

Bioassays of

Monterey Wastewater Treatment Facility

Jacksonville, Duval County, Florida

NPDES #FL0023604

Sampled 11/13/00

September 2001

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

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Monterey Wastewater Treatment Facility

Jacksonville, Duval County, Florida

NPDES #FL0023604

Biology Section
Bureau of Laboratories
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Introduction

Monterey Wastewater Treatment Facility, 5802 Harris Street, Jacksonville, Duval County, Florida, NPDES #FL0023604, tests performed from 14 to 16 November 2000.

This wastewater treatment facility has a design flow of 3.6 MGD. The treatment process consists of a sequencing batch reactor (SBR) comprised of four cells, one of which is used as a digester. The other three cells treat the effluent using an aeration tank for nitrification of organics, a static-anoxic denitrification tank that allows solids to settle to the bottom, and a decanting system that sends the cleared wastewater to an ultraviolet disinfection system. Treated wastewater is discharged into the Class III marine waters of the St. Johns River.

A toxicity-mixing zone has been established for this facility's discharge that begins 40 meters from the eastern shoreline of the St. Johns River and extends 182 meters along the axis of the diffuser pipe. The mixing zone covers 1,929 square meters.

The facility is currently working on repairing an effluent line problem, and the permit will be issued when the problem is resolved. In a Wastewater Compliance Inspection Report conducted on November 13, 2000, the facility was considered to be out-of-compliance due to altered information on the monitoring data provided to the FDEP. The situation is currently being addressed, and the permit renewal will not be delayed as a result of this status (facility summary provided by M. Reynolds, FDEP, Jacksonville).

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 the wetwells of this facility before discharge into the river. At the request of the Northeast District, tests were performed using the saltwater test species, the mysid shrimp, *Americamysis bahia*, and the inland silverside minnow, *Menidia beryllina*. The initial salinity of the effluent was less than one part per thousand (ppt), which was determined by conductivity and temperature measurements. An aliquot of the sample was adjusted to 9ppt using Forty Fathoms® artificial sea salts for the saltwater species tests. The control water was natural seawater (NSW) diluted to 9ppt. An additional artificial sea salt control was also prepared by using well water and salting it to 9ppt using Forty Fathoms® artificial sea salts. The purpose for the additional control was to test for possible toxic effects of adding artificial sea salts to the sample. No toxic effects were observed in any of the controls. The sample was not acutely toxic to either test species within 48 hours (Table 1).

Total ammonia was not detected in the laboratory. Total residual chlorine was not measured in the field and was less than the minimum detection limit (0.03 mg/L) in the laboratory. Further chemical analyses were performed on the sample, and several metals, pesticides, and an organic compound were identified (Table 2).

Conclusion

The sample of effluent collected from this facility on November 13, 2000, was not acutely toxic to the saltwater test species, *Americamysis bahia* or *Menidia beryllina* within 48 hours.

Table 1.

5802 Harris Street, Jacksonville, Duval County, Florida, NPDES# FL0023604, performed from November 14 to 16, 2000.

Facility:	**Monterey WWTF**			**NPDES #**	**FL0023604**	Facility Type:	**Waste Water**	**Analysts:**	Shannon Gerardi
Location:	5802 Harris Street, Jacksonville			Contact/District:	Pat O'Connor/ Northeast District		**Treatment Facility**		Della Parker-Hanson
County:	Duval			Test type:	static acute screen				Joshua Ayres
Sample Collection Date:	11/13/00	Time:	1110	# tests:	2	Receiving Water:	St. Johns River		
Test Beginning Date:	11/14/00	Time:	1330	Chlorination Type:	non-chlorinated			**Reviewer:**	Steve Wolfe
Test Ending Date:	11/16/00	Time:	1300				**Page 1 of 2**		

Organism: ***Americamysis bahia*** Age: 4 days

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[A]			Dissolved Oxygen			Conductivity 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	7.8	8.0	7.8	24.3	23.6	24.8	7.3	6.7	6.5	14.8	16.0
Control B	0/500	5	5	5	7.8	8.0	8.0	24.3	23.2	24.4	7.3	6.8	6.7	14.9	15.6
Control C	0/500	5	5	5	7.8	8.0	7.9	24.3	23.2	24.3	7.4	6.8	6.3	14.9	15.5
Control D	0/500	5	5	5	7.8	8.1	8.0	24.3	23.1	24.0	7.3	6.9	6.0	14.9	15.6
Salt Control A	0/500	5	5	4	8.2	8.3	8.2	25.0	23.4	24.3	7.3	6.7	6.1	14.8	15.6
Salt Control B	0/500	5	5	5	8.2	8.3	8.2	25.0	23.6	24.3	7.3	6.7	6.2	15.1	15.7
Salt Control C	0/500	5	5	5	8.2	8.3	8.2	25.0	23.0	24.4	7.3	6.8	6.1	15.1	15.7
Salt Control D	0/500	5	5	5	8.2	8.3	8.2	24.9	23.0	24.4	7.3	6.7	6.1	15.1	15.8
100% A	500/0	5	5	5	8.0	8.2	8.2	24.5	23.4	24.4	6.8	6.6	6.1	15.3	16.1
100% B	500/0	5	5	5	8.0	8.3	8.3	24.5	23.9	24.1	6.8	6.5	6.2	15.4	16.2
100% C	500/0	5	5	5	8.0	8.2	8.3	24.5	23.2	24.0	6.8	6.6	6.2	15.4	15.7
100% D	500/0	5	5	5	8.0	8.2	8.3	24.5	23.1	24.0	6.9	6.7	6.3	15.4	15.7

[A] Temperatures of test incubator and test room were continously recorded on strip chart recorders.
Incubator #3 temperature range for the test period was 24.5-25.0°C.
Room temperature range for the test period was 24.5-26.0°C.

continued

Data Transcription Verification	
date:	9/25/01
by:	Joshua Ayres
	Della Parker-Hanson

Total Residual CL2	mg/L	Method
Field:	-	-
Lab:	<0.03	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
Control Water :	<0.051	<0.051
100% Sample:	<0.051	<0.051

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	126	-
Control water (mysids):	126	-
100% Sample:	172	-

Salinity[B]	(ppt)	adjusted (ppt)
Control Water (fish):	~30	~9
Control water (mysids):	~30	~9
Salt Control:	1.0	~9
100% Sample:	<1	~9

[B] Salinity based on a combination of conductivity an temperature.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from Monterey Wastewater Treatment Facility, concluded 5802 Harris Street, Jacksonville, Duval County, Florida, NPDES# FL0023604, performed from November 14 to 16, 2000.

Facility:	**Monterey WWTF**		**NPDES #**	**FL0023604**	Facility Type:	**Waste Water**	**Analysts:**	Shannon Gerardi
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Test Beginning Date:	11/14/00	Time: 1330	Chlorination Type:	non-chlorinated			**Reviewer:**	Steve Wolfe
Test Ending Date:	11/16/00	Time: 1300				**Page 2 of 2**		

Organism: ***Menidia beryllina*** Age: 10 days

	Sample/Diluen	**SURVIVAL # Alive**			pH			Temperature[A]			Dissolved Oxygen			Conductivity mmhos/cm	
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Salt Control D	0/500	5	5	5	8.2	8.3	8.3	24.8	23.0	23.8	7.3	7.2	7.4	15.1	15.3
100% A	500/0	5	5	5	8.0	8.3	8.3	24.6	22.7	23.7	6.9	7.2	7.3	15.4	15.9
100% B	500/0	5	5	5	8.0	8.3	8.3	24.5	23.0	24.0	6.8	7.2	7.1	15.4	16.0
100% C	500/0	5	5	5	8.0	8.3	8.3	24.5	23.1	24.2	6.8	7.1	7.1	15.4	16.3
100% D	500/0	5	5	5	8.0	8.3	8.4	24.5	23.1	24.3	6.8	7.1	7.0	15.4	15.8

[A] Temperatures of test incubator and test room were continously recorded on strip chart recorders.
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Salinity[B]	(ppt)	adjusted (ppt)
Control Water (fish):	~30	~9
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Salt Control:	<1	~9
100% Sample:	<1	~9

[B] Salinity based on a combination of conductivity and temperature.

Table 2. Results of chemical analyses on the effluent from the Monterey WWTF sampled on November 13, 2000.

Metals

Calcium	70	mg/L	A
Copper	0.84	µg/L	I
Iron	43	µg/L	I
Lead	0.67	µg/L	I
Magnesium	25.7	mg/L	A
Zinc	28.8	µg/L	A

Pesticides and Herbicides

Atrazine	0.13	µg/L	I
Diazinon	0.067	µg/L	I

Base, Neutral, & Acid Extractable Organics

1,4-Dichlorobenzene	0.096	µg/L	IQ

Oil and Grease

none detected

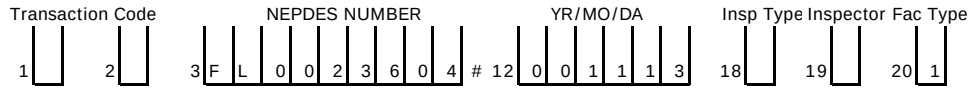
I Value reported is less than the minimum quantitation limit and greater than or equal to the minimum detection limit.

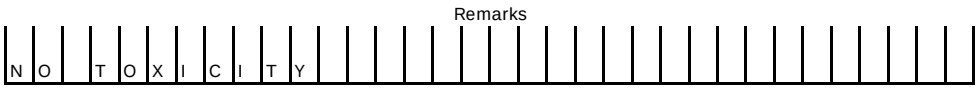
A Value reported is the mean of two or more determinations.

Q Sample held beyond normal holding time.

The Bioassay of the Monterey WWTF effluent sampled on November 13, 2000, NPDES #FL0023604.

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

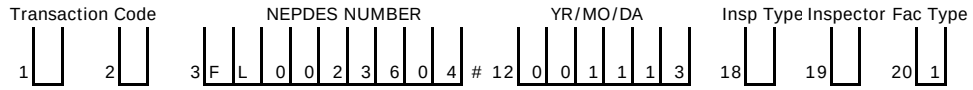


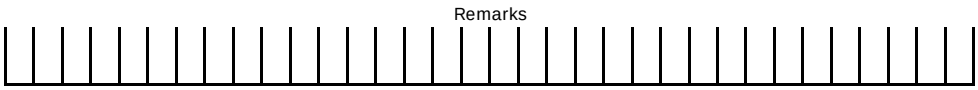


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The Priority Pollutants Analysis for Bioassay of the Monterey WWTF effluent sampled on November 13, 2000, NPDES #FL0023604.

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





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