

Bioassays of

Cross City Wastewater Treatment Facility

Cross City, Dixie County, Florida

NPDES #FL0027791

Sampled 3/11/02

August 2002

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

Bioassays of

Cross City Wastewater Treatment Facility

Cross City, Dixie County, Florida

NPDES #FL0027791

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Bureau of Laboratories
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Introduction

Cross City Wastewater Treatment Facility, Hill and Boundary Street, Cross City, Dixie County, Florida, NPDES #FL0027791, tests performed on 12 to 14 March 2002.

The Cross City Wastewater Treatment Facility consists of two extended-aeration wastewater treatment plants having a combined design flow of 0.400 MGD and an average combined flow of 0.185 MGD (average flow -April 2002). Wastewater is chlorinated for disinfection at each treatment plant. The wastewater from each plant is combined into a single stream after leaving the two separate chlorine contact chambers. The combined wastewater is dechlorinated with sulfur-dioxide gas prior to being discharged to the Class III freshwaters of Belly Deep Creek. Sludge from the treatment plants is land applied on the 79-acre J.R. Douglas site (facility information provided by Azeem Syed, FDEP, Jacksonville, and Mr. C.M. Odom, Cross City WWTF, Cross City).

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 the Cross City WWTF. The freshwater test species, the waterflea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*, were used in these bioassays. The test results did not indicate toxicity to either test species within 48 hours (Table 1).

The total residual chlorine (TRC) concentration in the bioassay sample was 0.008 mg/L in the field and less than the laboratory detection limit of 0.03 mg/L in the laboratory. Total and unionized ammonia concentrations were 0.197 mg/L and 0.010 mg/L, respectively in the bioassay sample. The total ammonia concentration in the sample preserved for chemical analysis was 0.54 mg/L. Additional samples of effluent were collected from this facility and analyzed for herbicides, nutrients, metals, organic compounds, and pesticides. Nutrients and several metals were identified (Table 2).

Conclusion

The sample of effluent collected from this facility on March 11, 2002, did not show acute toxicity to either test species within 48 hours.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Cross City Wastewater Treatment Facility, Hill and Boundary Street, Cross City, Dixie County, Florida, NPDES# FL0027791, performed from 12 to 14 March 2002.

Facility:	**Cross City Wastewater Treatment Facility**	**NPDES #**	**FL0027791**	Facility Type:	**Wastewater Treatment**	**Analysts:**	Della Parker-Hanson
Location:	Hill and Boundary Street, Cross City	Contact/District:	P. O'Conner/Northeast				Joshua Ayres
County:	Dixie	Test type:	static acute screen				Gary Hardie
Sample Collection Date:	3/11/02 Time: 1140	# tests:	2	Receiving Water:	Belly Deep Creek		Marshall Faircloth
Test Beginning Date:	3/12/02 Time: 1620	Chlorination Type:	Chlorinated	Classification:	Class III Freshwater		
Test Ending Date:	3/14/02 Time: 1615		sample collected after dechlorination		**Page 1 of 1**	**Reviewer:**	David Whiting

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

														Conductivity Uncorrected	
	Sample/Diluent	**SURVIVAL # Alive**			pH			Temperature[A]			Dissolved Oxygen			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	4	4	8.0	-	8.2	25.0	-	24.2	7.9	-	7.5	165	175
Control B	0/20	5	5	5	-	-	8.1	-	-	24.2	-	-	7.6	-	190
Control C	0/20	5	5	5	-	-	8.1	-	-	24.1	-	-	7.7	-	195
Control D	0/20	5	5	5	-	-	8.1	-	-	24.0	-	-	7.7	-	190
100% A	20/0	5	5	5	7.8	-	8.7	25.3	-	24.1	7.8	-	7.8	700	660
100% B	20/0	5	5	5	-	-	8.7	-	-	24.1	-	-	7.8	-	715
100% C	20/0	5	5	5	-	-	8.7	-	-	24.1	-	-	7.9	-	705
100% D	20/0	5	5	5	-	-	8.7	-	-	24.1	-	-	7.9	-	690

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

Organism: ***Cyprinella leedsi*** Life stage: 10 days

														Conductivity Uncorrected	
	Sample/Diluent	**SURVIVAL # Alive**			pH			Temperature[B]			Dissolved Oxygen			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	8.4	24.2	24.7	24.9	7.9	7.6	7.8	250	270
Control B	0/500	5	5	5	8.0	8.4	8.4	24.3	24.4	24.8	7.9	7.5	7.9	260	275
Control C	0/500	5	5	5	8.0	8.4	8.4	24.3	24.4	24.4	7.9	7.6	7.9	260	270
Cotnrol D	0/500	5	5	5	8.1	8.4	8.4	24.3	24.4	24.4	7.9	7.5	8.0	260	275
100% A	500/0	5	5	5	7.9	8.3	8.5	24.3	24.4	24.6	7.9	7.5	7.9	690	675
100% B	500/0	5	5	5	7.9	8.3	8.5	24.2	24.3	24.6	7.9	7.4	7.3	705	705
100 % C	500/0	5	5	5	7.9	8.3	8.5	24.2	24.8	24.6	7.9	7.2	7.2	690	720
100% D	500/0	5	5	5	7.9	8.3	8.5	24.2	24.6	24.4	7.9	7.1	7.2	710	700

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.5-25.0°C.
Incubator #3 temperature range for the test period was 24.5-26.0°C.

LIMS	
Job number:	TLH-2002-03-12-05
sample number:	581741

Data Transcription Verification	
date:	8/13/02
by:	Jacquelyn Brynda
	Christa Pierini

Total Residual CL2	mg/L	Method
Field:	0.008	-
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:	0.197	0.010

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water (fish):	142	134
Control water (water flea):	72	74
100% Sample:	265	261

Table 2. Results of chemical analyses on the effluent from Cross City Wastewater Treatment Facility sampled on March 11, 2002.

Metals

Arsenic	13	µg/L	
Calcium	92.5	mg/L	
Cadmium	0.057	µg/L	I
Copper	7.9	µg/L	
Iron	410	µg/L	
Lead	0.56	µg/L	I
Magnesium	10.8	mg/L	
Silver	0.12	µg/L	AJ
Zinc	29.6	µg/L	

Nutrients

Ammonia	0.54	mg N/L	A
Nitrite+Nitrate	5.7	mg N/L	
Total Kjeldahl Nitrogen	2.6	mg N/L	A
Orthophosphate	1.4	mg P/L	I
Total Phosphorus	3.0	mg P/L	A

Pesticides and Herbicides

None detected

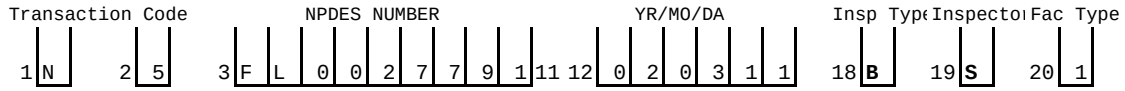
Base, Neutral, & Acid Extractable Organics

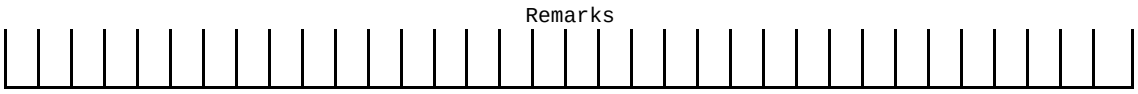
None detected

[A] Value reported is the mean of two or more determinations.
[I] The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
[J] Estimated value.

The Bioassay of the Cross City WWTF effluent sampled on March 11, 2002, NPDES #FL0027791.

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





The Priority Pollutants Analysis for the Bioassay of the Cross City WWTF effluent sampled on March 11, 2002, NPDES #FL0027791.

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

