



Quality Control

Norwest Labs
7217 Roper Road NW
Edmonton, AB. T6B 3J4
Phone: (780) 438-5522
Fax: (780) 438-0396

Bill to: Echo Bay Mines Ltd.
Report to: Echo Bay Mines Ltd.
9818 International Airport
Edmonton, AB, Canada
T5J 2T2
Attn: Michael Tansey
Sampled By: Steve Schlesak
Company: Kinross Gold Corporation

Project
ID:
Name: Lupin Mine
Location: Nunavut
LSD:
P.O.:
Acct. Code:

NWL Lot ID: 398142
Control Number:
Date Received: Jul 28, 2005
Date Reported: Aug 09, 2005
Report Number: 727534

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Metals Total (Continued...)

Replicates	Units	Replicate1	Replicate2	% RSD Criteria	Absolute Criteria	Passed QC
Iron	mg/L	0.1	0.1	15.0	0.2	✓
Manganese	mg/L	0.991	0.968	15.000	0.010	✓
Silicon	mg/L	1.86	1.81	15.00	0.10	✓
Sulfur	mg/L	97.3	94.8	15.0	0.1	✓
Mercury	mg/L	<0.0001	<0.0001	9.9900	0.0003	✓
Aluminum	ug/L	49	49	15	11	✓
Antimony	ug/L	1	1.1	15.0	0.4	✓
Arsenic	ug/L	4.3	4.3	15.0	0.4	✓
Barium	ug/L	2	2	15	2	✓
Beryllium	ug/L	<0.1	<0.1	15.0	0.2	✓
Bismuth	ug/L	<0.6	<0.6	15.0	1.1	✓
Boron	ug/L	86	86	15	4	✓
Cadmium	ug/L	<0.01	<0.01	15.00	0.02	✓
Chromium	ug/L	408	425	15.0	1.1	✓
Cobalt	ug/L	3.8	4.0	15.0	0.2	✓
Copper	ug/L	544	569	15	2	✓
Lead	ug/L	0.3	0.3	15.0	0.2	✓
Lithium	ug/L	95	95	15	2	✓
Molybdenum	ug/L	5	5	15	2	✓
Nickel	ug/L	29.4	30.2	15.0	1.1	✓
Selenium	ug/L	<0.2	<0.2	15.0	0.4	✓
Silver	ug/L	<0.1	<0.1	15.0	0.2	✓
Strontium	ug/L	1180	1190	15	2	✓
Thallium	ug/L	0.60	0.64	15.00	0.11	✓
Tin	ug/L	<1	<1	15	2	✓
Titanium	ug/L	13.6	12.8	15.0	1.1	✓
Uranium	ug/L	<0.6	<0.6	15.0	1.1	✓
Vanadium	ug/L	0.2	0.2	15.0	0.2	✓
Zinc	ug/L	9	10	15	2	✓

Material Used: Edmonton Duplicate
Date Acquired: Aug 03, 2005
Acquired By: Linda Li

Mercury	ug/L	<0.02	<0.02	30.000	0.050	✓
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Material Used: Metals Int. Duplicate - water tot
Date Acquired: Aug 08, 2005
Acquired By: Kelly Restiaux



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Metals Total (Continued...)

Control Sample	Units	Measured	Mean	Lower Limit	Upper Limit	Passed QC
Iron	mg/L	2.0	2.0	1.8	2.2	✓
Manganese	mg/L	0.485	0.500	0.450	0.550	✓
Silicon	mg/L	4.97	5.00	4.50	5.50	✓
Sulfur	mg/L	9.8	10.0	9.0	11.0	✓
Mercury	mg/L	0.0008	0.0008	0.0007	0.0010	✓
Aluminum	ug/L	307	322	273	371	✓
Antimony	ug/L	12.0	11.5	10.2	12.8	✓
Arsenic	ug/L	11.9	11.5	10.3	12.7	✓
Barium	ug/L	62	61	52	69	✓
Beryllium	ug/L	6.0	5.9	4.9	7.0	✓
Bismuth	ug/L	32.0	30.2	26.0	34.4	✓
Boron	ug/L	127	125	102	148	✓
Cadmium	ug/L	0.60	0.63	0.47	0.78	✓
Chromium	ug/L	31.3	31.8	27.5	36.2	✓
Cobalt	ug/L	6.8	6.4	5.4	7.5	✓
Copper	ug/L	63	63	55	70	✓
Lead	ug/L	6.8	6.2	5.4	7.0	✓
Lithium	ug/L	62	65	53	76	✓
Molybdenum	ug/L	62	61	53	69	✓
Nickel	ug/L	30.8	31.4	27.0	35.8	✓
Selenium	ug/L	11.2	11.0	9.7	12.3	✓
Silver	ug/L	6.2	6.2	5.5	7.0	✓
Strontium	ug/L	68	64	55	72	✓
Thallium	ug/L	3.46	3.14	2.56	3.72	✓
Tin	ug/L	59	59	52	66	✓
Titanium	ug/L	35.8	31.5	27.0	36.0	✓
Uranium	ug/L	32.7	30.8	26.9	34.7	✓
Vanadium	ug/L	6.3	6.5	5.4	7.6	✓
Zinc	ug/L	63	59	49	69	✓

Material Used: Edmonton Digestion Check

Date Acquired: Aug 03, 2005

Acquired By: Linda Li

Iron	mg/L	9.8	10.0	9.0	11.0	✓
Manganese	mg/L	2.37	2.500	2.250	2.750	✓
Silicon	mg/L	24.3	25.00	22.50	27.50	✓
Sulfur	mg/L	48.6	50.0	45.0	55.0	✓
Mercury	mg/L	0.0031	0.0031	0.0027	0.0035	✓

Material Used: Metals High

Date Acquired: Jul 29, 2005

Acquired By: To Thong



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Metals Total (Continued...)

Control Sample	Units	Measured	Mean	Lower Limit	Upper Limit	Passed QC
Iron	mg/L	0.2	0.2	0.2	0.2	✓
Manganese	mg/L	0.052	0.050	0.045	0.055	✓
Silicon	mg/L	0.53	0.50	0.45	0.55	✓
Sulfur	mg/L	1.0	1.0	0.9	1.2	✓
Mercury	mg/L	0.0008	0.0008	-0.0016	0.0032	✓
Aluminum	ug/L	963	1000	850	1150	✓
Antimony	ug/L	40.0	40.0	34.0	46.0	✓
Arsenic	ug/L	40.1	40.0	34.0	46.0	✓
Barium	ug/L	193	200	170	230	✓
Beryllium	ug/L	20.6	20.0	17.0	23.0	✓
Bismuth	ug/L	98.4	100.0	85.0	115.0	✓
Boron	ug/L	403	400	340	460	✓
Cadmium	ug/L	2.09	2.00	1.70	2.30	✓
Chromium	ug/L	95.8	100.0	85.0	115.0	✓
Cobalt	ug/L	19.8	20.0	17.0	23.0	✓
Copper	ug/L	189	200	170	230	✓
Lead	ug/L	20.6	20.0	17.0	23.0	✓
Lithium	ug/L	202	200	170	230	✓
Molybdenum	ug/L	188	200	170	230	✓
Nickel	ug/L	96.9	100.0	85.0	115.0	✓
Selenium	ug/L	39.7	40.0	34.0	46.0	✓
Silver	ug/L	20.8	20.0	17.0	23.0	✓
Strontium	ug/L	191	200	170	230	✓
Thallium	ug/L	10.4	10.00	8.50	11.50	✓
Tin	ug/L	183	200	170	230	✓
Titanium	ug/L	97.6	100.0	85.0	115.0	✓
Uranium	ug/L	98.1	100.0	85.0	115.0	✓
Vanadium	ug/L	18.3	20.0	17.0	23.0	✓
Zinc	ug/L	197	200	170	230	✓

Material Used: Metals Low
Date Acquired: Aug 03, 2005
Acquired By: Linda Li



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Metals Total (Continued...)

Control Sample	Units	Measured	Mean	Lower Limit	Upper Limit	Passed QC
Aluminum	ug/L	54	50	43	58	✓
Antimony	ug/L	2.2	2.0	1.7	2.3	✓
Arsenic	ug/L	2.1	2.0	1.7	2.3	✓
Barium	ug/L	11	10	9	12	✓
Beryllium	ug/L	1.1	1.0	0.9	1.2	✓
Bismuth	ug/L	5.2	5.0	4.3	5.8	✓
Boron	ug/L	22	20	17	23	✓
Cadmium	ug/L	0.11	0.10	0.09	0.12	✓
Chromium	ug/L	5.2	5.0	4.3	5.8	✓
Cobalt	ug/L	1.0	1.0	0.9	1.2	✓
Copper	ug/L	10	10	9	12	✓
Lead	ug/L	1.1	1.0	0.9	1.2	✓
Lithium	ug/L	9	10	9	12	✓
Molybdenum	ug/L	10	10	9	12	✓
Nickel	ug/L	5.2	5.0	4.3	5.8	✓
Selenium	ug/L	2.1	2.0	1.7	2.3	✓
Silver	ug/L	1.0	1.0	0.9	1.2	✓
Strontium	ug/L	10	10	9	12	✓
Thallium	ug/L	0.54	0.50	0.43	0.58	✓
Tin	ug/L	9	10	9	12	✓
Titanium	ug/L	5.2	5.0	4.3	5.8	✓
Uranium	ug/L	5.4	5.0	4.3	5.8	✓
Vanadium	ug/L	1.1	1.0	0.9	1.2	✓
Zinc	ug/L	10	10	9	12	✓

Material Used: Metals Trace
Date Acquired: Aug 03, 2005
Acquired By: Linda Li

Mercury	ug/L	13	14.000	11.000	17.000	✓
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Material Used: S0102 - Hg
Date Acquired: Aug 08, 2005
Acquired By: Kelly Restiaux



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Physical and Aggregate Properties

Certified Reference Material		Units	Measured	Target	Lower Limit	Upper Limit	Passed QC
Solids		mg/L	394	500	260	440	✓
Material Used:	S2016 - Solid						
Date Acquired:	Aug 02, 2005						
Acquired By:	Vanessa Li						
Solids		mg/L	<2	0	-1	1	✓
Material Used:	Surrey Blank 2						
Date Acquired:	Aug 02, 2005						
Acquired By:	Vanessa Li						
Replicates		Units	Replicate1	Replicate2	% RSD Criteria	Absolute Criteria	Passed QC
Solids		mg/L	43	45	10	15	✓
Material Used:	Edmonton Duplicate						
Date Acquired:	Jul 29, 2005						
Acquired By:	Christina Onyskiw						
Solids		mg/L	8	7	30	5	✓
Material Used:	Surrey - Int. Duplicate 1						
Date Acquired:	Aug 02, 2005						
Acquired By:	Vanessa Li						
Control Sample		Units	Measured	Mean	Lower Limit	Upper Limit	Passed QC
Solids		mg/L	200	200	180	220	✓
Material Used:	Water High						
Date Acquired:	Jul 29, 2005						
Acquired By:	Christina Onyskiw						
Solids		mg/L	20	20	18	22	✓
Material Used:	Water Low						
Date Acquired:	Jul 29, 2005						
Acquired By:	Christina Onyskiw						



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Routine Water

Blanks	Units	Measured	Mean	Lower Limit	Upper Limit	Passed QC
Calcium	mg/L	<0.2	0.0	-0.2	0.2	✓
Magnesium	mg/L	<0.1	0.0	-0.1	0.1	✓
Sodium	mg/L	<0.4	0.0	-0.4	0.4	✓
Potassium	mg/L	<0.4	0.0	-0.4	0.4	✓
Iron	mg/L	<0.01	0.00	-0.01	0.01	✓
Manganese	mg/L	<0.005	0.000	-0.005	0.005	✓
Chloride	mg/L	<0.4	0.0	-0.5	0.5	✓
Nitrate - N	mg/L	<0.01	0.00	-0.01	0.01	✓
Nitrite - N	mg/L	<0.005	0.000	-0.005	0.005	✓

Material Used: Edmonton Method Blank

Date Acquired: Jul 29, 2005

Acquired By: Marc Dzura

Calibration Check

	Units	Measured	Target	% Recovery	Criteria (%)	Passed QC
pH	pH	8.0	8.00	100.50	98.50-101.50	✓

Material Used: s2013 - pH

Date Acquired: Jul 29, 2005

Acquired By: Zahra Momen



Norwest Labs
7217 Roper Road NW
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Replicates	Units	Replicate1	Replicate2	% RSD Criteria	Absolute Criteria	Passed QC
pH		8.22	8.18	9.99	0.10	✓
Electrical Conductivity	dS/m at 25 C	0.839	0.840	9.990	0.002	✓
Calcium	mg/L	2310	2310	10.0	0.6	✓
Magnesium	mg/L	40	40	10.0	0.7	✓
Sodium	mg/L	13.2	13.0	10.0	1.2	✓
Potassium	mg/L	160	160	10.0	1.2	✓
Iron	mg/L	0.02	0.02	9.99	0.05	✓
Manganese	mg/L	0.073	0.074	9.990	0.010	✓
Chloride	mg/L	83.8	83.4	10.0	0.5	✓
Nitrate - N	mg/L	7.27	7.35	9.99	0.01	✓
Nitrite - N	mg/L	0.054	0.055	9.990	0.010	✓
Hydroxide	mg/L	<5	<5	10		✓
Carbonate	mg/L	8	8	10		✓
Bicarbonate	mg/L	150	149	10		✓
P-Alkalinity	mg/L	<5	<5	10	5	✓
T-Alkalinity	mg/L	6	6	10	5	✓

pH	pH	7.43	7.50	0.00	0.10	✓
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Material Used: Surrey - Int. Duplicate 1
Date Acquired: Jul 29, 2005
Acquired By: Zahra Momen



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Routine Water (Continued...)

Control Sample	Units	Measured	Mean	Lower Limit	Upper Limit	Passed QC
Chloride	mg/L	2070	2087.0	1875.2	2298.8	✓
Material Used:	Chloride High					
Date Acquired:	Jul 29, 2005					
Acquired By:	Andrew Jong					
Calcium	mg/L	234	250.0	225.0	275.0	✓
Magnesium	mg/L	94.6	100.0	90.0	110.0	✓
Sodium	mg/L	240	250.0	225.0	275.0	✓
Potassium	mg/L	243	250.0	225.0	275.0	✓
Iron	mg/L	9.75	10.00	9.01	10.99	✓
Manganese	mg/L	2.32	2.500	2.260	2.740	✓
Material Used:	Metals High					
Date Acquired:	Jul 29, 2005					
Acquired By:	To Thong					
Calcium	mg/L	5.0	5.0	4.5	5.5	✓
Magnesium	mg/L	2.1	2.0	1.8	2.2	✓
Sodium	mg/L	4.8	5.0	4.5	5.5	✓
Potassium	mg/L	4.7	5.0	4.5	5.5	✓
Iron	mg/L	0.21	0.20	0.18	0.22	✓
Manganese	mg/L	0.049	0.050	0.045	0.055	✓
Material Used:	Metals Low					
Date Acquired:	Jul 29, 2005					
Acquired By:	To Thong					
pH		9.21	9.23	9.11	9.35	✓
Electrical Conductivity	ds/m at 25 °C	2.78	2.730	2.611	2.849	✓
Chloride	mg/L	80.9	81.0	76.4	85.6	✓
Nitrate - N	mg/L	10.2	10.00	9.61	10.39	✓
Nitrite - N	mg/L	10.3	10.000	9.562	10.438	✓
P-Alkalinity	mg/L	492	507	415	599	✓
T-Alkalinity	mg/L	994	1009	969	1049	✓
Material Used:	Water High					
Date Acquired:	Jul 29, 2005					
Acquired By:	Annva Hundal					



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Routine Water (Continued...)

Control Sample	Units	Measured	Mean	Lower Limit	Upper Limit	Passed QC
pH		6.90	6.90	6.83	6.97	✓
Electrical Conductivity	dS/m at 25 C	0.080	0.076	0.070	0.081	✓
Chloride	mg/L	14.5	14.9	13.2	16.6	✓
Nitrate - N	mg/L	0.52	0.50	0.44	0.56	✓
Nitrite - N	mg/L	0.521	0.495	0.437	0.553	✓
P-Alkalinity	mg/L	57	54	20	88	✓
T-Alkalinity	mg/L	136	127	118	136	✓
Material Used:	Water Low					
Date Acquired:	Jul 29, 2005					
Acquired By:	Annva Hundal					



Methodology and Notes

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Method of Analysis:

MethodName	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* Conductivity - Laboratory Method, 2510 B	29-Jul-05	Norwest Labs Edmonton
Alkalinity, pH, and EC in water	APHA	* Electrometric Method, 4500-H+ B	29-Jul-05	Norwest Labs Edmonton
Alkalinity, pH, and EC in water	APHA	* Titration Method, 2320 B	29-Jul-05	Norwest Labs Edmonton
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G	2-Aug-05	Norwest Labs Edmonton
Anions (Routine) by Ion Chromatography	APHA	* Ion Chromatography with Chemical Suppression of Eluent Cond., 4110 B	2-Aug-05	Norwest Labs Edmonton
BOD in water (surrey)	APHA	* 5 Day, 5210 B	29-Jul-05	Norwest Labs Surrey
Chloride in Water	APHA	* Automated Ferricyanide Method, 4500-Cl- E	29-Jul-05	Norwest Labs Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	29-Jul-05	Norwest Labs Calgary
Cyanide (Strong Acid Dissociable) in water	APHA	* Total Cyanide after Distillation, 4500-CN- C	8-Aug-05	Norwest Labs Edmonton
Kjeldahl Nitrogen & Phosphorus (Total) in Water	Alberta Research Council	* Nitrogen, Total Kjeldahl, 07021 626	29-Jul-05	Norwest Labs Edmonton
Kjeldahl Nitrogen & Phosphorus (Total) in Water	APHA	* Automated Ascorbic Acid Reduction Method, 4500-P F	29-Jul-05	Norwest Labs Edmonton
Mercury (Total) in water	MDMES	* Determination of Mercury in Water by Cold Vapor Atomic Absor, 245.1	29-Jul-05	Norwest Labs Edmonton
Mercury Low Level (Total) in water	APHA	* Cold Vapour Atomic Absorption Spectrometric Method, 3112 B	9-Aug-05	Norwest Labs Surrey
Metals ICP-MS (Total) in water	US EPA	* Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8	29-Jul-05	Norwest Labs Edmonton
Metals Trace (Dissolved) in water	APHA	* Inductively Coupled Plasma (ICP) Method, 3120 B	29-Jul-05	Norwest Labs Edmonton
Metals Trace (Total) in water	APHA	* Inductively Coupled Plasma (ICP) Method, 3120 B	29-Jul-05	Norwest Labs Edmonton
Orthophosphate-P in Water	APHA	* Automated Ascorbic Acid Reduction Method, 4500-P F	29-Jul-05	Norwest Labs Edmonton
pH in water (Surrey)	APHA	* Electrometric Method, 4500-H+ B	29-Jul-05	Norwest Labs Surrey
Solids Suspended (Total, Fixed and Volatile)	APHA	* Total Suspended Solids Dried at 103-105°C, 2540 D	29-Jul-05	Norwest Labs Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	* Total Suspended Solids Dried at 103-105°C, 2540 D	2-Aug-05	Norwest Labs Surrey

Please direct any inquiries regarding this report to our Client Services group.
Results relate only to samples as submitted

The test report shall not be reproduced except in full, without the written approval of the laboratory



Methodology and Notes

Norwest Labs
7217 Roper Road NW
Edmonton, AB. T6B 3J4
Phone: (780) 438-5522
Fax: (780) 438-0396

Bill to: Echo Bay Mines Ltd.
Report to: Echo Bay Mines Ltd.
9818 International Airport
Edmonton, AB, Canada
T5J 2T2
Attn: Michael Tansey
Sampled By: Steve Schlesak
Company: Kinross Gold Corporation

Project
ID:
Name: Lupin Mine
Location: Nunavut
LSD:
P.O.:
Acct. Code:

NWL Lot ID: 398142
Control Number:
Date Received: Jul 28, 2005
Date Reported: Aug 09, 2005
Report Number: 727534

Page: 26 of 26

* Norwest method(s) is based on reference method

References:

Alberta Research Council	Methods Manual for Chemical Analysis of Water and Wastes
APHA	Standard Methods for the Examination of Water and Wastewater
MDMES	Mthds for the Determination of Metals in Enviromental Smpls
US EPA	US Environmental Protection Agency Test Methods

Comments:

Called Wayne from Kinross in regards to the last sample not being sent in, I just left a message on machine. The sample missing was 51081. This sample will not be added to the lot.

Sample 4 Insufficient sample was provided for TSS for samples 2 and 4 through 15 to reach lower detection limit of 1 mg/l.

Please direct any inquiries regarding this report to our Client Services group.

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#3, 6125 12th Street SE, Calgary, Alberta Canada T2H 2K1
Tel (403) 253-7121 / Fax (403) 252-9363 www.hydroqual.ca

Test Report

Client:	NOR239	Sample:	20051122
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Client

Client: Norwest Labs
Address: 7217 Roper Road
City: Edmonton
Country: Canada
Billing: Lot # 398418
Tel: 780-438-5522

Operation: Edmonton

Prov./State: Alberta
Postal/ZIP Code: T6B 3J4
Contact: Linda LeGroix/ Darlene Lintott
Fax: 780-438-0396

Sample

type: water method: grab
collected: 2005/07/27 at not given by not given
shipped: 2005/07/27 by First Air/Air Canada
received: 2005/07/29 at 1100 by L.Fantin
signed-in: 2005/07/29 at 1100 by L.Fantin
container: 12 x 10L containers - containers composited and split for testing
seals present: no initials on seals no sample condition good
storage: $4 \pm 2^{\circ}\text{C}$ in darkness initial temperature ($^{\circ}\text{C}$) 23
Samples are disposed following Supporting Work Instruction 4.3.1.4.3

Physical and Chemical Measurements at Sample Receipt

lab code	-1
client code	398418
water/effluent/pore water	
pH	7.1
EC (uS/cm)	868
DO (mg/L)	7.3
temp ($^{\circ}\text{C}$)	22
alkalinity	not done
hardness	157
NH4 (mg/L)	not done
TRC (mg/L)	not done
colour	clear
odour	odourless
soil/sediment	
moisture (%)	na
sand:silt:clay	na
TOC (%)	na

Test Log

type	TR-S	DA-S	LM-D	AG-D	CD-D	FM-D
number	20053127	20053126	20053129	20053130	20053128	20053131
started	2005/07/29	2005/07/29	2005/07/30	2005/07/29	2005/07/29	2005/07/29
ended	2005/08/02	2005/07/31	2005/08/06	2005/08/01	2005/08/05	2005/08/05
reported	2005/08/15	2005/08/15	2005/08/15	2005/08/15	2005/08/15	2005/08/15
faxed	2005/08/03	2005/08/01	na	na	na	na

Notes: D, definitive; S, single treatment; EC, electrical conductivity; DO, dissolved oxygen; TRC, total residual chlorine;
TOC, total organic carbon; na, not applicable



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Test Report

Client: NOR239	Sample: 20051122	Test: 20053126
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Method *Daphnia* 48h Static Acute Test (undiluted sample plus a control) (HQ 4.4.3.1)

Reference: Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna*, 1990. Environ. Can., EPS 1/RM/14. (amended 1996 and 2000)

Client: Norwest Labs

Operation: Edmonton

Sample:

description: 398418, location 925-10

collected: 2005/07/27	at	not given	by	not given
received: 2005/07/29	at	1100	by	L.Fantin

Test:

started: 2005/07/29	at	1300	by	L. Fantin
ended: 2005/07/31	at	1050	by	K. de Windt
reported: 2005/08/15			by	G. Diaz

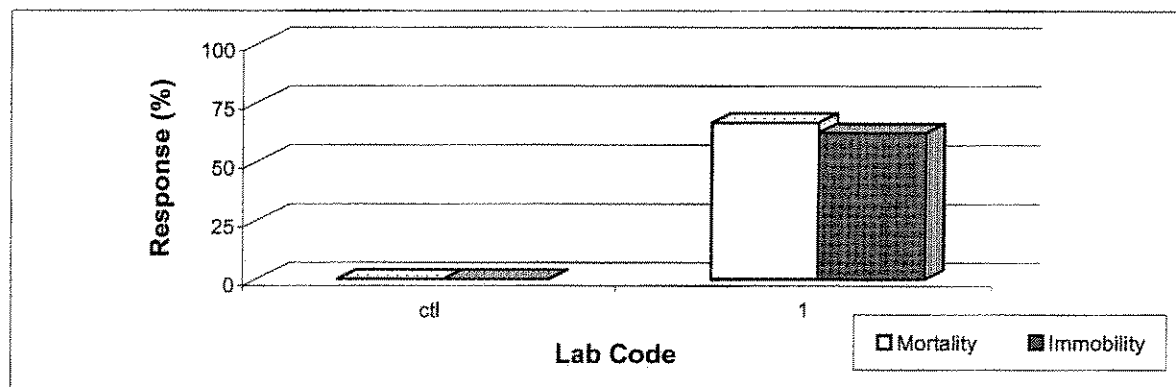
Result:

Lab Code	Client Code	Mortality (%)			Immobility (%)			Comment
		mean	sd	cv(%)	mean	sd	cv(%)	
ctl	lab control	0	0	0	0	0	0	
1	398418	67	15	23	62	21	33	toxic as tested

Notes: sd, sample standard deviation; cv, coefficient of variance

Mortality is calculated as percent of total daphnids per treatment at test initiation

Immobility is calculated as percent of live daphnids on day 2



Test Report

Test Data

Client: NOR239 Sample: 20051122 Test: 20053126

Day	Time	Technician	Comment/Observation
0	1300	L. Fantin	Test <i>Daphnia</i> appear normal.
1	1300	K. de Windt	Test <i>Daphnia</i> appear normal.
2	1050	K. de Windt	Test <i>Daphnia</i> appear normal.

lab code	ctl			1		
replicate	a	b	c	a	b	c

day	pH (units)					
0	8.4	8.4	8.4	7.3	7.3	7.3
2	8.4	8.5	8.5	7.3	7.3	7.4

	EC (uS/cm)					
0	423	423	423	902	902	902
2	417	401	398	880	891	886

	DO (mg/L)					
0	8.1	8.1	8.1	7.9	7.9	7.9
2	7.8	7.9	7.8	7.6	7.7	7.7

	Temperature (°C)					
0	19	19	19	21	21	21
2	19	20	20	20	20	20

	Number Alive (F, floating; I, immobile; B, stuck on bubble; D, caught in debris)					
1	10	10	10	10(3I)	10(1D,5I)	12(1I)
2	10	10	10	2(2I)	3 (2I)	5(1I)

Notes: EC, electrical conductivity; DO, dissolved oxygen; nd, not done; na, not applicable

Comments:

Organism: <24 h old *Daphnia magna*; in-house culture; mortality 7 days before test (%): 13
 Culture's time to first brood (d): 9 Brood size (neonates per brood): 26
 Adjustments prior to testing: pH: none hardness (mg CaCO₃/L): none
 The duration of pre-aeration, at a rate of 37.5 ± 12.5 mL/min·L⁻¹, was (min): 0
 The hardness of the lab dilution water was (mg CaCO₃/L): 161
 The test was conducted in 385 mL plastic vessels containing 150 mL of test solution and ten daphnids (loading density of 15 mL per daphnid or neonate).
 One of the 100% test vessels was loaded with 12 neonates.

The test data and results are verified correct.


 Authorized by K. Steele, B.Sc., Quality Assurance Officer

Our liability is limited to the cost of the test requested on the sample as received. No liability in whole or in part is assumed for the collection, handling or transport of the sample, application or interpretation of the test data or results in part or in whole.



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Test Report

Client: NOR239	Sample: 20051122	Test: 20053127
----------------	------------------	----------------

Method Trout 96h Static Acute Test (undiluted sample plus a control) (HQ 4.4.4.1)
Reference: Biological Test method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout, 1990. Environ. Can., EPS 1/RM/13.
(amended 1996 and 2000)

Client: Norwest Labs

Operation: Edmonton

Sample:

description: 398418, location 925-10

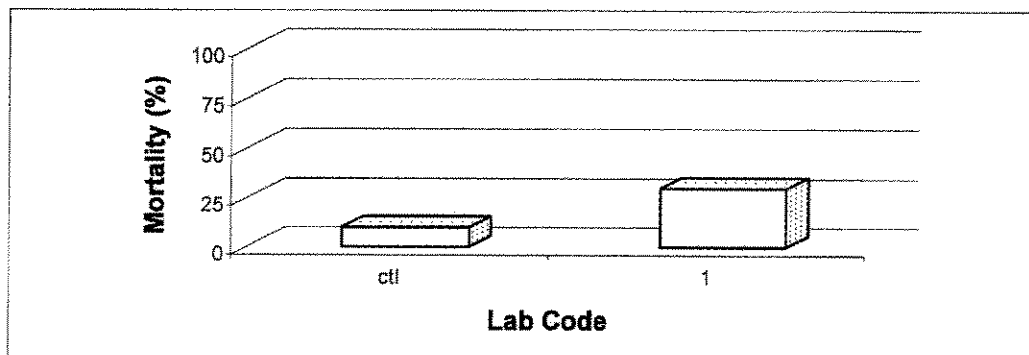
collected: 2005/07/27	at	not given	by	not given
received: 2005/07/29	at	1100	by	L.Fantin

Test:

started: 2005/07/29	at	1600	by	L.Fantin/A.Corbett
ended: 2005/08/02	at	1600	by	L.Fantin/A.Corbett
reported: 2005/08/15			by	G. Diaz

Result:

Lab Code	Client Code	Mortality (%)	Comment
ctl	lab control	10	
1	398418	30	not toxic as tested



Test Report

Test Data

Client:	NOR239	Sample:	20051122	Test:	20053127
---------	--------	---------	----------	-------	----------

Day	Time	Technician	Comment/Observation
0	1600	L.Fantin/A.Corbett	test fish loaded at 1600 h
1	1330	K.Steele/M.Luong	all test fish appear normal
2	1030	K. de Windt/M.Luong	all test fish appear normal
3	1415	K.Steele/M.Luong	all test fish appear normal
4	1600	L.Fantin/A.Corbett	all test fish appear normal

 Preaeration (6.5 mL/min/L)
 DO (mg/L)

0.5	1.0	1.5	2 (h)
8.5			

lab code	ctl	1					
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day	pH (units)						
0	8.0	6.8					
1	8.4	7.0					
2	8.4	7.4					
3	8.4	7.1					
4	8.3	7.3					

	EC (uS/cm)						
0	415	938					
1	395	877					
2	391	882					
3	401	885					
4	380	884					

	DO (mg/L)						
0	8.5	8.5					
1	8.3	8.4					
2	8.4	8.2					
3	8.4	8.6					
4	8.5	8.7					

	Temperature (°C)						
0	16	16					
1	16	16					
2	16	16					
3	16	16					
4	16	16					

	Number Alive						
0	10	10					
1	10	8					
2	10	8					
3	10	7					
4	9	7					

Mortality (%)							
10	30						

Test Report

Test Data

Client: NOR239	Sample: 20051122	Test: 20053127
----------------	------------------	----------------

Control Fish	Length (cm)	Weight (g)	Lab Code	Group Weight (g)	Ammonium (mg NH ₄ ⁺ -N/L)	
					initial	final
1	3.1	0.2	ctl 1	2.7	0.2	0.6
2	3.6	0.3		2.8	2.5	2.7
3	3.5	0.4				
4	3.2	0.2				
5	3.2	0.2				
6	3.2	0.2				
7	3.4	0.3				
8	3.3	0.2				
9	3.2	0.2				
10	3.6	0.3				
average	3.3	0.3				
sd	0.2	0.1				
cv(%)	5.5	22.7				

Test Information

 Organism: *Oncorhynchus mykiss* from Trout Lodge Inc.

Age and condition: The fish were held 14 days before testing (batch 20050714TR).

Conditions

The test volume was: 20 (L)

The test was conducted in 22 L plastic pails with polyethylene liners.

One replicate per treatment.

Ten fish per replicate with a loading density of: 0.1 (g/L)

Stock mortality 7 days prior to testing: 0.1 (%)

All treatments aerated at: 6.5 (±1 mL/min/L)

The sample was not pH adjusted.

Comments

none

The test data and results are verified correct.


 Authorized by K. Steele, B.Sc., Quality Assurance Officer

Our liability is limited to the cost of the test requested on the sample as received. No liability in whole or in part is assumed for the collection, handling or transport of the sample, application or interpretation of the test data or results in part or in whole.

Test Report

Client:	NOR239	Sample:	20051122	Test:	20053128
---------	--------	---------	----------	-------	----------

Method: *Ceriodaphnia* Survival and Reproduction Test (five treatments plus a control) (HQ 4.4.3.2)
reference: Biological Test Method: Test of Reproduction and Survival Using the Cladoceran
Ceriodaphnia dubia, 1992. Environ.Can., EPS 1/RM/21. (amended November, 1997)

Client: Norwest Labs

Operation: Edmonton

Sample:

description: 398418, location 925-10

collected: 2005/07/27 at not given by not given
 received: 2005/07/29 at 1100 by L.Fantin

Test:

started: 2005/07/29 at 1200 by B. Denny
 ended: 2005/08/05 at 1200 by B. Denny
 reported: 2005/08/15 by G.Diaz

Result:

	Endpoint	Value	Confidence Limits	Units	Method Calculated
Acute: (mortality)	LC25	>100		%	estimated
	LC50	>100		%	estimated
	NOEC	100		%	estimated
	LOEC	> 100		%	estimated
	MSD	could not be calculated		ceriodaphnid	
Chronic: (fecundity)	IC25	>100		%	estimated
	IC50	>100		%	estimated
	NOEC	100		%	estimated
	LOEC	>100		%	estimated
	MSD	could not be calculated		young	

Notes: LCx & ICx, concentrations lethal or inhibitory to 'x' percent of the test population; NOEC & LOEC, no and lowest observed effect concentrations; fecundity, reproduction as the number of young produced

Comments: The test results are plotted on page 2 of the report.

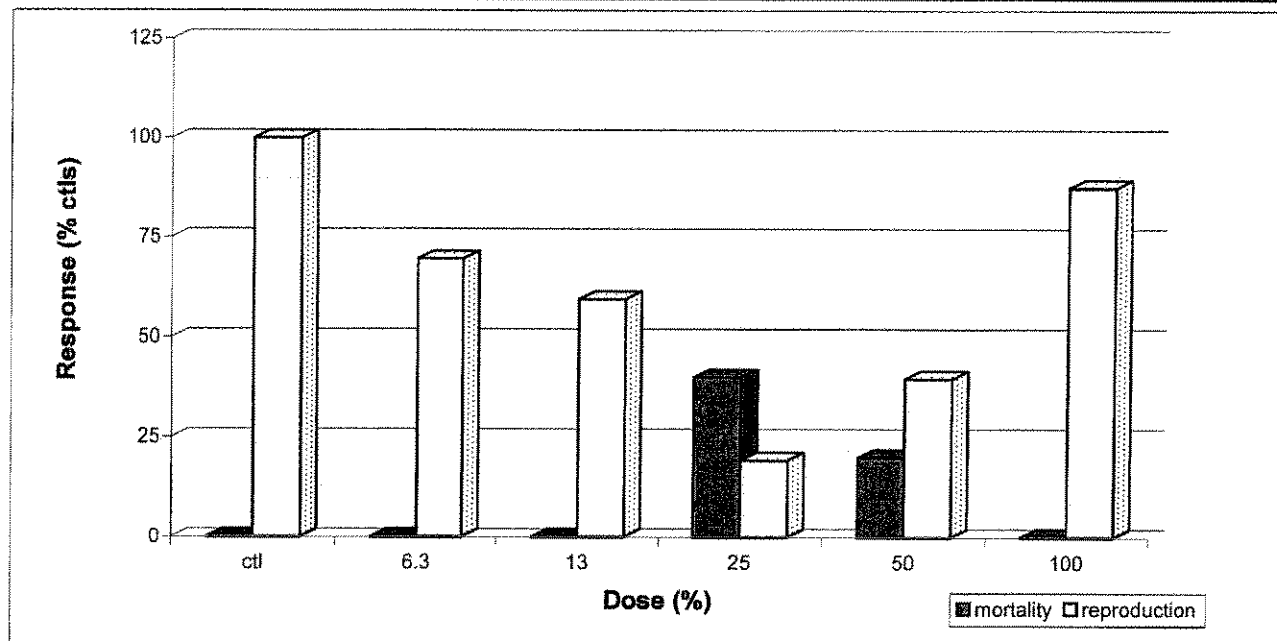
No unusual behaviour, appearance, or treatment of the test organisms was noted prior to or during the conduct of the test. All test organisms came from a brood source that are all the same age.

The numbers in bold print under the "Biology (#, young produced . . .) section refers to the number of young the test organism had the day it died.

Our liability is limited to the cost of the test requested. No liability is assumed for the application and or interpretation of the test results.

Test Report

Client: NOR239 Sample: 20051122 Test: 20053128



Test Design

Organism: *Ceriodaphnia dubia* Source: in-house cultures Age: <24 h; released within 12 h
 The number of young produced by each brood organism in the last complete brood before use was 7
 No ephippia were noted in the cultures 7 days before test initiation. Culture mortality was 0%
 during this period and the mean number of surviving young per adult was 15
 The dilution water was a mixture of moderately hard reconstituted water and Bow River Water (50:50).
 Chemicals added to dilution water: 0.96 g NaHCO₃, 0.60 g CaSO₄, 0.60 g MgSO₄, 0.04 g KCl per 20L
 The tests were conducted in 30 mL plastic vessels containing 15 mL of solution (2cm depth).
 The test organisms were fed daily a mixture of fermented trout chow, yeast, alfalfa powder, and the green
 alga *Raphidocelis subcapitata*. food expiration: 2005/07/30, 2005/08/14

Sample Information

The test was conducted with three subsamples. Samples a, b, and c were for days 0 to 2, 3 to 4, and 5 to 7.
 The sample was not aerated, filtered or pH adjusted prior to testing or during testing.
 The dissolved oxygen concentration (mg/L) was 7.1 The sample pH was 7.0

Test Log

Date	Day	Time	Technicians	Comments
2005/07/29	0	1200	B. Denny	Test <i>Ceriodaphnia</i> appear normal.
2005/07/30	1	1230	K. de Windt	Test <i>Ceriodaphnia</i> appear normal.
2005/07/31	2	0915	K. de Windt	Test <i>Ceriodaphnia</i> appear normal.
2005/08/01	3	1130	K. de Windt	Test <i>Ceriodaphnia</i> appear normal.
2005/08/02	4	1145	B. Denny	Test <i>Ceriodaphnia</i> appear normal.
2005/08/03	5	1045	B. Denny	Test <i>Ceriodaphnia</i> appear normal.
2005/08/04	6	1115	B. Denny	Test <i>Ceriodaphnia</i> appear normal.
2005/08/05	7	1200	B. Denny	Test <i>Ceriodaphnia</i> appear normal.



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Test Report

Test Data

Client: NOR239

Sample: 20051122

Test: 20053128

Chemistry

New Solutions

Dose (%)	ctl	6.3	13	25	50	100	
day							

pH (units)

0	8.3	8.3	8.3	8.2	8.0	7.0	
1	8.5	8.5	8.5	8.4	8.2	7.5	
2	8.4	8.4	8.3	8.3	8.1	7.7	
3	8.4	8.4	8.3	8.2	8.1	7.1	
4	8.4	8.4	8.3	8.3	8.1	7.3	
5	8.3	8.3	8.3	8.2	8.0	7.2	
6	8.3	8.3	8.3	8.2	8.0	7.3	
7							
8							

conductance (uS/cm)

0	378	397	429	497	628	877	
1	367	381	408	476	605	840	
2	371	385	415	480	613	858	
3	365	384	416	477	597	857	
4	353	379	410	479	603	851	
5	364	397	420	491	620	863	
6	382	407	430	496	630	880	
7							
8							

dissolved oxygen (mg/L)

0	7.1	7.1	7.1	7.1	7.1	7.1	
1	6.8	6.9	7.0	7.0	7.1	7.1	
2	7.1	7.1	7.1	7.1	7.1	7.1	
3	7.3	7.3	7.3	7.2	7.3	7.4	
4	7.0	7.0	7.0	7.0	7.0	7.0	
5	7.3	7.3	7.3	7.3	7.3	7.3	
6	7.4	7.3	7.3	7.3	7.3	7.3	
7							
8							

temperature (°C)

0	25	25	25	25	25	25	
1	25	25	25	25	25	25	
2	25	25	25	25	25	25	
3	25	25	25	25	25	25	
4	25	25	25	25	25	25	
5	25	25	25	25	25	25	
6	25	25	25	25	25	25	
7							
8							

Old Solutions

ctl	6.3	13	25	50	100	
-----	-----	----	----	----	-----	--

pH (units)

8.4	8.4	8.3	8.2	8.1	7.4	
8.3	8.3	8.3	8.2	8.1	7.7	
8.3	8.2	8.2	8.2	8.1	7.4	
8.2	8.3	8.2	8.2	8.1	7.5	
8.3	8.2	8.2	8.2	8.1	7.3	
8.3	8.2	8.2	8.2	8.1	7.4	
8.3	8.2	8.2	8.2	8.0	7.5	

conductance (uS/cm)

375	438	443	499	631	890	
368	415	432	494	634	886	
370	401	439	500	640	887	
364	393	423	489	635	885	
380	418	448	512	652	892	
377	412	435	508	655	900	
380	410	432	506	646	880	

dissolved oxygen (mg/L)

6.5	6.6	6.5	6.4	6.6	6.5	
6.7	6.7	6.7	6.7	6.8	6.8	
6.9	6.9	6.9	7.0	7.0	7.0	
6.4	6.4	6.4	6.6	6.7	6.8	
6.9	6.9	6.9	6.9	6.9	6.9	
6.9	6.9	6.9	6.9	6.9	6.9	
6.8	6.8	6.8	6.8	6.8	6.8	

temperature (°C)

25	25	25	25	25	25	
25	25	25	25	25	25	
25	25	25	25	25	25	
25	25	25	25	25	25	
25	25	25	25	25	25	
25	25	25	25	25	25	
24	24	24	24	24	24	