Florida
Department of Environmental Protection

Bioassays of

TECO Big Bend

North Ruskin, Hillsborough County, Florida

NPDES #FL0000817

Sampled 5/10/93

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August 1993

Biology Section
Division of Technical Services

Bioassays of

TECO Big Bend

North Ruskin, Hillsborough County, Florida

NPDES #FL0000817

Biology Section
Bureau of Laboratories
August 1993

Introduction

TECO Big Bend, North Ruskin, Hillsborough County, NPDES #FL0000817, tests performed on 11 to 13 May, 1993.

This facility is an electric power generating plant located on Big Bend Road in North Ruskin. It has three coal-fired generating units with a total nameplate rating of 1336.5 megawatts. Molten slag produced by the generating unit boilers is collected in tanks located beneath each unit. Saltwater is used to cool the slag which solidifies and shatters into small pieces. Overflow from the slag tanks and boiler blowdown water from each unit goes to a transfer sump, then to an 1800 feet by 200 feet slag pond. Saltwater is used as a sluicing medium for ejecting slag from the collection tanks and transporting it to the slag pond. After sedimentation of the particulate matter, wastewater from the slag pond is discharged through outfall 002 into the discharge canal which flows into Hillsborough Bay (NPDES file).

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 FDEP Biology Section performed two 48-hour static acute screening toxicity bioassays on a sample of effluent from this facility. The salinity of the sample was 25.8 ppt, therefore, the test species used for these bioassays were the mysid shrimp, *Mysidopsis bahia*, and the inland silverside, *Menidia beryllina*. The control water for the tests was prepared with an artificial sea salt mixture (Forty Fathoms®) and deionized water. The salinity of the sample was not altered.

The test results indicated 100% and 90% survival in 100% effluent for *M. bahia* and *M. beryllina*, respectively. Total residual chlorine and total ammonia were not detected in the sample.

Conclusion

The sample of effluent collected from this facility on 10 May, 1993 did not show toxicity.

Table 1. Concentration series and volumes used for the 48-hour static acute screening bioassays of the TECO Big Bend electric power generating plant effluent performed on 11 to 13 May, 1993.

Mysidopsis bahia (mysid shrimp)

Concentration	Dilution Water	Sample	Total Volume
Control	500 mL	0 mL	500 mL
100 %	0 mL	500 mL	500 mL

Menidia beryllina (inland silverside)

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 effluent from the TECO Big Bend electric power generating plant, North Ruskin, Hillsborough County, Florida, NPDES# FL0000817, performed on 11 to 13 May, 1993.

Facility:	**TECO Big Bend**		**NPDES #**	**FL0000817**	Facility Type: **Electric Power Generating Plant**
Location:	North Ruskin		Contact / District:	Kathy Hicks/SW	
County:	Hillsborough		Test type:	static acute screen	
Sample Collection Date:	**5/10/93**	Time: 1120	# tests:	2	Receiving Water: Drainage canal to Hillsborough Bay
Test Beginning Date:	5/11/93	Time: 1300	Chlorination Type:	**not chlorinated**	
Test Ending Date:	5/13/93	Time: 1330			**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:	< 0.017	0.00
100% Sample:	< 0.017	0.00

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water:	120	-
100% Sample:	140	-

Salinity (ppt)	
Control Water:	21.0
100% Sample:	25.8

Organism: ***Menidia beryllina*** Life stage: 11 days

	SURVIVAL			pH			Temperature			Dissolved Oxygen			mmhos 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	8.1	8.1	8.0	23.6	23.4	23.6	8.4	7.4	6.6	32.3	32.5
Control	5	5	5	8.1	8.1	8.0	-	-	-	8.4	7.5	6.6	32.3	32.6
100%	5	4	4	8.0	8.0	7.9	25.2	23.4	23.7	7.3	7.0	6.3	40.1	39.0
100%	5	5	5	8.0	8.0	7.9	-	-	-	7.3	7.0	6.4	40.1	39.0

Organism: ***Mysidopsis bahia*** Age: 4 days

	SURVIVAL			pH			Temperature			Dissolved Oxygen			mmhos 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	8.0	8.1	8.0	23.5	23.4	23.7	8.4	8.1	6.9	32.2	32.7
Control	5	5	5	8.0	8.1	8.0	-	-	-	8.4	8.1	6.9	32.3	32.8
100%	5	5	5	8.0	8.0	7.9	25.2	23.3	23.6	7.2	7.3	6.6	40.1	39.2
100%	5	5	5	8.0	8.0	8.0	-	-	-	7.2	7.2	6.6	40.2	39.1

Sample Source: TECO Big Bend
Location: Teco Big Bend Unit 2
County: Hillsborough
Contact/District: Kathy Hicks / SW
NPDES Permit #: FL0000817 Outfall #: 54964

93 MAY 11 04

Sample Collection: Date 05/10/93 Time 11:20
Test Beginning: Date 05/11/93 Time 1300
Test Ending: Date 5/13/93 Time 13:30
Organism Batch #: 20 Diluent Batch #: 25
Organism Age: 4 days
Test Organism: Mysidopsis Bahia

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

Test Number: 1 of 2

Remarks:

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
0 hr	7.0 @ 7.0 9.0 @ 9.0	23.7 @ 23.8	8.4 @ 24.0	980 @ 1,000 9880 @ 10,000 @24.1
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.8 @ 23.9	8.4 @ 24.2	985 @ 1,000 @24.4 9920 @ 10,000
48 hr	7.0 @ 7.0 9.0 @ 9.0	23.7 @ 23.8	8.4 @ 23.7	980 @ 1,000 @24.0 9880 @ 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	4	5	5	5	8.0	8.1	8.0	23.5	23.4	23.7	8.4	8.1	6.9	32.2	32.5	32.7
Control	881	5	5	5	8.0	8.1	8.0				8.4	8.1	6.9	32.3	32.5	32.8
100%	888	5	5	5	8.0	8.0	7.9	25.2	23.3	23.6	7.2	7.3	6.6	40.1	38.9	39.2
100%	79	5	5	5	8.0	8.0	8.0				7.2	7.2	6.6	40.2	38.9	39.1
Measured/Loaded by:		TM	TM	TM	TR	TM	TM	TR	TM	TM	TR	TM	TM	TR	TM	TM
Recorded by:		TM	TR	TM	TM	TR	TR	TM	TR	TR	TM	TR	TR	TM	TR	TR

Investigators' Signatures

Tina M. Kubalik
Tobin A. Rader
Marshall Tandell

Reviewer

form updated 10/20/92

(Salt Water) Water Quality Parameters

	Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2:					
Lab Total Residual Cl2:	<0.03	—	<0.03	DR-100	TM
Alkalinity:	120	—	140	Hach	TR
Hardness:	—	—	—	Hach	TR
Total Ammonia:	<0.017		<0.017	Nessler	MF

Cl_2 Blank: _____ Ammonia Meter Slope: -55.3 Ammonia Blank: <0.017 Sample Salinity: 25.8 ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Teco Big Bend
Location: Teco Big Bend Unit 2
County: Hillsborough
Contact/District: Kathy Hicks/SW
NPDES Permit #: FL0000817 **Outfall #:**
93 MAY 11 04 54964

Sample Collection: Date 05/10/93 Time 11:20
Test Beginning: Date 05/11/93 Time 1300
Test Ending: Date 5/13/93 Time 13:30
Organism Batch #: 4 **Diluent Batch #:** 25
Organism Age: 11 days
Test Organism: Menidia Beryllina

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

Test Number: 2 of 2

Remarks:

Instrument Calibrations:

	pH	Temperature °C	D.O. mg/L	Conductivity µmhos/cm
0 hr	7.0 @ 7.0 9.0 @ 9.0	23.7 @ 23.8	8.4 @ 24.0	980 @ 1,000 @24.1 9880 @ 10,000
24 hr	7.0 @ 7.0 9.0 @ 9.0	23.8 @ 23.9	8.4 @ 24.2	985 @ 1,000 @24.4 9920 @ 10,000
48 hr	7.0 @ 7.0 9.0 @ 9.0	23.7 @ 23.8	8.4 @ 23.7	980 @ 1,000 @24.0 9880 @ 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	65	5	5	5	8.1	8.1	8.0	23.6	23.4	23.6	8.4	7.4	6.6	32.3	32.3	32.5
Control	413	5	5	5	8.1	8.1	8.0				8.4	7.5	6.6	32.3	32.4	32.6
100%	29	5	4	4	8.0	8.0	7.9	25.2	23.4	23.7	7.3	7.0	6.3	40.1	39.0	39.0
100%	219	5	5	5	8.0	8.0	7.9				7.3	7.0	6.4	40.1	39.0	39.0
Measured/Loaded by:		MF	TM	TM	TR	TM	TM	TR	TM	TM	TR	TM	TM	TR	TM	TM
Recorded by:		TR	TR	TM	TM	TR	TR	TM	TR	TR	TM	TR	TR	TM	TR	TR

Investigators' Signatures

Tina Mikulski
Tobin C. Bader
Mark Stanchik

Reviewer

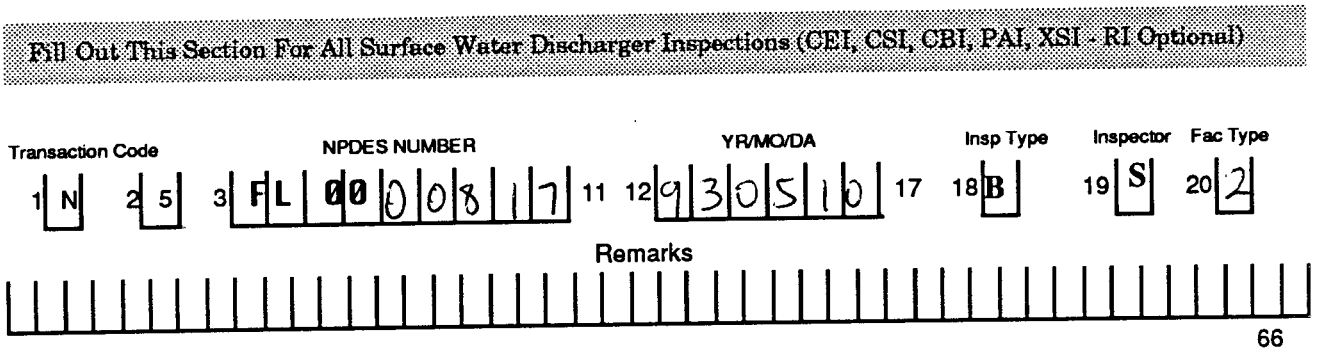
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Water Quality Parameters (Salt Water / Well Water / 20% Min Water)

	Sample	Method	Measured by
Field Total Residual Cl2:			
Lab Total Residual Cl2:	<0.03	DR-100	TM
Alkalinity:	140	Hach	TR
Hardness:	—	Hach	TR
Total Ammonia:	<0.017	Orion	MF

Cl_2 Blank: —
Ammonia Meter Slope: -55.3
Ammonia Blank: <0.017
Sample Salinity: 25.8 ppt

The Bioassay of the TECO Big Bend electric power generating plant effluent sampled on May 10, 1993, NPDES# FL0000817.



The Priority Pollutants Analyses for the the TECO Big Bend electric power generating plant effluent sampled on May 10, 1993, NPDES# FL0000817.

