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Bioassays of

Timber Energy Resources, Inc.

Telogia, Liberty County, Florida

NPDES #FL0039951

Sampled 11/12/91

January 3, 1991

Biology Section
Division of Technical Services

Bioassays of

Timber Energy Resources, Inc.

Telogia, Liberty County, Florida

NPDES #FL0039951

Biology Section
Bureau of Laboratories
January 3, 1991

Introduction

Timber Energy Resources, Inc., Telogia, Liberty County, Florida, NPDES #FL0039951, on 13 to 15 November, 1991.

This facility is located one mile south of Telogia on State Road 65. Timber Energy is permitted to operate an intermittent discharge of stormwater runoff and a wastewater treatment facility for a 14 MW waste wood-fueled power plant. Wastewater discharge consists of cooling tower blowdown, flash tank-boiler blowdown, non-contact cooling water, condensed steam, and raw water for contact cooling and dilution. Stormwater treatment consists of two stormwater retention basins with filter beds and a settling basin. Discharge is to Stokes Branch.

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 and Receiving Waters to Freshwater and Marine Organisms*, 4th Edition.

Results and Discussion

The FDER Biology Section performed static acute screening toxicity bioassays with 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 to *Notropis leedsi*. In the *C. dubia* test, 25% mortality was observed at 48 hours in the 100% effluent test concentration.

Total residual chlorine was not detected in the sample. Total and unionized ammonia concentrations were 0.84 mg/L and 0.07 mg/L (Hach), respectively. Further chemical analyses were performed on the sample and indicated the presence of the metals, aluminum (69 µg/L, mean), copper (23 µg/L, mean), and iron (599 µg/L, mean). Organics and pesticides were undetected.

Conclusion

The sample of effluent was not toxic to *N. leedsi* on 12 November, 1991, however 25% mortality was observed in the *C. dubia* test.

Table 1. Concentration Series and Volumes Used for the Static Acute Screening Bioassays of Timber Energy Resources, Inc., 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 Timber Energy Resources, Liberty County, on 12 November, 1991.

Base-Neutral & Acid Extractables

none detected

Chlorinated Pesticides

none detected

Metals

Aluminum	69	µg/L [a]
Copper	23	µg/L [a]
Iron	599	µg/L [a]

a Value reported is the mean of two or more determinations.

Table 3. Data recorded during the acute screening bioassay of a sample of effluent from Timber Energy Resources, Telogia, Liberty County, Florida, NPDES# FL0039951, on November 13-15, 1991.

Facility:	**Timber Energy Resources**		NPDES #	FL0039951	Facility Type: **waste wood-fueled**
Location:	SR 65, 1 mile south of Telogia		Contact/District:	Glen Butts / NW	**power plant**
County:	Liberty		Test type:	static acute screen	
Sample Collection Date:	**11/12/91**	Time: 1310	# tests:	2	Receiving Water: Stokes Branch
Test Beginning Date:	11/13/91	Time: 1330	Chlorination Type:	**not chlorinated**	
Test Ending Date:	11/15/91	Time: 1330			**Page 1 of 1**

Total Residual Cl2	mg/l	Method
Field:	not measured	-
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:	0.84	0.07

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	130	160
Cond. Control Water (daphnids):	80	110
100% Sample:	160	900

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	-	23.8	9.1	-	8.6	152	177
Control	5	5	5	-	-	8.2	-	-	-	-	-	8.6	-	-
Control	5	5	4	-	-	8.2	-	-	-	-	-	8.6	-	-
Control	5	5	5	-	-	8.2	-	-	-	-	-	8.6	-	-
100%	5	5	3	8.2	-	8.5	22.1	-	23.8	8.6	-	8.5	1589	1770
100%	5	4	4	-	-	8.5	-	-	-	-	-	8.5	-	-
100%	5	5	3	-	-	8.5	-	-	-	-	-	8.5	-	-
100%	5	5	5	-	-	8.5	-	-	-	-	-	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	7.8	8.2	8.3	21.7	22.1	23.1	8.5	8.7	8.7	238	251
Control	5	5	5	7.8	8.2	8.3	-	-	-	8.6	8.7	8.7	-	-
100%	5	4	4	8.1	8.2	8.3	24.8	22.1	23.0	8.5	8.7	8.7	1822	1679
100%	5	5	5	8.1	8.3	8.3	-	-	-	8.5	8.7	8.7	-	-

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: TIMBER ENERGY RESOURCES
Address/City: /
County: LIBERTY
Contact/District: GLEN BUTTS / NW
NPDES Permit #: FL00 39951 Outfall #: 1

Sample Collection: Date 11-12-91 Time 1310
Test Beginning: Date 11-13-91 Time 1330
Test Ending: Date 11-15-9 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: 91-NOV-13-01
25588

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7@7, 9@9	8.7@23.0	23.4@23.4	1359@23.3
24 hr	7@7, 9@9	8.6@23.5	23.2@23.2	1359@23.3
48 hr	7@7, 8@9	8.5@24.0	29.9@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		23.8	9.1		8.6	152	**	177
control	B	5	5	5			8.2						8.6			
control	C	5	5	4			8.2						8.6			
control	D	5	5	5			8.2						8.6			
100%	A	5	5	3	8.2		8.5	22.1		23.8	8.6		8.5	1589		1770
100%	B	5	4	4			8.5						8.5			
100%	C	5	5	3			8.5						8.5			
100%	D	5	5	5			8.5						8.5			
Measured/Loaded by:		KP	AJ	MF	AJ		MF	AJ		MF	AJ		MF	AJ		MF
Recorded by:		AJ	AJ	AJ	KP		AJ	KP		AJ	KP		AJ	KP		AJ

*unable to read cond. in water dated 11/15/91 mp

Investigators' Signatures

Kim Pearce.
Alexis Gulan
Andrea Hunnemeab

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			not measured		
Lab Tot. Resid. Cl2:		0.0	0.0	Hach	AJ.
Alkalinity:		80	160	Hach	AH
Hardness:		110	900	Hach	AJ
Total Ammonia:		.48	.54	Hach	AH

Ammonia Meter Slope: Ammonia Blank: Salinity Sample:

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: TIMBER ENERGY RESOURCES
Address/City: _____
County: LIBERTY
Contact/District: GLEN GUTTS
NPDES Permit #: FL0039951 Outfall #: 1

Sample Collection: Date 11-12-91 Time 1310
Test Beginning: Date 11-13-91 Time 1340
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@7, 9@9	8.7@23.0	23.4@23.4	1359@23.3
24 hr	7@7, 9@9	8.6@23.5	23.2@23.2	1359@23.3
48 hr	7@7, 9@9	8.5@24.0	23.9@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	62	5	5	5	7.8	8.2	8.3	21.7	22.1	23.1	8.5	8.7	8.7	235	247	251
control	38	5	5	5	7.8	8.2	8.3				8.6	8.7	8.7			
100%	63	5	4	4	8.1	8.2	8.3	24.8	22.1	23.0	8.5	8.7	8.7	1822	1630	1671
100%	77	5	5	5	8.1	8.3	8.3				8.5	8.7	8.7			
Measured/Loaded by:		AJ	AJ	AJ	AJ	AJ	MF	AJ	AJ	MF	AJ	AJ	MF	AJ	AJ	MF
Recorded by:		AJ	AJ	AJ	KP	AH	AJ	KP	AH	AJ	KP	AH	AJ	KP	AH	AJ

Investigators' Signatures

Kim Pearce
Alison Jordan
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Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			not	measured	
Lab Tot. Resid. Cl2:	0.0		0.0	hach	AJ
Alkalinity:	130		160	hach	AH
Hardness:	160		900	hach	AH
Total Ammonia:	0.0		.84	hach	AJ

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

The Bioassay of Timber Energy Resources, Inc., effluent sampled on November 12, 1991, NPDES# FL0039951.

