

Effluent Quality Assessment

CF Industries, Inc. – Bartow Operations

Polk County

NPDES #FL0000523

Sampled April 29, 2013

August 2013

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration
Quality Manual No. 870346G
NELAC Certification No. E31780

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CF Industries, Inc. – Bartow Operations, 2501 Bonnie Mine Road, Bartow, Polk County, Florida, 33831. NPDES #FL0000523.

Facility Overview

CF Industries, Inc. – Bartow Operations is a closed fertilizer chemical plant. See Appendix A for a description of the facility, summary of permit limits, Administrative Order (AO) and Discharge Monitoring Report (DMR) information.

Methods

Effluent grab samples for toxicity testing and biological and chemical analysis were collected on April 29, 2013. Samples were collected from the EFF-SWO NPDES sampling point for Outfall D-SWO for toxicity testing, and the OUI-003 NPDES sampling point for Outfall I-003 for chemical analysis by Jacquelyn Champion and Melani Dickenson (FDEP Division of Water Resource Management) following DEP-SOP-001/01 FS 2400 Wastewater Sampling (see Appendix C).

The 96-hour acute definitive toxicity tests and algal growth potential test were performed following internal DEP SOPs TA07_01, TA07_02, and TA08_01 through TA08_09 (see Appendix C).

Results

Chemistry Results (See Table 1 and Appendix D)

- Total residual chlorine and total ammonia were not detected in the bioassay sample in the laboratory. The total ammonia concentration in the composite sample collected and preserved for chemical analysis was 0.009 mg N/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was < 0.02 mg/L.
- As measured in the field, the final effluent's DO (4.85 mg/L) at Outfall D-SWO did not meet the minimum requirement for Class III Freshwater Criteria. Arsenic, nickel, turbidity, fluoride, sulfate, and radium 226 + 228 were detected in the effluent at levels that comply with Class III Freshwater Quality Criteria (62-302.530, F.A.C.) and/or permitted limits. Iron was detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL). Di-n-butyl phthalate and total organic carbon were detected in the field blank.

Algal Growth Potential (See Table 2 and Appendix D)

- The effluent Algal Growth Potential (AGP) was 2.7 mg dry wt/L of the unicellular green alga, *Pseudokirchneriella subcapitata*, formerly known as *Selenastrum capricornutum*. Raschke and Schultz (1987) determined that AGP values above 5.0 mg dry weight/L represent a "problem" threshold for fresh receiving waters, implying nutrient enrichment. The analytical chemistry suggests that the effluent is nitrogen -limited (Miller et al. 1978).
- To determine actual nutrient limitation, a limiting-nutrient algal growth potential test with associated nutrient chemistry should be performed (Miller et al. 1978).

Toxicity Test Results (See Appendices D- G)

- Tests were performed April 30 –May 4, 2013.

Ceriodaphnia dubia 96-hour acute definitive bioassay –	LC_{50} > 100%, 0%* mortality in 100% sample at 96 hours
Pimephales promelas 96-hour acute definitive bioassay –	LC_{50} > 100%, 5%* mortality in 100% sample at 96 hours

*NOTE: In a 96-hour acute definitive test of 100% effluent, mortality of <20% provides confidence that the effluent meets the acute toxicity criterion of Florida's Surface Water Quality Standards (Rule 62-302.500 (1) (a) 4, F.A.C.). Mortality between 20-50% indicates low to moderate levels of toxicity, and further action may be required. Mortality of >50% indicates that the effluent fails to meet the minimum requirement to discharge to waters of the state (Rule 62-4.244(3) (a), F.A.C.).

- The bioassay samples were not acutely toxic to the test organisms.
- The sample was aerated for 20 minutes at a rate of approximately 100 bubbles per minute to decrease the dissolved oxygen (DO) from 9.6 mg/L to 7.9 mg/L.

Conclusion

The effluent sample collected from the D-SWO NPDES sampling point for this facility on April 29, 2013, was not acutely toxic to either test species during the 96-hour acute definitive bioassays. The AGP result was less than the problem threshold for fresh receiving waters. Effluent water quality samples collected on April 29, 2013, exceeded the water quality standards for dissolved oxygen.

Literature Cited

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

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

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

CF Industries Inc. Bartow Operations FL0000523	Class III Criteria	Effluent Limits	I-003		D-SWO	
Organic Constituents (µg/L)						
Di-n-butyl phthalate	-	-	0.95	U	-	
Metals (µg/L unless otherwise noted)						
Arsenic	≤ 50	-	1.09		-	
Cadmium	≤ 0.5199 b	-	0.050	U	-	
Calcium (mg/L)	-	-	77.7		-	
Chromium-III	≤ 177.39 b	-	0.30	U	-	
Copper	≤ 19.81 b	-	0.50	U	-	
Iron	≤ 1,000	-	110	I	-	
Lead	≤ 9.768 b	-	0.20	U	-	
Magnesium (mg/L)	-	-	11.5		-	
Nickel	≤ 109.9 b	-	1.06		-	
Silver	≤ 0.07	-	0.025	U	-	
Sodium	-	-	19.7		-	
Zinc	≤ 252.8 b	-	5.0	U	-	
Nutrients (mg/L)						
Total Phosphorus	-	≤ 20 p	1.8		-	
Total Ammonia	-	Report	0.009		-	
Un-ionized Ammonia	≤ 0.02 s	< 0.02	< 0.02	c	-	
Nitrate and Nitrite	-	-	0.006	I	-	
Total Kjeldahl Nitrogen	-	Report	0.35		-	
Organic Nitrogen	-	-	0.3410	c	-	
Total Nitrogen	-	≤ 25 p	0.3560	c	-	
Total Organic Carbon	-	-	6.3		-	
General Physical and Chemical Parameters						
Dissolved Oxygen (mg/L)	≥ 5.0	-	7.70		4.85	
pH (SU)	6.0 - 8.5	6.0 - 8.5	6.78		6.80	
Specific Conductance (µmhos/cm)	≤ 1,275	-	548		578	
Temperature (°C)	-	Report	21.56		23.63	
Salinity	-	-	≤ 0.29	c	≤ 0.29	c
Total Residual Chlorine (mg/L)	≤ 0.01	-	-		≤ 0.03	QU£
Chlorophyll *a* (µg/L) - Corrected	-	-	0.55	U	-	
Phaeophytin (µg/L)	-	-	0.40	U	-	
Total Suspended Solids (mg/L)	-	≤ 150 p	2	U	-	
Total Dissolved Solids (mg/L)	-	-	373		-	
Turbidity (NTU)	< 29 t	Report	-		2.5	A
Color (true, PCU)	-	-	19		-	
Oils and Greases (mg/L)	≤ 5.0	-	0.76	U	-	
Chloride (mg/L)	-	-	6.4		-	
Fluoride (mg/L)	≤ 10.0	≤ 10.0 p	1.2		-	
Sulfate (mg/L)	-	Report	210		-	
Alpha, Total (pCi/L)	≤ 15	≤ 15.0 p	1.3	U	-	
Alpha-Counting Error (pCi/L)	-	-	0.8		-	
Radium 226 (pCi/L)	-	-	0.1		-	
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 p	0.55	c	-	c
Flow (MGD)	-	Report	-		2.11	a*
Hardness (mg $CaCO_3$)	-	-	241.37	c	0.00	c

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

Value exceeds the Class III Water Quality Criteria or permit limits

a - Annual average
b - Value is calculated based on hardness
c - Value is calculated
p - 24-hour flow proportioned composite
t - Shall not exceed 29 NTUs above background
A - Value reported is the mean of two or more determinations
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
Q - Sample held beyond normal holding time
U - Material analyzed for but not detected; value reported is the method detection limit
£ - measurement taken in the FDEP laboratory
* - Measured from 4/2012 - 3/2013

Table 2. 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.

CF Industries Inc. Bartow Operations					
Location	Test Species	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (TN) ± 20%	Total N:P ratio
Effluent	Fresh	2.7	0.6 ± 0.1	13.5 ± 2.7	0.2

Appendix A
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): CF Industries, Inc.-Bartow Operations	Former Names:
NPDES Permit Number: FL0000523	Permit Expiration Date: 1/24/2014
Physical Address: 2501 Bonnie Mine Road, Bartow, Florida 33831	
District: Division of Water Resource Management, Phosphate Management Program	County: Polk
Function of Facility: Closed Fertilizer Chemical Plant	
Facility Type: Closed phosphogypsum stack system	Permitted Capacity (MGD): n/a
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): D-SWO 2.11 MGD (4/2012-3/2013); I-003 1.45 MGD (4/2012-3/2013); I-001 0.66 MGD (4/2012-3/2013) Total Flow for stormwater outfalls from 4/2012-3/2013: D-005 116.43 MG; D-006 201.57 MG; D-007 37.33 MG; D-04A 55.06 MG; D-07A 69.99 MG	
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): D-004A (EFF-04A); D-005 (EFF-005); D-006 (EFF-006); D-007 (EFF-007); D-007A (EFF-07A); D-SWO (EFF-SWO); I-001 (OUI-001); I-003 (OUI-003); I-SWL (OUI-SWL)	
Description of Permitted Outfall(s): I-001 discharges treated process water which comingles with I-003 before discharging through D-SWO. Outfalls D-004A, D-005, D-006, D-007 and D-007A are stormwater outfalls that discharge rainfall runoff from the closed phosphogypsum stack system.	
Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility): Excess process water inventory is currently treated using single-stage liming, spray aeration, and an acidulation process in the treatment ponds prior to discharge. The solids from the liming process are allowed to settle in associated treatment impoundment areas. The lime treated wastewater is then pumped through one or two sets of sprays for ammonia removal. The water is then acidulated to lower the pH to within an acceptable effluent range of 6.0 to 8.5 standard units. The final treated process water is discharged by pumping or gravity flow to Internal Outfall I-001.	

PART I: Continued

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

	Discharge Limitations			Monitoring Requirements		
Parameters (units)	Daily Minimum	Monthly Average	Daily Maximum	Monitoring Frequency	Sample Type	Sample Point
Flow (MGD)	NA	Report	Report	Continuous	Recorder	OUI-001 *
Flow (MGD)	NA	Report	Report	Continuous	Recorder	OUI-003 **
Solids, Total Suspended (MG/L) [See Condition I.A.10.]	NA	Report	Report	2/week	24-hr. flow proportional composite	OUI-001
Solids, Total Suspended (MG/L) [See Condition I.A.10.]	NA	50	150	2/week	24-hr. flow proportional composite	OUI-003
Phosphorus, Total (as P) (MG/L) [See Condition I.A.9.]	NA	14.0	16.0	2/week	24-hr. flow proportional composite	OUI-001
Phosphorus, Total (as P) (MG/L) [See Condition I.A.9.]	NA	18.0	20.0	2/week	24-hr. flow proportional composite	OUI-003
Phosphorus, Total (as P) (LBS/DAY) [See Conditions I.A.9. & I.A.21.]	NA	Report	Report	2/week	Calculation	OUI-001 OUI-003
Nitrogen, Total (as N) (MG/L) [See Condition I.A.9.]	NA	Report	25.0	Weekly	24-hr. flow proportional composite	OUI-001 OUI-003
Nitrogen, Total (as N) (LBS/DAY) [See Conditions I.A.9. & I.A.21.]	NA	Report	Report	Weekly	Calculation	OUI-001 OUI-003
Nitrogen, Kjeldahl, Total (as N) (MG/L)	NA	NA	Report	Monthly	24-hr. flow proportional composite	OUI-001 OUI-003
Fluoride, Total (as F) (MG/L)	NA	Report	10.0	2/week	24-hr. flow proportional composite	OUI-001 OUI-003
Sulfate, Total (MG/L)	NA	NA	Report	Monthly	24-hr. flow proportional composite	OUI-001 OUI-003
Nitrogen, Ammonia, Total (as N) (MG/L) [See Condition I.A.14.]	NA	Report	Report	Weekly	Grab	OUI-001 OUI-003
Ammonia, Unionized (as NH_3) (MG/L) [See Conditions I.A.13. & I.A.14.]	NA	Report	0.02	Weekly	Calculation	OUI-001 OUI-003
pH (SU) [See Conditions I.A.13. & I.A.14.]	6.0	Report	8.5	Continuous	Recorder	OUI-001 OUI-003
Temperature (C), Water (DEG.C) [See Condition I.A.14.]	NA	Report	Report	Weekly	Meter	OUI-001 OUI-003
Alpha, Gross Particle Activity (PCI/L) [See Condition I.A.11.]	NA	NA	15.0	Monthly	24-hr. flow proportional composite	OUI-001 OUI-003
$Radium^{226}$ + $Radium^{228}$, Total (PCI/L) [See Condition I.A.11.]	NA	NA	5.0	Monthly	24-hr. flow proportional composite	OUI-001 OUI-003
Flow (USGS Keysville Station) (CFS) [See Condition I.A.18.]	NA	Report	NA	Monthly	USGS Recorder	SWD-01K

* I-001 flow is measured with an in-line flow meter.

** I-003 flow is measured upstream of the aeration ladder by a continuous flow meter calibrated to the Parshall Flume.

	Discharge Limitations			Monitoring Requirements		
Parameters (units)	Daily Minimum	Monthly Average	Daily Maximum	Monitoring Frequency	Sample Type	Sample Point
Oxygen, Dissolved (DO) (MG/L) [See Condition I.A.8.]	**5.0**	**Report**	**NA**	**Weekly**	**Meter**	**OUI-SWL**
Specific Conductance (effluent) (UMHO/CM) when NOT discharging treated process water	**NA**	**Report**	**See Condition I.A.6.**	**Continuous**	**Recorder**	**OUI-SWL**
Specific Conductance (effluent) (UMHO/CM) when discharging treated process water	**NA**	**Report**	**See Condition I.A.8.**	**Continuous**	**Recorder**	**OUI-SWL**
Turbidity (effluent) (NTU) [See Condition I.A.7.]	**NA**	**NA**	**Report**	**Monthly**	**Meter**	**EFF-SWO**
Turbidity (Background) (NTU) [See Condition I.A.7.]	**NA**	**NA**	**Report**	**Monthly**	**Meter**	**SWB-001**
Turbidity (effluent - calc. limit) (NTU) [See Condition I.A.7.]	**NA**	**NA**	**Report**	**Monthly**	**Calculation**	**EFF-SWO**
Turbidity (effluent - calc. limit) (NTU) [See Condition I.A.7.]	**NA**	**NA**	**0.00**	**Monthly**	**Calculation**	**EFF-SWO**
Whole Effluent Toxicity (Acute)	**See Condition I.A.17. below**					**EFF-SWO**
	Discharge Limitations					**Monitoring Requirements**
Parameters (units)	Daily Minimum	Monthly Total	Daily Maximum	Monitoring Frequency	Sample Type	Sample Point
Flow (MGD)†	**NA**	**Report**	**Report**	**Monthly**	**Calculation**	††
Solids, Total Suspended (MG/L) [See Condition I.A.10.]	**NA**	**NA**	**150**	**Monthly**	**Grab**	††
Phosphorus, Total (as P) (MG/L) [See Condition I.A.9.]	**NA**	**NA**	**20.0**	**Monthly**	**Grab**	††
Phosphorus, Total (as P) (LBS/DAY) [See Conditions I.A.9. & I.A.21.]	**NA**	**NA**	**Report**	**Monthly**	**Calculation**	††
Nitrogen, Total (as N) (MG/L) [See Condition I.A.9.]	**NA**	**NA**	**Report**	**Monthly**	**Grab**	††
Nitrogen, Total (as N) (LBS/DAY) [See Conditions I.A.9. & I.A.21.]	**NA**	**NA**	**Report**	**Monthly**	**Calculation**	††
Nitrogen, Ammonia, Total (as N) (MG/L) [See Condition I.A.14.]	**NA**	**NA**	**Report**	**Monthly**	**Grab**	††
Ammonia, Unionized (as NH_3) (MG/L) [See Conditions I.A.13. & I.A.14.]	**NA**	**NA**	**0.02**	**Monthly**	**Calculation**	††
Fluoride, Total (as F) (MG/L)	**NA**	**NA**	**10.0**	**Monthly**	**Grab**	††
Sulfate, Total (MG/L)	**NA**	**NA**	**Report**	**Monthly**	**Grab**	††
Oxygen, Dissolved (DO) (MG/L)	**5.0**	**NA**	**NA**	**Monthly**	**Meter**	††
pH (SU) [See Conditions I.A.13. & I.A.14.]	**6.0**	**NA**	**8.5**	**Monthly**	**Meter**	††
Temperature (C), Water (DEG.C) [See Condition I.A.14.]	**NA**	**NA**	**Report**	**Monthly**	**Meter**	††
Specific Conductance (effluent) (UMHO/CM)	**NA**	**NA**	**1275**	**Monthly**	**Meter**	††
Turbidity (effluent) (NTU)	**NA**	**NA**	**29.0**	**Monthly**	**Meter**	††
Alpha, Gross Particle Activity (PCI/L) [See Condition I.A.11.]	**NA**	**NA**	**15.0**	**Monthly**	**Grab**	††
$Radium^{226}$ + $Radium^{228}$, Total (PCI/L) [See Condition I.A.11.]	**NA**	**NA**	**5.0**	**Monthly**	**Grab**	††

† Flow calculation shall be based upon the rainfall, acreage, and a runoff factor of 100% for each area.

†† Sample Points for this parameter shall be EFF-04A, EFF-005, EFF-006, EFF-007, and EFF-07A.

PART I: Continued

Receiving Waters:	Classification (indicate whether fresh or marine):
D-SWO, D-006 and D-007: North Prong Alafia River; D-004A, D-005 and D-007A: Skinned Sapling Creek	Class III Freshwaters

Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.):
D-SWO-Acute toxicity testing twice per year

Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.): A consent order addressing groundwater issues exists for this site.

Facility Mixing Zone Details (if applicable): The permittee has been granted a mixing zone 730 meters downstream from the Southwest Outfall D-SWO for specific conductance during discharges of treated process water from Internal Outfall I-001 in accordance with Rule 62-4.244, F.A.C. During periods when the permittee is discharging treated process water from Internal Outfall I-001 and the specific conductance level exceeds 2000 micromhos per centimeter at the bottom of the Internal Outfall I-003 cascade structure (Internal Monitoring Station I-SWL), the discharge shall be considered in violation of the water quality standard as per Rule 62-302.530(22), F.A.C., for Class III Freshwaters of the State, at the end of the mixing zone due to its inaccessibility. The effluent at I-SWL when Internal Outfall I-001 is not discharging shall comply with the specific conductance limitation as per Rule 62-302.530(22), F.A.C. (see Condition I.A.6. above).

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: The effluent samples collected from Southwest Outfall for this facility on March 13, 15, and 17, 2006 were not toxic to the *Ceriodaphnia dubia* test species but were toxic to the *Pimephales promelas* test species during the 7-day chronic screen bioassays. The effluent AGP result exceeded the "problem" threshold for fresh receiving waters. Effluent water quality samples did not exceed any applicable water quality standards or violate any permit conditions.

Describe previous or current Enforcement Actions (including WLs): A compliance assistance letter was sent 2/15/2013 to address arsenic levels in a monitoring well. 4/8/2013 a letter was received from the facility confirming corrective actions and the facility was classified as in compliance without formal enforcement action.

Describe any violations or problems noted in previous inspection: None

Discuss whether DMR trends within previous five years are improving or declining:
Improving due to less treated process water discharge.

Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):
The chronic toxicity issues at the site were addressed through an extensive toxicity study.

PART II: Sampling Event Information

Date(s) sample collected:	Sampler(s):
4/29/2013	Jacki Champion, Melani Dickenson
Temperature (Deg C): I-003: 21.56 D-SWO: 23.63	pH (SU): I-003: 6.78 D-SWO: 6.80

Dissolved Oxygen (mg/L): I-003: 7.70J D-SWO: 4.85J	Conductivity (umhos/cm): I-003: 548 D-SWO: 578
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): I-003: 0.325 D-SWO: 0.325	
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): I-003: 1.45 MGD D-SWO 2.11 MGD (4/2012-3/2013)	
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:	

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2013-04-29-18
FYI3 for CF Industries-Bartow

Requester: Michelle Fish
Field Report Prepared By: Jackie Champion
Collected By: Jackie Champion / Melanie Dickerson
Send Final Report To: Vishwas Sathe
Sampling Agency: FDEP

Customer: BMR-TAMPA
Project ID: FYI5
PMAS: 1143

Lab ID *	Location	Collection (comp begin or grab) Eastern Central	Composite end Eastern Central	Bottle Group(s)**
	CF Bartow	☐ Comp ☒ Grab Date 4/29/13 Time 10:30	Date Time	A
	Field ID: I-003	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L): 7.70	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc): Fresh H2O	Temp (C): 21.56	pH: 6.78	Sample Depth ☐ m ☐ ft: 548
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms		Salinity (PPTh) ☒ Sp Conductance (umho/cm)
				NPDES Number: FL0000523
				Comments: %DO - 87.3

Lab ID *	Location	Collection (comp begin or grab) Eastern Central	Composite end Eastern Central	Bottle Group(s)**
	CF Bartow	☐ Comp ☒ Grab Date 4/29/13 Time 11:10	Date Time	B
	Field ID: SWO	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L): 4.85	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc): Fresh H2O	Temp (C): 23.63	pH: 6.80	Sample Depth ☐ m ☐ ft: 578
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms		Salinity (PPTh) ☒ Sp Conductance (umho/cm)
				NPDES Number: FL0000523
				Comments: %DO - 57.2

Lab ID *	Location	Collection (comp begin or grab) Eastern Central	Composite end Eastern Central	Bottle Group(s)**
	CF Bartow	☐ Comp ☒ Grab Date 4/29/13 Time 11:10	Date Time	B
	Field ID: SWO	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L): 4.85	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc): Fresh H2O	Temp (C): 23.63	pH: 6.80	Sample Depth ☐ m ☐ ft: 578
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms		Salinity (PPTh) ☒ Sp Conductance (umho/cm)
				NPDES Number: FL0000523
				Comments: Toxicity / Bioassay Sample

Lab ID *	Location	Collection (comp begin or grab) Eastern Central	Composite end Eastern Central	Bottle Group(s)**
	CF Bartow	☐ Comp ☒ Grab Date 4/29/13 Time 10:00	Date Time	C
	Field ID: Eq. BLK	Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc): Fresh H2O	Temp (C)	pH	Sample Depth ☐ m ☐ ft
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms		Salinity (PPTh) ☐ Sp Conductance (umho/cm)
				NPDES Number
				Comments: Equipment Blank - DI H2O

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
M. Champion	4/29/13 1:45pm	Fed Ex	[illegible]	4-30-13 09:30				

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

4 BIOASSAY
1020 4-30-13
rmspencer

Appendix C
Explanation of measurements

(1) Quality Assurance and Quality Control

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

(2) Chemical Analyses of the Effluent

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

(3) Toxicity Bioassays

Greater than 50% mortality in an acute toxicity test may constitute an exceedance of 62-302.500(1)a and/or a violation of facility permit limits. An inhibition concentration greater than 25% in a chronic test may constitute exceedances of 62-302.530(20), 62-302.530(61) and/or a violation of facility permit limits. A no observed effect concentration (NOEC) less than 100% effluent in a chronic test may constitute an exceedance of 62-302.530(61) and/or a violation of facility permit limits. Standard reference toxicant (SRT) tests are conducted monthly to ensure quality in toxicity testing.

(4) Bacteriological Testing

High levels of fecal coliform bacteria may constitute an exceedance of 62-302.530(6) and/or a violation of facility permit limits. Fecal coliform and enterococci results often are based on colony counts outside the acceptable range (B-qualifier). The dilutions performed on the sample did not yield results within the method acceptable range of 20-60 colony forming units per plate. The B-qualifier does not affect data quality.

(5) 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.

(7) Chlorophyll *a* Content

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

(8) Definition of Qualifiers

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

Appendix D
Chemical Analyses of Effluent

Date Sampled	Field ID	Analysis Group	Components	Results	Remark	Units	MDL	PQL
4/29/2013 10:30	I-003	AGP/LN	Algal Growth Potential	2.70		mg DryWt/L	0.3	0.9
4/29/2013 10:30	I-003	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.55	U	ug/L	0.55	1.7
4/29/2013 10:30	I-003	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.40	U	ug/L	0.4	1.2
4/29/2013 10:30	I-003	Metals	Nickel	1.06		ug/L	0.25	1
4/29/2013 10:30	I-003	Metals	Copper	0.50	U	ug/L	0.5	1
4/29/2013 10:30	I-003	Metals	Calcium	77.7		mg/L	0.075	0.3
4/29/2013 10:30	I-003	Metals	Lead	0.20	U	ug/L	0.2	0.8
4/29/2013 10:30	I-003	Metals	Cadmium	0.050	U	ug/L	0.05	0.2
4/29/2013 10:30	I-003	Metals	Arsenic	1.09		ug/L	0.25	1
4/29/2013 10:30	I-003	Metals	Chromium	0.30	U	ug/L	0.3	1.2
4/29/2013 10:30	I-003	Metals	Sodium	19.7		mg/L	0.5	2
4/29/2013 10:30	I-003	Metals	Magnesium	11.5		mg/L	0.04	0.16
4/29/2013 10:30	I-003	Metals	Potassium	0.30	U	mg/L	0.3	1.2
4/29/2013 10:30	I-003	Metals	Silver	0.025	U	ug/L	0.025	0.1
4/29/2013 10:30	I-003	Metals	Iron	110	I	ug/L	30	120
4/29/2013 10:30	I-003	Metals	Zinc	5.0	U	ug/L	5	20
4/29/2013 10:30	I-003	Nutrients	Color (true)	19		PCU	2.5	6
4/29/2013 10:30	I-003	Nutrients	Fluoride	1.2		mg F/L	0.035	0.1
4/29/2013 10:30	I-003	Nutrients	Total-P	1.8		mg P/L	0.025	0.25
4/29/2013 10:30	I-003	Nutrients	Kjeldahl Nitrogen	0.35		mg N/L	0.08	0.2
4/29/2013 10:30	I-003	Nutrients	Sulfate	210		mg SO4/L	2	5
4/29/2013 10:30	I-003	Nutrients	NO2NO3-N	0.006	I	mg N/L	0.004	0.01
4/29/2013 10:30	I-003	Nutrients	Ammonia-N	0.009		mg N/L	0.002	0.005
4/29/2013 10:30	I-003	Nutrients	Organic Carbon	6.3		mg C/L	0.5	1
4/29/2013 10:30	I-003	Nutrients	TSS	2	U	mg/L	2	10
4/29/2013 10:30	I-003	Nutrients	Chloride	6.4		mg Cl/L	0.4	1
4/29/2013 10:30	I-003	Nutrients	TDS	373		mg/L	15	25
4/29/2013 10:30	I-003	Overflow	Radium 226-Counting Error	0.1		pCi/L		
4/29/2013 10:30	I-003	Overflow	Radium 228	0.9	U	pCi/L		
4/29/2013 10:30	I-003	Overflow	Alpha, Total	1.3	U	pCi/L		
4/29/2013 10:30	I-003	Overflow	Radium 228-Counting Error	0.5		pCi/L		

Date Sampled	Field ID	Analysis Group	Components	Results	Remark	Units	MDL	PQL
4/29/2013 10:30	I-003	Overflow	Radium 226	0.1		pCi/L		
4/29/2013 10:30	I-003	Overflow	Alpha-Counting Error	0.8		pCi/L		
4/29/2013 10:30	I-003	Overflow	Oil and Grease	0.76	U	mg/L	0.76	2.7
4/29/2013 10:30	I-003	Pesticides	Norflurazon	0.15	UJ	ug/L	0.15	0.6
4/29/2013 10:30	I-003	Pesticides	Metalaxyl	0.20	U	ug/L	0.2	0.8
4/29/2013 10:30	I-003	Pesticides	Butylate	0.10	U	ug/L	0.1	0.4
4/29/2013 10:30	I-003	Pesticides	Naled	0.20	U	ug/L	0.2	0.8
4/29/2013 10:30	I-003	Pesticides	Metolachlor	0.30	U	ug/L	0.3	1.2
4/29/2013 10:30	I-003	Pesticides	Fonofos	0.050	U	ug/L	0.05	0.2
4/29/2013 10:30	I-003	Pesticides	Chlorpyrifos Ethyl	0.050	U	ug/L	0.05	0.2
4/29/2013 10:30	I-003	Pesticides	Atrazine	0.050	U	ug/L	0.05	0.2
4/29/2013 10:30	I-003	Pesticides	Alachlor	0.30	U	ug/L	0.3	1.2
4/29/2013 10:30	I-003	Pesticides	Prometryn	0.10	U	ug/L	0.1	0.4
4/29/2013 10:30	I-003	Pesticides	Parathion Ethyl	0.10	U	ug/L	0.1	0.4
4/29/2013 10:30	I-003	Pesticides	Diazinon	0.050	U	ug/L	0.05	0.2
4/29/2013 10:30	I-003	Pesticides	Fenamiphos	0.15	U	ug/L	0.15	0.6
4/29/2013 10:30	I-003	Pesticides	Chlorpyrifos Methyl	0.050	U	ug/L	0.05	0.2
4/29/2013 10:30	I-003	Pesticides	Metribuzin	0.10	U	ug/L	0.1	0.4
4/29/2013 10:30	I-003	Pesticides	Malathion	0.050	U	ug/L	0.05	0.2
4/29/2013 10:30	I-003	Pesticides	Ethoprop	0.025	U	ug/L	0.025	0.1
4/29/2013 10:30	I-003	Pesticides	Ethion	0.050	U	ug/L	0.05	0.2
4/29/2013 10:30	I-003	Pesticides	Hexazinone	0.15	U	ug/L	0.15	0.6
4/29/2013 10:30	I-003	Pesticides	Bromacil	0.20	U	ug/L	0.2	0.8
4/29/2013 10:30	I-003	Pesticides	Simazine	0.050	U	ug/L	0.05	0.2
4/29/2013 10:30	I-003	Pesticides	Phorate	0.025	U	ug/L	0.025	0.1
4/29/2013 10:30	I-003	Pesticides	Mevinphos	0.050	U	ug/L	0.05	0.2
4/29/2013 10:30	I-003	Pesticides	Azinphos Methyl	0.10	UJ	ug/L	0.1	0.4
4/29/2013 10:30	I-003	Pesticides	Parathion Methyl	0.050	U	ug/L	0.05	0.2
4/29/2013 10:30	I-003	Pesticides	Ametryn	0.050	U	ug/L	0.05	0.2
4/29/2013 10:30	I-003	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38	U	ug/L	38	150
4/29/2013 10:30	I-003	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	Hexachlorobenzene	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	11
4/29/2013 10:30	I-003	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.6
4/29/2013 10:30	I-003	Priority Organic Pollutants	2,6-Dinitrotoluene	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	4-Nitrophenol	14	U	ug/L	14	57

Date Sampled	Field ID	Analysis Group	Components	Results	Remark	Units	MDL	PQL
4/29/2013 10:30	I-003	Priority Organic Pollutants	Acenaphthene	0.19	U	ug/L	0.19	0.76
4/29/2013 10:30	I-003	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19	U	ug/L	0.19	0.76
4/29/2013 10:30	I-003	Priority Organic Pollutants	Anthracene	0.19	U	ug/L	0.19	0.76
4/29/2013 10:30	I-003	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	1.9	U	ug/L	1.9	7.6
4/29/2013 10:30	I-003	Priority Organic Pollutants	Fluoranthene	0.19	U	ug/L	0.19	0.76
4/29/2013 10:30	I-003	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19	U	ug/L	0.19	0.76
4/29/2013 10:30	I-003	Priority Organic Pollutants	Isophorone	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	Phenanthrene	0.19	U	ug/L	0.19	0.76
4/29/2013 10:30	I-003	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	2,4-Dinitrotoluene	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	2-Chloronaphthalene	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	2-Chlorophenol	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	11
4/29/2013 10:30	I-003	Priority Organic Pollutants	Diethyl phthalate	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	11
4/29/2013 10:30	I-003	Priority Organic Pollutants	Phenol	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	Pyrene	0.19	U	ug/L	0.19	0.76
4/29/2013 10:30	I-003	Priority Organic Pollutants	2,4-Dichlorophenol	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	2,4-Dimethylphenol	9.5	U	ug/L	9.5	38
4/29/2013 10:30	I-003	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	Acenaphthylene	0.19	U	ug/L	0.19	0.76
4/29/2013 10:30	I-003	Priority Organic Pollutants	Benzo(a)pyrene	0.19	U	ug/L	0.19	0.76
4/29/2013 10:30	I-003	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19	U	ug/L	0.19	0.76
4/29/2013 10:30	I-003	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.6
4/29/2013 10:30	I-003	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.6
4/29/2013 10:30	I-003	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.6
4/29/2013 10:30	I-003	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19	U	ug/L	0.19	0.76
4/29/2013 10:30	I-003	Priority Organic Pollutants	Chrysene	0.19	U	ug/L	0.19	0.76
4/29/2013 10:30	I-003	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	11
4/29/2013 10:30	I-003	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	11
4/29/2013 10:30	I-003	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	2-Nitrophenol	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	Benzidine	95	U	ug/L	95	380
4/29/2013 10:30	I-003	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19	U	ug/L	0.19	0.76

Date Sampled	Field ID	Analysis Group	Components	Results	Remark	Units	MDL	PQL
4/29/2013 10:30	I-003	Priority Organic Pollutants	Butyl benzyl phthalate	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	Di-n-butyl phthalate	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	2,4-Dinitrophenol	14	U	ug/L	14	57
4/29/2013 10:30	I-003	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	11
4/29/2013 10:30	I-003	Priority Organic Pollutants	Benzo(a)anthracene	0.19	U	ug/L	0.19	0.76
4/29/2013 10:30	I-003	Priority Organic Pollutants	Di-n-octyl phthalate	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	Dimethyl phthalate	0.95	U	ug/L	0.95	3.8
4/29/2013 10:30	I-003	Priority Organic Pollutants	Fluorene	0.19	U	ug/L	0.19	0.76
4/29/2013 10:30	I-003	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	U	ug/L	2.9	11
4/29/2013 10:30	I-003	Priority Organic Pollutants	Naphthalene	0.19	U	ug/L	0.19	0.76
4/29/2013 10:30	I-003	Field Parameter	Temperature	21.56		C		
4/29/2013 10:30	I-003	Field Parameter	pH	6.78				
4/29/2013 10:30	I-003	Field Parameter	Dissolved Oxygen	7.70		mg/L		
4/29/2013 10:30	I-003	Field Parameter	Specific Conductance	548		umhos/cm		
4/29/2013 11:10	SWO	Toxicology	Bioassay-Acute-Def-FW-C.dubia, LC50	100	L	LC50		
4/29/2013 11:10	SWO	Toxicology	Bioassay-Acute-Def-FW-Fish, LC50	100	L	LC50		
4/29/2013 11:10	SWO	Nutrients	Turbidity	2.5	A	NTU	0.1	0.1
4/29/2013 11:10	SWO	Field Parameter	pH	6.80				
4/29/2013 11:10	SWO	Field Parameter	Dissolved Oxygen	4.85		mg/L		
4/29/2013 11:10	SWO	Field Parameter	Specific Conductance	578		umhos/cm		
4/29/2013 11:10	SWO	Field Parameter	Temperature	23.63		C		
4/29/2013 10:00	EQ BLK	AGP/LN	Algal Growth Potential	0.3	U	mg DryWt/L	0.3	0.9
4/29/2013 10:00	EQ BLK	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.45	U	ug/L	0.45	1.4
4/29/2013 10:00	EQ BLK	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.62	U	ug/L	0.62	1.9
4/29/2013 10:00	EQ BLK	Metals	Copper	0.50	U	ug/L	0.5	1
4/29/2013 10:00	EQ BLK	Metals	Zinc	5.0	U	ug/L	5	20
4/29/2013 10:00	EQ BLK	Metals	Silver	0.025	U	ug/L	0.025	0.1
4/29/2013 10:00	EQ BLK	Metals	Magnesium	0.040	U	mg/L	0.04	0.16
4/29/2013 10:00	EQ BLK	Metals	Lead	0.20	U	ug/L	0.2	0.8
4/29/2013 10:00	EQ BLK	Metals	Cadmium	0.050	U	ug/L	0.05	0.2
4/29/2013 10:00	EQ BLK	Metals	Nickel	0.25	U	ug/L	0.25	1
4/29/2013 10:00	EQ BLK	Metals	Chromium	0.30	U	ug/L	0.3	1.2
4/29/2013 10:00	EQ BLK	Metals	Arsenic	0.25	U	ug/L	0.25	1
4/29/2013 10:00	EQ BLK	Metals	Calcium	0.075	U	mg/L	0.075	0.3
4/29/2013 10:00	EQ BLK	Metals	Iron	30	U	ug/L	30	120
4/29/2013 10:00	EQ BLK	Metals	Sodium	0.50	U	mg/L	0.5	2

Date Sampled	Field ID	Analysis Group	Components	Results	Remark	Units	MDL	PQL
4/29/2013 10:00	EQ BLK	Metals	Potassium	0.30	U	mg/L	0.3	1.2
4/29/2013 10:00	EQ BLK	Nutrients	Total-P	0.002	U	mg P/L	0.002	0.005
4/29/2013 10:00	EQ BLK	Nutrients	Kjeldahl Nitrogen	0.080	U	mg N/L	0.08	0.2
4/29/2013 10:00	EQ BLK	Nutrients	Sulfate	0.20	U	mg SO4/L	0.2	0.5
4/29/2013 10:00	EQ BLK	Nutrients	Color (true)	2.5	U	PCU	2.5	6
4/29/2013 10:00	EQ BLK	Nutrients	TSS	2	U	mg/L	2	10
4/29/2013 10:00	EQ BLK	Nutrients	Organic Carbon	0.53	I	mg C/L	0.5	1
4/29/2013 10:00	EQ BLK	Nutrients	Ammonia-N	0.002	U	mg N/L	0.002	0.005
4/29/2013 10:00	EQ BLK	Nutrients	Chloride	0.20	U	mg Cl/L	0.2	0.5
4/29/2013 10:00	EQ BLK	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
4/29/2013 10:00	EQ BLK	Nutrients	Fluoride	0.035	U	mg F/L	0.035	0.1
4/29/2013 10:00	EQ BLK	Overflow	Oil and Grease	0.72	U	mg/L	0.72	2.6
4/29/2013 10:00	EQ BLK	Overflow	Radium 228	0.8	U	pCi/L		
4/29/2013 10:00	EQ BLK	Overflow	Radium 226	0.2	U	pCi/L		
4/29/2013 10:00	EQ BLK	Overflow	Radium 226-Counting Error	0.1		pCi/L		
4/29/2013 10:00	EQ BLK	Overflow	Radium 228-Counting Error	0.5		pCi/L		
4/29/2013 10:00	EQ BLK	Overflow	Alpha-Counting Error	0.4		pCi/L		
4/29/2013 10:00	EQ BLK	Overflow	Alpha, Total	0.7	U	pCi/L		
4/29/2013 10:00	EQ BLK	Pesticides	Ethoprop	0.025	U	ug/L	0.025	0.099
4/29/2013 10:00	EQ BLK	Pesticides	Metolachlor	0.30	U	ug/L	0.3	1.2
4/29/2013 10:00	EQ BLK	Pesticides	Azinphos Methyl	0.099	UJ	ug/L	0.099	0.39
4/29/2013 10:00	EQ BLK	Pesticides	Malathion	0.049	U	ug/L	0.049	0.2
4/29/2013 10:00	EQ BLK	Pesticides	Parathion Methyl	0.049	U	ug/L	0.049	0.2
4/29/2013 10:00	EQ BLK	Pesticides	Hexazinone	0.15	U	ug/L	0.15	0.59
4/29/2013 10:00	EQ BLK	Pesticides	Naled	0.20	U	ug/L	0.2	0.79
4/29/2013 10:00	EQ BLK	Pesticides	Parathion Ethyl	0.099	U	ug/L	0.099	0.39
4/29/2013 10:00	EQ BLK	Pesticides	Fonofos	0.049	U	ug/L	0.049	0.2
4/29/2013 10:00	EQ BLK	Pesticides	Mevinphos	0.049	U	ug/L	0.049	0.2
4/29/2013 10:00	EQ BLK	Pesticides	Atrazine	0.049	U	ug/L	0.049	0.2
4/29/2013 10:00	EQ BLK	Pesticides	Metalaxyl	0.20	U	ug/L	0.2	0.79
4/29/2013 10:00	EQ BLK	Pesticides	Phorate	0.025	U	ug/L	0.025	0.099
4/29/2013 10:00	EQ BLK	Pesticides	Prometryn	0.099	U	ug/L	0.099	0.39
4/29/2013 10:00	EQ BLK	Pesticides	Simazine	0.049	U	ug/L	0.049	0.2
4/29/2013 10:00	EQ BLK	Pesticides	Ametryn	0.049	U	ug/L	0.049	0.2
4/29/2013 10:00	EQ BLK	Pesticides	Bromacil	0.20	U	ug/L	0.2	0.79
4/29/2013 10:00	EQ BLK	Pesticides	Fenamiphos	0.15	U	ug/L	0.15	0.59

Date Sampled	Field ID	Analysis Group	Components	Results	Remark	Units	MDL	PQL
4/29/2013 10:00	EQ BLK	Pesticides	Alachlor	0.30	U	ug/L	0.3	1.2
4/29/2013 10:00	EQ BLK	Pesticides	Butylate	0.099	U	ug/L	0.099	0.39
4/29/2013 10:00	EQ BLK	Pesticides	Chlorpyrifos Ethyl	0.049	U	ug/L	0.049	0.2
4/29/2013 10:00	EQ BLK	Pesticides	Chlorpyrifos Methyl	0.049	U	ug/L	0.049	0.2
4/29/2013 10:00	EQ BLK	Pesticides	Diazinon	0.049	U	ug/L	0.049	0.2
4/29/2013 10:00	EQ BLK	Pesticides	Ethion	0.049	U	ug/L	0.049	0.2
4/29/2013 10:00	EQ BLK	Pesticides	Metribuzin	0.099	U	ug/L	0.099	0.39
4/29/2013 10:00	EQ BLK	Pesticides	Norflurazon	0.15	U	ug/L	0.15	0.59
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	59
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.20	U	ug/L	0.2	0.78
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Benzo(b)fluoranthene	0.20	U	ug/L	0.2	0.78
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	2.0	U	ug/L	2	7.8
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Diethyl phthalate	0.98	U	ug/L	0.98	3.9
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	12
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	N-Nitrosodimethylamine	2.0	U	ug/L	2	7.8
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	U	ug/L	2.9	12
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.98	U	ug/L	0.98	3.9
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	2,4-Dichlorophenol	0.98	U	ug/L	0.98	3.9
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	2,4-Dimethylphenol	9.8	U	ug/L	9.8	39
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	2-Chloronaphthalene	0.98	U	ug/L	0.98	3.9
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	12
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Nitrobenzene	2.0	U	ug/L	2	7.8
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Benzidine	98	U	ug/L	98	390
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Di-n-octyl phthalate	0.98	U	ug/L	0.98	3.9
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Butyl benzyl phthalate	0.98	U	ug/L	0.98	3.9
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Anthracene	0.20	U	ug/L	0.2	0.78
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.98	U	ug/L	0.98	3.9
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2.0	U	ug/L	2	7.8
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	12
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	2,6-Dinitrotoluene	0.98	U	ug/L	0.98	3.9
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.98	U	ug/L	0.98	3.9
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Chrysene	0.20	U	ug/L	0.2	0.78
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Isophorone	0.98	U	ug/L	0.98	3.9
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	12
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	2-Nitrophenol	0.98	U	ug/L	0.98	3.9
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.98	U	ug/L	0.98	3.9

Date Sampled	Field ID	Analysis Group	Components	Results	Remark	Units	MDL	PQL
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Dimethyl phthalate	0.98	U	ug/L	0.98	3.9
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Hexachlorobenzene	0.98	U	ug/L	0.98	3.9
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.20	U	ug/L	0.2	0.78
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Benzo(k)fluoranthene	0.20	U	ug/L	0.2	0.78
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Fluoranthene	0.20	U	ug/L	0.2	0.78
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	12
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Phenanthrene	0.20	U	ug/L	0.2	0.78
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Phenol	0.98	U	ug/L	0.98	3.9
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	2,4-Dinitrotoluene	0.98	U	ug/L	0.98	3.9
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	2-Chlorophenol	0.98	U	ug/L	0.98	3.9
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Benzo(a)pyrene	0.20	U	ug/L	0.2	0.78
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Di-n-butyl phthalate	1.2	I	ug/L	0.98	3.9
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Fluorene	0.20	U	ug/L	0.2	0.78
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.20	U	ug/L	0.2	0.78
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Naphthalene	0.20	U	ug/L	0.2	0.78
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	12
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Pyrene	0.20	U	ug/L	0.2	0.78
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.98	U	ug/L	0.98	3.9
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L	15	59
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	3,3'-Dichlorobenzidine	39	U	ug/L	39	160
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2.0	U	ug/L	2	7.8
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Acenaphthene	0.20	U	ug/L	0.2	0.78
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Acenaphthylene	0.20	U	ug/L	0.2	0.78
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Benzo(a)anthracene	0.20	U	ug/L	0.2	0.78
4/29/2013 10:00	EQ BLK	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.98	U	ug/L	0.98	3.9

FDEP Biology Laboratory - Acute Bioassay Bench Sheets

Facility: CF Industries, Inc-Bartow Chemical Plant
Address : P.O. Box 15 Bonnie Mine Rd
City: Wauchula **County:** Hardee
Contact/District: Jacki Champion / SW BAM
NPDES Permit #: FL ~~0166057~~ MF 0000523
LIMS Job #: TCH-2013-04-30-19
LIMS Sample #: 1499659
Lims Data Entry: 5-14-13 MF
Data Entry Verification: 5-18-13 BA MF

Sample Collection: Date: 4-29-13 Time: ~~1030~~ AP 1110
Hold Time Start: Date: 4-29-13 Time: ~~1030~~ MF 1110

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: 9.6 mg/L Final DO: 2.9 mg/L Duration: 20 minutes Rate: ~ 100 bubbles/min
Salinity adjusted (Test 1): ☐ yes ☑ no Initial Salinity: ____ Final Salinity: ____ Salts Hypersaline brine
Salinity adjusted (Test 2): ☐ yes ☑ no Initial Salinity: ____ Final Salinity: ____ Salts Hypersaline brine
Dechlorination: ☐ yes ☑ no ____mL of 0.025N Sodium Thiosulfate per liter of sample. Final TRC: ____

Sample Validation:
Instructions: Check yes or no. Fill in temperatures.

Temperature: Shipped ≤ 6°C ☑ Yes ☐ No --- IF Hand Delivered: Cooling ☐ Yes ☐ No (received ____°C collected____°C)
Holding Time: ≤ 36 Hours ☑ Yes ☐ No (Composite-end of collection; grab-when collected; 4 in 24 - time last sample collected)

Investigators' Signatures:	Initials:
Adrienne Pennington	AP
Bruce Abel	BA
Marshall Faircloth	MF
Cassidy Merritt	CR
REVIEWER: Liz Miller	

Diluent/Control Batch#:	4-26-13		4.25.13						
Water Quality Parameters	~~MF 18 MHWD 20% DMW~~	Well Water	Moderately Hard Water	Salt Water ASW NSW Test 1	Salt Water ASW NSW Test 2	Other:	Original Sample	Measured by	Verified by
Field Total Residual Cl_2 (mg/L):	N/A	N/A	N/A	N/A	N/A	N/A	Not measured		MF
Lab Total Residual Cl_2 (mg/L):	<0.03		<0.03				<0.03	CR/HW/AP	BA
Alkalinity (mg/L as $CaCO_3$):	76		73				47	AP/HW/CR	BA
Hardness (mg/L as $CaCO_3$):	95		79				238	AP/HW/CR	BA
Total Ammonia (mg/L as N):	<0.017		<0.017				<0.017	MF	CR
Conductivity: ☐ µmhos ☐ mmhos	312		292				581	BA/MF	CR
Salinity (ppth):									

V 1.8 1/13/10

FDEP Biology Laboratory - Acute Bioassay Survival Bench Sheet

LIMS Sample # 1499659 **SOP#: TA 07** 01 **Test #** 1 **of** 2

Test Species:
Batch #: 4-30-13 Age: <24hrs
- [x] *Ceriodaphnia dubia*
- [ ] *Cyprinella leedsi*
- [ ] *Pimephales promelas*
- [ ] *Menidia beryllina*
- [ ] *Americamysis bahia*
- [ ] Other:_____

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

Diluent (Batch # 4-26-13**)**
- [ ] ASW
- [x] MHWCD
- [ ] MHW
- [ ] Well

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

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

Test Started: Date 4-30-13 Time 1210

Test Ended: Date 5.4.13 Time 1200

Chamber Size 30 **ml**
Test Volume: 20 **ml**

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
CTL	A	1	5	5	5	5	5	5
	B	2	5	5	5	5	5	5
	C	3	5	5	5	5	5	5
	D	4	5	5	5	5	5	5
6.25%	A	5	5	5	5	5	5	5
	B	6	5	5	5	5	5	5
	C	7	5	5	5	5	5	5
	D	8	5	5	5	5	5	4 1D
12.5%	A	9	5	5	5	5	5	5
	B	10	5	5	5	5	5	4 1D
	C	11	5	5	5	5	5	5
	D	12	5	5	5	5	5	5
25%	A	13	5	5	5	5	5	5
	B	14	5	5	5	5	5	4 1D
	C	15	5	5	5	5	5	5
	D	16	5	5	5	5	5	3 2D
50%	A	17	5	5	5	5	5	5
	B	18	5	5	5	5	5	2 3D
	C	19	5	5	5	5	5	5
	D	20	5	5	5	5	5	3 2D
100%	A	21	5	5	5	5	5	5
	B	22	5	5	5	5	5	5
	C	23	5	5	5	5	5	5
	D	24	5	5	5	5	5	5
	mf							
Checked or Verified by:			MF	MF	MF	MF	BB	AP

Food
- [x] YCT Batch# 4/3/13
- [x] P. subcapitata Batch# 1-18-13
- [ ] Artemia Lot#_____

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

Temperature Range (°C)
Incubator # 3
min 25.6 max 27.6 mean –

Incubator #___
min.____ max.____ mean____

Waterbath #___
min.____ max.____ mean____

Room B246
min 24.6 max 25.5 mean –

Light intensity (ft. candles): 50-100

Photoperiod (hours): 16 light, 8 dark

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

Test Results:
Screening Tests: Report LC50 as >100%, =100%, or <100%.
% mortality in 100% sample 0% LC50: >100%
Calculated LC50 (Definitive) 95% CI_____ Method_____

Comments:

V. 2.6 2-15-13

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

Page 00038

LIMS Sample # 1499659 SOP#: TA 07 02 Test # 2 of 2

Test Species:
Batch #: 4.30.13 Age: 7days
- ☐ Ceriodaphnia dubia
- ☐ Cyprinella leedsi
- ☑ Pimephales promelas
- ☐ Menidia beryllina
- ☐ Americamysis bahia
- ☐ Other:_____

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

Diluent (Batch # 4.25.13)
☐ ASW ☐ MHWCD
☑ MHW ☐ Well

Test Type: ☐ Screen ☑ Definitive
☐ Static ☑ Static Renewal ☐ Flow-Through

Test Duration:
☐ 48 hr
☑ 96 hr
☐ ___hr

Test Started: Date 4.30.13 Time 1400

Test Ended: Date 5.4.13 Time 1130

Chamber Size 1000 ml
Test Volume: 500 ml

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	~~AP D11~~ A	D11	10	10	9 10	9	~~10~~ 9	9
	~~D12~~ B	D12	10	10	10	10	10	10
6.25%	~~AP D13~~ A	~~AP~~ D13 D9	10	10	10	10	10	10
	~~D14~~ B	~~AP~~ D14 D8	10	10	10	10	10	10
12.5%	~~AP D15~~ A	~~AP~~ D15 D7	10	10	10	10	9 10	9
	B	~~AP~~ D16 D6	10	10	10	10	10	10
25%	A	~~AP~~ D17 D5	10	10	10	10	10	10
	B	~~AP~~ D18 D4	10	10	10	10	10	10
50%	A	~~AP~~ D19 D3	10	10	10	10	10	10
	B	~~AP~~ D20 D2	10	10	10	10	10	10
100%	A	D1	10	10	10	10	9 10	9
	B	D2	10	10	10	10	10	10
Checked or Verified by:			AP	CR	AP	AP	CR	AP

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

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

Food
- ☐ YCT Batch#_____
- ☐ P. subcapitata Batch#_____
- ☑ Artemia Lot# 08812

Feeding and Artemia Batch #
- ☑ 0 hr 86.13 ☑ Prior to Test
- ☐ 24 hr____
- ☑ 48 hr 87.13 ☑ Prior to Renewal
- ☐ 72 hr____

Temperature Range (°C)
Incubator # 2
min 25.1 max. 26.1 mean –
Incubator #___
min._____max._____mean_____
Waterbath #___
min._____max._____mean_____
Room B246
min 24.6 max. 25.5 mean –
Light intensity (ft. candles): 50-100
Photoperiod (hours): 16 light, 8 dark

Comments:

V. 2.6 2-15-13

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

LIMS Sample # 1499659 Test # 1 of 2

Test Species:

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

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

Concentration	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☑ µmhos ☐ mmhos	Salinity* (ppth)
CTL	M	0 hr	8.1	24.8	7.9	312	
		24 hr					
	A	48 hr BR	8.0	24.2	7.8	347	
	M	48 hr AR	8.1	24.2	7.6	302	
		72 hr					
	A	96 hr	8.0	24.4	8.0	355	
6.25%	M	0 hr	8.2	24.9	7.7	333	
		24 hr					
	A	48 hr BR	8.0	24.2	7.8	369	
	M	48 hr AR	8.1	24.3	7.7	327	
		72 hr					
	A	96 hr	7.9	24.6	7.9	367	
12.5%	M	0 hr	8.1	24.9	7.7	350	
		24 hr					
	A	48 hr BR	8.0	24.3	7.8	390	
	M	48 hr AR	8.0	24.3	7.7	341	
		72 hr					
	A	96 hr	7.9	24.9	7.9	375	
25%	M	0 hr	8.0	24.9	7.7	384	
		24 hr					
	A	48 hr BR	8.0	24.0	7.8	415	
	M	48 hr AR	8.0	24.4	7.6	370	
		72 hr					
	A	96 hr	7.9	25.2	7.9	398	
50%	M	0 hr	8.0	24.8	7.7	450	
		24 hr					
	A	48 hr BR	8.0	24.0	7.8	500	
	M	48 hr AR	7.9	24.5	7.6	443	
		72 hr					
	A	96 hr	7.9	25.3	7.8	467	
100%	M	0 hr	7.9	24.7	7.8	570	
		24 hr					
	A	48 hr BR	7.9	24.2	7.8	610	
	M	48 hr AR	7.8	24.8	7.6	563	
		72 hr					
	A	96 hr	7.8	25.3	7.9	596	
		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: AP

FDEP Biology Laboratory - Bioassay Parameter Sheet

LIMS Sample # 1499659 Test # 2 of 2

Test Species:

☐ *Ceriodaphnia dubia* ☒ *Pimephales promelas* ☐ *Americamysis bahia*

☐ *Cyprinella leedsi* ☐ *Menidia beryllina* ☐ Other:_____

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

Concentration	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☒ µmhos ☐ mmhos	Salinity* (ppth)
Ctrl	A	0 hr	7.5	24.8	7.4	292	
	B	24 hr	7.4	24.9	7.1	329	
	A	48 hr BR	7.5	25.1	8.0	350	
	A	48 hr AR	7.7	24.3	7.4	301	
	B	72 hr	7.5	24.9	7.6	378	
	A	96 hr	7.5	25.9	7.5	395	
6.25%	A	0 hr	7.5	24.9	7.5	316	
	B	24 hr	7.4	25.5	7.2	322	
	A	48 hr BR	7.6	25.8	8.1	331	
	A	48 hr AR	7.7	24.4	7.4	318	
	B	72 hr	7.5	25.2	7.6	318	
	A	96 hr	7.6	25.5	7.5	344	
12.5%	A	0 hr	7.4	24.9	7.3	339	
	B	24 hr	7.3	25.6	7.2	346	
	A	48 hr BR	7.6	24.7	8.1	350	
	A	48 hr AR	7.7	24.3	7.4 CR	334	
	B	72 hr	7.5	25.1	7.3	328	
	A	96 hr	7.6	25.3	7.6	352	
25%	A	0 hr	7.4	24.8	7.4 CR	373	
	B	24 hr	7.3	25.4	7.1	377	
	A	48 hr BR	7.5	24.5	8.1	386	
	A	48 hr AR	7.7	24.3	7.4	363	
	B	72 hr	7.5	25.1	7.3	367	
	A	96 hr	7.5	25.2	7.5	393	
50%	A	0 hr	7.4	24.8	7.2	435	
	B	24 hr	7.3	25.0	6.9	447	
	A	48 hr BR	7.5	24.8	8.2	468	
	A	48 hr AR	7.7	24.4	7.4	428	
	B	72 hr	7.4	25.7	7.3	431	
	A	96 hr	7.5	25.5	7.6	500	
100%	A	0 hr	7.3	24.8	7.2	581	
	B	24 hr	7.3	25.5	7.1	588	
	A	48 hr BR	7.5	24.6	7.6	600	
	A	48 hr AR	7.6	24.7	7.5	572	
	B	72 hr	7.4	25.5	6.8	558	
	A	96 hr	7.4	24.6	7.5	610	
_____		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
_____		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

*Measure/ record salinity for marine tests

Comments:

Measured By:
0 hr: BA
24 hr: AP/CR
48 hr BR: AP/CR
48 hr AR: AP/CR
72 hr: AP/CR
96 hr: AP

Test ID: CF Industries Burton Dates: 4/30/13 - 5/4/13

METER / DEVICE	ID	SOP	Parameter	Method	√ used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
YSI DO Probe	5905	TA06_04	Dissolved Oxygen	SM 4500 O G	✓
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H+	✓
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity Salinity	SM 2510 B SM 2520 B	✓
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	✓
Traceable Thermometer	#1-SN101686412 #2-SN221295527 #3-SN240116020 #4-SN80361795 #5-SN61990624	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	# 4
Hach Pocket Colorimeter II #1	05110C042029	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	
Hach Pocket Colorimeter II #2	05050C026378	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	✓
Alkalinity (Hach Kit)	No SN	TA06_08	Alkalinity	SM 2320 B	✓
Hardness (Hach Kit)	No SN	TA06_09	Hardness	SM 2340 C	✓
OHAUS Balance 250D	1125481084	TA06_21 TA06_27	Weight	-	
S-Weights	BIO-S-WEIGHTS-01	NA	Balance check	-	

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

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

Entered By: BA

V 1.3 2/15/13 MF

24000

PAGE

Appendix F
Standard Reference Toxicant Data

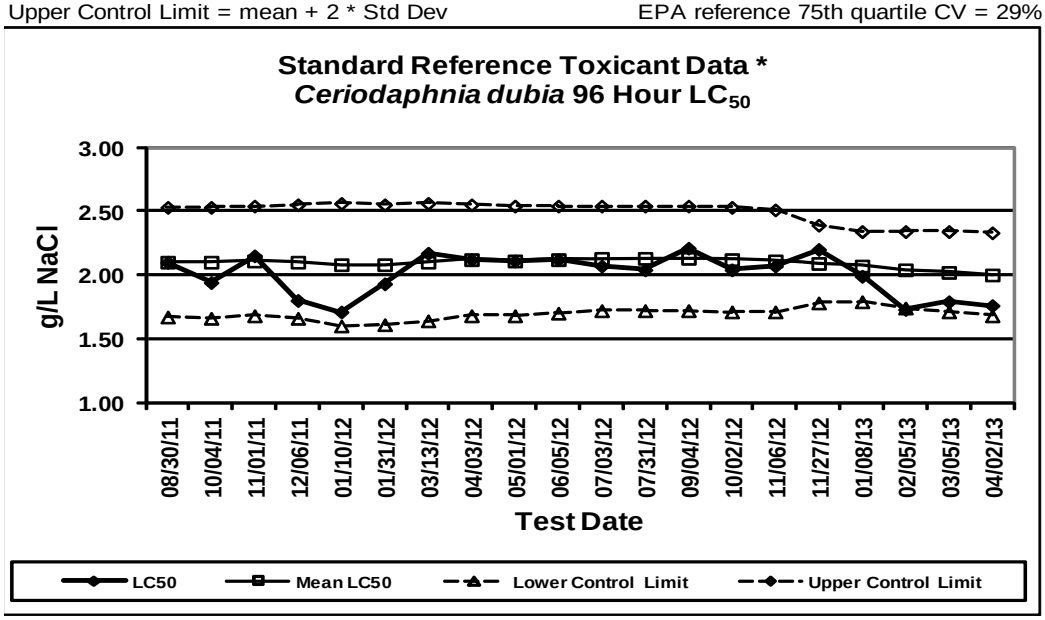
Florida Department of Environmental Protection
Bureau of Laboratories

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
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
11/01/11	2.15	2.11	0.22	1.68	2.54
12/06/11	1.80	2.10	0.22	1.66	2.55
01/10/12	1.71	2.08	0.24	1.60	2.56
01/31/12	1.93	2.08	0.24	1.61	2.55
03/13/12	2.17	2.10	0.23	1.64	2.56
04/03/12	2.12	2.12	0.22	1.68	2.55
05/01/12	2.11	2.11	0.22	1.68	2.54
06/05/12	2.12	2.12	0.21	1.70	2.54
07/03/12	2.07	2.13	0.21	1.72	2.54
07/31/12	2.04	2.13	0.20	1.72	2.54
09/04/12	2.21	2.13	0.21	1.72	2.54
10/02/12	2.04	2.12	0.20	1.71	2.53
11/06/12	2.07	2.11	0.20	1.71	2.51
11/27/12	2.20	2.09	0.15	1.78	2.39
01/08/13	1.99	2.07	0.14	1.79	2.34
02/05/13	1.73	2.04	0.15	1.74	2.34
03/05/13	1.79	2.02	0.16	1.71	2.34
04/02/13	1.76	2.00	0.16	1.68	2.33

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

CV = 8.10
EPA reference 75th quartile CV = 29%



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
- ☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
- ☑ *Ceriodaphnia dubia* Method 2002.0 TA07.01
- ☐ *Cyprinella leedsi* Method 2000.0 TA07.02
- ☐ *Pimephales promelas* Method 2000.0 TA07.02

Test Type: ☐ non-renewal ☑ renewal

Test Page 1 of 2

Diluent/ Batch #: MHWCD 1-3-27-13
Toxicant/ Batch#: NaCl 1-4-2-13

Organism Batch: 4-2-13 Age: <24hrs

Test Beginning: Date: 4-2-13 Time: 1210
Test Ending: Date: 4-6-13 Time: 0825

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	CR
Alkalinity (mg/L as $CaCO_3$):	74	TA06_08	CR
Hardness (mg.L as $CaCO_3$):	91	TA06_09	CR
Total Ammonia (mg/L as N):	<0.017	TA06_17	MF
Conductivity: (µmhos) mmhos	3260	TA06_25	MF
Salinity (ppth):		TA06_25	

Food:	Batch
☑ YCT	11-14-12
☑ *P. subcapitata*	1-18-13
☐ Artemia Lot #	Artemia Batch:

Chamber size: 30 mL
Test volume: 20 mL per replicate

0 hr:	
24 hr:	
48 hr:	
72 hr:	

Concentrations prepared by: M. Faircloth
Temperature Range °C:(if used)
Test Incubated in: Incubator # 3 Waterbath # ____
Incubator # 3 min 25.2 max 27.3 mean —
Light Intensity: 50-100 Ft. candles
Waterbath # ___ min. ____ max. ____ mean ____
Photoperiod: 16 hours Light / 8 hours dark
Room B246 min 24.7 max 25.5 mean —

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

H. azteca		
0 hr	Alk	Hrd
Well		
100%		
96 hr	Alk	Hrd
Well		
100%		

Concentration µg/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	1	5	4	4	4	4	4
	B	2	5	5	5	5	5	5
	C	3	5	5	5	5	5	4
	D	4	5	5	5	5	5	5
1.5	A	5	5	5	5	5	5	5
	B	6	5	5	5	5	5	5
	C	7	5	5	5	5	5	4
	D	8	5	5	5	5	5	5
2.0	A	9	5	4	3	3	1	0
	B	10	5	4	1	1	1	0
	C	11	5	4	2	2	2	1
	D	12	5	3	0	0	—	
2.5	A	13	5	0	0			
	B	14	5	1	0			
	C	15	5	1	0			
	D	16	5	1	0			
3.0	A	17	5	0				
	B	18	5	0				
	C	19	5	0				
	D	20	5	0				
4.0	A	21	5	0				
	B	22	5	0				
	C	23	5	0				
	D	24	5	0				
Organisms loaded by: MF	Checked by:		AP	MF	MF	MF	MF	MF

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

Comments: Numbers less than 5 indicate survival - Difference from 5 = dead or missing presumed dead mf 4-6-13

Investigators' Signatures
Marbel Faircloth
Adriana Pennington
Cassidy Velasco
Reviewer: Liz Molar

Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour:	—	—
96 hour: 1.76	1.71	1.80

Revised 7/15/2008 mf

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
- ☐ *Menidia Beryllina* Method 2006.0 TA07.04
- ☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
- ☑ *Ceriodaphnia dubia* Method 2002.0 TA07.01
- ☐ *Cyprinella leedsi* Method 2000.0 TA07.02
- ☐ *Pimephales promelas* Method 2000.0 TA07.02

Test Beginning: Date: 4-2-13 Time: 1210
Test Ending: Date: 4-6-13 Time: 0925

Test Type: ☐ non-renewal ☑ renewal

hr = hour AR = after renewal BR = before renewal

Concentration µg/L mg/L g/L	Replicate	Test Hour	pH (SU)	Temperature (° C)	Dissolved Oxygen (mg/L)	Conductivity ☑ µmhos ☐ mmhos	Salinity (ppth)
Control	m	0 hr	8.0	24.4 mf	8.0	326	
	m	24 hr	~~8.0 mf~~	~~24.9~~ 25.3	~~7.8 mf~~	mf 2830	
	A	48 hr BR	mf ~~8.078~~	mf ~~25.1~~ 24.9	~~7.7 mf~~ 7.4	mf ~~3900~~ 346	
	m	48 hr AR	mf ~~8.079~~	mf ~~25.2~~ 24.3	mf ~~7.7~~ 7.5	mf ~~4830~~ 335	
		72 hr	~~8.0 mf~~	~~25.2 mf~~	~~7.6 mf~~	~~5560 mf~~	
	A	96 hr	8.2	25.2	7.6	mf ~~7450~~ 366	
1.5	m	0 hr	8.0	24.9	7.8	2830	
	m	24 hr		25.0	~~7.5 mf~~		
	A	48 hr BR	7.8	24.3	7.8	3060	
	m	48 hr AR	7.8	25.3	7.3	2970	
		72 hr					
	A	96 hr	8.2	25.7	mf 7.9	3120	
2.0	m	0 hr	8.0	25.1	mf 7.87	3900	
	m	24 hr		24.7			
	A	48 hr BR	7.8	25.5	7.5	3950	
	m	48 hr AR	7.8	24.2	7.3	3890	
		72 hr					
	A	96 hr	8.2	25.6	8.0	4210	
2.5	m	0 hr	8.0	25.2	7.7	4830	
	A	24 hr	8.2	24.6	7.4	4930	
	B DFMF	48 hr BR	8.1	25.1	7.4	5010	
		48 hr AR				~~4850 mf~~	
		72 hr					
		96 hr					
3.0	m	0 hr	8.0	25.2	~~7.76 mf~~	5560	
	A	24 hr	8.2	24.3	7.4	5740	
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
4.0	m	0 hr	8.0	25.2	7.6	7450	
	A	24 hr	8.1	24.2	7.5	7900	
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

Investigators Signatures
Marshall Faircloth
Adrienne Pennington
Cassandra Merrell
Bruce Richards

Reviewed By: Liz Miller

Measured by:
0 hr: MF
24 hr: MF
48 hr BR: mf
48 hr AR: MF
72 hr:
96 hr: MF

Measure/record salinity for marine tests

Comments:

PAGE 00016

Revised 07/15/2008 MF

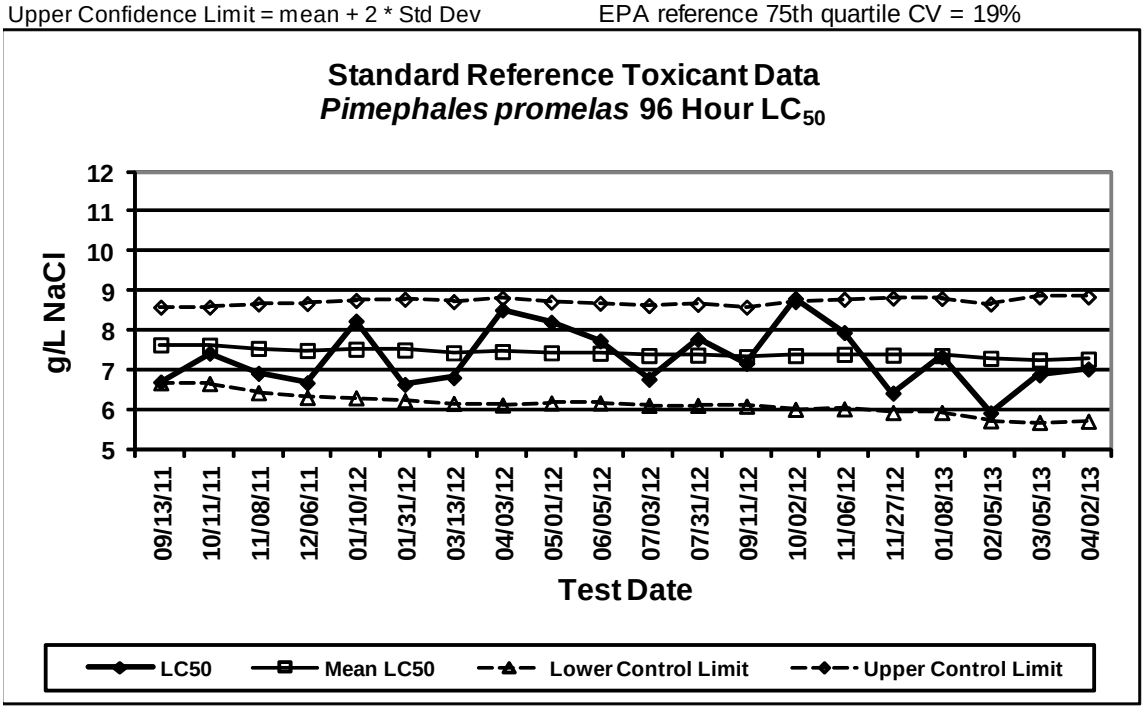
Florida Department of Environmental Protection
Bureau of Laboratories

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

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
09/13/11	6.69	7.63	0.48	6.67	8.58
10/11/11	7.42	7.62	0.48	6.65	8.58
11/08/11	6.91	7.54	0.56	6.42	8.66
12/06/11	6.67	7.49	0.59	6.3	8.67
01/10/12	8.23	7.52	0.61	6.29	8.75
01/31/12	6.63	7.5	0.64	6.22	8.78
03/13/12	6.80	7.43	0.64	6.15	8.72
04/03/12	8.51	7.46	0.68	6.11	8.81
05/01/12	8.20	7.43	0.64	6.16	8.71
06/05/12	7.73	7.42	0.63	6.16	8.68
07/03/12	6.76	7.36	0.63	6.1	8.62
07/31/12	7.77	7.37	0.64	6.1	8.65
09/11/12	7.16	7.33	0.62	6.08	8.58
10/02/12	8.80	7.36	0.68	6	8.72
11/06/12	7.94	7.39	0.69	6.01	8.78
11/27/12	6.41	7.37	0.72	5.92	8.81
01/08/13	7.33	7.36	0.72	5.92	8.8
02/05/13	5.91	7.29	0.79	5.71	8.66
03/05/13	6.87	7.25	0.79	5.67	8.84
04/02/13	7.02	7.27	0.78	5.7	8.84

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

CV = 10.78
EPA reference 75th quartile CV = 19%



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 ☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
☐ *Ceriodaphnia dubia* Method 2002.0 TA07.01 ☐ *Cyprinella leedsi* Method 2000.0 TA07.02 ☑ *Pimephales promelas* Method 2000.0 TA07.02

Test Type: ☐ non-renewal ☑ renewal

Test Page 1 of 2

Diluent/ Batch #: MHW 1.2.13
Toxicant/ Batch#: 10g/L NaCl 1.2.13
Organism Batch: 4.2.13 Age: 7 days
Test Beginning: Date: 4.2.13 Time: 1315
Test Ending: Date: 4-6-13 Time: 0930

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	CR/AP
Alkalinity (mg/L as $CaCO_3$):	77	TA06_08	CR/AP
Hardness (mg.L as $CaCO_3$):	87	TA06_09	CR/AP
Total Ammonia (mg/L as N):	<0.017	TA06_17	MF
Conductivity: µmhos (mmhos):	0.778	TA06_25	CR/AP
Salinity (ppth):		TA06_25	

Food:	Batch
☐ YCT	
☐ *P. subcapitata*	
☑ Artemia Lot # 08812	Artemia Batch:

Artemia Batch: 0 hr: 4.1.13; 24 hr:; 48 hr: 4.3.13; 72 hr:

Chamber size: 1000 mL
Test volume: 500 mL per replicate

Concentrations prepared by: BA
Test Incubated in: Incubator # 2 Waterbath # ____
Light Intensity: 50-100 Ft. candles
Photoperiod: 16 hours Light / 8 hours dark

Temperature Range °C:(if used)
Incubator # 2 min 24.7 max 25.9 mean —
Waterbath # ___ min.____ max.____ mean____
Room B246 min: 24.7 max 25.5 mean —

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

Concentration µg/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	G13	10	10	10	10	10	10
	B	G14	10	10	10	10	10	10
4	A	G15	10	10	10	10	10	9
	B	G16	10	10	10	10	10	9
5	A	G17	10	10	10	10	9 1S	9
	B	G18	10	10	10	10	10	10
6	A	G19	10	10	10	10	10	10
	B	G20	10	10	8 2D	8	8	8
7	A	G21	10	10	8 2D	8	6 2D	6
	B	G22	10	5 5D	3 2D	3	2 1D	2
10	A	G23	10	1 9D	0 1D			
	B	G24	10	2 8D	0 2D			
Organisms loaded by: BA		Checked by:	CR	CR	AP	AP	AP	MF

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

H. azteca		
0 hr	Alk	Hrd
Well		
100%		
96 hr	Alk	Hrd
Well		
100%		

Comments:

Investigators' Signatures
Adrienne Pennington
Cassidy Reichert
Mandy Fairchild
Brad Heck

Reviewer: Liz Miller

Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour: —	—	—
96 hour: 7.02	6.54	7.53

nnnnn

PAGE

Revised 7/15/2008 mf

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
- ☐ *Menidia Beryllina* Method 2006.0 TA07.04
- ☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
- ☐ *Ceriodaphnia dubia* Method 2002.0 TA07.01
- ☐ *Cyprinella leedsi* Method 2000.0 TA07.02
- ☑ *Pimephales promelas* Method 2000.0 TA07.02

Test Beginning: Date: 4.2.13 Time: 1315
Test Ending: Date: 4-6-13 Time: 0930

Test Type: ☐ non-renewal ☑ renewal

hr = hour AR = after renewal BR = before renewal

Concentration µg/L mg/L g/L	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☑ mmhos	Salinity (ppth)
Control	A	0 hr	8.0	23.1	8.1	0.778	
	B	24 hr	7.6	24.9	7.5	0.375	
	A	48 hr BR	7.8	25.4	7.5	0.329	
	A	48 hr AR	7.5	24.5	7.6	0.304	
	B	72 hr	AP 6.475	25.2	6.4	0.344	
	A	96 hr	7.8	25.2	7.1	0.333	
4	A	0 hr	8.1	23.1	8.1	7.17	
	B	24 hr	7.7	25.8	7.5	7.56	
	A	48 hr BR	7.8	25.3	7.4	7.52	
	A	48 hr AR	7.6	24.4	7.5	7.51	
	B	72 hr	AP 6.476	26.1	6.4	7.74	
	A	96 hr	7.8	25.6	6.9	8.02	
5	A	0 hr	8.0	23.1	8.0	8.87	
	B	24 hr	7.7	25.6	7.4	9.27	
	A	48 hr BR	7.8	25.8	7.3	9.52	
	A	48 hr AR	7.7	24.4	AP 7.3	9.32	
	B	72 hr	AP 6.276	25.3	6.2	9.54	
	A	96 hr	7.8	25.4	6.9	9.69	
6	A	0 hr	8.0	23.2	8.0	10.3	
	B	24 hr	7.7	25.4	7.3	10.71	
	A	48 hr BR	7.8	~~25.8~~ 25.8 CR	7.3	10.9	
	A	48 hr AR	7.7	~~24.5~~ 24.5 CR	7.2	10.9	
	B	72 hr	AP 6.376	25.3	6.3	11.1	
	A	96 hr	7.8	25.6	6.8	11.2	
7	A	0 hr	8.0	23.6	8.0	12.0	
	B	24 hr	7.7	25.7	7.3	12.5	
	A	48 hr BR	7.8	25.6	7.3	12.5	
	A	48 hr AR	7.7	24.5	7.2	12.5	
	B	72 hr	AP 6.276	25.2	6.2	12.7	
	A	96 hr	7.9	25.6	7.0	12.6	
10	A	0 hr	8.0	23.6	8.0	17.0	
	B	24 hr	7.7	25.4	7.2	17.4	
	A	48 hr BR	7.8	26.4	7.4	17.7	
		48 hr AR					
		72 hr					
		96 hr					

Investigators Signatures
Adrienne Pennington
Cassidy Reschke
Marshall Faircloth
Brian Adkins

Reviewed By: Steph Meeker

Measured by:
0 hr: AP/CR
24 hr: CR/AP
48 hr BR: AP/CR
48 hr AR: CR/AP
72 hr: AP/CR
96 hr: MF

Measure/record salinity for marine tests

Comments:

00020

PAGE

Revised 07/15/2008 MF

Appendix G
Organism Receipts

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: 4/1/13

Ship to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia	150 ac	4 DAYS	MS130328	25	7.9	20
Menidia beryllina	150 ac	12 DAYS	SS130320	25	7.9	20
						Hardness mg/L
Cyprinella leedsi	150 ac	12 DAYS	CL130320	25	7.8	80
Pimephales promelas	~~300~~ 250 ac	~~<24HRS~~ 7DAYS	FM130325	25	7.8	80
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: PM

Shipped Via: Fed Ex

Notes: _____

Thank you for your order.

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

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: ~~FDEP~~ 4/29/13

Ship to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (°/00)
Mysidopsis bahia						
Menidia beryllina						
						Hardness mg/L
Cyprinella leedsi	150 Ac	12 DAYS	CL ~~FM~~ 130417	25	7.8	80
Pimephales promelas	250 Ac	7 DAYS	FM 130429	25	7.8	80
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: PM

Shipped Via: Fed Ex

Notes: _____

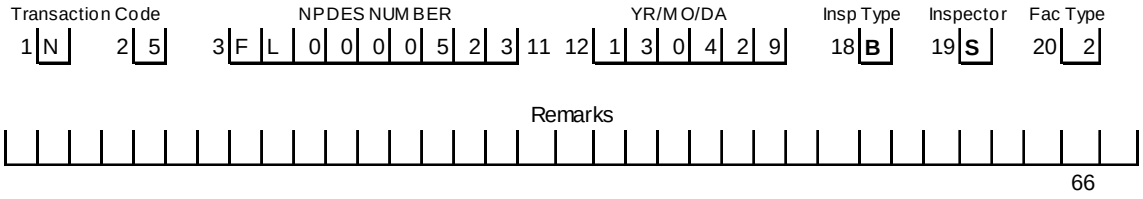
Thank you for your order.

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EPA End Sheet

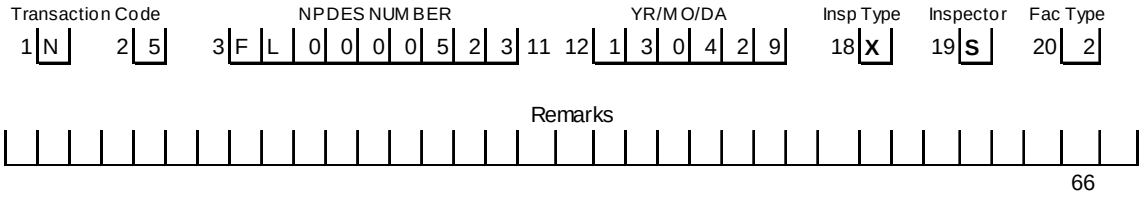
The Bioassay of CF Industries, Inc. - Bartow Operations effluent sampled on April 29, 2013. NPDES #FL0000523.

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



The Priority Pollutants Analysis of CF Industries, Inc. - Bartow Operations effluent sampled on April 29, 2013. NPDES #FL0000523.

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Biological Analyses of CF Industries, Inc. - Bartow Operations effluent sampled on April 29, 2013. NPDES #FL0000523.

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

