



Biological Assessment of
Mosaic Fertilizer, L.L.C. Wingate Creek Mine

Manatee County

NPDES # FL0032522

Sampled October 3 and 12, 2011

March 2012

Biology Section

Bureau of Laboratories

Division of Environmental Assessment and Restoration

Quality Manual No. 870346G

NELAC Certification No. E31780

CONTENTS

Facility Overview

Methods

Results

Conclusion

Literature Cited

Tables

Table 1	Effluent limits, Class III Freshwater Criteria and chemical and toxicological data.
Table 2	Effluent limits, Class III Freshwater Criteria and metals data.
Table 3	Measured and predicted algal growth potential (AGP)
Table 4	Phytoplankton samples - Quantitative
Table 5	Macroinvertebrate Hester-Dendy samples – Quantitative

Appendices

Appendix A	Map of facility
Appendix B	Facility summary
Appendix C	Explanation of measurements
Appendix D	Chain of Custody
Appendix E	Physical/Chemical and Habitat Assessment field sheets
Appendix F	Chemical analyses of effluent and receiving water
Appendix G	Toxicological results
Appendix H	Standard Reference Toxicant Data
Appendix I-1	Quantitative Phytoplankton – wet algal taxa list and number of algal units per mL
Appendix I-2	Quantitative Phytoplankton – diatom taxa list and number of diatom valves counted
Appendix J-1.	Hester-Dendy macroinvertebrate samples: taxa list and average number of individuals per m ²
Appendix J-2.	Hester-Dendy macroinvertebrate samples: taxa list and total number of individuals counted

EPA End Sheet

Facility Overview

The Mosaic Fertilizer, L.L.C. Wingate Creek Mine is a privately owned industrial facility responsible for the mining and beneficiation of phosphate ore. The beneficiation process involves pumping the slurried ore into the plant where the fine clays and sands are separated from the phosphate rock and then pumped into the settling areas. The wastewater treatment process consists of gravitational settling of sands, clays, and other suspended solids within the earthen diked settling areas. Clarified water is decanted from the settling areas into the mine recirculation system and either reused in the beneficiation process or discharged through Outfalls D-001 and D-002. Outfall D-001 discharge has been limited for several years and was not discharging during this study, and therefore it will not be discussed further in this report. The effluent from Outfall D-002 is discharged into Johnson Creek, which converges with Wingate Creek and then flows into the Myakka River, a Class III Fresh Water (see map Appendix A). There is no design flow for this facility. The mean flow for outfall D-002 from October 2010 to September 2011 was 0.117 MGD. The facility discharges are rainfall dependent, and the flow measured during this survey was 4.67 MGD (FDEP Bureau of Mining and Minerals Regulation 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, and summary of permit limits.

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 Johnson Creek approximately 600m upstream of the point of discharge) and a Test Site (located in Johnson Creek approximately 170m downstream of the point of discharge). Effluent samples for all analyses were taken as grab samples from Outfall D-002.

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 FDEP 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: Jacki Champion and Melani Dickenson (FDEP Bureau of Mining and Minerals Regulation, Tampa) and FDEP Central Laboratory in Tallahassee. The report was reviewed by District representatives and the Point Source Studies Review Committee (Ed Smith, Michelle Fish, and Nancy Ross).

Results

Organic Constituents (See Table 1 and Appendix F)

- No organic constituents were detected in the effluent.
- No organic constituents were detected in the equipment blank.

Metals (See Table 2 and Appendix F)

- Effluent metals were present at levels that complied with Class III Fresh Water Quality Criteria (62-302.530 F.A.C.). There are no effluent permit limits for metals.
- Control and Test Site metals were detected at levels that complied with Class III Fresh Water Quality Criteria.
- No metals were detected in the equipment blank.

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

- Tests were performed October 4 through October 8, 2011.

- The LC50 was greater than 100% effluent for the water flea, *Ceriodaphnia dubia*, and the fish, *Cyprinella leedsi*, during the 96 Hour Acute Screen bioassays. At 96 hours, there was 30% mortality in the 100% effluent sample for *C. leedsi*, and there was 0% mortality in the 100% effluent for *C. dubia*.
- The whole effluent toxicity did not exceed test mortality greater than 50% in the 100% effluent, and therefore it complied with the effluent permit limits.

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

- Habitat Assessment scores were similar at the Control Site (134) and Test Site (129), which places both sites in the Optimal category (category from Appendix C). While the Test Site had better substrate diversity, the Control Site had slightly better substrate availability. Also, both sites lost points for lack of bank stability for the left and right banks, and the Test Site lost points for riparian zone buffer width of the right bank.
- Dissolved oxygen (mg/L), pH (Standard Units), and specific conductance (µmhos/cm) of the effluent complied with Class III Fresh Water Quality Criteria and effluent permit limits.
- Chlorophyll a was detected in the effluent sample and was detected at a similar level at the Test Site. Chlorophyll a was detected in the Control Site sample at levels between the laboratory method detection limit and the laboratory practical quantitation limit.
- Effluent turbidity (NTU), oils and greases (mg/L), total Alpha (pCi/L), and Radium 226 + 228 (pCi/L) were detected below permit limits and Class III criteria.

Nutrients (See Table 1 and Appendix F)

- Effluent total phosphorus and total nitrogen levels complied with permit limits.
- Nutrient levels in the effluent and Test Site were similar. With the exception of nitrate+nitrite, nutrient levels in the effluent and Test Site samples were approximately two times the levels in the Control Site samples, suggesting nutrient enrichment from the effluent. Nitrate+nitrite at the Control Site was approximately five times higher than the effluent and Test Site, suggesting another source of input at the Control Site.
- No nutrients were detected in the equipment 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 represent a “problem” threshold for fresh receiving waters, implying nutrient enrichment. The AGP value in the effluent sample using the freshwater species, *Pseudokirchneriella subcapitata*, was 1.8 times greater than the “problem” threshold value. The analytical chemistry suggests that the effluent is nitrogen limited.
- The AGP values of the Control and Test Sites were approximately 2 times greater than the “problem” threshold. The analytical chemistry suggests that both sites are nitrogen limited. Although it appears that the effluent is contributing to nutrient enrichment at the Test Site in the form of ortho-phosphate, total phosphorus, and total kjeldahl nitrogen (TKN), there appears to be another source of enrichment (nitrate+nitrite) influencing the Control Site.

Bioassessment

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

- Phytoplankton communities in the effluent and at both the Control and Test Sites consisted mostly of the blue-green algae *Synechocystis* sp. and *Synechocystis aquatilis*. While all samples were dominated by the same blue-green algae, the algal density of the effluent sample and the Test Site sample were four and eleven times higher than the Control Site, respectively. The diatom communities of the effluent and Test Site samples were dominated by the species *Cyclotella atomus*. The Control Site was dominated by the genus *Nitzschia* sp, and the number of diatom taxa found in the Control Site sample was more than double the number of taxa in the effluent and Test Site samples. The effluent appears to be causing a shift in the algal community at the Test Site.

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

- Quantitative macroinvertebrate data were collected from floating Hester Dendy samplers at the Control and Test Sites. The Shannon-Weaver diversity scores were high at the Control and Test Sites (3.9 and 3.49 respectively). Both sites were dominated by dipterans and had few ephemeroptera, plecoptera, and trichoptera (EPT) taxa, which are expected to decrease with human disturbance. The Test Site had more than twice as many individuals counted than the Control Site. The higher percentage of trichopterans at the Test Site was mostly the taxon *Cheumatopsyche* sp., which is generally considered to be pollution tolerant. Overall, there were no negative effects on macroinvertebrates at the Test Site that were attributable to the effluent.

Conclusion

The AGP values for the effluent and both the Test and Control Sites were more than 1.8 times higher than the “problem” threshold. Higher nitrate+nitrite levels at the Control Site suggest another source of enrichment there that is not evident in the effluent or Test Site. However, with the exception of nitrate+nitrite, nutrient levels in the effluent do appear to be contributing to nutrient enrichment at the Test Site. This nutrient enrichment is evident in the phytoplankton communities. The chlorophyll *a* levels at the Test Site were similar to the effluent and were more than four times the levels for the Control Site, and a similar increase is apparent in the algal densities. Furthermore, the effluent appears to be causing a shift in the diatom community and a reduction in taxa richness at the Test Site. There was no detectable difference in the macroinvertebrate communities between instream sites. Overall, the effluent did not appear to be adversely affecting the downstream stream portion of Johnson Creek.

Literature Cited

- Karr, J.R. & E.W. Chu. 1998. Restoring life in running waters: Better biological monitoring. Island Press. Covelo, California. 200 p.
- Magurran, A. E. 1988. Ecological diversity and its measurement. Princeton University Press, Princeton, New Jersey.
- Miller, W. E., T. E. Maloney, and J. C. Greene. 1978. The *Selenastrum capricornutum* Printz algal assay bottle test. EPA-600/9-78-018. U. S. EPA, Cincinnati, Ohio. 126 p.
- Plafkin, J. L., M. T. Barbour, K. D. Porter, S. K. Gross and R. M. Hughes. 1989. Rapid bioassessment protocols for use in streams and rivers: Benthic macroinvertebrates and fish. U. S. EPA, Office of Water Regulations and Standards, Washington D.C., EPA 440-4-89-001
- Raschke, R. L. and D. A. Schultz. 1987. The use of the algal growth potential test for data assessment. J. Wat. Poll. Cont. Fed. 59(4): 222-227.
- Stevenson, R. J. and L. L. Bahls. 1999. Periphyton protocols. Pp. 6.1-6.22 in: Rapid bioassessment protocols for use in wadeable streams and rivers. 2nd edition. By: M. T. Barbour, J. Gerritsen, B. D. Snyder and J. B. Stribling. EPA 841-B-99-002. U. S. Environmental Protection Agency, Office of Water, Washington, D. C.
- Stevenson, R. J. and J. P. Smol. 2003. Use of algae in environmental assessments, pp. 775-803, in: Freshwater algae of North America, edited by J. D. Wehr and R. G. Sheath, Academic Press, San Diego. 918 pp.
- 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, and toxicological data.

Mosaic Fertilizer, L.L.C. - Wingate Creek Mine	Class III Criteria	Effluent Limits	Effluent	Control Site	Test Site
Organic Constituents (µg/L)					
None Detected	-	None Detected			
Nutrients (mg/L)					
Ortho-phosphate	-	-	0.17	0.083	0.17
Total Phosphorus	-	≤ 5.0	0.26	0.14	0.26
Total Ammonia	-	-	0.11	0.14	0.12
Un-ionized Ammonia	≤ 0.02 s	-	≤ 0.02 c	≤ 0.02 c	≤ 0.02 c
Nitrate and Nitrite	-	-	0.033	0.18	0.046
Total Kjeldahl Nitrogen	-	-	1.1	0.68	1.2
Organic Nitrogen	-	-	0.99 c	0.54 c	1.08 c
Total Nitrogen	-	≤ 3.0	1.133 c	0.86 c	1.246 c
General Physical and Chemical Parameters					
Habitat Assessment	-	-	-	134	129
Dissolved Oxygen (mg/L)	≥ 5.0	≥ 5.0	5.9	5.8	7.0
pH (SU)	6.0 - 8.5	6.0 - 8.5	7.7	7.6	7.8
Conductivity (µmhos/cm)	≤ 1,275	≤ 1,275	624	405	619
Temperature (°C)	-	Report	27.1	23.0	27.6
Sample Depth (m)	-	-	-	0.1	0.4
Chlorophyll a (µg/L) - Corrected	-	Report	7.2	1.4 I	6.5
Phaeophytin (µg/L)	-	-	4.3	0.4 U	3.6
Total Suspended Solids (mg/L)	-	≤ 60.0	5 I	5 I	7 I
Fixed Suspended Solids (mg/L)	-	≤ 25.0	-	-	-
Total Dissolved Solids (mg/L)	-	-	435	276 A	442
Turbidity (NTU)	< 29 t	< 29 t	2.1	5.1	1.6
Oils and Greases (mg/L)	≤ 5.0	≤ 5.0	0.7 U	-	-
Chloride (mg/L)	-	-	9.5	12	9.9
Fluoride (mg/L)	≤ 10.0	-	0.54	0.16	0.53
Sulfate (mg/L)	-	-	210	130	210
Alpha, Total (pCi/L)	≤ 15	≤ 15	1.9 U	-	-
Alpha-Counting Error (pCi/L)	-	-	1.2	-	-
Radium 226 (pCi/L)	-	-	0.3	-	-
Radium 226-Counting Error (pCi/L)	-	-	0.1	-	-
Radium 228 (pCi/L)	-	-	0.9 U	-	-
Radium 228-Counting Error (pCi/L)	-	-	0.5	-	-
Radium 226 + 228 (pCi/L)	≤ 5	≤ 5	0.3 c	-	-
Flow (MGD)	-	Report	4.67	-	-
Hardness (mg CaCO ₃)	-	-	252 c	153 c	251 c
Toxicity (96 Hour Acute Screen, percent mortality in 100% effluent)					
Bioassay - Water flea (<i>Ceriodaphnia dubia</i>)	-	≤ 50	30	-	-
Bioassay - Fish (<i>Cyprinella leedsii</i>)	-	≤ 50	0	-	-

c - Value is calculated

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

L - Actual value is known to be greater than value given

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

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.

Mosaic Fertilizer, L.L.C. - Wingate Creek Mine	Effluent Class III Criteria	Effluent Limits	Effluent	Control Site Class III Criteria	Control Site	Test Site Class III Criteria	Test Site
Metals (µg/L unless otherwise noted)							
Aluminum	-	-	101	-	240	-	134
Arsenic	≤ 50	-	4.9	≤ 50	0.48 I	≤ 50	4.69
Cadmium	≤ 0.500 b	-	0.05 U	≤ 0.400 b	0.05 U	≤ 0.500 b	0.05 U
Calcium (mg/L)	-	-	57.4	-	33.7	-	56.9
Chromium-III	≤ 184 b	-	1.2	≤ 122 b	0.6 I	≤ 183 b	1.1 I
Copper	≤ 20.6 b	-	0.5 U	≤ 13.4 b	0.5 U	≤ 20.5 b	0.5 U
Iron	≤ 1,000	-	85 I	≤ 1,000	800	≤ 1,000	120 I
Lead	≤ 10.3 b	-	0.2 U	≤ 5.46 b	0.2 U	≤ 10.3 b	0.2 U
Magnesium (mg/L)	-	-	26.5	-	16.7	-	26.5
Nickel	≤ 114 b	-	1.8	≤ 74.7 b	0.66 I	≤ 114 b	1.13
Selenium	≤ 5.0	-	1.19	≤ 5.0	0.2 U	≤ 5.0	1.12
Silver	≤ 0.07	-	0.025 U	≤ 0.07	0.025 U	≤ 0.07	0.025 U
Zinc	≤ 263 b	-	5 U	≤ 172 b	5 U	≤ 261 b	5 U

See Table 1 for calculated hardness.

b - Value is calculated based on hardness

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

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

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

Mosaic Fertilizer, L.L.C. - Wingate Creek Mine							
Location	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (TN) ± 20%	Inorganic N:P ratio	Total N:P ratio		
Effluent	9.0 A	5.4 ± 1.1	43.1 ± 8.6	0.8	4.4		
Control Site	11.1	12.2 ± 2.4	32.7 ± 6.5	3.9	6.1		
Test Site	10.4	6.3 ± 1.3	47.3 ± 9.5	1.0	4.8		

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

Table 4. Phytoplankton Composition - Quantitative

Mosaic Fertilizer, L.L.C. - Wingate Creek Mine	Effluent	Control Site	Test Site
Number of Taxa	29	27	32
Number of Wet Algal Units Identified	302	301	301
Algal Density (number/mL)	9,016	2,202	24,900
Percent Dominant Wet Taxon	34.4	56.8	37.4
Dominant Wet Taxon Name	<i>Synechocystis</i> sp. (Cyanophyceae)	<i>Synechocystis</i> <i>aquaticilis</i> (Cyanophyceae)	<i>Synechocystis</i> <i>aquaticilis</i> (Cyanophyceae)
Number of Diatom Taxa	29	63	26
Number of Diatom Valves Identified	501	502	500
Percent Dominant Diatom Taxon	38.7	12.4	34.0
Dominant Diatom Taxon Name	<i>Cyclotella atomus</i>	<i>Nitzschia</i> sp.	<i>Cyclotella atomus</i>
Percentage Composition of Wet Algae			
Blue-green algae	52.3	86.1	74.1
Green algae	38.1	5.0	19.3
Diatoms	7.6	4.0	5.0
Cryptophytes	0.0	2.0	0.0
Euglenophytes	1.0	3.0	1.0
Pyrrophytes	1.0	0.0	0.3
Other	0.0	0.0	0.3

Table 5. Macroinvertebrate Hester-Dendy Samples - Quantitative.

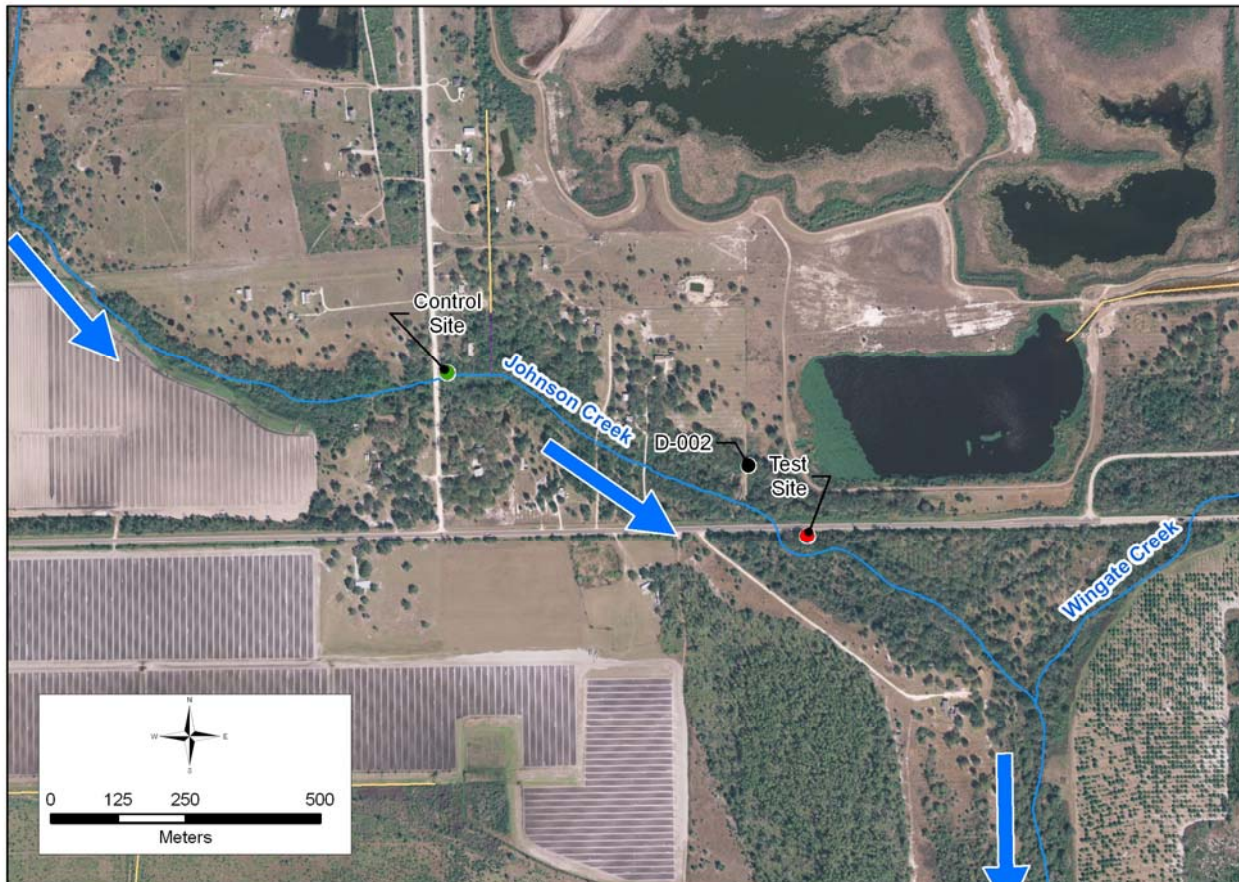
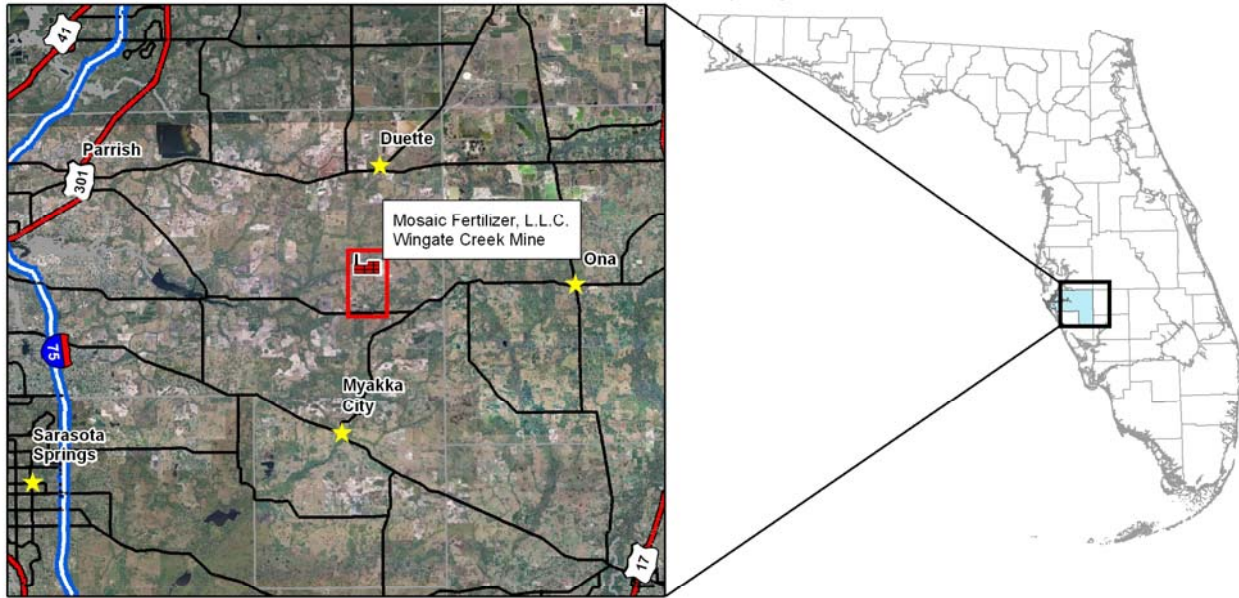
Mosaic Fertilizer, L.L.C. - Wingate Creek Mine	Control Site	Test Site
Summary Statistics		
Shannon-Weaver Diversity	3.90	3.49
Number of Taxa	39	45
Number of EPT Taxa	3	7
Percent Dominant Taxon	26.7	29.8
Dominant Taxon Name	<i>Paratanytarsus</i> sp. (Diptera)	<i>Asheum beckae</i> (Diptera)
Total Number of Individuals (counted)	706	1,743
Total Number of Individuals (#/m ²)	1,870	4,613
Community Composition: Percent of total		
Amphipoda	0.0	0.2
Bivalvia	0.0	3.7
Coleoptera	0.7	0.5
Diptera	88.3	80.5
Ephemeroptera	0.9	1.8
Gastropoda	6.2	2.4
Odonata	0.3	0.3
Oligochaeta	1.3	0.1
Trichoptera	2.3	10.3
Other	0.0	0.2
Functional Feeding Groups: Percent of total		
Burrowing Deposit Feeders	1.3	0.1
Predators	5.8	22.6
Scrapers	6.8	3.9
Shredders	17.0	10.5
Surface Deposit Feeders	47.6	45.0
Suspension Feeders	21.2	15.3
Unknown	0.3	2.6

Appendix A

Map of Facility

Mosaic Fertilizer L.L.C - Wingate Creek Mine

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: Jacki Champion	Contact Number: 813-632-7600 X133
Facility Name (as it appears on permit): Mosaic Fertilizer, L.L.C. Wingate Creek Mine	Former Names: Cargill Fertilizer-Wingate Creek Mine; Nu-Gulf Wingate Creek Holdings
NPDES Permit Number: FL0032522	Permit Expiration Date: 12/4/11
Physical Address: 38651 State Road 64 East, Myakka City, Florida 34251	
District: Bureau of Mining and Minerals Regulation-Phosphate Management	County: Manatee
Function of Facility: Phosphate mining and beneficiation facilities including the mining and washing of phosphate ore	
Facility Type: Phosphate Mine	Permitted Capacity (MGD): N/A
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): D-002 flow from October 2010 to September 2011- 0.117 MGD	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months):	
Description of type of Discharge: ☐ Continuous ☒ Intermittent ☐ Seasonal ☒ Rainfall Dependent ☐ Other, please specify	
Description of Sampling Location(s)-actual permit designation of permitted sampling point(s); Eff-01 and Eff-02	
Description of Permitted Outfalls(s): Outfall D-001 is a 22 foot rectangular concrete weir; Outfall D-002 is a 12 foot rectangular concrete weir	
Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility): Wastewater treatment consists of gravity settling sands, clays and other suspended solids within earthen diked settling areas. Clarified water is decanted from the settling areas into the mine recirculation system and either used in the beneficiation process or discharged.	

PART I: Continued

List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the faci

PARAMETERS (UNITS)	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS		
	Daily Minimum	Monthly Average	Daily Maximum	Monitoring Frequency	Sample Type	Sample Point
Flow (mgd)	N/A	Report	Report	Continuous	Recorder	EFF-01 EFF-02
pH (standard units) (See Condition I.A.2.)	6.0	Report	8.5	1/Week	Grab	EFF-01 EFF-02
Turbidity (NTUs)	N/A	Report	See Condition I.A.16.)	1/Week	Grab	EFF-01 EFF-02
Solids, Total Suspended (mg/l)	N/A	30.0	60.0	1/2 Weeks	Grab	EFF-01 EFF-02
Solids, Fixed Suspended (mg/l) *	N/A	12.0	25.0	1/2 Weeks	Grab	EFF-01 EFF-02
Phosphorus, Total (as P) (mg/l)	N/A	3.0 **	5.0	1/2 Weeks	Grab	EFF-01 EFF-02
Phosphorus, Total (as P) (lbs/day)	N/A	Report †	Report †	1/2 Weeks	Calculated	EFF-01 EFF-02
Chlorophyll a (µg/l)	N/A	N/A	Report	1/Month	Grab	EFF-01 EFF-02
Specific Conductance (µmho/cm)	N/A	N/A	See Condition I.A.3.	1/Month	Grab	EFF-01 EFF-02
Oxygen, Dissolved (DO) (mg/l) (See Condition I.A.7.)	5.0	N/A	N/A	1/Month	Grab	EFF-01 EFF-02
Temperature (°F)	N/A	N/A	Report	1/Month	Grab	EFF-01 EFF-02
Oil and Grease (mg/l) (See Condition I.A.11.)	N/A	N/A	5.0	1/Month	Grab	EFF-01 EFF-02
Nitrogen, Total (as N) (mg/l)	N/A	N/A	3.0 ***	1/Month	Grab	EFF-01 EFF-02
Nitrogen, Total (as N) (lbs/day)	N/A	N/A	Report †	1/Month	Calculated	EFF-01 EFF-02
Sulfate, Total (mg/l)	N/A	N/A	Report	1/Month	Grab	EFF-01 EFF-02
Radium ²²⁶ +Radium ²²⁸ , Total (PCI/L)	N/A	N/A	5.0	1/Quarter ††	Grab	EFF-01 EFF-02
Alpha, Gross Particle Activity (PCI/L)	N/A	N/A	15.0	1/Quarter ††	Grab	EFF-01 EFF-02
Phosphorus, Total (as P) (lbs/year)	N/A	N/A	Report † [Annual Total]	Annually	Calculated	EFF-01 EFF-02
Nitrogen, Total (as N) (lbs/year)	N/A	N/A	Report † [Annual Total]	Annually	Calculated	EFF-01 EFF-02
Whole Effluent Toxicity – Acute & Chronic	See Permit Conditions I.A.4. and I.A.5.					

PART I: Continued			
Receiving Waters: D-001 discharges to Wingate Creek D-002 discharges to Johnson Creek Both enter the Myakka River		Classification (indicate whether fresh or marine): Class III Fresh	
Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.): Acute screening tests twice per year and chronic screening test once per permit cycle			
Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.): None			
Facility Mixing Zone Details (if applicable): None			
List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year: None			
Date	Parameter and Units	Limit	Result
Describe previous FYI and WQBEL study: August 8 and September 12, 2005 sampling events for D-002 indicated that effluent met Class III water quality standards. The phosphorus was elevated at the outfall and downstream site. Algal and macroinvertebrate assemblages were reduced downstream of the discharge compared to the control site with 30% less macroinvertebrates on the Hester-Dendy samplers. The SCI for both the control and test sites was ranked "poor".			
Describe previous or current Enforcement Actions (including WLs): No current enforcement actions.			
Describe any violations or problems noted in previous inspection: none			
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: 10/3/11	Sampler(s): Jacki Champion, Melani Dickenson
Temperature (Deg C): 27.09	pH (SU): 7.66
Dissolved Oxygen (mg/L): 5.86	Conductivity (umhos/cm): 624
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): D-002 flow 4.67 MGD	
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): September 2010 to August 2011- 0.517 MGD	
Describe Discharge during Sampling Event: ☐ Continuous ☒ Intermittent ☐ Seasonal ☐ Rainfall Dependent ☐ Other, please specify	
Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here: Water samples were collected at D-002, the control site and the test site on 10/3/11. The Hester-Dendy columns were deployed from September 14 to October 12, 2011. The SCI was not done on October 12, 2011, due to a substantial increase in the depth of Johnson Creek following heavy rainfall. The Outfall D-002 was discharging from September 14 until October 12, 2011 during the Hester-Dendy deployment.	

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. Standard reference toxicant (SRT) tests are conducted monthly to ensure quality in toxicity testing.

(4) Habitat Assessment

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

(5) Algal Growth Potential (AGP)

The 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 $\pm 20\%$. When the ratio of nitrogen to phosphorus (N: P) is less than 10:1, nitrogen limitation of algal production is likely. When the N: P ratio is 20:1 or greater, phosphorus limitation is likely (USEPA 2000). For ratios in-between, co-limitation may occur. Production of lower biomass than expected may be evidence of growth inhibition related to toxic compounds present in the water sample tested and may constitute an exceedance of 62-302.530(61) F.A.C.

(6) Algal Phytoplankton and Periphyton Assemblages

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

Chlorophyll a Content: Chlorophyll a content is an estimate of algal biomass. High algal biomass implies nutrient stress (Stevenson and Bahls 1999) and may 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..

Algal Density: Algal density is estimated as number of natural units/ml for phytoplankton samples. Although algal density of a single site is highly variable and depends on a number of factors, comparison of algal density at a control site to algal density at a related test site gives a partial comparison of algal biomass at the two sites (Stevenson and Smol 2003).

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

Community Composition: Shifts in relative proportions of major groups of algae downstream of a point source, compared to upstream, control conditions, may indicate negative effects of a discharge (Stevenson and Bahls 1999) and may constitute 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.

(7) 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..

Appendix D

Chain of Custody

Florida Department of Environmental Protection										Event ID *	
Central Laboratory Sample Submittal Form											
Request Number: RQ-2011-10-10-22 Mosaic Wingate Creek Fifth Year Sampling				Requester: Jacquelyn M. Champion				Field Report Prepared By: <u>Jacki Champion</u>			
Customer: BMR-TAMPA				Collected By: <u>Jacki Champion / Melani Dickerson</u>				Send Final Report To: Vishwas Sathe			
Project ID: FY15				Sampling Agency: <u>FDEP</u>							
PMAS:											
Lab ID *	Location <u>Mosaic Wingate</u>			☐ Comp	Collection (begin)		☒ Grab	Collection (end)		Bottle Group(s)**	
Field ID	<u>Outfall D-002</u>			Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)		Storet Station Number				
Matrix (include type e.g. Salt, Fresh, etc)	<u>Fresh Water</u>			Temp (C)	pH		Sample Depth ☐ m ☐ ft		Salinity (PPTH)		NPDES Number
Latitude	☐ dd ☐ dms			Longitude	☐ dd ☐ dms			Comments			
Lab ID *	Location <u>Mosaic Wingate</u>			☐ Comp	Collection (begin)		☒ Grab	Collection (end)		Bottle Group(s)**	
Field ID	<u>Outfall D-002 (Bioassay)</u>			Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)		Storet Station Number				
Matrix (include type e.g. Salt, Fresh, etc)	<u>Fresh Water</u>			Temp (C)	pH		Sample Depth ☐ m ☐ ft		Salinity (PPTH)		NPDES Number
Latitude	☐ dd ☐ dms			Longitude	☐ dd ☐ dms			Comments			
Lab ID *	Location <u>Mosaic Wingate</u>			☐ Comp	Collection (begin)		☒ Grab	Collection (end)		Bottle Group(s)**	
Field ID	<u>Control Site</u>			Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)		Storet Station Number				
Matrix (include type e.g. Salt, Fresh, etc)	<u>Fresh Water</u>			Temp (C)	pH		Sample Depth ☒ m ☐ ft		Salinity (PPTH)		NPDES Number
Latitude	☐ dd ☐ dms			Longitude	☐ dd ☐ dms			Comments			
Lab ID *	Location <u>Mosaic Wingate</u>			☐ Comp	Collection (begin)		☒ Grab	Collection (end)		Bottle Group(s)**	
Field ID	<u>Test Site</u>			Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)		Storet Station Number				
Matrix (include type e.g. Salt, Fresh, etc)	<u>Fresh Water</u>			Temp (C)	pH		Sample Depth ☒ m ☐ ft		Salinity (PPTH)		NPDES Number
Latitude	☐ dd ☐ dms			Longitude	☐ dd ☐ dms			Comments			
Relinquished By: <u>J. Champion</u> Date/Time: <u>10/3/11 1:30</u> Shipping Method: <u>Fed Ex</u> Received By: <u>ABJ</u> Date/Time: <u>10/4/11 09:30</u>											

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Page 1 of 4

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2011-10-10-22

Mosaic Wingate Creek Fifth Year Sampling

Requester: Jacquelyn M. Champion

Field Report Prepared By: Jochi Champion

Customer: BMR-TAMPA

Collected By: Jochi Champion / Melani Dickenson

Send Final Report To: Vishwas Sathe

Project ID: FYI5

Sampling Agency: FDEP

PMAS:

Lab ID *	Location <u>Mosaic Wingate</u>		☐ Comp ☒ Grab	Collection (begin) Date <u>10/31</u> Time <u>10:25</u>	Eastern Central	Collection (end) Date _____ Time _____	Eastern Central	Bottle Group(s)**
Field ID	<u>Blank</u>		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 (PPT) ☐ Sp Conductance (umho/cm)		NPDES Number		D
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms		Comments <u>Added BUA's + Pesticide Blanks</u>					
Lab ID *	Location		☐ Comp ☐ Grab	Collection (begin) Date _____ Time _____	Eastern Central	Collection (end) Date _____ Time _____	Eastern Central	Bottle Group(s)**
Field ID			Tot Res Chlorine (mg/L)		Diss Oxygen (mg/L)		Storet Station Number	
Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPT) ☐ Sp Conductance (umho/cm)		NPDES Number		
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms		Comments					
Lab ID *	Location		☐ Comp ☐ Grab	Collection (begin) Date _____ Time _____	Eastern Central	Collection (end) Date _____ Time _____	Eastern Central	Bottle Group(s)**
Field ID			Tot Res Chlorine (mg/L)		Diss Oxygen (mg/L)		Storet Station Number	
Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPT) ☐ Sp Conductance (umho/cm)		NPDES Number		
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms		Comments					
Lab ID *	Location		☐ Comp ☐ Grab	Collection (begin) Date _____ Time _____	Eastern Central	Collection (end) Date _____ Time _____	Eastern Central	Bottle Group(s)**
Field ID			Tot Res Chlorine (mg/L)		Diss Oxygen (mg/L)		Storet Station Number	
Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth ☐ m ☐ ft	☐ Salinity (PPT) ☐ Sp Conductance (umho/cm)		NPDES Number		
Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms		Comments					

Relinquished By: <u>J. Champion</u>	Date/Time: <u>10/31/11</u>	Shipping Method: <u>Fed Ex</u>	Received By: <u>ABR</u>	Date/Time: <u>10/31/11</u>	Relinquished By:	Date/Time:	Received By:	Date/Time:
-------------------------------------	----------------------------	--------------------------------	-------------------------	----------------------------	------------------	------------	--------------	------------

Shaded Areas for Lab use only.

last revised October 1, 2003

Page 1 of 4

** Please see reverse side for Bottle Group information.

Florida Department of Environmental Protection

Event ID *

Request Number: RQ-2011-10-10-22

Central Laboratory Sample Submittal Form

Mosaic Wingate Creek Fifth Year Sampling

Requester: Jacquelyn M. Champion

Field Report Prepared By: Jackie Champion

Customer: BMR-TAMPA

Collected By: Jackie Champion / Melani Dickenson

Send Final Report To: Vishwas Sathe

Project ID: FY15

Sampling Agency: FDEP

PMAS:

Lab ID *	Location: Mosaic Wingate		☐ Comp ☒ Grab		Collection (begin) Date: 10/12/11 Time: 12:00	Collection (end) Date: 10/12/11 Time: 10:15	Bottle Group(s)**
	Field ID: Test Site		Tot Res Chlorine (mg/L)		Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (include type e.g. Salt, Fresh, etc): Fresh Inverts	Temp (C): 25.70	pH: 7.63	Sample Depth: 545	Salinity (PPT):	NPDES Number	
	Latitude: N27°27'34.7" dd dms	Longitude: W82°08'46.1" dd dms	Comments: SCI - NO SAMPLE				
Lab ID *	Location: Mosaic Wingate		☐ Comp ☒ Grab		Collection (begin) Date: 9/14/11 Time: 12:00	Collection (end) Date: 10/12/11 Time: 10:15	Bottle Group(s)**
	Field ID: Test Site		Tot Res Chlorine (mg/L)		Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (include type e.g. Salt, Fresh, etc): Fresh Inverts	Temp (C): 25.70	pH: 7.63	Sample Depth: 545	Salinity (PPT):	NPDES Number	
	Latitude: N27°27'34.7" dd dms	Longitude: W82°08'46.1" dd dms	Comments: Hester Dendy #1				
Lab ID *	Location: Mosaic Wingate		☐ Comp ☒ Grab		Collection (begin) Date: 9/14/11 Time: 12:00	Collection (end) Date: 10/12/11 Time: 10:15	Bottle Group(s)**
	Field ID: Test Site		Tot Res Chlorine (mg/L)		Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (include type e.g. Salt, Fresh, etc): Fresh Inverts	Temp (C): 25.70	pH: 7.63	Sample Depth: 545	Salinity (PPT):	NPDES Number	
	Latitude: N27°27'34.7" dd dms	Longitude: W82°08'46.1" dd dms	Comments: Hester Dendy #2				
Lab ID *	Location: Mosaic Wingate		☐ Comp ☒ Grab		Collection (begin) Date: 9/14/11 Time: 12:00	Collection (end) Date: 10/12/11 Time: 10:15	Bottle Group(s)**
	Field ID: Test Site		Tot Res Chlorine (mg/L)		Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (include type e.g. Salt, Fresh, etc): Fresh Inverts	Temp (C): 25.70	pH: 7.63	Sample Depth: 545	Salinity (PPT):	NPDES Number	
	Latitude: N27°27'34.7" dd dms	Longitude: W82°08'46.1" dd dms	Comments: Hester Dendy #3				
Relinquished By: A. Champion	Date/Time: 10/12/11 1:30	Shipping Method: Fed Ex	Received By: ABP	Date/Time: 10-12-11 09:10	Relinquished By:	Date/Time:	Received By:

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Page 1 of 4

Florida Department of Environmental Protection

Request Number: RQ-2011-10-10-22

Mosaic Wingate Creek Fifth Year Sampling

Central Laboratory Sample Submittal Form

Event ID *

Requester: Jacquelyn M. Champion

Field Report Prepared By: Jochi Champion

Customer: BMR-TAMPA

Collected By: Jochi Champion / Melani Delmon

Send Final Report To: Vishwas Sathe

Project ID: FYI5

PMAS:

Sampling Agency: FDEP

Lab ID *	Location: Mosaic Wingate		☒ Comp		Collection (begin)		☒ Eastern		Collection (end)		☒ Eastern		Bottle Group(s)**	
	Field ID: Control Site		☒ Grab		Date: 10/12/11 Time: 1:15pm		Date: 10/12/11 Time: 11:10							
	Matrix (include type e.g. Salt, Fresh, etc): Fresh inverts		Temp (C): 24.21		pH: 7.33		Tot Res Chlorine (mg/L): 5.25		Diss Oxygen (mg/L): 2.11		Storet Station Number:			
	Latitude: N27°27'44.9"		Longitude: W82°09'10.4"		Sample Depth: ☐ m ☐ ft		☐ Salinity (PPTH)		☒ Sp Conductance (umho/cm)		NPDES Number:			
	☐ dd ☐ dms		☐ dd ☐ dms		Comments: SCI - No Sample									
Lab ID *	Location: Mosaic Wingate		☒ Comp		Collection (begin)		☒ Eastern		Collection (end)		☒ Eastern		Bottle Group(s)**	
	Field ID: Control Site		☐ Grab		Date: 9/14/11 Time: 1:15pm		Date: 10/12/11 Time: 11:10							
	Matrix (include type e.g. Salt, Fresh, etc): Fresh inverts		Temp (C): 24.21		pH: 7.33		Tot Res Chlorine (mg/L): 5.25		Diss Oxygen (mg/L): 2.11		Storet Station Number:			
	Latitude: N27°27'44.9"		Longitude: W82°09'10.4"		Sample Depth: ☐ m ☐ ft		☐ Salinity (PPTH)		☒ Sp Conductance (umho/cm)		NPDES Number:			
	☐ dd ☐ dms		☐ dd ☐ dms		Comments: Hester Dendy #1									
Lab ID *	Location: Mosaic Wingate		☒ Comp		Collection (begin)		☒ Eastern		Collection (end)		☒ Eastern		Bottle Group(s)**	
	Field ID: Control Site		☐ Grab		Date: 9/14/11 Time: 1:15pm		Date: 10/12/11 Time: 11:10							
	Matrix (include type e.g. Salt, Fresh, etc): Fresh inverts		Temp (C): 24.21		pH: 7.33		Tot Res Chlorine (mg/L): 5.25		Diss Oxygen (mg/L): 2.11		Storet Station Number:			
	Latitude: N27°27'44.9"		Longitude: W82°09'10.4"		Sample Depth: ☐ m ☐ ft		☐ Salinity (PPTH)		☒ Sp Conductance (umho/cm)		NPDES Number:			
	☐ dd ☐ dms		☐ dd ☐ dms		Comments: Hester Dendy #2									
Lab ID *	Location: Mosaic Wingate		☒ Comp		Collection (begin)		☒ Eastern		Collection (end)		☒ Eastern		Bottle Group(s)**	
	Field ID: Control Site		☐ Grab		Date: 9/14/11 Time: 1:15pm		Date: 10/12/11 Time: 11:10							
	Matrix (include type e.g. Salt, Fresh, etc): Fresh inverts		Temp (C): 24.21		pH: 7.33		Tot Res Chlorine (mg/L): 5.25		Diss Oxygen (mg/L): 2.11		Storet Station Number:			
	Latitude: N27°27'44.9"		Longitude: W82°09'10.4"		Sample Depth: ☐ m ☐ ft		☐ Salinity (PPTH)		☒ Sp Conductance (umho/cm)		NPDES Number:			
	☐ dd ☐ dms		☐ dd ☐ dms		Comments: Hester Dendy #3									
Relinquished By:	Date/Time:	Shipping Method:	Received By:	Date/Time:	Relinquished By:	Date/Time:	Received By:	Date/Time:						
J. Champion	10/12/11 1:30	FedEx	ABP	10/12/11 09:10										

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

Page 1 of 4

Appendix E

Physical/Chemical and Habitat Assessment field sheets

DEP-SOP-001/01: Form FD 9000-3
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SAMPLE ID: _____ ORG ID: _____ Latitude: _____ Longitude: _____
 COUNTY: Alameda STORET #: _____ (degrees) (minutes) (seconds) (degrees) (minutes) (seconds)
 DATE: 9/14/11 TIME: _____
 SITE NAME: Johnson Creek @ 64 SAMPLE COMPLETE? _____
 FIELD ID/NAME: Test Site RECEIVING BODY OF WATER: Myakkae

RIPARIAN ZONE / STREAM FEATURES

PREDOMINANT LAND-USE IN WATERSHED (specify relative percent in each category): Road
 Forest/Natural silviculture Field/Pasture Agricultural Residential Commercial Industry Other (Specify) _____
 Local Watershed Erosion (select one): ☐ None ☒ Slight ☐ Moderate ☐ Heavy
 Local Watershed NPS Pollution: ☐ No evidence ☐ Slight ☒ Moderate ☐ Heavy
 Width of Riparian Vegetation (m) on Each Buffer Side
 Left Bank: 200 Right Bank: 15
 High Water Mark: 1.5 + 0.5 = 2.0 Artificially Impounded ☐ Yes ☒ No
 (m) (above present water level) (present depth) (above bed)
 Artificially ☒ No ☐ Mostly recovered, more sinuous
 Channelized: ☐ Some recovery ☐ 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 Clay
☐ Sludge Sand Smothering: ☐ None ☐ Slight ☒ Moderate ☐ Severe
☐ Silt Smothering: ☐ None ☐ Slight ☒ Moderate ☐ Severe
☐ Other (Specify): _____

SUBSTRATE TYPE

Assessment Tool: ☒ SCI ☐ BioRecon
☐ LCI ☐ LVI INVERT PERI
 % # Times # Times
 Coverage Sampled Sampled
 Woody Debris (Snags) 17 3 3
 Undercut Banks / Roots 3 3 3
 Leaf Packs or Mat 3 3 3
 Aquatic Vegetation 4 3 3
 Rock or Shell Rubble... 4 3 3
 Sand..... 63 3 3
 Mud / Muck / Silt 3 3 3
 Other 3 3 3
 Other 3 3 3

WATER QUALITY

Depth (M) Temp. (°C) pH (SU) D.O. (MG/L) Cond. (UMHO/CM) Salinity (PPT) SECCHI (M)
 Top: _____
 Mid-Depth: _____
 Bottom: _____
 Water Surface Oils: ☒ None ☐ Sheen ☐ Globbs ☐ Slick
 Water Odors: ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical
☐ Other (Specify): _____
 Water Sample Taken? ☐ Yes ☒ No
 Algae Sample Taken? ☐ Yes ☒ No
 Clarity ☒ Clear ☐ Slightly Turbid ☐ Turbid ☐ Opaque
 Color ☒ Tannic ☐ Green (Algae)
☐ Clear ☐ Other (Specify): _____

WEATHER CONDITIONS / NOTES:
Put out HDS @ 12:00pm / Noon
☐ The antecedent hydrologic conditions have been met to my best knowledge.
 Water samples preserved? ☐ Yes ☐ pH < 2 ☐ No Algae samples preserved? ☐ Yes ☐ No

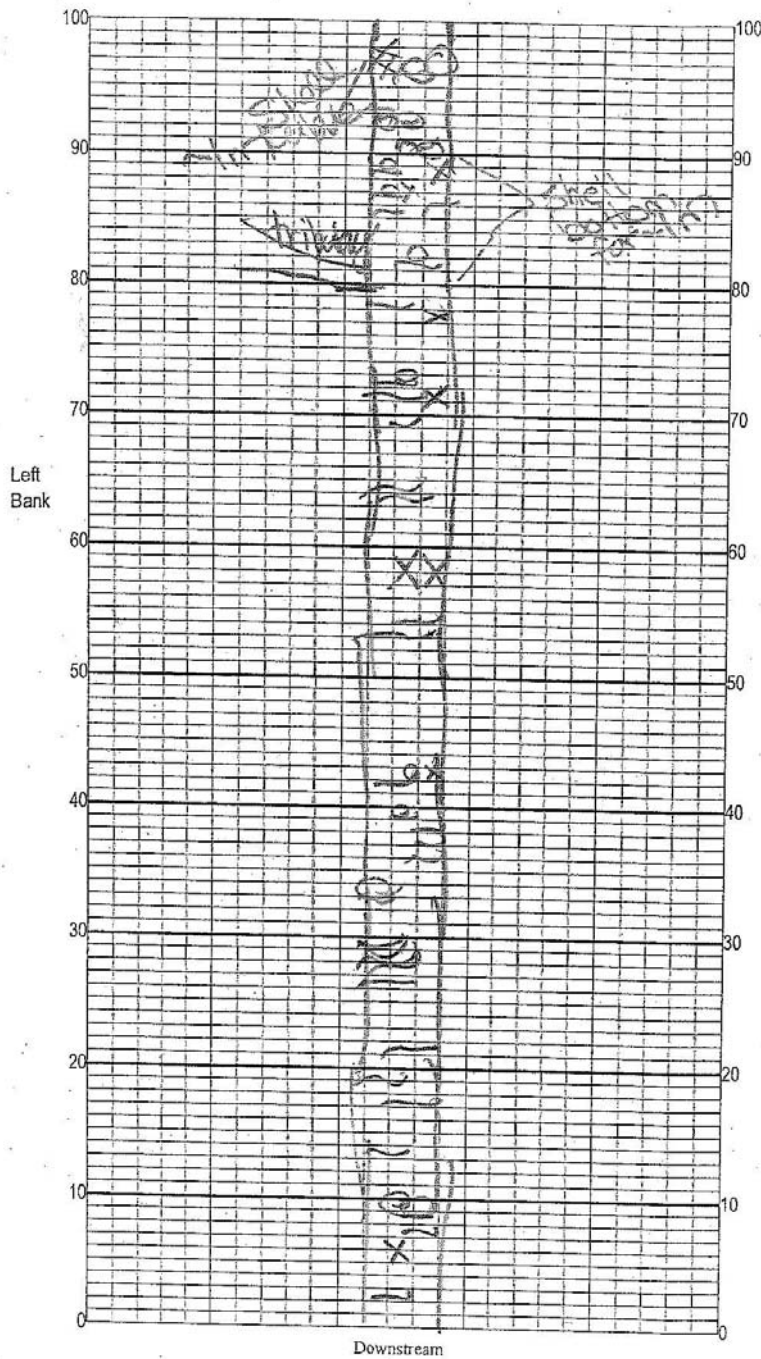
ABUNDANCE

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

SAMPLING TEAM: Jodi Champion / Melani Odenton SIGNATURE: Jodi Champion DATE: 9/14/11

Revision Date: September 5, 2008

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



Substrates: Code key, draw proportionate habitat abundance.

	Shags	50
	Roots/undercut banks	10 (most out of 100)
	Leaf Packs (or mats)	10
	Aquatic Macrophytes	
	Shell Rubble	14

Velocity:
Note where velocity measures were taken.

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

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

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

Downstream

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

Revision Date: September 10, 2008

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

SUBMITTING AGENCY CODE: _____		STORET STATION NUMBER: _____	DATE (mm/dd/yyyy): 9/14/11	RECEIVING BODY OF WATER: Myakka River
SUBMITTING AGENCY NAME: _____		COUNTY: Manatee	LOCATION: Johnson Creek #64	FIELD ID/NAME: Test Site
REMARKS: _____				

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components	Four or more productive habitats present (snags, tree roots, aquatic vegetation, leaf packs (partially decayed), rock)	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags)	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered
Substrate Diversity 18	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Substrate Availability 16/14	Greater than 30% productive habitat present at site	16% to 30% productive habitat, by aerial extent	6% to 15% productive habitat	Less than 5% productive habitat
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Water Velocity 19	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec	Max. observed at typical transect: > 0.1 to 0.25 m/sec	Max. observed at typical transect: 0.05 to 0.1 m/sec	Max. observed at typical transect: < 0.05 m/sec; or spate occurring: > 1 m/sec
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Habitat Smothering 16	Adequate number of pools (1-2 per 12 times width) and < 25% of habitats affected by sand or silt accumulation.	Adequate number of pools (1-2 per 12 times width) and > 25% of habitats affected by sand or silt accumulation.	Does not have required number of pools (1-2 per 12 times width) and/or has shallow pools (< 2 times prevailing depth).	Pools are absent. Most habitats affected by sand or silt accumulation.
Primary Score 67	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Secondary Habitat Components	Good sinuosity. No evidence of dredging or artificial straightening. No spoil banks. Diversity of depths.	Good sinuosity within old channelized area and a diversity of depths. Evidence of dredging in the past (> 10 yrs) but mostly recovered.	Some sinuosity developed within channelized area or some diversity of depth, but typically no pools (> 2 times prevailing depth) present.	Straightened with spoil banks. Box-cut, monotypic depth.
Artificial Channelization 18	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Bank Stability	Bankfull > 60% of bank height. Slope of bank < 60°. Bankfull is within or above the root zone with few raw, eroded areas.	Only meets 2 of the 3 requirements for optimal bank stability.	Only meets 1 of the 3 requirements for optimal bank stability.	Bankfull < 60% of bank height. Slope of bank > 60°. Bankfull is below the root zone with raw, eroded areas.
Right Bank 5	10 9	8 7 6	5 4	3 2 1
Left Bank 5				
Riparian Buffer Zone Width	Width of vegetation greater than 18 m	Width of vegetation > 12 to 18 m	Width of vegetation 6 to 12 m. human activities still close to system	Less than 6 m of buffer zone due to intensive human activities
Right Bank 4	10 9	8 7 6	5 4	3 2 1
Left Bank 10				
Riparian Zone Vegetation Quality	Over 80% of riparian surfaces consist of normal, expected plant community for given sunlight & habitat conditions (e.g., native plants, trees, understory shrubs, or non-woody macrophytes). Minimal disturbance.	> 50% to 80% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Some disruption in community observed.	25% to 50% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Disruption obvious.	Less than 25% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions).
Right Bank 10	10 9	8 7 6	5 4	3 2 1
Left Bank 10				
Secondary Score 62				

TOTAL SCORE 129

Date: 9/14/11	Analyst: John Chapman	Signature: John Chapman
---------------	-----------------------	-------------------------

DEP-SOP-001/01: Form FD 9000-3
PHYSICAL/CHEMICAL CHARACTERIZATION FIELD SHEET

SAMPLE ID: _____ ORG ID: _____ Latitude: _____ Longitude: _____
COUNTY: Maricopa STORET #: _____ (degrees) (minutes) (seconds) (degrees) (minutes) (seconds)
DATE: 9/14/11 TIME: _____
SITE NAME: Johnson Creek @ Logue Rd SAMPLE COMPLETE? _____
FIELD ID/NAME: Control Site RECEIVING BODY OF WATER: Myakka 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) _____
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: 78 Right Bank: 78
High Water Mark: 1.0 + 0.2 = 1.2 Artificially Impounded ☐ Yes ☒ No
(m) (above present water level) (present depth) (above bed)
Artificially ☒ No ☐ Mostly recovered, more sinuous
Channelized: ☐ Some recovery ☐ Recent, severe
Canopy Cover %: ☐ Open ☐ Lightly Shaded (11-45%)
☐ Heavily Shaded ☒ Moderate Shaded (46-80%)
Typical Width (m) Depth (m)/Velocity (m/sec) Transect 2 m wide
0.3 m/s 0.3 m/s 0.1 m/s
0.2 m deep 0.3 m deep 0.1 m deep

SEDIMENT / SUBSTRATE

Sediment Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse
Sediment Odors ☐ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☒ Anaerobic
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 INVERT PERI
% Coverage # Times Sampled # Times Sampled
Woody Debris (Snags) 11
Undercut Banks / Roots 20
Leaf Packs or Mat 41
Aquatic Vegetation
Rock or Shell Rubble.....
Sand..... 69
Mud / Muck / Silt
Other
Other
WATER QUALITY
Depth (M) Temp. (°C) pH (SU) D.O. (MG/L) Cond. (UMHO/CM) Salinity (PPT) SECCHI (M)
Top: _____
Mid-Depth: _____
Bottom: _____
Water Surface Oils: ☒ None ☐ Sheen ☐ Globbs ☐ Stick
Water Odors: ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical
Other (Specify): _____
Water Sample Taken? ☐ Yes ☐ No
Algae Sample Taken? ☐ Yes ☐ No
Clarity ☒ Clear ☐ Slightly Turbid ☐ Turbid ☐ Opaque
SYSTEM TYPE ☒ Stream ☐ Lake
☐ Wetland ☐ Estuary
Other (Specify): _____
Color ☒ Tannic ☐ Green (Algae)
☐ Clear ☐ Other (Specify): _____

WEATHER CONDITIONS / NOTES:

Lots of frogs. Big, Smelly, dead, dismembered gator @ bridge E.W.W.
☐ The antecedent hydrologic conditions have been met to my best knowledge.
Water samples preserved? ☐ Yes ☐ pH<2 ☐ No Algae samples preserved? ☐ Yes ☐ No
ABUNDANCE
Periphyton: ☐ Absent ☐ Rare ☒ Common ☐ Abundant
Fish: ☐ ☐ ☒ ☒
Aquatic Macrophytes: ☒ ☐ ☐ ☐
Iron/Sulfur Bacteria: ☒ ☐ ☐ ☐

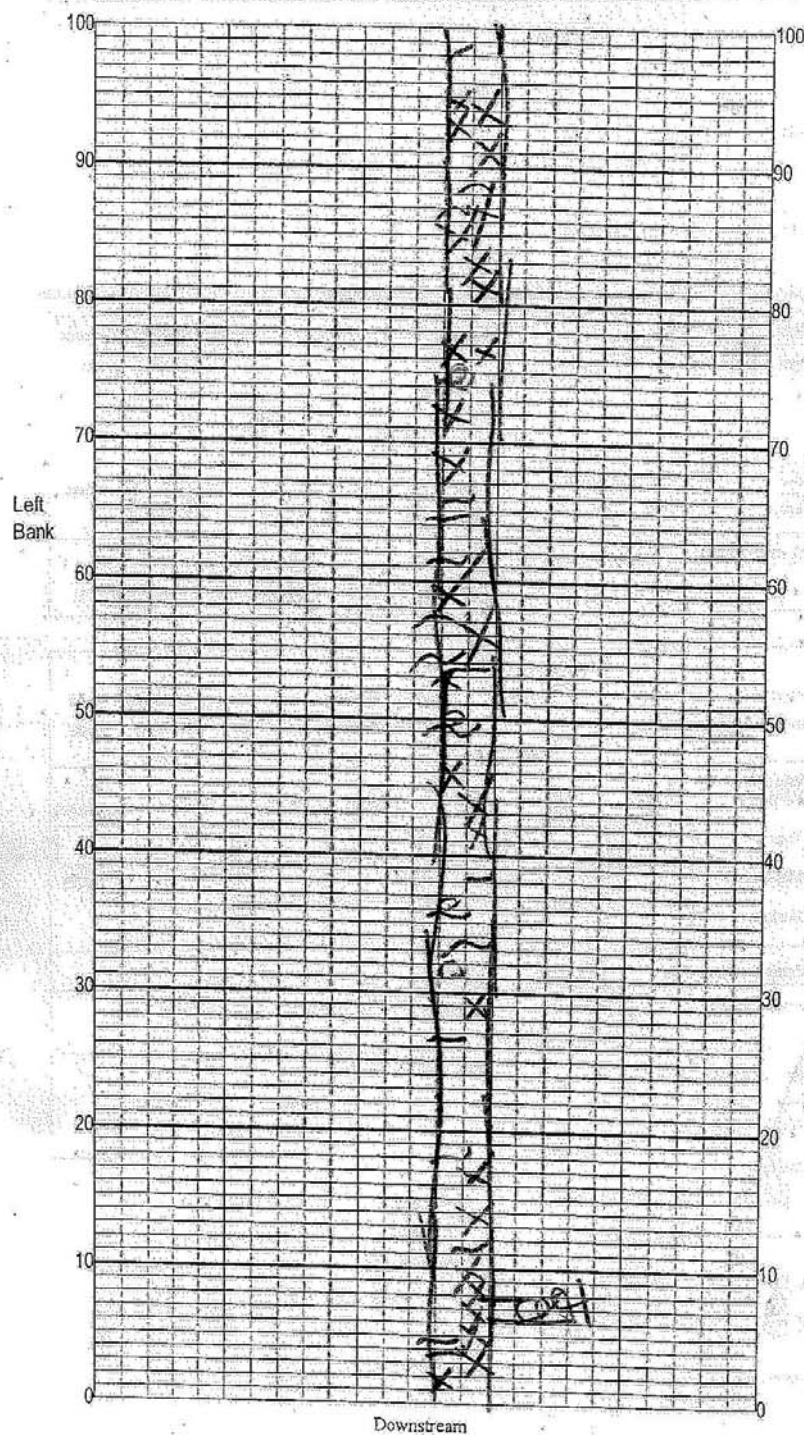
SAMPLING TEAM: Jaceli Champion / Melani Delon SIGNATURE: Jaceli Champion DATE: 9/14/11

Revision Date: September 5, 2008

Set out HD's.
@ 1:15pm.

35
353

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



Substrates: Code key, draw proportionate habitat abundance.

☐ Snags *22*

☒ Roots/undercut banks *39*

☒ Leaf Packs (or mats) *12*

☐ Aquatic Macrophytes *Not enough for map*

☐

☐

☐

Velocity:
Note where velocity measures were taken.

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

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

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

upstream

200

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

Revision Date: September 10, 2008

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

SUBMITTING AGENCY CODE: _____		STORET STATION NUMBER: _____	DATE: 9/14/11	RECEIVING BODY OF WATER: Malakka River
SUBMITTING AGENCY NAME: _____				
REMARKS: _____	COUNTY: Manatee	LOCATION: Johnson Creek @ Hogue Rd	FIELD ID/NAME: Control Site	

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components	Four or more productive habitats present (snags, tree roots, aquatic vegetation, leaf packs (partially decayed), rock)	Three productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags)	Two productive habitats present. Less than desirable habitat, frequently disturbed or removed	One or less productive habitat. Lack of habitat is obvious, substrates unstable or smothered
Substrate Diversity 10	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Substrate Availability 16	Greater than 30% productive habitat present at site	16% to 30% productive habitat, by aerial extent	6% to 15% productive habitat	Less than 5% productive habitat
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Water Velocity 17	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec	Max. observed at typical transect: > 0.1 to 0.25 m/sec	Max. observed at typical transect: 0.05 to 0.1 m/sec	Max. observed at typical transect: < 0.05 m/sec, or spate occurring: > 1 m/sec
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Habitat Smothering 19	Adequate number of pools (1-2 per 12 times width) and <25% of habitats affected by sand or silt accumulation.	Adequate number of pools (1-2 per 12 times width) and >25% of habitats affected by sand or silt accumulation.	Does not have required number of pools (1-2 per 12 times width) and/or has shallow pools (<2 times prevailing depth).	Pools are absent. Most habitats affected by sand or silt accumulation.
Primary Score 63	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Secondary Habitat Components	Good sinuosity. No evidence of dredging or artificial straightening. No spoil banks. Diversity of depths.	Good sinuosity within old channelized area and a diversity of depths. Evidence of dredging in the past (>10 yrs) but mostly recovered.	Some sinuosity developed within channelized area or some diversity of depth, but typically no pools (>2 times prevailing depth) present.	Straightened with spoil banks. Box-cut, monotypic depth.
Artificial Channelization 20	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Bank Stability	Bankfull > 60% of bank height. Slope of bank < 60°. Bankfull is within or above the root zone with few raw, eroded areas.	Only meets 2 of the 3 requirements for optimal bank stability.	Only meets 1 of the 3 requirements for optimal bank stability.	Bankfull < 60% of bank height. Slope of bank > 60°. Bankfull is below the root zone with raw, eroded areas.
Right Bank 66	10 9	8 7 6	5 4	3 2 1
Left Bank				
Riparian Buffer Zone Width	Width of vegetation greater than 18 m	Width of vegetation >12 to 18m	Width of vegetation 8 to 12 m. human activities still close to system	Less than 6 m of buffer zone due to intensive human activities
Right Bank 10	10 9	8 7 6	5 4	3 2 1
Left Bank 10				
Riparian Zone Vegetation Quality	Over 80% of riparian surfaces consist of normal, expected plant community for given sunlight & habitat conditions (e.g., native plants, trees, understory shrubs, or non-woody macrophytes). Minimal disturbance.	>50% to 80% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Some disruption in community observed.	25% to 50% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Disruption obvious.	Less than 25% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions).
Right Bank 10	10 9	8 7 6	5 4	3 2 1
Left Bank 10				
Secondary Score 72				

134 + 35 = TOTAL SCORE

Date: 9/14/11	Analyst: Jechi Champion	Signature: Jechi Champion
---------------	-------------------------	---------------------------

Appendix F
Chemical analysis of effluent and receiving water

Date Sampled	UDL	SCH Group	Component	Value	Qualifier	Units Word	Result	MDL	PQL
10/3/2011 11:00	Effluent	AGP/LN	Algal Growth Potential	8.96	A	mg DryWt/L		0.1	0.3
10/3/2011 11:00	Effluent	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	7.2		ug/L		0.55	1.7
10/3/2011 11:00	Effluent	Chlorophyll/Grain Size/BOD	Phaeophytin-a	4.3		ug/L		0.4	1.2
10/3/2011 11:00	Effluent	Field Parameter	Dissolved Oxygen	5.86		mg/L			
10/3/2011 11:00	Effluent	Field Parameter	pH	7.66					
10/3/2011 11:00	Effluent	Field Parameter	Specific Conductance	624		umhos/cm			
10/3/2011 11:00	Effluent	Field Parameter	Temperature	27.09		C			
10/3/2011 11:00	Effluent	Metals	Aluminum	101		ug/L		5	20
10/3/2011 11:00	Effluent	Metals	Arsenic	4.9		ug/L		0.25	1
10/3/2011 11:00	Effluent	Metals	Cadmium	0.05	U	ug/L		0.05	0.2
10/3/2011 11:00	Effluent	Metals	Calcium	57.4		mg/L		0.075	0.3
10/3/2011 11:00	Effluent	Metals	Chromium	1.2		ug/L		0.3	1.2
10/3/2011 11:00	Effluent	Metals	Copper	0.5	U	ug/L		0.5	1
10/3/2011 11:00	Effluent	Metals	Iron	85	I	ug/L		30	120
10/3/2011 11:00	Effluent	Metals	Lead	0.2	U	ug/L		0.2	0.8
10/3/2011 11:00	Effluent	Metals	Magnesium	26.5		mg/L		0.04	0.16
10/3/2011 11:00	Effluent	Metals	Nickel	1.8		ug/L		0.25	1
10/3/2011 11:00	Effluent	Metals	Selenium	1.19		ug/L		0.2	0.8
10/3/2011 11:00	Effluent	Metals	Silver	0.025	U	ug/L		0.025	0.1
10/3/2011 11:00	Effluent	Metals	Sodium	35.1		mg/L		0.5	2
10/3/2011 11:00	Effluent	Metals	Zinc	5	U	ug/L		5	20
10/3/2011 11:00	Effluent	Nutrients	Alkalinity	76		mg CaCO3/L		0.65	2.5
10/3/2011 11:00	Effluent	Nutrients	Ammonia-N	0.11		mg N/L		0.01	0.02
10/3/2011 11:00	Effluent	Nutrients	Chloride	9.5		mg Cl/L		1	2.5
10/3/2011 11:00	Effluent	Nutrients	Fluoride	0.54		mg F/L		0.035	0.1
10/3/2011 11:00	Effluent	Nutrients	Kjeldahl Nitrogen	1.1		mg N/L		0.08	0.2
10/3/2011 11:00	Effluent	Nutrients	NO2NO3-N	0.033		mg N/L		0.004	0.01
10/3/2011 11:00	Effluent	Nutrients	O-Phosphate-P	0.17		mg P/L		0.004	0.01
10/3/2011 11:00	Effluent	Nutrients	Sulfate	210		mg SO4/L		1	2.5
10/3/2011 11:00	Effluent	Nutrients	TDS	435		mg/L		15	25
10/3/2011 11:00	Effluent	Nutrients	Total-P	0.26		mg P/L		0.005	0.05
10/3/2011 11:00	Effluent	Nutrients	TSS	5	I	mg/L		2	10
10/3/2011 11:00	Effluent	Nutrients	Turbidity	2.1		NTU		0.1	0.1
10/3/2011 11:00	Effluent	Overflow	Alpha, Total	1.9	U	pCi/L			
10/3/2011 11:00	Effluent	Overflow	Alpha-Counting Error	1.2		pCi/L			
10/3/2011 11:00	Effluent	Overflow	Oil and Grease	0.7	U	mg/L		0.7	2.5
10/3/2011 11:00	Effluent	Overflow	Radium 226	0.3		pCi/L			
10/3/2011 11:00	Effluent	Overflow	Radium 226-Counting Error	0.1		pCi/L			

Date Sampled	UDL	SCH Group	Component	Value	Qualifier	Units	Word	Result	MDL	PQL
10/3/2011 11:00	Effluent	Overflow	Radium 228	0.9	U	pCi/L				
10/3/2011 11:00	Effluent	Overflow	Radium 228-Counting Error	0.5		pCi/L				
10/3/2011 11:00	Effluent	Pesticides	Alachlor	0.57	U	ug/L			0.57	2.3
10/3/2011 11:00	Effluent	Pesticides	Ametryn	0.048	U	ug/L			0.048	0.19
10/3/2011 11:00	Effluent	Pesticides	Atrazine	0.048	U	ug/L			0.048	0.19
10/3/2011 11:00	Effluent	Pesticides	Azinphos Methyl	0.19	U	ug/L			0.19	0.76
10/3/2011 11:00	Effluent	Pesticides	Bromacil	0.19	U	ug/L			0.19	0.76
10/3/2011 11:00	Effluent	Pesticides	Butylate	0.19	U	ug/L			0.19	0.76
10/3/2011 11:00	Effluent	Pesticides	Chlorpyrifos Ethyl	0.048	U	ug/L			0.048	0.19
10/3/2011 11:00	Effluent	Pesticides	Chlorpyrifos Methyl	0.095	U	ug/L			0.095	0.38
10/3/2011 11:00	Effluent	Pesticides	Diazinon	0.048	U	ug/L			0.048	0.19
10/3/2011 11:00	Effluent	Pesticides	Ethion	0.048	U	ug/L			0.048	0.19
10/3/2011 11:00	Effluent	Pesticides	Ethoprop	0.095	U	ug/L			0.095	0.38
10/3/2011 11:00	Effluent	Pesticides	Fenamiphos	0.19	U	ug/L			0.19	0.76
10/3/2011 11:00	Effluent	Pesticides	Fonofos	0.095	U	ug/L			0.095	0.38
10/3/2011 11:00	Effluent	Pesticides	Hexazinone	0.095	U	ug/L			0.095	0.38
10/3/2011 11:00	Effluent	Pesticides	Malathion	0.14	U	ug/L			0.14	0.57
10/3/2011 11:00	Effluent	Pesticides	Metalaxyl	0.24	U	ug/L			0.24	0.95
10/3/2011 11:00	Effluent	Pesticides	Metolachlor	0.48	U	ug/L			0.48	1.9
10/3/2011 11:00	Effluent	Pesticides	Metribuzin	0.095	U	ug/L			0.095	0.38
10/3/2011 11:00	Effluent	Pesticides	Mevinphos	0.19	U	ug/L			0.19	0.76
10/3/2011 11:00	Effluent	Pesticides	Naled	0.76	U	ug/L			0.76	3.1
10/3/2011 11:00	Effluent	Pesticides	Norflurazon	0.14	U	ug/L			0.14	0.57
10/3/2011 11:00	Effluent	Pesticides	Parathion Ethyl	0.14	U	ug/L			0.14	0.57
10/3/2011 11:00	Effluent	Pesticides	Parathion Methyl	0.095	U	ug/L			0.095	0.38
10/3/2011 11:00	Effluent	Pesticides	Phorate	0.048	U	ug/L			0.048	0.19
10/3/2011 11:00	Effluent	Pesticides	Prometryn	0.14	U	ug/L			0.14	0.57
10/3/2011 11:00	Effluent	Pesticides	Simazine	0.048	U	ug/L			0.048	0.19
10/3/2011 11:00	Effluent	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.96	U	ug/L			0.96	3.8
10/3/2011 11:00	Effluent	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.96	U	ug/L			0.96	3.8
10/3/2011 11:00	Effluent	Priority Organic Pollutants	2,4-Dichlorophenol	0.96	U	ug/L			0.96	3.8
10/3/2011 11:00	Effluent	Priority Organic Pollutants	2,4-Dimethylphenol	9.6	U	ug/L			9.6	38
10/3/2011 11:00	Effluent	Priority Organic Pollutants	2,4-Dinitrophenol	14	U	ug/L			14	58
10/3/2011 11:00	Effluent	Priority Organic Pollutants	2,4-Dinitrotoluene	0.96	U	ug/L			0.96	3.8
10/3/2011 11:00	Effluent	Priority Organic Pollutants	2,6-Dinitrotoluene	0.96	U	ug/L			0.96	3.8
10/3/2011 11:00	Effluent	Priority Organic Pollutants	2-Chloronaphthalene	0.96	U	ug/L			0.96	3.8
10/3/2011 11:00	Effluent	Priority Organic Pollutants	2-Chlorophenol	0.96	U	ug/L			0.96	3.8
10/3/2011 11:00	Effluent	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L			2.9	12
10/3/2011 11:00	Effluent	Priority Organic Pollutants	2-Nitrophenol	0.96	U	ug/L			0.96	3.8
10/3/2011 11:00	Effluent	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38	U	ug/L			38	150
10/3/2011 11:00	Effluent	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.96	U	ug/L			0.96	3.8
10/3/2011 11:00	Effluent	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.96	U	ug/L			0.96	3.8

Date Sampled	UDL	SCH Group	Component	Value	Qualifier	Units	Word	Result	MDL	PQL
10/3/2011 11:00	Effluent	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L			1.9	7.7
10/3/2011 11:00	Effluent	Priority Organic Pollutants	4-Nitrophenol	14	U	ug/L			14	58
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Acenaphthene	0.19	U	ug/L			0.19	0.77
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Acenaphthylene	0.19	U	ug/L			0.19	0.77
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Anthracene	0.19	U	ug/L			0.19	0.77
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Benzidine	96	U	ug/L			96	380
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Benzo(a)anthracene	0.19	U	ug/L			0.19	0.77
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Benzo(a)pyrene	0.19	U	ug/L			0.19	0.77
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19	U	ug/L			0.19	0.77
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19	U	ug/L			0.19	0.77
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19	U	ug/L			0.19	0.77
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.96	U	ug/L			0.96	3.8
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.96	U	ug/L			0.96	3.8
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L			2.9	12
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	14	U	ug/L			14	58
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Butyl benzyl phthalate	4.8	U	ug/L			4.8	19
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Chrysene	0.19	U	ug/L			0.19	0.77
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19	U	ug/L			0.19	0.77
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Diethyl phthalate	0.96	U	ug/L			0.96	3.8
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Dimethyl phthalate	9.6	U	ug/L			9.6	38
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Di-n-butyl phthalate	4.8	U	ug/L			4.8	19
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Di-n-octyl phthalate	0.96	U	ug/L			0.96	3.8
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Fluoranthene	0.19	U	ug/L			0.19	0.77
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Fluorene	0.19	U	ug/L			0.19	0.77
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Hexachlorobenzene	0.96	U	ug/L			0.96	3.8
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L			2.9	12
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L			2.9	12
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L			2.9	12
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19	U	ug/L			0.19	0.77
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Isophorone	0.96	U	ug/L			0.96	3.8
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Naphthalene	0.19	U	ug/L			0.19	0.77
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L			1.9	7.7
10/3/2011 11:00	Effluent	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L			1.9	7.7
10/3/2011 11:00	Effluent	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L			1.9	7.7
10/3/2011 11:00	Effluent	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	U	ug/L			2.9	12
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L			2.9	12
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Phenanthrene	0.19	U	ug/L			0.19	0.77
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Phenol	0.96	U	ug/L			0.96	3.8
10/3/2011 11:00	Effluent	Priority Organic Pollutants	Pyrene	0.19	U	ug/L			0.19	0.77
10/3/2011 11:00	Effluent	Toxicology	Bioassay-Acute-Screen-FW-C.dubia, LC50	100	L	LC50				
10/3/2011 11:00	Effluent	Toxicology	Bioassay-Acute-Screen-FW-Fish, LC50	100	L	LC50				
10/3/2011 13:25	Control Site	AGP/LN	Algal Growth Potential	11.1		mg DryWt/L			0.1	0.3

Date Sampled	UDL	SCH Group	Component	Value	Qualifier	Units	Word	Result	MDL	PQL
10/3/2011 13:25	Control Site	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	1.4	I	ug/L			0.55	1.7
10/3/2011 13:25	Control Site	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.4	U	ug/L			0.4	1.2
10/12/2011 11:10	Control Site	Field Parameter	Dissolved Oxygen	5.25		mg/L				
10/3/2011 13:25	Control Site	Field Parameter	Dissolved Oxygen	5.77		mg/L				
10/12/2011 11:10	Control Site	Field Parameter	pH	7.33						
10/3/2011 13:25	Control Site	Field Parameter	pH	7.64						
10/3/2011 13:25	Control Site	Field Parameter	Sample Depth	0.1		m				
10/12/2011 11:10	Control Site	Field Parameter	Specific Conductance	211		umhos/cm				
10/3/2011 13:25	Control Site	Field Parameter	Specific Conductance	405		umhos/cm				
10/12/2011 11:10	Control Site	Field Parameter	Temperature	24.21		C				
10/3/2011 13:25	Control Site	Field Parameter	Temperature	22.97		C				
10/3/2011 13:25	Control Site	Metals	Aluminum	240		ug/L			5	20
10/3/2011 13:25	Control Site	Metals	Arsenic	0.48	I	ug/L			0.25	1
10/3/2011 13:25	Control Site	Metals	Cadmium	0.05	U	ug/L			0.05	0.2
10/3/2011 13:25	Control Site	Metals	Calcium	33.7		mg/L			0.075	0.3
10/3/2011 13:25	Control Site	Metals	Chromium	0.6	I	ug/L			0.3	1.2
10/3/2011 13:25	Control Site	Metals	Copper	0.5	U	ug/L			0.5	1
10/3/2011 13:25	Control Site	Metals	Iron	800		ug/L			30	120
10/3/2011 13:25	Control Site	Metals	Lead	0.2	U	ug/L			0.2	0.8
10/3/2011 13:25	Control Site	Metals	Magnesium	16.7		mg/L			0.04	0.16
10/3/2011 13:25	Control Site	Metals	Nickel	0.66	I	ug/L			0.25	1
10/3/2011 13:25	Control Site	Metals	Selenium	0.2	U	ug/L			0.2	0.8
10/3/2011 13:25	Control Site	Metals	Silver	0.025	U	ug/L			0.025	0.1
10/3/2011 13:25	Control Site	Metals	Sodium	16		mg/L			0.5	2
10/3/2011 13:25	Control Site	Metals	Zinc	5	U	ug/L			5	20
10/3/2011 13:25	Control Site	Nutrients	Ammonia-N	0.14		mg N/L			0.01	0.02
10/3/2011 13:25	Control Site	Nutrients	Chloride	12		mg Cl/L			0.2	0.5
10/3/2011 13:25	Control Site	Nutrients	Fluoride	0.16		mg F/L			0.035	0.1
10/3/2011 13:25	Control Site	Nutrients	Kjeldahl Nitrogen	0.68		mg N/L			0.08	0.2
10/3/2011 13:25	Control Site	Nutrients	NO2NO3-N	0.18		mg N/L			0.004	0.01
10/3/2011 13:25	Control Site	Nutrients	O-Phosphate-P	0.083		mg P/L			0.004	0.01
10/3/2011 13:25	Control Site	Nutrients	Sulfate	130		mg SO4/L			2	5
10/3/2011 13:25	Control Site	Nutrients	TDS	276	A	mg/L			15	25
10/3/2011 13:25	Control Site	Nutrients	Total-P	0.14		mg P/L			0.005	0.05
10/3/2011 13:25	Control Site	Nutrients	TSS	5	I	mg/L			2	10
10/3/2011 13:25	Control Site	Nutrients	Turbidity	5.1		NTU			0.1	0.1
10/3/2011 12:45	Test Site	AGP/LN	Algal Growth Potential	10.4		mg DryWt/L			0.1	0.3
10/3/2011 12:45	Test Site	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	6.5		ug/L			0.55	1.7
10/3/2011 12:45	Test Site	Chlorophyll/Grain Size/BOD	Phaeophytin-a	3.6		ug/L			0.4	1.2
10/12/2011 10:15	Test Site	Field Parameter	Dissolved Oxygen	7.49		mg/L				
10/3/2011 12:45	Test Site	Field Parameter	Dissolved Oxygen	6.98		mg/L				
10/12/2011 10:15	Test Site	Field Parameter	pH	7.63						

Date Sampled	UDL	SCH Group	Component	Value	Qualifier	Units	Word	Result	MDL	PQL
10/3/2011 12:45	Test Site	Field Parameter	pH	7.82						
10/3/2011 12:45	Test Site	Field Parameter	Sample Depth	0.4		m				
10/12/2011 10:15	Test Site	Field Parameter	Specific Conductance	545		umhos/cm				
10/3/2011 12:45	Test Site	Field Parameter	Specific Conductance	619		umhos/cm				
10/12/2011 10:15	Test Site	Field Parameter	Temperature	25.7		C				
10/3/2011 12:45	Test Site	Field Parameter	Temperature	27.58		C				
10/3/2011 12:45	Test Site	Metals	Aluminum	134		ug/L			5	20
10/3/2011 12:45	Test Site	Metals	Arsenic	4.69		ug/L			0.25	1
10/3/2011 12:45	Test Site	Metals	Cadmium	0.05	U	ug/L			0.05	0.2
10/3/2011 12:45	Test Site	Metals	Calcium	56.9		mg/L			0.075	0.3
10/3/2011 12:45	Test Site	Metals	Chromium	1.1	I	ug/L			0.3	1.2
10/3/2011 12:45	Test Site	Metals	Copper	0.5	U	ug/L			0.5	1
10/3/2011 12:45	Test Site	Metals	Iron	120	I	ug/L			30	120
10/3/2011 12:45	Test Site	Metals	Lead	0.2	U	ug/L			0.2	0.8
10/3/2011 12:45	Test Site	Metals	Magnesium	26.5		mg/L			0.04	0.16
10/3/2011 12:45	Test Site	Metals	Nickel	1.13		ug/L			0.25	1
10/3/2011 12:45	Test Site	Metals	Selenium	1.12		ug/L			0.2	0.8
10/3/2011 12:45	Test Site	Metals	Silver	0.025	U	ug/L			0.025	0.1
10/3/2011 12:45	Test Site	Metals	Sodium	35		mg/L			0.5	2
10/3/2011 12:45	Test Site	Metals	Zinc	5	U	ug/L			5	20
10/3/2011 12:45	Test Site	Nutrients	Ammonia-N	0.12		mg N/L			0.01	0.02
10/3/2011 12:45	Test Site	Nutrients	Chloride	9.9		mg Cl/L			1	2.5
10/3/2011 12:45	Test Site	Nutrients	Fluoride	0.53		mg F/L			0.035	0.1
10/3/2011 12:45	Test Site	Nutrients	Kjeldahl Nitrogen	1.2		mg N/L			0.08	0.2
10/3/2011 12:45	Test Site	Nutrients	NO2NO3-N	0.046		mg N/L			0.004	0.01
10/3/2011 12:45	Test Site	Nutrients	O-Phosphate-P	0.17		mg P/L			0.004	0.01
10/3/2011 12:45	Test Site	Nutrients	Sulfate	210		mg SO4/L			1	2.5
10/3/2011 12:45	Test Site	Nutrients	TDS	442		mg/L			15	25
10/3/2011 12:45	Test Site	Nutrients	Total-P	0.26		mg P/L			0.005	0.05
10/3/2011 12:45	Test Site	Nutrients	TSS	7	I	mg/L			2	10
10/3/2011 12:45	Test Site	Nutrients	Turbidity	1.6		NTU			0.1	0.1
10/3/2011 10:25	Equipment Blank	Metals	Aluminum	5	U	ug/L			5	20
10/3/2011 10:25	Equipment Blank	Metals	Arsenic	0.25	U	ug/L			0.25	1
10/3/2011 10:25	Equipment Blank	Metals	Cadmium	0.05	U	ug/L			0.05	0.2
10/3/2011 10:25	Equipment Blank	Metals	Calcium	0.075	U	mg/L			0.075	0.3
10/3/2011 10:25	Equipment Blank	Metals	Chromium	0.3	U	ug/L			0.3	1.2
10/3/2011 10:25	Equipment Blank	Metals	Copper	0.5	U	ug/L			0.5	1
10/3/2011 10:25	Equipment Blank	Metals	Iron	30	U	ug/L			30	120
10/3/2011 10:25	Equipment Blank	Metals	Lead	0.2	U	ug/L			0.2	0.8
10/3/2011 10:25	Equipment Blank	Metals	Magnesium	0.04	U	mg/L			0.04	0.16
10/3/2011 10:25	Equipment Blank	Metals	Nickel	0.25	U	ug/L			0.25	1
10/3/2011 10:25	Equipment Blank	Metals	Selenium	0.2	U	ug/L			0.2	0.8

Date Sampled	UDL	SCH Group	Component	Value	Qualifier	Units	Word	Result	MDL	PQL
10/3/2011 10:25	Equipment Blank	Metals	Silver	0.025	U	ug/L			0.025	0.1
10/3/2011 10:25	Equipment Blank	Metals	Sodium	0.5	U	mg/L			0.5	2
10/3/2011 10:25	Equipment Blank	Metals	Zinc	5	U	ug/L			5	20
10/3/2011 10:25	Equipment Blank	Nutrients	Ammonia-N	0.01	U	mg N/L			0.01	0.02
10/3/2011 10:25	Equipment Blank	Nutrients	Chloride	0.2	U	mg Cl/L			0.2	0.5
10/3/2011 10:25	Equipment Blank	Nutrients	Fluoride	0.035	U	mg F/L			0.035	0.1
10/3/2011 10:25	Equipment Blank	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L			0.08	0.2
10/3/2011 10:25	Equipment Blank	Nutrients	NO2NO3-N	0.004	U	mg N/L			0.004	0.01
10/3/2011 10:25	Equipment Blank	Nutrients	O-Phosphate-P	0.004	U	mg P/L			0.004	0.01
10/3/2011 10:25	Equipment Blank	Nutrients	Sulfate	0.2	U	mg SO4/L			0.2	0.5
10/3/2011 10:25	Equipment Blank	Nutrients	Total-P	0.004	U	mg P/L			0.004	0.01
10/3/2011 10:25	Equipment Blank	Overflow	Alpha, Total	0.8	U	pCi/L				
10/3/2011 10:25	Equipment Blank	Overflow	Alpha-Counting Error	0.5		pCi/L				
10/3/2011 10:25	Equipment Blank	Overflow	Oil and Grease	0.7	U	mg/L			0.7	2.5
10/3/2011 10:25	Equipment Blank	Overflow	Radium 226	0.2	U	pCi/L				
10/3/2011 10:25	Equipment Blank	Overflow	Radium 226-Counting Error	0.1		pCi/L				
10/3/2011 10:25	Equipment Blank	Overflow	Radium 228	1	U	pCi/L				
10/3/2011 10:25	Equipment Blank	Overflow	Radium 228-Counting Error	0.6		pCi/L				
10/3/2011 10:25	Equipment Blank	Pesticides	Alachlor	0.59	U	ug/L			0.59	2.4
10/3/2011 10:25	Equipment Blank	Pesticides	Ametryn	0.049	U	ug/L			0.049	0.2
10/3/2011 10:25	Equipment Blank	Pesticides	Atrazine	0.049	U	ug/L			0.049	0.2
10/3/2011 10:25	Equipment Blank	Pesticides	Azinphos Methyl	0.2	U	ug/L			0.2	0.79
10/3/2011 10:25	Equipment Blank	Pesticides	Bromacil	0.2	U	ug/L			0.2	0.79
10/3/2011 10:25	Equipment Blank	Pesticides	Butylate	0.2	U	ug/L			0.2	0.79
10/3/2011 10:25	Equipment Blank	Pesticides	Chlorpyrifos Ethyl	0.049	U	ug/L			0.049	0.2
10/3/2011 10:25	Equipment Blank	Pesticides	Chlorpyrifos Methyl	0.098	U	ug/L			0.098	0.39
10/3/2011 10:25	Equipment Blank	Pesticides	Diazinon	0.049	U	ug/L			0.049	0.2
10/3/2011 10:25	Equipment Blank	Pesticides	Ethion	0.049	U	ug/L			0.049	0.2
10/3/2011 10:25	Equipment Blank	Pesticides	Ethoprop	0.098	U	ug/L			0.098	0.39
10/3/2011 10:25	Equipment Blank	Pesticides	Fenamiphos	0.2	U	ug/L			0.2	0.79
10/3/2011 10:25	Equipment Blank	Pesticides	Fonofos	0.098	U	ug/L			0.098	0.39
10/3/2011 10:25	Equipment Blank	Pesticides	Hexazinone	0.098	U	ug/L			0.098	0.39
10/3/2011 10:25	Equipment Blank	Pesticides	Malathion	0.15	U	ug/L			0.15	0.59
10/3/2011 10:25	Equipment Blank	Pesticides	Metaxyl	0.25	U	ug/L			0.25	0.98
10/3/2011 10:25	Equipment Blank	Pesticides	Metolachlor	0.49	U	ug/L			0.49	2
10/3/2011 10:25	Equipment Blank	Pesticides	Metribuzin	0.098	U	ug/L			0.098	0.39
10/3/2011 10:25	Equipment Blank	Pesticides	Mevinphos	0.2	U	ug/L			0.2	0.79
10/3/2011 10:25	Equipment Blank	Pesticides	Naled	0.79	U	ug/L			0.79	3.1
10/3/2011 10:25	Equipment Blank	Pesticides	Norflurazon	0.15	U	ug/L			0.15	0.59
10/3/2011 10:25	Equipment Blank	Pesticides	Parathion Ethyl	0.15	U	ug/L			0.15	0.59
10/3/2011 10:25	Equipment Blank	Pesticides	Parathion Methyl	0.098	U	ug/L			0.098	0.39
10/3/2011 10:25	Equipment Blank	Pesticides	Phorate	0.049	U	ug/L			0.049	0.2

Date Sampled	UDL	SCH Group	Component	Value	Qualifier	Units	Word	Result	MDL	PQL
10/3/2011 10:25	Equipment Blank	Pesticides	Prometryn	0.15	U	ug/L			0.15	0.59
10/3/2011 10:25	Equipment Blank	Pesticides	Simazine	0.049	U	ug/L			0.049	0.2
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.97	U	ug/L			0.97	3.9
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.97	U	ug/L			0.97	3.9
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	2,4-Dichlorophenol	0.97	U	ug/L			0.97	3.9
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	2,4-Dimethylphenol	9.7	U	ug/L			9.7	39
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L			15	58
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	0.97	U	ug/L			0.97	3.9
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	0.97	U	ug/L			0.97	3.9
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	2-Chloronaphthalene	0.97	U	ug/L			0.97	3.9
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	2-Chlorophenol	0.97	U	ug/L			0.97	3.9
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L			2.9	12
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	2-Nitrophenol	0.97	U	ug/L			0.97	3.9
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	39	U	ug/L			39	160
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.97	U	ug/L			0.97	3.9
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.97	U	ug/L			0.97	3.9
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L			1.9	7.8
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L			15	58
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Acenaphthene	0.19	U	ug/L			0.19	0.78
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Acenaphthylene	0.19	U	ug/L			0.19	0.78
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Anthracene	0.19	U	ug/L			0.19	0.78
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Benzidine	97	U	ug/L			97	390
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Benzo(a)anthracene	0.19	U	ug/L			0.19	0.78
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Benzo(a)pyrene	0.19	U	ug/L			0.19	0.78
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19	U	ug/L			0.19	0.78
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19	U	ug/L			0.19	0.78
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19	U	ug/L			0.19	0.78
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.97	U	ug/L			0.97	3.9
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.97	U	ug/L			0.97	3.9
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L			2.9	12
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	U	ug/L			15	58
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Butyl benzyl phthalate	4.9	U	ug/L			4.9	19
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Chrysene	0.19	U	ug/L			0.19	0.78
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19	U	ug/L			0.19	0.78
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Diethyl phthalate	0.97	U	ug/L			0.97	3.9
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Dimethyl phthalate	9.7	U	ug/L			9.7	39
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Di-n-butyl phthalate	4.9	U	ug/L			4.9	19
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Di-n-octyl phthalate	0.97	U	ug/L			0.97	3.9
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Fluoranthene	0.19	U	ug/L			0.19	0.78
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Fluorene	0.19	U	ug/L			0.19	0.78
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Hexachlorobenzene	0.97	U	ug/L			0.97	3.9
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L			2.9	12

Date Sampled	UDL	SCH Group	Component	Value	Qualifier	Units	Word	Result	MDL	PQL
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L			2.9	12
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L			2.9	12
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19	U	ug/L			0.19	0.78
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Isophorone	0.97	U	ug/L			0.97	3.9
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Naphthalene	0.19	U	ug/L			0.19	0.78
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L			1.9	7.8
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L			1.9	7.8
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L			1.9	7.8
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	U	ug/L			2.9	12
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L			2.9	12
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Phenanthrene	0.19	U	ug/L			0.19	0.78
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Phenol	0.97	U	ug/L			0.97	3.9
10/3/2011 10:25	Equipment Blank	Priority Organic Pollutants	Pyrene	0.19	U	ug/L			0.19	0.78

Appendix G

Toxicological results

FDEP Biology Laboratory - Acute Bioassay Bench Sheets

Facility: Mosiac Fertilizer, LLC, Wingate Creek Mine Sample Collection: Date: 10-3-11 Time: 1100
 Address: 38651 State Road 64 East Hold Time Start: Date: 10-3-11 Time: 1100

City: Myakka City County: Manatee
 Contact/District: Jackie Champion / Southwest BMR

NPDES Permit #: FL 0032522 LIMS Sample #: 1380206

LIMS Data Entry: 10-11-11 MF Data Entry Verification: 10-11-11 BT

Comments:

Initial sample handling:

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

pH adjustment: ☐ yes ☒ no Initial pH: NaOH N HCl N Drops mL Final pH:
 Aeration: ☐ yes ☒ no Initial DO: mg/L Final DO: mg/L Duration: minutes Rate: bubbles/min
 Salinity adjusted (Test 1): ☐ yes ☒ no Initial Salinity: Final Salinity: Salts Hypersaline brine
 Salinity adjusted (Test 2): ☐ yes ☒ no Initial Salinity: Final Salinity: Salts Hypersaline brine
 Dechlorination: ☐ yes ☒ no mL of 0.025N Sodium Thiosulfate per liter of sample. Final TRC:

Sample Validation:

Instructions: Check yes or no. Fill in temperatures.

Temperature: Shipped $\leq 6^{\circ}\text{C}$ ☐ Yes ☐ No IF Hand Delivered: Cooling ☐ Yes ☐ No (received $^{\circ}\text{C}$ collected $^{\circ}\text{C}$)
 Holding Time: ≤ 36 Hours ☒ Yes ☐ No (Composite-end of collection; grab-when collected; 4 in 24 - time last sample collected)

Investigators' Signatures: Initials:

Jana Davis JD
J. Marshall Faircloth JM
Brian Hulse BA

REVIEWER: Signature dm

Diluent/Control Batch#: <u>10-4-11</u>		20% DMW	Well Water	Moderately Hard Water	Salt Water ASW NSW Test 1	Salt Water ASW NSW Test 2	Other:	Original Sample	Measured by	Verified by
Water Quality Parameters										
Field Total Residual Cl ₂ (mg/L):		N/A	N/A	N/A	N/A	N/A		2003	JD/MF	MH/SD
Lab Total Residual Cl ₂ (mg/L):		20.03	20.03					93	MF	SD
Alkalinity (mg/L as CaCO ₃):		83	144					251	MF	SD
Hardness (mg/L as CaCO ₃):		85	138					20017	MF	SD
Total Ammonia (mg/L as N):		20.017	20.017					20.017	JD	MF
Conductivity: ☐ μmhos ☐ mmhos		135	283					20.017	JD	MF
Salinity (ppt):								20.017	JD	MF

V 1.8 1/13

35

Test # 2 of 2

☒ Acute ☐ Definitive Screen

☐ Static ☒ Static Renewal ☐ Flow-Through

Test Started:

☐ 48 hr☒ 96 hr

Test Ended:

☐ _____ h

Date 10-8-11 Time 0900

Chamber Size 1000 ml

Test Volume: 400 ml

Food

☐ YCT Batch# _____
☐ *P. subcapitata* Batch# _____
☒ *Artemia* Lot# 23613

Feeding and Artemia Batch #

☒ 0 hr 172-11 ☐ Prior to Test
☐ 24 hr _____
☒ 48 hr 174-11 ☒ Prior to
☐ 72 hr _____ Renewal

Temperature Range (°C)

Incubator # 3
min. 21.5 max 26.3 mean -

Incubator # _____

min. _____ max. _____ mean _____

Waterbath # _____

min. _____ max. _____ mean _____

Room B246
min. 22.5 max. 23.2 mean —

Light Intensity (ft. candles): 50-100

Photoperiod (hours): 16 light, 8 dark

Checked or Verified by:

Loaded/ Verified by: JK / BA

m = missing, d = dead, BR/AR Before/ After Renewal

Test Results:

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

% mortality in 100% sample: 30% LC50: >100%

Calculated LC50 (Definitive) 95% CI _____ Method _____

Comments:

V. 2.5 1-13-10

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

FDEP Biology Laboratory - Bioassay Parameter Sheet

LIMS Sample # 1380206

Test # 1 of 2

Test Species:

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

Test aerated:

- (if DO is < 4.0 mg/L)
☐ Yes ☒ No

Concentration	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ μmhos ☐ mmhos	Salinity* (ppt)
<u>Control</u>	mF	0 hr	8.0	24.5	7.8	185	
	mF	24 hr					
	A	48 hr BR	8.0	25.1	7.9	199	
	m	48 hr AR	8.1	24.9	8.0	186	
		72 hr				202 mF	
	A	96 hr	8.1	24.3	7.5	202	
<u>100%</u>	m	0 hr	7.6	25.0	7.1	650	
		24 hr					
	A	48 hr BR	7.8	25.2	7.9	680	
	M	48 hr AR	7.6	25.3	8.2	661	
		72 hr					
	A	96 hr	8.1	24.5	7.8	663	
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

*Measure/ record salinity for marine tests

Comments:

Measured By:
0 hr: mF
24 hr: —
48 hr BR: mF
48 hr AR: mF
72 hr: —
96 hr: mF

FDEP Biology Laboratory - Bioassay Parameter Sheet
LIMS Sample # 1380206 Test # 2 of 2

Test Species:
☐ *Ceriodaphnia dubia* ☐ *Pimephales promelas* ☐ *Americanmysis bahia*
☒ *Cyprinella leedsi* ☐ *Menidia beryllina* ☐ Other: _____

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

Concentration	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☒ μmhos ☐ mmhos	Salinity* (ppt)
<u>Ctrl</u>	A	0 hr	7.7	24.4	7.6	283	
	B	24 hr	7.9	24.3	7.5	311	
	A	48 hr BR	8.2	24.0	8.1	297	
	A	48 hr AR	7.8	25.5	8.0	302	
	B	72 hr	8.0	24.4	7.2	301	
	A	96 hr	8.1	25.1	6.9	318	
<u>100%</u>	A	0 hr	7.5	25.1	7.2	644	
	B	24 hr	7.8	24.2	7.6	641	
	A	48 hr BR	8.0	24.2	8.0	638	
	A	48 hr AR	7.7	24.4	7.8	639	
	B	72 hr	7.9	24.2	7.0	648	
	A	96 hr	8.2	24.8	7.4	686	
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

Comments:

Measured By:
 0 hr: JD
 24 hr: JD
 48 hr BR: JD
 48 hr AR: JD
 72 hr: JD
 96 hr: MT

*Measure/ record salinity for marine tests

Test ID: *Mosarc Wingsate Creek Mine*Dates: *10-4-11 — 10-8-11*

METER / DEVICE	ID	SOP	Parameter	Method	v 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	ec5 ✓
Hach Pocket Colorimeter II	05050C026378	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	✓
Alkalinity (Hach Kit)	No SN	TA06_08	Alkalinity	SM 2320 B	✓
Hardness (Hach Kit)	No SN	TA06_09	Hardness	SM 2340 C	✓
OHAUS Balance 250D	1125481084	TA06_21 TA06_27	Weight	-	
S-Weights	BIO-S-WEIGHTS-01	NA	Balance check	-	

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

Insert other device information in blank spaces (if used).

Test ID = Facility or SRTs (acute SRT-Chronic SRT)

entered by M. Faircloth 10-7-11

V 1.1 9/21/10 MF/jd

Page 18

FDEP Biology Laboratory - Acute SRT Bench Sheet

Method from EPA-821-R-02-012 except *H. azteca*

Test Organism:

(check one)

☐ *Americamysis bahia*

Method 2007.0 TA07.03

☒ *Ceriodaphnia dubia*

Method 2002.0 TA07.01

☐ *Menidia Beryllina*

Method 2006.0 TA07.04

☐ *Cyprinella leedsi*

Method 2000.0 TA07.02

☐ *Hyalella azteca*

Method 100.1 EPA-600-R-99-064

☐ *Pimephales promelas*

Method 2000.0 TA07.02

Test Type:

☐ non-renewal

☒ renewal

Test Page 1 of 2

Diluent/ Batch #: 9-30-11 120% DW

Toxicant/ Batch #: NACL 110-4-11 4g/L

Organism Batch: 10-4-11

Age: 224 hr

Test Beginning: Date: 10-4-11 Time: 1000

Test Ending: Date: 10-8-11 Time: 0830

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl ₂ (mg/L):	20.83	TA06_22	mf
Alkalinity (mg/L as CaCO ₃):	81	TA06_08	mf
Hardness (mg/L as CaCO ₃):	84	TA06_09	mf
Total Ammonia (mg/L as N):	20.17	TA06_17	mf
Conductivity (umhos):	185	TA06_25	mf
Salinity (ppt):	—	TA06_25	—

Food:	Batch
☒ YCT	8-26-11
☒ <i>P. subcapitata</i>	8-4-11
Artemia Lot #	Artemia Batch:

Chamber size: 30 mL

Test volume: 20 mL per replicate

Concentrations prepared by: mf

Temperature Range °C: (if used)

Test Incubated in: Incubator # 2 Waterbath # — Incubator # 2 min 24.7 max 27.5 mean —

Light Intensity: 50-100 Ft. candles

Waterbath # — min — max — mean —

Photoperiod: 16 hours Light / 8 hours dark

Room B246 min 22.5 max 23.2 mean —

Concentration ug/L mg/L g/L	Replicate	Chamber #	Test Hour					
			0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	5
	C	C	5	5	5	5	5	5
	D	D	5	5	5	5	5	5
1.5g/L	A	A	5	5	5	5	5	5
	B	B	5	5	5	5	5	5
	C	C	5	5	5	5	5	5
	D	D	5	5	5	5	5	5
20g/L	A	A	5	5	5	5	4 ¹⁰	4
	B	B	5	5	5	5	3 ²⁰	1 ²⁰
	C	C	5	5	5	5	3 ²⁰	3
	D	D	5	5	5	5	3 ²⁰	1 ²⁰
25g/L	A	A	5	5	1 ⁴⁰	1	0 ¹⁰	—
	B	B	5	5	1 ⁴⁰	1	0 ¹⁰	—
	C	C	5	5	1 ⁴⁰	1	0 ¹⁰	—
	D	D	5	5	1 ⁴⁰	1	0 ¹⁰	—
3.0g/L	A	A	5	2 ²⁰	0 ²⁰	—	—	—
	B	B	5	3 ²⁰	0 ³⁰	—	—	—
	C	C	5	4 ¹⁰	0 ⁴⁰	—	—	—
	D	D	5	3 ²⁰	0 ³⁰	—	—	—
4.0g/L	A	A	5	0 ⁵⁰	—	—	—	—
	B	B	5	0 ⁵⁰	—	—	—	—
	C	C	5	0 ⁵⁰	—	—	—	—
	D	D	5	0 ⁵⁰	—	—	—	—

Organisms loaded by: mf Checked by: BA

Loading Verified by: BA

m = missing d = dead BR = before renewal hr = hour

Investigators' Signatures

Marshall Faircloth

Bruce Reed

Janae Barish

Reviewer: Liz Mikeson

Comments:

Method: TSK	95% confidence intervals	
Statistics: LC50	Lower	Upper
48 hour: —	—	—
96 hour: 1.94	1.84	2.06

Feeding: √ as needed

☒ Before test

☐ 24 hr

☒ 48 hr

☐ 72 hr

all species 2 hrs prior to test

mysids daily

all species except *H. azteca* 2 hr prior to

renewal

H. azteca 0 hr and 48 hr

<i>H. azteca</i>		
0 hr	Alk	Hrd
Well		
100%		
96 hr	Alk	Hrd
Well		
100%		

FDEP Biology Laboratory - Acute SRT Bench Sheet
0-96 hour parameters

Methods from EPA-821-R-02-012
except *H. azteca*

Test Page 2 of 2

Test Organism:
(check one)

☐ *Americamysis bahia*
Method 2007.0 TA07.03
☒ *Ceriodaphnia dubia*
Method 2002.0 TA07.01

☐ *Menidia Beryllina*
Method 2006.0 TA07.04
☐ *Cyprinella leedsi*
Method 2000.0 TA07.02

☐ *Hyalomma azteca*
Method 100.1 EPA-600-R-99-064
☐ *Pimephales promelas*
Method 2000.0 TA07.02

Test Beginning: Date: 10-4-11 Time: 1000
Test Ending: Date: 10-8-11 Time: 0830

Test Type: ☐ non-renewal
☒ renewal

Concentration μg/L mg/L g/L	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity μmhos/cm mmhos	Salinity (ppt)
Control	m	0 hr	7.9	24.2	7.9	0.185	
		24 hr					
	A	48 hr BR	8.1	24.9	8.2	0.200	
	m	48 hr AR	8.0	25.2	7.9	0.190	
		72 hr					
		96 hr	8.0	24.3	7.8	0.199	
1.5/L	m	0 hr	7.9	24.3	8.1	2.99	
		24 hr					
	A	48 hr BR	8.1	24.9	8.3	3.09	
	m	48 hr AR	8.0	25.2	8.1	2.87	
		72 hr					
		96 hr	8.1	24.4	7.8	3.05	
2.0	m	0 hr	8.0	24.2	7.9	3.86	
		24 hr					
	A	48 hr BR	8.1	25.0	8.3	4.03	
	m	48 hr AR	8.0	25.1	8.1	3.57	
		72 hr					
		96 hr	8.1	24.6	7.8	3.74	
2.5	m	0 hr	8.0	24.2	8.1	4.81	
		24 hr					
	A	48 hr BR	8.1	25.0	8.2	4.92	
	m	48 hr AR	8.0	25.0	8.1	4.57	
	A	72 hr	8.0	24.4	7.8	4.47	
		96 hr	8.1	24.3	7.9	4.64	
3.0	m	0 hr	8.0	24.2	8.0	5.50	
		24 hr					
	A	48 hr BR	8.1	24.8	8.0	5.76	
	m	48 hr AR					
		72 hr		24.4	mf	mf	
		96 hr					
4.0	m	0 hr	8.0	24.3	8.0	7.16	
	A	24 hr	8.1	24.4	8.0	7.18	
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

Investigators Signatures

Marshall Faircloth
Brian R. R. R.
James R. R.

Measured by:

0 hr: MF
24 hr: MF
48 hr BR: MF
48 hr AR: MF
72 hr: MF
96 hr: MF

Measure/record salinity for marine tests

Comments:

Reviewed By: skj meller

FDEP Biology Laboratory - Acute SRT Bench Sheet

Method from EPA-821-R-02-012 except *H. azteca*

Test Organism:
(check one)

- ☐ *Americamysis bahia* Method 2007.0 TA07.03
☐ *Menidia Beryllina* Method 2006.0 TA07.04
☐ *Ceriodaphnia dubia* Method 2002.0 TA07.01
☒ *Cyprinella leedsii* Method 2000.0 TA07.02
☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
☐ *Pimephales promelas* Method 2000.0 TA07.02

Test Type: ☐ non-renewal
☒ renewal
 Test Page 1 of 2

Diluent/ Batch #: W11 104.1
 Toxicant/ Batch #: NaCl 104.1

Organism Batch: 104.11
 Age: 13 days

Test Beginning: Date: 10-4-11 Time: 1300
 Test Ending: Date: 10-8-11 Time: 0845

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl ₂ (mg/L):	<u><0.03</u>	TA06_22	<u>mf</u>
Alkalinity (mg/L as CaCO ₃):	<u>144</u>	TA06_08	<u>mf</u>
Hardness (mg/L as CaCO ₃):	<u>138</u>	TA06_09	<u>mf</u>
Total Ammonia (mg/L as N):	<u><0.017</u>	TA06_17	<u>mf</u>
Conductivity (µmhos) mmhos	<u>280</u>	TA06_25	<u>JD</u>
Salinity (ppt):	<u>—</u>	TA06_25	<u>—</u>

Food:	Batch
☐ YCT	
☐ <i>P. subcapitata</i>	
☒ Artemia Lot #	<u>23613</u>

Chamber size: 1000 mL
 Test volume: 400 mL per replicate

Artemia Batch:
 0 hr: 172-11
 24 hr: —
 48 hr: 174-11
 72 hr: —

Concentrations prepared by: JD

Temperature Range °C: (if used)

Test Incubated in: Incubator # 2 Waterbath # —

Incubator # 2 min 24.7 max 27.5 mean —

Light Intensity: 50-100 Ft. candles

Waterbath # — min — max — mean —

Photoperiod: 16 hours Light / 8 hours dark

Room B246 min 22.5 max 23.2 mean —

Concentration µg/L mg/L	Replicate	Chamber #	Test Hour					
			0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	D1	10	10	10	10	10	10
	B	D2	10	10	10	10	10	10
6	A	D3	10	10	730	7	520	5
	B	D4	10	10	730	7	610	5
7	A	D5	10	910	630	6	6	6
	B	D6	10	10	550	5	5	5
8	A	D7	10	910	630	6	510	5
	B	D8	10	640	330	3	210	020
9	A	D9	10	370	3	3	210	110
	B	D10	10	464	040	—	—	—
10	A	D11	10	280	020	—	—	—
	B	D12	10	190	010	—	—	—

Organisms loaded by: JD Checked by: mf JD JD JD JD mf

Loading Verified by: mf AR = after renewal
 m = missing d = dead BR = before renewal hr = hour

Investigators' Signatures

James Daniel
Marshall Faircloth
Brian Alumba

Reviewer: Signatures

Comments:

Method: TSK	95% confidence intervals	
Statistics: LC50	Lower	Upper
48 hour: <u>—</u>	<u>—</u>	<u>—</u>
96 hour: <u>7.09</u>	<u>6.42</u>	<u>7.82</u>

Feeding: ☒ as needed
☐ Before test
☐ 24 hr
☒ 48 hr
☐ 72 hr

all species 2 hrs prior to test

mysids daily

all species except *H. azteca* 2 hr prior to renewal

H. azteca 0 hr and 48 hr

<i>H. azteca</i>		
0 hr	Alk	Hrd
Well		
100%		
96 hr	Alk	Hrd
Well		
100%		

FDEP Biology Laboratory - Acute SRT Bench Sheet
0-96 hour parameters

Methods from EPA-821-R-02-012
except *H. azteca*

Test Page 2 of 2

Test Organism: ☐ *Americamysis bahia* Method 2007.0 TA07.03
(check one) ☐ *Ceriodaphnia dubia* Method 2002.0 TA07.01
☐ *Menidia Beryllina* Method 2006.0 TA07.04
☒ *Cyprinella leedsii* Method 2000.0 TA07.02
☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
☐ *Pimephales promelas* Method 2000.0 TA07.02

Test Beginning: Date: 10-4-11 Time: 1300
Test Ending: Date: 10-8-11 Time: 0845

Test Type: ☐ non-renewal
☒ renewal

hr = hour

AR = after renewal BR = before renewal

Concentration μg/L mg/L (μ)	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity μmhos (X) mmhos	Salinity (ppt)
Control	A	0 hr	7.7	24.2	8.1	0.280	
	B	24 hr	8.0	24.0	8.0	0.290	
	A	48 hr BR	8.2	24.3	8.1	0.304	
	A	48 hr AR	7.7	25.1	8.2	0.298	
	B	72 hr	8.0	24.3	6.8	0.301	
	A	96 hr	8.1	25.0	7.0	0.307	
6	A	0 hr	7.9	24.2	8.1	10.9	
	B	24 hr	8.1	24.1	7.8 ^{DD}	10.9	
	A	48 hr BR	8.2	24.6	8.1	11.2	
	A	48 hr AR	8.1	25.2	7.9	11.4	
	B	72 hr	8.0	24.6	6.2	11.0	
	A	96 hr	8.2	24.7	6.5	11.3	
7	A	0 hr	8.0	24.1	7.8	12.7	
	B	24 hr	8.1	24.1	7.3	12.7	
	A	48 hr BR	8.2	24.4	8.1	12.8	
	A	48 hr AR	8.1	25.2	7.8	13.1	
	B	72 hr	8.1	24.2	6.2	13.0	
	A	96 hr	8.2	25.3	6.4	13.2	
8	A	0 hr	8.0	24.0	7.8	14.1	
	B	24 hr	8.1	24.2	7.2	14.2	
	A	48 hr BR	8.2	24.1	8.1	13.9	
	A	48 hr AR	8.1	24.8	7.7	14.1	
	B	72 hr	8.0	24.0	6.1	14.1	
	A	96 hr	8.1	25.2	6.4	14.8	
9	A	0 hr	8.0	24.0	7.7	15.4	
	B	24 hr	8.1	24.1	7.4	15.3	
	A	48 hr BR	8.2	24.0	7.7	15.2	
	A	48 hr AR	8.0	25.1	7.7	15.9	
	A	72 hr	8.1	24.0	6.3	15.7	
	A	96 hr	8.1	25.3	6.4	15.9	
10	A	0 hr	7.9	24.0	7.6	17.8	
	B	24 hr	8.0	24.1	7.4	17.7	
	A	48 hr BR	8.2	24.1	7.8	17.6	
		48 hr AR					
		72 hr					
		96 hr					

Investigators Signatures

James Daniel
M. Campbell Faircloth
Bruce Allen

Measured by:

0 hr: JS
24 hr: JS
48 hr BR: JS
48 hr AR: JS
72 hr: JS
96 hr: MF

Measure/record salinity for marine tests

Comments:

Reviewed By: Shig Mullen

Appendix H

Standard Reference Toxicant Data

Florida Department of Environmental Protection
Bureau of Laboratories

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

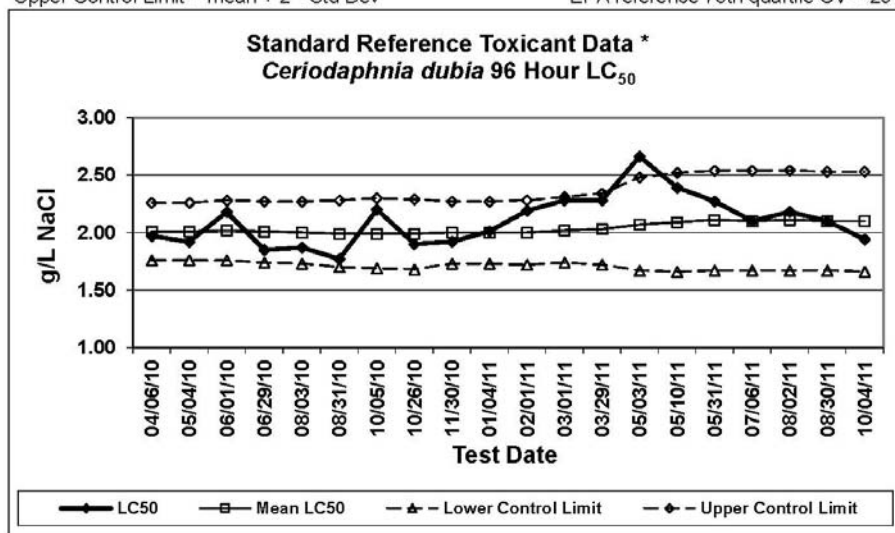
Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
04/06/10	1.97	2.01	0.12	1.76	2.26
05/04/10	1.92	2.01	0.12	1.76	2.26
06/01/10	2.18	2.02	0.13	1.76	2.28
06/29/10	1.85	2.01	0.13	1.74	2.27
08/03/10	1.87	2.00	0.14	1.73	2.27
08/31/10	1.77	1.99	0.14	1.70	2.28
10/05/10	2.20	1.99	0.15	1.69	2.30
10/26/10	1.90	1.99	0.15	1.68	2.29
11/30/10	1.92	2.00	0.14	1.73	2.27
01/04/11	2.01	2.00	0.14	1.73	2.27
02/01/11	2.19	2.00	0.14	1.72	2.28
03/01/11	2.28	2.02	0.14	1.74	2.31
03/29/11	2.28	2.03	0.15	1.72	2.34
05/03/11	2.66	2.07	0.20	1.67	2.48
05/10/11	2.39	2.09	0.21	1.66	2.52
05/31/11	2.27	2.11	0.22	1.67	2.54
07/06/11	2.10	2.10	0.22	1.67	2.54
08/02/11	2.18	2.11	0.22	1.67	2.54
08/30/11	2.10	2.10	0.22	1.67	2.53
10/04/11	1.94	2.10	0.22	1.66	2.53

Lower Control Limit = mean - 2 * Std Dev

CV = 10.38

Upper Control Limit = mean + 2 * Std Dev

EPA reference 75th quartile CV = 29%



Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 96-hour Acute Toxicity
Cyprinella leedsi (bannerfin shiner) - Sodium Chloride (NaCl)

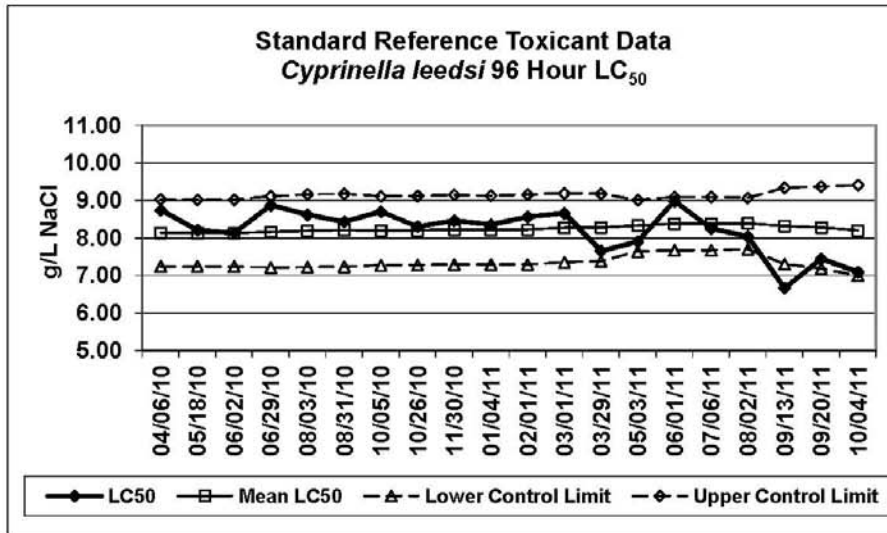
Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
04/06/10	8.74	8.14	0.45	7.24	9.03
05/18/10	8.21	8.13	0.45	7.24	9.02
06/02/10	8.13	8.13	0.45	7.24	9.02
06/29/10	8.87	8.16	0.47	7.21	9.11
08/03/10	8.62	8.19	0.48	7.22	9.16
08/31/10	8.43	8.21	0.49	7.23	9.18
10/05/10	8.70	8.19	0.46	7.27	9.11
10/26/10	8.30	8.20	0.46	7.28	9.12
11/30/10	8.46	8.22	0.46	7.29	9.15
01/04/11	8.35	8.21	0.46	7.29	9.13
02/01/11	8.56	8.22	0.47	7.29	9.16
03/01/11	8.66	8.27	0.46	7.35	9.19
03/29/11	7.65	8.28	0.45	7.38	9.18
05/03/11	7.90	8.33	0.34	7.64	9.01
06/01/11	8.98	8.38	0.36	7.67	9.09
07/06/11	8.25	8.38	0.36	7.67	9.09
08/02/11	8.04	8.39	0.34	7.70	9.07
09/13/11	6.66	8.32	0.51	7.30	9.34
09/20/11	7.44	8.28	0.55	7.18	9.37
10/04/11	7.09	8.20	0.60	7.00	9.41

Lower Confidence Limit = mean - 2 * Std Dev

CV = 7.33

Upper Confidence Limit = mean + 2 * Std Dev

EPA reference 75th quartile CV = 19%



Appendix I-1

Wet ID taxa list and density (number/mL) for quantitative phytoplankton collections made from the Mosaic Fertilizer, L.L.C. Wingate Creek Mine facility on 10/03/2011.

	Outfall	Control Site	Test Site
Bacillariophyta			
Bacillariophyta	686	88	1,241
Chlorophyceae			
<i>Actinastrum gracilimum</i>	30	-	83
<i>Ankistrodesmus falcatus</i>	30	7	579
<i>Chlamydomonas</i> sp.	179	22	83
<i>Chlorella</i> sp.	1,462	-	1,489
<i>Chlorococcum humicola</i>	149	-	83
<i>Chlorogonium elongatum</i>	-	-	165
<i>Coelastrum microporum</i>	-	-	83
<i>Crucigenia rectangularis</i>	-	-	331
<i>Crucigenia tetrapedia</i>	60	-	-
<i>Elakatothrix gelatinosa</i>	-	-	248
<i>Kirchneriella contorta</i>	-	-	83
<i>Oocystis</i> sp.	90	7	-
<i>Pediastrum duplex</i>	30	-	-
<i>Scenedesmus</i> sp.	239	-	414
<i>Scenedesmus abundans</i>	30	-	-
<i>Scenedesmus bijuga</i>	119	22	331
<i>Scenedesmus dimorphus</i>	90	-	-
<i>Scenedesmus quadricauda</i>	90	-	-
<i>Schroederia judayi</i>	60	-	165
<i>Selenastrum</i> sp.	537	51	579
<i>Tetraedron minimum</i>	60	-	-
<i>Tetrastrum heterocanthum</i>	-	-	83
<i>Westella botryoides</i>	179	-	-
Cryptophyceae			
<i>Cryptomonas</i> sp.	-	37	-
<i>Cryptomonas ovata</i>	-	7	-
Cyanophyceae			
<i>Aphanocapsa delicatissima</i>	30	-	83
<i>Anabaena</i> sp.	30	-	-
<i>Anabaena circinalis</i>	-	66	-
<i>Aphanocapsa elachista</i>	-	7	-
<i>Chroococcus minutus</i>	-	7	-
<i>Cyanobium parvum</i>	269	15	248
<i>Cylindrospermopsis raciborskii</i>	836	44	331
<i>Geitlerinema acutissimum</i>	-	-	83
<i>Jaaginema gracile</i>	298	95	496
<i>Merismopedia tenuissima</i>	30	-	83
<i>Merismopedia warmingiana</i>	149	7	-

Appendix I-1 (continued)

	Outfall	Control Site	Test Site
<i>Microcystis aeruginosa</i>	-	29	-
<i>Planktolyngbya limnetica</i>	-	183	-
<i>Planktothrix</i> sp.	-	7	-
<i>Planktothrix agardhii</i>	30	-	165
<i>Pseudanabaena</i> sp.	-	22	-
<i>Pseudanabaena mucicola</i>	-	59	248
<i>Rhabdoderma lineare</i>	-	-	2,233
<i>Rhabdogloea</i> sp.	179	15	83
<i>Romeria leopoliensis</i>	-	-	248
<i>Schizothrix calcicola</i>	-	51	-
<i>Synechocystis</i> sp.	2,865	88	5,294
<i>Synechocystis aquatilis</i>	-	1,201	8,851
Dinophyceae			
<i>Glenodinium</i> sp.	90	-	83
Euglenophyceae			
<i>Euglena acus</i>	-	7	-
<i>Euglena polymorpha</i>	-	29	83
<i>Lepocinclis</i> sp.	90	-	165
<i>Trachelomonas hispida</i>	-	7	-
<i>Trachelomonas volvocina</i>	-	22	-
Xanthophyceae			
<i>Ophiocytium capitatum</i>	-	-	83

Appendix I-2

Diatom taxa list and number of valves counted to a target of 500 valves for quantitative phytoplankton collected from the Mosaic Fertilizer, L.L.C. Wingate Creek Mine facility on 10/03/2011.

	Outfall	Control Site	Test Site
Bacillariophyta			
Bacillariophyceae			
<i>Achnanthes fluviatilis</i>	-	1	-
<i>Achnanthidium exiguum</i>	17	52	18
<i>Achnanthidium minutissimum</i>	1	-	-
<i>Amphora copulata</i>	1	-	-
<i>Caloneis</i> sp.	-	2	2
<i>Caloneis bacillum</i>	-	1	-
<i>Capartogramma crucicula</i>	-	12	-
<i>Cocconeis fluviatilis</i>	-	21	-
<i>Cocconeis placentula</i>	2	1	-
<i>Diadismis confervacea</i>	-	13	2
<i>Diadismis contenta</i>	-	1	-
<i>Encyonema minutum</i>	-	1	-
<i>Eunotia</i> sp.	1	6	-
<i>Eunotia bilunaris</i>	-	1	-
<i>Eunotia camelus</i>	-	1	-
<i>Eunotia carolina</i>	-	18	-
<i>Eunotia exigua</i>	-	2	-
<i>Eunotia flexuosa</i>	-	1	-
<i>Fallacia pygmaea</i>	-	6	-
<i>Geissleria acceptata</i>	-	5	2
<i>Gomphonema</i> sp.	-	1	-
<i>Gomphonema affine</i>	-	1	-
<i>Gomphonema gracile</i>	2	-	-
<i>Gomphonema parvulum</i>	-	23	-
<i>Gyrosigma obscurum</i>	-	1	1
<i>Hippodonta hungarica</i>	4	2	1
<i>Lemnicola hungarica</i>	-	3	-
<i>Mayamaea atomus</i>	4	32	-
<i>Navicula</i> sp.	4	21	2
<i>Navicula brasiliiana</i>	-	5	-
<i>Navicula germainii</i>	-	4	1
<i>Navicula longicephala</i>	-	1	-
<i>Navicula meniscus</i>	-	1	-
<i>Navicula minima</i>	1	1	5
<i>Navicula placentula</i>	1	-	-
<i>Navicula rostellata</i>	-	3	-
<i>Navicula seminulum hustedtii</i>	-	3	-
<i>Navicula viridulacalcis</i>	-	2	-
Naviculaceae	-	13	1
<i>Neidium</i> sp.	1	7	-

Appendix I-2 (continued)

	Outfall	Control Site	Test Site
<i>Nitzschia</i> sp.	12	62	38
<i>Nitzschia agnita</i>	9	-	4
<i>Nitzschia amphibia</i>	-	2	-
<i>Nitzschia clausii</i>	-	3	-
<i>Nitzschia filiformis</i>	-	1	-
<i>Nitzschia frustulum</i>	-	3	2
<i>Nitzschia gracilis</i>	1	3	-
<i>Nitzschia intermedia</i>	-	6	-
<i>Nitzschia nana</i>	-	3	-
<i>Nitzschia palea</i>	24	48	11
<i>Nitzschia reversa</i>	-	-	1
<i>Nitzschia subacicularis</i>	1	-	-
<i>Pinnularia</i> sp.	3	8	1
<i>Placoneis clementis</i>	-	1	1
<i>Placoneis elginensis</i>	-	5	-
<i>Placoneis gastrum</i>	-	7	-
<i>Planothidium apiculatum</i>	-	1	-
<i>Planothidium delicatulum</i>	2	-	2
<i>Planothidium frequentissimum</i>	1	2	-
<i>Planothidium rostratum</i>	3	-	-
<i>Psammothidium sacculum</i>	-	2	-
<i>Psammothidium subatomoides</i>	-	-	1
<i>Sellaphora laevissima</i>	3	2	-
<i>Sellaphora pupula</i>	2	10	1
<i>Sellaphora seminulum</i>	-	5	-
<i>Stauroneis phoenicenteron</i>	1	-	-
<i>Stauroneis prominula</i>	-	2	-
Coscinodiscophyceae			
<i>Aulacoseira</i> sp.	-	7	-
<i>Aulacoseira herzogii</i>	-	9	-
Fragilariophyceae			
<i>Pseudostaurosiraopsis geocollegarum</i>	2	-	-
<i>Staurosira elliptica</i>	143	1	144
<i>Synedra ulna</i>	-	-	2
Mediophyceae			
<i>Cyclotella atomus</i>	194	2	170
<i>Cyclotella meneghiniana</i>	4	17	3
<i>Stephanodiscus</i> sp.	-	16	-
<i>Stephanodiscus minutulus</i>	57	-	83
<i>Thalassiosira weissflogii</i>	-	5	1

Appendix J-1

Benthic macroinvertebrates collapsed taxa list and density (average number of individuals/m² rounded to the nearest individual, n = 3 samples) from Hester-Dendy artificial substrates incubated for 28 days upstream and downstream of the Mosaic Fertilizer, L.L.C. Wingate Creek Mine facility and collected on 10/12/2011. See SOP LT 7100 sect. 4.2.1 for method on collapsing taxa.

	Control Site	Test Site
Annelida		
Hirudinea		
Erpobdellidae	-	3
Oligochaeta		
Enchytraeidae	24	5
Arthropoda		
Crustacea		
Amphipoda		
<i>Hyaella azteca</i>	-	11
Insecta		
Coleoptera		
<i>Microcylloepus pusillus</i>	4	5
Noteridae	-	3
<i>Scirtes</i> sp.	3	3
<i>Stenelmis</i> sp.	7	11
Diptera		
<i>Ablabesmyia mallochi</i>	6	22
<i>Ablabesmyia rhamphe</i> grp.	9	53
<i>Asheum beckae</i>	62	1,377
<i>Chironomus</i> sp.	131	-
<i>Corynoneura</i> sp.	14	-
<i>Cryptochironomus</i> sp.	-	14
<i>Dasyhelea</i> sp.	-	3
<i>Dicrotendipes modestus</i>	44	-
<i>Dicrotendipes simpsoni</i>	22	14
<i>Glyptotendipes</i> sp.	-	14
<i>Goeldichironomus</i> cf. <i>natans</i>	-	120
<i>Goeldichironomus holoprasinus</i>	168	20
<i>Larsia</i> sp.	-	14
<i>Micropsectra</i> sp.	3	-
<i>Nanocladius</i> cf. <i>rectinervis</i>	9	-
<i>Palpomyia/bezzia</i> grp.	3	16
<i>Parachironomus carinatus</i>	37	-
<i>Paratanytarsus</i> sp.	499	11
<i>Pentaneura inconspicua</i>	77	925
<i>Polypedilum fallax</i>	6	34
<i>Polypedilum flavum</i>	74	347
<i>Polypedilum illinoense</i> grp.	281	113
<i>Polypedilum scalaenum</i> grp.	79	412
<i>Polypedilum tritum</i>	21	-

Appendix J-1 (continued)

	Control Site	Test Site
<i>Rheotanytarsus exiguus</i> grp.	29	81
<i>Rheotanytarsus pellucidus</i>	12	-
<i>Stenochironomus</i> sp.	-	11
<i>Tanytarsus</i> sp. B Epler	13	-
<i>Tanytarsus</i> sp. C Epler	22	11
<i>Tanytarsus</i> sp. L Epler	6	-
<i>Tanytarsus</i> sp. M Epler	6	-
<i>Tanytarsus</i> sp. V Epler	16	-
<i>Tanytarsus</i> sp. Y Epler	6	-
<i>Tribelos fuscicornis</i>	-	101
Ephemeroptera		
<i>Caenis</i> sp.	16	-
<i>Caenis diminuta</i>	-	77
Heptageniidae	-	3
<i>Pseudocloeon propinquum</i>	-	3
Odonata		
<i>Argia sedula</i>	-	8
<i>Calopteryx</i> sp.	-	3
Coenagrionidae	5	-
<i>Enallagma</i> sp.	-	3
Trichoptera		
<i>Cheumatopsyche</i> sp.	31	400
<i>Cyrnellus fraternus</i>	11	11
<i>Neotrichia</i> sp.	-	19
<i>Neureclipsis</i> sp.	-	44
Cnidaria		
Hydrozoa		
<i>Hydra</i> sp.	-	5
Mollusca		
Bivalvia		
<i>Corbicula fluminea</i>	-	98
Sphaeriidae(mollusca)	-	74
Gastropoda		
Ancylidae	85	72
Hydrobiidae	3	-
<i>Micromenetus</i> sp.	11	8
<i>Physa</i> sp.	19	20
<i>Planorbella</i> sp.	-	11

Appendix J-2

Benthic macroinvertebrates taxa list and counts (number of individuals counted) collected from Hester-Dendy artificial substrates (n= 3 samples) incubated upstream and downstream of the Mosaic Fertilizer, L.L.C. Wingate Creek Mine facility for 28 days and collected on 10/12/2011.

	Control Site	Test Site
Annelida		
Hirudinea		
Erpobdellidae	-	1
Oligochaeta		
Enchytraeidae	9	2
Arthropoda		
Crustacea		
Amphipoda		
<i>Hyaella azteca</i>	-	4
Insecta		
Coleoptera		
Elmidae	1	-
<i>Microcylloepus pusillus</i>	1	2
Noteridae	-	1
<i>Scirtes</i> sp.	1	1
<i>Stenelmis</i> sp.	2	4
Diptera		
<i>Ablabesmyia mallochi</i>	2	8
<i>Ablabesmyia rhamphe</i> grp.	3	19
<i>Asheum beckae</i>	21	488
Chironomidae	45	79
<i>Chironomus</i> sp.	46	-
<i>Corynoneura</i> sp.	5	-
<i>Cryptochironomus</i> sp.	-	5
<i>Dasyhelea</i> sp.	-	1
<i>Dicrotendipes</i> sp.	8	-
<i>Dicrotendipes modestus</i>	10	-
<i>Dicrotendipes simpsoni</i>	5	5
<i>Glyptotendipes</i> sp.	-	5
<i>Goeldichironomus</i> sp.	33	15
<i>Goeldichironomus</i> cf. <i>natans</i>	-	30
<i>Goeldichironomus holoprasinus</i>	26	5
<i>Larsia</i> sp.	-	5
<i>Micropsectra</i> sp.	1	-
<i>Nanocladius</i> cf. <i>rectinervis</i>	3	-
<i>Palpomyia/bezzia</i> grp.	1	6
<i>Parachironomus</i> sp.	5	-
<i>Parachironomus carinatus</i>	8	-
<i>Paratanytarsus</i> sp.	175	4
<i>Pentaneura inconspicua</i>	27	330
<i>Polypedilum</i> sp.	5	5

Appendix J-2 (continued)

	Control Site	Test Site
<i>Polypedilum fallax</i>	2	12
<i>Polypedilum flavum</i>	25	123
<i>Polypedilum illinoense</i> grp.	96	40
<i>Polypedilum scalaenum</i> grp.	27	146
<i>Polypedilum tritum</i>	7	-
<i>Rheotanytarsus exiguus</i> grp.	10	29
<i>Rheotanytarsus pellucidus</i>	4	-
<i>Stenochironomus</i> sp.	-	4
<i>Tanytarsus</i> sp.	2	-
<i>Tanytarsus</i> sp. B Epler	4	-
<i>Tanytarsus</i> sp. C Epler	7	4
<i>Tanytarsus</i> sp. L Epler	2	-
<i>Tanytarsus</i> sp. M Epler	2	-
<i>Tanytarsus</i> sp. V Epler	5	-
<i>Tanytarsus</i> sp. Y Epler	2	-
<i>Tribelos fuscicornis</i>	-	36
Ephemeroptera		
<i>Caenis</i> sp.	6	17
<i>Caenis diminuta</i>	-	12
Heptageniidae	-	1
<i>Pseudocloeon propinquum</i>	-	1
Odonata		
<i>Argia</i> sp.	-	2
<i>Argia sedula</i>	-	1
<i>Calopteryx</i> sp.	-	1
Coenagrionidae	2	-
<i>Enallagma</i> sp.	-	1
Trichoptera		
<i>Cheumatopsyche</i> sp.	11	136
<i>Cyrnellus fraternus</i>	3	4
Hydropsychidae	-	10
<i>Neotrichia</i> sp.	-	7
<i>Neureclipsis</i> sp.	-	16
Polycentropodidae	1	-
Trichoptera	1	6
Cnidaria		
Hydrozoa		
<i>Hydra</i> sp.	-	2
Mollusca		
Bivalvia		
<i>Corbicula fluminea</i>	-	37
Sphaeriidae(mollusca)	-	28
Gastropoda		
Ancylidae	32	26
<i>Micromenetus</i> sp.	4	3

Appendix J-2 (continued)

	Control Site	Test Site
<i>Physa</i> sp.	7	7
<i>Planorbella</i> sp.	-	4
Gastropoda	-	2
Hydrobiidae	1	-

EPA Endsheets

The Bioassay of the Mosaic Fertilizer LLC Wingate Creek Mine effluent sampled on October 3, 2011, NPDES #FL0032522

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

Transaction Code		NPDES NUMBER										YR/MO/DA				Insp Type	Inspector	Fac Type									
1	N	2	5	3	F	L	0	0	3	2	5	2	2	11	12	1	1	1	0	0	3	#	B	#	S	#	2

Remarks																									

#

The Priority Pollutants Analysis for Bioassay of the Mosaic Fertilizer LLC Wingate Creek Mine effluent sampled on October 3, 2011, NPDES #FL0032522

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

Transaction Code		NPDES NUMBER										YR/MO/DA				Insp Type	Inspector	Fac Type									
1	N	2	5	3	F	L	0	0	3	2	5	2	2	11	12	1	1	1	0	0	3	#	X	#	S	#	2

Remarks																									

#

Biological Analyses of the Mosaic Fertilizer LLC Wingate Creek Mine effluent sampled on October 3, 2011, NPDES #FL0032522

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

Transaction Code		NPDES NUMBER										YR/MO/DA				Insp Type	Inspector	Fac Type									
1	N	2	5	3	F	L	0	0	3	2	5	2	2	11	12	1	1	1	0	0	3	#	S	#	S	#	2

Remarks																									

#