Biological Assessment of

Panama City Beach Wastewater Treatment Plant

Bay County

NPDES # FL0021512

Sampled April 21-23, 25, and 29, 2013

September 2013

Biology Section

Bureau of Laboratories

Division of Environmental Assessment and Restoration

2013 FDEP Bureau of Laboratories Quality Manual

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Facility Overview

The Panama City Beach Wastewater Treatment Plant is a Municipal Domestic Wastewater Treatment Plant. The effluent is discharged into a Wetland Conservation Area, a Class III Fresh Water (see map Appendix A). The design flow of the wastewater system is 14.0 million gallons per day (MGD) annual average daily flow (AADF). The annual average flow for April 2012 to March 2013 was 4.0 MGD. The plant discharges continuously, and the flow measured during this survey was 5.79 MGD (Northwest District sampling staff).

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.

See the Facility Summary (Appendix B) for a description of the facility, summary of permit limits, and discharge monitoring report (DMR) information. The facility is operating under administrative order (AO067NW) for pH which establishes an interim range of 5.0-8.5 until April 2014.

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 Little Crooked Creek, 14 miles north of the facility off Highway 79) and a Test Site (located in an unnamed stream, 8 miles northwest of the facility which receives water from the Wetland Conservation Area). Effluent samples were taken as grab samples from monitoring location EFD-02, prior to dechlorination. Dechlorination takes place immediately prior to discharge at the wetlands. For toxicity testing, the samples were dechlorinated in the laboratory. Toxicity, carbonaceous biochemical oxygen demand, total suspended solids, and metals samples were collected as 24-hour flow-proportioned composite samples.

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

The following were involved in this investigation: Rick Abad, Frank Butera, and Nathan Mulkey (FDEP Northwest District Office, Pensacola), and FDEP Central Laboratory in Tallahassee. The report was reviewed by District representatives and the Point Source Studies Review Committee (Mike Tanski, Andrew Tintle, and Jennifer Weger).

Results

Organic Constituents (See Table 1 and Appendix F)

- 1,4-Dioxane was detected in the effluent sample, Test Site sample and the field blank sample. 1,4-Dioxane was undetected in the Control Site sample. The results for the effluent, Control Site, and field blank were obtained from an unpreserved or an improperly preserved sample (Y-qualified).
- Sucralose was detected in the effluent sample and the Test Site sample which indicates that the Test Site was receiving effluent at the time of sampling. Sucralose was undetected in the Control Site sample and the field blank sample.
- No additional organic constituents were detected in the effluent sample or field blank sample.

Metals (See Table 2 and Appendix F)

- Copper detected in the effluent composite sample (33.2 µg/L) exceeded the Class III Freshwater Quality Criterion (62-302.530(23), F.A.C.) and the permitted limit. All other metals detected in the

effluent composite and grab samples were either undetected or detected at levels that complied with effluent permit limits and Class III Freshwater Quality Criteria (62-302.530, F. A. C.).

- All metals in Control Site grab samples were either undetected or detected at levels that complied with Class III Freshwater Quality Criteria (62-302.530, F. A. C.).

- Iron (1,260 µg/L) and lead (1.13 µg/L) detected in the Test Site sample exceeded Class III Freshwater Quality Criteria (62-302.530(38), F.A.C. and 62-302.530(39), F.A.C.). All other metals in the Test Site sample were either undetected or detected at levels that complied with Class III Freshwater Quality Criteria (62-302.530, F.A.C.).
- Cadmium was detected between the method detection limit (MDL) and practical quantitation limit (PQL) in the field blank (I-qualifier).

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

- Tests were performed April 23 through April 30, 2013.
- Total Residual Chlorine (TRC) (0.44 mg/L) was detected in bioassay sample #1 (LIMS # 1498012) in the laboratory. TRC detected in sample #2 (LIMS#1499041) was 0.55 mg/L and was 0.39 mg/L in sample #3 (LIMS#1499621). An aliquot of sample #1 was dechlorinated by the addition of sodium thiosulfate (0.025 N) at a rate of 0.55 mL per liter of sample to neutralize the chlorine. Sodium thiosulfate was added at a rate of 0.40 mL/L to sample #2 and 0.90 mL/L to sample #3. The same concentration of sodium thiosulfate was added to the dechlorinated test controls. The purpose of the dechlorinated test controls was to confirm that there was no adverse effect of adding sodium thiosulfate to the sample. There was no mortality in the dechlorinated controls of either test species.
- Bioassays were performed on the dechlorinated aliquot in addition to the bioassays performed on the original sample. The effluent sample IC25 for the fish, *Pimephales promelas*, and the IC25 for the water flea, *Ceriodaphnia dubia,* during the chronic definitive bioassays performed on the original sample were less than 100%; however, this is not considered an exceedance since the effluent sample was collected prior to dechlorination.
- The dechlorinated effluent composite sample IC25 for the water flea, *Ceriodaphnia dubia*, and the IC25 for the fish, *Pimephales promelas*, were calculated as being greater than 100% effluent.

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

- The Habitat Assessment score at the Control Site (137-Optimal Category) was higher than the Test Site (114-Suboptimal Category). The Control Site has three major productive habitats while the Test Site only had two major productive habitats. There were snag and root habitats at both study sites but the leaf pack/mats were only counted as a major habitat at the Control Site. The Control Site had greater substrate availability and a higher water velocity than did the Test Site. Habitat smothering affected more habitat at the Control Site. The Test Site banks scored in the suboptimal category and were less stable than the Control Site banks. Some disruption of the riparian zone plant community at the Test Site was observed while minimal disturbance was observed at the Control Site.
- The pH of the effluent complied with Class III Freshwater Quality Criteria and the effluent interim permit limits established by the Administrative Order. The pH of the Control and Test Sites was below the Class III Freshwater Quality Criterion (62-302.530(51)(c), F.A.C.) limits, but the natural background pH is low in this area so it is not considered an exceedance. The facility was required to petition for Site Specific Alternative Criteria (SSAC) for pH by April 2013 but has requested an extension as part of the permit renewal application. The extension is being processed with the permit application.
- Dissolved oxygen (mg/L), and specific conductance (µmhos/cm) of the effluent, Control Site, and Test Site complied with Class III Freshwater Quality Criteria (62-302.530, F.A.C.) and effluent permit limits.
- Chlorophyll *a* (corrected) was undetected in the effluent sample and Control Site sample and was detected at a low level between the MDL and PQL in the Test Site sample.
- Total Suspended Solids (TSS; mg/L) and Carbonaceous Biochemical Oxygen Demand (CBOD; mg/L) of the effluent sample complied with permit limits.

- Alkalinity (mg $CaCO_3$/L) of the Control Site and Test Site samples was less than 20 mg $CaCO_3$/L; however, the effluent is not depressing alkalinity below 20 mg $CaCO_3$/L, and this does not constitute an exceedance of Class III Freshwater Quality Criterion (62-302.530(1), F.A.C.)

Microbiology (See Table 1 and Appendix F)

- Fecal coliform analyses were performed by The Water Spigot, Panama City, Florida.
- Fecal coliforms were detected in the effluent and at both the Control and Test Sites at levels which complied with Class III Freshwater Quality Criterion (62-302.530(6), F.A.C.) and facility permit limits.

Nutrients (See Table 1 and Appendix F)

- Effluent nutrient levels complied with permit limits.
- Ortho-phosphate, total phosphorus, total Kjeldahl nitrogen, organic nitrogen, and total nitrogen in the effluent grab samples were detected at higher levels than in the Control Site samples and higher or close to the levels found in the Test Site samples. The amounts of these nutrients in the Test Site samples were greater than the amounts detected in the Control Site samples and were more similar to the amounts detected in the effluent grab samples. This indicates that the effluent is contributing to nutrient enrichment at the Test Site.
- Total ammonia detected in the Test Site sample was three times the amount detected in the effluent sample and approximately 50 times greater than the amount detected in the Control Site sample.
- Nitrate+nitrite (NO_x) detected in the effluent grab sample was approximately 50 times greater than the amount in the Control Site. NO_x was undetected in the Test Site sample.
- Total organic carbon detected in the Test Site sample was approximately 4 times the amount detected in the effluent sample and in the Control Site sample.
- NO_x was detected in the field blank.

Algal Growth Potential (See Table 3 and Appendix F)

- Raschke and Shultz (1987) determined that AGP values above 5.0 mg dry weight/L, which represents a "problem" threshold for fresh receiving waters, imply nutrient enrichment. The AGP value in the effluent sample using the freshwater species, *Pseudokirchneriella subcapitata,* was approximately 12 times greater than the problem threshold value. The analytical chemistry suggests that the effluent is nitrogen limited.
- The AGP value for the Control Site sample was detected but lower than the problem threshold. The Control Site sample was phosphorus limited.
- The AGP value for the Test Site sample was just above the problem threshold but is not elevated to the level of the effluent. The Test Site sample was nitrogen limited and the AGP value was two orders of magnitude higher than the Control Site sample, which indicates that the effluent is contributing to nutrient enrichment at the Test Site.

Bioassessment

Macroinvertebrates (See Tables 4 and Appendices I-1 and I-2)

- Qualitative macroinvertebrate data from dipnet samples indicated low diversity in the macroinvertebrate community at the Test Site. The Test Site scored 18 A on the Stream Condition Index (SCI) placing it in Category 3, and the Control Site scored 74 A, placing it in Category 1. (See Appendix C for an explanation of SCI Categories). The Test Site had fewer total taxa, fewer Trichoptera taxa, fewer clinger taxa, and fewer sensitive taxa than the Control Site. Also, the Test Site had no Ephemeroptera taxa and no long-lived taxa while the Control Site had several of each. The Control Site had a higher percentage of suspension feeders and filterers than did the Test Site. Approximately two-thirds of the Test Site sample was dominated by the isopod, *Lirceus* sp. The dominant taxon at the Control Site was the dipteran, *Simulium* sp. which made up one-fifth of the sample. (See Appendix C for an explanation of how these SCI metrics typically respond to human disturbance). The Suboptimal Category Habitat Assessment score at the Test Site may account for

some loss of diversity in the Test Site. The low SCI score of the Test Site cannot be attributed to the effluent as there may be confounding factors due to prior land use. The area was a pine plantation and the presence of residual herbicides or pesticides cannot be discounted since those parameters were not sampled during this event. Further sampling is necessary to determine if the effluent, prior land use, or a combination of the two is negatively affecting the macroinvertebrate community at the Test Site.

Conclusion

Copper detected in the effluent composite sample exceeded Class III Freshwater Quality Criterion (62-302.530(23), F.A.C.) and the permitted limit. Iron and lead detected in the Test Site sample exceeded Class III Freshwater Quality Criterion (62-302.530(38), F.A.C. and 62-302.530(39), F.A.C.). The nutrients results and the AGP values indicate that the effluent is contributing to nutrient enrichment at the Test Site.

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

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

Panama City Beach WWTP	Class III Criteria	Effluent Limits	Effluent (24-hour Composite)	Effluent (Grab)	Control Site	Test Site	Field Blank
Organic Constituents (µg/L)							
1,4-Dioxane	-	-	-	0.51 Y	0.020 UY	0.14	0.13 Y
Sucralose	-	-	-	25	0.010 U	12	0.012 U
Nutrients (mg/L)							
Ortho-phosphate	-	-	-	0.27	0.004 U	0.11	0.004 U
Total Phosphorus	-	≤ 2.0 ps	-	0.42	0.004 I	0.15	0.002 U
Total Ammonia	-	≤ 2.0**	-	0.060	0.004 I	0.19	0.002 U
Un-ionized Ammonia	≤ 0.02 s	≤ 0.02 s	-	< 0.02 c	< 0.02 c	< 0.02 c	-
Nitrate and Nitrite	-	-	-	0.91	0.019	0.004 U	0.015
Total Kjeldahl Nitrogen	-	-	-	1.3	0.27	1.6	0.080 U
Organic Nitrogen	-	-	-	1.240 c	0.266 c	1.410 c	0.039 c
Total Nitrogen	-	≤ 6.0 ps	-	2.210 c	0.289 c	1.602 c	0.055 c
Total Organic Carbon	-	-	-	8.3	9.2	36	0.50 U
General Physical and Chemical Parameters							
Habitat Assessment	-	-	-	-	137	114	-
Dissolved Oxygen (mg/L)	≥ 5.0	≥ 5.0	-	6.5	8.4	7.1	-
pH (SU)	6.0 - 8.5	5.0-8.5†	-	7.0	3.7 β	5.0 β	-
Specific Conductance (µmhos/cm)	≤ 1,275	-	-	445	31	294	-
Temperature (°C)	-	Report	-	23.6	17.3	20.7	-
Sample Depth (m)	-	-	-	-	-	0.15	-
Total Residual Chlorine (mg/L)	≤ 0.01	≤ 0.01 s	0.44* Q£	-	-	-	-
Chlorophyll *a* (µg/L) - Corrected	-	-	-	0.69 U	0.69 U	0.89 I	-
Phaeophytin (µg/L)	-	-	-	0.50 I	0.50 U	1.1 I	-
Total Suspended Solids (mg/L)	-	≤ 10.0 ps	2 U	-	3 I	4 I	-
Turbidity (NTU)	< 29 t	-	-	1.6	1.1	3.3	0.10 U
Color (true, PCU)	-	-	-	12	91 A	760	2.5 U
Alkalinity (mg CaCO3/L)	≥ 20	-	-	66 A	0.65 U	3.6	0.65 U
CBOD, 5 day (mg/L), N - inhibited	-	≤ 10.0 ps	0.51 IQ	-	0.50 I	1.0 I	-
Chloride (mg/L)	-	-	-	62	4.7	69	0.20 U
Fluoride (mg/L)	≤ 10.0	-	-	0.56	0.035 U	0.17	0.035 U
Sulfate (mg/L)	-	-	-	40	1.3	11	0.20 U
Flow (MGD)	-	≤ 14.0 a	-	3.7 a	-	-	-
Hardness (mg $CaCO_3$)	-	-	53.8 c	73.9 c	4.8 c	14.9 c	0.35 c
Toxicity (Chronic Screen, IC25, % effluent)							
Bioassay - Water flea *(Ceriodaphnia dubia)* - survival and reproduction[θ]	-	≥ 100	> 100	-	-	-	-
Bioassay - Fish *(Pimephales promelas)* -survival and growth[θ]	-	≥ 100	> 100	-	-	-	-
Microbiology (Number of colony forming units/100ml)							
Fecal Coliforms [¥]	≤ 400s [#]	≤ 800s	-	1	32	20	-

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.

Value exceeds the Class III Water Quality Criteria or permit limits

a - Annual average

c - Value is calculated

p - 24-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

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

Q - Sample held beyond normal holding time

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

Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.

IC25 - A 25% inhibition concentration less than 100% effluent will constitute a violation of this permit

¥ - Fecal coliform analysis performed by The Water Spigot, Panama City, FL

- If 10 or fewer samples are taken within a month, the single sample limit is 400 CFU (62-302.530(6), F.A.C.)

£ - Measurement taken in the FDEP laboratory

* - This value was obtained from the first toxicity sample. The total residual chlorine of the second and third toxicity samples was 0.55 mg/L and 0.39 mg/L. These samples were taken prior to dechlorination.

** - Monthly average

† - Administrative Order (AO) interim limit until April 2014

β - The natural background pH is low in this area. The facility is required to petition for Site Specific Alternative Criteria (SSAC) and has filed for an extension that is being processed as part of the permit renewal application.

θ - Dechlorinated in the laboratory prior to toxicity testing.

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

Panama City Beach WWTP	Effluent (24-hour Composite) Class III Criteria	Effluent (24-hour Composite) Limits	Effluent (24-hour Composite)	Effluent (Grab) Class III Criteria	Effluent (Grab)	Control Site Class III Criteria	Control Site	Test Site Class III Criteria	Test Site	Field Blank
Metals (µg/L unless otherwise noted)										
Aluminum	-	-	-	-	52	-	-	-	-	5.0 U
Arsenic	≤ 50	-	0.25 U	≤ 50	0.47 I	≤ 50	0.25 U	≤ 50	0.77 I	0.25 U
Cadmium	≤ 0.171 b	-	0.050 U	≤ 0.216 b	0.050 U	≤ 0.097 b	0.057 I	≤ 0.097 b	0.070 I	0.051 I
Calcium (mg/L)	-	-	17.5	-	24.4	-	1.34	-	3.92	0.075 U
Chromium, total	≤ 51.8 bψ	-	0.30 U	≤ 67.2 bψ	0.31 I	≤ 27.7 bψ	0.33 I	≤ 27.7 bψ	0.68 I	0.30 U
Copper	≤ 5.49 b	≤ 5.49 bp	33.2	≤ 7.20 b	5.32	≤ 2.85 b	0.50 U	≤ 2.85 b	0.93 I	0.50 U
Iron	≤ 1,000	-	43 I	≤ 1,000	46 I	≤ 1,000	210	≤ 1,000	1,260	30 U
Lead	≤ 1.44 b	≤ 1.44 bp	0.42 I	≤ 2.16 b	0.20 U	≤ 0.545 b	0.32 I	≤ 0.545 b	1.13	0.20 U
Magnesium (mg/L)	-	-	2.45	-	3.14	-	0.36	-	1.24	0.040 U
Nickel	≤ 30.9 b	-	2.78	≤ 40.4 b	3.57	≤ 16.1 b	0.34 I	≤ 16.1 b	2.87	0.25 U
Potassium	-	-	6.3	-	-	-	-	-	-	-
Selenium	≤ 5.0	-	-	≤ 5.0	0.23 I	≤ 5.0	-	≤ 5.0	-	0.20 U
Silver	≤ 0.07	-	0.025 U	≤ 0.07	0.025 U	≤ 0.07	0.025 U	≤ 0.07	0.025 U	0.025 U
Sodium	-	-	35.3	-	55.7	-	2.5	-	46.9	0.50 U
Zinc	≤ 70.8 b	≤ 70.8 bp	43	≤ 92.7 b	53	≤ 37.0 b	5.0 U	≤ 37.0 b	5.0 U	5.0 U

See Table 1 for calculated hardness.

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.

Value exceeds the Class III Water Quality Criteria or permit limits

b - Value is calculated based on hardness

p - 24-hour flow proportioned composite

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

ψ - Class III Freshwater Quality Criterion (62-302.530(19)(a), F.A.C.) for chromium-III

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

Panama City Beach WWTP								
Location	Test Species	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (OP) ± 20%	Predicted AGP (TN) ± 20%	Predicted AGP (TP) ± 20%	Inorganic N:P ratio	Total N:P ratio
Effluent	Fresh	62 A	36.9 ± 7.4		84.0 ± 16.8		3.6	5.3
Control Site	Fresh	0.037		1.7 ± 0.3		1.7 ± 0.3	5.8	72.3
Test Site	Fresh	8.61	7.4 ± 1.5	47.3 ± 9.5	61.0 ± 12.2	64.5 ± 12.9	1.8	10.7

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

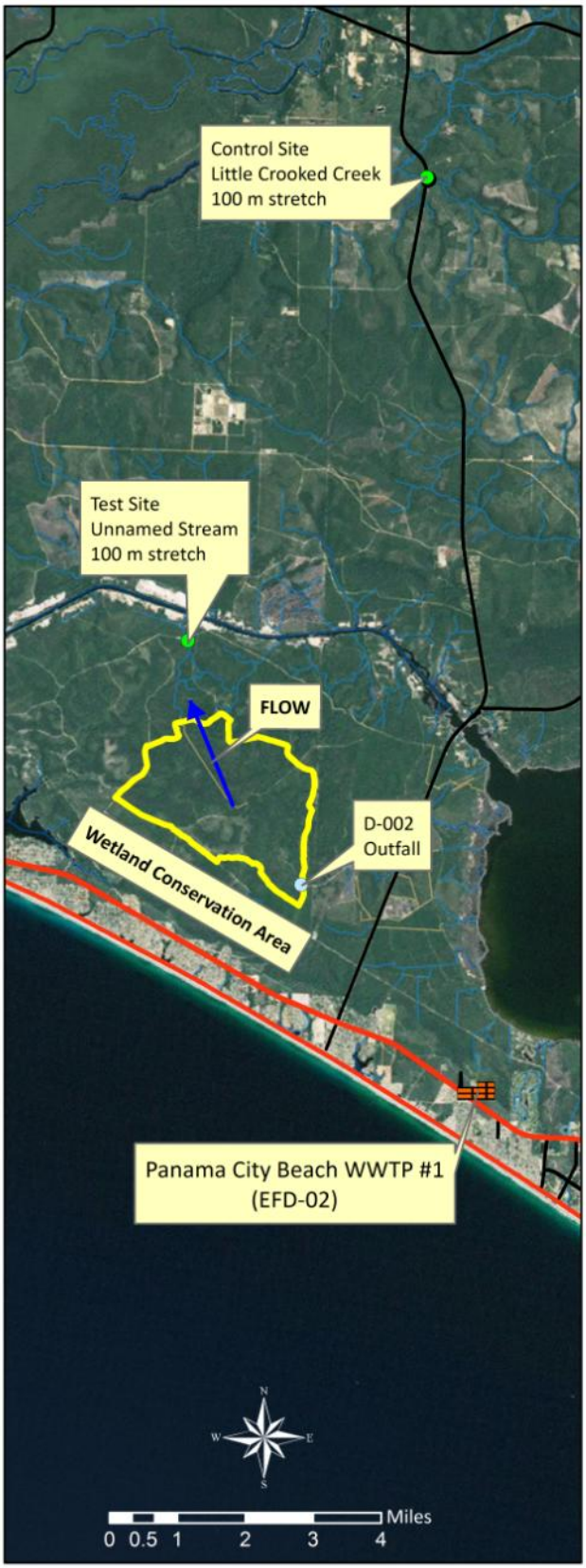
Table 4. Macroinvertebrate Dipnet Samples - Qualitative.

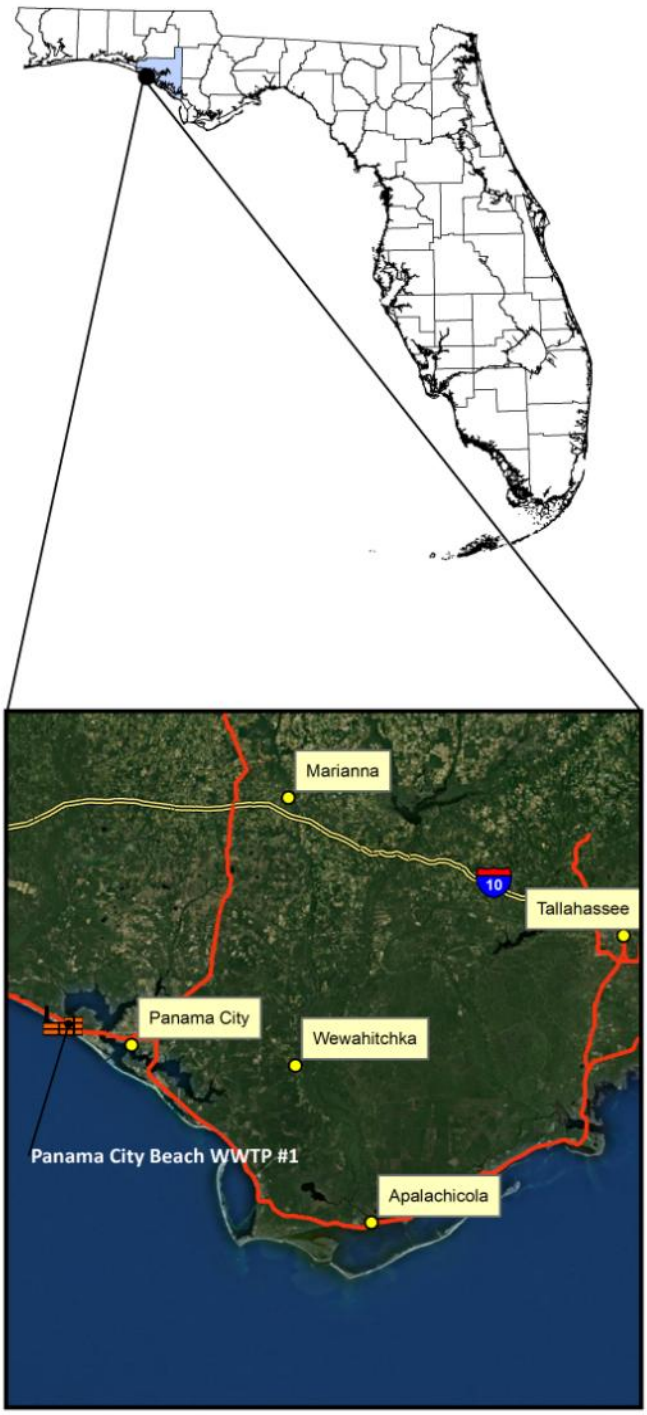
Panama City Beach WWTP	Control Site		Test Site	
Summary Statistics				
Stream Condition Index 2007 (value)	74 A		18 A	
Stream Condition Index 2007 (category) *	Category 1		Category 3	
Stream Condition Index Metrics	Rep 1	Rep 2	Rep 1	Rep 2
Number of Total Taxa	37	34	16	17
Number of Ephemeroptera Taxa	3	2	0	0
Number of Trichoptera Taxa	6	5	1	1
Number of Clinger Taxa	12	11	4	3
Number of Long-lived Taxa	5	4	0	0
Number of Sensitive Taxa	15	15	3	3
Percent of Dominant Taxon	19.6	22.2	67.5	64.9
Percent Suspension Feeders and Filterers	28.1	33.3	9.7	13.9
Percent of Tanytarsini Individuals	0.7	0.7	0.7	2.7
Percent of Very Tolerant Individuals	0.0	0.7	2.0	6.6
Total Number of Individuals	153	144	154	151
Community Composition: Percent of total				
Dominant Taxon Name	*Simulium* sp. (Diptera)	*Simulium* sp. (Diptera)	*Lirceus* sp. (Isopoda)	*Lirceus* sp. (Isopoda)
Acariformes	2.0	1.4	0.0	0.0
Amphipoda	5.9	12.5	1.3	0.7
Coleoptera	9.2	6.9	1.3	2.0
Decapoda	0.7	0.7	0.0	0.0
Diptera	45.8	43.1	21.4	26.5
Ephemeroptera	13.1	9.0	0.0	0.0
Isopoda	0.0	0.0	71.4	66.9
Odonata	0.7	1.4	0.7	0.7
Oligochaeta	2.6	0.0	0.7	0.7
Plecoptera	9.2	11.8	0.0	0.0
Trichoptera	11.1	13.2	2.6	2.7
Other	0.0	0.0	0.6	0.0
Functional Feeding Groups: Percent of total				
Browser-Grazers	0.0	0.0	34.4	32.8
Burrowing Deposit Feeders	2.6	0.0	0.7	0.7
Predators	18.6	27.4	8.4	7.6
Scavengers	0.3	0.4	36.4	34.1
Scrapers	12.1	7.6	0.3	0.0
Shredders	12.1	7.6	2.3	3.6
Surface Deposit Feeders	24.8	22.9	7.8	7.3
Suspension Feeders	28.1	33.3	9.7	13.9
Unknown	1.3	0.7	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
Panama City Beach WWTP #1
Fifth Year Bioassessment Sampling Locations





Appendix B

Facility Summary

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Kim Allen	**Contact Number:** (850) 595-0553
Facility Name (as it appears on permit): Panama City Beach WWTP #1	**Former Names:**
NPDES Permit Number: FL0021512	**Permit Expiration Date:** 10/15/2013
Physical Address: 206 North Gulf Boulevard	
District: NWD	**County:** Bay
Function of Facility: Municipal wastewater treatment facility	
Facility Type: Domestic	**Permitted Capacity (MGD):** 14.0 MGD AADF
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): **(3/1/12 –2/28/13): D-002 Annual Average Flow = 3.7 mgd**	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months): **(3/1/12 – 2/28/13): R-001 Annual Average Flow = 1.8 mgd**	
Description of type of Discharge: ☒ **Continuous** ☐ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☐ **Other, please specify**	

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

Facility Discharge Monitoring Locations:

13. Effluent samples shall be taken at the monitoring site locations listed in Permit Condition I.A.12. and as described below:

Monitoring Location Site Number	Description of Monitoring Location
EFF-05	Flow to Receiving Wetlands (D-002)
EFA-01	Ultraviolet Disinfection and/or Chlorine Contact Chamber.
EFD-02	Sample Monitoring Point prior to Discharge to Receiving Wetlands.
EFD-02	Sampling Point after dechlorination.
EFB-01	TSS and Turbidity Sample Monitoring Sites. Sampling Point After the ABW filters.
PPI-02	Internal Monitoring at UV Unit.

Ambient Surface Water Monitoring Locations associated with the wetland:

4. **Surface water ambient monitoring station samples shall be taken at the monitoring site locations listed in Permit Condition I.C.2 and as described below:**

Monitoring Location Site Number	Description of Monitoring Location
SWA-1	Intercoastal Waterway Upstream Monitoring Station.
SWA-2	Wetland creek confluence into the Intercoastal Waterway.
SWA-3	Intercoastal Waterway Downstream Monitoring Station.

Wetland Monitoring Locations:

2. **Effluent samples shall be taken at the monitoring site locations listed in Permit Condition I.E.1 and as described below:**

Monitoring Location Site Number	Description of Monitoring Location
WIM-1A	Located in Hog Pen Basin near Tammie Road (see Figure 4.1).
WIM-1B	Located in Baxley Homestead Basin near Buck Point Road (see Figure 4.1)
WIM-2	Located in Long Mudhole Basin near Long Mudhole Road (see Figure 4.1).
WEF-3	Located in Bear Track Basin - Point of discharge from the receiving wetlands (see Figure 4.1)

Description of Permitted Outfall(s):

D-002 the new wetland application of reclaimed water to a 3,000 acre Wetland Conservation Area as a receiving wetland (WBID 1048) (Class III Freshwater) which is a tributary flow to the Intracoastal Waterway (WBID 1008). The receiving wetland capacity of 14.0 MGD AADF will provide wetland capacity for the future WWTP build-out to 18.0 MGD MADF. D-002 is located at approximate latitude 30° 17' 41" N, Longitude: 85° 55' 39" W in Bay County. Reclaimed water discharged to D-002 is classified as reuse pursuant to Rule 62-610.810(2)(g), F.A.C.

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

An existing 14.0 MGD annual average daily flow (AADF) permitted capacity activated sludge wastewater treatment facility (WWTP). The treatment facility will operate in the extended aeration mode. The wastewater treatment facility consists of four (4) extended aeration trains [one 4.0 MGD unit and three 2.0 MGD units]. The treatment facility has provisions for pretreatment,nitrification, denitrification, secondary clarification, filtration, aerobic digestion, ultraviolet disinfection, with backup chlorination, dechlorination, and sludge handling. The treatment facility is equipped with an 8.66 MG reject holding pond and a 5.0 MG wetweather storage tank.

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)

D-002 (To Receiving Wetland):

Parameter	Units	Max/Min	Annual Average	Monthly Average	Weekly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location	Notes
Flow to Wetlands (D-002)	MGD	Maximum	14	Report	-	-	Continuous	Flow Meter	FLW-05	
BOD, Carbonaceous 5 day, 20C	MG/L	Maximum	5	6.25	7.5	10	Daily, 5/Week	24-hr FPC	EFB-01	
Solids, Total Suspended	MG/L	Maximum	5	6.25	7.5	10	Daily, 5/Week	24-hr FPC	EFB-01	
Nitrogen, Total	MG/L	Maximum	3	3.75	4.5	6	Daily, 5/Week	24-hr FPC	EFD-02	
Phosphorus, Total (as P)	MG/L	Maximum	1	1.25	1.5	2	Daily, 5/Week	24-hr FPC	EFD-02	
Nitrogen, Ammonia, Total as NH4	MG/L	Maximum	-	2	-	-	Daily, 5/Week	Grab	EFD-02	
Ammonia, Un-ionized as N	MG/L	Maximum	-	-	-	0.02	Daily, 5/Week	Calculate	EFD-02	
pH	**SU**	**Range**	**-**	**-**	**-**	**5.0 - 8.5**	**Continuous**	**Meter**	**EFD-02**	***AO Interim limit until April 2015**
Coliform, Fecal	#/100ML	Maximum	200	200 (Geo Mean)		800	Daily, 5/Week	Grab	EFD-02	
Total Residual Chlorine (For Disinfection)	MG/L	Minimum	-	-	-	0.5	Continuous	Meter	EFA-01	
Total Residual Chlorine (For Dechlorination)	MG/L	Maximum	-	-	-	0.01	Daily	Grab	EFD-02	
Temperature (C), Water	DEG.C	Maximum	-	-	-	Report	Daily, 5/Week	Meter	EFD-02	
Oxygen, Dissolved (DO)	MG/L	Minimum	-	-	-	5	Daily	Grab	EFB-01	

Ultraviolet Light Intensity	MW/CM 2	Minimum	-	-	-	Report	Continuous	Meter	PPI-02	
Ultraviolet Light Dosage	MW-S/CM2	Minimum	-	-	-	41	Continuous	Calculated	PPI-02	
Ultraviolet Light Transmittance	PERCENT	Minimum	-	-	-	Report	Continuous	Meter	PPI-02	
Whole Effluent Toxicity (Chronic)						IC25>100		See Toxicity Section	EFD-02	
Lead, Total Recoverable	UG/L	Maximum					Monthly	24-hr FPC	EFD-02	Hardness Based
Zinc, Total Recoverable	UG/L	Maximum					Monthly	24-hr FPC	EFD-02	Hardness Based
Copper, Total Recoverable	UG/L	Maximum					Monthly	24-hr FPC	EFD-02	Hardness Based
Hardness, Total (as CaCO3)	MG/L	Maximum					Monthly	24-hr FPC	EFD-02	Hardness Based

Surface Water Monitoring Locations:

Parameter	Units	Max/Min	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number
Nitrogen, Nitrate, Total (as N)	MG/L	Maximum	Report	Quarterly	Grab	SWA-1, SWA-2, SWA-3
Total Nitrogen	MG/L	Maximum	Report	Quarterly	Grab	SWA-1, SWA-2, SWA-3
pH	SU	Range	Report	Quarterly	Grab	SWA-1, SWA-2, SWA-3
Dissolved Oxygen (DO)	MG/L	Minimum	Report	Quarterly	Grab	SWA-1, SWA-2, SWA-3
Temperature, Water	DEG C	Maximum	Report	Quarterly	Field Thermometer	SWA-1, SWA-2, SWA-3
Coliform, Fecal	#/100ML	Maximum	Report	Quarterly	Grab	SWA-1, SWA-2, SWA-3
Nitrogen, Ammonia, Total as NH4	MG/L	Maximum	Report	Quarterly	Grab	SWA-1, SWA-2, SWA-3
Specific conductance, Field	UMHOS/C M	Maximum	Report	Quarterly	Field Probe	SWA-1, SWA-2, SWA-3
BOD, Carbonaceous 5 day, 20C	MG/L	Maximum	Report	Quarterly	Grab	SWA-1, SWA-2, SWA-3
Solids, Total Suspended	MG/L	Maximum	Report	Quarterly	Grab	SWA-1, SWA-2, SWA-3
Phosphorus, Total (as P)	MG/L	Maximum	Report	Quarterly	Grab	SWA-1, SWA-2, SWA-3
Chlorophyll-A, Phytoplankton,Fluorometric Method	MG/CU. METER	Maximum	Report	Quarterly	Grab	SWA-1, SWA-2, SWA-3
Water Depth	Feet	Maximum	Report	Quarterly	Field Instrument	SWA-1, SWA-2, SWA-3
Wind Direction	Degrees from North	Maximum	Report	Quarterly	Field Instrument	SWA-1, SWA-2, SWA-3
Turbidity	NTU	Maximum	Report	Quarterly	Grab	SWA-1, SWA-2, SWA-3

D.O. % Saturation	%	Maximum	Report	Quarterly	Grab	SWA-1, SWA-2, SWA-3
Salinity	PPT	Maximum	Report	Quarterly	Grab	SWA-1, SWA-2, SWA-3
Secchi Depth	Inches	Maximum	Report	Quarterly	Grab	SWA-1, SWA-2, SWA-3
Color	PT-CO	Maximum	Report	Quarterly	Grab	SWA-1, SWA-2, SWA-3
Wind Force	MPH	Maximum	Report	Quarterly	Field Instrument	SWA-1, SWA-2, SWA-3

Receiving Wetland Monitoring Stations:

Parameter	Units	Max/Min	Annual Avg	Monthly Avg	Weekly Avg	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Staff Gauge Reading	Feet	Max	-	-	-	Report	Continuous	Stage Recorder	WIM-1A, WIM-1B, WIM-2, WEP-3	
Water Level Reading	NGVD	Max	-	-	-	Report	Continuous	Meter	WIM-1A, WIM-1B, WIM-2, WEP-3	
BOD, Carbonaceous 5 day, 20C	MG/L	Max	-	-	-	Report	Quarterly	Grab	WIM-1A, WIM-1B, WIM-2, WEP-3	
Solids, Total Suspended	MG/L	Max	-	-	-	Report	Quarterly	Grab	WIM-1A, WIM-1B, WIM-2, WEP-3	
pH	SU	Range	-	-	-	Report	Quarterly	Field Probe	WIM-1A, WIM-1B, WIM-2, WEP-3	
Temperature, Water	DEG C	Max	-	-	-	Report	Quarterly	Field Thermometer	WIM-1A, WIM-1B, WIM-2, WEP-03	48 hr dawn-dusk, m 4 hr interval
Coliform, Fecal	#/100ML	Max	-	-	-	Report	Quarterly	Grab	WIM-1A, WIM-1B, WIM-2, WEP-3	
Oxygen, Dissolved (DO)	MG/L	Min	-	-	-	Report	Quarterly	Field Probe	WIM-1A, WIM-1B, WIM-2, WEP-3	48 hr dawn-dusk, m 4 hr interval
Nitrogen, Total Kjeldahl as N	MG/L	Max	-	-	-	Report	Quarterly	Grab	WIM-1A, WIM-1B, WIM-2, WEP-3	

Nitrogen, Ammonia, Total as NH4	MG/L	Max	-	-	-	Report	Quarterly	Grab	WIM-1A, WIM-1B, WIM-2, WEP-3	
Specific conductance, Field	UMHOS/CM	Max	-	-	-	Report	Quarterly	Field Probe	WIM-1A, WIM-1B, WIM-2, WEP-3	
NO2+NO3, Total 1 DET. as N	MG/L	Max	-	-	-	Report	Quarterly	Grab	WIM-1A, WIM-1B, WIM-2, WEP-3	
Total Nitrogen	MG/L	Max	3	-	-	-	Quarterly	Grab	WEP-3	
Un-ionized Ammonia	MG/L	Max	0.02	-	-	-	Quarterly	Calculated	WEP-3	
Phosphorus, Total (as P)	MG/L	Max	0.8	-	-	-	Quarterly	Grab	WEP-3	
Phosphorus, Total (as P)	MG/L	Max	-	-	-	Report	Quarterly	Grab	WIM-1A, WIM-1B, WIM-2	
Sulfate, Total as SO4	MG/L	Max	-	-	-	Report	Quarterly	Grab	WIM-1A, WIM-1B, WIM-2, WEP-3	
Chlorophyll-A,Phytoplankton,Fluorometric Method	UG/L		-	-	-	Report	Quarterly	Grab	WIM-1A, WIM-1B, WIM-2, WEP-3	
Herbaceous Vegetation Sampling	Yes/No		-	-	-	Report	Quarterly	Line Intercept Method	WIM-1A, WIM-1B, WIM-2, WEP-3	
Benthic Macroinvertebrates	Yes/No					Report	Quarterly	FWCI	WIM-1A, WIM-1B, WIM-2, WEP-3	FWCI = Florida Wetland Conditio Index
Woody Vegetation Sampling	Yes/No		-	-	-	Report	Annually	Field	WIM-1A, WIM-1B, WIM-2, WEP-3	
Fish Sampling	Yes/No		-	-	-	Report	Annually	Field	WIM-1A, WIM-1B, WIM-2, WEP-3	
Threatened And Endangered Plant and Animal Species List	Yes/No		-	-	-	Report	Annually	Field	WIM-1A, WIM-1B, WIM-2, WEP-3	
Sulfide (Sediment Sampling)	MG/KG	Max	-	-	-	Report	Annually	Grab	WIM-1A, WIM-1B, WIM-2, WEP-3	

Reuse (R-001):

Parameter	Units	Max/Min	Annual Avg	Monthly Avg	Weekly Avg	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location
Flow to R-001	MGD	Maximum	10	-	-	-	Continuous	Flow Meter	FLW-02
Flow (ground water)	MGD	Maximum	Report	-	-	-	Continuous	Flow Meter	FLW-04
BOD, Carbonaceous 5 day, 20C	MG/L	Maximum	20	30	45	60	Weekly	24-hour FPC	EFB-01
Solids, Total Suspended	MG/L	Maximum	-	-	-	5	Daily	24-hour FPC	EFB-01
pH	SU	Range	-	-	-	6.0 to 8.5	Continuous	Meter	EFF-01
Coliform, Fecal	#/100ML	Maximum				25	Daily	Grab	EFF-01
Total Residual Chlorine (For Disinfection)	MG/L	Minimum		-	-	1	Continuous	Meter	EFF-01
Turbidity	NTU	Maximum					Continuous	Meter	EFB-01
Giardia	CYSTS/100 L	Maximum	-	-	-	Report	two years	Filtered	EFF-01
Cryptosporidium	OOCYSTS/100 L	Maximum	-	-	-	Report	two years	Filtered	EFF-01

PART I: Continued

Receiving Waters:	**Classification (indicate whether fresh or marine):**
3,000 acre Wetland Conservation Area as a receiving wetland (WBID 1048) which is a tributary flow to the Intracoastal Waterway (WBID 1008).	Class III Fresh

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

c. Sampling Requirements

(1) For each routine test or additional follow-up test conducted, a total of three flow proportional 24-hour composite samples of final effluent shall be collected and used in accordance with the sampling protocol discussed in EPA-821-R-02-013, Section 8.

(2) The first sample shall be used to initiate the test. The remaining two 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.

(3) Samples for routine and additional follow-up tests shall not be collected on the same day.

d. Test Requirements

(1) Routine Tests: All routine tests shall be conducted using a control (0% effluent) and a minimum of five test dilutions: **100%**, **50%**, **25%**, **12.5%**, and **6.25%** final effluent.

(2) The permittee shall conduct a daphnid, **Ceriodaphnia dubia**, Survival and Reproduction Test and a fathead minnow, **Pimephales promelas**, Larval Survival and Growth Test, concurrently.

(3) 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. Any deviation of the bioassay procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use. In the event the above method is revised, the permittee shall conduct chronic toxicity testing in accordance with the revised method.

(4) The control water and dilution water shall be moderately hard water as described in EPA-821-R-02-013, Section 7.

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

AO067NW was issued on April 8, 2009. It required the facility to petition for a SSAC for pH by April 2013and provides an interim limit for pH until April 2014. The facility requested an extension to the date to petition for a SSAC as part of the permit renewal application received 4/15/2013. This extension is being processed with the permit application.

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	Limit (mg/L)	Result (mg/L unless otherwise noted)

4/2013 (D-002)	Total Phosphorus (daily max)	2.0	2.1
4/2013 (R-001)	Total Residual Chlorine (for disinfection) (min)	1.0	0.8
3/2013 (R-001)	TSS (max)	5.0	11.0
12/2012 (D-002)	Total Nitrogen (max)	6.0	6.1
5/2012 (D-002)	Total Phosphorus (max)	2.0	2.2
2/2012 (D-002	(Ceriodaphnia) (min)	IC25 = 100%	50.2%

Describe previous FYI and WQBEL study:

FYI3's were conducted in 2003 and 2008 when the facility was discharging to West Bay.

Describe previous or current Enforcement Actions (including WLs):

None.

Describe any violations or problems noted in previous inspection:

Discuss whether DMR trends within previous five years are improving or declining:

Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):

PART II: Sampling Event Information

Date(s) sample collected: 4/22/13 & 4/29/13	Sampler(s): Nathan Mulkey/Rick Abad/Frank Butera
Temperature (Deg C): 23.59	pH (SU): 6.97
Dissolved Oxygen (mg/L): 6.86	Conductivity (umhos/cm): 445
Total Residual Chlorine (mg/L):	Total Residual Chlorine - after Disinfection (mg/L):
Method of Chlorination:	Method of De-chlorination:

Flow During Sample Collection for each outfall(MGD):
5.79

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):
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: **Effluent and control site (Little Crooked Creek) sampled on 4/22/13** **Discharge stream sampled on 4/29/13**

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 exceedance 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 exceedances of 62-302.530(20), 62-302.530(61) and/or a violation of facility permit limits. A no observed effect concentration (NOEC) less than 100% effluent in a chronic test may constitute an exceedance of 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 exceedance of 62-302.530(6) and/or a violation of facility permit limits. Fecal coliform and enterococci results often are based on colony counts outside the acceptable range (B-qualifier). The dilutions performed on the sample did not yield results within the method acceptable range of 20- 60 colony forming units per plate. The B-qualifier does not affect data quality.

(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 exceedances 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 ± 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 exceedance of 62-302.530(61), F.A.C.

(7) Algal Assemblages

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 exceedances 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..

(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 exceedances 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 exceedances 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 exceedances 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 exceedances 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 exceedances 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 exceedances 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).

(9) Definition of Qualifiers

A - Value reported is the mean of two or more determinations
B - Results based on colony counts outside the acceptable range.
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J - Estimated value
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
N - Presumptive evidence of presence of material.
O - Sampled, but analysis lost or not performed.
Q - Sample held beyond normal holding time.
T - Value reported is less than the criterion of detection.
U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
V - Analyte was detected in both sample and method blank.
X - Too few individuals to calculate SCI value.
Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate
Z - Colonies were too numerous to count (TNTC)

Appendix D

Chain of Custody

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2013-04-22-27
FYI Panama City Beach WWTP #1 Sampling Inspection

Requester: Michelle Fish
Field Report Prepared By: N. Milky
Collected By: Nathan Milky
Send Final Report To: Kim Allen
Sampling Agency: FDEP

Customer: NW-DIST
Project ID: FYI5
PMAS: 1143

Lab ID *	Location / Field ID / Matrix / Temp (C) / pH / Latitude / Longitude	Collection (comp begin or grab) / Composite 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)**
	Location: Panama City Beach WWTP #1 Field ID: Effluent Matrix: (Fresh) etc; Temp (C): 23.59; pH: 6.97 Latitude: 30.21685 dd; Longitude: 85.85325 dd	☐ Comp ☑ Grab; Collection Date 4/22/13 Time 1630 (Central); Composite end Date Time Eastern Central Tot Res Chlorine (mg/L); Diss Oxygen (mg/L): 6.46; Storet Station Number Sample Depth ☐ m ☐ ft: 445; ☐ Salinity (PPTh) ☑ Sp Conductance (umho/cm); NPDES Number Comments: EFD-01 monitoring station	B
	Location: Panama City Beach WWTP #1 Field ID: TOX Matrix: (Fresh) etc; Temp (C); pH Latitude: dd; Longitude: dd	☑ Comp ☐ Grab; Collection Date 4/21/13 Time 0700 (Central); Composite end Date 4/22/13 Time 0700 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 Comments	A
	Location: Panama City Beach WWTP #1 Field ID: Effluent Composite Matrix: (Fresh, etc); Temp (C); pH Latitude: dd; Longitude: dd	☑ Comp ☐ Grab; Collection Date 4/21/13 Time 0700 (Central); Composite end Date 4/22/13 Time 0700 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 Comments	A
	Location: Panama City Beach WWTP #1 Field ID: Field Blank Matrix: (Fresh, etc); Temp (C); pH Latitude: dd; Longitude: dd	☐ Comp ☐ Grab; Collection Date 4/22/13 Time 1100 (Central); Composite 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 Comments	DE

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** Please see reverse side for Bottle Group information.

last revised October 1, 2003

2 bioassays AP 4.23.13 @ 10:19

Page 1 of 5

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2013-04-22-27
FYI Panama City Beach WWTP #1 Sampling Inspection

Requester: Michelle Fish
Field Report Prepared By:

Customer: NW-DIST
Project ID: FYI5
PMAS: 1143

Collected By:
Sampling Agency:
Send Final Report To: Kim Allen

Lab ID *	Location	Collection (comp begin or grab) Eastern Central	Composite end Eastern Central	Bottle Group(s)**
	Little Crooked Creek Abv SR 79	☐ Comp ☑ Grab Date 4/22/13 Time 1330	Date Time	C
	Field ID: Little Crooked Creek Abv SR 79	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 ☐ dd ☐ dms / Longitude ☐ dd ☐ dms	Comments: Background / "control" site, SCI/HAB protocol		

Lab ID *	Location	Collection (comp begin or grab) Eastern Central	Composite end Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab Date Time	Date Time	
	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 ☐ dd ☐ dms / Longitude ☐ dd ☐ dms	Comments		

Lab ID *	Location	Collection (comp begin or grab) Eastern Central	Composite end Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab Date Time	Date Time	
	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 ☐ dd ☐ dms / Longitude ☐ dd ☐ dms	Comments		

Lab ID *	Location	Collection (comp begin or grab) Eastern Central	Composite end Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab Date Time	Date Time	
	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 ☐ dd ☐ dms / Longitude ☐ dd ☐ dms	Comments		

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* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

2013-04-22-27

Request Number: RQ ~~2013-13-10-20~~

Event ID *

Requester: ~~Chargé~~

Field Report Prepared By: N. Mills

Customer: NW-DIST

Project ID: ~~DISCRETIONARY~~ FYI

PMAS: ~~4886~~

Collected By: Fred Baker / Rick Hand

Sampling Agency: FDEP

Send Final Report To: ~~Charge~~

Lab ID *	Location	Collection (comp begin or grab)	Composite end	Bottle Group(s)**
	Little Crooked Creek	☐ Comp ☐ Grab Date 4/2/13 Time 1320 Eastern Central	Date Time Eastern Central	F
	Field ID: Little Crooked Creek Above SR 79	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 30.41351 ☒ dd ☐ dms	Longitude 85.86842 ☒ dd ☐ dms	Comments: macro invert	

Lab ID *	Location	Collection (comp begin or grab)	Composite end	Bottle Group(s)**
		☐ Comp ☐ Grab Date Time Eastern Central	Date Time Eastern Central	
	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 ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments	

Lab ID *	Location	Collection (comp begin or grab)	Composite end	Bottle Group(s)**
		☐ Comp ☐ Grab Date Time Eastern Central	Date Time Eastern Central	
	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 ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments	

	Location	Collection (comp begin or grab)	Composite end	Bottle Group(s)**
		☐ Comp ☐ Grab Date Time Eastern Central	Date Time Eastern Central	
	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 ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments	

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* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2013-~~0000125~~ 04-22-27

~~WBID 361 432 675 655 656 674 323~~

Requester: ~~Michael King~~ Field Report Prepared By:

Customer: NW-DIST

Project ID: ~~0000~~ FYIS Collected By: Daniel Crean Send Final Report To: ~~Michael King~~ Kim Allen

PMAS: ~~1000~~ 1143 Sampling Agency: FDEP

Lab ID *	Location	Collection (comp begin or grab) Eastern	Composite end Eastern	Bottle Group(s)**
	Panama City Beach WWTP #1	☑ Comp ☐ Grab Date 4/3/13 Time 0700 Central	Date 4/4/13 Time 0700 Central	A
	Field ID: TOX 2	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 ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments	

Lab ID *	Location	Collection (comp begin or grab) Eastern	Composite end Eastern	Bottle Group(s)**
		☐ Comp ☐ Grab Date Time Central	Date Time Central	
	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 ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments	

Lab ID *	Location	Collection (comp begin or grab) Eastern	Composite end Eastern	Bottle Group(s)**
		☐ Comp ☐ Grab Date Time Central	Date Time Central	
	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 ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments	

Lab ID *	Location	Collection (comp begin or grab) Eastern	Composite end Eastern	Bottle Group(s)**
		☐ Comp ☐ Grab Date Time Central	Date Time Central	
	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 ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments	

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** Please see reverse side for Bottle Group information.

last revised October 1, 2003

2 bioassays @ 1000
4.25.13 CR

04-22-27

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2013-~~03~~ ~~Choctawhatchee Bay-Aqualab~~

Requester: ~~Cheryl Dumph~~

Field Report Prepared By:

Customer: NW-DIST

Project ID: ~~DISCRETIONARY~~ FY15

Collected By: Daniel Crean

Send Final Report To: ~~Cheryl Dumph~~ Kim Allen

PMAS: ~~1000~~ 1143

Sampling Agency: FDEP

Lab ID *	Location			Collection (comp begin or grab) Eastern	Composite end Eastern	Bottle Group(s)**
	Panama City Beach WWTP #1			☑ Comp ☐ Grab Date 4/25/13 Time 0700 Central	Date 4/26/13 Time 0700 Central	A
	Field ID TOX 3			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 ☐ dd ☐ dms	Longitude ☐ dd ☐ dms		Comments		

Lab ID *	Location			Collection (comp begin or grab) Eastern	Composite end Eastern	Bottle Group(s)**
				☐ Comp ☐ Grab Date Time Central	Date Time Central	
	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 ☐ dd ☐ dms	Longitude ☐ dd ☐ dms		Comments		

Lab ID *	Location			Collection (comp begin or grab) Eastern	Composite end Eastern	Bottle Group(s)**
				☐ Comp ☐ Grab Date Time Central	Date Time Central	
	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 ☐ dd ☐ dms	Longitude ☐ dd ☐ dms		Comments		

Lab ID *	Location			Collection (comp begin or grab) Eastern	Composite end Eastern	Bottle Group(s)**
				☐ Comp ☐ Grab Date Time Central	Date Time Central	
	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 ☐ dd ☐ dms	Longitude ☐ dd ☐ dms		Comments		

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* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

White #2+#3
Cooler 2 jugs Temp: 1.3 C
Cooler 1 jugs #1 Temp: 1.6 C

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

2013-04-22-27

Request Number: RQ-~~2012-10-15-41~~

~~FYI Dolomite, Inc. Sampling Inspection~~

Panama City Beach WWTP #1

Event ID *

Customer: NW-DIST
Project ID: FYI5
PMAS: 1143

Requester: Michelle Fish
Collected By: Nathan Milby / Rick Aland / Frank Butler
Sampling Agency: FDEP
Field Report Prepared By: N. Milby
Send Final Report To: ~~Toni Edwards~~ Kim Allen

Lab ID *	Location	Collection (comp begin or grab) Eastern Central	Composite end Eastern Central	Bottle Group(s)**
	Panama City Beach WWTP #1 Discharge Stream	☐ Comp ☑ Grab Date 4/29/13 Time 1200 (Central)	Date Time	C+F
	Field ID: PCB Discharge Stream Test	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L): 7.11	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc): Fresh	Temp (C): 20.65	pH: 4.99	Sample Depth: .15 ☑ m ☐ ft
		Salinity (PPTh)	Sp Conductance (umho/cm): 294	NPDES Number
	Latitude: Quality: 30.31290 ☑ dd ☐ dms	Longitude: 85.92605 ☑ dd ☐ dms	Comments: VERY DARK TANNINS	

Lab ID *	Location	Collection (comp begin or grab) Eastern Central	Composite end Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab Date Time	Date Time	
	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 ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments	

Lab ID *	Location	Collection (comp begin or grab) Eastern Central	Composite end Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab Date Time	Date Time	
	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 ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments	

Lab ID *	Location	Collection (comp begin or grab) Eastern Central	Composite end Eastern Central	Bottle Group(s)**
		☐ Comp ☐ Grab Date Time	Date Time	
	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 ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments	

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* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

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Appendix E
Physical/Chemical and Habitat Assessment field sheets

DEP-SOP-001/01: Form FD 9000-3 30.41351 85.86842 ELFS

PHYSICAL/CHEMICAL CHARACTERIZATION ELECTRONIC FIELD SHEET

SAMPLE ID: 71356 ORG ID: 21FLPNS
COUNTY: BAY STORET #: 32020063
DATE: 4-22-2013 TIME: 13:30 CST

Latitude: 30 (degrees) 24 (minutes) 48.4 (seconds)
Longitude: 85 (degrees) 52 (minutes) 06.5 (seconds)

SITE NAME: LITTLE CROOKED CK ABOVE S.R. 79 SAMPLE COMPLETE? ____
FIELD ID/NAME: ____ RECEIVING BODY OF WATER: Choctawhatchee R.

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)
✓							Hwy

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: >18 Right Bank: >18 0-10 15m

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

Artificially Impounded ☐ Yes ☑ No

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

0.2 m/s	0.33 m/s	0.5 m/s
5 sec	3 sec	2 sec
0.4 m deep	0.6 m deep	0.6 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
Sand Smothering: None Slight Moderate Severe
Silt Smothering: None Slight Moderate Severe
☐ Other (Specify):

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

	% Coverage	INVERT # Times Sampled	PERI # Times Sampled
Woody Debris (Snags)	20.6	5	
Undercut Banks / Roots	4.06	5	
Leaf Packs or Mat	1.8	5	
Aquatic Vegetation			
Rock or Shell Rubble..			
Sand.....		4	
Mud / Muck / Silt		1	
Other			
Other			

WATER QUALITY

	Depth (M)	Temp. (°C)	pH (SU)	D.O. (MG/L)	Cond. (UMHO/CM)	Salinity (PPT)	SECCHI (M)
Top:							
Mid-Depth:							☐ VOB
Bottom: (FB)	0.63	17.32	17.32	3.7	8.35	31	0.01 87.0%

Water Surface Oils: ☑ None ☐ Sheen ☐ Globs ☐ Slick

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

Water Sample Taken? ☑ Yes ☐ No
Algae Sample Taken? ☐ Yes ☑ No

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

Clarity: ☑ Clear ☐ Slightly Turbid ☐ Turbid ☐ Opaque

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

WEATHER CONDITIONS / NOTES:
FYI Panama City Beach Control/
Cloudy

ABUNDANCE

	Absent	Rare	Common	Abundant
Periphyton:	☐	☐	☑	☐
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: Nathan Mulkey, Frank Butera Rick Abad SIGNATURE: [signature] DATE: 4-22-2013

Revision Date: September 5, 2008

SAMPLE ID: 71356

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

SUBMITTING AGENCY CODE: 21 FLPNS SUBMITTING AGENCY NAME: FL DEP NWD	STORET STATION NUMBER: 32020063	DATE (MM/DD/YY): 4-22-2013	RECEIVING BODY OF WATER: CHOCTAW. R.
REMARKS:	COUNTY: BAY	LOCATION: Little Crooked Ck ABWE S.R. 79	FIELD ID/NAME:

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 14	Four or more major productive habitats present [snags, tree roots, aquatic vegetation, leaf packs (partially decayed), rock] 20 19 18 17 16	Three major productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags) leaf, snag + root ⑭ 15 (14) 13 12 11	Two major productive habitats present. Less than desirable habitat, frequently disturbed or removed 10 9 8 7 6	One or less major productive habitat. Lack of habitat is obvious, substrates unstable or smothered 5 4 3 2 1
Substrate Availability 14	Greater than 30% major productive habitat present at site 20 19 18 17 16	16% to 30% major productive habitat, by aerial extent 26.96 15 (14) 13 12 11	6% to 15% major productive habitat 10 9 8 7 6	Less than 5% major productive habitat 5 4 3 2 1
Water Velocity 20	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec 0.34 ≥0.33 0.31 0.29 0.27 >0.25 (20) 19 18 17 16	Max. observed at typical transect: >0.1 to 0.25 m/sec 0.25 0.21 0.17 0.13 >0.1 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 0.1 0.09 0.07 0.06 0.05 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec; or spate occurring: > 1 m/sec <0.05 0.04 0.03 0.01 <0.01 5 4 3 2 1
Habitat Smothering 10 Primary Score 58	Adequate number of stable pools (1-2 per 12 times width) and <25% of habitats affected by sand, silt, or algae. 20 19 18 17 16	Adequate number of stable pools (1-2 per 12 times width) and >25% of habitats affected by sand, silt, or algae. 15 14 13 12 11	Does not have required number of stable pools (1-2 per 12 x width) and/or has shallow pools (<2 x prevalling depth). (10) 9 8 7 6	Stable pools are absent. Most habitats affected by sand, silt, or algae accumulation. 5 4 3 2 1
Secondary Habitat Components **Artificial Channelization** 20	Expected sinuosity given the stream width. No evidence of dredging or artificial straight-ening. No spoil banks. (20) 19 18 17 16	Good sinuosity within old chan-nelized area. Evidence of dredging in the past (>25 yrs) but mostly recovered. 15 14 13 12 11	Straightened with trapezoidal cross section, but has a small degree of sinuosity developed within channelized area. 10 9 8 7 6	Straightened or engineered by dredging, has trapezoidal or box cut cross section, lacks required pools. May have spoil banks. 5 4 3 2 1
Bank Stability Right Bank 10 Left Bank 10	Bankfull > 60% of bank height. Slope of bank ≤ 60° from bankful to top of bank. 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 10 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 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 10 Left Bank 10 Secondary Score 79	Over 80% of riparian surfaces consist of normal, expected plant community for given sunlight & habitat conditions (e.g., native plants; tree, shrub, and forbs represented, if appropriate). 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

137 **TOTAL SCORE**

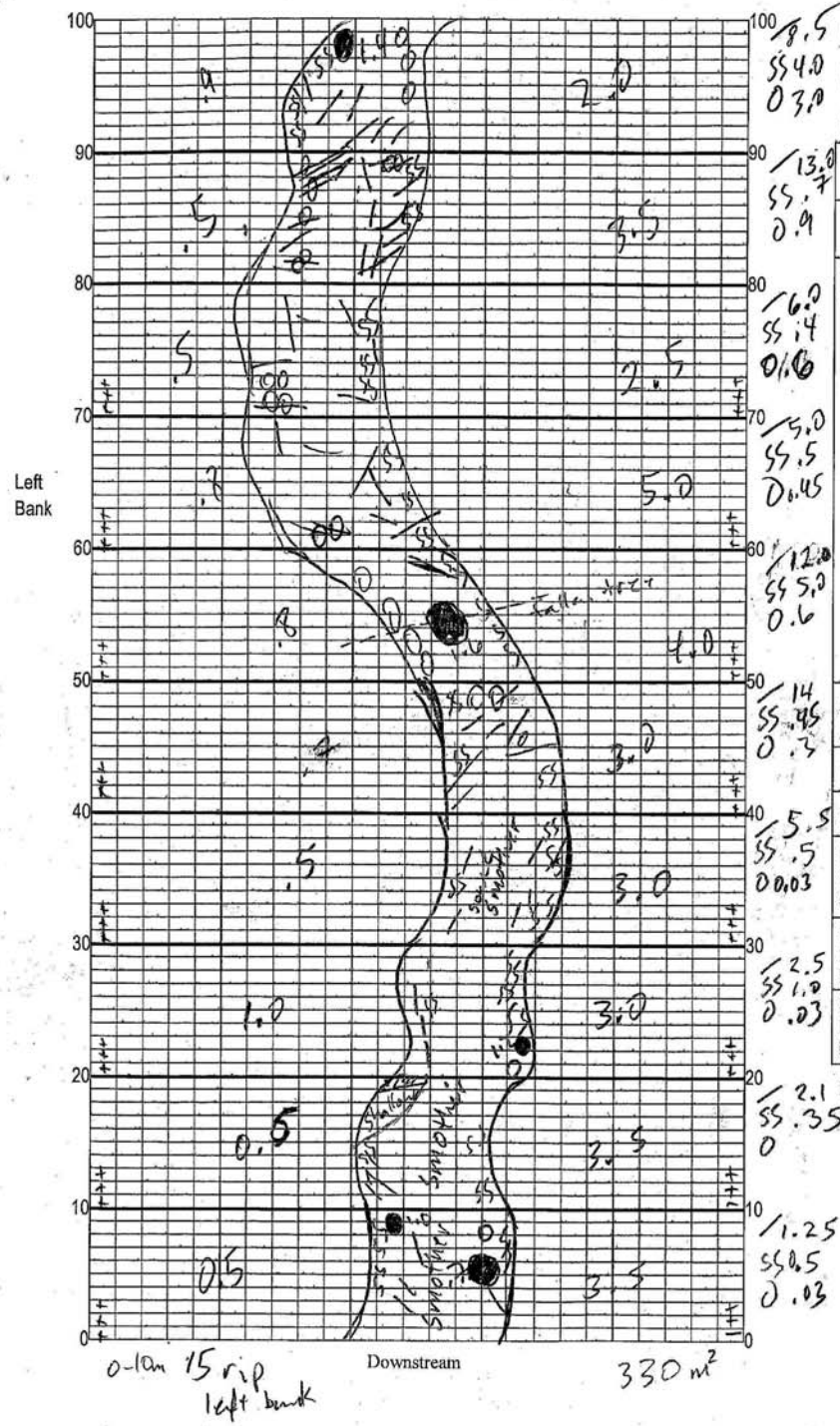
Date: 4-22-2013	Analyst: Rick ABAD	Signature:

Form FD 9000-5 Revision Date: December 19, 2011

STORET ~~71356~~ FB SAMPLE ID 71356 Start 1415

32602063

DEP-SOP-001/01 Form FD 9000-4
Stream/River Habitat Sketch Sheet



Location: Little Crooked Cr abv CR 79

Date: 4-22-2013

Sampler: Rick Abud Frank Butrara

100 m: Lattitude	30.41362
Longitude	085.86826
0 m: Lattitude	30.41351
Longitude	85.86942

Substrates: Code key, draw proportionate habitat abundance.

/	Snags	20.6
SS	Roots/undercut banks	4.0%
O	Leaf Packs (or mats)	1.8
	Aquatic Macrophytes	
	Pools	total # observed = 2
		# range expected = 3-6

Average width 3.3 m
Average depth 0.67 m

Velocity measured at 75 meter mark.

WQ & chemistry taken at 0 meter mark.

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:

Black gum
Cypress
Acer rubrum
Sphagnum moss
Carex
Hypericum
Blueberry
Water oak

Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).

Revision Date: June 2, 2011

STORET ~~3210130~~ FB
3210313 1

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

ELFS

PHYSICAL/CHEMICAL CHARACTERIZATION ELECTRONIC FIELD SHEET

SAMPLE ID : 71353 ORG ID : 21 FLPNS
COUNTY : Bay STORET # : 32130131 FB
DATE : 4/29/12 TIME : 1200

Latitude : 30 (degrees) 18 (minutes) 43.05 (seconds)
Longitude : 85 (degrees) 55 (minutes) 33.78 (seconds)

SITE NAME : RCB WWTF#1 Discharge Stream Test
SAMPLE COMPLETE ? _____
FIELD ID/NAME : DISCHARGE STREAM Test RECEIVING BODY OF WATER : West Bay / St. Andrew Bay

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)
X	X					X	

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 : 718 Right Bank : 718

High Water Mark: 1.5 (m) + 1.6 (above present water level) = 3.1 (present depth) (above bed)

Artificially Impounded ☐ Yes ☒ No

Typical Width (m) Depth (m)/Velocity (m/sec) Transect
40 m wide
0.15 m/s 0.25 m/s 0.2 m/s
6 sec
0.4 m deep 0.4 m deep 0.4 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
Sand Smothering : None Slight Moderate Severe
Silt Smothering : None Slight Moderate Severe
☐ Other (Specify) :

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

	% Coverage	INVERT # Times Sampled	PERI # Times Sampled
Woody Debris (Snags)	5.3	7	
Undercut Banks / Roots	6.5	7	
Leaf Packs or Mat	0.2	1	
Aquatic Vegetation			
Rock or Shell Rubble..			
Sand.....	60	2	
Mud / Muck / Silt	7	/	
Other Pipe clay	21	1	
Other			

WATER QUALITY

	Depth (M)	Temp. (°C)	pH (SU)	D.O. (MG/L)	Cond. (UMHO/CM)	Salinity (PPT)	SECCHI (M)
Top :	0.20	20.16	4.99	7.11	294	0.14	.02
Mid-Depth :							☐ VOB
Bottom :							

Water Surface Oils : ☐ None ☒ Sheen (a few m) ☐ Globs ☐ Slick

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

Water Sample Taken ? ☒ Yes ☐ No
Algae Sample Taken ? ☐ Yes ☒ No

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

Clarity ☐ Clear ☒ Slightly Turbid ☐ Turbid ☐ Opaque

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

WEATHER CONDITIONS / NOTES : P.C. Extremely Dark Hard Bottom. CAN NOT SEE HABITAT. Lots of Pools Pipe Clay & sand/silt Comm bottom. * Sheen Lots MANY EROSION SPOTS IN BANK @ RM mark

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

ABUNDANCE

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

SAMPLING TEAM : N. Mullen, Rick ABAD, Frank Butera
SIGNATURE : [signature]
DATE : 4-29-2012

Revision Date: September 5, 2008

SBIO STATION NAME: UNNAMED STREAM, PCB WWTP DISCHARGE
* No Veg. No LVS due to lack of PLANTS!

Un-NAMED STREAM, PCB WWTP DISCHARGE

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

SAMPLE ID: 71356

SUBMITTING AGENCY CODE: 21 FLPNS SUBMITTING AGENCY NAME: FL DEP-NWD	STORET STATION NUMBER: 32430131	DATE (MM/DD/YY): 4-29-13	RECEIVING BODY OF WATER: West Bay / St. Andrews Bay
REMARKS:	COUNTY: BAY	LOCATION: PCB WWTF #1 Discharge Stream Test	FIELD ID/NAME: DISCHARGE STREAM

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components **Substrate Diversity** 9	Four or more major productive habitats present [snags, tree roots, aquatic vegetation, leaf packs (partially decayed), rock] 20 19 18 17 16	Three major productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags) 15 14 13 12 11	Two major productive habitats present. Less than desirable habitat, frequently disturbed or removed 10 (9) 8 7 6	One or less major productive habitat. Lack of habitat is obvious, substrates unstable or smothered 5 4 3 2 1
Substrate Availability 9 13%	Greater than 30% major productive habitat present at site 20 19 18 17 16	16% to 30% major productive habitat, by aerial extent 15 14 13 12 11	6% to 15% major productive habitat 10 (9) 8 7 6	Less than 5% major productive habitat 5 4 3 2 1
Water Velocity 15	Max. observed at typical transect: > 0.25 m/sec. But <.1 m/sec ≥0.33 0.31 0.29 0.27 >0.25 20 19 18 17 (16)	Max. observed at typical transect: >0.1 to 0.25 m/sec 0.25 0.21 0.17 0.13 >0.1 (15) 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 0.1 0.09 0.07 0.06 0.05 10 9 8 7 6	Max. observed at typical transect: <0.05 m/sec; or spate occurring: > 1 m/sec <0.05 0.04 0.03 0.01 <0.01 5 4 3 2 1
Habitat Smothering 14 Primary Score 47	Adequate number of stable pools (1-2 per 12 times width) and <25% of habitats affected by sand, silt, or algae. 20 19 18 17 16	Adequate number of stable pools (1-2 per 12 times width) and >25% of habitats affected by sand, silt, or algae. 15 (14) 13 12 11	Does not have required number of stable pools (1-2 per 12 x width) and/or has shallow pools (<2 x prevailing depth). 10 9 8 7 6	Stable pools are absent. Most habitats affected by sand, silt, or algae accumulation. 5 4 3 2 1
Secondary Habitat Components **Artificial Channelization** 20	Expected sinuosity given the stream width. No evidence of dredging or artificial straightening. No spoil banks. (20) 19 18 17 16	Good sinuosity within old channelized area. Evidence of dredging in the past (>25 yrs) but mostly recovered. 15 14 13 12 11	Straightened with trapezoidal cross section, but has a small degree of sinuosity developed within channelized area. 10 9 8 7 6	Straightened or engineered by dredging, has trapezoidal or box cut cross section, lacks required pools. May have spoil banks. 5 4 3 2 1
Bank Stability Right Bank 6 Left Bank 7	Bankfull > 60% of bank height. Slope of bank ≤ 60° from bankful to top of bank. 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 10 Left Bank 10	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 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 7 Left Bank 7 Secondary Score 67	Over 80% of riparian surfaces consist of normal, expected plant community for given sunlight & habitat conditions (e.g., native plants; tree, shrub, and forbs represented, if appropriate). 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

114 **TOTAL SCORE**

Date: 4-29-13	Analyst: F BUTERA	Signature: F Butera

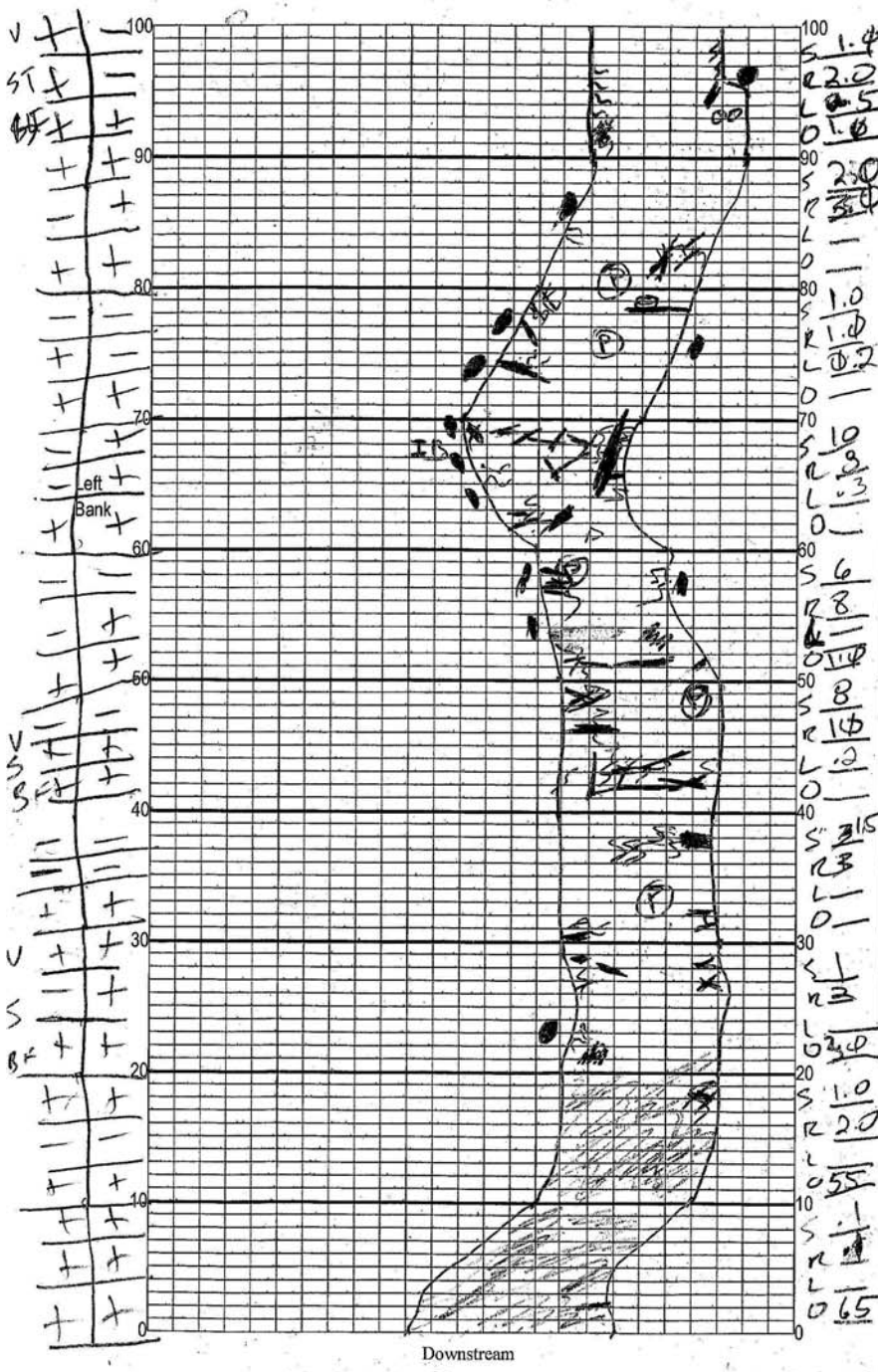
Form FD 9000-5 Revision Date: December 19, 2011

Un-NAMED STREAM, PCB-WWTP DISCHARGE

STORET: 32030131

SAMPLE ID: 71355

DEP-SOP-001/01 Form FD 9000-4
Stream/River Habitat Sketch Sheet



Location: DISCHARGE STREAM

Date: 4-29-2013

Sampler: FB, MK, RA

100 m: Lattitude 30.31196
Longitude 85.92583

0 m: Lattitude 30.31290
Longitude 85.92605

Substrates: Code key, draw proportionate habitat abundance. %

- Snags 31.6/600 5.3
- Roots/undercut banks 26.5%
- Leaf Packs (or mats) 39.1/600 0.2
- Aquatic Macrophytes 1.3/600
- Pipe CLAY 125/600 21%
- EROSION
- Pools total # observed = ____ # range expected = ____

Average width 6 m
Average depth 0.3 m

Velocity measured at 95 meter mark.

WQ & chemistry taken at 0 meter mark.

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:

POISON IVY
BLACK T.T.
ROYAL FERN
MUSCODINE
ITEA
RED T.T.
CYPRESS
RED MAPLE
BLUE BERRY
HRD OAK
SMILAX
CHAIN FERN
POISON SUMAC
WOODWARDIA AREOLATA
Amphicarpum Muhlenbergii

Length of grid represents 100 m of stream (not linear meters).
(Horizontal scale is double vertical scale, draw proportionately).

Revision Date: June 2, 2011

Iron Sulfur Bacteria (IB) 65m

Appendix F
Chemical analysis of effluent and receiving water

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
4/22/2013 8:00	Effluent	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	0.51	IQ	mg/L	0.2	2
4/22/2013 8:00	Effluent	Metals	Arsenic	0.25	U	ug/L	0.25	1
4/22/2013 8:00	Effluent	Metals	Cadmium	0.050	U	ug/L	0.05	0.2
4/22/2013 8:00	Effluent	Metals	Calcium	17.5		mg/L	0.075	0.3
4/22/2013 8:00	Effluent	Metals	Chromium	0.30	U	ug/L	0.3	1.2
4/22/2013 8:00	Effluent	Metals	Copper	33.2		ug/L	0.5	1
4/22/2013 8:00	Effluent	Metals	Iron	43	I	ug/L	30	120
4/22/2013 8:00	Effluent	Metals	Lead	0.42	I	ug/L	0.2	0.8
4/22/2013 8:00	Effluent	Metals	Magnesium	2.45		mg/L	0.04	0.16
4/22/2013 8:00	Effluent	Metals	Nickel	2.78		ug/L	0.25	1
4/22/2013 8:00	Effluent	Metals	Potassium	6.3		mg/L	0.3	1.2
4/22/2013 8:00	Effluent	Metals	Silver	0.025	U	ug/L	0.025	0.1
4/22/2013 8:00	Effluent	Metals	Sodium	35.3		mg/L	0.5	2
4/22/2013 8:00	Effluent	Metals	Zinc	43		ug/L	5	20
4/22/2013 8:00	Effluent	Nutrients	TSS	2	U	mg/L	2	10
4/22/2013 8:00	Effluent	Toxicology	Bioassay-Chron-Def-FW-C.dubia, IC25	100	L	IC25		
4/22/2013 8:00	Effluent	Toxicology	Bioassay-Chron-Def-FW-C.dubia, NOEC	100		NOEC		
4/22/2013 8:00	Effluent	Toxicology	Bioassay-Chron-Def-FW-Fish, IC25	100	L	IC25		
4/22/2013 8:00	Effluent	Toxicology	Bioassay-Chron-Def-FW-Fish, NOEC	100		NOEC		
4/22/2013 8:00	Effluent	Toxicology	Bioassay-Chronic-Scrn-FW-C.dubia, NOEC	100	K	NOEC		
4/22/2013 8:00	Effluent	Toxicology	Bioassay-Chronic-Scrn-FW-Fish, NOEC	100	K	NOEC		
4/22/2013 11:30	Effluent	AGP/LN	Algal Growth Potential	62.0	A	mg DryWt/L	0.3	0.9
4/22/2013 11:30	Effluent	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.69	U	ug/L	0.69	2.1
4/22/2013 11:30	Effluent	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.50	I	ug/L	0.5	1.5
4/22/2013 11:30	Effluent	Field Parameter	Dissolved Oxygen	6.46		mg/L		
4/22/2013 11:30	Effluent	Field Parameter	pH	6.97				
4/22/2013 11:30	Effluent	Field Parameter	Specific Conductance	445		umhos/cm		
4/22/2013 11:30	Effluent	Field Parameter	Temperature	23.59		C		
4/22/2013 11:30	Effluent	Metals	Aluminum	52		ug/L	5	20
4/22/2013 11:30	Effluent	Metals	Arsenic	0.47	I	ug/L	0.25	1
4/22/2013 11:30	Effluent	Metals	Cadmium	0.050	U	ug/L	0.05	0.2
4/22/2013 11:30	Effluent	Metals	Calcium	24.4		mg/L	0.075	0.3
4/22/2013 11:30	Effluent	Metals	Chromium	0.31	I	ug/L	0.3	1.2
4/22/2013 11:30	Effluent	Metals	Copper	5.32		ug/L	0.5	1

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
4/22/2013 11:30	Effluent	Metals	Lead	0.20	U	ug/L	0.2	0.8
4/22/2013 11:30	Effluent	Metals	Magnesium	3.14		mg/L	0.04	0.16
4/22/2013 11:30	Effluent	Metals	Nickel	3.57		ug/L	0.25	1
4/22/2013 11:30	Effluent	Metals	Selenium	0.23	I	ug/L	0.2	0.8
4/22/2013 11:30	Effluent	Metals	Silver	0.025	U	ug/L	0.025	0.1
4/22/2013 11:30	Effluent	Metals	Sodium	55.7		mg/L	0.5	2
4/22/2013 11:30	Effluent	Metals	Zinc	53		ug/L	5	20
4/22/2013 11:30	Effluent	Nutrients	Alkalinity	66	A	mg CaCO3/L	0.65	2.5
4/22/2013 11:30	Effluent	Nutrients	Ammonia-N	0.060		mg N/L	0.002	0.005
4/22/2013 11:30	Effluent	Nutrients	Chloride	62		mg Cl/L	0.2	0.5
4/22/2013 11:30	Effluent	Nutrients	Color (true)	12		PCU	2.5	6
4/22/2013 11:30	Effluent	Nutrients	Fluoride	0.56		mg F/L	0.035	0.1
4/22/2013 11:30	Effluent	Nutrients	Kjeldahl Nitrogen	1.3		mg N/L	0.08	0.2
4/22/2013 11:30	Effluent	Nutrients	NO2NO3-N	0.91		mg N/L	0.04	0.1
4/22/2013 11:30	Effluent	Nutrients	O-Phosphate-P	0.27		mg P/L	0.02	0.05
4/22/2013 11:30	Effluent	Nutrients	Organic Carbon	8.3		mg C/L	0.5	1
4/22/2013 11:30	Effluent	Nutrients	Sulfate	40		mg SO4/L	0.2	0.5
4/22/2013 11:30	Effluent	Nutrients	Total-P	0.42		mg P/L	0.005	0.05
4/22/2013 11:30	Effluent	Nutrients	Turbidity	1.6		NTU	0.1	0.1
4/22/2013 11:30	Effluent	Overflow	Fecal Coliforms-Membrane Filter	1		cfu/100 mL	1	
4/22/2013 11:30	Effluent	Pesticides	Alachlor	0.33	U	ug/L	0.33	1.3
4/22/2013 11:30	Effluent	Pesticides	Ametryn	0.055	U	ug/L	0.055	0.22
4/22/2013 11:30	Effluent	Pesticides	Atrazine	0.055	U	ug/L	0.055	0.22
4/22/2013 11:30	Effluent	Pesticides	Azinphos Methyl	0.11	U	ug/L	0.11	0.44
4/22/2013 11:30	Effluent	Pesticides	Bromacil	0.22	U	ug/L	0.22	0.89
4/22/2013 11:30	Effluent	Pesticides	Butylate	0.11	U	ug/L	0.11	0.44
4/22/2013 11:30	Effluent	Pesticides	Chlorpyrifos Ethyl	0.055	U	ug/L	0.055	0.22
4/22/2013 11:30	Effluent	Pesticides	Chlorpyrifos Methyl	0.055	U	ug/L	0.055	0.22
4/22/2013 11:30	Effluent	Pesticides	Diazinon	0.055	U	ug/L	0.055	0.22
4/22/2013 11:30	Effluent	Pesticides	Ethion	0.055	U	ug/L	0.055	0.22
4/22/2013 11:30	Effluent	Pesticides	Ethoprop	0.028	U	ug/L	0.028	0.11
4/22/2013 11:30	Effluent	Pesticides	Fenamiphos	0.17	U	ug/L	0.17	0.66
4/22/2013 11:30	Effluent	Pesticides	Fonofos	0.055	U	ug/L	0.055	0.22
4/22/2013 11:30	Effluent	Pesticides	Hexazinone	0.17	U	ug/L	0.17	0.66
4/22/2013 11:30	Effluent	Pesticides	Malathion	0.055	U	ug/L	0.055	0.22
4/22/2013 11:30	Effluent	Pesticides	Metalaxyl	0.22	U	ug/L	0.22	0.89

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
4/22/2013 11:30	Effluent	Pesticides	Metribuzin	0.11	U	ug/L	0.11	0.44
4/22/2013 11:30	Effluent	Pesticides	Mevinphos	0.055	U	ug/L	0.055	0.22
4/22/2013 11:30	Effluent	Pesticides	Naled	0.22	U	ug/L	0.22	0.89
4/22/2013 11:30	Effluent	Pesticides	Norflurazon	0.17	U	ug/L	0.17	0.66
4/22/2013 11:30	Effluent	Pesticides	Parathion Ethyl	0.11	U	ug/L	0.11	0.44
4/22/2013 11:30	Effluent	Pesticides	Parathion Methyl	0.055	U	ug/L	0.055	0.22
4/22/2013 11:30	Effluent	Pesticides	Phorate	0.028	UJ	ug/L	0.028	0.11
4/22/2013 11:30	Effluent	Pesticides	Prometryn	0.11	U	ug/L	0.11	0.44
4/22/2013 11:30	Effluent	Pesticides	Simazine	0.055	U	ug/L	0.055	0.22
4/22/2013 11:30	Effluent	Pesticides	Sucralose	25		ug/L	0.2	1
4/22/2013 11:30	Effluent	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1.0	U	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	1,4-Dioxane	0.51	Y	ug/L	0.02	0.1
4/22/2013 11:30	Effluent	Priority Organic Pollutants	2,4,6-Trichlorophenol	1.0	U	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	2,4-Dichlorophenol	1.0	U	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	2,4-Dimethylphenol	10	U	ug/L	10	40
4/22/2013 11:30	Effluent	Priority Organic Pollutants	2,4-Dinitrophenol	15	UJ	ug/L	15	60
4/22/2013 11:30	Effluent	Priority Organic Pollutants	2,4-Dinitrotoluene	1.0	U	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	2,6-Dinitrotoluene	1.0	U	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	2-Chloronaphthalene	1.0	U	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	2-Chlorophenol	1.0	U	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.0	UJ	ug/L	3	12
4/22/2013 11:30	Effluent	Priority Organic Pollutants	2-Nitrophenol	1.0	U	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	3,3'-Dichlorobenzidine	40	UJ	ug/L	40	160
4/22/2013 11:30	Effluent	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1.0	U	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	4-Chloro-3-methylphenol	1.0	U	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2.0	U	ug/L	2	8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	60
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Acenaphthene	0.20	U	ug/L	0.2	0.8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Acenaphthylene	0.20	U	ug/L	0.2	0.8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Anthracene	0.20	U	ug/L	0.2	0.8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Benzidine	100	U	ug/L	100	400
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Benzo(a)anthracene	0.20	U	ug/L	0.2	0.8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Benzo(a)pyrene	0.20	U	ug/L	0.2	0.8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Benzo(b)fluoranthene	0.20	U	ug/L	0.2	0.8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.20	U	ug/L	0.2	0.8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Benzo(k)fluoranthene	0.20	U	ug/L	0.2	0.8

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1.0	U	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.0	U	ug/L	3	12
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	2.0	U	ug/L	2	8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Butyl benzyl phthalate	1.0	U	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Chrysene	0.20	U	ug/L	0.2	0.8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.20	U	ug/L	0.2	0.8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Diethyl phthalate	1.0	UJ	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Dimethyl phthalate	1.0	UJ	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Di-n-butyl phthalate	1.0	UJ	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Di-n-octyl phthalate	1.0	U	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Fluoranthene	0.20	U	ug/L	0.2	0.8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Fluorene	0.20	U	ug/L	0.2	0.8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Hexachlorobenzene	1.0	U	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Hexachlorobutadiene	3.0	U	ug/L	3	12
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.0	U	ug/L	3	12
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Hexachloroethane	3.0	U	ug/L	3	12
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.20	U	ug/L	0.2	0.8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Isophorone	1.0	U	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Naphthalene	0.20	U	ug/L	0.2	0.8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Nitrobenzene	2.0	U	ug/L	2	8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	N-Nitrosodimethylamine	2.0	U	ug/L	2	8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2.0	U	ug/L	2	8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.0	U	ug/L	3	12
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Pentachlorophenol	3.0	U	ug/L	3	12
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Phenanthrene	0.20	U	ug/L	0.2	0.8
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Phenol	1.0	U	ug/L	1	4
4/22/2013 11:30	Effluent	Priority Organic Pollutants	Pyrene	0.20	UJ	ug/L	0.2	0.8
4/22/2013 14:30	Control Site	AGP/LN	Algal Growth Potential	0.0370		mg DryWt/L	0.3	0.9
4/22/2013 14:30	Control Site	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	0.50	I	mg/L	0.2	2
4/22/2013 14:30	Control Site	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.69	U	ug/L	0.69	2.1
4/22/2013 14:30	Control Site	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.50	U	ug/L	0.5	1.5
4/22/2013 14:30	Control Site	Metals	Arsenic	0.25	U	ug/L	0.25	1
4/22/2013 14:30	Control Site	Metals	Cadmium	0.057	I	ug/L	0.05	0.2
4/22/2013 14:30	Control Site	Metals	Calcium	1.34		mg/L	0.075	0.3
4/22/2013 14:30	Control Site	Metals	Chromium	0.33	I	ug/L	0.3	1.2
4/22/2013 14:30	Control Site	Metals	Copper	0.50	U	ug/L	0.5	1

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
4/22/2013 14:30	Control Site	Metals	Lead	0.32	I	ug/L	0.2	0.8
4/22/2013 14:30	Control Site	Metals	Magnesium	0.36		mg/L	0.04	0.16
4/22/2013 14:30	Control Site	Metals	Nickel	0.34	I	ug/L	0.25	1
4/22/2013 14:30	Control Site	Metals	Silver	0.025	U	ug/L	0.025	0.1
4/22/2013 14:30	Control Site	Metals	Sodium	2.5		mg/L	0.5	2
4/22/2013 14:30	Control Site	Metals	Zinc	5.0	U	ug/L	5	20
4/22/2013 14:30	Control Site	Nutrients	Alkalinity	0.65	U	mg CaCO3/L	0.65	2.5
4/22/2013 14:30	Control Site	Nutrients	Ammonia-N	0.004	I	mg N/L	0.002	0.005
4/22/2013 14:30	Control Site	Nutrients	Chloride	4.7		mg Cl/L	0.2	0.5
4/22/2013 14:30	Control Site	Nutrients	Color (true)	91	A	PCU	2.5	6
4/22/2013 14:30	Control Site	Nutrients	Fluoride	0.035	U	mg F/L	0.035	0.1
4/22/2013 14:30	Control Site	Nutrients	Kjeldahl Nitrogen	0.27		mg N/L	0.08	0.2
4/22/2013 14:30	Control Site	Nutrients	NO2NO3-N	0.019		mg N/L	0.004	0.01
4/22/2013 14:30	Control Site	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
4/22/2013 14:30	Control Site	Nutrients	Organic Carbon	9.2		mg C/L	0.5	1
4/22/2013 14:30	Control Site	Nutrients	Sulfate	1.3		mg SO4/L	0.2	0.5
4/22/2013 14:30	Control Site	Nutrients	Total-P	0.004	I	mg P/L	0.002	0.005
4/22/2013 14:30	Control Site	Nutrients	TSS	3	I	mg/L	2	10
4/22/2013 14:30	Control Site	Nutrients	Turbidity	1.1		NTU	0.1	0.1
4/22/2013 14:30	Control Site	Overflow	Fecal Coliforms-Membrane Filter	32		cfu/100 mL	1	
4/22/2013 14:30	Control Site	Pesticides	Sucralose	0.010	U	ug/L	0.01	0.05
4/22/2013 14:30	Control Site	Priority Organic Pollutants	1,4-Dioxane	0.020	UY	ug/L	0.02	0.1
4/29/2013 13:00	Test Site	AGP/LN	Algal Growth Potential	8.61		mg DryWt/L	0.3	0.9
4/29/2013 13:00	Test Site	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Demand-5 Day,N-Inhib	1.0	I	mg/L	0.2	2
4/29/2013 13:00	Test Site	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.89	I	ug/L	0.62	1.9
4/29/2013 13:00	Test Site	Chlorophyll/Grain Size/BOD	Phaeophytin-a	1.1	I	ug/L	0.45	1.4
4/29/2013 13:00	Test Site	Field Parameter	Dissolved Oxygen	7.11		mg/L		
4/29/2013 13:00	Test Site	Field Parameter	pH	4.99				
4/29/2013 13:00	Test Site	Field Parameter	Sample Depth	0.15		m		
4/29/2013 13:00	Test Site	Field Parameter	Specific Conductance	294		umhos/cm		
4/29/2013 13:00	Test Site	Field Parameter	Temperature	20.65		C		
4/29/2013 13:00	Test Site	Metals	Arsenic	0.77	I	ug/L	0.25	1
4/29/2013 13:00	Test Site	Metals	Cadmium	0.070	I	ug/L	0.05	0.2
4/29/2013 13:00	Test Site	Metals	Calcium	3.92		mg/L	0.075	0.3
4/29/2013 13:00	Test Site	Metals	Chromium	0.68	I	ug/L	0.3	1.2
4/29/2013 13:00	Test Site	Metals	Copper	0.93	I	ug/L	0.5	1

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
4/29/2013 13:00	Test Site	Metals	Lead	1.13		ug/L	0.2	0.8
4/29/2013 13:00	Test Site	Metals	Magnesium	1.24		mg/L	0.04	0.16
4/29/2013 13:00	Test Site	Metals	Nickel	2.87		ug/L	0.25	1
4/29/2013 13:00	Test Site	Metals	Silver	0.025	U	ug/L	0.025	0.1
4/29/2013 13:00	Test Site	Metals	Sodium	46.9		mg/L	0.5	2
4/29/2013 13:00	Test Site	Metals	Zinc	5.0	U	ug/L	5	20
4/29/2013 13:00	Test Site	Nutrients	Alkalinity	3.6		mg CaCO3/L	0.65	2.5
4/29/2013 13:00	Test Site	Nutrients	Ammonia-N	0.19		mg N/L	0.002	0.005
4/29/2013 13:00	Test Site	Nutrients	Chloride	69		mg Cl/L	0.2	0.5
4/29/2013 13:00	Test Site	Nutrients	Color (true)	760		PCU	18	42
4/29/2013 13:00	Test Site	Nutrients	Fluoride	0.17		mg F/L	0.035	0.1
4/29/2013 13:00	Test Site	Nutrients	Kjeldahl Nitrogen	1.6		mg N/L	0.08	0.2
4/29/2013 13:00	Test Site	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
4/29/2013 13:00	Test Site	Nutrients	O-Phosphate-P	0.11		mg P/L	0.004	0.01
4/29/2013 13:00	Test Site	Nutrients	Organic Carbon	36		mg C/L	0.5	1
4/29/2013 13:00	Test Site	Nutrients	Sulfate	11		mg SO4/L	0.2	0.5
4/29/2013 13:00	Test Site	Nutrients	Total-P	0.15		mg P/L	0.005	0.05
4/29/2013 13:00	Test Site	Nutrients	TSS	4	I	mg/L	2	10
4/29/2013 13:00	Test Site	Nutrients	Turbidity	3.3		NTU	0.1	0.1
4/29/2013 13:00	Test Site	Overflow	Fecal Coliforms-Membrane Filter	20		cfu/100 mL	1	
4/29/2013 13:00	Test Site	Pesticides	Sucralose	12		ug/L	0.2	1
4/29/2013 13:00	Test Site	Priority Organic Pollutants	1,4-Dioxane	0.14		ug/L	0.02	0.1
4/22/2013 12:00	Field Blank	Metals	Aluminum	5.0	U	ug/L	5	20
4/22/2013 12:00	Field Blank	Metals	Arsenic	0.25	U	ug/L	0.25	1
4/22/2013 12:00	Field Blank	Metals	Cadmium	0.051	I	ug/L	0.05	0.2
4/22/2013 12:00	Field Blank	Metals	Calcium	0.075	U	mg/L	0.075	0.3
4/22/2013 12:00	Field Blank	Metals	Chromium	0.30	U	ug/L	0.3	1.2
4/22/2013 12:00	Field Blank	Metals	Copper	0.50	U	ug/L	0.5	1
4/22/2013 12:00	Field Blank	Metals	Iron	30	U	ug/L	30	120
4/22/2013 12:00	Field Blank	Metals	Lead	0.20	U	ug/L	0.2	0.8
4/22/2013 12:00	Field Blank	Metals	Magnesium	0.040	U	mg/L	0.04	0.16
4/22/2013 12:00	Field Blank	Metals	Nickel	0.25	U	ug/L	0.25	1
4/22/2013 12:00	Field Blank	Metals	Selenium	0.20	U	ug/L	0.2	0.8
4/22/2013 12:00	Field Blank	Metals	Silver	0.025	U	ug/L	0.025	0.1
4/22/2013 12:00	Field Blank	Metals	Sodium	0.50	U	mg/L	0.5	2
4/22/2013 12:00	Field Blank	Metals	Zinc	5.0	U	ug/L	5	20

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
4/22/2013 12:00	Field Blank	Nutrients	Ammonia-N	0.002	U	mg N/L	0.002	0.005
4/22/2013 12:00	Field Blank	Nutrients	Chloride	0.20	U	mg Cl/L	0.2	0.5
4/22/2013 12:00	Field Blank	Nutrients	Color (true)	2.5	U	PCU	2.5	6
4/22/2013 12:00	Field Blank	Nutrients	Fluoride	0.035	U	mg F/L	0.035	0.1
4/22/2013 12:00	Field Blank	Nutrients	Kjeldahl Nitrogen	0.080	U	mg N/L	0.08	0.2
4/22/2013 12:00	Field Blank	Nutrients	NO2NO3-N	0.015		mg N/L	0.004	0.01
4/22/2013 12:00	Field Blank	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
4/22/2013 12:00	Field Blank	Nutrients	Organic Carbon	0.50	U	mg C/L	0.5	1
4/22/2013 12:00	Field Blank	Nutrients	Sulfate	0.20	U	mg SO4/L	0.2	0.5
4/22/2013 12:00	Field Blank	Nutrients	Total-P	0.002	U	mg P/L	0.002	0.005
4/22/2013 12:00	Field Blank	Nutrients	Turbidity	0.10	U	NTU	0.1	0.1
4/22/2013 12:00	Field Blank	Pesticides	Alachlor	0.33	U	ug/L	0.33	1.3
4/22/2013 12:00	Field Blank	Pesticides	Ametryn	0.054	U	ug/L	0.054	0.22
4/22/2013 12:00	Field Blank	Pesticides	Atrazine	0.054	U	ug/L	0.054	0.22
4/22/2013 12:00	Field Blank	Pesticides	Azinphos Methyl	0.11	U	ug/L	0.11	0.43
4/22/2013 12:00	Field Blank	Pesticides	Bromacil	0.22	U	ug/L	0.22	0.87
4/22/2013 12:00	Field Blank	Pesticides	Butylate	0.11	U	ug/L	0.11	0.43
4/22/2013 12:00	Field Blank	Pesticides	Chlorpyrifos Ethyl	0.054	U	ug/L	0.054	0.22
4/22/2013 12:00	Field Blank	Pesticides	Chlorpyrifos Methyl	0.054	U	ug/L	0.054	0.22
4/22/2013 12:00	Field Blank	Pesticides	Diazinon	0.054	U	ug/L	0.054	0.22
4/22/2013 12:00	Field Blank	Pesticides	Ethion	0.054	U	ug/L	0.054	0.22
4/22/2013 12:00	Field Blank	Pesticides	Ethoprop	0.027	U	ug/L	0.027	0.11
4/22/2013 12:00	Field Blank	Pesticides	Fenamiphos	0.16	U	ug/L	0.16	0.65
4/22/2013 12:00	Field Blank	Pesticides	Fonofos	0.054	U	ug/L	0.054	0.22
4/22/2013 12:00	Field Blank	Pesticides	Hexazinone	0.16	U	ug/L	0.16	0.65
4/22/2013 12:00	Field Blank	Pesticides	Malathion	0.054	U	ug/L	0.054	0.22
4/22/2013 12:00	Field Blank	Pesticides	Metalaxyl	0.22	U	ug/L	0.22	0.87
4/22/2013 12:00	Field Blank	Pesticides	Metolachlor	0.33	U	ug/L	0.33	1.3
4/22/2013 12:00	Field Blank	Pesticides	Metribuzin	0.11	U	ug/L	0.11	0.43
4/22/2013 12:00	Field Blank	Pesticides	Mevinphos	0.054	U	ug/L	0.054	0.22
4/22/2013 12:00	Field Blank	Pesticides	Naled	0.22	U	ug/L	0.22	0.87
4/22/2013 12:00	Field Blank	Pesticides	Norflurazon	0.16	U	ug/L	0.16	0.65
4/22/2013 12:00	Field Blank	Pesticides	Parathion Ethyl	0.11	U	ug/L	0.11	0.43
4/22/2013 12:00	Field Blank	Pesticides	Parathion Methyl	0.054	U	ug/L	0.054	0.22
4/22/2013 12:00	Field Blank	Pesticides	Phorate	0.027	UJ	ug/L	0.027	0.11
4/22/2013 12:00	Field Blank	Pesticides	Prometryn	0.11	U	ug/L	0.11	0.43

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
4/22/2013 12:00	Field Blank	Pesticides	Sucralose	0.012	U	ug/L	0.012	0.059
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	1.0	U	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	1,4-Dioxane	0.13	Y	ug/L	0.02	0.1
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	1.0	U	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	2,4-Dichlorophenol	1.0	U	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	2,4-Dimethylphenol	10	U	ug/L	10	40
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	2,4-Dinitrophenol	15	UJ	ug/L	15	61
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	1.0	U	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	1.0	U	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	2-Chloronaphthalene	1.0	U	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	2-Chlorophenol	1.0	U	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	3.0	UJ	ug/L	3	12
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	2-Nitrophenol	1.0	U	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	40	UJ	ug/L	40	160
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	1.0	U	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	1.0	U	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2.0	U	ug/L	2	8.1
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	61
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Acenaphthene	0.20	U	ug/L	0.2	0.81
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Acenaphthylene	0.20	U	ug/L	0.2	0.81
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Anthracene	0.20	U	ug/L	0.2	0.81
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Benzidine	100	U	ug/L	100	400
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Benzo(a)anthracene	0.20	U	ug/L	0.2	0.81
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Benzo(a)pyrene	0.20	U	ug/L	0.2	0.81
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.20	U	ug/L	0.2	0.81
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.20	U	ug/L	0.2	0.81
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.20	U	ug/L	0.2	0.81
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	1.0	U	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	1.0	U	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	3.0	U	ug/L	3	12
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	2.0	U	ug/L	2	8.1

Date_Sampled	UDL	SCH_Group	Component	Value	Qualifier	Units_Word_Result	MDL	PQL
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Chrysene	0.20	U	ug/L	0.2	0.81
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.20	U	ug/L	0.2	0.81
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Diethyl phthalate	1.0	UJ	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Dimethyl phthalate	1.0	UJ	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Di-n-butyl phthalate	1.0	UJ	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Di-n-octyl phthalate	1.0	U	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Fluoranthene	0.20	U	ug/L	0.2	0.81
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Fluorene	0.20	U	ug/L	0.2	0.81
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Hexachlorobenzene	1.0	U	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Hexachlorobutadiene	3.0	U	ug/L	3	12
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	3.0	U	ug/L	3	12
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Hexachloroethane	3.0	U	ug/L	3	12
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.20	U	ug/L	0.2	0.81
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Isophorone	1.0	U	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Naphthalene	0.20	U	ug/L	0.2	0.81
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Nitrobenzene	2.0	U	ug/L	2	8.1
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	2.0	U	ug/L	2	8.1
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2.0	U	ug/L	2	8.1
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	3.0	U	ug/L	3	12
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Pentachlorophenol	3.0	U	ug/L	3	12
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Phenanthrene	0.20	U	ug/L	0.2	0.81
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Phenol	1.0	U	ug/L	1	4
4/22/2013 12:00	Field Blank	Priority Organic Pollutants	Pyrene	0.20	UJ	ug/L	0.2	0.81

Appendix G

Toxicological results

FDEP Biology Laboratory - Chronic Definitive Bench Sheet
Ceriodaphnia dubia

Facility: Panama City Beach WWTP #1
Address: 206 N Gulf Blvd, Panama City Beach
County: BAY
NPDES Permit #: FL 0021512
Contact/District: Nathan Mulkey / Northwest
LIMS entry: 5/1/13 MF verified: BA 5.1.13 Batch for BA

SOP#: TA07_05 EPA 821-R-02-013 Method 1002.0

Organism: *Ceriodaphnia dubia*
Organism Batch #: 4-23-13
Organism age : <24 hours
Feeding: Prior to Test and Daily
Food: ☑ YCT ☑ *P. subcapitata*
Food Batch: 4-3-13 1-18-13
Chamber size : 30 ml
Sample volume : 20 ml

Diluent/ Batch: MHWCD / 4-17-13 Test Days Used: 0
MHWCD / 4-19-13 Test Days Used: 1-5

Sample Received	LAB Sample #	LIMS JOB #	LIMS SAMPLE #	Collection Date/Time	Received Date/Time
Test Day 0	1	TLH-2013-04-23-29	1498012	4-22-13 0800	4-23-13 1018
Test Day 2	2	TLH-2013-04-25-01	1499041	4-24-13 0800	4-25-13 1000
Test Day 4	3	TLH-2013-04-30-07 dm	1499(a21)	4-26-13 0800	4-27-13 0900

Batch #	4-17-13	4-19-13	NA	NA	NA			
Water Quality Parameters	MHWCD	MHWCD	Sample 1	Sample 2	Sample 3	Other:	Measured By:	Verified by:
Field Total Residual Cl_2 (mg/L):	NA	NA	Not measured				—	MF
Lab Total Residual Cl_2 (mg/L):	<0.03	<0.03	0.44	055	0.39	AP/CR →		BA
Alkalinity (mg/L as $CaCO_3$):	666	67	49	70	69	CR/AP →		BA
Hardness (mg/L as $CaCO_3$):	90	89	53	55	61	CR/AP →		BA
Total Ammonia (mg/L as N):	<0.017	<0.017	0.191	<0.017	<0017	MF →		AP
Conductivity: µmhos mmhos:	326	309	315	358	342	MF →		AP
Salinity (ppth):								

Test Incubated in: Incubator #: 3

Temperature Shipped ≤ 6° C (all samples) yes no
Holding Time ≤ 36 hours yes no
Light Intensity : 50 - 100 ft. candles
Photoperiod : 16 light 8 dark
Temperature Range °C:
Incubator # 3 min. 25.3 max. 27.5
Room B246 min 24.6 max 25.7
Test min: 24.0 AP max. 25.8

Investigators' signatures

	Initials
Marshall Fairchild	MF
Adrienne Pennington	AP
Brian Ashley	BA
Cassidy Hescott	CR

REVIEWER Liz Miller dm

Loaded by: MF

Test Replicates	Loaded from culture vial
1	B1
2	B11
3	B12
4	B16
5	B17
6	B18
7	B20
8	B24
9	B27
10	C2

Results	
Control % CV:	20.5%
Dunnetts PMSD:	31.9%
Reproduction NOEC:	100%
Reproduction LOEC:	>100%
Survival NOEC:	100%
Survival LOEC:	>100%
ICP_{20}:	>100%
ICP_{25}:	>100%

Comments:

Test Page 1 of 6 PAGE 00019 revised 02/15/13 MF

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Survival and Reproduction

SOP TA07_05

Facility: Panama City Beach

LIMS Sample #: 1498012 for lab sample #1

Start Date: 4-23-13 Time: 1315

End Date: 4-29-13 Time: 1520

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving orginal organisms	Neonates per female
Control	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	4	3	3	0	3	4	4	3	3	4	32	10	3.2
	4	0	3	6	6	15	4	8	3	0	6	36	10	3.6
	5	5	0	0	0	0	0	4	0	3	0	12	10	1.2
	6	13	11	6	7	13	13	12	9	13	1	86	10	8.6
	7													
	8													
	Total	22	17	15	13	17	21	16	15	19	11	166	10	16.6

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving orginal organisms	Neonates per female
Dechlorinated ~~6.25%~~ Control	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	3	2	4	0	3	0	3	2	4	2	26	10	2.6
	4	0	2	4	4	3	5	2	0	5	15	23	10	2.3
	5	7	0	6	5	9	5	12	10	0	0	49	10	4.9
	6	12	10	10	6	15	8	10	8	13	8	75	10	7.5
	7													
	8													
	Total	17	14	14	15	15	18	27	20	22	11	173	10	17.3

27 BA

Organisms loaded by: MF

Day	Counted/ verified by:	Concentrations prepared by:
0	BA	MF
1	MF	MF
2	MF	MF
3	MF	MF
4	MF	MF
5	BA	MF
6	MF	
7		
8		

Concentration	Mean neonates /female	% survival
Control	16.6	100%
~~6.25%~~ Dechlorinated	17.3	100%
12.50%	19.3	100%
25%	18.1	100%
50%	20.0	100%
100%	20.7	100%

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

Comments: ⑤ = aprit brood ④ 4th brood - not counted

See Page 22 comment for chlorine screening Test, MF 5-2-13

100% mortality within 24 hrs.

*Day 0 is test initiation day

X = Dead (original organism)

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Survival and Reproduction

SOP TA07_05

Facility: Panama City Beach

LIMS Sample # : 1498012 for lab sample #1

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving orginal organism	Neonates per female
12.50%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	3	3	4	0	5	2	3	0	3	3	26	10	2.6
	4	7	8	9	4	3	3	6	6	6	10	63	10	6.3
	5	(S) 1	0	0	3	0	6	4	9	0	13	40	10	4.0
	6	13	10	9	3	6	10	(S) 7	10	13	(A) 11	64	10	6.4
	7													
	8													
	Total	24	21	22	10	14	11	18	25	22	26	193	10	19.3

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving orginal organism	Neonates per female
25%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	2	3	3	3	3	2	0	0	4	3	23	10	2.3
	4	3	6	6	4	8	6	9	4	7	10	63	10	6.3
	5	0	9	9	3	9	9	(S) 10	4	11	(S) 0	64	10	6.4
	6	9	(S) 2	(S) 9	0	(S) 5	(S) 10	7	2	(S) 5	13	31	10	3.1
	7													
	8													
	Total	14	18	18	10	20	17	26	10	22	26	181	10	18.1

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving orginal organism	Neonates per female
50%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	0	3	4	0	0	3	0	3	2	4	19	10	1.9
	4	10	7	7	5	5	5	7	5	9	7	67	10	6.7
	5	0	8	0	2	7	0	9	13	11	14	64	10	6.4
	6	13	(S) 9	14	1	11	5	6	(A) 12	(S) 10	6	50	10	5.0
	7													
	8													
	Total	23	18	25	8	23	15	22	21	22	25	200	10	20.0

Conc.	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Surviving orginal organism	Neonates per female
100%	0*												10	
	1												10	
	2	0	0	0	0	0	0	0	0	0	0	0	10	0
	3	3	2	2	0	3	2	3	0	2	2	20	10	2.0
	4	9	4	8	8	7	7	9	2	10	(S) 1	67	10	6.7
	5	0	0	0	3	0	(S) 1	(S) 1	10	0	10	23	10	2.3
	6	9	6	12	0	7	15	13	13	13	9	97	10	9.7
	7													
	8													
	Total	21	12	22	11	17	26	26	25	25	22	207	10	20.7

Comments: (S) - split brood, (A) 4th brood - not counted

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

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Parameters

SOP TA07_05

Facility: Panama City Beach

LIMS Sample #: 1498012 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	8.2	24.3	8.0	326					
	1	~~6.25%~~ Decl CTL MF	M	8.2	24.6	8.1	323					
	1	12.5%	M	8.2	24.7	8.1	316					
	1	25%	M	8.2	24.7	8.2	318					
	1	50%	M	8.2	24.6	8.2	318					
	1	100%	M	8.2	24.6	8.2	315					
	Measured by:			MF	MF	MF	MF					
	Recorded by:			MF	MF	MF	MF					
Day 1	sample:	Control	M	8.1	24.3	7.8	309	M	8.1	25.2	7.9	347
	1	~~6.25%~~ Decl CTL MF	M	8.2	24.3	7.8	320	M	8.1	25.1	7.9	345
	1	12.5%	M	8.2	24.5	7.7	312	M	8.1	25.0	7.8	342
	1	25%	M	8.2	24.6	7.7	311	M	8.1	24.9	7.8	347
	1	50%	M	8.2	24.7	7.7	313	M	8.2	24.9	7.8	346
	1	100%	M	8.2	25.0	7.7	315	M	8.2	25.0	7.8	347
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 2	sample:	Control	M	7.7	24.7	7.8	310	M	7.9	25.1	8.1	357
	2	~~6.25%~~ Decl CTL MF	M	7.7	24.4	7.8	317	M	7.8	25.1	8.1	348
	2	12.5%	M	7.7	25.0	7.8	321	M	7.8	25.2	8.1	354
	2	25%	M	7.7	25.1	7.9	324	M	7.7	25.5	8.1	353
	2	50%	M	7.7	25.2	7.9	335	M	7.7	25.8	8.0	344
	2	100%	M	7.7	25.4	8.0	358	M	7.7	25.6	8.0	365
	Measured by:			MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF
Day 3	sample:	Control	M	7.9	24.5	7.5	317	M	7.9	24.4	7.7	344
	2	~~6.25%~~ Decl CTL MF	M	8.0	24.7	7.7	323	M	7.9	24.5	7.5	346
	2	12.5%	M	7.9	24.8	7.8	326	M	7.9	24.8	7.4	338
	2	25%	M	7.9	24.8	7.8	332	M	7.9	24.8	7.4 MF	347
	2	50%	M	8.0	24.7	7.9	339	M	8.0	24.8	7.4	360
	2	100%	M	8.0	24.6	7.9	365	M	7.9	25.0	7.3	382
	Measured by:			CR	MF	CR	CR		CR	MF	CR	CR
	Recorded by:			MF	MF	MF	MF		MF	MF	MF	MF

Comments: Decl = dechlorinated CTL = Control MF 4-23-13

DAY 0 - 100% Sample T = 24.6 DO = 8.3 pH = 8.2 Cond = 316 umhos-cm MF 4-23-13

DAY 1 - 100% Sample all dead T = 25.0 DO = 7.8 pH = 8.2 Cond = 322 umhos-cm MF 4-24-13

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

FDEP Biology Laboratory - Chronic Definitive Bench Sheet

Ceriodaphnia dubia Parameters

Facility: Panama City Beach SOP TA07_05

LIMS Sample #: 1498012 for lab sample 1

Circle µmhos-cm or mmhos-cm

Test Day ↓		Concentration	New Sample					Old Sample				
			Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)	Test Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)
Day 4	sample:	Control	M	8.2	24.7	8.1	312	M	8.0	24.3	7.9	353
	3	~~6.25%~~ Decl CTL MF	M	8.2	24.9	8.0	316	M	8.0	24.2	7.9	353
	3	12.5%	M	8.2	25.0	8.0	316	M	8.1	24.6	7.9	345
	3	25%	M	8.2	25.1	8.1	320	M	8.0	24.8	8.1	349
	3	50%	M	8.1	25.1	8.1	326	M	8.0	25.2	8.1	355
	3	100%	M	8.1	25.4	8.1	342	M	8.0	24.8	8.0	383
	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	7.5	25.1	7.1	308	M	7.7	24.0	7.1	372
	3	~~6.25%~~ Decl CTL MF	M	7.6	24.1	7.0	316	M	7.8	24.0	7.2	372
	3	12.5%	M	7.6	24.0	7.1	316	M	7.8	24.0	7.5	363
	3	25%	M	7.6	24.0	7.2	321	M	7.8	24.0	7.7	373
	3	50%	M	7.6	24.0	7.3	328	M	7.8	24.0	6.8	381
	3	100%	M	7.6	24.0	7.4	345	M	7.8	24.0	7.4	408
	Measured by:			BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:			BA	BA	BA	BA		BA	BA	BA	BA
Day 6	sample:	Control	M					M	7.9	24.8	7.8	365
	3	~~6.25%~~ Decl CTL MF	M					M	8.0	24.8	7.8	362
	3	12.5%	M					M	7.9	25.0	7.1	357
	3	25%	M					M	7.9	24.9	7.9	370
	3	50%	M					M	7.9	24.7	8.0	365
	3	100%	M					M	8.0	24.4	8.0	382
	Measured by:								MF	MF	MF	MF
	Recorded by:								MF	MF	MF	MF
Day 7	sample:	Control	M					M				
	3	6.25%	M					M				
	3	12.5%	M					M				
	3	25%	M					M				
	3	50%	M					M				
	3	100%	M					M				
	Measured by:											
	Recorded by:											
Day 8	sample:	Control	M					M				
	3	6.25%	M					M				
	3	12.5%	M					M				
	3	25%	M					M				
	3	50%	M					M				
	3	100%	M					M				
	Measured by:											
	Recorded by:											

Comments: Decl = dechlorinated CTL = control

Test ID: Panama City Beach WWTP #1 Dates: 4/23/13 - 4/29/13

METER / DEVICE	ID	SOP	Parameter	Method	√ used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
YSI DO Probe	5905	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 Salinity	SM 2510 B SM 2520 B	✓
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	✓
Traceable Thermometer	#1-SN101686412 #2-SN221295527 #3-SN240116020 #4-SN80361795 #5-SN61990624	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	#4
Hach Pocket Colorimeter II #1	05110C042029	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	
Hach Pocket Colorimeter II #2	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: JD

V 1.3 2/15/13 MF

PAGE

FDEP Biology Laboratory - Chronic Bioassay Bench Sheet

Pimphales promelas or Menidia beryllina

Facility: Panama City Beach WWTP #1
Address: 206 N Gulf Blvd, Panama City Beach
County: Bay
NPDES Permit #: FL 0021512
Contact/District: Nathan Mulky / Northwest DF

Test Species (circle one)
(P. promelas) SOP#: TA07_09 EPA-821-R-02-013 Method 1000.0
M. beryllina SOP#: TA07_14 EPA-821-R-02-014 Method 1006.0

Start Date: 4.23.13 Time: 1400
End Date: 4.30.13 Time: 1000

Diluent/ Batch:
MHW / 4.20.13 Test Days Used: 0-3
MHW / 4.25.13 Test Days Used: 4-6
ASW /_____ Test Days Used: _____
ASW /_____ Test Days Used: _____

Organism age: <24 hrs days
Feeding Prior to Test and Daily
Artemia Lot #: 08812
Chamber size : 1000 ml
Test volume : 500 ml

Organism Batch #: 4-23-13			
Artemia Batch #		Day 3	82.13
Day 0	79.13	Day 4	83.13
Day 1	80.13	Day 5	84.13
Day 2	81.13	Day 6	85.13

LIMS entry. Entry verification:

Sample Received	Lab Sample #	LIMS Job #	LIMS Sample #	Collection Date/Time	Received Date/Time
Test Day 0	1	TLH- 2013-04-23-29	1498012	4-22-13 0800	4-23-13 1018
Test Day 2	2	TLH-2013-04-25-01	1499041	4-24-13 0800	4-25-13 1000
Test Day 4	3	TLH-2013-04-30-07 fm	1499621	4-26-13 0800	4-27-13 0900

Water Quality Parameters	Batch #	4.20.13 MHW CD ASW AP (circle one)	4.25.13 MHW CD ASW AP (circle one)	NA Sample 1	NA Sample 2	NA Sample 3	Other:	Measured By:	Verified by:
Field Total Residual Cl_2 (mg/L):		NA	NA	Not Measured				—	MF
Lab Total Residual Cl_2 (mg/L):		<0.03	<0.03	0.44	0.55	0.31		HW/AP/CR	BA
Alkalinity (mg/L as $CaCO_3$):		62	73	49	70	69		HW/CR/AP	BA
Hardness (mg/L as $CaCO_3$):		79	79	53	55	61		HW/CR/AP	BA
Total Ammonia (mg/L as N):		<0.017	<0.017	0.191	<0.017	<0.017		MF	AP
Conductivity (umhos) mmhos:		300	316	314	346	348		AP	BA
Salinity (ppth):									

Screening test with MF HRC

Dechlorinated

Statistics		
Growth NOEC:	100%	<100%
Growth LOEC:	>100%	100%
Growth IC_{20}:	>100%	NA
Growth IC_{25}:	>100%	NA
Ctrl % CV:	4,8%	4.8
Dunnetts PMSD:	15.5%	NA
Survival NOEC:	100%	<100%
Survival LOEC:	>100%	100%

Light Intensity : 50 - 100 ft. candles
Photoperiod : 16 light 8 dark
Temperature Range °C:
Incubator # 2 min 24.6 max 26.1
Water bath # ____ min _____ max _____
Room B246 min 24.6 max 25.7

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:
Becca Abshire	BA
Marshall Fairbrother	MF
Adrienne Pennington	AP
Cassidy Neblett	CR

REVIEWER: Kay Miller fm

Comments:
Original samples dechlorinated to <0.03 AP
Interrupted dose response at 12.5% dechlorinated sample thought to be Type I error. MF 5-2-13. Results reported as NOEC 100% sample and IC25 >100% sample.
The screening test with chlorine NOEC was < 100% sample for ~~growth~~ survival. MF 5-2-13
MF

PAGE 00015

revised 03/26/13 MF

Chronic Bioassay Survival Benchsheet

Facility: Panama City Beach

LIMS Sample Number: 1498012
(for Lab Sample # 1)

Department of Environmental Protection
Biology Laboratory Chronic Screening Bioassay
***P. promelas* SOP TA07_09 *M. beryllina* SOP TA07_14**

Organism: *P. promelas* *M.beryllina* (circle one)

		TEST DAY							
Concentration	Replicate	0	1	2	3	4	5	6	7
Control DCI	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
Sample ~~6.25~~ % 8% DCI 12.5	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	9 1D	9
	D	10	10	10	10	10	10	10	10
Sample ~~12.5~~ % 8% DCI 25%	A	10	10	10	10	10	10	10	9 1D
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	9 1D	9
Sample ~~25~~ % 8% DCI 50%	A	10	10	10	10	10	10	10	~~9 1D~~ AP 10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
Sample ~~50~~ % 8% DCI 100%	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	9 1D	9	9	9	9
Sample ~~100~~ % 8% ~~DCL~~ Crrl	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
Sample ~~DCL~~ % 8% 100%	A	10	10	9 1D	9	9	9	9	9
	B	10	10	6 4D	6	6	6	6	6
	C	10	9 1D	5 ~~4D~~ AP	5	5	5	5	5
	D	10	7 3D	6 ~~3D~~ AP	5 1D	4 1D	4	3 1D	3
Loaded by: BA	Checked by:		AP	AP	AP	AP	CR	CR	AP
Verified by: AP									

Comments:

Chronic Bioassay Parameters Benchsheet

P. promelas and M. beryllina SOP TA07_09 and TA-07_14

parameter pg. 1

Sample Source: Panama City Beach

LIMS Sample #: 1498012 (for Lab sample #1)

conc = concentration rep = replicate circle umhos or mmhos

Test Day ↓		Conc.	Before Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth	After Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth
Day 0	sample:	DCl Control	A	7.6	24.0	8.0	300							
	1	DCl 12.5%	A	7.6	24.1	8.1	300							
	1	DCl 25%	A	7.7	24.1	8.1	303							
	1	DCl 50%	A	7.7	24.3	8.1	307							
	1	DCl 100%	A	7.7	24.7	8.1	316							
	1	Ctrl	A	7.8	~~24.6~~ 25.0 RT	8.0	299							
	1	100%	A	7.7	25.0	8.2	314							
	Measured by:			AP	BA	AP	AP							
	Recorded by:			AP	AP	AP	AP							
Day 1	sample:	DCl Control	B	7.7	24.9	7.6	338		B	7.4	24.3	6.7	306	
	1	DCl 12.5%	B	7.8	24.9	7.4	304		B	7.5	24.2	6.6	306	
	1	DCl 25%	B	7.8	24.6	7.3	302		B	7.6	24.3	6.6	309	
	1	DCl 50%	B	7.7	24.3	6.8	304		B	7.6	24.3	6.7	310	
	1	DCl 100%	B	7.7	24.3	7.2	311		B	7.6	24.6	6.9	318	
	1	Ctrl.	B	7.7	24.6	7.8	303		B	7.6	24.1	6.8	309	
	1	100%	B	7.6	24.5	7.8	307		B	7.5	24.4	6.9	317	
	Measured by:			CR	AP	CR	CR			BA	BA	BA	BA	
	Recorded by:			AP	AP	AP	AP			BA	BA	~~BA~~	BA	
Day 2	sample:	DCl Control	C	7.4	24.8	6.4	336		C	7.3	24.4	7.2	341	
	2	DCl 12.5%	C	7.5	24.8	6.4	306		C	7.4	24.4	7.2	309	
	2	DCl 25%	C	7.4	24.7	6.5	312		C	7.3	24.3	7.2	314	
	2	DCl 50%	C	7.4	24.5	6.2	313		C	7.3	24.3	7.1	321	
	2	DCl 100%	C	7.3	24.7	6.4	324		C	7.4	24.7	7.2	350	
	2	Ctrl	C	7.4	25.4	6.2	308		C	7.4	24.4	7.3	305	
	2	100%	C	7.3	25.3	6.3	321		C	7.4	24.7	7.5	346	
	Measured by:			AP	AP	AP	AP			CR	CR	CR	CR	
	Recorded by:			CR	AP	CR	CR			AP	AP	AP	AP	
Day 3	sample:	DCl Control	D	7.3	24.7	6.3	387		D	7.4	24.0	7.2	327	
	2	DCl 12.5%	D	7.4	24.5	6.1	325		D	7.5	23.8	7.2	307	
	2	DCl 25%	D	7.4	24.7	5.9	330		D	7.4	23.8	7.2	313	
	2	DCl 50%	D	7.3	24.4	5.8	344		D	7.5	23.8	7.1	329	
	2	DCl 100%	D	7.3	24.6	5.3	362		D	7.5	23.7	7.1	352	
	2	Ctrl	D	7.4	24.9	6.8	318		D	7.5	23.7	7.1	305	
	2	100%	D	7.4	24.7	6.9	356		D	7.5	23.7	7.2	351	
	Measured by:			CR	CR	CR	CR			AP	AP	AP	AP	
	Recorded by:			CR	CR	CR	CR			CR	CR	CR	CR	

Comments:

For salinity <1 ppth insert <1. For salinity > 1 ppth, conductivity measurement is not required if salinity probe is functional.

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Chronic Bioassay Parameters Benchsheet

P. promelas and M. beryllina SOP TA07_09 and TA-07_14

parameter pg. 2

Sample Source: Panama City Beach

LIMS Sample #: 1498012 (for Lab sample #1)

conc = concentration rep = replicate

Test Day		Conc.	Before Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/mmhos)	Salinity ppth	After Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/mmhos)	Salinity ppth
Day 4	sample:	DCI Control	A	7.5	25.7	7.0	436		A	7.8	24.7	7.8	316	
	3	DCI 12.5%	A	7.5	25.8	7.0	324		A	7.8	24.8	7.7	301	
	3	DCI 25%	A	7.5	25.6	6.0	329		A	7.7	24.8	7.7	306	
	3	DCI 50%	A	7.4	25.7	6.0	343		A	7.7	24.8	7.5	319	
	3	DCI 100%	A	7.5	25.9	6.2	369		A	7.7	24.7	7.5	346	
	3	Ctrl	A	7.5	24.6	6.1	315		A	7.7	24.6	7.2	299	
	3	100%	A	7.4	24.9	6.1	369		A	7.6	25.0	7.2	348	
	Measured by:			AP	MF	AP	AP			AP	AP	AP	AP	
	Recorded by:			AP	AP	AP	AP			AP	AP	AP	AP	
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 5	sample:	DCI Control	B	7.5	26.0	6.9	348		B	7.8	24.8	7.4	421	
	3	DCI 12.5%	B	7.5	25.2	6.8	316		B	7.8	24.8	7.2	300	
	3	DCI 25%	B	7.4	25.5	6.1	324		B	7.8	24.8	6.8	306	
	3	DCI 50%	B	7.4	25.0	5.3	336		B	7.7	24.9	6.9	318	
	3	DCI 100%	B	7.4	25.1	5.5	364		B	7.6	25.5	7.5	347	
	3	Ctrl	B	7.3	25.5	5.8	314		B	7.7	24.8	7.2	296	
	3	100%	B	7.4	25.3	7.0	352		B	7.7	25.5	7.8	345	
	Measured by:			CR	BA	CR	CR			CR	CR	CR	CR	
	Recorded by:			CR	BA	CR	CR			CR	CR	CR	CR	
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 6	sample:	DCI Control	C	7.4	25.7	6.6	333		C	7.5	24.4	7.0	307	
	3	DCI 12.5%	C	7.4	25.6	6.4	304		C	7.6	24.3	6.9	292	
	3	DCI 25%	C	7.5	24.9	6.2	311		C	7.5	24.3	6.8	300	
	3	DCI 50%	C	7.5	25.2	6.6	326		C	7.5	24.2	6.8	312	
	3	DCI 100%	C	7.5	24.3	6.4	356		C	7.5	24.5	6.8	341	
	3	Ctrl	C	7.5	25.8	6.9	301		C	7.6	24.5	6.8	288	
	3	100%	C	7.6	25.7	7.3	348		C	7.5	24.5	6.8	333	
	Measured by:			CR	CR	CR	CR			AP	AP	AP	AP	
	Recorded by:			CR	CR	CR	CR			CR	CR	CR	CR	
			Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 7	sample:	DCI Control	D	7.2	24.9	5.8	252		D					
	3	DCI 12.5%	D	7.2	25.4	6.2	294		D					
	3	DCI 25%	D	7.3	24.4	6.0	302		D					
	3	DCI 50%	D	7.3	25.8	6.7	312		D					
	3	DCI 100%	D	7.2	25.2	6.6	337		D					
	3	Ctrl	D	7.3	24.5	6.4	291		D					
	3	100%	D	7.3	24.4	6.9	339		D					
	Measured by:			CR	AP	CR	CR							
	Recorded by:			AP	CR	AP	AP							

Comments:

For salinity <1 ppth insert <1. For salinity > 1 ppth, conductivity measurement is not required if salinity probe is functional.

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Chronic Bioassay Weighing Benchsheet

Facility: Panama City Beach

LIMS Sample Number: 1498012
(for Lab Sample # 1)

P. promelas and *M. beryllina* Bench Sheet
SOP TA06_21

			mean wt = fish wt divided by 10 convert g to mg: move decimal 3 places to right					
Concentration	Replicate	Pan #	Pan wt. g	Pan + Fish g	Fish wt. g	Original # Fish	Mean wt. mg	
Control Dechlorinated	A	1	0.02181	0.02964	0.00783	10	0.783	
	B	2	0.02175	0.02778	0.00603	10	0.603	
	C	3	0.02133	0.02737	0.00604	10	0.604	0.644
	D	4	0.02166	0.02753	0.00587	10	0.587	
sample 12.5 % Dcl	A	5	0.02138	0.02577	0.00439	10	0.439	
	B	6	0.02361	0.02829	0.00468	10	0.468	
	C	7	0.02331	0.02798	0.00467	10	0.467	0.4720
	D	8	0.02265	0.02771	0.00506	10	0.506	
sample 25 % Dcl	A	9	0.02218	0.02881	0.00663	10	0.663	
	B	10	0.02195	0.02705	0.00510	10	0.510	
	C	11	0.02178	0.02746	0.00568	10	0.568	0.5605
	D	12	0.02370	0.02871	0.00501	10	0.501	
sample 50 % Dcl	A	13	0.02189	0.02776	0.00587	10	0.587	
	B	14	0.02160	0.02694	0.00534	10	0.534	
	C	15	0.02143	0.02765	0.00622	10	0.622	0.575?
	D	16	0.02245	0.02803	0.00558	10	0.558	
sample 100 % Dcl	A	17	0.02244	0.02726	0.00482	10	0.482	
	B	18	0.02372	0.02919	0.00547	10	0.547	
	C	19	0.02212	0.02702	0.00490	10	0.490	0.5223
	D	20	0.02135	0.02705	0.00570	10	0.570	
sample % Control	A	21	0.02201	0.02815	0.00614	10	0.614	
	B	22	0.02116	0.02679	0.00563	10	0.563	
	C	23	0.02081	0.02631	0.00550	10	0.550	0.5755
	D	24	0.02282	0.02857	0.00575	10	0.575	
sample 100 %	A	25	0.02072	0.02425	0.00353	10	0.353	
	B	26	0.02150	0.02430	0.00280	10	0.280	
	C	27	0.02248	0.02527	0.00279	10	0.279	0.2515
	D	28	0.02102	0.02196	0.00094	10	0.094	
	Weighed by initials:		CR	BA	revised 7/16/08 mf			

Comments:

Balance: Ohaus 250D Ser# 1125481084
S-Weights: BIO-S-Weights-01

Note: Pan number (#) refers to actual Pan number.

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Chronic Bioassay Weighing Benchsheet

Quality Control

Facility: Panama City Beach

LIMS Sample Number: 149802
(for Lab Sample # 1)

***P. promelas and M. beryllina* Bench sheet**
SOPs TA07_09, TA07_14 and TA06_21

Drying Oven ID:	ER034000	Tare weighed by:	CR
Temperature °C:	~~85~~ AP 100	Final weighed by:	BA
Hours:	8		
Tare Weighing Date: 4.29.13		Final Weighing Date: 5.1.13	

				Measured Value (g)		S-weight Value (g)
Tare Pan 1 after Pan 5 (g)	0.02182	@	0.02181	S-weights	0.00999	@ 0.01
Tare Pan 1 after Pan 10 (g)	0.02180	@	0.02181	at tare	0.03004	@ 0.03
Tare Pan 1 after Pan 15 (g)	0.02181	@	0.02181	S-weights	0.00998	@ 0.01
Tare Pan 1 after Pan 20 (g)	0.02180	@	0.02181	at final	0.03002	@ 0.03
Tare Pan 1 after Pan 25 (g)	0.02178	@	0.02181			
Tare Pan 1 after Pan ~~30~~ 28 (g)	0.02178	@	0.02181	Balance: Ohaus 250D Ser# 1125481084		
Tare Pan 1 after Pan 35 (g)		@		S-Weights: BIO-S-Weights-01		
Tare Pan 1 after Pan 40 (g)		@				
Tare Pan 1 after Pan 45 (g)		@				
Tare Pan 1 after Pan 48 (g)		@				
Final Pan 1 after Pan 5 (g)	0.02966	@	0.02964			
Final Pan 1 after Pan 10 (g)	0.02964	@	0.02964			
Final Pan 1 after Pan 15 (g)	0.02965	@	0.02964			
Final Pan 1 after Pan 20 (g)	0.02964	@	0.02964			
Final Pan 1 after Pan 25 (g)	0.02965	@	0.02964			
Final Pan 1 after Pan ~~30~~ 28 (g)	0.02966	@	0.02964			
Final Pan 1 after Pan 35 (g)		@				
Final Pan 1 after Pan 40 (g)		@				
Final Pan 1 after Pan 45 (g)		@				
Final Pan 1 after Pan 48 (g)		@				

Note: Pan numbers (5, 10, etc.) for Tare and Final refers to sequence of weighing as actual Pan #s may differ.

Comments:

revised 7/16/08 MF

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Test ID: Panama City Beach WWTP #1 Dates: 4/23/13 - 4/30/13

METER / DEVICE	ID	SOP	Parameter	Method	√ used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
YSI DO Probe	5905	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 Salinity	SM 2510 B SM 2520 B	✓
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	✓
Traceable Thermometer	#1-SN101686412 #2-SN221295527 #3-SN240116020 #4-SN80361795 #5-SN61990624	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	#4
Hach Pocket Colorimeter II #1	05110C042029	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	
Hach Pocket Colorimeter II #2	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: BK

V 1.3 2/15/13 MF

PAGE

Appendix H

Standard Reference Toxicant Data

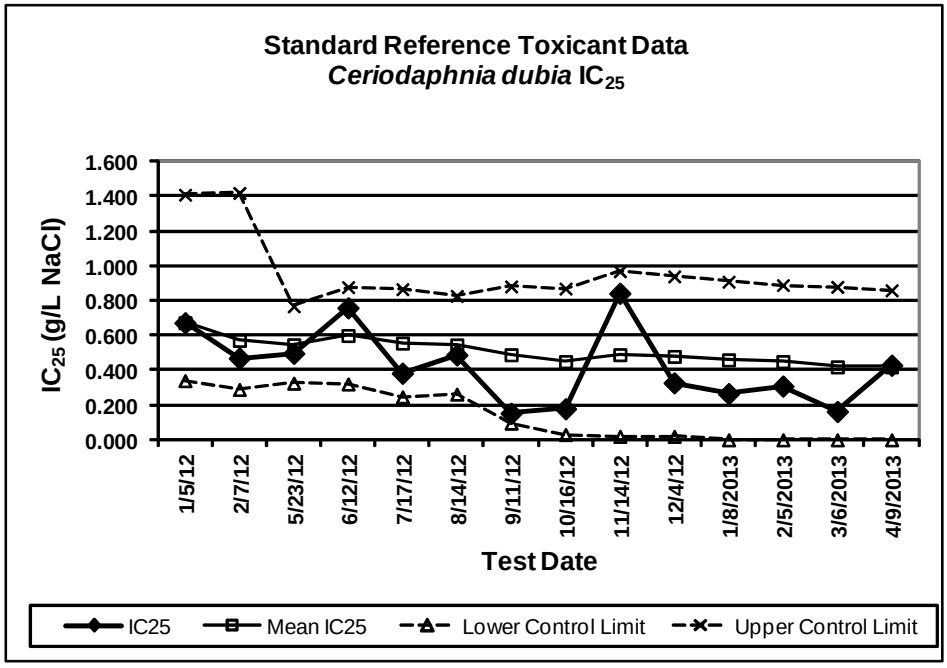
Florida Department of Environmental Protection
Bureau of Laboratories

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

Date	IC25	Mean IC25	Std Dev	Lower Control Limit	Upper Control Limit
1/5/12	0.674	0.67	0.14	0.34	1.41
2/7/12	0.470	0.57	0.11	0.29	1.42
5/23/12	0.498	0.55	0.11	0.33	0.77
6/12/12	0.760	0.60	0.14	0.32	0.88
7/17/12	0.383	0.56	0.15	0.25	0.87
8/14/12	0.489	0.55	0.14	0.26	0.83
9/11/12	0.153	0.49	0.20	0.10	0.88
10/16/12	0.179	0.45	0.21	0.03	0.87
11/14/12	0.843	0.49	0.24	0.02	0.97
12/4/12	0.328	0.48	0.23	0.02	0.94
1/8/2013	0.266	0.46	0.23	0.00	0.91
2/5/2013	0.309	0.45	0.22	0.00	0.89
3/6/2013	0.163	0.42	0.23	0.00	0.88
4/9/2013	0.429	0.42	0.22	0.00	0.86

Means are of the last 10 SRT tests.
Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev

EPA 75th Percentile %CV for Reproduction **45%**
Last 10 - Lab %CV Repr **51.1%**



FDEP Biology Laboratory - Chronic SRT Bench Sheet

Ceriodaphnia dubia

Diluent/ Batch: ~~20% SDMHW~~ MF / 4.8.13 Test Days Used: 0 - 5
~~20% SDMHW~~ MF / 4.9.13 Test Days Used: _____
Toxicant/ Batch: NaCl / 4-9-13 (3.2, 1C)

SOP # : TA 07_05
EPA-821-R-02-013 Method 1002.0

Organism: *Ceriodaphnia dubia*
Organism Batch #/ Age: 4-9-13 / <24 hr.
Feeding: Prior to Test and Daily
Food: ☑ YCT ☑ *P. subcapitata*
Food Batch: 4-3-13 1-18-13
Chamber size: 30 mL
Test Volume: 20 mL

Start Date: 4-9-13 Time: 1300
End Date: 4-15-13 Time: 1400

Batch:	4-8-13 MF				
Water Quality Parameters	20% SDMHW	20% SDMHW	Other	Measured by:	Verified by:
Lab Total Residual Cl_2 (mg/L):	<0.03			CR	AP
Alkalinity (mg/L as $CaCO_3$):	76			CR	AP
Hardness (mg/L as $CaCO_3$):	87			CR	AP
Total Ammonia (mg/L as N):	<0.017			MF	CR
Conductivity (~~µmhos-cm~~) mmhos-cm :	396			CR	AP

Results	
Control % CV:	45.5%
Dunnetts PMSD:	34%
Reproduction NOEC:	0.4 g/L
Reproduction LOEC:	0.8 g/L
Survival NOEC:	1.6 g/L
Survival LOEC:	3.2 g/L
IC_{P20}:	0.3840 g/L
IC_{P25}:	0.4292 g/L

Loaded by: MF

Day	Concentrations prepared by	Counted by
0	MF	AP
1	MF	MF
2	MF	MF
3	MF	BA
4	MF	BA
5	MF	MF
6	MF	BA
7		
8		

Test Replicate	Loaded from culture vial
1	A1
2	A2
3	A3
4	A4 (MF 4.9)
5	B13
6	C7
7	C6
8	A28
9	C10
10	B10

Comments:

Investigators' signatures

Marshall Faircloth
Adrienne Pennington
Cassidy Roichert
Bruce Hudson

Liz Mileur
REVIEWER

Test Incubated in: Incubator: # 3 MF
Light Intensity : 50 - 100 ft. candles
Photoperiod : 16 light 8 dark
Temperature Range °C:
Incubator # 3 min. 25.2 max. 27.5 mean —
Room B246 — min. 23.8 max. 25.3 mean —
Test min. ~~7~~ 24.0 max. 25.6 mean —

00019

Test Page 1 of 6

PAGE

10/30/12 BA

Ceriodaphnia dubia Survival and Reproduction

Start Date: 4-9-13 Time: 1300 Loaded by: MF
End Date: 4-15-13 MF Time: 1400 Verified by: AP

Concentration	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Live adults	Neonates per adult
Control	0												10	
	1						X						MF 9	
*	MF 3	0	0	0	0	6	|	0	0	0	5	11	9	1.1
	MF 4	4	3	6	2	9	|	4	3	1	0	32	9	3.2
	4						|					9	
	5	6	10	7	5	0	|	9	9	9	9	64	9	6.4
	6	7	7	4	0	7	|	4	8	4	9	50	9	5.0
	7						|						
	8						|						
	Total	17	20	17	7	22	0	17	20	14	23	157	9	15.7
0.59 ppth	0												10	
	1												10	
	MF 3	0	0	0	0	0	0	0	0	0	4	4	10	0.4
	MF 4	3	4	1	3	6	3	0	4	3	0	27	10	2.7
	4												10	
	5	7	0	7	8	6	7	4	9	11	9	68	10	6.8
	6	13	7	2	0	7	0	10	11	8	10	68	10	6.8
	7													
	8													
	Total	23	11	9 10	11	19	10	14	24	22	23	16 87	10	16.7
0.89 ppth	0												10	
	1												10	
	MF 3	0	0	0	0	3	0	0	0	0	X	3	9	0.3
	MF 4	5	1	5	4	2	1	4	3	3	|	28	9	2.8
	4										|		9	
	5	4	10	7	6	4	5	5	7	5	|	53	9	5.3
	6	7	9	0	0	(6)	5	8	6	7	|	42	9	4.2
	7										|			
	8										|			
	Total	16	20	12	10	9	11	17	16	15	0	126	9	12.6

Comments: (A 4th brood not counted) * DAY 2 no reproduction in any concentration ~~0.89~~ MF Zeros inadvertently not recorded, DAY 3 & 4 recorded in DAY 2 - 5 spaces in all concentrations. MF 4-16-13

FDEP Biology Laboratory - Chronic SRT Bench Sheet

Ceriodaphnia dubia Survival and Reproduction

Concentration	Day	Replicate Number 1	2	3	4	5	6	7	8	9	10	Total neonates	Live adults	Neonates per adult
0.8 MF ~~1.3~~ ppth	0												10	
	1												10	
	MF 3	0	0	0	0	0	2	0	X	0	X4	6	8	0.6
	MF 4	0	0	3	3	X	0	0	|	1	|	7	7	0.7
	4					|			|		|		7	
	5	3	0	0	6	|	2	8	|	6	|	25	7	2.5
	6	2	3	2	0	|	2	3	|	4	|	16	7	1.6
	7					|			|		|			
	8					|			|		|			
	Total	5	3	5	9	0	6	11	0	11	4	5MF4	7	5.4
1.6 MF ~~2.0~~ ppth	0												10	
	1												10	
	MF 3	0	0	0	0	0	0	0	0	0	0	0	10	0
	MF 4	1	1	3	2	3	1	0	2	1	1	15	10	1.5
	4													
	5	3	2	2	0	0	1	2	2	1	2	15	10	1.5
	6	0	0	5	0	3	0	2	3	3	3	MF24P	10	1.9
	7													
	8													
	Total	4	3	10	2	6	2	4	7	5	6	4/9MF	10	4.9
3.2 MF ~~3.0~~ ppth	0												10	
	1	X	X	X	X	X	X	X	X	X			1	
	CR 3	0	0	0	0	0	0	0	0	0	0X	0	0	0
	3													
	4													
	5													
	6													
	7													
	8													
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments: * Day 2 no reproduction in any concentration or ~~MF 5~~ Zeros were inadvertantly not recorded. Day 3 & 4 recorded in Day 2 & 3 spaces in all concentrations for MF 4-15-11-13

00021

FDEP Biology Laboratory - Chronic SRT Bench Sheet

Ceriodaphnia dubia Parameters

Test Day	Conc.	New Sample Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)	Old Sample Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)
Day 0 ←	Control	M	7.8	24.8	7.6	396					
	0.2 MF 0.59 ppth	M	7.8	25.1	7.8	667					
	0.4 MF 0.89 ppth	M	7.9	25.2	7.8	1028					
	0.8 MF 1.3ppth	M	7.9	25.2	7.8	1725					
	1.6 MF 2.0 ppth	M	7.9	25.2	7.8	3140					
	2 MF 3.0 ppth	M	7.9	25.4	7.8	5830					
	Measured by:		CR	MF	CR	CR					
	Recorded by:		AP	MF	AP	AP					
Day 1	Control	M	8.2	24.5	7.6	298	A	8.2	24.4	7.7	345
	0.2 MF 0.59 ppth	M	8.2	25.0	7.6	654	A	8.2	24.4	7.6	741
	0.4 MF 0.89 ppth	M	8.2	25.1	7.7	1016	A	8.2	24.4	7.7	1088
	0.8 MF 1.3ppth	M	8.1	25.2	7.7	1729	A	8.2	24.5	7.8	1823
	1.6 MF 2.0 ppth	M	8.1	25.5	7.7	3090	A	8.2	24.8	7.8	3200
	2 MF 3.0 ppth	M	8.1	25.6	7.7	5870	A	8.1	24.8	7.9	6010
	Measured by:		MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:		MF	MF	MF	MF		MF	MF	MF	MF
Day 2	Control	M	8.2	24.1	7.5	309	A	8.1	24.1	7.7	348
	0.2 MF 0.59 ppth	M	8.1	24.1	7.6	700	A	8.0	24.4	7.8	746
	0.4 MF 0.89 ppth	M	8.1	24.1	7.5	1045	A	8.0	24.5	7.7	1144
	0.8 MF 1.3ppth	M	8.1	24.4	7.5	1756	A	8.0	24.6	7.6	1822
	1.6 MF 2.0 ppth	M	8.0	24.6	7.5	3210	A	8.0	24.7	7.8	3280
	2 MF 3.0 ppth	M	←	MF ~~DO 7.9~~ Recorded	—	—	J	8.0	24.9	7.6	6100
	Measured by:		MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:		MF	MF	MF	MF		MF	MF	MF	MF
Day 3	Control	M	7.4	24.9	6.9	322	A	7.6	24.0	7.1	396
	0.2 MF 0.59 ppth	M	7.5	24.7	7.1	725	A	7.6	24.0	7.2	834
	0.4 MF 0.89 ppth	M	7.5	24.5	7.2	1065	A	7.6	BA 24.0	7.2	1204
	0.8 MF 1.3ppth	M	7.6	24.3	7.3	1870	A	7.6	24.0	7.2	1944
	1.6 MF 2.0 ppth	M	7.6	24.2	7.1	3290	A	7.7	24.0	7.2	3520
	2 MF 3.0 ppth	M									
	Measured by:		BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:		BA	BA	BA	BA		BA	BA	BA	BA

Comments:

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

FDEP Biology Laboratory - Chronic SRT Bench Sheet

Ceriodaphnia dubia Parameters

Test Day	Conc.	New Sample Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)	Old Sample Replicate	pH (su)	Temp (°C)	DO (mg/L)	Conductivity (µmhos/cm) (mmhos/cm)
Day 4 ←	Control	M	7.5	24.9	7.1	322	A	7.5	24.0	7.4	337
	0.2 mf 0.59 ppth	M	7.5	25.1	7.5	720	A	7.5	24.0	7.4	751
	0.4 mf 0.89 ppth	M	7.4	25.0	6.8	1061	A	7.6	24.0	7.3	1106
	0.8 mf 1.3ppth	M	7.4	25.0	6.7	1853	A	7.6	24.0	7.3	1930
	1.6 mf 2.0 ppth	M	7.4	24.9	7.1	3270	A	7.5	24.0	7.2	3400
	2 mf 3.0 ppth	M									
	Measured by:		BA	BA	BA	BA		BA	BA	BA	BA
	Recorded by:		BA	BA	BA	BA		BA	BA	BA	BA
Day 5	Control	M	8.0	25.0	8.0	327	A	8.1	24.1	7.9	365
	0.2 mf 0.59 ppth	M	8.0	24.9	8.0	711	A	7.9	24.0	8.0	803
	0.4 mf 0.89 ppth	M	8.0	24.9	7.9	1047	A	7.9	24.2	7.9	1129
	0.8 mf 1.3ppth	M	7.9	25.0	7.9	1845	A	7.9	24.5	8.0	1938
	1.6 mf 2.0 ppth	M	7.9	25.1	7.9	3200	A	7.9	24.7	8.0	3420
	2 mf 3.0 ppth	M									
	Measured by:		MF	MF	MF	MF		MF	MF	MF	MF
	Recorded by:		MF	MF	MF	MF		MF	MF	MF	MF
Day 6	Control	M					A	7.3	25.2	7.0	333
	0.2 mf 0.59 ppth	M					A	7.4	24.9	7.0	744
	0.4 mf 0.89 ppth	M					A	7.4	24.7	6.8	1106
	0.8 mf 1.3ppth	M					A	7.4	24.6	6.8	1931
	1.6 mf 2.0 ppth	M					A	7.4	24.5	6.9	3340
	2 mf 3.0 ppth	M									
	Measured by:							BA	BA	BA	BA
	Recorded by:							BA	BA	BA	BA
Day 7	Control	M									
	0.2 mf 0.59 ppth	M									
	0.4 mf 0.89 ppth	M									
	0.8 mf 1.3ppth	M									
	1.6 mf 2.0 ppth	M									
	2 mf 3.0 ppth	M									
	Measured by:										
	Recorded by:										
Day 8	Control	M									
	0.2 mf 0.59 ppth	M									
	0.4 mf 0.89 ppth	M									
	0.8 mf 1.3ppth	M									
	1.6 mf 2.0 ppth	M									
	3.2 mf 3.0 ppth	M									
	Measured by:										
	Recorded by:										

pH renewed

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

BIOASSAY INSTRUMENT ID Chronic SRT 4-9-13 — 4-15-13

METER / DEVICE	ID	SOP	Parameter	Method	used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
YSI DO Probe	5750 SN 05J1720	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
YSI DO Probe	5905	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 Salinity	SM 2510 B SM 2520 B	✓
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	✓
Thermometer	BIOLAB #1 BIOLAB #2 BIOLAB #3 BIOLAB #4 BIOLAB #5	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	NA
Traceable Thermometer	EC#1-SN101686412 EC #2-SN221295527 EC#3-SN240116020 EC#4-SN80361795 EC#5-SN61990624	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	all 4 ✓
Hach Pocket Colorimeter II #1	05110C042029	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	NA
Hach Pocket Colorimeter II #2	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)

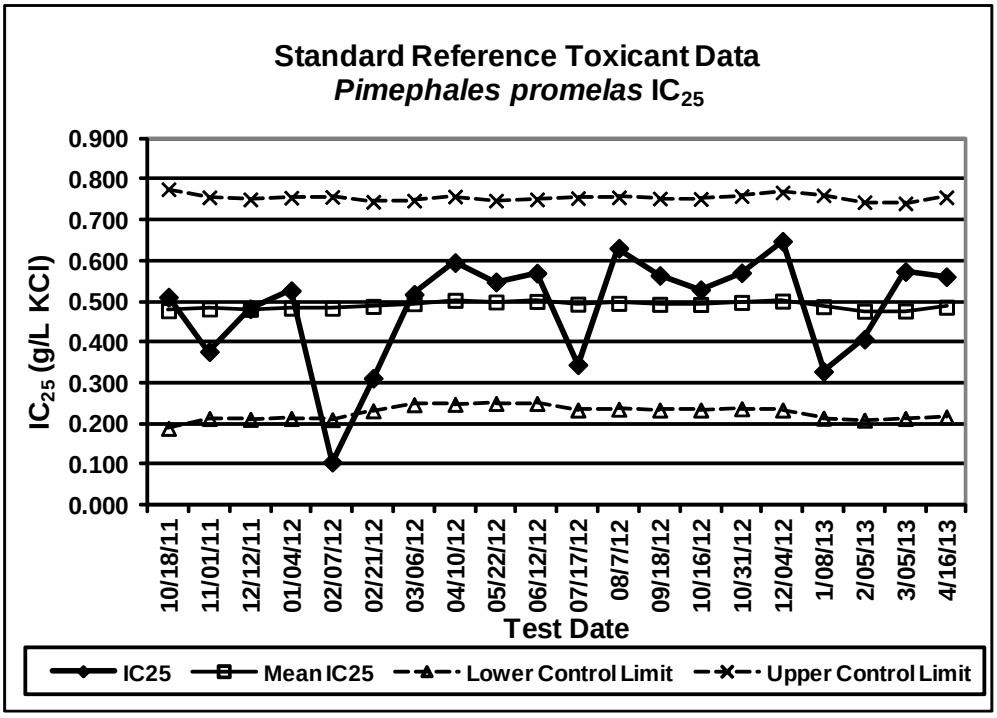
Entered By: M. Faircloth 4-18-13

V 1.1 9/21/10 MF/jd

Florida Department of Environmental Protection
Bureau of Laboratories
Standard Reference Toxicant (SRT) Test Data - 7-Day Chronic Toxicity
Pimephales promelas (fathead minnow) - Potassium Chloride (KCl)

Date	IC25	Mean IC25	Std Dev	Lower Control Limit	Upper Control Limit
10/18/11	0.511	0.478	0.14	0.189	0.776
11/01/11	0.377	0.482	0.14	0.213	0.756
12/12/11	0.483	0.481	0.14	0.211	0.751
01/04/12	0.527	0.484	0.14	0.213	0.755
02/07/12	0.106	0.484	0.14	0.210	0.757
02/21/12	0.312	0.489	0.13	0.232	0.745
03/06/12	0.518	0.495	0.13	0.247	0.748
04/10/12	0.596	0.503	0.13	0.248	0.758
05/22/12	0.548	0.499	0.12	0.250	0.748
06/12/12	0.570	0.501	0.12	0.250	0.751
07/17/12	0.345	0.494	0.13	0.234	0.754
08/7/12	0.631	0.496	0.13	0.236	0.756
09/18/12	0.564	0.493	0.13	0.234	0.753
10/16/12	0.529	0.493	0.13	0.234	0.752
10/31/12	0.571	0.498	0.13	0.237	0.759
12/04/12	0.648	0.501	0.13	0.234	0.768
1/08/13	0.329	0.488	0.14	0.214	0.761
2/05/13	0.408	0.477	0.13	0.209	0.744
3/05/13	0.574	0.477	0.13	0.213	0.741
4/16/13	0.561	0.486	0.13	0.217	0.756

Means are from the last 20 SRTs.
Lower Confidence Limit = mean - 2 * Std Dev EPA 75th %CV: 38%
Upper Confidence Limit = mean + 2 * Std Dev lab % CV:27.7%



FDEP Biology Laboratory - Chronic SRT Benchsheet

Pimephales promelas or *Menidia beryllina*

Test Species (circle one)

(*P. promelas*)	SOP#: TA07_09	EPA-821-R-02-013	Method 1000.0
M. beryllina	SOP#: TA07_14	EPA-821-R-02-014	Method 1006.0

Diluent/ Batch: MHW/4.6.13 Test Days Used: 0 - 1

Diluent/ Batch: MHW/4.13.13 Test Days Used: 2 - 6

Toxicant/ Batch # : 29/L KCl 4.16.13

Artemia Lot # : 08812

Start Date: 4.16.13 Time: 1400

End Date: 4.23.13 Time: 1030

Organism Batch #/ Age: 4.16.13 / <24 hrs

Artemia Batch # ~~0~~ AP	Day 2 74.13	Day 5 77.13	
Day 0 72.13	Day 3 75.13	Day 6 78.13	
Day1 73.13	Day 4 76.13		

Chamber size : 1000 ml

Test volume : 500 ml

Feeding: *P. promelas* 0.15 g wet wt. 2X day 6 hour interval

M. beryllina 0.10 g wet wt days 0-2 0.15g wet wt. days 3-7

Water Quality Parameters	Diluent MHW 4.6.13	Diluent 4.13.13 (or other)	Method	Measured by	Verified by
Total Residual Cl_2 (mg/L):	<0.03	<0.03	HACH	AP/CR	BA
Alkalinity (mg/L as $CaCO_3$):	70	75	HACH	AP/CR	BA
Hardness (mg/L as $CaCO_3$):	88	87	HACH	AP/CR	BA
Total Ammonia (mg/L as N):	<0.017	<0.017	DENVER	MF	AP
Conductivity (µmhos-cm) mmhos-cm:	295	286	METTLER	CR	AP

Statistics	
Growth NOEC:	0.5 g/L
Growth LOEC:	1 g/L
Growth IC_{20}:	0.5320
Growth IC_{25}:	0.5612
Ctrl % CV:	8.92%
Dunnetts PMSD:	13.5%
Survival NOEC:	0.5 g/L
Survival LOEC:	1 g/L

Light Intensity : 50 - 100 ft. candles

Photoperiod : 16 light 8 dark

Test incubated in : Temperature Range °C:

Incubator # 2 min. 24.8 max. 26.0

Water bath # ____ min. ____ max. ____

Room B246 min. 24.4 max. 25.5

P. promelas PMSD Bounds for Growth: Lower 12 Upper 30

M. beryllina PMSD Bounds for Growth: Lower 11 Upper 28

Investigators' signatures

Adriana Pennington

Bruce Alvis

Cassidy Reichert

Jackson Kelly

REVIEWER Liz Miller

Comments:

PAGE 00022

revised 8/6/12 JD

FDEP Biology Laboratory - Chronic SRT Benchsheet

Pimephales promelas or Menidia beryllina Survival

Organism: (*P. promelas*) *M.beryllina* (circle one) D = dead M = missing

Concentration: µg/L (g/L) (circle one)

			TEST DAY							
Concentration	Replicate	Chamber	0	1	2	3	4	5	6	7
Control	A	A1	10	10	10	10	10	10	10	10
	B	A2	10	10	10	10	10	10	10	10
	C	A3	10	10	10	9 1D	9	9	9	9
	D	A4	10	10	10	10	10	10	10	10
0.125	A	A5	10	10	9 1D	9	9	9	9	9
	B	A6	10	10	10	10	10	10	10	10
	C	A7	10	10	10	10	10	10	10	10
	D	A8	10	10	10	10	10	10	10	10
0.25	A	A9	10	10	10	10	10	10	10	10
	B	A10	10	10	10	10	10	10	10	10
	C	A11	10	10	10	10	10	10	10	10
	D	A12	10	10	10	10	10	10	10	10
0.5	A	A13	10	10	10	10	10	10	10	10
	B	A14	10	10	10	10	10	10	10	10
	C	A15	10	10	10	10	10	10	10	10
	D	A16	10	10	10	10	10	10	10	10
1.0	A	A17	10	3 7D	2 1D	1 1D	0 1D			
	B	A18	10	0 10D	–	–	–			
	C	A19	10	0 10D	–	–	–			
	D	A20	10	0 10D	–	–	–			
2.0	A	A21	10	0 10D	–					
	B	A22	10	0 10D	–					
	C	A23	10	0 10D	–					
	D	A24	10	0 10D						
	A		10							
	B		10							
	C		10							
	D		10							
Loaded by (0 hr): CR		Checked by:		AP	BA	AP	AP	CR	CR	CR
Verified by (0 hr): AP										
Concentrations prepared by:			BA	CR	BA	CR	AP	CR	CR	

Comments:

Chronic SRT Parameters Benchsheet

P. promelas and M. beryllina SOP TA07_09 and TA-07_15

parameter pg. 1

Start Date: 4-16-13 End Date: 4.23.13

Start Time: 1400 End Time: 1030

conc = concentration rep = replicate circle umhos or mmhos

Test Day / Conc.	Before Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos/mmhos	Salinity ppth	After Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos/mmhos	Salinity ppth
Day 0												
Control	A	8.2	24.5	7.8	295							
0.125	A	8.1	24.7	7.8	544							
0.25	A	8.1	24.8	7.9	781							
0.5	A	8.1	25.3	7.9	1245							
1.0	A	8.2	25.8	8.0	2160							
2.0	A	8.2	25.0	7.8	3940							
	A											
Measured by		CR	AP	CR	CR							
Recorded by		AP	AP	AP	AP							
	Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 1												
Control	B	7.9	24.1	6.9	297		B	7.8	24.3	7.6	286	
0.125	B	8.0	24.3	6.9	542		B	7.8	24.1	7.6	528	
0.25	B	8.0	24.3	6.8	773		B	7.8	24.1	7.7	757	
0.5	B	8.0	24.2	6.8	1249		B	7.9	24.0	7.7	1215	
1.0	B	8.0	24.7	6.9	2170		A/B AP	7.9	24.2	7.8	2110	
2.0	B	8.0	24.7	6.7	4010		B					
	B						B					
Measured by		BA	BA	BA	BA			CR	AP	CR	CR	
Recorded by		BA	BA	BA	BA			CR	AP	CR	CR	
	Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 2												
Control	C	7.7	24.5	7.2	311		C	7.6	24.2	7.2	289	
0.125	C	7.7	24.7	7.2	535		C	7.6	24.1	6.5	532	
0.25	C	7.7	24.7	7.2	765		C	7.6	24.2	6.7	742	
0.5	C	7.8	24.6	7.2	1224		C	7.6	24.2	6.8	1181	
1.0	A/C AP	7.8	24.4	7.3	2140		A/C AP	7.7	24.3	7.0	2240	
	C						C					
	C						C					
Measured by		CR	CR	CR	CR			BA	BA	BA	BA	
Recorded by		CR	CR	CR	CR			BA	BA	BA	BA	
	Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 3												
Control	D	7.7	25.4	6.7	301		D	7.7	24.5	7.4	313	
0.125	D	7.7	25.2	6.7	564		D	7.7	24.3	7.3	523	
0.25	D	7.7	25.2	5.9	784		D	7.7	24.3	7.3	739	
0.5	D	7.7	25.5	6.9	1253		D	7.7	24.3	7.1	1194	
1.0	A/D AP	7.8	25.4	6.9	2330		A/D AP	7.8	24.5	7.3	2140	
	D						D					
	D						D					
Measured by		CR	CR	CR	CR			AP	AP	AP	AP	
Recorded by		CR	CR	CR	CR			CR	CR	CR	CR	

Comments:

For salinity <1 ppth insert <1. For salinity > 1 ppth, conductivity measurement is not required if salinity probe is functional.

Page 00024

Chronic SRT Parameters Benchsheet

P. promelas and M. beryllina SOP TA07_09 and TA-07_15 parameter pg. 2

Start Date: 4-16-13 End Date: 4.23.13

Start Time: 1400 End Time: 1030

conc = concentration rep = replicate

Test Day	Conc.	Before Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth	After Renewal: Test Rep.	pH (su)	Temp (°C)	DO (mg/L)	Conductivity umhos mmhos	Salinity ppth
Day 4	Control	A	6.7	24.5	6.5	321		A	7.1	25.0	6.9	305	
	0.125	A	6.7	24.8	6.4	553		A	~~7.5~~ N	24.8	7.0	534	
	0.25	A	6.9	25.0	6.6	777		A	7.3	24.9	7.3	767	
	0.5	A	7.0	24.7	6.9	1247		A	7.4	24.8	7.2	1241	
	1.0	A	7.1	24.3	7.3	2200		A					
		A						A					
		A						A					
	Measured by		gl	AP	gl	gl			gl	AP	gl	gl	
	Recorded by		gl	AP	gl	gl			gl	AP	gl	gl	
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 5	Control	B	7.4	25.1	6.5	314		B	7.5	24.7	7.3	301	
	0.125	B	7.4	24.2	6.3	555		B	7.5	24.5	7.3	533	
	0.25	B	7.4	24.3	6.1	790		B	7.6	24.4	7.1	768	
	0.5	B	7.4	25.0	6.3	1268		B	7.6	24.4	7.3	1233	
		B						B					
		B						B					
		B						B					
	Measured by		CR	CR	CR	CR			CR	CR	CR	CR	
	Recorded by		CR	CR	CR	CR			CR	CR	CR	CR	
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 6	Control	C	7.4	25.3	6.9	319		C	7.8	24.0	7.9	339	
	0.125	C	7.5	25.0	6.9	544		C	7.8	24.1	7.8	511	
	0.25	C	7.5	24.6	7.0	782		C	7.8	24.1	7.6	754	
	0.5	C	7.6	24.4	7.1	1265		C	7.8	24.4	7.6	1220	
		C						C					
		C						C					
		C						C					
	Measured by		CR	AP	CR	CR			CR	CR	CR	CR	
	Recorded by		CR	AP	CR	CR			CR	CR	CR	CR	
		Rep	pH	Temp	DO	Conductivity	Salinity	Rep	pH	Temp	DO	Conductivity	Salinity
Day 7	Control	D	7.4	24.5	7.3	297		D					
	0.125	D	7.5	24.6	7.4	527		D					
	0.25	D	7.6	24.8	7.2	780		D					
	0.5	D	7.6	24.3	7.3	1253		D					
		D						D					
		D						D					
		D						D					
	Measured by		CR	AP	CR	CR							
	Recorded by		CR	AP	CR	CR							

Day 4 After renewal, 0.125 pH = 7.2 AP

For salinity <1 ppth insert <1. For salinity > 1 ppth, conductivity measurement is not required if salinity probe is functional

FDEP Biology Laboratory - Chronic SRT Benchsheet

Pimephales promelas or *Menidia beryllina* Weights

SOP TA06_21

Organism: (*P. promelas*) *M.beryllina* (circle one)

Concentration: µg/L (g/L) (circle one)

mean wt = fish wt divided by 10

convert g to mg: move decimal 3 places to right

Concentration	Replicate	Pan #	Pan wt. (g)	Pan + Fish (g)	Fish wt. (g)	Original # of fish	Mean wt. (mg)	Avg.
Control	A	54	0.02148	0.02571	0.00423	10	0.423	
	B	55	0.02101	0.02604	0.00503	10	0.503	0.482
	C	56	0.02049	0.02527	0.00478	10	0.478	
	D	57	0.02118	0.02640	0.00522	10	0.522	
0.125	A	58	0.02129	0.02597	0.00468	10	0.468	
	B	59	0.02192	0.02669	0.00477	10	0.477	
	C	60	0.02187	0.02607	0.0042	10	~~0.0~~0.42 AP	0.439
	D	61	0.02233	0.02624	0.00391	10	0.391	
0.25	A	62	0.02221	0.02623	0.00402	10	0.402	
	B	63	0.02148	0.02543	0.00395	10	0.395	
	C	64	0.02213	0.02608	0.00395	10	0.395	0.389
	D	65	0.02239	0.02601	0.00362	10	0.362	
0.5	A	66	0.02247	0.02711	0.00464	10	0.464	
	B	67	0.02249	0.02620	0.00371	10	0.371	
	C	68	0.02211	0.02628	0.00417	10	0.417	0.435
	D	69	0.02180	0.02666	0.00486	10	0.486	
	A	~~70~~ AP				10		
	B	~~71~~ AP				10		
	C	~~72~~ AP				10		
	D	~~73~~ AP				10		
	A	~~74~~ AP				10		
	B					10		
	C					10		
	D					10		
	A					10		
	B					10		
	C					10		
	D					10		
		Weighed by:	CR	CR				

Comments:

Note: Pan number (#) refers to actual Pan number.

PAGE 00026 revised 8/24/06 MF/SP

FDEP Biology Laboratory - Chronic SRT Benchsheet

Pimephales promelas or *Menidia beryllina* QC

SOPs TA07_09, TA07_14 and TA06_21

all weights in grams

Empty Pan Weights Date: 4.22.13 Weighed by: CR

	Pan 1 wt.	Pan 1 initial wt.
after Pan 5	0.02149	@ ~~0.02571~~ 0.02148 - AR
after Pan 10	0.02148	@ 0.02148
after Pan 15	0.02148	@ 0.02148
after Pan 20	0.02148	@ 0.02148
after Pan 25		@
after Pan 30		@
after Pan 35		@
after Pan 40		@
after Pan 45		@
after Pan 48		@

	Measured Value	S-weight Value
S-weights	0.00998	@ 0.01
	0.03002	@ 0.03

Balance: Ohaus 250D Ser# 1125481084

S-Weights: BIO-S-Weights-01

Fish + Pan Weights Date: 4.25.13 Weighed by: CR

	Pan 1 wt.	Pan 1 initial wt.
after Pan 5	0.02570	@ 0.02571
after Pan 10	0.02569	@ 0.02571
after Pan 15	0.02569	@ 0.02571
after Pan 20	0.02570	@ 0.02571
after Pan 25		@
after Pan 30		@
after Pan 35		@
after Pan 40		@
after Pan 45		@
after Pan 48		@

	Measured Value	S-weight Value
S-weights	0.00999	@ 0.01
	0.05003	@ 0.05

Drying Oven ID: ER034000

Temperature °C: 100

Drying Hours: 8

Note: Pan number (5, 10, etc.) refers to sequence of weighing as actual Pan #s may differ.

Comments:

Test ID: P. promelas chronic SRT Dates: 4-16-13 to 4-23-13

METER / DEVICE	ID	SOP	Parameter	Method	√ used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
YSI DO Probe	5905	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 Salinity	SM 2510 B SM 2520 B	✓
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	✓
Traceable Thermometer	#1-SN101686412 #2-SN221295527 #3-SN240116020 #4-SN80361795 #5-SN61990624	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	✓ #4
Hach Pocket Colorimeter II #1	05110C042029	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	✓
Hach Pocket Colorimeter II #2	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: AP 4-25-13

V 1.2 2/20/11 MF/jd

PAGE

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: 4/22/13

Ship to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia						
Menidia beryllina						
						Hardness mg/L
Cyprinella leedsi	150	12 DAYS	CL130410	25	7.8	80
Pimephales promelas	550	<24	FM130421-1550	25	7.8	80
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: QM

Shipped Via: Fed Ex

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 I-1

Qualitative benthic macroinvertebrate collapsed taxa list and number of individuals counted from 20-discrete-dipnet sweeps conducted in a background creek north of the Panama City Beach WWTP Wetland Conservation Area on 04/22/13 and a stream receiving water from the Panama City Beach WWTP Wetland Conservation Area on 04/29/13. 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					
	Eclipidrilus sp.	4	-	1	1
Arthropoda					
Arachnida					
	Hydrodroma sp.	2	1	-	-
	Rhyncholimnochares sp.	1	1	-	-
Crustacea					
	Amphipoda	-	-	2	1
	Crangonyx sp.	9	18	-	-
	Cambaridae	1	1	-	-
	Caecidotea sp.	-	-	6	3
	Lirceus sp.	-	-	104	98
Insecta					
Coleoptera					
	Ancyronyx variegatus	5	2	-	-
	Dytiscidae	-	-	-	2
	Ectopria thoracica	1	-	-	-
	Gonielmis dietrichi	1	3	-	-
	Gyrinus sp.	-	-	-	1
	Pachydrus sp.	-	-	1	-
	Stenelmis sp.	7	5	1	-
Diptera					
	Ablabesmyia mallochi	1	1	-	-
	Atrichopogon sp.	2	3	-	-
	Chironomus sp.	-	-	-	1
	Cricotopus or *Orthocladius* sp.	-	-	1	-
	Cryptochironomus sp.	-	1	-	-
	Hemerodromia sp.	1	4	-	-
	Hexatoma sp.	2	3	-	-
	Kribiodorum perpulchrum	1	1	-	-
	Neoplasta sp.	1	1	-	-
	Orthocladius annectens	-	-	-	2

Appendix I-1 (continued)

	Control Site		Test Site	
	Rep 1	Rep 2	Rep 1	Rep 2
Palpomyia/bezzia grp.	-	-	-	2
Paralauterborniella nigrohalterale	1	-	-	-
Polypedilum aviceps	18	8	-	-
Polypedilum flavum	3	1	-	-
Polypedilum illinoense grp.	-	-	3	9
Rheocricotopus robacki	-	1	-	-
Rheotanytarsus exiguus grp.	1	1	1	4
Simulium sp.	30	32	10	13
Stenochironomus sp.	4	-	-	1
Thienemannimyia grp.	3	2	11	7
Tipulidae	-	-	1	-
Tribelos jucundum	-	-	6	1
Xylotopus par	2	3	-	-
Ephemeroptera				
Eurylophella doris	-	1	-	-
Heptageniidae	17	12	-	-
Labiobaetis propinquus	1	-	-	-
Leptophlebiidae	2	-	-	-
Lepidoptera				
Lepidoptera	-	-	1	-
Odonata				
Aeshnidae	-	-	-	1
Argia sp.	-	-	1	-
Gomphidae	-	1	-	-
Libellulidae	1	1	-	-
Plecoptera				
Acroneuria abnormis	8	12	-	-
Acroneuria arenosa/evoluta	-	1	-	-
Leuctra sp.	3	3	-	-
Neoperla sp.	1	-	-	-
Perlesta placida complex	2	1	-	-
Trichoptera				
Anisocentropus pyraloides	1	-	-	-
Brachycentrus chelatus	2	6	-	-
Cheumatopsyche sp.	-	1	4	4
Chimarra sp.	10	7	-	-

Appendix I-1 (continued)

	Control Site		Test Site	
	Rep 1	Rep 2	Rep 1	Rep 2
Hydropsyche sp.	1	3	-	-
Lype diversa	2	-	-	-
Nyctiophylax sp.	-	2	-	-
Oecetis sphyra/morsei	1	-	-	-

Appendix I-2

Qualitative benthic macroinvertebrate collapsed taxa list and number of individuals counted from 20-discrete-dipnet sweeps conducted in a background creek north of the Panama City Beach WWTP Wetland Conservation Area on 04/22/13 and a stream receiving water from the Panama City Beach WWTP Wetland Conservation Area on 04/29/13.

	Control Site		Test Site	
	Rep 1	Rep 2	Rep 1	Rep 2
Annelida				
Oligochaeta				
Eclipidrilus sp.	4	-	1	1
Arthropoda				
Arachnida				
Hydrodroma sp.	2	1	-	-
Rhyncholimnochares sp.	1	1	-	-
Crustacea				
Amphipoda	3	-	2	1
Crangonyx sp.	6	18	-	-
Cambaridae	1	1	-	-
Caecidotea sp.	-	-	6	3
Lirceus sp.	-	-	104	98
Insecta				
Coleoptera				
Ancyronyx variegatus	5	2	-	-
Dytiscidae	-	-	-	2
Ectopria thoracica	1	-	-	-
Gonielmis dietrichi	1	3	-	-
Gyrinus sp.	-	-	-	1
Pachydrus sp.	-	-	1	-
Stenelmis sp.	7	5	1	-
Diptera				
Ablabesmyia mallochi	1	1	-	-
Atrichopogon sp.	1	3	-	-
Ceratopogonidae	1	-	-	1
Chironomidae	2	-	6	2
Chironomus sp.	-	-	-	1
Cricotopus or *orthocladius* sp.	-	-	1	-
Cryptochironomus sp.	-	1	-	-
Hemerodromia sp.	1	4	-	-
Hexatoma sp.	2	3	-	-
Kribiodorum perpulchrum	1	1	-	-
Neoplasta sp.	1	1	-	-

Appendix I-2 (continued)

	Control Site		Test Site	
	Rep 1	Rep 2	Rep 1	Rep 2
Orthocladius annectens	-	-	-	2
Palpomyia/bezzia grp.	-	-	-	1
Paralauterborniella nigrohalterale	1	-	-	-
Polypedilum aviceps	16	8	-	-
Polypedilum flavum	3	1	-	-
Polypedilum illinoense grp.	-	-	2	8
Rheocricotopus robacki	-	1	-	-
Rheotanytarsus exiguus grp.	1	1	1	4
Simulium sp.	30	32	10	13
Stenochironomus sp.	4	-	-	1
Thienemannimyia grp.	3	2	8	6
Tipulidae	-	-	1	-
Tribelos sp.	-	-	1	-
Tribelos jucundum	-	-	3	1
Xylotopus par	2	3	-	-
Ephemeroptera				
Eurylophella doris	-	1	-	-
Heptageniidae	17	12	-	-
Labiobaetis propinquus	1	-	-	-
Leptophlebiidae	2	-	-	-
Lepidoptera				
Undetermined Lepidoptera	-	-	1	-
Odonata				
Aeshnidae	-	-	-	1
Argia sp.	-	-	1	-
Gomphidae	-	1	-	-
Libellulidae	1	1	-	-
Plecoptera				
Acroneuria abnormis	8	12	-	-
Acroneuria arenosa/evoluta	-	1	-	-
Leuctra sp.	3	3	-	-
Neoperla sp.	1	-	-	-
Perlesta placida complex	2	1	-	-
Trichoptera				
Anisocentropus pyraloides	1	-	-	-
Brachycentrus chelatus	2	6	-	-
Cheumatopsyche sp.	-	1	3	4

Appendix I-2 (continued)

	Control Site		Test Site	
	Rep 1	Rep 2	Rep 1	Rep 2
Chimarra sp.	9	6	-	-
Hydropsyche sp.	1	3	-	-
Hydropsychidae	-	-	1	-
Lype diversa	2	-	-	-
Nyctiophylax	-	2	-	-
Oecetis sphyra/morsei	1	-	-	-
Undetermined Trichoptera	1	1	-	-

EPA Endsheet

The Bioassay of the Panama City Beach WWTP effluent sampled on April 21, 2013 NPDES #FL0021512

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	1	5	1	2	11	12	1	3	0	4	2	1	# **B**	# **S**	# 1

Remarks

#

The Priority Pollutants Analysis for Bioassay of the Panama City Beach WWTP effluent sampled on April 21, 2013 NPDES #FL0021512

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	1	5	1	2	11	12	1	3	0	4	2	1	# **X**	# **S**	# 1

Remarks

#

Biological Analyses of the Panama City WWTP effluent sampled on April 29, 2013, NPDES #FL0021512

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	1	5	1	2	11	12	1	3	0	4	2	9	# **S**	# **S**	# 1

Remarks

#