Work Order Number: 204482
Sample Number: 7880

Comments

No inhibitory gradient was detected in the control group using the Mann-Kendall Trend test (α=0.05).

Negative cell yield indicates no growth. Prior to statistical analyses, any negative numbers for cell yield were replaced with zero values.

The holding time was extended to four days as the sample was collected on 2003-08-09, but was not received until 2003-08-13. A power failure occurred on 2003-08-14 which resulted in insufficient lighting for 17 hours. There were no other unusual conditions or deviations from the test protocol. The results reported relate only to the sample tested.

Reference Toxicant Data

Substance	: Sodium Chloride
Test Date	: 2003-08-26
IC25 Growth (mg/L)	: 189.5
Lower 95% Confidence Limit	: 160.3
Upper 95% Confidence Limit	: 196.8
Test Duration	: 72 hours
Historical Mean IC25 (mg/L)	: 173.0
Upper Warning Limit (+2SD)	: 278.9
Lower Warning Limit (-2 SD)	: 108.4
Statistical Method	: Linear Interpolation (Toxstat 3.5)[a]
Selenastrum Batch Number	: Sel03-08
Test Conducted By	: H.Roshon/T.Patey

Reference toxicant test was conducted under conditions identical to the test.

References

[a] West, Inc. and D. Gulley. 1996. Toxstat Release 3.5. Western Ecosystems Technology. Cheyenne, WY, U.S.A.

Date: 2003-09-10

Approved By: K Holtze
Keith Holtze, Director, Laboratory Operations

Selenastrum capricornutum Growth Inhibition

Work Order Number :	204482	*Selenastrum* Batch # :	Sel03-08
Sample Number :	7880		
Industry :	Nanisivik Mine (a Division of CanZinco Ltd.)	Initial Cell Innoculum (cells/ml) :	0.9448 x10000
Start Date :	2003-08-13	Control Cell Density Increase Factor :	156.117
Start Time :	12:35		
Setup Technician :	T. Patey/ K. Olaveson		
Completion Date :	2003-08-16		
Takedown Technician :	K. Olaveson/J. Pickett		
Technique :	Hemacytometer		

Test Day :	0 (Start)	1	2	3 (End)
Date :	2003-08-13	2003-08-14	2003-08-15	2003-08-16
Temp. (°C) :	25.0	25.0	24.5	25.0

72 Hour Cell Counts (x10 000)

Conc. (%)		1	2	3	4	5	6	7	8	9	10	Mean	St. Dev.	%CV
Control	*Count*	138.50	139.50	155.50	128.00	*	*	156.50	154.00	168.00	140.00	147.50	13.03	8.84
	Yield	137.56	138.56	154.56	127.06	*	*	155.56	153.06	167.06	139.06	146.56	13.03	8.89
0.195	*Count*	-	-	-								-	-	-
	Yield	-	-	-								-	-	-
0.39	*Count*	-	-	-								-	-	-
	Yield	-	-	-								-	-	-
0.78	*Count*	-	-	-								-	-	-
	Yield	-	-	-								-	-	-
1.56	*Count*	-	-	-								-	-	-
	Yield	-	-	-								-	-	-
3.13	*Count*	-	-	-								-	-	-
	Yield	-	-	-								-	-	-
6.25	*Count*	163.50	163.50	159.00								162.00	2.60	1.60
	Yield	162.56	162.56	158.06								161.06	2.60	1.61
12.5	*Count*	95.50	96.50	98.00								96.67	1.26	1.30
	Yield	94.56	95.56	97.06								95.72	1.26	1.31
25	*Count*	32.50	42.00	44.00								39.50	6.14	15.55
	Yield	31.56	41.06	43.06								38.56	6.14	15.94
50	*Count*	27.00	27.00	30.50								28.17	2.02	7.17
	Yield	26.06	26.06	29.56								27.22	2.02	7.42
100	*Count*	8.00	9.00	6.50								7.83	1.26	16.06
	Yield	7.06	8.06	5.56								6.89	1.26	18.27

"-" = not counted

*replicates 5 and 6 used for pH measurement

Sample pH at start of test	7.6
Initial Control pH	8.5
Final Control pH	8.5

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Test Data Reviewed By: HL
Date: 2003-08-18

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ACUTE LETHALITY REPORT SUMMARY

Workorder No: 204482

Murray Markle
Nanisivik Mine (a Division of CanZinco Ltd.)
P.O. Box 225
Nanisivik NU
X0A 0X0

RESULTS

Substance	Date Collected	Date Tested	Species / Test	% Mortality at 100% Effluent Concentration
159-4 August 8, 2003	2003-08-09	2003-08-13	Dm Single Concentration	83.3
	2003-08-09	2003-08-13	RBT Single Concentration	0

RBT = rainbow trout
Dm = *Daphnia magna*

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Test Protocols

Environment Canada.1990. Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Daphnia magna. Environment Canada, Conservation and Protection. Ottawa, Ontario. Reference Method EPS1/RM14 (including Dec.2000 amendments).

Environment Canada.1990. Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout. Environment Canada, Conservation and Protection. Ottawa,Ontario. Reference Method EPS1/RM/13 (including Dec.2000 amendments).

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TOXICITY TEST REPORT
Daphnia magna

Stantec

Work Order : 204482
Sample Number : 7880

SAMPLE IDENTIFICATION

Company :	Nanisivik Mine (a Division of CanZinco Ltd.)	Time Collected :	11:00
Location :	Nanisivik NU	Date Collected :	2003-08-09
Substance :	159-4 August 8, 2003	Date Received :	2003-08-13
Sampling Method :	grab	Date Tested :	2003-08-13
Sampled By :	M. Markle	Temp. on arrival :	22.0°C
Sample Description:	Clear, colourless, odourless.		
Test Method :	*Daphnia magna* Acute Lethality Toxicity Test Protocol EPS 1/RM/14, Environment Canada, 1990 (including December, 2000 amendments) with deviation(s) as noted below		

TEST RESULTS

**** 83.3 % mortality at 100% effluent concentration. ****

The results reported relate only to the sample tested.

SODIUM CHLORIDE REFERENCE TOXICANT DATA

Daphnia Batch # :	Dm03-15		
Date Tested (y/m/d) :	2003-08-05	Historical Mean LC50 :	6.0 g/L
LC50 (95% Confidence Limits) :	5.9 g/L (5.2 - 7.2)	Warning Limits (± 2SD) :	5.5 - 6.4 g/L
Statistical Method :	Non-linear Interpolation	Technician(s) Performing Test :	J. Pickett/J. Lauinger

Daphnia magna CULTURE HEALTH DATA

Time to First Brood (days) :	7.4	Avg. # Young Per Brood :	48.3
Culture Mortality (prev. 7 d) (%):	6.3		

TEST CONDITIONS

Sample Treatment :	None	# Replicates :	3
pH Adjustment :	None	# Animals / Replicate :	10
Test Aeration :	None	Total # Animals / Test Level :	30
Daphnia Batch # :	Dm03-15	*Daphnia* Loading Rate :	15.0 mL/organism

Noted Deviation(s): A power failure occurred, which resulted in loss of lighting for this test for approximately 5 hours on 2003-08-14.

Date: 2003-09-10

Approved by: K Holtze
Keith Holtze, Director, Laboratory Operations

Certified by the Canadian Association of Environmental Analytical Laboratories (CAEAL)
Accredited by Standards Council of Canada (SCC)

Daphnia magna TOXICITY TEST REPORT

Work Order: 204482
Sample Number: 7880

	Temp. (°C)	pH	D.O. (mg/L)	O_2 Sat. (%)*	Cond. (µ s/cm)	Hardness (mg/L as $CaCO_3$)	Hardness Adjustment	Total Pre-Aeration Time (h) @ 30 mL/min/L
Initial Water Chemistry:	19.5	7.6	9.3	104	2341	>1000	None	0:30

0 hours

Date & Time 2003-08-13 13:50
Technician: JP

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	O_2 Sat. (%)*	Hardness
100A	0	0	7.6	9.0	2341	19.5	102	>1000
100B	0	0	7.6	9.0	2341	19.5		
100C	0	0	7.6	9.0	2341	19.5		
Control A	0	0	8.5	8.8	399	20.0		
Control B	0	0	8.5	8.8	399	20.0		
Control C	0	0	8.5	8.8	399	20.0	101	200

Notes:

24 hours

Date & Time 2003-08-14 13:50
Technician: JP

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100A	0	4	–	–	–	21.0
100B	0	4	–	–	–	21.0
100C	0	6	–	–	–	21.0
Control A	0	0	–	–	–	21.0
Control B	0	0	–	–	–	21.0
Control C	0	0	–	–	–	21.0

Notes:

48 hours

Date & Time 2003-08-15 13:50
Technician: DH/JL

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100A	8	2	7.7	7.7	2344	21.0
100B	10	0	7.6	7.7	2321	21.0
100C	7	3	7.6	7.9	2300	21.0
Control A	0	0	8.5	8.6	401	21.0
Control B	0	0	8.5	8.6	401	21.0
Control C	0	0	8.5	8.6	398	21.0

Notes:

# of control organisms showing stress: 0
Daphnia Batch #: Dm03-15

Number immobile does not include number of mortalities.

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– = not measured
* adjusted for actual temp. & barometric pressure

Test Data Reviewed By: JL
Date: 2003-08-21

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TOXICITY TEST REPORT
Rainbow Trout

Stantec

Work Order : 204482
Sample Number : 7880

SAMPLE IDENTIFICATION

Company :	Nanisivik Mine (a Division of CanZinco Ltd.)	Time Collected :	11:00
Location :	Nanisivik NU	Date Collected :	2003-08-09
Substance :	159-4 August 8, 2003	Date Received :	2003-08-13
Sampling Method :	grab	Date Tested :	2003-08-13
Sampled By :	M. Markle	Temp. on arrival :	22.0°C
Sample Description :	Clear, colourless, odourless.		

Test Method : Acute Lethality of Liquid Effluents to Fish EPS 1/RM/13, Environment Canada, 1990 (including December, 2000 amendments) with deviation(s) as noted below.

TEST RESULTS

**** 0 % mortality at 100% effluent concentration. ****
The results reported relate only to the sample tested.

PHENOL REFERENCE TOXICANT DATA

Trout Batch # :	T03-07		
Date Tested (y/m/d) :	2003-08-06	Historical Mean LC50 :	10.0 mg/L
LC50 (95% Confidence Limits) :	11.2 mg/L (10.0 - 12.5)	Warning Limits (± 2SD) :	7.9 - 12.8 mg/L
Statistical Method :	Non-linear Interpolation	Technician(s) Performing Test :	R. Colgan/T. Boudrea

TEST FISH

Control Fish Sample Size :	10	Cumulative prev. 7d stock tank mortality (%) :	0
Mean Fish Weight (g) (± 2 SD) :	0.77 (± 0.28)	Mean Fish Fork Length (mm) (± 2 SD) :	42.6 (± 5.1)
Range of Weights (g) :	0.58 - 1.01	Range of Fork Lengths (mm) :	39 - 48
Fish Loading Rate (g/L) :	0.38		

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TEST CONDITIONS

Sample Treatment :	None	Volume Tested (L) :	20
pH Adjustment :	None	# Replicates :	1
Test Aeration :	Yes	# Animals Per Replicate :	10
Aeration Rate (mL/min/L) :	6.5 ± 1	Total # Animals Per Test Level :	10
Trout Batch # :	T03-07		

Noted Deviation(s): A power failure occurred, which resulted in loss of lighting for this test for approximately 5 hours on 2003-08-14.

Date: 2003-09-10

Approved by: K Holtze
Keith Holtze, Director, Laboratory Operations

RAINBOW TROUT TOXICITY TEST REPORT

Work Order: 204482
Sample Number: 7880

	Temp. (°C)	pH	D.O. (mg/L)	O_2 Sat. (%)*	Cond. (umhos)	Total Pre-Aeration Time(h) @ 6.5 mL/min/L
Initial Water Chemistry:	16.0	7.7	9.5	–	2301	
Chemistry after 30min air:	16.0	7.7	9.4	98	2303	0:30

0 hours

Date & Time 2003-08-13 13:50
Technician: RC/TG

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	O_2 Sat. (%)*
100	0	0	7.7	9.4	2303	16.0	98
Control	0	0	8.4	9.7	550	16.0	101

Notes:

24 hours

Date & Time 2003-08-14 13:50
Technician: RF/TG

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100	0	0	–	–	–	16.0
Control	0	0	–	–	–	16.0

Notes:

48 hours

Date & Time 2003-08-15 13:50
Technician: TG

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100	0	0	–	–	–	16.0
Control	0	0	–	–	–	16.0

Notes:

72 hours

Date & Time 2003-08-16 13:50
Technician: DR

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100	0	0	–	–	–	16.0
Control	0	0	–	–	–	16.0

Notes:

96 hours

Date & Time 2003-08-17 13:50
Technician: DR

Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100	0	0	8.5	8.0	2295	16.0
Control	0	0	8.2	8.4	545	16.0

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Notes:

# of control organisms showing stress 0
Trout Batch #: T03-07

"–" = not measured
Number immobile does not include number of mortalities.
* adjusted for actual temp. & barometric pressure

Test Data Reviewed By: JL
Date: 2003-08-21

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Work Order : 204601
Sample Number : 8088

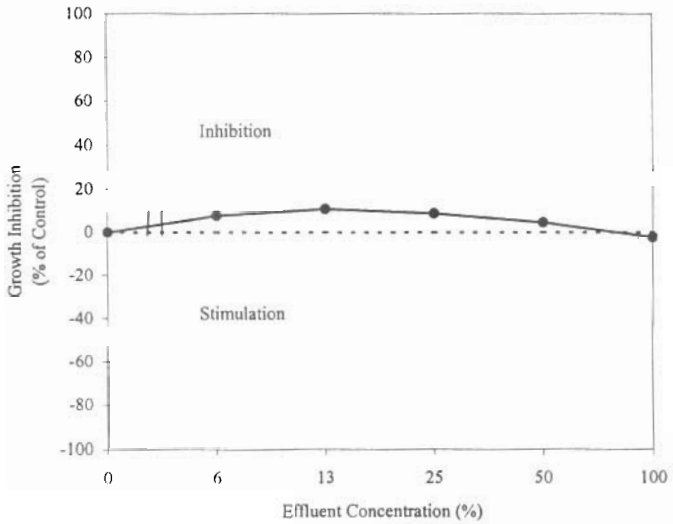
Sample Identification

Company :	Nanisivik Mine (a Division of CanZinco Ltd.)		
Location :	Nanisivik NU	Date Collected :	2003-09-13
Substance :	159-4	Time Collected :	13:00
Sampling Method :	grab	Date Received :	2003-09-16
Sampled By :	M. Markle	Time Received :	08:45
Shipped By:	First Air/Air + ATS/Rd	Date Tested :	2003-09-16
Temp. on arrival :	3.0°C	Lab Storage:	4±2 °C
Sample Description:	Clear, colourless, odourless.		

Test Results

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

Fathead Minnow Growth Inhibition



Work Order Number: 204601
Sample Number: 8088

Test Conditions

Test Organism	: *Pimephales promelas*	Test Volume Per Replicate	: 500 mL
Source	: Stantec stock	Test Vessel	: 1 L polypropylene beaker
Life Stage	: Larval (<24 h old)	Depth of test solution	: 7.5 cm
pH Adjustment	. None	# Replicates	: 3
Sample Filtration	· None	# Organisms per Replicate	: 10
Hardness Adjustment	: None	Renewal Method[d]	: Syphon
Test Aeration	: None	Renewal Period	: 24 h intervals
Photoperiod (h) light/dark	. 16/8	Feeding Rate	: 1500-2250 nauplii
Control/Dilution Water[c]	· Undiluted well water	Feeding Frequency	: 3 times daily
Test Type	Static renewal	Test Duration	: 7 days

Control/Dilution Water: Well water with trace NaCl (29.6 mg/L).

Renewal Method: Three subsamples were used for testing. Subsample 1 was used for day 0,1 and 2 renewals, subsample 2 was used for day 3 and 4 renewals, and subsample 3 was used for day 5 and 6 renewals. Approximately 85 - 90% of test solution removed by syphon. New solution added to achieve desired test volume.

Test Protocol: Biological Test Method: Test of Growth and Survival using fathead minnows. Environment Canada, Conservation and Protection. Ottawa, Ontario. Report EPS 1/RM/22 (including November 1997 amendments).

Test Organisms: No organisms exhibiting unusual appearance, behaviour, or undergoing unusual treatment were used in the test. All test organisms were from the same culture.

Comments

Test conducted using three subsamples from a single sampling. There were no unusual conditions or deviations from the test protocol. The results reported relate only to the sample tested.

Work Order Number: 204601
Sample Number: 8088

Reference Toxicant Data

Substance	:	Potassium Chloride
Test Date	:	2003-09-03
IC25 Survival (g/L)	:	1.02
Lower 95% Confidence Limit	:	0.97
Upper 95% Confidence Limit	:	1.15
Test Duration	:	7 days
Historical Mean IC25 (g/L)	:	1.06
Upper Warning Limit (+2SD)	:	1.28
Lower Warning Limit (-2 SD)	:	0.89
Statistical Method	:	Linear Interpolation (Toxstat 3.5)[b]
Fathead minnow Batch Number	:	Fm03-09
Test Conducted By	:	A.Mistry/L.Muise

Reference toxicant test was conducted under conditions identical to the test.

References

[a] Stephan, C. E. 1977. Methods for calculating an LC50. P. 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: 2003-10-07

Approved By: K. Holtze
Keith Holtze, Director, Laboratory Operations

Larval Fathead Minnow Survival

Work Order Number : 204601
Sample Number : 8088
Industry : Nanisivik Mine (a Division of CanZinco Ltd.)
Time Start : 16:00
Fathead Batch # : Fm03-09
Previous 7d Stock Mort. : 0.0%

		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7 Completion Date		
Start Date:	2003-09-16	2003-09-17	2003-09-18	2003-09-19	2003-09-20	2003-09-21	2003-09-22	2003-09-23		
Technician:	NK(EW)	NK(EW)	NK(EW)	NK(EW)	TG	JL	JL	NK(EW)		
Conc.(%)	Rep	Mortality							Mean Mortality (%)	Standard Deviation
0	A	0	0	1	1	1	1	1	10.0	0.00
	B	0	0	0	1	1	1	1		
	C	0	0	0	0	0	1	1		
6	A	0	0	0	0	0	0	1	6.7	0.58
	B	0	0	0	0	0	0	0		
	C	0	0	0	1	1	1	1		
13	A	0	0	0	1	2	2	2	6.7	1.15
	B	0	0	0	0	0	0	0		
	C	0	0	0	0	0	0	0		
25	A	0	0	0	0	0	0	0	0.0	0.00
	B	0	0	0	0	0	0	0		
	C	0	0	1*	1	1	1	1		
50	A	0	0	0	0	0	0	0	3.3	0.58
	B	0	0	0	0	0	0	1		
	C	0	0	0	0	0	0	0		
100	A	0	0	0	0	0	0	0	3.3	0.58
	B	0	0	0	0	0	0	0		
	C	0	0	0	0	0	1	1		

Aberrant behaviour or swimming impairment noted during test: none

Notes : 2003-09-19: Replicate 25C = Accidental mortality. NK
2003-10-05: Statistical analysis for mortality and weight for replicate 25C are calculated using 9 fish. HR

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Test Data Reviewed By: HR
Date: 2003-10-05

Larval Fathead Minnow Weights

Work Order Number : 204601
Sample Number : 8088

Concentration (%)	Replicate	# of Larvae Weighed	Mean Dry Wt. Of Larvae (mg)	Mean Dry Wt. (mg)	Standard Deviation
Control	A	9	0.606	0.650	0.038
	B	9	0.672		
	C	9	0.672		
6	A	9	0.600	0.600	0.052
	B	10	0.651		
	C	9	0.548		
13	A	8	0.566	0.579	0.012
	B	10	0.580		
	C	10	0.591		
25	A	10	0.604	0.592	0.037
	B	10	0.622		
	C	9	0.551		
50	A	10	0.580	0.620	0.035
	B	9	0.638		
	C	10	0.643		
100	A	10	0.642	0.666	0.038
	B	10	0.709		
	C	9	0.646		

Larval Fathead Minnow Survival and Growth
Water Chemistry Data

Work Order Number : 204601
Sample Number : 8088

Initial Parameters:	Temp. (°C)	D.O. (mg/L)	pH	Cond. (µs)	Hardness (mg/L as $CaCO_3$)
	26.0	9.4	7.5	2688	1070

		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Initial Temp. (°C):		26.0	25.0	25.0	25.0	25.0	25.0	25.0
Initial D.O. (mg/L):		9.4	9.0	9.7	9.6	10.0	9.5	9.9
% Sat. of 100% Effluent*		118	112	121	121	125	119	123
Preaeration (min)(≤100 bubbles/min)		20	20	20	20	20	20	20
		Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**	**Day 6**	**Day 7**
Technician	New	EW	NK(EW)	LM	NK(EW)	TP	TP	SWR(EW)
	Old	TG	AM(EW)	NK(EW)	JG(JL)	RC(JL)	SWR(EW)	AM(EW)
Control	**0%**							
Temp. (°C)	Initial:	26.0	25.0	25.5	24.5	24.0	24.5	25.0
	Final:	25.0	25.5	25.0	26.0	25.0	25.0	25.5
D.O. (% Sat.*)	Initial:	101	101	98	102	99	97	nm
D.O. (mg/L)	Initial:	8.0	8.2	7.9	8.1	8.0	7.9	7.9
	Final:	7.3	7.3	7.1	6.9	6.7	6.7	7.3
pH	Initial:	8.4	8.4	8.3	8.3	8.4	8.2	8.3
	Final:	8.5	8.4	8.4	8.3	8.3	8.3	8.2
Conductivity	Initial:	509	542	498	571	501	571	514
Low	**6%**							
Temp. (°C)	Initial:	26.0	25.0	25.5	24.5	24.0	24.5	25.0
	Final:	25.0	25.5	25.0	26.0	25.0	25.0	25.5
D.O. (mg/L)	Initial:	8.1	8.2	7.9	8.0	8.1	7.9	7.9
	Final:	7.1	7.1	6.8	6.3	5.9	6.1	5.7
pH	Initial:	8.3	8.3	8.3	8.2	8.3	8.2	8.3
	Final:	8.4	8.2	8.1	8.1	7.9	8.1	8.0
Conductivity	Initial:	662	702	657	723	663	723	675
Middle	**25%**							
Temp. (°C)	Initial:	26.0	25.0	25.5	24.5	24.0	24.5	25.0
	Final:	25.0	25.5	25.0	26.0	25.0	25.0	25.5
D.O. (mg/L)	Initial:	8.1	8.2	8.1	8.1	8.2	8.1	8.0
	Final:	7.0	7.0	6.6	5.5	6.0	5.1	4.1
pH	Initial:	8.2	8.2	8.2	8.1	8.2	8.1	8.1
	Final:	8.5	8.0	8.0	7.8	7.7	7.7	7.5
Conductivity	Initial:	1123	1121	1112	1145	1124	1177	1129
High	**100%**							
Temp. (°C)	Initial:	26.0	25.0	25.5	24.5	24.0	24.5	25.0
	Final:	25.0	25.5	25.0	26.0	25.0	25.0	25.5
D.O. (mg/L)	Initial:	8.8	8.8	9.2	9.5	9.0	9.1	8.9
	Final:	6.8	6.9	5.6	5.5	5.8	5.7	4.6
pH	Initial:	7.7	7.7	7.7	7.6	7.8	7.7	7.7
	Final:	8.3	7.6	7.2	7.1	6.9	7.1	6.6
Conductivity	Initial:	2699	2700	2703	2699	2714	2709	2665

nm = not measured
* % saturation adjusted for actual temperature and barometric pressure

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Work Order : 204601
Sample Number : 8088

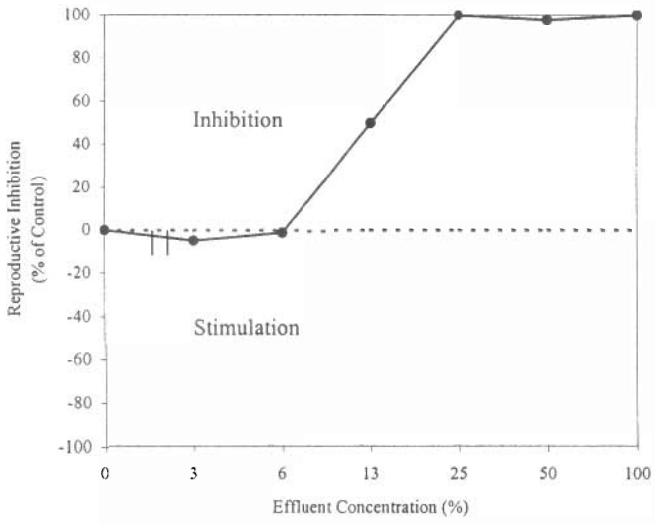
Sample Identification

Company :	Nanisivik Mine (a Division of CanZinco Ltd.)		
Location :	Nanisivik NU	Date Collected :	2003-09-13
Substance :	159-4	Time Collected :	13:00
Sampling Method :	grab	Date Received :	2003-09-16
Sampled By :	M. Markle	Time Received :	08:45
Shipped By:	First Air/Air + ATS/Rd	Date Tested :	2003-09-16
Temp. on arrival :	3.0°C	Lab Storage:	4±2 °C
Sample Description:	Clear, colourless, odourless.		

Test Results

Effect	Value	95% Confidence Limits	Statistical Method
LC50 (Survival)	30.8%	20.2-50.3	Probit (Stephan) a
IC25 (Reproduction)	8.7%	6.7-10.5	Linear Interpolation (Toxstat 3.5) b

Ceriodaphnia dubia Reproductive Inhibition



Work Order Number: 204601
Sample Number: 8088

Test Conditions

Test Organism	: *Ceriodaphnia dubia*	Control/Dilution Water[c]	: Lake Erie and Well water
Source	: Stantec stock	Test Type	: Static renewal
Life Stage	: Neonate (<24 h)	Test Volume Per Replicate	: 15 mL
Mean Young Produced (previous 7 days)	: ≥15.0	Test Vessel	: 15 mL polystyrene vial
# Young in Previous Brood	: ≥6.0	Depth of test solution	: 4.5 cm
pH Adjustment	: None	# Replicates	: 10
Sample Filtration	: None	# Organisms per Replicate	: 1
Hardness Adjustment	: None	Renewal Method[d]	: transfer
Test Aeration	: None	Renewal Period	: 24 h intervals
Photoperiod (h) light/dark	: 16/8	Feeding Rate	: 0.2 mL YCT and algae
		Feeding Frequency	: once daily

[c] Control/Dilution Water: Mixture consisting of 25% Lake Erie water and 75% well water. The well water was supplemented with 29.6 mg/L of NaCl.

[d] Renewal Method: Three subsamples were used for testing. Subsample 1 was used for day 0,1 and 2 renewals, subsample 2 was used for day 3 and 4 renewals, and subsample 3 was used for the day 5 renewal. Organisms were transferred to new solution daily using a wide bore pipet.

Test Protocol: Biological Test Method: Test of Reproduction and Survival using the Cladoceran *Ceriodaphnia dubia*. Environment Canada, Conservation and Protection. Ottawa, Ontario. Report EPS 1/RM/21 (including November 1997 amendements).

Test Organisms: No organisms exhibiting unusual appearance, behaviour, or undergoing unusual treatment were used in the test. No ephippia were present in cultures. All organisms were within 12 hours of the same age. Test neonates were obtained from single broods from culture organisms. All test organisms were from the same culture.

Comments

Test conducted using three subsamples from a single sampling. There were no unusual conditions or deviations from the test protocol. The results reported relate only to the sample tested.

Work Order Number: 204601
Sample Number: 8088

Reference Toxicant Data

Substance	:	Sodium Chloride
Test Date	:	2003-09-19
IC25 Reproduction (g/L)	:	1.35
Lower 95% Confidence Limit	:	0.87
Upper 95% Confidence Limit	:	1.46
Test Duration	:	7 days
Historical Mean IC25 (g/L)	:	1.11
Upper Warning Limit (+2SD)	:	1.80
Lower Warning Limit (-2 SD)	:	0.70
Statistical Method	:	Linear Interpolation (Toxstat 3.5)[b]
Ceriodaphnia Batch Number	:	Cd03-09
Test Conducted By	:	A. Mistry/E. Williams

Reference toxicant test was conducted under conditions identical to the test.

References

[a] Stephan, C. E. 1977. Methods for calculating an LC50. P. 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: 2003-10-07

Approved By: K Holtze

Keith Holtze, Director, Laboratory Operations

Ceriodaphnia dubia Survival and Reproduction

Work Order Number : 204601
Sample Number : 8088
Industry : Nanisivik Mine (a Division of CanZinco Ltd.)
Time Start : 15:10 — *C. dubia* Batch Number : Cd03-09
Start Date : 2003-09-16 — Previous 7d culture mortality (%) : 0.0%
Completion Date : 2003-09-22

Concentration: Control	Day	Replicate 1	2	3	4	5	6	7	8	9	10	% Mortality	Mean # Young	In'l EW
2003-09-17	1	0	0	0	0	0	0	0	0	0	0	0	0	TG
2003-09-18	2	0	0	0	0	0	0	0	0	0	0	0	0	AM(EW)
2003-09-19	3	0	0	0	0	0	0	0	0	0	0	0	0	AM/LM
2003-09-20	4	6	6	5	7	5	6	5	6	4	7	0	5.7	TP
2003-09-21	5	13	14	13	11	9	13	10	11	12	14	0	12	TP
2003-09-22	6	0	6	7	13	0	14	11	13	12	13	0	8.9	EW/TG
Total neonates		19	26	25	31	14	33	26	30	28	34			

Mean # young: 26.6
Total adult mortality: 0

Concentration: 3%	Day	Replicate 1	2	3	4	5	6	7	8	9	10	% Mortality	Mean # Young
	1	0	0	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0	0	0	0	0
	4	7	6	7	7	4	7	8	4	4	5	0	5.9
	5	13	15	14	12	15	12	9	10	10	10	0	12
	6	2	12	10	10	0	16	10	16	12	12	0	10
Total neonates		22	33	31	29	19	35	27	30	26	27		

Mean # young: 27.9
Total adult mortality: 0

Concentration: 6%	Day	Replicate 1	2	3	4	5	6	7	8	9	10	% Mortality	Mean # Young
	1	0	0	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0	0	0	0	0
	4	7	7	6	7	8	4	4	6	5	6	0	6
	5	13	13	14	12 x	16	10	13	14	12	12	10	12.9
	6	0	20	15	0	0	15	0	11	13	6	10	8
Total neonates		20	40	35	19 x	24	29	17	31	30	24		

Mean # young: 26.9
Total adult mortality: 1

Concentration: 13%	Day	Replicate 1	2	3	4	5	6	7	8	9	10	% Mortality	Mean # Young
	1	0	0	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0	0	0	0	0
	4	8 x	1	8	0 x	8	7	5	6	6	7	20	5.6
	5	0	0	0	0	0	1	10	2	0	0	20	1.3
	6	0	0 x	13	0	0	10	0	13	12	17	30	6.5
Total neonates		8 x	1 x	21	0 x	8	18	15	21	18	24		

Mean # young: 13.4
Total adult mortality: 3

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x = mortality
* = accidental death

Test Data Reviewed By: HR
Date: 2003-10-05

Concentration	Day	Replicate 1	2	3	4	5	6	7	8	9	10	% Mortality	Mean # Young
25%	1	0	0	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0	0	0	0	0
	4	0	0	0	0	0 x	0	0	0	0	0	10	0
	5	0	0	0	0	0	0	0	0	0	0 x	20	0
	6	0	0	0	0	0	0	0	0	0	0	20	0
Total neonates		0	0	0	0	0 x	0	0	0	0	0 x		
												Mean # young:	0
												Total adult mortality:	2

Concentration	Day	Replicate 1	2	3	4	5	6	7	8	9	10	% Mortality	Mean # Young
50%	1	0	0	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0 x	0	0 x	20	0
	5	0	0	0	0	0	0	0	0	0	0	20	0
	6	0 x	6	0	0 x	0 x	0	0 x	0	0	0	60	0.6
Total neonates		0 x	6	0	0 x	0 x	0	0 x	0 x	0	0 x		
												Mean # young:	0.6
												Total adult mortality:	6

Concentration	Day	Replicate 1	2	3	4	5	6	7	8	9	10	% Mortality	Mean # Young
100%	1	0	0	0	0	0	0	0	0	0	0	0	0
	2	0	0 x	0 x	0	0	0 x	0	0	0	0	30	0
	3	0	0	0	0	0 x	0	0	0	0	0	40	0
	4	0 x	0	0	0 x	0	0	0 x	0	0	0 x	80	0
	5	0	0	0	0	0	0	0	0	0 x	0	90	0
	6	0	0	0	0	0	0	0	0 x	0	0	100	0
Total neonates		0 x	0 x	0 x	0 x	0 x	0 x	0 x	0 x	0 x	0 x		
												Mean # young:	0
												Total adult mortality:	10

x = mortality
* = accidental death

Test Data Reviewed By: HR
Date: 2003-10-05

Ceriodaphnia dubia Survival and Reproduction
Water Chemistry Data

Work Order Number : 204601
Sample Number : 8088

Initial Parameters:	Temp. (°C)	D.O. (mg/L)	pH	Cond. (µs)	Hardness (mg/L as $CaCO_3$)
	26.0	9.4	7.5	2688	1070

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
Initial Temp. (°C):	26.0	25.0	25.0	25.0	25.0	25.0
Initial D.O. (mg/L):	9.4	9.0	9.7	9.6	10.0	9.5
% Sat. of 100% Effluent*	118	112	121	121	125	119
Preaeration (≤100 bubbles/min):	20	20	20	20	20	20
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**	**Day 6**
Technician New	EW	NK(EW)	LM	NK(EW)	TP	TP
Old	NK(EW)	AM(EW)	NK(EW)	TP	RC(JL)	TG
Control	**0%**					
Temp. (°C) Initial:	26.0	24.5	24.5	25.0	24.5	24.0
Final:	25.0	25.0	24.5	25.0	25.0	25.0
D.O. (% Sat.*) Initial:	100	101	99	101	100	97
D.O. (mg/L) Initial:	8.0	8.2	8.0	8.0	8.1	8.0
Final:	7.4	7.6	7.5	7.4	7.6	7.3
pH Initial:	8.4	8.4	8.4	8.4	8.4	8.3
Final:	8.5	8.6	8.4	8.5	8.5	8.5
Conductivity Initial:	449	490	451	509	453	499
Low	**3%**					
Temp. (°C) Initial:	26.0	24.5	24.5	25.0	24.5	24.0
Final:	25.0	25.0	24.5	25.0	25.0	25.0
D.O. (mg/L) Initial:	8.0	8.2	8.0	8.0	8.1	7.9
Final:	7.4	7.2	7.0	7.2	7.4	7.2
pH Initial:	8.4	8.4	8.4	8.4	8.4	8.3
Final:	8.4	8.4	8.2	8.4	8.4	8.4
Conductivity Initial:	532	573	534	589	538	593
Middle	**25%**					
Temp. (°C) Initial:	26.0	24.5	24.5	25.0	24.5	24.0
Final:	25.0	25.0	24.5	25.0	25.0	25.0
D.O. (mg/L) Initial:	8.1	8.2	8.2	8.0	8.1	7.9
Final:	7.5	7.4	2.9	5.0	6.3	6.2
pH Initial:	8.2	8.3	8.2	8.2	8.3	8.1
Final:	8.2	8.5	7.1	7.5	7.6	7.8
Conductivity Initial:	1076	1108	1079	1133	1067	1116
High	**100%**					
Temp. (°C) Initial:	26.0	24.5	24.5	25.0	24.5	24.0
Final:	25.0	25.0	24.5	25.0	25.0	25.0
D.O. (mg/L) Initial:	8.8	8.8	9.2	9.5	9.0	9.1
Final:	7.3	6.8	7.0	3.6	7.7	7.5
pH Initial:	7.7	7.7	7.7	7.6	7.8	7.7
Final:	7.7	8.0	7.6	6.6	7.1	7.4
Conductivity Initial:	2699	2700	2703	2699	2714	2709

* % saturation adjusted for actual temperature and barometric pressure

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Work Order : 204601
Sample Number : 8088

Sample Identification

Company :	Nanisivik Mine (a Division of CanZinco Ltd.)		
Location :	Nanisivik NU	Date Collected :	2003-09-13
Substance :	159-4	Time Collected :	13:00
Sampling Method :	grab	Date Received :	2003-09-16
Sampled By :	M. Markle	Time Received :	08:45
Shipped By:	First Air/Air + ATS/Rd	Date Tested :	2003-09-16
Temp. on arrival :	5.0°C	Lab Storage:	4±2 °C
Sample Description:	Clear, colourless, odourless.		

Test Results

Effect	Value	95% Confidence Limits	Statistical Method
IC25 (Weight)	>97.0%	-	-
IC25 (Frond Production)	37.0%	20.4-54.3	Linear Interpolation (Toxstat 3.5) b

Lemna minor Growth Inhibition