

Bioassays of

Motiva Enterprises LLC – Port Everglades North Terminal

Fort Lauderdale, Broward County, Florida

NPDES #FL0000582

Sampled 3/25/02

November 2002

Biology Section

Division of Resource Assessment & Management

Comprehensive Quality Assurance Plan #870346G

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Introduction

Motiva Enterprises LCL – Port Everglades North Terminal, 909 SE 24th Street, Fort Lauderdale, Broward County, Florida, NPDES # 0000582, tests performed on 26 to 30 March 2002.

This bulk petroleum storage terminal discharges effluent once to several times a month, with a flow range of 0.0075 to 0.359 MGD. The wastewater is not treated prior to discharge, and usually consists of storm water runoff and brackish ground water from an onsite pond. The wastewater is discharged into the Class III marine waters of the Intracoastal waterway (facility information provided by Stanley 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 Freshwaters and Marine Organisms*, 4th Edition, EPA/600/4-90/027F.

Results and Discussion

The FDEP Biology Section performed two 48-hour static acute toxicity bioassays on a sample of effluent collected from the outfall of this facility. The test species used were the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Cyprinella leedsi* (Table 1). The sample was aerated for 45 minutes to increase the dissolved oxygen concentration from 3.8 to 8.0 mg/L. The *C. leedsi* test was terminated on March 27 after 24 hours due to excessive control mortality. The test was invalid due to 15% mortality of controls, while only 10% mortality is allowed in a valid test. This test was re-set on March 28 with the remaining bioassay sample. In the re-set bioassay, the 5% *C. leedsi* mortality in the 100% effluent was equivalent to the 5% mortality in the *C. leedsi* controls; therefore the sample mortality can't be attributed to toxicity of the sample (Table 1).

Total residual chlorine was not detected in the bioassay sample. Total ammonia and unionized ammonia were detected in the original bioassay sample at concentrations of 0.09 mg/L and 0.009 mg/L respectively. Total ammonia in the sample submitted for chemical analysis was 0.12 mg/L. When the *C. leedsi* test was re-set on March 28, ammonia was measured a second time and was not detected in the sample. Additional samples of effluent were collected from this facility and analyzed for herbicides, nutrients, metals, organic compounds, and pesticides. Several metals, two herbicides, and nutrients were detected (Table 2).

Conclusion

The sample of effluent collected on March 25, 2002 from this facility did not show acute toxicity to *C. dubia* test organisms within 48 hours. The *C. leedsi* test was invalidated due to excessive control mortality.

Table 1. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Motiva Enterprises LLC - Port Everglades North Terminal, 909 SE 24th Street, Fort Lauderdale, Broward County, Florida, NPDES# FL0000582, performed from 26 to 28 March 2002.

Facility:	**Motiva Enterprises LLC- PE**	**NPDES #**	**FL0000582**	**Facility Type:**	Bulk Petroleum storage	**Analysts:**	Della Parker-Hanson
Location:	909 SE 24th Street	Contact/District:	Davis/Southeast		terminal		Joshua Ayres
County:	Broward	Test type:	static acute screen				Gary Hardie
Sample Collection Date:	03/25/02 Time: 1130	# tests:	1	Receiving Water:	Intracoastal Waterway		Marshall Faircloth
Test Beginning Date[1]:	03/26/02 Time: 1600	Chlorination Type:	non-chlorinated		Class III Marine waters		
Test Ending Date[1]:	03/28/02 Time: 1400				**Page 1 of 1**	**Reviewer:**	David Whiting

[1] Data for *C. dubia*

Organism: ***Ceriodaphnia dubia*** Life stage: <24 hours

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[A]			Dissolved Oxygen[B]			Conductivity Uncorrected µmhos/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	0/20	5	5	5	8.2	-	8.2	24.7	-	23.4	8.1	-	7.8	170	215
Control B	0/20	5	5	4	-	-	8.2	-	-	23.4	-	-	7.8	-	205
Control C	0/20	5	5	5	-	-	8.3	-	-	23.7	-	-	7.8	-	220
Control D	0/20	5	5	5	-	-	8.3	-	-	23.3	-	-	7.8	-	225
100% A	20/0	5	5	5	8.2	-	8.6	24.7	-	23.3	8.1	-	7.8	385	480
100% B	20/0	5	5	5	-	-	8.6	-	-	23.2	-	-	7.8	-	460
100% C	20/0	5	5	5	-	-	8.7	-	-	23.1	-	-	7.8	-	505
100% D	20/0	5	5	5	-	-	8.7	-	-	23.1	-	-	7.8	-	550

[A] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.0-25.5 °C.
Incubator #3 temperature range for the test period was 23.5-25.5°C.

[B] The sample was aerated for 45 minutes to increase the dissolved oxygen from 3.8 to 8.0 mg/L

LIMS	
Job number:	TLH-2002-03-26-61
sample number:	584365

Data Transcription Verification	
date:	9/9/2002
by:	Joshua Ayres
	Christa Pierini

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

Ammonia	Total (mg/L)	Unionized (mg/L)
Control water (water flea):	<0.017	<0.017
Control water (fish):	<0.017	<0.017
100% Sample[3]:	0.09	0.009

Organism: [2]***Cyprinella leedsi*** Life stage: 9 days

	Sample/Diluent	SURVIVAL # Alive			pH			Temperature[C]			Dissolved Oxygen[B]			Conductivity Uncorrected µmhos/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	7.7	8.2	8.5	24.2	23.9	24.4	7.5	7.5	7.7	245	280
Control B	0/500	5	5	5	7.8	8.3	8.5	24.2	23.9	24.5	7.7	7.6	7.7	250	275
Control C	0/500	5	5	4	7.8	8.3	8.5	24.2	23.9	24.4	7.8	7.5	7.8	255	280
Control D	0/500	5	5	5	7.8	8.3	8.5	24.2	24.0	24.2	7.8	7.6	7.8	255	275
100% A	500/0	5	5	5	8.3	8.5	8.5	24.5	24.0	24.4	7.9	7.6	7.6	385	425
100% B	500/0	5	5	5	8.3	8.5	8.5	24.7	24.0	24.6	7.9	7.5	7.6	385	420
100% C	500/0	5	5	5	8.3	8.4	8.5	24.8	24.0	24.5	8.0	7.5	7.5	400	420
100% D	500/0	5	4	4	8.3	8.4	8.5	24.9	24.0	24.4	8.0	7.4	7.5	395	445

Alk & Hardness	Alkalinity (mg/L)	Hardness (mg/L)
Control water (water flea):	74	76
Control water (fish):	174	166
100% Sample:	170	164

[2] The C. leedsi test set up on 3/26/02 was terminated due to excessive control mortality. The test was re-set on 3/28/02 at 1300 and ended 3/30/02 at 1135.

[3] Ammonia was not detected in the sample on 3/28/02.

[C] Temperatures of room and test incubator were continuously recorded on a strip chart recorder.
Room Temperature range for the test period was 24.0-25.5 °C.
Incubator #3 temperature range for the test period was 23.5-25.5°C.

Table 2. Results of chemical analyses on the effluent from Motiva Enterprises LLC – Port Everglades North Terminal sampled on March 25, 2002.

Metals			
Aluminum_308	90	ug/L	I
Cadmium	0.058	ug/L	I
Calcium	57.8	mg/L	A
Copper	2	ug/L	I
Iron_271	940	ug/L	A
Lead	2.85	ug/L	A
Magnesium	3.5	mg/L	A
Zinc	18.6	ug/L	A
Pesticides and Herbicides			
Ametryn	0.19	ug/L	I
Atrazine	0.11	ug/L	I
Base, Neutral, & Acid Extractable Organics			
None detected			
Nutrients			
Ortho-phosphate	0.035	mg P/L	
Total phosphorous	0.068	mg P/L	
Ammonia-N	0.12	mg N/L	
Total Kjeldahl nitrogen	0.88	mg N/L	

[A] The reported value is an average of two or more values.
[I] The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

The Bioassay of Motiva Enterprises LLC-Port Everglades North Terminal effluent sampled on March 25, 2002, NPDES # FL0000582.

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



Remarks



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The Priority Pollutants Analysis for Bioassay of Motiva Enterprises LLC-Port Everglades North Terminal effluent sampled on March 25, 2002, NPDES # FL0000582.

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



Remarks



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