DEPARTMENT OF ENVIRONMENTAL PROTECTION

FLORIDA

Bioassays of

Arthur Dozier Wastewater Treatment Facility

Marianna, Jackson County, Florida

NPDES #FL0028185

Sampled 9/30/96

January 1997

Biology Section

Division of Administrative & Technical Services

Comprehensive Quality Assurance Plan #870346G

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Arthur Dozier Wastewater Treatment Facility

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Bureau of Laboratories
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Introduction

Arthur Dozier WWTF, South Street (SR 276), Marianna, Jackson County, Florida, NPDES #FL0028185, tests performed on 1 to 3 October, 1996.

This wastewater treatment facility has a design flow of 0.1 MGD and an annual average flow of 0.023 MGD (7/95-6/96). Wastewater is treated by contact stabilization, extended aeration, four polishing filter beds, chlorination for disinfection, and dechlorination prior to being discharged to an unnamed ditch which flows into the Chipola River (facility summary provided by Lisa Kelly, FDEP, Pensacola).

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*. No mortality was observed in the *Ceriodaphnia dubia* 100% whole effluent by 48-hours. The *Cyprinella leedsi* test was invalidated at 48-hours due to excessive control mortality (15%). The mortality occurred in the "A" replicate, and is believed to have been caused by inadequate rinsing of the potassium chloride filling solution from the pH probe during the 24-hour physical-chemistry measurements. No mortality was observed in the *Cyprinella leedsi* 100% whole effluent at 48-hours (Table 1).

Total residual chlorine was not detected in the sample. The total and unionized ammonia concentrations were 0.09 mg/L and 0.001 mg/L, respectively. Further chemical analyses were performed on the sample and several metals were identified (Table 2).

Conclusion

The sample of effluent collected from this facility on September 16, 1996, did not show toxicity.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Arthur Dozier WWTF, Marianna , Jackson County, Florida, NPDES# FL0028185, performed on 1 to 3 October, 1996.

Facility:	**Arthur Dozier WWTF**		**NPDES #**	**FL0028185**	Facility Type: **Wastewater Treatment Facility**
Location:	South Street (SR 276), Marianna		Contact/District:	Glenn Butts/Northwest	
County:	Jackson		Test type:	static acute screen	
Sample Collection Date:	9/30/96	Time: 1045	# tests:	2	Receiving Water: unnamed ditch to the Chipola River
Test Beginning Date:	10/1/96	Time: 1355	Chlorination Type:	Chlorinated	
Test Ending Date:	10/3/96	Time: 1435		Sample collected after plant dechlorination unit.	**Page 1 of 1**

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

Ammonia	Total (mg/L)	Unionized (mg/L)
Control Water (fish):	0.054	0.005
20% Dilute Mineral Water (cladocerans):	0.052	0.003
100% Sample:	0.090	0.001

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	125	130
20% Dilute Mineral Water (cladocerans):	75	85
100% Sample:	60	135

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	-	8.2	23.9	-	25.2	8.0	-	6.3	180	185
Control B	0/20	5	5	5	-	-	8.2	-	-	25.6	-	-	6.8	-	195
Control C	0/20	5	5	5	-	-	8.2	-	-	25.7	-	-	6.7	-	190
Control D	0/20	5	5	5	-	-	8.3	-	-	25.7	-	-	6.7	-	190
100% A	20/0	5	5	5	7.3	-	8.1	24.2	-	25.5	7.3	-	7.0	375	380
100% B	20/0	5	5	5	-	-	8.2	-	-	25.7	-	-	7.0	-	355
100% C	20/0	5	5	5	-	-	8.2	-	-	25.7	-	-	6.5	-	360
100% D	20/0	5	5	5	-	-	8.2	-	-	25.7	-	-	6.7	-	385

[A] Temperature of test incubator was continously recorded on a strip chart recorder. Incubator temperature range for the test period was 24.4-25.6°C.

Organism: ***Cyprinella leedsi*** Age: 10 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	2	8.0	8.3	8.5	24.0	22.7	23.8	7.8	8.0	7.7	245	250
Control B	0/500	5	5	5	8.0	8.3	8.5	24.0	22.5	23.7	7.8	8.0	7.7	250	250
Control C	0/500	5	5	5	8.0	8.3	8.5	24.1	22.5	23.7	7.7	8.1	7.7	250	250
Control D	0/500	5	5	5	8.0	8.3	8.5	24.2	22.7	23.6	7.8	8.1	7.8	250	250
100% A	500/0	5	5	5	7.2	7.9	8.2	25.3	22.6	23.8	7.2	8.0	7.8	395	380
100% B	500/0	5	5	5	7.2	7.8	8.2	25.2	22.4	23.8	7.1	8.0	7.7	395	390
100% C	500/0	5	5	5	7.2	7.8	8.1	25.2	22.4	23.8	7.1	8.0	7.8	395	390
100% D	500/0	5	5	5	7.2	7.8	8.1	25.3	22.6	23.8	7.1	8.0	7.8	395	395

[B] Temperature of test room was continously recorded on a strip chart recorder. Room temperature range for the test period was 22.0-24.0°C.

Table 2. Results of chemical analyses on the effluent from the Arthur Dozier Wastewater Treatment Facility sampled on September 30, 1996.

Metals

Cadmium	0.2	µg/L[I]
Calcium	34.4	mg/L
Copper	7.9	µg/L
Iron	27	µg/L
Magnesium	9.78	mg/L
Silver	0.06	µg/L[I]
Zinc	45	µg/L

Pesticides and Herbicides

none detected

Base, Neutral, & Acid Extractable Organics

none detected

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: AD Dairy
County: JACKSON
Contact / District: Glenn Butts / Northwest
NPDES Permit #: FL0028185
LIMS Sample #: 154542 LIMS Job #: 96-Oct-01-26
sample log 10-8-96
Test Type: Screening / Definitive
Static / Static Renewal / Flow-through
Test Number: 1 of 2
Remarks: *in wrong column JS

Sample Collection: Date 9-30-96 Time 1045
Test Beginning: Date 10-1-96 Time 1355
Test Ending: Date 10-3-96 Time 1435
Organism Batch #: 42 Diluent Batch #: 42
Organism Age: < 24 hours
Test Organism: Ceriodaphnia dubia

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	23.8 @ 23.9	8.4 @ 23.4 °C	108.3 @ 101.3 1386 @ 1409 @ 24.1 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	22.3 @ 22.3	8.6 @ 22.3 °C	101.8 @ 101.3 1320 @ 1409 @ 22.1 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	24.1 @ 24.1	8.5 @ 23.4 °C	1083 @ 101.3 1390 @ 1409 @ 24.1 °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	5	5	5	8.2	~~8.2~~ 8.05	8.2	23.9		25.2	8.0		6.3	180		185
Control	B	5	5	5			8.2			25.6			6.8			195
Control	C	5	5	5			8.2			25.7			6.7			190
Control	D	5	5	5			8.3			25.7			6.7			190
100%	A	5	5	5	7.3		8.1	24.2		25.5	7.3		7.0	375		380
100%	B	5	5	5			8.2			25.7			7.0			355
100%	C	5	5	5			8.2			25.7			6.5			360
100%	D	5	5	5			8.2			25.7			6.7			365
Measured/Loaded by:		MF	MF	ND	MF		DB	MF		DB	MF		DB	MF		DB
Recorded by:		MF	MF	ND	MF		JS	MF		JS	MF		JS	MF		JS

Investigators' Signatures

Marshall Faircloth
Julie Sharpe
Jessica Lingo
Glenn Nicholson
Dan Gatz
Paul Clark
A H Wolfe
reviewer

form updated 4/01/96

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			Not measured		
Lab Total Residual Cl2 (mg/L):	—	<0.03	<0.03	**Hach	MF 10-1-96 DR-100 Dig/JS
Alkalinity (mg/L as $CaCO_3$):	—	75	60	Hach	JS/ND
Hardness (mg/L as $CaCO_3$):	—	85	135	Hach	JS/ND
Total ammonia (mg/L as N):	—	0.052	0.09	Orion	DN

Ammonia Meter #98136 Ammonia Meter Slope: -.590 Ammonia Blank: <0.01 Control Salinity: 0 ppt Sample Salinity: 0 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: A. D. Dozier School WWTP
County: Jackson
Contact / District: Glenn Botts / Northwest
NPDES Permit #: FL0028185
LIMS Sample #: 154542 LIMS Job #: 96-Oct-01-26
sample log 10-3-96

Sample Collection: Date 9-30-96 Time 1045
Test Beginning: Date 10-1-96 Time 1430
Test Ending: Date 10-3-96 Time 1445
Organism Batch #: 74 Diluent Batch #: well
Organism Age: 10 days
Test Organism: Cyprinella leedsi

Test Type: Screening / Definitive
Static / Static Renewal / Flow-through

Test Number: 2 of 2

Remarks:
pH probe storage solution (KCl) may have contaminated A9 test [illegible] insufficient [illegible] 24hr pH during 24hr renewal [illegible] 10/3/96

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	23.8 @ 23.9	8.4 @ 23.4 °C	108.3 @ 101.3 1386 @ 1409 @ 24.1 °C
24 hr	7.0 @ 7.0 9.0 @ 9.0	22.3 @ 22.3	8.6 @ 22.3 °C	101.8 @ 101.3 1320 @ 1409 @ 22.1 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	24.1 @ 24.1	8.5 @ 23.4 °C	105.3 @ 101.3 1390 @ 1409 @ 24.1 °C

Conc.	Chamber #	Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
		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	A9	5	5	2	8.0	8.3	8.5	24.0	22.7	23.8	7.8	8.0	7.7	245	245	250
Control B	A10	5	5	5	8.0	8.3	8.5	24.0	22.5	23.7	7.8	8.0	7.7	250	240	250
Control C	A11	5	5	5	8.0	8.3	8.5	24.1	22.5	23.7	7.7	8.1	7.7	250	245	250
Control D	A12	5	5	5	8.0	8.3	8.5	24.2	22.7	23.6	7.8	8.1	7.8	250	240	250
100% A	A13	5	5	5	7.2	7.9	8.2	25.3	22.6	23.8	7.2	8.0	7.8	395	380	380
100% B	A14	5	5	5	7.2	7.8	8.2	25.2	22.4	23.8	7.1	8.0	7.7	395	375	390
100% C	A15	5	5	5	7.2	7.8	8.1	25.2	22.4	23.8	7.1	8.0	7.8	395	375	390
100% D	A16	5	5	5	7.2	7.8	8.1	25.3	22.6	23.8	7.1	8.0	7.8	395	380	395
Measured/Loaded by:		MF	MF	ND	MF	ND	DB	MF	ND	DB	MF	ND	DB	MF	DN	DB
Recorded by:		MF	MF	ND	MF	MF	JS	MF	MF	JS	MF	MF	JS	MF	MF	JS

*antyerson MF 10-2-96

Investigators' Signatures

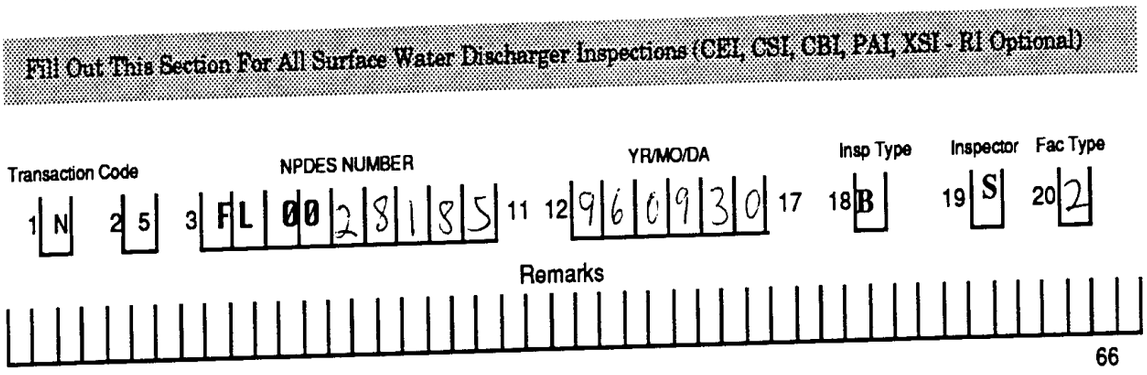
Marshall Faircloth
Julie Thorpe
[illegible]
Dennis Nicholson
[illegible]
[illegible]
[illegible]
reviewer

form updated 4/01/96

Water Quality Parameters	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			not measured		
Lab Total Residual Cl2 (mg/L):			<0.03	DR-100	DW/JS
Alkalinity (mg/L as $CaCO_3$):	125	—	60	Hach	JS/ND
Hardness (mg/L as $CaCO_3$):	130	—	135	HACH	JS/ND
Total ammonia (mg/L as N):	0.054	—	0.09	Orion	DN

Ammonia Meter #98136 Ammonia Meter Slope: -59.0 Ammonia Blank: <0.017 Control Salinity: 0 ppt Sample Salinity: 0 ppt

The Bioassay of the Andrew Dozier WWTF effluent sampled on September 30, 1996, NPDES #FL0028185.



The Priority Pollutants Analysis for the Bioassay of the Andrew Dozier WWTF effluent sampled on September 30, 1996, NPDES #FL0028185.

