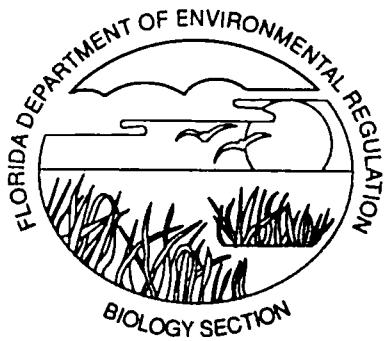


Bioassays of

Seminole Electric Cooperative, Inc.

Palatka, Putnam County, Florida

NPDES #FL0036498

Sampled 10/7/91

November 20, 1991

Biology Section
Division of Technical Services

Bioassays of

Seminole Electric Cooperative, Inc.

Palatka, Putnam County, Florida

NPDES #FL0036498

Biology Section
Bureau of Laboratories
November 20, 1991

Introduction

Seminole Electric Cooperative, Inc., Palatka, Putnam County, Florida, NPDES #FL0036498 on 8 to 10 October, 1991.

This facility, located on State Road 17 near Palatka, is a two-unit, coal-fueled steam electric power plant. It operates a WWTP which reduces the quantities of pollutants by neutralization, coagulation, flocculation, and sedimentation. Percolation fields are used in the treatment of a portion of the metal-cleaning wastes and boiler blowdown. Recirculating cooling towers are used to control the thermal component of the discharge. The treated effluent is discharged into the St. Johns River.

The toxicity tests discussed in this report were performed in accordance with methods described by Peltier and Weber, 1985, *Methods for Measuring the Acute Toxicity of Effluents to Aquatic Organisms*, 3rd Edition, and by the FDER Biology Section, 1985, *Quality Assurance Manual for Performing Acute Toxicity Tests*, 2nd Edition.

Results and Discussion

The Biology Section performed two acute screening toxicity bioassays on a sample of effluent from this facility. The bioassay organisms used for these tests were the waterflea, *Ceriodaphnia dubia*, and the fish, *Notropis leedsi*. Test results suggested that the effluent sample was not toxic.

Total residual chlorine was not detected in the sample. The total ammonia and unionized ammonia concentrations detected in the bioassay sample by the Hach method were 1.0 mg/L and 0.005 mg/L, respectively. Other constituents detected in the sample were the metals: aluminum (235 µg/L), copper (179 µg/L), iron (53 µg/L), lead (2.2^{T} µg/L), nickel (34 µg/L), selenium (< 2 µg/L), and zinc (107 µg/L). Di-N-butyl phthalate (4.4^{T} µg/L) was detected and tentative identification was made of aliphatic compounds with an estimated concentration of 2 µg/L. No pesticides were detected in the sample.

Conclusion

The sample of effluent from this facility was not toxic on 7 October, 1991.

^{T}Value reported is less than the practical quantitation limit.

Table 1. Concentration Series and Volumes used for the Static Acute Screening Bioassays of Seminole Electric Cooperative on October 8-10, 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. Data recorded during the acute screening bioassay of a sample of effluent from Seminole Electric Cooperative, Inc., Palatka, Putnam County, Florida, NPDES# FL0036498, on 8 to 10 October, 1991.

Facility:	Seminole Electric			NPDES #	FL0036498	Facility Type:	Power Plant
Location:	State Road 17, Palatka			Contact/District:	R. Felton / Northeast		
County:	Putnam			Test type:	static screening		
Sample Collection Date:	10/7/91	Time:	1215	# tests:	2	Receiving Water:	St. Johns River
Test Beginning Date:	10/8/91	Time:	1400	Chlorination Type:	chlorinated		
Test Ending Date:	10/10/91	Time:	1400	No residual chlorine was detected in the bioassay sample.			Page 1 of 1

Total Residual Cl2	mg/l	Method
Field:	-	-
Lab:	0.0	Hach

Ammonia	Total (mg/l)	Unionized (mg/l)
Control Water (fish):	0.00	0.00
Cond. Control Water (daphnids):	0.00	0.00
100% Sample:	1.00	0.005

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	120	130
Cond. Control Water (daphnids):	65	85
100% Sample:	35	475

Organism: ***Ceriodaphnia dubia*** Life stage: < 24 hours
LC50: -

	SURVIVAL			Dissolved Oxygen			pH			Temperature			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	9.2	-	8.7	6.8	-	8.3	20.0	-	20.4	163	189
Control	5	5	5	-	-	8.7	-	-	8.3	-	-	-	-	-
Control	5	5	5	-	-	8.7	-	-	8.3	-	-	-	-	-
Control	5	5	5	-	-	8.7	-	-	8.3	-	-	-	-	-
100.0%	5	5	5	8.8	-	8.7	7.0	-	7.8	19.6	-	20.3	2300	2750
100.0%	5	5	5	-	-	8.7	-	-	7.8	-	-	-	-	-
100.0%	5	5	5	-	-	8.7	-	-	7.8	-	-	-	-	-
100.0%	5	5	5	-	-	8.7	-	-	7.8	-	-	-	-	-

Organism: ***Notropis leedsi*** Age: 24 days
LC50: -

	SURVIVAL			Dissolved Oxygen			pH			Temperature			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	8.4	8.0	7.8	7.8	8.1	8.1	19.9	20.0	20.5	-	-
Control	5	5	5	8.4	8.0	7.8	7.8	8.1	8.2	-	-	-	240	245
100%	5	5	5	8.9	7.7	7.3	7.3	7.5	7.4	20.3	20.0	20.5	-	-
100%	5	5	5	8.9	8.0	7.3	7.3	7.5	7.4	-	-	-	2450	2460

Table 3. Results of chemical analyses on the sample of effluent from Seminole Electric Cooperative, Putnam County, on 7 October, 1991.

Base-Neutral & Acid Extractables

Di-n-butyl phthalate	4.4 µg/L[t]

Tentitive Identification	*Estimated concentrations*
Aliphatics	2 µg/L

Chlorinated Pesticides

None Detected

Metals

Aluminum	235	µg/L
Copper	17	µg/L
Iron	53	µg/L
Lead	2.2	µg/L[t]
Nickel	34	µg/L
Selenium	< 2	µg/L
Zinc	31	µg/L

Nutrients

Ammonia	None detected

[t] Value reported is less than the practical quantitation limit.

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Seminole Electric
Address/City:
County: Putnam
Contact/District: Rita Felton / Northeast
NPDES Permit #: FL00 Outfall #: 001

Sample Collection: Date 10-7-91 Time 1215
Test Beginning: Date 10-8-91 Time 1400
Test Ending: Date 10/10/91 Time 1400
Test Organism: C. dubia
Life Stage/Age: <24 hrs

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

Remarks: No spine sticker

24043
entered 10/11/91 KWP

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7@7.9@9	9.0@21°C	20.4@23.4°C	1355@23.3°C@1361
24 hr	7@7.9@9	8.9@21.5°C	20.2@23.4°C	136@23.4@1377
48 hr	7@7.9@9	9.0@21°	20.5@23.9	1370@24@1388

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		5	5	5	6.8		8.3	20.0		20.4	9.1		8.7	183		189
Control		5	5	5			8.3						8.7			
Control		5	5	5			8.5						8.7			
Control		5	5	5			8.3						8.7			
100%		5	5	5	7.0		7.8	19.6		20.3	8.8		8.7	2300		2750
100%		5	5	5			7.8						8.7			
100%		5	5	5			7.8						8.7			
100%		5	5	5			7.8						8.7			
Measured/Loaded by:		MF	AJ	MF	MF		MF	MF		MF	MF		MF	MF		MF
Recorded by:		AJ	AJ	AJ MF			AJ	AJ		AJ	AJ		AJ	AJ		AJ

Investigators' Signatures
Alison Jordan
Marshall Faircloth

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:	1 blank 0				
Lab Tot. Resid. Cl2:			0	HACH	MF
Alkalinity:	120	65	35	HACH	AJ
Hardness:	130	85	475	HACH	AJ
Total Ammonia:	0.0	0.0	1.0	Hach	MF

Ammonia
Meter Slope:
Ammonia Blank: 0.0
Salinity Sample: ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Seminole Electric
Address/City:
County: Putnam
Contact/District: Rita Felton Northeast
NPDES Permit #: FL0036498 Outfall #: 001

Sample Collection: Date 10-7-91 Time 1215
Test Beginning: Date 10-8-91 Time 1400
Test Ending: Date 10/10/91 Time 1400
Test Organism: N. leeclai
Life Stage/Age: 24 days

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

Remarks: * wrote C. dubia value in N. leeds. spot. 10/8/91 AJ

24043

Instrument Calibrations:

	pH	DO	Temp °C	Cond umhos
0 hr	7@7.99	9.0@21°C	20.4@23.4°C	1355@23.3°C@1361
24 hr	7@7.99	8.9@21.5°C	20.2@23.4°	1366@23.9°C@1377
48 hr	7@7.99	8.0@21.0	20.5@23.9	1370@24°@1380

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		5	5	5	7.8	8.1	8.1	19.9	20.0	20.5	8.4	8.0	7.8	~~175~~ *		
control		5	5	5	7.8	8.1	8.2				8.4	8.0	7.8	240	242	245
100%		5	5	5	7.3	7.5	7.4	20.3	20.0	20.5	8.4	7.7	7.3			
100%		5	5	5	7.3	7.5	7.4				8.9	8.0	7.3	2450	2420	2460
Measured/Loaded by:		MF	AS	AS	MF	MF	AJ	MF	MF	MF	MF	MF	MF	MF	MF	MF
Recorded by:		MF	AJ	AS	MF	AS	AJ	AS	AS	AS	AS	AS	AS	AS	AS	AJ

Investigators' Signatures
Marshall Faircloth
Alison Jordan
Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:	C-blank 0				
Lab Tot. Resid. Cl2:			0	HACH	MF
Alkalinity:	120	65	35	HACH	MF
Hardness:	130	85	475	HACH	MF
Total Ammonia:	0.0	0.0	1.0	Hach	MF
Ammonia Meter Slope:			Ammonia		