

Bioassays of the City of

Madison Wastewater Treatment Plant

Madison, Madison County, Florida

NPDES #FL0020281

Sampled 7/24/95

October 1995

Biology Section

Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan #870346G

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NPDES #FL0020281

Biology Section
Bureau of Laboratories
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Introduction

City of Madison WWTP, Madison, Madison County, Florida, NPDES #FL0020281, tests performed on 25 to 27 July, 1995.

This wastewater treatment plant is located on Jesse Hughey Drive in Madison. The facility has a design flow of 0.7 MGD and an average flow of 0.909 MGD. The wastewater treatment process includes secondary biological treatment, filtration, chlorination, and dechlorination. Effluent is discharged into a drainage ditch which leads to an unnamed lake (facility summary provided by Jon Dinges, 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 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 an organic compound were identified (Table 2).

Conclusion

The sample of effluent collected from this facility on July 24, 1995, did not show toxicity.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the City of Madison WWTP, Madison, Madison County, Florida, NPDES# FL0020281, performed on 25 to 27 July,1995.

Facility:	**City of Madison WWTP**			NPDES #	FL0020281	Facility Type:	**Wastewater Treatment Plant**
Location:	Jesse Hughey Drive, Madison			Contact/District:	Jon Dinges/Northwest		
County:	Madison			Test type:	static acute screen		
Sample Collection Date:	7/24/95	Time:	1405	# tests:	2	Receiving Water:	Drainage ditch to an unnamed lake
Test Beginning Date:	7/25/95	Time:	1300	Chlorination Type:	The sample was collected after being dechlorinated in the treatment process.		
Test Ending Date:	7/27/95	Time:	1300				**Page 1 of 1**

Total Residual CL2	mg/L	Method
Field:	<0.03	DR-100
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	0.00

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	130	125
20% Dilute Mineral Water (cladocerans):	75	80
100% Sample:	215	155

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	-	8.2	23.6	-	25.2	8.3	-	7.9	170	190
Control B	0/20	5	5	5	-	-	8.2	-	-	25.3	-	-	7.9	-	190
Control C	0/20	5	5	5	-	-	8.2	-	-	25.2	-	-	7.9	-	195
Control D	0/20	5	5	5	-	-	8.2	-	-	25.1	-	-	7.9	-	190
100% A	20/0	5	5	5	7.5	-	8.6	24.2	-	25.4	8.0	-	7.8	1805	1765
100% B	20/0	5	5	5	-	-	8.6	-	-	25.4	-	-	7.8	-	1850
100% C	20/0	5	5	4	-	-	8.6	-	-	25.5	-	-	7.8	-	1880
100% D	20/0	5	5	4	-	-	8.6	-	-	25.6	-	-	7.8	-	1875

[A] Temperature of test incubator was continously recorded on a strip chart recorder. Incubator temperature range for the test period was 23.4-24.4°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	7.8	8.3	8.4	24.3	24.1	23.9	8.4	8.1	8.0	250	250
Control B	0/500	5	5	5	7.8	8.3	8.4	24.4	-	23.8	8.4	8.1	8.0	250	250
Control C	0/500	5	5	5	7.8	8.3	8.4	24.3	-	23.8	8.5	8.1	8.1	250	250
Control D	0/500	5	5	5	7.8	8.3	8.4	24.3	-	23.8	8.5	8.2	8.1	250	250
100% A	500/0	5	5	5	7.5	8.2	8.3	24.7	24.2	23.9	8.1	7.8	8.0	1865	1850
100% B	500/0	5	5	5	7.5	8.2	8.3	24.7	-	23.9	7.8	7.8	8.0	1865	1855
100% C	500/0	5	5	5	7.5	8.2	8.3	24.7	-	23.8	8.0	7.9	8.1	1865	1850
100% D	500/0	5	5	5	7.5	8.2	8.3	24.7	-	23.8	8.0	7.9	8.1	1865	1855

[B] Temperature of test room was continously recorded on a strip chart recorder. Room temperature range for the test period was 23.5-24.1°C.

Table 2. Results of chemical analyses on the effluent from the City of Madison Wastewater Treatment Plant sampled on July 24, 1995.

Metals

Calcium	41.9	mg/L[A]
Copper	7	µg/L[I]
Iron	25	µg/L[A]
Magnesium	8.25	mg/L[A]
Silver	0.09	µg/L[I]
Zinc	20	µg/L[I]

Pesticides and Herbicides

none detected

Base, Neutral, & Acid Extractable Organics

4,6-trichlorophenol	0.89	µg/L[I]

[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.

FDEP Biology Section — Acute Bioassay Bench

Sample Source: City of Madison WWTP
County: Madison
Contact / District: Jon Dinges
NPDES Permit #: FL00 20281
LIMS Sample #: 111784 (comp log 7/27/95) LIMS Job #: 95-Jul-25-02-01

Sample Collection: Date 7.24.95 Time 1405
Test Beginning: Date 7.25.95 Time 1300
Test Ending: Date 7.27.95 Time 1300
Organism Batch #: 36 Diluent Batch #: 30
Organism Age: <24 mo.
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	24.5 @ 24.6	8.3 @ 24.9 °C	102.3 @ 102.1 996 @ 1000 @ 24.9 °C
24 hr	___ @ 7.0 ___ @ ___	___ @ ___	___ @ ___ °C	___ @ ___ ___ @ ___ @ ___ °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	24.5 @ 24.7	8.4 @ 24.1 °C	102.4 @ 102.1 1419 @ 1412 @ 23.9 °C

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) 0 hr	24 h	48 h
Control	A	5	5	5	8.0		8.2	23.6		25.2	8.3		7.9	170		190
Control	B	5	5	5			8.2			25.3			7.9			190
Control	C	5	5	5			8.2			25.2			7.9			195
Control	D	5	5	5			8.2			25.1			7.9			190
100%	A	5	5	5	7.5		8.16	24.2		25.4	8.0		7.8	1805		1765
100%	B	5	5	5 (10)			8.16			25.4			7.8			1850
100%	C	5	5	4 (10)			8.16			25.5			7.8			1880
100%	D	5	5	4 (12)			8.16			25.6			7.8			1875
Recorded by:		TR	MF	JRS	JN		JRS	JN		JRS	JN		JRS	JN		JRS
Measured/Loaded by:		TR	MF	JRS	JLS		MF	JLS		MF	JLS		MF	JLS		MF

(*) JLS 7/27/95 wrote in number alive.

Investigators' Signatures Tina Mikulski

Reviewer

form updated 10/05/94

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):	—	—	<0.01	—	Jon Dinges
Lab Total Residual Cl2 (mg/L):	<	<0.03	<0.03	DR400	TM
Alkalinity (mg/L as $CaCO_3$) :	—	75	215	HACH	JRS
Hardness (mg/L as $CaCO_3$) :	—	80	155	HACH	JRS
Total ammonia (mg/L as N) :	—	<0.017	<0.017	Orion	JN

Ammonia Meter #98136 Ammonia Meter Slope: ~~-58.1~~ -58.2 JN 7.26.95 ENTRY ERROR
Ammonia Blank: <0.017
Control Salinity: 0 ppt
Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: City of Madison WWTP
County: Madison
Contact / District: Jon Dinges
NPDES Permit #: FL00 20281
LIMS Sample #: 111784 LIMS Job #: 95-Jul-25-02-01

Sample Collection: Date 7.24.95 Time 1405
Test Beginning: Date 7.25.95 Time 1300
Test Ending: Date 7.27.95 Time 1300
Organism Batch #: 29 Diluent Batch #: well
Organism Age: 11 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	24.5 @ 24.6	8.3 @ 24.9 °C	102.3 @ 102.1 996 @ 1000 @ 24.9 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	24.0 @ 24.0	8.2 @ 25.1 °C	102.1 @ 102.1 1412 @ 1414 @ 24.6 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	24.5 @ 24.7	8.4 @ 24.1 °C	1024 @ 102.1 1419 @ 1412 @ 23.9 °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
Control A	308	5	5	5	7.8	8.3	8.4	24.3	24.1	23.9	8.4	8.1	8.0	250	250	250
Control B	B19	5	5	5	7.8	8.3	8.4	24.4		23.8	8.4	8.1	8.0	250	250	250
Control C	A22	5	5	5	7.8	8.3	8.4	24.3		23.8	8.5	8.1	8.1	250	250	250
Control D	A14	5	5	5	7.8	8.3	8.4	24.3		23.8	8.5	8.2	8.1	250	250	250
100% A	A1	5	5	5	7.5	8.2	8.3	24.7	24.2	23.9	8.1	7.8	8.0	1865	1845	1850
100% B	D4	5	5	5	7.5	8.2	8.3	24.7		23.9	7.8	7.8	8.0	1865	1850	1855
100% C	D10	5	5	5	7.5	8.2	8.3	24.7		23.8	8.0	7.9	8.1	1865	1850	1850
100% D	E6	5	5	5	7.5	8.2	8.3	24.7		23.8	8.0	7.9	8.1	1865	1855	1855
Recorded by:		TR	MF	JAS	JN	JLS	JAS	JN	JLS	JAS	JN	JLS	JAS	JN	JLS	JAS
Measured/Loaded by:		TR	MF	JAS	JLS	MF	MF	JLS	MF	MF	JLS	MF	MF	JLS	MF	MF

(*) 7/26/95 JAS wrote wrong number

Investigators' Signatures: Tina Mikulski, Joseph Smith, Jennifer Sprague, Robin L. Rader, Marshall Faircloth

Reviewer

form updated 10/05/94

Water Quality Parameters	Salt Water: Well Water / 20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):		<0.01	—	Jon Dinges
Lab Total Residual Cl2 (mg/L):	<0.03	<0.03	DR-100	TM
Alkalinity (mg/L as $CaCO_3$):	130	215	HACH	JAS
Hardness (mg/L as $CaCO_3$):	125	155	HACH	JAS
Total ammonia (mg/L as N):	<0.017	<0.017	Orion	JN

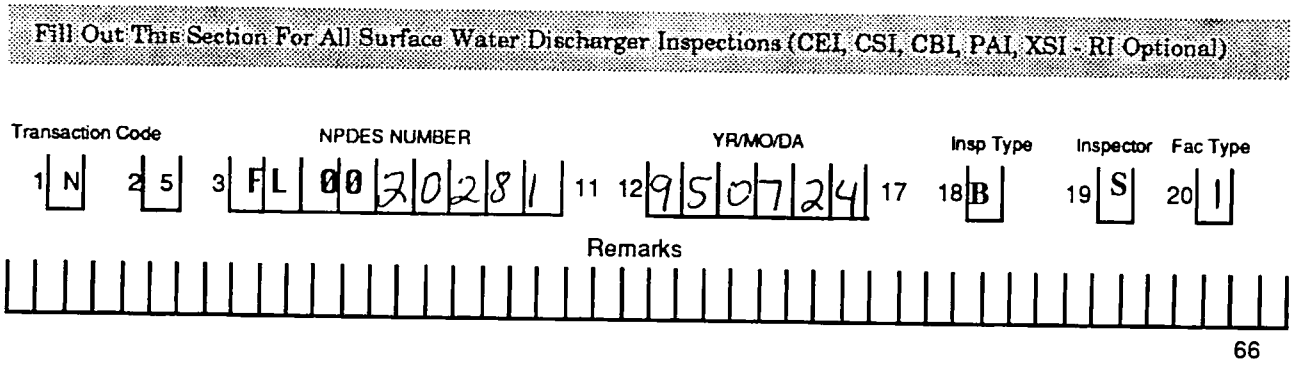
Ammonia Meter #98136 Ammonia Meter Slope: ~~-58.2~~ * JN 7-26-95 — 58.2 ENTRY ERROR

Ammonia Blank: <0.017

Control Salinity: 0 ppt

Sample Salinity: 0 ppt

The Bioassay of the City of Madison WWTP effluent sampled on July 24, 1995, NPDES #FL0020281.



The Priority Pollutants Analysis for the Bioassay of the City of Madison WWTP effluent sampled on July 24, 1995, NPDES #FL0020281.

