Florida
Department of Environmental Protection

Bioassays of

Coastal Systems Station (USN) WWTP

Panama City, Bay County, Florida

NPDES #FL0002551

Sampled 11/29/93

February 1994

Biology Section
Division of Technical Services

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Biology Section
Bureau of Laboratories
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Introduction

Coastal Systems Station (USN) WWTP, Panama City, Bay County, Florida, NPDES #FL0002551, tests performed on 30 November to 2 December, 1993.

This wastewater treatment facility is located on U.S. Highway 98 in Panama City and has a 0.2 MGD design capacity. A high-rate trickling filter is used for treating combined municipal and industrial wastes. The effluent is approximately 90% domestic waste (from the base) and 10% industrial waste (from seven oil/water separators on base). Chlorine is used for disinfection. An average flow of 0.131 MGD is dechlorinated prior to discharge to St. Andrew Bay at Military Point (facility summary provided by D. Gorres, FDEP Pensacola).

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 FDEP 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, *Cyprinella leedsi* (formerly *Notropis leedsi*). The test results did not indicate toxicity.

Total residual chlorine was < 0.03 mg/L in the laboratory and 0.01 mg/L in the field. Total and unionized ammonia concentrations were 1.51 mg/L and 0.004 mg/L, respectively.

Further chemical analyses were performed on the sample and several metals and volatile organic compounds were identified (Table 2). Pesticides and organics (other than VOC's) were not detected. The copper (11 µg/L) and silver (0.77 µg/L) concentrations exceeded the state water quality standards for Class III marine waters of ≤ 2.9 µg/L and ≤ 0.05 µg/L, respectively.

Conclusion

The sample of effluent collected from this facility on 29 November, 1993, did not show toxicity.

Table 1. Concentration series and volumes used for the 48-hour static acute screening toxicity bioassays of the USN Coastal Systems WWTP effluent performed on 30 November to 02 December, 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

Cyprinella leedsi (bannerfin shiner, formerly *Notropis leedsi*)

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 USN Coastal Systems WWTP, sampled on 29 November, 1993.

Metals

Aluminum	182	µg/L	I
Calcium	26.3	mg/L	
Copper	11	µg/L	
Iron	282	µg/L	
Magnesium	3.6	mg/L	
Silver	0.77	µg/L	
Zinc	41	µg/L	

Volatile Organic Compounds

Bromodichloromethane	3.1	µg/L	A
Chloroform	9.1	µg/L	A
Dibromochloromethane	1.2	µg/L	A
Toluene	8.9	µg/L	A

Pesticides & Herbicides

None Detected

Base-Neutral & Acid Extractables

None Detected

A Value reported is the mean of two or more determinations.
I Value reported is between the laboratory method detection limit and the laboratory practical quantitation limit.

Table 3. Data recorded during the 48-hour static acute screening bioassays of a sample of effluent from the USN Coastal Systems WWTP, Panama City, Bay County, Florida, NPDES# FL0002551, performed on 30 November to 2 December, 1993.

Facility:	USN Coastal Systems		NPDES #	FL0002551	Facility Type: WWTP
Location:	Panama City		Contact/District:	Glenn Butts / NW	
County:	Bay		Test type:	static acute screen	
Sample Collection Date:	11/29/93	Time: 1100	# tests:	2	Receiving Water: St. Andrews Bay
Test Beginning Date:	11/30/93	Time: 1400	Chlorination Type:	sample collected	at Military Point
Test Ending Date:	12/2/93	Time: 1430		after dechlorination	Page 1 of 1

Total Residual Cl2	mg/L	Method
Field:	0.40	
Lab:	< 0.03	DR-100

Ammonia	Total (mg/L)	Unionized (mg/L)
Control Water (fish):	<0.017	0.00
20% Dilute Mineral Water (cladocerans):	<0.017	0.00
100% Sample:	1.51	0.003

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	125	120
20% Dilute Mineral Water (cladocerans):	80	85
100% Sample:	35	85

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

Organism: ***Ceriodaphnia dubia*** Life stage: < 24 hours old

	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	8.0	-	8.0	22.0	-	23.3	8.2	-	8.2	180	165
Control	5	5	4	-	-	8.1	-	-	23.3	-	-	8.2	-	170
Control	5	5	5	-	-	8.2	-	-	23.2	-	-	8.4	-	180
Control	5	5	5	-	-	8.2	-	-	23.0	-	-	8.5	-	190
100%	5	5	5	6.7	-	7.7	22.3	-	23.0	8.0	-	8.5	350	330
100%	5	5	5	-	-	7.6	-	-	23.2	-	-	8.6	-	345
100%	5	5	5	-	-	7.6	-	-	23.2	-	-	8.4	-	360
100%	5	5	5	-	-	7.6	-	-	23.2	-	-	8.3	-	385

Organism: ***Cyprinella leedsi*** Age: 10 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	7.7	8.1	8.2	22.5	22.4	22.6	8.1	8.4	8.9	240	250
Control	5	5	5	7.7	8.1	8.2	-	-	22.6	8.1	8.5	8.9	240	250
100%	5	5	5	6.5	7.1	7.2	22.7	22.4	22.6	8.3	8.0	8.8	380	380
100%	5	5	5	6.5	7.1	7.2	-	-	22.6	8.4	8.1	8.6	380	380

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: USN Coastal Systems
Location: PANAMA CITY
County: BAY
Contact/District: GLENN BUTTS NW
NPDES Permit #: FL00 02551 Outfall #:

Sample Collection: Date 11/29/93 Time 11:00
Test Beginning: Date 11/30/93 Time 14:00
Test Ending: Date 12/2/93 Time 14:30
Organism Batch #: 120 Diluent Batch #: 31
Organism Age: < 24 hrs.
Test Organism: Ceriodaphnia dubia

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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
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	22.0 @ 22.1	8.5 @ 23.0	970 @ 1,000 9030 @ 10,000 @ 22.5 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	22.5 @ 22.6	8.6 @ 22.4	975 @ 1,000 9390 @ 10,000 @ 23.4 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	22.6 @ 22.7	8.4 @ 23.5	980 @ 1,000 9330 @ 10,000 @ 23.5 °C

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
Conc.	Chamber #	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Control	A	5	5	5	8.0		8.0	22.0		23.3	8.2		8.2	180	1	165
Control	B	5	5	4			8.1			23.3			8.2			170
Control	C	5	5	5			8.2			23.2			8.4			180
Control	D	5	5	5			8.2			23.0			8.5			190
100%	A	5	5	5	6.7		7.7	22.3		23.0	8.0		8.5	350		330
100%	B	5	5	5			7.6			23.2			8.6			345
100%	C	5	5	5			7.6			23.2			8.4			360
100%	D	5	5	5			7.6			23.2			8.3			385
Measured/Loaded by:		MF	TM	TM	TM		TM	TM		TM	TM		TM	TM		TM
Recorded by:		TR	TM	TM	TR		TR	TR		TR	TR		TR	TR		TR

Investigators' Signatures

Tina Mikulski
Marshall Faircloth
Robin C. Raden

Reviewer

form updated 7/8/93

	Salt Water/ Well Water	20% Min Water	Water Quality Parameters Sample	Method	Measured by
Field Total Residual Cl2:			~~0.04~~ 0.0 read wrong field sheet KP 12/6/93		GB
Lab Total Residual Cl2:	<0.03	<0.03	<0.03	DR-100	TR
Alkalinity:	125	80	35	Hach	TR
Hardness:	120	85	85	Hach	TR
Total Ammonia:	<0.017	<0.017	~~59.7~~		MF

Ammonia Meter #98136 Ammonia Meter Slope: −59.7 Ammonia Blank: <0.017 Control Salinity: ~~1.51~~ MF 0 ppt Sample Salinity: 0 ppt

* Slope written in place of sample result MF

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: USN Coastal Systems
Location: PANAMA CITY
County: BAY
Contact/District: GLENN BUTTS NWD
NPDES Permit #: FL0002551 Outfall #: _____

Sample Collection: Date 11/29/93 Time 11:00
Test Beginning: Date 11/30/93 Time 14:00
Test Ending: Date 12/2/93 Time 14:30
Organism Batch #: 50 Diluent Batch #: well
Organism Age: 10 days old
Test Organism: Cyprinella leedsi

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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
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	22.0 @ 22.1	8.5 @ 23.0	970 @ 1,000 9030 @ 10,000 @ 22.9 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	22.5 @ 22.6	8.6 @ 22.4	975 @ 1,000 9380 @ 10,000 @ 23.4 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	22.6 @ 22.7	8.4 @ 23.5	980 @ 1,000 9330 @ 10,000 @ 23.5 °C

Conc.	Chamber #	Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
		0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Control A	63	5	5	5	7.7	8.1	8.2	22.5	22.4	22.6	8.1	8.4	8.9	240	250	250
Control B	57	5	5	5	7.7	8.1	8.2			22.6	8.1	8.5	8.9	240	250	250
100% A	87	5	5	5	6.5	7.1	7.2	22.7	22.4	22.6	8.3	8.0	8.8	380	380	380
100% B	88	5	5	5	6.5	7.1	7.2			22.6	8.4	8.1	8.6	380	380	380
Measured/Loaded by:		TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM	TM
Recorded by:		TM	TM	TM	TR	TM	TR	TR	TM	TR	TR	TM	TR	TR	TM	TR

Investigators' Signatures

Tina Mikulski
Marshall Faircloth
Tobin C. Rader

Reviewer

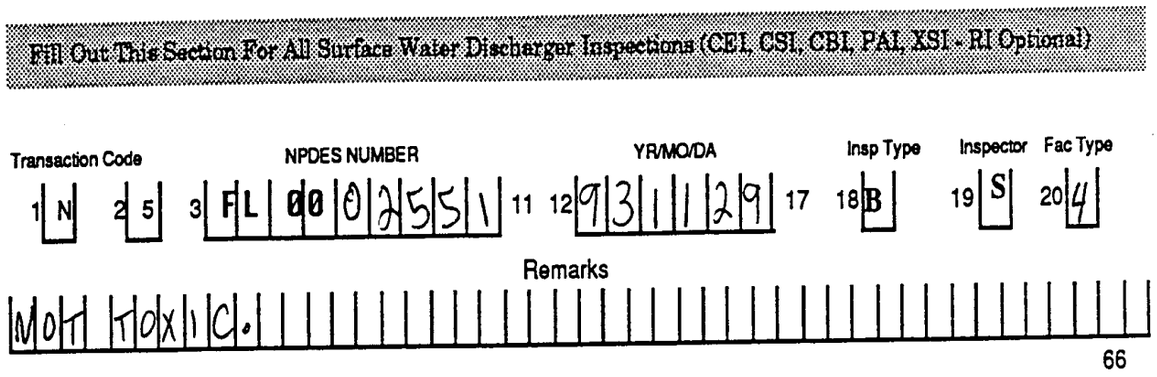
form updated 7/8/93

Water Quality Parameters	Salt Water/ Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			KD 0.40, 0.01		CB
Lab Total Residual Cl2:	<0.03	<0.03	<0.03	DR-100	TR
Alkalinity:	125	80	35	Hach	TR
Hardness:	120	85	85	Hach	TR
Total Ammonia:	<0.017	<0.017	1.51	orion	MF

read wrong, field sheet 12/6 KD

Ammonia Meter #98136 Ammonia Meter Slope: -59.7 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

The Bioassay of USN Coastal Systems effluent sampled on November 29, 1993, NPDES #FL0002551.



The Priority Pollutants Analyses for the Bioassay of USN Coastal Systems effluent sampled on November 29, 1993, NPDES #FL0002551.

