

Effluent Quality Assessment

Mulberry Phosphate, Inc. – Phosphogypsum Stack Closure

Polk County

NPDES #FL0334944

Sampled September 10, 2012

February 2013

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
NELAC Certification No. E31780

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Mulberry Phosphate, Inc. – Phosphogypsum Stack Closure, 4000 State Road 60 East, Mulberry, Polk County, FL 33860. NPDES #FL0334944. Effluent grab samples for biological and chemical analyses for this facility were collected on September 10, 2012.

Introduction

Mulberry Phosphate, Inc – Phosphogypsum Stack Closure is a Phosphogympsum Stack System that uses a two-stage liming and acidulation station and settling of lime solids or reverse osmosis for treatment of process water. Stormwater runoff is treated through settling of solids. Mosaic Fertilizer, L.L.C. has a service agreement to close the phosphogypsum stack system. (See Appendix F for detailed facility information provided by Jacki Champion of FDEP Southwest District.)

Methods

Samples were collected from the EFF-01F NPDES sampling point for Outfall D-001F by Jacki Champion, Melani Dickenson, and Scott Rose (FDEP Southwest District) following DEP-SOP-001/01 FS 2400 Wastewater Sampling. Samples were also collected from the MSA sampling point which is where stormwater enters the property. These samples are collected to monitor what is being contributed from off-site. There are no limits on these samples. All DEP SOPs are available on the web at: http://www.floridadep.org/labs/bars/sas/sop/index.htm.

See Appendix A for the completed chain of custody form.

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. All internal DEP SOPs are available on the web at: http://www.dep.state.fl.us/water/sas/sop/index.htm.

Results and Discussion

- **Toxicity Test Results**
  Tests were performed September 11-15, 2012.

  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%, 0%* mortality in 100% sample at 96 hours

  The bioassay samples were not acutely toxic to the test organisms.

  *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.).

  See Appendix B for bioassay bench sheets. See Appendix C for results of the last 20 standard reference toxicant (SRT) tests and the bench sheets and statistical analyses of the SRT tests that correspond to these facility tests. See Appendix D for test organism receipts.

- **Algal Growth Potential**
  The effluent Algal Growth Potential (AGP) was 15.2 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 ratio (0.4:1) of total nitrogen to total phosphorus suggests that the effluent is nitrogen -limited (Miller et al. 1978).

See Table 1 for AGP results and qualifiers.

- **Chemistry Results**
  Total residual chlorine was not detected in the bioassay sample in the laboratory. Total ammonia was 0.197 mg/L as N in the bioassay sample in the laboratory. The total ammonia concentration in the composite sample collected and preserved for chemical analysis was 0.24 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.

  Arsenic, iron, fluoride, 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 the permitted limits. Dissolved oxygen (DO), pH, and conductivity were detected in the effluent at levels that comply with Class III Freshwater quality criteria and/or the permitted limits. Cadmium, chromium-III, nickel, and total suspended solids were detected in the effluent between the laboratory method detection limits (MDL) and practical quantitation limits (PQL).

  Oils and greases were detected in the field blank between the MDL and PQL.

  See Table 2 for results of analytes detected in the effluent, corresponding limits, and qualifiers. See Appendix E for a complete list of chemical analyses performed. See Appendix B for bioassay lab equipment.

Conclusion

The effluent sample collected from the EFF-01F NPDES sampling point for this facility on September 10, 2012, was not acutely toxic to either test species during the 96-hour acute definitive bioassays. The effluent AGP result was greater than the "problem" threshold for fresh receiving waters suggesting that nutrient enrichment may be an issue. Effluent water quality samples collected on September 10, 2012, did not exceed any applicable water quality standards or violate any permit conditions.

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

Mulberry Phosphate, Inc - Phosphogypsum Stack Closure					
Location	AGP (measured)	Predicted AGP (TSIN) ± 20%	Predicted AGP (TN) ± 20%	Inorganic N:P ratio	Total N:P ratio
Effluent	15.2	10.6 ± 2.1	47.0 ± 9.4	0.1	0.4

Table 2. Effluent limits, Class III Freshwater Criteria and chemical data.

Mulberry Phosphate, Inc - Phosphogypsum Stack Closure	Class III Criteria	Effluent Limits	Effluent		Field Blank	
Organic Constituents (µg/L)						
None Detected	-	-	None Detected			
Metals (µg/L unless otherwise noted)						
Aluminum	-	-	101		5	U
Arsenic	≤ 50	-	2.16		0.25	U
Cadmium	≤ 0.4 b	-	0.05	I	0.05	U
Calcium (mg/L)	-	-	51.1		0.075	U
Chromium-III	≤ 130.3 b	-	0.32	I	0.3	U
Copper	≤ 14.4 b	-	0.5	U	0.5	U
Iron	≤ 1,000	-	140		30	U
Lead	≤ 6.1 b	-	0.2	U	0.2	U
Magnesium (mg/L)	-	-	9.25		0.04	U
Nickel	≤ 80.0 b	-	0.71	I	0.25	U
Selenium	≤ 5.0	-	0.2	U	0.2	U
Silver	≤ 0.07	-	0.025	U	0.025	U
Sodium (mg/L)	-	-	16.1		0.5	U
Zinc	≤ 183.8 b	-	5	U	5	U
Nutrients (mg/L)						
Ortho-phosphate	-	Report	2.4		0.004	U
Total Phosphorus	-	Report p	2.8		0.004	U
Total Ammonia	-	Report	0.24		0.01	U
Un-ionized Ammonia	≤ 0.02 s	≤ 0.02	≤ 0.02	c	-	
Nitrate and Nitrite	-	-	0.038		0.004	U
Total Kjeldahl Nitrogen	-	-	1.2		0.08	U
Organic Nitrogen	-	-	0.96	c	0.04	c
Total Nitrogen	-	Report p	1.238	c	0.04	c
General Physical and Chemical Parameters						
Dissolved Oxygen (mg/L)	≥ 5.0	≥ 5.0	6.7		-	
pH (SU)	6.0 - 8.5	6.0 - 8.5	7.2		-	
Conductivity (µmhos/cm)	≤ 1,275	≤ 1,275	384		-	
Temperature (°C)	-	Report	27.9		-	
Alkalinity (mg CaCO3/L)	-	-	75		-	
Chlorophyll *a* (µg/L) - Corrected	-	-	29		-	
Phaeophytin (µg/L)	-	-	4		-	
Total Suspended Solids (mg/L)	-	≤ 15	7	I	2	U
Total Dissolved Solids (mg/L)	-	-	238	A	15	U
Oils and Greases (mg/L)	≤ 5.0	-	0.74	U	0.76	I
Chloride (mg/L)	-	-	8		0.2	U
Fluoride (mg/L)	≤ 10.0	≤ 10 p	1.9		0.035	U
Sulfate (mg/L)	-	Report	88		0.2	U
Alpha, Total (pCi/L)	≤ 15	≤ 15 p	1.3	U	0.5	U
Alpha-Counting Error (pCi/L)	-	-	0.9		0.4	
Radium 226 (pCi/L)	-	-	0.5		0.2	U
Radium 226-Counting Error (pCi/L)	-	-	0.2		0.1	
Radium 228 (pCi/L)	-	-	1	U	0.9	U
Radium 228-Counting Error (pCi/L)	-	-	0.6		0.6	
Radium 226 + 228 (pCi/L)	≤ 5	≤ 5 p	0.5	c	0	c
Flow (MGD)	-	Report	1.3		-	
Hardness (mg $CaCO_3$)	-	-	165.69	c	0.35	c

Value exceeds the Class III Water Quality Criteria or permit limits

b - Value is calculated based on hardness

c - Value is calculated

p - 24 hour flow proportioned composite

s - Single sample

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

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

Appendix A. Chain of Custody Form

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2012-09-10-37
FYI3 Mulberry Stack System

Requester: Jacquelyn M. Champion
Field Report Prepared By: Jacki Champion
Collected By: Jacki Champion / Melani Dickenson
Send Final Report To: Jacki Champion
Sampling Agency: FDEP

Customer: BMR-TAMPA
Project ID: FYI3
PMAS:

Lab ID *	Location	Collection (comp begin or grab)	Composite end	Bottle Group(s)**
	Mulberry Stack	☐ Comp ☒ Grab Eastern/Central Date 9/10/12 Time 10:2[illegible]	Date Time Eastern/Central	A
	Field ID: D-001-F	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L): 6.71	Storet Station Number:
	Matrix (include type e.g. Salt, Fresh, etc): Fresh Water	Temp (C): 27.86	pH: 7.15	Sample Depth ☐ m ☐ ft: 38
				☐ Salinity (PPTh) ☒ Sp Conductance (umho/cm)
				NPDES Number: FL0334944
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments:	

Lab ID *	Location	Collection (comp begin or grab)	Composite end	Bottle Group(s)**
	Mulberry Stack	☐ Comp ☒ Grab Eastern/Central Date 9/10/12 Time 11:35	Date Time Eastern/Central	B
	Field ID: MSA	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L): 4.68	Storet Station Number:
	Matrix (include type e.g. Salt, Fresh, etc): Fresh Water	Temp (C): 27.5	pH: 6.56	Sample Depth ☐ m ☐ ft: 229
				☐ Salinity (PPTh) ☒ Sp Conductance (umho/cm)
				NPDES Number: FL0334944
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments: From Sample bottle. [illegible] 9-11-12	

Lab ID *	Location	Collection (comp begin or grab)	Composite end	Bottle Group(s)**
	Blank	☐ Comp ☒ Grab Eastern/Central Date 9/10/12 Time 9:45	Date Time Eastern/Central	C
	Field ID: Blank	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L):	Storet Station Number:
	Matrix (include type e.g. Salt, Fresh, etc): Fresh Water	Temp (C):	pH:	Sample Depth ☐ m ☐ ft:
				☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)
				NPDES Number:
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments: DI H_2O	

Lab ID *	Location	Collection (comp begin or grab)	Composite end	Bottle Group(s)**
		☐ Comp ☐ Grab Eastern/Central Date Time	Date Time Eastern/Central	
	Field ID	Tot Res Chlorine (mg/L):	Diss Oxygen (mg/L):	Storet Station Number:
	Matrix (include type e.g. Salt, Fresh, etc):	Temp (C):	pH:	Sample Depth ☐ m ☐ ft:
				☐ Salinity (PPTh) ☐ Sp Conductance (umho/cm)
				NPDES Number:
	Latitude ☐ dd ☐ dms	Longitude ☐ dd ☐ dms	Comments: Yellow Red in Tote by JD. 9:41 9.11.12	

Relinquished By	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
J. Champion	9/10/12 1:48pm	FedEx	[illegible]	09/11/12 09:10				

* Shaded Areas for Lab use only.
** Please see reverse side for Bottle Group information.

last revised October 1, 2003

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Appendix B. Bench Sheets

FDEP Biology Laboratory - Acute Bioassay Bench Sheets

Facility: Mulberry Phosphate STACK Closure

Address: 4000 State Road 60 East

City: Mulberry County: Polk Zip 33860

Contact/District: Jacki Champion

NPDES Permit #: FL 0334944

LIMS Job #: TLH-2012-09-11-29 LIMS Sample #: 1452271

Lims Data Entry: 9-17-12 MF Data Entry Verification: 9.18.12 BA

Sample Collection: Date: 9-10-12 MF Time: 1020

Hold Time Start: Date: 9-10-12 Time: 1020

Comments:

Initial sample handling:

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

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

Aeration: ☐ yes ☑ no Initial DO: ____ mg/L Final DO: ____ mg/L Duration: ____ minutes Rate: ~ ____ bubbles/min

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

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

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

Sample Validation:

Instructions: Check yes or no. Fill in temperatures.

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

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

Investigators' Signatures:	Initials:
Marshall Faircloth	MF
Bruce Abernathy	BA
James Daniels	JD
REVIEWER: Liz Miller	

Diluent/Control Batch#:	9-7-12		8-20-12						
Water Quality Parameters	SDMW ~~20% DMW~~ MF	Well Water	Moderately Hard Water	Salt Water ASW NSW Test 1	Salt Water ASW NSW Test 2	Other: BA	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	JD	MF
Lab Total Residual Cl_2 (mg/L):	<0.03		<0.03			~~<0.03~~	<0.03	JD	BA
Alkalinity (mg/L as $CaCO_3$):	72		74			~~84~~	88	BA/JD	MF
Hardness (mg/L as $CaCO_3$):	85		100			~~153~~	153	BA/JD	MF
Total Ammonia (mg/L as N):	<0.017		~~<0.03~~ <0.017 BA			~~<0.03~~	0.197	MF	BA
Conductivity: ☑ µmhos ☐ mmhos	314		340			~~354~~	354	MF	BA
Salinity (ppth):									

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FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample # 1452271 SOP#: TA 07 01 Test # 1 of 2

Test Species:
Batch #: 9-11-12 Age: <24 hrs
- [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

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

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

Test Started: Date 9-11-12 Time 1215

Test Ended: Date 9-15-12 Time 1025

Diluent (Batch # 9-7-12)
- [ ] ASW
- [x] ~~20% DMW~~ SDMW
- [ ] MHW
- [ ] Well

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
Control	A	mf A 1	5	5	5	5	5	5
	B	mf B 2	5	5	5	5	5	5
	C	mf C 3	5	5	5	5	5	5
	D	mf 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	5
12.5%	A	9	5	5	5	5	5	5
	B	10	5	5	5	5	5	5
	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	5
	C	15	5	5	5	5	5	5
	D	16	5	5	5	5	5	5
50%	A	17	5	5	5	5	5	5
	B	18	5	5	5	5	5	5
	C	19	5	5	5	5	5	5
	D	20	5	5	5	5	5	5
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
Checked or Verified by:			BA	BA	MF	MF	MF	MF

Food
- [x] YCT Batch# 9-10-12
- [x] P. subcapitata Batch# 6-7-12
- [ ] Artemia Lot#_____

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

Temperature Range (°C)
Incubator # 2
min. 24.5 max. 25.7 mean_____
Incubator #___
min._____max._____mean_____
Waterbath #___
min._____max._____mean_____
Room B246
min. 24.5 max. 25.1 mean_____
Light intensity (ft. candles): 50-100
Photoperiod (hours): 16 light, 8 dark

Loaded/ Verified by: MF/ 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: 0 LC50: >100%
Calculated LC50 (Definitive) 95% CI_____ Method_____

Comments:

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

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample # 1452271 SOP#: TA 07 02 Test # 2 of 2

Test Species:
Batch #: 9.11.12 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 # 8.20.12)
☐ ASW ☐ 20% DMW ☒ MHW ☐ Well

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

Test Duration: ☐ 48 hr ☑ 96 hr ☐ ___hr

Test Started: Date 9.11.12 Time 13:15

Test Ended: Date 9-15-12 Time 1040

Chamber Size 300 ml
Test Volume: 100 ml

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl	A	C1	10	10	10	10	10	10
	B	C2	10	10	10	10	10	10
6.25%	A	C3	10	10	10	10	10	10
	B	C4	10	10	10	10	10	10
12.5%	A	C5	10	10	10	10	10	10
	B	C6	10	10	10	10	10	10
25%	A	C7	10	10	10	10	10	10
	B	C8	10	10	10	10	10	10
50%	A	C9	10	10	10	10	10	10
	B	C10	10	10	10	10	10	10
100%	A	C11	10	10	10	10	10	10
	B	C12	10	10	10	10	10	10
Checked or Verified by:			BA	JD	JD	JD	JD	MF

Food
- ☐ YCT Batch#_____
- ☐ P. subcapitata Batch#_____
- ☒ Artemia Lot# 08817

Feeding and Artemia Batch #
- ☒ 0 hr 12-12 ☑ Prior to Test
- ☐ 24 hr___
- ☒ 48 hr 12-12 ☒ Prior to Renewal
- ☐ 72 hr___

Temperature Range (°C)
Incubator # 3
min. 24.5 max. 26.5 mean –

Incubator #___
min.____max.____mean____

Waterbath #___
min.____max.____mean____

Room B246
min. 24.5 max. 25.1 mean –

Light intensity (ft. candles): 50-100

Photoperiod (hours): 16 light, 8 dark

Loaded/ Verified by: JD / 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: 0 LC50: >100%
Calculated LC50 (Definitive) 95% CI_____ Method_____

Comments:

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

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FDEP Biology Laboratory - Bioassay Parameter Sheet

LIMS Sample # 145227I 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)
C+C	M	0 hr	8.1	24.2	7.6	314	
		24 hr					
	MF A	48 hr BR	8.2	24.2	8.1	335	
	M	48 hr AR	8.3	24.6	8.1	320	
		72 hr					
	A	96 hr	8.0	25.1	7.9	370	
6.25%	M	0 hr	8.1	24.2	7.7	322	
		24 hr					
	A	48 hr BR	8.2	24.1	8.2	337	
	M	48 hr AR	8.2	24.5	8.2	328	
		72 hr					
	A	96 hr	8.0	25.1	7.9	363	
12.5%	M	0 hr	8.0	24.3	7.7	327	
		24 hr					
	A	48 hr BR	8.3	24.0	8.2	343	
	M	48 hr AR	8.2	24.6	8.2	341	
		72 hr					
	A	96 hr	8.0	24.9	7.9	364	
25%	M	0 hr	8.0	24.4	7.7	335	
		24 hr					
	A	48 hr BR	8.2	24.2	8.2	348	
	M	48 hr AR	8.2	24.5	8.2	332	
		72 hr					
	A	96 hr	8.0	24.7	8.0	382	
50%	M	0 hr	7.9	24.4	7.6	349	
		24 hr					
	A	48 hr BR	8.2	24.1	8.1	407	
	M	48 hr AR	8.0	24.5	8.2	346	
		72 hr					
	A	96 hr	8.1	24.6	8.0	391	
100%	M	0 hr	7.8	24.6	7.7	388	
		24 hr					
	A	48 hr BR	8.2	24.2	8.2	459	
	M	48 hr AR	7.9	24.9	8.2	388	
		72 hr					
	A	96 hr	8.0	24.4	8.0	440	
		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

V. 2.3 1-13-10

FDEP Biology Laboratory - Bioassay Parameter Sheet

LIMS Sample # 1452271 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	24.5	7.7	340	
	B	24 hr	7.7	25.8	7.2	363	
	A	48 hr BR	7.9	24.7	7.4	346	
	A	48 hr AR	7.8	24.3	7.6	345	
	B	72 hr	7.5	25.9	6.3	355	
	A	96 hr	8.1	24.2	7.1	364	
6.25%	A	0 hr	7.6	24.7	7.6	339	
	B	24 hr	7.7	25.6	7.2	359	
	A	48 hr BR	7.9	24.0	7.4	345	
	A	48 hr AR	7.8	24.2	7.8	341	
	B	72 hr	7.6	25.5	6.3	348	
	A	96 hr	8.0	24.3	7.1	368	
12.5%	A	0 hr	7.6	24.9	7.8	344	
	B	24 hr	7.7	25.4	7.2	359	
	A	48 hr BR	7.9	24.4	7.7	351	
	A	48 hr AR	7.8	24.3	7.9	339	
	B	72 hr	7.6	25.4	6.4	357	
	A	96 hr	8.0	24.2	7.0	360	
25%	A	0 hr	7.6	25.2	7.7	351	
	B	24 hr	7.8	25.6	7.4	364	
	A	48 hr BR	7.9	24.0	7.7	357	
	A	48 hr AR	7.8	24.3	7.9	349	
	B	72 hr	7.6	25.7	6.5	361	
	A	96 hr	7.9	24.0	7.0	371	
50%	A	0 hr	7.6	25.8	7.9	367	
	B	24 hr	7.8	25.3	7.3	371	
	A	48 hr BR	8.0	24.5	8.0	367	
	A	48 hr AR	7.8	24.3	8.0	362	
	B	72 hr	7.6	25.4	6.4	365	
	A	96 hr	7.9	24.1	7.0	376	
100%	A	0 hr	7.5	25.9	7.9	404	
	B	24 hr	7.8	25.9	7.6	397	
	A	48 hr BR	8.1	24.0	8.3	389	
	A	48 hr AR	7.8	24.3	8.0	391	
	B	72 hr	7.6	25.9	6.6	392	
	A	96 hr	8.2	24.7	7.7 7.8	403	
		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: JD
24 hr: JD
48 hr BR: JD
48 hr AR: JD
72 hr: JD
96 hr: MR

V. 2.3 1-13-10

Test ID: Mulberry Phosphate STACK Closure Dates: September 11-15, 2012

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	#5
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 9-17-12

V 1.1 9/21/10 MF/jd

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Appendix C. SRT Bench Sheets and Statistical Analysis

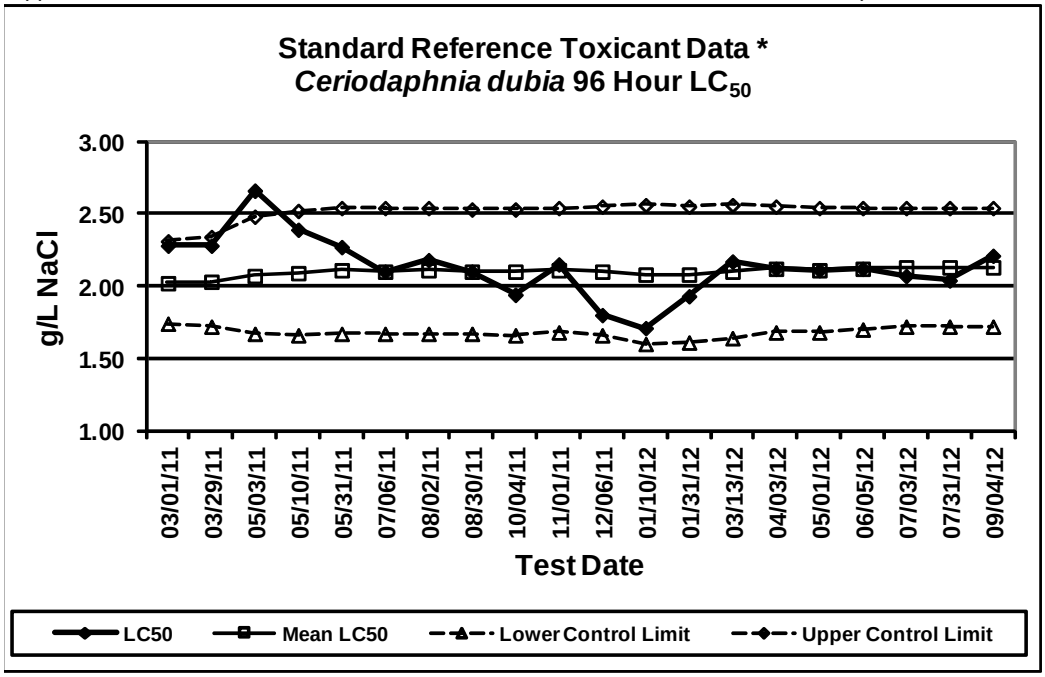
Florida Department of Environmental Protection
Bureau of Laboratories

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
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
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

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

CV = 9.62
EPA reference 75th quartile CV = 29%



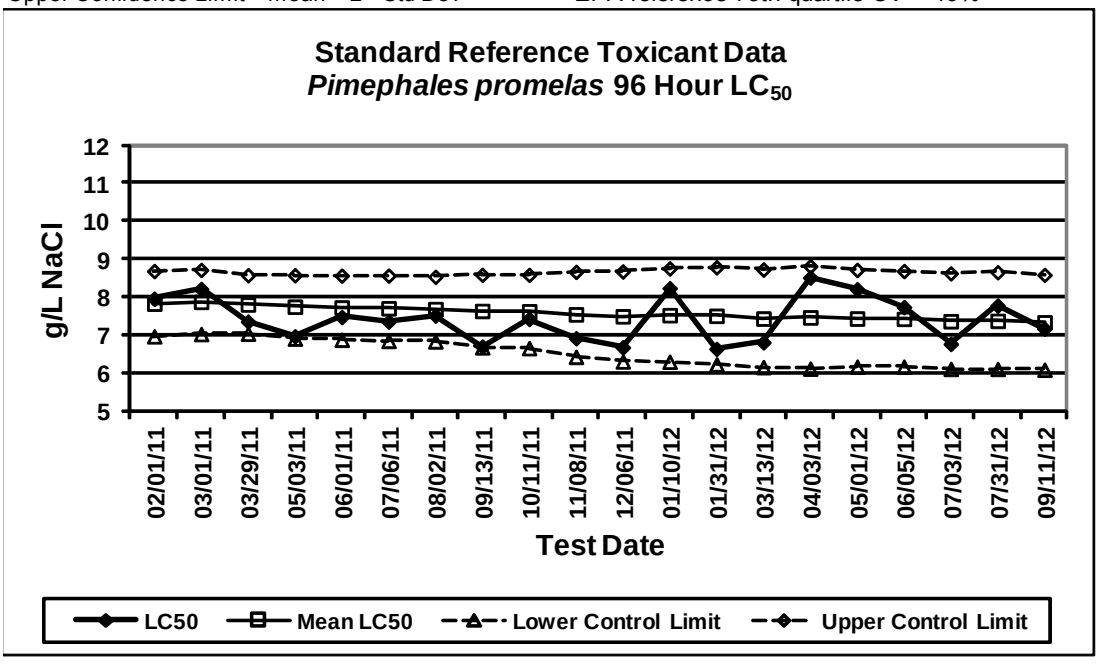
Florida Department of Environmental Protection
Bureau of Laboratories

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

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
02/01/11	7.95	7.82	0.43	6.96	8.68
03/01/11	8.21	7.87	0.42	7.02	8.71
03/29/11	7.35	7.8	0.39	7.03	8.57
05/03/11	6.96	7.74	0.42	6.9	8.57
06/01/11	7.47	7.72	0.42	6.87	8.56
07/06/11	7.35	7.7	0.43	6.84	8.56
08/02/11	7.51	7.68	0.43	6.83	8.53
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

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

CV = 8.52
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
- ☑ *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 #: SDmHw 1 8-24-12
Toxicant/ Batch#: NaCl 1 9-4-12
Organism Batch: 9-4-12 Age: < 24 hr
Test Beginning: Date: 9-4-12 Time: 0845
Test Ending: Date: 9-5-12 Time: 0800

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	MF/JD
Alkalinity (mg/L as $CaCO_3$):	73	TA06_08	BA
Hardness (mg.L as $CaCO_3$):	90	TA06_09	BA
Total Ammonia (mg/L as N):	<0.017	TA06_17	MF/MF
Conductivity: ~~umhos~~ mmhos	306	TA06_25	MF
Salinity (ppth):	—	TA06_25	—

Food:	Batch
☑ YCT	5-14-12
☑ *P. subcapitata*	6-7-12
☐ Artemia Lot #	

Artemia Batch:
0 hr:
24 hr:
48 hr:
72 hr:

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

Concentrations prepared by: MF
Temperature Range °C:(if used)
Test Incubated in: Incubator # 4 Waterbath # ___ Incubator # 4 min 25.5 max 26.1 mean —
Light Intensity: 50-100 Ft. candles Waterbath # ___ min ___ max ___ mean ___
Photoperiod: 16 hours Light / 8 hours dark Room B246 min 24.7 max 25.0 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	A1	5	5	5	5	5	5
	B	A2	5	5	5	5	5	5
	C	A3	5	5	5	5	5	5
	D	A4	5	5	5	5	5	5
1.5	A	B1	5	5	5	5	5	5
	B	B2	5	5	5	5	5	5
	C	B3	5	5	5	5	5	5
	D	B4	5	5	5	5	5	5
2.0	A	C1	5	5	5	5	5	5
	~~mt~~ B	C2	5	5	5	5	5	5
	C	C3	5	5	5	5	5	5
	D	C4	5	5	4 1D	4	4	4
2.5	A	D1	5	5	1 4D	1	1	0 1D
	B	D2	5	3 2D	1 2D	1	0 1D	—
	C	D3	5	4 1D	1 3D	1	0 1D	—
	D	D4	5	4 1D	1 3D	1	0 1D	—
3.0	A	E1	5	3 2D	0	—		
	B	E2	5	1 4D	0	—		
	C	E3	5	3 2D	0	—		
	D	E4	5	3 2D	0	—		
4.0	A	F1	5	0 5D	—			
	B	F2	5	0 5D	—			
	C	F3	5	0 5D	—			
	D	F4	5	0 5D	—			
Organisms loaded by: MF		Checked by:	JD	JM	MF	MF	MF	MF

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

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

Investigators' Signatures
Marshall Faircloth
Liz Miller
James Daniels

Reviewer: Liz Miller

Comments:

Method: TSK — 95% confidence intervals

Statistics: LC50		Lower	Upper
48 hour:	—	96h>2.15	2.26
96 hour:	2.21		

Revised 7/15/2008 mf

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

Test Beginning: Date: 9-4-12 Time: 0845
Test Ending: Date: 9-8-12 Time: 0800

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	8.2	24.4	7.7	306	
		24 hr					
	A	48 hr BR	7.9	24.4	8.1	350	
	M	48 hr AR	7.9	24.7	8.1	355	
		72 hr					
	A	96 hr	8.1	24.3	7.6	343	
1.5	M	0 hr	8.1	24.8	7.7	2790	
		24 hr					
	A	48 hr BR	7.9	24.7	8.1	2830	
	M	48 hr AR	7.9	25.2	8.0	2780	
		72 hr	7.9 MF				
	A	96 hr	8.0	24.8	7.6	2840	
2.0	M	0 hr	8.1	24.7	7.7	3640	
		24 hr					
	A	48 hr BR	7.9	24.7	8.0	3820	
	M	48 hr AR	7.9	25.4	7.9	3710	
		72 hr					
	A	96 hr	8.0	24.9	7.4	3850	
2.5	M	0 hr	8.1	24.6	7.8	4520	
		24 hr					
	A	48 hr BR	7.9	24.7	8.0	4710	
	M	48 hr AR	7.9	25.7	7.9	4590	
	B	72 hr	7.9	25.0	7.8	4500	
	A	96 hr	8.0	24.8	7.6	4690	
3.0	M	0 hr	8.1	24.4	7.8	5160	
		24 hr					
	A	48 hr BR	7.9	24.4	8.0	5290	
	M low	48 hr AR	—	~~25.8 MF~~	—	—	
		72 hr					
		96 hr					
4.0	M	0 hr	8.1	24.2	7.7	6890	
	A	24 hr	7.8	24.0	7.8	7340	
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

Investigators Signatures
Marshall Fairbeth
Liz Miller
James Daniel

Reviewed By: Liz Miller

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:

PAGE 2

Revised 07/15/2008 MF

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 8.20.12
Toxicant/ Batch#: NaCl 1 9.10.12

Organism Batch: 9.11.12 Age: 7days

Test Beginning: Date: 9.11.12 Time: 1300
Test Ending: Date: 9-15-12 Time: 1110

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	JD
Alkalinity (mg/L as $CaCO_3$):	74	TA06_08	HW
Hardness (mg.L as $CaCO_3$):	100	TA06_09	HW
Total Ammonia (mg/L as N):	<0.017	TA06_17	MF
Conductivity: (µmhos) mmhos	336	TA06_25	JD
Salinity (ppth):	—	TA06_25	—

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

Artemia Batch:
- 0 hr: 124-12
- 24 hr: —
- 48 hr: 125-12
- 72 hr: —

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

Concentrations prepared by: JD

Test Incubated in: Incubator # 3 Waterbath # ___

Light Intensity: 50-100 Ft. candles

Photoperiod: 16 hours Light / 8 hours dark

Temperature Range °C:(if used)
Incubator # 3 min. 24.5 max 26.5 mean —
Waterbath # ___ min. ___ max. ___ mean ___
Room B246 min. 24.5 max. 25.1 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 @/L	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	C13	10	10	10	10	10	10
	B	C14	10	10	10	10	10	10
5.0	A	C15	10	10	10	10	10	9 1D
	B	C16	10	10	10	10	10	10
6.0	A	C17	10	10	10	10	8 2D	8
	B	C18	10	10	10	10	10	9 1D
7.0	A	C19	10	9 1D	9	9	7 2D	7
	B	C20	10	9 1D	9	9	8 1D	8
8.0	A	C21	10	4 6D	2 3D	2	1 1D	1
	B	C22	10	4 6D	3 1D	3	2 1D	1 1D D
10.0	A	C23	10	0 10D				
	B	C24	10	0 10D				
Organisms loaded by: JD		Checked by:	BD	JD	JD	JD	JD	MF
Loading Verified by: BD								

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

Reviewer: Stig Millen

Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour: —	—	—
96 hour: 7.16	6.82	7.53

Revised 7/15/2008 mf

TCEQ 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: 9.11.12 Time: 1300
Test Ending: Date: 9-15-12 Time: 1110

Test Type: ☐ non-renewal ☑ renewal

hr = hour AR = after renewal BR = before renewal

Concentration µg/L mg/L	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☒ mmhos	Salinity (ppth)
Control	A	0 hr	7.8	24.7	7.4	0.336	
	B	24 hr	8.2	25.1	7.1	0.352	
	A	48 hr BR	7.9	24.7	8.0	0.351	
	A	48 hr AR	8.2	24.0	8.1	0.349	
	B	72 hr	8.3	24.9	6.6	0.414	
	A	96 hr	7.8	25.2	7.3	0.366	
5	A	0 hr	7.8	25.4	7.5	10.0	
	B	24 hr	8.1	25.1	7.1	10.1	
	A	48 hr BR	8.0	24.9	7.8	10.3	
	A	48 hr AR	8.1	24.0	7.8	10.0	
	B	72 hr	8.0	25.4	6.6	10.2	
	A	96 hr	7.7	25.6	6.7	10.6	
6	A	0 hr	7.8	25.6	7.7	11.8	
	B	24 hr	8.1	24.9	7.0	11.5	
	A	48 hr BR	8.1	24.9	7.6	11.9	
	A	48 hr AR	8.1	24.0	7.7	11.6	
	B	72 hr	8.0	25.2	6.9	12.2	
	A	96 hr	7.9	25.6	6.6	12.5	
7	A	0 hr	7.8	25.8	7.8	13.7	
	B	24 hr	8.1	24.5	7.0	13.3	
	A	48 hr BR	8.1	24.9	7.6	13.8	
	A	48 hr AR	8.1	24.0	7.9	13.5	
	B	72 hr	8.0	24.9	6.7	13.7	
	A	96 hr	7.9	25.4	6.7	14.2	
8	A	0 hr	7.9	25.8	7.8	15.2	
	B	24 hr	8.0	24.5	7.0	15.0	
	A	48 hr BR	8.0	24.8	7.6	15.5	
	A	48 hr AR	8.1	24.0	7.9	15.2	
	B	72 hr	7.9	25.0	6.4	15.6	
	A	96 hr	7.9	25.3	6.7	15.9	
10	A	0 hr	7.9	25.9	8.0	19.3	
	B	24 hr	8.0	24.5	7.0	18.7	
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

Investigators Signatures

Reviewed By: Liz Miller

Measured by:
- 0 hr: JD
- 24 hr: JD
- 48 hr BR: JD
- 48 hr AR: JD
- 72 hr: JD
- 96 hr: MA

Measure/record salinity for marine tests

Comments:

PAGE 6

Revised 07/15/2008 MF

Appendix D. Test Organism Receipt

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: 9/10/12

Ship to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia						
Menidia beryllina	150 ac	12 DAYS	SS12 0829	25	7.9	20
						Hardness mg/L
Cyprinella leedsi	150	11 DAYS	CL 120830	25	7.8	80
Pimephales promelas	250 ac	6 DAYS	FM 120904	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

Appendix E. Chemical Analyses performed on the effluent from the Mulberry Phosphate, Inc. – Phosphogypsum Stack Closure Outfall D-001F, sampled on September 10, 2012.

Date_Sampled	Field_ID	SCH_Group	Component	Value	Qualifier	Units	MDL	PQL
9/10/2012 10:20	D-001 F	AGP/LN	Algal Growth Potential	15.2		mg DryWt/L	0.3	0.9
9/10/2012 10:20	D-001 F	Chlorophyll/Grain Size/BOD	Phaeophytin-a	4		ug/L	0.4	1.2
9/10/2012 10:20	D-001 F	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	29		ug/L	0.55	1.7
9/10/2012 10:20	D-001 F	Toxicology	Bioassay-Acute-Def-FW-Fish, LC50	100	L	LC50		
9/10/2012 10:20	D-001 F	Toxicology	Bioassay-Acute-Def-FW-C.dubia, LC50	100	L	LC50		
9/10/2012 10:20	D-001 F	Metals	Sodium	16.1		mg/L	0.5	2
9/10/2012 10:20	D-001 F	Metals	Silver	0.025	U	ug/L	0.025	0.1
9/10/2012 10:20	D-001 F	Metals	Cadmium	0.05	I	ug/L	0.05	0.2
9/10/2012 10:20	D-001 F	Metals	Chromium	0.32	I	ug/L	0.3	1.2
9/10/2012 10:20	D-001 F	Metals	Calcium	51.1		mg/L	0.075	0.3
9/10/2012 10:20	D-001 F	Metals	Lead	0.2	U	ug/L	0.2	0.8
9/10/2012 10:20	D-001 F	Metals	Nickel	0.71	I	ug/L	0.25	1
9/10/2012 10:20	D-001 F	Metals	Arsenic	2.16		ug/L	0.25	1
9/10/2012 10:20	D-001 F	Metals	Selenium	0.2	U	ug/L	0.2	0.8
9/10/2012 10:20	D-001 F	Metals	Copper	0.5	U	ug/L	0.5	1
9/10/2012 10:20	D-001 F	Metals	Magnesium	9.25		mg/L	0.04	0.16
9/10/2012 10:20	D-001 F	Metals	Zinc	5	U	ug/L	5	20
9/10/2012 10:20	D-001 F	Metals	Aluminum	101		ug/L	5	20
9/10/2012 10:20	D-001 F	Metals	Iron	140		ug/L	30	120
9/10/2012 10:20	D-001 F	Nutrients	NO2NO3-N	0.038		mg N/L	0.004	0.01
9/10/2012 10:20	D-001 F	Nutrients	Alkalinity	75		mg CaCO3/L	0.65	2.5
9/10/2012 10:20	D-001 F	Nutrients	Fluoride	1.9		mg F/L	0.035	0.1
9/10/2012 10:20	D-001 F	Nutrients	Ammonia-N	0.24		mg N/L	0.01	0.02
9/10/2012 10:20	D-001 F	Nutrients	TDS	238	A	mg/L	15	25
9/10/2012 10:20	D-001 F	Nutrients	Total-P	2.8		mg P/L	0.025	0.25
9/10/2012 10:20	D-001 F	Nutrients	Kjeldahl Nitrogen	1.2		mg N/L	0.08	0.2
9/10/2012 10:20	D-001 F	Nutrients	O-Phosphate-P	2.4		mg P/L	0.04	0.1
9/10/2012 10:20	D-001 F	Nutrients	Chloride	8		mg Cl/L	0.2	0.5
9/10/2012 10:20	D-001 F	Nutrients	Sulfate	88		mg SO4/L	0.4	1
9/10/2012 10:20	D-001 F	Nutrients	TSS	7	I	mg/L	2	10
9/10/2012 10:20	D-001 F	Overflow	Radium 228	1	U	pCi/L		
9/10/2012 10:20	D-001 F	Overflow	Radium 226-Counting Error	0.2		pCi/L		
9/10/2012 10:20	D-001 F	Overflow	Oil and Grease	0.74	U	mg/L	0.74	2.6

Date_Sampled	Field_ID	SCH_Group	Component	Value	Qualifier	Units	MDL	PQL
9/10/2012 10:20	D-001 F	Overflow	Radium 228-Counting Error	0.6		pCi/L		
9/10/2012 10:20	D-001 F	Overflow	Radium 226	0.5		pCi/L		
9/10/2012 10:20	D-001 F	Overflow	Alpha-Counting Error	0.9		pCi/L		
9/10/2012 10:20	D-001 F	Overflow	Alpha, Total	1.3	U	pCi/L		
9/10/2012 10:20	D-001 F	Pesticides	Atrazine	0.05	U	ug/L	0.05	0.2
9/10/2012 10:20	D-001 F	Pesticides	Butylate	0.1	U	ug/L	0.1	0.4
9/10/2012 10:20	D-001 F	Pesticides	Chlorpyrifos Ethyl	0.05	U	ug/L	0.05	0.2
9/10/2012 10:20	D-001 F	Pesticides	Diazinon	0.05	U	ug/L	0.05	0.2
9/10/2012 10:20	D-001 F	Pesticides	Fenamiphos	0.15	U	ug/L	0.15	0.6
9/10/2012 10:20	D-001 F	Pesticides	Simazine	0.05	U	ug/L	0.05	0.2
9/10/2012 10:20	D-001 F	Pesticides	Chlorpyrifos Methyl	0.05	U	ug/L	0.05	0.2
9/10/2012 10:20	D-001 F	Pesticides	Fonofos	0.05	U	ug/L	0.05	0.2
9/10/2012 10:20	D-001 F	Pesticides	Hexazinone	0.15	U	ug/L	0.15	0.6
9/10/2012 10:20	D-001 F	Pesticides	Metalaxyl	0.2	U	ug/L	0.2	0.8
9/10/2012 10:20	D-001 F	Pesticides	Metolachlor	0.3	U	ug/L	0.3	1.2
9/10/2012 10:20	D-001 F	Pesticides	Parathion Ethyl	0.1	U	ug/L	0.1	0.4
9/10/2012 10:20	D-001 F	Pesticides	Naled	0.2	U	ug/L	0.2	0.8
9/10/2012 10:20	D-001 F	Pesticides	Norflurazon	0.15	U	ug/L	0.15	0.6
9/10/2012 10:20	D-001 F	Pesticides	Azinphos Methyl	0.1	U	ug/L	0.1	0.4
9/10/2012 10:20	D-001 F	Pesticides	Parathion Methyl	0.05	U	ug/L	0.05	0.2
9/10/2012 10:20	D-001 F	Pesticides	Phorate	0.025	U	ug/L	0.025	0.1
9/10/2012 10:20	D-001 F	Pesticides	Bromacil	0.2	UJ	ug/L	0.2	0.8
9/10/2012 10:20	D-001 F	Pesticides	Ametryn	0.05	U	ug/L	0.05	0.2
9/10/2012 10:20	D-001 F	Pesticides	Alachlor	0.3	U	ug/L	0.3	1.2
9/10/2012 10:20	D-001 F	Pesticides	Prometryn	0.1	U	ug/L	0.1	0.4
9/10/2012 10:20	D-001 F	Pesticides	Metribuzin	0.1	U	ug/L	0.1	0.4
9/10/2012 10:20	D-001 F	Pesticides	Malathion	0.05	U	ug/L	0.05	0.2
9/10/2012 10:20	D-001 F	Pesticides	Ethoprop	0.025	U	ug/L	0.025	0.1
9/10/2012 10:20	D-001 F	Pesticides	Mevinphos	0.05	U	ug/L	0.05	0.2
9/10/2012 10:20	D-001 F	Pesticides	Ethion	0.05	U	ug/L	0.05	0.2
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Butyl benzyl phthalate	4.9	U	ug/L	4.9	19
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19	U	ug/L	0.19	0.78
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L	15	58
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	12
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Benzidine	97	U	ug/L	97	390
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Di-n-butyl phthalate	4.9	U	ug/L	4.9	19

Date_Sampled	Field_ID	SCH_Group	Component	Value	Qualifier	Units	MDL	PQL
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	12
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Phenol	0.97	U	ug/L	0.97	3.9
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	2,4-Dimethylphenol	9.7	U	ug/L	9.7	39
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	2,4-Dinitrotoluene	0.97	U	ug/L	0.97	3.9
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.97	U	ug/L	0.97	3.9
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	58
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19	U	ug/L	0.19	0.78
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Pyrene	0.19	U	ug/L	0.19	0.78
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	2-Chlorophenol	0.97	U	ug/L	0.97	3.9
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.97	U	ug/L	0.97	3.9
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Acenaphthene	0.19	U	ug/L	0.19	0.78
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19	U	ug/L	0.19	0.78
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Dimethyl phthalate	9.7	U	ug/L	9.7	39
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19	U	ug/L	0.19	0.78
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	12
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	2,6-Dinitrotoluene	0.97	U	ug/L	0.97	3.9
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	3,3'-Dichlorobenzidine	39	U	ug/L	39	160
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.97	U	ug/L	0.97	3.9
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Fluoranthene	0.19	U	ug/L	0.19	0.78
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	12
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Phenanthrene	0.19	U	ug/L	0.19	0.78
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.97	U	ug/L	0.97	3.9
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	2,4-Dichlorophenol	0.97	U	ug/L	0.97	3.9
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Anthracene	0.19	U	ug/L	0.19	0.78
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	12
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Di-n-octyl phthalate	0.97	U	ug/L	0.97	3.9
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Hexachlorobenzene	0.97	U	ug/L	0.97	3.9
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	12
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Isophorone	0.97	U	ug/L	0.97	3.9
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.8
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	U	ug/L	2.9	12
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Benzo(a)pyrene	0.19	U	ug/L	0.19	0.78
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19	U	ug/L	0.19	0.78
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	U	ug/L	15	58
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Naphthalene	0.19	U	ug/L	0.19	0.78
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.8

Date_Sampled	Field_ID	SCH_Group	Component	Value	Qualifier	Units	MDL	PQL
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.97	U	ug/L	0.97	3.9
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	2-Chloronaphthalene	0.97	U	ug/L	0.97	3.9
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	2-Nitrophenol	0.97	U	ug/L	0.97	3.9
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.8
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Acenaphthylene	0.19	U	ug/L	0.19	0.78
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Benzo(a)anthracene	0.19	U	ug/L	0.19	0.78
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.97	U	ug/L	0.97	3.9
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Chrysene	0.19	U	ug/L	0.19	0.78
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Diethyl phthalate	0.97	U	ug/L	0.97	3.9
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	Fluorene	0.19	U	ug/L	0.19	0.78
9/10/2012 10:20	D-001 F	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.8
9/10/2012 10:20	D-001 F	Field Parameter	Temperature	27.86		C		
9/10/2012 10:20	D-001 F	Field Parameter	Dissolved Oxygen	6.71		mg/L		
9/10/2012 10:20	D-001 F	Field Parameter	pH	7.15				
9/10/2012 10:20	D-001 F	Field Parameter	Specific Conductance	384		umhos/cm		
9/10/2012 9:45	FIELD BLANK	Metals	Aluminum	5	U	ug/L	5	20
9/10/2012 9:45	FIELD BLANK	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
9/10/2012 9:45	FIELD BLANK	Metals	Iron	30	U	ug/L	30	120
9/10/2012 9:45	FIELD BLANK	Metals	Copper	0.5	U	ug/L	0.5	1
9/10/2012 9:45	FIELD BLANK	Metals	Chromium	0.3	U	ug/L	0.3	1.2
9/10/2012 9:45	FIELD BLANK	Metals	Nickel	0.25	U	ug/L	0.25	1
9/10/2012 9:45	FIELD BLANK	Metals	Silver	0.025	U	ug/L	0.025	0.1
9/10/2012 9:45	FIELD BLANK	Metals	Calcium	0.075	U	mg/L	0.075	0.3
9/10/2012 9:45	FIELD BLANK	Metals	Selenium	0.2	U	ug/L	0.2	0.8
9/10/2012 9:45	FIELD BLANK	Metals	Sodium	0.5	U	mg/L	0.5	2
9/10/2012 9:45	FIELD BLANK	Metals	Cadmium	0.05	U	ug/L	0.05	0.2
9/10/2012 9:45	FIELD BLANK	Metals	Zinc	5	U	ug/L	5	20
9/10/2012 9:45	FIELD BLANK	Metals	Lead	0.2	U	ug/L	0.2	0.8
9/10/2012 9:45	FIELD BLANK	Metals	Arsenic	0.25	U	ug/L	0.25	1
9/10/2012 9:45	FIELD BLANK	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
9/10/2012 9:45	FIELD BLANK	Nutrients	Chloride	0.2	U	mg Cl/L	0.2	0.5
9/10/2012 9:45	FIELD BLANK	Nutrients	Total-P	0.004	U	mg P/L	0.004	0.01
9/10/2012 9:45	FIELD BLANK	Nutrients	Fluoride	0.035	U	mg F/L	0.035	0.1
9/10/2012 9:45	FIELD BLANK	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
9/10/2012 9:45	FIELD BLANK	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
9/10/2012 9:45	FIELD BLANK	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01

Date_Sampled	Field_ID	SCH_Group	Component	Value	Qualifier	Units	MDL	PQL
9/10/2012 9:45	FIELD BLANK	Nutrients	TSS	2	U	mg/L	2	10
9/10/2012 9:45	FIELD BLANK	Nutrients	Sulfate	0.2	U	mg SO4/L	0.2	0.5
9/10/2012 9:45	FIELD BLANK	Nutrients	TDS	15	U	mg/L	15	25
9/10/2012 9:45	FIELD BLANK	Overflow	Radium 228	0.9	U	pCi/L		
9/10/2012 9:45	FIELD BLANK	Overflow	Oil and Grease	0.76	I	mg/L	0.76	2.7
9/10/2012 9:45	FIELD BLANK	Overflow	Alpha, Total	0.5	U	pCi/L		
9/10/2012 9:45	FIELD BLANK	Overflow	Radium 228-Counting Error	0.6		pCi/L		
9/10/2012 9:45	FIELD BLANK	Overflow	Radium 226-Counting Error	0.1		pCi/L		
9/10/2012 9:45	FIELD BLANK	Overflow	Alpha-Counting Error	0.4		pCi/L		
9/10/2012 9:45	FIELD BLANK	Overflow	Radium 226	0.2	U	pCi/L		
9/10/2012 9:45	FIELD BLANK	Pesticides	Malathion	0.05	U	ug/L	0.05	0.2
9/10/2012 9:45	FIELD BLANK	Pesticides	Ametryn	0.05	U	ug/L	0.05	0.2
9/10/2012 9:45	FIELD BLANK	Pesticides	Norflurazon	0.15	U	ug/L	0.15	0.6
9/10/2012 9:45	FIELD BLANK	Pesticides	Bromacil	0.2	UJ	ug/L	0.2	0.79
9/10/2012 9:45	FIELD BLANK	Pesticides	Naled	0.2	U	ug/L	0.2	0.79
9/10/2012 9:45	FIELD BLANK	Pesticides	Mevinphos	0.05	U	ug/L	0.05	0.2
9/10/2012 9:45	FIELD BLANK	Pesticides	Metribuzin	0.099	U	ug/L	0.099	0.4
9/10/2012 9:45	FIELD BLANK	Pesticides	Azinphos Methyl	0.099	U	ug/L	0.099	0.4
9/10/2012 9:45	FIELD BLANK	Pesticides	Metalaxyl	0.2	U	ug/L	0.2	0.79
9/10/2012 9:45	FIELD BLANK	Pesticides	Chlorpyrifos Methyl	0.05	U	ug/L	0.05	0.2
9/10/2012 9:45	FIELD BLANK	Pesticides	Atrazine	0.05	U	ug/L	0.05	0.2
9/10/2012 9:45	FIELD BLANK	Pesticides	Parathion Methyl	0.05	U	ug/L	0.05	0.2
9/10/2012 9:45	FIELD BLANK	Pesticides	Fonofos	0.05	U	ug/L	0.05	0.2
9/10/2012 9:45	FIELD BLANK	Pesticides	Ethion	0.05	U	ug/L	0.05	0.2
9/10/2012 9:45	FIELD BLANK	Pesticides	Chlorpyrifos Ethyl	0.05	U	ug/L	0.05	0.2
9/10/2012 9:45	FIELD BLANK	Pesticides	Alachlor	0.3	U	ug/L	0.3	1.2
9/10/2012 9:45	FIELD BLANK	Pesticides	Simazine	0.05	U	ug/L	0.05	0.2
9/10/2012 9:45	FIELD BLANK	Pesticides	Prometryn	0.099	U	ug/L	0.099	0.4
9/10/2012 9:45	FIELD BLANK	Pesticides	Metolachlor	0.3	U	ug/L	0.3	1.2
9/10/2012 9:45	FIELD BLANK	Pesticides	Hexazinone	0.15	U	ug/L	0.15	0.6
9/10/2012 9:45	FIELD BLANK	Pesticides	Ethoprop	0.025	U	ug/L	0.025	0.099
9/10/2012 9:45	FIELD BLANK	Pesticides	Diazinon	0.05	U	ug/L	0.05	0.2
9/10/2012 9:45	FIELD BLANK	Pesticides	Butylate	0.099	U	ug/L	0.099	0.4
9/10/2012 9:45	FIELD BLANK	Pesticides	Parathion Ethyl	0.099	U	ug/L	0.099	0.4
9/10/2012 9:45	FIELD BLANK	Pesticides	Fenamiphos	0.15	U	ug/L	0.15	0.6
9/10/2012 9:45	FIELD BLANK	Pesticides	Phorate	0.025	U	ug/L	0.025	0.099

Date_Sampled	Field_ID	SCH_Group	Component	Value	Qualifier	Units	MDL	PQL
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	2-Chlorophenol	0.98	U	ug/L	0.98	3.9
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Acenaphthylene	0.2	U	ug/L	0.2	0.78
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.98	U	ug/L	0.98	3.9
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	12
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	12
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Pyrene	0.2	U	ug/L	0.2	0.78
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	2,4-Dichlorophenol	0.98	U	ug/L	0.98	3.9
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	12
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.98	U	ug/L	0.98	3.9
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Phenanthrene	0.2	U	ug/L	0.2	0.78
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Anthracene	0.2	U	ug/L	0.2	0.78
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Di-n-octyl phthalate	0.98	U	ug/L	0.98	3.9
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Dimethyl phthalate	9.8	U	ug/L	9.8	39
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Naphthalene	0.2	U	ug/L	0.2	0.78
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Nitrobenzene	2	U	ug/L	2	7.8
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.98	U	ug/L	0.98	3.9
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	3,3'-Dichlorobenzidine	39	U	ug/L	39	160
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Benzo(b)fluoranthene	0.2	U	ug/L	0.2	0.78
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.98	U	ug/L	0.98	3.9
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Di-n-butyl phthalate	4.9	U	ug/L	4.9	20
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.2	U	ug/L	0.2	0.78
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.2	U	ug/L	0.2	0.78
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.98	U	ug/L	0.98	3.9
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	2	U	ug/L	2	7.8
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Benzo(a)anthracene	0.2	U	ug/L	0.2	0.78
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.2	U	ug/L	0.2	0.78
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Benzo(k)fluoranthene	0.2	U	ug/L	0.2	0.78
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Fluoranthene	0.2	U	ug/L	0.2	0.78
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Hexachlorobenzene	0.98	U	ug/L	0.98	3.9
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	N-Nitrosodimethylamine	2	U	ug/L	2	7.8
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	2,4-Dimethylphenol	9.8	U	ug/L	9.8	39
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	2-Chloronaphthalene	0.98	U	ug/L	0.98	3.9
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	4-Nitrophenol	15	U	ug/L	15	59
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Acenaphthene	0.2	U	ug/L	0.2	0.78
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Butyl benzyl phthalate	4.9	U	ug/L	4.9	20
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Fluorene	0.2	U	ug/L	0.2	0.78

Date_Sampled	Field_ID	SCH_Group	Component	Value	Qualifier	Units	MDL	PQL
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	12
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	2	U	ug/L	2	7.8
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Phenol	0.98	U	ug/L	0.98	3.9
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.98	U	ug/L	0.98	3.9
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	2,4-Dinitrotoluene	0.98	U	ug/L	0.98	3.9
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	2,6-Dinitrotoluene	0.98	U	ug/L	0.98	3.9
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Diethyl phthalate	0.98	U	ug/L	0.98	3.9
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	12
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	12
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Isophorone	0.98	U	ug/L	0.98	3.9
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	U	ug/L	2.9	12
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	2,4-Dinitrophenol	15	U	ug/L	15	59
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	2-Nitrophenol	0.98	U	ug/L	0.98	3.9
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Benzidine	98	U	ug/L	98	390
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Benzo(a)pyrene	0.2	U	ug/L	0.2	0.78
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	15	U	ug/L	15	59
9/10/2012 9:45	FIELD BLANK	Priority Organic Pollutants	Chrysene	0.2	U	ug/L	0.2	0.78
9/10/2012 11:35	MSA	Chlorophyll/Grain Size/BOD	Phaeophytin-a	7		ug/L	0.6	1.8
9/10/2012 11:35	MSA	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	12		ug/L	0.82	2.5
9/10/2012 11:35	MSA	Metals	Nickel	1.36		ug/L	0.25	1
9/10/2012 11:35	MSA	Metals	Selenium	0.33	I	ug/L	0.2	0.8
9/10/2012 11:35	MSA	Metals	Aluminum	617		ug/L	5	20
9/10/2012 11:35	MSA	Metals	Zinc	24		ug/L	5	20
9/10/2012 11:35	MSA	Metals	Copper	1.81		ug/L	0.5	1
9/10/2012 11:35	MSA	Metals	Silver	0.025	U	ug/L	0.025	0.1
9/10/2012 11:35	MSA	Metals	Cadmium	0.073	I	ug/L	0.05	0.2
9/10/2012 11:35	MSA	Metals	Arsenic	3.17		ug/L	0.25	1
9/10/2012 11:35	MSA	Metals	Calcium	33.3		mg/L	0.075	0.3
9/10/2012 11:35	MSA	Metals	Lead	1.71		ug/L	0.2	0.8
9/10/2012 11:35	MSA	Metals	Iron	10900		ug/L	30	120
9/10/2012 11:35	MSA	Metals	Chromium	1.7		ug/L	0.3	1.2
9/10/2012 11:35	MSA	Metals	Magnesium	5.32		mg/L	0.04	0.16
9/10/2012 11:35	MSA	Metals	Sodium	8.6		mg/L	0.5	2
9/10/2012 11:35	MSA	Nutrients	Chloride	7.2		mg Cl/L	0.2	0.5
9/10/2012 11:35	MSA	Nutrients	Kjeldahl Nitrogen	1.9		mg N/L	0.08	0.2
9/10/2012 11:35	MSA	Nutrients	Sulfate	24		mg SO4/L	0.2	0.5

Date_Sampled	Field_ID	SCH_Group	Component	Value	Qualifier	Units	MDL	PQL
9/10/2012 11:35	MSA	Nutrients	O-Phosphate-P	1.6		mg P/L	0.04	0.1
9/10/2012 11:35	MSA	Nutrients	TSS	56		mg/L	2	10
9/10/2012 11:35	MSA	Nutrients	Ammonia-N	0.56		mg N/L	0.01	0.02
9/10/2012 11:35	MSA	Nutrients	NO2NO3-N	0.09		mg N/L	0.02	0.05
9/10/2012 11:35	MSA	Nutrients	Alkalinity	71		mg CaCO3/L	0.65	2.5
9/10/2012 11:35	MSA	Nutrients	Total-P	3.8		mg P/L	0.025	0.25
9/10/2012 11:35	MSA	Nutrients	TDS	158		mg/L	15	25
9/10/2012 11:35	MSA	Nutrients	Fluoride	1.1		mg F/L	0.035	0.1
9/10/2012 11:35	MSA	Overflow	Alpha-Counting Error	1.2		pCi/L		
9/10/2012 11:35	MSA	Overflow	Radium 226	0.7		pCi/L		
9/10/2012 11:35	MSA	Overflow	Radium 226-Counting Error	0.2		pCi/L		
9/10/2012 11:35	MSA	Overflow	Alpha, Total	1.7		pCi/L		
9/10/2012 11:35	MSA	Overflow	Radium 228-Counting Error	0.5		pCi/L		
9/10/2012 11:35	MSA	Overflow	Radium 228	0.8	U	pCi/L		
9/10/2012 11:35	MSA	Overflow	Oil and Grease	0.77	I	mg/L	0.77	2.7
9/10/2012 11:35	MSA	Pesticides	Ethion	0.047	U	ug/L	0.047	0.19
9/10/2012 11:35	MSA	Pesticides	Malathion	0.047	U	ug/L	0.047	0.19
9/10/2012 11:35	MSA	Pesticides	Phorate	0.024	U	ug/L	0.024	0.094
9/10/2012 11:35	MSA	Pesticides	Ametryn	0.047	U	ug/L	0.047	0.19
9/10/2012 11:35	MSA	Pesticides	Chlorpyrifos Ethyl	0.047	U	ug/L	0.047	0.19
9/10/2012 11:35	MSA	Pesticides	Fenamiphos	0.14	U	ug/L	0.14	0.57
9/10/2012 11:35	MSA	Pesticides	Metalaxyl	0.19	U	ug/L	0.19	0.75
9/10/2012 11:35	MSA	Pesticides	Mevinphos	0.047	U	ug/L	0.047	0.19
9/10/2012 11:35	MSA	Pesticides	Alachlor	0.28	U	ug/L	0.28	1.1
9/10/2012 11:35	MSA	Pesticides	Parathion Methyl	0.047	U	ug/L	0.047	0.19
9/10/2012 11:35	MSA	Pesticides	Prometryn	0.094	U	ug/L	0.094	0.38
9/10/2012 11:35	MSA	Pesticides	Bromacil	0.19	UJ	ug/L	0.19	0.75
9/10/2012 11:35	MSA	Pesticides	Hexazinone	0.14	U	ug/L	0.14	0.57
9/10/2012 11:35	MSA	Pesticides	Norflurazon	0.14	U	ug/L	0.14	0.57
9/10/2012 11:35	MSA	Pesticides	Azinphos Methyl	0.094	U	ug/L	0.094	0.38
9/10/2012 11:35	MSA	Pesticides	Metribuzin	0.094	U	ug/L	0.094	0.38
9/10/2012 11:35	MSA	Pesticides	Parathion Ethyl	0.094	U	ug/L	0.094	0.38
9/10/2012 11:35	MSA	Pesticides	Simazine	0.047	U	ug/L	0.047	0.19
9/10/2012 11:35	MSA	Pesticides	Chlorpyrifos Methyl	0.047	U	ug/L	0.047	0.19
9/10/2012 11:35	MSA	Pesticides	Atrazine	0.047	U	ug/L	0.047	0.19
9/10/2012 11:35	MSA	Pesticides	Butylate	0.094	U	ug/L	0.094	0.38

Date_Sampled	Field_ID	SCH_Group	Component	Value	Qualifier	Units	MDL	PQL
9/10/2012 11:35	MSA	Pesticides	Diazinon	0.047	U	ug/L	0.047	0.19
9/10/2012 11:35	MSA	Pesticides	Ethoprop	0.024	U	ug/L	0.024	0.094
9/10/2012 11:35	MSA	Pesticides	Fonofos	0.047	U	ug/L	0.047	0.19
9/10/2012 11:35	MSA	Pesticides	Metolachlor	0.28	U	ug/L	0.28	1.1
9/10/2012 11:35	MSA	Pesticides	Naled	0.19	U	ug/L	0.19	0.75
9/10/2012 11:35	MSA	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.96	U	ug/L	0.96	3.8
9/10/2012 11:35	MSA	Priority Organic Pollutants	Dimethyl phthalate	9.6	U	ug/L	9.6	38
9/10/2012 11:35	MSA	Priority Organic Pollutants	2-Chlorophenol	0.96	U	ug/L	0.96	3.8
9/10/2012 11:35	MSA	Priority Organic Pollutants	Acenaphthene	0.19	U	ug/L	0.19	0.77
9/10/2012 11:35	MSA	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19	U	ug/L	0.19	0.77
9/10/2012 11:35	MSA	Priority Organic Pollutants	Chrysene	0.19	U	ug/L	0.19	0.77
9/10/2012 11:35	MSA	Priority Organic Pollutants	Di-n-octyl phthalate	0.96	U	ug/L	0.96	3.8
9/10/2012 11:35	MSA	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.7
9/10/2012 11:35	MSA	Priority Organic Pollutants	2-Chloronaphthalene	0.96	U	ug/L	0.96	3.8
9/10/2012 11:35	MSA	Priority Organic Pollutants	Diethyl phthalate	0.96	U	ug/L	0.96	3.8
9/10/2012 11:35	MSA	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	14	U	ug/L	14	58
9/10/2012 11:35	MSA	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19	U	ug/L	0.19	0.77
9/10/2012 11:35	MSA	Priority Organic Pollutants	2,6-Dinitrotoluene	0.96	U	ug/L	0.96	3.8
9/10/2012 11:35	MSA	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.96	U	ug/L	0.96	3.8
9/10/2012 11:35	MSA	Priority Organic Pollutants	Pyrene	0.19	U	ug/L	0.19	0.77
9/10/2012 11:35	MSA	Priority Organic Pollutants	2,4-Dichlorophenol	0.96	U	ug/L	0.96	3.8
9/10/2012 11:35	MSA	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	12
9/10/2012 11:35	MSA	Priority Organic Pollutants	4-Nitrophenol	14	U	ug/L	14	58
9/10/2012 11:35	MSA	Priority Organic Pollutants	Anthracene	0.19	U	ug/L	0.19	0.77
9/10/2012 11:35	MSA	Priority Organic Pollutants	Benzo(a)anthracene	0.19	U	ug/L	0.19	0.77
9/10/2012 11:35	MSA	Priority Organic Pollutants	Phenanthrene	0.19	U	ug/L	0.19	0.77
9/10/2012 11:35	MSA	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.96	U	ug/L	0.96	3.8
9/10/2012 11:35	MSA	Priority Organic Pollutants	Di-n-butyl phthalate	4.8	U	ug/L	4.8	19
9/10/2012 11:35	MSA	Priority Organic Pollutants	Hexachlorobenzene	0.96	U	ug/L	0.96	3.8
9/10/2012 11:35	MSA	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	12
9/10/2012 11:35	MSA	Priority Organic Pollutants	Naphthalene	0.19	U	ug/L	0.19	0.77
9/10/2012 11:35	MSA	Priority Organic Pollutants	2,4-Dimethylphenol	9.6	U	ug/L	9.6	38
9/10/2012 11:35	MSA	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38	U	ug/L	38	150
9/10/2012 11:35	MSA	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.96	U	ug/L	0.96	3.8
9/10/2012 11:35	MSA	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.7
9/10/2012 11:35	MSA	Priority Organic Pollutants	Acenaphthylene	0.19	U	ug/L	0.19	0.77

Date_Sampled	Field_ID	SCH_Group	Component	Value	Qualifier	Units	MDL	PQL
9/10/2012 11:35	MSA	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	12
9/10/2012 11:35	MSA	Priority Organic Pollutants	Butyl benzyl phthalate	4.8	U	ug/L	4.8	19
9/10/2012 11:35	MSA	Priority Organic Pollutants	Fluoranthene	0.19	U	ug/L	0.19	0.77
9/10/2012 11:35	MSA	Priority Organic Pollutants	Fluorene	0.19	U	ug/L	0.19	0.77
9/10/2012 11:35	MSA	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	12
9/10/2012 11:35	MSA	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	U	ug/L	2.9	12
9/10/2012 11:35	MSA	Priority Organic Pollutants	Phenol	0.96	U	ug/L	0.96	3.8
9/10/2012 11:35	MSA	Priority Organic Pollutants	2,4-Dinitrophenol	14	U	ug/L	14	58
9/10/2012 11:35	MSA	Priority Organic Pollutants	Benzidine	96	U	ug/L	96	380
9/10/2012 11:35	MSA	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19	U	ug/L	0.19	0.77
9/10/2012 11:35	MSA	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.7
9/10/2012 11:35	MSA	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	12
9/10/2012 11:35	MSA	Priority Organic Pollutants	2,4-Dinitrotoluene	0.96	U	ug/L	0.96	3.8
9/10/2012 11:35	MSA	Priority Organic Pollutants	2-Nitrophenol	0.96	U	ug/L	0.96	3.8
9/10/2012 11:35	MSA	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.96	U	ug/L	0.96	3.8
9/10/2012 11:35	MSA	Priority Organic Pollutants	Benzo(a)pyrene	0.19	U	ug/L	0.19	0.77
9/10/2012 11:35	MSA	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19	U	ug/L	0.19	0.77
9/10/2012 11:35	MSA	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.96	U	ug/L	0.96	3.8
9/10/2012 11:35	MSA	Priority Organic Pollutants	Isophorone	0.96	U	ug/L	0.96	3.8
9/10/2012 11:35	MSA	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.7
9/10/2012 11:35	MSA	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19	U	ug/L	0.19	0.77
9/10/2012 11:35	MSA	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	12
9/10/2012 11:35	MSA	Field Parameter	pH	6.56				
9/10/2012 11:35	MSA	Field Parameter	Dissolved Oxygen	4.68		mg/L		
9/10/2012 11:35	MSA	Field Parameter	Temperature	27.5		C		
9/10/2012 11:35	MSA	Field Parameter	Specific Conductance	229		umhos/cm		

Appendix F. Facility Summary, Effluent Limits, and Permit Violations Recorded on Discharge Monitoring Report

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Jacki Champion	Contact Number: 813-63-7600 X133
Facility Name (as it appears on permit): Mulberry Phosphate, Inc.-Phosphogypsum Stack Closure	Former Names:
NPDES Permit Number: FL0334944	Permit Expiration Date: 6/16/13
Physical Address: 4000 State Road 60 East, Mulberry, FL 33860	
District: BMMR-PM located in SW	County: Polk
Function of Facility: Closure of a Phosphogypsum Stack System	
Facility Type: Phosphogypsum Stack System	Permitted Capacity (MGD):
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months):	
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-01F	
Description of Permitted Outfall(s): V-notch weir approximately 5.0 feet in length	
Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility): When process water discharge is necessary a two-stage liming and acidulation station may be used for treatment in addition to settling of the lime solids before discharge. Process water may also be treated by Reverse Osmosis. Stormwater runoff entering the property from Highway 60 is treated through settling of solids.	

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PART I: Continued										
List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under (Leave cell blank if not applicable)										
			Effluent Limitations				Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Monthly Average	Weekly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes

There are two sets of limits in the permit below. The first applies to discharges containing treated process water, the second applies when no treated process water is being discharged.

A. Surface Water Discharges

1. During the period beginning on the effective date and lasting through the expiration date of this permit, the permittee is authorized to discharge from Outfall D-001F **[when Internal Outfall I-001 is discharging treated process water]** **(Attachment A)** treated process wastewater and stormwater run-off from the closed phosphogypsum stack system. The discharge shall not exceed the effluent limitations and shall be limited and monitored by the permittee as specified below. If there is no discharge from the facility on a day scheduled for sampling, the sample shall be collected on the next working day (Monday - Friday) following the next discharge. The sample shall be taken at the point nearest the discharge prior to mixing with the receiving water body.

PARAMETERS (UNITS)	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS		
	Daily Minimum	Monthly Average	Daily Maximum	Monitoring Frequency	Sample Type	Sample Points
Flow (mgd)	N/A	Report	Report	Continuous	Recorder	EFF-01F
Temperature (°C) (See I.A.8.)	N/A	Report	Report	1/Week	Grab	EFF-01F
Turbidity [Effluent] (NTUs)	N/A	Report	See I.A.9.	1/Week	Grab	EFF-01F
Turbidity [Background] (NTUs) (see II.A.9.)	N/A	Report	Report	1/Week	Grab	SWB-01F
Solids, Total Suspended (mg/l)	N/A	Report	15	1/Week	Grab	EFF-01F*
pH (standard units) (See I.A.8. & I.A.10.)	6.0	Report	8.5	1/Week	Grab	EFF-01F
Phosphorus, Total (as P) (mg/l)	N/A	Report	Report	1/Week	24 hour composite	EFF-01F
Phosphorus, Total (as P) (lbs/day) †	N/A	Report	Report	1/Week	Calculated	EFF-01F
Fluoride, Total (as F) (mg/l)	N/A	Report	10	1/Week	24 hour composite	EFF-01F
Oxygen, Dissolved (DO) (mg/l)	5.0	Report	N/A	1/Week (See I.A.7.)	Grab	EFF-01F
Nitrogen, Total (as N) (mg/l)	N/A	Report	Report	1/Week	24 hour composite	EFF-01F
Nitrogen, Total (as N) (lbs/day) †	N/A	Report	Report	1/Week	Calculated	EFF-01F
Total Ammonia (as N) (mg/l) (See I.A.8.)	N/A	Report	Report	1/Week	Grab	EFF-01F
Un-ionized Ammonia (as NH_3) (mg/l) (See I.A.8.)	N/A	Report	0.02	1/Week	Calculated	EFF-01F
Sulfate, Total (as S) (mg/l)	N/A	Report	Report	1/Week	Grab	EFF-01F

(See I.A.8.)						
Un-ionized Ammonia (as NH_3) (mg/l) (See I.A.8.)	N/A	Report	0.02	1/Week	Calculated	EFF-01F
Sulfate, Total (as S) (mg/l)	N/A	Report	Report	1/Week	Grab	EFF-01F
Ortho-phosphate (as P) (mg/l)	N/A	Report	Report	1/Week	Grab	EFF-01F
Specific Conductance (µmhos/cm)	N/A	Report	2,398 (See I.A.5.)	1/Day	Grab	EFF-01F
$Radium^{226}$ + $Radium^{228}$, Total (pCi/l) (See I.A.19.)	N/A	N/A	5	1/Month	24 hour composite	EFF-01F
Alpha, Gross Particle Activity (pCi/l) (See I.A.19.)	N/A	N/A	15	1/Month	24 hour composite	EFF-01F
Whole Effluent Toxicity – Chronic and Acute	See Permit Conditions I.A.11. & I.A.12.					

† **The total nitrogen and total phosphorus loading values shall be for monitoring and reporting purposes only. (See Condition I.A.6. below)**

* **TSS shall be monitored at the upstream end of the culvert located in Condition I.A.3.**

2. During the period beginning on the effective date and lasting through the expiration date of this permit, the permittee is authorized to discharge from Outfall D-001F **[when Internal Outfall I-001 is not discharging treated process water]** **(Attachment A)** treated process wastewater and stormwater run-off from the closed phosphogypsum stack system. The discharge shall not exceed the effluent limitations and shall be limited and monitored by the permittee as specified below. If there is no discharge from the facility on a day scheduled for sampling, the sample shall be collected on the next working day (Monday - Friday) following the next discharge. The sample shall be taken at the point nearest the discharge prior to mixing with the receiving water body.

PARAMETERS (UNITS)	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS		
	Daily Minimum	Monthly Average	Daily Maximum	Monitoring Frequency	Sample Type	Sample Points
Flow (mgd)	N/A	Report	Report	Continuous	Recorder	EFF-01F
Temperature (°C) (See I.A.8.)	N/A	Report	Report	1/Week	Grab	EFF-01F
Turbidity [Effluent] (NTUs)	N/A	Report	See I.A.9.	1/Week	Grab	EFF-01F
Turbidity [Background] (NTUs) (see II.A.9.)	N/A	Report	Report	1/Week	Grab	SWB-01F
Solids, Total Suspended (mg/l)	N/A	Report	15	1/Week	Grab	EFF-01F*
pH (standard units) (See I.A.8. & I.A.10.)	6.0	Report	8.5	1/Week	Grab	EFF-01F
Phosphorus, Total (as P) (mg/l)	N/A	Report	Report	1/Week	24 hour composite	EFF-01F
Phosphorus, Total (as P) (lbs/day) †	N/A	Report	Report	1/Week	Calculated	EFF-01F
Fluoride, Total (as F) (mg/l)	N/A	Report	10	1/Week	24 hour composite	EFF-01F
Oxygen, Dissolved (DO) (mg/l)	5.0	Report	N/A	1/Week (See I.A.7.)	Grab	EFF-01F
Nitrogen, Total (as N) (mg/l)	N/A	Report	Report	1/Week	24 hour composite	EFF-01F
Nitrogen, Total (as N) (lbs/day) †	N/A	Report	Report	1/Week	Calculated	EFF-01F
Total Ammonia (as N) (mg/l) (See I.A.8.)	N/A	Report	Report	1/Week	Grab	EFF-01F
Un-ionized Ammonia (as NH_3) (mg/l) (See I.A.8.)	N/A	Report	0.02	1/Week	Calculated	EFF-01F
Sulfate, Total (as S) (mg/l)	N/A	Report	Report	1/Week	Grab	EFF-01F
Ortho-phosphate (as P) (mg/l)	N/A	Report	Report	1/Week	Grab	EFF-01F
Specific Conductance [Effluent] (umhos/cm)	N/A	Report	(See I.A.5.)	1/Week	Grab	EFF-01F

(See I.A.5.)						
Sulfate, Total (as S) (mg/l)	N/A	Report	Report	1/Week	Grab	EFF-01F
Ortho-phosphate (as P) (mg/l)	N/A	Report	Report	1/Week	Grab	EFF-01F
Specific Conductance [Effluent] (µmhos/cm)	N/A	Report	(See I.A.5.)	1/Week	Grab	EFF-01F
Specific Conductance [Background] (µmhos/cm) (see I.A.5.)	N/A	Report	Report	1/Week	Grab	SWB-01F
Radium^{226} + Radium^{228}, Total (pCi/l) (See I.A.19.)	N/A	N/A	5	1/Month	24 hour composite	EFF-01F
Alpha, Gross Particle Activity (pCi/l) (See I.A.19.)	N/A	N/A	15	1/Month	24 hour composite	EFF-01F
Whole Effluent Toxicity – Chronic and Acute	See Permit Conditions I.A.11. & I.A.12.					

† **The total nitrogen and total phosphorus loading values shall be for monitoring and reporting purposes only. (See Condition I.A.6. below)**

* **TSS shall be monitored at the upstream end of the culvert located in Condition I.A.3.**

3. All surface water sample points, listed in the Specific Conditions of Part I.A., shall be taken at the monitoring site locations as described below:

PART I: Continued

Receiving Waters:	Classification (indicate whether fresh or marine):
Skinned Sapling Creek	Class III Fresh Waters

Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.):
A fresh water chronic toxicity test is required in the permit when the certificate of completion of construction for closure is received. Routine testing is fresh water acute tests twice per year for discharges that do not contain lime treated process water. The frequency changes to once every two weeks when discharging lime treated process water.

Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.):
An Administrative Order authorizes Mosaic Fertilizer, L.L.C. (Cargill Fertilizer, Inc.) as the contractor to close the Phosphogypsum stack system.

Facility Mixing Zone Details (if applicable):
When discharge contains lime treated process water the specific conductance limit at the outfall is 2,398 µmhos/cm to comply with the mixing zone. The monthly average flow of process water through D-001F is limited to a monthly average of 2 MGD. Discharges that do not contain treated process water must meet the Class III Fresh Water standard.

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:
No relevant studies were located for this facility.

Describe previous or current Enforcement Actions (including WLs):
None

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):
The MSA sampling point is where inflow from north of the facility enters the property via a culvert. This point is monitoring to evaluate what is being contributed to the effluent from off-site. It was sampled as part of this inspection. There are no limits on this as it is inflow onto the property.

In 2001 Mulberry Corporation filed for bankruptcy. In 2002 Cargill Fertilizer, Inc., now Mosaic Fertilizer, L.L.C., entered into a service agreement with the Department to close the phosphogypsum stack system.

PART II: Sampling Event Information

Date(s) sample collected: 9/10/12	**Sampler(s): Jacki Champion, Melani Dickenson, Scott Rose**
Temperature (Deg C): 27.86	**pH (SU): 7.15**
Dissolved Oxygen (mg/L): 6.71	**Conductivity (umhos/cm): 384**
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): 1.3 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):

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:
The compliance point for Total Suspended Solids is located at a culvert downstream of the outfall structure before the effluent enters Skinned Sapling Creek. During this sampling event the Total Suspended Solids sample was collected at the Outfall, however the permit limit of 15 mg/L maximum does not apply at this sampling location.

Double lime treated process water was not being discharged during the sampling event.

Appendix G. EPA End Sheet

The Bioassay of Mulberry Phosphate, Inc. - Phosphogypsum Stack Closure effluent sampled on September 10, 2012. NPDES #FL0334944.

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 3 3 4 9 4 4 11	12 1 2 0 9 1 0	18 B	19 S	20 2

Remarks

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The Priority Pollutants Analysis of Bioassy of Mulberry Phosphate, Inc. - Phosphogypsum Stack Closure effluent sampled on September 10, 2012. NPDES #FL0334944.

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 3 3 4 9 4 4 11	12 1 2 0 9 1 0	18 X	19 S	20 2

Remarks

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Biological Analyses of Mulberry Phosphate, Inc. - Phosphogypsum Stack Closure effluent sampled on September 10, 2012. NPDES #FL0334944.

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 3 3 4 9 4 4 11	12 1 2 0 9 1 0	18 S	19 S	20 2

Remarks

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