

Bioassays of the City of

Milton Wastewater Treatment Facility

Milton, Santa Rosa County, Florida

NPDES #FL0021903

Sampled 9/5/00

April 2001

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

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Milton Wastewater Treatment Facility

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Biology Section
Bureau of Laboratories
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Introduction

City of Milton Wastewater Treatment Facility, East Walker Street, Milton, Santa Rosa County, Florida, NPDES #FL0021903, tests performed on 6 to 8 September 2000.

This carrousel activated sludge wastewater treatment facility has a three-month average daily flow of 2.5 MGD. The wastewater treatment system includes an influent pump station, pretreatment, an oxidation ditch, clarification, chlorination for disinfection, and dechlorination. After the dechlorination process, which uses sulfur dioxide gas and sodium thiosulfate, treated effluent is discharged into the Class III fresh waters of the Blackwater River.

Residuals are aerobically digested, and both wet and dried residuals are land applied. The permit allows this facility to apply approximately 6,800 GPD of reclaimed water to the area within the 1.75-acre treatment facility compound (facility summary provided by Kenny Ferguson, FDEP, Pensacola).

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 City of Milton Wastewater Treatment Facility. The test species used for these bioassays were the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*. The test results indicated that the sample was not toxic to the *C. dubia* or the *C. leedsi* test organisms by 48 hours (Table 1).

Total residual chlorine and total ammonia were not detected in the sample. Further chemical analyses were performed on the sample, and several metals were identified (Table 2). The concentration of silver found in the sample (0.083 µg/L) exceeded the State of Florida Class III fresh water surface water quality criterion for silver (0.07 µg/L).

Conclusion

The sample of effluent collected from this facility on September 5, 2000, did not show toxicity. The concentration of silver detected within the sample exceeded the State of Florida Class III fresh water surface water quality criterion for silver.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the City of Milton WWTF, East Walker Street, Milton, Santa Rosa County, Florida, NPDES# FL0021903 performed on 6 to 8 September 2000.

Facility:	**City of Milton WWTF**			**NPDES #**	**FL0021903**	Facility Type:	**Wastewater**
Location:	East Walker Street			Contact/District:	G. Smith/G. Butts/ Northwest		**Treatment Facility**
County:	Santa Rosa			Test type:	static acute screen		
Sample Collection Date:	9/5/00	Time:	1040	# tests:	2	Receiving Water:	Blackwater River
Test Beginning Date:	9/6/00	Time:	1130	Chlorination Type:	dechlorinated		
Test Ending Date:	9/8/00	Time:	1115		sample collected after dechlorination		**Page 1 of 1**

Total Residual Cl2	mg/L	Method
Field:	N/A	N/A
Lab:	<0.03	DR-100

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):	133	128
20% Dilute Mineral Water (cladocerans):	75	84
100% Sample:	66	74

Salinity[C]	(ppt)
Control Water:	<1
100% Sample:	<1

[C] Salinity based on conductivity and temperature measurements.

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

	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	7.7	-	8.3	24.8	-	23.9	8.1	-	7.9	175	255
Control B	0/20	5	5	5	-	-	8.5	-	-	23.8	-	-	7.9	-	230
Control C	0/20	5	5	5	-	-	8.4	-	-	23.9	-	-	7.8	-	220
Control D	0/20	5	5	5	-	-	8.4	-	-	24.6	-	-	7.7	-	215
100% A	20/0	5	5	5	7.3	-	8.2	25.0	-	23.9	7.6	-	7.8	385	535
100% B	20/0	5	5	5	-	-	8.2	-	-	23.8	-	-	7.8	-	465
100% C	20/0	5	5	5	-	-	8.2	-	-	24.2	-	-	7.8	-	445
100% D	20/0	5	5	5	-	-	8.2	-	-	24.7	-	-	7.7	-	450

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.5-25.5°C.
Incubator #3 temperature range for the test period was 24.1-25.0°C.

Organism: ***Cyprinella leedsi*** Age: 12 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	7.9	8.2	8.4	24.7	24.9	25.7	7.7	7.6	7.5	250	270
Control B	0/500	5	5	5	8.0	8.3	8.4	24.6	24.8	25.5	7.8	7.6	7.6	250	265
Control C	0/500	5	5	5	8.0	8.3	8.5	24.5	24.6	25.3	7.8	7.6	7.6	250	265
Control D	0/500	5	5	5	8.0	8.3	8.5	24.5	24.9	24.8	7.8	7.6	7.6	250	265
100% A	500/0	5	5	5	7.3	7.8	8.0	25.1	24.8	24.8	7.7	7.3	7.5	395	420
100% B	500/0	5	5	5	7.3	7.8	8.0	25.2	25.5	24.8	7.7	7.2	7.5	395	415
100% C	500/0	5	5	5	7.3	7.8	8.0	25.3	25.2	25.2	7.7	7.1	7.5	395	415
100% D	500/0	5	5	5	7.3	7.8	8.0	25.3	25.0	25.1	7.7	7.2	7.3	395	415

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24 24.5-25.5°C
Incubator #3 temperature range for the test period was 24.1-25.0°C.

Table 2. Results of chemical analyses on the effluent from The City of Milton WWTF sampled on September 5, 2000.

Metals

Cadmium	0.27 µg/L	
Calcium	26.1 mg/L	
Copper	6.8 µg/L	
Iron	28 µg/L	I
Lead	0.92 µg/L	I
Magnesium	1.8 mg/L	
Nickel	2.5 µg/L	I
Silver	0.083µg/L	I
Zinc	44.3 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 minimum detection limit.

FDEP Biology Section — Acute Bioassay Bench Sheet

ample Source: City of Milton
County: Santa Rosa
ntact / District: Greg Smith / Glenn Butts / NW-DIST
DES Permit #: FL0021903
MS Sample #: 478779 LIMS Job #: TLH-20000904-06-04

Sample Collection: Date 9/5/00 Time 1040
Test Beginning: Date 9/6/00 Time 1135
Test Ending: Date 9/8/00 Time 1115
Organism Batch #: 47 Diluent Batch #: DMW27
Organism Age: < 24 hrs. SRT toxicant batch #: —

sample log
st Type: Screening | Definitive
Static | Static Renewal | Flow-through
st Number: 1 of 2

Remarks:

Test organism: C. dubia

Conc.	Chamber #	Number Live 0 hr	Number Live 24 h	Number Live 48 h	pH 0 hr	pH 24 h	pH 48 h	Temperature (°C) 0 hr	Temperature (°C) 24 h	Temperature (°C) 48 h	D.O. (mg/L) 0 hr	D.O. (mg/L) 24 h	D.O. (mg/L) 48 h	UNCORRECTED Cond. (mmhos/cm) Cond (µmhos/cm) 0 hr	24 h	48 h
NTC A	A	5	5	5	7.7	—	8.3	24.8	—	23.9	8.1	—	7.9	175	—	255
B	B	5	5	5	—	—	8.5	—	—	23.8	—	—	7.9	—	—	230
C	C	5	5	5	—	—	8.4	—	—	23.9	—	—	7.8	—	—	220
D	D	5	5	5	—	—	8.4	—	—	24.6	—	—	7.7	—	—	215
100% A	A	5	5	5	7.3	—	8.2	25.0	—	23.9	7.6	—	7.8	385	—	535
B	B	5	5	5	—	—	8.2	—	—	23.8	—	—	7.8	—	—	465
C	C	5	5	5	—	—	8.2	—	—	24.2	—	—	7.8	—	—	445
D	D	5	5	5	—	—	8.2	—	—	24.7	—	—	7.7	—	—	450
measured by:		DPH	SG	SG	DPH	—	SG	DPH	—	SG	DPH	—	SG	DPH	—	SG
recorded by:		SG	SG	SG	YMK	—	YMK	YMK	—	YMK	YMK	—	YMK	YMK	—	YMK

nvestigators' Signatures

Temperature Range °C
Incubator # 3 24.1-25.0°C
Room B246 24.5-25.5°C

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			NA	NA	NA	SG
Lab Total Residual Cl2 (mg/L):		<0.03	<0.03	DR100	DPH/YMK	SG
Alkalinity (mg/L as $CaCO_3$):	/	75	66	Hach	SG	SG
Hardness (mg/L as $CaCO_3$):		84	74	Hach	SG	SG
Total ammonia (mg/L as N):		<0.017	<0.017	Denver	YMK/SG	SG
Salinity:		0	0	Ysi	DPH	SG

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FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: City of Milton
County: Santa Rosa
Contact / District: Greg Smith / Glenn Butts / NW-DIST
NPDES Permit #: FL0021903
LIMS Sample #: 478279 LIMS Job #: TLH-2000-09-06-04
sample log ____
Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through
Test Number: 2 of 2

Remarks:

Sample Collection: Date 9/5/00 Time 1040
Test Beginning: Date 9/6/00 Time 1130
Test Ending: Date 9/8/00 Time 1115
Organism Batch #: 69 Diluent Batch #: Well
Organism Age: 12 days SRT toxicant batch #: —
Test organism: C. leedsi

Conc.	Chamber #	Number Live 0 hr	24 h	48 h	pH 0 hr	24 h	48 h	Temperature (°C) 0 hr	24 h	48 h	D.O. (mg/L) 0 hr	24 h	48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
CNTL. A	E1	5	5	5	7.9	8.2	8.4	24.7	24.9	25.7	7.7	7.6	7.5	250	270	270
B	E2	5	5	5	8.0	8.3	8.4	24.6	24.8	25.5	7.8	7.6	7.6	250	255	265
C	E3	5	5	5	8.0	8.3	8.5	24.5	24.6	25.3	7.8	7.6	7.6	250	260	265
D	E4	5	5	5	8.0	8.3	8.5	24.5	24.9	25.0	7.8	7.6	7.6	250	260	265
100% A	E5	5	5	5	7.3	7.8	8.0	25.1	24.8	24.8	7.7	7.3	7.5	380	400	420
B	E6	5	5	5	7.3	7.8	8.0	25.2	25.5	24.8	7.7	7.2	7.5	395	405	415
C	E7	5	5	5	7.3	7.8	8.0	25.3	25.2	25.2	7.7	7.1	7.5	395	405	415
D	E8	5	5	5	7.3	7.8	8.0	25.3	25.0	25.1	7.7	7.2	7.3	395	405	415
measured by:		SG	SG	SG	DPH	SG	YMK	DPH	SG	YMK	DPH	SG	YMK	DPH	SG	YMK
recorded by:		YMK	SG	SG	YMK	JA	DPH	YMK	JA	DPH	YMK	JA	DPH	YMK	JA	DPH

(C) (A) F.O. Fourthen obser.

Investigators' Signatures
Sharron Gerardi
Della Parker Hanson
Tom Fatter
John Lyons

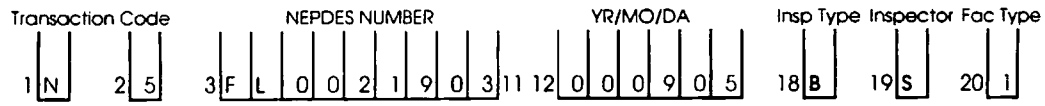
Temperature Range °C
Incubator # 3 24.1-25.1°C
Room B246 24.5-25.5°C

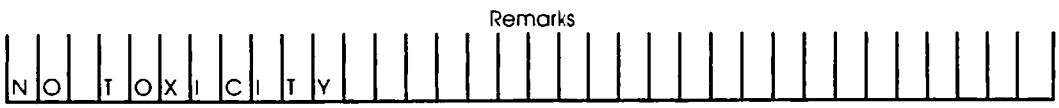
Water Quality Parameters	Salt Water (Well Water)	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			NA	NA	NA	SG
Lab Total Residual Cl2 (mg/L):	<0.03		<0.03	DR100	DPH/YMK	SG
Alkalinity (mg/L as $CaCO_3$):	133		66	Hach	JG	SG
Hardness (mg/L as $CaCO_3$):	128		74	Hach	SG	JG
Total ammonia (mg/L as N):	<0.017		<0.017	Denver	YMK/SG	SG
Salinity:	0		0	Ysi	DPH	SG

reviewer
form updated 3/3/99

The Bioassay of the City of Milton Wastewater Treatment Facility effluent sampled on September 5, 2000, NPDES #FL0021903.

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





The Priority Pollutants Analysis for Bioassay of the City of Milton Wastewater Treatment Facility effluent sampled on September 5, 2000, NPDES #FL0021903.

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

