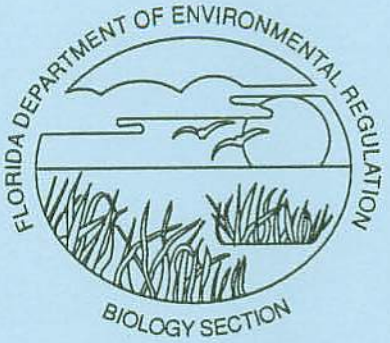


Bioassays of

Sunshine Metal Processing, Inc.

Opa Locka, Dade County, Florida

NPDES #FL0040282

Sampled 8/21/90

December 26, 1990

Biology Section
Division of Administrative and Technical Services

Bioassays of

Sunshine Metal Processing, Inc.

Opa Locka, Dade County, Florida

NPDES #FL0040282

Biology Section
Bureau of Laboratories
December 26, 1990

Introduction

Sunshine Metal Processing, Inc., Opa Locka, Dade County, Florida, NPDES #FL0040282 on 22 to 24 August, 1990.

This facility is located at 13200 Cairo Lane in Opa Locka. It is a scrap metal recycling plant which discharges less than 60,000 GPD of non-contact cooling water to a ditch leading to the Opa Locka Canal. Scrap metal brought to the site is separated from non-metal products. Small pieces of scrap are put through a shredder and then separated through air cyclones. Non-contact cooling water is used to cool this machine during the shredding process and another shredder used to reduce larger scrap.

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, using the bioassay test organisms, the water flea, *Ceriodaphnia dubia*, and the fish, *Notropis leedsi*, performed static acute toxicity bioassays on a sample of discharge from this facility.

Test results indicated that the sample was toxic to *C. dubia*, producing an LC_{50} of 88.4%. The sample was not toxic to *N. leedsi*. The total ammonia and unionized ammonia concentrations in the sample were 0.42 mg/l and 0.01 mg/l, respectively. Further chemical analyses detected the metals, cadmium (0.2K µg/l), iron (1200 µg/l), and zinc (8.0 µg/l). Copper was analyzed for but not detected. The pesticides, aldrin and heptachlor, were detected in the sample, however, these results were invalidated because these substances were also detected in the chemical blank. Hydrocarbons were analyzed for but not detected in the sample.

The agent(s) which contributed to the observed mortality in the *C. dubia* bioassay tests was not determined.

Conclusion

The sample of discharge from this facility was toxic on 21 August, 1990. The cause of toxicity was not determined.

K: Actual value is known to be less than the value given.

Table 1. Concentration Series and Volumes Used for These Static Bioassays.

Ceriodaphnia dubia (water flea)

Concentration	Dilution Water	Sample	Total Volume
Control	15.0 ml	0.0 ml	15 ml
10.0%	13.5 ml	1.5 ml	15 ml
30.0%	10.5 ml	4.5 ml	15 ml
50.0%	7.5 ml	7.5 ml	15 ml
70.0%	4.5 ml	10.5 ml	15 ml
85.0%	2.25 ml	12.75 ml	15 ml
100.0%	0.0 ml	15.0 ml	15 ml

Notropis leedsi (bannerfin shiner)

Concentration	Dilution Water	Sample	Total Volume
Control	500 ml	0 ml	500 ml
10.0%	450 ml	50 ml	500 ml
30.0%	350 ml	150 ml	500 ml
50.0%	250 ml	250 ml	500 ml
70.0%	150 ml	350 ml	500 ml
85.0%	75 ml	425 ml	500 ml
100.0%	0 ml	500 ml	500 ml

Table 2. Data recorded during the static acute bioassay of a sample of discharge from the Sunshine Metal Processing, Inc. facility, Opa Locka, Dade County, Florida, NPDES #FL0040282, on 22 to 24 August, 1990.

Facility:	Sunshine Metal Processing, Inc.		NPDES #	FL0040282	Facility Type: industrial
Location:	13200 Cairo Lane, Opa Locka		Contact/District:	T. Powell	
County:	Dade		Test type:	static definitive	
Sample Collection Date:	8/21/90	Time: 1030	# tests:	2	Receiving Water: Opa Locka Canal
Test Beginning Date:	8/22/90	Time: 1130	Chlorination Type:	not chlorinated	
Test Ending Date:	8/24/90	Time: 1100			Page 1 of 2

Total Residual Cl2	mg/l	Method
Field:	-	-
Lab:	<0.02	Hach
Lab:	-	-

Ammonia	Total (mg/l)	Unionized (mg/l)
Control Water (fish):	0.00	0.00
Cond. Control Water (daphnids):	0.00	0.00
100% Sample:	0.42	0.01

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	121	118
Cond. Control Water (daphnids):	111	128
100% Sample:	256	273

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

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

LC50: 88.3 Binomial: 88.3% Moving Average: 86.7% Probit: -

	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	7.7	-	8.2	8.4	-	8.6	24.0	-	23.5	350	385
Control	5	5	5	-	-	8.2	-	-	8.6	-	-	-	-	-
Control	5	5	4	-	-	8.2	-	-	8.6	-	-	-	-	-
Control	5	5	4	-	-	8.2	-	-	8.6	-	-	-	-	-
10%	5	5	5	7.9	-	8.2	8.4	-	8.6	24.0	-	23.7	375	395
10%	5	5	5	-	-	8.3	-	-	8.6	-	-	-	-	-
10%	5	5	5	-	-	8.3	-	-	8.6	-	-	-	-	-
10%	5	5	5	-	-	8.3	-	-	8.6	-	-	-	-	-
30%	5	5	5	7.6	-	8.3	8.0	-	8.7	23.9	-	23.5	425	475
30%	5	5	4	-	-	8.3	-	-	8.7	-	-	-	-	-
30%	5	5	5	-	-	8.3	-	-	8.7	-	-	-	-	-
30%	5	5	5	-	-	8.3	-	-	8.7	-	-	-	-	-
50%	5	5	4	7.5	-	8.2	7.8	-	8.7	23.9	-	23.7	480	480
50%	5	4	3	-	-	8.2	-	-	8.7	-	-	-	-	-
50%	5	5	4	-	-	8.2	-	-	8.7	-	-	-	-	-
50%	5	5	5	-	-	8.3	-	-	8.7	-	-	-	-	-
70%	5	4	4	7.3	-	8.3	7.7	-	8.7	24.0	-	23.6	520	530
70%	5	5	4	-	-	8.3	-	-	8.7	-	-	-	-	-
70%	5	5	4	-	-	8.3	-	-	8.7	-	-	-	-	-
70%	5	5	4	-	-	8.3	-	-	8.6	-	-	-	-	-
85%	5	5	2	7.2	-	8.2	7.6	-	8.6	23.9	-	23.8	560	525
85%	5	5	5	-	-	8.2	-	-	8.6	-	-	-	-	-
85%	5	5	3	-	-	8.3	-	-	8.6	-	-	-	-	-
85%	5	5	2	-	-	8.3	-	-	8.6	-	-	-	-	-
100%	5	5	1	7.1	-	8.2	7.6	-	8.5	23.9	-	23.6	595	535
100%	5	5	0	-	-	8.2	-	-	8.6	-	-	-	-	-
100%	5	5	3	-	-	8.3	-	-	8.6	-	-	-	-	-
100%	5	5	0	-	-	8.3	-	-	8.6	-	-	-	-	-

-continued-

Table 2. Continued.

Facility:	Sunshine Metal Processing, Inc.		NPDES #	FL0040282	Facility Type: Industrial
Location:	13200 Cairo Lane, Opa Locka		Contact/District:	T. Powell	
County:	Dade		Test type:	static definitive	
Sample Collection Date:	8/21/90	Time: 1030	# tests:	2	Receiving Water: Opa Locka Canal
Test Beginning Date:	8/22/90	Time: 1130	Chlorination Type:	not chlorinated	
Test Ending Date:	8/24/90	Time: 1100			Page 2 of 2

Total Residual Cl2	mg/l	Method
Field:	-	-
Lab:	<0.02	Hach
Lab:	-	-

Ammonia	Total (mg/l)	Unionized (mg/l)
Control Water (fish):	0.00	0.00
Cond. Control Water (daphnids):	0.00	0.00 -
100% Sample:	0.42	0.01

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	121	118
Cond. Control Water (daphnids):	111	128
100% Sample:	256	273

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

Organism: *Notropis leedsi* Age: 18 days days

LC50: - Binomial: - Moving Average: - Probit: -

	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	7.7	7.3	7.8	7.9	8.2	8.2	23.8	23.0	23.0	240	385
Control	5	5	5	7.7	7.3	7.8	7.9	8.2	8.3	-	-	-	-	-
10%	5	5	5	7.5	7.3	7.7	7.8	8.2	8.3	23.7	23.0	22.8	280	395
10%	5	5	5	7.5	7.3	7.8	7.8	8.2	8.3	-	-	-	-	-
30%	5	5	5	7.3	7.3	7.7	7.6	8.1	8.3	23.7	23.0	22.8	360	475
30%	5	5	5	7.3	7.3	7.7	7.6	8.1	8.3	-	-	-	-	-
50%	5	5	5	6.9	7.3	7.7	7.4	8.1	8.4	23.9	23.0	22.9	430	480
50%	5	5	5	6.9	7.3	7.7	7.4	8.1	8.4	-	-	-	-	-
70%	5	5	5	6.4	7.1	7.6	7.3	8.1	8.4	24.0	23.0	22.9	510	530
70%	5	5	5	6.6	7.1	7.7	7.4	8.1	8.4	-	-	-	-	-
85%	5	5	5	6.0	7.2	7.6	7.3	8.1	8.4	24.0	23.0	23.0	560	525
85%	5	5	5	6.2	7.1	7.6	7.3	8.1	8.4	-	-	-	-	-
100%	5	5	5	5.6	7.0	7.6	7.3	8.1	8.4	24.0	23.3	23.1	620	535
100%	5	5	5	5.8	7.0	7.6	7.3	8.1	8.4	-	-	-	-	-

Table 3. LC_{50} Data for Bioassay of Sunshine Metal Processing, Inc., Opa Locka, Florida, NPDES # Fl0040282.

Organism	Method of Data Analysis	48 Hour LC_{50} (95% Confidence Intervals)
Ceriodaphnia dubia	Binomial	88.37% (70.00%, 100.00%)[a]
	Moving Average	86.73% (79.89%, 95.96%)
	Probit	b

a This LC_{50} is reported in the text since it is the most statistically conservative value of the data set.

b Due to an insufficient number of dead organisms, or to the irregular distribution of mortality, an LC_{50} value cannot be calculated using this method of statistical analysis.

Table 4. Results of chemical analyses on the sample of discharge from the Sunshine Metal Processing, Inc. facility, Dade County, Florida.

Organics

Acid Extractables	None detected
Base Neutral Extractables	None detected
Pesticide Extractables	Aldrin *
	Heptachlor *

Metals

Cadmium	0.2[k] µg/l
Copper	15.0[u] µg/l
Iron	1200.0 µg/l
Zinc	8.0 µg/l

* these compounds are reported because they were detected in the sample; however, the results are invalid because the compounds were also detected in the sample blanks at concentrations greater than the values given for the sample.

[k] actual value known to be less than value given.
[u] analyzed for but not detected.the value reported is the minimum detection limit.

DER Biology Section — A

say Bench Sheet

Sample Source: SUNSHINE HEIGHTS ~~SE Pipeline Terminal Plant (City)~~
Address/City: ~~St Marks~~
County: ~~Wakulla~~
Contact/District: ~~Tallahassee (City) Jennette Curtis~~
NPDES Permit #: ~~FL0025534~~ **Outfall #:** ~~001~~

ample Collection: Date 8-21-90 Time 10:30
Test Beginning: Date 8-22-90 Time ~~11:30 A~~ 11:30
Test Ending: Date 8-22-90 Time 12:00 P
Test Organism: Notropis leavisi 8/24/11
Life Stage/Age: 18 days

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

Remarks: UNCHLORINATED

* probe faulty, suspect values

Instrument Calibrations:

	pH	DO	Cond	Temp
0 hr	7@7, 9@9	~~5.5~~ ~~5.4@25°~~	~~3.7380~~ ~~1350~~ @ 24.0C	24.0@23.9
24 hr	7@7, 9@9	3.5@24.0°	1370@23.9°C	23.8@23.6
48 hr	7@7, 9@9	8.5@23.5°C	1370@24.0°C	23.7@23.6°C

Conc.	Chamber #	Number Live 0	24	48	DO (mg/l) 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	Cond. (µmhos/cm) 0	24	48	
Control	21	5	5	5	7.1	7.3	7.8	7.9	8.2	8.2	23.8	23.0	23.0	340		355	345
"	63	5	5	5	7.1	7.3	7.8	7.9	8.2	8.3							
10%	43	5	5	5	7.5	7.3	7.7	7.8	8.2	8.3	23.7	23.0	22.8	330		395	230
"	111	5	5	5	7.5	7.3	7.8	7.8	8.2	8.3							
30%	20	5	5	5	7.3	7.3	7.7	7.6	8.1	8.3	23.7	23.0	22.8	360		475	355
"	18	5	5	5	7.3	7.3	7.7	7.6	8.1	8.3							
50%	50	5	5	5	6.9	7.3	7.7	7.4	8.1	8.4	23.9	23.0	22.9	430		480	425
"	83	5	5	5	6.9	7.3	7.7	7.4	8.1	8.4							
70%	86	5	5	5	6.4	7.1	7.6	7.3	8.1	8.4	24.0	23.0	22.9	510		530	495
"	27	5	5	5	~~6.6~~	7.1	7.7	7.4	8.1	8.4							
85%	11	5	5	5	6.0	7.2	7.6	7.3	8.1	8.4	24.0	23.0	23.0	560		535	545
"	271	5	5	5	6.2	7.1	7.6	7.3	8.1	8.4							
100%	87	5	5	5	5.6	7.0	7.6	7.3	8.1	8.4	24.0	23.9	23.1	620		535	600
"	119	5	5	5	5.8	7.0	7.6	7.3	8.1	8.4							
Measured/Loaded by:		MF	SW	MF	SM	SM	SW	SM	SM	SW	SM	SM	SW	SM		SW	
Recorded by:		MF	SW	MF	SW	SW	MF	SW	SW	MF	SW	SW	MF	SW		MF	

Investigators' Signatures

Steven A Wolfe
Sandy McClure
Marshall Faircloth

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			~~<.02~~		
Lab Tot. Resid. Cl2:			<.02	Hach	RBF
Alkalinity:	121	20mg/L CaCO3	256	Hach	SW
Hardness:	115.0	"	273	Hach	SW
Total Ammonia:	0.00	"	.42*	Orion	SM

Chlorine: <.02 Ammonia meter slope: -49.34

Sample Source: ~~SUNSHINE METALS~~ RUDISH POWER PLANT

Address/City:

County:

Contact/District:

NPDES Permit #: Outfall #:

Test Number: 2 of 2 Test Type: Screening (Definitive)

(Static) | Static Renewal | Flow-through

Remarks:

Sample Collection: Date 8/21/90 Time ~~11:00~~ 10:30 SW

Test Beginning: Date 8/22/90 Time 11:00 SW

Test Ending: Date 8/24/90 Time 11:10

Test Organism: Ceriodaphnia dubia

Life Stage/Age: <24 hrs

Instrument Calibrations:

	pH	DO	Cond	Temp
0 hr				
24 hr				
48 hr				

Conc.	Chamber #	Number Live 0	24	48	DO (mg/l) 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	Cond. (µmhos/cm) 0	24	48
CONTROL		5	5	5	7.7		8.2	8.4		8.6	24.0		23.5	350		355
"		5	5	5			8.2			8.6						
"		5	5	4			8.2			8.6						
"		5	5	4			8.2			8.6						
10%		5	5	5	7.9		8.2	8.4		8.6	24.0		23.7	375		395
"		5	5	5			8.3			8.6						
"		5	5	5			8.3			8.6						
"		5	5	5			8.3			8.6						
30%		5	5	5	7.6		8.3	8.0		8.7	23.9		23.5	425		475
"		5	5	4			8.3			8.7						
"		5	5	5			8.3			8.7						
"		5	5	5			8.3			8.7						
50%		5	5	4	7.5		8.2	7.8		8.7	23.9		23.7	480		480
"		5	~~4~~	3			8.2			8.7						
"		5	5	4			8.2			8.7						
"		5	5	5			8.3			8.7						
70%		5	4	4	7.3		8.3	7.7		8.7	24.0		23.6	520		530
"		5	5	4			8.3			8.7						
"		5	5	4			8.3			8.7						
"		5	5	4			8.3			8.6						
85%		5	5	2	7.2		8.2	7.6		8.6	23.9		23.8	560		525
"		5	5	5			8.2			8.6						
"		5	5	3			8.3			8.7						
"		5	5	2			8.3			8.6						
100%		5	5	1	7.1		8.2	7.6		8.5	23.9		23.6	545		535
"		5	5	0			8.2			8.6						
"		5	1	0			8.3			8.6						
"		5	5	0			8.3			8.6						
Measured/Loaded by		MF	MF	MF	SM		SW	SM		SW	SM		SW	SM		SW
Recorded by:		MF	MF	MF	SW		MF	SW		MF	SW		MF	SW		MF

Investigators' Signatures

Steven H Walke

Sandy McClure

Marshall Fairleth

Reviewer

Water-quality Parameters

	Well Water	Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:					
Lab Tot. Resid. Cl2:					
Alkalinity:					
Hardness:					
Total Ammonia:					

Ammonia meter slope: