

Bioassays of

Coca Cola Foods-Minute Maid

Dunedin, Pinellas County, Florida

NPDES #FL0000477

Sampled 1/11/00

September 2000

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

Bioassays of

Coca Cola Foods-Minute Maid

Dunedin, Pinellas County, Florida

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Biology Section
Bureau of Laboratories
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Introduction

Coca Cola Foods - Minute Maid juice processing facility, 427 San Christopher Drive, Dunedin, Pinellas County, Florida, NPDES #FL0000477, tests performed on 12 to 14 January, 2000.

Coca Cola Foods - Minute Maid Food Service is a fruit juice blending and packaging facility producing an average of 356 tons per day of frozen and chilled fruit juices. This food- processing facility's wastewater treatment system, having a permitted discharge limit of 0.45 MGD, has as average discharge ranging from 0.15 MGD—0.2 MGD. Treatment of wastewater includes aeration, clarification, and sand and cartridge filtration. Wastewater includes: product spilled during blending, cleaning, and packaging; boiler blow-down water; and defrost water. Additional sources of wastewater include water used for cleaning processing equipment, well water used for cleaning the activated sludge treatment plant and contaminated stormwater. After treatment, effluent is discharged to St. Joseph Sound, a tidal estuary designated as an Outstanding Florida Water Body. The facility also uses a portion of the treated effluent to irrigate lawns and other vegetated areas within the plant site.

The facility has a mixing zone for toxicity. The mixing zone is restricted to a radial distance of 20.2 meters from the outfall (facility summary prepared by Eddie Hughes, FDEP, Tampa).

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*. Test results did not show toxicity (Table 1).

Total residual chlorine (TRC) was not measured in the field and was less than the minimum detection limit (0.03 mg/L) in the laboratory. Total ammonia was not detected in the sample. 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 January 11, 2000, did not show toxicity.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Coca Cola Foods-Minute Maid facility, Dunedin, Pinellas County, Florida, NPDES Permit #FL0000477, performed on 12 to 14 January 2000.

Facility:	Coca Cola Foods-Minute Maid			NPDES #	FL0000477	Facility Type:	Food Processing
Location:	427 San Christopher Drive, Dunedin			Contact/District:	Charles Kovach/Southwest		
County:	Pinellas			Test type:	static acute screen		
Sample Collection Date:	1/11/00	Time:	1530	# tests:	2	Receiving Water:	St. Joseph Sound
Test Beginning Date:	1/12/00	Time:	1300	Chlorination Type:	nonchlorinated		
Test Ending Date:	1/14/00	Time:	1350				Page 1 of 1

Total Residual CL2	mg/L	Method
100% sample Field:	not measured	
100% sample Lab:	<0.03	DR-100

Ammonia	Total (mg/L)	Unionized (mg/L)
Control Water (fish):	<0.017	<0.017
Control Water (20% DMW) (cladocerans):	<0.017	<0.017
100% Sample:	<0.017	<0.017

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	138	133
Control Water (20% DMW) (cladocerans):	83	82
100% Sample:	635	191

Salinity*	(ppt) estimated
Control Water (fish):	0
Control Water (20% DMW) (cladocerans):	0
100% Sample:	1.1

*Salinity based on conductivity and temperature measurements.

Organism: *Ceriodaphnia dubia* Life stage: < 24 hours old

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[A]			Dissolved Oxygen			Conductivity mmhos/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	8.4	-	8.5	24.7	-	24.0	7.6	-	7.5	0.162	0.20
Control B	0/20	5	5	5	-	-	8.5	-	-	23.5	-	-	7.5	-	0.24
Control C	0/20	5	5	5	-	-	8.5	-	-	23.4	-	-	7.6	-	0.25
Control D	0/20	5	5	5	-	-	8.5	-	-	23.2	-	-	7.8	-	0.31
100% A	20/0	5	5	5	8.2	-	9.1	25.6	-	23.4	6.7	-	7.8	2.28	2.47
100% B	20/0	5	5	5	-	-	9.1	-	-	23.3	-	-	7.4	-	2.78
100% C	20/0	5	5	5	-	-	9.1	-	-	23.3	-	-	7.5	-	2.42
100% D	20/0	5	5	5	-	-	9.2	-	-	23.4	-	-	7.6	-	2.50

[A] Temperature of test incubator #2 and test room were continuously recorded on strip chart recorders.
Incubator #2 temperature range for the test period was 26.0-26.5°C.
Test room temperature range for the test period was 24.0-25.5°C.

Organism: *Cyprinella leedsi* Age: 11 days

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[B]			Dissolved Oxygen			Conductivity mmhos/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	5	7.9	8.3	8.5	24.3	25.2	24.9	7.2	7.3	7.6	0.252	0.265
Control B	0/500	5	5	5	7.9	8.3	8.5	24.2	25.6	26.0	7.4	7.0	7.0	0.249	0.276
Control C	0/500	5	5	5	7.9	8.3	8.5	24.0	25.1	25.3	7.5	7.2	7.4	0.250	0.275
Control D	0/500	5	5	5	7.9	8.3	8.5	23.9	25.9	25.0	7.5	7.0	7.3	0.248	0.272
100% A	500/0	5	5	5	8.1	8.6	8.7	25.6	25.6	25.0	6.5	7.0	7.3	2.25	2.33
100% B	500/0	5	5	5	8.1	8.6	8.7	25.6	25.1	24.8	6.4	6.7	6.5	2.32	2.35
100% C	500/0	5	5	5	8.1	8.6	8.7	25.8	25.9	26.0	6.4	6.8	6.5	2.34	2.40
100% D	500/0	5	5	5	8.1	8.6	8.7	25.8	25.5	25.7	6.4	6.2	6.2	2.34	2.37

[B] Temperature of test incubator #3 and test room were continuously recorded on strip chart recorders.
Incubator #3 temperature range for the test period was 25.0-27.0°C.
Test room temperature range for the test period was 24.0-25.5°C.

Table 2. Results of chemical analyses on a sample of effluent from the Coca Cola Foods-Minute Maid Juice Processing Plant sampled on January 11, 2000.

Metals

Aluminum	56	µg/L[I]
Arsenic	6.5	µg/L[I]
Calcium	62.5	mg/L
Copper	0.97	µg/L[I]
Iron	70	µg/L
Lead	0.36	µg/L[I]
Magnesium	9.0	mg/L
Zinc	150	µg/L

Base, Neutral, & Acid Extractable Organics

None Detected

Pesticides

None Detected

Volatile Organic Compounds

None Detected

[I] Value reported is less than the practical quantitation limit and greater than or equal to the minimum detection limit.

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Coca Cola
County: Pinellas
Contact / District: Charles Kovac / SW-DIST
NPDES Permit #: FL0000477
LIMS Sample #: 426253 LIMS Job #: TLH2000-01-12-40-01
sample log 1/31/00
Test Type: Screening | Definitive
Static | Static Renewal | Flow-through
Test Number: 2 of 2

Sample Collection: Date 1/11/00 Time 1530
Test Beginning: Date 1/12/00 Time 1300
Test Ending: Date 1/14/00 Time 1350
Organism Batch #: 105 Diluent Batch #: Well
Organism Age: 11 days SRT toxicant batch #: N/A
Test organism: C. leedsi
Remarks:

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) 0 hr	UNCORRECTED Cond (mmhos/cm) 24 h	UNCORRECTED Cond (mmhos/cm) 48 h
CONT. A	E1	5	5	5	7.9	8.3	8.5	24.3	25.2	24.9	7.2	7.3	7.6	.252	.258	.265
B	E2	5	5	5	7.9	8.3	8.5	24.2	25.6	26.0	7.4	7.0	7.0	.249	.262	.276
C	E3	5	5	5	7.9	8.3	8.5	24.0	25.1	25.3	7.5	7.2	7.4	.250	.264	.275
D	E4	5	5	5	7.9	8.3	8.5	23.9	25.9	25.0	7.5	7.0	7.3	.248	.265	.272
100% A	E5	5	5	5	8.1	8.6	8.7	25.6	25.6	25.0	6.5	7.0	7.3	2.25	2.26	2.33
B	E6	5	5	5	8.1	8.6	8.7	25.6	25.1	24.8	6.4	6.7	6.5	2.32	2.33	2.35
C	E7	5	5	5	8.1	8.6	8.7	25.8	25.9	26.0	6.4	6.8	6.5	2.34	2.39	2.46
D	E8	5	5	5	8.1	8.6	8.7	25.8	25.5	25.7	6.4	6.2	6.2	2.34	2.35	2.37
measured by:		SG	SG	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH
recorded by:		DPH	SG	CH	SG	SG	CH	SG	SG	CH	SG	SG	CH	SG	SG	CH

Investigators' Signatures
Marshall Faulkner
Shannon Gerardi
Candace Hess
A. Dallas Hacker Hobson

Temperature Range °C
Incubator # 3 25.0 - 27.0°C
Room B246 24.0 - 25.5°C

Water Quality Parameters	Salt Water Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			N/A	N/A	N/A	N/A
Lab Total Residual Cl2 (mg/L):			<0.03	DR-100	CH	SG
Alkalinity (mg/L as $CaCO_3$):			65.3	Hach	SG	SG
Hardness (mg/L as $CaCO_3$):			191 <0.017	Hach	SG	SG
Total ammonia (mg/L as N):			~~≈1.1~~	Denver	~~SG~~	SG
Salinity:			≈1.1	YSI	SG	SG

* <0.017 * MF

A.J. Wolfe
reviewer form updated 3/3/99

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: Coca Cola
County: Pinellas
Contact / District: Charles Kovach / SW-DIST
NPDES Permit #: FL0000477
LIMS Sample #: 426253 LIMS Job #: TLH2000-01-12-40-01
sample log 1/31/00
Test Type: Screening | Definitive
Static | Static Renewal | Flow-through
Test Number: 1 of 2

Sample Collection: Date 1/11/00 Time 1530
Test Beginning: Date 1/12/00 Time 1300
Test Ending: Date 1/14/00 Time 1350
Organism Batch #: 2 Diluent Batch #: DMW #55
Organism Age: 24 hrs SRT toxicant batch #: N/A
Test organism: C. dubia

Remarks:

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) 0 hr	UNCORRECTED Cond. (mmhos/cm) 24 h	UNCORRECTED Cond. (mmhos/cm) 48 h
CONT.	A	5	5	5	8.4	–	8.5	24.7	–	24.0	7.4	–	7.5	.162	–	.200
	B	5	5	5	–	–	8.5	–	–	23.5	–	–	7.5	–	–	.240
	C	5	5	5	–	–	8.5	–	–	23.4	–	–	7.6	–	–	.248
	D	5	5	5	–	–	8.5	–	–	23.2	–	–	7.8	–	–	.305
100%	A	5	5	5	8.2	–	9.1	25.0	–	23.4	6.7	–	7.8	2.28	–	2.47
	B	5	5	5	–	–	9.1	–	–	23.3	–	–	7.4	–	–	2.78
	C	5	5	5	–	–	9.1	–	–	23.3	–	–	7.5	–	–	2.62
	D	5	5	5	–	–	9.2	–	–	23.4	–	–	7.6	–	–	2.50
measured by:		DH	SG	CH	CH	–	CH	CH	–	CH	CH	–	CH	CH	–	CH
recorded by:		SG	SG	CH	SG	–	CH	SG	–	CH	SG	–	CH	SG	–	CH

Investigators' Signatures
Shannon Gerardi
Courtney Hess
Dina Parker Hess
Marshall Faircloth

Temperature Range °C
Incubator # 2 26 – 26.5°C
Room B246 24.2 – 25.5°C

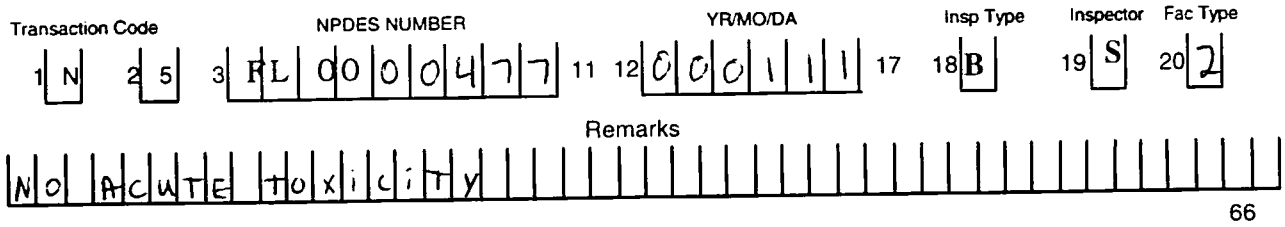
Water Quality Parameters	Salt Water Well Water	20% Min Water	Sample	Method	Measured by	Verified by
Field Total Residual Cl2 (mg/L):			N/A	N/A	N/A	N/A
Lab Total Residual Cl2 (mg/L):		<0.03	<0.03	DR-100	CH	SG
Alkalinity (mg/L as $CaCO_3$):		83	653	Hach	SG	SG
Hardness (mg/L as $CaCO_3$):		82	191	Hach	SG	SG
Total ammonia (mg/L as N):		<0.017	<0.017	Denver	MF	SG
Salinity:		0	≃1.1	YSI	SG	SG

A H Wolfe
reviewer

form updated 3/3/99

The Bioassay of the Coca Cola Foods-Minute Maid effluent sampled on January 11, 2000, NPDES# FL0000477.

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



The Priority Pollutants Analysis for the Bioassay of the Coca Cola Foods-Minute Maid effluent sampled on January 11, 2000, NPDES# FL0000477.

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

