

Bioassays of the City of

Clearwater Marshall Street Wastewater Treatment Plant

Clearwater, Pinellas County, Florida

NPDES #FL0021857

Sampled 2/26/96

April 1996

Biology Section

Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan #870346G

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Bureau of Laboratories
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Introduction

City of Clearwater Marshall Street WWTP, Clearwater, Pinellas County, Florida, NPDES #FL0021857, tests performed on 27 to 29 February, 1996.

This wastewater treatment plant is located at 1605 Harbor Drive in Clearwater. The facility has a design flow of 10.0 MGD and an average flow of 7-8 MGD. The wastewater treatment process includes advanced waste treatment by the Bardenpho process, which consists of primary anoxic and aeration tanks, secondary anoxic and aeration tanks, and clarification. Filtration, chlorination, and dechlorination are also part of the wastewater treatment process. Effluent is discharged into Stevenson Creek (facility summary provided by Brent Johnson, FDEP, TAMPA).

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 test species used for these bioassays were the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi*. The tests 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 two herbicides, atrazine and hexazinone, were identified (Table 2).

Conclusion

The sample of effluent collected from this facility on February 26, 1996, did not show toxicity.

Table 1. Data recorded during the 48-hour acute toxicity screening bioassays of a sample of effluent from the City of Clearwater Marshall Street WWTP, Clearwater, Pinellas County, Florida, NPDES#FL0021857, performed on 27 to 29 February, 1996.

Facility:	**City of Clearwater Marshall St. WWTP**		**NPDES #**	**FL0021857**	Facility Type: **WWTP**
Location:	1605 Harbor Drive		Contact/District:	B. Johnson/Southwest	
County:	Pinellas		Test type:	static acute screen	
Sample Collection Date:	**2/26/96**	Time: 1030	# tests:	2	Receiving Water: Stevenson Creek
Test Beginning Date:	2/27/96	Time: 1100	Chlorination Type:	Sample collected after dechlorination	
Test Ending Date:	2/29/96	Time: 1030			**Page 1 of 1**

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	0.00
20% Dilute Mineral Water (cladocerans):	< 0.017	0.00
100% Sample:	<0.017	0.000

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	115	125
20% Dilute Mineral Water (cladocerans):	70	80
100% Sample:	175	220

Salinity	(ppt)
Control Water:	0
100% Sample:	0

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	8.0	-	8.1	24.5	-	24.6	7.9	-	7.6	180	195
Control B	0/20	5	5	5	-	-	8.1	-	-	24.5	-	-	7.5	-	190
Control C	0/20	5	5	5	-	-	8.1	-	-	24.5	-	-	7.6	-	190
Control D	0/20	5	5	5	-	-	8.1	-	-	24.3	-	-	7.5	-	195
100% A	20/0	5	5	5	7.9	-	8.5	22.9	-	24.4	7.8	-	7.6	1020	1190
100% B	20/0	5	5	5	-	-	8.5	-	-	24.4	-	-	7.6	-	1105
100% C	20/0	5	5	5	-	-	8.5	-	-	24.4	-	-	7.5	-	1155
100% D	20/0	5	5	5	-	-	8.5	-	-	24.1	-	-	7.5	-	1150

[A] Temperature of test incubator was continously recorded on a strip chart recorder. Incubator temperature range for the test period was 24.4-25.5°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	24 hour
Control A	0/500	5	5	5	7.9	8.3	8.0	24.4	23.9	24.5	8.0	7.8	7.8	250	250
Control B	0/500	5	5	5	7.9	8.3	8.0	24.3	23.8	24.4	7.9	7.8	7.8	250	250
Control C	0/500	5	5	5	7.9	8.3	8.0	24.3	23.8	24.4	8.0	7.8	7.9	250	250
Control D	0/500	5	5	5	7.9	8.3	8.0	24.4	23.9	24.4	8.0	7.7	7.8	250	255
100% A	500/0	5	5	5	7.8	8.3	8.1	22.4	24.0	24.4	8.3	7.9	7.5	1035	1080
100% B	500/0	5	5	5	7.8	8.3	8.1	22.1	24.0	24.3	8.2	7.9	7.6	1030	1085
100% C	500/0	5	5	5	7.8	8.3	8.1	22.0	24.0	24.3	8.4	7.8	7.7	1025	1090
100% D	500/0	5	5	5	7.8	8.3	8.1	22.0	23.9	24.3	8.4	7.7	7.7	1025	1090

[B] Temperature of test room was continously recorded on a strip chart recorder. Room temperature range for the test period was 24.3-24.5°C.

Table 2. Results of chemical analyses on the effluent from the City of Clearwater Marshall Street WWTP sampled on February 26, 1996.

Metals

Cadmium	0.12	µg/L[I]
Calcium	69.0	mg/L[A]
Copper	4	µg/L[I]
Iron	17	µg/L[A]
Magnesium	10.6	mg/L[A]
Zinc	33	µg/L[A]

Pesticides and Herbicides

Atrazine	0.12	µg/L[I]
Hexazinone	0.20	µg/L[T]

Base, Neutral, & Acid Extractable Organics

none detected

A Value reported is the mean of two or more determinations.
I Value reported is less than the minimum quantitation limit and greater than or equal to the minimum detection limit.
T Value reported is less than the criterion of detection.

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Clearwater Marshall St.
County: Pinellas
Contact / District: Brent Johnson / Southwest
NPDES Permit #: FL0021857
LIMS Sample #: 130692 LIMS Job #: 96-Feb-27-21
sampled 2-29-96

Sample Collection: Date 2-26-96 Time 1030
Test Beginning: Date 2-27/96 Time 1100
Test Ending: Date 2-29-96 Time 1030
Organism Batch #: 10 Diluent Batch #: 9
Organism Age: <24 hrs
Test Organism: Ceriodaphnia dubia

Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through

Test Number: 1 of 2

Remarks:

Instrument Calibrations:	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	24.6 @ 24.6	8.2 @ 25.5 °C	108.1 @ 106.2 1414 @ 1409 @ 25.1 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	24.3 @ 24.4	8.2 @ 25.4 °C	106.7 @ 106.2 1404 @ 1409 @ 25.7 °C
48 hr	7.0 @ 7.0 7.0 @ 9.0	23.0 @ 23.1	8.1 @ 25.8 °C	107.4 @ 106.2 1413 @ 1409 @ 24.9 °C

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) (Cond. (µmhos/cm))		
Conc.	Chamber #	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
CTL	A	5	5	5	8.0		8.1	24.5		24.6	7.9		7.6	180		195
CTL	B	5	5	5			8.1			24.5			7.5			190
CTL	C	5	5	5			8.1			24.5			7.6			190
CTL	D	5	5	5			8.1			24.3			7.5			195
100%	A	5	5	5	7.9		8.5	22.9		24.4	7.8		7.6	1020		1190
100%	B	5	5	5			8.5			24.4			7.6			1105
100%	C	5	5	5			8.5			24.4			7.5			1155
100%	D	5	5	5			8.5			24.1			7.5			1150
Measured/Loaded by:		TM	TR	JS	JLS		MF	JLS		MF	JLS		MF	JLS		MF
Recorded by:		TM	TR	JS	JN		DW	JN		DW	JN		DW	JN		DW

Investigators' Signatures

Jennifer Sparapani
Tina Mikulski
reviewer

form updated 5/05/95

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			—	—	—
Lab Total Residual Cl2 (mg/L):	—	<0.03	<0.03	DR100	TM
Alkalinity (mg/L as $CaCO_3$):	—	70	175	HACH	JLS
Hardness (mg/L as $CaCO_3$):	—	80	220	HACH	JLS
Total ammonia (mg/L as N):	—	<0.017	<0.017	Orion	JN

Ammonia Meter #98136 Ammonia Meter Slope: -57.7 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Clearwater Marshall St
County: Pinellas
Contact / District: Brent Johnson / Southwest
NPDES Permit #: FL0021857
LIMS Sample #: 130692 LIMS Job #: 96-Fe6-27-21

Sample Collection: Date 2-26-96 Time 1030
Test Beginning: Date 2/27/96 Time 1100
Test Ending: Date 2-29-96 Time 10:30
Organism Batch #: 11 Diluent Batch #: well
Organism Age: 12 days

Test Organism: Cyprinella leedsi

Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through

Test Number: 2 of 2

Remarks:

Instrument Calibrations:	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	24.6 @ 24.6	8.2 @ 25.5 °C	108.1 @ 106.2 1414 @ 1409 @ 25.1 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	24.3 @ 24.4	8.2 @ 25.4 °C	106.7 @ 106.2 1404 @ 1409 @ 25.7 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	23.0 @ 23.1	8.1 @ 25.8 °C	1024 @ 106.2 1413 @ 1409 @ 24.9 °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	24 h	48 h
CTL A	20	5	5	5	7.9	8.3	8.0	24.4	23.9	24.5	8.0	7.8	7.8	250	250	250
CTL B	25	5	5	5	7.9	8.3	8.0	24.3	23.8	24.4	7.9	7.8	7.8	250	250	250
CTL C	608	5	5	5	7.9	8.3	8.0	24.3	23.8	24.4	8.0	7.8	7.9	250	250	250
CTL D	506	5	5	5	7.9	8.3	8.0	24.4	23.9	24.4	8.0	7.7	7.8	250	250	255
100% A	174	5	5	5	7.8	8.3	7.9	22.4	24.0	24.4	8.3	7.9	7.5	1035	1035	1030
100% B	149	5	5	5	7.8	8.3	7.9	22.1	24.0	24.3	8.2	7.9	7.6	1030	1080	1085
100% C	148	5	5	5	7.8	8.3	7.9	22.0	24.0	24.3	8.4	7.8	7.7	1025	1075	1070
100% D	630	5	5	5	7.8	8.3	7.9	22.0	23.9	24.3	8.4	7.7	7.7	1025	1080	1090
Measured/Loaded by:		TM	JN	JRS	JLS	MF	MF	JLJ	MF	MF	JLS	MF	MF	JLS	MF	MF
Recorded by:		TM	JN	JRS	JN	DW	DW	JN	DW	DW	JN	DW	DW	JN	DW	DW

* Unable to read pH units on DO meter. Cal. 7/2 7.9 pH units

Investigators' Signatures

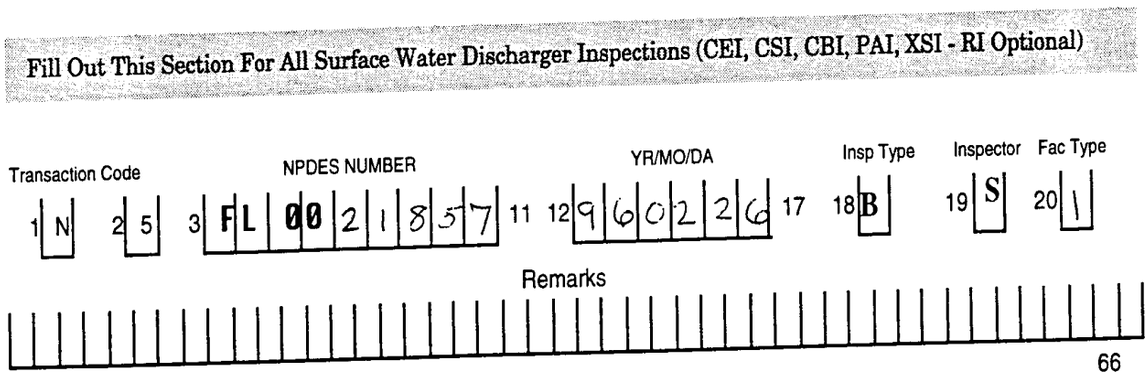
reviewer

form updated 5/05/95

Water Quality Parameters	Salt Water: Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			—	—	—
Lab Total Residual Cl2 (mg/L):	<0.03	—	<0.03	DR-100	TM
Alkalinity (mg/L as $CaCO_3$):	115	—	175	HACH	JRS
Hardness (mg/L as $CaCO_3$):	125	—	220	HACH	JRS
Total ammonia (mg/L as N):	<0.017	—	<0.017	Orion	JN

Ammonia Meter #98136 Ammonia Meter Slope: -57.7 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

The Bioassay of the City of Clearwater Marshall Street WWTP effluent sampled on February 26, 1996, NPDES #FL0021857.



The Priority Pollutants Analysis for the Bioassay of the City of Clearwater Marshall Street WWTP effluent sampled on February 26, 1996, NPDES #FL0021857.

