

Bioassays of the City of

Bradenton Wastewater Treatment Plant

Bradenton, Manatee County, Florida

NPDES #FL0021369

Sampled 12/10/01

May 2002

Biology Section
Division of Resource Assessment & Management
Comprehensive Quality Assurance Plan #870346G

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Biology Section
Bureau of Laboratories
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Introduction

City of Bradenton Wastewater Treatment System, 1810 First Street West, Bradenton, Manatee County, Florida, NPDES #FL0021369, tests performed on 11 to 13 December 2001.

This wastewater treatment plant has a design flow of 7.5 MGD and an annual average daily flow of 5.1 MGD. The wastewater treatment system is a Type I extended-aeration activated-sludge advanced wastewater treatment plant. The plant consists of headwork with two mechanical bar screens, two carrousel-type aeration basins, two clarifiers, a below-grade filter lift station, four single media gravity denitrification filters, below-grade open Parshall flume flow measuring device, and a combined chlorine contact chamber and dechlorination basin. Sulfur dioxide is used to dechlorinate the effluent before it is discharged into the Class III marine waters of the Manatee River (facility summary provided by Dane Huge, FDEP, Tampa).

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 collected from this facility. The test species used for these bioassays were the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*. The test results did not indicate toxicity to either test species within 48 hours (Table 1).

Total residual chlorine and total ammonia were not detected in the bioassay sample in the laboratory. Further chemical analyses were performed on the sample, and several metals and an herbicide were identified (Table 2). Chemical analyses were also performed on an additional composite sample, and several metals were detected (Table 3).

Conclusion

The sample of effluent collected from this facility on December 10, 2001, did not show acute toxicity to the either test species within 48 hours.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the City of Bradenton Wastewater Treatment Plant, 1810 First Street West, Bradenton, Manatee County, Florida, NPDES# FL0021369 performed on 11 to 13 December 2001.

Facility:	**City of Bradenton**		**NPDES #**	**FL0021369**	Facility Type:	**Wastewater Treatment Plant**	**Analysts:** Della Parker-Hanson, Marshall Faircloth, Joshua Ayres, Gary Hardie
Location:	1810 First Street West		Contact/District:	Grainger/Southwest			
County:	Manatee		Test type:	static acute screen			
Sample Collection Date:	12/10/01	Time: 1200	# tests:	2	Receiving Water:	Manatee River	
Test Beginning Date:	12/11/01	Time: 1500	Chlorination Type:	Chlorinated sample collected after dechlorination		**Page 1 of 1**	**Reviewer:** David Whiting
Test Ending Date:	12/13/01	Time: 1540					

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

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[A]			Dissolved Oxygen			Conductivity Uncorrected µmhos/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	0/20	5	5	5	8.2	-	8.2	24.1	-	24.6	7.9	-	7.5	155	160
Control B	0/20	5	5	5	-	-	8.4	-	-	24.4	-	-	7.5	-	160
Control C	0/20	5	5	5	-	-	8.3	-	-	24.1	-	-	7.6	-	195
Control D	0/20	5	5	5	-	-	8.3	-	-	23.7	-	-	7.6		200
100% A	20/0	5	5	5	7.8	-	8.6	24.3	-	24.3	7.6	-	7.7	1055	1395
100% B	20/0	5	5	5	-	-	8.6	-	-	24.6	-	-	7.6	-	1205
100% C	20/0	5	5	5	-	-	8.6	-	-	24.2	-	-	7.6	-	1370
100% D	20/0	5	5	5	-	-	8.3	-	-	24.0	-	-	7.6	-	1430

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.0-26.0°C.
Incubator #2 temperature range for the test period was 25.0-27.0°C.

Organism: ***Cyprinella leedsi*** Life stage: 15 days

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[B]			Dissolved Oxygen			Conductivity Uncorrected µmhos/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	8.0	8.3	8.5	24.3	25.0	24.9	7.3	7.0	7.2	245	270
Control B	0/500	5	5	5	8.0	8.3	8.5	24.5	25.2	24.8	7.5	7.0	7.1	260	275
Control C	0/500	5	5	5	8.1	8.3	8.5	24.5	25.3	24.8	7.4	6.9	7.1	265	280
Control D	0/500	5	5	5	8.1	8.3	8.5	24.4	24.9	25.3	7.4	6.9	7.1	265	290
100% A	500/0	5	5	5	7.8	8.1	8.4	24.7	25.0	25.2	7.4	6.9	7.1	1080	1130
100% B	500/0	5	5	5	7.8	8.1	8.4	24.8	25.4	24.8	7.3	7.0	7.0	1135	1140
100% C	500/0	5	5	5	7.8	8.1	8.4	24.9	25.3	24.8	7.4	6.8	7.1	1145	1165
100% D	500/0	5	5	5	7.8	8.1	8.4	24.9	25.6	24.7	7.5	6.9	7.0	1140	1155

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.0-26.0°C.
Incubator #3 temperature range for the test period was 24.0-26.0°C.

Data Transcription Verification	
date:	2/12/02
by:	Karla Whiddon, Della Parker-Hanson

LIMS	
Job number:	TLH-2001-12-11-01
Sample number:	566037

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

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

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	141	132
20% Dilute Mineral Water (cladocerans):	76	78
100% Sample:	126	232

Table 2. Results of chemical analyses on the effluent from City of Bradenton Wastewater Treatment Plant sampled on December 10, 2001.

Metals			
Calcium	65.4	mg/L	
Iron	61	µg/L	I
Magnesium	16.5	mg/L	
Zinc	27	µg/L	A
Pesticides and Herbicides			
Atrazine	0.75	µg/L	
Base, Neutral, & Acid Extractable Organics			
None detected			

[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.

Table 3. Results of chemical analyses on an additional composite sample from City of Bradenton Wastewater Treatment Plant sampled on December 10, 2001.

Metals

Calcium	63.8	mg/L	[I]
Copper	3.1	µg/L	[I]
Iron	140	µg/L	
Magnesium	16.1	mg/L	[I]
Selenium	0.51	µg/L	
Zinc	30	µg/L	

Pesticides and Herbicides

None detected

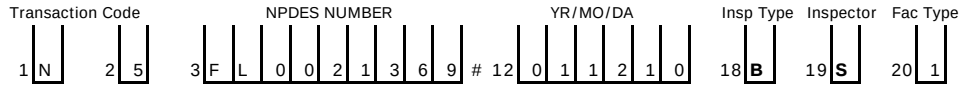
Base, Neutral, & Acid Extractable Organics

None detected

[I] Value reported is less than the minimum quantitation limit, and greater than or equal to the min imum detection limit.

The Bioassay of City of Bradenton Wastewater Treatment Plant effluent sampled on December 10, 2001, NPDES #FL0021369.

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

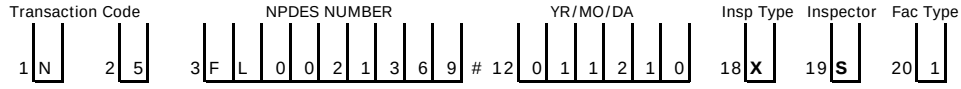


Remarks

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The Priority Pollutants Analysis for Bioassay of City of Bradenton Wastewater Treatment Plant effluent sampled on December 10, 2001, NPDES #FL0021369.

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



Remarks

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