

Bioassays of

Buccaneer Wastewater Facility

Atlantic Beach, Duval County, Florida

NPDES #FL0023248

Sampled 11/12/91

January 3, 1991

Biology Section
Division of Technical Services

Bioassays of

Buccaneer Wastewater Facility

Atlantic Beach, Duval County, Florida

NPDES #FL0023248

Biology Section
Bureau of Laboratories
January 3, 1991

Introduction

Buccaneer Wastewater Facility, Atlantic Beach, Duval County, Florida, NPDES #FL0023248, on 13 to 15 November, 1991.

This facility is located at 739 Wonderwood Drive in Atlantic Beach. The facility is permitted to expand the existing 1.05 mgd extended aeration facility to a 1.30 mgd extended aeration facility. The expanded facility will utilize an effluent chlorination system and a sulfur dioxide dechlorination system, followed by discharge to a force main, thence to the the Class III waters of the St. Johns River at Sherman Point .

The toxicity tests discussed in this report were performed in accordance with methods described by Weber, 1991, *Methods for Measuring the Acute Toxicity of Effluents to Aquatic Organisms*, 4th Edition.

Results and Discussion

The FDER Biology Section performed static acute screening toxicity bioassays on a sample of effluent from this facility. The bioassay organisms used for these tests were the water flea, *Ceriodaphnia dubia*, and the fish, *Notropis leedsi*. The test results indicated that the sample was not toxic.

Total residual chlorine was not detected in the sample. Total and unionized ammonia concentrations were 2.04 mg/L and 0.02 mg/L (Hach), respectively. Further chemical analyses were performed on the sample and indicated the presence of the metals, aluminum (116 µg/L), copper (20 µg/L), iron (37 µg/L), and zinc (25 µg/L). The analyses for chlorinated pesticides indicated a gamma-BHC (lindane) concentration of 0.04 µg/L. The Class III water quality standard for lindane in freshwater is ≤ 0.01 µg/L. Base-neutral and acid extractable organics were undetected.

Conclusion

The sample of effluent from this facility was not toxic on 12 November, 1991.

Table 1. Concentration Series and Volumes Used for the Static Acute Screening Bioassays of the Buccaneer Wastewater Facility on November 13-15, 1991.

Ceriodaphnia dubia (water flea)

Concentration	Dilution Water	Sample	Total Volume
Control	20 mL	0 mL	20 mL
100 %	0 mL	20 mL	20 mL

Notropis leedsi (bannerfin shiner)

Concentration	Dilution Water	Sample	Total Volume
Control	500 mL	0 mL	500 mL
100 %	0 mL	500 mL	500 mL

Table 2. Results of chemical analyses on the sample of effluent from the Buccaneer Wastewater Facility, Duval County, on 12 November, 1991.

Base-Neutral & Acid Extractables

none detected

Chlorinated Pesticides

Gamma-BHC	0.04	µg/L

Metals

Aluminum	116	µg/L
Copper	20	µg/L
Iron	37	µg/L
Zinc	25	µg/L

Table 3. Data recorded during the acute screening bioassay of a sample of effluent from the Buccaneer WWF, Atlantic Beach, Duval County, Florida, NPDES# FL0023248, on 13 to 15 November, 1991.

Facility:	**Buccaneer WWF**	NPDES #	**FL0023248**	Facility Type:	**wastewater facility**
Location:	739 Wonderwood Drive, Atlantic Beach	Contact/District:	Jim Wright / NE		(WWF)
County:	Duval	Test type:	static acute screen		
Sample Collection Date:	**11/12/91** Time: 1200	# tests:	2	Receiving Water:	St. Johns River
Test Beginning Date:	11/13/91 Time: 1330	Chlorination Type:	**dechlorinated at plant**		at Sherman Point
Test Ending Date:	11/15/91 Time: 1330				**Page 1 of 1**

Total Residual Cl2	mg/l	Method
Field:	not detected	Hach
Lab:	0.0	Hach

Ammonia	Total (mg/l)	Unionized (mg/l)
Control Water (fish):	0.00	0.00
Cond. Control		
Water (daphnids):	0.48	0.04
100% Sample:	2.04	0.02

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	130	160
Cond. Control		
Water (daphnids):	80	110
100% Sample:	130	400

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

Organism: ***Ceriodaphnia dubia*** Life stage: neonate
LC50: - Binomial: - Moving Average: - Probit: -

	SURVIVAL			pH			Temperature			Dissolved Oxygen			Conductivity	
Concentrations	# at 0 hr	Live at 24 hr	Live at 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	5	5	5	8.5	-	8.2	22.1	-	24.0	8.6	-	8.5	150	174
Control	5	5	5	-	-	8.2	-	-	-	-	-	8.6	-	-
Control	5	5	5	-	-	8.2	-	-	-	-	-	8.6	-	-
Control	5	5	5	-	-	8.2	-	-	-	-	-	8.6	-	-
100%	5	5	4	7.3	-	8.4	22.1	-	24.2	7.9	-	8.5	849	1024
100%	5	5	4	-	-	8.4	-	-	-	-	-	8.5	-	-
100%	5	5	5	-	-	8.4	-	-	-	-	-	8.5	-	-
100%	5	5	5	-	-	8.4	-	-	-	-	-	8.5	-	-

Organism: ***Notropis leedsi*** Age: 12 days
LC50: - Binomial: - Moving Average: - Probit: -

	SURVIVAL			pH			Temperature			Dissolved Oxygen			Conductivity	
Concentrations	# at 0 hr	Live at 24 hr	Live at 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	5	5	5	7.9	8.2	8.4	22.0	22.5	23.2	8.7	8.4	8.7	-	-
Control	5	4	4	7.9	8.2	8.4	-	-	-	8.7	8.4	8.7	235	257
100%	5	5	5	7.2	7.9	8.1	23.9	22.3	23.1	7.5	8.3	8.6	-	-
100%	5	5	5	7.2	7.8	8.1	-	-	-	7.5	8.3	8.6	1090	1065

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: BUCCANEER WWTP
Address/City:
County: DUVAL
Contact/District: JIM WRIGHT / NE
NPDES Permit #: FL00 23248 Outfall #:

Sample Collection: Date 11-12-91 Time 1200
Test Beginning: Date 11-13-91 Time 1330
Test Ending: Date 11/15/91 Time 1330
Test Organism: C. dubia
Life Stage/Age: <24 hours

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

Remarks:

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7@7,9@9	8.7@23.0	23.4@23.4	1354@23.3
24 hr	7@7,9@9	8.6@23.5	23.2@23.2	1355@23.3
48 hr	7@7,9@9	8.5@24.0	23.5@24.0	1376@24.0

		Number Live			pH			Temp. (°C)			DO (mg/L)			Cond. (µmhos/cm)		
Conc.	Chamber #	0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
control	A	5	5	5	8.5		8.2	22.1		24.0	8.6		8.5	150		174
control	B	5	5	5			8.2						8.6			
control	C	5	5	5			8.2						8.6			
control	D	5	5	5			8.2						8.6			
100%	A	5	5	4	7.3		8.4	22.1		24.2	7.9		8.5	849		1024
100%	B	5	5	4			8.4						8.5			
100%	C	5	5	5			8.4						8.5			
100%	D	5	5	5			8.4						8.5			
Measured/Loaded by:		KP	AJ		AJ		MF	AJ		MF	AJ		MF	AJ		MF
Recorded by:		AJ	AJ		KP		AJ	KP		AJ	KP		AJ	KP		AJ

25630 91-NOV-13-13-01
BIOLOGY Matrix: W-EFFLUENT
Date Collected: 12-NOV-1991 12:00:00.
Field ID:Buccaneer WWTP
BSY-SN-CLD BSY-SN-FSH

Investigators' Signatures

Kim Pearce
Alicia Yoder
Andrea Summerak
Marshall Faircloth
Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			not	detected	
Lab Tot. Resid. Cl2:	0.0		0.0	Hach	AJ
Alkalinity:	130		130	Hach	AH
Hardness:	160		400	Hach	AH
Total Ammonia:	.98		2.04	Hach	AJ

Ammonia Meter Slope: _____ Ammonia Blank: _____ Salinity Sample: _____ ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: BUCCANEER WWTP
Address/City: _____
County: _____
Contact/District: _____
NPDES Permit #: FL0023248 Outfall #: _____

Sample Collection: Date 11-12-91 Time 1200
Test Beginning: Date 11-13-91 Time 1530
Test Ending: Date 11/15/91 Time 1330
Test Organism: NOTROPIS LEEDSI
Life Stage/Age: 12 days

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

Remarks:

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7.0, 7.09	8.7 @ 23.2	23.4 @ 23.4	1359 @ 23.3
24 hr	7.0, 7.09	8.6 @ 23.5	23.2 @ 23.2	1359 @ 23.3
48 hr	7.0, 7.09	8.5 @ 24.0	23.9 @ 24.0	1376 @ 24.0

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	DO (mg/L) 0	24	48	Cond. (µmhos/cm) 0	24	48
control	147	5	5	5	7.9	8.2	8.4	22.0	22.5	23.2	8.7	8.4	8.7			
control	19	5	4	4	7.9	8.2	8.4				8.7	8.4	8.7	235	251	257
100%	21	5	5	5	7.2	7.9	8.1	23.9	22.3	23.1	7.5	8.3	8.6			
100%	47	5	5	5	7.2	7.8	8.1				7.5	8.3	8.6	1090	1035	1065
Measured/Loaded by:		AJ	AJ	AJ	AJ	AJ	MF	AJ	AJ	MF	AJ	AJ	MF	HJ	AJ	MF
Recorded by:		AJ	AJ	AJ	KP	AH	AJ	KP	AH	DB	KP	AH	AJ	KP	AH	DB

Investigators' Signatures

Kim Pearce
Alison Jordan
Andrea Humeniak
Marshall Tandy
Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			not detected		
Lab Tot. Resid. Cl2:	0.0		0.0	hach	DB
Alkalinity:	130	SC	130	hach	AH
Hardness:	160	110	400	hach	AH
Total Ammonia:	0.0		2.04	hach	DB

Ammonia Meter Slope: _____ Ammonia Blank: _____ Salinity Sample: _____ ppt

The Bioassay of Buccaneer Wastewater Facility effluent sampled on November 12, 1991, NPDES# FL0023248.

