

Bioassays of

Tampa Electric Company-Big Bend Power Station

Apollo Beach, Hillsborough County, Florida

NPDES #FL0000817

Sampled 11/26/01

June 2002

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

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Bureau of Laboratories
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Introduction

Tampa Electric Company-Big Bend Power Station, Big Bend Road, Apollo Beach, Hillsborough County, Florida, NPDES #FL0000817, tests performed on 27 to 29 November 2001.

This coal-powered electric generating facility comprises four outfalls, D0011, D0012, D0013, and D0014, a flue-gas desulfurization (FGD) wastewater treatment system, Internal Outfall IO130, and Outfall D001. The four outfalls D0011 through D0014 correspond to the four cooling units. The monthly average flow for these outfalls ranges from 345.6 MGD to 358.9 MGD. Outfall D001 has a long term average flow of 1,304 MGD. Cooling water is not treated prior to discharge. The FGD wastewater is treated by precipitation/chemical adsorption, settling, filtration, and sludge de-watering. This effluent is combined with the cooling water effluent through the Internal Outfall IO130 before it is discharged through Outfall D001 into the Class III marine waters of Tampa Bay (facility information provided by Andrea Grainger and Cynthia Cathey, 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 collected from this facility using the mysid shrimp, *Americamysis bahia*, and the inland silverside, *Menidia beryllina.* The salinity of the sample was approximately 27 parts per thousand (ppt). The control water was natural seawater (NSW) diluted to the test salinity. The test results did not indicate toxicity to either test species within 48 hours (Table 1).

Total residual chlorine and total ammonia were not detected in the bioassay sample in the laboratory. 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 November 26, 2001, did not show acute toxicity to either test species within 48 hours.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Tampa Electric Company-Big Bend Power Station, Big Bend Road, Apollo Beach, Hillsborough County, Florida, NPDES# FL0000817 performed from 27 to 29 November 2001.

Facility:	**TECO-Big Bend Power Station**	**NPDES #**	**FL0000817**	Facility Type:	**Coal Powered**	**Analysts:**	Della Parker-Hanson
Location:	Big Bend Road, Apollo Beach	Contact/District:	Grainger/Southwest		**Electric Generating**		Joshua Ayres
County:	Hillsborough	Test type:	static acute screen		**Plant**		Marshall Faircloth
Sample Collection Date:	11/26/01 Time: 1230	# tests:	2	Receiving Water:	Tampa Bay		Victor Brunell
Test Beginning Date:	11/27/01 Time: 1400	Chlorination Type:	non-chlorinated				
Test Ending Date:	11/29/01 Time: 1505				**Page 1 of 1**	**Reviewer:**	David Whiting

Organism: ***Americamysis bahia*** Life stage: 5 days

	Sample/Diluent	SURVIVAL # Alive			pH			TemperatureA			Dissolved Oxygen			Conductivity Uncorrected 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	8.2	8.2	8.1	23.4	23.9	23.4	6.6	6.8	6.8	40.3	45.0
Control B	0/500	5	5	5	8.2	8.2	8.1	24.2	24.0	24.0	6.6	6.8	6.8	40.8	44.6
Control C	0/500	5	5	5	8.2	8.2	8.1	24.1	24.3	23.9	6.6	6.8	7.0	40.9	44.4
Cotnrol D	0/500	5	5	5	8.2	8.2	8.1	24.0	23.9	23.7	6.6	6.7	6.9	40.8	44.6
100% A	500/0	5	5	5	8.0	8.0	8.0	24.5	23.9	23.7	6.1	6.7	6.6	42.5	47.5
100% B	500/0	5	5	5	8.0	8.0	8.0	24.5	23.9	23.7	6.1	6.7	6.6	42.6	44.8
100 % C	500/0	5	5	5	8.0	8.0	8.0	24.5	23.9	23.8	6.1	6.6	6.6	42.5	46.7
100% D	500/0	5	5	5	8.0	8.0	8.0	24.5	24.0	23.7	6.0	6.6	6.5	42.6	43.5

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.0-24.5°C.
Incubator #3 temperature range for the test period was 24.0-25.0°C.

Organism: ***Menidia beryllina*** Life stage: 8 days

	Sample/Diluent	SURVIVAL # Alive			pH			TemperatureB			Dissolved Oxygen			Conductivity Uncorrected 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	8.2	8.1	8.1	24.4	24.0	23.7	6.6	6.6	6.4	40.1	43.7
Control B	0/500	5	5	5	8.2	8.1	8.1	24.4	23.8	23.6	6.6	6.5	6.3	40.7	45.4
Control C	0/500	5	5	5	8.2	8.1	8.1	24.4	24.1	23.8	6.6	6.6	6.4	40.8	44.2
Cotnrol D	0/500	5	5	5	8.2	8.1	8.1	24.4	24.1	23.8	6.6	6.4	6.2	41.2	42.7
100% A	500/0	5	5	5	8.0	8.0	8.0	24.6	24.1	23.9	6.1	6.5	6.4	42.7	45.6
100% B	500/0	5	5	5	8.0	8.0	8.0	24.7	24.2	23.8	6.1	5.9	6.2	41.9	43.3
100 % C	500/0	5	4	4	8.0	8.0	8.0	24.7	24.1	23.2	6.1	6.2	6.4	42.6	47.8
100% D	500/0	5	5	5	8.0	8.0	8.0	24.7	23.8	23.2	6.1	6.5	6.4	47.5	47.8

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 23.0-24.5°C.
Incubator #3 temperature range for the test period was 24.0-25.0°C.

Data Transcription Verification	
date:	1/24/01
by:	Della Parker-Hanson
	Karla Whiddon

Total Residual CL2	mg/L	Method
Field:	-	-
Lab:	<0.03	Hach

Ammonia	Total (mg/L)	Unionized (mg/L)
NSW	<0.051	<0.051
100% Sample:	<0.051	<0.051

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
NSW	132	-
100% Sample:	130	-

Salinity [C]	ppt
NSW	~27
100% Sample	~27

[C] Salinity based on conductivity and temperature.

Table 3. Results of chemical analyses on the effluent from Tampa Electric Company-Big Bend Power Station sampled on November 26, 2001.

Metals

Aluminum	270	µg/L	[I]
Calcium	316	mg/L	
Copper	0.72	µg/L	[I]
Iron	91	µg/L	[I]
Magnesium	1040	mg/L	

Pesticides and Herbicides

None detected

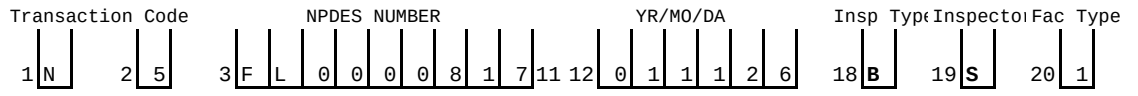
Base, Neutral, & Acid Extractable Organics

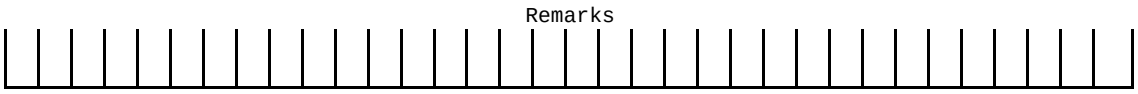
None detected

[I] The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

The Bioassay of Tampa Electric Company-Big Bend Power Station effluent sampled on November 26, 2001, NPDES #FL0000817.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, X

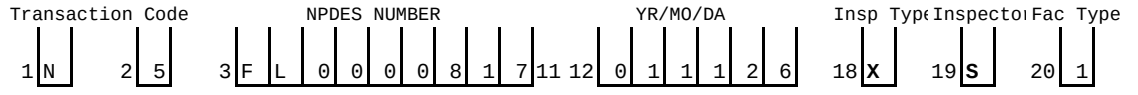


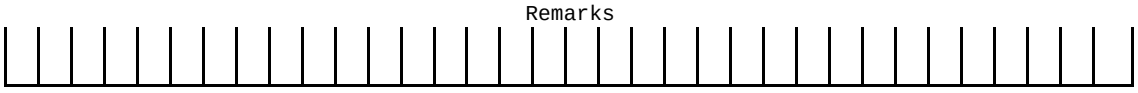


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The Priority Pollutants Analysis for Bioassay of Tampa Electric Company-Big Bend Power Station effluent sampled on November 26, 2001, NPDES #FL0000817.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, X





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