

Bioassays of

DOT Rest Area I-10 Westbound Wastewater Treatment Plant

Sanderson, Baker County, Florida

NPDES #FL0039217

Sampled 2/1/93

March 1993

Biology Section
Division of Technical Services

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Biology Section
Bureau of Laboratories
March 1993

Introduction

DOT Rest Area I-10 Westbound WWTP, Sanderson, Baker County, Florida, NPDES #FL0039217, tests performed on 2 to 4 February, 1993.

This facility is located on Interstate 10 Westbound near Sanderson. The wastewater treatment facility currently has a 5,000-gpd capacity with a recently-added 6,000-gpd surge tank. A permit has been granted to permit construction of a 13,000-gpd capacity extended-aeration wastewater facility with chlorine disinfection and discharge to a 1.7-acre spray field. Disposal to a roadside drainage ditch is limited to 5,000 gpd. The new facility will serve both eastbound and westbound rest areas. (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 48-hour static acute screening toxicity bioassays with a sample of effluent from this facility. The test species used for these bioassays were the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Notropis leedsi*. The tests resulted some toxicity to *C. dubia* (15% mortality in 48 hours), but did not indicate toxicity to *N. leedsi*.

Total residual chlorine of the sample was 0.02 mg/L in the laboratory and 0.1 mg/L in the field. Total and unionized ammonia concentrations were 0.5 mg/L and < 0.01 mg/L, respectively.

Further chemical analyses were performed on the sample and indicated the presence of the metals as shown in Table 2. The metals do not appear to be present in toxic concentrations. Two organic compounds were tentatively identified and their concentrations estimated: cyclohexadecane (20 µg/L) and 1-hexadecene (36 µg/L). Toxicity data are not available for these two compounds in the EPA AQUIRE toxicity database. None of the 24 pesticides for which this sample was analyzed were detected. This does not rule out other pesticides as a possible cause of toxicity.

Conclusion

The sample of effluent collected from this facility on 1 February, 1993, showed some toxicity to *C. dubia*. The cause of toxicity was not determined.

Table 1. Concentration series and volumes used for the 48-hour static acute screening bioassays of the DOT I-10 Westbound Rest Area WWTP effluent performed on 2 to 4 February, 1993.

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 effluent from DOT I-10 West Rest Area WWTP, NPDES# FL0039217, sampled on February 1, 1993.

Pesticides & Herbicides

none detected

Metals

Aluminum	67	µg/L	A
Cadmium	0.09	mg/L	T
Calcium	53	µg/L	A
Copper	11	µg/L	A
Iron	47	µg/L	A
Magnesium	25	mg/L	A
Zinc	71	µg/L	A

Base-Neutral & Acid Extractables

Tentative identification and estimated concentrations:

cyclohexadecane	20	µg/L
1-hexadecene	36	µg/L

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 acute screening bioassays of a sample of effluent from the DOT Rest Area I-10 Westbound WWTP, Sanderson, Baker County, Florida, NPDES# FL0039217, performed on 2 to 4 February, 1993.

Facility:	**DOT Rest Area I-10 Westbound**		**NPDES #**	**FL0039217**	Facility Type: **WWTP**
Location:	Sanderson		Contact / District:	Jeff Martin/NE	
County:	Baker		Test type:	static acute screen	
Sample Collection Date:	**2/1/93**	Time: 1305	# tests:	2	Receiving Water: Roadside Drainage Ditch
Test Beginning Date:	2/2/93	Time: 1400	Chlorination Type:	**sample collected**	
Test Ending Date:	2/4/93	Time: 1400		**after dechlorination**	**Page 1 of 1**

Total Residual Cl2	mg/l	Method
Field:	0.10	
Lab:	0.02	DR-100

Ammonia	Total (mg/l)	Unionized (mg/l)
Control Water (fish):	<0.001	0.00
20% Dilute Mineral Water (cladocerans):	<0.001	0.00
100% Sample:	0.50	< 0.01

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	125	130
20% Dilute Mineral Water (cladocerans):	70	80
100% Sample:	80	235

Salinity (ppt)	
Control Water:	0
100% Sample:	0

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

	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	8.2	-	8.0	21.9	-	22.7	8.3	-	7.8	155	175
Control	5	5	5	-	-	8.2	-	-	-	-	-	7.8	-	180
Control	5	5	5	-	-	8.2	-	-	-	-	-	7.7	-	175
Control	5	5	5	-	-	8.2	-	-	-	-	-	7.7	-	175
100%	5	5	5	7.1	-	7.9	21.8	-	22.7	7.5	-	7.7	860	875
100%	5	3	2	-	-	7.9	-	-	-	-	-	7.6	-	900
100%	5	5	5	-	-	7.9	-	-	-	-	-	7.6	-	890
100%	5	5	5	-	-	7.9	-	-	-	-	-	7.7	-	875

Organism: ***Notropis leedsi*** Age: 11 days

	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	23.2	21.9	22.4	8.0	7.9	7.6	240	240
Control	5	5	5	7.9	8.2	8.3	-	-	-	8.0	7.9	7.7	240	240
100%	5	5	5	7.1	7.4	7.5	23.0	22.0	22.3	6.2	6.1	6.4	950	950
100%	5	5	5	7.1	7.4	7.5	-	-	-	6.4	6.2	6.5	950	950

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: I-10 Wayside Rest area
Location: DOT I-10 Wayside Rest Area
County: BAKER
Contact/District: J. Martin
NPDES Permit #: FL00 39217 49120 Outfall #: 93F2B 0204

Sample Collection: Date 2/1/93 Time 1305
Test Beginning: Date 2/2/93 Time 1400
Test Ending: Date 2/4/93 Time 1400
Organism Batch #: ____ Diluent Batch #: 2
Organism Age: < 24 hours
Test Organism: Ceriodaphnia dubia

Test Type: Screening | Definitive
Static | Static Renewal | Flow-through

Test Number: 1 of 2

Remarks:

Instrument Calibrations: pH | Temperature °C | D.O. mg/L | Conductivity µmhos/cm

0 hr 7.0 @ 7.0, 10.00 @ 10.0 | 22.2 @ 22.4 | *7.4 @ 22.0, 8.5 @ 23.0 (*recorded wrong DO) | 970 @ 1,000, 9700 @ 10,000 @ 23.1

24 hr 7.0 @ 7.0, 10.0 @ 10.0 | 21.5 @ 21.6 | 8.6 @ 23.0 | 970 @ 1,000, 9740 @ 10,000 @ 23.1

48 hr 7.0 @ 7.0, 10.0 @ 10.0 | 21.8 @ 21.9 | 7.9 @ 26.0 | 980 @ 1,000, 9790 @ 10,000 @ 23.9

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temperature (°C) 0	24	48	D.O. (mg/L) 0	24	48	Cond. (mmhos/cm) Cond. (µmhos/cm) 0	24	48
Control	A	5	5	5	8.2		8.0	21.9		22.7	*7.2		7.8	155		175
Control	B	5	5	5			8.2				8.3		7.8			180
Control	C	5	5	5			8.2						7.7			175
Control	D	5	5	5			8.2						7.7			175
100%	A	5	5	5	7.1		7.9	21.8		22.7	*6.7		7.7	860		875
100%	B	5	3	2			7.9				7.5		7.6			900
100%	C	5	5	5			7.9						7.6			890
100%	D	5	5	5			7.9						7.7			875
											*recorded wrong DO Salinity at 0‰			wasn't		
Measured/Loaded by:		TR	mF	MF	TM		TM	TM		TM	TM		TM	TM		TM
Recorded by:		TR	TM	MF	JR		TR	JR		TR	TR		JR	TR		TR

Investigators' Signatures

Marshall Faircloth
Tobin A. Rader
Tina Mikulski

Reviewer

form updated 10/20/92

Water Quality Parameters	Salt Water/ Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			0.1		JM
Lab Total Residual Cl2:	.02	.02	.02	DR100	TR
Alkalinity:	125	70	80	Hach	TM
Hardness:	130	80	235	Hach	TM
Total Ammonia:	<0.001	<0.001	0.495	Orion	MF

Cl_2 Blank: ____ Ammonia Meter Slope: -56.4 Ammonia Blank: 0.0 Sample Salinity: ____ ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: I-10 Wayside Rest area
Location: DOT I-10 Wayside Rest Area
County: BAKER
Contact/District: J. Martin
NPDES Permit #: FL0039217 Outfall #:
49120 93 Feb 0204

Sample Collection: Date 2/1/93 Time 1305
Test Beginning: Date 2/2/93 Time 1400
Test Ending: Date 2/4/93 Time 14:00
Organism Batch #: 2 Diluent Batch #: WELL
Organism Age: 11 days
Test Organism: Notropis lootsi

Test Type: Screening | Definitive
Static | Static Renewal | Flow-through

Test Number: 2 of 2

Remarks:

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
0 hr	7.0 @ 7.0 10.00 @ 10.0	22.2 @ 22.4	~~7.9~~ 8.5 @ ~~23.0~~ 23.6 (* recorded wrong DO)	970 @ 1,000 @23.2 9700 @ 10,000
24 hr	7.0 @ 7.0 10.0 @ 10.0	21.5 @ 21.6	8.6 @ 23.0	970 @ 1,000 @23.1 9740 @ 10,000
48 hr	7.0 @ 7.0 10.0 @ 10.0	21.8 @ 21.9	7.7 @ 26.0	980 @ 1,000 @23.9 9790 @ 10,000

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temperature (°C) 0	24	48	D.O. (mg/L) 0	24	48	Cond. (µmhos/cm) 0	24	48
Control		5	5	5	7.9	8.2	8.3	23.2	21.9	22.4	*7.0	7.9	7.6	240	235	240
Control		5	5	5	7.9	8.2	8.3				*7.1	7.9	7.7	240	235	240
100%		5	5	5	7.1	7.4	7.5	23.0	22.0	22.3	*5.4	6.1	6.4	950	930	950
100%		5	5	5	7.1	7.4	7.5				*5.5	6.2	6.5	950	930	950
											*recorded wrong DO					
											Salinity wasn't at 0‰					
										Control A	8.0					
										Control B	8.0					
										100% A	6.2					
										100% B	6.4					
Measured/Loaded by:		TM	MF	MF	TM	TR	TM	TM	TR	TM	TM	TR	TM	TM	TR	TM
Recorded by:		TR	TM	MF	TR	TM	TR	TR	TM	TR	TR	TM	TR	TR	TM	TR

Investigators' Signatures

Marshall Faircloth
Tobin A. Hader
Tina Mikulski

Reviewer

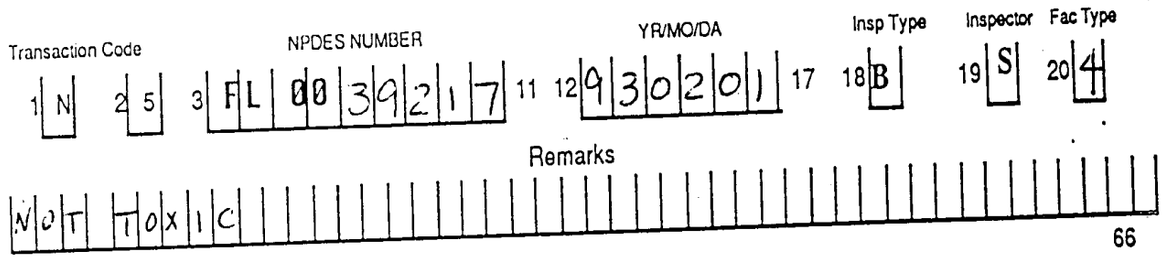
Water Quality Parameters

	Salt Water/ Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			0.1		JM
Lab Total Residual Cl2:	.02	.02	.02	DR100	TR
Alkalinity:	125	70	80	Hach	TM
Hardness:	130	80	235	Hach	TM
Total Ammonia:	<0.001	<0.001	0.495	Orion	MF

Cl_2 Blank: ______ Ammonia Meter Slope: -56.4 Ammonia Blank: ______ Sample Salinity: ______ ppt

form updated 10/20/92

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)

