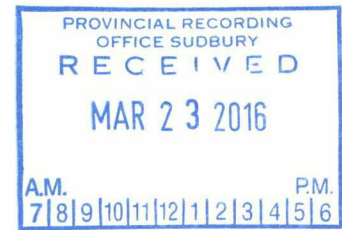


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2.56706

Copper - Sulfur Anomaly

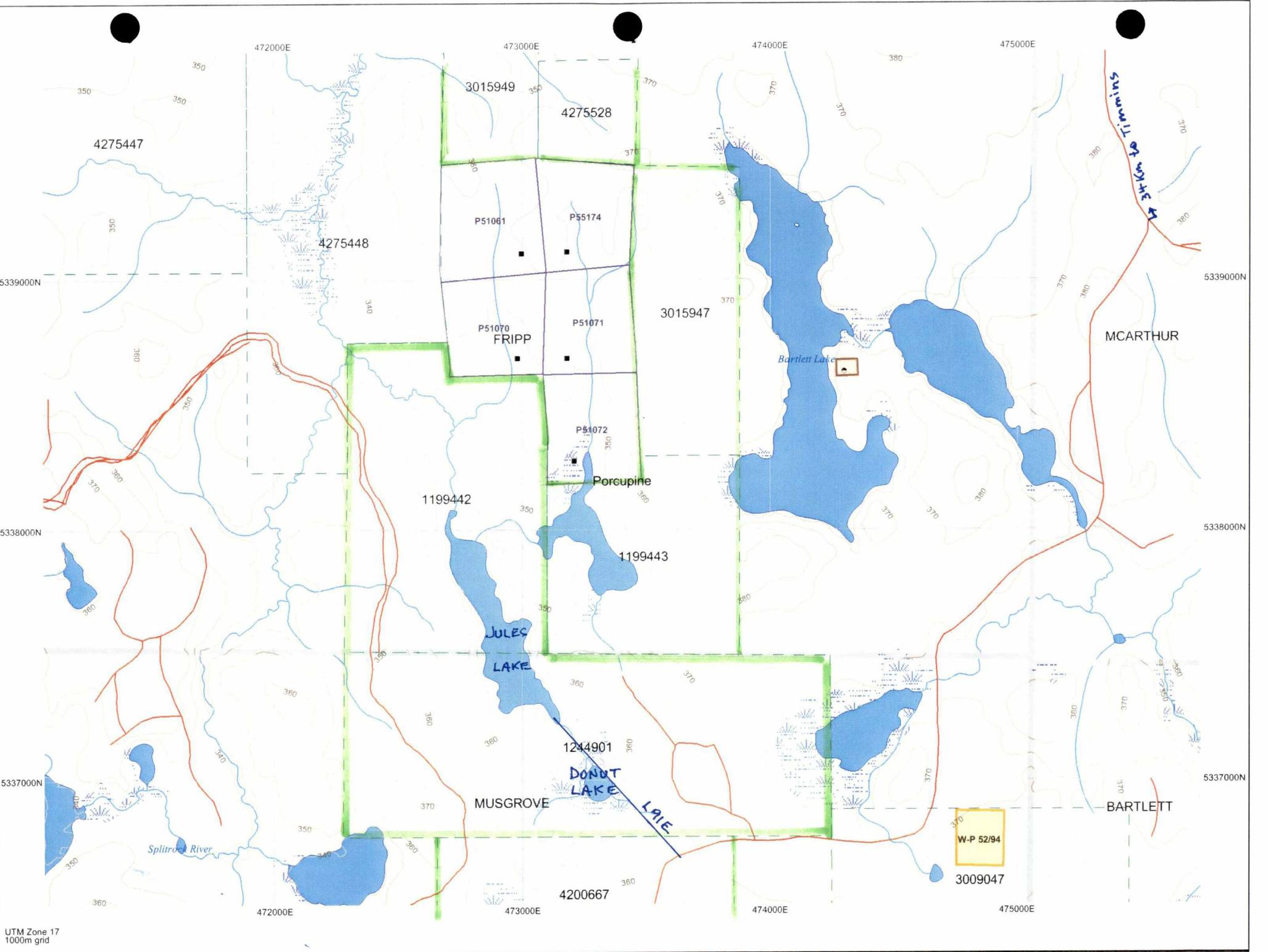
in

Jules Lake Sludge

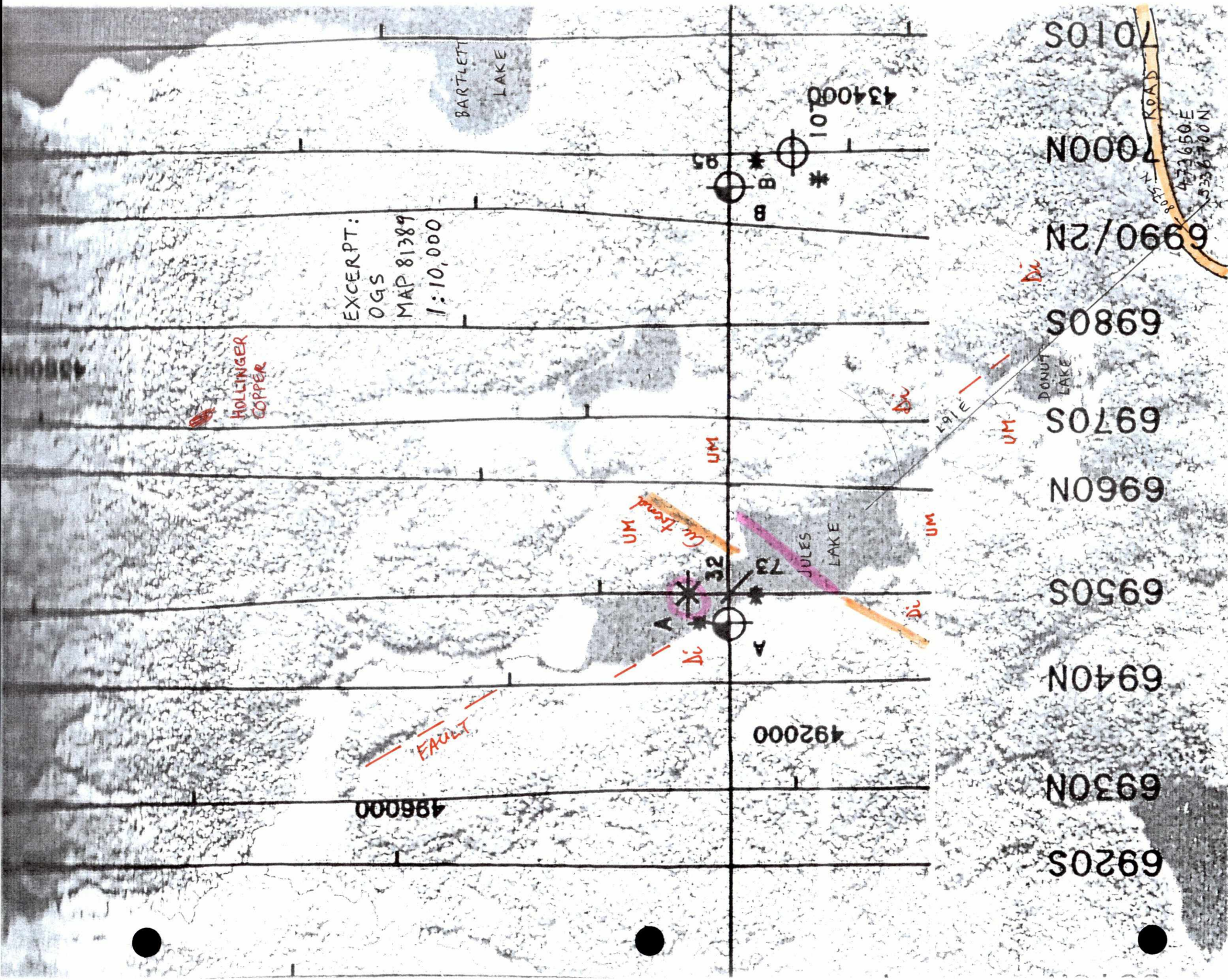
Fripp / Musgrove Townships, Ontario
Claims P 1199442 and P 1244901

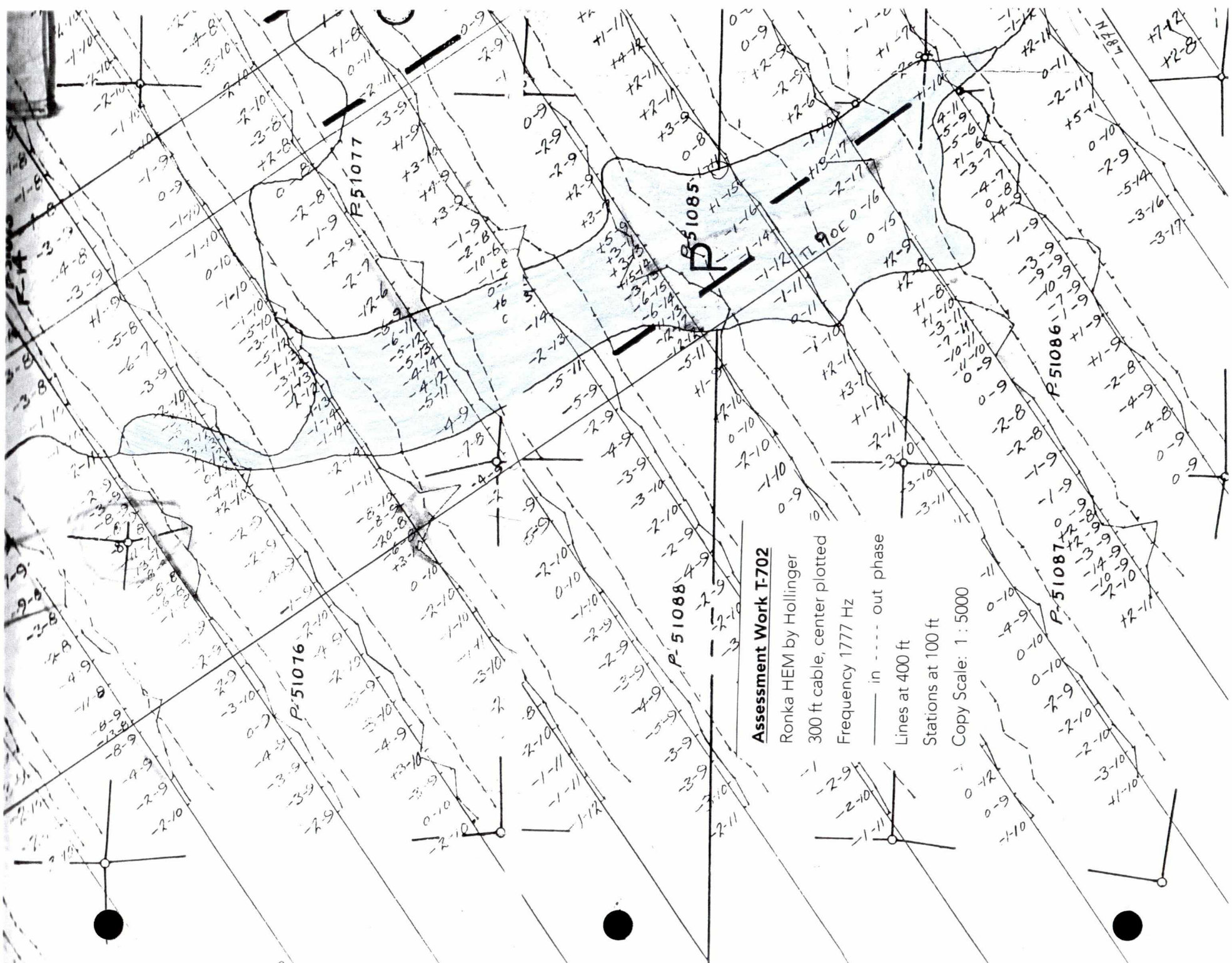
Report by Hermann Daxl, M.Sc. Minex, Claim Holder

20 March 2016



UTM Zone 17
1000m grid





Assessment Work T-702

Ronka HEM by Hollinger

300 ft cable, center plotted

Frequency 1777 Hz

— in — out phase

Lines at 400 ft

Stations at 100 ft

Copy Scale: 1: 5000

Introduction

The main trend of copper soil anomalies of my assessment work 2.54791 is now confirmed to connect through Jules Lake, where in addition it coincides with sulfur and possibly nickel anomalies, as well as a Ronka HEM conductor. I collected the 39 samples of top-level sludge from the lake bottom through the ice in April 2014 and April 2015, covering the entire Jules Lake which straddles the boundary of my claims P1199442 and P1244901. I dried and sieved them myself and had them analyzed by Actlabs.

I took more soil samples around the lake which I already plotted on the sample location map but they will be part of a future report. I also intend to sample deeper levels in the sludge for comparison since the present values are subtle. My similar assessment work on this claim group is of Donut Lake included in T-6079, 2.44900. Others are T-5850 - 2.40746; T-2689 - 2.48457; and 2.51155.

Travel from Timmins center via gravel roads is 34 km south on Pine Street South, then 3.8 km on the Peterlong Lake Road to NAD83, 17U 473650 E - 5336700 N, which is Line 91E - 8075N in a depression, along which it is 700 m az. 320 via Donut Lake to Jules Lake.

Present Work

The 39 samples of top-level sludge I collected from the bottom of Jules Lake show the anomalous copper-sulfur trend of 30 az. across the lake, and its western splay. This bridges the main copper trend of my report 2.54791. It also fits the pronounced Ronka HEM 1777 Hz NE-dipping (plunging?) conductor on old Line 45 having no cliffs (assessment work T-702 by Hollinger, see excerpt attached). Conductivity of sludge samples was like tapwater. Airborne EM maps show anomalies nearby, but do not show the Hollinger Resource under 10m of swamp, which sheds doubt on seeing conductors through the lake filled with deep sand here (see excerpt OGS Map 81389).

Samples 5131 - 5139 were collected on 18 - 19 April 2014, and 5611 - 5640 on 5 - 12 April 2015, all before the run-off started and the slush came to surface. The several layers of ice totaled 60cm, usually with water in between. The water depth from the ice surface to the

sludge was only 2 - 5 m, and the sludge a further 1 m to a solid bottom of fine sand at the few measurable spots (5131, 32, 36, 39). In comparison, the sludge at Donut Lake was 8m thick and gradually denser downward (T-6079 - 2.44900). This fine glacial beach sand is probably very deep, judging from <15 m high cliffs on shore caused by the long fault parallel to the lake. This western serpentinite margin, if containing a sulfide deposit like the historic high-grade Hollinger Copper Reserve 1300m northward, would have been eroded deeply, so that one should not judge by the strength of conductors. My GPS elevation of Jules Lake is 348m. The samples were located within 5m by GPS as plotted on the enclosed maps.

A 3-L plastic bottle, inverted without bottom and with a sledgehammer head tied inside, was dropped on an insulated cable, then jiggled to make it descend into the sludge, usually <50 cm. Tilting it by pulling on a second wire, a somewhat consistent lump of sludge could be pulled up after several attempts. I poured the lump on packed snow to drain some water, and on the way back it was easy to collect with a pointing trowel into a plastic bag. At home I made an 8cm ball wrapped in paper towels and squeezed the excess clean water of pH 6-7 out. Loosening and crumbling it on paper towels, which I changed about 6 times, drying took 72 to 96 hours at room temperature. The dry crumbs were very hard to crush with a glass bottle in a glass bowl, unless they were diluted with undesirable silt or larger fibers. After sieving to <125 micron in 2014 and to <250 micron in 2015, and rolling with paper for homogenization, about 2 g were sent to Activation Laboratories for Ultratrace 2 - 0.5g aqua regia extraction and ICP/MS analyses. These are not reliable for gold, but for base metals. Please refer to the attached lab certificates.

Scintillometer readings on the southern half of Jules Lake were 1 - 3, versus 10 -13 at home where the sludge samples also had no effect.

Anomalies

The attached element distribution maps of sulfur, copper, nickel, chromium, silver, lead, with the pertaining lab certificates, illustrate two copper-sulfur trends, one possibly with nickel, in Jules Lake top-level sludge.

The main Cu-S high coincides with the Ronka conductor at the crossing of the main fault az. 330 along the west-shore, and connects the string of Cu soil anomalies along the gully

trending 30az. and continuing 210 az. This augurs well for a copper deposit centered under Jules Lake. Please refer to the attached Ronka excerpt and my copper map of 2014.

The smaller anomaly further north in Jules Lake could be a splay as suggested by another gully from the east, or copper spread along the fault az.330. The excerpt of airborne EM survey Map 81389 shows a conductor here considering side-seeking from crossing flight lines.

I took 6 similar sludge samples previously but from Donut Lake and at about 4 m into the sludge. Background values there are about 10 x lower for Mn, Pb, and several times lower for Ni, Cr, Fe, but similar for Cu, Ag and Zn (T-6079 - 2.44900). That deeper level in the sludge (black muck) there, or the surrounding rocks here, may cause the difference. My other previous work showed that Mn and Pb do not concentrate in black muck. This needs further testing, but should not affect the present copper-sulfur anomalies in Jules Lake.

Sample 5032 (in 2.54791) of thin decayed vegetation attached to local melabasalt 70m east of 5176 is anomalous in Ni, Cr, Pb, Zn, contrary to such a sample over thicker soil nearby, but not in Cu. Anomalous values of Ni, Cr, Pb, but not of copper, may therefore be due to the ultramafic rocks east and south of Jules Lake, possibly enhanced by run-off into the eastern bay. The nearest known sulfide occurrence is uphill southwest of Jules Lake (5352-56), and had no effect even on local soils 5698-99 nor 3041.

However, in addition to copper, nickel also correlates fairly well with sulfur and is higher relative to chromium along the copper-sulfur trend through the lake, so that any sulfides below Jules Lake may also contain nickel. Duplicates show much deviation for Pb and Ag, and both are very low, so that these elements have no importance.

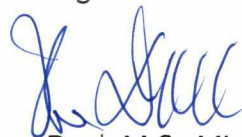
Conclusions and Recommendations

One copper-sulfur anomaly, possibly with nickel, bridges the copper trend across Jules Lake. The other 200m north may be a splay. The values may have been subdued by water flow through the sampled top-level sludge. Sampling of the deepest level of the sludge may result in stronger and more distinct anomalies.

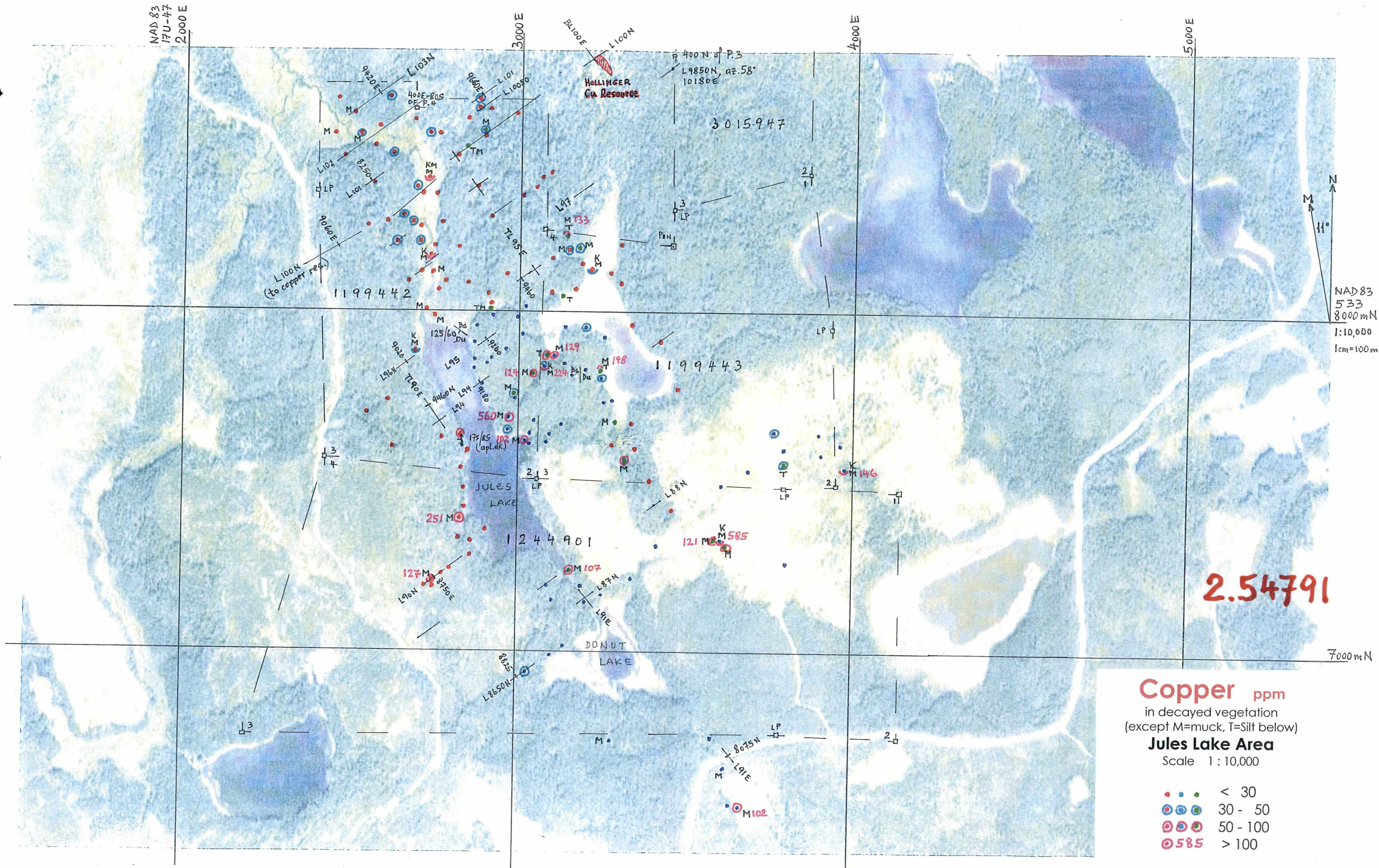
Augering the deeper sludge, as well as a MAG and MaxMin survey on several crossing lines, with 50m and 100m coil separation, 1777 and 3555 Hz, and stations at 25m, all like at Donut Lake (T-6079 - 2.44900) are recommended before drilling.

Respectfully submitted,

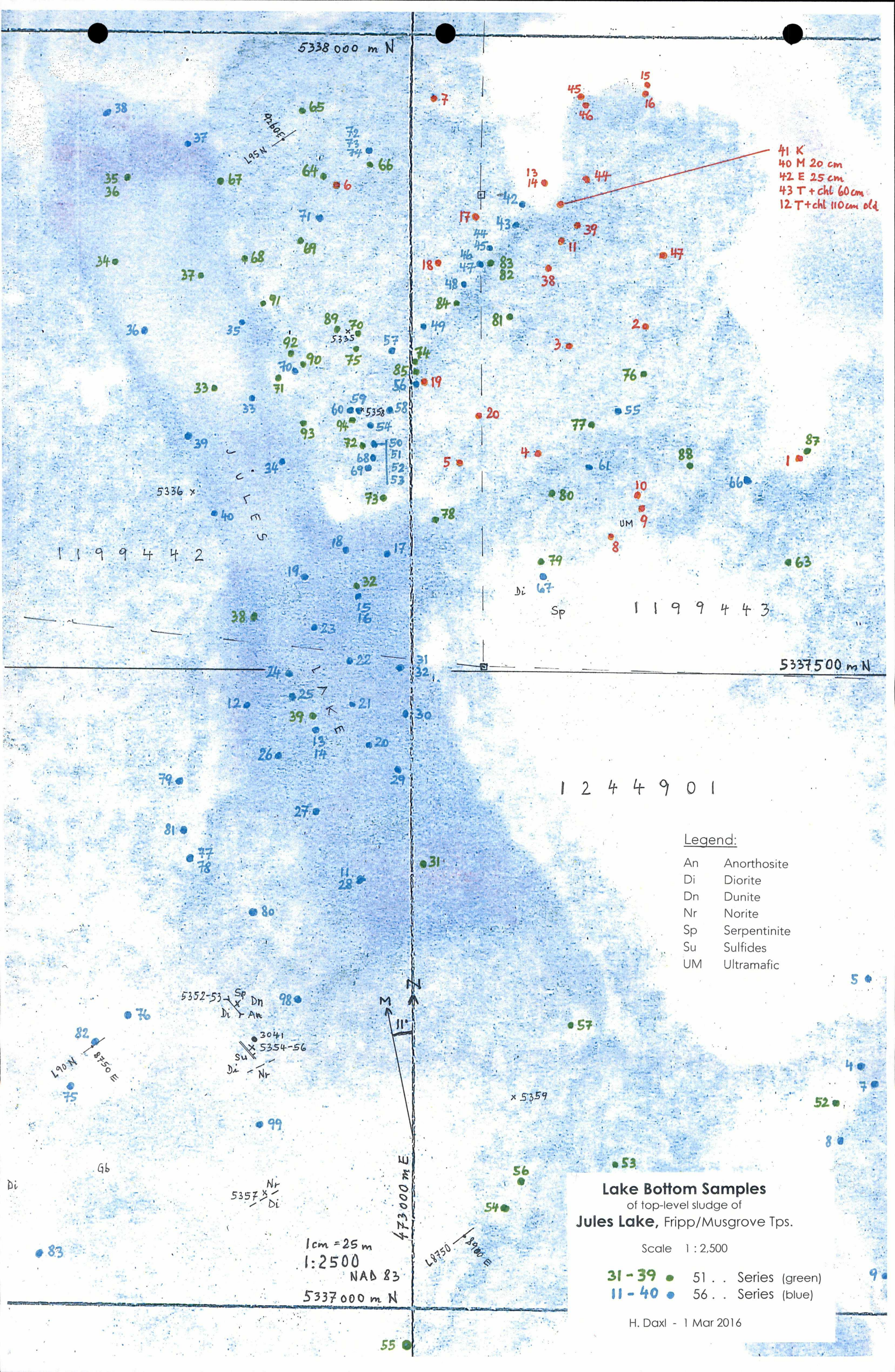
20 March 2016



Hermann Daxl, M.Sc.Minex, Claim Holder



S.2#4D1



52 t

45 t

47 t
79 t

38 t

105

66

104

125

160

97

136

139 t

60

60

116

81

97

93

75

114

107

116

107

87

130

72

86

132

128

152

149

138

114

125

47 t

148

134

129

Chromium ppm

in top-level sludge of

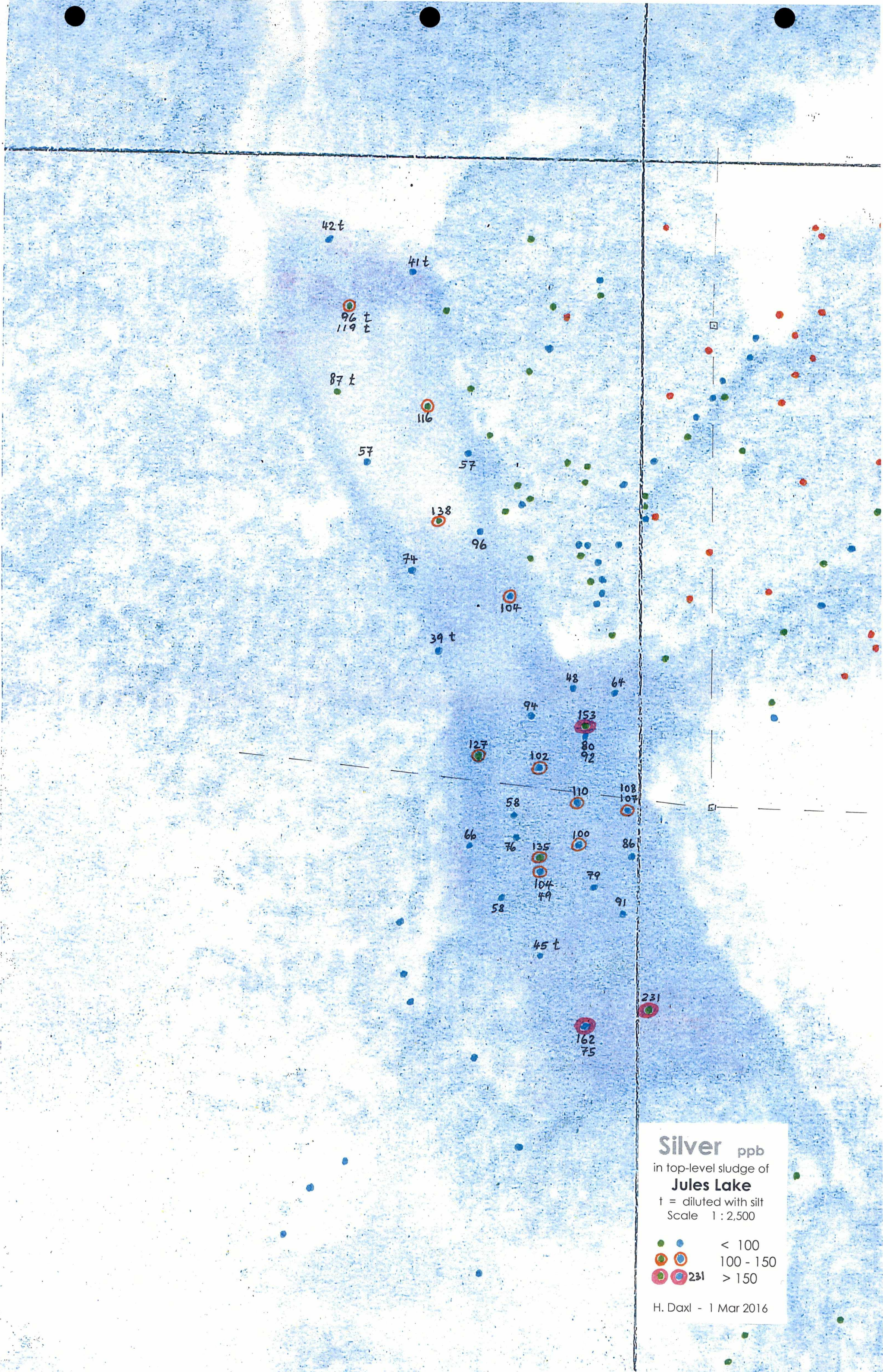
Jules Lake

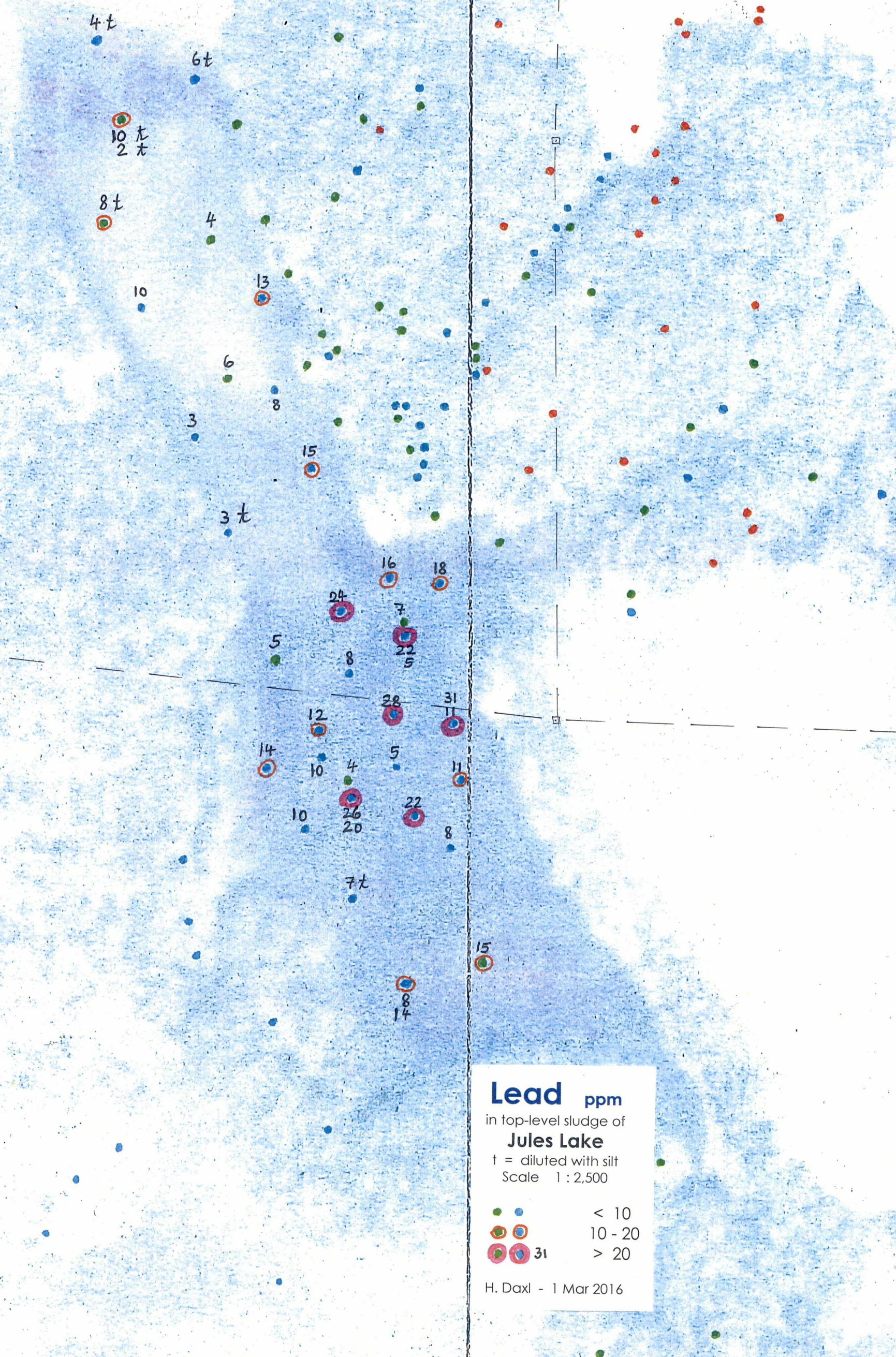
† = diluted with silt

Scale 1:2,500

● ● < 80
● ● 80 - 130
● ● 160 > 130

H. Daxl - 1 March 2016





Quality Analysis ...



Innovative Technologies

Date Submitted: 20-May-14
Invoice No.: A14-03414 (i)
Invoice Date: 02-Jun-14
Your Reference: JULBOT-UT2

Hermann Daxl
39-630 Riverpark Road
Timmings Ontario P4P 1B4
Canada

ATTN: Hermann Daxl

Dried crushed near-top CERTIFICATE OF ANALYSIS
Lake bottom sludge, sieved $<125\ \mu\text{m}$
11 ~~Vegetation~~ samples were submitted for analysis.

The following analytical package was requested Code UT-2-0.5g Aqua Regia ICP-ICP/MS - Ultratrace 2- 0.5 g.

REPORT **A14-03414 (i)**

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Notes:

Assays are recommended for values $>10,000$ for Cu and Au. The Au from AR-MS is only semi-quantitative. For accurate Au data, fire assay is recommended.

CERTIFIED BY :

A handwritten signature in black ink, appearing to read "Emmanuel Esemé", written over a horizontal line.

Emmanuel Esemé, Ph.D.
Quality Control

ACTIVATION LABORATORIES LTD.

1336 Sandhill Drive, Ancaster, Ontario Canada L9G 4V5 TELEPHONE +1.905.648.9611 or
+1.888.228.5227 FAX +1.905.648.9613
E-MAIL ancaster@actlabsint.com ACTLABS GROUP WEBSITE <http://www.actlabsint.com>

DRIED CRUSHED NEAR-TOP
Lake bottom sludge, sieved <125 µm

Activation Laboratories Ltd.

Report: A14-03414 (I) rev 1

Aqua regia - Ultratrace 2 - ICP/MS-0.5g

Analyte Symbol	Li	Be	B	Na	Mg	Al	P	S	K	Ca	V	Cr	Ti	Mn	Fe	Co	Ni	Cu	Zn	Ga	
Unit Symbol	ppm	ppm	ppm	%	%	%	%	%	%	%	ppm	ppm	%	ppm	%	ppm	ppm	ppm	ppm	ppm	
Detection Limit	0.1	0.1	1	0.001	0.01	0.01	0.001	0.001	0.01	0.01	1	1	0.01	1	0.01	0.1	0.1	0.01	0.1	0.02	
Analysis Method	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-ICP	AR-ICP	AR-MS	AR-MS	AR-MS	AR-MS	AR-ICP	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	
5131	5.0	4.6	0.3	7	0.024	0.55	0.96	0.088	0.472	0.03	1.14	18	148	0.02	234	1.11	10.2	99.2	53.7	69.3	1.64
5132	4.0	3.1	0.2	8	0.025	0.34	0.66	0.050	1.812	0.04	1.30	16	81	0.02	310	1.63	22.1	173.0	110.0	74.7	1.17
5133	4.0	4.6	0.2	5	0.025	0.49	0.92	0.067	0.632	0.03	1.16	15	125	0.03	256	1.02	8.7	89.5	51.7	66.1	1.59
5134 25%T	2.0	2.9	0.2	3	0.025	0.22	0.38	0.046	0.322	0.02	0.54	10	38	0.05	134	0.59	5.2	34.2	17.9	32.7	1.03
5135 35%T	2.0	3.7	0.1	3	0.025	0.26	0.46	0.051	0.346	0.02	0.62	12	47	0.05	157	0.67	5.3	37.0	19.0	40.6	1.24
5136 40%T	4.0	4.7	0.2	5	0.024	0.37	0.68	0.052	0.476	0.02	0.94	16	79	0.04	201	0.76	8.0	62.6	41.5	55.4	1.41
5137	3.0	4.8	0.2	4	0.023	0.44	0.76	0.056	0.563	0.03	0.85	14	105	0.04	204	0.95	8.2	73.9	40.0	58.3	1.47
5138	3.0	4.0	0.2	5	0.022	0.36	0.81	0.056	0.798	0.03	1.11	18	97	0.03	304	1.00	12.5	97.2	69.6	64.1	1.30
5139	3.0	3.1	0.2	9	0.025	0.35	0.63	0.055	2.637	0.04	1.37	17	86	0.02	298	1.99	26.7	207.0	125.0	80.5	1.06
5140 = 5131 Sludge	5.0	0.3	6	0.026	0.55	1.01	0.094	0.535	0.03	1.22	19	150	0.02	239	1.15	10.5	103.0	59.2	76.1	1.70	
5141 OREAS 45P	10.4	0.8	9	0.031	0.17	4.65	0.033	0.026	0.09	0.25	182	789	0.28	1030	17.20	111.0	348.0	711.0	140.0	19.80	

Activation Laboratories Ltd.

Report: A14-03414 (I) rev 1

Analyte Symbol	Ge	As	Se	Rb	Sr	Y	Zr	Sc	Pr	Gd	Dy	Ho	Er	Tm	Nb	Mo	Ag	Cd	In	Sn
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.1	0.1	0.1	0.1	0.5	0.01	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.01	0.002	0.01	0.02	0.05
Analysis Method	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS
5131	0.1	7.2	1.8	3.0	21.1	9.46	1.1	2.6	3.7	2.4	1.8	0.4	1.0	0.1	0.6	1.97	0.231	0.73	< 0.02	0.46
5132	0.1	7.2	2.2	4.2	24.8	8.85	5.0	2.6	2.9	2.1	1.6	0.3	0.9	0.1	0.6	4.59	0.153	0.65	< 0.02	0.27
5133	0.1	3.7	1.9	3.0	21.9	9.97	1.0	2.5	3.5	2.4	1.8	0.3	1.0	0.1	0.7	0.74	0.138	0.61	< 0.02	0.24
5134 25% T	0.1	2.4	0.8	1.7	15.0	5.18	0.8	1.6	2.7	1.6	1.0	0.2	0.5	< 0.1	1.0	0.46	0.087	0.31	< 0.02	0.31
5135 35% T	0.1	2.7	1.1	2.0	16.7	5.66	1.0	1.8	2.8	1.7	1.1	0.2	0.6	< 0.1	1.0	0.47	0.096	0.35	< 0.02	0.37
5136 40% T	0.1	2.7	1.3	2.4	19.1	8.44	1.3	2.4	3.3	2.2	1.5	0.3	0.8	0.1	0.9	0.94	0.119	0.33	< 0.02	0.17
5137	0.1	2.6	1.3	2.6	17.9	8.63	1.0	2.4	3.5	2.3	1.7	0.3	0.9	0.1	0.8	0.69	0.116	0.37	< 0.02	0.19
5138	0.1	4.1	2.4	3.1	21.1	12.30	1.3	2.5	4.3	3.0	2.2	0.4	1.3	0.2	0.8	1.20	0.127	0.50	< 0.02	0.21
5139	0.1	6.6	3.0	4.2	25.9	10.90	5.8	3.2	3.2	2.4	1.9	0.4	1.1	0.2	0.6	3.90	0.135	0.70	< 0.02	0.17
5140 = 5131 Sludge	0.1	3.6	2.3	3.2	22.7	10.20	1.4	2.6	3.6	2.5	1.8	0.4	1.0	0.1	0.6	0.66	0.178	0.76	< 0.02	0.50
5141 OREAS 45P	0.3	4.2	1.1	12.6	17.5	9.97	21.4	57.8	4.5	37	30	0.5	1.4	0.2	0.5	1.17	0.295	0.10	0.02	1.67

Activation Laboratories Ltd.

Report: A14-03414 (I) rev 1

Analyte Symbol	Sb	Te	Cs	Ba	La	Ce	Nd	Sm	Eu	Tb	Yb	Lu	Hf	Ta	W	Re	Au	Tl	Pb	Bi
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppm	ppm	ppm
Detection Limit	0.02	0.02	0.02	0.5	0.5	0.01	0.02	0.1	0.1	0.1	0.1	0.1	0.1	0.05	0.1	0.001	0.5	0.02	0.01	0.02
Analysis Method	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS
5131	0.15	0.14	1.10	40.9	14.5	20.9	13.90	2.6	0.6	0.3	0.8	0.1	< 0.1	< 0.05	0.4	0.003	< 0.5	0.14	15.30	0.20
5132	0.24	0.06	1.44	30.3	11.4	15.3	11.30	2.1	0.5	0.3	0.7	0.1	< 0.1	< 0.05	0.2	0.009	< 0.5	0.31	7.00	0.12
5133	0.10	0.08	0.95	36.9	14.2	20.6	13.50	2.5	0.6	0.3	0.8	0.1	< 0.1	< 0.05	0.2	0.003	8.3	0.14	6.13	0.09
5134 25 % T	0.11	0.05	0.50	16.8	11.0	20.5	9.92	1.7	0.3	0.2	0.4	< 0.1	< 0.1	< 0.05	0.5	0.002	< 0.5	0.09	7.95	0.09
5135 35 % T	0.11	0.04	0.59	19.9	11.4	21.1	10.50	1.9	0.4	0.2	0.4	< 0.1	< 0.1	< 0.05	< 0.1	0.001	1.8	0.09	9.85	0.09
5136 40 % T	0.06	< 0.02	0.74	26.5	13.4	21.8	12.70	2.4	0.5	0.3	0.7	0.1	< 0.1	< 0.05	< 0.1	0.003	< 0.5	0.14	2.33	0.05
5137	0.06	0.05	0.82	27.8	14.3	22.6	13.40	2.5	0.5	0.3	0.7	0.1	< 0.1	< 0.05	0.1	0.002	10.3	0.17	3.71	0.06
5138	0.09	< 0.02	0.99	36.5	16.8	23.1	16.50	3.1	0.7	0.4	1.0	0.2	< 0.1	< 0.05	< 0.1	0.006	< 0.5	0.23	4.88	0.10
5139	0.19	0.02	1.22	28.2	12.1	16.0	12.30	2.3	0.6	0.3	0.9	0.2	< 0.1	< 0.05	0.2	0.008	< 0.5	0.38	3.74	0.09
5140 = 5131 Sludge	0.15	0.11	1.09	43.6	14.4	20.2	13.80	2.5	0.6	0.3	0.8	0.1	< 0.1	< 0.05	0.1	0.003	< 0.5	0.13	16.00	0.19
5141 OREAS 45P	0.29	< 0.02	1.47	178.0	19.3	40.0	16.70	3.6	1.0	0.5	1.0	0.1	0.5	< 0.05	< 0.1	< 0.001	32.9	0.13	18.10	0.17

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Report: A14-03414 (I) rev 1

Analyte Symbol	Th	U	Hg
Unit Symbol	ppm	ppm	ppb
Detection Limit	0.1	0.1	10
Analysis Method	AR-MS	AR-MS	AR-MS
5131	0.5	1.7	130
5132	0.9	2.7	100
5133	0.4	1.5	130
5134 25 % T	1.4	0.7	20
5135 35 % T	1.1	0.8	30
5136 40 % T	0.5	1.3	20
5137	0.4	1.3	90
5138	0.4	1.9	60
5139	1.0	3.0	90
5140 = 5131 Sludge	0.5	1.8	130
5141 OREAS 45P	7.0	1.1	40

- shrank a lot in drying, extremely hard to crush

- shrank a lot in drying, extremely hard to crush

QUALITY CONTROL

Activation Laboratories Ltd.

Report: A14-03414 (I) rev 1

Quality Control																			
Analyte Symbol	Li	Be	B	Na	Mg	Al	P	S	K	Ca	V	Cr	Ti	Mn	Fe	Co	Ni	Cu	Zn
Unit Symbol	ppm	ppm	ppm	%	%	%	%	%	%	%	ppm	ppm	%	ppm	%	ppm	ppm	ppm	ppm
Detection Limit	0.1	0.1	1	0.001	0.01	0.01	0.001	0.001	0.01	0.01	1	1	0.01	1	0.01	0.1	0.1	0.01	0.1
Analysis Method	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-ICP	AR-ICP	AR-MS	AR-MS	AR-MS	AR-MS	AR-ICP	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS
GXR-1 Meas	5.20	0.90	12.00	0.0540	0.170	0.38	0.0410	0.2010	0.030	0.870	80.0	8.0	< 0.01	831	24.80	8.10	40.2	1230.00	855.0
GXR-1 Cert	8.20	1.22	15.00	0.0520	0.217	3.52	0.0650	0.2570	0.050	0.960	80.0	12.0	0.036	852	23.60	8.20	41.0	1110.00	760.0
GXR-4 Meas	9.60	1.50	5.00	0.1480	1.610	2.85	0.1170	1.7340	1.790	0.880	81.0	57.0	0.140	151	2.99	14.30	39.9	5860.00	76.9
GXR-4 Cert	11.10	1.90	4.50	0.5640	1.660	7.20	0.1200	1.7700	4.010	1.010	87.0	64.0	0.290	155	3.09	14.60	42.0	6520.00	73.0
GXR-6 Meas	25.70	1.10	6.00	0.0760	0.460	7.55	0.0320	0.0140	1.260	0.140	178.0	84.0		1000	5.63	14.10	24.9	74.70	139.0
GXR-6 Cert	32.00	1.40	9.80	0.1040	0.609	17.70	0.0350	0.0160	1.870	0.180	186.0	96.0		1010	5.58	13.80	27.0	66.00	118.0
SAR-M (U.S.G.S.) Meas	14.00	1.10		0.0420	0.390	1.16	0.0600		0.330	0.300	35.0	87.0	0.070	3760	2.76	9.70	41.4	317.00	918.0
SAR-M (U.S.G.S.) Cert	27.40	2.20		1.1400	0.500	6.30	0.0700		2.940	0.610	67.2	79.7	0.380	5220	2.99	10.70	41.5	331.00	930.0
5132 Orig	3.20	0.20	8.00	0.0260	0.350	0.68	0.0500	1.8110	0.040	1.330	16.0	82.0	0.020	315	1.65	22.50	177.0	112.00	76.3
5132 Dup	3.00	0.20	8.00	0.0240	0.340	0.65	0.0510	1.8130	0.040	1.270	16.0	79.0	0.020	306	1.61	21.80	169.0	108.00	73.1
Method Blank	< 0.1	< 0.1	< 1	< 0.001	< 0.01	< 0.01	< 0.001	< 0.001	< 0.01	< 0.01	< 1	< 1	< 0.01	< 1	< 0.01	< 0.1	< 0.1	< 0.01	< 0.1

Quality Control																			
Analyte Symbol	Ge	As	Se	Rb	Sr	Y	Zr	Sc	Pr	Gd	Dy	Ho	Er	Tm	Nb	Mo	Ag	Cd	In
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.1	0.1	0.1	0.1	0.5	0.01	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.01	0.002	0.01	0.02
Analysis Method	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS
GXR-1 Meas		439.0	17.900	2.3	208.0	28.40	10.4	1.30		3.90	5.10			0.4000	0.100	19.20	33.900	2.520	0.750
GXR-1 Cert		427.0	16.600	14.0	275.0	32.00	38.0	1.58		4.20	4.30			0.4300	0.800	18.00	31.000	3.300	0.770
GXR-4 Meas		102.0	5.700	102.0	81.8	12.50	10.4	7.00		5.30	2.80			0.2000	0.300	315.00	3.820	0.030	0.200
GXR-4 Cert		98.0	5.600	160.0	221.0	14.00	186.0	7.70		5.25	2.60			0.2100	10.000	310.00	4.000	0.860	0.270
GXR-6 Meas		256.0	0.600	74.1	32.5	7.28	14.9	24.30		2.30	1.70			0.1000	0.200	1.35	0.307	0.120	0.060
GXR-6 Cert		330.0	0.940	90.0	35.0	14.00	110.0	27.60		2.97	2.80			0.0320	7.500	2.40	1.300	1.000	0.260
SAR-M (U.S.G.S.) Meas		36.1	0.800	28.9	30.7	22.50		3.80							4.000	11.80	3.050	4.340	0.880
SAR-M (U.S.G.S.) Cert		38.8	0.390	146.0	151.0	28.00		7.83							29.900	13.10	3.640	5.270	1.080
5132 Orig	0.1	7.5	2.100	4.3	25.3	9.05	5.1	2.70	2.9	2.10	1.70	0.3	0.9	0.1000	0.600	4.75	0.167	0.630	< 0.02
5132 Dup	0.2	6.9	2.300	4.1	24.2	8.66	4.8	2.50	2.8	2.10	1.60	0.3	0.9	0.1000	0.600	4.43	0.139	0.660	< 0.02
Method Blank	< 0.1	< 0.1	< 0.1	< 0.1	< 0.5	< 0.01	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.01	< 0.002	< 0.01	< 0.02

Quality Control																			
Analyte Symbol	Sb	Te	Cs	Ba	La	Ce	Nd	Sm	Eu	Tb	Yb	Lu	Hf	Ta	W	Re	Au	Tl	Pb
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppm	ppm
Detection Limit	0.02	0.02	0.02	0.5	0.5	0.01	0.02	0.1	0.1	0.1	0.1	0.1	0.1	0.05	0.1	0.001	0.5	0.02	0.01
Analysis Method	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS
GXR-1 Meas	82.00	13.9000	2.68	429.0	5.80	11.20	6.51	2.40	0.500	0.700	2.00	0.300	0.200	< 0.05	161.00		3280.0	0.380	599.00
GXR-1 Cert	122.00	13.0000	3.00	750.0	7.50	17.00	18.00	2.70	0.690	0.830	1.90	0.280	0.960	0.175	164.00		3300.0	0.390	730.00
GXR-4 Meas	2.55	0.6800	2.42	63.2	53.50	99.50	38.30	6.10	1.300	0.500	0.80	0.100	0.300	< 0.05	12.00			2.880	43.00
GXR-4 Cert	4.80	0.9700	2.80	1640.0	64.50	102.00	45.00	6.60	1.630	0.360	1.60	0.170	6.300	0.790	30.80			3.200	52.00
GXR-6 Meas	1.54	0.0500	3.71	890.0	11.90	33.40	11.60	2.30	0.600	0.300	0.70	0.100	0.300	< 0.05	< 0.1			1.960	95.50
GXR-6 Cert	3.60	0.0180	4.20	1300.0	13.90	36.00	13.00	2.67	0.760	0.415	2.40	0.330	4.300	0.485	1.90			2.200	101.00
SAR-M (U.S.G.S.) Meas	2.85	0.7700		175.0	50.90	104.00									2.80			1.180	687.00
SAR-M (U.S.G.S.) Cert	6.00	0.9600		801.0	57.40	122.00									9.78			2.700	982.00
5132 Orig	0.25	0.0500	1.48	31.7	11.50	15.60	11.50	2.20	0.500	0.300	0.80	0.100	< 0.1	< 0.05	0.30	0.009	< 0.5	0.320	7.07
5132 Dup	0.24	0.0700	1.39	28.9	11.30	15.10	11.00	2.10	0.500	0.300	0.70	0.100	< 0.1	< 0.05	0.20	0.009	1.5	0.310	6.92
Method Blank	< 0.02	< 0.02	< 0.02	< 0.5	< 0.5	< 0.01	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.05	< 0.1	< 0.001	< 0.5	< 0.02	< 0.01

Quality Control

Analyte Symbol	Th	U	Hg
Unit Symbol	ppm	ppm	ppb
Detection Limit	0.1	0.1	10
Analysis Method	AR-MS	AR-MS	AR-MS

GXR-1 Meas	1.80	31.50	4190
GXR-1 Cert	2.44	34.90	3900
GXR-4 Meas	18.20	4.60	
GXR-4 Cert	22.50	6.20	
GXR-6 Meas	4.00	0.80	
GXR-6 Cert	5.30	1.54	
SAR-M (U.S.G.S.) Meas	10.90	1.90	
SAR-M (U.S.G.S.) Cert	17.20	3.57	
5132 Orig	0.90	2.70	80
5132 Dup	0.90	2.60	120
Method Blank	< 0.1	< 0.1	< 10

Date Submitted: 04-May-15
Invoice No.: A15-03043
Invoice Date: 08-Jun-15
Your Reference: JULBOT2-UT2

Hermann Daxl
39-630 Riverpark Road

Timmins Ontario P4P 1B4
Canada

ATTN: Hermann Daxl

CERTIFICATE OF ANALYSIS

DRIED CRUSHED SLUDGE NEAR-TOP

31 Lake Sediments samples were submitted for analysis. sieved < 250 μm (except 5627 + 38 125-250 μm)

The following analytical package was requested Code UT-2-0.5g Aqua Regia ICP-ICP/MS - Ultratrace 2-0.5g

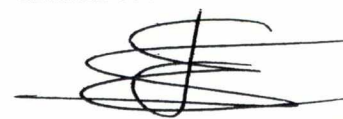
REPORT **A15-03043**

This report may be reproduced without our consent. If only selected portions of the report are reproduced, permission must be obtained. If no instructions were given at time of sample submittal regarding excess material, it will be discarded within 90 days of this report. Our liability is limited solely to the analytical cost of these analyses. Test results are representative only of material submitted for analysis.

Notes:

Assays are recommended for values >10,000 for Cu and Au. The Au from AR-MS is only semi-quantitative. For accurate Au data, fire assay is recommended.

CERTIFIED BY :



Emmanuel Esemé, Ph.D.
Quality Control

ACTIVATION LABORATORIES LTD.

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Near-top dried crushed
Lake bottom sludge, Sieved <250 μm
except 5627 + 38 125-250 μm

Activation Laboratories Ltd.

Report: A15-03043

Aqua regia - ULTRACE 2-ICP/MS 0.5g

Analyte Symbol	P	S	Ti	Li	Be	B	Na	Mg	Al	K	Ca	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga
Unit Symbol	%	%	%	ppm	ppm	ppm	%	%	%	%	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.001	0.001	0.01	0.1	0.1	1	0.001	0.01	0.01	0.01	0.01	1	1	1	0.01	0.1	0.1	0.01	0.1	0.02
Analysis Method	AR-ICP	AR-ICP	AR-ICP	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS
5611 at 5628	0.081	0.507	0.02	3.3	0.2	5	0.014	0.36	0.87	0.02	1.07	16	134	301	0.76	9.5	96.9	64.9	72.7	1.07
5612	0.039	1.111	0.02	2.2	<0.1	5	0.014	0.39	0.45	0.01	0.83	16	130	203	1.02	13.1	98.8	36.8	57.2	1.00
5613	0.082	0.993	0.02	3.5	0.2	6	0.014	0.40	0.72	0.03	1.01	20	149	378	1.21	15.5	136.0	65.3	90.5	1.02
5614	0.067	0.777	0.02	3.5	0.1	4	0.014	0.44	0.67	0.02	1.11	16	138	266	0.90	10.2	92.4	45.1	73.8	0.93
5615	0.071	1.018	0.02	2.4	0.1	7	0.015	0.26	0.61	0.02	1.00	15	93	446	0.98	12.8	125.0	67.1	83.0	0.62
5616	0.046	1.414	0.01	1.8	0.1	7	0.012	0.20	0.45	0.01	0.97	13	75	313	1.04	16.5	161.0	86.9	72.4	0.73
5617	0.058	1.140	0.02	2.5	<0.1	5	0.015	0.37	0.42	0.02	2.76	16	60	467	1.11	16.2	118.0	53.6	64.4	0.25
5618	0.050	0.940	0.03	3.2	<0.1	5	0.015	0.46	0.46	0.02	2.79	12	60	210	0.86	10.5	90.6	45.1	53.3	1.08
5619	0.088	0.628	0.02	3.2	0.2	6	0.013	0.31	0.78	0.02	1.03	15	116	342	0.80	9.1	92.9	55.6	91.1	1.65
5620	0.090	0.621	0.02	3.6	0.2	7	0.013	0.35	0.84	0.02	1.04	14	114	193	0.71	7.7	81.9	52.9	83.5	0.93
5621	0.086	0.448	0.02	3.2	0.2	5	0.014	0.33	0.89	0.02	1.10	15	132	243	0.72	9.1	104.0	66.3	72.8	1.40
5622	0.098	0.645	0.02	3.7	0.2	5	0.014	0.33	0.82	0.02	1.02	14	107	298	0.78	7.3	79.5	51.6	88.6	2.18
5623	0.071	1.064	0.02	2.8	0.2	5	0.013	0.29	0.77	0.02	1.18	22	114	356	0.93	18.8	154.0	105.0	88.1	0.67
5624	0.054	1.872	0.02	2.4	0.1	7	0.014	0.25	0.51	0.02	1.05	15	87	283	1.44	20.2	160.0	91.0	79.7	1.07
5625	0.054	0.729	0.03	1.9	<0.1	3	0.009	0.21	0.38	0.01	0.50	9	72	163	0.57	7.7	60.9	29.1	44.9	1.24
5626	0.041	1.109	0.04	3.1	<0.1	4	0.014	0.43	0.47	0.02	0.50	17	152	263	1.27	19.2	126.0	59.3	58.1	1.26
5627 125-250	0.044	0.223	0.03	2.4	<0.1	2	0.013	0.17	0.33	<0.01	0.34	7	47	117	0.35	4.4	33.0	15.1	31.2	0.87
5628 at 5611	0.080	0.543	0.02	3.3	0.1	5	0.013	0.34	0.82	0.02	1.10	17	129	297	0.77	9.0	99.2	59.9	77.9	0.84
5629	0.095	0.428	0.01	3.0	0.2	4	0.014	0.32	0.85	0.02	1.01	18	125	217	0.79	8.9	96.3	61.0	71.7	0.89
5630	0.096	0.547	0.02	3.0	0.2	5	0.014	0.33	0.90	0.02	1.12	16	128	232	0.71	8.7	101.0	66.4	78.4	0.94
5631	0.106	0.662	0.02	3.2	0.2	5	0.015	0.32	0.83	0.03	1.08	15	116	293	0.79	9.0	97.2	59.3	95.2	0.93
5632	0.085	0.524	0.02	2.8	0.2	4	0.012	0.28	0.78	0.02	1.07	14	107	261	0.66	7.8	94.1	61.3	76.7	1.24
5633	0.051	1.030	0.02	3.7	0.2	3	0.016	0.45	0.74	0.02	1.01	23	160	313	1.09	17.1	145.0	87.6	93.0	1.05
5634	0.078	0.734	0.02	3.6	0.2	4	0.014	0.38	0.85	0.02	1.00	17	136	286	0.85	10.4	108.0	62.1	89.5	1.26
5635	0.055	1.380	0.03	3.4	<0.1	5	0.014	0.34	0.51	0.02	0.82	16	104	261	1.21	16.8	140.0	66.3	72.4	1.31
5636	0.060	0.561	0.03	3.9	0.1	3	0.014	0.26	0.58	0.01	0.67	11	66	166	0.62	5.5	51.6	32.4	57.0	1.58
5637	0.039	0.447	0.03	2.4	<0.1	2	0.013	0.19	0.31	<0.01	0.69	11	45	143	0.46	5.0	43.4	28.8	30.3	1.08
5638 125-250	0.038	0.368	0.04	3.7	<0.1	3	0.013	0.21	0.40	0.01	0.69	12	52	179	0.46	6.4	50.3	31.5	50.1	0.95
5639	0.062	1.343	0.02	3.5	0.2	2	0.012	0.29	0.74	0.01	1.12	23	97	309	1.11	20.8	132.0	104.0	113.0	1.49
5640	0.016	0.768	0.05	5.6	0.1	3	0.014	0.48	0.56	0.02	0.55	20	139	195	1.04	16.5	129.0	49.0	45.1	2.66

Activation Laboratories Ltd.

Report: A15-03043

Analyte Symbol	Ge	As	Se	Rb	Sr	Y	Zr	Sc	Pr	Gd	Dy	Ho	Er	Tm	Nb	Mo	Ag	Cd	In	Sn
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.1	0.1	0.1	0.1	0.5	0.01	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.01	0.002	0.01	0.02	0.05
Analysis Method	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS
5611 at 5628	0.3	4.3	2.2	1.5	21.7	8.01	3.0	0.8	3.7	2.1	1.1	0.3	0.8	0.1	0.5	1.25	0.162	0.64	< 0.02	0.24
5612	0.2	9.9	1.3	1.1	15.2	4.21	1.6	1.3	1.8	1.2	0.5	0.2	0.4	< 0.1	0.4	2.04	0.066	0.58	< 0.02	0.27
5613	0.2	4.4	2.3	1.9	17.8	6.66	1.1	0.8	3.0	1.9	0.9	0.3	0.7	0.1	0.5	1.50	0.104	0.97	0.02	0.56
5614	0.2	3.0	2.2	1.2	14.0	4.84	1.4	0.9	2.3	1.6	0.8	0.2	0.6	< 0.1	0.5	0.71	0.049	0.69	0.05	0.34
5615	0.2	4.8	2.5	2.1	19.9	6.37	1.0	1.0	2.9	1.9	1.0	0.3	0.7	< 0.1	0.6	1.91	0.080	1.08	< 0.02	0.65
5616	0.2	4.4	2.5	1.4	19.9	6.28	2.1	1.3	2.6	1.9	0.9	0.3	0.6	0.1	0.4	3.79	0.092	0.56	< 0.02	< 0.05
5617	0.2	4.4	2.3	1.4	22.2	4.66	0.7	0.7	2.1	1.4	0.7	0.2	0.5	< 0.1	0.4	1.82	0.064	0.52	< 0.02	0.40
5618	0.2	2.7	2.2	1.5	19.1	3.92	1.3	1.1	2.0	1.2	0.7	0.2	0.5	< 0.1	0.5	1.41	0.048	0.55	0.02	0.33
5619	0.3	4.3	1.5	1.8	18.6	7.04	0.8	1.0	3.2	2.0	1.0	0.3	0.7	0.1	0.5	0.55	0.094	1.15	0.05	1.03
5620	0.3	2.4	2.6	1.5	17.5	6.07	1.2	0.8	3.0	2.0	0.9	0.3	0.7	0.1	0.4	0.60	0.079	1.08	< 0.02	0.41
5621	0.3	1.5	2.5	1.5	20.6	8.53	1.9	1.0	4.0	2.3	1.1	0.4	0.9	0.1	0.5	0.90	0.100	0.71	< 0.02	0.17
5622	0.2	3.2	3.0	2.0	16.3	6.43	1.0	0.3	2.9	1.8	1.0	0.3	0.6	0.1	0.4	0.39	0.110	1.00	0.03	0.71
5623	0.3	4.8	3.3	2.0	21.9	10.10	2.0	0.9	4.3	2.9	1.4	0.4	0.9	0.2	0.5	2.09	0.102	0.69	< 0.02	0.27
5624	0.3	5.6	2.4	1.5	22.1	6.55	2.5	1.3	2.8	1.9	0.9	0.3	0.7	0.1	0.5	2.97	0.058	0.44	< 0.02	0.27
5625	0.1	2.6	0.5	0.8	9.8	3.46	0.2	0.4	1.7	1.0	0.5	0.1	0.4	< 0.1	0.2	0.52	0.076	0.40	< 0.02	0.26
5626	0.1	4.1	1.7	1.8	10.5	3.79	0.6	1.1	1.8	1.2	0.5	0.1	0.4	< 0.1	0.5	1.87	0.058	0.47	< 0.02	0.36
5627	0.1	0.8	0.8	0.7	6.9	2.39	0.3	0.3	1.4	1.0	0.4	0.1	0.3	< 0.1	0.3	0.23	0.045	0.35	0.02	0.25
5628 at 5611	0.3	2.5	2.0	1.5	22.9	7.75	0.8	0.6	3.6	2.1	1.1	0.3	0.8	0.1	0.5	0.60	0.075	0.97	< 0.02	0.39
5629	0.3	1.6	1.9	1.2	17.4	7.61	0.5	0.7	3.4	2.4	1.1	0.3	0.8	0.1	0.4	0.46	0.091	0.66	< 0.02	0.22
5630	0.2	2.1	1.8	2.0	22.2	7.94	0.7	0.7	3.7	2.4	1.1	0.4	0.8	0.1	0.4	0.65	0.086	0.72	0.02	0.19
5631	0.2	2.8	2.6	2.0	18.5	7.28	0.9	0.4	3.4	2.1	1.0	0.3	0.8	0.1	0.5	0.52	0.108	1.15	0.04	0.70
5632	0.2	2.8	1.8	1.7	20.7	7.73	0.6	0.2	3.5	2.3	1.0	0.3	0.8	0.1	0.3	0.51	0.107	0.43	< 0.02	0.38
5633	0.3	4.3	2.0	1.2	18.8	8.51	3.4	1.1	3.6	2.5	1.1	0.4	0.8	0.1	0.5	1.70	0.096	0.78	0.02	0.17
5634	0.3	3.4	2.1	1.5	19.5	7.98	1.0	0.5	3.6	2.4	1.1	0.3	0.8	0.1	0.6	0.82	0.104	0.65	< 0.02	0.37
5635	0.2	3.8	1.8	1.5	16.2	5.63	1.6	1.3	2.4	1.7	0.7	0.2	0.7	< 0.1	0.4	2.54	0.057	0.66	< 0.02	0.34
5636	0.2	2.1	1.7	1.2	11.6	4.44	0.8	0.5	2.4	1.5	0.8	0.2	0.5	< 0.1	0.5	0.41	0.057	0.48	< 0.02	0.32
5637	0.1	2.2	0.6	0.9	14.9	3.35	1.1	0.8	1.9	1.1	0.5	0.1	0.4	< 0.1	0.5	0.63	0.041	0.23	< 0.02	0.27
5638	0.1	1.7	1.2	1.2	13.1	4.22	0.8	0.9	2.3	1.3	0.6	0.2	0.5	< 0.1	0.5	0.78	0.042	0.41	0.02	0.10
5639	0.3	5.6	2.4	1.9	19.9	10.00	1.7	2.0	4.2	2.8	1.4	0.4	1.1	0.2	0.6	1.73	0.074	0.52	< 0.02	0.19
5640	0.2	2.5	1.2	1.8	12.1	4.19	3.5	2.4	2.3	1.2	0.6	0.2	0.5	< 0.1	0.6	2.84	0.039	0.32	< 0.02	0.15

Activation Laboratories Ltd.

Report: A15-03043

Analyte Symbol	Sb	Te	Cs	Ba	La	Ce	Nd	Sm	Eu	Tb	Yb	Lu	Hf	Ta	W	Re	Au	Tl	Pb	Bi
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppm	ppm	ppm
Detection Limit	0.02	0.02	0.02	0.5	0.5	0.01	0.02	0.1	0.1	0.1	0.1	0.1	0.1	0.05	0.1	0.001	0.5	0.02	0.01	0.02
Analysis Method	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS
5611 <i>at 5628</i>	0.08	0.09	1.01	48.0	14.9	16.90	12.50	2.3	0.6	0.3	0.9	0.2	< 0.1	< 0.05	< 0.1	0.002	3.0	0.17	8.28	0.11
5612	0.17	0.05	0.63	27.0	7.6	8.90	6.00	1.0	0.3	0.1	0.5	< 0.1	< 0.1	< 0.05	< 0.1	0.006	1.8	0.11	13.90	0.12
5613	0.23	0.09	1.04	32.5	12.2	14.40	10.10	1.8	0.5	0.2	0.6	0.1	< 0.1	< 0.05	< 0.1	< 0.001	3.7	0.12	26.10	0.25
5614	0.13	0.10	0.83	34.7	9.5	11.30	8.37	1.4	0.4	0.2	0.5	< 0.1	< 0.1	< 0.05	0.2	< 0.001	< 0.5	0.08	19.50	0.21
5615	0.19	0.04	0.95	23.7	11.8	13.70	10.40	1.6	0.4	0.2	0.7	0.1	< 0.1	< 0.05	0.1	< 0.001	2.7	0.12	22.30	0.21
5616	0.20	< 0.02	0.73	23.0	11.0	12.00	10.00	1.7	0.5	0.2	0.8	0.1	< 0.1	< 0.05	< 0.1	0.010	2.4	0.14	5.08	0.07
5617	0.17	< 0.02	0.77	32.0	9.2	11.30	7.52	1.1	0.3	0.1	0.5	< 0.1	< 0.1	< 0.05	< 0.1	0.005	2.0	0.13	17.60	0.16
5618	0.17	0.04	0.65	34.1	8.1	10.60	7.36	1.1	0.3	0.2	0.5	< 0.1	< 0.1	< 0.05	0.1	< 0.001	2.7	0.10	15.80	0.16
5619	0.28	0.09	1.05	46.4	13.2	15.70	11.70	2.3	0.6	0.2	0.8	0.1	< 0.1	< 0.05	< 0.1	0.004	2.1	0.11	23.80	0.24
5620	0.21	0.09	0.94	44.3	12.1	14.10	10.60	1.8	0.5	0.3	0.7	0.1	< 0.1	< 0.05	0.2	0.003	1.1	0.10	21.80	0.22
5621	0.05	< 0.02	0.94	48.7	15.5	17.70	13.60	2.2	0.6	0.3	1.0	0.1	< 0.1	< 0.05	< 0.1	< 0.001	1.8	0.21	4.81	0.08
5622	0.18	0.06	0.85	47.1	12.3	14.10	10.60	1.7	0.5	0.3	0.7	0.1	< 0.1	< 0.05	0.1	< 0.001	1.0	0.10	28.20	0.28
5623	0.12	0.05	0.91	28.2	17.3	18.70	14.60	2.5	0.8	0.4	1.1	0.2	< 0.1	< 0.05	< 0.1	0.008	1.4	0.18	8.43	0.12
5624	0.24	0.07	0.92	15.4	11.4	12.50	10.10	1.7	0.5	0.2	0.7	0.1	< 0.1	< 0.05	< 0.1	0.003	1.8	0.21	11.60	0.13
5625	0.06	0.04	0.62	23.9	6.9	8.84	5.60	0.9	0.2	0.1	0.3	< 0.1	< 0.1	< 0.05	< 0.1	0.005	1.4	0.09	10.00	0.10
5626	0.12	0.03	1.00	25.6	7.4	10.10	6.60	0.9	0.3	0.1	0.4	< 0.1	< 0.1	< 0.05	< 0.1	0.005	2.2	0.11	9.94	0.10
5627	0.07	0.03	0.33	20.2	5.8	8.24	5.30	0.9	0.2	0.1	0.3	< 0.1	< 0.1	< 0.05	< 0.1	0.004	1.2	0.06	7.28	0.08
5628 <i>at 5611</i>	0.12	< 0.02	0.81	51.8	14.5	16.60	12.50	2.0	0.5	0.3	0.8	0.1	< 0.1	< 0.05	< 0.1	< 0.001	1.6	0.10	14.10	0.14
5629	0.04	< 0.02	0.91	44.6	14.2	16.20	11.70	2.2	0.6	0.3	0.9	0.1	< 0.1	< 0.05	< 0.1	< 0.001	1.9	0.08	7.66	0.10
5630	0.20	0.06	0.85	48.1	15.0	17.20	12.60	2.2	0.6	0.3	0.9	0.1	< 0.1	< 0.05	< 0.1	0.003	1.6	0.08	11.10	0.14
5631	0.19	0.11	0.91	50.9	13.6	16.30	11.40	2.0	0.5	0.3	0.7	0.1	< 0.1	< 0.05	< 0.1	< 0.001	3.7	0.08	31.00	0.30
5632	0.09	0.05	0.98	44.7	14.0	16.10	12.00	2.2	0.5	0.3	0.8	0.1	< 0.1	< 0.05	< 0.1	< 0.001	1.1	0.07	11.20	0.13
5633	0.19	0.07	0.98	23.3	14.3	15.80	12.00	2.4	0.6	0.3	1.0	0.1	< 0.1	< 0.05	< 0.1	0.003	1.1	0.30	8.27	0.11
5634	0.19	0.07	1.05	37.9	14.7	17.00	13.20	2.1	0.6	0.3	0.9	0.1	< 0.1	< 0.05	< 0.1	0.006	1.7	0.19	15.20	0.18
5635	0.16	0.04	1.24	24.1	10.5	12.30	8.67	1.3	0.4	0.2	0.6	0.1	< 0.1	< 0.05	< 0.1	0.007	2.7	0.16	12.70	0.14
5636	0.14	0.10	0.62	33.5	9.5	12.50	8.51	1.2	0.4	0.2	0.6	< 0.1	< 0.1	< 0.05	0.5	0.003	< 0.5	0.08	9.54	0.11
5637	0.06	< 0.02	0.45	25.2	7.6	10.80	5.97	1.1	0.2	0.1	0.4	< 0.1	< 0.1	< 0.05	< 0.1	< 0.001	2.5	0.08	5.80	0.05
5638	0.07	0.02	0.70	30.6	9.7	13.00	7.69	1.4	0.3	0.2	0.4	< 0.1	< 0.1	< 0.05	0.1	0.004	0.9	0.08	3.55	0.04
5639	0.03	0.06	0.86	18.6	17.2	18.90	14.30	2.4	0.6	0.3	1.0	0.2	< 0.1	< 0.05	< 0.1	0.003	1.7	0.26	3.19	0.11
5640	0.12	< 0.02	0.86	26.5	9.2	13.60	8.11	1.3	0.4	0.1	0.5	< 0.1	< 0.1	< 0.05	< 0.1	0.002	1.1	0.12	2.56	0.05

Analyte Symbol	Thi	U	Hg
Unit Symbol	ppm	ppm	ppb
Detection Limit	0.1	0.1	10
Analysis Method	AR-MS	AR-MS	AR-MS

5611 at 5628	0.4	2.0	220 - took 2 samples of same kind
5612	0.3	7.5	110 - bit fibrous
5613	0.2	2.0	180 - finer top sludge
5614	0.2	1.7	150 - denser but < 50 cm depth
5615	0.1	2.0	250 - top dense
5616	0.2	2.4	140 - < 50 cm bit denser
5617	< 0.1	2.1	160 - 2% shells < 1 mm which fizz
5618	0.2	2.1	160 - 2% shells < 0.5 mm which fizz
5619	< 0.1	1.8	220
5620	0.1	2.1	220
5621	0.2	2.1	220
5622	0.1	2.1	220
5623	0.2	2.7	170 - dried extremely hard
5624	0.2	2.6	180 - dried extremely hard
5625	< 0.1	0.9	100
5626	0.2	1.3	110
5627	< 0.1	0.7	70 - silty, 125-250 μ m fraction
5628 at 5611	< 0.1	2.0	230 - 2nd sample of same kind
5629	< 0.1	1.8	180
5630	< 0.1	2.1	220
5631	< 0.1	1.9	310 - finer top sludge
5632	< 0.1	2.0	190 - denser < 50 cm
5633	0.3	2.0	180 - extremely hard to crush
5634	0.2	1.8	250 - extremely hard to crush
5635	0.3	1.7	150 - extremely hard to crush
5636	0.1	1.4	140
5637	0.3	1.2	100 - 10% silt
5638	0.2	1.3	90 - 20% silt, 125-250 μ m fraction
5639	0.2	2.6	140
5640	0.9	0.9	30 - 15% silt

NOTE

Dried crumbs are very hard to crush of all except when fibrous or silty.

STANDARD OREAS 45P

Activation Laboratories Ltd.

Report: A15-03043

Analyte Symbol	P	S	Ti	Li	Be	B	Na	Mg	Al	K	Ca	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga
Unit Symbol	%	%	%	ppm	ppm	ppm	%	%	%	%	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.001	0.001	0.01	0.1	0.1	1	0.001	0.01	0.01	0.01	0.01	1	1	1	0.01	0.1	0.1	0.01	0.1	0.02
Analysis Method	AR-ICP	AR-ICP	AR-ICP	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS
5641 OREAS 45P	0.032	0.026	0.25	6.6	0.5	13	0.024	0.12	3.42	0.07	0.22	256	972	1140	16.70	122.0	358.0	743.0	146.0	18.40
	✓	✓	✓									vs. 162 - 217	vs. 873		✓	vs. 104	vs. 281	vs. 646	vs. 122	

Calibrated all a little too high,
but are similar to A14-03414 Sludge.

Activation Laboratories Ltd.

Report: A15-03043

Analyte Symbol	Ge	As	Se	Rb	Sr	Y	Zr	Sc	Pr	Gd	Dy	Ho	Er	Tm	Nb	Mo	Ag	Cd	In	Sn
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.1	0.1	0.1	0.1	0.5	0.01	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.01	0.002	0.01	0.02	0.05
Analysis Method	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS
5641 OREAS 45P	0.3	3.7	1.3	6.9	13.9	6.93	22.6	58.8	3.8	2.7	1.6	0.4	0.9	0.1	0.9	1.48	0.152	0.08	0.08	1.63
		✓															✓	✓		
																	0.3			
																	?			

Activation Laboratories Ltd.

Report: A15-03043

Analyte Symbol	Sb	Te	Cs	Ba	La	Ce	Nd	Sm	Eu	Tb	Yb	Lu	Hf	Ta	W	Re	Au	Tl	Pb	Bi
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppm	ppm	ppm
Detection Limit	0.02	0.02	0.02	0.5	0.5	0.01	0.02	0.1	0.1	0.1	0.1	0.1	0.1	0.05	0.1	0.001	0.5	0.02	0.01	0.02
Analysis Method	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS
5641 OREAS 45P	0.45	0.04	1.23	174.0	16.5	29.90	12.50	2.4	0.8	0.4	1.0	< 0.1	0.5	< 0.05	< 0.1	< 0.001	37.2	0.09	17.80	0.15
	✓	✓															✓		✓	
																	49		19	

Activation Laboratories Ltd.

Report: A15-03043

Analyte Symbol	Th	U	Hg
Unit Symbol	ppm	ppm	ppb
Detection Limit	0.1	0.1	10
Analysis Method	AR-MS	AR-MS	AR-MS
5641 OREAS 45P	6.0	1.1	30

QUALITY CONTROL

Activation Laboratories Ltd.

Report: A15-03043

Quality Control																			
Analyte Symbol	P	S	Ti	Li	Be	B	Na	Mg	Al	K	Ca	V	Cr	Mn	Fe	Co	Ni	Cu	Zn
Unit Symbol	%	%	%	ppm	ppm	ppm	%	%	%	%	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
Detection Limit	0.001	0.001	0.01	0.1	0.1	1	0.001	0.01	0.01	0.01	0.01	1	1	1	0.01	0.1	0.1	0.01	0.1
Analysis Method	AR-ICP	AR-ICP	AR-ICP	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS
GXR-1 Meas	0.0430	0.2090	< 0.01	4.20	0.70	11.00	0.0390	0.120	0.270	0.020	0.750	82.0	7.0	880.000	22.900	8.60	42.5260.0000?	901.0	
GXR-1 Cert	0.0650	0.2570	0.036	8.20	1.22	15.00	0.0520	0.217	3.520	0.050	0.960	80.0	12.0	852.000	23.600	8.20	41.0110.0000	760.0	
DH-1a Meas																			
DH-1a Cert																			
GXR-4 Meas	0.1160	1.7310	0.130	8.00	1.00	2.00	0.0980	1.230	2.090	1.310	0.710	79.0	52.0	128.000	2.570	14.10	36.8620.0000	75.2	
GXR-4 Cert	0.1200	1.7700	0.290	11.10	1.90	4.50	0.5640	1.660	7.200	4.010	1.010	87.0	64.0	155.000	3.090	14.60	42.0520.0000	73.0	
GXR-6 Meas	0.0320	0.0140		23.40	0.60	3.00	0.0680	0.270	4.870	0.730	0.150	142.0	63.0	840.000	4.150	11.50	20.0 58.5000	111.0	
GXR-6 Cert	0.0350	0.0160		32.00	1.40	9.80	0.1040	0.609	17.700	1.870	0.180	186.0	96.0	1010.000	5.580	13.80	27.0 66.0000	118.0	
SAR-M (U.S.G.S.) Meas	0.0600		0.050	10.20	0.80		0.0220	0.260	0.690	0.150	0.210	28.0	85.0	4320.000	2.400	10.80	44.4332.0000	1060.0	
SAR-M (U.S.G.S.) Cert	0.0700		0.380	27.40	2.20		1.1400	0.500	6.300	2.940	0.610	67.2	79.7	5220.000	2.990	10.70	41.5331.0000	930.0	
OREAS 45d (4-Acid) Meas	0.0310	0.0420	0.140	11.70	0.40		0.0290	0.120	3.790	0.070	0.070	188.0	427.0	348.000	11.200	25.60	182.0323.0000	34.7	
OREAS 45d (4-Acid) Cert	0.0420	0.0490	0.773	21.50	0.79		0.1010	0.245	8.150	0.412	0.185	235.0	549.0	490.000	14.520	29.50	231.0371.0000	45.7	
5612 Orig				2.20	0.10	5.00	0.0140	0.390	0.450	0.010	0.850	16.0	130.0	205.000	1.040	13.40	99.1 37.6000	58.6	
5612 Dup ✓				2.10	< 0.1	5.00	0.0140	0.390	0.450	0.010	0.810	16.0	131.0	201.000	0.990	12.90	98.5 35.9000	55.7	
5640 Orig	0.0170	0.7770	0.050																
5640 Dup ✓	0.0160	0.7590	0.050																
5641 Orig				6.70	0.50	14.00	0.0240	0.120	3.460	0.070	0.220	258.0	984.0	1150.000	16.800	124.00	365.0751.0000	149.0	
5641 Dup ✓				6.40	0.50	13.00	0.0240	0.120	3.380	0.070	0.220	254.0	960.0	1130.000	16.500	121.00	350.0734.0000	142.0	
Method Blank	< 0.001	< 0.001	< 0.01																
Method Blank	< 0.001	< 0.001	< 0.01																
Method Blank				< 0.1	< 0.1	< 1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.01	< 1	< 1	< 1	< 0.01	< 0.1	< 0.1	< 0.01	< 0.1
Method Blank				< 0.1	< 0.1	< 1	< 0.001	< 0.01	< 0.01	< 0.01	< 0.01	< 1	< 1	< 1	< 0.01	< 0.1	< 0.1	< 0.01	< 0.1

QUALITY CONTROL

Activation Laboratories Ltd.

Report: A15-03043

Quality Control																			
Analyte Symbol	Ge	As	Se	Rb	Sr	Y	Zr	Sc	Pr	Gd	Dy	Ho	Er	Tm	Nb	Mo	Ag	Cd	In
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.1	0.1	0.1	0.1	0.5	0.01	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.01	0.002	0.01	0.02
Analysis Method	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS
GXR-1 Meas		431.00	14.800	1.5	142.00	19.40	9.1	1.30		3.10	2.70			0.300	< 0.1	17.900	29.700	3.010	0.720
GXR-1 Cert		427.00	16.600	14.0	275.00	32.00	38.0	1.58		4.20	4.30			0.430	0.800	18.000	31.000	3.300	0.770
DH-1a Meas																			
DH-1a Cert																			
GXR-4 Meas		99.80	5.400	62.8	63.70	7.90	7.4	6.20		3.70	1.30			0.100	0.200	303.000	2.770	0.370	0.180
GXR-4 Cert		98.00	5.600	160.0	221.00	14.00	186.0	7.70		5.25	2.60			0.210	10.000	310.000	4.000	0.860	0.270
GXR-6 Meas		186.00	0.900	33.4	34.40	4.07	10.7	18.10		1.40	0.80				< 0.1	1.570	0.182	0.110	0.050
GXR-6 Cert		330.00	0.940	90.0	35.00	14.00	110.0	27.60		2.97	2.80				7.500	2.400	1.300	1.000	0.260
SAR-M (U.S.G.S.) Meas		37.30	2.300	10.5	23.60	12.20		2.60							2.500	11.700	2.580	4.370	0.850
SAR-M (U.S.G.S.) Cert		38.80	0.390	146.0	151.00	28.00		7.83							29.900	13.100	3.640	5.270	1.080
OREAS 45d (4-Acid) Meas		4.20		12.0	8.40	3.09	18.8	37.00	2.30	1.40	0.70	0.20	0.30		0.500	1.740			0.070
OREAS 45d (4-Acid) Cert		13.80		42.1	31.30	9.53	141.0	49.30	3.70	2.42	2.26	0.46	1.38		14.500	2.500			0.096
5612 Orig	0.2	10.20	1.100	1.3	14.00	4.19	1.8	1.30	1.80	1.20	0.60	0.20	0.40	< 0.1	0.500	2.040	0.078	0.600	< 0.02
5612 Dup	0.1	9.70	1.600	1.0	16.30	4.24	1.3	1.30	1.80	1.10	0.50	0.10	0.40	< 0.1	0.400	2.030	0.055	0.550	< 0.02
5640 Orig																			
5640 Dup																			
5641 Orig	0.3	4.00	1.300	6.8	13.90	7.18	23.3	60.30	3.80	2.90	1.60	0.40	0.90	0.100	1.000	1.390	0.134	0.070	0.060
5641 Dup	0.3	3.50	1.400	7.1	14.00	6.68	21.9	57.30	3.70	2.60	1.50	0.40	0.90	0.200	0.800	1.570	0.169	0.090	0.110
Method Blank																			
Method Blank																			
Method Blank	< 0.1	< 0.1	< 0.1	< 0.1	< 0.5	< 0.01	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.01	< 0.002	< 0.01	< 0.02
Method Blank	< 0.1	< 0.1	< 0.1	< 0.1	< 0.5	< 0.01	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.01	< 0.002	< 0.01	< 0.02

QUALITY CONTROL

Activation Laboratories Ltd.

Report: A15-03043

Quality Control																			
Analyte Symbol	Sb	Te	Cs	Ba	La	Ce	Nd	Sm	Eu	Tb	Yb	Lu	Hf	Ta	W	Re	Au	Tl	Pb
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppm	ppm
Detection Limit	0.02	0.02	0.02	0.5	0.5	0.01	0.02	0.1	0.1	0.1	0.1	0.1	0.1	0.05	0.1	0.001	0.5	0.02	0.01
Analysis Method	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS	AR-MS
GXR-1 Meas	81.50	13.9000	2.850	151.0	4.40	7.58	4.97	1.80	0.400	0.600	1.80	0.300	0.200	< 0.05	125.00		3350.000	0.450	742.00
GXR-1 Cert	122.00	13.0000	3.000	750.0	7.50	17.00	18.00	2.70	0.690	0.830	1.90	0.280	0.960	0.175	164.00		3300.000	0.390	730.00
DH-1a Meas																			
DH-1a Cert																			
GXR-4 Meas	3.13	0.9300	2.010	24.5	41.30	67.40	26.80	3.90	1.100	0.400	0.70	0.100	0.200	< 0.05	9.90		564.000	2.470	46.80
GXR-4 Cert	4.80	0.9700	2.800	1640.0	64.50	102.00	45.00	6.60	1.630	0.360	1.60	0.170	6.300	0.790	30.80		470.000	3.200	52.00
GXR-6 Meas	1.54	0.0400	2.300	1090.0	8.80	21.80	7.40	1.50	0.400	0.200	0.60	< 0.1	0.400	< 0.05	< 0.1		76.000	1.160	89.80
GXR-6 Cert	3.60	0.0180	4.200	1300.0	13.90	36.00	13.00	2.67	0.760	0.415	2.40	0.330	4.300	0.485	1.90		95.000	2.200	101.00
SAR-M	3.74	0.8800		138.0	40.90	73.90									2.60		146.000	0.540	1010.00
(U.S.G.S.)																	?		
Meas																			
SAR-M	6.00	0.9600		801.0	57.40	122.00									9.78		462.000	2.700	982.00
(U.S.G.S.) Cert																			
OREAS 45d (4-Acid) Meas	0.34		2.030	68.2	8.70	17.90	7.61	1.20	0.400	0.200	0.40	< 0.1	0.500	< 0.05	< 0.1			0.140	17.00
OREAS 45d (4-Acid) Cert	0.82		3.910	183.0	16.90	37.20	13.40	2.80	0.570	0.400	1.33	0.180	3.830	1.020	1.62			0.270	21.80
5612 Orig	0.12	0.0400	0.710	28.1	7.90	9.33	5.90	1.00	0.300	0.100	0.50	< 0.1	< 0.1	< 0.05	< 0.1	0.005	1.900	0.120	14.20
5612 Dup	0.22	0.0500	0.550	25.9	7.40	8.48	6.10	0.90	0.300	0.100	0.40	< 0.1	< 0.1	< 0.05	< 0.1	0.006	1.600	0.100	13.60
5640 Orig																			
5640 Dup																			
5641 Orig	0.46	0.0500	1.350	178.0	17.10	30.50	12.50	2.50	0.800	0.400	1.00	< 0.1	0.600	< 0.05	< 0.1	< 0.001	41.100	0.100	18.00
5641 Dup	0.45	0.0400	1.100	170.0	15.90	29.30	12.60	2.40	0.800	0.300	1.00	0.100	0.500	< 0.05	< 0.1	< 0.001	33.200	0.090	17.60
Method Blank																			
Method Blank																			
Method Blank	< 0.02	< 0.02	< 0.02	< 0.5	< 0.5	< 0.01	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.05	< 0.1	< 0.001	< 0.5	< 0.02	< 0.01
Method Blank	< 0.02	< 0.02	< 0.02	< 0.5	< 0.5	< 0.01	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.05	< 0.1	< 0.001	< 0.5	< 0.02	< 0.01

QUALITY CONTROL

Activation Laboratories Ltd.

Report: A15-03043

Quality Control

Analyte Symbol	Th	U	Hg
Unit Symbol	ppm	ppm	ppb
Detection Limit	0.1	0.1	10
Analysis Method	AR-MS	AR-MS	AR-MS

GXR-1 Meas	2.30	34.60	4010.0
GXR-1 Cert	2.44	34.90	3900.0
DH-1a Meas	> 200	2680.00	
DH-1a Cert	910.00	2629.00	
GXR-4 Meas	15.80	5.10	100.0
GXR-4 Cert	22.50	6.20	110.0
GXR-6 Meas	3.50	0.80	90.0
GXR-6 Cert	5.30	1.54	68.0
SAR-M (U.S.G.S.) Meas	10.00	2.10	
SAR-M (U.S.G.S.) Cert	17.20	3.57	

OREAS 45d (4- Acid) Meas	13.90	1.80	
OREAS 45d (4- Acid) Cert	14.50	2.63	
5612 Orig	0.30	7.70	100.0
5612 Dup	0.20	7.30	110.0
5640 Orig			
5640 Dup			
5641 Orig	6.20	1.10	20.0
5641 Dup	5.80	1.10	30.0
Method Blank			
Method Blank			

Method Blank	< 0.1	< 0.1	< 10
Method Blank	< 0.1	< 0.1	< 10