ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1682103-6				
	Description	WATER				
	Sampled Date	30-SEP-15				
	Sampled Time	12:14				
	Client ID	LUP-21-150930				
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	6.08				
	Total Suspended Solids (mg/L)	<3.0				
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	3.1				
	Ammonia, Total (as N) (mg/L)	<0.050				
Cyanides	Cyanide, Total (mg/L)	<0.0050				
Total Metals	Aluminum (Al)-Total (mg/L)	0.0397				
	Antimony (Sb)-Total (mg/L)	<0.00010				
	Arsenic (As)-Total (mg/L)	0.00037				
	Barium (Ba)-Total (mg/L)	0.00277				
	Beryllium (Be)-Total (mg/L)	<0.00010				
	Bismuth (Bi)-Total (mg/L)	<0.000050				
	Boron (B)-Total (mg/L)	<0.010				
	Cadmium (Cd)-Total (mg/L)	<0.0000050				
	Calcium (Ca)-Total (mg/L)	1.24				
	Cesium (Cs)-Total (mg/L)	0.000012				
	Chromium (Cr)-Total (mg/L)	0.00012				
	Cobalt (Co)-Total (mg/L)	0.00014				
	Copper (Cu)-Total (mg/L)	0.00079				
	Iron (Fe)-Total (mg/L)	0.069				
	Lead (Pb)-Total (mg/L)	<0.000050				
	Lithium (Li)-Total (mg/L)	0.0012				
	Magnesium (Mg)-Total (mg/L)	0.727				
	Manganese (Mn)-Total (mg/L)	0.00426				
	Mercury (Hg)-Total (mg/L)	<0.0000050				
	Molybdenum (Mo)-Total (mg/L)	<0.000050				
	Nickel (Ni)-Total (mg/L)	0.00090				
	Phosphorus (P)-Total (mg/L)	<0.050				
	Potassium (K)-Total (mg/L)	0.354				
	Rubidium (Rb)-Total (mg/L)	0.00097				
	Selenium (Se)-Total (mg/L)	<0.000050				
	Silicon (Si)-Total (mg/L)	0.719				
	Silver (Ag)-Total (mg/L)	<0.000010				
	Sodium (Na)-Total (mg/L)	0.721				
	Strontium (Sr)-Total (mg/L)	0.00721				
	Sulfur (S)-Total (mg/L)	1.16				
	Tellurium (Te)-Total (mg/L)	<0.00020				
	Thallium (Tl)-Total (mg/L)	<0.000010				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1682103-1	L1682103-2	L1682103-3	L1682103-4	L1682103-5
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	28-SEP-15	28-SEP-15	28-SEP-15	28-SEP-15	30-SEP-15
	Sampled Time	15:31	14:36	14:00	14:42	10:54
	Client ID	LUP-22-150928	LUP-24-150928	LUP-25-150928	LUP-37-150928	LUP-20-150930
Grouping	**Analyte**					
WATER						
Total Metals	Thorium (Th)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	0.00015	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	0.00301	0.00062	<0.00030	0.00064	0.00034
	Tungsten (W)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Uranium (U)-Total (mg/L)	0.000031	0.000027	0.000024	0.000027	<0.000010
	Vanadium (V)-Total (mg/L)	0.00079	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Total (mg/L)	0.0348	0.0062	<0.0030	0.0058	0.181
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1682103-6				
	Description	WATER				
	Sampled Date	30-SEP-15				
	Sampled Time	12:14				
	Client ID	LUP-21-150930				
Grouping	**Analyte**					
WATER						
Total Metals	Thorium (Th)-Total (mg/L)	<0.00010				
	Tin (Sn)-Total (mg/L)	<0.00010				
	Titanium (Ti)-Total (mg/L)	0.00065				
	Tungsten (W)-Total (mg/L)	<0.00010				
	Uranium (U)-Total (mg/L)	0.000024				
	Vanadium (V)-Total (mg/L)	<0.00050				
	Zinc (Zn)-Total (mg/L)	<0.0030				
	Zirconium (Zr)-Total (mg/L)	<0.00030				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Samples Listed:

Sample Number	Client Sample ID	Qualifier	Description
L1682103-2	LUP-24-150928	SPL	Sample was Preserved at the laboratory - HG T
L1682103-3	LUP-25-150928	SPL	Sample was Preserved at the laboratory - HG T
L1682103-4	LUP-37-150928	SPL	Sample was Preserved at the laboratory - HG T
L1682103-6	LUP-21-150930	SPL	Sample was Preserved at the laboratory - HG T

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TOT-ED	Water	Alkalinity, T	APHA 2320 B-Auto-Pot. Titration
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002

This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.

ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
HG-T-CVAA-ED	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.

SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric

Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Lupin Mines Incorporated c/o Elgin Mining Inc.	Select Report Format: ☒ PDF ☒ EXCEL ☐ EDD (DIGITAL)	R ☒ Regular (Standard TAT if received by 3 pm - business days)
Contact:	K. Lewis	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	76 Richmond Street East, Suite 330 Toronto, ON M5C 1P1	☐ Criteria on Report - provide details below if box checked Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	778-386-7340	Email 1 or Fax klewis@elginmining.com	Specify Date Required for E2,E or P:
		Email 2	

Invoice To	Same as Report To ☑ Yes ☐ No	Invoice Distribution	Analysis Request
	Copy of Invoice with Report ☐ Yes ☐ No	Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
Company:		Email 1 or Fax klewis@elginmining.com	
Contact:		Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q5314	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): L1682103 | ALS Contact: Rick Zoliewski | Sampler: C.de Repentigny

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Alkalinity	Total Suspended Solids	Hardness	Ammonia (NH4)	Total Cyanide	Total Metals (ICPMetals Scan)							Number of Containers
								P	P	P							
	LUP-22-150928	28-sept-15	15:31	Water	R	R	R	R	R	R							4
	LUP-24-150928	28-sept-15	14:36	Water	R	R	R	R	R	R							4
	LUP-25-150928	28-sept-15	14:00	Water	R	R	R	R	R	R							4
	LUP-28-150928	28-sept-15	14:42	Water	R	R	R	R	R	R							4
	LUP-20-150930	30-sept-15	10:54	Water	R	R	R	R	R	R							4
	LUP-21-150930	30-sept-15	12:14	Water	R	R	R	R	R	R							4
			Alberta time														

L1682103-COFC

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)	SAMPLE CONDITION AS RECEIVED (lab use only)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No	CCME Industrial land use	Frozen ☐ SIF Observations Yes ☐ No ☐
Are samples for human drinking water use? ☐ Yes ☐ No		Ice packs Yes ☐ No ☐ Custody seal intact Yes ☐ No ☐
		Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		

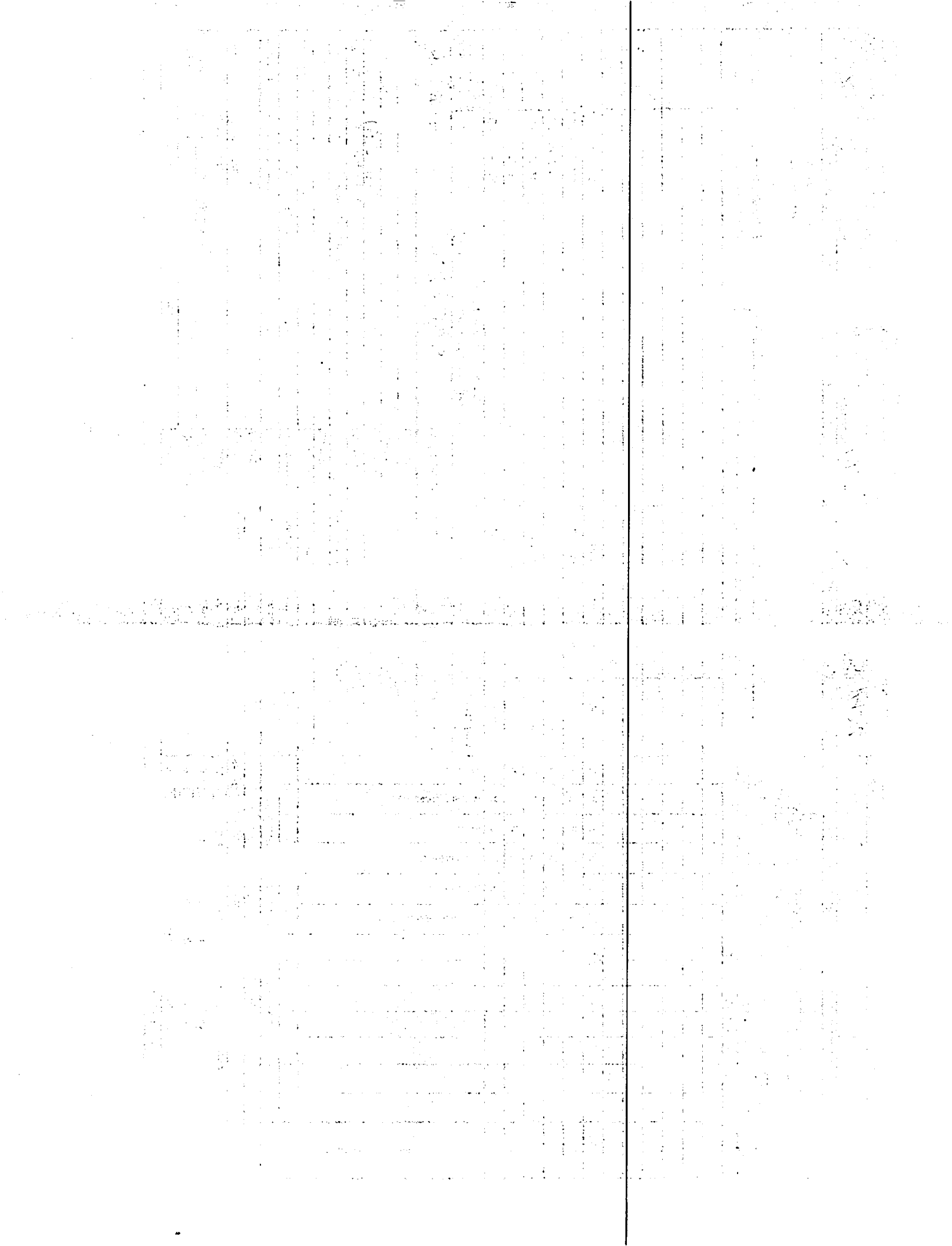
SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	Oct 1, 2015	1100 am.		Oct 1/15	1422			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC** form.



LUPIN MINES INCORPORATED
ATTN: Karen Lewis
76 Richmond Street
Suite 330
Toronto ON M5C 1P1

Date Received: 08-OCT-15
Report Date: 22-OCT-15 14:48 (MT)
Version: FINAL

Client Phone: 778-386-7340

Certificate of Analysis

Lab Work Order #: L1686003

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Comments: ADDITIONAL 21-OCT-15 15:29

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1686003-1	L1686003-2	L1686003-3	L1686003-4	L1686003-5
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	02-OCT-15	03-OCT-15	04-OCT-15	05-OCT-15	06-OCT-15
	Sampled Time	08:36	08:46	08:40	08:07	08:16
	Client ID	LUP-10-151002	LUP-10-151003	LUP-10-151004	LUP-10-151005	LUP-10-151006
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	168	175	176	175	184
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	<3.0	<3.0
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	4.1	5.1	4.5	4.4	5.5
	Nitrate and Nitrite (as N) (mg/L)					1.04
	Nitrate (as N) (mg/L)					1.04
	Nitrite (as N) (mg/L)					<0.010
Cyanides	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050 HTD	<0.0050
Total Metals	Aluminum (Al)-Total (mg/L)	0.0254	0.0297	0.0241	0.0212	0.0242
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00658	0.00710	0.00604	0.00577	0.00643
	Barium (Ba)-Total (mg/L)	0.0142	0.0144	0.0141	0.0143	0.0147
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Total (mg/L)	0.054	0.054	0.054	0.054	0.056
	Cadmium (Cd)-Total (mg/L)	0.000203	0.000201	0.000199	0.000204	0.000216
	Calcium (Ca)-Total (mg/L)	55.7	58.7	58.8	58.4	61.9
	Cesium (Cs)-Total (mg/L)	0.000079	0.000080	0.000080	0.000079	0.000082
	Chromium (Cr)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Cobalt (Co)-Total (mg/L)	0.0315	0.0311	0.0314	0.0312	0.0313
	Copper (Cu)-Total (mg/L)	0.00197	0.00212	0.00184	0.00170	0.00176
	Iron (Fe)-Total (mg/L)	0.120	0.138	0.115	0.107	0.123
	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Total (mg/L)	0.0229	0.0234	0.0236	0.0225	0.0239
	Magnesium (Mg)-Total (mg/L)	7.07	6.99	7.17	7.08	7.12
	Manganese (Mn)-Total (mg/L)	0.816	0.778	0.802	0.786	0.790
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Nickel (Ni)-Total (mg/L)	0.0704	0.0701	0.0705	0.0702	0.0698
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	4.60	4.58	4.61	4.61	4.44
	Rubidium (Rb)-Total (mg/L)	0.00215	0.00221	0.00198	0.00197	0.00214
	Selenium (Se)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Silicon (Si)-Total (mg/L)	1.80	1.80	1.77	1.77	1.74
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	43.2	42.3	43.0	42.8	42.5
	Strontium (Sr)-Total (mg/L)	0.252	0.257	0.258	0.254	0.265
	Sulfur (S)-Total (mg/L)	73.0	73.0	72.2	72.6	71.2
	Tellurium (Te)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1686003-6				
	Description	WATER				
	Sampled Date	07-OCT-15				
	Sampled Time	08:45				
	Client ID	LUP-10-151007				
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	184				
	Total Suspended Solids (mg/L)	<3.0				
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	5.9				
	Nitrate and Nitrite (as N) (mg/L)	1.04				
	Nitrate (as N) (mg/L)	1.04				
	Nitrite (as N) (mg/L)	<0.010				
Cyanides	Cyanide, Total (mg/L)	<0.0050				
Total Metals	Aluminum (Al)-Total (mg/L)	0.0206				
	Antimony (Sb)-Total (mg/L)	<0.00010				
	Arsenic (As)-Total (mg/L)	0.00587				
	Barium (Ba)-Total (mg/L)	0.0144				
	Beryllium (Be)-Total (mg/L)	<0.00010				
	Bismuth (Bi)-Total (mg/L)	<0.000050				
	Boron (B)-Total (mg/L)	0.056				
	Cadmium (Cd)-Total (mg/L)	0.000205				
	Calcium (Ca)-Total (mg/L)	61.5				
	Cesium (Cs)-Total (mg/L)	0.000080				
	Chromium (Cr)-Total (mg/L)	<0.00010				
	Cobalt (Co)-Total (mg/L)	0.0310				
	Copper (Cu)-Total (mg/L)	0.00155				
	Iron (Fe)-Total (mg/L)	0.103				
	Lead (Pb)-Total (mg/L)	<0.000050				
	Lithium (Li)-Total (mg/L)	0.0226				
	Magnesium (Mg)-Total (mg/L)	7.26				
	Manganese (Mn)-Total (mg/L)	0.790				
	Molybdenum (Mo)-Total (mg/L)	<0.000050				
	Nickel (Ni)-Total (mg/L)	0.0697				
	Phosphorus (P)-Total (mg/L)	<0.050				
	Potassium (K)-Total (mg/L)	4.70				
	Rubidium (Rb)-Total (mg/L)	0.00211				
	Selenium (Se)-Total (mg/L)	<0.000050				
	Silicon (Si)-Total (mg/L)	1.79				
	Silver (Ag)-Total (mg/L)	<0.000010				
	Sodium (Na)-Total (mg/L)	43.7				
	Strontium (Sr)-Total (mg/L)	0.258				
	Sulfur (S)-Total (mg/L)	72.6				
	Tellurium (Te)-Total (mg/L)	<0.00020				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1686003-1	L1686003-2	L1686003-3	L1686003-4	L1686003-5
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	02-OCT-15	03-OCT-15	04-OCT-15	05-OCT-15	06-OCT-15
	Sampled Time	08:36	08:46	08:40	08:07	08:16
	Client ID	LUP-10-151002	LUP-10-151003	LUP-10-151004	LUP-10-151005	LUP-10-151006
Grouping	**Analyte**					
WATER						
Total Metals	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Thorium (Th)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Tungsten (W)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Uranium (U)-Total (mg/L)	0.000021	0.000022	0.000019	0.000019	0.000018
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Total (mg/L)	0.233	0.231	0.226	0.227	0.226
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1686003-6				
	Description	WATER				
	Sampled Date	07-OCT-15				
	Sampled Time	08:45				
	Client ID	LUP-10-151007				
Grouping	**Analyte**					
WATER						
Total Metals	Thallium (Tl)-Total (mg/L)	<0.000010				
	Thorium (Th)-Total (mg/L)	<0.00010				
	Tin (Sn)-Total (mg/L)	<0.00010				
	Titanium (Ti)-Total (mg/L)	<0.00030				
	Tungsten (W)-Total (mg/L)	<0.00010				
	Uranium (U)-Total (mg/L)	0.000017				
	Vanadium (V)-Total (mg/L)	<0.00050				
	Zinc (Zn)-Total (mg/L)	0.218				
	Zirconium (Zr)-Total (mg/L)	<0.00030				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Antimony (Sb)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6
Duplicate	Beryllium (Be)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6
Duplicate	Bismuth (Bi)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6
Duplicate	Cesium (Cs)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6
Duplicate	Chromium (Cr)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6
Duplicate	Cobalt (Co)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6
Duplicate	Copper (Cu)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6
Duplicate	Lead (Pb)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6
Duplicate	Phosphorus (P)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6
Duplicate	Silver (Ag)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6
Duplicate	Tellurium (Te)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6
Duplicate	Thallium (Tl)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6
Duplicate	Thorium (Th)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6
Duplicate	Tin (Sn)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6
Duplicate	Titanium (Ti)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6
Duplicate	Tungsten (W)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6
Duplicate	Vanadium (V)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6
Duplicate	Zinc (Zn)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6
Duplicate	Zirconium (Zr)-Total	DLDS	L1686003-1, -2, -3, -4, -5, -6

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
HTD	Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TOT-ED	Water	Alkalinity, T	APHA 2320 B-Auto-Pot. Titration
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002

This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.

ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NO2+NO3-CALC-ED	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-ED	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-ED	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric

Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Lupin Mines Incorporated c/o Elgin Mining Inc.	Select Report Format: ☒ PDF ☒ EXCEL | | EDD (DIGITAL)	R ☒ Regular (Standard TAT if received by 3 pm - business days)
Contact:	K. Lewis	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	76 Richmond Street East, Suite 330 Toronto, ON M5C 1P1	☐ Criteria on Report - provide details below if box checked Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	778-386-7340	Email 1 or Fax klewis@elginmining.com	Specify Date Required for E2,E or P:
		Email 2	

Invoice To	Same as Report To ☑ Yes ☐ No	Invoice Distribution	Analysis Request
	Copy of Invoice with Report ☐ Yes ☐ No	Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
Company:		Email 1 or Fax klewis@elginmining.com	
Contact:		Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	53119	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:	Lupin Mine	Location:	

ALS Lab Work Order # (lab use only): L1686003 | ALS Contact: Rick Zoliewski | Sampler: Corine de Repen

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals	Total Cyanide	Total Suspended Solids, Alkalinity, Hardness	Nitrate, Nitrite								Number of Containers
					P	P										
	Lup-10-151002	02-oct-15	8:36	Water	R	R	R									3
	Lup-10-151003	03-oct-15	8:46	Water	R	R	R									3
	Lup-10-151004	04-oct-15	8:40	Water	R	R	R									3
	Lup-10-151005	05-oct-15	8:07	Water	R	R	R									3
	Lup-10-151006	06-oct-15	8:16	Water	R	R	R	R								3
	Lup-10-151007	07-oct-15	8:45	Water	R	R	R	R								3

L1686003-COFC

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☑ No	
Are samples for human drinking water use? ☐ Yes ☑ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | SIF Observations Yes ☐ No ☐

Ice packs Yes ☐ No ☐ | Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
4.8					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	Oct. 8/15	9:45		Oct 8/15	1200			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326e v09 Front/04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

LUPIN MINES INCORPORATED
ATTN: Karen Lewis
76 Richmond Street
Suite 330
Toronto ON M5C 1P1

Date Received: 08-OCT-15
Report Date: 22-OCT-15 14:59 (MT)
Version: FINAL

Client Phone: 778-386-7340

Certificate of Analysis

Lab Work Order #: L1686014

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Comments: ADDITIONAL 22-OCT-15 14:50

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1686014-1 WATER 05-OCT-15 15:38 LUP-22-151005	L1686014-2 WATER 05-OCT-15 14:35 LUP-24-151005	L1686014-3 WATER 05-OCT-15 14:05 LUP-25-151005	L1686014-4 WATER 05-OCT-15 14:45 LUP-37-151005	L1686014-5 WATER 06-OCT-15 14:20 LUP-20-151005
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	45.9	40.5	11.9	41.6	154
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	<3.0	<3.0
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	2.1	2.1	2.6	<2.0	<2.0
	Ammonia, Total (as N) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Nitrate and Nitrite (as N) (mg/L)					
	Nitrate (as N) (mg/L)		0.139		0.143	
	Nitrite (as N) (mg/L)					
Cyanides	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Total Metals	Aluminum (Al)-Total (mg/L)	0.0434	0.0458	0.0175	0.0441	0.0435
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00075	0.00072	0.00038	0.00075	0.00141
	Barium (Ba)-Total (mg/L)	0.00860	0.00991	0.00433	0.00992	0.0179
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Total (mg/L)	0.013	0.012	<0.010	0.012	0.047
	Cadmium (Cd)-Total (mg/L)	0.0000548	0.0000531	0.0000130	0.0000474	0.000158
	Calcium (Ca)-Total (mg/L)	14.2	12.3	3.24	12.8	50.9
	Cesium (Cs)-Total (mg/L)	0.000029	0.000028	0.000012	0.000028	0.000076
	Chromium (Cr)-Total (mg/L)	0.00013	0.00012	<0.00010	0.00019	<0.00010
	Cobalt (Co)-Total (mg/L)	0.00572	0.00502	0.00106	0.00500	0.0201
	Copper (Cu)-Total (mg/L)	0.00110	0.00110	0.00076	0.00114	0.00101
	Iron (Fe)-Total (mg/L)	0.046	0.050	0.019	0.050	0.028
	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Total (mg/L)	0.0060	0.0055	0.0017	0.0057	0.0214
	Magnesium (Mg)-Total (mg/L)	2.51	2.38	0.926	2.32	6.57
	Manganese (Mn)-Total (mg/L)	0.127	0.109	0.0231	0.108	0.485
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	0.000052
	Nickel (Ni)-Total (mg/L)	0.0203	0.0193	0.00501	0.0191	0.0631
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	1.23	1.14	0.540	1.15	3.81
	Rubidium (Rb)-Total (mg/L)	0.00133	0.00151	0.00120	0.00145	0.00223
	Selenium (Se)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Silicon (Si)-Total (mg/L)	1.24	1.14	0.345	1.13	2.09
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	10.4	9.13	2.39	9.16	35.8
	Strontium (Sr)-Total (mg/L)	0.0631	0.0542	0.0163	0.0558	0.221
	Sulfur (S)-Total (mg/L)	17.7	15.8	3.85	15.6	62.6

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1686014-6				
	Description	WATER				
	Sampled Date	06-OCT-15				
	Sampled Time	14:42				
	Client ID	LUP-21-151005				
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	6.01				
	Total Suspended Solids (mg/L)	<3.0				
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	2.8				
	Ammonia, Total (as N) (mg/L)	<0.050				
	Nitrate and Nitrite (as N) (mg/L)	<0.022				
	Nitrate (as N) (mg/L)	<0.020				
	Nitrite (as N) (mg/L)	<0.010				
Cyanides	Cyanide, Total (mg/L)	<0.0050				
Total Metals	Aluminum (Al)-Total (mg/L)	0.0249				
	Antimony (Sb)-Total (mg/L)	<0.00010				
	Arsenic (As)-Total (mg/L)	0.00030				
	Barium (Ba)-Total (mg/L)	0.00248				
	Beryllium (Be)-Total (mg/L)	<0.00010				
	Bismuth (Bi)-Total (mg/L)	<0.000050				
	Boron (B)-Total (mg/L)	<0.010				
	Cadmium (Cd)-Total (mg/L)	<0.0000050				
	Calcium (Ca)-Total (mg/L)	1.29				
	Cesium (Cs)-Total (mg/L)	0.000010				
	Chromium (Cr)-Total (mg/L)	<0.00010				
	Cobalt (Co)-Total (mg/L)	0.00015				
	Copper (Cu)-Total (mg/L)	0.00080				
	Iron (Fe)-Total (mg/L)	0.041				
	Lead (Pb)-Total (mg/L)	<0.000050				
	Lithium (Li)-Total (mg/L)	0.0012				
	Magnesium (Mg)-Total (mg/L)	0.675				
	Manganese (Mn)-Total (mg/L)	0.00338				
	Molybdenum (Mo)-Total (mg/L)	<0.000050				
	Nickel (Ni)-Total (mg/L)	0.00106				
	Phosphorus (P)-Total (mg/L)	<0.050				
	Potassium (K)-Total (mg/L)	0.309				
	Rubidium (Rb)-Total (mg/L)	0.00097				
	Selenium (Se)-Total (mg/L)	<0.000050				
	Silicon (Si)-Total (mg/L)	0.605				
	Silver (Ag)-Total (mg/L)	<0.000010				
	Sodium (Na)-Total (mg/L)	0.671				
	Strontium (Sr)-Total (mg/L)	0.00718				
	Sulfur (S)-Total (mg/L)	1.11				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1686014-1	L1686014-2	L1686014-3	L1686014-4	L1686014-5
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	05-OCT-15	05-OCT-15	05-OCT-15	05-OCT-15	06-OCT-15
	Sampled Time	15:38	14:35	14:05	14:45	14:20
	Client ID	LUP-22-151005	LUP-24-151005	LUP-25-151005	LUP-37-151005	LUP-20-151005
Grouping	**Analyte**					
WATER						
Total Metals	Tellurium (Te)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Thorium (Th)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	0.00035	0.00041	0.00035	0.00046	<0.00030
	Tungsten (W)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Uranium (U)-Total (mg/L)	0.000023	0.000026	0.000023	0.000026	<0.000010
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Total (mg/L)	0.0476	0.0420	0.0099	0.0419	0.158
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1686014-6				
	Description	WATER				
	Sampled Date	06-OCT-15				
	Sampled Time	14:42				
	Client ID	LUP-21-151005				
Grouping	**Analyte**					
WATER						
Total Metals	Tellurium (Te)-Total (mg/L)	<0.00020				
	Thallium (Tl)-Total (mg/L)	<0.000010				
	Thorium (Th)-Total (mg/L)	<0.00010				
	Tin (Sn)-Total (mg/L)	<0.00010				
	Titanium (Ti)-Total (mg/L)	<0.00030				
	Tungsten (W)-Total (mg/L)	<0.00010				
	Uranium (U)-Total (mg/L)	0.000016				
	Vanadium (V)-Total (mg/L)	<0.00050				
	Zinc (Zn)-Total (mg/L)	<0.0030				
	Zirconium (Zr)-Total (mg/L)	<0.00030				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Antimony (Sb)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6
Duplicate	Beryllium (Be)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6
Duplicate	Bismuth (Bi)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6
Duplicate	Cesium (Cs)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6
Duplicate	Chromium (Cr)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6
Duplicate	Cobalt (Co)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6
Duplicate	Copper (Cu)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6
Duplicate	Lead (Pb)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6
Duplicate	Phosphorus (P)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6
Duplicate	Silver (Ag)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6
Duplicate	Tellurium (Te)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6
Duplicate	Thallium (Tl)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6
Duplicate	Thorium (Th)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6
Duplicate	Tin (Sn)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6
Duplicate	Titanium (Ti)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6
Duplicate	Tungsten (W)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6
Duplicate	Vanadium (V)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6
Duplicate	Zinc (Zn)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6
Duplicate	Zirconium (Zr)-Total	DLDS	L1686014-1, -2, -3, -4, -5, -6

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TOT-ED	Water	Alkalinity, T	APHA 2320 B-Auto-Pot. Titration
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002

This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.

ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.

NO2+NO3-CALC-ED	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-ED	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-ED	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric

Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location

Reference Information

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Lupin Mines Incorporated c/o Elgin Mining Inc.	Select Report Format: ☒ PDF ☒ EXCEL ☐ EDD (DIGITAL)	R ☒ Regular (Standard TAT if received by 3 pm - business days)
Contact:	K. Lewis	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	76 Richmond Street East, Suite 330 Toronto, ON M5C 1P1	☐ Criteria on Report - provide details below if box checked Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	778-386-7340	Email 1 or Fax klewis@elginmining.com	Specify Date Required for E2,E or P:
		Email 2	

Invoice To	Same as Report To ☑ Yes ☐ No	Invoice Distribution	Analysis Request
	Copy of Invoice with Report ☐ Yes ☐ No	Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
Company:		Email 1 or Fax klewis@elginmining.com	
Contact:		Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	53119	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:	Lupin Mine	Location:	

ALS Lab Work Order # (lab use only): L1686014 | ALS Contact: Rick Zoliewski | Sampler: C.de Repentigny

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Alkalinity	Total Suspended Solids	Hardness	Ammonia (NH4)	Total Cyanide	Total Metals	Nitrate							Number of Containers
					P	P	P											
	LUP-22-151005	05-oct-15	15:38	Water	R	R	R	R	R	R								4
	LUP-24-151005	05-oct-15	14:35	Water	R	R	R	R	R	R								4
	LUP-25-151005	05-oct-15	14:05	Water	R	R	R	R	R	R								4
	LUP-28-151005	05-oct-15	14:45	Water	R	R	R	R	R	R								4
	LUP-20-151006	06-oct-15	14:20	Water	R	R	R	R	R	R								4
	LUP-21-151006	06-oct-15	14:42	Water	R	R	R	R	R	R	R							4
			Alberta time															

L1686014-COFC

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)	SAMPLE CONDITION AS RECEIVED (lab use only)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No		Frozen ☐ SIF Observations Yes ☐ No ☐
Are samples for human drinking water use? ☐ Yes ☐ No		Ice packs Yes ☐ No ☐ Custody seal intact Yes ☐ No ☐
		Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
4.8					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	Oct. 8/15	9:47		Oct 8/15	1200			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326a v09 Front/04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

LUPIN MINES INCORPORATED
ATTN: Karen Lewis
76 Richmond Street
Suite 330
Toronto ON M5C 1P1

Date Received: 09-OCT-15
Report Date: 02-NOV-15 11:42 (MT)
Version: FINAL

Client Phone: 778-386-7340

Certificate of Analysis

Lab Work Order #: L1686101

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1686101-1	L1686101-2			
	Description	WATER	WATER			
	Sampled Date	08-OCT-15	08-OCT-15			
	Sampled Time	07:45	07:50			
	Client ID	LUP-10-151008	LUP-35-151008			
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	175	185			
	Total Suspended Solids (mg/L)	<3.0	<3.0			
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	4.6	4.5			
	Ammonia, Total (as N) (mg/L)	0.087	0.089			
	Nitrate and Nitrite (as N) (mg/L)	0.908	0.894			
	Nitrate (as N) (mg/L)	0.908	0.894			
	Nitrite (as N) (mg/L)	<0.010	<0.010			
Cyanides	Cyanide, Total (mg/L)	<0.0050	<0.0050			
Total Metals	Aluminum (Al)-Total (mg/L)	0.0187	0.0193			
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010			
	Arsenic (As)-Total (mg/L)	0.00627	0.00627			
	Barium (Ba)-Total (mg/L)	0.0143	0.0144			
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010			
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050			
	Boron (B)-Total (mg/L)	0.055	0.057			
	Cadmium (Cd)-Total (mg/L)	0.000203	0.000190			
	Calcium (Ca)-Total (mg/L)	58.0	61.6			
	Cesium (Cs)-Total (mg/L)	0.000084	0.000078			
	Chromium (Cr)-Total (mg/L)	<0.00010	<0.00010			
	Cobalt (Co)-Total (mg/L)	0.0313	0.0317			
	Copper (Cu)-Total (mg/L)	0.00152	0.00155			
	Iron (Fe)-Total (mg/L)	0.110	0.113			
	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050			
	Lithium (Li)-Total (mg/L)	0.0244	0.0248			
	Magnesium (Mg)-Total (mg/L)	7.20	7.47			
	Manganese (Mn)-Total (mg/L)	0.813	0.813			
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050			
	Nickel (Ni)-Total (mg/L)	0.0693	0.0709			
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050			
	Potassium (K)-Total (mg/L)	4.64	4.74			
	Rubidium (Rb)-Total (mg/L)	0.00211	0.00221			
	Selenium (Se)-Total (mg/L)	0.000054	<0.000050			
	Silicon (Si)-Total (mg/L)	1.82	1.83			
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010			
	Sodium (Na)-Total (mg/L)	42.5	44.6			
	Strontium (Sr)-Total (mg/L)	0.263	0.263			
	Sulfur (S)-Total (mg/L)	73.0	73.7			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1686101-1	L1686101-2			
	Description	WATER	WATER			
	Sampled Date	08-OCT-15	08-OCT-15			
	Sampled Time	07:45	07:50			
	Client ID	LUP-10-151008	LUP-35-151008			
Grouping	**Analyte**					
WATER						
Total Metals	Tellurium (Te)-Total (mg/L)	<0.00020	<0.00020			
	Thallium (Tl)-Total (mg/L)	0.000012	<0.000010			
	Thorium (Th)-Total (mg/L)	<0.00010	<0.00010			
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010			
	Titanium (Ti)-Total (mg/L)	<0.00030	<0.00030			
	Tungsten (W)-Total (mg/L)	<0.00010	<0.00010			
	Uranium (U)-Total (mg/L)	0.000020	0.000017			
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050			
	Zinc (Zn)-Total (mg/L)	0.228	0.232			
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030			
Radiological Parameters	Ra-226 (Bq/L)	<0.0100	<0.0100			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Antimony (Sb)-Total	DLDS	L1686101-1, -2
Duplicate	Beryllium (Be)-Total	DLDS	L1686101-1, -2
Duplicate	Bismuth (Bi)-Total	DLDS	L1686101-1, -2
Duplicate	Cesium (Cs)-Total	DLDS	L1686101-1, -2
Duplicate	Chromium (Cr)-Total	DLDS	L1686101-1, -2
Duplicate	Cobalt (Co)-Total	DLDS	L1686101-1, -2
Duplicate	Copper (Cu)-Total	DLDS	L1686101-1, -2
Duplicate	Lead (Pb)-Total	DLDS	L1686101-1, -2
Duplicate	Phosphorus (P)-Total	DLDS	L1686101-1, -2
Duplicate	Silver (Ag)-Total	DLDS	L1686101-1, -2
Duplicate	Tellurium (Te)-Total	DLDS	L1686101-1, -2
Duplicate	Thallium (Tl)-Total	DLDS	L1686101-1, -2
Duplicate	Thorium (Th)-Total	DLDS	L1686101-1, -2
Duplicate	Tin (Sn)-Total	DLDS	L1686101-1, -2
Duplicate	Titanium (Ti)-Total	DLDS	L1686101-1, -2
Duplicate	Tungsten (W)-Total	DLDS	L1686101-1, -2
Duplicate	Vanadium (V)-Total	DLDS	L1686101-1, -2
Duplicate	Zinc (Zn)-Total	DLDS	L1686101-1, -2
Duplicate	Zirconium (Zr)-Total	DLDS	L1686101-1, -2

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TOT-ED	Water	Alkalinity, T	APHA 2320 B-Auto-Pot. Titration
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002
This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.			
ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
NH3-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)
This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.			
NO2+NO3-CALC-ED	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-ED	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-ED	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
RA226-MMER-FC	Water	Ra226 by Alpha Scint, MDC=0.01 Bq/L	EPA 903.1
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code **Laboratory Location**

Reference Information

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Radium-226

Case Narrative

ALS Environmental

L1686101

Work Order Number: 1510223

1. This report consists of the analytical results for two water samples received by ALS on 10/14/2015.

2. These samples were prepared and analyzed according to the current revision of SOP 783. The analyses were completed on 10/23/2015.

3. The analysis results for these samples are reported in units of BQ/l. The samples were not filtered prior to analysis.

4. Due to uncertainty associated with the ICP-AES determination of barium concentration in the samples, the calculated yield for samples RE151015-2MB and RE151015-2LCSD fell between 100% and 110%. To minimize the potential for low bias, results have been calculated conservatively assuming quantitative chemical yield (100%). The magnitude of the low bias is estimated to be less than 10% of the reported value and is acceptable according the ALS LQAP. These samples are identified with a “Y1” qualifier on the final report.

5. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Jill Latelle — 10/27/15
Jill Latelle — Date
Radiochemistry Primary Data Reviewer

10/27/15
Radiochemistry Final Data Reviewer — Date

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1510223
Client Name: ALS Environmental
Client Project Name:
Client Project Number: L1686101
Client PO Number: L1686101

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L1686101-1	1510223-1		WATER	08-Oct-15	
L1686101-2	1510223-2		WATER	08-Oct-15	

ALS Environmental

151022 3

L1686101

YELLOWKNIFE

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA
225 COMMERCE DRIVE
FORT COLLINS,CO 80524

NOTES: Please reference on final report and invoice: PO# *L1686101*
ALS requires QC data to be provided with your final results.

Please see enclosed 2 **sample(s) in** 2 **Container(s)**

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
(1) **L1686101-1 LUP-10-151008**		10/ 8/ 2015	
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	11/2/2015	
(2) **L1686101-2 LUP-29-151008**		10/ 8/ 2015	
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	11/2/2015	

Subcontract Info Contact: Sean Whitaker (867) 873-5593

Analysis and reporting info contact: Rick Zolkiewski
314 OLD AIRPORT ROAD
Unit 116
YELLOWKNIFE,NT X1A 3T3
Phone: (867) 873-5593 Email: Rick.Zolkiewski@alsglobal.com

Please email confirmation of receipt to: **Rick.Zolkiewski@alsglobal.com**

Shipped By: _____ Date Shipped: _____

Received By: _____ Date Received: 10/14/15 1015

Verified By: _____ Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS Yellow Knife Workorder No: 1510223

Project Manager: ARW Initials: SDM Date: 10-14-15

1. Does this project require any special handling in addition to standard ALS procedures?		YES	(NO)
2. Are custody seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		(YES)	NO
5. Are the COC and bottle labels complete and legible?		(YES)	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		(YES)	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	(YES)	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	(YES)	NO
9. Are all aqueous non-preserved samples pH 4-9?	(N/A)	YES	NO
10. Is there sufficient sample for the requested analyses?		(YES)	NO
11. Were all samples placed in the proper containers for the requested analyses?		(YES)	NO
12. Are all samples within holding times for the requested analyses?		(YES)	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		(YES)	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	(N/A)	YES	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	N/A	YES	(NO)
16. Were the samples shipped on ice?		(YES)	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: (#2) #4	(RAD ONLY)	YES	(NO)

Cooler #:	1								
Temperature (°C):	12.1								
No. of custody seals on cooler:	0								
DOT Survey/ Acceptance Information — External µR/hr reading:	12								
Background µR/hr reading:	10								

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? (YES) / NO / NA (If no, see Form 008.)

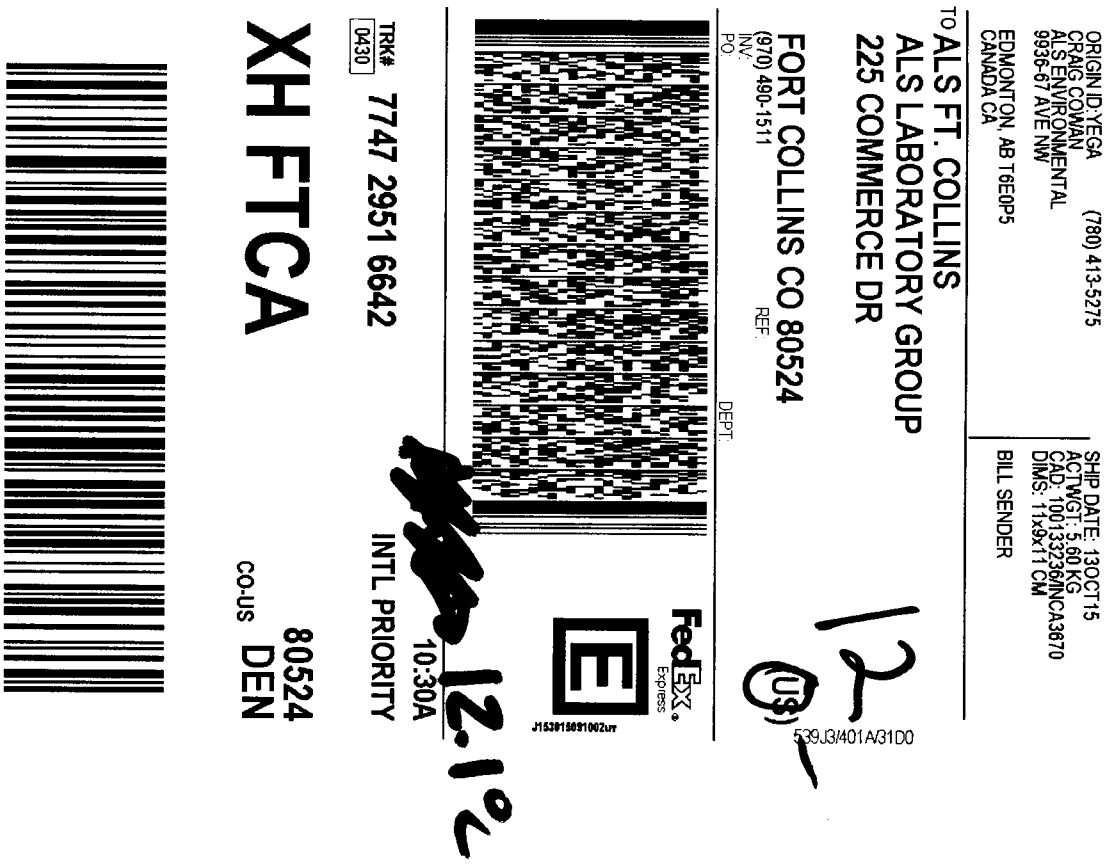
Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? YES / NO (NA) Contact: _____ Date/Time: _____

Project Manager Signature / Date: 10/14/15

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

1510223



After printing this label:

CONSIGNEE COPY - PLEASE PLACE IN FRONT OF POUCH

1. Fold the printed page along the horizontal line.
2. Place label in shipping pouch and affix it to your shipment.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

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For those shipments transported solely by road, if a conflict arises between the provisions of the CMR and this Air Waybill, the terms of the CMR shall prevail. LIMITATION OF LIABILITY. If not governed by the Warsaw Convention, the CMR, or other international treaties, laws, other government regulations, orders, or requirements, FedEx's maximum liability for damage, loss, delay, shortage, mis-delivery, nondelivery, misinformation or failure to provide information in connection with your shipment is limited by this Agreement and as set out in the terms and conditions of the contract of carriage. Please refer to the contract of carriage set forth in the applicable FedEx Service Guide or its equivalent to determine the contractual limitation. FedEx does not provide cargo liability or all-risk insurance, but you may pay an additional charge for each additional U.S. $100 (or equivalent local currency for the country of origin) of declared value for carriage. 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Refer to the Convention to determine the claims period for your shipment. The right to damages against us shall be extinguished unless an action is brought within two years, as set forth in the Convention. FedEx is not obligated to act on any claim until all transportation charges have been paid. The claim amount may not be deducted from the transportation charges. If the recipient accepts the shipment without noting any damage on the delivery record, FedEx will assume the shipment was delivered in good condition. In order for us to consider a claim for damage, the contents, original shipping carton and packing must be made available to us for inspection. MANDATORY LAW. Insofar as any provision contained or referred to in this Air Waybill may be contrary to any applicable international treaties, laws, government regulations, orders or requirements such provisions shall remain in effect as a part of our agreement to the extent that it is not overridden. The invalidity or unenforceability of any provisions shall not affect any other part of this Air Waybill. Unless otherwise indicated, FEDERAL EXPRESS CORPORATION, 2005 Corporate Avenue, Memphis, TN 38132, USA, is the first carrier of this shipment. Email address located at www.fedex.com.

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Method Blank Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1510223
Client Name: ALS Environmental
ClientProject ID: L1686101

Lab ID: RE151015-2MB

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 15-Oct-15
Date Prepared: 15-Oct-15
Date Analyzed: 23-Oct-15

Prep Batch: RE151015-2
QCBatchID: RE151015-2-1
Run ID: RE151015-2A
Count Time: 30 minutes

Final Aliquot: 995 ml
Result Units: BQ/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	BDL	0.0068	0.00999	NA	Y1,U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15190	15400	ug	102	40 - 110 %	Y1

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: *RE1510223-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Environmental -- FC
Work Order Number: 1510223
Client Name: ALS Environmental
ClientProject ID: L1686101

Lab ID: RE151015-2LCS

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 15-Oct-15
Date Prepared: 15-Oct-15
Date Analyzed: 23-Oct-15

Prep Batch: RE151015-2
QCBatchID: RE151015-2-1
Run ID: RE151015-2A
Count Time: 15 minutes

Final Aliquot: 995 ml
Result Units: BQ/l
File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	1.65 +/- 0.412	0.0105	1.704	96.8	67 - 120	P,M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15190	15100	ug	99.2	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: *RE1510223-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Environmental -- FC
Work Order Number: 1510223
Client Name: ALS Environmental
ClientProject ID: L1686101

Lab ID: RE151015-2LCSD

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 15-Oct-15
Date Prepared: 15-Oct-15
Date Analyzed: 23-Oct-15

Prep Batch: RE151015-2
QCBatchID: RE151015-2-1
Run ID: RE151015-2A
Count Time: 15 minutes

Final Aliquot: 995 ml
Result Units: BQ/l
File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	1.60 +/- 0.399	0.0108	1.704	93.8	67 - 120	P,Y1,M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15190	15800	ug	104	40 - 110 %	Y1

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: *RE1510223-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Environmental -- FC
Work Order Number: 1510223
Client Name: ALS Environmental
ClientProject ID: L1686101

Field ID:
Lab ID: RE151015-2LCSD

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 15-Oct-15
Date Prepared: 15-Oct-15
Date Analyzed: 23-Oct-15

Prep Batch: RE151015-2
QCBatchID: RE151015-2-1
Run ID: RE151015-2A
Count Time: 15 minutes

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: BQ/l
File Name: Manual Entry

CASNO	Analyte	Sample			Duplicate			DER	DER Lim
		Result +/- 2 s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags		
13982-63-3	Ra-226	1.65 +/- 0.412	0.0105	P,M3	1.60 +/- 0.399	0.0108	P,Y1,M3	0.0897	2.13

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty
DER - Duplicate Error Ratio
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: *RE1510223-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1510223
Client Name: ALS Environmental
ClientProject ID: L1686101

Field ID: L1686101-1
Lab ID: 1510223-1

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 08-Oct-15
Date Prepared: 15-Oct-15
Date Analyzed: 23-Oct-15

Prep Batch: RE151015-2
QCBatchID: RE151015-2-1
Run ID: RE151015-2A
Count Time: 30 minutes
Report Basis: Unfiltered

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: BQ/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.0091 +/- 0.0060	0.0072	0.00999	NA	LT

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15190	14400	ug	95.0	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *RE1510223-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1510223
Client Name: ALS Environmental
ClientProject ID: L1686101

Field ID: L1686101-2
Lab ID: 1510223-2

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 08-Oct-15
Date Prepared: 15-Oct-15
Date Analyzed: 23-Oct-15

Prep Batch: RE151015-2
QCBatchID: RE151015-2-1
Run ID: RE151015-2A
Count Time: 30 minutes
Report Basis: Unfiltered

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: BQ/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.0086 +/- 0.0057	0.0066	0.00999	NA	LT

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15190	14800	ug	97.4	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *RE1510223-1*

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Lupin Mines Incorporated c/o Elgin Mining Inc.	Select Report Format: ☒ PDF ☒ EXCEL | EDD (DIGITAL)	R ☒ Regular (Standard TAT if received by 3 pm - business days)
Contact:	K. Lewis	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	76 Richmond Street East, Suite 330 Toronto, ON M5C 1P1	☐ Criteria on Report - provide details below if box checked	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
Phone:	778-386-7340	Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
		Email 1 or Fax klewis@elginmining.com	Specify Date Required for E2,E or P:
		Email 2	

Invoice To	Same as Report To ☑ Yes ☐ No	Invoice Distribution
	Copy of Invoice with Report ☐ Yes ☐ No	Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX
Company:		Email 1 or Fax klewis@elginmining.com
Contact:		Email 2

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	53119	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:	Lupin Mine	Location:	

ALS Lab Work Order # (lab use only): L1686101 | ALS Contact: Rick Zoliewski | Sampler: C.de Repentigny

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals	Total Cyanide	Total Suspended Solids	Alkalinity	Hardness	Nitrate, Nitrite	Ammonia	Radium	Number of Containers
					P	P					P	P	
	Lup-10-151008	08-oct-15	7:45	Water	R	R	R	R	R	R	R	R	6
	Lup-29-151008	08-oct-15	7:50	Water	R	R	R	R	R	R	R	R	6

L1686101-COFC

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No	
Are samples for human drinking water use? ☐ Yes ☐ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐			SIF Observations	Yes ☐	No ☐	
Ice packs	Yes ☐	No ☐		Custody seal intact	Yes ☐	No ☐	
Cooling Initiated	☐						

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
8.6					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	oct 8/15	8:40		10/9/15	12:30			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326e v09 Front/04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

LUPIN MINES INCORPORATED
ATTN: Karen Lewis
76 Richmond Street
Suite 330
Toronto ON M5C 1P1

Date Received: 15-OCT-15
Report Date: 27-OCT-15 08:58 (MT)
Version: FINAL

Client Phone: 778-386-7340

Certificate of Analysis

Lab Work Order #: L1688171

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1688171-1	L1688171-2	L1688171-3	L1688171-4	L1688171-5
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	09-OCT-15	10-OCT-15	11-OCT-15	12-OCT-15	13-OCT-15
	Sampled Time	08:10	07:55	08:05	09:15	08:40
	Client ID	LUP-10-151009	LUP-10-151010	LUP-10-151011	LUP-10-151012	LUP-10-151013
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	183	187	178	184	185
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	<3.0	<3.0
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	4.7	5.0	4.8	4.6	4.2
	Nitrate and Nitrite (as N) (mg/L)	0.933	0.936	0.939	0.946	0.943
	Nitrate (as N) (mg/L)	0.933	0.936	0.939	0.946	0.943
	Nitrite (as N) (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
Cyanides	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Total Metals	Aluminum (Al)-Total (mg/L)	0.0199	0.0225	0.0203	0.0287	0.0387
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00602	0.00656	0.00638	0.00697	0.00783
	Barium (Ba)-Total (mg/L)	0.0136	0.0135	0.0137	0.0136	0.0134
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Total (mg/L)	0.061	0.060	0.057	0.059	0.060
	Cadmium (Cd)-Total (mg/L)	0.000210	0.000212	0.000215	0.000203	0.000207
	Calcium (Ca)-Total (mg/L)	61.1	62.0	58.4	61.0	61.3
	Cesium (Cs)-Total (mg/L)	0.000074	0.000076	0.000077	0.000074	0.000076
	Chromium (Cr)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Cobalt (Co)-Total (mg/L)	0.0313	0.0315	0.0314	0.0316	0.0320
	Copper (Cu)-Total (mg/L)	0.00156	0.00157	0.00147	0.00183	0.00217
	Iron (Fe)-Total (mg/L)	0.113	0.123	0.114	0.123	0.134
	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	0.000078
	Lithium (Li)-Total (mg/L)	0.0233	0.0226	0.0215	0.0224	0.0222
	Magnesium (Mg)-Total (mg/L)	7.52	7.72	7.76	7.64	7.74
	Manganese (Mn)-Total (mg/L)	0.816	0.806	0.798	0.804	0.813
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Nickel (Ni)-Total (mg/L)	0.0696	0.0705	0.0700	0.0700	0.0714
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	4.56	4.61	4.57	4.47	4.65
	Rubidium (Rb)-Total (mg/L)	0.00207	0.00210	0.00190	0.00208	0.00201
	Selenium (Se)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Silicon (Si)-Total (mg/L)	1.83	1.82	1.86	1.89	1.91
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	41.9	42.7	42.7	42.4	42.5
	Strontium (Sr)-Total (mg/L)	0.255	0.255	0.250	0.260	0.259
	Sulfur (S)-Total (mg/L)	73.8	74.3	74.4	75.9	76.1
	Tellurium (Te)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1688171-6				
	Description	WATER				
	Sampled Date	14-OCT-15				
	Sampled Time	08:20				
	Client ID	LUP-10-151014				
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	191				
	Total Suspended Solids (mg/L)	<3.0				
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	3.3 RRV				
	Nitrate and Nitrite (as N) (mg/L)	0.955				
	Nitrate (as N) (mg/L)	0.955				
	Nitrite (as N) (mg/L)	<0.010				
Cyanides	Cyanide, Total (mg/L)	<0.0050				
Total Metals	Aluminum (Al)-Total (mg/L)	0.0410				
	Antimony (Sb)-Total (mg/L)	<0.00010				
	Arsenic (As)-Total (mg/L)	0.00787				
	Barium (Ba)-Total (mg/L)	0.0137				
	Beryllium (Be)-Total (mg/L)	<0.00010				
	Bismuth (Bi)-Total (mg/L)	<0.000050				
	Boron (B)-Total (mg/L)	0.061				
	Cadmium (Cd)-Total (mg/L)	0.000216				
	Calcium (Ca)-Total (mg/L)	63.7				
	Cesium (Cs)-Total (mg/L)	0.000074				
	Chromium (Cr)-Total (mg/L)	<0.00010				
	Cobalt (Co)-Total (mg/L)	0.0323				
	Copper (Cu)-Total (mg/L)	0.00220				
	Iron (Fe)-Total (mg/L)	0.136				
	Lead (Pb)-Total (mg/L)	0.000085				
	Lithium (Li)-Total (mg/L)	0.0229				
	Magnesium (Mg)-Total (mg/L)	7.75				
	Manganese (Mn)-Total (mg/L)	0.809				
	Molybdenum (Mo)-Total (mg/L)	<0.000050				
	Nickel (Ni)-Total (mg/L)	0.0720				
	Phosphorus (P)-Total (mg/L)	<0.050				
	Potassium (K)-Total (mg/L)	4.64				
	Rubidium (Rb)-Total (mg/L)	0.00212				
	Selenium (Se)-Total (mg/L)	0.000053				
	Silicon (Si)-Total (mg/L)	1.93				
	Silver (Ag)-Total (mg/L)	<0.000010				
	Sodium (Na)-Total (mg/L)	42.9				
	Strontium (Sr)-Total (mg/L)	0.268				
	Sulfur (S)-Total (mg/L)	76.0				
	Tellurium (Te)-Total (mg/L)	<0.00020				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1688171-1	L1688171-2	L1688171-3	L1688171-4	L1688171-5
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	09-OCT-15	10-OCT-15	11-OCT-15	12-OCT-15	13-OCT-15
	Sampled Time	08:10	07:55	08:05	09:15	08:40
	Client ID	LUP-10-151009	LUP-10-151010	LUP-10-151011	LUP-10-151012	LUP-10-151013
Grouping	**Analyte**					
WATER						
Total Metals	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Thorium (Th)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Tungsten (W)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Uranium (U)-Total (mg/L)	0.000014	0.000014	0.000012	0.000014	0.000016
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Total (mg/L)	0.223	0.225	0.226	0.227	0.232
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1688171-6				
	Description	WATER				
	Sampled Date	14-OCT-15				
	Sampled Time	08:20				
	Client ID	LUP-10-151014				
Grouping	**Analyte**					
WATER						
Total Metals	Thallium (Tl)-Total (mg/L)	<0.000010				
	Thorium (Th)-Total (mg/L)	<0.00010				
	Tin (Sn)-Total (mg/L)	<0.00010				
	Titanium (Ti)-Total (mg/L)	<0.00030				
	Tungsten (W)-Total (mg/L)	<0.00010				
	Uranium (U)-Total (mg/L)	0.000016				
	Vanadium (V)-Total (mg/L)	<0.00050				
	Zinc (Zn)-Total (mg/L)	0.232				
	Zirconium (Zr)-Total (mg/L)	<0.00030				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Aluminum (Al)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Antimony (Sb)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Beryllium (Be)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Bismuth (Bi)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Cadmium (Cd)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Cesium (Cs)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Chromium (Cr)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Cobalt (Co)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Copper (Cu)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Lead (Pb)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Nickel (Ni)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Phosphorus (P)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Selenium (Se)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Silver (Ag)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Tellurium (Te)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Thallium (Tl)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Thorium (Th)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Tin (Sn)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Titanium (Ti)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Tungsten (W)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Vanadium (V)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Zirconium (Zr)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Aluminum (Al)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Antimony (Sb)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Beryllium (Be)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Bismuth (Bi)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Cesium (Cs)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Chromium (Cr)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Copper (Cu)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Lead (Pb)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Phosphorus (P)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Selenium (Se)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Silver (Ag)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Tellurium (Te)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Thallium (Tl)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Thorium (Th)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Tin (Sn)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Titanium (Ti)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Tungsten (W)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Vanadium (V)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Zinc (Zn)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Duplicate	Zirconium (Zr)-Total	DLDS	L1688171-1, -2, -3, -4, -5, -6
Matrix Spike	Nitrate (as N)	MS-B	L1688171-1, -2, -3, -4, -5, -6

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

Reference Information

ALK-TOT-ED	Water	Alkalinity, T	APHA 2320 B-Auto-Pot. Titration
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002

This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.

ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NO2+NO3-CALC-ED	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-ED	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-ED	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric

Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Lupin Mines Incorporated c/o Elgin Mining Inc.	Select Report Format: ☒ PDF ☒ EXCEL ☐ EDD (DIGITAL)	R ☒ Regular (Standard TAT if received by 3 pm - business days)
Contact:	K. Lewis	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	76 Richmond Street East, Suite 330 Toronto, ON M5C 1P1	☐ Criteria on Report - provide details below if box checked Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	778-386-7340	Email 1 or Fax klewis@elginmining.com Email 2	Specify Date Required for E2,E or P:

Invoice To		Invoice Distribution	Analysis Request
	Same as Report To ☑ Yes ☐ No		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
	Copy of Invoice with Report ☐ Yes ☐ No	Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	P P
Company:		Email 1 or Fax klewis@elginmining.com	
Contact:		Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	53119	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:	Lupin Mine	Location:	

ALS Lab Work Order # (lab use only)	L1688171	ALS Contact:	Rick Zoliewski	Sampler:	C.de Repentigny

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals	Total Cyanide	TSS, Alkalinity, Hardness, Nitrate, Nitrate	Number of Containers
	Lup-10-151009	09-oct-15	8:10	Water	R	R	R	3
	Lup-10-151010	10-oct-15	7:55	Water	R	R	R	3
	Lup-10-151011	11-oct-15	8:05	Water	R	R	R	3
	Lup-10-151012	12-oct-15	9:15	Water	R	R	R	3
	Lup-10-151013	13-oct-15	8:40	Water	R	R	R	3
	Lup-10-151014	14-oct-15	8:20	Water	R	R	R	3

L1688171-COFC

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☑ No Are samples for human drinking water use? ☐ Yes ☑ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐	SIF Observations	Yes ☐	No ☐
Ice packs	Yes ☐	No ☐	Custody seal intact	Yes ☐ No ☐
Cooling Initiated	☐			

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
8.5					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: Oct. 14/2015	Time: 13:40	Received by:	Date: 10/15/15	Time: 12:00	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326e v09 Front/04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

LUPIN MINES INCORPORATED
ATTN: Karen Lewis
76 Richmond Street
Suite 330
Toronto ON M5C 1P1

Date Received: 15-OCT-15
Report Date: 27-OCT-15 09:00 (MT)
Version: FINAL

Client Phone: 778-386-7340

Certificate of Analysis

Lab Work Order #: L1688190

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1688190-1	L1688190-2	L1688190-3	L1688190-4	L1688190-5
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	13-OCT-15	13-OCT-15	13-OCT-15	13-OCT-15	13-OCT-15
	Sampled Time	11:10	10:15	12:20	13:25	12:55
	Client ID	LUP-25-151013	LUP-24-151013	LUP-22-151013	LUP-21-151013	LUP-20-151013
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	16.2	41.4	57.0	6.30	203
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	<3.0	<3.0
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	3.4	2.6	4.5	2.9	2.0
	Ammonia, Total (as N) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Nitrate and Nitrite (as N) (mg/L)	0.042	0.126	0.202	<0.022	0.922
	Nitrate (as N) (mg/L)	0.042	0.126	0.202	<0.020	0.922
	Nitrite (as N) (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
Cyanides	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Total Metals	Aluminum (Al)-Total (mg/L)	0.0196	0.0239	0.0277	0.0146	0.0625
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00041	0.00051	0.00063	0.00026	0.00146
	Barium (Ba)-Total (mg/L)	0.00447	0.00728	0.00908	0.00216	0.0230
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Total (mg/L)	<0.010	0.012	0.017	<0.010	0.063
	Cadmium (Cd)-Total (mg/L)	0.0000130	0.0000358	0.0000584	<0.0000050	0.000204
	Calcium (Ca)-Total (mg/L)	4.66	12.9	17.9	1.31	66.7
	Cesium (Cs)-Total (mg/L)	0.000013	0.000021	0.000029	<0.000010	0.000085
	Chromium (Cr)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Cobalt (Co)-Total (mg/L)	0.00115	0.00365	0.00581	<0.00010	0.0243
	Copper (Cu)-Total (mg/L)	0.00066	0.00075	0.00079	0.00072	0.00086
	Iron (Fe)-Total (mg/L)	0.026	0.024	0.033	0.031	0.028
	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Total (mg/L)	0.0022	0.0049	0.0071	<0.0010	0.0248
	Magnesium (Mg)-Total (mg/L)	1.12	2.23	2.98	0.734	8.85
	Manganese (Mn)-Total (mg/L)	0.0272	0.0872	0.141	0.00280	0.634
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Nickel (Ni)-Total (mg/L)	0.00577	0.0152	0.0213	0.00075	0.0755
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	0.619	1.12	1.51	0.345	4.83
	Rubidium (Rb)-Total (mg/L)	0.00116	0.00134	0.00156	0.00103	0.00267
	Selenium (Se)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Silicon (Si)-Total (mg/L)	0.347	0.783	0.914	0.313	2.18
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	3.27	8.83	12.7	0.652	45.6
	Strontium (Sr)-Total (mg/L)	0.0214	0.0523	0.0763	0.00688	0.275
	Sulfur (S)-Total (mg/L)	5.70	15.7	22.4	1.28	82.7

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1688190-1	L1688190-2	L1688190-3	L1688190-4	L1688190-5
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	13-OCT-15	13-OCT-15	13-OCT-15	13-OCT-15	13-OCT-15
	Sampled Time	11:10	10:15	12:20	13:25	12:55
	Client ID	LUP-25-151013	LUP-24-151013	LUP-22-151013	LUP-21-151013	LUP-20-151013
Grouping	**Analyte**					
WATER						
Total Metals	Tellurium (Te)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Thorium (Th)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	0.00035	<0.00030	<0.00030	<0.00030	<0.00030
	Tungsten (W)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Uranium (U)-Total (mg/L)	0.000020	0.000016	0.000015	0.000013	<0.000010
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Total (mg/L)	0.0119	0.0342	0.0538	<0.0030	0.204
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Aluminum (Al)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Antimony (Sb)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Beryllium (Be)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Bismuth (Bi)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Cadmium (Cd)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Cesium (Cs)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Chromium (Cr)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Cobalt (Co)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Copper (Cu)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Lead (Pb)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Nickel (Ni)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Phosphorus (P)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Selenium (Se)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Silver (Ag)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Tellurium (Te)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Thallium (Tl)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Thorium (Th)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Tin (Sn)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Titanium (Ti)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Tungsten (W)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Vanadium (V)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Zirconium (Zr)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Aluminum (Al)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Antimony (Sb)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Beryllium (Be)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Bismuth (Bi)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Cesium (Cs)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Chromium (Cr)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Copper (Cu)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Lead (Pb)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Phosphorus (P)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Selenium (Se)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Silver (Ag)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Tellurium (Te)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Thallium (Tl)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Thorium (Th)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Tin (Sn)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Titanium (Ti)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Tungsten (W)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Vanadium (V)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Zinc (Zn)-Total	DLDS	L1688190-1, -2, -3, -4, -5
Duplicate	Zirconium (Zr)-Total	DLDS	L1688190-1, -2, -3, -4, -5

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TOT-ED	Water	Alkalinity, T	APHA 2320 B-Auto-Pot. Titration
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002

This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and

Reference Information

CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.

ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.

NO2+NO3-CALC-ED	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-ED	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-ED	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric

Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Lupin Mines Incorporated c/o Elgin Mining Inc.	Select Report Format: ☒ PDF ☒ EXCEL ☐ EDD (DIGITAL)	R ☒ Regular (Standard TAT if received by 3 pm - business days)
Contact:	K. Lewis	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	76 Richmond Street East, Suite 330 Toronto, ON M5C 1P1	☐ Criteria on Report - provide details below if box checked Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	778-386-7340	Email 1 or Fax klewis@elginmining.com Email 2	Specify Date Required for E2,E or P:

Invoice To		Invoice Distribution	Analysis Request
	Same as Report To ☑ Yes ☐ No	Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
	Copy of Invoice with Report ☐ Yes ☐ No	Email 1 or Fax klewis@elginmining.com	
Company:		Email 2	
Contact:			

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	53119	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:	Lupin Mine	Location:	

ALS Lab Work Order # (lab use only): L1688190 | ALS Contact: Rick Zoliewski | Sampler: C.deR./A.Bowie

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Nitrate	TSS, Alkalinity, Hardness	Total Metals	Ammonia (NH4)	Total Cyanide								Number of Containers
							P	P	P								
	LUP-25-151013	13-oct-15	11:10	Water	R	R	R	R	R								5
	LUP-24-151013	13-oct-15	10:15	Water	R	R	R	R	R								5
	LUP-22-151013	13-oct-15	12:20	Water	R	R	R	R	R								5
	LUP-21-151013	13-oct-15	13:25	Water	R	R	R	R	R								5
	LUP-20-151013	13-oct-15	12:55	Water	R	R	R	R	R								5
			Alberta time														

L1688190-COFC

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No	
Are samples for human drinking water use? ☐ Yes ☐ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐		SIF Observations	Yes ☐	No ☐		
Ice packs	Yes ☐	No ☐	Custody seal intact	Yes ☐	No ☐		
Cooling Initiated	☐						

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
9.7					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	Oct.14/2015	13:25		10/15/15	12:00			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326e v09 Front04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

LUPIN MINES INCORPORATED
ATTN: Karen Lewis
76 Richmond Street
Suite 330
Toronto ON M5C 1P1

Date Received: 15-OCT-15
Report Date: 09-NOV-15 15:22 (MT)
Version: FINAL

Client Phone: 778-386-7340

Certificate of Analysis

Lab Work Order #: L1688508

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1688508-1	L1688508-2	L1688508-3		
	Description	WATER	WATER	WATER		
	Sampled Date	15-OCT-15	15-OCT-15	15-OCT-15		
	Sampled Time	09:25	09:30	09:55		
	Client ID	LUP-10-151015	LUP-35-151015	LUP-36-151015		
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	184	186	<0.13		
	pH (pH)	6.53	6.69	5.23		
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0		
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	3.1	3.8	<2.0		
	Ammonia, Total (as N) (mg/L)	0.066	0.075	<0.050		
	Nitrate and Nitrite (as N) (mg/L)	0.55	0.55	<0.022		
	Nitrate (as N) (mg/L)	0.55 DLDS	0.55 DLDS	<0.020		
	Nitrite (as N) (mg/L)	<0.10 DLDS	<0.10 DLDS	<0.010		
Cyanides	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050		
Total Metals	Aluminum (Al)-Total (mg/L)	0.0370	0.0389	<0.0030		
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Arsenic (As)-Total (mg/L)	0.00791	0.00793	<0.00010		
	Barium (Ba)-Total (mg/L)	0.0151	0.0153	<0.000050		
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050		
	Boron (B)-Total (mg/L)	0.057	0.057	<0.010		
	Cadmium (Cd)-Total (mg/L)	0.000219	0.000219	<0.0000050		
	Calcium (Ca)-Total (mg/L)	62.4	62.6	<0.050		
	Cesium (Cs)-Total (mg/L)	0.000084	0.000079	<0.000010		
	Chromium (Cr)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Cobalt (Co)-Total (mg/L)	0.0319	0.0323	<0.00010		
	Copper (Cu)-Total (mg/L)	0.00213	0.00219	<0.00050		
	Iron (Fe)-Total (mg/L)	0.123	0.124	<0.010		
	Lead (Pb)-Total (mg/L)	0.000079	0.000081	<0.000050		
	Lithium (Li)-Total (mg/L)	0.0263	0.0249	<0.0010		
	Magnesium (Mg)-Total (mg/L)	6.88	7.28	0.0092		
	Manganese (Mn)-Total (mg/L)	0.814	0.843	0.00048		
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050	<0.000050		
	Nickel (Ni)-Total (mg/L)	0.0709	0.0720	<0.00050		
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050		
	Potassium (K)-Total (mg/L)	4.69	4.86	<0.050		
	Rubidium (Rb)-Total (mg/L)	0.00225	0.00222	<0.00020		
	Selenium (Se)-Total (mg/L)	<0.000050	<0.000050	<0.000050		
	Silicon (Si)-Total (mg/L)	1.84	1.84	<0.050		
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010		
	Sodium (Na)-Total (mg/L)	40.6	41.3	<0.050		
	Strontium (Sr)-Total (mg/L)	0.273	0.265	0.00023		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1688508-1	L1688508-2	L1688508-3		
	Description	WATER	WATER	WATER		
	Sampled Date	15-OCT-15	15-OCT-15	15-OCT-15		
	Sampled Time	09:25	09:30	09:55		
	Client ID	LUP-10-151015	LUP-35-151015	LUP-36-151015		
Grouping	**Analyte**					
WATER						
Total Metals	Sulfur (S)-Total (mg/L)	76.5	77.0	<0.50		
	Tellurium (Te)-Total (mg/L)	<0.00020	<0.00020	<0.00020		
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010		
	Thorium (Th)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Titanium (Ti)-Total (mg/L)	<0.00030	<0.00030	<0.00030		
	Tungsten (W)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Uranium (U)-Total (mg/L)	0.000020	0.000017	<0.000010		
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Zinc (Zn)-Total (mg/L)	0.234	0.236	<0.0030		
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030		
Radiological Parameters	Ra-226 (Bq/L)	<0.0100	0.015	<0.0100		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TOT-ED	Water	Alkalinity, T	APHA 2320 B-Auto-Pot. Titration
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002
This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.			
ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
NH3-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)
This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.			
NO2+NO3-CALC-ED	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-ED	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-ED	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
PH-ED	Water	pH	APHA 4500 H-Electrode
All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed)			
RA226-MMER-FC	Water	Ra226 by Alpha Scint, MDC=0.01 Bq/L	EPA 903.1
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Radium-226

Case Narrative

ALS Environmental

L1688508

Work Order Number: 1510342

1. This report consists of the analytical results for three water samples received by ALS on 10/21/15.

2. These samples were prepared and analyzed according to the current revision of SOP 783. The analyses were completed on 11/3/15.

3. The analysis results for these samples are reported in units of Bq/L. These samples were not filtered prior to analysis.

4. Sample volume was insufficient to allow preparation of a duplicate. A laboratory control sample duplicate (LCSD) was prepared in lieu of a client sample duplicate.

5. ICP-AES measurement of barium concentrations prior to chemical separation for the associated QC samples showed concentrations less than zero. To avoid a low bias in the final analytical results, the initial barium concentration was taken to be zero.

6. Due to uncertainty associated with the ICP-AES determination of barium concentration in the samples, the calculated yield for samples RE151023-1LCSD fell between 100% and 110%. To minimize the potential for low bias, results have been calculated conservatively assuming quantitative chemical yield (100%). The magnitude of the low bias is estimated to be less than 10% of the reported value and is acceptable according the ALS LQAP. This sample is identified with a “Y1” flag on the final reports.

7. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Hannah Alt — 11/4/15

Hannah Alt
Radiochemistry Primary Data Reviewer
Date

11/6/15

Radiochemistry Final Data Reviewer
Date

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1510342
Client Name: ALS Environmental
Client Project Name:
Client Project Number: L1688508
Client PO Number: L1688508

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L1688508-1	1510342-1		WATER	15-Oct-15	
L1688508-2	1510342-2		WATER	15-Oct-15	
L1688508-3	1510342-3		WATER	15-Oct-15	

ALS Environmental

151034Z

L1688508

YELLOWKNIFE

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA
225 COMMERCE DRIVE
FORT COLLINS,CO 80524

NOTES: Please reference on final report and invoice: PO# *L1688508*
ALS requires QC data to be provided with your final results.

Please see enclosed 3 sample(s) in 3 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
(1) **L1688508-1 LUP-10-151015**		**10/15/2015**	
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	11/9/2015	
(2) **L1688508-2 LUP-35-151015**		**10/15/2015**	
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	11/9/2015	
(3) **L1688508-3 LUP-36-151015**		**10/15/2015**	
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	11/9/2015	

Subcontract Info Contact: Sean Whitaker (867) 873-5593

Analysis and reporting info contact: Rick Zolkiewski
314 OLD AIRPORT ROAD
Unit 116
YELLOWKNIFE,NT X1A 3T3
Phone: (867) 873-5593 Email: Rick.Zolkiewski@alsglobal.com

Please email confirmation of receipt to: **Rick.Zolkiewski@alsglobal.com**

Shipped By: _____ Date Shipped: _____

Received By: _____ Date Received: 10-21-15 / 0935

Verified By: _____ Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS yellowknife Workorder No: 1510342

Project Manager: ARO Initials: SDM Date: 10-21-15

1. Does this project require any special handling in addition to standard ALS procedures?		YES	(NO)
2. Are custody seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		(YES)	NO
5. Are the COC and bottle labels complete and legible?		(YES)	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		(YES)	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	(YES)	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	(YES)	NO
9. Are all aqueous non-preserved samples pH 4-9?	(N/A)	YES	NO
10. Is there sufficient sample for the requested analyses?		(YES)	NO
11. Were all samples placed in the proper containers for the requested analyses?		(YES)	NO
12. Are all samples within holding times for the requested analyses?		(YES)	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		(YES)	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	(N/A)	YES	NO
15. Do any water samples contain sediment? Amount of sediment: ____ dusting ____ moderate ____ heavy	N/A	YES	(NO)
16. Were the samples shipped on ice?		(YES)	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: (#2) #4	(RAD ONLY)	YES	(NO)

Cooler #:	1							
Temperature (°C):	9.0							
No. of custody seals on cooler:	0							
DOT Survey/ Acceptance Information — External µR/hr reading:	11							
Background µR/hr reading:	11							

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? **(YES) / NO / NA** (If no, see Form 008.)

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? **YES / NO / (NA)** Contact: _____ Date/Time: _____

Project Manager Signature / Date: 10/21/15

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

DEFINITIONS: On the Air Waybill 'We', 'Our', 'us' and 'FedEx' refer to Federal Express Corporation, its subsidiaries and branches and their respective employees, agents and independent contractors. 'You' and 'your' refer to the shipper, its employees, principals and agents. If your shipment originates outside the United States, your contract of carriage is with the Federal Express subsidiary, branch or independent contractor who originally accepts the shipment from you. 'Package' means any container or envelope that is accepted by us for delivery, including any such items tendered by you utilizing our automated systems, meters, manifests or waybills. 'Shipment' means all packages, which are tendered to and accepted by us on a single Air Waybill.
AGREEMENT TO TERMS. By giving us your shipment, you agree, regardless of whether you sign the front of this Air Waybill, for yourself and as agent for and on behalf of any other person having an interest in this shipment, to all terms on this NON-NEGOTIABLE Air Waybill. In any applicable tariff, and in our current Service Guide or Standard Conditions of Carriage, copies of which are available upon request. If there is a conflict between this Air Waybill and either the tariff, Service Guide or Standard Conditions then in effect, the tariff and the terms of any customer automation agreement between the shipper and Federal Express will control(the Service Guide or Standard Conditions have secondary priority). No one is authorized to alter or modify the terms of our agreement. This Air Waybill shall be binding on us when the shipment is accepted.
YOUR OBLIGATIONS: You warrant that each article in the shipment is properly described on this Air Waybill and is acceptable for transport by us, and that the shipment is properly marked, addressed (including postal codes) and packaged to ensure safe transportation with ordinary care in handling.
NOTE CONCERNING LIMITATIONS OF LIABILITY. Air Carriage Notice. If the carriage of your shipment by air involves an ultimate destination or stop in a country other than the country of departure, the Warsaw Convention, an international treaty relating to international carriage by air, may be applicable, which treaty would then govern and in most cases limit our liability for loss or delay of or damage to your shipment. In the U.S. the Warsaw Convention limits our liability to U.S. $9.07 per pound (U.S. $20.39 per kilogram). Unless you declare a higher value for carriage as described below. The interpretation of the Warsaw Convention liability limits may vary in other countries. There are no stopping places which are agreed at the time of tender of the shipment and we reserve the right to route shipments in any way we deem appropriate.
Road Transport Notice. Shipments transported partly or solely by road be it explicit agreement to do so or not-in, to, from a country which is party to the Convention on the Contract for the International Carriage of Goods by Road (the 'CMR') are subject to the terms and conditions of the CMR, notwithstanding any other provisions of this Agreement to the contrary. For these shipments transported solely by road, if a conflict arises between the provisions of the CMR and this Air Waybill the terms of the CMR shall prevail.
Limitation of Liability, If not governed by the Warsaw Convention or the CMR as described above, our maximum liability for loss, damage or delay is limited by this Air Waybill to U.S. $100 per shipment or U.S. $9.07 per pound (U.S. $20.39 per kilo) (or equivalent local currency), whichever is greater, unless you declare a higher value for carriage as described below. FedEx does not provide cargo liability or all-risk insurance, but you may pay an additional charge to each additional U.S. $100 (or equivalent local currency) of described value for carriage. If a higher value for carriage is declared and the additional charge is paid, FedEx maximum liability will be the lesser of the declared value for carriage or your actual damages.
LIABILITIES NOT ASSUMED. IN ANY EVENT, WE WON'T BE LIABLE FOR ANY DAMAGES WHETHER DIRECT , INCIDENTAL, SPECIAL OR CONSEQUENTIAL , IN EXCESS OF THE DECLARED VALUE FOR CARRIAGE (INCLUDING BUT NOT LIMITED TO LOSS OF INCOME OR PROFITS) WHETHER OR NOT WE HAD ANY KNOWLEDGE THAT SUCH DAMAGES MIGHT BE INCURRED, UNLESS SUCH DAMAGES WERE CAUSED BY OUR OWN WILLFUL MICONDUCT OR GROSS NEGLIGENCE.
We won't be liable for your actions or omissions, including but not limited to incorrect declaration of cargo, improper or insufficient packing, securing, marking or addressing of the shipment, or for the acts or omissions of the recipient or anyone else with an interest in the shipment. Also we won't be liable if you (or) the recipient violate any of the terms of our agreement. We won't be liable for loss of or damage to shipments of cash, currency or other prohibited items. We won't be liable for loss, damages or delay caused by events we cannot control, including but not limited to acts of God, perils of the air, weather conditions mechanical delays, acts of public enemies, war, strikes, civil commotions, or acts or omissions of public authorities (including customs and health officials) with actual or apperent authority.
NO WARRANTIES. We make no warranties, express or implied.
CLAIM FOR LOSS, DAMAGE FOR DELAY. ALL CLAIMS MUST BE NOTIFIED TO US WITHIN 15 DAYS AFTER DELIVERY OF THE SHIPMENT FAILING WHICH NO ACTION FOR DAMAGES MAY BE BROUGHT. All claims for loss, non-delivery or mis-delivery must be received by us within 90 days after the shipment is accepted by us. The right to damages against us shall be extinguished unless an action is brought within two years from the date of delivery of the shipment or from date on which the shipment should have been delivered. Within 30 days after notification to us (of) the claim, it must be documented by sending us all relevant information about it. We are not obligated to act on any claim until all transportation charges have been paid; the claim amount may not be deducted from those charges. If the recipient accepts the shipment without noting any damage on the delivery record, we will assume the shipment was delivered in good condition. In order for us to consider a claim for damages, the content(s), original shipping cartons, and packing must be available to us for inspection.
RIGHT TO INSPECT. Your shipment may, at our option or at the request of governmental authorities, be opened and inspected by us or such authorities or us at any time.
CUSTOMS CLEARANCE. It is your responsibility to provide proper customs documentation and confirmation, where required.
EXPORT CONTROL. You authorize Federal Express to act as forwarding agent for you for export control and customs purposes. You hereby certify that all statements and information contained in this air waybill relating to exportation are true and correct. Furthermore, you understand that civil and criminal penalties, including forfeiture and sale, may be imposed for making false or fraudulent statements or for the violation of any United States laws on exportation, including but not limited to, 13 USC Sec. 305; 22 USC Sec 401; 18 USC Sec. 1001; 50 USC app. 2410.
MANDATORY LAW. Insofar as any provision contained or referred to in this air Waybill may be contrary to any applicable international treaty, law government regulations, orders or requirements such provision shall remain in effect as a part of our agreement to the extent that it is not overridden. The invalidity or unenforceability of any provision shall not affect any other part of this Air Waybill. Unless otherwise indicated the Sender's address indicated on the face of this Waybill is the place of execution and the place of departure, and Recipient's address listed on the face of this Waybill is the place of destination. Unless otherwise indicated Federal Express Corporation, P.O. Box 727, Memphis, TN 38194 USA is the first carrier of this shipment.

After printing this label:
CONSIGNEE COPY - PLEASE PLACE IN FRONT OF POUCH
1. Fold the printed page along the horizontal line.
2. Place label in shipping pouch and affix it to your shipment.

1510342

From: (604) 253-4188 Origin ID: YBYA
HARJIT GILL
ALS ENVIRONMENTAL LAB GROUP
LOUGHEED HIGHWAY

BURNABY, BC V5A1W9
CANADA

FedEx Express

J141214073804uv

Ship Date: 19OCT15
ActWgt: 25.0 LB MAN
CAD: 0347419/CAFE2807

REF: Sublets
DESC-1: environmental Water samples for anlysis
DESC-2:
DESC-3:
DESC-4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 10.00 CAD
T/C: S *********
SIGN: HARJIT GILL
EIN/VAT:
PKG TYPE: CUSTOMER

11
-0
9.02

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521C3/401A6F03

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Method Blank Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1510342
Client Name: ALS Environmental
ClientProject ID: L1688508

Lab ID: RE151023-1MB

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 23-Oct-15
Date Prepared: 23-Oct-15
Date Analyzed: 03-Nov-15

Prep Batch: RE151023-1
QCBatchID: RE151023-1-1
Run ID: RE151023-1A
Count Time: 30 minutes

Final Aliquot: 995 ml
Result Units: BQ/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	BDL	0.0067	0.00999	NA	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	16340	15100	ug	92.2	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: *RE1510342-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Environmental -- FC
Work Order Number: 1510342
Client Name: ALS Environmental
ClientProject ID: L1688508

Lab ID: RE151023-1LCS

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 23-Oct-15
Date Prepared: 23-Oct-15
Date Analyzed: 03-Nov-15

Prep Batch: RE151023-1
QCBatchID: RE151023-1-1
Run ID: RE151023-1A
Count Time: 15 minutes

Final Aliquot: 995 ml
Result Units: BQ/l
File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	1.52 +/- 0.379	0.0115	1.704	89.1	67 - 120	P,M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	16340	15600	ug	95.7	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: *RE1510342-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Environmental -- FC
Work Order Number: 1510342
Client Name: ALS Environmental
ClientProject ID: L1688508

Lab ID: RE151023-1LCSD

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 23-Oct-15
Date Prepared: 23-Oct-15
Date Analyzed: 03-Nov-15

Prep Batch: RE151023-1
QCBatchID: RE151023-1-1
Run ID: RE151023-1A
Count Time: 15 minutes

Final Aliquot: 995 ml
Result Units: BQ/l
File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	1.29 +/- 0.323	0.0106	1.704	75.9	67 - 120	P,Y1,M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	16340	16400	ug	100	40 - 110 %	Y1

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: *RE1510342-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Environmental -- FC
Work Order Number: 1510342
Client Name: ALS Environmental
ClientProject ID: L1688508

Field ID:
Lab ID: RE151023-1LCSD

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 23-Oct-15
Date Prepared: 23-Oct-15
Date Analyzed: 03-Nov-15

Prep Batch: RE151023-1
QCBatchID: RE151023-1-1
Run ID: RE151023-1A
Count Time: 15 minutes

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: BQ/l
File Name: Manual Entry

CASNO	Analyte	Sample			Duplicate			DER	DER Lim
		Result +/- 2 s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags		
13982-63-3	Ra-226	1.52 +/- 0.379	0.0115	P,M3	1.29 +/- 0.323	0.0106	P,Y1,M3	0.452	2.13

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty
DER - Duplicate Error Ratio
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: *RE1510342-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1510342
Client Name: ALS Environmental
ClientProject ID: L1688508

Field ID: L1688508-1
Lab ID: 1510342-1

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 15-Oct-15
Date Prepared: 23-Oct-15
Date Analyzed: 03-Nov-15

Prep Batch: RE151023-1
QCBatchID: RE151023-1-1
Run ID: RE151023-1A
Count Time: 30 minutes
Report Basis: Unfiltered

Final Aliquot: 1190 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: BQ/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	BDL	0.0063	0.00999	NA	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	16340	15100	ug	92.5	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *RE1510342-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1510342
Client Name: ALS Environmental
ClientProject ID: L1688508

Field ID: L1688508-2
Lab ID: 1510342-2

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 15-Oct-15
Date Prepared: 23-Oct-15
Date Analyzed: 03-Nov-15

Prep Batch: RE151023-1
QCBatchID: RE151023-1-1
Run ID: RE151023-1A
Count Time: 30 minutes
Report Basis: Unfiltered

Final Aliquot: 1190 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: BQ/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.015 +/- 0.0066	0.0061	0.00999	NA	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	16340	15000	ug	91.6	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *RE1510342-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1510342
Client Name: ALS Environmental
ClientProject ID: L1688508

Field ID: L1688508-3
Lab ID: 1510342-3

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 15-Oct-15
Date Prepared: 23-Oct-15
Date Analyzed: 03-Nov-15

Prep Batch: RE151023-1
QCBatchID: RE151023-1-1
Run ID: RE151023-1A
Count Time: 30 minutes
Report Basis: Unfiltered

Final Aliquot: 1090 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: BQ/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	BDL	0.0068	0.00999	NA	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	16340	14800	ug	90.6	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *RE1510342-1*

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Lupin Mines Incorporated c/o Elgin Mining Inc.	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	K. Lewis	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	76 Richmond Street East, Suite 330 Toronto, ON M5C 1P1	☐ Criteria on Report - provide details below if box checked Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	778-386-7340	Email 1 or Fax klewis@elginmining.com	Specify Date Required for E2,E or P:
		Email 2	

Invoice To	Same as Report To ☑ Yes ☐ No	Invoice Distribution	Analysis Request
	Copy of Invoice with Report ☐ Yes ☐ No	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
Company:		Email 1 or Fax klewis@elginmining.com	
Contact:		Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	53119	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:	Lupin Mine	Location:	

ALS Lab Work Order # (lab use only): L1688508 | ALS Contact: Rick Zoliewski | Sampler: ~~Oliver~~ /A.Bowie

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals	Total Cyanide	TSS, Alkalinity, Hardness	Radium	Ammonia	Nitrate, Nitrite							Number of Containers
					P	P		P	P								
	LUP-10-151015	15-Oct-15	9:25am	Water	R	R	R	R	R	R							6
	LUP-35-151015	15-Oct-15	9:30am	Water	R	R	R	R	R	R							6
	LUP-36-151015	15-Oct-15	9:35am	Water	R	R	R	R	R	R							6
			Alberta Time														

L1688508-COFC

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No Are samples for human drinking water use? ☐ Yes ☐ No	

Frozen ☐ SIF Observations Yes ☐ No ☐
Ice packs Yes ☐ No ☐ Custody seal intact Yes ☐ No ☐
Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
6.1 °C					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
A Bowie	Oct 15/15	11:30am		Oct 15/15	15:15			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

LUPIN MINES INCORPORATED
ATTN: Karen Lewis
76 Richmond Street
Suite 330
Toronto ON M5C 1P1

Date Received: 23-OCT-15
Report Date: 02-NOV-15 14:44 (MT)
Version: FINAL

Client Phone: 778-386-7340

Certificate of Analysis

Lab Work Order #: L1692471

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1692471-1	L1692471-2	L1692471-3	L1692471-4	L1692471-5
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	16-OCT-15	17-OCT-15	18-OCT-15	19-OCT-15	20-OCT-15
	Sampled Time	07:45	09:05	09:00	08:55	09:05
	Client ID	LUP-10-151016	LUP-10-151017	LUP-10-151018	LUP-10-151019	LUP-10-151020
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	172	175	173	176	175
	Total Suspended Solids (mg/L)	<3.0	<3.0	3.2	<3.0	<3.0
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	4.2	3.8 RRV	4.0	4.2	3.9
	Nitrate and Nitrite (as N) (mg/L)					
	Nitrate (as N) (mg/L)					
	Nitrite (as N) (mg/L)					
Cyanides	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Total Metals	Aluminum (Al)-Total (mg/L)	0.0380	0.0355	0.0402	0.0347	0.0309
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00762	0.00706	0.00798	0.00715	0.00670
	Barium (Ba)-Total (mg/L)	0.0141	0.0140	0.0144	0.0143	0.0146
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Total (mg/L)	0.055	0.056	0.055	0.057	0.055
	Cadmium (Cd)-Total (mg/L)	0.000205	0.000205	0.000212	0.000201	0.000214
	Calcium (Ca)-Total (mg/L)	57.2	58.3	57.5	58.3	58.0
	Cesium (Cs)-Total (mg/L)	0.000081	0.000077	0.000080	0.000080	0.000080
	Chromium (Cr)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Cobalt (Co)-Total (mg/L)	0.0315	0.0308	0.0317	0.0319	0.0317
	Copper (Cu)-Total (mg/L)	0.00219	0.00205	0.00217	0.00205	0.00206
	Iron (Fe)-Total (mg/L)	0.118	0.111	0.131	0.105	0.094
	Lead (Pb)-Total (mg/L)	0.000085	0.000075	0.000085	0.000075	0.000074
	Lithium (Li)-Total (mg/L)	0.0242	0.0238	0.0241	0.0243	0.0245
	Magnesium (Mg)-Total (mg/L)	7.18	7.23	7.27	7.39	7.43
	Manganese (Mn)-Total (mg/L)	0.809	0.784	0.826	0.825	0.831
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Nickel (Ni)-Total (mg/L)	0.0717	0.0704	0.0722	0.0718	0.0719
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	4.60	4.57	4.68	4.57	4.64
	Rubidium (Rb)-Total (mg/L)	0.00212	0.00213	0.00210	0.00212	0.00216
	Selenium (Se)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Silicon (Si)-Total (mg/L)	1.90	1.90	1.88	1.90	1.89
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	43.2	41.2	41.8	42.8	42.5
	Strontium (Sr)-Total (mg/L)	0.249	0.251	0.254	0.256	0.256
	Sulfur (S)-Total (mg/L)	75.0	75.7	74.9	76.3	74.6
	Tellurium (Te)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1692471-6	L1692471-7			
	Description	WATER	WATER			
	Sampled Date	21-OCT-15	23-OCT-15			
	Sampled Time	09:20				
	Client ID	LUP-10-151021	LUP-10-151023			
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	180	174			
	Total Suspended Solids (mg/L)	<3.0	<3.0			
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	4.0	5.7			
	Nitrate and Nitrite (as N) (mg/L)		0.960			
	Nitrate (as N) (mg/L)		0.960			
	Nitrite (as N) (mg/L)		<0.010			
Cyanides	Cyanide, Total (mg/L)	<0.0050	<0.0050			
Total Metals	Aluminum (Al)-Total (mg/L)	0.0368	0.0344			
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010			
	Arsenic (As)-Total (mg/L)	0.00736	0.00638			
	Barium (Ba)-Total (mg/L)	0.0142	0.0149			
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010			
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050			
	Boron (B)-Total (mg/L)	0.056	0.056			
	Cadmium (Cd)-Total (mg/L)	0.000211	0.000219			
	Calcium (Ca)-Total (mg/L)	60.3	57.5			
	Cesium (Cs)-Total (mg/L)	0.000083	0.000076			
	Chromium (Cr)-Total (mg/L)	<0.00010	<0.00010			
	Cobalt (Co)-Total (mg/L)	0.0319	0.0317			
	Copper (Cu)-Total (mg/L)	0.00200	0.00199			
	Iron (Fe)-Total (mg/L)	0.106	0.088			
	Lead (Pb)-Total (mg/L)	0.000074	0.000062			
	Lithium (Li)-Total (mg/L)	0.0253	0.0237			
	Magnesium (Mg)-Total (mg/L)	7.26	7.30			
	Manganese (Mn)-Total (mg/L)	0.818	0.826			
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050			
	Nickel (Ni)-Total (mg/L)	0.0713	0.0719			
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050			
	Potassium (K)-Total (mg/L)	4.58	4.59			
	Rubidium (Rb)-Total (mg/L)	0.00219	0.00217			
	Selenium (Se)-Total (mg/L)	<0.000050	0.000050			
	Silicon (Si)-Total (mg/L)	1.90	1.89			
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010			
	Sodium (Na)-Total (mg/L)	42.8	42.7			
	Strontium (Sr)-Total (mg/L)	0.260	0.261			
	Sulfur (S)-Total (mg/L)	75.0	75.3			
	Tellurium (Te)-Total (mg/L)	<0.00020	<0.00020			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1692471-1	L1692471-2	L1692471-3	L1692471-4	L1692471-5
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	16-OCT-15	17-OCT-15	18-OCT-15	19-OCT-15	20-OCT-15
	Sampled Time	07:45	09:05	09:00	08:55	09:05
	Client ID	LUP-10-151016	LUP-10-151017	LUP-10-151018	LUP-10-151019	LUP-10-151020
Grouping	**Analyte**					
WATER						
Total Metals	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Thorium (Th)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.00030	<0.00030	0.00046	<0.00030	<0.00030
	Tungsten (W)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Uranium (U)-Total (mg/L)	0.000019	0.000018	0.000020	0.000018	0.000016
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Total (mg/L)	0.239	0.234	0.241	0.241	0.241
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1692471-6	L1692471-7			
	Description	WATER	WATER			
	Sampled Date	21-OCT-15	23-OCT-15			
	Sampled Time	09:20				
	Client ID	LUP-10-151021	LUP-10-151023			
Grouping	**Analyte**					
WATER						
Total Metals	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010			
	Thorium (Th)-Total (mg/L)	<0.00010	<0.00010			
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010			
	Titanium (Ti)-Total (mg/L)	0.00039	<0.00030			
	Tungsten (W)-Total (mg/L)	<0.00010	<0.00010			
	Uranium (U)-Total (mg/L)	0.000018	0.000015			
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050			
	Zinc (Zn)-Total (mg/L)	0.242	0.243			
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TOT-ED	Water	Alkalinity, T	APHA 2320 B-Auto-Pot. Titration
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002
This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.			
ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
NO2+NO3-CALC-ED	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-ED	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-ED	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Lupin Mines Incorporated c/o Elgin Mining Inc.	Select Report Format: ☒ PDF ☒ EXCEL ☐ EDD (DIGITAL)	R ☒ Regular (Standard TAT if received by 3 pm - business days)
Contact:	K. Lewis	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	76 Richmond Street East, Suite 330	☐ Criteria on Report - provide details below if box checked	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
	Toronto, ON M5C 1P1	Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	778-386-7340	Email 1 or Fax klewis@elginmining.com	Specify Date Required for E2,E or P:
		Email 2 abowie@srk.com	Analysis Request
Invoice To	Same as Report To ☑ Yes ☐ No	Invoice Distribution	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
	Copy of Invoice with Report ☐ Yes ☐ No	Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	P P
Company:		Email 1 or Fax klewis@elginmining.com	
Contact:		Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	53119	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:	Lupin Mine	Location:	

ALS Lab Work Order # (lab use only): L1692471

ALS Contact: Rick Zoliewski Sampler: C.de Repentigny

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals	Total Cyanide	TSS, Alkalinity, Hardness,	Nitrate, Nitrite			Number of Containers
	Lup-10-151016	16-oct-15	7:45	Water	R	R	R				3
	Lup-10-151017	17-oct-15	9:05	Water	R	R	R				3
	Lup-10-151018	18-oct-15	9:00	Water	R	R	R				3
	Lup-10-151019	19-oct-15	8:55	Water	R	R	R				3
	Lup-10-151020	20-oct-15	9:05	Water	R	R	R				3
	Lup-10-151021	21-oct-15	9:20	Water	R	R	R				3
	Lup-10-151023	23-oct-15	9:25	Water	R	R	R	R			4

L1692471-COFC

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ Yes ☑ No

Are samples for human drinking water use? ☐ Yes ☑ No

Special Instructions / Specify Criteria to add on report (client Use)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice packs Yes ☐ No ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: Oct. 23/15	Time: 11:20	Received by:	Date: 10/23/15	Time: 16:00	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326a v09 Front04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

LUPIN MINES INCORPORATED
ATTN: Karen Lewis
76 Richmond Street
Suite 330
Toronto ON M5C 1P1

Date Received: 23-OCT-15
Report Date: 03-NOV-15 14:49 (MT)
Version: FINAL

Client Phone: 778-386-7340

Certificate of Analysis

Lab Work Order #: L1692475

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1692475-1	L1692475-2	L1692475-3	L1692475-4	L1692475-5
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	21-OCT-15	21-OCT-15	21-OCT-15	21-OCT-15	21-OCT-15
	Sampled Time	10:40	11:45	12:20	12:55	13:15
	Client ID	LUP-25-151021	LUP-24-151021	LUP-22-151021	LUP-21-151021	LUP-20-151021
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	6.97	31.4	75.0	6.06	174
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	<3.0	<3.0
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	3.1	3.1	2.9	3.9	2.4
	Ammonia, Total (as N) (mg/L)	<0.050	<0.050	<0.050	<0.050	0.061
Cyanides	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Total Metals	Aluminum (Al)-Total (mg/L)	0.0082	0.0160	0.0287	0.0102	0.0583
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00025	0.00041	0.00068	0.00027	0.00127
	Barium (Ba)-Total (mg/L)	0.00281	0.00626	0.0102	0.00222	0.0196
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Total (mg/L)	<0.010	<0.010	0.023	<0.010	0.052
	Cadmium (Cd)-Total (mg/L)	0.0000077	0.0000328	0.0000805	<0.0000050	0.000213
	Calcium (Ca)-Total (mg/L)	1.76	9.83	24.4	1.28	57.0
	Cesium (Cs)-Total (mg/L)	<0.000010	0.000019	0.000037	0.000011	0.000075
	Chromium (Cr)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Cobalt (Co)-Total (mg/L)	0.00033	0.00289	0.00852	<0.00010	0.0255
	Copper (Cu)-Total (mg/L)	0.00071	0.00066	0.00077	0.00066	0.00085
	Iron (Fe)-Total (mg/L)	<0.010	0.012	0.026	0.022	0.068
	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Total (mg/L)	0.0013	0.0048	0.0105	0.0013	0.0244
	Magnesium (Mg)-Total (mg/L)	0.622	1.67	3.43	0.693	7.78
	Manganese (Mn)-Total (mg/L)	0.00833	0.0739	0.221	0.00272	0.666
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Nickel (Ni)-Total (mg/L)	0.00199	0.0120	0.0295	0.00064	0.0749
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	0.431	0.990	1.94	0.359	4.78
	Rubidium (Rb)-Total (mg/L)	0.00109	0.00133	0.00169	0.00109	0.00254
	Selenium (Se)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Silicon (Si)-Total (mg/L)	0.214	0.478	0.926	0.192	2.01
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	1.22	7.26	17.0	0.662	43.0
	Strontium (Sr)-Total (mg/L)	0.00910	0.0448	0.106	0.00701	0.250
	Sulfur (S)-Total (mg/L)	1.80	12.2	30.3	1.11	76.8
	Tellurium (Te)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Thorium (Th)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1692475-6				
	Description	WATER				
	Sampled Date	21-OCT-15				
	Sampled Time	11:35				
	Client ID	LUP-37-151021				
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	31.6				
	Total Suspended Solids (mg/L)	<3.0				
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	2.7				
	Ammonia, Total (as N) (mg/L)	<0.050				
Cyanides	Cyanide, Total (mg/L)	<0.0050				
Total Metals	Aluminum (Al)-Total (mg/L)	0.0171				
	Antimony (Sb)-Total (mg/L)	<0.00010				
	Arsenic (As)-Total (mg/L)	0.00043				
	Barium (Ba)-Total (mg/L)	0.00644				
	Beryllium (Be)-Total (mg/L)	<0.00010				
	Bismuth (Bi)-Total (mg/L)	<0.000050				
	Boron (B)-Total (mg/L)	0.012				
	Cadmium (Cd)-Total (mg/L)	0.0000292				
	Calcium (Ca)-Total (mg/L)	9.94				
	Cesium (Cs)-Total (mg/L)	0.000020				
	Chromium (Cr)-Total (mg/L)	<0.00010				
	Cobalt (Co)-Total (mg/L)	0.00288				
	Copper (Cu)-Total (mg/L)	0.00069				
	Iron (Fe)-Total (mg/L)	0.013				
	Lead (Pb)-Total (mg/L)	<0.000050				
	Lithium (Li)-Total (mg/L)	0.0046				
	Magnesium (Mg)-Total (mg/L)	1.66				
	Manganese (Mn)-Total (mg/L)	0.0740				
	Molybdenum (Mo)-Total (mg/L)	<0.000050				
	Nickel (Ni)-Total (mg/L)	0.0117				
	Phosphorus (P)-Total (mg/L)	<0.050				
	Potassium (K)-Total (mg/L)	0.977				
	Rubidium (Rb)-Total (mg/L)	0.00138				
	Selenium (Se)-Total (mg/L)	<0.000050				
	Silicon (Si)-Total (mg/L)	0.470				
	Silver (Ag)-Total (mg/L)	<0.000010				
	Sodium (Na)-Total (mg/L)	7.25				
	Strontium (Sr)-Total (mg/L)	0.0453				
	Sulfur (S)-Total (mg/L)	12.6				
	Tellurium (Te)-Total (mg/L)	<0.00020				
	Thallium (Tl)-Total (mg/L)	<0.000010				
	Thorium (Th)-Total (mg/L)	<0.00010				

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1692475-1	L1692475-2	L1692475-3	L1692475-4	L1692475-5
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	21-OCT-15	21-OCT-15	21-OCT-15	21-OCT-15	21-OCT-15
	Sampled Time	10:40	11:45	12:20	12:55	13:15
	Client ID	LUP-25-151021	LUP-24-151021	LUP-22-151021	LUP-21-151021	LUP-20-151021
Grouping	**Analyte**					
WATER						
Total Metals	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Tungsten (W)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Uranium (U)-Total (mg/L)	0.000022	0.000018	0.000012	0.000016	<0.000010
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Total (mg/L)	0.0041	0.0328	0.0895	<0.0030	0.230
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1692475-6				
	Description	WATER				
	Sampled Date	21-OCT-15				
	Sampled Time	11:35				
	Client ID	LUP-37-151021				
Grouping	**Analyte**					
WATER						
Total Metals	Tin (Sn)-Total (mg/L)	<0.00010				
	Titanium (Ti)-Total (mg/L)	<0.00030				
	Tungsten (W)-Total (mg/L)	<0.00010				
	Uranium (U)-Total (mg/L)	0.000018				
	Vanadium (V)-Total (mg/L)	<0.00050				
	Zinc (Zn)-Total (mg/L)	0.0328				
	Zirconium (Zr)-Total (mg/L)	<0.00030				

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TOT-ED	Water	Alkalinity, T	APHA 2320 B-Auto-Pot. Titration
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002

This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.

ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.

SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric

Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Lupin Mines Incorporated c/o Elgin Mining Inc.	Select Report Format: ☒ PDF ☒ EXCEL | EDD (DIGITAL)	R ☒ Regular (Standard TAT if received by 3 pm - business days)
Contact:	K. Lewis	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	76 Richmond Street East, Suite 330 Toronto, ON M5C 1P1	☐ Criteria on Report - provide details below if box checked Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	778-386-7340	Email 1 or Fax klewis@elginmining.com	Specify Date Required for E2,E or P:
		Email 2 abowie@srk.com	

Invoice To	Same as Report To ☑ Yes ☐ No	Invoice Distribution	Analysis Request
	Copy of Invoice with Report ☐ Yes ☐ No	Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
Company:		Email 1 or Fax klewis@elginmining.com	
Contact:		Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	53119	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:	Lupin Mine	Location:	

ALS Lab Work Order # (lab use only): L1692475 | ALS Contact: Rick Zoliewski | Sampler: C.deRepentigny

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Cyanide	TSS, Alkalinity, Hardness	Total Metals	Ammonia (NH4)										Number of Containers
					P		P	P										
	LUP-25-151021	21-oct-15	10:40	Water	R	R	R	R										4
	LUP-24-151021	21-oct-15	11:45	Water	R	R	R	R										4
	LUP-22-151021	21-oct-15	12:20	Water	R	R	R	R										4
	LUP-21-151021	21-oct-15	12:55	Water	R	R	R	R										4
	LUP-20-151021	21-oct-15	13:15	Water	R	R	R	R										4
	LUP-37-151021	21-oct-15	11:35	Water	R	R	R	R										4
			Alberta time															

L1692475-COFC

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No	
Are samples for human drinking water use? ☐ Yes ☐ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐			SIF Observations	Yes ☐	No ☐	
Ice packs	Yes ☐	No ☐		Custody seal intact	Yes ☐	No ☐	
Cooling Initiated	☐						

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	Oct. 23/15	11:20		10/23/15	16:00			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326e v09 Front/04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

LUPIN MINES INCORPORATED
ATTN: Karen Lewis
76 Richmond Street
Suite 330
Toronto ON M5C 1P1

Date Received: 23-OCT-15
Report Date: 16-NOV-15 11:15 (MT)
Version: FINAL

Client Phone: 778-386-7340

Certificate of Analysis

Lab Work Order #: L1692900

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1692900-1	L1692900-2	L1692900-3		
	Description	WATER	WATER	WATER		
	Sampled Date	22-OCT-15	22-OCT-15	22-OCT-15		
	Sampled Time	09:15	09:10	09:05		
	Client ID	LUP-10-151022	LUP-35-151022	LUP-36-151022		
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (EC) (uS/cm)	631	632	1.66		
	Hardness (as CaCO3) (mg/L)	180	177	0.55		
	pH (pH)	6.58	6.56	5.22		
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0		
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	<5.0	<5.0	<5.0		
	Alkalinity, Total (as CaCO3) (mg/L)	4.2	4.1	<2.0		
	Ammonia, Total (as N) (mg/L)	0.108	<0.050	0.112		
Cyanides	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050		
Total Metals	Aluminum (Al)-Total (mg/L)	0.0313	0.0317	<0.0030		
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Arsenic (As)-Total (mg/L)	0.00658	0.00664	<0.00010		
	Barium (Ba)-Total (mg/L)	0.0149	0.0149	0.000071		
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050		
	Boron (B)-Total (mg/L)	0.054	0.054	<0.010		
	Cadmium (Cd)-Total (mg/L)	0.000231	0.000233	<0.0000050		
	Calcium (Ca)-Total (mg/L)	60.4	59.3	0.198		
	Cesium (Cs)-Total (mg/L)	0.000082	0.000079	<0.000010		
	Chromium (Cr)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Cobalt (Co)-Total (mg/L)	0.0332	0.0335	<0.00010		
	Copper (Cu)-Total (mg/L)	0.00202	0.00208	<0.00050		
	Iron (Fe)-Total (mg/L)	0.100	0.101	<0.010		
	Lead (Pb)-Total (mg/L)	0.000063	0.000066	<0.000050		
	Lithium (Li)-Total (mg/L)	0.0234	0.0230	<0.0010		
	Magnesium (Mg)-Total (mg/L)	7.02	6.96	0.0128		
	Manganese (Mn)-Total (mg/L)	0.836	0.839	0.00102		
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050	<0.000050		
	Nickel (Ni)-Total (mg/L)	0.0743	0.0758	<0.00050		
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050		
	Potassium (K)-Total (mg/L)	4.19	4.28	0.068		
	Rubidium (Rb)-Total (mg/L)	0.00206	0.00220	<0.00020		
	Selenium (Se)-Total (mg/L)	<0.000050	<0.000050	<0.000050		
	Silicon (Si)-Total (mg/L)	2.01	1.99	<0.050		
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010		
	Sodium (Na)-Total (mg/L)	42.5	43.3	0.098		
	Strontium (Sr)-Total (mg/L)	0.260	0.266	0.00086		
	Sulfur (S)-Total (mg/L)	75.5	75.6	<0.50		

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1692900-1	L1692900-2	L1692900-3		
	Description	WATER	WATER	WATER		
	Sampled Date	22-OCT-15	22-OCT-15	22-OCT-15		
	Sampled Time	09:15	09:10	09:05		
	Client ID	LUP-10-151022	LUP-35-151022	LUP-36-151022		
Grouping	**Analyte**					
WATER						
Total Metals	Tellurium (Te)-Total (mg/L)	<0.00020	<0.00020	<0.00020		
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010		
	Thorium (Th)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Titanium (Ti)-Total (mg/L)	<0.00030	<0.00030	<0.00030		
	Tungsten (W)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Uranium (U)-Total (mg/L)	0.000017	0.000016	<0.000010		
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Zinc (Zn)-Total (mg/L)	0.256	0.258	<0.0030		
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030		
Radiological Parameters	Ra-226 (Bq/L)	0.018	0.0100	<0.0100		

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACIDITY-ED	Water	Acidity (as CaCO3)	APHA 2310 B - Potentiometric Titration
ALK-TOT-ED	Water	Alkalinity, T	APHA 2320 B-Auto-Pot. Titration
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002

This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.

ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.

PH/EC-ED	Water	pH and Conductivity	APHA 4500-H, 2510

All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed)

RA226-MMER-FC	Water	Ra226 by Alpha Scint, MDC=0.01 Bq/L	EPA 903.1
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric

Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Radium-226

Case Narrative

ALS Environmental

L1692900

Work Order Number: 1510441

1. This report consists of the analytical results for three water samples received by ALS on 10/27/15.

2. These samples were prepared and analyzed according to the current revision of SOP 783. The analyses were completed on 11/10/15.

3. The analysis results for these samples are reported in units of Bq/L. The samples were not filtered prior to analysis.

4. Sample volume was insufficient to allow preparation of a duplicate. A laboratory control sample duplicate (LCSD) was prepared in lieu of a client sample duplicate.

5. ICP-AES measurement of barium concentrations prior to chemical separation for sample 1510441-3 and the associated QC samples showed concentrations less than zero. To avoid a low bias in the final analytical results, the initial barium concentration was taken to be zero.

6. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Hannah Alt — 11/11/15

Hannah Alt
Radiochemistry Primary Data Reviewer
Date

11/13/15

Radiochemistry Final Data Reviewer
Date

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1510441
Client Name: ALS Environmental
Client Project Name:
Client Project Number: L1692900
Client PO Number: L1692900

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L1692900-1	1510441-1		WATER	22-Oct-15	
L1692900-2	1510441-2		WATER	22-Oct-15	
L1692900-3	1510441-3		WATER	22-Oct-15	

ALS Environmental

151044

L1692900

YELLOWKNIFE

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA
225 COMMERCE DRIVE
FORT COLLINS,CO 80524

NOTES: Please reference on final report and invoice: PO# *L1692900*
ALS requires QC data to be provided with your final results.

Please see enclosed 3 sample(s) in 3 Container(s)

	SAMPLE NUMBER / ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
(1)	**L1692900-1 LUP-10-151022**	**10/22/2015**	
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	11/18/2015	
(2)	**L1692900-2 LUP-35-151022**	**10/22/2015**	
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	11/18/2015	
(3)	**L1692900-3 LUP-36-151022**	**10/22/2015**	
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	11/18/2015	

Subcontract Info Contact: Sean Whitaker (867) 873-5593

Analysis and reporting info contact: Rick Zolkiewski
314 OLD AIRPORT ROAD
Unit 116
YELLOWKNIFE,NT X1A 3T3
Phone: (867) 873-5593 Email: Rick.Zolkiewski@alsglobal.com

Please email confirmation of receipt to: **Rick.Zolkiewski@alsglobal.com**

Shipped By: _____ Date Shipped: Oct 26, 2015

Received By: _____ Date Received: 10-27-15 | 0930

Verified By: _____ Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS Yellowknife Workorder No: 1510441

Project Manager: ARJ Initials: SDR Date: 10-27-2015

1.	Does this project require any special handling in addition to standard ALS procedures?		YES	(NO)
2.	Are custody seals on shipping containers intact?	(NONE)	YES	NO
3.	Are Custody seals on sample containers intact?	(NONE)	YES	NO
4.	Is there a COC (Chain-of-Custody) present or other representative documents?		(YES)	NO
5.	Are the COC and bottle labels complete and legible?		(YES)	NO
6.	Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		(YES)	NO
7.	Were airbills / shipping documents present and/or removable?	DROP OFF	(YES)	NO
8.	Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	(YES)	NO
9.	Are all aqueous non-preserved samples pH 4-9?	(N/A)	YES	NO
10.	Is there sufficient sample for the requested analyses?		(YES)	NO
11.	Were all samples placed in the proper containers for the requested analyses?		(YES)	NO
12.	Are all samples within holding times for the requested analyses?		(YES)	NO
13.	Were all sample containers received intact? (not broken or leaking, etc.)		(YES)	NO
14.	Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	(N/A)	YES	NO
15.	Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	N/A	YES	(NO)
16.	Were the samples shipped on ice?		(YES)	NO
17.	Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: (#2) #4	RAD ONLY	(YES)	NO

Cooler #:	1							
Temperature (°C):	3.8							
No. of custody seals on cooler:	0							
DOT Survey/ Acceptance Information — External µR/hr reading:	10							
Background µR/hr reading:	11							

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? (YES) / NO / NA (If no, see Form 008.)

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? YES / NO / (NA) Contact: _____ Date/Time: _____

Project Manager Signature / Date: 10/27/15

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

Form 201r24.xls (06/04/2012)

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AGREEMENT TO TERMS. By giving us your shipment, you agree, regardless of whether you sign the front of this Air Waybill, for yourself and as agent for and on behalf of any other person having an interest in this shipment, to all terms on this NON-NEGOTIABLE Air Waybill. In any applicable tariff, and in our current Service Guide or Standard Conditions of Carriage, copies of which are available upon request. If there is a conflict between this Air Waybill and either the tariff, Service Guide or Standard Conditions then in effect, the tariff and the terms of any customer automation agreement between the shipper and Federal Express will control (the Service Guide or Standard Conditions have secondary priority). No one is authorized to alter or modify the terms of our agreement. This Air Waybill shall be binding on us when the shipment is accepted.

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LIABILITIES NOT ASSUMED. IN ANY EVENT, WE WON'T BE LIABLE FOR ANY DAMAGES WHETHER DIRECT , INCIDENTAL, SPECIAL OR CONSEQUENTIAL , IN EXCESS OF THE DECLARED VALUE FOR CARRIAGE (INCLUDING BUT NOT LIMITED TO LOSS OF INCOME OR PROFITS) WHETHER OR NOT WE HAD ANY KNOWLEDGE THAT SUCH DAMAGES MIGHT BE INCURRED, UNLESS SUCH DAMAGES WERE CAUSED BY OUR OWN WILLFUL MICONDUCT OR GROSS NEGLIGENCE.

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RIGHT TO INSPECT. Your shipment may, at our option or at the request of governmental authorities, be opened and inspected by us or such authorities or us at any time.

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151044

From: (604) 253-4188 Origin ID: YBYA
MELISSA YAGI
ALS ENVIRONMENTAL LAB GROUP
8081 LOUGHEED HIGHWAY
SUITE 100
BURNABY, BC V5A1W9
CANADA

FedEx Express

J1412140730e4uw

Ship Date: 26OCT15
ActWgt: 20.0 LB MAN
CAD: 0347419/CAFE2807

REF: sublet
DESC-1: environmental Water samples for anlysis
DESC-2:
DESC-3:
DESC-4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 4.00 CAD
T/C: S *********
SIGN: MELISSA YAGI
EIN/VAT:
PKG TYPE: CUSTOMER

3.0°C

SHIP TO: (970) 490-1511 **BILL SENDER**

LANCE STEERE
ALS ENVIRONMANTAL
225 COMMERCE DRIVE

FORT COLLINS, CO 80524
US

10:30A
INTL PRIORITY
ISR
80524
CO-US
DEN

TRK# 6116 7669 8375
0430

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521C2/97D7/6F03

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Method Blank Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1510441
Client Name: ALS Environmental
ClientProject ID: L1692900

Lab ID: RE151030-1MB

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 30-Oct-15
Date Prepared: 30-Oct-15
Date Analyzed: 10-Nov-15

Prep Batch: RE151030-1
QCBatchID: RE151030-1-1
Run ID: RE151030-1A
Count Time: 30 minutes

Final Aliquot: 995 ml
Result Units: BQ/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	BDL	0.0080	0.00999	NA	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15670	15000	ug	95.5	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: *RE1510441-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Environmental -- FC
Work Order Number: 1510441
Client Name: ALS Environmental
ClientProject ID: L1692900

Lab ID: RE151030-1LCS

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 30-Oct-15
Date Prepared: 30-Oct-15
Date Analyzed: 10-Nov-15

Prep Batch: RE151030-1
QCBatchID: RE151030-1-1
Run ID: RE151030-1A
Count Time: 15 minutes

Final Aliquot: 995 ml
Result Units: BQ/l
File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	1.81 +/- 0.453	0.00927	1.704	106	67 - 120	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15670	15100	ug	96.4	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: *RE1510441-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Environmental -- FC
Work Order Number: 1510441
Client Name: ALS Environmental
ClientProject ID: L1692900

Lab ID: RE151030-1LCSD

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 30-Oct-15
Date Prepared: 30-Oct-15
Date Analyzed: 10-Nov-15

Prep Batch: RE151030-1
QCBatchID: RE151030-1-1
Run ID: RE151030-1A
Count Time: 15 minutes

Final Aliquot: 995 ml
Result Units: BQ/l
File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	1.77 +/- 0.442	0.0103	1.704	104	67 - 120	P,M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15670	14800	ug	94.5	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: *RE1510441-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Environmental -- FC
Work Order Number: 1510441
Client Name: ALS Environmental
ClientProject ID: L1692900

Field ID:
Lab ID: RE151030-1LCSD

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 30-Oct-15
Date Prepared: 30-Oct-15
Date Analyzed: 10-Nov-15

Prep Batch: RE151030-1
QCBatchID: RE151030-1-1
Run ID: RE151030-1A
Count Time: 15 minutes

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: BQ/l
File Name: Manual Entry

CASNO	Analyte	Sample			Duplicate			DER	DER Lim
		Result +/- 2 s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags		
13982-63-3	Ra-226	1.81 +/- 0.453	0.00927	P	1.77 +/- 0.442	0.0103	P,M3	0.0692	2.13

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty
DER - Duplicate Error Ratio
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: *RE1510441-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1510441
Client Name: ALS Environmental
ClientProject ID: L1692900

Field ID: L1692900-1
Lab ID: 1510441-1

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 22-Oct-15
Date Prepared: 30-Oct-15
Date Analyzed: 10-Nov-15

Prep Batch: RE151030-1
QCBatchID: RE151030-1-1
Run ID: RE151030-1A
Count Time: 30 minutes
Report Basis: Unfiltered

Final Aliquot: 1190 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: BQ/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.018 +/- 0.0073	0.0039	0.00999	NA	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15680	15600	ug	99.3	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *RE1510441-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1510441
Client Name: ALS Environmental
ClientProject ID: L1692900

Field ID: L1692900-2
Lab ID: 1510441-2

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 22-Oct-15
Date Prepared: 30-Oct-15
Date Analyzed: 10-Nov-15

Prep Batch: RE151030-1
QCBatchID: RE151030-1-1
Run ID: RE151030-1A
Count Time: 30 minutes
Report Basis: Unfiltered

Final Aliquot: 1190 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: BQ/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.010 +/- 0.0058	0.0060	0.00999	NA	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15680	14100	ug	89.8	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *RE1510441-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 11

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1510441
Client Name: ALS Environmental
ClientProject ID: L1692900

Field ID: L1692900-3
Lab ID: 1510441-3

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 11
Date Collected: 22-Oct-15
Date Prepared: 30-Oct-15
Date Analyzed: 10-Nov-15

Prep Batch: RE151030-1
QCBatchID: RE151030-1-1
Run ID: RE151030-1A
Count Time: 30 minutes
Report Basis: Unfiltered

Final Aliquot: 1190 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: BQ/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.0083 +/- 0.0054	0.0066	0.00999	NA	LT

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15670	14800	ug	94.6	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *RE1510441-1*

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Lupin Mines Incorporated c/o Elgin Mining Inc.	Select Report Format:	☒ PDF ☒ EXCEL | | EDD (DIGITAL)	R ☒ Regular (Standard TAT if received by 3 pm - business days)
Contact:	K. Lewis	Quality Control (QC) Report with Report	☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	76 Richmond Street East, Suite 330 Toronto, ON M5C 1P1	☐ Criteria on Report - provide details below if box checked Select Distribution:	☒ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
Phone:	778-386-7340	Email 1 or Fax	klewis@elginmining.com	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
		Email 2	abowie@srk.com	Specify Date Required for E2,E or P:

Invoice To	Same as Report To ☑ Yes ☐ No	Invoice Distribution		
	Copy of Invoice with Report ☐ Yes ☐ No	Select Invoice Distribution:	☒ EMAIL ☐ MAIL ☐ FAX	
Company:		Email 1 or Fax	klewis@elginmining.com	
Contact:		Email 2		

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	53119	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:	Lupin Mine	Location:	

ALS Lab Work Order # (lab use only):

ALS Contact: Rick Zoliewski **Sampler:** A.Bowie

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals (P)	Total Cyanide (P)	TSS, Alkalinity, Hardness, pH, Acidity	Radium (P)	Ammonia (P)	Number of Containers
	LUP-10-151022	22-oct-15	9:15	Water	R	R	R	R	R	5
	LUP-35-151022	22-oct-15	9:10	Water	R	R	R	R	R	5
	LUP-36-151022	22-oct-15	9:05	Water	R	R	R	R	R	5
			Alberta Time							

L1692900-COFC

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No	
Are samples for human drinking water use? ☐ Yes ☐ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐			SIF Observations	Yes ☐	No ☐	
Ice packs	Yes ☐	No ☐		Custody seal intact	Yes ☐	No ☐	
Cooling Initiated	☐						

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	Oct. 23/15	11:20		10/23/15	16:00			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326e v09 Front/04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

LUPIN MINES INCORPORATED
ATTN: Karen Lewis
76 Richmond Street
Suite 330
Toronto ON M5C 1P1

Date Received: 28-OCT-15
Report Date: 30-NOV-15 13:25 (MT)
Version: FINAL

Client Phone: 778-386-7340

Certificate of Analysis

Lab Work Order #: L1695173

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1695173-1	L1695173-2	L1695173-3		
	Description	WATER	WATER	WATER		
	Sampled Date	27-OCT-15	27-OCT-15	27-OCT-15		
	Sampled Time	09:40	09:45	09:50		
	Client ID	LUP-10-151027	LUP-35-151027	LUP-36-151027		
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	183	185	0.15		
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0		
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	4.1	4.1	<2.0		
	Ammonia, Total (as N) (mg/L)	0.111	0.112	<0.050		
	Nitrate and Nitrite (as N) (mg/L)	0.980	0.995	<0.022		
	Nitrate (as N) (mg/L)	0.980	0.995	<0.020		
	Nitrite (as N) (mg/L)	<0.010	<0.010	<0.010		
	Sulfate (SO4) (mg/L)	224	224	<0.30		
Cyanides	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050		
Total Metals	Aluminum (Al)-Total (mg/L)	0.0253	0.0260	<0.0030		
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Arsenic (As)-Total (mg/L)	0.00602	0.00613	<0.00010		
	Barium (Ba)-Total (mg/L)	0.0149	0.0153	0.000126		
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050		
	Boron (B)-Total (mg/L)	0.064	0.064	<0.010		
	Cadmium (Cd)-Total (mg/L)	0.000212	0.000212	<0.0000050		
	Calcium (Ca)-Total (mg/L)	61.2	61.2	0.058		
	Cesium (Cs)-Total (mg/L)	0.000083	0.000081	<0.000010		
	Chromium (Cr)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Cobalt (Co)-Total (mg/L)	0.0338	0.0340	<0.00010		
	Copper (Cu)-Total (mg/L)	0.00197	0.00197	<0.00050		
	Iron (Fe)-Total (mg/L)	0.082	0.081	<0.010		
	Lead (Pb)-Total (mg/L)	0.000052	<0.000050	<0.000050		
	Lithium (Li)-Total (mg/L)	0.0256	0.0251	<0.0010		
	Magnesium (Mg)-Total (mg/L)	7.45	7.67	<0.0050		
	Manganese (Mn)-Total (mg/L)	0.834	0.854	0.00059		
	Mercury (Hg)-Total (mg/L)	<0.0000050	<0.0000050	<0.0000050		
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050	<0.000050		
	Nickel (Ni)-Total (mg/L)	0.0751	0.0763	<0.00050		
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050		
	Potassium (K)-Total (mg/L)	4.90	5.14	<0.050		
	Rubidium (Rb)-Total (mg/L)	0.00215	0.00229	<0.00020		
	Selenium (Se)-Total (mg/L)	<0.000050	<0.000050	<0.000050		
	Silicon (Si)-Total (mg/L)	1.96	1.90	<0.050		
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010		
	Sodium (Na)-Total (mg/L)	46.1	45.7	<0.050		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1695173-1	L1695173-2	L1695173-3		
	Description	WATER	WATER	WATER		
	Sampled Date	27-OCT-15	27-OCT-15	27-OCT-15		
	Sampled Time	09:40	09:45	09:50		
	Client ID	LUP-10-151027	LUP-35-151027	LUP-36-151027		
Grouping	**Analyte**					
WATER						
Total Metals	Strontium (Sr)-Total (mg/L)	0.270	0.271	0.00029		
	Sulfur (S)-Total (mg/L)	78.6	77.1	<0.50		
	Tellurium (Te)-Total (mg/L)	<0.00020	<0.00020	<0.00020		
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010		
	Thorium (Th)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Titanium (Ti)-Total (mg/L)	<0.00030	<0.00030	<0.00030		
	Tungsten (W)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Uranium (U)-Total (mg/L)	0.000017	0.000017	<0.000010		
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Zinc (Zn)-Total (mg/L)	0.255	0.259	<0.0030		
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030		
Radiological Parameters	Ra-226 (Bq/L)	<0.0100	0.015	<0.0100		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Sulfate (SO4)	MS-B	L1695173-1, -2, -3

Qualifiers for Individual Parameters Listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TOT-ED	Water	Alkalinity, T	APHA 2320 B-Auto-Pot. Titration
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002
This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.			
ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
HG-T-CVAA-ED	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
NH3-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)
This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.			
NO2+NO3-CALC-ED	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-ED	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-ED	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
RA226-MMER-FC	Water	Ra226 by Alpha Scint, MDC=0.01 Bq/L	EPA 903.1
SO4-IC-N-ED	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Tuesday, November 24, 2015

Rick Zolkiewski
ALS Environmental
314 Old Airport Road Unit 116
Yellowknife, NT X1A 3T3

Re: ALS Workorder: 1511214
Project Name:
Project Number: L1695173

Dear Mr. Zolkiewski:

Three water samples were received from ALS Environmental, on 11/11/2015. The samples were scheduled for the following analysis:

Radium-226

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Amy R. Wolf
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Connecticut (CT)	PH-0232
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
L-A-B (DoD ELAP/ISO 170250)	L2257
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280

1511214

Radium-226:
The samples were prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1511214
Client Name: ALS Environmental
Client Project Name:
Client Project Number: L1695173
Client PO Number: L1695173

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L1695173-1	1511214-1		WATER	27-Oct-15	
L1695173-2	1511214-2		WATER	27-Oct-15	
L1695173-3	1511214-3		WATER	27-Oct-15	

ALS Environmental

15 11/14

L1695173

YELLOWKNIFE

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA
225 COMMERCE DRIVE
FORT COLLINS,CO 80524

NOTES: Please reference on final report and invoice: PO# *L1695173*
ALS requires QC data to be provided with your final results.

Please see enclosed 3 sample(s) in 3 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
(1) **L1695173-1 LUP-10-151027**		**10/27/2015**	
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	11/23/2015	
(2) **L1695173-2 LUP-35-151027**		**10/27/2015**	
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	11/23/2015	
(3) **L1695173-3 LUP-36-151027**		**10/27/2015**	
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	11/23/2015	

Subcontract Info Contact: Sean Whitaker (867) 873-5593

Analysis and reporting info contact: Rick Zolkiewski
314 OLD AIRPORT ROAD
Unit 116
YELLOWKNIFE,NT X1A 3T3
Phone: (867) 873-5593 Email: Rick.Zolkiewski@alsglobal.com

Please email confirmation of receipt to: Rick.Zolkiewski@alsglobal.com

Shipped By: _____ Date Shipped: _____

Received By: SA Date Received: 11-11-15 10:50

Verified By: _____ Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS Yellowknife Workorder No: 1511214

Project Manager: ARW Initials: SDM Date: 11-11-15

1.	Does this project require any special handling in addition to standard ALS procedures?		YES	(NO)
2.	Are custody seals on shipping containers intact?	(NONE)	YES	NO
3.	Are Custody seals on sample containers intact?	(NONE)	YES	NO
4.	Is there a COC (Chain-of-Custody) present or other representative documents?		(YES)	NO
5.	Are the COC and bottle labels complete and legible?		(YES)	NO
6.	Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		(YES)	NO
7.	Were airbills / shipping documents present and/or removable?	DROP OFF	(YES)	NO
8.	Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	(YES)	NO
9.	Are all aqueous non-preserved samples pH 4-9?	(N/A)	YES	NO
10.	Is there sufficient sample for the requested analyses?		(YES)	NO
11.	Were all samples placed in the proper containers for the requested analyses?		(YES)	NO
12.	Are all samples within holding times for the requested analyses?		(YES)	NO
13.	Were all sample containers received intact? (not broken or leaking, etc.)		(YES)	NO
14.	Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	(N/A)	YES	NO
15.	Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	N/A	YES	(NO)
16.	Were the samples shipped on ice?		(YES)	NO
17.	Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: (#2) #4	RAD ONLY	(YES)	NO

Cooler #:	1								
Temperature (°C):	4.4								
No. of custody seals on cooler:	0								
DOT Survey/ Acceptance Information — External µR/hr reading:	10								
Background µR/hr reading:	11								

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? **(YES) / NO / NA** (If no, see Form 008.)

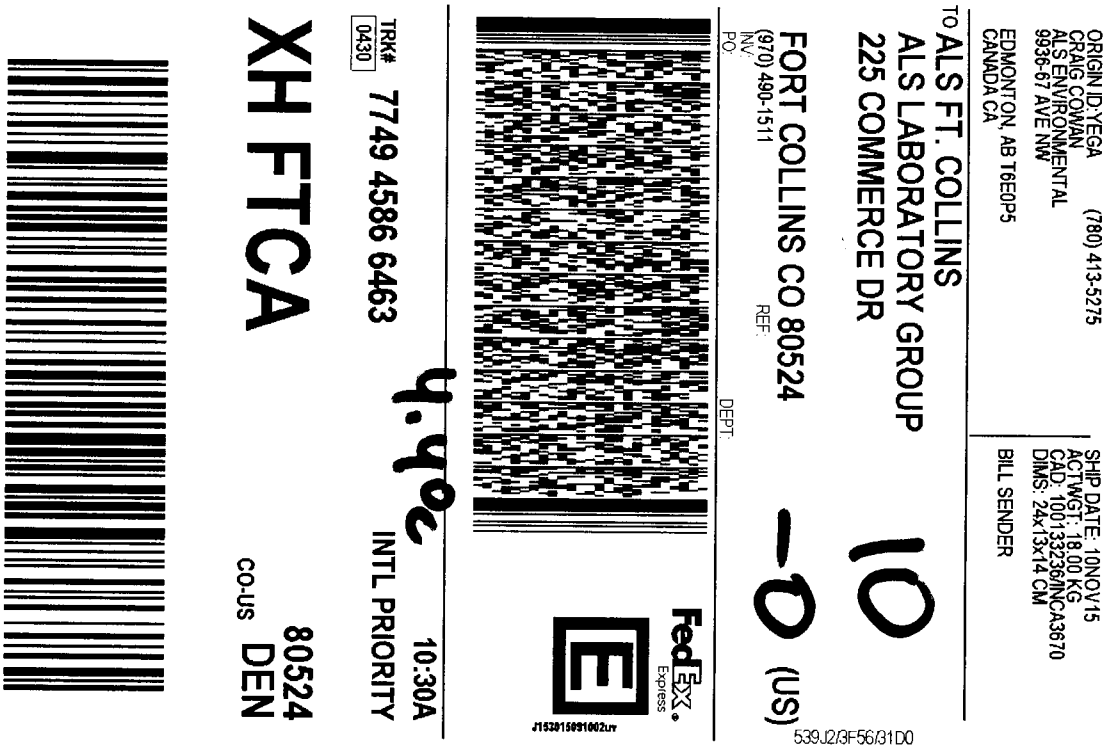
Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? **YES / NO / (NA)** Contact: _____ Date/Time: _____

Project Manager Signature / Date: 11/11/15

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

1511214



/templates/components/dotcom_label_contents/FoldInstr/en/Folding_instructions_shippingLabel.html loading...
/templates/components/dotcom_label_contents/WarningsOriginalLabel/en/Folding_warning.html loading...
/templates/components/dotcom_label_contents/TnCIntl/en/TC_intl.html loading...

Client:	ALS Environmental	**Date:**	*24-Nov-15*
Project:	L1695173	**Work Order:**	1511214
Sample ID:	L1695173-1	**Lab ID:**	1511214-1
Legal Location:		**Matrix:**	WATER
Collection Date:	10/27/2015	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**PAI 783**			Prep Date: **11/13/2015**	PrepBy: **ECP**
Ra-226	0.0078 (+/- 0.0053)	LT	0.0065	BQ/l	NA	11/23/2015 13:21
Carr: BARIUM	*90.5*		*40-110*	*%REC*	DL = NA	11/23/2015 13:21

Client:	ALS Environmental	**Date:**	*24-Nov-15*
Project:	L1695173	**Work Order:**	1511214
Sample ID:	L1695173-2	**Lab ID:**	1511214-2
Legal Location:		**Matrix:**	WATER
Collection Date:	10/27/2015	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**PAI 783**			Prep Date: **11/13/2015**	PrepBy: **ECP**
Ra-226	**0.015 (+/- 0.0073)**		**0.0071**	**BQ/l**	NA	11/23/2015 13:57
Carr: BARIUM	*92.5*		*40-110*	*%REC*	DL = NA	11/23/2015 13:57

Client:	ALS Environmental	**Date:**	*24-Nov-15*
Project:	L1695173	**Work Order:**	1511214
Sample ID:	L1695173-3	**Lab ID:**	1511214-3
Legal Location:		**Matrix:**	WATER
Collection Date:	10/27/2015	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**PAI 783**			Prep Date: **11/13/2015**	PrepBy: **ECP**
Ra-226	0.0071 (+/- 0.0042)	LT	0.0043	BQ/l	NA	11/23/2015 13:57
Carr: BARIUM	*98.6*		*40-110*	*%REC*	DL = NA	11/23/2015 13:57

Client:	ALS Environmental	**Date:**	*24-Nov-15*
Project:	L1695173	**Work Order:**	1511214
Sample ID:	L1695173-3	**Lab ID:**	1511214-3
Legal Location:		**Matrix:**	WATER
Collection Date:	10/27/2015	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed

Explanation of Qualifiers

Radiochemistry:

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

LT - Result is less than requested MDC but greater than achieved MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

Batch ID: **RE151113-1-1** Instrument ID **Alpha Scin** Method: **Radium-226 by Radon Emanation**

LCS Sample ID: **RE151113-1** Units: **BQ/l** Analysis Date: **11/23/2015 13:57**

Client ID: Run ID: **RE151113-1A** Prep Date: **11/13/2015** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.82 (+/- 0.453)	0.0132	1.704		107	67-120					P,M3
Carr: BARIUM	15200		16110		94.2	40-110					

LCSD Sample ID: **RE151113-1** Units: **BQ/l** Analysis Date: **11/23/2015 13:57**

Client ID: Run ID: **RE151113-1A** Prep Date: **11/13/2015** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.97 (+/- 0.490)	0.0133	1.704		115	67-120		1.82	0.2	2.1	P,M3
Carr: BARIUM	15700		16110		97.5	40-110		15200			

MB Sample ID: **RE151113-1** Units: **BQ/l** Analysis Date: **11/23/2015 13:57**

Client ID: Run ID: **RE151113-1A** Prep Date: **11/13/2015** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	ND	0.0063									U
Carr: BARIUM	15800		16110		97.9	40-110					

The following samples were analyzed in this batch: 1511214-1 1511214-2 1511214-3

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Lupin Mines Incorporated c/o Elgin Mining Inc.	Select Report Format: ☒ PDF ☒ EXCEL | | EDD (DIGITAL)	R ☒ Regular (Standard TAT if received by 3 pm - business days)
Contact:	K. Lewis	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	76 Richmond Street East, Suite 330 Toronto, ON M5C 1P1	☐ Criteria on Report - provide details below if box checked	E | | Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
		Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	778-386-7340	Email 1 or Fax klewis@elginmining.com	Specify Date Required for E2,E or P:
		Email 2 abowie@srk.com	

Invoice To	Same as Report To ☑ Yes ☐ No	Invoice Distribution
	Copy of Invoice with Report ☐ Yes ☐ No	Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX
Company:		Email 1 or Fax klewis@elginmining.com
Contact:		Email 2

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	53119	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:	Lupin Mine	Location:	

ALS Lab Work Order # (lab use only): L1695173 **ALS Contact:** Rick Zoliewski **Sampler:** C.de Repentigny

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals	Total Cyanide	TSS, Hardness, Alkalinity, Sulphate	Total Mercury	Radium	Ammonia	Nitrate/Nitrate							Number of Containers
					P	P		P	P	P								
	Lup-10-151027	27-oct-15	9:40	Water	R	R	R	R	R	R	R							7
	Lup-35-151027	27-oct-15	9:45	Water	R	R	R	R	R	R	R							7
	Lup-36-151027	27-oct-15	9:50	Water	R	R	R	R	R	R	R							7
			Alberta Time															

L1695173-COFC

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No	
Are samples for human drinking water use? ☐ Yes ☐ No	

SAMPL

Frozen ☐

Ice packs Yes ☐ No ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
1.9°C					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
[illegible]	Oct 28/15	11:00	[illegible]	Oct 28/15	1515			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326a v09 Front/04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

LUPIN MINES INCORPORATED
ATTN: Karen Lewis
76 Richmond Street
Suite 330
Toronto ON M5C 1P1

Date Received: 28-OCT-15
Report Date: 30-NOV-15 13:28 (MT)
Version: FINAL

Client Phone: 778-386-7340

Certificate of Analysis

Lab Work Order #: L1695179

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1695179-1	L1695179-2	L1695179-3	L1695179-4	L1695179-5
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	27-OCT-15	27-OCT-15	27-OCT-15	27-OCT-15	27-OCT-15
	Sampled Time	09:45	10:20	11:15	11:55	12:30
	Client ID	LUP-25-151027	LUP-24-151027	LUP-22-151027	LUP-21-151027	LUP-20-151027
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	5.29	5.51	85.0	6.45	183
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	<3.0	<3.0
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	2.6	2.8	2.8	3.9	<2.0
	Ammonia, Total (as N) (mg/L)	<0.050	<0.050	<0.050	<0.050	0.092
Cyanides	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Total Metals	Aluminum (Al)-Total (mg/L)	0.0067	0.0069	0.0314	0.0085	0.0992
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00025	0.00025	0.00073	0.00026	0.00183
	Barium (Ba)-Total (mg/L)	0.00245	0.00279	0.0128	0.00252	0.0273
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Total (mg/L)	<0.010	<0.010	0.027	<0.010	0.063
	Cadmium (Cd)-Total (mg/L)	0.0000053	<0.0000050	0.000100	<0.0000050	0.000220
	Calcium (Ca)-Total (mg/L)	1.21	1.27	27.6	1.34	60.1
	Cesium (Cs)-Total (mg/L)	<0.000010	<0.000010	0.000042	0.000016	0.000080
	Chromium (Cr)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Cobalt (Co)-Total (mg/L)	0.00014	0.00014	0.0127	<0.00010	0.0360
	Copper (Cu)-Total (mg/L)	0.00064	0.00062	0.00096	0.00069	0.00112
	Iron (Fe)-Total (mg/L)	<0.010	<0.010	0.123	0.024	1.04
	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Total (mg/L)	<0.0010	<0.0010	0.0117	0.0011	0.0254
	Magnesium (Mg)-Total (mg/L)	0.548	0.569	3.89	0.752	8.00
	Manganese (Mn)-Total (mg/L)	0.00344	0.00344	0.308	0.00272	0.857
	Mercury (Hg)-Total (mg/L)		<0.0000050		<0.0000050	
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Nickel (Ni)-Total (mg/L)	0.00123	0.00123	0.0351	0.00067	0.0764
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	0.409	0.427	2.32	0.409	4.91
	Rubidium (Rb)-Total (mg/L)	0.00120	0.00106	0.00185	0.00123	0.00275
	Selenium (Se)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	0.000056
	Silicon (Si)-Total (mg/L)	0.141	0.100	1.00	0.205	2.05
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	0.765	0.805	20.2	0.696	45.5
	Strontium (Sr)-Total (mg/L)	0.00672	0.00690	0.117	0.00744	0.263
	Sulfur (S)-Total (mg/L)	0.98	0.97	34.8	1.04	79.8
	Tellurium (Te)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	0.000013

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1695179-6				
	Description	WATER				
	Sampled Date	27-OCT-15				
	Sampled Time	10:10				
	Client ID	LUP-37-151027				
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	5.53				
	Total Suspended Solids (mg/L)	<3.0				
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	3.1				
	Ammonia, Total (as N) (mg/L)	<0.050				
Cyanides	Cyanide, Total (mg/L)	<0.0050				
Total Metals	Aluminum (Al)-Total (mg/L)	0.0062				
	Antimony (Sb)-Total (mg/L)	<0.00010				
	Arsenic (As)-Total (mg/L)	0.00026				
	Barium (Ba)-Total (mg/L)	0.00256				
	Beryllium (Be)-Total (mg/L)	<0.00010				
	Bismuth (Bi)-Total (mg/L)	<0.000050				
	Boron (B)-Total (mg/L)	<0.010				
	Cadmium (Cd)-Total (mg/L)	<0.0000050				
	Calcium (Ca)-Total (mg/L)	1.29				
	Cesium (Cs)-Total (mg/L)	<0.000010				
	Chromium (Cr)-Total (mg/L)	<0.00010				
	Cobalt (Co)-Total (mg/L)	0.00014				
	Copper (Cu)-Total (mg/L)	0.00056				
	Iron (Fe)-Total (mg/L)	<0.010				
	Lead (Pb)-Total (mg/L)	<0.000050				
	Lithium (Li)-Total (mg/L)	<0.0010				
	Magnesium (Mg)-Total (mg/L)	0.559				
	Manganese (Mn)-Total (mg/L)	0.00360				
	Mercury (Hg)-Total (mg/L)	<0.0000050				
	Molybdenum (Mo)-Total (mg/L)	<0.000050				
	Nickel (Ni)-Total (mg/L)	0.00123				
	Phosphorus (P)-Total (mg/L)	<0.050				
	Potassium (K)-Total (mg/L)	0.418				
	Rubidium (Rb)-Total (mg/L)	0.00106				
	Selenium (Se)-Total (mg/L)	<0.000050				
	Silicon (Si)-Total (mg/L)	0.096				
	Silver (Ag)-Total (mg/L)	<0.000010				
	Sodium (Na)-Total (mg/L)	0.793				
	Strontium (Sr)-Total (mg/L)	0.00713				
	Sulfur (S)-Total (mg/L)	1.16				
	Tellurium (Te)-Total (mg/L)	<0.00020				
	Thallium (Tl)-Total (mg/L)	<0.000010				

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1695179-1	L1695179-2	L1695179-3	L1695179-4	L1695179-5
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	27-OCT-15	27-OCT-15	27-OCT-15	27-OCT-15	27-OCT-15
	Sampled Time	09:45	10:20	11:15	11:55	12:30
	Client ID	LUP-25-151027	LUP-24-151027	LUP-22-151027	LUP-21-151027	LUP-20-151027
Grouping	**Analyte**					
WATER						
Total Metals	Thorium (Th)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	0.00101
	Tungsten (W)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Uranium (U)-Total (mg/L)	0.000020	0.000020	0.000013	0.000023	0.000017
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030	0.104	<0.0030	0.227
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Radiological Parameters	Ra-226 (Bq/L)		0.011		<0.0100	

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1695179-6				
	Description	WATER				
	Sampled Date	27-OCT-15				
	Sampled Time	10:10				
	Client ID	LUP-37-151027				
Grouping	**Analyte**					
WATER						
Total Metals	Thorium (Th)-Total (mg/L)	<0.00010				
	Tin (Sn)-Total (mg/L)	<0.00010				
	Titanium (Ti)-Total (mg/L)	<0.00030				
	Tungsten (W)-Total (mg/L)	<0.00010				
	Uranium (U)-Total (mg/L)	0.000020				
	Vanadium (V)-Total (mg/L)	<0.00050				
	Zinc (Zn)-Total (mg/L)	<0.0030				
	Zirconium (Zr)-Total (mg/L)	<0.00030				
Radiological Parameters	Ra-226 (Bq/L)	<0.0100				

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TOT-ED	Water	Alkalinity, T	APHA 2320 B-Auto-Pot. Titration
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002
This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.			
ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
HG-T-CVAA-ED	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
NH3-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)
This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.			
RA226-MMER-FC	Water	Ra226 by Alpha Scint, MDC=0.01 Bq/L	EPA 903.1
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Tuesday, November 24, 2015

Rick Zolkiewski
ALS Environmental
314 Old Airport Road Unit 116
Yellowknife, NT X1A 3T3

Re: ALS Workorder: 1511216
Project Name:
Project Number: L1695179

Dear Mr. Zolkiewski:

Three water samples were received from ALS Environmental, on 11/11/2015. The samples were scheduled for the following analysis:

Radium-226

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Amy R. Wolf
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Connecticut (CT)	PH-0232
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
L-A-B (DoD ELAP/ISO 170250)	L2257
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280

1511216

Radium-226:
The samples were prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1511216
Client Name: ALS Environmental
Client Project Name:
Client Project Number: L1695179
Client PO Number: L1695179

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L1695179-2	1511216-1		WATER	27-Oct-15	
L1695179-4	1511216-2		WATER	27-Oct-15	
L1695179-6	1511216-3		WATER	27-Oct-15	

ALS Environmental

15 11216

L1695179

YELLOWKNIFE

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA
225 COMMERCE DRIVE
FORT COLLINS,CO 80524

NOTES: Please reference on final report and invoice: PO# *L1695179*
ALS requires QC data to be provided with your final results.

Please see enclosed 3 sample(s) in 3 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
(1) **L1695179-2 LUP-24-151027**		**10/27/2015**	
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	11/23/2015	
(2) **L1695179-4 LUP-21-151027**		**10/27/2015**	
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	11/23/2015	
(3) **L1695179-6 LUP-37-151027**		**10/27/2015**	
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	11/23/2015	

Subcontract Info Contact: Sean Whitaker (867) 873-5593

Analysis and reporting info contact: Rick Zolkiewski
314 OLD AIRPORT ROAD
Unit 116
YELLOWKNIFE,NT X1A 3T3
Phone: (867) 873-5593 Email: Rick.Zolkiewski@alsglobal.com

Please email confirmation of receipt to: **Rick.Zolkiewski@alsglobal.com**

Shipped By: _____ Date Shipped: _____

Received By: _____ Date Received: 11-11-15 / 0950

Verified By: _____ Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS Yellowknife Workorder No: 1511216

Project Manager: ARN Initials: SDM Date: 11-11-15

1. Does this project require any special handling in addition to standard ALS procedures?		YES	(NO)
2. Are custody seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		(YES)	NO
5. Are the COC and bottle labels complete and legible?		(YES)	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		(YES)	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	(YES)	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	(YES)	NO
9. Are all aqueous non-preserved samples pH 4-9?	(N/A)	YES	NO
10. Is there sufficient sample for the requested analyses?		(YES)	NO
11. Were all samples placed in the proper containers for the requested analyses?		(YES)	NO
12. Are all samples within holding times for the requested analyses?		(YES)	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		(YES)	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	(N/A)	YES	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	N/A	YES	(NO)
16. Were the samples shipped on ice?		(YES)	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	RAD ONLY	(YES)	NO

Cooler #:	1								
Temperature (°C):	4.4								
No. of custody seals on cooler:	0								
DOT Survey/ Acceptance Information — External µR/hr reading:	10								
Background µR/hr reading:	11								

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? (YES) / NO / NA (If no, see Form 008.)

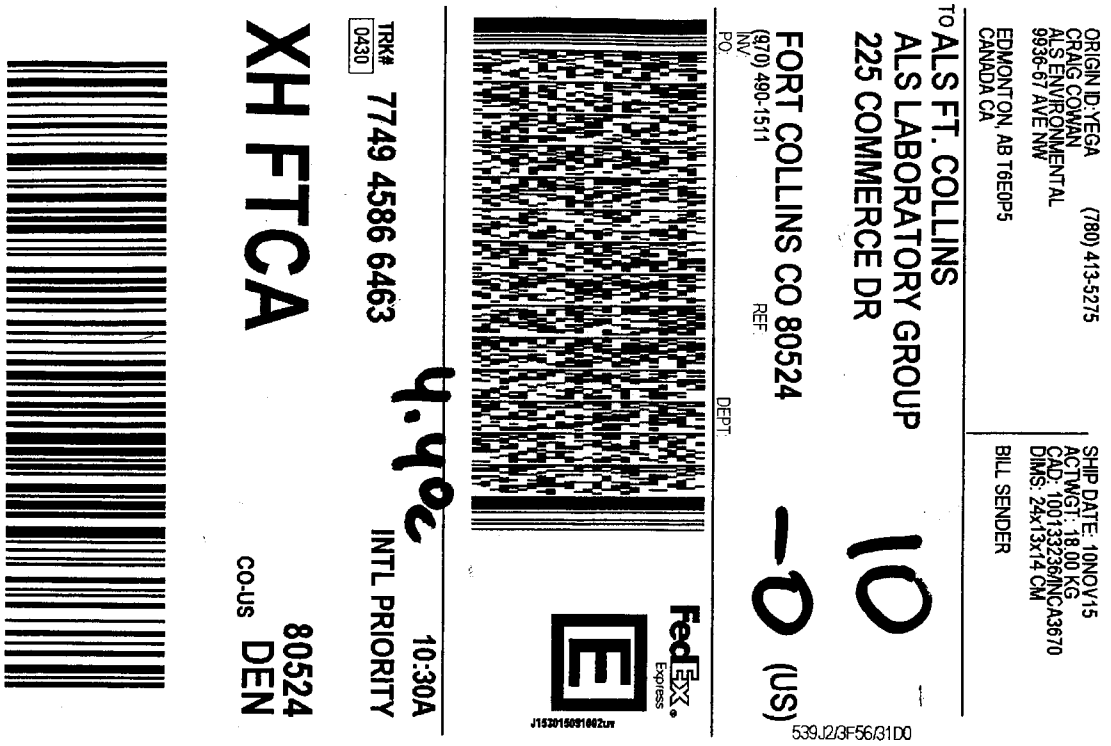
Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? YES / NO / (NA) Contact: _____ Date/Time: _____

Project Manager Signature / Date: 11/11/15

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

1511216



/templates/components/dotcom_label_contents/FoldInstr/en/Folding_instructions_shippingLabel.html loading...
/templates/components/dotcom_label_contents/WarningsOriginalLabel/en/Folding_warning.html loading...
/templates/components/dotcom_label_contents/TnCIntl/en/TC_intl.html loading...

Client:	ALS Environmental	**Date:**	*24-Nov-15*
Project:	L1695179	**Work Order:**	1511216
Sample ID:	L1695179-2	**Lab ID:**	1511216-1
Legal Location:		**Matrix:**	WATER
Collection Date:	10/27/2015	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**PAI 783**			Prep Date: **11/13/2015**	PrepBy: **ECP**
Ra-226	**0.011 (+/- 0.0065)**		**0.0075**	**BQ/l**	NA	11/23/2015 13:57
Carr: BARIUM	*90.5*		*40-110*	*%REC*	DL = NA	11/23/2015 13:57

Client:	ALS Environmental	**Date:**	*24-Nov-15*
Project:	L1695179	**Work Order:**	1511216
Sample ID:	L1695179-4	**Lab ID:**	1511216-2
Legal Location:		**Matrix:**	WATER
Collection Date:	10/27/2015	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**PAI 783**			Prep Date: **11/13/2015**	PrepBy: **ECP**
Ra-226	ND (+/- 0.0056)	U	0.0095	BQ/l	NA	11/23/2015 13:57
Carr: BARIUM	*73.5*		*40-110*	*%REC*	DL = NA	11/23/2015 13:57

Client:	ALS Environmental	**Date:**	*24-Nov-15*
Project:	L1695179	**Work Order:**	1511216
Sample ID:	L1695179-6	**Lab ID:**	1511216-3
Legal Location:		**Matrix:**	WATER
Collection Date:	10/27/2015	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**PAI 783**			Prep Date: **11/13/2015**	PrepBy: **ECP**
Ra-226	ND (+/- 0.0059)	U	0.0087	BQ/l	NA	11/23/2015 13:57
Carr: BARIUM	*84*		*40-110*	*%REC*	DL = NA	11/23/2015 13:57

Client:	ALS Environmental	**Date:**	*24-Nov-15*
Project:	L1695179	**Work Order:**	1511216
Sample ID:	L1695179-6	**Lab ID:**	1511216-3
Legal Location:		**Matrix:**	WATER
Collection Date:	10/27/2015	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed

Explanation of Qualifiers

Radiochemistry:

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

LT - Result is less than requested MDC but greater than achieved MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

Batch ID: **RE151113-1-1** Instrument ID **Alpha Scin** Method: **Radium-226 by Radon Emanation**

LCS Sample ID: **RE151113-1** Units: **BQ/l** Analysis Date: **11/23/2015 13:57**

Client ID: Run ID: **RE151113-1A** Prep Date: **11/13/2015** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.82 (+/- 0.453)	0.0132	1.704		107	67-120					P,M3
Carr: BARIUM	15200		16110		94.2	40-110					

LCSD Sample ID: **RE151113-1** Units: **BQ/l** Analysis Date: **11/23/2015 13:57**

Client ID: Run ID: **RE151113-1A** Prep Date: **11/13/2015** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.97 (+/- 0.490)	0.0133	1.704		115	67-120		1.82	0.2	2.1	P,M3
Carr: BARIUM	15700		16110		97.5	40-110		15200			

MB Sample ID: **RE151113-1** Units: **BQ/l** Analysis Date: **11/23/2015 13:57**

Client ID: Run ID: **RE151113-1A** Prep Date: **11/13/2015** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	ND	0.0063									U
Carr: BARIUM	15800		16110		97.9	40-110					

The following samples were analyzed in this batch: 1511216-1 1511216-2 1511216-3

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Lupin Mines Incorporated c/o Elgin Mining Inc.	Select Report Format: ☒ PDF ☒ EXCEL | EDD (DIGITAL)	R ☒ Regular (Standard TAT if received by 3 pm - business days)
Contact:	K. Lewis	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	76 Richmond Street East, Suite 330 Toronto, ON M5C 1P1	☐ Criteria on Report - provide details below if box checked	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
		Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	778-386-7340	Email 1 or Fax klewis@elginmining.com	Specify Date Required for E2,E or P:
		Email 2 abowie@srk.com	

Invoice To		Invoice Distribution
	Same as Report To ☑ Yes ☐ No	Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX
	Copy of Invoice with Report ☐ Yes ☐ No	Email 1 or Fax klewis@elginmining.com
Company:		Email 2
Contact:		

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	53119	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:	Lupin Mine	Location:	

ALS Lab Work Order # (lab use only): L1695179 | ALS Contact: Rick Zoliewski | Sampler: C.deRepentigny

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Cyanide	TSS, Alkalinity, Hardness	Total Metals	Ammonia (NH4)	Radium	Total Mercury	Number of Containers
					P		P	P	P	P	
	LUP-25-151027	27-oct-15	9:45	Water	R	R	R	R			4
	LUP-24-151027	27-oct-15	10:20	Water	R	R	R	R	R	R	6
	LUP-22-151027	27-oct-15	11:15	Water	R	R	R	R			4
	LUP-21-151027	27-oct-15	11:55	Water	R	R	R	R	R	R	6
	LUP-20-151027	27-oct-15	12:30	Water	R	R	R	R			4
	LUP-37-151027	27-oct-15	10:10	Water	R	R	R	R	R	R	6
			Alberta time								

L1695179-COFC

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No	
Are samples for human drinking water use? ☐ Yes ☐ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | SIF Observations Yes ☐ No ☐ | Ice packs Yes ☐ No ☐ | Custody seal intact Yes ☐ No ☐ | Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C	
1.4			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	Oct 28/15	11:00.		Oct 28/15	1515			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326a v09 Front/04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

LUPIN MINES INCORPORATED
ATTN: Karen Lewis
76 Richmond Street
Suite 330
Toronto ON M5C 1P1

Date Received: 28-OCT-15
Report Date: 06-NOV-15 18:59 (MT)
Version: FINAL

Client Phone: 778-386-7340

Certificate of Analysis

Lab Work Order #: L1695192

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1695192-1	L1695192-2	L1695192-3	L1695192-4	
Description	WATER	WATER	WATER	WATER	
Sampled Date	24-OCT-15	25-OCT-15	26-OCT-15	28-OCT-15	
Sampled Time	09:15	09:15	09:15	09:55	
Client ID	LUP-10-151024	LUP-10-151025	LUP-10-151026	LUP-10-151028	
Grouping / **Analyte**					
WATER					
Physical Tests Hardness (as CaCO3) (mg/L)	176	191	179	189	
Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	<3.0	
Anions and Nutrients Alkalinity, Total (as CaCO3) (mg/L)	4.0	4.1	4.0	3.8	
Cyanides Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	
Total Metals Aluminum (Al)-Total (mg/L)	0.0333	0.0264	0.0288	0.0284	
Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
Arsenic (As)-Total (mg/L)	0.00699	0.00615	0.00625	0.00622	
Barium (Ba)-Total (mg/L)	0.0156	0.0158	0.0154	0.0154	
Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	
Boron (B)-Total (mg/L)	0.056	0.059	0.055	0.057	
Cadmium (Cd)-Total (mg/L)	0.000217	0.000221	0.000247	0.000234	
Calcium (Ca)-Total (mg/L)	58.9	64.8	59.5	64.1	
Cesium (Cs)-Total (mg/L)	0.000081	0.000083	0.000081	0.000080	
Chromium (Cr)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
Cobalt (Co)-Total (mg/L)	0.0320	0.0322	0.0344	0.0341	
Copper (Cu)-Total (mg/L)	0.00199	0.00193	0.00205	0.00208	
Iron (Fe)-Total (mg/L)	0.099	0.082	0.089	0.090	
Lead (Pb)-Total (mg/L)	0.000066	0.000059	0.000059	0.000055	
Lithium (Li)-Total (mg/L)	0.0259	0.0261	0.0249	0.0247	
Magnesium (Mg)-Total (mg/L)	6.94	7.07	7.31	7.00	
Manganese (Mn)-Total (mg/L)	0.847	0.807	0.863	0.836	
Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	
Nickel (Ni)-Total (mg/L)	0.0709	0.0721	0.0765	0.0755	
Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	
Potassium (K)-Total (mg/L)	4.77	4.89	4.41	4.36	
Rubidium (Rb)-Total (mg/L)	0.00228	0.00225	0.00221	0.00219	
Selenium (Se)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	
Silicon (Si)-Total (mg/L)	1.90	1.90	2.01	2.03	
Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
Sodium (Na)-Total (mg/L)	41.2	42.3	44.4	43.1	
Strontium (Sr)-Total (mg/L)	0.260	0.271	0.265	0.283	
Sulfur (S)-Total (mg/L)	77.9	77.3	78.2	77.6	
Tellurium (Te)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
Thorium (Th)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1695192-1	L1695192-2	L1695192-3	L1695192-4	
	Description	WATER	WATER	WATER	WATER	
	Sampled Date	24-OCT-15	25-OCT-15	26-OCT-15	28-OCT-15	
	Sampled Time	09:15	09:15	09:15	09:55	
	Client ID	LUP-10-151024	LUP-10-151025	LUP-10-151026	LUP-10-151028	
Grouping	**Analyte**					
WATER						
Total Metals	Titanium (Ti)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	
	Tungsten (W)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Uranium (U)-Total (mg/L)	0.000019	0.000017	0.000017	0.000015	
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Zinc (Zn)-Total (mg/L)	0.237	0.239	0.265	0.262	
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TOT-ED	Water	Alkalinity, T	APHA 2320 B-Auto-Pot. Titration
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002
This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.			
ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Lupin Mines Incorporated c/o Elgin Mining Inc.	Select Report Format: ☒ PDF ☒ EXCEL | EDD (DIGITAL)	R ☒ Regular (Standard TAT if received by 3 pm - business days)
Contact:	K. Lewis	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	76 Richmond Street East, Suite 330 Toronto, ON M5C 1P1	☐ Criteria on Report - provide details below if box checked Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	E Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	778-386-7340	Email 1 or Fax klewis@elginmining.com	Specify Date Required for E2,E or P:
		Email 2 abowie@srk.com	

Invoice To	Same as Report To ☑ Yes ☐ No	Invoice Distribution
	Copy of Invoice with Report ☐ Yes ☐ No	Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX
Company:		Email 1 or Fax klewis@elginmining.com
Contact:		Email 2

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	53119	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:	Lupin Mine	Location:	

ALS Lab Work Order # (lab use only): L1695192 **ALS Contact:** Rick Zoliewski **Sampler:** C.de Repentigny

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals	Total Cyanide	TSS, Alkalinity, Hardness										Number of Containers
					P	P											
	Lup-10-151024	24-oct-15	9:15	Water	R	R	R										3
	Lup-10-151025	25-oct-15	9:15	Water	R	R	R										3
	Lup-10-151026	26-oct-15	9:15	Water	R	R	R										3
	Lup-10-151028	28-oct-15	9:55	Water	R	R	R										3

L1695192-COFC

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ Yes ☑ No

Are samples for human drinking water use? ☐ Yes ☑ No

Special Instructions / Specify Criteria to add on report (client Use)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice packs Yes ☐ No ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
1.9°C					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	28/10/15	1100		Oct 28/15	1515			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326e v09 Front/04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

LUPIN MINES INCORPORATED
ATTN: Karen Lewis
76 Richmond Street
Suite 330
Toronto ON M5C 1P1

Date Received: 28-OCT-15
Report Date: 30-NOV-15 13:31 (MT)
Version: FINAL

Client Phone: 778-386-7340

Certificate of Analysis

Lab Work Order #: L1695201

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1695201-1				
	Description	WATER				
	Sampled Date	27-OCT-15				
	Sampled Time	11:10				
	Client ID	LUP-102-151027				
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	190				
	Total Suspended Solids (mg/L)	<3.0				
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	3.6				
	Ammonia, Total (as N) (mg/L)	0.102				
	Sulfate (SO4) (mg/L)	227				
Cyanides	Cyanide, Total (mg/L)	<0.0050				
Total Metals	Aluminum (Al)-Total (mg/L)	0.0241				
	Antimony (Sb)-Total (mg/L)	<0.00010				
	Arsenic (As)-Total (mg/L)	0.00614				
	Barium (Ba)-Total (mg/L)	0.0150				
	Beryllium (Be)-Total (mg/L)	<0.00010				
	Bismuth (Bi)-Total (mg/L)	<0.000050				
	Boron (B)-Total (mg/L)	0.066				
	Cadmium (Cd)-Total (mg/L)	0.000221				
	Calcium (Ca)-Total (mg/L)	63.6				
	Cesium (Cs)-Total (mg/L)	0.000087				
	Chromium (Cr)-Total (mg/L)	<0.00010				
	Cobalt (Co)-Total (mg/L)	0.0335				
	Copper (Cu)-Total (mg/L)	0.00192				
	Iron (Fe)-Total (mg/L)	0.081				
	Lead (Pb)-Total (mg/L)	0.000084				
	Lithium (Li)-Total (mg/L)	0.0265				
	Magnesium (Mg)-Total (mg/L)	7.47				
	Manganese (Mn)-Total (mg/L)	0.826				
	Mercury (Hg)-Total (mg/L)	<0.0000050				
	Molybdenum (Mo)-Total (mg/L)	<0.000050				
	Nickel (Ni)-Total (mg/L)	0.0745				
	Phosphorus (P)-Total (mg/L)	<0.050				
	Potassium (K)-Total (mg/L)	4.87				
	Rubidium (Rb)-Total (mg/L)	0.00240				
	Selenium (Se)-Total (mg/L)	<0.000050				
	Silicon (Si)-Total (mg/L)	1.93				
	Silver (Ag)-Total (mg/L)	<0.000010				
	Sodium (Na)-Total (mg/L)	45.1				
	Strontium (Sr)-Total (mg/L)	0.280				
	Sulfur (S)-Total (mg/L)	78.3				
	Tellurium (Te)-Total (mg/L)	<0.00020				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1695201-1				
	Description	WATER				
	Sampled Date	27-OCT-15				
	Sampled Time	11:10				
	Client ID	LUP-102-151027				
Grouping	**Analyte**					
WATER						
Total Metals	Thallium (Tl)-Total (mg/L)	<0.000010				
	Thorium (Th)-Total (mg/L)	<0.00010				
	Tin (Sn)-Total (mg/L)	<0.00010				
	Titanium (Ti)-Total (mg/L)	<0.00030				
	Tungsten (W)-Total (mg/L)	<0.00010				
	Uranium (U)-Total (mg/L)	0.000015				
	Vanadium (V)-Total (mg/L)	<0.00050				
	Zinc (Zn)-Total (mg/L)	0.249				
	Zirconium (Zr)-Total (mg/L)	<0.00030				
Radiological Parameters	Ra-226 (Bq/L)	0.015				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Sulfate (SO4)	MS-B	L1695201-1

Qualifiers for Individual Parameters Listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TOT-ED	Water	Alkalinity, T	APHA 2320 B-Auto-Pot. Titration
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002
This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.			
ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
HG-T-CVAA-ED	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
NH3-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)
This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.			
RA226-MMER-FC	Water	Ra226 by Alpha Scint, MDC=0.01 Bq/L	EPA 903.1
SO4-IC-N-ED	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Tuesday, November 24, 2015

Rick Zolkiewski
ALS Environmental
314 Old Airport Road Unit 116
Yellowknife, NT X1A 3T3

Re: ALS Workorder: 1511215
Project Name:
Project Number: L1695201

Dear Mr. Zolkiewski:

One water sample was received from ALS Environmental, on 11/11/2015. The sample was scheduled for the following analysis:

Radium-226

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Amy R. Wolf
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Connecticut (CT)	PH-0232
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
L-A-B (DoD ELAP/ISO 170250)	L2257
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280

1511215

Radium-226:
The sample was prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1511215
Client Name: ALS Environmental
Client Project Name:
Client Project Number: L1695201
Client PO Number: L1695201

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L1695201-1	1511215-1		WATER	27-Oct-15	

ALS Environmental

1511215

L1695201

YELLOWKNIFE

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA
225 COMMERCE DRIVE
FORT COLLINS,CO 80524

NOTES: Please reference on final report and invoice: PO# *L1695201*
ALS requires QC data to be provided with your final results.

Please see enclosed 1 sample(s) in 1 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
L1695201-1 LUP-102-151027		**10/27/2015**	
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	11/20/2015	

Subcontract Info Contact: Sean Whitaker (867) 873-5593

Analysis and reporting info contact: Rick Zolkiewski
314 OLD AIRPORT ROAD
Unit 116
YELLOWKNIFE,NT X1A 3T3
Phone: (867) 873-5593 Email: Rick.Zolkiewski@alsglobal.com

Please email confirmation of receipt to: **Rick.Zolkiewski@alsglobal.com**

Shipped By: _____ Date Shipped: _____

Received By: _____ Date Received: 11-11-15 | 0950

Verified By: _____ Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS Yellowknife Workorder No: 1511215

Project Manager: ARW Initials: SDM Date: 11-11-15

1. Does this project require any special handling in addition to standard ALS procedures?		YES	(NO)
2. Are custody seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		(YES)	NO
5. Are the COC and bottle labels complete and legible?		(YES)	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		(YES)	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	(YES)	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles) SDM 11-11-15	(N/A)	(YES)	NO
9. Are all aqueous non-preserved samples pH 4-9?	(N/A)	YES	NO
10. Is there sufficient sample for the requested analyses?		(YES)	NO
11. Were all samples placed in the proper containers for the requested analyses?		(YES)	NO
12. Are all samples within holding times for the requested analyses?		(YES)	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		(YES)	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	(N/A)	YES	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	N/A	YES	(NO)
16. Were the samples shipped on ice?		(YES)	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: (#2) #4	RAD ONLY	(YES)	NO

Cooler #:	1								
Temperature (°C):	4.4								
No. of custody seals on cooler:	0								
DOT Survey/ Acceptance Information — External µR/hr reading:	10								
Background µR/hr reading:	11								

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? **YES / NO / NA** (If no, see Form 008.)

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

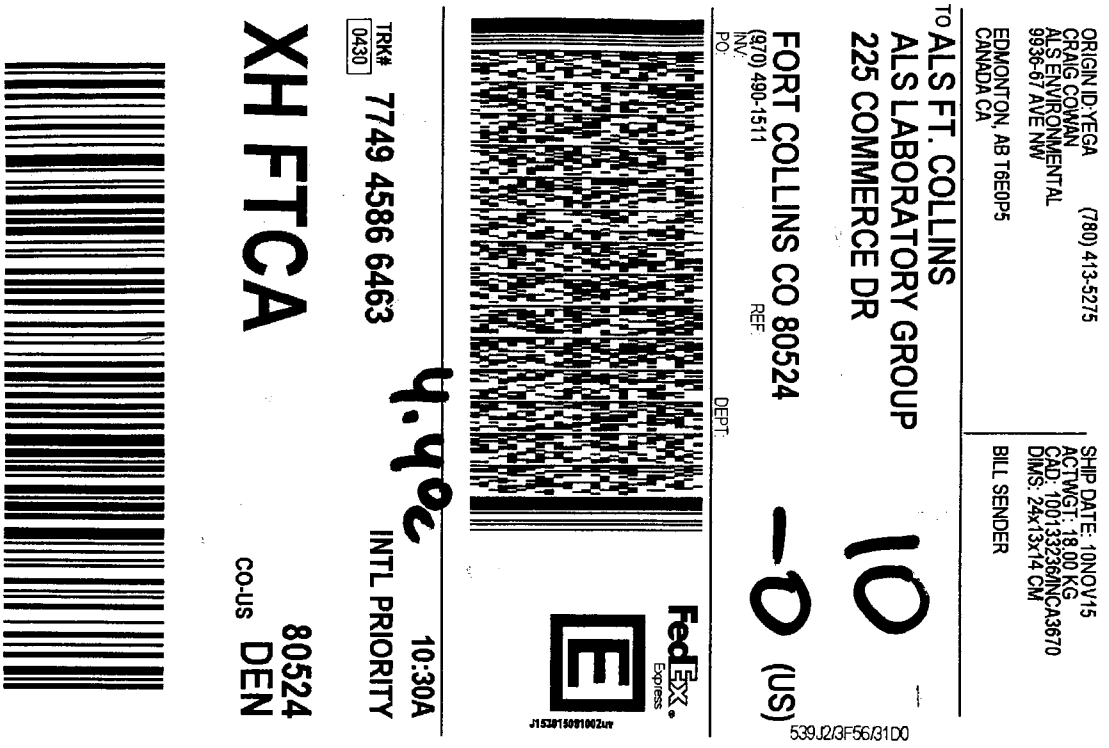
If applicable, was the client contacted? **YES / NO / (NA)** Contact: _____ Date/Time: _____

Project Manager Signature / Date: SDM 11/11/15

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

Form 201r24.xls (06/04/2012)

1511215



/templates/components/dotcom_label_contents/FoldInstr/en/Folding_instructions_shippingLabel.html loading...
/templates/components/dotcom_label_contents/WarningsOriginalLabel/en/Folding_warning.html loading...
/templates/components/dotcom_label_contents/TnCIntl/en/TC_intl.html loading...

Client:	ALS Environmental	**Date:**	*24-Nov-15*
Project:	L1695201	**Work Order:**	1511215
Sample ID:	L1695201-1	**Lab ID:**	1511215-1
Legal Location:		**Matrix:**	WATER
Collection Date:	10/27/2015	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**PAI 783**			Prep Date: **11/13/2015**	PrepBy: **ECP**
Ra-226	**0.015 (+/- 0.0084)**		**0.0091**	**BQ/l**	NA	11/23/2015 13:57
Carr: BARIUM	*85.8*		*40-110*	*%REC*	DL = NA	11/23/2015 13:57

Client:	ALS Environmental	**Date:**	*24-Nov-15*
Project:	L1695201	**Work Order:**	1511215
Sample ID:	L1695201-1	**Lab ID:**	1511215-1
Legal Location:		**Matrix:**	WATER
Collection Date:	10/27/2015	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed

Explanation of Qualifiers

Radiochemistry:

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

LT - Result is less than requested MDC but greater than achieved MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

Batch ID: **RE151113-1-1** Instrument ID **Alpha Scin** Method: **Radium-226 by Radon Emanation**

LCS Sample ID: **RE151113-1** Units: **BQ/l** Analysis Date: **11/23/2015 13:57**

Client ID: Run ID: **RE151113-1A** Prep Date: **11/13/2015** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.82 (+/- 0.453)	0.0132	1.704		107	67-120					P,M3
Carr: BARIUM	15200		16110		94.2	40-110					

LCSD Sample ID: **RE151113-1** Units: **BQ/l** Analysis Date: **11/23/2015 13:57**

Client ID: Run ID: **RE151113-1A** Prep Date: **11/13/2015** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.97 (+/- 0.490)	0.0133	1.704		115	67-120		1.82	0.2	2.1	P,M3
Carr: BARIUM	15700		16110		97.5	40-110		15200			

MB Sample ID: **RE151113-1** Units: **BQ/l** Analysis Date: **11/23/2015 13:57**

Client ID: Run ID: **RE151113-1A** Prep Date: **11/13/2015** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	ND	0.0063									U
Carr: BARIUM	15800		16110		97.9	40-110					

The following samples were analyzed in this batch: 1511215-1

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Lupin Mines Incorporated c/o Elgin Mining Inc.	Select Report Format: ☒ PDF ☒ EXCEL ☐ EDD (DIGITAL)	R ☒ Regular (Standard TAT if received by 3 pm - business days)
Contact:	K. Lewis	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	76 Richmond Street East, Suite 330 Toronto, ON M5C 1P1	☐ Criteria on Report - provide details below if box checked	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
Phone:	778-386-7340	Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
		Email 1 or Fax klewis@elginmining.com	Specify Date Required for E2,E or P:
		Email 2 abowie@srk.com	

Invoice To		Invoice Distribution
	Same as Report To ☑ Yes ☐ No	Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX
	Copy of Invoice with Report ☐ Yes ☐ No	Email 1 or Fax klewis@elginmining.com
Company:		Email 2
Contact:		

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	53119	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:	Lupin Mine	Location:	

ALS Lab Work Order # (lab use only): L1695201 | ALS Contact: Rick Zoliewski | Sampler: C.de Repentigny

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals (P)	Total Cyanide (P)	TSS, Hardness, Alkalinity, Sulphate	Total Mercury (P)	Radium (P)	Ammonia (P)	Number of Containers
	Lup-102-151027	27-oct-15	11:10	Water	R	R	R	R	R	R	6

L1695201-COFC

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No	
Are samples for human drinking water use? ☐ Yes ☐ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | SIF Observations Yes ☐ No ☐ | Ice packs Yes ☐ No ☐ | Custody seal intact Yes ☐ No ☐ | Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
1.4					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	Oct 28/15	11:00		Oct 28/15	1515			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326e v09 Front04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

LUPIN MINES INCORPORATED
ATTN: Karen Lewis
76 Richmond Street
Suite 330
Toronto ON M5C 1P1

Date Received: 06-NOV-15
Report Date: 18-NOV-15 12:41 (MT)
Version: FINAL

Client Phone: 778-386-7340

Certificate of Analysis

Lab Work Order #: L1699300

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1699300-1	L1699300-2	L1699300-3	L1699300-4	
	Description	WATER	WATER	WATER	WATER	
	Sampled Date	03-NOV-15	03-NOV-15	03-NOV-15	03-NOV-15	
	Sampled Time	12:05	13:05	13:10	14:20	
	Client ID	LUP-22-151103	LUP-24-151103	LUP-37-151103	LUP-25-151103	
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	71.8	5.73	5.68	5.23	
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	<3.0	
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	4.1	3.0	3.2	3.4	
	Ammonia, Total (as N) (mg/L)	<0.050	<0.050	<0.050	<0.050	
Cyanides	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	
Total Metals	Aluminum (Al)-Total (mg/L)	0.0286	0.0075	0.0070	0.0070	
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Arsenic (As)-Total (mg/L)	0.00063	0.00023	0.00026	0.00022	
	Barium (Ba)-Total (mg/L)	0.0120	0.00258	0.00263	0.00248	
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	
	Boron (B)-Total (mg/L)	0.020	<0.010	<0.010	<0.010	
	Cadmium (Cd)-Total (mg/L)	0.0000792	<0.0000050	<0.0000050	<0.0000050	
	Calcium (Ca)-Total (mg/L)	23.2	1.33	1.31	1.19	
	Cesium (Cs)-Total (mg/L)	0.000036	<0.000010	<0.000010	<0.000010	
	Chromium (Cr)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Cobalt (Co)-Total (mg/L)	0.00867	0.00015	0.00013	0.00011	
	Copper (Cu)-Total (mg/L)	0.00087	0.00069	0.00074	0.00119	
	Iron (Fe)-Total (mg/L)	0.097	<0.010	<0.010	<0.010	
	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	
	Lithium (Li)-Total (mg/L)	0.0096	<0.0010	<0.0010	<0.0010	
	Magnesium (Mg)-Total (mg/L)	3.38	0.584	0.587	0.548	
	Manganese (Mn)-Total (mg/L)	0.224	0.00407	0.00375	0.00294	
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	
	Nickel (Ni)-Total (mg/L)	0.0248	0.00131	0.00130	0.00110	
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	
	Potassium (K)-Total (mg/L)	1.71	0.407	0.414	0.389	
	Rubidium (Rb)-Total (mg/L)	0.00188	0.00107	0.00107	0.00108	
	Selenium (Se)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	
	Silicon (Si)-Total (mg/L)	0.835	0.100	0.083	0.089	
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
	Sodium (Na)-Total (mg/L)	15.0	0.822	0.734	0.660	
	Strontium (Sr)-Total (mg/L)	0.0928	0.00692	0.00685	0.00631	
	Sulfur (S)-Total (mg/L)	25.5	1.23	1.12	1.01	
	Tellurium (Te)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
	Thorium (Th)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1699300-1	L1699300-2	L1699300-3	L1699300-4	
	Description	WATER	WATER	WATER	WATER	
	Sampled Date	03-NOV-15	03-NOV-15	03-NOV-15	03-NOV-15	
	Sampled Time	12:05	13:05	13:10	14:20	
	Client ID	LUP-22-151103	LUP-24-151103	LUP-37-151103	LUP-25-151103	
Grouping	**Analyte**					
WATER						
Total Metals	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Titanium (Ti)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	
	Tungsten (W)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Uranium (U)-Total (mg/L)	0.000019	0.000020	0.000020	0.000019	
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Zinc (Zn)-Total (mg/L)	0.0709	<0.0030	<0.0030	<0.0030	
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TOT-ED	Water	Alkalinity, T	APHA 2320 B-Auto-Pot. Titration
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002

This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.

ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.

SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric

Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Lupin Mines Incorporated c/o Elgin Mining Inc.	Select Report Format: ☒ PDF ☒ EXCEL ☐ EDD (DIGITAL)	R ☒ Regular (Standard TAT if received by 3 pm - business days)
Contact:	K. Lewis	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	76 Richmond Street East, Suite 330 Toronto, ON M5C 1P1	☐ Criteria on Report - provide details below if box checked	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
Phone:	778-386-7340	Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
		Email 1 or Fax klewis@elginmining.com	Specify Date Required for E2,E or P:
		Email 2 abowie@srk.com	

Invoice To		Invoice Distribution
	Same as Report To ☑ Yes ☐ No	Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX
	Copy of Invoice with Report ☐ Yes ☐ No	Email 1 or Fax klewis@elginmining.com
Company:		Email 2
Contact:		

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	53119	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:	Lupin Mine	Location:	

ALS Lab Work Order # (lab use only): L1699300

ALS Contact: Rick Zoliewski Sampler: C.deRepentigny

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Cyanide (P)	TSS, Alkalinity, Hardness (P)	Total Metals (P)	Ammonia (NH4) (P)	Number of Containers
	LUP-22-151103	03-nov-15	12:05	Water	R	R	R	R	4
	LUP-24-151103	03-nov-15	13:05	Water	R	R	R	R	4
	LUP-37-151103	03-nov-15	13:10	Water	R	R	R	R	4
	LUP-25-151103	03-nov-15	14:20	Water	R	R	R	R	4
			Alberta time						

L1699300-COFC

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No	
Are samples for human drinking water use? ☐ Yes ☐ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐			SIF Observations	Yes ☐	No ☐	
Ice packs	Yes ☐	No ☐		Custody seal intact	Yes ☐	No ☐	
Cooling Initiated	☐						

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
6.0					

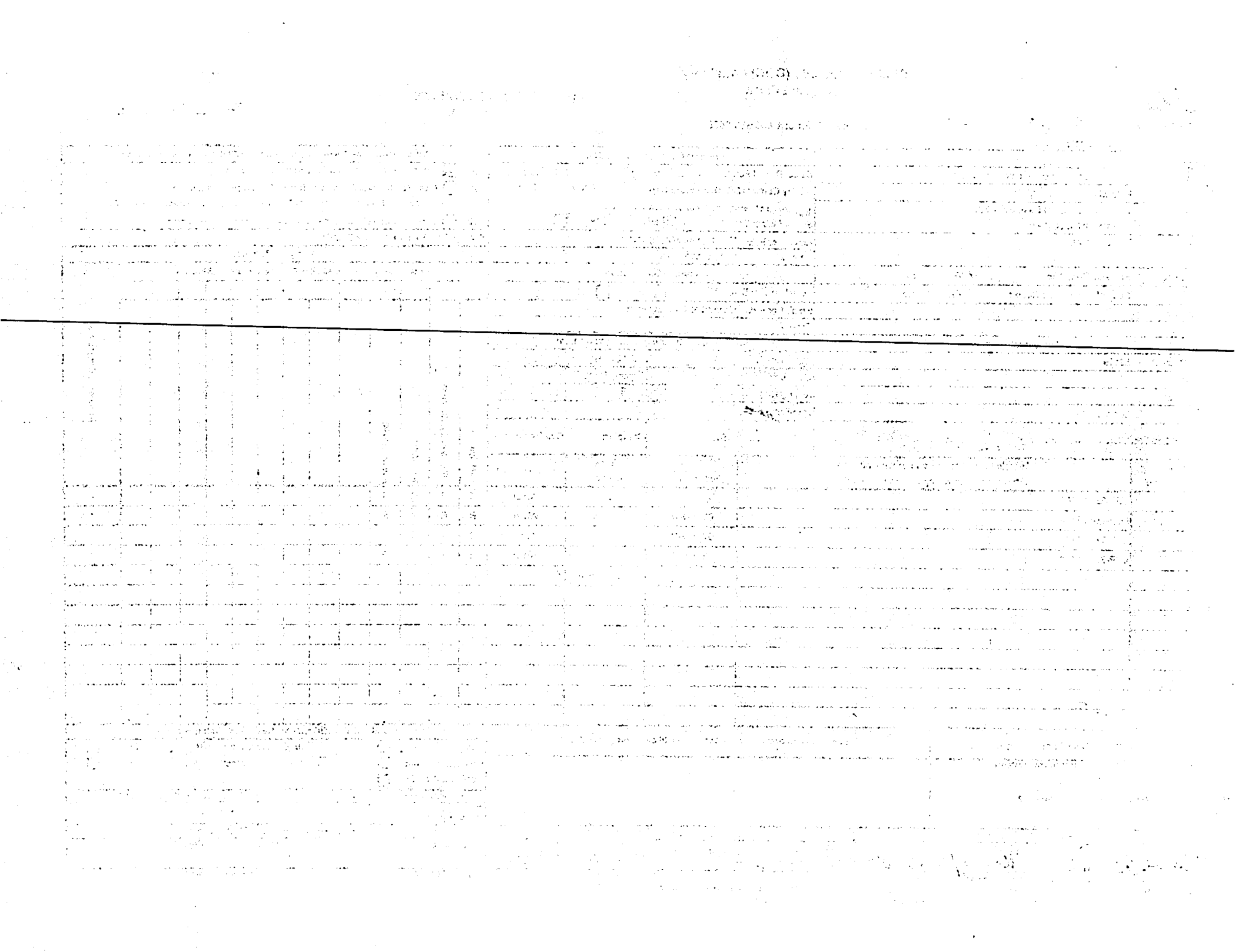
SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	Nov. 5/15	15:05		Nov 6/15	09:35			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.



LUPIN MINES INCORPORATED
ATTN: Karen Lewis
76 Richmond Street
Suite 330
Toronto ON M5C 1P1

Date Received: 06-NOV-15
Report Date: 16-NOV-15 11:17 (MT)
Version: FINAL

Client Phone: 778-386-7340

Certificate of Analysis

Lab Work Order #: L1699310

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1699310-1				
	Description	WATER				
	Sampled Date	29-OCT-15				
	Sampled Time	14:10				
	Client ID	LUP-10-151029				
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	203				
	Total Suspended Solids (mg/L)	<3.0				
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	5.7				
Cyanides	Cyanide, Total (mg/L)	<0.0050				
Total Metals	Aluminum (Al)-Total (mg/L)	0.0374				
	Antimony (Sb)-Total (mg/L)	<0.00010				
	Arsenic (As)-Total (mg/L)	0.00780				
	Barium (Ba)-Total (mg/L)	0.0153				
	Beryllium (Be)-Total (mg/L)	<0.00010				
	Bismuth (Bi)-Total (mg/L)	<0.000050				
	Boron (B)-Total (mg/L)	0.057				
	Cadmium (Cd)-Total (mg/L)	0.000233				
	Calcium (Ca)-Total (mg/L)	67.9				
	Cesium (Cs)-Total (mg/L)	0.000089				
	Chromium (Cr)-Total (mg/L)	<0.00010				
	Cobalt (Co)-Total (mg/L)	0.0334				
	Copper (Cu)-Total (mg/L)	0.00199				
	Iron (Fe)-Total (mg/L)	0.112				
	Lead (Pb)-Total (mg/L)	0.000066				
	Lithium (Li)-Total (mg/L)	0.0271				
	Magnesium (Mg)-Total (mg/L)	8.08				
	Manganese (Mn)-Total (mg/L)	0.895				
	Molybdenum (Mo)-Total (mg/L)	<0.000050				
	Nickel (Ni)-Total (mg/L)	0.0747				
	Phosphorus (P)-Total (mg/L)	<0.050				
	Potassium (K)-Total (mg/L)	4.78				
	Rubidium (Rb)-Total (mg/L)	0.00230				
	Selenium (Se)-Total (mg/L)	0.000062				
	Silicon (Si)-Total (mg/L)	2.00				
	Silver (Ag)-Total (mg/L)	<0.000010				
	Sodium (Na)-Total (mg/L)	41.4				
	Strontium (Sr)-Total (mg/L)	0.284				
	Sulfur (S)-Total (mg/L)	78.8				
	Tellurium (Te)-Total (mg/L)	<0.00020				
	Thallium (Tl)-Total (mg/L)	<0.000010				
	Thorium (Th)-Total (mg/L)	<0.00010				
	Tin (Sn)-Total (mg/L)	<0.00010				

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1699310-1				
	Description	WATER				
	Sampled Date	29-OCT-15				
	Sampled Time	14:10				
	Client ID	LUP-10-151029				
Grouping	**Analyte**					
WATER						
Total Metals	Titanium (Ti)-Total (mg/L)	0.00058				
	Tungsten (W)-Total (mg/L)	<0.00010				
	Uranium (U)-Total (mg/L)	0.000018				
	Vanadium (V)-Total (mg/L)	<0.00050				
	Zinc (Zn)-Total (mg/L)	0.243				
	Zirconium (Zr)-Total (mg/L)	<0.00030				

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TOT-ED	Water	Alkalinity, T	APHA 2320 B-Auto-Pot. Titration
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002
This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.			
ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Lupin Mines Incorporated c/o Elgin Mining Inc.	Select Report Format: ☒ PDF ☒ EXCEL ☐ EDD (DIGITAL)	R ☒ Regular (Standard TAT if received by 3 pm - business days)
Contact:	K. Lewis	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	76 Richmond Street East, Suite 330 Toronto, ON M5C 1P1	☐ Criteria on Report - provide details below if box checked Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	778-386-7340	Email 1 or Fax klewis@elginmining.com Email 2 abowie@srk.com	Specify Date Required for E2,E or P:

Invoice To		Invoice Distribution	Analysis Request
	Same as Report To ☑ Yes ☐ No	Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
	Copy of Invoice with Report ☐ Yes ☐ No	Email 1 or Fax klewis@elginmining.com	
Company:		Email 2	
Contact:			

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	53119	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:	Lupin Mine	Location:	

ALS Lab Work Order # (lab use only): L1699310

ALS Contact: Rick Zoliewski Sampler: C.de Repentigny

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals	Total Cyanide	TSS, Alkalinity, Hardness											Number of Containers
					P	P												
	Lup-10-151029	29-oct-15	14:10	Water	R	R	R											3

L1699310-COFC

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☑ No	
Are samples for human drinking water use? ☐ Yes ☑ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐		SIF Observations	Yes	☐	No	☐
Ice packs	Yes ☐	No ☐	Custody seal intact	Yes	☐	No	☐
Cooling Initiated	☐						

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
~6.1					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
Connie deRe	Nov. 5/15	15:05		Nov 6/15	09:35			

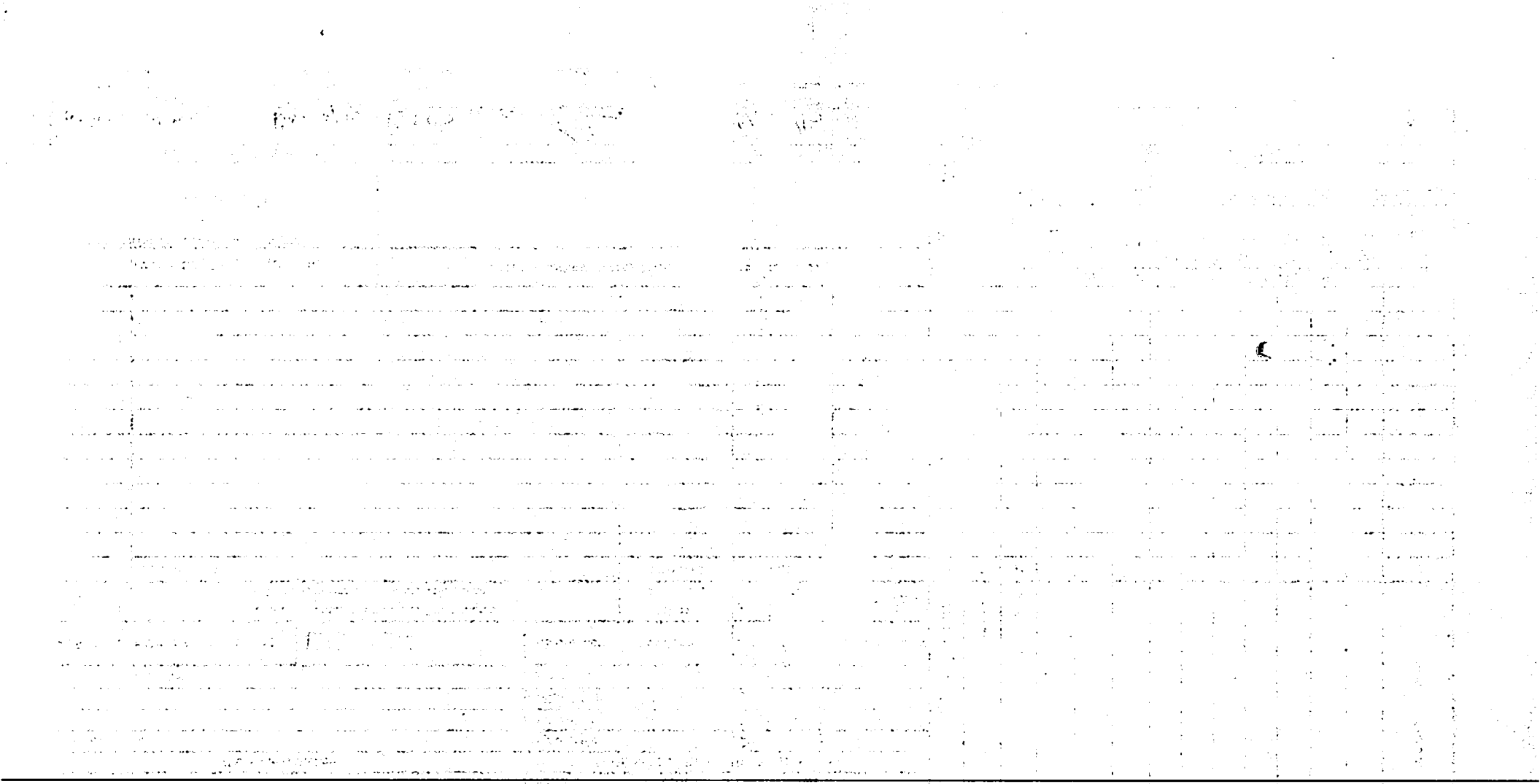
REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

ALS-FM-0329e v09 Front04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.



LUPIN MINES INCORPORATED
ATTN: Karen Lewis
76 Richmond Street
Suite 330
Toronto ON M5C 1P1

Date Received: 18-DEC-15
Report Date: 31-DEC-15 20:16 (MT)
Version: FINAL

Client Phone: 778-386-7340

Certificate of Analysis

Lab Work Order #: L1716424

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1716424-1	L1716424-2	L1716424-3	L1716424-4	
Description	WATER	WATER	WATER	WATER	
Sampled Date	17-DEC-15	18-DEC-15	18-DEC-15	18-DEC-15	
Sampled Time	14:30	10:43	10:43	11:01	
Client ID	LUP-22-151217	LUP-24-151217	LUP-37-151217	LUP-25-151217	
Grouping	**Analyte**				
WATER					
Physical Tests	Conductivity (EC) (uS/cm)	94.5	55.8	55.8	18.7	
	Hardness (as CaCO3) (mg/L)	26.1	15.2	15.8	5.93	
	pH (pH)	6.44	6.34	6.29	6.29	
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	<3.0	
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	5.0	3.7	3.4	3.4	
	Ammonia, Total (as N) (mg/L)	<0.050	<0.050	<0.050	<0.050	
	Nitrate and Nitrite (as N) (mg/L)		0.055	0.052		
	Nitrate (as N) (mg/L)		0.055	0.052		
	Nitrite (as N) (mg/L)		<0.010	<0.010		
Cyanides	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	
Total Metals	Aluminum (Al)-Total (mg/L)	0.0225	0.0111	0.0116	0.0094	
	Antimony (Sb)-Total (mg/L)	0.00076	<0.00010	<0.00010	0.00010	
	Arsenic (As)-Total (mg/L)	0.00047	0.00031	0.00030	0.00024	
	Barium (Ba)-Total (mg/L)	0.00743	0.00470	0.00512	0.00294	
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	
	Boron (B)-Total (mg/L)	0.013	<0.010	<0.010	<0.010	
	Cadmium (Cd)-Total (mg/L)	0.0000769	0.0000210	0.0000199	0.0000150	
	Calcium (Ca)-Total (mg/L)	7.76	4.39	4.61	1.39	
	Cesium (Cs)-Total (mg/L)	0.000029	0.000014	0.000014	<0.000010	
	Chromium (Cr)-Total (mg/L)	0.00024	<0.00010	<0.00010	<0.00010	
	Cobalt (Co)-Total (mg/L)	0.00078	0.00035	0.00036	<0.00010	
	Copper (Cu)-Total (mg/L)	0.00294	0.00122	0.00124	0.00100	
	Iron (Fe)-Total (mg/L)	0.070	0.015	0.016	<0.010	
	Lead (Pb)-Total (mg/L)	0.000350	<0.000050	0.000053	0.000060	
	Lithium (Li)-Total (mg/L)	0.0038	0.0023	0.0024	0.0010	
	Magnesium (Mg)-Total (mg/L)	1.64	1.03	1.05	0.600	
	Manganese (Mn)-Total (mg/L)	0.0327	0.0137	0.0138	0.00207	
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	
	Nickel (Ni)-Total (mg/L)	0.00911	0.00461	0.00462	0.00126	
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	
	Potassium (K)-Total (mg/L)	1.52	0.679	0.695	0.462	
	Rubidium (Rb)-Total (mg/L)	0.00179	0.00145	0.00141	0.00127	
	Selenium (Se)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	
	Silicon (Si)-Total (mg/L)	0.463	0.238	0.234	0.117	
	Silver (Ag)-Total (mg/L)	0.000013	<0.000010	<0.000010	<0.000010	
	Sodium (Na)-Total (mg/L)	4.89	2.93	3.04	0.836	

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1716424-1	L1716424-2	L1716424-3	L1716424-4	
	Description	WATER	WATER	WATER	WATER	
	Sampled Date	17-DEC-15	18-DEC-15	18-DEC-15	18-DEC-15	
	Sampled Time	14:30	10:43	10:43	11:01	
	Client ID	LUP-22-151217	LUP-24-151217	LUP-37-151217	LUP-25-151217	
Grouping	**Analyte**					
WATER						
Total Metals	Strontium (Sr)-Total (mg/L)	0.0356	0.0203	0.0219	0.00744	
	Sulfur (S)-Total (mg/L)	8.40	4.76	4.95	1.12	
	Tellurium (Te)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
	Thorium (Th)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Tin (Sn)-Total (mg/L)	0.00024	0.00054	0.00055	0.00025	
	Titanium (Ti)-Total (mg/L)	0.00049	<0.00030	<0.00030	<0.00030	
	Tungsten (W)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Uranium (U)-Total (mg/L)	0.000023	0.000019	0.000019	0.000023	
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Zinc (Zn)-Total (mg/L)	0.0264	0.0114	0.0116	<0.0030	
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TOT-ED	Water	Alkalinity, T	APHA 2320 B-Auto-Pot. Titration
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002
This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.			
ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
NH3-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)
This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.			
NO2+NO3-CALC-ED	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-ED	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-ED	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
PH/EC-ED	Water	pH and Conductivity	APHA 4500-H, 2510
All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed)			
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
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mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Lupin Mines Incorporated c/o Elgin Mining Inc.	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	K. Lewis	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	76 Richmond Street East, Suite 330 Toronto, ON M5C 1P1	☐ Criteria on Report - provide details below if box checked Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	778-386-7340	Email 1 or Fax: klewis@elginmining.com	Specify Date Required for E2,E or P:
		Email 2: abowie@srk.com	

Invoice To		Invoice Distribution	Analysis Request
	Same as Report To ☑ Yes ☐ No	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
	Copy of Invoice with Report ☐ Yes ☐ No	Email 1 or Fax: klewis@elginmining.com	
Company:		Email 2:	
Contact:			

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	53119	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:	Lupin Mine	Location:	

ALS Lab Work Order # (lab use only): L1716424 **ALS Contact:** Rick Zoliewski **Sampler:** C.deRepentigny

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Cyanide	pH, TSS, Alkalinity, Hardness	Total Metals	Ammonia (NH4)	Nitrate (NO3)	Number of Containers
	LUP-22-1511__	17-12-15	14:30	Water	R	R	R	R		1
	LUP-24-1511__	18-12-15	10:43	Water	R	R	R	R	R	1
	LUP-37-1511__	18-12-15	10:43	Water	R	R	R	R	R	0
	LUP-25-1511__	18-12-15	11:01	Water	R	R	R	R		1
			Alberta time							

L1716424-COFC

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☑ No Are samples for human drinking water use? ☐ Yes ☑ No	Samples need to be separated into individual bottles and preserved. Please use sample LUP-24-1511___ to create a duplicate sample called LUP-37-1511___ CCME FWAL and MMER criteria apply.

Frozen
Ice packs
Cooling Initiated ☐

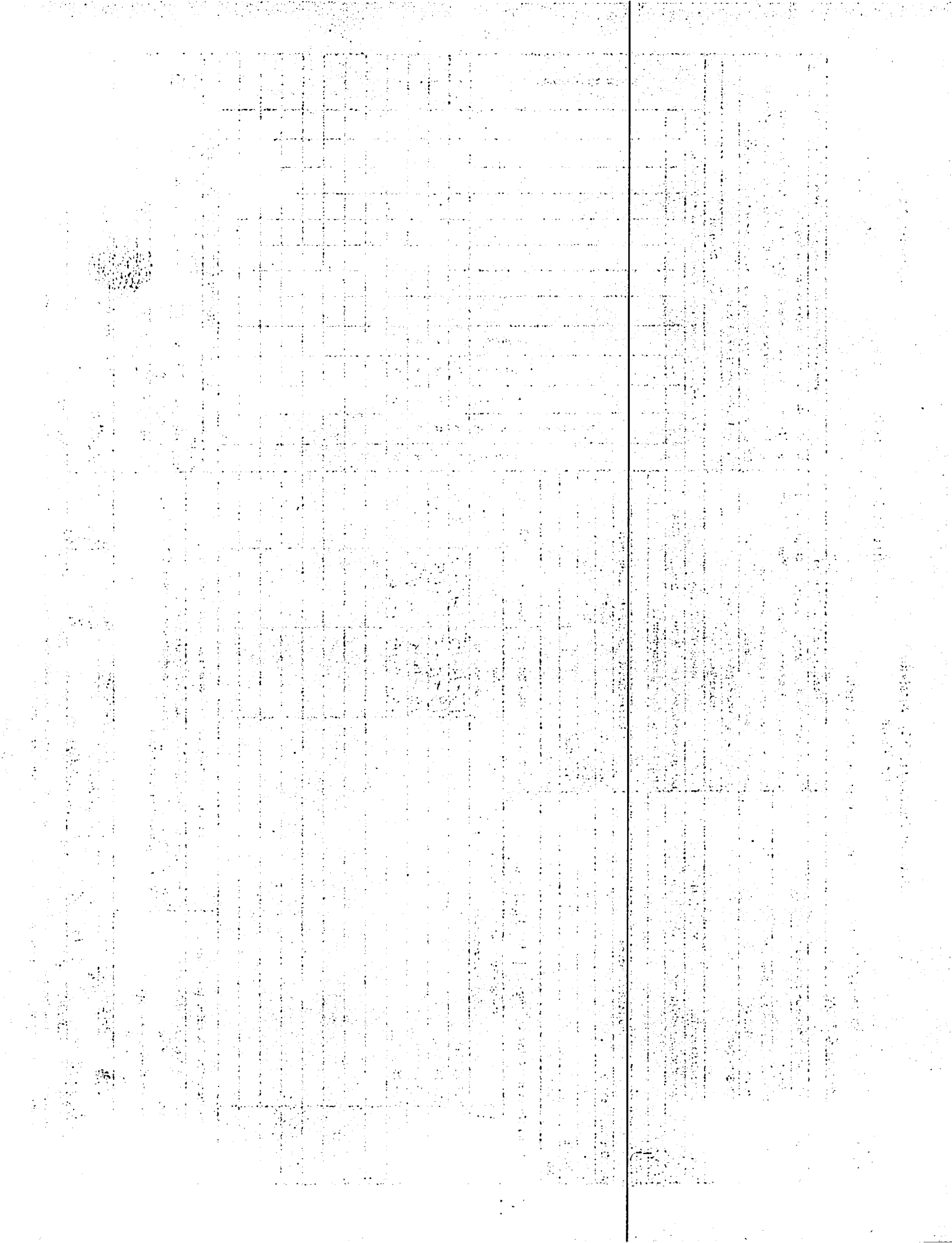
INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Matt Bowden	Date: 18-12-15	Time: 15:15	Received by: L. Chikoppa	Date: Dec 18/15	Time: 1515	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System** please submit using an **Authorized DW COC form**.



Nautilus Environmental

Lupin Mines
ATTN: K. Lewis
76 Richmond St. East, Suite 330
Toronto, ON
M5C 1P1

Report Date: September 3, 2015
Work Order: 15648 - 649

Data Report

Species: **Rainbow trout (*Oncorhynchus mykiss*)**
Protocol: **EPS 1/RM/13 (Second Ed. with 2007 amendments)**

Species: ***Daphnia magna***
Protocol: **EPS 1/RM/14 (Second Ed. 2000)**

Table 1. Results for the 96-h rainbow trout acute toxicity tests.

Sample ID	Collection Date and Time	Survival in the undiluted sample (%)
Lup-Station (pH 7.0)	Aug 19, 2015 @ 1000h	100
Lup-Station (pH 7.5)	Aug 19, 2015 @ 1000h	100
Lup-Station (pH 8.5)	Aug 19, 2015 @ 1000h	100

Table 2. Results for the 48-h *Daphnia magna* acute toxicity tests.

Sample ID	Collection Date and Time	Survival in the undiluted sample (%)
Lup-Station (pH 7.0)	Aug 19, 2015 @ 1000h	93
Lup-Station (pH 7.5)	Aug 19, 2015 @ 1000h	93
Lup-Station (pH 8.5)	Aug 19, 2015 @ 1000h	70

The Lup-Station sample was tested for toxicity using three pH-test treatments (pH 7.0, pH 7.5 and pH 8.5). The sample had an initial pH of 4.7, which was adjusted to the three pH values (7.0, 7.5 and 8.5) using a 1.0 M Ca $(OH)_2$ (lime) solution provided and requested by client to use in this particular study. Corresponding pH-controls (pH 7.0, pH 7.5 and pH 8.5) were also

prepared and tested concurrently with the sample treatments. These control pH-treatments were prepared similarly using either 1.0 M Ca $(OH)_2$ lime solution or 0.1M HCl to increase or decrease the pH of the control water.

Significant pH drift was observed during the rainbow trout testing and, therefore, the pH was re-adjusted with the lime solution at each 24-h interval. The *D. magna* did not require further pH-adjustments during the exposure period. The initial and final pH measurements during testing are shown in Tables 3 and 4 for the rainbow trout and *D. magna* toxicity tests, respectively.

Table 3. Measured pH values during the 96-h rainbow trout testing.

Sample ID	0hr	24hr		48hr		72hr		96hr
	Initial	Initial	Final	Initial	Final	Initial	Final	Final
Lup-Station (pH 7.0)	7.1	6.4	7.1	6.6	7.0	6.6	6.9	6.9
Lup-Station (pH 7.5)	7.7	6.5	7.5	6.7	7.6	6.7	7.7	7.0
Lup-Station (pH 8.5)	8.6	6.6	8.5	7.0	8.6	6.9	8.5	7.1
Control (pH 7.0)	6.9	6.8	6.8	7.2	7.0	7.0	7.1	7.1
Control (pH 7.5)	7.6	7.2	7.4	7.2	7.5	7.2	7.5	7.2
Control (pH 8.5)	8.6	7.1	8.4	7.3	8.4	7.3	8.6	7.4

Table 4. Measured pH values during the 48-h *D. magna* testing.

Sample ID	0hr	48hr
	Initial	Final
Lup-Station (pH 7.0)	7.0	6.6
Lup-Station (pH 7.5)	7.4	6.8
Lup-Station (pH 8.5)	8.6	7.2
Control (pH 7.0)	7.0	7.2
Control (pH 7.5)	7.5	7.8
Control (pH 8.5)	8.5	8.2

The tests met performance criteria and there were no deviations from the test methods. The results presented herein relate only to the sample and associated test-treatments evaluated in this study.

Josh Baker, M.Sc.
Environmental Chemist

Reviewed By:
Edmund Canaria, R.P. Bio.
Senior Reviewer

Rainbow Trout Summary Sheet

Client: SRK

Start Date/Time: Aug 22/15 @1145h

Work Order No.: 15649

Test Species: *Oncorhynchus mykiss*

Test Validity Criteria:
≥ 90% control survival
WQ Ranges:
T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Sample Information:

Sample ID: LUP-STATION102-150819
Sample Date: Aug 19/15
Date Received: Aug 21/15
Sample Volume: 2×20L
Other: pH adjusted to 7.0

Dilution Water:

Type: Dechlorinated Municipal Tap Water
Hardness (mg/L $CaCO_3$): 8
Alkalinity (mg/L $CaCO_3$): 10

Test Organism Information:

Batch No.: 072015
Source: Aqua Farm
No. Fish/Volume (L): 10/12L
Loading Density (g/L): 0.29
Mean Length ± SD (mm): 33 ± 3 Range: 30-39
Mean Weight ± SD (g): 0.35 ± 0.08 Range: 0.27-0.48

Zinc Reference Toxicant Results:

Reference Toxicant ID: RTZn18
Stock Solution ID: 15Zn04
Date Initiated: Aug 17/15
96-h LC50 (95% CL): 102.8 (72.0-163.3) mg/L Zn

Reference Toxicant Mean and Historical Range: 69.4 (41.7-115.6) mg/L Zn
Reference Toxicant CV (%): 29.0%

Test Results: 100 % survival at 96 hours in the 100 % (v/v) undiluted sample adjusted to a pH of 7.0.

Reviewed by: [signature] Date reviewed: Sept. 3/15

Rainbow Trout Summary Sheet

Client: SRK

Start Date/Time: Aug 22/15 @1145h

Work Order No.: 15649

Test Species: *Oncorhynchus mykiss*

Test Validity Criteria:
≥ 90% control survival
WQ Ranges:
T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Sample Information:

Sample ID: LUP-STATION102-160819 SSD
Sample Date: Aug 19/15
Date Received: Aug 21/15
Sample Volume: 2x20L
Other: pH adjusted to 7.5

Dilution Water:

Type: Dechlorinated Municipal Tap Water
Hardness (mg/L $CaCO_3$): 8
Alkalinity (mg/L $CaCO_3$): 10

Test Organism Information:

Batch No.: 072015
Source: Aqua Farm
No. Fish/Volume (L): 10/12L
Loading Density (g/L): 0.42
Mean Length ± SD (mm): 38 ± 2 Range: 34-41
Mean Weight ± SD (g): 0.50 ± 0.07 Range: 0.38-0.61

Zinc Reference Toxicant Results:

Reference Toxicant ID: RTZn18
Stock Solution ID: 15Zn04
Date Initiated: Aug 17/15
96-h LC50 (95% CL): 102.8 (72.0-163.3) ug/L Zn

Reference Toxicant Mean and Historical Range: 69.4 (41.7-115.6) ug/L Zn
Reference Toxicant CV (%): 29.0%

Test Results: 100 % survival at 96 hours in the 100 % (v/v) undiluted sample adjusted to a pH of 7.5. SRB

Reviewed by: [signature] Date reviewed: Sept-3/15

Rainbow Trout Summary Sheet

Client: SRK

Start Date/Time: Aug 22/15 @1145h

Work Order No.: 15649

Test Species: *Oncorhynchus mykiss*

Test Validity Criteria:
≥ 90% control survival
WQ Ranges:
T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Sample Information:

Sample ID: LUP-STATION102-1050819 (SSD)
Sample Date: Aug 19/15
Date Received: Aug 21/15
Sample Volume: 2x20L
Other: pH adjusted to 8.5

Dilution Water:

Type: Dechlorinated Municipal Tap Water
Hardness (mg/L $CaCO_3$): 8
Alkalinity (mg/L $CaCO_3$): 10

Test Organism Information:

Batch No.: 072015
Source: Aqua Farm
No. Fish/Volume (L): 10/12L
Loading Density (g/L): 0.31
Mean Length ± SD (mm): 33 ± 2 Range: 29-35
Mean Weight ± SD (g): 0.37 ± 0.09 Range: 0.24-0.56

Zinc Reference Toxicant Results:

Reference Toxicant ID: RTZn18
Stock Solution ID: 15Zn04
Date Initiated: Aug 17/15
96-h LC50 (95% CL): 102.8 (72.0-163.3) ug/L Zn

Reference Toxicant Mean and Historical Range: 69.4 (41.7-115.6) ug/L Zn
Reference Toxicant CV (%): 29.0%

Test Results: 100% survival at 96 hours in the 100% (v/v) undiluted sample adjusted to a pH of 8.5

Reviewed by: [signature]

Date reviewed: Sept-3/15

96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: SEK
Sample I.D. Lup - Station
W.O. # 15649
RBT Batch #: 072015
Date Collected/Time: Aug 19/15 @ 1000h
Date Setup/Time: Aug 23/15 @ 1145h
Sample Setup By: Amy

D.O. meter: DO - 2
pH meter: pH - 1
Cond. Meter: C - 2

Number Fish/Volume: 10/12 L
7-d % Mortality: ~~0~~ 1.1
Total Pre-aeration Time (mins): 30
Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Yes

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	15.0	①	refer to
pH	~~10.1~~ 4.7	②	time 0
D.O. (mg/L)	10.1	③	NO parameters
Cond. (µS/cm)	583		

Concentration	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)	
(% v/v)	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
Control ①				10	10	10	10	15.0	15.0	15.0	15.0	14.0	9.9	9.4	9.1	9.8	9.6	6.9	6.8	7.0	7.1	7.1	33	39
100 ①				10	10	10	10	15.0	15.0	15.0	15.0	14.0	9.8	9.3	9.4	9.9	9.8	7.1	7.1	7.0	6.9	6.9	585	603
Control ②				10	10	10	10	15.0	15.0	15.0	15.0	14.0	9.9	9.4	9.1	9.8	9.6	7.6	7.4	7.5	7.5	7.2	34	44
100 ②				10	10	10	10	15.0	15.0	15.0	15.0	14.0	9.9	9.4	9.2	9.8	9.5	7.7	7.5	7.6	7.7	7.0	587	607
Control ③				10	10	10	10	15.0	14.5	15.0	15.0	14.0	9.8	9.5	9.2	9.7	9.5	8.6	8.4	8.4	8.6	7.4	37	60
100 ③				10	10	10	10	15.0	14.5	15.0	15.0	14.0	9.9	9.5	9.3	9.8	9.6	8.6	8.5	8.6	8.5	7.1	589	~~603~~ 613
Initials				SSD	SSD	SSD			SSD	SSD	SSD	SSD		SSD	SSD	SSD	KL		SSD	JAB	JAB	SSD		SSD

WQ Ranges: **T** (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Sample Description/Comments: clear, brown ppt present on bottom of tank for each 100%

Fish Description at 96 h: Fish look okay — Number of Stressed Fish at 96 h: 0

Other Observations: ① pH adjusted to 7.0 ± 0.2 w/ ~~0.1N~~ 1.0N CaOH ② pH adjusted to 7.5 ± 0.2 w/ ~~0.1N~~ 1.0N $Ca(OH)_2$ ③ pH adjusted to 6.5 w/ 1.0 ~~D~~N CaOH

Reviewed by: [signature] — Date Reviewed: Sept 3/15

Daphnia magna Summary Sheet

Client: SRK
Work Order No.: 15648

Start Date/Time: August 24, 2015 @ 0930h
Test Species: *Daphnia magna*
Set up by: YYL

Sample Information:

Sample ID: LUP-STATION 102-150819
Sample Date: August 19, 2015
Date Received: August 21, 2015
Sample Volume: 2x1L
- pH adjusted to 7.0

Test Validity Criteria:
≥ 90% mean control survival (no more than 2 mortalities in any control replicate)

WQ Ranges:
T (°C) = 20 ± 2; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

Test Organism Information:

Broodstock No.: 080515A+B
Age of young (Day 0): <24 h
Avg No. young per brood in previous 7 d: 32
Mortality (%) in previous 7 d: 10
Days to first brood: 9

NaCl Reference Toxicant Results:

Reference Toxicant ID: DMTC20
Stock Solution ID: ISN202
Date Initiated: August 18, 2015
48-h LC50 (95% CL): 3.7 (3.2 - 4.2) g/LNaCL

Reference Toxicant Mean and Historical Range: 4.4 (3.5 - 5.4) g/L NaCL
Reference Toxicant CV (%): 11

Test Results: 93% survival at 48h in the 100% (v/v) undiluted sample. Sample adjusted to a pH of 7.0

Reviewed by: [signature]
Date reviewed: Sept. 3/15

Daphnia magna Summary Sheet

Client: SRK
Work Order No.: 15648

Start Date/Time: August 24, 2015 @ 0930h
Test Species: *Daphnia magna*
Set up by: YNL

Sample Information:

Sample ID: LUP-STATION 102-150819
Sample Date: August 19, 2015
Date Received: August 21, 2015
Sample Volume: 2x1L
-pH adjusted to 7.5

Test Validity Criteria:
≥ 90% mean control survival (no more than 2 mortalities in any control replicate)

WQ Ranges:
T (°C) = 20 ± 2; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

Test Organism Information:

Broodstock No.: 080515A+B
Age of young (Day 0): <24 h
Avg No. young per brood in previous 7 d: 32
Mortality (%) in previous 7 d: 10
Days to first brood: 9

NaCl Reference Toxicant Results:

Reference Toxicant ID: DMTC20
Stock Solution ID: ISNa02
Date Initiated: August 18, 2015
48-h LC50 (95% CL): 3.7 (3.2 - 4.2) g/L NaCL

Reference Toxicant Mean and Historical Range: 4.4 (3.5 - 5.4) g/L NaCL
Reference Toxicant CV (%): 11

Test Results: 93% survival at 48h in the 100% (v/v) undiluted sample. Sample adjusted to a pH of 7.5

Reviewed by: [signature]
Date reviewed: Sept 3/15

Daphnia magna Summary Sheet

Client: SRK
Work Order No.: 15648

Start Date/Time: August 24, 2015 @ 0930h
Test Species: *Daphnia magna*
Set up by: YNL

Sample Information:

Sample ID: LUP - STATION 102-150819
Sample Date: August 19, 2015
Date Received: August 21, 2015
Sample Volume: 2 x 1L
- pH adjusted to 8.5

Test Validity Criteria:
≥ 90% mean control survival (no more than 2 mortalities in any control replicate)

WQ Ranges:
T (°C) = 20 ± 2; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

Test Organism Information:

Broodstock No.: 080515A+B
Age of young (Day 0): <24 h
Avg No. young per brood in previous 7 d: 32
Mortality (%) in previous 7 d: 10
Days to first brood: 9

NaCl Reference Toxicant Results:

Reference Toxicant ID: DMTC20
Stock Solution ID: ISNA02
Date Initiated: August 18, 2015
48-h LC50 (95% CL): 3.7 (3.2 - 4.2) g/LNaCL

Reference Toxicant Mean and Historical Range: 4.4 (3.5 - 5.4) g/L NaCL
Reference Toxicant CV (%): 11

Test Results: 70% survival at 48h in the 100% (v/v) undiluted sample. Sample adjusted to a pH of 8.5

Reviewed by: [signature]
Date reviewed: Sept. 3/15

Freshwater Acute
48 Hour Toxicity Test Data Sheet

Client: SEK
Sample ID: Lup - Station 102 - 150819
Work Order No.: 15648
Start Date/Time: Aug 24/15 @ 0930h
No. Organisms/volume: 10/200mL
Test Organism: D.magna
Set up by: VML ~~AMM~~ MC

Thermometer: Temp-5 DO meter: DO-3/2 pH meter: pH-3/2 Conductivity meter: C-3/2

Concentration (% v/v)	Rep	Number of Live Organisms 24	Number of Live Organisms 48	No. Immobilized 48	Temperature (°C) 0	Temperature (°C) 24	Temperature (°C) 48	Dissolved oxygen (mg/L) 0	Dissolved oxygen (mg/L) 24	Dissolved oxygen (mg/L) 48	pH 0	pH 24	pH 48	Conductivity (µS/cm) 0	Conductivity (µS/cm) 48
Control (pH 7 adj)	A	10	10	0	19.5	20.5	19.5	8.5	\	8.4	7.0	\	7.2	362	378
	B	10	9	0											
	C	10	10	0											
	D														
100 (pH 7 adj)	A	10	10	0	20.0	20.5	19.5	8.7	\	8.2	7.0	\	6.6	585	612
	B	10	8	0											
	C	10	10	0											
	D														
Control (pH 7.5 adj)	A	10	10	0	19.5	20.5	19.5	8.4	\	8.3	7.5	\	7.8	356	372
	B	10	10	0											
	C	10	10	0											
	D														
100 (pH 7.5 adj)	A	8	8	0	20.0	20.5	19.5	8.6	\	8.2	7.4	\	6.8	588	609
	B	10	10	0											
	C	10	10	0											
	D														
Control (pH 8.5 adj)	A	10 ~~AMM~~	10	0	19.5	20.5	19.5	8.6	\	8.4	8.5	\	8.2	~~36~~ AMM	373
	B	10	10	0										357	
	C	10	9	0											
	D														
100 (pH 8.5 adj)	A	10	10	0	20.0	20.5	19.5	8.7	\	8.2	8.6	\	7.2	589	596
	B	6	6	0											
	C	6	~~AMM~~ 5	② 1 ~~AMM~~											
	D														
Technician Initials		RMM	VML	VML	~~VML~~	RMM	VML	~~VML~~	—	VML	~~VML~~	\	VML	~~VML~~	VML

WQ Ranges: T (°C) = 20 ± 2; DO (mg/L) at 20°C = 3.6 to 9.1; pH = 6 to 8.5

	Hardness*	Alkalinity*
Conc.	*(mg/L as CaCo3)	
Control (MHW)	See Hardness & Alkalinity	
Highest conc.	datasheet for values	
Hardness adjusted	—	—

	Initial WQ	Adjustment	Adjusted WQ
Temp (°C)	19.5		
DO (mg/L)	8.8	(pH ①	- see corresponding
pH	4.7 ~~8.0~~ AMM	adjusted)	values above
Cond (µS/cm)	~~AMM~~ 353 583		for each pH

Sample Description: clear; w/ slight particulate Mortality: Heartbeat checked under a microscope Yes

Comments: ① control - pH 7 + control pH 7.5 adjusted w/ 0.1 ~~1~~ M HCl; the rest w/ $Ca(OH)_2$
② Debris on organism

Batch#: 0805I5A+B 7-d previous # young/brood: 32 Previous 7-d Mortality (%): 10 Day of 1st Brood: 9

Reviewed by: [signature] Date reviewed: Sept 3/15

Client: Lupin Mines

W.O.#: 156498

Hardness and Alkalinity Datasheet

	Alkalinity						Hardness			
Sample ID	Sample Date	Sample Volume (mL)	(mL) 0.02N HCL/H_2SO_4 used to pH 4.5	(mL) of 0.02N HCL/H_2SO_4 used to pH 4.2	Total Alkalinity ($mg/LCaCO_3$)		Sample Volume (mL)	Volume of 0.01M EDTA Used (mL)	Total Hardness ($mg/L\ CaCO_3$)	Technician
MHW - pH 7.0	Aug 24/15	50	3.6	3.7	70		50	8.3	96	YYC
MHW - pH 7.5	↓	↓	3.8	4.0	72		↓	5.0	100	↓
MHW - pH 8.5	↓	↓	4.8	5.0	92		↓	5.5	110	↓
Lup - Station 102 - pH 7.0	Aug 24/15	50	0.5	0.6	8		50	8.3	166	YYC
Lup - Station 102 - pH 7.5	Aug 24/15	50	0.6	0.7	10		50	8.2	164	YYC
Lup - Station 102 - pH 8.5	Aug. 24/15	50	0.9	1.0	16		50	9.0	180	YYC

Notes:

Reviewed by: [signature]

Date Reviewed: Sept. 3/15

Nautilus Environmental

Chain of Custody (electronic)

[X] British Columbia: 8664 Commerce Court, Burnaby, BC, V5A 4N7

Aug 19,2015 Page 1 of 1

Sample Collection By:	A.Bowie	
	Report to:	**Invoice to:**
Company	Lupin Mines Incorporated c/o Elgin Mining Co.	same as report
Address	76 Richmond St. East, Suite 330	
City/Prov/Postal Code	Toronto, ON M5C 1P1	
Contact	K.Lewis	
Phone	778-386-7340	
Email	klewis@elginmining.com	

	SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	# OF CONTAINERS	COMMENTS	ANALYSES REQUIRED: Natural pH D.Magna	Natural pH Rainbow Trout	pH 7.5 D.Magna P/F	pH 7.5 Rainbow Trout P/F	pH 8.5 D.Magna P/F	pH 8.5 Rrainbow Trout P/F	pH 7.0 D.Magna P/F	pH 7.0 Rainbow Trout P/F				Receipt Temperature (°C)
1	LUP-STATION102-150819	19/08/15	10:00 am	Water	1 L	6	Total water provided for 3 pH tests (natural, 7.5 and 8.5), pH to be adjsuted in lab. This adjustment will take very little lime. As quoted by Armando.	0	0	1	1	1	1	1	1				8.9
2	LUP-STATION102-150819	19/08/15	10:00 am	Water	20 L	2													8.9
3	LUP-STATION102-150819	19/08/15	10:00 am	Water	10 L	2													8.9
4	-		Calcium Hydroxide (Lime)			1 bag													
5							Revision: Please adjust the natural pH sample to 7.0												
6																			
7								WO #: 15648-48H D.Magna P/F.											
8														PH adjusted to 7.0, 7.5, 8.5					
9										15649-96H Rbt P/F									
10														PH adjusted to 7.0, 7.5, 8.5					

PROJECT INFORMATION	SAMPLE RECEIPT		RELIQUINSHED BY (CLIENT)	RELIQUINSHED BY (COURIER)
Client: Lupin Mines Inc. c/o Elgin	**Total # Containers:**	12 (1)	**Signature:**	**Signature:**
P.O. No.:	**Good Condition?**	Y	**Print: Andrea Bowie**	**Print:**
Shipped Via:	**Matches Schedule?**	Y	**Company: SRK Consulting (Canada) Inc.**	**Company:**
			Time/Date:	**Time/Date:**
			RECEIVED BY (COURIER)	**RECEIVED BY (LABORATORY)**
			Signature:	**Signature:** NY
			Print:	**Print:** Nan Yamamoto
			Company:	**Company:** Nautilus
			Time/Date:	**Time/Date:** Aug 21/15 @16:59

SPECIAL INSTRUCTIONS/COMMENTS:
Please see Armando regarding sample pH adjustment and preparation.
Thanks!
Arlene spoke with Krysta August 21, 2015 10am to request revisions as highlighted in yellow.

(1) Received: 2x20L + 2x10L + 8x1L NY

Additional costs may be required for sample disposal or storage. Net 30 unless otherwise contracted.

Nautilus Environmental

Chain of Custody (electronic)

[X] British Columbia: 8664 Commerce Court, Burnaby, BC, V5A 4N7

Aug 19,2015 Page 1 of 1

Sample Collection By:	A.Bowie	
	Report to:	**Invoice to:**
Company	Lupin Mines Incorporated c/o Elgin Mining Co.	same as report
Address	76 Richmond St. East, Suite 330	
City/Prov/Postal Code	Toronto, ON M5C 1P1	
Contact	K.Lewis	
Phone	778-386-7340	
Email	klewis@elginmining.com	

	SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	# OF CONTAINERS	COMMENTS	ANALYSES REQUIRED: Natural pH D.Magna	Natural pH Rainbow Trout	pH 7.5 D.Magna	pH 7.5 Rainbow Trout	pH 8.5 D.Magna	pH 8.5 Rrainbow Trout	Receipt Temperature (°C)
1	LUP-STATION102-150819	19/08/15	10:00 am	Water	1 L	6	Total water provided for 3 pH tests (natural, 7.5 and 8.5), pH to be adjsuted in lab. This adjustment will take very little lime. As quoted by Armando.	1	1	1	1	1	1	
2	LUP-STATION102-150819	19/08/15	10:00 am	Water	20 L	2								
3	LUP-STATION102-150819	19/08/15	10:00 am	Water	10 L	2								
4	-		Calcium Hydroxide (Lime)			1 bag								
5														
6														
7														
8														
9														
10														

PROJECT INFORMATION	SAMPLE RECEIPT		RELIQUINSHED BY (CLIENT)	RELIQUINSHED BY (COURIER)
Client: Lupin Mines Inc. c/o Elgin	**Total # Containers:**		**Signature:**	**Signature:**
P.O. No.:	**Good Condition?**		**Print: Andrea Bowie**	**Print:**
Shipped Via:	**Matches Schedule?**		**Company: SRK Consulting (Canada) Inc.**	**Company:**
			Time/Date:	**Time/Date:**

SPECIAL INSTRUCTIONS/COMMENTS:
Please see Armando regarding sample pH adjustment and preparation.
Thanks!

COC updated

RECEIVED BY (COURIER)	RECEIVED BY (LABORATORY)
Signature:	**Signature:**
Print:	**Print:**
Company:	**Company:**
Time/Date:	**Time/Date:**

Additional costs may be required for sample disposal or storage. Net 30 unless otherwise contracted.

HydroQual Laboratories Ltd.

ATTN: Karyn Lewis; Andrea Bowie
SRK Consulting
76 Richmond Street E, Suite 300
Toronto, Ontario
Canada M5C 1P1

Received: 2015/09/25
Report Date: 2015/10/13
Version: FINAL

HydroQual Test Report

Client: SRK100
Reference: 15-1294
Billing: C/O A Bowie @ SRK

Senior Verifier

HydroQual Laboratories Ltd.

Trout (96-h LC50) Test Report

Result Summary

Client: SRK100
Reference: 15-1294-01-TRD

Client: SRK Consulting; operation Lupin Mine

Sample: LUP-10-150924

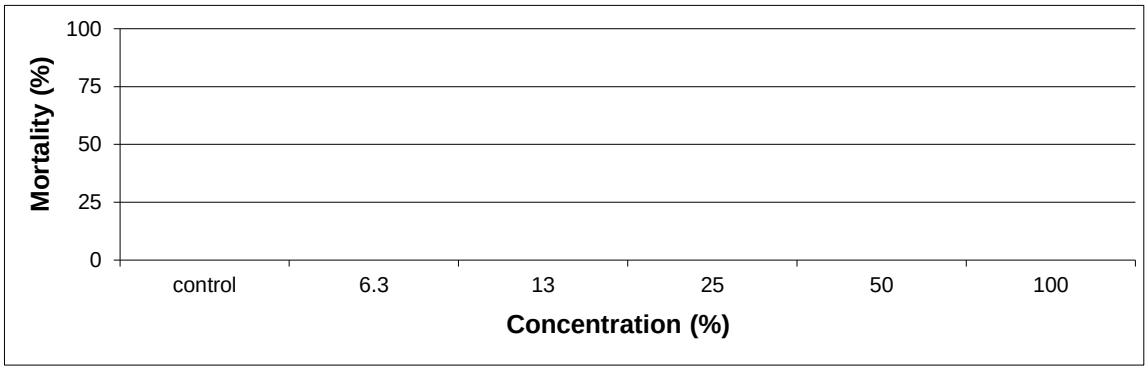
Collection: collected on 2015/09/24 at 0915 by CDCR
Receipt: received on 2015/09/25 at 1130 by JP
Containers: received 2 x 20 L containers at 8 °C, in good condition with no seals and no initials
Description: type: water, collection method: grab

Test: started on 2015/09/28 ; ended on 2015/10/02

Result:

	Endpoint (96-hour)	Value (%)	Confidence Limits (95%) lower	upper	Method Calculated
Acute:	LC50	>100			could not be calculated
(mortality)	LC25	>100			could not be calculated

Notes: LC25 & LC50, concentrations lethal to 25% and 50% of the test population



The test data and results are authorized and verified correct.

Senior Verifier

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Test Conditions

Client: SRK100
Reference: 15-1294-01-TRD

Method: Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout, 2000. Environment Canada, EPS 1/RM/13. Second Edition (amended May 2007).

Test type: Trout 96-h Static Acute Test (WTR-ME-041)
Species: *Oncorhynchus mykiss*
Organism source: Miracle Springs (Batch 20150826TR)
Acclimation: 33 days (must be ≥2 weeks)
Stock mortality: 0% (seven days preceding testing)

Sample initial chemistry: pH: 5.6; EC: 654 (µS/cm @ 25°C); DO: 10.1 (mg/L); temperature: 11 °C
hardness (mg CaC03/L): 114; colour: colourless; odour: odourless
Sample holding time: 4 days (must be ≤ 5 days)
Sample storage: 4 ± 2°C in darkness

Test vessel: The test was conducted in 22 L plastic pails with polyethylene liners
Test volume: 20 Litres (depth of solution in each test vessel ≥15cm)
Sample pre-treatment: All test solutions and controls were pre-aerated for 120 minutes at 6.5 ±1 mL/min/L
Dissolved oxygen in 100 % sample was 9.2 mg/L after pre-aeration
The sample was not filtered or pH adjusted prior to or during testing
Loading density: 0.144 g/Litre (must be ≤ 0.5 g/Litre)
Control/dilution water: Dechlorinated City of Calgary water acclimated to test conditions
Test concentrations: 5 effluent concentrations (6.3, 12.5, 25, 50, 100% (v/v) plus a negative control)
Test replicates: One replicate per treatment; 10 fish per replicate
Feeding: Fish are not fed 24 hours before test initiation and no feeding during test
Measurements: pH, conductivity, dissolved oxygen and temperature measured at test initiation and test termination
Aeration: All treatments aerated at 6.5 ±1 mL/min/L by oil-free compressed air passed through airline tubes connected to disposable air stones
Lighting: Overhead full spectrum fluorescent lights
Photoperiod: 16h light:8h dark
Test temperature: 15 ± 1°C

Endpoint: Mortality, 96-h LC50 (with 95% confidence limits)
Test validity: The control had 100% survival (must ≥ 90%)
The control had 0 percent (%) stressed behaviour (must ≤ 10%)
Reference toxicant: 96-h test with Potassium Chloride (KCl) initiated September 21, 2015; current results (96-h LC50 and 95% confidence limits) = 0.60 (0.50-0.65) log (g/L KCl)
historical results: (96-h LC50 and 95% confidence limits) = 0.56 (0.49-0.64) log (g/L KCl)

Note: Outlined sections are protocol deviations explained on the comment page; v/v, volume per volume

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Test Data

Client: SRK100
Reference: 15-1294-01-TRD

Test Log:

Date	Day	Time	Technician
2015/09/28	0	1530	CQ
2015/09/29	1	0925	HKS
2015/09/30	2	0800	DS
2015/10/01	3	0900	DS/JN
2015/10/02	4	0905	HKS/JN

Chemistry:

Conc. (%)	control	6.3	13	25	50	100
Day	pH (units)					
0	7.8	7.8	7.7	7.7	7.6	7.3
4	8.1	8.1	8.1	8.0	7.9	7.4
	Conductivity (µS/cm @ 25°C)					
0	475	490	502	523	583	651
4	474	446	455	473	511	590
	Dissolved Oxygen (mg/L)					
0	8.7	8.9	9.0	9.0	9.1	9.2
4	8.9	8.9	9.0	8.9	8.9	9.0
	Temperature (^{o}C)					
0	15	15	15	15	15	15
4	15	15	15	15	15	15

Number Alive (In brackets number stressed):

Conc. (%)	control	6.3	13	25	50	100
Day						
0	10	10	10	10	10	10
1	10	10	10	10	10	10
2	10	10	10	10	10	10
3	10	10	10	10	10	10
4	10	10	10	10	10	10
	Mortality (%)					
4	0	0	0	0	0	0
	Stressed (%)					
4	0	0	0	0	0	0

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Client: SRK100
Reference: 15-1294-01-TRD

Test Data

Biology Summary Tables:

Control Fish	Length (cm)	Wet Weight(g)
1	3.2	0.5
2	3.0	0.3
3	3.0	0.3
4	2.9	0.2
5	3.0	0.3
6	2.3	0.1
7	2.7	0.2
8	3.3	0.4
9	3.1	0.3
10	2.6	0.2
average	2.9	0.3
sd	0.3	0.1
cv(%)	10.3	36.1

Notes: nd, not done; na, not applicable; sd, standard deviation; cv(%), coefficient of variation

Conc. (%)	Group Wet Weight (g)
control	2.9
6.3	3.2
13	3.5
25	3.3
50	2.6
100	3.5

Comments/Statistics

Test Result Comments:
None

Data Analysis:
Endpoints for mortality could not be calculated. No effect occurred.

Protocol Deviations:
None

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Result Summary

Client: SRK100
Reference: 15-1294-01-DAD

Client: SRK Consulting; operation Lupin Mine

Sample: LUP-10-150924

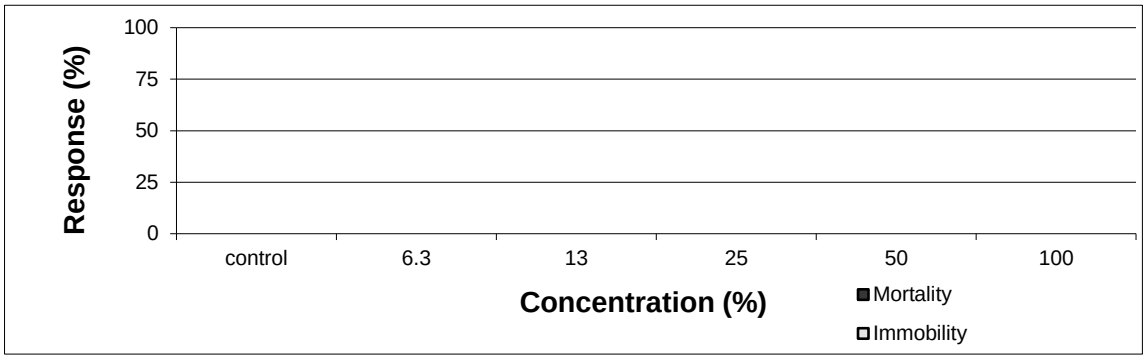
Collection: collected on 2015/09/24 at 0915 by CDCR
Receipt: received on 2015/09/25 at 1130 by JP
Containers: received 2 x 20 L containers at 8 °C, in good condition with no seals and no initials
Description: type: water, collection method: grab

Test: started on 2015/09/25 ; ended on 2015/09/27

Result:

	Endpoint (48-hour)	Value (%)	Confidence Limits (95%) lower	upper	Method Calculated
Acute: (mortality)	LC50	>100			could not be calculated
	LC25	>100			could not be calculated
Acute: (immobility)	EC50	>100			could not be calculated
	EC25	>100			could not be calculated

Notes: LC25 & LC50, concentrations lethal to 25% and 50% of the test population



The test data and results are authorized and verified correct.

Senior Verifier

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Test Conditions

Client: SRK100
Reference: 15-1294-01-DAD

Method: Biological Test method: Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* , 2000. Environ. Can., EPS 1/RM/14. Second Edition.

Test type: *Daphnia* 48-h Static Acute Test (WTR-ME-015)
Species: *Daphnia magna*
Age: < 24 hours old
Organism source: in-house culture
Stock mortality: 0%
Culture brood data: 9 days to first brood
17 neonates per average brood

Sample initial chemistry: pH: 5.6; EC: 654 (µS/cm @ 25°C); DO: 10.1 (mg/L); temperature: 11 °C
hardness (mg CaC03/L): 114; colour: colourless; odour: odourless
Sample holding time: 1 day (must be ≤ 5 days)
Sample storage: 4 ± 2°C in darkness

Test vessel: 385 mL plastic vessels
Test volume: 150 mL
Sample pre-treatment: The sample was not filtered or pH adjusted prior to or during testing
The sample was pre-aerated for 20 minutes (rate of 37.5 ± 12.5 mL/min.L-1)
The hardness of the sample was not adjusted (mg CaCO3/L) prior to or during testing

Loading density: One daphnid/15 mL (must ≤ 1 organism/15 mL)
Control/dilution water: Moderately hard reconstituted water supplemented with vitamin B12 (2 µg/L), Na2SeO3 (5 µg/L)

The hardness of the control/dilution water was 68 mg $CaCO_3$/L
Test concentrations: 5 effluent concentrations (6.3, 12.5, 25, 50, 100% (v/v) plus a negative control)
Test replicates: One replicate per treatment, 10 daphnids per replicate
Feeding: None
Aeration: None
Measurements: pH, conductivity, dissolved oxygen and temperature at test initiation and termination
Lighting: Cool white fluorescent lights
Photoperiod: 16h light:8h dark
Test temperature: 20 ± 2°C

Note: Outlined sections are protocol deviations explained on the comment page

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Test Conditions

Client: SRK100
Reference: 15-1294-01-DAD

Endpoint: Mortality, 48-h LC50 (95% confidence limits)
Immobility, 48-h EC50 (95% confidence limits)

Test validity: The control had 100% survival (must ≥ 90%)
Control had 0 percent (%) abnormal behaviour (must ≤ 10%, immobility)

Reference toxicant: 48-h test with NaCl initiated September 21, 2015; current results
(48-h LC50 and 95% confidence limits) = 0.75 (0.73-0.76) log (g/L NaCl)
historical results: (48-h LC50 and 95% confidence limits) = 0.76 (0.69-0.83) log (g/L NaCl)

Note: Outlined sections are protocol deviations explained on the comment page

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Test Data

Client: SRK100
Reference: 15-1294-01-DAD

Test Log:

Date	Day	Time	Technician
2015/09/25	0	1630	ML/HKS
2015/09/26	1	1030	DS
2015/09/27	2	1400	CQ

Chemistry:

Conc. (%)	control	6.3	13	25	50	100		
Day	pH (units)							
0	8.1	8.0	8.0	7.9	7.8	7.6		
2	8.0	8.0	7.9	7.9	7.7	7.3		
	Conductivity (µS/cm @ 25°C)							
0	204	220	262	309	409	613		
2	209	237	280	328	435	635		
	Dissolved Oxygen (mg/L)							
0	8.1	8.1	8.1	8.1	8.1	8.1		
2	8.1	8.1	8.0	8.1	8.1	8.0		
	Temperature (^{o}C)							
0	18	18	18	18	18	18		
2	19	20	20	20	20	20		

Biology:

Conc. (%)	control	6.3	13	25	50	100		
Day	Number Alive and Behavior (behavior is in brackets)							
1	10	10	10	10	10	10		
2	10	10	10	10	10	10		

Notes: F, floating; I, immobile; B, stuck on bubble; D, caught in debris; nd, not done; na, not applicable;

	Mortality (%)							
2	0	0	0	0	0	0		
	Immobility (%)							
2	0	0	0	0	0	0		

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Comments/Statistics

Client: SRK100
Reference: 15-1294-01-DAD

Test Result Comments:
None

Data Analysis:
Endpoints for mortality could not be calculated. No effect occurred.

Endpoints for immobility could not be calculated. No effect occurred.

Protocol Deviations:
None

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
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GENERAL TERMS AND CONDITIONS:

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1. **Definitions:** Capitalized terms shall have the definition ascribed as such in these General Terms and Conditions and the Chain of Custody.
2. **The Services:** HydroQual will provide the Services to the Client as listed and described in the Chain of Custody.
3. **Prices:** HydroQual may review and change all prices, fees, surcharges or other charges as set out in proposals and/or price quotations if there are changes to HydroQual's cost beyond HydroQual's control, including changes in legislative requirements, Client variations of sample numbers and Client requests for changes to standard reporting requirements. Notwithstanding condition 3, all quotations are reviewed and updated on a yearly basis.
4. **Payment Terms:** The Client shall pay HydroQual within 30 days of the invoice date as provided by HydroQual. HydroQual may, for reasonable business reasons, require the Client to arrange for payment in advance.
5. **Quotation Numbers:** The Client shall provide the proposal and/or price quotation number to HydroQual (where applicable) to ensure correct pricing.
6. **Taxes:** Applicable taxes are not included in prices, surcharges and additional fees and will be added at the time of invoicing.
7. **No Guarantee of Results:** The Client is responsible for informing itself on the limitation of the results and acknowledges that the results are not guaranteed.
8. **Standard of Care:** HydroQual will use reasonable care and diligence as required by the laws of the province or territory where the sample is tested, subject to that level of care and skill ordinarily exercised by other laboratories currently practicing under similar conditions in the same locality, subject to the time limits and financial, physical or other constraints applicable to the Services. No warranty, express or implied, is made.
9. **Storage:** Where possible, HydroQual will store samples until a final report is issued to the Client, after which time HydroQual may discard the sample.
10. **Holds:** If the Client requests a sample be placed on hold, HydroQual will store the sample for the mutually agreed upon written time and price, after which HydroQual will invoice the Client and discard the sample.
11. **Archives:** If the Client requests a sample be archived, HydroQual will store the sample for a mutually agreed upon written time frame and price, after which HydroQual will invoice the Client and discard the sample.
12. **Handling Protocol:** Legal sample handling protocol must be arranged, and provided in writing, before samples are collected. HydroQual will provide a price quotation for legal sample protocol. Samples processed under legal protocol are stored indefinitely, subject to a storage charge as advised by HydroQual.
13. **Samples:** The quality, condition, content and source of samples stored and tested are not known to HydroQual except as declared and described on the Chain of Custody completed and submitted by the Client and accompanying the sample.
14. **Risk of Loss:** HydroQual will use reasonable care to protect samples during storage, however, all samples are stored at the Client's risk and the Client is responsible for obtaining appropriate insurance, if desired. The Client acknowledges that during the performance of the Services samples may be altered, lost, damaged or destroyed and the client forever releases HydroQual from any and all claims the Client may have for any loss or damage to the sample.
15. **Environmental:** the Client must comply with all applicable environmental legislation, including labeling all hazardous samples to comply with Canada's *Workplace Hazardous Materials Information System* and the Alberta *Transfer of Dangerous Goods* regulations, and must provide appropriate material safety data sheets that include the nature of the hazard and a contact name and phone number to call for information. The Client shall defend, indemnify and hold harmless HydroQual for all loss or damages, including any fine or cost of complying with an order of any government authority, resulting from the Client's breach of this paragraph.
16. **Hazardous Materials Disposal:** HydroQual may return, at the Client's cost, hazardous material to the Client for disposal.
17. **Hazardous Materials Surcharge:** HydroQual may apply an additional surcharge for handling of hazardous samples or samples with Naturally Occurring Radioactive Materials ("NORM"), such as and including without limitation, H_2S and CN.
18. **Sample Containers:** HydroQual may ship sample containers to the Client's location by the most cost effective means using HydroQual's preferred courier suppliers, within the specified project timeline. Shipping will be charged back to the Client.
19. **Additional Charges:** HydroQual may charge the Client:
    (a) for pick-up and delivery services when provided subject in each instance to a minimum charge of $50.00; and,
    (b) for rush service (processing samples and/or reporting).
20. **Large Bottle Orders:** The Client shall provide HydroQual with not less than 24 hours' notice for large bottle orders.
21. **Re-Tests:** HydroQual reserves the right to re-test any samples that remain in HydroQual's possession. Re-tests requested by the Client may be charged to Client and Client agrees to pay for such charges.
22. **Waiver:** The Client is responsible for making any assessment regarding the suitability of the Services and the intended results for the Client's purposes and waives any and all claims against HydroQual that the Client may have against HydroQual as a result of the interpretation of the results provided to the Client. The Client shall defend, indemnify and save harmless HydroQual for any and all claims made by any third party against HydroQual in respect of all losses however arising from the performance of the Services or the use of any report provided in the performance of the Services.
23. **LIMITATION OF LIABILITY:** IN NO EVENT SHALL HYDROQUAL BE RESPONSIBLE FOR ANY CONSEQUENTIAL, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY OR PUNITIVE DAMAGES, WHETHER FORESEEABLE OR UNFORESEEABLE (INCLUDING CLAIMS FOR LOSS OF PROFITS OR REVENUE OR LOSSES CAUSED BY STOPPAGE OF OTHER WORK OR IMPAIRMENT OF OTHER ASSETS) INCURRED BY THE CLIENT ARISING OUT OF BREACH OR FAILURE OF EXPRESS OF IMPLIED WARRANTY, BREACH OF CONTRACT, BREACH OF WARRANTY, MISREPRESENTATION, NEGLIGENCE, STRICT LIABILITY IN TORT OR OTHERWISE. IN ANY EVENT, THE LIABILITY OF HYDROQUAL TO THE CLIENT SHALL BE LIMITED TO THE COST OF TESTING THE SAMPLE AS REQUESTED IN THE CHAIN OF CUSTODY UNDER WHICH THE SAMPLE WAS ORIGINALLY DEPOSITED. FOR THE PURPOSES OF THIS PARAGRAPH AND PARAGRAPHS 7, 14, 15, 22, AND 24, AS APPLICABLE, "HYDROQUAL" INCLUDES WITHOUT LIMITATIONS ITS DIRECTORS, OFFICERS, EMPLOYEES AND AFFILIATES AND THE "CLIENT" INCLUDES WITHOUT LIMITATION ANY THIRD PARTY THAT MAY HAVE A CLAIM AGAINST HYDROQUAL THROUGH THE CLIENT.
24. **Notice of Liability:** Notwithstanding paragraph 23, HydroQual shall not be liable to the Client unless the Client provides notice in writing to HydroQual of such loss or damage, together with full particulars thereof, within 30 days of the Client's receipt of the report of the analysis of the sample giving rise to such liability. The provisions of this paragraph allocate the risk between the Client and HydroQual, and the fees to be paid by the Client to HydroQual reflect this allocation of any such risks and the limitations of liability in these General Terms and Conditions.
25. **Entire Agreement:** These General Terms and Conditions, the Chain of Custody and price quotations constitute the entire agreement between the parties and supersede and take precedence over any terms and conditions contained in any documentation provided by the Client. HydroQual's execution of any subsequent documentation from the Client only acknowledges receipt and not acceptance of any terms or conditions therein unless expressly stipulated otherwise by HydroQual. If there is a conflict between these General Terms and Conditions and any other document, these General Terms and Conditions prevail.

HydroQual Laboratories Ltd.

ATTN: Karyn Lewis; Andrea Bowie
SRK Consulting
76 Richmond Street E, Suite 300
Toronto, Ontario
Canada M5C 1P1

Received: 2015/10/29
Report Date: 2015/11/16
Version: FINAL

HydroQual Test Report

Client: SRK100
Reference: 15-1503
Billing: 20150050

Senior Verifier

Trout (Single Concentration) Test Report

Result Summary

Client: SRK100
Reference: 15-1503-01-TRS

Client: SRK Consulting; operation Lupin Mine

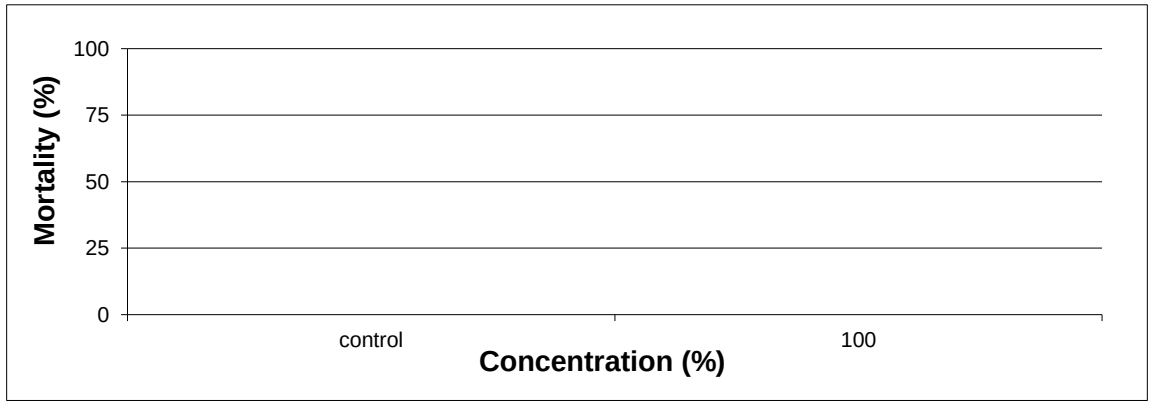
Sample: LUP-102-151027

Collection: collected on 2015/10/27 at 1110 by AJB
Receipt: received on 2015/10/29 at 1600 by MC
Containers: received 2 x 20 L jugs, 4 x 1 L bottles at 10 °C, in good condition with seals and no initials
Description: type: water, collection method: not given

Test: started on 2015/10/31 ; ended on 2015/11/04

Result:

Sample	Client Code	Mortality (%)	Comment
control	lab control	0	
100%	LUP-102-151027	0	none



The test data and results are authorized and verified correct.

Senior Verifier

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Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Test Conditions

Client: SRK100
Reference: 15-1503-01-TRS

Method: Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout, 2000. Environment Canada, EPS 1/RM/13. Second Edition (amended 2007).

Test type: Trout 96-h Static Acute Test (WTR-ME-041)
Species: *Oncorhynchus mykiss*
Organism source: Sam Livingston (Batch 20151009TR)
Acclimation: 22 days (must be ≥ 2 weeks)
Stock mortality: 0.08% (seven days preceding testing)

Sample initial chemistry: pH: 4.9; EC: 680 (µS/cm @ 25°C); DO: 10.2 (mg/L); temperature: 14 °C
hardness (mg CaC03/L): 180; colour: colourless; odour: odourless
Sample holding time: 4 days (must be ≤ 5 days)
Sample storage: 4 ± 2°C in darkness

Test vessel: The test was conducted in 22 L plastic pails with polyethylene liners
Test volume: 20 Litres (depth of solution in each test vessel ≥15cm)
Sample pre-treatment: All test solutions and controls were pre-aerated for 120 minutes at 6.5 ±1 mL/min/l
Dissolved oxygen in full strength sample was 9 mg/L after pre-aeration
The sample was not filtered or pH adjusted prior to or during testing
Loading density: 0.195 g/Litre (must be ≤ 0.5 g/Litre)
Control water: Dechlorinated City of Calgary water acclimated to test conditions
Test concentrations: Undiluted sample plus a negative control
Test replicates: One replicate per treatment; 10 fish per replicate
Feeding: Fish are not fed 24 hours before test initiation and no feeding during test
Measurements: pH, conductivity, dissolved oxygen and temperature measured at test initiation and termination
Aeration: All treatments aerated at 6.5 ±1 mL/min/L by oil-free compressed air passed through airline tubes connected to disposable air stones
Lighting: Overhead full spectrum fluorescent lights
Photoperiod: 16h light:8h dark
Test temperature: 15 ± 1°C

Endpoint: Mortality, % mortality at 96-h
Test validity: The control had 100% survival (must ≥ 90%)
The control had 0 percent (%) stressed behaviour (must ≤ 10%)
Reference toxicant: 96-h test with Potassium Chloride (KCl) initiated October 26, 2015; current results (96-h LC50 and 95% confidence limits) = 0.58 (0.50-0.63) log (g/L KCl)
historical results:
(96-h LC50 and 95% confidence limits) = 0.57 (0.50-0.64) log (g/L KCl)

Note: Outlined sections are protocol deviations explained on the comment page; v/v, volume per volume

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HydroQual Laboratories Ltd.

Trout (Single Concentration) Test Report

Client: SRK100
Reference: 15-1503-01-TRS

Test Data

Test Log:

Date	Day	Time	Technician
2015/10/31	0	1600	CQ
2015/11/01	1	0830	HL
2015/11/02	2	0915	DS
2015/11/03	3	0845	ML/HKS
2015/11/04	4	0930	CQ/DS/JN

Chemistry:

Conc. (%)	control	100
Day		
	pH (units)	
0	7.6	7.3
4	8.1	7.7
	Conductivity (µS/cm @ 25°C)	
0	444	644
4	442	637
	Dissolved Oxygen (mg/L)	
0	8.7	9.0
4	8.7	8.7
	Temperature (^{o}C)	
0	15	15
4	15	15

Number Alive (In brackets number stressed):

Conc. (%)	control	100
Day		
0	10	10
1	10	10
2	10	10
3	10	10
4	10	10
	Mortality (%)	
4	0	0
	Stressed (%)	
4	0	0

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Client: SRK100
Reference: 15-1503-01-TRS

Test Data

Biology Summary Tables:

Control Fish	Length (cm)	Wet Weight(g)
1	3.7	0.6
2	2.9	0.3
3	3.4	0.5
4	3.6	0.5
5	2.9	0.2
6	2.9	0.2
7	3.2	0.3
8	3.5	0.5
9	3.6	0.5
10	3.0	0.3
average	3.3	0.4
sd	0.3	0.1
cv(%)	10.0	37.2

Notes: nd, not done; na, not applicable; sd, standard deviation; cv(%), coefficient of variation

Sample	Group Wet Weight (g)
control	3.9
100	3.3

Comments/Statistics

Test Result Comments:
None

Data Analysis:
None

Protocol Deviations:
None

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Result Summary

Client: SRK100
Reference: 15-1503-01-DAS

Client: SRK Consulting; operation Lupin Mine

Sample: LUP-102-151027

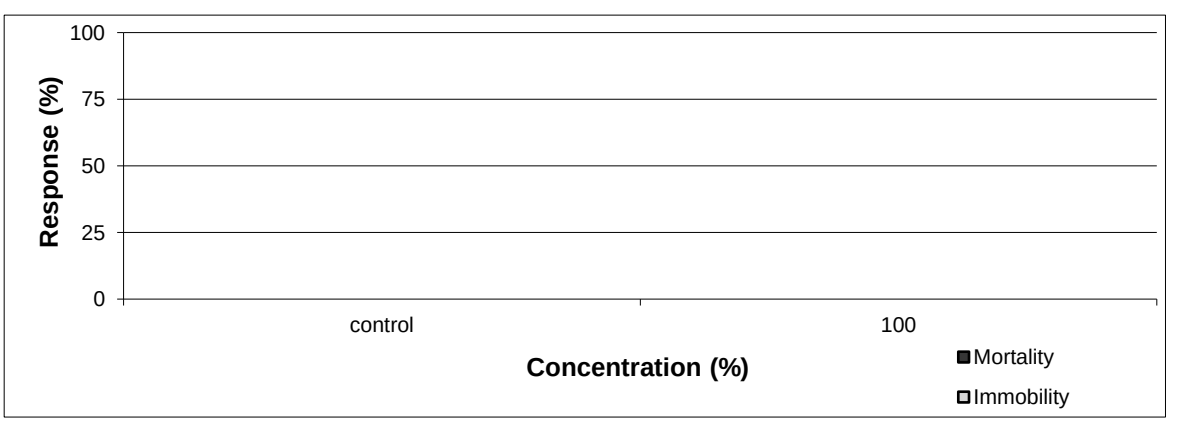
Collection: collected on 2015/10/27 at 1110 by AJB
Receipt: received on 2015/10/29 at 1600 by MC
Containers: received 2 x 20 L jugs, 4 x 1 L bottles at 10 °C, in good condition with seals and no initials
Description: type: water, collection method: not given

Test: started on 2015/10/30 ; ended on 2015/11/01

Result:

Sample	Client Code	Average Mortality (%)	Average Immobility (%)	Comment
control	lab control	0	0	
100	P-102-151027	0	0	none

Notes: sd, sample standard deviation; cv, coefficient of variation; nd, not done; na, not applicable;



The test data and results are authorized and verified correct.

Senior Verifier

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Test Conditions

Client: SRK100
Reference: 15-1503-01-DAS

Method: Biological Test method: Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* , 2000. Environ. Can., EPS 1/RM/14. Second Edition.

Test type: *Daphnia* 48-h Static Acute Test (WTR-ME-015)
Species: *Daphnia magna*
Age: < 24 hours old
Organism source: in-house culture
Stock mortality: 0%
Culture brood data: 12 days to first brood
16 neonates per average brood

Sample initial chemistry: pH: 4.9; EC: 680 (µS/cm @ 25°C); DO: 10.2 (mg/L); temperature: 14 °C
hardness (mg CaC03/L): 180; colour: colourless; odour: odourless
Sample holding time: 3 days (must be ≤ 5 days)
Sample storage: 4 ± 2°C in darkness

Test vessel: 385 mL plastic vessels
Test volume: 150 mL
Sample pre-treatment: The sample was not filtered or pH adjusted prior to or during testing
The sample was pre-aerated for 20 minutes (rate of 37.5 ± 12.5 mL/min.L-1)
The hardness of the sample was not adjusted (mg CaCO3/L) prior to or during testing

Loading density: One daphnid/15 mL (must ≤ 1 organism/15 mL)
Control water: Moderately hard reconstituted water supplemented with vitamin B12 (2 µg/L) and Na_2SeO_3 (5 µg/L)

The hardness of the control/dilution water was 87 mg $CaCO_3$/L
Test concentrations: Undiluted sample plus a negative control
Test replicates: Three replicates per treatment, 10 daphnids per replicate
Feeding: None
Aeration: None
Measurements: pH, conductivity, dissolved oxygen and temperature at test initiation and termination
Lighting: Cool white fluorescent lights
Photoperiod: 16h light:8h dark
Test temperature: 20 ± 2°C

Note: Outlined sections are protocol deviations explained on the comment page

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Test Conditions

Client: SRK100
Reference: 15-1503-01-DAS

Endpoint: Mortality, % mortality at 48-h
Immobility, % immobility at 48-h

Test validity: The control had 100% survival (must ≥ 90%)
Control had 0% abnormal behaviour (must ≤ 10%), e.g. immobility

Reference toxicant: 48-h test with NaCl initiated October 23, 2015; current results
(48-h LC50 and 95% confidence limits) = 0.78 (0.76-0.81) log (g/L NaCl)
historical results:
(48-h LC50 and 95% confidence limits) =0.77 (0.70-0.84) log (g/L NaCl)

Note: Outlined sections are protocol deviations explained on the comment page

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Test Data

Client: SRK100
Reference: 15-1503-01-DAS

Test Log:

Date	Day	Time	Technician
2015/10/30	0	1730	CQ
2015/10/31	1	1020	JK
2015/11/01	2	1100	NM

Chemistry:

Conc (%)	control			100		
replicate	a	b	c	a	b	c
pH (units)						
0	8.1	8.0	8.0	7.9	7.9	8.0
2	8.1	8.0	8.0	7.7	7.5	7.4
Conductivity (µS/cm @ 25°C)						
0	203	206	210	631	660	666
2	221	246	255	689	715	741
Dissolved Oxygen (mg/L)						
0	8.0	8.0	8.1	8.1	8.1	8.2
2	8.0	7.9	8.0	8.0	8.0	7.9
Temperature (^{o}C)						
0	19	19	19	19	19	19
2	19	19	19	19	19	19

Biology:

Conc (%)	control			100		
replicate	a	b	c	a	b	c
Number Alive and Behavior (behavior is in brackets)						
1	10	10	10	10	10	10
2	10	10	10	10 (1F)	10 (1F)	10
Mortality (%)						
2	0	0	0	0	0	0
Immobility (%)						
2	0	0	0	0	0	0

Notes: F, floating; I, immobile; B, stuck on bubble; D, caught in debris

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Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Comments/Statistics

Client: SRK100
Reference: 15-1503-01-DAS

Test Result Comments:
None

Data Analysis:
None

Protocol Deviations:
None

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4. **Payment Terms:** The Client shall pay HydroQual within 30 days of the invoice date as provided by HydroQual. HydroQual may, for reasonable business reasons, require the Client to arrange for payment in advance.
5. **Quotation Numbers:** The Client shall provide the proposal and/or price quotation number to HydroQual (where applicable) to ensure correct pricing.
6. **Taxes:** Applicable taxes are not included in prices, surcharges and additional fees and will be added at the time of invoicing.
7. **No Guarantee of Results:** The Client is responsible for informing itself on the limitation of the results and acknowledges that the results are not guaranteed.
8. **Standard of Care:** HydroQual will use reasonable care and diligence as required by the laws of the province or territory where the sample is tested, subject to that level of care and skill ordinarily exercised by other laboratories currently practicing under similar conditions in the same locality, subject to the time limits and financial, physical or other constraints applicable to the Services. No warranty, express or implied, is made.
9. **Storage:** Where possible, HydroQual will store samples until a final report is issued to the Client, after which time HydroQual may discard the sample.
10. **Holds:** If the Client requests a sample be placed on hold, HydroQual will store the sample for the mutually agreed upon written time and price, after which HydroQual will invoice the Client and discard the sample.
11. **Archives:** If the Client requests a sample be archived, HydroQual will store the sample for a mutually agreed upon written time frame and price, after which HydroQual will invoice the Client and discard the sample.
12. **Handling Protocol:** Legal sample handling protocol must be arranged, and provided in writing, before samples are collected. HydroQual will provide a price quotation for legal sample protocol. Samples processed under legal protocol are stored indefinitely, subject to a storage charge as advised by HydroQual.
13. **Samples:** The quality, condition, content and source of samples stored and tested are not known to HydroQual except as declared and described on the Chain of Custody completed and submitted by the Client and accompanying the sample.
14. **Risk of Loss:** HydroQual will use reasonable care to protect samples during storage, however, all samples are stored at the Client's risk and the Client is responsible for obtaining appropriate insurance, if desired. The Client acknowledges that during the performance of the Services samples may be altered, lost, damaged or destroyed and the client forever releases HydroQual from any and all claims the Client may have for any loss or damage to the sample.
15. **Environmental:** the Client must comply with all applicable environmental legislation, including labeling all hazardous samples to comply with Canada's *Workplace Hazardous Materials Information System* and the Alberta *Transfer of Dangerous Goods* regulations, and must provide appropriate material safety data sheets that include the nature of the hazard and a contact name and phone number to call for information. The Client shall defend, indemnify and hold harmless HydroQual for all loss or damages, including any fine or cost of complying with an order of any government authority, resulting from the Client's breach of this paragraph.
16. **Hazardous Materials Disposal:** HydroQual may return, at the Client's cost, hazardous material to the Client for disposal.
17. **Hazardous Materials Surcharge:** HydroQual may apply an additional surcharge for handling of hazardous samples or samples with Naturally Occurring Radioactive Materials ("NORM"), such as and including without limitation, H_2S and CN.
18. **Sample Containers:** HydroQual may ship sample containers to the Client's location by the most cost effective means using HydroQual's preferred courier suppliers, within the specified project timeline. Shipping will be charged back to the Client.
19. **Additional Charges:** HydroQual may charge the Client:
    (a) for pick-up and delivery services when provided subject in each instance to a minimum charge of $50.00; and,
    (b) for rush service (processing samples and/or reporting).
20. **Large Bottle Orders:** The Client shall provide HydroQual with not less than 24 hours' notice for large bottle orders.
21. **Re-Tests:** HydroQual reserves the right to re-test any samples that remain in HydroQual's possession. Re-tests requested by the Client may be charged to Client and Client agrees to pay for such charges.
22. **Waiver:** The Client is responsible for making any assessment regarding the suitability of the Services and the intended results for the Client's purposes and waives any and all claims against HydroQual that the Client may have against HydroQual as a result of the interpretation of the results provided to the Client. The Client shall defend, indemnify and save harmless HydroQual for any and all claims made by any third party against HydroQual in respect of all losses however arising from the performance of the Services or the use of any report provided in the performance of the Services.
23. **LIMITATION OF LIABILITY:** IN NO EVENT SHALL HYDROQUAL BE RESPONSIBLE FOR ANY CONSEQUENTIAL, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY OR PUNITIVE DAMAGES, WHETHER FORESEEABLE OR UNFORESEEABLE (INCLUDING CLAIMS FOR LOSS OF PROFITS OR REVENUE OR LOSSES CAUSED BY STOPPAGE OF OTHER WORK OR IMPAIRMENT OF OTHER ASSETS) INCURRED BY THE CLIENT ARISING OUT OF BREACH OR FAILURE OF EXPRESS OF IMPLIED WARRANTY, BREACH OF CONTRACT, BREACH OF WARRANTY, MISREPRESENTATION, NEGLIGENCE, STRICT LIABILITY IN TORT OR OTHERWISE. IN ANY EVENT, THE LIABILITY OF HYDROQUAL TO THE CLIENT SHALL BE LIMITED TO THE COST OF TESTING THE SAMPLE AS REQUESTED IN THE CHAIN OF CUSTODY UNDER WHICH THE SAMPLE WAS ORIGINALLY DEPOSITED. FOR THE PURPOSES OF THIS PARAGRAPH AND PARAGRAPHS 7, 14, 15, 22, AND 24, AS APPLICABLE, "HYDROQUAL" INCLUDES WITHOUT LIMITATIONS ITS DIRECTORS, OFFICERS, EMPLOYEES AND AFFILIATES AND THE "CLIENT" INCLUDES WITHOUT LIMITATION ANY THIRD PARTY THAT MAY HAVE A CLAIM AGAINST HYDROQUAL THROUGH THE CLIENT.
24. **Notice of Liability:** Notwithstanding paragraph 23, HydroQual shall not be liable to the Client unless the Client provides notice in writing to HydroQual of such loss or damage, together with full particulars thereof, within 30 days of the Client's receipt of the report of the analysis of the sample giving rise to such liability. The provisions of this paragraph allocate the risk between the Client and HydroQual, and the fees to be paid by the Client to HydroQual reflect this allocation of any such risks and the limitations of liability in these General Terms and Conditions.
25. **Entire Agreement:** These General Terms and Conditions, the Chain of Custody and price quotations constitute the entire agreement between the parties and supersede and take precedence over any terms and conditions contained in any documentation provided by the Client. HydroQual's execution of any subsequent documentation from the Client only acknowledges receipt and not acceptance of any terms or conditions therein unless expressly stipulated otherwise by HydroQual. If there is a conflict between these General Terms and Conditions and any other document, these General Terms and Conditions prevail.

HydroQual Laboratories Ltd.

ATTN: Karyn Lewis; Andrea Bowie
SRK Consulting
76 Richmond Street E, Suite 300
Toronto, Ontario
Canada M5C 1P1

Received: 2015/10/29
Report Date: 2015/11/25
Version: FINAL

HydroQual Test Report

Client: SRK100
Reference: 15-1498
Billing: C/O A Bowie @ SRK

Jacklyn Poole

Senior Verifier

Algae
Test Report

Results Summary

Client: SRK100
Reference: 15-1498-01-AGD

Client: SRK Consulting; operation Lupin Mine

Sample: LUP-10-151027

Collection: collected on 2015/10/27 at not given by AJB
Receipt: received on 2015/10/29 at 1600 by MC
Containers: received 4 x 20 L jugs, 8 x 1 L bottle at 10 °C, in good condition with seals and no initials
Description: type: water, collection method: not given

Test: started on 2015/10/30 ; ended on 2015/11/02

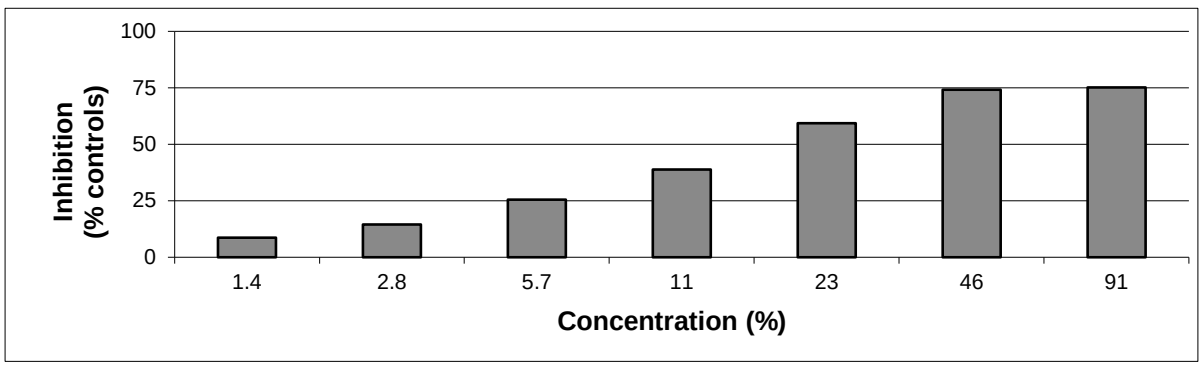
Results:

	Endpoint (72-hour)	Value	Confidence Limits (95%) lower	upper		Method Calculated
Chronic:						
Growth	IC25	5.5	1.7	8.6	%	Linear Interpolation
Inhibition	IC50	17	12	20	%	Linear Interpolation

Notes: ICx, concentrations inhibiting growth by 'x' percent relative to controls; CV, coefficient of variation (%); SD, standard deviation

	Stimulation Observed	Test Concentrations		Method Calculated
Chronic: Growth Stimulation	no	none	%	Figner-Wolfe Test

Notes: Stimulation refers to increased response at all concentrations or at high concentrations



The test data and results are authorized and verified correct.

Senior Verifier

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Test Conditions

Client: SRK100
Reference: 15-1498-01-AGD

Method: Biological Test Method: Growth Inhibition Test Using a Freshwater Alga *Pseudokirchneriella subcapitata (formerly Selenastrum capricornutum)* . Environment Canada, EPS 1/RM/25, 2nd Edition, March 2007

Test type: Algal Growth Inhibition Test (WTR-ME-034)
Species: *Pseudokirchneriella subcapitata* (formerly *Selenastrum capricornutum* and *Raphidocelis subcapitata*)
Organism source: In-house culture (original source: UTCC 37; strain: LB37)
Culture age: The test was started with 3-day old, exponentially growing cells determined with an algal growth curve. The algal growth curve was started with an inoculum from the algal stock culture determined over an 8-10 day period. This culture name was TUES-JULY-20150512AG. Algal cultures are regrown every 2 months from slants made from a new culture purchased twice annually.
Culture observations: No unusual appearance or treatment of the algae was noted prior to or during the conduct of the test.
Sample initial chemistry: pH: 5.1; EC: 658 (µS/cm); DO: 10.1 (mg/L); temperature: 15 °C
hardness (mg CaC03/L): 161; colour: colourless; odour: odourless
Sample holding time: 3 days (must be ≤ 3 days)
Sample storage: 4 ± 2°C in darkness
Test concentrations: 10 effluent concentrations (0.2, 0.4, 0.7, 1.4, 2.8, 5.7, 11, 23, 46, and 91% (v/v), plus a negative control) (≥6 enumerated; see Test Result Comments)
Test vessel: The test was conducted in 96-well microplates. Two microplates (the test plate and a backup plate for use only in the case of an invalid test plate) were run. Test concentrations were isolated from each other with microplate sealing film.
Test replicates: 5 replicate wells per test concentration (≥3 enumerated)
10 replicate wells per control (8 enumerated).
Test volume: 220 µL final volume in each well with 200 µL of sample;
10µL of enrichment medium and 10µL of algal inoculum.
Inoculum: The initial cell density of the inoculum was 10201 (cells/mL), it was prepared less than 3 hours before test initiation.
Control/dilution water: Made up with 85% deionized and 15% dechlorinated City of Calgary water spiked with nutrients as per EPS 1/RM/25
The metal stock with 25% reduced EDTA was used.
Sample Filtration: 100 mL filtered through a 0.45 µm pore diameter membrane.
Sample treatment: Sample spiked with nutrients as per EPS 1/RM/25; no other chemicals added.
Measurements: Final cell densities were determined using an electronic particle counter.

Aeration: Not required
pH Adjustment: Not required
Lighting: The plates were incubated under continuous light: 3720 lux
(cool white fluorescent bulbs) 52.08 µmol/(m^2·S)
Test temperature: 24 ± 2°C

Note: Outlined sections are protocol deviations explained on the comment page

Test Conditions

Client: SRK100
Reference: 15-1498-01-AGD

Endpoint: Growth, 72-h IC25 (with 95% confidence limits)
Test endpoint was bracketed by at least 1 test concentration (except for <1.4% or >91%)
No outliers were observed within the data set.

Test validity: Control growth was a 41-fold increase over the inoculum. (Must be >16-fold)
The CV of the standard control wells was 12.1%. (Must be ≤20%)

Statistics: See Data Analysis section.
Mann-Kendall trend analysis yielded p=0.36, therefore no trend was observed. (Must have p>0.05 if 10%<CV≤20%)

Reference toxicant: 72-h test with Zinc (ZnSO4*7H2O) initiated November 3, 2015; current results (72-h IC25 and 95% confidence limits) = 1.44 (1.36-1.49) log (µg Zn2+/L)
historical results:
(72-h IC25 and 95% confidence limits) = 1.35 (1.13-1.58) log (µg Zn2+/L)

The reference toxicant test was performed under the same conditions as those used during this test.

Note: Outlined sections are protocol deviations explained on the comment page

HydroQual Laboratories Ltd.

Algae
Test Report

Test Data

Client: SRK100
Reference: 15-1498-01-AGD

Test Log:

Date	Day	Technician	Time	Rotated	Temperature (°C)
2015/10/30	0	ML	1130	N/A	25
2015/10/31	1	JK	0820	Yes	25
2015/11/01	2	HKS	1400	Yes	24
2015/11/02	3	ML	1330	Yes	25

pH Measurements:

Concentration	Initial Value	Final Value
100%	6.8	-
control (well D6)	7.2	-
control (well D7)	-	8.4

Initial cell density (cells/mL): 10201

Backup microplate used? No

Standard Control Well Final Cell Densities (D Row):

Column	Final Cell Density ($x10^3$ cells/mL)	Cell Yield ($x10^3$ cells/mL)
2	544	534
3	425	415
4	401	391
5	395	385
8	395	385
9	395	385
10	425	415
11	437	427
Average	-	417
SD	-	50
CV (%)	-	12.1
	Fold Growth (x)	41

Test Well Final Cell Densities:

Concentration (%)	Calculated Final Cell Density ($x10^3$ cells/ mL)				
	Row				
	B	C	E	F	G
0.2	-	-	-	-	-
0.4	-	-	-	-	-
0.7	-	-	-	-	-
1.4	395	395	383	*	*
2.8	365	359	377	*	*
5.7	323	311	329	*	*
11	275	263	257	*	*
23	179	179	179	*	*
46	120	117	118	*	*
91	114	115	111	*	*

Cell Yield Results:

Concentration (%)	Cell Yield ($x10^3$ cells/ mL)								Percent Controls	Inhibition (%)	Stimulation (%)
	Row					**Mean**	SD	CV (%)			
	B	C	E	F	G						
0.2	-	-	-	-	-	**-**	-	-	-	-	-
0.4	-	-	-	-	-	**-**	-	-	-	-	-
0.7	-	-	-	-	-	**-**	-	-	-	-	-
1.4	385	385	373	*	*	**381**	7	2	91	9	-9
2.8	355	349	367	*	*	**357**	9	3	86	14	-14
5.7	313	301	319	*	*	**311**	9	3	75	25	-25
11	265	253	247	*	*	**255**	9	4	61	39	-39
23	169	169	169	*	*	**169**	0	0	41	59	-59
46	109	106	108	*	*	**108**	2	1	26	74	-74
91	103	105	101	*	*	**103**	2	2	25	75	-75

*see test result comments

Test Validity Criteria:

Control growth was a 41-fold increase over the inoculum. (Must be >16-fold)
The CV of the standard control wells was 12.1%. (Must be ≤20%)
Mann-Kendall trend analysis yielded p=0.36, therefore no trend was observed. (Must have p>0.05 if 10%<CV≤20%)

Comments/Statistics

Client: SRK100
Reference: 15-1498-01-AGD

Test Result Comments:
Electronic enumeration using a Beckman-Coulter particle counter was performed on the same day as test termination. A minimum of 3 replicates were enumerated for each concentration. Additional replicates were enumerated for concentrations with high variability between replicates.

Only seven concentrations were enumerated as the test endpoints were bracketed within this concentration range (1.4 - 91%).

Data Analysis:
Significant stimulatory effects in growth were not observed in any test concentration as calculated by ANOVA analysis with CETIS v. 1.9.0.8 (Fligner Wolfe).

Regression analysis was attempted on the data, but the assumptions of normality and homoscedasticity of residuals were not met. Therefore, endpoints for growth inhibition were calculated using a Linear Interpolation model using CETIS v. 1.9.0.8

Protocol Deviations:
None

Ceriodaphnia (6-8d LC50/IC25) Test Report

Client: SRK100
Reference: 15-1498-01-CDD

Result Summary

Client: SRK Consulting; operation Lupin Mine

Sample: LUP-10-151027

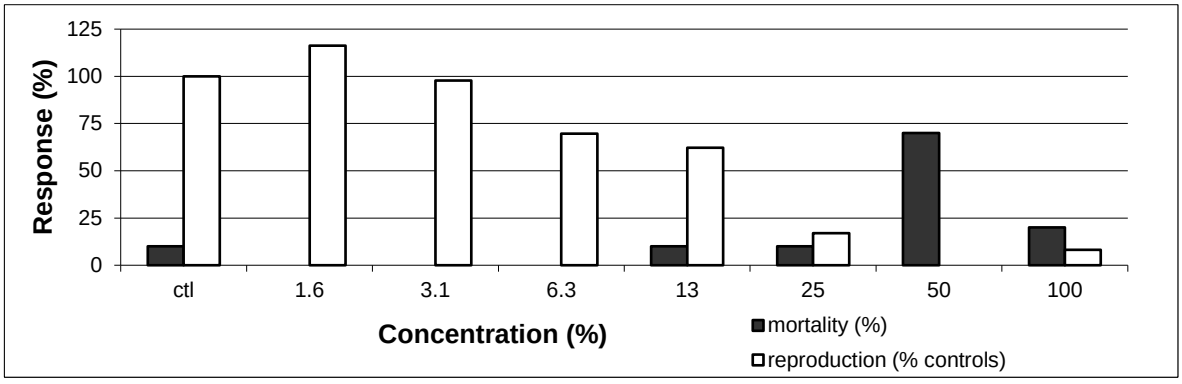
Collection: collected on 2015/10/27 at not given by AJB
Receipt: received on 2015/10/29 at 1600 by MC
Containers: received 4 x 20 L jugs, 8 x 1 L bottle at 10 °C, in good condition with seals and no initials
Description: type: water, collection method: not given

Test: started on 2015/10/30 ; ended on 2015/11/07

Result:

	Endpoint (8-day)	Value	Confidence Limits (95%) lower	upper	Units	Method Calculated
Acute:	LC25	>100			%	could not be calculated
(survival)	LC50	>100			%	could not be calculated
Chronic:	IC25	4.7	2.3	13	%	Linear Interpolation
(fecundity)	IC50	14	5.8	17	%	Linear Interpolation

Notes: LCx & ICx, concentrations lethal or inhibitory to 'x' percent of the test population; fecundity, reproduction as the number of young produced



The test data and results are authorized and verified correct.

Senior Verifier

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Test Conditions

Client: SRK100
Reference: 15-1498-01-CDD

Method: Biological Test method: Test of Reproduction and Survival Using the Cladoceran *Ceriodaphnia dubia.* Environment Canada, EPS 1/RM/21, 2nd Edition, February 2007.

Test type: *Ceriodaphnia* Survival and Reproduction Static Renewal Test (WTR-ME-018)
Species: *Ceriodaphnia dubia*
Age: <24 hours old; all from same brood source within 12 hours of the same age.
Organism source: in-house cultures; cultures from a single brood organism to provide test organisms.
Culture health: Culture mortality was 4% (must be ≤ 20%).
7-d prior to test initiation: No ephippia were noted in the cultures at any time.
Average young produced per adult in the first three broods was 21 (must be ≥ 15)
Number of young produced by each brood organism in the last complete brood before use was 13 (must be ≥ 8).
Organism observations: No unusual behavior, appearance or treatment of test organisms was noted prior to or during the test. All first-generation mortality was recorded on the day it was observed.
Sample initial chemistry: pH: 5.1; EC: 658 (µS/cm); DO: 10.1 (mg/L); temperature: 15 °C
hardness (mg CaC03/L): 161; colour: colourless; odour: odourless
Sample holding time: 3 days (must be ≤ 3 days); 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 respectively
Sample storage: 4 ± 2°C in darkness
Test vessel: The tests were conducted in 30 mL plastic vessels (2 cm depth).
Test volume: 15 mL of solution (1 cm depth); replenished daily.
Control/dilution water: Moderately hard water supplemented with vitamin B12 (2 µg/L) and Na_2SeO_3 (5 µg/L)

Test concentrations: 7 effluent concentrations (1.6, 3.1, 6.3, 13, 25, 50, 100% (v/v) plus a negative control)
Test replicates: One neonate <24 hours old was loaded per test vessel; 10 replicates/concentration
Feeding: The test organisms were fed daily a mixture of fermented trout chow, yeast, alfalfa powder, and the green alga *Pseudokirchneriella subcapitata* (formerly *Selenastrum capricornutum* and *Raphidocelis subcapitata*).
Food expiration date: 2015/11/15, 2015/11/22, 2015/11/28
Measurements: pH, conductivity, dissolved oxygen and temperature were measured daily.
Sample pre-treatment: The sample was not filtered, aerated, or pH adjusted prior to or during testing.

The dissolved oxygen concentration (mg/L) was: 7.6
The sample pH was: 7.4
Lighting: Overhead full spectrum fluorescent lights
Photoperiod: 16h light:8h dark
Test temperature: 25 ± 1°C

Note: Outlined sections are protocol deviations explained on the comment page

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Test Conditions

Client: SRK100
Reference: 15-1498-01-CDD

Endpoints: Survival, 8-d LC50 (with 95% confidence limits)
Reproduction, 8-d IC25 (with 95% confidence limits)
Test endpoints were bracketed by at least 1 test concentration (except for <1.6% or >100 %)
No outliers were observed within the data set.

Test completion: 80% of the control organisms had ≥ 3 broods on day 8 (must be ≥ 60% within 8 days) Any neonates produced after third brood were not included in the mean young per adult calculation.

Test validity: The control had 90% survival (must ≥ 80%)
Number of young produced by each surviving control adult within the first three broods was 15 (must be ≥ 15).

Reference toxicant: 8-d test with NaCl initiated on October 19, 2015;
(must be evaluated within 14 days before or after test is started or during it)
current results: (8-d LC50 and 95% confidence limits) =
3.33 (3.24-3.42) log (mg/L NaCl)
historical results: (8-d LC50 and 95% confidence limits)=
3.36 (3.27 - 3.45) log (mg/L NaCl)
current results: (8-d IC50 and 95% confidence limits) =
3.13 (3.01-3.23 log (mg/L NaCl)
historical results: (8-d IC50 and 95% confidence limits)=
2.98 (2.74 - 3.23) log (mg/L NaCl)
The reference toxicant test was performed under the same conditions as those used during this test.

Note: Outlined sections are protocol deviations explained on the comment page

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Ceriodaphnia (6-8d LC50/IC25) Test Report

Test Data

Client: SRK100
Reference: 15-1498-01-CDD

Test Log:

Date	Day	Time	Technicians	Temperature (ºC)	
				Control	Sample
2015/10/30	0	1620	ML	25	25
2015/10/31	1	1110	JN/EP	25	25
2015/11/01	2	1400	HKS/JW	25	25
2015/11/02	3	0800	CQ/EP	25	25
2015/11/03	4	0800	DS/EP	25	25
2015/11/04	5	0855	ML/JW	25	25
2015/11/05	6	0805	DS	25	25
2015/11/06	7	0950	JN	25	25
2015/11/07	8	1350	JN/JW	na	na

Chemistry Summary Tables:

	New Solutions								Old Solutions							
Conc. %	ctl	1.6	3.1	6.3	13	25	50	100	ctl	1.6	3.1	6.3	13	25	50	100
Average Values																
pH	7.8	7.8	7.8	7.8	7.8	7.8	7.7	7.3	7.9	7.9	8.0	8.0	7.9	7.9	7.8	7.6
cond.	224	224	226	243	269	318	426	627	244	241	288	279	301	352	500	764
DO	7.6	7.6	7.5	7.5	7.5	7.5	7.5	7.7	7.6	7.6	7.5	7.5	7.5	7.4	7.4	7.5
temp.	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Coefficients of Variation (%)																
pH	2	2	2	2	2	2	1	2	2	2	2	2	2	1	1	2
cond.	18	9	7	6	7	7	6	7	10	6	10	7	6	6	26	8
DO	2	2	3	3	2	3	2	3	2	2	2	2	2	2	2	3
temp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Test Data

Client: SRK100
Reference: 15-1498-01-CDD

Biology (number of young produced):

Day	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
Replicate	Control								13%							
1	0	0	0	**0**	X	X	X	X	0	0	0	0	0	0	0	0
2	0	0	0	0	3	0	6	8	0	0	**0**	X	X	X	X	X
3	0	0	0	0	6	8	0	12	0	0	0	0	3	0	5	6
4	0	0	0	3	6	0	7	-	0	0	0	0	3	0	6	5
5	0	0	0	0	5	3	0	4	0	0	0	0	0	6	4	0
6	0	0	0	0	6	6	0	4	0	0	0	0	5	4	0	0
7	0	0	0	0	4	0	0	0	0	0	0	0	0	6	0	0
8	0	0	0	4	5	7	-	-	0	0	0	0	4	0	4	6
9	0	0	0	0	4	8	0	4	0	0	0	0	4	2	4	-
10	0	0	0	0	3	0	6	3	0	0	0	0	3	4	0	0
	1.6%								25%							
1	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
2	0	0	0	0	3	0	6	0	0	0	0	**0**	X	X	X	X
3	0	0	0	0	4	0	7	11	0	0	0	0	0	0	0	0
4	0	0	0	0	4	0	8	12	0	0	0	0	3	0	0	2
5	0	0	0	0	3	0	7	9	0	0	0	0	0	4	2	0
6	0	0	0	0	3	0	5	10	0	0	0	0	3	0	0	2
7	0	0	0	0	3	0	8	0	0	0	0	0	0	0	0	0
8	0	0	0	0	4	0	8	11	0	0	0	0	3	0	0	0
9	0	0	0	0	4	0	8	7	0	0	0	0	0	0	0	0
10	0	0	0	0	6	0	0	0	0	0	0	0	0	4	0	0
	3.1%								50%							
1	0	0	0	0	0	3	7	2	0	0	0	0	0	0	0	**0**
2	0	0	0	0	3	0	8	3	0	0	**0**	X	X	X	X	X
3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	5	10	0	13	0	0	0	0	0	0	0	0
5	0	0	0	0	4	9	0	5	0	0	**0**	X	X	X	X	X
6	0	0	0	0	4	8	0	3	0	0	**0**	X	X	X	X	X
7	0	0	0	0	6	0	0	0	0	0	**0**	X	X	X	X	X
8	0	0	0	0	5	0	8	4	0	0	0	**0**	X	X	X	X
9	0	0	0	0	3	0	8	8	0	0	0	**0**	X	X	X	X
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Notes: #, young produced; 0, no young; X, dead; bold #, number of young the test organism had the day it died; —, young produced after third brood

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HydroQual Laboratories Ltd.

Ceriodaphnia (6-8d LC50/IC25) Test Report

Test Data

Client: SRK100
Reference: 15-1498-01-CDD

Biology (number of young produced):

Day	1	2	3	4	5	6	7	8

Day	1	2	3	4	5	6	7	8

Replicate	6.3%							
1	0	0	0	0	0	4	5	0
2	0	0	0	0	4	0	7	8
3	0	0	0	0	4	0	6	5
4	0	0	0	0	5	0	0	0
5	0	0	0	0	3	0	0	0
6	0	0	0	0	4	3	0	2
7	0	0	0	0	3	3	5	0
8	0	0	0	0	3	0	4	5
9	0	0	0	0	0	0	6	0
10	0	0	0	0	0	0	5	0

100%							
0	0	0	0	0	0	0	0
0	0	0	**0**	X	X	X	X
0	0	0	0	0	0	0	0
0	0	0	0	0	0	5	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	**0**	X	X	X	X
0	0	0	0	0	0	0	0
0	0	0	0	0	0	6	0
0	0	0	0	0	0	0	0

Notes: #, young produced; 0, no young; X, dead; bold #, number of young the test organism had the day it died; —, young produced after third brood

Biology Summary Tables:

Conc. %	ctl	1.6	3.1	6.3	13	25	50	100

	ctl	1.6	3.1	6.3	13	25	50	100

Day	Number of Organism Alive							
0	10	10	10	10	10	10	10	10
1	9	10	10	10	10	10	10	10
2	9	10	10	10	10	10	10	10
3	9	10	10	10	9	10	6	10
4	9	10	10	10	9	9	4	8
5	9	10	10	10	9	9	4	8
6	9	10	10	10	9	9	4	8
7	9	10	10	10	9	9	4	8
8	9	10	10	10	9	9	3	8

Day	Daily Young Production							
0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	7	0	0	0	0	0	0	0
5	42	34	33	26	22	9	0	0
6	32	0	30	10	22	8	0	0
7	19	63	31	38	23	2	0	11
8	35	60	38	20	17	4	0	0

	Percent Mortality (%)							
mean	10	0	0	0	10	10	70	20

Total	135	157	132	94	84	23	0	11

Replicate	Total Young Produced by Each Adult							
1	0	6	12	9	0	0	0	0
2	17	9	14	19	0	0	0	0
3	26	22	3	15	14	0	0	0
4	16	24	28	5	14	5	0	5
5	12	19	18	3	10	6	0	0
6	16	18	15	9	9	5	0	0
7	4	11	6	11	6	0	0	0
8	16	23	17	12	14	3	0	0
9	16	19	19	6	10	0	0	6
10	12	6	0	5	7	4	0	0

Young Per Adult (within first three broods)

mean	14	16	13	9	8	2	0	1
sd	7.23	7.02	8.34	4.99	5.25	2.54	0	2.33
cv(%)	53.6	44.7	63.2	53.1	62.5	110	0	212

Young Production as a Percent of Controls

100	116	98	70	62	17	0	8	

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Test Data

Client: SRK100
Reference: 15-1498-01-CDD

Chemistry:

	New Solutions								Old Solutions							
Conc. %	ctl	1.6	3.1	6.3	13	25	50	100	ctl	1.6	3.1	6.3	13	25	50	100
Day	pH (units)								pH (units)							
0	7.7	7.7	7.8	7.8	7.8	7.8	7.7	7.4								
1	8.0	7.9	7.9	7.9	7.8	7.8	7.7	7.4	8.0	8.0	8.0	8.0	7.9	7.8	7.8	7.5
2	7.8	7.8	7.8	7.8	7.8	7.7	7.6	7.3	7.9	7.9	8.0	8.0	7.9	7.9	7.8	7.5
3	7.9	7.9	8.0	7.9	7.9	7.9	7.7	7.4	7.9	8.0	8.1	8.0	8.0	7.9	7.8	7.5
4	7.9	7.9	7.9	7.9	7.9	7.8	7.7	7.0	7.8	8.0	8.0	8.0	8.0	7.9	7.9	7.6
5	7.7	7.7	7.7	7.6	7.6	7.6	7.6	7.1	7.7	7.7	7.7	7.7	7.7	7.7	7.6	7.8
6	7.6	7.6	7.6	7.6	7.6	7.6	7.5	7.3	7.7	7.8	7.8	7.8	7.8	7.8	7.6	7.8
7	8.1	8.1	8.0	8.0	8.0	7.9	7.8	7.3	8.1	8.1	8.1	8.1	8.1	8.0	7.9	7.5
8									8.0	8.0	8.0	8.0	7.9	7.9	7.8	7.4
	Conductivity (µS/cm)								Conductivity (µS/cm)							
0	213	223	224	240	276	304	437	625								
1	212	224	236	249	280	335	445	658	260	238	326	274	299	349	514	836
2	213	232	235	256	282	333	441	658	251	248	292	289	321	372	545	802
3	300	252	245	256	285	341	448	650	259	257	321	289	324	370	513	794
4	272	246	243	261	285	337	448	685	278	263	289	312	317	381	670	772
5	185	204	202	231	232	293	392	562	212	224	244	259	279	340	272	654
6	187	195	205	219	250	286	382	573	216	236	250	261	280	332	541	704
7	207	212	221	233	260	316	413	601	221	227	288	289	297	342	593	781
8									256	234	292	261	287	326	348	770
	Dissolved Oxygen (mg/L)								Dissolved Oxygen (mg/L)							
0	7.7	7.7	7.7	7.7	7.6	7.6	7.6	7.6								
1	7.5	7.5	7.4	7.4	7.4	7.4	7.4	7.6	7.7	7.5	7.4	7.4	7.4	7.3	7.3	7.3
2	7.3	7.3	7.3	7.4	7.4	7.4	7.4	7.8	7.5	7.5	7.4	7.4	7.4	7.4	7.3	7.4
3	7.7	7.4	7.2	7.2	7.2	7.2	7.3	7.3	7.5	7.5	7.3	7.3	7.3	7.2	7.2	7.2
4	7.7	7.6	7.4	7.5	7.5	7.5	7.5	7.9	7.7	7.5	7.5	7.5	7.5	7.4	7.4	7.5
5	7.5	7.5	7.6	7.7	7.6	7.8	7.8	8.0	7.9	7.8	7.7	7.7	7.6	7.5	7.4	7.6
6	7.7	7.7	7.7	7.7	7.8	7.7	7.7	7.8	7.8	7.8	7.6	7.6	7.6	7.6	7.6	7.7
7	7.6	7.7	7.7	7.7	7.6	7.7	7.6	7.6	7.6	7.7	7.8	7.8	7.7	7.6	7.7	7.8
8									7.4	7.5	7.4	7.4	7.5	7.4	7.3	7.3
	Temperature (^{o}C)								Temperature (^{o}C)							
0	25	25	25	25	25	25	25	25								
1	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
2	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
3	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
4	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
5	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
6	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
7	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
8									25	25	25	25	25	25	25	25

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Comments/Statistics

Client: SRK100
Reference: 15-1498-01-CDD

Test Result Comments:
None

Data Analysis:
Endpoints for mortality could not be calculated. No effect occurred.

Regression analysis was attempted on the data, but the assumptions of normality and homoscedasticity of residuals were not met. Therefore, endpoints for reproduction were calculated using a Linear Interpolation model using CETIS v. 1.9.0.8

Protocol Deviations:
None

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Quality Assurance Information

Culture history for adults used in the test for reference 15-1498:

Number of young produced per brood adult:
(Note: The third brood per adult may be on the day the test is set)

	row/replicate	A2	A2	D7	D9	B9	D4	D5				
	number of young											
	number of adults											
		A2	A2	D7	D9	B9	D4	D5				
	number of young											
	number of adults											
		A2	A2	D7	D9	B9	D4	D5				
	number of young											
	number of adults											
		A2	A2	D7	D9	B9	D4	D5				
	number of young			3		4		2				
	number of adults			1		1		1				
		A2	A2	D7	D9	B9	D4	D5				
	number of young	3	4	6	4	8	3	6				
	number of adults	1	1	1	1	1	1	1				
		A2	A2	D7	D9	B9	D4	D5				
	number of young	6	8	10	3	10	4	17				
	number of adults	1	1	1	1	1	1	1				
		A2	A2	D7	D9	B9	D4	D5				
DAY USED	number of young	8	12	16	9	12	14	17				
2015/10/30	number of adults	1	1	1	1	1	1	1				
		A2	A2	D7	D9	B9	D4	D5				
totals	number of young	17	24	19	16	22	21	25				
(# of young in first 3 broods)												

Number of young produced per organism in the last brood before use	13
Mean number of surviving young per adult over the first three broods	21
Culture mortality over the last seven days	4

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Fathead Minnow (7-d LC50/IC25) Test Report

Result Summary

Client: SRK100
Reference: 15-1498-01-FMD

Client: SRK Consulting; operation Lupin Mine

Sample: LUP-10-151027

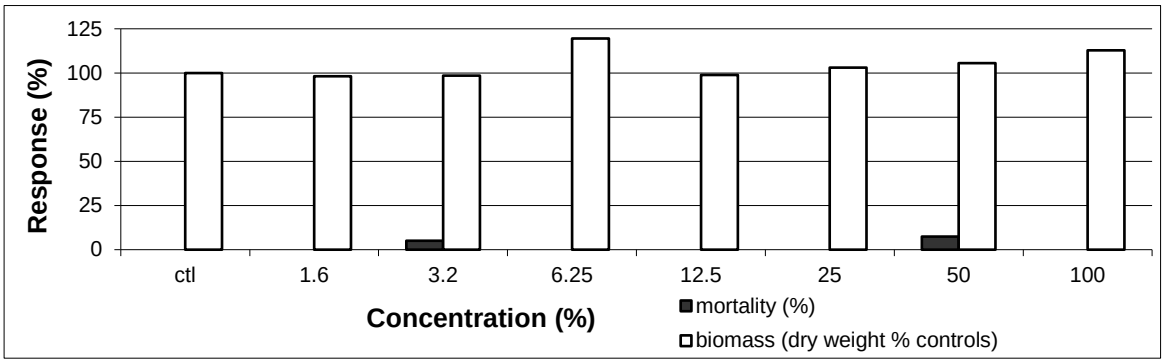
Collection: collected on 2015/10/27 at not given by AJB
Receipt: received on 2015/10/29 at 1600 by MC
Containers: received 4 x 20 L jugs, 8 x 1 L bottle at 10 °C, in good condition with seals and no initials
Description: type: water, collection method: not given

Test: started on 2015/10/30 ; ended on 2015/11/06

Result:

	Endpoint (7-day)	Value	Confidence Limits (95%) lower	upper	Units	Method Calculated
Acute:	LC25	>100			%	could not be calculated
(survival)	LC50	>100			%	could not be calculated
Chronic:	IC25	>100			%	could not be calculated
(growth)	IC50	>100			%	could not be calculated

Notes: LCx & ICx, concentrations lethal or inhibitory to 'x' percent of the test population;



The test data and results are authorized and verified correct.

Senior Verifier

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
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Test Conditions

Client: SRK100
Reference: 15-1498-01-FMD

Method: Biological Test Method: Test of Larval Growth and Survival Using Fathead minnows. Environment Canada, EPS 1/RM/22, Second Edition, February 2011.

Test type: Fathead Minnow 7-d Survival and Growth Static Renewal Test (WTR-ME-052)
Species: *Pimephales promelas*
Age: 24 hours post hatch
Organism source: Aquatox Inc., Hot Springs, Arkansas (Batch 20151030FM)
Culture conditions: temperature, 25.1 °C; dissolved oxygen, 95-100 % saturation
Shipped: 2015/10/29
Breeding Stock Mortality: < 1 % during the week prior to test initiation
Organisms upon receipt: mortality, < 1 %; temperature, 22°C: dissolved oxygen, 13.2 mg/L
No acclimation was necessary. Test organisms maintained at 25 ± 1°C until loaded.
The EC guidance document on the importation of test organisms (1999) has been followed. Test organisms were received in good condition, with inflated swim bladders and normal feeding behaviour.
Organism observation: No unusual behaviour or appearance or treatment of test organisms was noted prior to shipping, upon arrival, preceding or during the test.
Normal feeding behaviour was noted during the test.
Sample initial chemistry: pH: 5.1; EC: 658 (µS/cm); DO: 10.1 (mg/L); temperature: 15 °C
hardness (mg CaC03/L): 161; colour: colourless; odour: odourless
Sample holding time: 3 days (must be ≤ 3 days); The test was conducted with three subsamples
samples a, b, and c were for days 0 to 2, 3 to 4, and 5 to 6 respectively
Sample storage: 4 ± 2°C in darkness
Test vessel: Tests were conducted in 500 mL plastic vessels
Test volume: 250 mL of solution (depth of 6.5 cm), replenished daily
Control/dilution water: The control and dilution water was dechlorinated City of Calgary water acclimated to the test conditions; no chemicals were added to the dilution/control water
A second control was not set up for this test. However, duplicate controls are run in the reference toxicant for each batch of fish.
Test concentrations: 7 effluent concentrations (1.6, 3.2, 6.3, 13, 25, 50, 100% (v/v)
plus a negative control)
Test replicates: Ten fish ≤ 24 hours old were loaded per test vessel; 4 replicates/conc.
Feeding: The test organisms were fed twice daily newly-hatched brine shrimp nauplii
The fish are not fed during the final 12 hours of the test
Measurements: pH, conductivity, dissolved oxygen and temperature were measured daily
Sample pre-treatment: The sample was not aerated, pH or hardness adjusted prior to or during testing.
No sample filtration, settling, or decanting occurred prior to or during testing
The dissolved oxygen concentration (mg/L) was: 8.3
The sample pH was: 7.6
Lighting: Overhead full spectrum fluorescent lights
Photoperiod: 16h light:8h dark
Test temperature: 25 ± 1°C

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Note: Outlined sections are protocol deviations explained on the comment page

Test Conditions

Client: SRK100
Reference: 15-1498-01-FMD

Endpoint: Survival, 7-d LC50 (with 95% confidence limits)
Biomass, 7-d IC25 (with 95% confidence limits)
Test endpoints were bracketed by at least 1 test concentration (except for <1.6% or >100 %)
No outliers were observed within the data set

Test validity: Control had 100% survival (must ≥ 80%)
Control had 0% abnormal behaviour (must < 20%), e.g.atypical swimming, loss of equilibrium
The average dry weight of the control fish was 0.3 (must ≥ 0.25 mg)

Reference toxicant: 7-d test with NaCl initiated October 30, 2015;
current results: (7-d LC50 and 95% confidence limits) = 2.86 (2.80-2.91) log (mg/L NaCl)
current results: (7-d IC25 and 95% confidence limits) =2.67 (2.60-2.69) log (mg/L NaCl)
historical results: (7-d LC50 and 95% confidence limits) =2.96 (2.76-3.15) log (mg/L NaCl)
historical results: (7-d IC25 and 95% confidence limits) =2.71 (2.54-2.88) log (mg/L NaCl)

The reference toxicant test was performed under the same conditions as those used during this test.

Note: Outlined sections are protocol deviations explained on the comment page

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Test Data

Client: SRK100
Reference: 15-1498-01-FMD

Test Log:

Date	Day	Time	Technicians	Temperature Before Use(ºC)	
				Control	Sample
2015/10/30	0	1600	JW/JN/JK/DS	25	25
2015/10/31	1	1455	JN	25	25
2015/11/01	2	1130	HL/NM/JW	25	25
2015/11/02	3	1355	CQ	25	25
2015/11/03	4	1000	DS/EP	25	25
2015/11/04	5	1230	JK	25	25
2015/11/05	6	1100	JK/EP	25	25
2015/11/06	7	1330	CQ/JW	na	na

Combined Mortality and Atypical Swimming Behavior (%):

Day	ctl	1.6	3.2	6.3	12.5	25	50	100
0	0%	0%	0%	0%	0%	0%	0%	0%
1	0%	0%	0%	0%	0%	0%	0%	0%
2	0%	0%	3%	0%	0%	0%	3%	0%
3	0%	3%	2%	0%	0%	3%	8%	0%
4	0%	0%	5%	0%	0%	3%	8%	0%
5	0%	0%	5%	0%	0%	3%	8%	0%
6	0%	0%	5%	0%	0%	0%	8%	0%
7	0%	0%	5%	0%	0%	0%	8%	0%

Chemistry Summary Tables:

	New Solutions								Old Solutions							
Conc. (%)	ctl	1.6	3.2	6.25	12.5	25	50	100	ctl	1.6	3.2	6.25	12.5	25	50	100
Average Values																
pH	8.2	8.2	8.2	8.2	8.2	8.1	8.0	7.6	8.0	8.0	8.0	8.0	8.0	7.9	7.8	7.2
cond.	434	447	452	460	473	508	555	664	440	444	456	463	479	504	558	664
DO	7.7	7.6	7.6	7.6	7.6	7.7	7.8	7.9	7.2	7.1	7.0	6.9	6.9	6.9	6.9	6.9
temp	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Coefficients of Variation (%)																
pH	2	2	2	2	2	2	1	4	2	1	2	1	2	1	1	3
cond.	5	5	4	4	4	7	3	2	4	6	2	2	2	3	2	2
DO	1	1	1	2	1	1	3	4	3	2	2	3	4	4	4	4
temp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Test Data

Client: SRK100
Reference: 15-1498-01-FMD

Biology (number alive):

Conc. (%)	ctl	1.6	3.2	6.25	12.5	25	50	100
Replicate				Day 1				
a	10	10	10	10	10	10	10	10
b	10	10	10	10	10	10	10	10
c	10	10	10	10	10	10	10	10
d	10	10	10	10	10	10	10	10
				Day 2				
a	10	10	10	10	10	10	10	10
b	10	10	10	10	10	10	10	10
c	10	10	9	10	10	10	10	10
d	10	10	10	10	10	10	10	10
				Day 3				
a	10	10	10	10	10	10	10	10
b	10	10	9	10	10	10	9	10
c	10	10	9	10	10	10	10	10
d	10	10	10	10	10	10	8	10
				Day 4				
a	10	10	10	10	10	10	10	10
b	10	10	9	10	10	10	9	10
c	10	10	9	10	10	10	10	10
d	10	10	10	10	10	10	8	10
				Day 5				
a	10	10	10	10	10	10	10	10
b	10	10	9	10	10	10	9	10
c	10	10	9	10	10	10	10	10
d	10	10	10	10	10	10	8	10
				Day 6				
a	10	10	10	10	10	10	10	10
b	10	10	9	10	10	10	9	10
c	10	10	9	10	10	10	10	10
d	10	10	10	10	10	10	8	10
				Day 7				
a	10	10	10	10	10	10	10	10
b	10	10	9	10	10	10	9	10
c	10	10	9	10	10	10	10	10
d	10	10	10	10	10	10	8	10

Biology (% mortality):

Conc. (%)	ctl	1.6	3.2	6.25	12.5	25	50	100
Replicate				Day 1				
a	0	0	0	0	0	0	0	0
b	0	0	0	0	0	0	0	0
c	0	0	0	0	0	0	0	0
d	0	0	0	0	0	0	0	0
				Day 2				
a	0	0	0	0	0	0	0	0
b	0	0	0	0	0	0	0	0
c	0	0	10	0	0	0	0	0
d	0	0	0	0	0	0	0	0
				Day 3				
a	0	0	0	0	0	0	0	0
b	0	0	10	0	0	0	10	0
c	0	0	10	0	0	0	0	0
d	0	0	0	0	0	0	20	0
				Day 4				
a	0	0	0	0	0	0	0	0
b	0	0	10	0	0	0	10	0
c	0	0	10	0	0	0	0	0
d	0	0	0	0	0	0	20	0
				Day 5				
a	0	0	0	0	0	0	0	0
b	0	0	10	0	0	0	10	0
c	0	0	10	0	0	0	0	0
d	0	0	0	0	0	0	20	0
				Day 6				
a	0	0	0	0	0	0	0	0
b	0	0	10	0	0	0	10	0
c	0	0	10	0	0	0	0	0
d	0	0	0	0	0	0	20	0
				Day 7				
a	0	0	0	0	0	0	0	0
b	0	0	10	0	0	0	10	0
c	0	0	10	0	0	0	0	0
d	0	0	0	0	0	0	20	0

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Client: SRK100
Reference: 15-1498-01-FMD

Biology (number displaying atypical swimming):

Conc. (%)	ctl	1.6	3.2	6.25	12.5	25	50	100
Replicate								
Day 1								
a	0	0	0	0	0	0	0	0
b	0	0	0	0	0	0	0	0
c	0	0	0	0	0	0	0	0
d	0	0	0	0	0	0	0	0
Day 2								
a	0	0	0	0	0	0	0	0
b	0	0	0	0	0	0	0	0
c	0	0	0	0	0	0	0	0
d	0	0	0	0	0	0	1	0
Day 3								
a	0	0	0	0	0	1	0	0
b	0	0	0	0	0	0	0	0
c	0	0	0	0	0	0	0	0
d	0	0	0	0	0	0	0	0
Day 4								
a	0	0	0	0	0	1	0	0
b	0	0	0	0	0	0	0	0
c	0	0	0	0	0	0	0	0
d	0	0	0	0	0	0	0	0
Day 5								
a	0	0	0	0	0	0	0	0
b	0	0	0	0	0	0	0	0
c	0	0	0	0	0	1	0	0
d	0	0	0	0	0	0	0	0
Day 6								
a	0	0	0	0	0	0	0	0
b	0	0	0	0	0	0	0	0
c	0	0	0	0	0	0	0	0
d	0	0	0	0	0	0	0	0
Day 7								
a	0	0	0	0	0	0	0	0
b	0	0	0	0	0	0	0	0
c	0	0	0	0	0	0	0	0
d	0	0	0	0	0	0	0	0

Biology (% atypical swimming behavior):

Conc. (%)	ctl	1.6	3.2	6.25	12.5	25	50	100
Replicate								
Day 1								
a	0	0	0	0	0	0	0	0
b	0	0	0	0	0	0	0	0
c	0	0	0	0	0	0	0	0
d	0	0	0	0	0	0	0	0
Day 2								
a	0	0	0	0	0	0	0	0
b	0	0	0	0	0	0	0	0
c	0	0	0	0	0	0	0	0
d	0	0	0	0	0	0	10	0
Day 3								
a	0	0	0	0	0	10	0	0
b	0	0	0	0	0	0	0	0
c	0	0	0	0	0	0	0	0
d	0	0	0	0	0	0	0	0
Day 4								
a	0	0	0	0	0	10	0	0
b	0	0	0	0	0	0	0	0
c	0	0	0	0	0	0	0	0
d	0	0	0	0	0	0	0	0
Day 5								
a	0	0	0	0	0	0	0	0
b	0	0	0	0	0	0	0	0
c	0	0	0	0	0	10	0	0
d	0	0	0	0	0	0	0	0
Day 6								
a	0	0	0	0	0	0	0	0
b	0	0	0	0	0	0	0	0
c	0	0	0	0	0	0	0	0
d	0	0	0	0	0	0	0	0
Day 7								
a	0	0	0	0	0	0	0	0
b	0	0	0	0	0	0	0	0
c	0	0	0	0	0	0	0	0
d	0	0	0	0	0	0	0	0

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Test Data

Client: SRK100
Reference: 15-1498-01-FMD

Unpreserved Dry Weights (mg)

Conc. (%)	ctl	1.6	3.2	6.25	12.5	25	50	100
	3.1	2.5	3.3	3.8	2.9	3.1	3.2	3.8
	3.2	3.3	2.9	3.6	3.0	3.1	3.3	3.4
	2.9	3.1	2.6	3.5	2.8	2.8	3.2	3.2
	2.7	2.9	3.1	3.4	3.2	3.3	3.0	3.1

Biology Summary Tables:

Conc. (%)	ctl	1.6	3.2	6.25	12.5	25	50	100	ctl	1.6	3.2	6.25	12.5	25	50	100
	Mortality (%)								Biomass Data (mg per fish)							
a	0	0	0	0	0	0	0	0	0.31	0.25	0.33	0.38	0.29	0.31	0.32	0.38
b	0	0	10	0	0	0	10	0	0.32	0.33	0.29	0.36	0.30	0.31	0.33	0.34
c	0	0	10	0	0	0	0	0	0.29	0.31	0.26	0.35	0.28	0.28	0.32	0.32
d	0	0	0	0	0	0	20	0	0.27	0.29	0.31	0.34	0.32	0.33	0.30	0.31
mean	0	0	5	0	0	0	8	0	0.30	0.29	0.29	0.36	0.30	0.31	0.32	0.34
sd	0	0	6	0	0	0	10	0	0.02	0.03	0.03	0.02	0.02	0.02	0.01	0.03
cv(%)	0	0	115	0	0	0	128	0	8	12	11	5	6	6	4	9

		Biomass as a Percent of Controls						
Average Dry Weight of Surviving Control Fish:	0.30	100	98	98	120	99	103	106	113

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Test Data

Client: SRK100
Reference: 15-1498-01-FMD

Chemistry:

	New Solutions								Old Solutions							
Conc. (%)	ctl	1.6	3	6.25	12.5	25	50	100	ctl	1.6	3	6.25	12.5	25	50	100
Day	pH (units)								pH (units)							
0	8.0	8.1	8.1	8.1	8.1	8.0	8.0	7.6								
1	8.0	8.0	8.0	8.0	8.0	8.0	7.9	7.6	8.0	8.0	8.0	8.0	8.0	7.9	7.8	7.5
2	8.3	8.3	8.3	8.3	8.3	8.3	8.2	7.8	8.1	8.1	8.2	8.1	8.1	8.0	7.9	7.1
3	8.2	8.2	8.2	8.2	8.2	8.2	8.1	7.7	7.9	8.0	8.0	8.0	7.8	7.9	7.7	7.2
4	8.3	8.3	8.3	8.3	8.3	8.2	8.1	7.8	8.1	8.1	8.1	8.1	8.0	8.0	7.8	7.3
5	8.0	8.0	8.0	8.0	8.0	8.0	7.9	7.6	7.9	7.9	7.9	7.9	7.9	7.8	7.7	7.3
6	8.3	8.3	8.3	8.3	8.2	8.0	8.0	7.0	8.2	8.2	8.2	8.1	8.2	8.0	7.9	7.2
7									7.8	7.9	7.9	7.8	7.8	7.8	7.6	6.9
8																
	Conductivity (µS/cm)								Conductivity (µS/cm)							
0	416	438	444	453	472	505	575	675								
1	454	465	472	480	492	516	566	667	423	445	449	455	473	510	572	666
2	429	445	449	456	468	490	552	666	466	385	470	479	489	524	575	677
3	400	421	428	436	453	481	543	665	427	455	453	462	476	504	552	669
4	471	473	476	487	494	579	566	674	445	453	449	458	470	506	560	674
5	438	461	464	471	483	509	552	650	430	456	456	463	474	501	545	650
6	427	425	428	434	446	473	528	649	461	466	468	473	492	506	555	653
7									425	445	444	449	478	480	546	658
8																
	Dissolved Oxygen (mg/L)								Dissolved Oxygen (mg/L)							
0	7.5	7.5	7.6	7.6	7.6	7.7	8.2	8.3								
1	7.7	7.6	7.6	7.6	7.6	7.6	7.7	7.8	7.5	7.2	7.1	6.9	6.9	6.9	6.9	6.9
2	7.5	7.5	7.5	7.5	7.7	7.6	7.6	7.6	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
3	7.7	7.6	7.6	7.5	7.5	7.6	7.6	7.8	7.0	6.9	6.8	6.7	6.5	6.4	6.5	6.5
4	7.7	7.7	7.7	7.7	7.7	7.8	7.8	7.7	7.3	7.3	7.3	7.3	7.2	7.3	7.3	7.3
5	7.8	7.8	7.7	7.8	7.7	7.7	7.8	8.2	7.4	7.1	7.0	6.8	6.6	6.7	6.7	6.8
6	7.7	7.7	7.5	7.5	7.5	7.6	7.6	8.2	7.5	7.0	6.9	6.9	6.8	6.9	6.9	6.8
7									7.0	7.0	7.0	7.0	7.1	7.0	6.9	7.0
8																
	Temperature (°C)								Temperature (°C)							
0	25	25	25	25	25	25	25	25								
1	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
2	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
3	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
4	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
5	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
6	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
7									25	25	25	25	25	25	25	25
8																

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Comments/Statistics

Client: SRK100
Reference: 15-1498-01-FMD

Test Result Comments:
None

Data Analysis:
Endpoints for mortality could not be calculated. No effect occurred.

Endpoints for biomass could not be calculated. No effect occurred.

Protocol Deviations:
None

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Result Summary

Client: SRK100
Reference: 15-1498-01-LMD

Client: SRK Consulting; operation Lupin Mine

Sample: LUP-10-151027

Collection: collected on 2015/10/27 at not given by AJB
Receipt: received on 2015/10/29 at 1600 by MC
Containers: received 4 x 20 L jugs, 8 x 1 L bottle at 10 °C, in good condition with seals and no initials
Description: type: water, collection method: not given
Test: started on 2015/10/29 ; ended on 2015/11/05

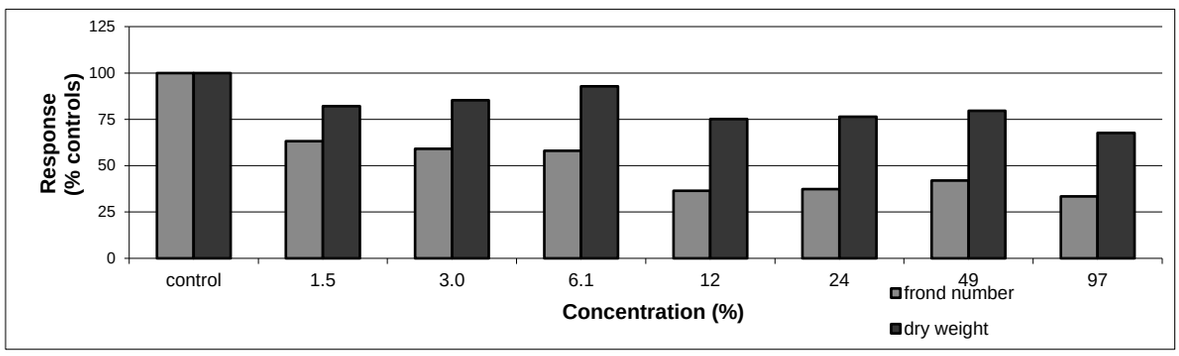
Result:

	Endpoint (7-day)	Value	Confidence Limits (95%) lower	upper	Units	Method Calculated
Chronic:						
Frond Number Inhibition	IC25	<1.5	<1.5	<1.5	%	3P Log-Logistic
	IC50	7.9	4.6	13.5	%	3P Log-Logistic
Dry Weight Inhibiton	IC25	57	n/a	n/a	%	Linear Interpolation
	IC50	>97	n/a	n/a	%	Linear Interpolation

Notes: ICx, concentrations lethal or inhibitory to 'x' percent of the test population;

	Stimulation Observed	Test Concentrations		Method Calculated
Chronic:				
Frond Number Stimulation	no	none	%	Dunnet Multiple Comparison Test
Dry Weight Stimulation	no	none	%	Dunnet Multiple Comparison Test

Notes: Stimulation refers to increased response at all concentrations or at high concentrations



The test data and results are authorized and verified correct.

Senior Verifier

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Test Conditions

Client: SRK100
Reference: 15-1498-01-LMD

Method: Biological Test Method: Test for Measuring the Inhibition of Growth Using the Freshwater Macrophyte, *Lemna minor* . Environment Canada, EPS 1/RM/37 2nd Edition, January 2007

Test type: *Lemna* 7-d Inhibition of Growth Static Test (WTR-ME-030)
Species: *Lemna minor*
Organism source: in-house culture, ≥ 3 weeks in age (original source: UTCC 492, clone 7730)
Culture health: The fronds were acclimated in test media (≥2cm) for 24 hours prior to test initiation. The test culture was axenic prior to testing. There was an 19 fold increase in frond number of culture over last 7 days. Test loaded with 3 frond daughter plants, all with light green fronds and short roots.
Culture age: The test was started with 10 day old fronds.
Culture media: modified Hoagland's E+ medium
Organism observation: No unusual behaviour, appearance or treatment of test organisms was noted prior to or during the test.

Sample initial chemistry: pH: 5.1; EC: 658 (µS/cm); DO: 10.1 (mg/L); temperature: 15 °C hardness (mg CaC03/L): 161; colour: colourless; odour: odourless
Sample holding time: 2 days (must be ≤ 3 days)

Sample storage: 4 ± 2°C in darkness
Test vessel: The test was a static test conducted in 200 mL polyethylene plastic containers with clear lids. Test vessel size is adequate to ensure no overlapping of fronds occurs.
Test volume: The test volume was 150 mL, depth of ≥ 4 cm
Test concentrations: 7 effluent concentrations (1.5, 3.0, 6.1, 12.1, 24, 49, 97% (v/v) plus a negative control)
Test replicates: There were four replicates per treatment with two 3 frond daughter plants per replicate; replicates are randomly rotated daily.
Control/dilution water: Test media (modified APHA medium) made up with deionized City of Calgary water water spiked with nutrients as per Environment Canada EPS 1/RM/37, 2007. made by adding 60 mL of each of the three stock solutions to 5.82 L of DRO The media aerated for 2 hours and was pH adjusted to 8.3 ± 0.1 with 6N HCl or NaOH. The test media was not filtered.
Elutriate preparation: 2015/10/29
Sample pre-treatment: 1455 mL of sample spiked with 15 mL of each of the three APHA stock solutions, no other chemicals added. The sample was not pH adjusted or filtered prior to testing.
Aeration: The sample was pre-aerated for 20 minutes at a rate of 100 bubbles/minute with oil free filtered compressed air from a 1 mL glass pipette attached to an air pump.

Note: Outlined sections are protocol deviations explained on the comment page

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Test Conditions

Client: SRK100
Reference: 15-1498-01-LMD

Lighting: The cups were incubated under continuous full-spectrum light. The light levels were measured at the sample surface, at three locations on the testing bench, during testing:

left:	4970	lux	≈	80	µmol/m^2•S
centre:	4160	lux	≈	67	µmol/m^2•S
right:	4650	lux	≈	74	µmol/m^2•S

Measurements:
pH, conductivity, dissolved oxygen and temperature at test initiation and termination; temperature in the control, low, middle and high concentrations are recorded daily.

Test temperature: 25 ± 2°C

Endpoint: Growth (based on increase in frond number), 7-d IC25 (with 95% confidence limits)
Growth (based on dry weight), 7-d IC25 (with 95% confidence limits)
Test endpoints were bracketed by at least 1 test concentration.
(except for <1.5% or >97 %)
No outliers were observed within the data set

Test validity: The mean number of fronds in the controls have increased 9 times (must be ≥ 8 time increase). The average number attained at test termination was 56 (must be ≥48 fronds per test vessel).

Reference toxicant: 7-d test with Potassium Chloride (KCl) initiated November 6, 2015;
current results:
(Frond Number; 7-d IC25 and 95% confidence limits) = 3.28 (2.89-3.46) log(mg KCl/L)
Historical results:
(Frond Number, 7-d IC25 and 95% confidence limits) = 3.28 (3.10-3.46) log(mg KCl/L)
current results:
(Dry Weight; 7-d IC25 and 95% confidence limits) = 3.83 (3.74-3.93) log (mg KCl/L)
Historical results:
(Dry Weight; 7-d IC25 and 95% confidence limits) = 3.56 (3.22-3.90) log (mg KCl/L)

The reference toxicant test was performed under the same conditions as those used during this test .

Note: Outlined sections are protocol deviations explained on the comment page

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Test Data

Client: SRK100
Reference: 15-1498-01-LMD

Test Log:

Date	Day	Time	Technicians	Rotate	Temperature (°C)			
					Control	3.0%	24%	97%
2015/10/29	0	1715	CQ/JP	na	25	25	25	25
2015/10/30	1	0815	JK	yes	24	24	24	24
2015/10/31	2	0820	JK	yes	24	24	24	24
2015/11/01	3	0800	HKS	yes	24	24	24	24
2015/11/02	4	0830	JK	yes	24	24	24	24
2015/11/03	5	0820	JK	yes	24	24	24	24
2015/11/04	6	0820	JK	yes	24	24	24	24
2015/11/05	7	1330	HKS/EP/CQ	na	25	25	25	25

Chemistry:

Conc.(%)	control	1.5	3.0	6.1	12	24	49	97	
Day 0									
pH	8.3	8.4	8.5	8.5	8.4	8.4	8.3	7.8	
cond.	971	978	976	993	1029	1062	1164	1393	
DO	7.6	7.6	7.6	7.6	7.6	7.7	7.7	8	
temp.	25	25	25	25	25	25	25	25	
Day 7									
pH	8.5	8.5	8.5	8.4	8.4	8.4	8.4	8.3	
cond.	1097	1397	1545	1517	1672	1614	1702	1848	
DO	8.7	8.7	8.3	8.1	8	7.9	7.9	7.9	
temp.	26	26	26	26	26	26	26	26	

Notes: pH, units; cond., conductivity (µS/cm); DO, dissolved oxygen (mg/L); temp., temperature (°C)

Frond Appearance:

Concentration (%)	Day 0	Day 7
control	green, short roots, healthy	medium green, long roots, healthy
1.5	green, short roots, healthy	medium green, long roots, healthy
3.0	green, short roots, healthy	medium green, long roots, healthy
6.1	green, short roots, healthy	medium green, long roots, healthy
12.1	green, short roots, healthy	light green, long roots, some necorsis
24	green, short roots, healthy	light green, long roots, some necorsis
49	green, short roots, healthy	light green, long roots, some necorsis
97	green, short roots, healthy	light green, long roots, some necorsis

Notes: chl, chlorotic; nec, necrotic; asf, abnormally sized fronds; gib, gibbosity; cd, colony destroyed; rd, roots destroyed; lb, loss of bouyancy; ag, algae

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Client: SRK100
Reference: 15-1498-01-LMD

Test Data

Frond number:

Conc.(%)	control	1.5	3.0	6.1	12.1	24	49	97
Replicate				Day 0				
a	6	6	6	6	6	6	6	6
b	6	6	6	6	6	6	6	6
c	6	6	6	6	6	6	6	6
d	6	6	6	6	6	6	6	6
				Day 7				
a	55	33	37	32	22	34	29	24
b	62	39	36	33	21	25	30	26
c	59	36	33	34	24	19	25	17
d	46	41	35	40	29	20	23	23
average	**56**	37	35	35	24	25	27	23
fold increase	**9**	6	6	6	4	4	4	4

Increase in Frond Number compared to the Control:

a	49	27	31	26	16	28	23	18
b	56	33	30	27	15	19	24	20
c	53	30	27	28	18	13	19	11
d	40	35	29	34	23	14	17	17
average	50	31	29	29	18	19	21	17
sd	7	4	2	4	4	7	3	4
cv	14	11	6	13	20	37	16	23
% ctls	100	63	59	58	36	37	42	33
% stim	0	-37	-41	-42	-64	-63	-58	-67

Total Dry Weights (mg):

Conc.(%)	control	1.5	3.0	6.1	12.1	24	49	97
Replicate					Day 7			
a	5.4	3.5	4.5	4.4	3.1	5.0	4.2	4.1
b	5.9	4.4	4.7	4.8	3.8	4.1	5.0	3.6
c	6.1	4.5	4.2	4.5	5.1	3.8	3.4	3.0
d	4.0	4.9	4.7	6.1	4.0	3.5	4.4	3.7
					Day 7			
average	5.3	4.4	4.5	4.9	4.0	4.1	4.2	3.6
sd	0.9	0.6	0.2	0.8	0.8	0.6	0.7	0.4
cv	18	13	5	15	21	16	15	12
%ctls	100	82	85	93	75	76	80	68
% stim	0	-18	-15	-7	-25	-24	-20	-32

Notes: cv, coefficient of variation; %ctls, percent of controls; sd, standard deviation, % stim, percent stimulation

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Comments/Statistics

Client: SRK100
Reference: 15-1498-01-LMD

Test Result Comments:
None

Data Analysis:
Endpoints for frond number were calculated using a non-linear regression model (3P Log-Logistic) with CETIS v. 1.9.0.8

Regression analysis was attempted on the data, but the assumptions of normality and homoscedasticity of residuals were not met. Therefore, endpoints for biomass were calculated using a Linear Interpolation model using CETIS v. 1.9.0.8

Significant stimulatory effects in frond number were not observed in any test concentration as calculated by ANOVA analysis with CETIS v. 1.9.0.8. (Dunnet Multiple Comparison).

Significant stimulatory effects in dry weight were not observed in any test concentration as calculated by ANOVA analysis with CETIS v. 1.9.0.8 (Dunnet Multiple Comparison).

Protocol Deviations:
None

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Trout (96-h LC50) Test Report

Result Summary

Client: SRK100
Reference: 15-1498-01-TRD

Client: SRK Consulting; operation Lupin Mine

Sample: LUP-10-151027

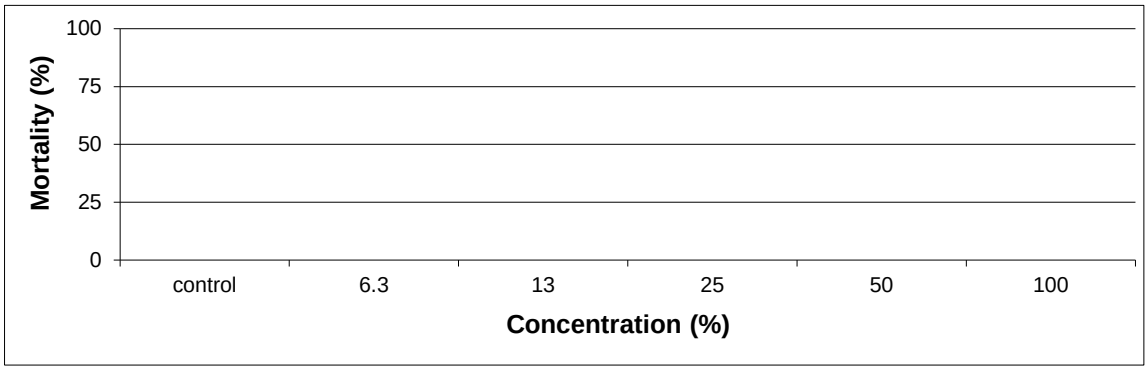
Collection: collected on 2015/10/27 at not given by AJB
Receipt: received on 2015/10/29 at 1600 by MC
Containers: received 4 x 20 L jugs, 8 x 1 L bottle at 10 °C, in good condition with seals and no initials
Description: type: water, collection method: not given

Test: started on 2015/10/31 ; ended on 2015/11/04

Result:

	Endpoint (96-hour)	Value (%)	Confidence Limits (95%) lower	upper	Method Calculated
Acute:	LC50	>100			could not be calculated
(mortality)	LC25	>100			could not be calculated

Notes: LC25 & LC50, concentrations lethal to 25% and 50% of the test population



The test data and results are authorized and verified correct.

Jacklyn Poole

Senior Verifier

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Test Conditions

Client: SRK100
Reference: 15-1498-01-TRD

Method: Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout, 2000. Environment Canada, EPS 1/RM/13. Second Edition (amended May 2007).

Test type: Trout 96-h Static Acute Test (WTR-ME-041)
Species: *Oncorhynchus mykiss*
Organism source: Sam Livingston (Batch 20151009TR)
Acclimation: 22 days (must be ≥2 weeks)
Stock mortality: 0.08% (seven days preceding testing)

Sample initial chemistry: pH: 5.1; EC: 658 (µS/cm @ 25°C); DO: 10.1 (mg/L); temperature: 15 °C
hardness (mg CaC03/L): 161; colour: colourless; odour: odourless
Sample holding time: 4 days (must be ≤ 5 days)
Sample storage: 4 ± 2°C in darkness

Test vessel: The test was conducted in 22 L plastic pails with polyethylene liners
Test volume: 20 Litres (depth of solution in each test vessel ≥15cm)
Sample pre-treatment: All test solutions and controls were pre-aerated for 120 minutes at 6.5 ±1 mL/min/L
Dissolved oxygen in 100 % sample was 8.9 mg/L after pre-aeration
The sample was not filtered or pH adjusted prior to or during testing
Loading density: 0.193 g/Litre (must be ≤ 0.5 g/Litre)
Control/dilution water: Dechlorinated City of Calgary water acclimated to test conditions
Test concentrations: 5 effluent concentrations (6.3, 12.5, 25, 50, 100% (v/v) plus a negative control)
Test replicates: One replicate per treatment; 10 fish per replicate
Feeding: Fish are not fed 24 hours before test initiation and no feeding during test
Measurements: pH, conductivity, dissolved oxygen and temperature measured at test initiation and test termination
Aeration: All treatments aerated at 6.5 ±1 mL/min/L by oil-free compressed air passed through airline tubes connected to disposable air stones
Lighting: Overhead full spectrum fluorescent lights
Photoperiod: 16h light:8h dark
Test temperature: 15 ± 1°C

Endpoint: Mortality, 96-h LC50 (with 95% confidence limits)
Test validity: The control had 100% survival (must ≥ 90%)
The control had 0 percent (%) stressed behaviour (must ≤ 10%)
Reference toxicant: 96-h test with Potassium Chloride (KCl) initiated October 26, 2015; current results (96-h LC50 and 95% confidence limits) = 0.58 (0.50-0.63) log (g/L KCl)
historical results:
(96-h LC50 and 95% confidence limits) = 0.57 (0.50-0.64) log (g/L KCl)

Note: Outlined sections are protocol deviations explained on the comment page; v/v, volume per volume

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Test Data

Client: SRK100
Reference: 15-1498-01-TRD

Test Log:

Date	Day	Time	Technician
2015/10/31	0	1600	CQ
2015/11/01	1	0830	HL
2015/11/02	2	0945	DS
2015/11/03	3	0830	ML/HKS
2015/11/04	4	0950	DS/CQ/JW

Chemistry:

Conc. (%)	control	6.3	13	25	50	100
Day			pH (units)			
0	7.3	7.3	7.4	7.3	7.3	7.1
4	7.8	7.8	7.8	7.7	7.6	7.2
			Conductivity (µS/cm @ 25°C)			
0	439	457	465	491	530	643
4	423	452	451	478	516	623
			Dissolved Oxygen (mg/L)			
0	8.6	8.7	8.7	8.6	8.6	8.9
4	8.3	8.5	8.6	8.7	8.7	8.6
			Temperature (^{o}C)			
0	15	15	16	16	16	15
4	15	15	15	15	15	15

Number Alive (In brackets number stressed):

Conc. (%)	control	6.3	13	25	50	100
Day						
0	10	10	10	10	10	10
1	10	10	10	10	10	10
2	10	10	10	10	10	10
3	10	10	10	10	10	10
4	10	10	10	10	10	10
			Mortality (%)			
4	0	0	0	0	0	0
			Stressed (%)			
4	0	0	0	0	0	0

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Client: SRK100
Reference: 15-1498-01-TRD

Test Data

Biology Summary Tables:

Control Fish	Length (cm)	Wet Weight(g)
1	4.1	0.8
2	3.5	0.5
3	3.6	0.6
4	3.1	0.3
5	3.1	0.3
6	2.9	0.3
7	3.0	0.3
8	3.1	0.3
9	2.9	0.3
10	2.8	0.2
average	3.2	0.4
sd	0.4	0.2
cv(%)	12.6	46.9

Notes: nd, not done; na, not applicable; sd, standard deviation; cv(%), coefficient of variation

Conc. (%)	Group Wet Weight (g)
control	3.9
6.3	3.1
13	2.9
25	3.0
50	3.4
100	3.9

Comments/Statistics

Test Result Comments:
None

Data Analysis:
Endpoints for mortality could not be calculated. No effect occurred.

Protocol Deviations:
None

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Result Summary

Client: SRK100
Reference: 15-1498-01-DAD

Client: SRK Consulting; operation Lupin Mine

Sample: LUP-10-151027

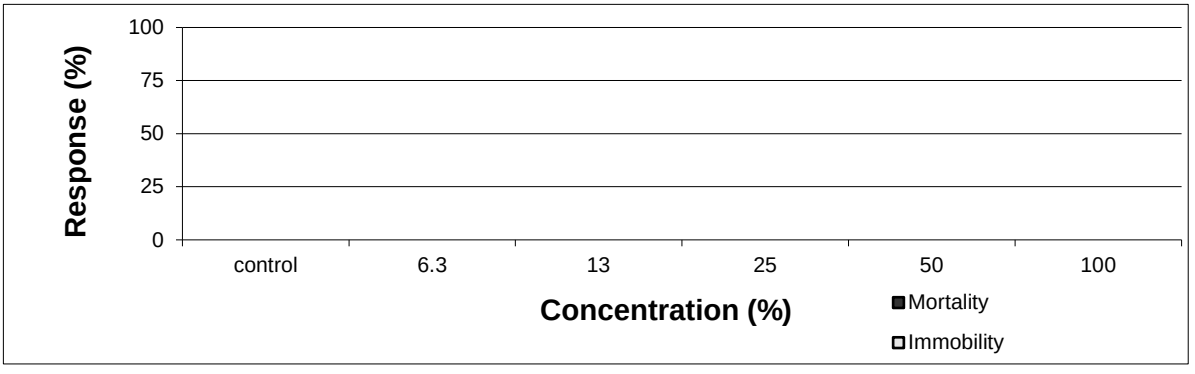
Collection: collected on 2015/10/27 at not given by AJB
Receipt: received on 2015/10/29 at 1600 by MC
Containers: received 4 x 20 L jugs, 8 x 1 L bottle at 10 °C, in good condition with seals and no initials
Description: type: water, collection method: not given

Test: started on 2015/10/30 ; ended on 2015/11/01

Result:

	Endpoint (48-hour)	Value (%)	Confidence Limits (95%) lower	upper	Method Calculated
Acute: (mortality)	LC50	>100			could not be calculated
	LC25	>100			could not be calculated
Acute: (immobility)	EC50	>100			could not be calculated
	EC25	>100			could not be calculated

Notes: LC25 & LC50, concentrations lethal to 25% and 50% of the test population



The test data and results are authorized and verified correct.

Senior Verifier

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
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Test Conditions

Client: SRK100
Reference: 15-1498-01-DAD

Method: Biological Test method: Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* , 2000. Environ. Can., EPS 1/RM/14. Second Edition.

Test type: *Daphnia* 48-h Static Acute Test (WTR-ME-015)
Species: *Daphnia magna*
Age: < 24 hours old
Organism source: in-house culture
Stock mortality: 0%
Culture brood data: 12 days to first brood
16 neonates per average brood

Sample initial chemistry: pH: 5.1; EC: 658 (µS/cm @ 25°C); DO: 10.1 (mg/L); temperature: 15 °C hardness (mg CaC03/L): 161; colour: colourless; odour: odourless
Sample holding time: 3 days (must be ≤ 5 days)
Sample storage: 4 ± 2°C in darkness

Test vessel: 385 mL plastic vessels
Test volume: 150 mL
Sample pre-treatment: The sample was not filtered or pH adjusted prior to or during testing
The sample was pre-aerated for 20 minutes (rate of 37.5 ± 12.5 mL/min.L-1)
The hardness of the sample was not adjusted (mg CaCO3/L) prior to or during testing

Loading density: One daphnid/15 mL (must ≤ 1 organism/15 mL)
Control/dilution water: Moderately hard water supplemented with vitamin B12 (2 µg/L) and Na_2SeO_3 (5 µg/L)

The hardness of the control/dilution water was 87 mg $CaCO_3$/L
Test concentrations: 5 effluent concentrations (6.3, 12.5, 25, 50, 100% (v/v) plus a negative control)
Test replicates: One replicate per treatment, 10 daphnids per replicate
Feeding: None
Aeration: None
Measurements: pH, conductivity, dissolved oxygen and temperature at test initiation and termination
Lighting: Cool white fluorescent lights
Photoperiod: 16h light:8h dark
Test temperature: 20 ± 2°C

Note: Outlined sections are protocol deviations explained on the comment page

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Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Test Conditions

Client: SRK100
Reference: 15-1498-01-DAD

Endpoint: Mortality, 48-h LC50 (95% confidence limits)
Immobility, 48-h EC50 (95% confidence limits)

Test validity: The control had 100% survival (must ≥ 90%)
Control had 0 percent (%) abnormal behaviour (must ≤ 10%, immobility)

Reference toxicant: 48-h test with NaCl initiated November 4, 2015; current results
(48-h LC50 and 95% confidence limits) = 0.80 (0.78-0.82) log (g/L NaCl)
historical results:
(48-h LC50 and 95% confidence limits) =0.77 (0.70-0.84) log (g/L NaCl)

Note: Outlined sections are protocol deviations explained on the comment page

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Test Data

Client: SRK100
Reference: 15-1498-01-DAD

Test Log:

Date	Day	Time	Technician
2015/10/30	0	1730	CQ
2015/10/31	1	1015	JK
2015/11/01	2	1015	NM

Chemistry:

Conc. (%)	control	6.3	13	25	50	100		
Day	pH (units)							
0	8.1	8.0	8.0	7.9	7.8	7.8		
2	7.9	7.8	7.8	7.8	7.7	7.5		
	Conductivity (µS/cm @ 25°C)							
0	206	236	264	320	430	631		
2	217	259	302	356	466	696		
	Dissolved Oxygen (mg/L)							
0	7.9	8.0	8.0	8.0	8.0	8.1		
2	7.9	7.9	7.8	7.9	8.0	7.9		
	Temperature (^{o}C)							
0	19	19	19	19	19	19		
2	19	19	19	19	19	19		

Biology:

Conc. (%)	control	6.3	13	25	50	100		
Day	Number Alive and Behavior (behavior is in brackets)							
1	10	10	10	10	10	10		
2	10	10	10	10	10	10		

Notes: F, floating; I, immobile; B, stuck on bubble; D, caught in debris; nd, not done; na, not applicable;

	Mortality (%)							
2	0	0	0	0	0	0		
	Immobility (%)							
2	0	0	0	0	0	0		

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Comments/Statistics

Client: SRK100
Reference: 15-1498-01-DAD

Test Result Comments:
None

Data Analysis:
Endpoints for mortality could not be calculated. No effect occurred.

Endpoints for immobility could not be calculated. No effect occurred.

Protocol Deviations:
None

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
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GENERAL TERMS AND CONDITIONS:

These terms and conditions are incorporated into and form part of the Chain of Custody between HydroQual Laboratories Ltd. ("HydroQual") and the party named in the Chain of Custody (the "Client").

1. **Definitions:** Capitalized terms shall have the definition ascribed as such in these General Terms and Conditions and the Chain of Custody.
2. **The Services:** HydroQual will provide the Services to the Client as listed and described in the Chain of Custody.
3. **Prices:** HydroQual may review and change all prices, fees, surcharges or other charges as set out in proposals and/or price quotations if there are changes to HydroQual's cost beyond HydroQual's control, including changes in legislative requirements, Client variations of sample numbers and Client requests for changes to standard reporting requirements. Notwithstanding condition 3, all quotations are reviewed and updated on a yearly basis.
4. **Payment Terms:** The Client shall pay HydroQual within 30 days of the invoice date as provided by HydroQual. HydroQual may, for reasonable business reasons, require the Client to arrange for payment in advance.
5. **Quotation Numbers:** The Client shall provide the proposal and/or price quotation number to HydroQual (where applicable) to ensure correct pricing.
6. **Taxes:** Applicable taxes are not included in prices, surcharges and additional fees and will be added at the time of invoicing.
7. **No Guarantee of Results:** The Client is responsible for informing itself on the limitation of the results and acknowledges that the results are not guaranteed.
8. **Standard of Care:** HydroQual will use reasonable care and diligence as required by the laws of the province or territory where the sample is tested, subject to that level of care and skill ordinarily exercised by other laboratories currently practicing under similar conditions in the same locality, subject to the time limits and financial, physical or other constraints applicable to the Services. No warranty, express or implied, is made.
9. **Storage:** Where possible, HydroQual will store samples until a final report is issued to the Client, after which time HydroQual may discard the sample.
10. **Holds:** If the Client requests a sample be placed on hold, HydroQual will store the sample for the mutually agreed upon written time and price, after which HydroQual will invoice the Client and discard the sample.
11. **Archives:** If the Client requests a sample be archived, HydroQual will store the sample for a mutually agreed upon written time frame and price, after which HydroQual will invoice the Client and discard the sample.
12. **Handling Protocol:** Legal sample handling protocol must be arranged, and provided in writing, before samples are collected. HydroQual will provide a price quotation for legal sample protocol. Samples processed under legal protocol are stored indefinitely, subject to a storage charge as advised by HydroQual.
13. **Samples:** The quality, condition, content and source of samples stored and tested are not known to HydroQual except as declared and described on the Chain of Custody completed and submitted by the Client and accompanying the sample.
14. **Risk of Loss:** HydroQual will use reasonable care to protect samples during storage, however, all samples are stored at the Client's risk and the Client is responsible for obtaining appropriate insurance, if desired. The Client acknowledges that during the performance of the Services samples may be altered, lost, damaged or destroyed and the client forever releases HydroQual from any and all claims the Client may have for any loss or damage to the sample.
15. **Environmental:** the Client must comply with all applicable environmental legislation, including labeling all hazardous samples to comply with Canada's *Workplace Hazardous Materials Information System* and the Alberta *Transfer of Dangerous Goods* regulations, and must provide appropriate material safety data sheets that include the nature of the hazard and a contact name and phone number to call for information. The Client shall defend, indemnify and hold harmless HydroQual for all loss or damages, including any fine or cost of complying with an order of any government authority, resulting from the Client's breach of this paragraph.
16. **Hazardous Materials Disposal:** HydroQual may return, at the Client's cost, hazardous material to the Client for disposal.
17. **Hazardous Materials Surcharge:** HydroQual may apply an additional surcharge for handling of hazardous samples or samples with Naturally Occurring Radioactive Materials ("NORM"), such as and including without limitation, H_2S and CN.
18. **Sample Containers:** HydroQual may ship sample containers to the Client's location by the most cost effective means using HydroQual's preferred courier suppliers, within the specified project timeline. Shipping will be charged back to the Client.
19. **Additional Charges:** HydroQual may charge the Client:
    (a) for pick-up and delivery services when provided subject in each instance to a minimum charge of $50.00; and,
    (b) for rush service (processing samples and/or reporting).
20. **Large Bottle Orders:** The Client shall provide HydroQual with not less than 24 hours' notice for large bottle orders.
21. **Re-Tests:** HydroQual reserves the right to re-test any samples that remain in HydroQual's possession. Re-tests requested by the Client may be charged to Client and Client agrees to pay for such charges.
22. **Waiver:** The Client is responsible for making any assessment regarding the suitability of the Services and the intended results for the Client's purposes and waives any and all claims against HydroQual that the Client may have against HydroQual as a result of the interpretation of the results provided to the Client. The Client shall defend, indemnify and save harmless HydroQual for any and all claims made by any third party against HydroQual in respect of all losses however arising from the performance of the Services or the use of any report provided in the performance of the Services.
23. **LIMITATION OF LIABILITY:** IN NO EVENT SHALL HYDROQUAL BE RESPONSIBLE FOR ANY CONSEQUENTIAL, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY OR PUNITIVE DAMAGES, WHETHER FORESEEABLE OR UNFORESEEABLE (INCLUDING CLAIMS FOR LOSS OF PROFITS OR REVENUE OR LOSSES CAUSED BY STOPPAGE OF OTHER WORK OR IMPAIRMENT OF OTHER ASSETS) INCURRED BY THE CLIENT ARISING OUT OF BREACH OR FAILURE OF EXPRESS OF IMPLIED WARRANTY, BREACH OF CONTRACT, BREACH OF WARRANTY, MISREPRESENTATION, NEGLIGENCE, STRICT LIABILITY IN TORT OR OTHERWISE. IN ANY EVENT, THE LIABILITY OF HYDROQUAL TO THE CLIENT SHALL BE LIMITED TO THE COST OF TESTING THE SAMPLE AS REQUESTED IN THE CHAIN OF CUSTODY UNDER WHICH THE SAMPLE WAS ORIGINALLY DEPOSITED. FOR THE PURPOSES OF THIS PARAGRAPH AND PARAGRAPHS 7, 14, 15, 22, AND 24, AS APPLICABLE, "HYDROQUAL" INCLUDES WITHOUT LIMITATIONS ITS DIRECTORS, OFFICERS, EMPLOYEES AND AFFILIATES AND THE "CLIENT" INCLUDES WITHOUT LIMITATION ANY THIRD PARTY THAT MAY HAVE A CLAIM AGAINST HYDROQUAL THROUGH THE CLIENT.
24. **Notice of Liability:** Notwithstanding paragraph 23, HydroQual shall not be liable to the Client unless the Client provides notice in writing to HydroQual of such loss or damage, together with full particulars thereof, within 30 days of the Client's receipt of the report of the analysis of the sample giving rise to such liability. The provisions of this paragraph allocate the risk between the Client and HydroQual, and the fees to be paid by the Client to HydroQual reflect this allocation of any such risks and the limitations of liability in these General Terms and Conditions.
25. **Entire Agreement:** These General Terms and Conditions, the Chain of Custody and price quotations constitute the entire agreement between the parties and supersede and take precedence over any terms and conditions contained in any documentation provided by the Client. HydroQual's execution of any subsequent documentation from the Client only acknowledges receipt and not acceptance of any terms or conditions therein unless expressly stipulated otherwise by HydroQual. If there is a conflict between these General Terms and Conditions and any other document, these General Terms and Conditions prevail.