

Bioassays of

Cooper City Wastewater Treatment Plant

Cooper City, Broward County, Florida

NPDES #FL0040398

2/11/02

July 2002

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

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Bureau of Laboratories
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Introduction

Cooper City Wastewater Treatment Plant, 11791 SW 49th Street, Cooper City, Broward County, Florida, NPDES #FL0040398, tests performed on 12 to 14 February 2002.

This wastewater treatment facility consists of three small package plants with a combined design flow of 3.75 MGD and a three-month average daily flow of 2.945 MGD (October, 2001-December, 2001). Wastewater treatment includes clarification, aeration, and digestion. Wastewater is chlorinated prior to being discharged into an on-site holding pond. Wastewater from the holding pond is mixed with effluent from the Town of Davie WWTP and effluent from the City of Hollywood WWTP prior to discharge into the Class III marine waters of the Atlantic Ocean. Wastewater is partially dechlorinated through dissipation in the holding pond and within the discharge pipeline to the ocean outfall (facility summary provided by Hubert Philoctete, FDEP, West Palm Beach).

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 Cooper City Wastewater Treatment Plant. The test species used for the freshwater bioassays were the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*. Since total residual chlorine (0.13 mg/L) was detected in the sample, additional tests were performed on aliquots of the sample that had been dechlorinated by the addition of sodium thiosulfate. Controls for the sodium thiosulfate were created by adding similar concentrations of sodium thiosulfate to aliquots of the control waters used in each test. The test results did not indicate toxicity to either of the test species within 48 hours of test initiation (Table 1).

Total residual chlorine was measured at 0.37 mg/L in the field and 0.13 mg/L in the bioassay sample in the laboratory. The total and unionized ammonia concentrations in the bioassay sample were 2.61 mg/L and 0.021 mg/L, respectively. Total ammonia in the sample collected for chemical analyses was 2.3 mg/L. Further chemical analyses were performed on the sample for base, neutral, and acid extractible organic compounds, metals, nutrients, and pesticides. Several metals, nutrients, and pesticides were identified (Table 2).

Conclusion

The sample of effluent collected from this facility on February 11, 2002, did not show acute toxicity to either the *C. dubia* or the *C. leedsi* test species within 48 hours of test initiation.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Cooper City Wastewater Treatment Plant, 11791 Southwest 49th Street, Cooper City, Broward County, Florida, NPDES# FL0040398, performed from 12 to 14 February 2002.

Facility:	**Cooper City WWTP**		**NPDES #**	**FL0040398**	Facility Type:	**Wastewater Treatment Plant**	**Analysts:** Della Parker-Hanson
Location:	11791 SW 49th Street		Contact/District:	T. Davis/Southeast			Joshua Ayres
County:	Broward		Test type:	static acute screen			Gary Hardie
Sample Collection Date:	2/11/02	Time: 1115	# tests:	2	Receiving Water:	Atlantic Ocean	Marshall Faircloth
Test Beginning Date:	2/12/02	Time: 1415	Chlorination Type:	Chlorinated			
Test Ending Date:	2/14/02	Time: 1355				**Page 1 of 1**	**Reviewer:** David Whiting

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	23.7	-	23.1	8.0	-	8.1	150	190
Control B	0/20	5	5	5	-	-	8.3	-	-	23.2	-	-	8.1	-	180
Control C	0/20	5	5	5	-	-	8.3	-	-	23.2	-	-	8.1	-	185
Control D	0/20	5	5	5	-	-	8.3	-	-	22.9	-	-	8.1	-	195
Dechl Ctrl A	0/20	5	5	5	8.2	-	8.3	23.8	-	23.0	8.0	-	8.1	165	200
Dechl Ctrl B	0/20	5	5	5	-	-	8.3	-	-	23.2	-	-	8.1	-	205
Dechl Ctrl C	0/20	5	5	5	-	-	8.3	-	-	23.1	-	-	8.1	-	250
Dechl Ctrl D	0/20	5	5	5	-	-	8.3	-	-	22.9	-	-	8.0	-	230
100% A	20/0	5	5	5	7.3	-	8.2	23.8	-	22.9	7.9	-	8.1	1010	1060
100% B	20/0	5	5	5	-	-	8.2	-	-	23.1	-	-	8.1	-	1145
100% C	20/0	5	5	5	-	-	8.2	-	-	23.2	-	-	8.0	-	1105
100% D	20/0	5	5	5	-	-	8.2	-	-	23.0	-	-	8.0	-	1140
Dechl 100 A	20/0	5	5	5	7.2	-	8.2	24.2	-	23.1	8.0	-	8.1	1070	1070
Dechl 100 B	20/0	5	5	5	-	-	8.2	-	-	23.2	-	-	8.0	-	1070
Dechl 100 C	20/0	5	5	5	-	-	8.2	-	-	23.2	-	-	8.0	-	1080
Dechl 100 D	20/0	5	5	5	-	-	8.2	-	-	23.0	-	-	8.0	-	1105

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.0-24.5 °C.
Incubator #3 temperature range for the test period was 25.0-25.5°C.

Organism: ***Cyprinella leedsi*** Life stage: 9 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	24.0	24.3	23.9	7.6	7.7	8.1	245	265
Control B	0/500	5	5	5	8.0	8.3	8.5	24.0	24.5	24.1	7.6	7.6	8.1	255	270
Control C	0/500	5	5	5	8.0	8.4	8.5	24.0	24.1	24.1	7.6	7.6	8.0	255	275
Cotnrol D	0/500	5	5	5	8.0	8.4	8.5	24.0	23.8	24.1	7.7	7.5	8.0	255	305
Dechl Ctrl A	0/500	5	5	5	8.0	8.3	8.5	24.2	23.6	24.5	7.8	7.8	7.9	260	290
Dechl Ctrl B	0/500	5	5	5	8.0	8.4	8.5	24.3	24.2	24.1	7.7	7.7	7.8	260	280
Dechl Ctrl C	0/500	5	5	5	8.1	8.4	8.5	24.3	24.1	23.9	7.8	7.7	7.9	260	280
Dechl Ctrl D	0/500	5	5	5	8.0	8.4	8.5	24.3	23.8	24.2	7.8	7.6	8.0	265	280
100% A	500/0	5	5	5	7.3	7.9	8.0	24.2	23.6	23.8	7.8	7.8	7.9	1025	1100
100% B	500/0	5	5	5	7.3	7.9	8.0	24.3	23.7	24.0	7.7	7.8	7.9	1050	1095
100 % C	500/0	5	5	5	7.3	7.9	8.0	24.3	23.8	24.2	7.8	7.7	7.5	1055	1095
100% D	500/0	5	5	5	7.3	7.9	8.0	23.9	23.6	23.8	7.7	7.6	7.4	1055	1130
Dechl 100 A	500/0	5	5	5	7.1	7.9	8.0	23.9	23.5	24.0	7.8	7.7	7.6	1060	1150
Dechl 100 B	500/0	5	5	5	7.1	7.9	8.0	24.0	23.6	23.9	7.7	7.6	7.6	1065	1120
Dechl 100 C	500/0	5	5	5	7.1	7.8	8.0	24.0	24.0	24.2	7.5	7.6	7.4	1065	1095
Dechl 100 D	500/0	5	5	5	7.1	7.9	8.0	23.0	23.6	24.1	7.3	7.6	7.3	1045	1155

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.0-24.5°C.
Incubator #3 temperature range for the test period was 25.0-25.5°C.

LIMS	
Job number:	TLH-2002-02-12-36
sample number:	576397

Data Transcription Verification	
date:	4/8/02
by:	Cathy Oaks
	Della Parker-Hanson

Total Residual CL2	mg/L	Method
Field:	0.37	-
Lab:	0.13	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:	2.61	0.021

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water (fish):	131	126
Control water (water flea):	76	76
100% Sample:	87	353

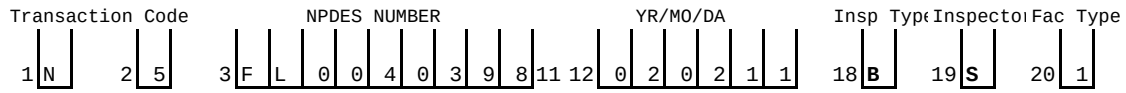
Table 2. Results of chemical analyses on the effluent from the Cooper City Wastewater Treatment Plant, sampled on February 11, 2002.

Metals		
Calcium	127	mg/L
Iron	390	µg/L
Magnesium	10.2	mg/L
Selenium	0.85	µg/L [I]
Nutrients		
Ammonia	2.3	mg N/L
Nitrite+Nitrate	7.4	mg N/L
Total Kjeldahl Nitrogen	4.4	mg N/L
Orthophosphate	0.40	mg P/L
Total Phosphorus	0.51	mg P/L
Pesticides and Herbicides		
Atrazine	0.72	µg/L
Fonofos	0.2	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 Cooper City Wastewater Treatment Plant effluent sampled on February 11, 2002, NPDES # FL0040398.

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

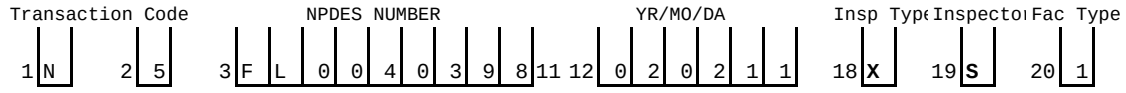


Remarks

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The Priority Pollutants Analysis for the Bioassay of the Cooper City Wastewater Treatment Plant effluent sampled on February 11, 2002, NPDES # FL0040398.

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



Remarks

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