

Bioassays of

Everglades City Wastewater Treatment Plant

Everglades City, Collier County, Florida

NPDES #FL0027618

Sampled 9/18/95

December 1995

Biology Section

Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan #870346G

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Bureau of Laboratories
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Introduction

Everglades City WWTP, Everglades City, Collier County, Florida, NPDES #FL0027618, tests performed on 19 to 21 September, 1995.

This extended-aeration wastewater treatment plant is located on State Road 29 in Everglades City. The facility has a design flow of 0.1 MGD. The wastewater treatment process includes chlorination and dechlorination. Effluent is discharged into the Lake Placid Canal (facility summary provided by Andrew Barienbrock, FDEP, Punta Gorda).

The toxicity tests discussed in this report were performed in accordance with methods described by Weber, 1993, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 4th Edition, EPA/600/4-90/027F.

Results and Discussion

The FDEP Biology Section performed two 48-hour static acute screening toxicity bioassays on a sample of effluent from this facility. The salinity of the sample was 3.7 ppt, therefore, the test species used for these bioassays were the mysid shrimp, *Mysidopsis bahia*, and the inland silverside, *Menidia beryllina*. The salinity of the effluent was not adjusted for the *Menidia* test. The control water for the *Menidia* test was adjusted to a salinity of 3.7 ppt using natural saltwater diluted with deionized water. To accommodate the salinity requirement of the *Mysidopsis bahia* test organisms, the effluent for the mysid test was adjusted to 6.0 ppt using 40 Fathoms® artificial sea salts. The control water for the mysid test was adjusted to a salinity of 6.0 ppt using natural saltwater diluted with deionized water. Test results for both species did not indicate toxicity (Table 1).

Total residual chlorine was 0.01 mg/L in the field, but was not detected in the laboratory. Total ammonia was not detected in the sample. Further chemical analyses were performed on the sample and several metals were identified (Table 2).

Conclusion

The sample of effluent collected from this facility on September 18, 1995, did not show toxicity.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Everglades City WWTP, Everglades City, Collier County, Florida, NPDES# FL0027618, performed on 19 to 21 September,1995.

Facility:	Everglades City WWTP	NPDES #	FL0027618	Facility Type:	Wastewater Treatment Plant
Location:	State Road 29, Everglades City	Contact/District:	Andrew Barienbrock/South		
County:	Collier	Test type:	static acute screen		
Sample Collection Date:	9/18/95 Time: 1100	# tests:	2	Receiving Water:	Lake Placid Canal
Test Beginning Date:	9/19/95 Time: 1600	Chlorination Type:	Sample collected after dechlorination		
Test Ending Date:	9/21/95 Time: 1600				Page 1 of 1

Total Residual CL2	mg/L	Method
Field:	0.01	-
Lab:	<0.03	DR-100

Ammonia	Total (mg/L)	Unionized (mg/L)
Control Water (fish):	< 0.017	0.00
Control Water (mysids)	< 0.017	0.00
100% Sample:	<0.017	0.00

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	30	-
Control Water (mysids)	20	-
100% Sample:	315	910

	fish	mysids
Salinity	(ppt)	
Control Water:	3.7	6.0
100% Sample:	3.7	6.0

Organism: ***Mysidopsis bahia*** Life stage: 3 days old

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[A]			Dissolved Oxygen			Conductivity Uncorrected mmhos/cm	
Concentrations	Volume(mL)	0 hr	24 hr	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 A	0/500	5	5	5	8.3	7.8	7.9	23.9	23.5	23.3	7.6	7.6	7.9	10.4	10.3
Control B	0/500	5	5	5	8.3	7.8	7.8	23.9	23.3	23.2	7.6	7.7	8.0	10.5	10.3
Control C	0/500	5	5	5	8.3	7.8	7.8	23.9	23.3	23.2	7.6	7.7	7.9	10.5	10.3
Control D	0/500	5	4	4	8.3	7.8	7.8	23.9	23.5	23.4	7.5	7.7	7.9	10.5	10.4
100% A	500/0	5	5	5	8.0	8.5	8.6	24.4	23.5	23.4	7.4	7.6	7.9	10.6	10.4
100% B	500/0	5	5	5	8.0	8.5	8.6	24.4	23.4	23.2	7.4	7.7	7.9	10.6	10.3
100% C	500/0	5	5	5	8.0	8.5	8.6	24.4	23.3	23.2	7.5	7.7	7.9	10.6	10.3
100% D	500/0	5	4	4	8.0	8.5	8.6	24.4	23.5	23.3	7.5	7.5	8.0	10.6	10.4

[A] Temperature of test room was continously recorded on a strip chart recorder.
Room temperature range for the test period was 23.4-24.4°C.

Organism: ***Menidia beryllina*** Age: 12 days

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[B]			Dissolved Oxygen			Conductivity Uncorrected mmhos/cm	
Concentrations	Volume(mL)	0 hr	24 hr	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 A	0/500	5	5	5	8.1	7.5	7.1	23.9	23.5	23.4	7.2	7.6	8.3	6.8	6.8
Control B	0/500	5	5	5	8.1	7.5	7.1	23.9	23.4	23.4	7.2	7.6	8.0	6.8	6.7
Control C	0/500	5	5	5	8.1	7.5	7.2	23.9	23.4	23.5	7.4	7.7	8.0	6.8	6.7
Control D	0/500	5	5	5	8.1	7.5	7.2	23.8	23.4	23.5	7.4	7.8	8.1	6.8	6.7
100% A	500/0	5	5	5	7.8	8.5	8.6	23.9	23.4	23.3	7.6	7.8	8.2	6.9	6.8
100% B	500/0	5	5	5	7.8	8.5	8.6	23.9	23.3	23.3	7.7	8.0	8.0	6.8	6.7
100% C	500/0	5	5	5	7.8	8.5	8.6	23.9	23.2	23.3	7.7	7.9	8.0	6.8	6.7
100% D	500/0	5	5	5	7.8	8.5	8.6	23.9	23.3	23.4	7.7	7.9	8.0	6.8	6.8

[B] Temperature of test room was continously recorded on a strip chart recorder.
Room temperature range for the test period was 23.4-24.4°C.

Table 2. Results of chemical analyses on the effluent from the Everglades City Wastewater Treatment Plant sampled on September 18, 1995.

Metals

Calcium	146	mg/L
Copper	13	µg/L[A]
Iron	176	µg/L[A]
Magnesium	131	mg/L
Zinc	21	µg/L[I]

Pesticides and Herbicides

none detected

Base, Neutral, & Acid Extractable Organics

Phenol	3.1	µg/L[I]

A Value reported is the mean of two or more determinations.

I Value reported is less than the minimum quantitation limit and greater than or equal to the minimum detection limit.

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Everglades City WWTP
County: Collier
Contact / District: Andrew Barienbrock / South Ft. Myers
NPDES Permit #: FL0027618
LIMS Sample #: 117087 (Sample by ?/22) LIMS Job #: 95-SEP-19-12

Sample Collection: Date 9-18-95 Time 1100
Test Beginning: Date 9/19/95 Time 1600
Test Ending: Date 9-21-95 Time 1600
Organism Batch #: 260 Diluent Batch #: NSW
Organism Age: 3 days
Test Organism: Mysidopsis bahia

Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through

Test Number: 1 of 2

Remarks: salinity of sample increased to 6‰ to accomodate the salinity requirements of the test species.

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	23.7 @ 23.8	8.3 @ 24.5 °C	109.0 @ 102.3 1386 @ 1412 @ 24.1 °C 10.03 @ 10.32 mmhos
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.2 @ 23.2	8.4 @ 24.1 °C	110.4 @ 102.3 1383 @ 1412 @ 24.1 °C 10.03 @ 10.32 mmhos
48 hr	7.0 @ 7.0 9.0 @ 9.0	23.2 @ 23.2	8.4 @ 24.2 °C	1028 @ 1023 984 @ 1013 @ 23.9 °C 786 @ 10.32

		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
CTL A	136	5	5	5	8.3	7.8	7.9	23.9	23.5	23.3	7.6	7.6	7.9	10.4	10.4	10.3
CTL B	25	5	5	5	8.3	7.8	7.9	23.9	23.3	23.2	7.6	7.7	8.0	10.5	10.4	10.3
CTL C	502	5	5	5	8.3	7.8	7.9	23.4	23.3	23.2	7.6	7.7	7.9	10.5	10.4	10.3
CTL D	618	5	4(10)	4	8.3	7.8	7.8	23.9	23.5	23.4	7.5	7.7	7.9	10.5	10.4	10.4
100% A	506	5	5	5	8.0	8.5	8.6	24.4	23.5	23.4	7.4	7.6	7.9	10.6	10.5	10.4
100% B	48	5	5	5	8.0	8.5	8.6	24.4	23.4	23.2	7.4	7.7	7.9	10.6	10.5	10.3
100% C	306	5	5	5	8.0	8.5	8.6	24.4	23.3	23.2	7.5	7.7	7.9	10.6	10.4	10.3
100% D	520	5	4(10)	4	8.0	8.5	8.6	24.4	23.5	23.3	7.5	7.5	8.0	10.6	10.5	10.4
Measured/Loaded by:		TM	MF	MF	TM	MF	JN	TM	MF	JN	TM	MF	JN	TM	MF	JN
Recorded by:		TM	MF	MF	JN	JN	LM	JN	JN	LM	JN	JN	LM	JN	JN	LM

Investigators' Signatures

Liz Morel
Jennifer Martin
Tina Mikulasko
Marshall Faulkner

reviewer

form updated 5/05/95

Water Quality Parameters

(Salt Water) / Well Water

	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):		0.01	—	Andrew Barienbrock
Lab Total Residual Cl2 (mg/L):	< 0.03	< .04	DR-100	LM
Alkalinity (mg/L as $CaCO_3$):	20	315	Hach	LM
Hardness (mg/L as $CaCO_3$):		910	Hach	LM
Total ammonia (mg/L as N):	< 0.017	< 0.017	Orion	JN

Ammonia Meter #98136 Meter Slope: -57.3
Ammonia Blank: < 0.017
Control Salinity: 6.0 / 3.7 ppt
Sample Salinity: 6.0 / 3.6 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Everglades City WWTP
County: Collier
Contact / District: Andrew Barienbrock / South FT. Myers
NPDES Permit #: FL0027618
LIMS Sample #: 117087 LIMS Job #: 95-SEP-19-12
sample log 9/22

Sample Collection: Date 9-18-95 Time 1100
Test Beginning: Date 9/19/95 Time 1600
Test Ending: Date 9-21-95 Time 1600
Organism Batch #: 55 Diluent Batch #: NSW
Organism Age: 12 days
Test Organism: Menidia beryllina

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	23.7 @ 23.8	8.3 @ 24.5 °C	109.0 @ 102.3 1386 @ 1412 @ 24.1 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.2 @ 23.2	8.4 @ 24.1 °C	110.4 @ 102.3 1383 @ 1412 @ 24.1 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	23.2 @ 23.2	8.4 @ 24.2 °C	102.2 @ 102.3 984 @ 1013 @ 23.9 °C

10041@10.30 10.32 mmhos
9960 @ 10320

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) 0 hr	UNCORRECTED Cond. (mmhos/cm) 24 h	UNCORRECTED Cond. (mmhos/cm) 48 h
CTL A	607	5	5	5	8.1	7.5	7.1	23.9	23.5	23.4	7.2	7.6	8.3	6.8	6.8	6.8
CTL B	476	5	5	5	8.1	7.5	7.1	23.9	23.4	23.4	7.2	7.6	8.0	6.8	6.8	6.7
CTL C	307	5	5	5	8.1	7.5	7.2	23.9	23.4	23.5	7.4	7.7	8.0	6.8	6.8	6.7
CTL D	2190	5	5	5	8.1	7.5	7.2	23.8	23.4	23.5	7.4	7.8	8.1	6.8	6.8	6.7
100% A	85	5	5	5	7.8	8.5	8.6	23.9	23.4	23.3	7.6	7.8	8.2	6.9	6.8	6.8
100% B	348	5	5	5	7.8	8.5	8.6	23.9	23.3	23.3	7.7	8.0	8.0	6.8	6.8	6.7
100% C	630	5	5	5	7.8	8.5	8.6	23.9	23.2	23.3	7.7	7.9	8.0	6.8	6.8	6.7
100% D	53	5	5	5	7.8	8.5	8.6	23.9	23.3	23.4	7.7	7.9	8.0	6.8	6.8	6.8
Measured/Loaded by:		MF	MF	MF	JM	MF	JN	JM	MF	JN	JM	MF	JN	JM	MF	JN
Recorded by:		MF	MF	MF	JN	JN	LM	JN	JN	LM	JN	JN	LM	JN	JN	LM

Investigators' Signatures

reviewer

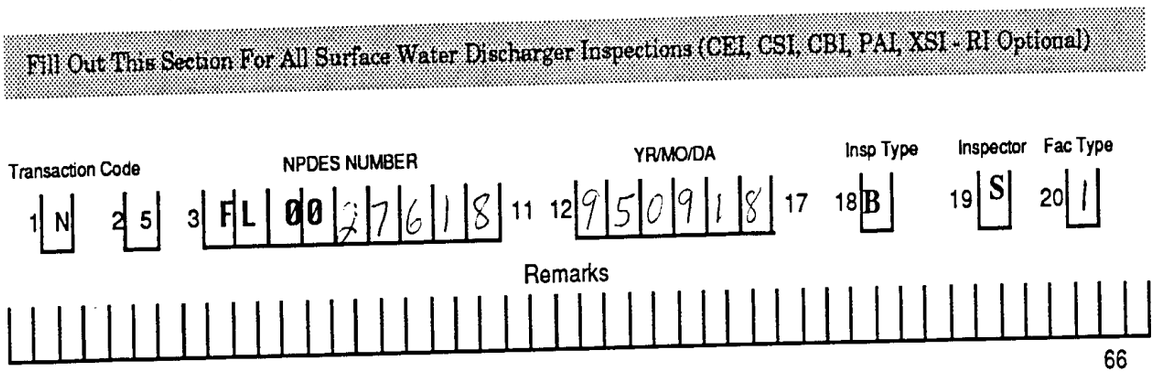
form updated 5/05/95

Water Quality Parameters

	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			0.01	—	Andrew Barienbrock
Lab Total Residual Cl2 (mg/L):	<0.03	—	<0.03	DR-100	LM
Alkalinity (mg/L as $CaCO_3$):	30	—	315	Hach	LM
Hardness (mg/L as $CaCO_3$):	—	—	910	Hach	LM
Total ammonia (mg/L as N):	<0.017	—	<0.017	Orion	JN

Ammonia Meter #98136 Meter Slope: -57.3 Ammonia Blank: <0.017 Ammonia Control Salinity: 3.7 ppt incorrect number mf 9/20/95 Sample Salinity: 3.7 ppt

The Bioassay of the Everglades City WWTP effluent sampled on September 18, 1995, NPDES #FL0027618.



The Priority Pollutants Analysis for the Bioassay of Everglades City WWTP effluent sampled on September 18, 1995, NPDES #FL0027618.

