

Bioassays of

Holly Oaks Wastewater Treatment Plant

Jacksonville, Duval County, Florida

NPDES #FL0023621

Sampled 1/28/02

July 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

Holly Oaks Wastewater Treatment Plant, 10797 Fort Caroline Road, Jacksonville, Duval County, Florida, NPDES #FL0023621, tests performed on 29 to 31 January 2002.

This wastewater treatment plant has a design flow of 1.0 MGD and an annual average flow of 0.99 MGD (June 2000-June 2001). Wastewater treatment is by a conventional activated-sludge process, which includes influent screening, comminution, aeration, secondary clarification, and ultraviolet disinfection. The treated effluent is discharged into the Class III fresh waters of Cowhead Creek, which flows into Mill Cove and then into the St. Johns River (facility information provided by Brian Kelsay, 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 collected from Outfall 001 of this facility using the freshwater test species, the waterflea, *Ceriodaphnia dubia,* and the bannerfin shiner, *Cyprinella leedsi*. The *C. dubia* test was invalidated due to excessive control mortality. The cause of the control mortality was undetermined. The test results did not indicate toxicity to the *C. leedsi* 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 were identified (Table 2).

Conclusion

The sample of effluent collected from this facility on January 28, 2002, did not show acute toxicity to the *C. leedsi* test species within 48 hours.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Holly Oaks Wastewater Treatment Plant, 10797 Fort Caroline Road, Jacksonville, Duval County, Florida, NPDES# FL0023621, performed from 29 to 31 January 2002.

Facility:	**Holly Oaks WWTP**		**NPDES #**	**FL0023621**	Facility Type:	**Wastewater Treatment Plant**	**Analysts:** Della Parker-Hanson, Joshua Ayres, Gary Hardie, Marshall Faircloth
Location:	10797 Fort Caroline Road		Contact/District:	Martin/Northeast			
County:	Duval		Test type:	static acute screen			
Sample Collection Date:	1/28/02	Time: 1517	# tests:	2	Receiving Water:	Cowhead Creek	
Test Beginning Date:	1/29/02	Time: 1345	Chlorination Type:	Non-chlorinated			
Test Ending Date:	1/31/02	Time: 1410				**Page 1 of 1**	**Reviewer:** David Whiting

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

	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	0/20	5	5	3 [A]	8.3	-	8.1	24.3	-	24.4	7.9	-	7.7	160	185
Control B	0/20	5	5	0 [A]	-	-	8.2	-	-	24.3	-	-	7.7	-	180
Control C	0/20	5	5	5 [A]	-	-	8.2	-	-	24.2	-	-	7.7	-	180
Control D	0/20	5	5	3 [A]	-	-	8.3	-	-	24.1	-	-	7.7	-	180
100% A	20/0	5	5	5	7.6	-	8.5	24.5	-	24.1	8.0	-	7.6	1240	1330
100% B	20/0	5	5	5	-	-	8.5	-	-	24.1	-	-	7.6	-	1410
100% C	20/0	5	5	5	-	-	8.5	-	-	24.1	-	-	7.6	-	1410
100% D	20/0	5	5	5	-	-	8.5	-	-	24.0	-	-	7.5	-	1475

[A] Test invalidated due to excessive control mortality. The cause of mortality was undetermined.

[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.

Organism: ***Cyprinella leedsi*** Life stage: 11 days

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[C]			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	8.2	8.5	25.7	24.7	24.3	7.6	7.6	7.6	280	280
Control B	0/500	5	5	5	8.0	8.3	8.5	25.6	24.5	24.2	7.5	7.5	7.6	270	290
Control C	0/500	5	5	5	8.0	8.3	8.5	25.4	24.6	24.7	7.5	7.7	7.6	275	280
Cotnrol D	0/500	5	5	5	8.0	8.3	8.5	25.4	24.5	24.4	7.5	7.6	7.5	270	285
100% A	500/0	5	5	5	7.6	8.2	8.0	25.1	24.4	24.5	7.6	7.7	3.9	1240	1395
100% B	500/0	5	5	5	7.6	8.2	8.0	25.1	24.4	24.3	7.8	7.7	4.3	1285	1400
100 % C	500/0	5	5	5	7.6	8.2	7.8	25.1	24.4	24.6	7.8	7.6	3.0	1295	1355
100% D	500/0	5	5	5	7.6	8.2	7.9	25.0	24.4	24.4	7.8	7.6	3.7	1295	1370

[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 was23.0-25.0C.

LIMS	
Job number:	TLH-2002-01-29-01
sample number:	573316

Data Transcription Verification	
date:	5/2/02
by:	Joshua Ayres
	Gary Hardie

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
Control water (water flea):	<0.017	<0.017
100% Sample:	<0.017	<0.017

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water (fish):	141	148
Control water (water flea):	74	78
100% Sample:	152	322

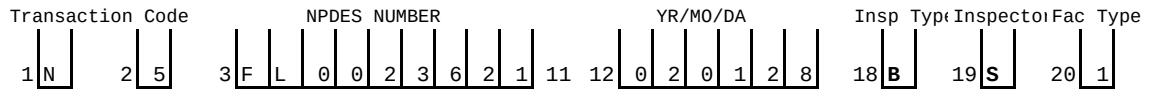
Table 2. Results of chemical analyses on the effluent from Holly Oaks Wastewater Treatment Plant sampled on January 28, 2002.

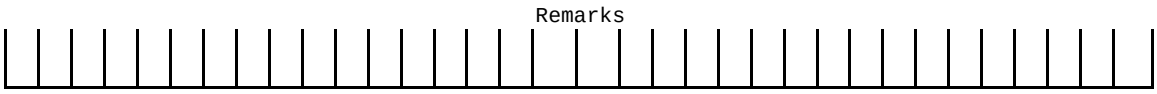
Metals			
Cadmium	0.059	µg/L	[I]
Copper	2.3	µg/L	[I]
Lead	0.48	µg/L	[I]
Selenium	0.71	µg/L	[I]
Silver	0.047	µg/L	[I]
Calcium	76.1	mg/L	
Iron_271	52	µg/L	[I]
Magnesium	29.9	mg/L	
Nickel	3	µg/L	[I]
Zinc	60	µg/L	
Pesticides and Herbicides			
Atrazine	0.05	µg/L	[I]
Diazinon	0.053	µg/L	[I]
Fonofos	0.29	µg/L	[I]
Base, Neutral, & Acid Extractable Organics			
None detected			

[I] The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

The Bioassay of the Holly Oaks WWTP effluent sampled on January 28, 2002, NPDES #FL0023621.

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





The Priority Pollutants Analysis for Bioassay of the Holly Oaks WWTP effluent sampled on January 28, 2002, NPDES #FL0023621.

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