

Bioassays of

Lake Forest Chiropractic Wastewater Treatment Plant

Jacksonville, Duval County, Florida

NPDES #FL0043982

Sampled 12/7/98

March 1999

Biology Section
Division of Administrative & Technical Services
Comprehensive Quality Assurance Plan #870346G

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Introduction

Lake Forest Chiropractic (Community Rehabilitation Center) WWTP, 7240 Lem Turner Blvd., Jacksonville, Duval County, Florida, NPDES #FL0043982, tests performed on 8 to 10 December 1998.

This privately owned wastewater treatment plant has a design flow of 2,000 GPD and an average annual flow of 300 GPD. Wastewater is treated by extended aeration, chlorination for disinfection, and dechlorination with sodium sulfite prior to being discharged via an unnamed ditch into Moncrief Creek, which flows into the Trout River. The discharge from this facility is intermittent (facility summary provided by Kathleen Gerard, 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 from this facility. The species used for these tests were the waterflea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*. The test results did not show toxicity (Table 1).

Total residual chlorine was not detected in the sample. The total ammonia and unionized ammonia concentrations were 0.190 mg/L and 0.003 mg/L, respectively. Further chemical analyses were performed on the sample and several metals were identified (Table 2). The lead concentration (10.2 µg/L) and the silver concentration exceeded their respective State of Florida Class III freshwater surface water criteria for lead (9.70 µg/L) and silver (≤0.07 µg/L) (FAC 62-302.530).

Conclusion

The sample of effluent collected from this facility on December 7, 1998 did not show toxicity. The lead and silver concentrations exceeded the State of Florida Class III freshwater-surface water criteria for lead and silver.

Table 1. Data recorded during the 48-hour acute toxicity screening bioassays of a sample of effluent from the Lake Forest Chiropractic WWTP, Jacksonville, Duval County, Florida, NPDES# FL0043982, performed on 8 to 10 December, 1998.

Facility:	Lake Forest Chiropractic WWTP			NPDES #	FL0043982	Facility Type:	Wastewater
Location:	7240 Lem Turner Blvd., Jacksonville			Contact/District:	Kathleen Gerard/Northeast		Treatment Facility
County:	Duval			Test type:	static acute screen	Receiving Water:	Drainage Ditch to
Sample Collection Date:	12/7/98	Time:	1210	# tests:	2		Moncriel Creek to the
Test Beginning Date:	12/8/98	Time:	1750	Chlorination Type:	Chlorinated*		Trout River
Test Ending Date:	12/10/98	Time:	1645			Page 1 of 1	

*Sample collected after Plant Dechlorination unit

Total Residual CL2	mg/L	Method
Field:	not measured	
Lab:	<0.03	DR-100

Ammonia	Total (mg/L)	Unionized (mg/L)
Control Water (fish):	< 0.017	< 0.017
Control Water (20% DMW) (cladocerans):	< 0.017	< 0.017
100% Sample:	0.190	0.004

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	133	125
Control Water (20% DMW) (cladocerans):	85	86
100% Sample:	142	240

Salinity	(ppt)
Control Water (fish):	0
Control Water (20% DMW) (cladocerans):	0
100% Sample:	0

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

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[A]			Dissolved Oxygen			Conductivity 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	7.6	-	8.0	23.9	-	23.9	7.5	-	7.7	170	215
Control B	0/20	5	5	5	-	-	8.1	-	-	23.9	-	-	7.7	-	245
Control C	0/20	5	5	5	-	-	8.1	-	-	23.6	-	-	8.0	-	230
Control D	0/20	5	5	5	-	-	8.1	-	-	23.4	-	-	8.0	-	245
100% A	20/0	5	5	5	7.4	-	8.2	24.0	-	23.4	7.5	-	8.3	550	660
100% B	20/0	5	5	5	-	-	8.3	-	-	23.5	-	-	8.2	-	710
100% C	20/0	5	5	5	-	-	8.3	-	-	23.5	-	-	8.2	-	695
100% D	20/0	5	5	5	-	-	8.3	-	-	23.5	-	-	8.1	-	745

[A] Temperature of test incubator # 1 and test room were continuously recorded on strip chart recorders.
Incubator #1 temperature range for the test period was 23.4-24.4°C.
Test room temperature range for the test period was 25.2-25.8°C.

Organism: *Cyprinella leedsi* Age: 12 days

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[B]			Dissolved Oxygen			Conductivity 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	7.4	7.7	8.3	24.6	24.1	24.6	7.6	7.2	7.4	230	255
Control B	0/500	5	5	5	7.4	7.8	8.3	24.7	23.9	24.5	7.7	7.2	7.6	245	255
Control C	0/500	5	5	5	7.4	7.8	8.3	24.7	23.9	24.5	7.7	7.3	7.7	250	255
Control D	0/500	5	5	5	7.4	7.8	8.3	24.9	23.9	24.4	7.7	7.2	7.7	250	255
100% A	500/0	5	5	5	7.4	7.9	8.3	24.5	23.8	24.4	7.4	7.3	7.7	550	575
100% B	500/0	5	5	5	7.5	7.9	8.3	24.4	23.9	24.5	7.4	7.2	7.7	565	585
100% C	500/0	5	5	5	7.5	7.9	8.3	24.5	23.9	24.5	7.3	7.1	7.5	570	595
100% D	500/0	5	5	5	7.5	7.9	8.3	24.6	23.9	24.5	7.3	7.0	7.6	580	595

[B] Temperature of test incubator # 3 and test room were continuously recorded on strip chart recorders.
Incubator #3 temperature range for the test period was 25.0-25.8°C.
Test room temperature range for the test period was 25.2-25.8°C.

Table 2. Results of chemical analyses on the effluent from the Lake Forest Chiropractic WWTP, sampled on December 7, 1998.

Metals

Calcium	58.9	mg/L
Copper	13.1	µg/L
Iron	273	µg/L
Lead	10.2	µg/L
Magnesium	20.4	mg/L
Silver	2.40	µg/L[A]
Zinc	35	µg/L

Base, Neutral, & Acid Extractable Organics

None Detected

Pesticides

None Detected

[A] Value reported is the mean of two or more determinations.

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Lake Forest Chiropractic
County: Duval
Contact / District: R. Bowman / NED
NPDES Permit #: FL0043982
LIMS Sample #: 359600 LIMS Job #: TLH-1998-12-09-10
sample log 12/11/98 DW

Sample Collection: Date 12/7/98 Time 12:10
Test Beginning: Date 12/8/98 Time 17:50
Test Ending: Date 12/10/98 Time 1645
Organism Batch #: Mass Culture Diluent Batch #: 60
Organism Age: <24 hr SRT toxicant batch #: —
Test organism: Ceriodaphnia dubia

Test Type: (Screening) / Definitive
(Static) / Static Renewal / Flow-through
Test Number: 1 of 2

Remarks: Sample aerated for 10 minutes before pouring up the test. Initial D.O. was <40% saturation. DW 12/8/98

Incubator temperature range = (23.4-24.4) °C
Room temperature range = (25.2-25.8) °C

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	UNCORRECTED Cond. (mmhos/cm) (Cond. (µmhos/cm)) 24 h	UNCORRECTED Cond. (mmhos/cm) (Cond. (µmhos/cm)) 48 h
Ctr	A	5	5	5	7.6		8.0	23.9		23.7	7.5	~~7.8~~ (A)	7.8	170		215
Ctr	B	5	5	5			8.1			23.9		(A)	7.7			245
Ctr	C	5	5	5			8.1			23.6			8.0			230
Ctr	D	5	5	5			8.1			23.4			8.0			245
100%	A	5	5	5	7.4		8.2	24.0		23.4	7.5		8.3	550		660
100%	B	5	5	5			8.3			23.5			8.2			710
100%	C	5	5	5			8.3			23.5			8.2			695
100%	D	5	5	5			8.3			23.5			8.1			745
measured by:		DW	DW	FW	FW		DAW	FW		DAW	FW		DAW	FW		DAW
recorded by:		DW	DW	FW	CH		CH	CH		CH	CH		CH	CH		CH

(A) written in wrong column. DW 12/8/98 CH

Investigators' Signatures

Anthony Hall (DW)
Marshall Faircloth
Dennis R. Wimpee (DAW)

reviewer

form updated 5/22/98

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			not measured			MF
Lab Total Residual Cl2 (mg/L):		<0.03	<0.03	DR-100	CH	MF
Alkalinity (mg/L as $CaCO_3$):		85	142	Hach	CH	MF
Hardness (mg/L as $CaCO_3$):		86	240	Hach	CH	MF
Total ammonia (mg/L as N):		<0.017	0.190	orion	CH	MF
Salinity:		0	0	YSI meter	FW	MF

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Lake Forest Chlorinator
County: Duval
Contact / District: R. Bowman / NED
NPDES Permit #: FL0043982
LIMS Sample #: 359600 LIMS Job #: TLH-1998-12-09-10
sample log 12/11/98 DW
Test Type: Screening / Definitive
Static / Static Renewal / Flow-through
Test Number: 2 of 2
Incubator #3 temperature = (25.6-25.8)°C
Room temperature range = (25.2-25.6)°C

Sample Collection: Date 12/7/98 Time 17:10
Test Beginning: Date 12/8/98 Time 17:00
Test Ending: Date 12/10/98 Time 16:45
Organism Batch #: 94 Diluent Batch #: Well
Organism Age: 12 days SRT toxicant batch #: —
Test organism: Cyprinella leedsi

Remarks: Sample aerated for 10 minutes before pouring up the test. Initial D.O. was < 40% saturation. DW 12/8/98

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) 0 hr	UNCORRECTED Cond. (mmhos/cm) 24 h	UNCORRECTED Cond. (mmhos/cm) 48 h
Ctr A	A9	5	5	5	7.4	7.7	8.3	24.6	24.1	24.6	7.6	7.2	7.4	230	240	255
Ctr B	A10	5	5	5	7.4	7.8	8.3	24.7	23.9	24.5	7.7	7.2	7.6	245	245	255
Ctr C	A11	5	5	5	7.4	7.8	8.3	24.7	23.9	24.5	7.7	7.3	7.7	250	245	255
Ctr D	A12	5	5	5	7.4	7.8	8.3	24.9	23.9	24.4	7.7	7.2	7.7	250	245	255
100% A	A13	5	5	5	7.4	7.9	8.3	24.5	23.8	24.4	7.4	7.3	7.7	550	540	575
100% B	A14	5	5	5	7.5	7.9	8.3	24.4	23.9	24.5	7.4	7.2	7.7	565	565	585
100% C	A15	5	5	5	7.5	7.9	8.3	24.5	23.9	24.5	7.3	7.1	7.5	570	570	595
100% D	A16	5	5	5	7.5	7.9	8.3	24.6	23.9	24.5	7.3	7.0	7.6	550	570	595
measured by:		DW	FW	DAW	FW	CH	DAW	FW	CH	DAW	FW	CH	DAW	FW	CH	DAW
recorded by:		DW	FW	DAW	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH

Investigators' Signatures

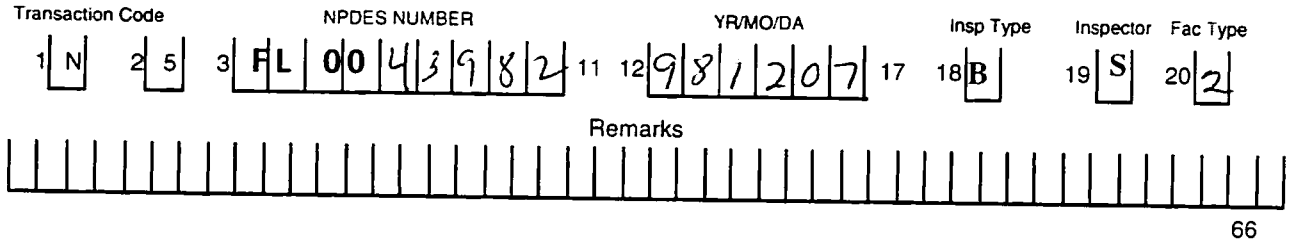
Salt Water: Well Water / 20% Min Water

Water Quality Parameters	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):		Not measured		MF
Lab Total Residual Cl2 (mg/L):	<0.03	DR-100	CH	MF
Alkalinity (mg/L as $CaCO_3$):	142	Hach	CH	MF
Hardness (mg/L as $CaCO_3$):	240	Hach	CH	MF
Total ammonia (mg/L as N):	0.190	Hach	CH	MF
Salinity:	0	Yorimeter	FW	MF

reviewer form updated 5/22/98

The Bioassay of the Lake Forest Chiropractic WWTP effluent sampled on December 7, 1998, NPDES #FL0043982.

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



The Priority Pollutants Analysis for the Bioassay of the Lake Forest Chiropractic WWTP effluent sampled on December 7, 1998, NPDES #FL0043982.

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

