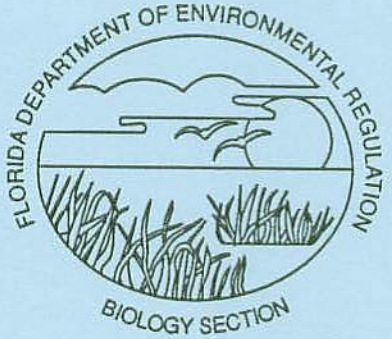


Bioassays of

Monsanto Chemical Company

Pensacola, Escambia County, Florida

NPDES #FL0002488

Sampled 6/4, 6, & 8/90

November 16, 1990

Biology Section
Division of Administrative and Technical Services

Bioassays of

Monsanto Chemical Company

Pensacola, Escambia County, Florida

NPDES #FL0002488

Biology Section
Bureau of Laboratories
November 16, 1990

Introduction

Monsanto Chemical Company, Pensacola, Escambia County, Florida, NPDES #FL0002488 on 5 to 11 June, 1990.

The Monsanto facility is located on Chemstrand Road at the intersection of State Road 292 and 297, near Gonzalez in Escambia County. It operates continuously producing nylon fibers and intermediate products. Process wastewater is generated by the production of adipic acid and nylon fibers. This reclaimed water is concentrated and disposed of through deep well injection. Additional sources of reclaimed water are cooling water and stormwater. This water is discharged through outfall #001 to the Escambia River. Prior to discharge an oil skimmer collects floating oil, grease, and other debris. Stormwater is collected from the plant and surrounding properties and is discharged through outfall #002 to the Escambia River.

The toxicity tests discussed in this report were performed in accordance with methods described by Weber and Peltier, 1987, *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms,* 2nd Edition. The samples used for these tests were collected on 4, 6, and 8 June, 1990, by FDER NW District personnel.

Results and Discussion

The static renewal Cladoceran survival and reproduction test using the Cladoceran, the waterflea, *Ceriodaphnia dubia,* was performed on samples of discharge from outfall #001 of this facility. The test results indicated that the discharge was not toxic to the test organism, *C. dubia*, and was not inhibitory to the reproduction of the test organism. The control organisms' failure to reproduce did not alter the conclusion that the sample was not toxic to the test organism. The lack of reproduction in the control organisms was attributed to a dietary deficiency. The samples did not contain any measurable total ammonia, and only the sample collected on 8 June, 1990, contained any measurable total chlorine (0.1 mg/l Hach). No further chemical analyses were performed on the samples.

Conclusion

The samples collected from this facility on 4, 6, and 8 June, 1990, did not exhibit any chronic toxicity to the test organism, *Ceriodaphnia dubia.*

Table 1. Data recorded during the Ceriodaphnia dubia chronic bioassay of samples of discharge from outfall #001 of the Monsanto Chemical Company, NPDES #FL0002488, Pensacola, Escambia County, Florida on 5 to 11 June, 1990.

Facility:	Monsanto Chemical Company	Test Beginning Date:	6/5/90	Time: 1100	Facility Type: Industrial
NPDES #	FL0002488 Outfall # 001	Test Ending Date:	6/11/90	Time: 1100	Chlorination Type: dechlorinated
Location:	Chemstrand Rd., Pensacola				
County:	Escambia	Sample "A" Collection Date:	6/4/90	Time: 1405	Receiving Water: Escambia River
Contact/District:	T. Willard	Sample "B" Collection Date:	6/6/90	Time: 1340	
Sample Log #:	93	Sample "C" Collection Date:	6/8/90	Time: 1335	Page 1 of 2

Total Residual Cl2	mg/l
Sample "A" Field:	0.1
Sample "A" Lab:	0.0
Sample "B" Field:	<0.1
Sample "B" Lab:	0.0
Sample "C" Field:	<0.1
Sample "C" Lab:	<0.1

Ammonia	Total (mg/l)	Unionized (mg/l)
Diluent Batch "A":	0.00	0.00
Diluent Batch "B":	-	-
Sample "A":	0.00	0.00
Sample "B":	0.00	0.00
Sample "C":	0.00	0.00

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)	Salinity
Diluent Batch "A":	62	95	0
Diluent Batch "B":	-	-	-
Sample "A":	21	21	0
Sample "B":	22	29	0
Sample "C":	20	29	0

Diluent Batch Use	Days Used
Diluent Batch "A":	7
Diluent Batch "B":	

NOEC: - LOEC: -

SURVIVAL

Concentrations	# surviving adults	Young/adult
Control	8	0
6.00%	10	0.4
12.0%	10	2.7
25%	10	2.8
50%	9	8.1
100%	9	14.6

		pH	Temp	DO	Cond
Day 0	Control	8.0	21.8	8.2	205.0
New Sample	6.25%	8.0			
	12.5%	8.0			
	25%	7.9			
	50%	7.8			
	100%	7.7	21.7	8.2	225.0
Day 1	Control	8.1	22.0	8.2	200.0
New Sample	6.25%	8.1			
	12.5%	8.1			
	25%	8.0			
	50%	7.9			
	100%	7.9	22.0	8.2	220.0
Old Sample	Control	8.1		7.9	
	6.25%	8.1		7.7	
	12.5%	8.0		7.7	
	25%	8.0		7.7	
	50%	7.9		7.7	
	100%	7.8		7.6	
Day 2	Control	8.0	22.3	8.2	200.0
New Sample	6.25%	8.1			
	12.5%	8.0			
	25%	8.0			
	50%	7.9			
	100%	7.7	23.5	7.9	155.0
Old Sample	Control	7.9		7.7	
	6.25%	7.9		7.4	
	12.5%	7.9		7.4	
	25%	7.8		7.4	
	50%	7.8		7.4	
	100%	7.8		7.7	

		pH	Temp	DO	Cond
Day 3	Control	8.1	21.7	8.3	205.0
New Sample	6.25%	8.1			
	12.5%	8.1			
	25%	7.9			
	50%	7.8			
	100%	7.7	23.1	8.1	180.0
Old Sample	Control	8.0		8.0	
	6.25%	8.0		7.9	
	12.5%	8.0		7.7	
	25%	7.8		7.6	
	50%	7.8		7.5	
	100%	7.7		7.2	
Day4	Control	8.0	23.2	8.2	210.0
New Sample	6.25%	8.0			
	12.5%	7.9			
	25%	7.9			
	50%	7.7			
	100%	7.7	24.0	7.9	240.0
Old Sample	Control	8.0		7.8	
	6.25%	7.8		6.9	
	12.5%	7.8		7.1	
	25%	7.8		7.0	
	50%	7.8		7.2	
	100%	7.6		7.2	
Day 5	Control	8.2	23.0	8.7	200.0
New Sample	6.25%	8.1			
	12.5%	8.1			
	25%	8.0			
	50%	7.9			
	100%	7.7	25.2	8.6	240.0
Old Sample	Control	8.0		8.4	
	6.25%	7.9		8.1	
	12.5%	7.9		7.9	
	25%	7.9		8.0	
	50%	7.8		8.2	
	100%	7.6		8.2	

-continued-

Table 1. Continued.

Facility:	Monsanto Chemical Company	Test Beginning Date:	6/5/90	Time: 1100	Facility Type: Industrial
NPDES #	FL0002488 Outfall # 001	Test Ending Date:	6/11/90	Time: 1100	Chlorination Type: dechlorinated
Location:	Chemstrand Rd., Pensacola				
County:	Escambia	Sample "A" Collection Date:	6/4/90	Time: 1405	Receiving Water: Escambia River
Contact/District:	T. Willard	Sample "B" Collection Date:	6/6/90	Time: 1340	
Sample Log #:	93	Sample "C" Collection Date:	6/8/90	Time: 1335	Page 2 of 2

Total Residual Cl2	mg/l
Sample "A" Field:	0.1
Sample "A" Lab:	0.0
Sample "B" Field:	<0.1
Sample "B" Lab:	0.0
Sample "C" Field:	<0.1
Sample "C" Lab:	<0.1

Ammonia	Total (mg/l)	Unionized (mg/l)
Diluent Batch "A":	0.00	0.00
Diluent Batch "B":	-	-
Sample "A":	0.00	0.00
Sample "B":	0.00	0.00
Sample "C":	0.00	0.00

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)	Salinity
Diluent Batch "A":	62	95	0
Diluent Batch "B":	-	-	-
Sample "A":	21	21	0
Sample "B":	22	29	0
Sample "C":	20	29	0

Diluent Batch Use	Days Used
Diluent Batch "A":	7
Diluent Batch "B":	

NOEC: - LOEC: -

SURVIVAL

Concentrations	# surviving adults	Young/adult
Control	8	0
6.00%	10	0.4
12.0%	10	2.7
25%	10	2.8
50%	9	8.1
100%	9	14.8

		pH	Temp	DO	Cond
Day 6	Control	8.2	22.2	8.6	210.0
New Sample	6.25%	8.2			
	12.5%	8.2			
	25%	8.1			
	50%	7.9			
	100%	7.7	22.1	8.7	225.0
Old Sample	Control	7.8		7.5	
	6.25%	7.7		7.3	
	12.5%	7.7		7.0	
	25%	7.7		7.2	
	50%	7.6		7.0	
	100%	7.5		7.1	

DER Biology Section — *Ceriodaphnia dubia* Chronic-bioassay Bench Sheet

Sample Source: MONSANTO
NPDES Permit #: FL0002488 Outfall #: 001
Log #: 93

Sample Collection: Date 6/4/90 Time 2205
Test Beginning: Date 6/5/90 Time 1100
Test Ending: Date 6/11/90 Time 1100

		New Sample				Old Sample	
	Conc.	pH (SU)	Temp (°C)	DO (mg/l)	Cond (µmhos/cm)	pH (SU)	DO (mg/l)
Day 1 Sample A	Control	8.0	21.8	8.2	205		
	12.5%	8.0	21.4	8.3			
	25%	8.0	21.4	8.4			
	50%	7.9	21.4	8.3			
	75%	7.8	21.4	8.3			
	100%	7.7	21.7	8.2	225		
Day 2 Sample A	Control	8.1	22.0	8.4	200	8.1	7.7
	12.5%	8.1	22.0	8.4		8.1	7.7
	25%	8.1	22.0	8.4		8.0	7.7
	50%	8.0	22.0	8.3		8.0	7.7
	75%	7.9	22.0	8.3		7.9	7.7
	100%	7.9	22.0	8.2	220	7.8	7.6
Day 3 Sample B	Control	8.0	22.3	8.2	200	7.9	7.7
	12.5%	8.1	22.8	8.1	175	7.9	7.4
	25%	8.0	22.7	8.1	185	7.9	7.4
	50%	8.0	23	8.0	175	7.8	7.4
	75%	7.9	23.1	7.9	165	7.7	7.4
	100%	7.7	23.5	7.8	155	7.7	7.7
Day 4 Sample B MF SHW	Control	8.1	21.7	8.3	205	8.0	8.0
	12.5%	8.1				8.0	7.9
	25%	8.1				8.0	7.7
	50%	7.9				7.8	7.6
	75%	7.8				7.8	7.5
	100%	7.7	23.1	8.1	180	7.7	7.2
Day 5 Sample C MF SW	Control	8.0	23.3	8.2	210	8.0	7.8
	12.5%	8.0				7.8	7.6
	25%	7.9				7.8	7.1
	50%	7.9				7.9	7.0
	75%	7.7				7.8	7.2
	100%	7.7	24.0	7.9	225	7.7	7.2
Day 6 Sample C SW SW	Control	8.2	23.0	8.7	200	8.0	8.0
	12.5%	8.1				7.9	8.1
	25%	8.1				7.9	7.9
	50%	8.0				7.9	8.0
	75%	7.9				7.9	8.2
	100%	7.7	24.2	8.6	220	7.6	8.2
Day 7 Sample C MF MF	Control					7.8	7.5
	12.5%					7.7	7.3
	25%					7.7	7.0
	50%					7.7	7.2
	75%					7.6	7.0
	100%					7.5	7.1
Measured by:		MF DMF	MF	MF	SW	MF	SW
Recorded by:		TH MC	SW	SW	MF	SW	MF

Investigators' Signatures

Marshall Faircloth
Steven H Woelk

Reviewer

Remarks: Calibrated 6-7-90 Temp Work 23.2°C

* Temp is MF temp during DO

6/5 slope -56.3
mortality to chronic
cont 0.0
100% 0.0

6/7/90 weighed out
cont 0.0
100% 0.0

6/9/90 slope -57.4
control 0.0
100% 0.0

total Residual Chlorine
6/5 100% 0.0
6/7 100% 0.0
6/9 100% <.1

Cond Temp
Ohm 27.7@25°C 1355@1330 2
24hr 7.7; 9.4 8.7@25°C 1410 uMOS 2
48hr 7.7
72 hr
96 hr
120 hr
144 hr

Calibration
Cond
1355@1310 23°C @ 23.5
1410@1405 23°C @ 23.5
1380@1381 22.2°C @ 23.1
1380@1385 22.8°C @ 23.7°C
1372@1376 22.2@ 23.1
1357@1358 24.8@25.6
1350@1341 24.3@ 25.2

DO
Ohm 27.7@23°C 8.7@23°C
24hr 27.9@24 8.7@23°C
48hr 27.9@24 8.8@22°C
72hr 27.9@24 8.7@23°C
96hr 27.9@25°C 8.7@25°C
120hr 27.7@24°C 8.5@24°C
144hr 27.7@24°C 8.4@25°C

control	6/5	6/7	6/9
ALK	62	70	72
HRD	95	~~85~~ 90	81
Sample			
ALK	21	22	20
HRD	32	29	29

DER Biology Section — *Ceriodaphnia dubia* Chronic-bioassay Bench Sheet

Sample Source: Monsanto
NPDES Permit #: FL0002488 Outfall #: 001
Log #: 93

Sample Collection: Date 6-4-10 Time _____
Test Beginning: Date 6-5-10 Time 1110
Test Ending: Date 6-11-10 Time 1110

		New Sample				Old Sample	
	Conc.	pH (SU)	Temp (°C)	DO (mg/l)	Cond (µmhos/cm)	pH (SU)	DO (mg/l)
Day 7 Sample A	Control	8.2	22.2	8.6	210		
	12.5%	8.2	22mf				
	25%	8.2					
	50%	8.1					
	75%	7.9					
	100%	7.7	22.1	8.7	225		
Day 2 Sample A	Control						
	12.5%						
	25%						
	50%						
	75%						
	100%						
Day 3 Sample B	Control						
	12.5%						
	25%						
	50%						
	75%						
	100%						
Day 4 Sample B	Control						
	12.5%						
	25%						
	50%						
	75%						
	100%						
Day 5 Sample C	Control						
	12.5%						
	25%						
	50%						
	75%						
	100%						
Day 6 Sample C	Control						
	12.5%						
	25%						
	50%						
	75%						
	100%						
Day 7 Sample C	Control						
	12.5%						
	25%						
	50%						
	75%						
	100%						
Measured by:		MF	MF	FMF	MF		
Recorded by:		SW	SW	SW	SW		

SW/mf

Investigators' Signatures

Remarks:

Marshall Faircloth
Reviewer

DER Biology Section — *Ceriodaphnia dubia* Chronic-bioassay Bench Sheet

Sample Source: MONSANTO

NPDES Permit #: FL0002399 Outfall #: 001

Sample Collection: Date 6/4/90 Time 1405

Test Beginning: Date 6/5/90 Time 1100

Test Ending: Date 6/11/90 Time 1100

		Replicate Number																				Total		Grand Total	
		1		2		3		4		5		6		7		8		9		10					
	Conc.	#Live	#Yng	#Live	#Yng	#Live	#Yng	#Live	#Yng	#Live	#Yng	#Live	#Yng	#Live	#Yng	#Live	#Yng	#Live	#Yng	#Live	#Yng	#Live	#Yng	#Live	#Yng
Day 1 Sample A	Control	1		1		1		1		1		1		1		1		1		1		10		10	
	12.5%	1		1		1		1		1		1		1		1		1		1		10		10	
	25%	1		1		1		1		1		1		1		1		1		1		10		10	
	50%	1		1		1		1		1		1		1		1		1		1		10		10	
	75%	1		1		1		1		1		1		1		1		1		1		10		10	
	100%	1		1		1		1		1		1		1		1		1		1		10		10	
24hr Day 2 Sample A	Control	1		1		1		1		1		1		1		1		1		1		10		10	
	12.5%	1		1		1		1		1		1		1		1		1		1		10		10	
	25%	1		1		1		1		1		1		1		1		1		1		10		10	
	50%	1		1		1		1		1		1		1		1		1		1		10		10	
	75%	1		1		1		1		1		1		1		1		1		1		10		10	
	100%	1		1		1		1		1		1		1		1		1		1		10		10	
24hr Day 3 Sample B 6/7/90	Control	1		1		1		1		1		1		1		1		1		X		9		9	
	12.5%	1		1		1		1		1		1		1		1		1		1		10		10	
	25%	1		1		1		1		1		1		1		1		1		1		10		10	
	50%	1		1		1		1		1		1		1		1		1		1		10		10	
	75%	1		1		1		1		1		X		1		1		1		1		9		9	
	100%	1		1		1		1		1		1		1		1		1		1		10		10	
48hr Day 4 Sample B	Control	1		1		1		1		1		1		1		1		1		X		9		9	
	12.5%	1		1		1		1		1		1		1		1		1		1		10		10	
	25%	1		1		1		1		1		1		1		1		1		1		10		10	
	50%	1		1		1		1		1		1		1		1		1		1		10		10	
	75%	1		1		1		1		1		X		1		1		1		1		9		9	
	100%	1		1		1		1		1		1		1		1		X		1		9		9	
72hr Day 5 Sample C 6/9/90	Control	1		X		1		1		1		1		1		1		1		X		8	0		0
	12.5%	1		1		1		1		1		1		1		1		1		1		10	0		0
	25%	1		1		1		1		1		1	1	1		1		1	-	1	-	10	1		1
	50%	1	1	1		1		1		1	1	1		1		1		1		1		10	2		2
	75%	1		1	3	1	1	1		1		X		1	1	1	3	1	1	1	1	9	10	1	10
	100%	1	2	1	2	1	2	1	3	1	3	1		1		1	4	X		1	2	9	18	1	18
96hr Day 6 Sample C	Control	1		1		1		1		1		1		1	X	1		1		X		8	0		0
	12.5%	1		1		1		1		1	☆	1		1		1		1		1		10	0		0
	25%	1		1		1		1		1	☆	1		1		1		1		1	☆	10	1		1
	50%	1		1	4	1		1		1		1	3	1	XX	1	☆X	1	5	1	☆	10	13	1	14
	75%	1	6	1		1	4	1	1	1	5	1		1	7	1	1X	1	☆	1	4	9	28	1	38
	100%	1	6	1	4	1	7	1	4	1	1	1	5	1	7	1	3	X		1	6	9	43	1	61
120hr Day 7 Sample C	Control	1		X		1		1		1		1		1		1		1		X		8			0
	12.5%	1		1		1		1	2	1		1		1		1		1		1	1	10	3		4
	25%	1	7	1		1	1*	1		1		1		1		1	4	1	4	1		10	26	1	27
	50%	1		1	11	1	2	1		1		1		1		1		1		1	1	10	14		28
	75%	1		1	11	1	5	1	4	1	7	X		1		1		1	2	1	6	9	35	1	73
	100%	1		1	8	1	4*	1	9	1	8	1	8	1	11	1	14	X		1	10	9	72	1	133
Measured by:																									
Recorded by:																									

Investigators' Signatures

Marshall Faircloth

Reviewer

Remarks: ☆ B stillborn young

* stillborn mlt

Day 7 4* (no ♀) 5 stillborn