

Bioassays of

Tampa Electric Company

Tampa, Hillsborough County, Florida

NPDES #FL0000809

Sampled 6/16/97

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August 1997

Biology Section
Division of Administrative & Technical Services
Comprehensive Quality Assurance Plan #870346G

Bioassays of

Tampa Electric Company

Tampa, Hillsborough County, Florida

NPDES #FL0000809

Biology Section
Bureau of Laboratories
August 1997

Introduction

Tampa Electric Company (TECO), Gannon Station Steam-Electric Generating Plant, U.S. 41 and Port Sutton Road, Tampa, Hillsborough County, Florida, NPDES #FL0000809, tests performed on 17 to 19 June, 1997.

This coal-burning electric power generating plant is permitted for the operation of a saltwater treatment and disposal system (outfall 001) as well as the discharge of the once-through condenser cooling water and boiler blowdown water (outfall 002). The bioassay sample was collected from outfall 002. The average annual flow of 989.992 MGD (4/96-3/97) through outfall 002 consisted of once-through condenser cooling water (average 989.98 MGD) and boiler blowdown water (average 0.012 MGD). The once-through condenser cooling water and the boiler blowdown streams mix instantaneously at the discharge flume prior to discharge through outfall 002 into the discharge canal which flows into Hillsborough Bay (facility summary provided by Andrea Grainger and Anna Luft, FDEP, Southwest District, 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 toxicity bioassays on a sample of effluent from this facility. The salinity of the sample was approximately 28 ppt, therefore, the test species used for these bioassays were the mysid shrimp, *Americamysis* (formerly known as *Mysidopsis*) *bahia*, in the definitive test, and the inland silverside minnow, *Menidia beryllina*, in the screening test.

The control water for both tests and the diluent for the definitive test was natural seawater diluted with deionized water to a salinity of 28 ppt.

The test results indicated that the sample was not toxic to either test species (Table 1). Total residual chlorine and total ammonia were not detected in the sample. Further chemical analysis were performed on the sample and several metals were detected (Table 2).

Conclusion

The sample of effluent collected on 16 June, 1997, from outfall 002 of this facility did not show toxicity.

Table 1. Data recorded during the 48-hour acute toxicity bioassays of a sample of effluent from the Tampa Electric Company-Gannon Steam Plant Outfall 002, Tampa, Hillsborough County, Florida, NPDES# FL0000809, performed on 17 to 19 June, 1997.

Facility:	**Tampa Electric Company-Gannon Steam Plant**	NPDES #	FL0000809	Facility Type:	Electric Power
Location:	US Highway 41 at Port Sutton Road	Contact/District:	Kent Edwards/Southeast		Generating Plant
County:	Hillsborough	Test type:	static acute definitive and screening		
Sample Collection Date:	6/16/97 Time: 1615	# tests:	2	Receiving Water:	Hillsborough Bay
Test Beginning Date:	6/17/97 Time: 1500	Chlorination Type:	not chlorinated		
Test Ending Date:	6/19/97 Time: 1500			Page 1 of 1	

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

Ammonia	Total (mg/L)	Unionized (mg/L)
Control Water (fish):	< 0.017	< 0.017
Control Water (mysids):	< 0.017	< 0.017
100% Sample:	0.08	<0.017

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water (fish):	103	-
Control Water (mysids):	103	-
100% Sample:	97	-

Salinity	(ppt)
Control Water (fish):	28.0
Control Water (mysids):	28.0
100% sample:	28.0

Organism: ***Americamysis bahia*** Life stage: 4 days

															Conductivity Uncorrected mmhos/cm	
	Sample/Diluent	**SURVIVAL # Alive**			pH			Temperature[A]			Dissolved Oxygen				
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	8.1	8.0	8.0	26.0	24.8	25.0	6.6	6.2	6.4	44.7	45.8
Control B	0/500	5	5	5	8.1	8.0	8.0	26.0	24.7	24.4	6.6	6.2	6.3	44.6	44.4
Control C	0/500	5	5	5	8.1	8.0	8.0	25.9	24.6	24.5	6.6	6.2	6.3	44.8	45.0
Control D	0/500	5	5	5	8.1	8.0	7.9	25.9	24.6	24.4	6.5	6.2	6.3	44.8	44.9
6.25% A	31/469	5	5	5	8.1	8.0	8.0	26.0	24.5	24.1	6.5	6.2	6.3	44.6	44.3
6.25% B	31/469	5	5	5	8.1	8.0	8.0	26.1	24.8	24.1	6.5	6.3	6.3	44.9	45.0
6.25% C	31/469	5	5	5	8.1	8.0	8.0	26.1	24.4	23.4	6.5	6.2	6.5	45.0	43.8
6.25% D	31/469	5	5	5	8.1	8.0	8.0	26.1	24.4	24.4	6.5	6.2	6.5	44.9	45.2
12.5% A	63/437	5	5	5	8.1	8.0	8.0	26.1	24.4	23.8	6.5	6.3	6.3	44.7	44.1
12.5% B	63/437	5	5	5	8.1	8.0	8.0	26.0	24.8	23.9	6.4	6.3	6.3	45.0	44.9
12.5% C	63/437	5	5	5	8.1	8.0	7.9	26.0	24.2	24.7	6.5	6.2	6.1	45.0	45.6
12.5% D	63/437	5	5	5	8.1	8.0	8.0	26.0	24.3	24.2	6.4	6.2	6.1	45.0	44.6
25% A	125/375	5	5	5	8.1	8.0	8.0	26.0	24.4	24.8	6.4	6.3	6.2	44.8	45.7
25% B	125/375	5	5	5	8.1	8.0	8.0	25.9	23.9	23.9	6.4	6.2	6.2	45.0	45.3
25% C	125/375	5	5	5	8.1	8.0	8.0	26.0	25.0	25.2	6.4	6.2	6.1	45.0	47.3
25% D	125/375	5	5	5	8.1	8.0	8.0	26.0	24.5	24.3	6.4	6.1	6.1	45.0	45.0
50% A	250/250	5	5	5	8.1	8.0	8.0	25.9	25.2	23.7	6.4	6.1	6.3	44.9	45.9
50% B	250/250	5	5	5	8.1	8.0	8.0	25.8	24.6	24.3	6.3	6.1	6.4	45.0	45.2
50% C	250/250	5	5	5	8.1	8.0	8.0	25.8	23.8	23.8	6.3	6.3	6.2	45.0	44.6
50% D	250/250	5	5	5	8.1	8.0	8.0	25.8	24.6	24.3	6.3	6.4	6.2	45.0	45.7
100% A	0/500	5	5	5	8.0	8.0	8.0	25.7	24.7	24.8	6.1	6.2	6.2	45.2	46.2
100% B	0/500	5	5	5	8.0	8.0	8.0	25.7	24.2	24.2	5.8	6.1	6.2	45.2	45.2
100% C	0/500	5	5	5	8.0	8.0	8.0	25.7	24.1	24.2	5.7	6.3	6.4	45.2	45.6
100% D	0/500	5	5	5	8.0	8.1	8.0	25.6	24.8	23.8	5.7	6.3	6.3	45.1	45.2

[A] Temperature of test incubator was continously recorded on a strip chart recorder. Incubator temperature range for the test period was 25.0-25.9°C.

Organism: ***Menidia beryllina*** Age: 12 days

															Conductivity Uncorrected mmhos/cm	
	Sample/Diluent	**SURVIVAL # Alive**			pH			Temperature[B]			Dissolved Oxygen				
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	8.1	8.1	8.0	25.9	25.2	25.3	6.1	6.0	6.0	44.4	45.8
Control B	0/500	5	5	5	8.1	8.1	8.0	26.0	25.0	25.1	6.1	6.1	6.0	44.7	45.6
Control C	0/500	5	5	5	8.1	8.1	8.0	25.9	24.9	25.0	6.1	6.2	6.0	44.8	45.1
Control D	0/500	5	5	5	8.1	8.1	8.0	26.0	25.3	25.2	6.1	6.2	6.0	44.8	46.2
100% A	500/0	5	5	5	8.0	8.1	8.0	25.9	24.8	25.3	5.3	6.1	6.0	45.2	46.2
100% B	500/0	5	5	5	8.0	8.1	8.0	25.7	25.2	25.4	5.4	6.2	6.0	45.2	46.5
100% C	500/0	5	5	5	8.0	8.1	8.1	25.7	25.2	25.3	5.3	6.1	6.1	45.2	46.5
100% D	500/0	5	5	5	8.0	8.1	8.0	25.7	25.1	25.3	5.4	6.1	6.2	45.1	46.2

[B] Temperature of test incubator was continously recorded on a strip chart recorder. Incubator temperature range for the test period was 25.0-25.9°C.

Table 2. Results of chemical analyses on the effluent from outfall 002 of the Tampa Electric Company-Gannon Steam Electric Generating Plant sampled on June 16, 1997.

Metals

Aluminum	130	µg/L
Calcium	349	mg/L
Iron	73	µg/L
Magnesium	1020	mg/L

Base, Neutral, & Acid Extractable Organics

None detected

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: TECO - Gannon Station Power Plant
County: Hillsborough
Contact / District: Ken Edwards SW
NPDES Permit #: FL0000809
LIMS Sample #: 180816 **LIMS Job #:** 97-JUN-THIC1
sample log: 6/23/97 KRIMP (customs test type KR)
Test Type: Screening / Definitive
Static / Static Renewal / Flow-through
Temperature range: room 24.5-25.5°C
incubator 25.0-25.9°C
Test Number: 1 of 2
Remarks: D = dead, M = missing

Sample Collection: Date 6/16/97 Time 1615
Test Beginning: Date 6/17/97 Time 1500
Test Ending: Date 6/19/97 Time 1500
Organism Batch #: 23 **Diluent Batch #:** NSW
Organism Age: 12 days (hatch 6-5-97)
Test Organism: Menidia beryllina

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0	25.3 @ 25.2	8.3 @ 24.6 °C	104.6 @ 103.6
	9.0 @ 9.0			1015 @ 1003 @ 25.5 °C 10210 @ 9944
24 hr	7.0 @ 7.0	25.4 @ 25.4	8.3 @ 24.5 °C	108.8 @ 103.6
	9.0 @ 9.0			1008 @ 1003 @ 25.4 °C 10140 @ 9944
48 hr	7.0 @ 7.0	25.3 @ 25.2	8.3 @ 24.6 °C	108.7 @ 1036
	9.0 @ 9.0			1009 @ 1003 @ 25.3 °C 10180 @ 9944

Conc.	Chamber #	Number Live 0 hr	24 h	48 h	pH 0 hr	24 h	48 h	Temperature (°C) 0 hr	24 h	48 h	D.O. (mg/L) 0 hr	24 h	48 h	UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm) 0 hr	24 h	48 h
C+1 A	D13	5	5	5	8.1	8.1	8.0	25.9	25.2	25.3	6.1	6.0	6.0	44.4	44.6	54.8 A
C+1 B	D14	5	5	5	8.1	8.1	8.0	26.0	25.0	25.1	6.1	6.1	6.0	44.7	44.5	45.6
C+1 C	D15	5	5	5	8.1	8.1	8.0	25.9	24.9	25.0	6.1	6.2	6.0	44.8	44.2	45.1
C+1 D	D16	5	5	5	8.1	8.1	8.0	26.0	25.3	25.2	6.1	6.2	6.0	44.8	45.1	46.2
100% A	D17	5	5	5	8.0	8.1	8.0	25.9	24.8	25.3	5.3	6.1	6.0	45.2	44.8	46.2
100% B	D18	5	5	5	8.0	8.1	8.0	25.7	25.2	25.4	5.4	6.2	6.0	45.2	45.4	46.5
100% C	D19	5	5	5	8.0	8.1	8.1	25.7	25.2	25.3	5.3	6.1	6.1	45.2	45.4	46.5
100% D	D20	5	5	5	8.0	8.1	8.0	25.7	25.1	25.3	5.4	6.1	6.2	45.1	45.1	46.2
Measured/Loaded by:		DW	JS	ND	JS	KJ	ND	JS	KJ	ND	JS	KJ	ND	JS	KJ	ND
Recorded by:		KJ	JS	ND	KR	JS	JS	KR	JS	JS	KR	JS	JS	KR	JS	JS

A 45.8 corrected value per JS 6/19/97

Investigators' Signatures
Kellie Ralston
Julie Sharpe
Ken Johnson
Mark Knight
Marshall Faircloth
Dan Call
Art Wolfe
reviewer

form updated 4/01/96

Water Quality Parameters (Salt Water)

	Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			NOT	MEASURED	
Lab Total Residual Cl2 (mg/L):	<0.03		<0.03	DR100	JS
Alkalinity (mg/L as $CaCO_3$):	103		97	Hach	KJ
Hardness (mg/L as $CaCO_3$):	—		—	Hach	KJ
Total ammonia (mg/L as N):	<0.017		<0.017	Orion	MF

Ammonia Meter #98136 Ammonia Meter Slope: -60.0 Ammonia Blank: <0.017 Control Salinity: 28 ppt Sample Salinity: 28 ppt

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: TECO Gannon Station Power Plant
County: Hillsborough
Contact / District: Ken Edwards SW
NPDES Permit #: FL00 00809
LIMS Sample #: 180816 **LIMS Job #:** 97-JUN-17-1401
sample log: 6/23/97 KR/mF
Test Type: Screening | Definitive
Static | Static Renewal | Flow-through
Temperature range: room 24.5-25.5°C
incubator 25.0-25.5°C
Test Number: 2 of 2
Remarks: D = dead, M = missing

Sample Collection: Date 6/16/97 Time 1615
Test Beginning: Date 6/17/97 Time 1500
Test Ending: Date 6/19/97 Time 1500
Organism Batch #: 164 **Diluent Batch #:** NSW
Organism Age: 4days (6/14/97)
Test Organism: Americamysis bahia

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	25.3 @ 25.2	8.3 @ 24.6 °C	1016 @ 1036 1015 @ 1003 @ 25.5 °C 10210@9944
24 hr	7.0 @ 7.0 9.0 @ 9.0	25.4 @ 25.4	8.3 @ 24.5 °C	1038 @ 1036 1008 @ 1003 @ 25.4 °C 10140@9944
48 hr	7.0 @ 7.0 9.0 @ 9.0	25.3 @ 25.2	8.3 @ 24.6 °C	1087 @ 1036 1009 @ 1003 @ 25.3 °C 10180@9944

Conc.	Chamber #	Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
		0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h	0 hr	24 h	48 h
Ctl A	F1	5	5	5	8.1	8.0	8.0	26.0	24.8	25.0	6.6	6.2	6.4	44.7	44.1	45.8
Ctl B	F2	5	5	5	8.1	8.0	8.0	26.0	24.7	24.4	6.6	6.2	6.3	44.6	44.1	44.4
Ctl C	F3	5	5	5	8.1	8.0	8.0	25.9	24.6	24.5	6.6	6.2	6.3	44.8	44.3	45.0
Ctl D	F4	5	5	5	8.1	8.0	7.9	25.9	24.6	24.4	6.5	6.2	6.3	44.8	44.3	44.9
6.25% A	F5	5	5	5	8.1	8.0	8.0	26.0	24.5	24.1	6.5	6.2	6.3	44.6	44.2	44.3
6.25% B	F6	5	5	5	8.1	8.0	8.0	26.1	24.8	24.1	6.5	6.3	6.3	44.9	44.6	45.0
6.25% C	F7	5	5	5	8.1	8.0	8.0	26.1	24.4	23.4	6.5	6.2	6.5	45.0	43.9	43.8
6.25% D	F8	5	5	5	8.1	8.0	8.0	26.1	24.4	24.4	6.5	6.2	6.5	44.9	44.1	45.2
12.5% A	F9	5	5	5	8.1	8.0	8.0	26.1	24.4	23.8	6.5	6.3	6.3	44.7	44.0	44.1
12.5% B	F10	5	5	5	8.1	8.0	8.0	26.0	24.8	23.9	6.4	6.3	6.3	45.0	45.0	44.9
12.5% C	F11	5	5	5	8.1	8.0	7.9	26.0	24.2	24.7	6.5	6.2	6.1	45.0	44.0	45.6
12.5% D	F12	5	5	5	8.1	8.0	8.0	26.0	24.3	24.2	6.4	6.2	6.1	45.0	44.1	44.6
25% A	F13	5	5	5	8.1	8.0	8.0	26.0	24.4	24.8	6.4	6.3	6.2	44.8	44.2	45.7
25% B	F14	5	5	5	8.1	8.0	8.0	25.9	23.9	23.9	6.4	6.2	6.2	45.0	44.5	45.3
25% C	F15	5	5	5	8.1	8.0	8.0	26.0	25.0	25.2	6.4	6.2	6.1	45.0	45.0	47.3
25% D	F16	5	5	5	8.1	8.0	8.0	26.0	24.5	24.3	6.4	6.1	6.1	45.0	44.3	45.0
50% A	F17	5	5	5	8.1	8.0	8.0	25.9	25.2	23.7	6.4	6.1	6.3	44.9	46.0	45.9
50% B	F18	5	5	5	8.1	8.0	8.0	25.8	24.6	24.3	6.3	6.1	6.4	45.0	44.6	45.2
50% C	F19	5	5	5	8.1	8.0	8.0	25.8	23.8	23.8	6.3	6.3	6.2	45.0	44.0	44.6
50% D	F20	5	5	5	8.1	8.0	8.0	25.8	24.6	24.3	6.3	6.4	6.2	45.0	45.3	45.7
100% A	F21	5	5	5	8.0	8.0	8.0	25.7	24.7	24.8	6.1	6.2	6.2	45.2	44.9	46.2
100% B	F22	5	5	5	8.0	8.0	8.0	25.7	24.2	24.2	5.8	6.1	6.2	45.2	44.4	45.2
100% C	F23	5	5	5	8.0	8.0	8.0	25.7	24.1	24.2	5.7	6.3	6.4	45.2	44.7	45.6
100% D	F24	5	5	5	8.0	8.1	8.0	25.6	24.8	23.8	5.7	6.3	6.3	45.1	45.2	45.2
Measured/Loaded by:		KR	KJ	JS	KR	JS	ND	KR	JS	ND	KR	JS	ND	KR	JS	ND
Recorded by:		JS	KJ	JS	JS	ND	JS	JS	ND	JS	JS	ND	JS	JS	ND	JS

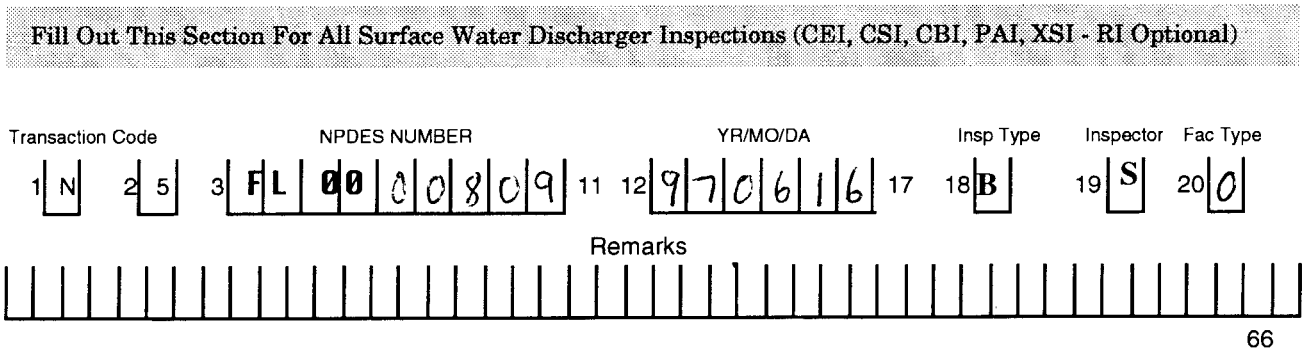
Investigators' Signatures
Kellie Ralston
Julie Sharpe
Keri Johnson
Mark Fundell
AH Wolfe
reviewer form updated 4/01/96

Water Quality Parameters

	Salt Water / Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			NOT MEASURED		
Lab Total Residual Cl2 (mg/L):	<0.03		<0.03	DR100	JS
Alkalinity (mg/L as $CaCO_3$):	103		97	Hach	KJ
Hardness (mg/L as $CaCO_3$):	—		—	Hach	KJ
Total ammonia (mg/L as N):	<0.017		<0.017	Orion	MF

Ammonia Meter #98136 Ammonia Meter Slope: -60.0 Ammonia Blank: <0.017 Control Salinity: 28 ppt Sample Salinity: 28 ppt

The Bioassay of the Tampa Electric Company-Gannon Steam Electric Generating Plant effluent from Outfall 002, sampled on June 16, 1997, NPDES # FL0000809.



The Priority Pollutants Analysis for the Bioassay of the Tampa Electric Company-Gannon Steam Electric Generating Plant effluent from Outfall 002, sampled on June 16, 1997, NPDES # FL0000809.

