

Sample Number : N3-1-C

SAMPLE IDENTIFICATION

Company :	Department of Earth Sciences, University of Waterloo	Date Collected :	2006-08-14
Location :	Waterloo ON	Date Received :	2006-08-15
Substance :	N3-1-C	Time Received :	8:30
Sampled By :	M. Fraser	Date Tested :	2006-08-15
Temp. on arrival :	15.0°C		
Sample Description :	Clear, colourless, odourless		
Test Method :	Test of Reproduction and Survival using the Cladoceran <i>Ceriodaphnia dubia</i> . Environment Canada, Conservation and Protection. Ottawa, Ontario. Report EPS 1/RM/21 (as amended November 1997).		

TEST RESULTS

Effect	Value	95 % Confidence Limits	Statistical Method
LC50 (Survival)	>100%	-	-
IC25 (Reproduction)	>100%	-	-

The results reported relate only to the sample tested.

SODIUM CHLORIDE REFERENCE TOXICANT DATA

Date Tested :	2006-08-21	Statistical Method :	Linear Interpolation (Toxstat 3.5) ^b
Organism Batch :	Cd06-08	Historical Mean IC25 :	1.28 g/L
Test Duration :	6 days	Warning Limits (± 2SD) :	0.88 - 1.89
IC25 Survival :	1.34 g/L	Analyst(s) :	SM/NK
95% Confidence Limits :	0.68-1.52		

TEST CONDITIONS

Test Organism :	<i>Ceriodaphnia dubia</i>	Sample Filtration :	None
Organism Batch :	Cd06-08	Test Aeration :	None
Source :	Stantec In-house Culture	Control/Dilution Water :	Well water with 29.6 mg/L NaCl
Age (on Test Day 0) :	≤24 h (within 12 h of same age)	Test Volume per Replicate :	15 mL
Culture Mortality :	10 % (during previous 7 days)	Test Vessel :	25mL glass vial
Mean Young Produced :	≥ 15.0 (during previous 7 days)	Depth of Test Solution :	5.0 cm
Young Produced :	≥ 6.0 (previous brood)	Organisms per Replicate :	1
Ephippia in Culture :	None	Number of Replicates :	10
pH Adjustment :	None	Daily Renewal Method :	Transferred to fresh solutions
Hardness Adjustment :	None	Test Method Deviation(s) :	None

COMMENTS

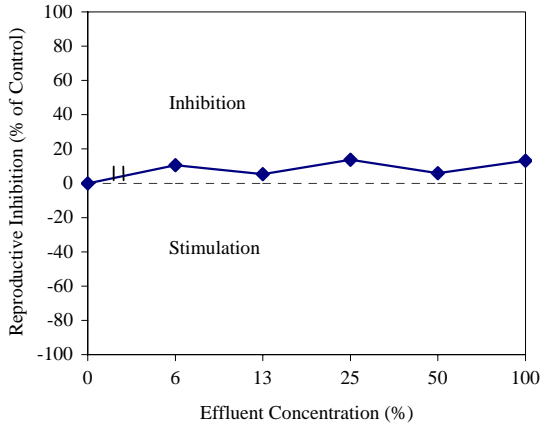
All test validity criteria as specified in the test method cited above were met.

No organisms exhibiting unusual appearance, behaviour, or undergoing unusual treatment were used in the test.

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SUMMARY OF TEST DATA

Ceriodaphnia dubia Reproductive Inhibition



Total Neonates per Test Organism at Test Completion

Replicate	Effluent Concentration (%)					
	Control	6	13	25	50	100
1	36	34	36	26	30	41
2	36	36	39	35	33	36
3	25	35	26	25	23	19
4	29	31	0	0	20	12
5	36	31	38	28	39	33
6	0	24	25	24	0	22
7	38	41	37	36	37	31
8	31	6	30	31	37	5
9	37	0	37	34	39	35
10	37	35	21	24	29	31
Mean	30.5	27.3	28.9	26.3	28.7	26.5

Cumulative Daily Test Organism Mortality (%)

Date	Test Day	Effluent Concentration (%)					
		Control	6	13	25	50	100
2006-08-16	1	0	10	0	0	0	0
2006-08-17	2	0	10	0	10	10	0
2006-08-18	3	0	10	0	10	10	0
2006-08-19	4	0	20	0	10	10	10
2006-08-20	5	0	20	0	20	10	20
2006-08-21	6	0	30	10	20	10	20
Total Mortality (%)		0	30	10	20	10	20

REFERENCES

^a Stephan, C. E. 1977. Methods for calculating an LC50. pp 65-84 in : P. L. Mayer and J. L. Hamelink (eds.), Aquatic Toxicology and Hazard Evaluation. Amer. Soc. Testing and Materials, Philadelphia PA. ASTM STP 634.

^b West, Inc. and D. Gulley. 1996. Toxstat Release 3.5. Western Ecosystems Technology. Cheyenne, WY, U.S.A.

Date : _____

Approved By : _____

Senior Laboratory Technician

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Ceriodaphnia dubia Survival and Reproduction

Test Initiation Date : 2006-08-15

Initiation Time : 12:00

Test Completion Date : 2006-08-21

Concentration (%)													Analyst(s)	Concentration (%)													
Control	Day	1	2	3	4	Replicate					Mean Young	25		Day	1	2	3	4	5	6	7	8	9	10	Mean Young		
2006-08-16	1	0	0	0	0	0	0	0	0	0	0	0	EW	2006-08-16	1	0	0	0	0	0	0	0	0	0	0	0	
2006-08-17	2	0	0	0	0	0	0	0	*	0	0	0	MF	2006-08-17	2	0	0	0	0	x	0	0	0	0	0	0	
2006-08-18	3	4	7	0	6	7	0	7	5	6	7	4.9	EW	2006-08-18	3	2	7	0	0	5	6	8	5	4	2	3.9	
2006-08-19	4	15	13	6	8	12	0	12	1	13	13	9.3	EW	2006-08-19	4	11	12	3	0	11	10	12	12	13	9	9.3	
2006-08-20	5	0	0	5	0	0	0	0	11	0	0	1.6	EW	2006-08-20	5	0	0	7	0	0	8	x	0	0	0	0	1.5
2006-08-21	6	17	16	14	15	17	0	19	14	18	17	14.7	EW	2006-08-21	6	13	16	15	0	12	0	16	14	17	13	11.6	

Concentration (%)													Concentration (%)													
6	Day	1	2	3	4	Replicate					Mean Young	50	Day	1	2	3	4	5	6	7	8	9	10	Mean Young		
2006-08-16	1	0	0	0	0	0	0	0	0	0	x	0	0	2006-08-16	1	0	0	0	0	0	0	0	0	0	0	0
2006-08-17	2	0	0	0	0	0	0	0	0	0	0	0	0	2006-08-17	2	0	0	0	0	0	0	x	0	0	0	0
2006-08-18	3	4	6	0	5	5	6	8	2	0	7	4.3	0	2006-08-18	3	5	6	0	5	6	0	6	7	7	1	4.3
2006-08-19	4	15	13	8	10	12	11	14	4	x	0	9.9	0	2006-08-19	4	12	13	4	11	14	0	14	14	14	11	10.7
2006-08-20	5	0	0	11	0	0	7	0	0	0	0	1.8	0	2006-08-20	5	0	0	6	0	0	0	0	0	0	0	0.6
2006-08-21	6	15	17	16	16	14	0	x	19	0	0	11.3	0	2006-08-21	6	13	14	13	4	19	0	17	16	18	17	13.1

Concentration (%)													Concentration (%)													
13	Day	1	2	3	4	Replicate					Mean Young	100	Day	1	2	3	4	5	6	7	8	9	10	Mean Young		
2006-08-16	1	0	0	0	0	0	0	0	0	0	0	0	2006-08-16	1	0	0	0	0	0	0	0	0	0	0	0	0
2006-08-17	2	0	0	0	0	0	*	0	0	0	0	0	2006-08-17	2	0	0	0	0	0	0	0	0	0	0	0	0
2006-08-18	3	5	7	0	0	7	5	6	6	6	6	4.8	2006-08-18	3	7	6	0	4	5	5	5	4	6	5	4.7	
2006-08-19	4	13	13	4	0	13	11	13	11	13	1	9.2	2006-08-19	4	14	13	3	0	12	9	10	1	x	12	13	8.7
2006-08-20	5	0	0	8	0	0	8	0	0	0	0	1.6	2006-08-20	5	0	0	5	0	0	8	x	0	0	0	0	1.3
2006-08-21	6	18	19	14	0	18	1	x	18	13	18	13.3	2006-08-21	6	20	17	11	8	16	0	16	0	17	13	11.8	

"x" = adult mortality
 "*" = accidental adult mortality

Data Reviewed By : _____

Date : _____

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Ceriodaphnia dubia Water Chemistry Data

Initial Chemistry:		Temp. (°C)	DO (mg/L)	pH	Conductivity (µmhos/cm)	Hardness (mg/L as CaCO ₃)	
		25.5	6.0	7.8	348.0	210	
		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
Effluent Sub-sample Used		1	2	3	4	5	6
Temperature (°C)		25.5	25.5	24.5	25.5	25.5	25.5
Dissolved Oxygen (mg/L)		6.0	6.0	6.4	5.9	6.0	6.1
Dissolved Oxygen % Sat.¹		76	75	79	76	76	78
Pre-aeration Time (min)²		0	0	0	0	0	0
Analyst(s)	Initial	EW	EW	MF	EW	EW	EW
	Final	EW	MF	EW	EW	EW	EW
Control (0%)							
Temp. (°C)	Initial	24.5	25.0	25.0	25.0	25.0	24.0
	Final	25.0	25.0	25.0	24.0	24.0	25.0
DO % Sat. ¹	Initial	97	100	99	99	100	96
DO (mg/L)	Initial	7.8	8.0	7.9	7.9	8.0	7.7
	Final	6.7	6.7	6.2	6.4	6.2	5.7
pH	Initial	8.3	8.2	8.2	8.3	8.3	8.1
	Final	8.3	8.3	8.2	8.3	8.3	8.1
Cond. (µmhos/cm)	Initial	588	596	598	609	598	568
6 %							
Temp. (°C)	Initial	24.5	25.0	25.0	25.0	25.0	24.0
	Final	25.0	25.0	25.0	24.0	24.0	25.0
DO (mg/L)	Initial	7.9	7.9	8.1	7.9	8.0	7.9
	Final	6.4	6.8	6.2	6.7	6.1	5.9
pH	Initial	8.2	8.1	8.3	8.2	8.2	8.1
	Final	8.3	8.3	8.2	8.4	8.3	8.2
Cond. (µmhos/cm)	Initial	555	559	575	578	568	539
25 %							
Temp. (°C)	Initial	24.5	25.0	25.0	25.0	25.0	24.0
	Final	25.0	25.0	25.0	24.0	24.0	25.0
DO (mg/L)	Initial	7.8	7.8	8.1	7.9	8.0	7.7
	Final	6.7	6.7	6.4	6.5	6.4	6.2
pH	Initial	8.1	8.1	8.2	8.2	8.2	8.1
	Final	8.3	8.2	8.2	8.3	8.3	8.2
Cond. (µmhos/cm)	Initial	515	519	533	533	525	501
100 %							
Temp. (°C)	Initial	24.5	25.0	25.0	25.0	25.0	24.0
	Final	25.0	25.0	25.0	24.0	24.0	25.0
DO (mg/L)	Initial	6.4	6.4	7.0	7.0	6.9	6.2
	Final	6.2	6.7	6.5	6.5	6.0	5.6
pH	Initial	7.8	7.9	8.0	7.9	7.9	7.8
	Final	8.2	8.3	8.2	8.3	8.1	8.0
Cond. (µmhos/cm)	Initial	350	349	349	350	349	350

"-" = not measured

¹ % saturation (adjusted for actual temperature and barometric pressure)

² ≤100 bubbles/minute