

Bioassays of

Stock Island Power Plant

Stock Island, Monroe County, Florida

NPDES #FL0002089

Sampled 9/24/01

January 2002

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

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Introduction

Stock Island Power Plant, Front Street, Stock Island, Monroe County, Florida, NPDES #FL0002089, tests performed on 25 to 27 September 2001.

This electric power generating plant has a design flow of 7.62 MGD and an average flow ranging from 3.0 MGD during the winter months to 5.0 MGD during the summer months. The once-through non-contact cooling water is not treated prior to being discharged into the Class III marine waters of the Atlantic Ocean. This facility has mixing zones for dissolved oxygen and toxicity both within a 150-ft radius from the end of the power plant discharge canal (facility summary provided by Barbara Feakes, FDEP, Marathon).

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. The test species used for these bioassays were the mysid shrimp, *Americamysis bahia*, and the inland silverside, *Menidia beryllina*. Natural seawater was used as the control. 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 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 September 24, 2001, did not show acute toxicity to the either test species within 48 hours.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Stock Island Power Plant, Front Street, Stock Island, Monroe County, Florida, NPDES# FL0002089 performed from 25 to 27 September 2001.

Facility:	**Stock Island Power Plant**		**NPDES #**	**FL0002089**	Facility Type:	**Electric Power**	**Analysts:** Della Parker-Hanson
Location:	Front Street, Stock Island		Contact/District:	Brannon Briggs/South		**Generating Plant**	Joshua Ayres
County:	Monroe		Test type:	static acute screen			Marshall Faircloth
Sample Collection Date:	9/24/01	Time: 1049	# tests:	2	Receiving Water:	Atlantic Ocean	
Test Beginning Date:	9/25/01	Time: 1500	Chlorination Type:	non-chlorinated			**Reviewer:** David Whiting
Test Ending Date:	9/27/01	Time: 1425				**Page 1 of 1**	

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

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[A]			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	8.4	8.2	8.1	24.6	24.6	24.8	7.4	5.9	5.9	52.2	54.4
Control B	0/500	5	5	5	8.4	8.2	8.1	24.6	24.3	24.5	7.5	5.9	5.8	52.2	53.2
Control C	0/500	5	5	5	8.4	8.2	8.1	24.6	24.1	24.6	7.5	6.0	5.9	52.2	53.5
Control D	0/500	5	5	5	8.4	8.2	8.0	24.6	23.4	24.6	7.5	5.9	5.8	52.2	56.8
100% A	500/0	5	5	5	8.0	8.0	8.0	24.9	24.3	24.8	5.8	5.7	5.7	52.2	54.4
100% B	500/0	5	5	5	8.0	8.0	8.0	24.9	23.8	24.8	5.8	5.7	5.6	52.6	56.5
100% C	500/0	5	5	5	8.0	8.0	7.9	24.9	24.1	24.8	5.7	5.7	5.7	52.0	56.8
100% D	500/0	5	5	5	8.0	8.0	8.0	24.9	23.4	24.8	5.7	5.9	5.7	52.8	56.4

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.0-25.2 °C.
Incubator #3 temperature range for the test period was 24.5-25.5°C.

Organism: ***Menidia beryllina*** Life stage: 14 days

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[B]			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	8.4	8.1	8.0	24.4	24.6	24.7	7.3	5.7	5.8	52.2	53.2
Control B	0/500	5	5	5	8.4	8.1	8.0	24.2	24.1	24.7	7.4	5.6	5.8	52.2	54.9
Control C	0/500	5	5	5	8.4	8.2	8.0	24.4	23.9	24.7	7.4	5.7	5.8	52.2	52.6
Cotnrol D	0/500	5	5	5	8.4	8.1	8.0	24.6	23.6	24.5	7.4	5.6	5.7	52.2	54.8
100% A	500/0	5	5	5	8.0	8.0	8.0	24.8	23.4	24.6	5.8	6.0	5.7	52.1	59.4
100% B	500/0	5	5	5	8.0	8.0	8.0	24.8	23.4	24.6	5.7	6.0	5.7	52.4	56.8
100 % C	500/0	5	5	5	8.0	7.9	7.9	24.9	23.9	24.5	5.7	5.5	5.7	52.4	56.2
100% D	500/0	5	5	5	8.0	8.0	8.0	24.9	23.2	24.5	5.7	5.6	5.7	52.5	59.6

[B] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.0-25.2°C.
Incubator #3 temperature range for the test period was 24.5-25.5°C.

Data Transcription Verification	
date:	11/30/01
by:	Della Parker-Hanson Victor Brunell

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	115	-
100% Sample:	129	-

Salinity[C]	ppt
NSW	35
100% Sample	35

[C] Salinity based on conductivity and temperature.

Table 2. Results of chemical analyses on the effluent from Stock Island Power Plant sampled on September 24, 2001.

Metals

Calcium	434	mg/L
Magnesium	1390	mg/L
Selenium	104	µg/L

Pesticides and Herbicides

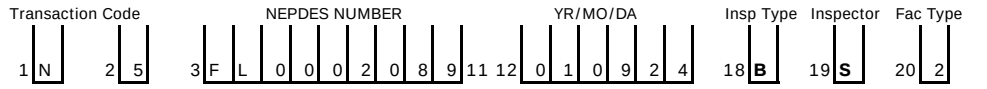
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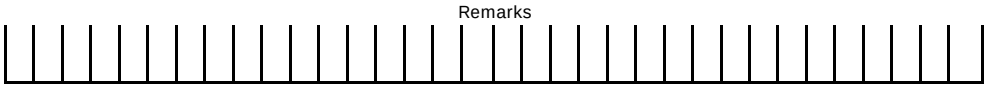
Base, Neutral, & Acid Extractable Organics

None detected

The Bioassay of Stock Island Power Plant effluent sampled on September 24, 2001, NPDES #FL0002089.

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

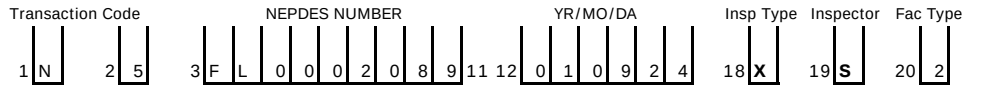


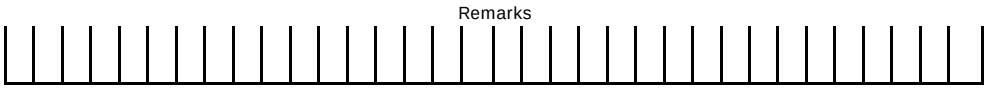


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The Priority Pollutants Analysis for Bioassay of Stock Island Power Plant effluent sampled on September 24, 2001, NPDES #FL0002089.

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