



Bioassays of
Siesta Key Utilities Authority
Wastewater Treatment Plant
Sarasota, Sarasota County, Florida
NPDES #FL0025755
Sampled 1/28/02

May 2002

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

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Wastewater Treatment Plant
Sarasota, Sarasota County, Florida
NPDES #FL0025755

Biology Section
Bureau of Laboratories
May 2002

Introduction

Siesta Key Utilities Authority Wastewater Treatment Plant, 5200 Oakmont Place, Sarasota, Sarasota County, Florida, NPDES #FL0025755, tests performed on 29 to 31 January 2002.

This wastewater treatment plant has a design flow of 2.70 MGD and an annual average flow of 1.50 MGD. Wastewater treatment includes headworks with two Parshall flumes, bar screen, two de-gritting chambers, a flow equalization basin, a re-aeration basin, dual clarifiers, a nitrification tank, a holding tank, three de-nitrification towers, a clarifier, a filtration unit, chlorination, and dechlorination using sulfur dioxide gas. After treatment the effluent is discharged into the Class III marine waters of the Grand Canal (facility information provided Michele Duggan, 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 using the freshwater test species, the water-flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsii*. The test results did not indicate toxicity to the *C. leedsii* test organisms within 48 hours. The *C. dubia* test was invalidated due to excess mortality in the control (50% mortality) (Tables 1). The cause of the *C. dubia* control mortality was not determined.

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). The concentration of iron detected in the sample (420 μ g/L) exceeded the State of Florida Water Quality Criteria for iron in Class III marine waters (\leq 300 μ g/L).

Conclusion

The sample of effluent collected from this facility on January 28, 2002, did not show acute toxicity to the test species *C. leedsii* within 48 hours. The *C. dubia* test was invalidated due to excess mortality in the control. The cause of the *C. dubia* control mortality was not determined. The concentration of iron within the sample exceeded the State of Florida Water Quality Criteria for iron in Class III marine waters.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Siesta Key Utilities Authority Wastewater Treatment Plant, 5200 Oakmont Place, Sarasota, Sarasota County, Florida, NPDES# FL0025755, performed from 29 to 31 January 2002.

Facility: Siesta Key Utilities Authority WWTP	NPDES # FL0025755	Facility Type: Wastewater Treatment Plant	Analysts: Della Parker-Hanson Joshua Ayres Cathy Oaks Marshall Faircloth
Location: 5200 Oakmont Plance	Contact/District: T. Gucciardo/ Southwest		
County: Sarasota	Test type: static acute screen		
Sample Collection Date: 1/28/02 Time: 1100	# tests: 2	Receiving Water: Grand Canal	
Test Beginning Date: 1/29/02 Time: 1345	Chlorination Type: Chlorinated		
Test Ending Date: 1/31/02 Time: 1330	sample collected after dechlorination	Page 1 of 1	Reviewer: David Whiting

Organism: <i>Ceriodaphnia dubia</i>		Life stage: <24 hours											Conductivity		
Concentrations	Sample/Diluent	SURVIVAL # Alive			pH			Temperature ^B			Dissolved Oxygen			Uncorrected µmhos/cm	
	Volume(mL)	0 hr	24 hr	48 hr ^A	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	8.3	-	8.3	24.3	-	24.0	8.0	-	7.7	160	200
Control B	0/20	5	5	2	-	-	8.3	-	-	24.4	-	-	7.7	-	200
Control C	0/20	5	5	1	-	-	8.3	-	-	24.6	-	-	7.7	-	195
Control D	0/20	5	5	2	-	-	8.3	-	-	24.4	-	-	7.7	-	190
100% A	20/0	5	5	5	7.5	-	8.4	25.1	-	24.1	8.5	-	7.6	1380	1505
100% B	20/0	5	5	5	-	-	8.4	-	-	24.1	-	-	7.6	-	1505
100% C	20/0	5	5	5	-	-	8.4	-	-	24.1	-	-	7.6	-	1540
100% D	20/0	5	5	5	-	-	8.4	-	-	24.1	-	-	7.6	-	1505

^A Test was invalidated due to excess control mortality (>10% mortality).

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

Data Transcription Verification		
date:	4/1/02	
by:	Joshua Ayres Gary Hardie	

Total Residual CL2	mg/L	Method
Field:	1.82	-
Lab:	<0.03	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
Control water (fish):	<0.017	<0.017
Control water (water flea):	<0.017	<0.017
100% Sample:	<0.017	<0.017

Organism: <i>Cyprinella leedsi</i>		Life stage: 11 days											Conductivity		
Concentrations	Sample/Diluent	SURVIVAL # Alive			pH			Temperature ^C			Dissolved Oxygen			Uncorrected µmhos/cm	
	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	7.9	8.4	8.5	25.1	24.3	24.5	7.5	7.8	7.4	260	280
Control B	0/500	5	5	5	7.9	8.4	8.5	25.3	24.4	24.5	7.4	7.8	7.4	265	275
Control C	0/500	5	5	5	7.9	8.4	8.5	25.4	24.5	24.6	7.4	7.7	7.5	265	280
Control D	0/500	5	5	5	8.0	8.4	8.5	25.5	24.4	24.6	7.4	7.7	7.4	265	285
100% A	500/0	5	5	5	7.5	8.2	8.0	25.9	24.6	25.0	8.4	7.7	5.8	1430	1565
100% B	500/0	5	5	5	7.5	8.1	8.0	26.0	24.8	24.8	8.4	7.5	5.7	1470	1515
100% C	500/0	5	5	5	7.5	8.1	8.0	26.0	24.6	24.5	8.3	7.5	5.4	1470	1530
100% D	500/0	5	5	5	7.5	8.1	8.0	26.0	24.6	24.5	8.3	7.6	5.5	1470	1525

^C Temperatures of room and test incubator were continuously recorded on a strip chart recorder. Room Temperature range for the test period was 24.0-25.0°C. Incubator #3 temperature range for the test period was 23.5-25.0°C.

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water (fish):	141	148
Control water (water flea):	74	78
100% Sample:	130	252

Table 2. Results of chemical analyses on the effluent from Siesta Key Utilities Authority Wastewater Treatment Plant sampled on January 28, 2002.

Metals

Cadmium	0.12	µg/L
Calcium	51.5	mg/L
Iron	420	µg/L
Magnesium	29.1	mg/L
Selenium	1.1	µg/L ¹

Pesticides and Herbicides

Atrazine	0.1	µg/L ¹
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Base, Neutral, & Acid Extractable Organics

None detected

¹ The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

The Bioassay of Siesta Key Utilites Authority Wastewater Treatment Plant effluent sampled on January 28, 2002, NPDES #FL0025755.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, X

Transaction Code		NPDES NUMBER										YR/MO/DA				Insp Type	Inspector	Fac Type									
1	N	2	5	3	F	L	0	0	2	5	7	5	5	11	12	0	2	0	1	2	8	18	B	19	S	20	1

Remarks

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The Priority Pollutants Analysis for Bioassay of Siesta Key Utilites Authority Wastewater Treatment Plant effluent sampled on January 28, 2002, NPDES #FL0025755.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, X

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1	N	2	5	3	F	L	0	0	2	5	7	5	5	11	12	0	2	0	1	2	8	18	X	19	S	20	1

Remarks

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