

Bioassays of the Town of

Century Wastewater Treatment Plant

Century, Escambia County, Florida

NPDES #FL0032468

Sampled 10/5/99

June 2000

Biology Section

Division of Administrative & Technical Services

Comprehensive Quality Assurance Plan #870346G

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Century, Escambia County, Florida

NPDES #FL0032468

Biology Section
Bureau of Laboratories
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Introduction

Town of Century WWTP, Century, Escambia County, Florida, NPDES #FL0032468, tests performed on 6 to 8, October 1999.

This wastewater treatment plant is located on Jefferson Street in Century, Florida. This facility, a conventional extended-aeration WWTP providing secondary treatment, has a design flow of 0.450 MGD and a monthly average daily flow of 0.273 MGD. The flow during the sample collection was 0.248 MGD. The treatment process consists of flow equalization, influent screening, aeration, secondary clarification, chlorination, dechlorination, and post-aeration. Effluent is discharged into the class III waters of the Escambia River (facility summary provided by Glenn Butts, Kenny Ferguson, and Kim Allen, 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 Town of Century WWTP. The test species used for these bioassays were the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*. The effluent was sampled at 0930 on 4 October 1999, and was received in the Biology Section at 1130 on 6 October 1999. The bioassay tests were initiated at 1415 on 6, October 1999; therefore, the sample exceeded the recommended maximum holding time of 36 hours.

Although the test results did not indicate toxicity (Table 1), the results should be used for informational purposes only.

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 copper concentration (25.4 µg/L) in the sample exceeded the State of Florida Class III Freshwater Standard for copper of 6.98 µg/L at a calculated hardness of 54mg/L (as $CaCO_3$) (FAC 62.302).

Conclusion

The sample of effluent collected from this facility on October 4, 1999, did not show toxicity. However, the sample exceeded the maximum recommended holding time and the results should be used for information only.

Introduction

Marcus Bayou WRF, 3050 Fayal Drive, Escambia County, Pensacola, Florida, NPDES #FL0031801, tests performed on 28 to 30 September 1999.

This Water Reclamation Facility, having a permitted capacity of 8.2 MGD was constructed by the expansion and modification of an existing 2.0 MGD WRF. The facility was permitted as an extended-aeration advanced domestic wastewater treatment plant. The facility has a mean flow of 2.592 MGD. The flow during the survey was 3.532 MGD. Treatment of effluent includes influent fine screening, anoxic/oxic activated sludge biological treatment, alum addition for phosphorus removal, secondary clarification, tertiary filters, and effluent ultraviolet disinfection. Effluent is discharged into the Bayou Marcus wetlands with discharge from the wetlands into Perdido Bay (facility summary provided by Glenn Butts, Kenny Ferguson, and Kim Allen, 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 Marcus Bayou WRF. The test species used for these bioassays were the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*. The test results did not indicate toxicity (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 and pesticides were identified (Table 2).

Conclusion

The sample of effluent collected from this facility on September 27, 1999, did not show toxicity.

Table1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Town of Century WWTP, Century, Escambia County, Florida, NPDES# FL000032468, performed on 6 to 8 October, 1999.

Facility:	Town of Century WWTP			NPDES #	FL0032468	Facility Type:	Wastewater
Location:	Jefferson Street			Contact/District:	Glenn Butts/Northwest		Treatment Plant
County:	Escambia			Test type:	static acute screen		
Sample Collection Date:	10/4/99	Time:	0930	# tests:	2	Receiving Water:	Escambia River
Test Beginning Date:	10/6/99	Time:	1415	Chlorination Type:	Dechlorinated		
Test Ending Date:	10/8/99	Time:	1430		sample collected after plant dechlorination		Page 1 of 1

Total Residual CL2	mg/L	Method
Field:	<0.04	-
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):	141	144
20% Dilute Mineral Water (cladocerans):	75	85
100% Sample:	30	62

Salinity[C]	(ppt)
Control Water:	0
100% Sample:	0

[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	8.2	-	8.3	25.3	-	24.6	7.2	-	7.2	170	200
Control B	0/20	5	5	5	-	-	8.4	-	-	24.6	-	-	7.4	-	190
Control C	0/20	5	5	5	-	-	8.4	-	-	24.4	-	-	7.5	-	200
Control D	0/20	5	5	5	-	-	8.4	-	-	24.3	-	-	7.6	-	210
100% A	20/0	5	5	5	7.0	-	7.8	25.2	-	24.3	7.4	-	7.7	345	410
100% B	20/0	5	5	5	-	-	7.8	-	-	24.3	-	-	7.7	-	415
100% C	20/0	5	5	5	-	-	7.7	-	-	24.2	-	-	7.7	-	440
100% D	20/0	5	5	5	-	-	7.7	-	-	24.2	-	-	7.7	-	440

[A] Temperatures of room and test incubator were continously recorded on a strip chart recorder.
Room Temperature range for the test period was 25.0-26.5°C.
Incubator #2 temperature range for the test period was 25.0-26.0°C.

Organism: *Cyprinella leedsi* Age: 11 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	25.5	25.3	24.5	6.9	7.0	7.4	255	260
Control B	0/500	5	5	5	8.0	8.4	8.5	25.4	24.7	24.7	7.0	7.0	7.6	270	275
Control C	0/500	5	5	5	8.0	8.4	8.5	25.2	24.8	24.1	7.4	7.4	7.7	260	260
Control D	0/500	5	5	5	8.0	8.4	8.5	25.1	24.8	24.4	7.4	7.4	7.6	260	260
100% A	500/0	5	5	5	7.0	7.5	7.5	25.2	24.8	24.6	7.4	6.9	7.4	380	390
100% B	500/0	5	5	5	6.9	7.5	7.5	25.3	24.7	24.3	7.2	7.2	6.9	380	385
100% C	500/0	5	5	5	6.9	7.4	7.5	25.1	24.5	24.4	7.1	7.3	7.5	380	400
100% D	500/0	5	5	5	6.9	7.4	7.5	25.1	24.7	24.3	7.0	7.4	7.5	380	380

B Temperatures of room and test incubator were continously recorded on a strip chart recorder.
Room Temperature range for the test period was 25.0-26.5°C.
Incubator #3 temperature range for the test period was 24.5-25.5°C.

Table 2. Results of chemical analyses on the effluent from the Town of Century Wastewater Treatment Plant sampled on October 4, 1999.

Metals

Aluminum	56	µg/L[I]
Cadmium	0.11	µg/L[I]
Calcium	18.9	mg/L
Copper	25.4	µg/L
Iron	76	µg/L
Lead	0.27	µg/L[I]
Magnesium	1.7	mg/L
Nickel	2.7	µg/L[I]

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

Sample Source: Century WWTP
County: Escambia
Contact / District: Glenn Butts / Northwest
NPDES Permit #: FL0032468
LIMS Sample #: 410979 **LIMS Job #:** TCH-1999-10-06-05
sample log 10/6/99 MF

Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Test Number: 2 of 2

Sample Collection: Date 10/4/99 Time 0930
Test Beginning: Date 10/6/99 Time 14:30
Test Ending: Date 10/8/99 Time 14:30
Organism Batch #: 50 **Diluent Batch #:** DMW #40
Organism Age: 24 hrs. **SRT toxicant batch #:** —
Test organism: Ceriodaphnia dubia

Remarks:
Sample was not received on the 5th as scheduled. (1 day past deadline.)

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
Cont.	A	5	5	5	8.2	–	8.3	25.3	–	24.6	7.2	–	7.2	170	–	~~170~~ 210
	B	5	5	5	–	–	8.4	–	–	24.6	–	–	7.4	–	–	190
	C	5	5	5	–	–	8.4	–	–	24.4	–	–	7.5	–	–	200
	D	5	5	5	–	–	8.4	–	–	24.3	–	–	7.6	–	–	210
100%	A	5	5	5	7.0	–	7.8	25.2	–	24.3	7.4	–	7.7	345	–	410
	B	5	5	5	–	–	7.8	–	–	24.3	–	–	7.7	–	–	415
	C	5	5	5	–	–	7.7	–	–	24.2	–	–	7.7	–	–	440
	D	5	5	5	–	–	7.7	–	–	24.2	–	–	7.7	–	–	440
measured by:		MF	SH	SH	CH		CH	CH		CH	CH		CH	CH		CH
recorded by:		SH	SH	SH	SH		SH	SH		SH	SH		SH	SH		SH

Investigators' Signatures
Shannon Gerard
Marshall Faircloth
Courtney Hess

Temperature Range °C
Incubator # 2 25.0°C-26.0°C
Room B24 25.0°C-26.5°C

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			<0.04	—	Glenn Butts	Glenn Butts
Lab Total Residual Cl2 (mg/L):		<0.03	<0.03	FREE	CH	SH
Alkalinity (mg/L as $CaCO_3$):		75	30	HACH	CH	SH
Hardness (mg/L as $CaCO_3$):		85	62	HACH	CH	SH
Total ammonia (mg/L as N):		<0.017	<0.017	Denver	MF	SH
Salinity:		0	0	YSI	CH	SH

Jeff Wolfe
reviewer

form updated 3/3/99

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Century WWTP
County: Escambia
Contact / District: Glenn Butts / Northwest
NPDES Permit #: FL0032468
LIMS Sample #: 410979 LIMS Job #: TLH-1999-10-06-05
sample log 10/8/99 MF
Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Test Number: 1 of 2

Sample Collection: Date 10/4/99 Time 0930
Test Beginning: Date 10/6/99 Time 14:15
Test Ending: Date 10/8/99 Time 14:30
Organism Batch #: 76 Diluent Batch #: Well
Organism Age: 12 days SRT toxicant batch #: —
Test organism: Cyprinella leedsi

Remarks: Sample was not received on the 5th as scheduled. (1day past deadline.)

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
Cont. A	H9	5	5	5	8.0	8.3	8.5	25.5	25.3	24.5	6.9	7.0	7.4	255	265	260
B	H10	5	5	5	8.0	8.4	8.5	25.4	24.7	24.7	7.0	7.0	7.6	270	265	275
C	H11	5	5	5	8.0	8.4	8.5	25.2	24.8	24.1	7.4	7.4	7.7	260	260	260
D	H12	5	5	5	8.0	8.4	8.5	25.1	24.8	24.4	7.4	7.4	7.6	260	255	260
100% A	H13	5	5	5	7.0	7.5	7.5	25.2	24.8	24.6	7.4	6.9	~~27.4~~	380	380	390
B	H14	5	5	5	6.9	7.5	7.5	25.3	24.7	24.3	7.2	7.2	6.9	380	370	385
C	H15	5	5	5	6.9	7.4	7.5	25.1	24.5	24.4	7.1	7.3	7.5	380	385	400
D	H16	5	5	5	6.9	7.4	7.5	25.1	24.7	24.3	7.0	7.4	7.5	380	370	380
			SG													
measured by:		SG	~~CH~~	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH
recorded by:		MF	SG	CH	SG	SG	SG	SG	SG	SG	SG	SG	SG	SG	SG	SG

Investigators' Signatures
Shannon Gerard
Marshall Faircloth
Century Area

Temperature Range °C
Incubator # 3 24.5°C-25.5°C
Room B216 25.0°C-26.5°C

Water Quality Parameters	Salt Water: Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			<0.04	—	Glenn Butts	Glenn Butts
Lab Total Residual Cl2 (mg/L):	<0.03		<0.03	PR100	CH	SG
Alkalinity (mg/L as $CaCO_3$):	141		30	HACH	CH	SG
Hardness (mg/L as $CaCO_3$):	144		92	HACH	CH	SG
Total ammonia (mg/L as N):	<0.017		<0.017	Denver	MF	SG
Salinity:	0		0	ysi	CH	SG

reviewer
form updated 3/3/99