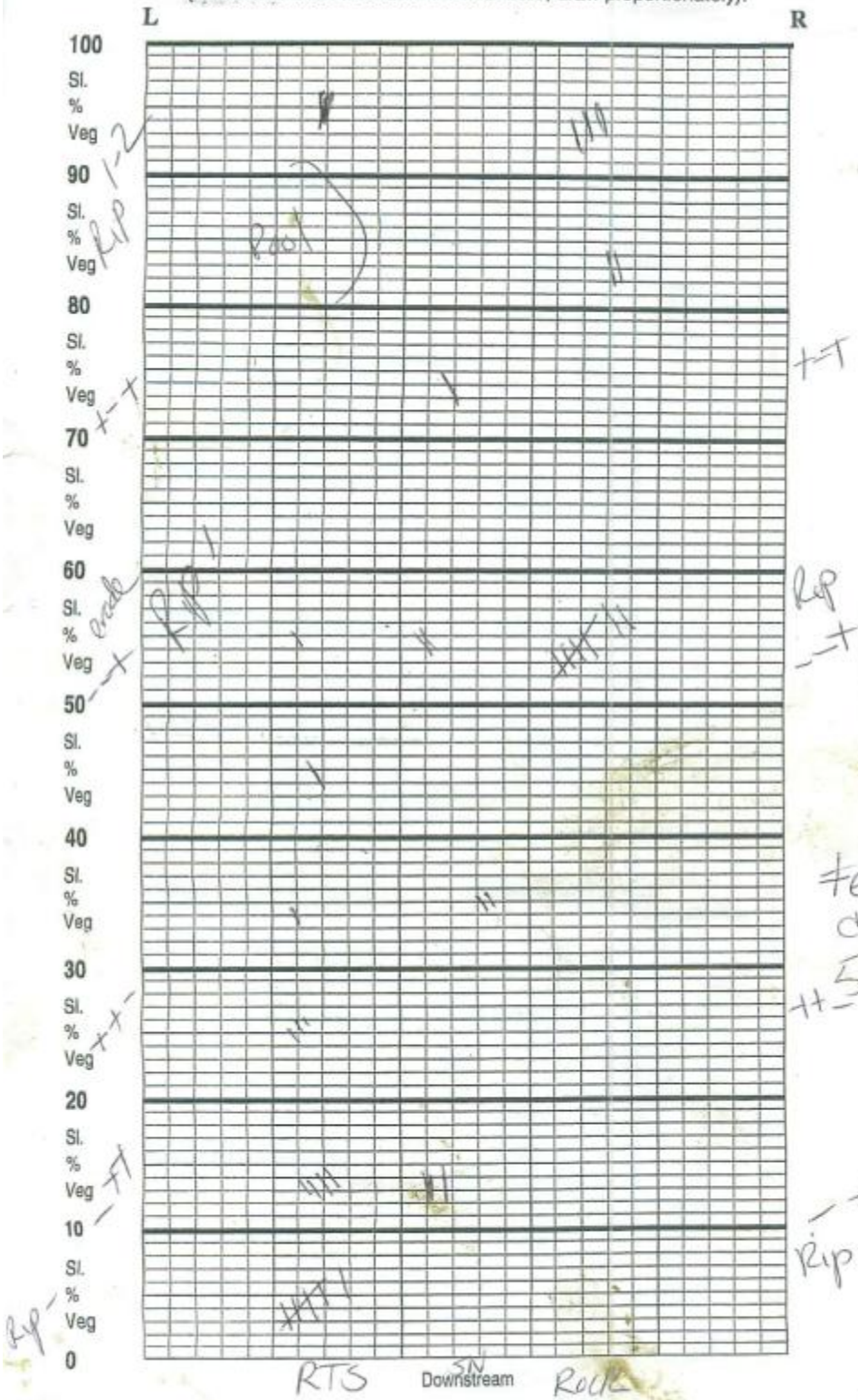
mixed grass cattle

104 **TOTAL SCORE**

Date:	Analyst:	Signature:
2-22-10	Peggy Morgan	Peggy Morgan

Form FD 9000-5 Revision Date: June 6, 2008

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



Substrates: Code key, draw proportionate habitat abundance.

- [x] 2% Snags 2%0
- [x] 4% Roots/undercut banks
- [ ] <2m Leaf Packs (or mats)
- [ ] Macrophytes <2m
- [x] 3% Rock
- [ ] D=1m
- [ ] See=0.5m

Velocity:
Note where velocity measures were taken.

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

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

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

Plants observed/other notes:

test Mulberry downstream

+/- 5 m wide

some sinuosity recovering 1 pool

Prod. hab	1	2	3	4
Sweeps (Maj)	10	7	5	4
Sweeps (Min)	10	6	5	4

2-22-10 Peggy Morgan

Appendix I-1

Wet ID taxa list and number of algal units counted to a target of 300 natural units for qualitative natural periphyton collections made from Mulberry WWTP on 2/22/10.

	Control Site	Test Site
Bacillariophyta		
Bacillariophyta	266	281
Chlorophycota		
Ankistrodesmus falcatus	-	1
Chlorella sp.	1	-
Closterium moniliferum moniliferum	-	2
Cosmarium garrolense crassum	1	-
Scenedesmus arcuatus	1	-
Scenedesmus dimorphus	2	-
Scenedesmus quadricauda	1	-
Scenedesmus sp.	1	-
Stigeoclonium sp.	1	-
Cyanophycota		
Aphanocapsa sp.	-	1
Jaaginema sp.	6	5
Planktolyngbya sp.	2	3
Pseudanabaena mucicola	5	-
Schizothrix calcicola	13	9
Synechocystis sp.	2	2

Appendix I-2

Diatom taxa list and number of valves counted to a target of 500 valves for qualitative periphyton collected from made from Mulberry WWTP on 2/22/10.

	Control Site	Test Site
Bacillariophyta		
Achnanthidium exiguum	5	5
Amphora ovalis	3	-
Bacillaria paxillifer	1	2
Caloneis bacillum	-	2
Chamaepinnularia sp.	-	2
Cocconeis sp.	-	2
Cocconeis fluviatilis	15	16
Cocconeis placentula	3	1
Craticula sp.	3	-
Craticula molestiformis	9	-
Cyclostephanos invisitatus	5	2
Cyclotella atomus	2	2
Cyclotella meneghiniana	10	6
Diadesmis confervacea	2	-
Discostella pseudostelligera	-	3
Encyonema minutum	-	2
Encyonema silesiacum	-	2
Eunotia sp.	3	-
Eunotia bilunaris	1	2
Fragilaria capucina	7	4
Fragilaria capucina gracilis	-	2
Fragilariaceae	2	2
Frustulia vulgaris	-	1
Gomphonema sp.	20	7
Gomphonema affine	-	2
Gomphonema grovei	3	3
Gomphonema olivaceum	-	1
Gomphonema parvulum	18	12
Hippodonta sp.	-	2
Hippodonta capitata	4	2
Hippodonta hungarica	-	1
Karayevia clevei	-	4
Lemnicola hungarica	9	2
Mayamaea atomus	9	7
Melosira sp.	-	3
Melosira varians	56	192
Navicula sp.	-	6

Appendix I-2 (continued)

	Control Site	Test Site
Navicula cryptocephala	6	2
Navicula germainii	9	20
Navicula minima	10	3
Navicula muraliformis	3	-
Navicula rostellata	2	-
Navicula schroeteri	2	-
Navicula symmetrica	-	2
Naviculaceae	13	7
Nitzschia sp.	20	14
Nitzschia amphibia	-	1
Nitzschia clausii	1	2
Nitzschia dissipata	-	1
Nitzschia frustulum	2	-
Nitzschia liebethruthii	1	2
Nitzschia linearis	1	-
Nitzschia palea	16	12
Nitzschia rosenstockii	-	5
Planothidium sp.	4	7
Planothidium apiculatum	1	-
Planothidium delicatulum	2	5
Planothidium frequentissimum	20	16
Planothidium lanceolatum	2	8
Planothidium rostratum	15	10
Staurosira construens venter	2	3
Stephanodiscaceae	8	4
Stephanodiscus sp.	1	-
Surirella sp.	4	2
Surirella angusta	32	10
Synedra acus	-	7
Synedra nana	4	4
Synedra ulna	125	36
Tabularia fasciculata	3	15
Thalassiosira sp.	1	-

Appendix J-1

Benthic macroinvertebrates collapsed taxa list and density (average number of individuals/m^2 rounded to the nearest individual, n = 3 samples) from Hester-Dendy artificial substrates incubated for 28 days upstream and downstream of the Mulberry WWTP on 2/22/10. See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

	Control Site	Test Site
Annelida		
Hirudinea		
Helobdella triserialis	3	-
Oligochaeta		
Nais communis complex	5	1,164
Slavina appendiculata	8	53
Arthropoda		
Arachnida		
Acariformes		
Atractides sp.	3	-
Crustacea		
Amphipoda		
Hyalella azteca	3	-
Isopoda		
Caecidotea sp.	-	5
Insecta		
Coleoptera		
Microcylloepus pusillus	-	5
Stenelmis sp.	11	8
Diptera		
Chironomus sp.	-	57
Corynoneura sp.	69	161
Cricotopus bicinctus	397	1,122
Cricotopus or orthocladius sp.	6	-
Hemerodromia sp.	21	37
Limonia sp.	-	3
Pentaneura inconspicua	72	191
Polypedilum flavum	745	1,649
Polypedilum illinoense grp.	3	-
Polypedilum scalaenum grp.	12	-
Rheocricotopus robacki	3	125
Rheotanytarsus exiguus grp.	58	197
Rheotanytarsus pellucidus	49	51
Simulium sp.	19	-
Simulium taxodium	-	53
Tanytarsus sp. A Epler	-	15

Appendix J-1 (continued)

	Control Site	Test Site
Tanytarsus sp. C Epler	3	-
Thienemanniella xena	434	1,456
Ephemeroptera		
Baetis intercalaris	114	180
Caenis sp.	3	-
Tricorythodes albilineatus	-	3
Megaloptera		
Corydalus cornutus	3	-
Odonata		
Enallagma sp.	-	5
Trichoptera		
Cernotina sp.	-	3
Cheumatopsyche sp.	481	1,027
Hydropsyche sp.	-	26
Hydroptila sp.	17	35
Neotrichia sp.	-	3
Mollusca		
Gastropoda		
Ancylidae	5	13
Planorbella sp.	-	3
Nemertea		
Prostoma sp.	-	3

Appendix J-2

Benthic macroinvertebrates taxa list and counts (number of individuals counted) collected from Hester-Dendy artificial substrates (n= 3 samples) incubated upstream and downstream of the Mulberry WWTP for 28 days and collected on 2/22/10.

	Control Site	Test Site
Annelida		
Hirudinea		
Helobdella triserialis	1	-
Oligochaeta		
Nais communis complex	2	440
Slavina appendiculata	3	20
Arthropoda		
Arachnida		
Acariformes		
Atractides sp.	1	-
Crustacea		
Amphipoda		
Hyalella azteca	1	-
Isopoda		
Caecidotea sp.	-	2
Insecta		
Coleoptera		
Microcylloepus pusillus	-	2
Stenelmis sp.	4	3
Diptera		
Chironomidae	56	215
Chironomus sp.	-	19
Corynoneura sp.	24	54
Cricotopus sp.	2	96
Cricotopus bicinctus	136	280
Cricotopus or orthocladius	2	-
Hemerodromia sp.	8	14
Limonia sp.	-	1
Pentaneura inconspicua	25	64
Polypedilum sp.	-	9
Polypedilum flavum	259	544
Polypedilum illinoense grp.	1	-
Polypedilum scalaenum grp.	4	-
Rheocricotopus robacki	1	42
Rheotanytarsus exiguus grp.	20	66
Rheotanytarsus pellucidus	17	17

Appendix J-2 (continued)

	Control Site	Test Site
Simulium sp.	7	1
Simulium taxodium	-	19
Tanytarsus sp. A Epler	-	5
Tanytarsus sp. C Epler	1	-
Thienemanniella sp.	10	126
Thienemanniella xena	141	362
Ephemeroptera		
Baetidae	3	-
Baetis intercalaris	40	68
Caenis sp.	1	-
Tricorythodes albilineatus	-	1
Megaloptera		
Corydalus cornutus	1	-
Odonata		
Coenagrionidae	-	1
Enallagma sp.	-	1
Trichoptera		
Cernotina sp.	-	1
Cheumatopsyche sp.	176	388
Hydropsyche sp.	-	10
Hydroptila sp.	6	13
Neotrichia sp.	-	1
Trichoptera	6	-
Mollusca		
Gastropoda		
Ancylidae	2	5
Planorbella sp.	-	1
Nemertea		
Prostoma sp.	-	1

Appendix K-1

Qualitative benthic macroinvertebrate collapsed taxa list and number of individuals counted from 20-discrete-dipnet sweeps conducted upstream and downstream of Mulberry WWTP on 2/22/10. See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

	Control Site		Test Site	
	Rep 1	**Rep 2**	**Rep 1**	**Rep 2**
Annelida				
Oligochaeta				
Aulodrilus pigueti	-	-	-	1
Nais communis complex	-	-	23	30
Slavina appendiculata	-	-	33	56
Arthropoda				
Arachnida				
Acariformes				
Atractides sp.	2	2	-	-
Crustacea				
Amphipoda				
Hyalella azteca	20	11	2	2
Decapoda				
Cambaridae	-	-	1	1
Palaemonetes sp.	-	-	4	2
Isopoda				
Caecidotea sp.	-	-	1	-
Insecta				
Coleoptera				
Dubiraphia vittata	4	2	2	3
Microcylloepus pusillus	-	1	3	3
Stenelmis sp.	5	5	5	5
Diptera				
Ablabesmyia mallochi	-	-	3	-
Ablabesmyia rhamphe grp.	1	-	-	-
Chironomus sp.	-	-	1	-
Cricotopus bicinctus	5	8	10	2
Hemerodromia sp.	-	-	-	1
Pentaneura inconspicua	5	8	10	2
Polypedilum flavum	44	46	12	14
Polypedilum illinoense grp.	-	-	4	2
Polypedilum scalaenum grp.	-	-	-	2
Rheocricotopus robacki	-	-	1	-
Rheotanytarsus exiguus grp.	3	1	4	-
Rheotanytarsus pellucidus	-	-	4	5

Appendix K-1 (continued)

	Control Site		Test Site	
	Rep 1	**Rep 2**	**Rep 1**	**Rep 2**
Simulium sp.	4	4	-	-
Stenochironomus sp.	-	-	-	1
Tanytarsus sp. A Epler	1	-	3	6
Thienemanniella sp.	1	-	-	-
Thienemanniella xena	-	-	1	1
Tribelos fuscicornis	-	-	1	-
Ephemeroptera				
Baetis intercalaris	14	12	6	3
Caenidae	-	1	-	-
Caenis sp.	-	-	6	1
Odonata				
Argia sp.	-	2	4	2
Calopterygidae	-	1	-	-
Hagenius brevistylus	-	1	-	-
Trichoptera				
Cernotina sp.	-	-	-	1
Cheumatopsyche sp.	27	35	11	10
Hydroptila sp.	3	3	-	-
Mollusca				
Bivalvia				
Corbicula fluminea	-	-	-	1
Gastropoda				
Ancylidae	-	2	3	-
Amnicola sp.	-	-	2	1
Hydrobiidae	1	-	-	-
Nemertea				
Prostoma sp.	-	-	-	1

Appendix K-2

Qualitative benthic macroinvertebrate taxa list and number of individuals counted from 20-discrete-dipnet sweeps conducted upstream and downstream of Mulberry WWTP on 2/22/10.

	Control Site		Test Site	
	Rep 1	**Rep 2**	**Rep 1**	**Rep 2**
Annelida				
Oligochaeta				
Aulodrilus pigueti	-	-	-	1
Nais communis complex	-	-	23	30
Slavina appendiculata	-	-	33	56
Arthropoda				
Arachnida				
Acariformes				
Acariformes	1	1	-	-
Atractides sp.	1	1	-	-
Crustacea				
Amphipoda				
Hyalella azteca	20	11	2	2
Decapoda				
Cambaridae	-	-	1	1
Palaemonetes sp,	-	-	4	2
Isopoda				
Caecidotea sp.	-	-	1	-
Insecta				
Coleoptera				
Dubiraphia vittata	4	2	2	3
Microcylloepus pusillus	-	1	3	3
Stenelmis sp.	5	5	5	5
Diptera				
Ablabesmyia mallochi	-	-	2	-
Ablabesmyia rhamphe grp.	1	-	-	-
Chironomidae	15	13	12	4
Chironomus sp.	-	-	1	-
Cricotopus bicinctus	4	6	8	2
Hemerodromia sp.	-	-	-	1
Pentaneura inconspicua	4	6	8	2
Polypedilum flavum	32	37	9	12
Polypedilum illinoense grp.	-	-	3	2
Polypedilum scalaenum grp.	-	-	-	2
Rheocricotopus robacki	-	-	1	-
Rheotanytarsus sp.	1	-	-	-

Appendix K-2 (continued)

	Control Site		Test Site	
	Rep 1	**Rep 2**	**Rep 1**	**Rep 2**
Rheotanytarsus exiguus grp.	1	1	3	-
Rheotanytarsus pellucidus	-	-	3	4
Simuliidae	1	1	-	-
Simulium sp.	3	3	-	-
Stenochironomus sp.	-	-	-	1
Tanytarsus sp. A Epler	1	-	2	5
Thienemanniella sp.	1	-	-	-
Thienemanniella xena	-	-	1	1
Tribelos fuscicornis	-	-	1	-
Ephemeroptera				
Baetidae	-	1	-	-
Baetis intercalaris	14	11	6	3
Caenidae	-	1	-	-
Caenis sp.	-	-	6	1
Odonata				
Argia sp.	-	2	4	2
Calopterygidae	-	1	-	-
Hagenius brevistylus	-	1	-	-
Trichoptera				
Cernotina sp.	-	-	-	1
Cheumatopsyche sp.	25	34	11	10
Hydropsychidae	2	1	-	-
Hydroptila sp.	3	3	-	-
Mollusca				
Bivalvia				
Corbicula fluminea	-	-	-	1
Gastropoda				
Ancylidae	-	2	3	-
Amnicola sp.	-	-	2	1
Hydrobiidae	1	-	-	-
Nemertea				
Prostoma sp.	-	-	-	1

The Bioassay of the Mulberry Wastewater Treatment Plant effluent sampled on February 21, 2010 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	1	0	0	2	2	1	# B	# S	# 1

Remarks

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The Priority Pollutants Analysis for Bioassay of the Mulberry Wastewater Treatment Plant effluent sampled on February 21, 2010 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	1	0	0	2	2	1	# X	# S	# 1

Remarks

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Biological Analyses of the Mulberry Wastewater Treatment Plant effluent sampled on February 21, 2010 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	1	0	0	2	2	1	# I	# S	# 1

Remarks

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