Bioassays of

Florida Power and Light Company
Riviera Beach Power Plant

Riviera Beach, Palm Beach County, Florida

NPDES #FL0001546

Sampled 1/30/95

March 1995

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

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Bureau of Laboratories
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Introduction

Florida Power and Light Company, Riviera Beach Power Plant, Riviera Beach, Palm Beach County, Florida, NPDES #FL0001546, tests performed on 31 January to 2 February, 1995.

This steam electric power plant is located at 200-300 Broadway in Riviera Beach. Boiler blowdown and approximately 645 MGD of once through cooling water is discharged to Lake Worth (Intracoastal Waterway). Chlorine is periodically injected into the circulating water system as part of scheduled maintanance. The effluent is then dechlorinated with sodium bisulfite before discharge (facility summary provided by Jeff Christian, FDEP West Palm Beach).

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 bioassays on a sample of effluent from this facility. The salinity of the sample was 36 ppt. Therefore, the test species used for these bioassays were the mysid shrimp, *Mysidopsis bahia*, and the inland silverside, *Menidia beryllina*. Control water for the tests was prepared with an artificial sea salt mixture (Forty Fathoms®) and well water to match the salinity of the effluent as collected. Test results did not indicate toxicity (Table 1).

Total residual chlorine and total ammonia were not detected in the sample. Further chemical analyses were performed on the sample and several metals were identified. Analyses were also performed for chloride and sulfate and both were identified in the sample (Table 2).

Conclusion

The sample of effluent collected from this facility on 30 January, 1995, did not show toxicity.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Florida Power and Light Company Power Plant, Riviera Beach, Palm Beach County, Florida, NPDES# FL0001546, performed on 31 January to 02 February, 1995.

Facility:	**Florida Power and Light Company Power Plant**		**NPDES #**	**FL0001546**	Facility Type: **Power Plant**
Location:	200-300 Broadway Riviera Beach		Contact/District:	T. Davis/SE	
County:	Palm Beach		Test type:	static acute screen	
Sample Collection Date:	**1/30/95**	Time: 1030	# tests:	2	Receiving Water: Intracoastal Waterway
Test Beginning Date:	1/31/95	Time: 1600	Chlorination Type:	**Chlorinated**	
Test Ending Date:	2/2/95	Time: 1600	Sample collected after plant dechlorination		**Page 1 of 1**

Total Residual CL2	mg/L	Method
Field:	-	-
Lab:	< 0.03	DR-100

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

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control Water:	300	-
100% Sample:	120	-

Salinity*	(ppt)
Control Water:	36
100% Sample:	36

*Salinity converted from conductivity / temperature measurements

Organism: ***Mysidopsis bahia*** Age: 1day

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature			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	8.3	8.3	8.3	23.9	20.7	21.6	7.1	6.4	6.2	52.5	51.2
Control B	0/500	5	5	5	8.3	8.3	8.3	-	-	21.8	7.0	6.5	6.3	52.3	51.2
Control C	0/500	5	5	5	8.3	8.3	8.3	-	-	21.8	7.1	6.5	6.3	52.1	51.2
Control D	0/500	5	5	5	8.3	8.3	8.3	-	-	21.8	7.0	6.6	6.4	51.7	51.7
100% A	500/0	5	5	5	8.2	8.1	8.0	21.6	20.8	21.7	7.0	6.6	6.4	49.6	51.3
100% B	500/0	5	5	5	8.2	8.1	8.0	-	-	21.6	7.1	6.6	6.4	49.7	51.2
100% C	500/0	5	5	5	8.2	8.1	8.0	-	-	21.7	7.1	6.7	6.4	49.8	51.4
100% D	500/0	5	5	5	8.2	8.1	8.0	-	-	21.8	7.2	6.7	6.3	49.7	51.8

Organism: ***Menidia beryllina*** Age: 11 and12 days

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature			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	8.3	8.4	8.4	23.5	20.9	21.8	7.0	6.9	6.5	51.8	50.0
Control B	0/500	5	5	4	8.3	8.4	8.4	-	-	21.7	7.1	6.9	6.7	52.2	50.2
Control C	0/500	5	5	4	8.3	8.4	8.4	-	-	21.5	7.1	7.0	6.7	52.0	50.1
Control D	0/500	5	5	5	8.3	8.4	8.4	-	-	21.5	7.2	7.1	6.8	52.4	50.8
100% A	500/0	5	5	5	8.2	8.0	8.1	21.1	21.1	21.8	7.2	7.0	6.7	49.4	49.9
100% B	500/0	5	5	5	8.2	8.0	8.1	-	-	21.7	7.3	6.9	6.6	49.4	49.9
100% C	500/0	5	5	5	8.2	8.0	8.1	-	-	21.5	7.2	6.9	6.7	49.6	50.1
100% D	500/0	5	5	5	8.2	8.0	8.1	-	-	21.5	7.2	7.0	6.8	49.5	50.5

Table 2. Results of chemical analyses on the effluent from the Florida Power and Light Company, Riveria Beach Power Plant sampled on January 17, 1995.

Metals		
Calcium	372	mg/L [A]
Magnesium	1,290	mg/L [A]
Sodium	10,900	mg/L [A]
Chloride and Sulfate		
Chloride	18,000	mg/L [A]
Sulfate	2,600	mg/L [A]

[A] Value reported is the mean of two or more determinations.

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: FP+L
County: Palm Beach
Contact / District: T. Davis / SE
NPDES Permit #: FL0001546
LIMS Sample #: 98189 LIMS Job #: 95-JAN-31-11

Sample Collection: Date 1/30/95 Time 1030
Test Beginning: Date 1/31/95 Time 1600
Test Ending: Date 2/2/95 Time 1600
Organism Batch #: 30 Diluent Batch #: 36‰ #1
Organism Age: 1 day
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
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	19.7 @ 19.8	8.9 @ 20.7 °C	100.2 @ 104.1 930 @ 1000 @ 21.9 °C (9550 10000)
24 hr	7.0 @ 7.0 9.0 @ 9.0	20.4 @ 20.5	8.8 @ 21.2 °C	102 @ 104.1 925 @ 1000 @ 21.2 °C (9500 @ 10000)
48 hr	7.0 @ 7.0 9.0 @ 9.0	20.6 @ 20.7	8.7 @ 22.0 °C	940 @ 1000 9520 @ 10000 @ 22.3 °C

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
Conc.	Chamber #	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
Control A	209	5	5	5	8.3	8.3	8.3	23.9	20.7	21.6	~~8.6~~	6.4	~~6.8~~	52.5	50.0	51.2
Control B	70	5	5	5	8.3	8.3	8.3			21.6	~~8.5~~	6.5	6.3	52.3	49.9	51.2
Control C	76	5	5	5	8.3	8.3	8.3			21.8	~~8.5~~	6.5	6.3	52.1	49.9	51.2
Control D	333	5	5	5	8.3	8.3	8.3			21.8	~~8.5~~	6.6	6.4	51.7	50.2	51.7
100% A	630	5	5	5	8.2	8.1	8.0	21.6	20.8	21.7	~~8.5~~	6.6	6.4	~~50.4~~	50.0	51.3
100% B	4	5	5	5	8.2	8.1	8.0			21.6	~~8.6~~	6.6	6.4	~~52.1~~	~~49.8~~	51.2
100% C	75	5	5	5	8.2	8.1	8.0			21.7	~~8.6~~	6.7	6.4	~~52.3~~	49.8	51.4
100% D	438	5	5	5	8.2	8.1	8.0			21.8	~~8.6~~	6.7	6.3		50.2	51.8
										*	Salinity kuch			A Wrong		
										on DO meter	result adjusted			conductivity TR		
											TR			1/31/95		
										Control A	7.1			~~49.6~~		
										Control B	7.0					
										Control C	7.1					
										Control D	7.0					
										100% A	7.0			49.6		
										100% B	7.1			49.7		
										100% C	7.1			49.8		
										100% D	7.2			49.7		
Recorded by:		TR	MF	MF	TR	MJN	TR	TR	JN	TR	TR	JN	TR	TR	JN	TR
Measured/Loaded by:		ME	JN	MF	JN	MF	JN	JN	MF	JN	JN	MF	JN	JN	MF	JN

Investigators' Signatures

Reviewer

Salt Water

Water Quality Parameters	Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			—	—	—
Lab Total Residual Cl2 (mg/L):	<0.03		<0.03	DR-100	TM
Alkalinity (mg/L as $CaCO_3$):	300		120	Hach	TR
Hardness (mg/L as $CaCO_3$):	—		—	Hach	TR
Total ammonia (mg/L as N):	<0.017		<0.017	Orion	TM

Ammonia Meter #98136 Ammonia Meter Slope: -57.1 Ammonia Blank: <0.017 Control Salinity: 36 ppt Sample Salinity: 36 ppt

form updated 10/05/94

FDEP Biology Section — Acute Bioassay Bench Sheet

Sample Source: FP&L
County: Palm Beach
Contact / District: T. Davis / SE
NPDES Permit #: FL0001546
LIMS Sample #: 98189 LIMS Job #: 95-JAN-31-11

Sample Collection: Date 1/30/95 Time 1030
Test Beginning: Date 1/31/95 Time 1600
Test Ending: Date 2/2/95 Time 1600
Organism Batch #: 5996 Diluent Batch #: 36‰ #1
Organism Age: 11 and 12 days old
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
meter #	7851	90H018262	90H018262	G9005749
0 hr	7.0 @ 7.0 9.0 @ 9.0	19.7 @ 19.8	8.9 @ 20.7°C	100.2 @ 104.1 930 @ 1000 @ 21.9 °C 9350 10000
24 hr	7.0 @ 7.0 9.0 @ 9.0	20.4 @ 20.5	8.8 @ 21.2°C	102 @ 104.1 925 @ 1000 @ 21.2 °C
48 hr	7.0 @ 7.0 9.0 @ 9.0	20.6 @ 20.7	8.7 @ 22.0°C	940 @ 1000 9500 @ 10000 @ 22.3 °C

		Number Live			pH			Temperature (°C)			D.O. (mg/L)			UNCORRECTED Cond. (mmhos/cm) Cond. (µmhos/cm)		
Conc.	Chamber #	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
Control A	476	5	5	5 MF	8.3	8.4	8.4	23.5	20.9	21.8	~~8.1~~	6.9	6.5	51.8	49.6	50.0
Control B	149	5	5	~~5~~ 4 MF	8.3	8.4	8.4			21.7	~~8.2~~	6.9	6.7	52.2	49.4	50.2
Control C	114	5	5	~~5~~ 4 MF	8.3	8.4	8.4			21.5	~~8.3~~	7.0	6.7	52.0	49.4	50.1
Control D	48	5	5	5	8.3	8.4	8.4			21.5	~~8.3~~	7.1	6.8	52.4	49.6	50.8
100% A	6	5	5	5	8.2	8.0	8.1	21.1	21.1	21.8	~~8.2~~	7.0	6.7	49.4	49.4	49.9
100% B	13	5	5	5	8.2	8.0	8.1			21.7	7.3	6.9	6.6	49.4	49.6	49.9
100% C	306	5	5	5	8.2	8.0	8.1			21.5	7.2	6.9	6.7	49.6	~~49.3~~ 49.3	50.1
100% D	196	5	5	5	8.2	8.0	8.1			21.5	7.2	7.0	6.8	49.5	49.3	50.5
				CvD	started writing				Control A		7.0					
					wrong species Numbers in Menidia agaics.				Control B		7.1					
					MF 2/2/95				Control C		7.1			A-incorrect number called/written		
									Control D		7.2					
									100% A		7.2				JN	2/1/95
											*Salinity Knob on DO meter was adjusted					
													TR 1/31/95			
Recorded by:		TR	MF	MF	TR	JN	TR	TR	JN	JR	JR	JN	TR	TR	JN	TR
Measured/Loaded by:		MF	MF	MF	JN	MF	JN	JN	MF	JN	JN	MF	JN	JN	MF	JN

Investigators' Signatures

Robin A. Rader
Tina Mikulski
Joseph M. Faircloth
Reviewer

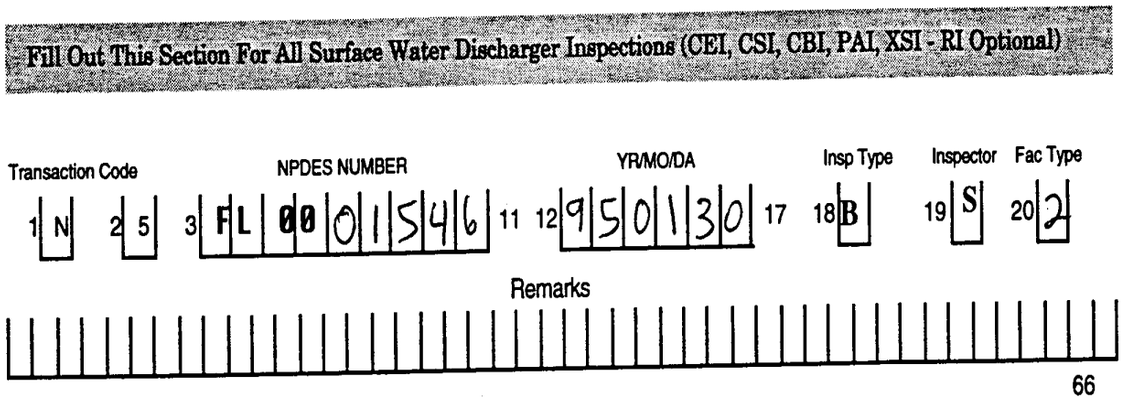
form updated 10/05/94

Salt Water

Water Quality Parameters	Well Water	20% Min Water	Sample	Method	Measured by
Field Total Residual Cl2 (mg/L):			—	—	—
Lab Total Residual Cl2 (mg/L):	<0.03		<0.03	DR-100	TM
Alkalinity (mg/L as $CaCO_3$):	300		120	Hach	TR
Hardness (mg/L as $CaCO_3$):	—		—	Hach	TR
Total ammonia (mg/L as N):	<0.017		<0.017	Orion	TM

Ammonia Meter #98136 Meter Slope: -57.1 Ammonia Blank: <0.017 Control Salinity: 36 ppt Sample Salinity: 36 ppt

The Bioassay of the Florida Power and Light Company, Riveria Beach Power Plant effluent sampled on January 30, 1995, NPDES #FL0001546.



The Priority Pollutants Analysis for the Bioassay of the Florida Power and Light Company, Riveria Beach Power Plant effluent sampled on January 30, 1995, NPDES #FL0001546

