

Bioassays of

Marianna Sewage Treatment Plant

Marianna, Jackson County, Florida

NPDES #FL0020117

Sampled 2/5/92

March 5, 1992

Biology Section
Division of Technical Services

Bioassays of

Marianna Sewage Treatment Plant

Marianna, Jackson County, Florida

NPDES #FL0020117

Biology Section
Bureau of Laboratories
March 5, 1992

Introduction

Marianna Sewage Treatment Plant, Marianna, Jackson County, Florida, NPDES #FL0020117, on 6 to 8 February, 1992.

This facility is located at 1001 East Franklin Street in Marianna. It has a design capacity of 2.7 MGD with an average flow of 0.993 MGD discharged to the Chipola River. Treatment consists of screening, grit removal, primary sedimentation, trickling filter, and two oxidation ditches. Phosphorus is removed by alum addition. The biological processes are followed by clarification, chlorination, and dechlorination. Sludge is treated by anaerobic digestion in the trickling filter process and the oxidation ditches provide sludge stabilization prior to dewatering by belt presses. Final sludge disposal is via land spreading on road shoulders and city-owned land (facility description from NPDES files).

The toxicity tests discussed in this report were performed in accordance with methods described by Weber, 1991, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 4th Edition (EPA/600/4-90/027).

Results and Discussion

The FDER Biology Section performed two static acute screening toxicity bioassays on a sample of effluent from this facility. The water flea, *Ceriodaphnia dubia*, and the fish, *Notropis leedsi*, were the bioassay organisms used for these tests. The test results indicated that the sample was not toxic. Total residual chlorine was not detected in the sample. The total and unionized ammonia concentrations were 1.80 mg/L and 0.03 mg/L (Hach), respectively.

Further chemical analyses were performed on the sample. The metals detected in the sample were aluminum (740 µg/L[A]), cadmium (0.55 µg/L[A]), copper (8 µg/L[T]), iron (105 µg/L[A]), mercury (0.10 µg/L), silver (0.21 µg/L[A]), and zinc (31 µg/L[A]). Analyses for base neutral and acid extractables led to the tentative identification of aliphatic compounds with an estimated concentration of 16 µg/L. Pesticides and nitrite/nitrate were not detected.

Conclusion

The sample of effluent from this facility was not toxic on February 5, 1992.

[A]Value reported is the mean of two or more determinations.
[T]Value reported is less than the practical quantitation limit.

Table 1. Concentration Series and Volumes Used for the Static Acute Screening Bioassays of the Marinna STP on 6 to 8 February, 1992.

Ceriodaphnia dubia (water flea)

Concentration	Dilution Water	Sample	Total Volume
Control	20 mL	0 mL	20 mL
100%	0 mL	20 mL	20 mL

Notropis leedsi (bannerfin shiner)

Concentration	Dilution Water	Sample	Total Volume
Control	500 mL	0 mL	500 mL
100%	0 mL	500 mL	500 mL

Table 2. Results of chemical analyses on the sample of effluent from the Marianna STP, Jackson County, on 5 February, 1992.

Base-Neutral & Acid Extractables

Tentative identification		
Aliphatic Compounds	16 µg/L	j

Metals

Aluminum	740 µg/L	a
Cadmium	0.55 µg/L	a
Copper	8 µg/L	t
Iron	105 µg/L	a
Mercury	0.10 µg/L	
Silver	0.21 µg/L	a
Zinc	31 µg/L	a

j Estimated concentration.
a Value reported is the mean of two or more determinations.
t Value reported is less than the practical quantitation limit.

Table 3. Data recorded during the static acute screening bioassay of a sample of effluent from the Marianna STP, Marianna, Jackson County Florida, NPDES# FL0020117, on 6 to 8 February, 1992.

Facility:	**Marianna STP**		NPDES #	**FL0020117**	Facility Type: **Sewage Treatment**
Location:	1001 East Franklin Street		Contact/District:	W. C. Overstreet / Northwest	
County:	Jackson		Test type:	static screening	
Sample Collection Date:	**2/5/92**	Time: 1100	# tests:	2	Receiving Water: Chipola River
Test Beginning Date:	2/6/92	Time: 1230	Chlorination Type:	**chlorinated**	
Test Ending Date:	2/8/92	Time: 1100	Dechlor Method:	plant dechlorination	**Page 1 of 1**

Total Residual Cl2	mg/l	Method
Field:	not	measured
Lab:	0.0	Hach

Ammonia	Total (mg/l)	Unionized (mg/l)
Control Water (fish):	0.00	0.00
Cond. Control Water (daphnids):	0.48	0.02
100% Sample:	1.80	0.03

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	120	136
Cond. Control Water (daphnids):	72	83
100% Sample:	135	150

Organism: ***Ceriodaphnia dubia*** Life stage: < 24 hours
LC50: -

	SURVIVAL			pH			Temperature			Dissolved Oxygen			Conductivity	
Concentrations	# at 0 hr	Live at 24 hr	Live at 48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control	5	5	5	7.9	-	8.0	22.9	-	23.0	9.0	-	8.9	157	167
Control	5	5	5	-	-	8.0	-	-	-	-	-	8.9	-	-
Control	5	5	5	-	-	8.0	-	-	-	-	-	8.9	-	-
Control	5	5	5	-	-	8.0	-	-	-	-	-	8.9	-	-
100%	5	5	5	7.5	-	8.2	21.7	-	23.0	9.8	-	8.8	430	456
100%	5	5	5	-	-	8.2	-	-	-	-	-	8.8	-	-
100%	5	5	5	-	-	8.2	-	-	-	-	-	8.8	-	-
100%	5	5	5	-	-	8.2	-	-	-	-	-	8.8	-	-

Organism: ***Notropis leedsi*** Age: 20 days
LC50: -

	SURVIVAL			pH			Temperature			Dissolved Oxygen			Conductivity	
Concentrations	# at 0 hr	Live at 24 hr	Live at 48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control	5	5	5	7.7	8.0	7.9	20.7	22.2	21.7	9.0	8.5	8.6	-	-
Control	5	5	5	7.7	8.0	7.9	-	-	-	9.0	8.5	8.6	228	238
100%	5	5	5	7.4	7.8	7.9	21.5	22.2	21.7	10.3	8.2	8.6	-	-
100%	5	5	5	7.4	7.8	7.9	-	-	-	10.3	8.2	8.6	445	457

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Marianna
Address/City:
County: Jackson
Contact/District: W. Craig Overstreet / NW
NPDES Permit #: FL00.2017 Outfall #:

Sample Collection: Date 2/5/92 Time 1100
Test Beginning: Date 2/6/92 Time 1230
Test Ending: Date 2/8/92 Time 1100
Test Organism: C. dubia
Life Stage/Age: <24 hrs

Test Number: 1 of 2 Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through

Remarks:

28393
92-Feb-06-15-01

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7.09@7.09	8.8@22°	23.0@23.1	1340@23.1
24 hr	7.09@7.09	8.5@24°	23.2@23.2°	1345@23.4
48 hr	7.09@7.09	8.2@23°C	21.3@21.4°C	1332@23.9 @1351

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	DO (mg/L) 0	24	48	Cond. (µmhos/cm) 0	24	48
Control		5	5	5	7.9		8.0	22.9		23.0	9.0		8.9	157		167
Control		5	5	5			8.0						8.9			
Control		5	5	5			8.0						8.9			
Control		5	5	5			8.0						8.9			
100%		5	5	5	7.5		8.2	21.7		23.0	9.8		8.8	430		456
100%		5	5	5			8.2						8.8			
100%		5	5	5			8.2						8.8			
100%		5	5	5			8.2						8.8			
Measured/Loaded by:		MF	MF	MF	MF		MF	MF		MF	MF		MF	MF		MF
Recorded by:		MF	MF	MF	MF		MF	AJ		MF	AJ		MF	AJ		MF

Investigators' Signatures

Alvon Jordan
Mark Marshall

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:					
Lab Tot. Resid. Cl2:	0.0	0.0	0.0	HACH	AJ
Alkalinity:	120	72	135	HACH	AJ
Hardness:	136	83	150	HACH	AJ
Total Ammonia:	.48	.48	1.80	HACH	AJ

Ammonia Meter Slope: _____ Ammonia Blank: _____ Salinity Sample: _____ ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Marianna
Address/City:
County: Jackson
Contact/District: W. Craig Overstreet / NW
NPDES Permit #: FL0022101 Outfall #:

Sample Collection: Date 2/5/92 Time 1100
Test Beginning: Date 2/6/92 Time 1230
Test Ending: Date 2/8/92 Time 1100
Test Organism: N. leeisi
Life Stage/Age: 20 days

Test Number: 2 of 2 Test Type: Screening | Definitive
Static | Static Renewal | Flow-through

Remarks: 28393
92-Feb-06-15-01

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7.0 7.9 8.9	8.8 @ 22°	22.0 @ 22.1	1340 @ 23.1
24 hr	7.0 7.9 8.9	8.5 @ 24°	23.2 @ 23.2	1345 @ 23.4
48 hr	7.0 7.9 8.9	8.2 @ 22°C	21.3 @ 21.4°C	1332 @ 22.9°C

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	DO (mg/L) 0	24	48	Cond. (µmhos/cm) 0	24	48
Control	3	5	5	5	7.7	8.0	7.9	20.7	22.2	21.7	9.0	8.5	8.6			
Control	79	5	5	5	7.7	8.0	7.9				9.0	8.5	8.6	228	235	238
100%	7	5	5	5	7.4	7.8	7.9	21.5	22.2	21.7	10.3	8.2	8.6			
100%	163	5	5	5	7.4	7.8	7.9				10.3	8.2	8.6	445	454	457
Measured/Loaded by:		MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF
Recorded by:		MF	MF	MF	AJ	AJ	MF	AJ	AJ	MF	AJ	AJ	MF	AJ	AJ	MF

Investigators' Signatures
Allison Jordan
Mark W Faircloth

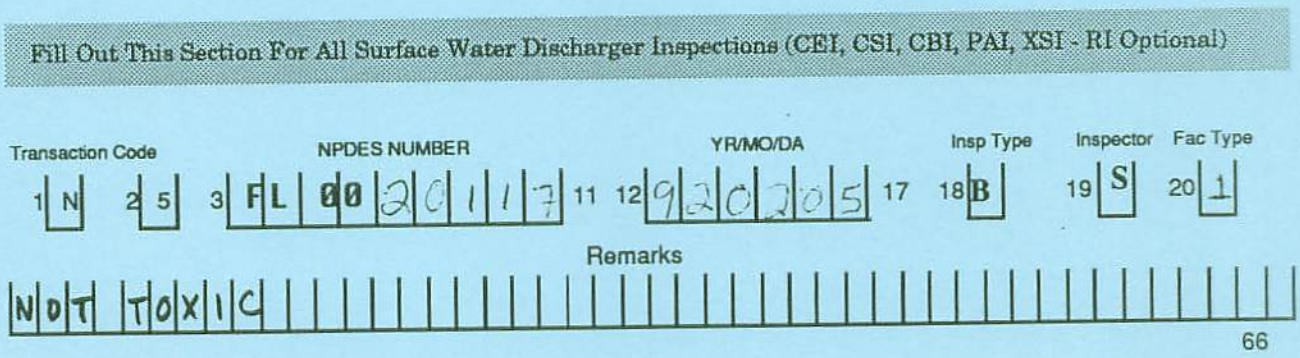
Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:					
Lab Tot. Resid. Cl2:	0.0	0.0	0.0	HACH	AJ
Alkalinity:	120	72	155	HACH	AJ
Hardness:	136	83	150	HACH	AJ
Total Ammonia:	0.48	0.48	1.50	HACH	AJ

Ammonia Meter Slope: _____
Ammonia Blank: 0
Salinity Sample: _____ ppt

The Bioassay of Marianna STP, NPDES# FL0020117, effluent sampled on February 5, 1991.



The Priority Pollutants Analysis for the Bioassay of Marianna STP, NPDES# FL0020117, effluent sampled on February 5, 1991.

