

Bioassays of

Florida Power & Light Company – Riviera Plant

Riviera Beach, Palm Beach County, Florida

NPDES #FL0001546

Sampled 5/13/02

November 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

Florida Power and Light Company-Riviera Plant, 200-300 Broadway, Riviera Beach, Palm Beach County, Florida, NPDES #FL0001546, tests performed on 14 to 16 May 2002.

This fossil-fueled power plant has a design flow of 564 MGD and an average flow of 494 MGD (February, 2001-January, 2002). Once-through cooling water (OTCW) is treated with chlorine gas for two hours/day for each of the two power generating units. Chlorinated OTCW is dechlorinated with sodium bisulfite. During this sampling event, the OTCW was not being treated with chlorine gas. The effluent is discharged into the Class III marine waters of the Intracoastal Waterway. The facility is permitted for a mixing zone for total residual oxidants. The samples collected on 13 May 2002 from this facility were taken from the discharge pipe at the sea wall prior to the actual point of discharge, which is approximately 1500 feet off shore (facility information provided by Stan Ganthier, 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 toxicity bioassays on a sample of effluent collected from this facility using the mysid shrimp, *Americamysis bahia*, and the inland silverside minnow, *Menidia beryllina*. The salinity of the sample was approximately 33 ‰. The control water was natural seawater (NSW) of approximately 32 ‰ salinity. The test results did not show toxicity to either test species within 48 hours (Table 1).

Total residual chlorine was not measured in the field and was 0.04 mg/L in the bioassay sample in the laboratory. Total ammonia was not detected in the bioassay sample in the laboratory. Total ammonia in the sample preserved for chemical analysis was 0.025 mg/L [I]. Further chemical analyses were performed on effluent samples for base, neutral, and acid extractible organic compounds, metals, nutrients, and pesticides. Several metals and nutrients were identified (Table 2).

Conclusion

The sample of effluent collected from this facility on May 13, 2002, did not show acute toxicity to either test species within 48 hours.

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

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Florida Power and Light Company-Riviera Beach Plant, 200-300 Broadway, Riviera Beach, Palm Beach County, Florida, NPDES# FL0001546 performed from 14 to 16 May 2002.

Facility:	**Florida Power & Light- Riviera Beach Plant**	**NPDES #**	**FL0001546**	Facility Type:	**Electric Power**	**Analysts:**	Della Parker-Hanson
Location:	200-300 Broadway, Riviera Beach	Contact/District:	T. Davis/Southeast		**Generating Plant**		Joshua Ayres
County:	Palm Beach	Test type:	static acute screen				Marshall Faircloth
Sample Collection Date:	5/13/2002 Time: 1115	# tests:	2	Receiving Water:	Intracoastal Waterway		Gary Hardee
Test Beginning Date:	5/14/2002 Time: 1430	Chlorination Type:	non-chlorinated	Classification:	Class III Marine		
Test Ending Date:	5/16/2002 Time: 1500		at time of sampling		**Page 1 of 1**	**Reviewer:**	David Whiting

Organism: ***Americamysis bahia*** Life stage: 3 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	8.3	8.1	7.9	24.2	24.0	25.4	6.6	5.8	4.9	46.1	51.6
Control B	0/500	5	5	5	8.3	8.1	7.9	24.0	23.9	24.8	6.7	5.8	4.7	47.2	51.3
Control C	0/500	5	4	4	8.3	8.1	7.9	24.0	24.4	24.8	6.7	5.7	4.8	47.7	51.0
Control D	0/500	5	5	5	8.3	8.1	7.9	24.1	24.4	24.4	6.7	5.8	4.7	48.2	50.9
100% A	500/0	5	5	5	8.2	8.1	8.0	23.9	24.1	25.5	6.1	5.6	4.7	50.4	55.8
100% B	500/0	5	5	5	8.2	8.1	8.0	23.9	24.2	24.6	6.0	5.8	4.7	50.7	54.8
100 % C	500/0	5	5	5	8.2	8.1	8.0	23.8	24.5	24.7	5.9	5.7	4.9	51.2	55.1
100% D	500/0	5	5	5	8.2	8.1	8.0	23.9	24.3	24.1	6.0	5.8	5.3	51.1	54.8

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.0-25.0°C.
Incubator #3 temperature range for the test period was 23.8-25.0°C.

Organism: ***Menidia beryllina*** Life stage: 13 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	8.3	8.1	7.9	24.4	24.2	25.1	6.6	5.4	4.7	46.7	51.5
Control B	0/500	5	5	5	8.3	8.1	7.9	24.2	24.6	24.8	6.7	5.4	4.7	47.7	51.5
Control C	0/500	5	5	5	8.3	8.1	7.9	24.1	24.3	24.8	6.7	5.3	4.7	47.7	51.3
Control D	0/500	5	5	5	8.3	8.1	7.9	24.1	24.1	24.2	6.8	5.5	4.7	47.9	50.8
100% A	500/0	5	5	5	8.2	8.0	7.9	24.0	24.7	24.6	6.4	5.3	4.9	50.6	56.1
100% B	500/0	5	5	5	8.2	8.0	7.9	23.9	24.8	24.4	6.0	5.3	4.9	51.4	54.6
100 % C	500/0	5	5	5	8.2	8.0	7.9	23.9	23.9	24.3	5.9	5.6	5.0	51.4	55.8
100% D	500/0	5	5	5	8.2	8.0	7.9	23.9	24.2	24.2	5.9	5.7	5.1	51.4	55.2

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.0-25.0°C.
Incubator #3 temperature range for the test period was 23.8-25.0°C.

LIMS	
Job number:	TLH-2002-05-14-44
sample number:	593908

Data Transcription Verification	
date:	10/4/2002
by:	Jacquelyn Brynda
	Christa Pierini

Total Residual CL2	mg/L	Method
Field:	-	-
Lab:	0.04	Hach

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

*Method detection limit increased with salinity > 10 ppt.

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
NSW	198	-
100% Sample:	139	-

Salinity [C]	ppt
NSW	~32
100% Sample	~33

[C] Salinity based on conductivity and temperature.

Table 2. Results of chemical analyses on the effluent from the Florida Power and Light Company-Riviera Plant sampled on May 13, 2002.

Metals		
Calcium	423	mg/L
Magnesium	1290	mg/L
Zinc	102	µg/L
Nutrients		
Ammonia	0.025	mg N/L [I]
Nitrite+Nitrate	0.008	mg N/L [I]
Total Kjeldahl Nitrogen	0.28	mg N/L [A]
Orthophosphate	0.011	mg P/L
Total Phosphorus	0.033	mg P/L [I]
Pesticides and Herbicides		
None detected		
Base, Neutral, & Acid Extractable Organics		
None detected		

[A] Value reported is the mean of two or more determinations.
[I] The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

The Bioassay of the Florida Power and Light-Riviera Plant effluent sampled on May 13, 2002, NPDES #FL0001546.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code		NPDES NUMBER		YR/MO/DA		Insp Type	Inspector	Fac Type
1 N	2 5	3 F L 0 0 0 1 5 4 6 #	# 0 2 0 5 1 3	# **B**	# **S**	# 2

Remarks

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The Priority Pollutants Analysis for the Bioassay of Florida Power and Light-Riviera Plant effluent sampled on May 13, 2002, NPDES #FL0001546.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code		NPDES NUMBER		YR/MO/DA		Insp Type	Inspector	Fac Type
1 N	2 5	3 F L 0 0 0 1 5 4 6 #	# 0 2 0 5 1 3	# **X**	# **S**	# 2

Remarks

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