

Bioassays of

Bay County Regional Wastewater Treatment Plant

Panama City Beach, Bay County, Florida

NPDES #FL0002631

Sampled 9/5/95

December 1995

Biology Section

Division of Administrative and Technical Services

Comprehensive Quality Assurance Plan #870346G

Bioassays of

Bay County Regional Wastewater Treatment Plant

Panama City Beach, Bay County, Florida

NPDES #FL0002631

Biology Section
Bureau of Laboratories
December 1995

Introduction

Bay County Regional WWTP, Panama City Beach, Bay County, Florida, NPDES #FL0002631, tests performed on 6 to 8 September, 1995.

This wastewater treatment plant, also known as Bay County WWTF #1, is located at Military Point, on Tyndall AFB, Panama City. The facility has a design flow of 37.0 MGD and an annual mean flow of 29.8 MGD. Approximately 80% of the design flow is reserved for industrial wastewater and 20% of the design flow is reserved for domestic wastewater. This facility, a 69 acre aerated lagoon, provides final secondary treatment to wastewater from six separate upstream plants. Four of the six contributors are domestic sources (Bay County WWTF #2, City of Lynn Haven WWTP, Millville WWTP, and Tyndall AFB WWTF), and two are industrial sources (Stone Container and Arizona Chemical Company). Wastewater is aerated in the stabilization basin prior to discharge to St. Andrew Bay. Accumulated sludge is removed from the lagoon basin for land application (facility summary provided by Steven Kelly, FDEP, Panama City).

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 was not detected in the sample. Total and unionized ammonia concentrations were 5.15 mg/L and 0.17 mg/L, respectively. Further chemical analyses were performed on the sample and several metals were identified. Several organic compounds having a chromatographic pattern similar to motor oil were also detected (Table 2).

Conclusion

The sample of effluent collected from this facility on September 5, 1995, did not show toxicity.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Bay County Regional WWTP, Panama City, Bay County, Florida, NPDES# FL0002631, performed on 06 to 08 September,1995.

Facility:	Bay County Regional WWTP			NPDES #	FL0002631	Facility Type:	Wastewater Treatment Plant
Location:	Tyndall AFB, Panama City			Contact/District:	Glenn Butts/Northwest		
County:	Bay			Test type:	static acute screen		
Sample Collection Date:	9/5/95	Time:	1015	# tests:	2	Receiving Water:	St. Andrew Bay
Test Beginning Date:	9/6/95	Time:	1330	Chlorination Type:	Not chlorinated		
Test Ending Date:	9/8/95	Time:	1330				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:	5.15	0.17

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	125	120
20% Dilute Mineral Water (cladocerans):	80	105
100% Sample:	165	170

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	8.2	-	8.0	23.8	-	24.5	8.3	-	8.0	170	185
Control B	0/20	5	5	5	-	-	8.0	-	-	24.5	-	-	8.0	-	185
Control C	0/20	5	5	5	-	-	8.0	-	-	24.2	-	-	8.1	-	185
Control D	0/20	5	5	5	-	-	8.0	-	-	24.0	-	-	8.2	-	185
100% A	20/0	5	5	5	7.8	-	8.2	24.0	-	24.6	8.0	-	7.9	1570	1590
100% B	20/0	5	5	5	-	-	8.2	-	-	24.5	-	-	7.8	-	1645
100% C	20/0	5	5	5	-	-	8.2	-	-	24.4	-	-	7.8	-	1645
100% D	20/0	5	5	5	-	-	8.2	-	-	24.2	-	-	7.7	-	1615

[A] Temperature of test incubator was continously recorded on a strip chart recorder. Incubator temperature range for the test period was 23.9-24.4°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	7.8	8.3	8.5	24.3	23.8	23.9	8.2	7.6	7.9	245	245
Control B	0/500	5	5	5	7.8	8.3	8.5	24.3	23.8	23.9	8.2	7.6	8.0	250	245
Control C	0/500	5	5	5	7.8	8.3	8.5	24.3	23.7	23.9	8.2	7.6	8.0	250	245
Control D	0/500	5	5	5	7.8	8.3	8.5	24.3	23.9	24.0	8.2	7.7	8.0	250	250
100% A	500/0	5	5	4	7.7	8.0	8.1	24.5	23.9	24.2	8.1	6.0	7.0	1640	1635
100% B	500/0	5	5	5	7.7	8.0	8.1	24.5	23.9	24.2	8.1	6.0	5.8	1640	1645
100% C	500/0	5	5	5	7.7	8.0	8.1	24.5	23.9	24.2	8.1	6.0	5.8	1640	1645
100% D	500/0	5	5	5	7.7	8.0	8.1	24.5	24.0	24.3	8.1	6.0	5.8	1640	1650

[B] Temperature of test room was continously recorded on a strip chart recorder. Room temperature range for the test period was 23.5-24.5°C.

Table 2. Results of chemical analyses on the effluent from the Bay County Regional Wastewater Treatment Plant sampled on September 5, 1995.

Metals

Aluminum	1100	µg/L
Arsenic	13	µg/L[I]
Calcium	44.4	mg/L[A]
Copper	6	µg/L[I]
Iron	396	µg/L
Magnesium	7.10	mg/L
Nickel	5	µg/L[I]
Silver	0.11	µg/L[I]

Pesticides and Herbicides

none detected

Base, Neutral, & Acid Extractable Organics

Chromatographic pattern similar to motor oil 10W40

estimated concentration 3000 µg/L

[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 Sheet

Sample Source: Bay County Regional
County: Bay
Contact / District: Glenn Bates / NW
NPDES Permit #: FL0026131
LIMS Sample #: 115924 LIMS Job #: 95-SEP-CO-14
Sample log 9/14/95

Sample Collection: Date 9-5-95 Time 1015
Test Beginning: Date 9-6-95 Time DF 1330
Test Ending: Date 9-8-95 Time 1320
Organism Batch #: 46 Diluent Batch #: 37
Organism Age: <24hrs
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	24.8 @ 24.7	8.2 @ 24.5 °C	146.0 @ 141.3 1390 @ 1412 @ 24.5 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.2 @ 23.3	8.4 @ 23.7 °C	145.2 @ 141.3 1380 @ 1412 @ 24.3 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	24.0 @ 24.1	8.2 @ 25.4 °C	145.8 @ 141.3 1388 @ 1412 @ 24.2 °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
Control	A	5	5	5	8.2		8.0	23.8		24.5	8.3		8.0	170		185
Control	B	5	5	5			8.0			24.5			8.0			185
Control	C	5	5	5			8.0			24.2			8.1			185
Control	D	5	5	5			8.0			24.0			8.2			185
100%	A	5	5	5	7.8		8.2	24.0		24.6	8.0		7.9	1570		1540
100%	B	5	5	5			8.2			24.5			7.8			~~1045~~ 1045
100%	C	5	5	5			8.2			24.4			7.8			1045
100%	D	5	5	5			8.2			24.2			7.7			1015
Measured/Loaded by:		MF	MF	MF	TR		MF	TR		MF	TR		MF	TR		MF
Recorded by:		MF	MF	MF	JN		JRS	JN		JRS	JN		JRS	JN		JRS

Did not round up JRS 9/8/95

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 / TR
Alkalinity (mg/L as $CaCO_3$):	—	80	165	Hach / TR
Hardness (mg/L as $CaCO_3$):	—	105	170	Hach / TR
Total ammonia (mg/L as N):	—	<0.017	5.15	Orion / JN

Ammonia Meter #98136 Ammonia Meter Slope: -57.0 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Bay County Regional
County: Bay
Contact / District: Glenn Bolts / NW
NPDES Permit #: FL00 02631
LIMS Sample #: 115929 LIMS Job #: 95-SEP-06 14
sample log 9/14/95

Sample Collection: Date ~~9-5-95~~ 9-5-95 TR Time 1015
Test Beginning: Date 9-6-95 Time 1330
Test Ending: Date 9-8-95 Time 1340
Organism Batch #: 39 Diluent Batch #: well
Organism Age: 12 days old
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	24.8 @ 24.9	8.3 @ 24.5 °C	146.0 @ 141.3
	9.0 @ 9.0			1390 @ 1412 @ 24.5 °C
24 hr	7.0 @ 7.0	23.2 @ 23.3	8.4 @ 23.7 °C	145.2 @ 141.3
	9.0 @ 9.0			1380 @ 1417 @ 24.3 °C
48 hr	7.0 @ 7.0	24.0 @ 24.1	8.2 @ 25.4 °C	145.8 @ 141.3
	9.0 @ 9.0			1388 @ 1412 @ 24.2 °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
Control A	82	5	5	5	7.8	8.3	8.5	24.3	23.8	23.9	8.2	7.6	7.9	245	245	245
Control B	308	5	5	5	7.8	8.3	8.5	24.3	23.8	23.9	8.2	7.6	8.0	250	245	245
Control C	120	5	5	5	7.8	8.3	8.5	24.3	23.7	23.9	8.2	7.6	8.0	250	245	245
Control D	57	5	5	5	7.8	8.3	8.5	24.3	23.9	24.0	8.2	7.7	8.0	250	245	250
100% A	23	5	5	4 (6)	7.7	8.0	8.1	24.5	23.9	24.2	8.1	6.0	~~7.8~~ (8)	1640	1625	1635
100% B	114	5	5	5	7.7	8.0	8.1	24.5	23.9	24.2	8.1	6.0	5.8	1640	1630	1645
100% C	178	5	5	5	7.7	8.0	8.1	24.5	23.9	24.2	8.1	6.0	5.8	1640	1630	1645
100% D	79	5	5	5	7.7	8.0	8.1	24.5	24.0	24.3	8.1	6.0	5.8	1640	1635	1655
Measured/Loaded by:		TR	MF	[illegible]	TR	MF	[illegible]	TR	MF	[illegible]	TR	MF	[illegible]	TR	MF	[illegible]
Recorded by:		[illegible]	[illegible]	[illegible]	JN	LM	[illegible]	JN	LM	[illegible]	JN	LM	[illegible]	JN	LM	[illegible]

(6) 7.0 ml [illegible] Number

Investigators' Signatures

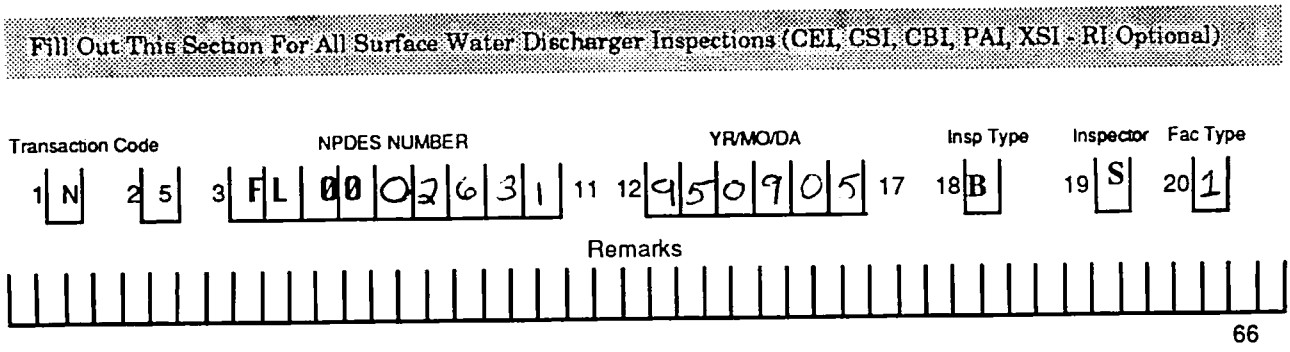
reviewer

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):	[illegible]	—	—	—
Lab Total Residual Cl2 (mg/L):	[illegible]	—	[illegible]	DR
Alkalinity (mg/L as $CaCO_3$):	123	—	[illegible]	TR
Hardness (mg/L as $CaCO_3$):	170	—	[illegible]	TR
Total ammonia (mg/L as N):	<0.017	—	5.15	Orion JN

Ammonia Meter #98136 Ammonia Meter Slope: -57.0 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

The Bioassay of the Bay County Regional WWTP effluent sampled on September 5, 1995, NPDES #FL0002631.



The Priority Pollutants Analysis for the Bioassay of the Bay County Regional WWTP effluent sampled on September 5, 1995, NPDES #FL0002631.

