2010 SOIL GEOCHEMICAL ASSESSMENT REPORT

Property Comprising the Following Claims:

Orchid 1 to 12, and Orchid 17 to 20
Located in the:
Keno Hill Area
Mayo Mining District
Yukon Territory, Canada
N.T.S. 105M/14

Latitude: 63° 57' N
Longitude: 135° 10' W

PREPARED FOR:

Alexco Resource Corp.
1150-200 Granville Street
Vancouver, B.C. V6C 1S4

and

PREPARED BY:

Richard Lippoth, MS, Geologist

Alexco Resource Corp.
1150-200 Granville St.
Vancouver, B.C. V6C 1S4

DATES WORK PERFORMED:
August 17, 25, 27, 28, 2010

DATE OF REPORT:
December 17, 2010

TABLE OF CONTENTS

1.0 SUMMARY ……4

2.0 INTRODUCTION …….. 4

3.0 LOCATION AND ACCESS …….. 4

4.0 CLAIM STATUS ……....6

5.0 REGIONAL GEOLOGY ……....6

6.0 PROPERTY GEOLOGY ……..……..7

7.0 SLUDGE/SEDIMENT SAMPLING WORK PROGRAM ……7

9.0 CONCLUSIONS AND RECOMMENDATIONS ……..9

LIST OF FIGURES

Figure 1: Yukon Location map ……5

Figure 2: Claim map ……6

Figure 3: Property Geology Map ……7

Figure 4: Map Showing Sludge/Sediment Sample Locations ……8

LIST OF APPENDICES - PAPER

Appendix 1: List of Claims

Appendix 2: Personnel and Contractors

Appendix 3: Statement of Expenditures

Appendix 4: Statement of Qualifications

Appendix 5: Sludge/Sediment Sample Descriptions

Appendix 6: Sludge/Sediment Sample Analyses

LIST OF APPENDICES – DIGITAL

Disc 1: Appendices 1-6.

1.0 SUMMARY

Thirteen sludge/sediment samples were recovered from the margin of Flat Creek where historic mill tailings had been deposited on a portion of the Orchid claim block. Analyses of the samples showed that they did indeed contain metals consistent with the tailings. The sample results will be incorporated into an existing database of samples used in the evaluation of the historic tailings as a possible future economic resource of silver and possibly other metals.

2.0 INTRODUCTION

This report summarizes work completed during the 2010 field season on the contiguous Orchid 1 to 12 and Orchid 17 to 20 full and fractional quartz claims located in the Keno Hill silver district. Work for assessment purposes was conducted on August 17, 25, 27 & 28, 2010. Planning, supervision, implementation and reporting of this work were performed by Alexco Resource Corp. staff.

The property shows considerable disturbance in places related to the historic mill tailings impoundment. Some areas were, however, completely revegitated.

3.0 LOCATION AND ACCESS

The properties are located at Keno Hill in the Mayo Mining District approximately 350 km north of Whitehorse (Figure 1). The area is covered by NTS map sheets 105M/14. The reference datum used is UTM NAD83 Zone 8, unless otherwise noted.

Access to the property can be had via the Silver Trail highway connecting the villages of Mayo and Keno City. A road leading north from the abandoned company town of Elsa drops into the McQuesten river valley and cuts across the Orchid claim block. Alexco maintains an office and camp at Elsa.

FIGURE 1, KENO HILL, YUKON LOCATION MAP

4.0 CLAIM STATUS

The contiguous full and fractional quartz claims on which assessment work was conducted are held by Elsa Reclamation and Development Co., Ltd. All full and fractional quartz claims covered by this report are active having been staked in 1956.

A complete list of claims pertaining to this assessment report may be found in Appendix 1. Figure 2 is a claim location map. A cost statement and list of personnel related to the application of Certificates of Work are included as Appendices 2 and 3.

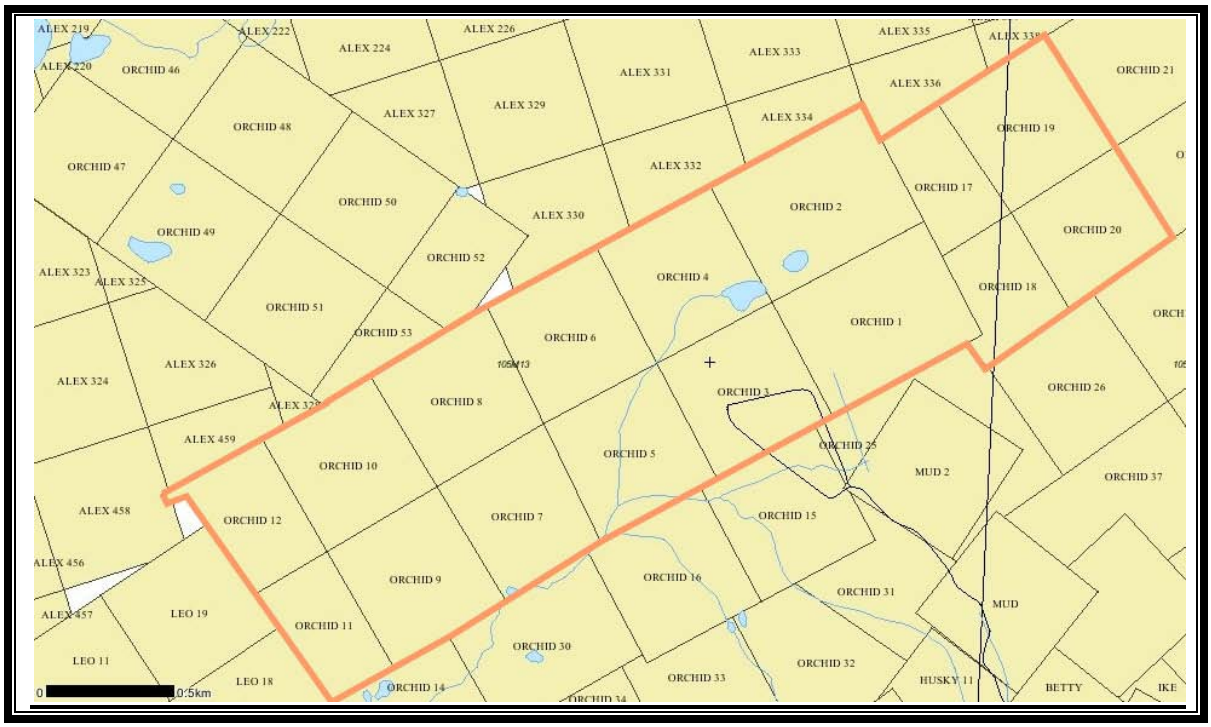

FIGURE 2 OUTLINE SHOWING CLAIM GROUP LOCATION

5.0 REGIONAL GEOLOGY

The property is situated within the western part of the Selwyn Basin in an area dominated by deformed and metamorphosed sediments accumulated at the edge of the Neoproterozoic to Paleozoic continental margin. During the Jurassic and Cretaceous, the area was subjected to compressional tectonic forces producing imbricate thrust sheets and widespread folding. In the mid-Cretaceous, renewed tectonism resulted in extensive brittle deformation and the emplacement of intrusive plutons.

Rocks thought to underlie the claim area include the Keno Hill Quartzite (Mississippian) host to most of the past producing ore bodies in the Keno Hill Camp. Structurally

juxtaposed below the quartzite is the Lower Schist which has been correlated with the Devonian-Mississippian Earn Group. Overlying the quartzite in thrust contact is the Upper Schist (Hyland Group, pre-Cambrian to Cambrian).

6.0 PROPERTY GEOLOGY

A variety of mineral deposits occur near the claim areas, mainly localized by veins cutting interbanded quartzites and schists (Figure 3). In detail the structures controlling the distribution of mineralization form generally northeast trending zones that dip to the south. Intersecting structures are often important sites of mineral deposition where sufficiently brittle host rocks produce permeable fluid pathways. However, the most important mineralized material known on the Orchid claims is related to the man made deposition of mill tailings containing potentially economic levels of silver, gold, lead and zinc.

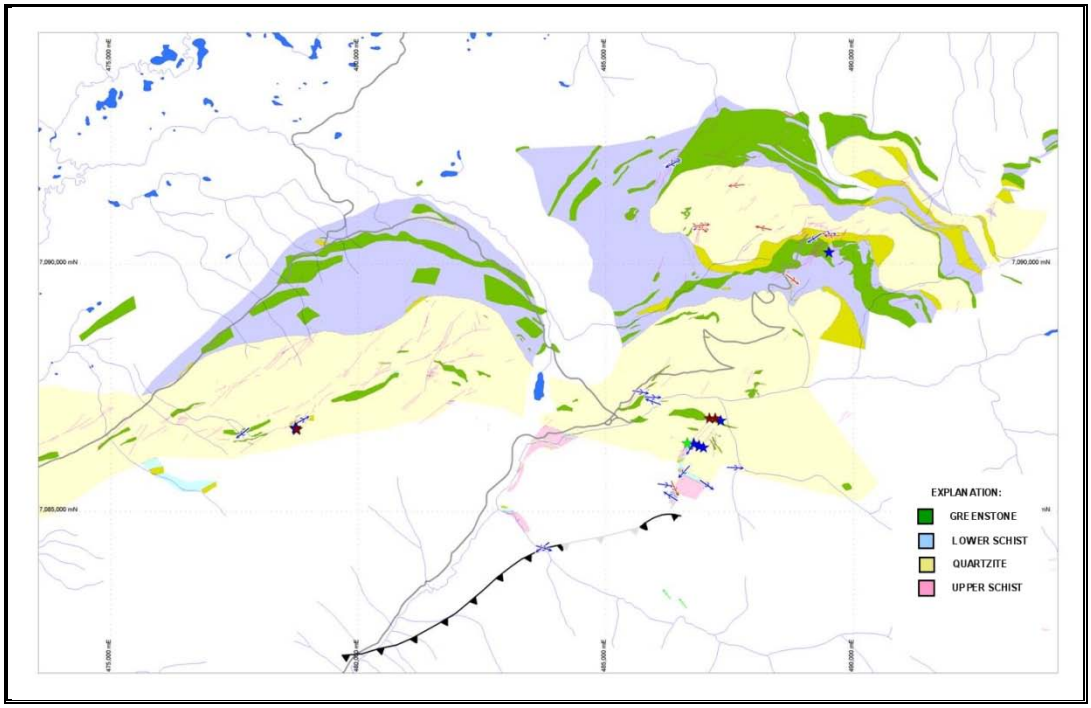

FIGURE 3 KENO HILL DISTRICT GEOLOGY MAP

7.0 2010 SLUDGE/SEDIMENT SAMPLING WORK PROGRAM

Samples were collected using a “sludge/sediment” sampler manufactured by AMS Corp. and operated by two people wearing hip waders. Sample sites were selected to cover areas of submerged tailings known to exist between historic tailings dams and below the dams along the drainage of Flat Creek. The AMS sampler is capable of loading sludge like sediment covered by water into two inch diameter plastic sample sleeves which can

be up to four feet long. Thirteen samples were collected on the Orchid group of claims (Figure 4). All work was performed by geologists in the employ of Alexco Resource Corp. Material collected in the sampler tubes was visually examined in the field to determine if it had the right consistency to be mill tailings. The sample depths were determined by direct measurement of the top and bottom of the sample interval using the surface as a datum. Samples were transferred to bags which were then forwarded to a laboratory for analysis. Sample characteristics were recorded in the field and entered into standardized spreadsheets (Appendix 5). Analysis of the samples for 36 elements by the ICP method was carried out by AGAT Laboratories of Burnaby, B.C. with the results appended in Appendix 6.

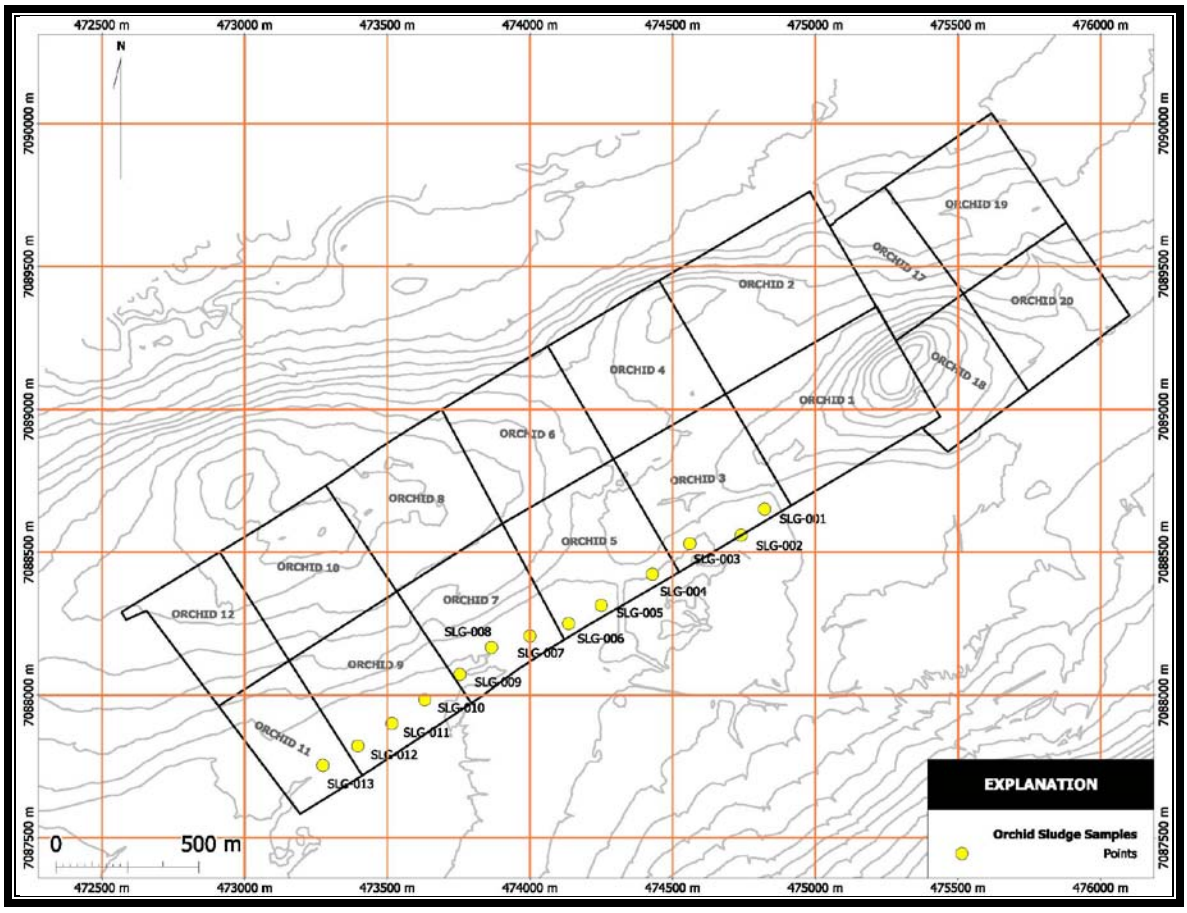

FIGURE 4 MAP SHOWING SLUDGE SEDIMENT SAMPLE LOCATIONS

Sampling Results:

All sludge/sediment samples collected on the Orchid claims contained highly anomalous amounts of silver, lead and zinc suggesting that mill tailings did indeed make up a large portion of the sample. The sample widths were relatively narrow which is in keeping with the sample locations along the margins of the Flat Creek drainage.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The sample results of this program will be incorporated into a database of tailings samples collected in 2009 from the main portion of the historic tailings impoundment. The AMS sludge sediment sampler has some limitations when organic material is present in the sample column (peat or roots tend to clog the sample tube) but in general it worked well for shallow sediment sampling.

APPENDIX 1

LIST OF CLAIMS

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Claim Name	Grant No.	Owner	Date Recorded	Expiration Date*
Orchid 1	62950	Elsa Reclamation & Dev. Co.	5/30/1956	12/31/2014
Orchid 2	62951	Elsa Reclamation & Dev. Co.	5/30/1956	12/31/2014
Orchid 3	62952	Elsa Reclamation & Dev. Co.	5/30/1956	12/31/2014
Orchid 4	62953	Elsa Reclamation & Dev. Co.	5/30/1956	12/31/2014
Orchid 5	62954	Elsa Reclamation & Dev. Co.	5/30/1956	12/31/2014
Orchid 6	62955	Elsa Reclamation & Dev. Co.	5/30/1956	12/31/2014
Orchid 7	62956	Elsa Reclamation & Dev. Co.	5/30/1956	12/31/2014
Orchid 8	62957	Elsa Reclamation & Dev. Co.	5/30/1956	12/31/2014
Orchid 9	62958	Elsa Reclamation & Dev. Co.	5/30/1956	12/31/2014
Orchid 10	62959	Elsa Reclamation & Dev. Co.	5/30/1956	12/31/2014
Orchid 11	62960	Elsa Reclamation & Dev. Co.	5/30/1956	12/31/2014
Orchid 12	62961	Elsa Reclamation & Dev. Co.	5/30/1956	12/31/2014
Orchid 17	62964	Elsa Reclamation & Dev. Co.	5/30/1956	12/31/2014
Orchid 18	62965	Elsa Reclamation & Dev. Co.	5/30/1956	12/31/2014
Orchid 19	62966	Elsa Reclamation & Dev. Co.	5/30/1956	12/31/2014
Orchid 20	62967	Elsa Reclamation & Dev. Co.	5/30/1956	12/31/2014

*Subject to government acceptance of this assessment report

APPENDIX 2

LIST OF PERSONNEL

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Personnel:

Richard Lippoth
3890 N. Nicklaus Drive
Coeur d'Alene, ID 83815

Natasha Morris
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Calgary, AB T2N 4M1

Joann Anderson
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Burnt Church, NB E9G 2G3

Peter Tipple
3b 7250 West Saanich Rd.
Brentwood Bay, BC V8M 0A3

Stephanie Savidant
2-355 Duthie Ave.
Burnaby, BC V5A 2P3

Kristin Chislett
8601-100 A St.
Grande Prairie, AB T8V 3C4

Stephanie Nicholls
202-1106 West 11th Ave.
Vancouver, BC V6H 1K3

Linette MacInnis
20 Paper Birch Place
Upper Tantallon, NS B32 1C8

Cassandra Murphy
326-200 Dallas Rd.
Victoria, BC V8N 1A4

APPENDIX 3

STATEMENT OF EXPENDITURES

COST STATEMENT - Alexco Exploration Canada Corp.
2010 Assessment Filing

Grant No.	Claim	Sediment Analyses	Geologist Wage + Room & Board	Field Prep./ Report	EST. TOTAL
62952	Orchid 3	$45.00	$1229.78	$599.83	$1874.61
62954	Orchid 5	$45.00	$1229.78	$599.00	$1873.78
62956	Orchid 7	$45.00	$1229.78	$599.00	$1873.78
62958	Orchid 9	$45.00	$1229.78	$599.00	$1873.78
62960	Orchid 11	$15.00	$409.92	$198.65	$623.57

Total $8119.52

APPENDIX 4

STATEMENT OF QUALIFICATIONS

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RICHARD LIPPOTH

I, Richard E. Lippoth of 3890 N. Nicklaus Drive, Coeur d'Alene, Idaho, USA,
DO HEREBY CERTIFY:

1 THAT, I am a senior geologist with Alexco Resource Corp., 1150-200 Granville Street, Vancouver, BC, V6E 1S4

2 THAT, I have practiced my profession with various mining companies in the Yukon, Idaho, Utah, Colorado, Montana, Nevada and Australia for 25 years.

3 THAT, I am a graduate of the University of Utah holding an M.S. in Geology and in addition a B.S. in Mining Engineering from the Colorado School of Mines.

4 THAT, I am a member of the Society of Economic Geologists.

5 THAT, I am a member of the American Institute of Professional Geologists, and am Certified Professional Geologist #11185.

6 THAT, this report is based on work which I personally participated in during the year 2010.

7 THAT, I have no interest in the property described herein, nor do I expect to receive any such interest.

DATED at Coeur d'Alene, Idaho, this 17th day of December, 2010.

Richard E. Lippoth

APPENDIX 5

SLUDGE/SEDIMENT SAMPLE DESCRIPTIONS

Sample No.	UTM Easting	UTM Northing	Sample Length (m)	Sample From (m)	Sample To (m)	Sample Description
SLG-001	474822	7088651	0.330	0	0.330	Dark brown peat/organics
SLG-002	474740	7088560	0.350	0.050	0.400	Grey silt/fine/med sand.
SLG-003	474560	7088530	0.300	0.200	0.500	Dark brown peat/organics
SLG-004	474429	7088423	0.240	0	0.240	Brown clay/organics.
SLG-005	474250	7088314	0.457	0.152	0.609	Mud, micro-roots
SLG-006	474135	7088250	0.698	0	0.609	Sand
SLG-007	474000	7088207	0.579	0	0.579	Mud
SLG-008	473865	7088167	0.400	0.150	0.400	Dark grey clay/silt.
SLG-009	473754	7088072	0.290	0.080	0.290	Dark grey clay/silt.
SLG-010	473631	7087984	0.420	0.000	0.420	clay/silt.
SLG-011	473516	7087901	0.570	0.150	0.570	clay/silt.
SLG-012	473397	7087822	0.360	0.170	0.360	Dark grey clay.
SLG-013	473274	7087754	0.640	0.150	0.430	Sandy silt/clay.

APPENDIX 6

SLUDGE/SEDIMENT SAMPLE ANALYSES

ELEMENT	Au	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr
UNITS	g/t	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
DETECTION	0.002	0.5	0.01	1	1	0.5	1	0.01	0.5	1	0.5	0.5
SLG-001	0.235	362	1.14	112	360	<0.5	9	7.99	105	5	23.3	18.6
SLG-002	0.108	126	1.01	396	68	<0.5	12	1.7	116	<1	4.3	7.1
SLG-003	0.008	4.4	0.42	4	317	<0.5	8	3.47	10.8	4	0.6	5.8
SLG-004	0.054	52.8	1.23	280	485	<0.5	10	3.22	67.8	5	4.6	22.4
SLG-005	0.062	104	3.67	167	761	1.4	9	0.99	61.7	15	10.3	55.4
SLG-006	0.123	60	1.03	263	152	<0.5	13	0.56	163	<1	3.1	7.9
SLG-007	0.083	93	1.88	249	279	<0.5	11	0.63	126	5	3.8	24.2
SLG-008	0.069	62.3	1.16	158	179	<0.5	10	0.59	91.1	1	2.3	11.8
SLG-009	0.073	56.1	1.63	160	186	<0.5	11	0.78	101	2	4.1	20.8
SLG-010	0.045	44.9	3.58	237	850	1.4	9	1.21	89.2	16	10.1	55.8
SLG-011	0.02	26.3	2.88	162	1190	1.9	9	1.03	21.3	18	14.9	59.5
SLG-012	0.013	3.9	3.15	10	1330	2.1	7	0.93	3.7	22	15.7	65.8
SLG-013	0.062	47.6	1.7	107	194	<0.5	13	0.79	94.1	3	4.2	20.9

ELEMENT	Cs	Cu	Fe	Ga	In	K	La	Li	Mg	Mn	Mo	Na
UNITS	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%
DETECTION	0.5	0.5	0.01	5	1	0.01	2	1	0.01	1	0.5	0.01
SLG-001	<0.5	326	1.59	<5	<1	0.34	4	4	0.34	19700	3.3	0.08
SLG-002	<0.5	168	9.55	<5	<1	0.35	3	4	0.49	37000	<0.5	0.04
SLG-003	<0.5	25.4	0.86	<5	<1	0.08	<2	2	0.37	1800	3.6	0.05
SLG-004	<0.5	141	2.5	<5	<1	0.37	4	3	0.35	14300	2.8	0.08
SLG-005	<0.5	202	5.82	<5	<1	1.18	10	20	0.64	21200	<0.5	0.46
SLG-006	<0.5	162	11.5	<5	<1	0.35	3	3	0.48	40800	<0.5	0.03
SLG-007	<0.5	171	8.64	<5	<1	0.6	4	6	0.42	32400	<0.5	0.09
SLG-008	<0.5	110	7.3	<5	<1	0.39	3	5	0.39	32500	<0.5	0.06
SLG-009	<0.5	105	7.56	<5	<1	0.55	4	7	0.47	32100	<0.5	0.09
SLG-010	<0.5	132	5.52	<5	<1	1.19	10	17	0.64	18900	<0.5	0.46
SLG-011	<0.5	107	3.37	<5	<1	1.24	12	22	0.65	6820	<0.5	0.69
SLG-012	<0.5	44.6	2.62	<5	<1	1.39	13	28	0.8	1130	0.9	0.8
SLG-013	<0.5	125	7.12	<5	<1	0.57	5	7	0.47	31900	<0.5	0.09

ELEMENT	Ni	P	Pb	Rb	S	Sb	Sc	Se	Sn	Sr	Ta	Te
UNITS	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
DETECTION	0.5	10	1	10	0.005	1	1	10	5	1	10	10
SLG-001	87.4	598	1600	52	1.36	67	<1	<10	14	123	<10	<10
SLG-002	20.2	457	5670	54	2.45	203	<1	<10	11	20	<10	<10
SLG-003	11.6	517	180	11	1.07	7	<1	<10	<5	98	<10	<10
SLG-004	37.7	716	6650	51	1.4	140	<1	<10	14	93	<10	<10
SLG-005	33.8	1000	6130	136	0.844	223	7	<10	13	86	<10	<10
SLG-006	16.3	530	10100	50	3.16	264	1	<10	10	15	<10	<10
SLG-007	18	596	8810	82	1.71	252	2	<10	15	28	<10	<10
SLG-008	14.4	439	5210	56	1.57	160	1	<10	10	20	<10	<10
SLG-009	20.7	550	4750	78	2.01	149	2	<10	9	28	<10	<10
SLG-010	34.9	848	6400	121	0.946	172	6	<10	14	85	<10	<10
SLG-011	35	922	2030	96	0.214	62	6	<10	<5	98	<10	<10
SLG-012	38.2	872	164	102	0.124	12	6	<10	<5	101	<10	<10
SLG-013	19.7	534	3780	79	1.76	131	2	<10	9	28	<10	<10

ELEMENT	Th	Ti	Tl	U	V	W	Y	Zn	Zr
UNITS	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
DETECTION	5	0.01	5	5	0.5	1	1	0.5	5
SLG-001	<5	0.03	<5	<5	22	<1	3	5790	10
SLG-002	<5	0.01	<5	<5	12.3	<1	8	7320	12
SLG-003	<5	0.01	<5	<5	11.2	<1	2	751	<5
SLG-004	<5	0.02	<5	<5	21.5	<1	3	5240	10
SLG-005	<5	0.13	<5	<5	88.5	<1	11	3520	33
SLG-006	<5	0.01	<5	<5	9.8	<1	9	10370	12
SLG-007	<5	0.03	<5	<5	30	<1	8	7520	16
SLG-008	<5	0.03	<5	<5	16.9	<1	7	5990	13
SLG-009	<5	0.03	<5	<5	28.6	<1	8	6940	16
SLG-010	<5	0.14	<5	<5	82.7	<1	10	5380	34
SLG-011	<5	0.21	<5	<5	98.9	<1	9	1520	40
SLG-012	<5	0.26	<5	<5	114	<1	8	387	44
SLG-013	<5	0.04	<5	<5	30.3	<1	7	6510	17