Bioassays of

Coca-Cola Foods, Auburndale South Sprayfield

Auburndale, Polk County, Florida

NPDES #FL0000418

Sampled 3/1/93

March 1993

Biology Section
Division of Technical Services

Bioassays of

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NPDES #FL0000418

Biology Section
Bureau of Laboratories
March 1993

Introduction

Coca-Cola Foods South sprayfield run-off, Auburndale, Polk County, Florida, NPDES #FL0000418, tests performed on 2 to 4 March, 1993.

This facility is located at McKean Street and Darby Avenue in Auburndale. Strong citrus waste is collected from the juicing plant, cold storage, fruit handling, canning, treated and chlorinated domestic waste, and underdrain effluent and is routed to Coca-Cola's own industrial wastewater treatment plant (IWWTP). Up to 2 MGD of treated effluent from the IWWTP is pumped eleven miles to the 570-acre Florida Gold Grove (or North sprayfield - a citrus grove owned by Coca-Cola Foods) and land applied (DER permit #IO 53-152061).

The DER permit also authorizes the use of a 110-acre South sprayfield for disposal of treated effluent. The Florida Gold Grove system may use 50 acres of the South sprayfield as backup during maintenance, while the remaining 60 acres is designated for emergency use only. Although the permit states (specific condition #5) that the permittee shall ensure that run-off from the sprayfields does not occur as a result of the spray irrigation, run-off was collected for the bioassays from sample site 03, prior to its entering Lake Lena Run.

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, EPA/600/4-90/027.

Results and Discussion

The FDER Biology Section performed two 48-hour static acute screening toxicity bioassays with a sample of effluent from this facility. The test species used for these bioassays were the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Notropis leedsi*. The test results did not indicate toxicity.

Total residual chlorine of the sample was 0.06 mg/L in the laboratory. Total residual chlorine was not measured in the field. Total and unionized ammonia concentrations were 0.063 mg/L and < 0.01 mg/L, respectively.

Conclusion

The sample of effluent collected from this facility on 1 March, 1993, did not show toxicity.

Table 1. Concentration series and volumes used for the 48-hour static acute screening bioassays of the Coca-Cola Foods 110-acre South sprayfield run-off performed on 2 to 4 March, 1993.

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 48-hour acute screening bioassays of a sample of run-off from the Coca-Cola Foods 110-acre South sprayfield, Auburndale, Polk County, Florida, NPDES# FL0000418, performed on 2 to 4 March, 1993.

Facility:	Coca-Cola 110-acre South sprayfield		NPDES #	FL0000418	Facility Type: Citrus Processing
Location:	Auburndale		Contact / District:	Pat Fricano / SW	
County:	Polk		Test type:	static acute screen	
Sample Collection Date:	3/1/93	Time: 1138	# tests:	2	Receiving Water: Lake Lena Run
Test Beginning Date:	3/2/93	Time: 1400	Chlorination Type:	Non-chlorinated	
Test Ending Date:	3/4/93	Time: 1400			Page 1 of 1

Organism: ***Ceriodaphnia dubia*** Life stage: < 24 hrs

	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	22.9	-	23.1	7.8	-	8.0	160	165
Control	5	5	5	-	-	8.2	-	-	-	-	-	8.0	-	165
Control	5	5	5	-	-	8.2	-	-	-	-	-	8.1	-	165
Control	5	5	5	-	-	8.2	-	-	-	-	-	8.1	-	165
100%	5	5	5	7.5	-	8.2	23.7	-	23.2	8.1	-	8.0	465	450
100%	5	5	5	-	-	8.2	-	-	-	-	-	8.1	-	475
100%	5	5	5	-	-	8.2	-	-	-	-	-	8.0	-	475
100%	5	5	5	-	-	8.2	-	-	-	-	-	8.1	-	480

Organism: ***Notropis leedsi*** Age: 9 days

	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	8.2	22.0	23.1	22.9	7.5	7.9	7.9	235	275
Control	5	5	5	7.8	8.2	8.3	-	-	-	7.6	8.0	7.8	235	265
100%	5	5	5	7.4	7.8	7.9	24.5	23.2	22.6	8.0	7.9	7.7	495	490
100%	5	5	5	7.4	7.8	7.9	-	-	-	8.0	7.9	7.8	495	495

Total Residual Cl2	mg/l	Method
Field:	not measured	
Lab:	0.06	DR-100

Ammonia	Total (mg/l)	Unionized (mg/l)
Control Water (fish):	<0.017	0.00
20% Dilute Mineral Water (cladocerans):	<0.017	0.00
100% Sample:	0.063	< 0.01

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	120	125
20% Dilute Mineral Water (cladocerans):	65	70
100% Sample:	77	85

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

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Coca Cola
Location: Coca Cola Sprayfield
County: Polk
Contact/District: Pat Fricano / ~~Central~~ SW District
NPDES Permit #: FL00 Outfall #:

Sample Collection: Date 3/1/93 Time 11:38
Test Beginning: Date 3/2/93 Time 1400
Test Ending: Date 3-4-93 Time 1400
Organism Batch #: 9 Diluent Batch #: 4
Organism Age: < 24 hours
Test Organism: Ceriodaphnia dubia

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

Test Number: 1 of 2
Remarks: 93-MAR-02-06 50666

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
0 hr	7.0 @ 7.0 9.0 @ 9.0	22.6 @ 22.8	8.4 @ 24.2	978 @ 1,000 @ 24. 970 @ 10,000
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.8 @ 23.9	8.4 @ 24.0	980 @ 1,000 @ 2 9730 @ 10,000
48 hr	7.0 @ 7.0 9.0 @ 9.0	23.3 @ 23.4	8.4 @ 23.6	975 @ 1,000 @ 24. 9730 @ 10,000

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temperature (°C) 0	24	48	D.O. (mg/L) 0	24	48	Cond. (mmhos/cm) Cond. (µmhos/cm) 0	24	48
Control	A	5	5	5	8.5		8.2	22.9		23.1	7.8		8.0	160		165
Control	B	5	5	5			8.2						8.0			165
Control	C	5	5	5			8.2						8.1			165
Control	D	5	5	5			8.2						8.1			165
100 %	A	5	5	5	7.5		8.2	23.7		23.2	8.1		8.0	465		450
100 %	B	5	5	5			8.2						8.1			475
100 %	C	5	5	5			8.2						8.0			475
100 %	D	5	5	5			8.2						8.1			480
Measured/Loaded by:		TM	TM	TM	MF		TM	MF		TM	MF		TM	MF		TM
Recorded by:		TR	TR	TM	EAM		TR	EAM		TR	EAM		TR	EAM		TR

Investigators' Signatures

Marshall Faircloth
Tobie Rader
Tina Mikulski

Reviewer

form updated 10/20/92

Water Quality Parameters	Salt Water/ Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:			not measured		
Lab Total Residual Cl2:	.02	.02	.06	DR100	TM
Alkalinity:	120	65	77	Hach	TR
Hardness:	125	70	85	Hach	TR
Total Ammonia:	<0.017	<0.017	0.063	Orion	MF

Cl_2 Blank: 0.02 Ammonia Meter Slope: -57.9 Ammonia Blank: <0.017 Sample Salinity: ____ ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Coca Cola
Location: Coca Cola Spray field
County: Polk SW
Contact/District: Pat Fricano / ~~Central~~ District
NPDES Permit #: FL00 Outfall #:

Sample Collection: Date 3/1/93 Time 11:38
Test Beginning: Date 3/2/93 Time 1400
Test Ending: Date 3-4-93 Time 1400
Organism Batch #: 9 Diluent Batch #: well H2O
Organism Age: 9 days
Test Organism: Notropis Leedsi

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

Test Number: 2 of 2
Remarks: 93-MAR-02-06 50666

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
0 hr	7.0 @ 7.0	22.6 @ 22.8	8.4 @ 24.2	978 @ 1,000
	9.0 @ 9.0			9700 @ 10,000 24.4°
24 hr	7.0 @ 7.0	23.8 @ 23.9	8.4 @ 24.0	980 @ 1,000 @24.4
	9.0 @ 9.0			9730 @ 10,000
48 hr	7.0 @ 7.0	23.3 @ 23.4	8.4 @ 23.6	975 @ 1,000 @24.2
	9.0 @ 9.0			9730 @ 10,000

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			Cond. (mmhos/cm) Cond. (µmhos/cm)		
Conc.	Chamber #	0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control	76	5	5	5	7.8	8.2	8.2	22.0	23.1	22.9	7.5	7.9	7.9	235	245	275
Control	147	5	5	5	7.3	8.2	8.3				7.6	8.0	7.8	235	240	265
100%	219	5	5	5	7.4	7.8	7.9	24.5	23.2	22.6	8.0	7.9	7.7	495	480	490
100%	164	5	5	5	7.4	7.8	7.9				8.0	7.9	7.8	495	485	495
Measured/Loaded by:		TM	TM	TM	TR	TM	TM	TR	TM	TM	TR	TM	TM	TR	TM	TM
Recorded by:		TR	TR	TM	EAM	TR	TR	EAM	TR	TR	EAM	TR	TR	EAM	TR	TR

Investigators' Signatures
Marshall Faircloth
Tobin Rader
Tina Mikulski

Reviewer

	Salt Water/ Well Water	20% Min Water	Water Quality Parameters: Sample	Method	Measured by
Field Total Residual Cl2:			not measured		
Lab Total Residual Cl2:	0.02	0.02	.06	DR100	TM
Alkalinity:	120	65	~~77~~	Hach	TR
Hardness:	125	70	85	Hach	TR
Total Ammonia:	<0.017	<0.017	0.063	Orion	MF

Cl_2 Blank: 0.02 Ammonia Meter Slope: -57.9 Ammonia Blank: <0.017 Sample Salinity: ____ ppt

form updated 10/20/92

Map of Coca Cola Springfield + Sampling stations for 3/1/93 CSI, CSI, and XSI

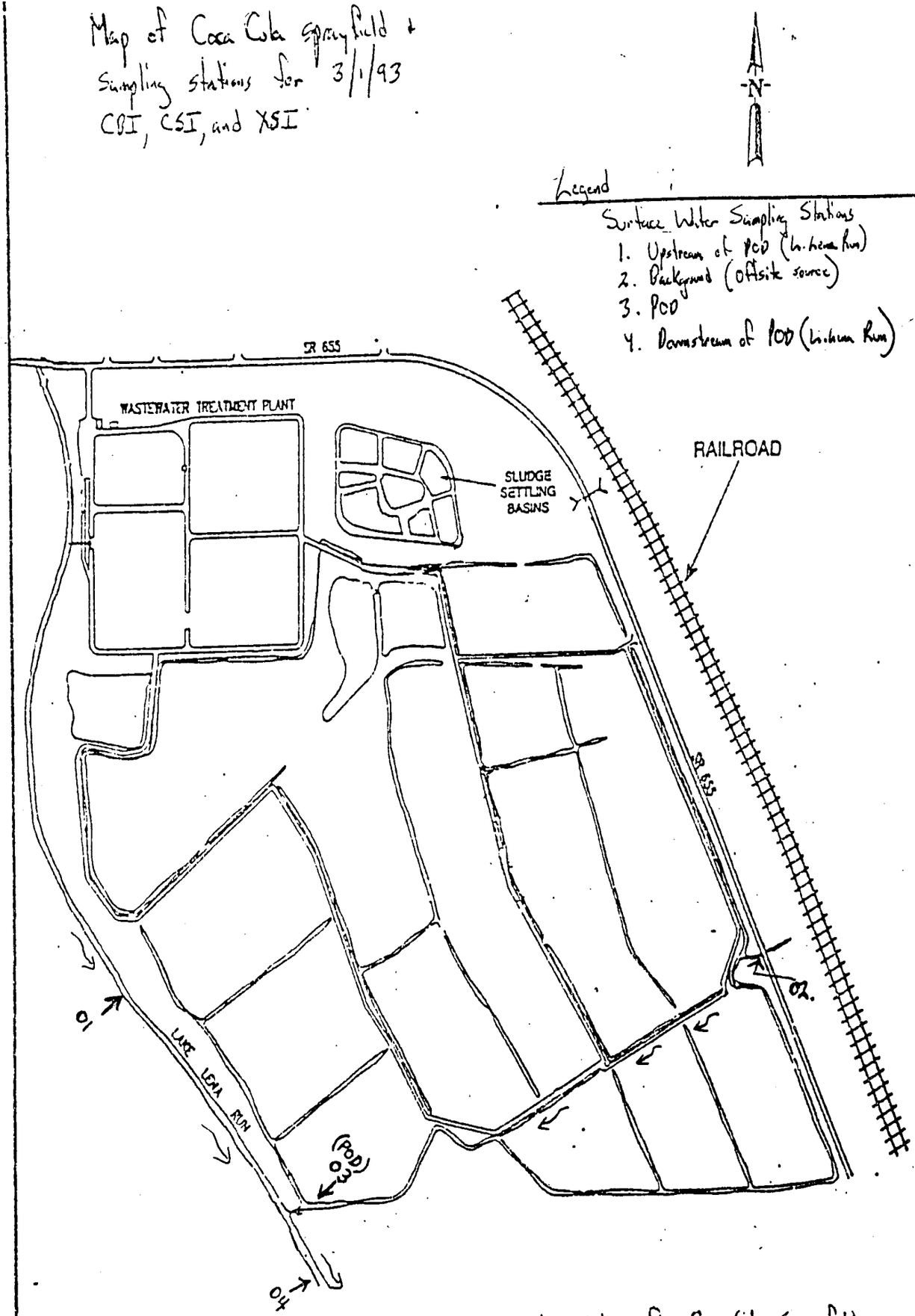
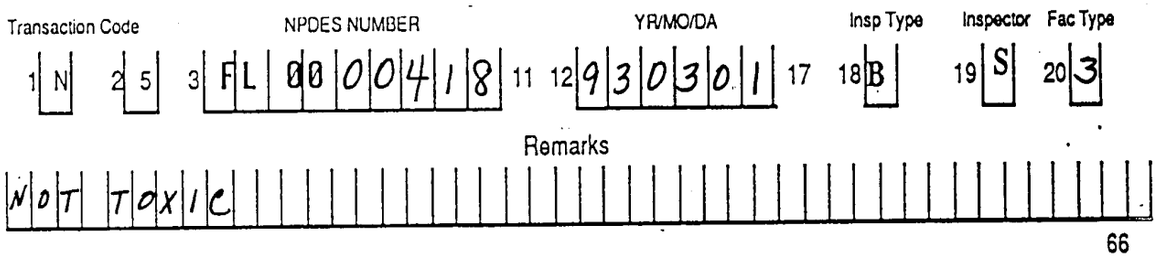


FIGURE Proposed Surface Water Sampling Stations for Coca-Cola Springfield

SOURCE: Jim Snitzer, 1993
03750-813-01-00 DISK Graphics Dept

Fill Out This Section For All Surface Water Discharger Inspections (CEI, CSI, CBI, PAI, XSI - RI Optional)



Fill Out This Section For All Surface Water Discharger Inspections (CEI, CSI, CBI, PAI, XSI - RI Optional)

