

Bioassays of

Monroe County Public Service Building Wastewater Treatment Plant

Stock Island, Monroe County, Florida

NPDES #FL0030562

Sampled 1/11/93

February 1993

Biology Section
Division of Technical Services

Bioassays of

Monroe County Public Service Building Wastewater Treatment Plant

Stock Island, Monroe County, Florida

NPDES #FL0030562

Biology Section
Bureau of Laboratories
February 1993

Introduction

Monroe County Public Service Building WWTP, Key West, Monroe County, Florida, NPDES #FL0030562, tests performed on 12 to 14 January, 1993.

This facility is located on Junior College Road on Stock Island. It has a design capacity of 12,000 GPD and is an extended aeration wastewater treatment plant. Chlorination is used for disinfection and dechlorination is accomplished by the addition of sodium sulfite tablets. The average daily flow of 3,000 GPD is discharged to Cow Key Channel.

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 Biology Section performed two 48-hour static acute definitive toxicity bioassays on a sample of effluent from this facility. The test organisms used for these bioassays were the waterflea, *Ceriodaphnia dubia*, and the fish, *Notropis leedsi*. The test results did not indicate toxicity. No mortality occurred in either test.

Total residual chlorine of the sample was 0.02 mg/L in the laboratory and 0.25 mg/L in the field. Total ammonia was not detected in the sample.

Conclusion

The sample of effluent collected from this facility on 11 January, 1993, did not show toxicity.

Table 1. Concentration series and volumes used for the 48-hour static acute definitive bioassays of the Monroe County Public Service Building WWTP effluent performed on 12 to 14 January, 1993.

Ceriodaphnia dubia (water flea)

Concentration	Dilution Water	Sample	Total Volume
Control	20 mL	0 mL	20 mL
25 %	15 mL	5 mL	20 mL
50 %	10 mL	10 mL	20 mL
75 %	5 mL	15 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
25 %	375 mL	125 mL	500 mL
50 %	250 mL	250 mL	500 mL
75 %	125 mL	375 mL	500 mL
100 %	0 mL	500 mL	500 mL

Table 3. Data recorded during the 48-hour static acute definitive bioassays of a sample from the Monroe County Public Service Building WWTP, NPDES #FL0030562, Key West, Monroe County, Florida, on 12 to 14 January, 1993.

Facility:	Monroe County Public Service Bldg WWTP	NPDES #	FL0030562	Facility Type:	WWTP
Location:	Key West	Contact / District:	Gus Rios/S		
County:	Monroe	Test type:	static acute definitive		
Sample Collection Date:	1/11/93 Time: 0945	# tests:	2	Receiving Water:	Cow Key Channel
Test Beginning Date:	1/12/93 Time: 1300	Chlorination Type:	sample collected		
Test Ending Date:	1/14/93 Time: 1400		after dechlorination	Page 1 of 2	

Total Residual Cl2	mg/l	Method
Field:	0.25	-
Lab:	0.02	DR-100

Ammonia	Total (mg/l)	Unionized (mg/l)
Control Water (fish):	0.00	0.00
20% Dilute Mineral Water (cladocerans):	0.00	0.00
100% Sample:	0.00	0.00

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	115	120
20% Dilute Mineral Water (cladocerans):	70	75
100% Sample:	95	390

Organism: *Ceriodaphnia dubia* Life stage: < 24 hrs

LC50: - Binomial: - Moving Average: - Probit: -

	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	8.4	-	8.0	23.1	-	23.3	8.3	-	8.1	120	135
Control	5	5	5	-	-	8.0	-	-	-	-	-	8.1	-	140
Control	5	5	5	-	-	8.0	-	-	-	-	-	8.1	-	140
Control	5	5	5	-	-	8.0	-	-	-	-	-	8.1	-	140
25%	5	5	5	7.7	-	8.1	23.2	-	23.4	8.3	-	8.2	700	730
25%	5	5	5	-	-	8.1	-	-	-	-	-	8.2	-	840
25%	5	5	5	-	-	8.1	-	-	-	-	-	8.2	-	790
25%	5	5	5	-	-	8.1	-	-	-	-	-	8.2	-	870
50%	5	5	5	7.4	-	8.2	23.1	-	23.4	8.3	-	8.3	1300	1415
50%	5	5	5	-	-	8.2	-	-	-	-	-	8.3	-	1410
50%	5	5	5	-	-	8.2	-	-	-	-	-	8.3	-	1430
50%	5	5	5	-	-	8.2	-	-	-	-	-	8.3	-	1405
75%	5	5	5	7.3	-	8.2	23.0	-	23.4	8.3	-	8.2	1880	1995
75%	5	5	5	-	-	8.2	-	-	-	-	-	8.2	-	1980
75%	5	5	5	-	-	8.2	-	-	-	-	-	8.2	-	2030
75%	5	5	5	-	-	8.2	-	-	-	-	-	8.2	-	2030
100%	5	5	5	7.2	-	8.2	22.9	-	23.3	8.1	-	8.2	2450	2540
100%	5	5	5	-	-	8.2	-	-	-	-	-	8.2	-	2580
100%	5	5	5	-	-	8.2	-	-	-	-	-	8.2	-	2590
100%	5	5	5	-	-	8.2	-	-	-	-	-	8.2	-	2750

Table 3 (continued). Data recorded during the 48-hour static acute definitive bioassays of a sample from the Monroe County Public Service Building WWTP, NPDES #FL0030562, Key West, Monroe County, Florida, on 12 to 14 January, 1993.

Facility:	Monroe County Public Service Bldg WWTP			NPDES #	FL0030562	Facility Type:	WWTP
Location:	Key West			Contact / District:	Gus Rios/S		
County:	Monroe			Test type:	static acute delinitive		
Sample Collection Date:	1/11/93	Time:	0945	# tests:	2	Receiving Water:	Cow Key Channel
Test Beginning Date:	1/12/93	Time:	1300	Chlorination Type:	sample collected		
Test Ending Date:	1/14/93	Time:	1400		after dechlorination	Page 2 of 2	

Total Residual Cl2	mg/l	Method
Field:	0.25	-
Lab:	0.02	DR-100

Ammonia	Total (mg/l)	Unionized (mg/l)
Control Water (fish):	0.00	0.00
20% Dilute Mineral Water (cladocerans):	0.00	0.00
100% Sample:	0.00	0.00

Organism: *Notropis leedsi* Age: 11 days
LC50: - Binomial: - Moving Average: - Probit: -

	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	8.2	8.3	22.1	22.8	21.9	8.4	8.4	8.6	235	235
Control	5	5	5	7.9	8.2	8.3	-	-	-	8.4	8.4	8.6	235	235
25%	5	5	5	7.7	8.0	8.2	22.0	22.6	21.7	8.5	8.1	8.5	810	810
25%	5	5	5	7.7	8.0	8.2	-	-	-	8.4	8.1	8.5	815	815
50%	5	5	5	7.5	7.9	8.1	22.1	22.5	21.8	8.3	8.0	8.5	1400	1400
50%	5	5	5	7.5	7.9	8.1	-	-	-	8.2	8.0	8.5	1400	1400
75%	5	5	5	7.3	7.8	8.0	22.2	22.5	21.9	8.1	7.8	8.4	1965	1960
75%	5	5	5	7.3	7.8	8.0	-	-	-	8.0	7.8	8.3	1960	1940
100%	5	5	5	7.2	7.6	7.9	22.6	22.7	22.3	7.9	7.8	8.0	2540	2510
100%	5	5	5	7.2	7.6	7.9	-	-	-	7.8	7.8	8.0	2540	2530

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	115	120
20% Dilute Mineral Water (cladocerans):	70	75
100% Sample:	95	390

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Monroe Co Public
Address/City: Service Bldg WWTP
County: MONROE
Contact/District: Gus Rios MARATHON
NPDES Permit #: FL00 ~~350688~~ 30562 Outfall #: ___ KP wrong # 1-27-93
Test Number: 1 of 2 Test Type: Screening (Definitive)
(Static) Static Renewal | Flow-through
Remarks:

Sample Collection: Date 1-11-93 Time 0945
Test Beginning: Date 1-12-93 Time 13:00
Test Ending: Date 1-14-93 Time 1400
Test Organism: Ceriodaphnia dubia
Life Stage/Age: <24 hrs
47899 93-JAN-12-15
verified 1-15-93 KP

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7.0 7.0	8.5 8.36	23.2 23.4	950 9450 @ 23.8 °C
24 hr	7.0 7.0	8.48 8.28	23.7 @ 23.7	990 9940 @ 24.0
48 hr	7.7 10.0	8.16 22.4	22.0 @ 22.2	980 9880 @ 23.3

		Number Live			pH			Temp. (°C)			DO (mg/L)			Cond. (µmhos/cm)		
Conc.	Chamber #	0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control	A	5	5	5	8.4		8.0	23.1		23.3	8.3		8.1	120		135
Control	B	5	5	5			8.0						8.1			140
Control	C	5	5	5			8.0						8.1			140
Control	D	5	5	5			8.0						8.1			140
25%	A	5	5	5	7.7		8.1	23.2		23.4	8.3		8.2	700		730
25%	B	5	5	5			8.1						8.2			840
25%	C	5	5	5			8.1						8.2			790
25%	D	5	5	5			8.1						8.2			870
50%	A	5	5	5	7.4		8.2	23.1		23.4	8.3		8.3	1300		1415
50%	B	5	5	5			8.2						8.3			1410
50%	C	5	5	5			8.2						8.3			1430
50%	D	5	5	5			8.2						8.3			1405
75%	A	5	5	5	7.3		8.2	23.0		23.4	8.3		8.2	1880		1995
75%	B	5	5	5			8.2						8.2			1980
75%	C	5	5	5			8.2						8.2			2030
75%	D	5	5	5			8.2						8.2			2030
100%	A	5	5	5	7.2		8.2	22.9	* ~~23.3~~ TM STARTED WRITING WRONG # 1-14-93 * 23.3 **		8.1		8.2	2450		2590
100%	B	5	5	5			8.2						8.2			3580
100%	C	5	5	5			8.2						8.2			2590
100%	D	5	5	5			8.2						8.2			2750
Measured/Loaded by:		MF	TR	MF	TM		MF	TM		MF	TM		MF	TM		MF
Recorded by:		TR	TR	TM	TR		TM	TR		TM	TR		TM	TR		TM

Investigators' Signatures
Tina Mikulski
Tobin Rader
Marshall Faircloth

Reviewer

Water-quality Parameters

	Well Water	Cond. Water (2090)	Sample	Method	Measured by
Field Tot. Resid. Cl2:			0.25		GR
Lab Tot. Resid. Cl2:	.08	.04	.02	DR100	TR
Alkalinity:	115	70	95	Hach	TM
Hardness:	120	75	390	Hach	TM
Total Ammonia:	0.0	0.0	0.0	Hach	TM

Ammonia Meter Slope: -58.6
Ammonia Blank: 0.0
Salinity Sample: ___ ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Monroe County Public Service Bldg WWTP
Address/City: [illegible]
County: MONROE
Contact/District: GUS RIOS MARATHON
NPDES Permit #: FL00~~35068~~ 30562 KP wrong # 1-27-93 Outfall #:
Test Number: 2 of 2 Test Type: Screening | Definitive
Static | Static Renewal | Flow-through
Remarks:

Sample Collection: Date 1-11-93 Time 0945
Test Beginning: Date 01/12/93 Time 13:00
Test Ending: Date 1-14-93 Time 1400
Test Organism: Notropis leedsi
Life Stage/Age: 11 days

verified 1-15-93 KP
47899 93-JAN-12-15

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7@7, 10.03@10	8.5@23.6°C	23.2@23.4	950 9450 @23.8°C
24 hr	7@7, 10.02@10	8.4@22.8	22.2@23.7	950 9440 @24.0
48 hr	7@7, 10.02@10	8.6@22.4	22.0@22.2	950 9400 @23.3

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	A(87)	5	5	5	7.9	8.2	8.3	22.1	22.8	21.9	~~7.9~~*	8.4	8.6	235	240	235
Control	B(263)	5	5	5	7.9	8.2	8.3				~~7.9~~*	8.4	8.6	235	240	235
25%	A(10)	5	5	5	7.7	8.0	8.2	22.0	22.6	21.7	8.5	8.1	8.5	810	820	810
25%	B(77)	5	5	5	7.7	8.0	8.2				8.4	8.1	8.5	815	830	815
50%	A (2)	5	5	5	7.5	7.9	8.1	22.1	22.5	21.8	8.3	8.0	8.5	1400	1410	1400
50%	B (22)	5	5	5	7.5	7.9	8.1				8.2	8.0	8.5	1400	1420	1400
75%	A (682)	5	5	5	7.3	7.8	8.0	22.2	22.5	21.9	8.1	7.8	8.4	1965	1975	1960
75%	B (18)	5	5	5	7.3	7.8	8.0				8.0	7.8	8.3	1960	1955	1940
100%	A (891)	5	5	5	7.2	7.6	7.9	22.6	22.7	22.3	7.9	7.8	8.0	2540	2530	2510
100%	B (4)	5	5	5	7.2	7.6	7.9				7.8	7.8	8.0	2540	2540	2530
											* 8.4 recorded					
											* 8.4 wrong #					
											~~TR~~ ~~TM~~ 1-12-93					
Measured/Loaded by:		MF	TR	TM	TM	MF	MF	TM	MF	MF	TM	MF	MF	TM	MF	MF
Recorded by:		TR	TR	TM	TR	TR	TM	TR	TR	TM	TR	TR	TM	TR	TR	TM

Investigators' Signatures

Tina Mikulski
Tom Rader
Marshall Faircloth

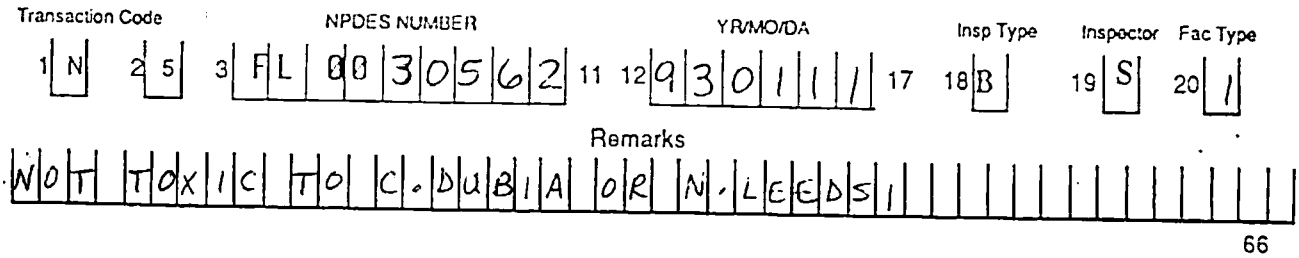
Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			0.25		GR
Lab Tot. Resid. Cl2:	.08	.04	.02	DR100	TR
Alkalinity:	115	70	95	Hach	TM
Hardness:	120	75	390	Hach	TM
Total Ammonia:	0.0	0.0	0.0	Hach	TM

Ammonia Meter Slope: -58.6
Ammonia Blank: 0.0
Salinity

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



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

