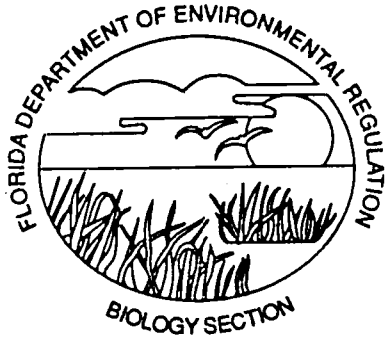


Bioassays of

Seminole Kraft

Jacksonville, Duval County, Florida

NPDES #FL0000400

Sampled 8/19/91

September 6, 1991

Biology Section
Division of Technical Services

Bioassays of

Seminole Kraft

Jacksonville, Duval County, Florida

NPDES #FL0000400

Biology Section
Bureau of Laboratories
September 6, 1991

Introduction

Seminole Kraft, Jacksonville, Duval County, Florida, NPDES #FL0000400, on 20 to 22 August, 1991.

This facility, located at 9469 Eastport Road, is a Kraft pulp and paper manufacturer. The mill produces approximately 1500 tons per day of unbleached packaging paper and paperboard. The industrial wastewater treatment system has a 20 MGD design capacity. Treatment includes a clarifier with settling and aeration lagoon and averages treating 17 MGD of post-process water. Treated wastewater is discharged to 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 static acute screening bioassays on a sample of effluent from this facility. The bioassay test organisms used for these tests were the fish, *Notropis leedsi*, and the shrimp, *Mysidopsis bahia*. The results of these tests indicated that the sample was not toxic to either species. Total residual chlorine and total ammonia were not detected in the bioassay sample. Further chemical analyses performed on the effluent sample detected the organic compounds, Bis(2-ethylhexyl) phthalate (12 µg/L) and Diethylphthalate (< 3 µg/L). Tentative identifications and estimated concentrations were made for aliphatics (1100 µg/L), aromatics (12 µg/L), PAH (100 µg/L), and unidentified organics (30 µg/L) were also detected. Analyses for metals detected aluminum (461 µg/L), copper (27 µg/L, mean value), iron (423 µg/L, estimated value), and zinc (15 µg/L). The nutrients, ammonia-N and nitrate/nitrite-N averaged 0.13 mg/L and 0.097 mg/L, respectively in the effluent sample. Pesticides were not detected.

Conclusion

The sample of effluent from this facility was not toxic on 19 August, 1991.

Table 1. Concentration Series and Volumes Used for the Static Screening Bioassays of the Seminole Kraft facility, NPDES# FL0000400 on 20 to 22 August, 1991.

Mysidopsis bahia (mysid shrimp)

Concentration	Dilution Water	Sample	Total Volume
Control	500 mL	0 mL	500 mL
100%	0 mL	500 mL	500 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 static acute screening bioassay of a sample of effluent from the Seminole Kraft facility, NPDES# FL0000400, Jacksonville, Duval County, Florida, on 20 to 22 August, 1991.

Facility:	**Seminole Kraft**		NPDES #	FL0000400	Facility Type: **Paper Mill**
Location:	9469 Eastport Rd., Jacksonville		Contact/District:	Rita Felton / NE	
County:	Duval		Test type:	static acute screen	
Sample Collection Date:	**8/19/91**	Time: 1415	# tests:	2	Receiving Water: St. Johns River
Test Beginning Date:	8/20/91	Time: 1330	Chlorination Type:	**not chlorinated**	
Test Ending Date:	8/22/91	Time: 1330			**Page 1 of 1**

Total Residual Cl2	mg/l	Method
Lab:	0.0	Hach

Ammonia	Total (mg/l)	Unionized (mg/l)
Control Water (fish):	0.00	0.00
Control Water (Mysids):	0.00	0.00
100% Sample:	0.00	0.00

Salinity (ppt)	Fish test
Control Water:	0.0
100% Sample:	7.5

Salinity (ppt)	Mysid test
Control Water:	15.0
100% Sample:	16.0

Organism: ***Notropis leedsi*** Age: 18 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	9.1	9.0	9.0	7.7	8.2	8.3	21.3	21.3	20.2	252	244
Control	5	5	5	9.1	9.0	9.0	7.7	8.2	8.3	-	-	-	-	-
100%	5	5	5	8.8	7.2	7.6	7.7	8.0	8.2	23.8	21.6	20.2	12460	11900
100%	5	5	5	8.8	7.2	7.7	7.7	8.0	8.2	-	-	-	-	-

Organism: ***Mysidopsis bahia*** Age: <3 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	9.0	7.7	8.0	8.7	8.2	7.9	21.0	21.7	20.3	23300	23700
Control	5	5	5	9.0	7.7	8.0	8.7	8.2	7.8	-	-	-	-	-
100%	5	5	5	8.0	6.9	7.5	8.0	8.1	8.2	23.0	21.7	20.5	26800	26200
100%	5	5	5	8.0	6.9	7.5	8.0	8.1	8.2	-	-	-	-	-

Table 3. Results of chemical analyses on the sample of effluent from the Seminole Kraft facility, Duval County, Florida.

Organics

Base Neutrals and Acids Extractables	Bis(2-ethylhexyl)phthalate	12 µg/L
	Di-n-butyl phthalate	3.7 µg/L[t]
	Diethylphthalate	3 µg/L[k]
Pesticides		Not Detected

Tentative identification and estimated concentrations of the following:

Aliphatics	1100 µg/L
Aromatics	12 µg/L
PAH	100 µg/L
Unidentified organics	30 µg/L

Metals

Aluminum	461 µg/L
Copper	27 µg/L[a]
Iron	423 µg/L[j]
Zinc	15 µg/L

Nutrients

Ammonia	0.13 mg/L
Nitrite / Nitrate	0.097 mg/L

[a] Value reported is the mean of two or more determinations.
[j] Estimated value.
[k] Actual value is known to be less than the value given.
[t] Value reported is less than the practical quantitation limit.

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Seminole Kraft
Address/City:
County: Duval
Contact/District: Rita Felton / Northeast
NPDES Permit #: Outfall #: 001

Sample Collection: Date 8/19/91 Time 1415
Test Beginning: Date 8/20/91 Time 1330
Test Ending: Date 8/22/91 Time 1330
Test Organism: [illegible]
Life Stage/Age: [illegible]

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

Remarks:
SALINITY OF SAMPLE ~ 7.5 ppt

Instrument Calibrations:

	pH	DO	Cond	Temp
0 hr	7.7, [illegible]	[illegible]	[illegible]	[illegible]
24 hr	7.7, 7.69	[illegible]	[illegible]	[illegible]
48 hr				

Conc	Chamber #	Number Live 0	Number Live 24	Number Live 48	DO (mg/l) 0	DO 24	DO 48	pH 0	pH 24	pH 48	Temp (°C) 0	Temp 24	Temp 48	Cond. (µmhos/cm) 0	Cond 24	Cond 48
Control	92	5	5	5	9.1	9.0	[illegible]	7.7	8.2	[illegible]	21.3	21.[illegible]	[illegible]			
Control	77	5	5	5	9.1	9.0	[illegible]	7.8	8.2	[illegible]				252	[illegible]	[illegible]
100%	188	5	5	5	8.8	7.2	[illegible]	7.7	8.0	[illegible]	23.8	24.6	[illegible]			
100%	68	5	5	5	8.8	7.2	[illegible]	7.7	8.2	[illegible]				12400	[illegible]	[illegible]
Measured/Loaded by:		MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF
Recorded by:		MF	MF	MF	KP	MF	MF	KP	MF	MF	KP	MF	MF	KP	MF	MF

21677 91-AUG-21-01-01
BIOLOGY Matrix: W-EFFLUENT
Date Collected: 19-AUG-1991 14:15:00
Seminole Kraft
BSY-SN-OLD BSY-SN-FSH

Investigators' Signatures
Marshall Faircloth
Kim Pearce
[signature]

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			0.0	Hach	MF
Lab Tot. Resid. Cl2:			↓	↓	↓
Alkalinity:			[illegible]	[illegible]	-
Hardness:			[illegible]	[illegible]	[illegible]
Total Ammonia:	0.0	0.0	0.0	Hach	MF

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: SEMINOLE KRAFT
Address/City: _____
County: _____
Contact/District: RITA FELTON / NE
NPDES Permit #: FL00 Outfall #: _____

Sample Collection: Date 8-19-91 Time 1415
Test Beginning: Date 8-20-91 Time 1415
Test Ending: Date 8-23-91 Time 1335
Test Organism: MYSIDOPSIS BAHIA
Life Stage/Age: <3 days

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

Remarks:
ORIGINAL SALINITY OF SAMPLE ~ 7.5 ppt.
ADJUSTED SALINITY TO 15 ppt FOR M. BAHIA TEST
EFFLUENT SALINITY FOR TEST IS ~ 16 ppt.
CONTROL SALINITY FOR TEST IS ~ 15 ppt.

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7@7.9(CK)	8.9@21.5	21.5@24.3	1384@24.0
24 hr	7@7.09	8.5@24	21.7@24.2	1384@24.5@1389
48 hr	7@7.15	8.1@24.5	21.2@24.5	1384@24.0@1391

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	108	5	5	5	8.7	8.2	7.1	21.0	21.7	24.3	9.0	7.7	3.8			
control	114	5	5	5	8.7	8.2	7.1				9.0	7.7	3.8	23300	23400	23600
100%	12	5	5	5	8.0	8.1	7.2	23.0	21.7	24.5	8.0	6.9	3.5			
100%	44	5	5	5	8.0	8.1	7.2				8.0	6.9	3.5	26800	25500	25600

Measured by: MF MF MF | MF MF | MF MF | MF MF | MF MF | MF MF
Verified by: MF KP KP | KP MF | KP MF | KP MF | KP MF

8-AUG-91 7:07 -
Seminole Kraft on 21-AUG-1991 08:54
Date Received: 21-AUG-1991 08:54:34
Federal Express BIOLOGY
W-EFFLUENT NE-JAX
SS/-SN-CLU 3SY-SN-FSH

Investigators' Signatures
Kim Pearce
Marshall Faircloth

Water-quality Parameters

	Well Water	Conc. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:					
Lab Tot. Resid. Cl2:			↓	↓	KP
Alkalinity:					
Hardness:					
Total Ammonia:	0.0	0.0	0.0	Hach	MF

Ammonia Meter Slope: _____ Ammonia Blank: _____ Salinity Sample: 7.5 ppt