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Report on Diamond Drilling
-
Separation Rapids Lithium Deposit

March 27 - May 13, 2017

Work Completed on Mining Lease 108395,

composed of claim package CLM469

comprising Mining Claims K1178304, K1178305, K1178306, K1178349

and K1247023, Parts 1 to 5 on Plan 23R-11732, Paterson and Snook Lake Areas

in the District of Kenora

held by

Avalon Advanced Materials Inc.

Suite 1901, 130 Adelaide Street West

Toronto, ON M5H 3P5

UTM Zone 15, 388400 East and 5569000 N (UTM NAD83)

Report by

Volker Moeller, PhD, GIT (ON)

Signed_____

and William Mercer, PhD, P.Geo (ON)

Signed_____

DATE January 19, 2018

Table of Contents

List of Figures

List of Tables

Summary

A drill program of five holes totalling 1,473 metres was performed in the spring of 2017 over 48 field days, which targeted the Separation Rapids lithium-rubidium pegmatite and a magnetic low in the west of the main pegmatite. Four diamond drill holes successfully confirmed the geological and grade continuity of the main pegmatite mass. Significant drill intercepts of petalite + lepidolite and petalite ± spodumene pegmatite, all given as true horizontal thicknesses and length-weighted average grades, include 15.4 m grading 1.176 % Li_2O (drill hole SR17-71), 8.1 m grading 1.431 % Li_2O and 6.9 m grading 1.506 % Li_2O (SR17-72), 19.5 m grading 1.576 % Li_2O (SR17-73) and 8.2 m grading 1.565 % Li_2O in drill hole SR17-74. The lithium grades are elevated compared to previous resource estimates for the entire deposit, indicating a moderate grade increase with depth. The intersected intercepts are associated with length-weighted averages of Rb_2O between 0.343 and 0.473 %. Preliminary geotechnical evaluations on the drill core, in combination with previous studies, indicate good rock stability based on a range of parameters including rock hardness, weathering, core recovery, rock quality designation and fracture indices. A waste rock study was initiated which indicates overall low absolute concentrations of environmental contaminants in the rocks and a low environmental risk of acid mine drainage, based on acid base accounting analyses. The results of the 2017 spring drill program provide the basis for better-constrained geological, geotechnical, environmental and mineral resource models, provided samples for mineralogical studies, and indicate that further lithium-rubidium resource potential can be unlocked by deep drilling of the Separation Rapids Li-Rb pegmatite.

The total expenditure on the drill program was $708,231.16 or $480.81 per metre. Costs were unusually high due to very difficult spring breakup conditions. The program involved 47 days with the drill crew on site and approximately two weeks of additional work for the geological crew to prepare for the program and complete the sampling of the core.

1. Introduction and aims of the drill program

The Separation Rapids pegmatite, previously referred to as the Big Whopper pegmatite (Avalon Ventures Ltd., 1998, 1999), contains 8.0 Mt of measured and indicated resources grading 1.29% Li_2O and 0.35% Rb_2O with additional 1.63 Mt of inferred resources grading 1.63% Li_2O (Avalon Advanced Materials Inc.,

2016). It is located near Kenora, Ontario. Lithium is hosted in the minerals petalite, lepidolite (polylithionite-trilithionite solid solution series), spodumene and other lithium-bearing micas in a subvertical pegmatite approximately 500 by 70 m in outcrop which is elongated in east-southeasterly direction (Avalon Ventures Ltd., 1998). Lepidolite is enriched in a distinct subunit of the lithium pegmatite.

Avalon Advanced Materials Inc. holds 15 additional mineral exploration claims around the main pegmatite, which is located on Mining Lease 108395 (claim package CLM469, Fig. 1). Mining Lease 108395 is a 21-year lease registered on October 1, 2009 and expiring on September 30, 2030. It covers 421 hectares. The drill program was completed on Mining Lease 108395. All mineral claims held by Avalon in the area are contiguous with the mining lease (Fig. 1).

The 2017 spring drill program was designed to test the depth extension of the Separation Rapids lithium pegmatite in the east, west and center with potential for a resource increase. One drill hole targeted the possible western along-strike extension of the pegmatite. The diamond drilling was performed from March 27 to May 13, 2017, and related field activities were carried out from the beginning of March to the end of May 2017. The final assay data was received in July and August 2017. Supporting planning, data evaluation and reporting activities lasted from February until at least October 2017.

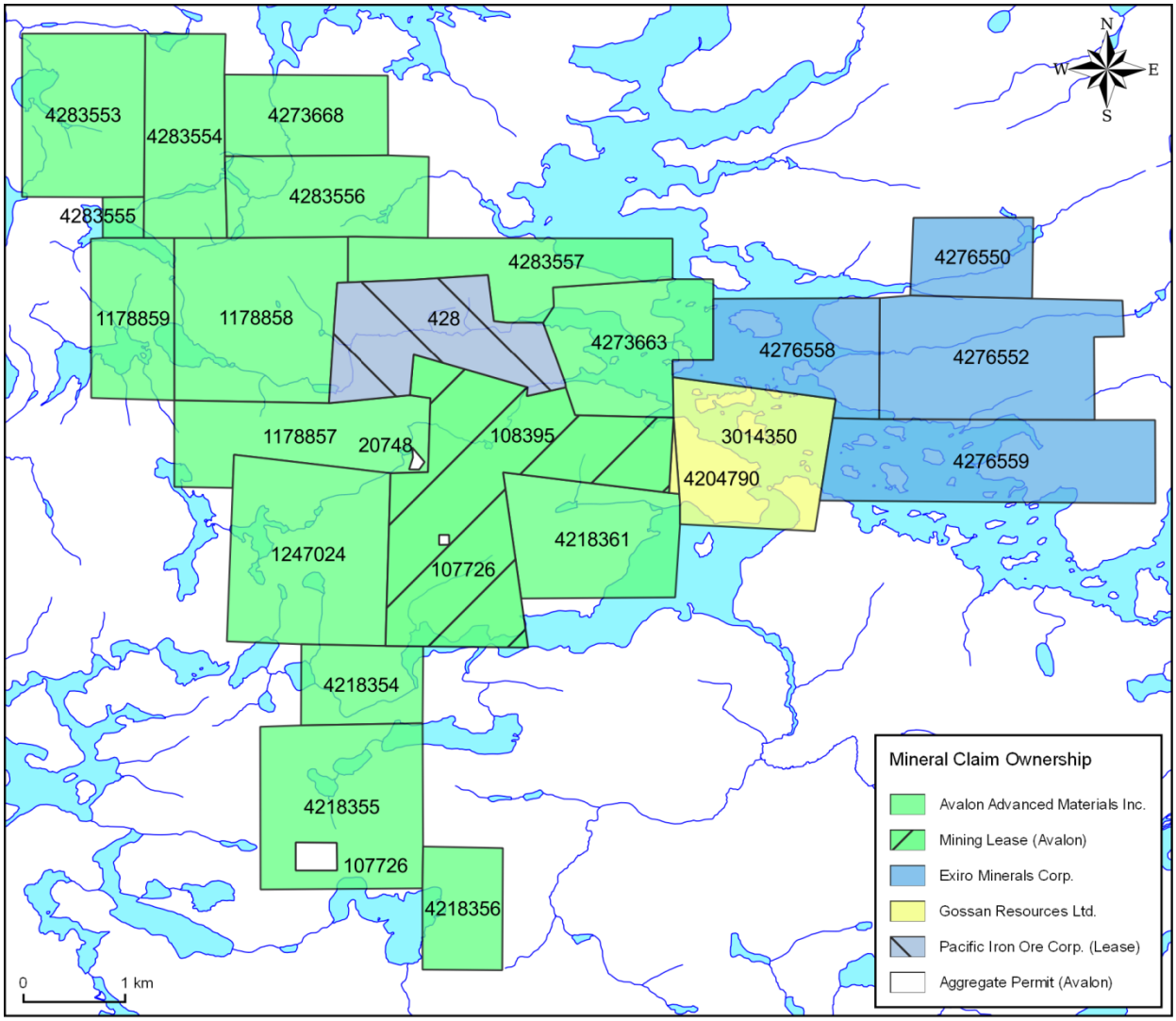

Fig. 1 Overview of the claims held by Avalon Advanced Materials Inc. in the Kenora Mining Division and adjacent properties.

2. Previous work

A brief timeline of the history of work performed on the Separation Rapids lithium pegmatite is provided below.

1994-1996	Ontario Geological Survey field program discovers lithium pegmatites in the Separation Rapids area
1996	Avalon Ventures Ltd. acquires the Separation Rapids prospect
1997 - 1998	Diamond drill program, 57 holes, Avalon Ventures Ltd.

1998 Resource estimate, 7.1 Mt grading 1.28% Li_2O and 0.34% Rb_2O, Avalon Ventures Ltd.

1998 Ground magnetometer survey, Avalon Ventures Ltd.

1998 Comprehensive geological report presented by Avalon Ventures Ltd.

1999 Prefeasibility study including a resource estimate of 11.6 Mt grading 1.34% Li_2O, Avalon Ventures Ltd. / MICON International Ltd.

2001 Geotechnical and definition diamond drill program, 12 holes, Avalon Ventures Ltd.

2016 Preliminary Economic Assessment, including a measured + indicated resource estimate of 8.00 Mt grading 1.29% Li_2O and 0.35% Li_2O (additional 1.63 Mt of inferred resources), Avalon Ventures Ltd. / MICON International Ltd.

3. Location and access

The Separation Rapids lithium pegmatite is located at easting 388,400 m and northing 5,569,000 m (UTM NAD83 Zone 15 N) or 94°33'57" west and 50°15'46" north. The project site access is via Highway 658 (Kenora-Redditt) turning onto the English River Road approximately 28 km north of Kenora for 38 km and following the Sand Lake Road for 5.5 km (gravel roads) and the Avalon Road, a dirt road, for 9 km.

4. Geological and mineralogical overview

The Separation Rapids pegmatite is hosted in mafic metavolcanics (amphibolites) of the Bird River greenstone belt and located between the English River and Winnipeg River Subprovinces in the north and south, respectively (Figs. 2, 3). It is part of a group of complex-type, petalite subtype LCT pegmatites, the biggest of which are the Separation Rapids (Big Whopper), Big Mack and Glitter pegmatites (Breaks & Tindle, 2002). It has been proposed that the pegmatites are genetically related to the 2646 Ma old (U-Pb monazite concordia age; Larbi et al., 1999) Separation Rapids pluton, which consists mainly of peraluminous S-type granite (Tindle & Breaks, 1998). The Separation Rapids pegmatite consists of variable proportions of albite, microcline, quartz, petalite, lepidolite (polylithionite-trilithionite solid solution series), spodumene, muscovite, biotite and minor garnet, topaz and apatite, trace cassiterite and tantalite (see Avalon Ventures Ltd., 1998, for further details). Spodumene replaced earlier primary magmatic

petalite in the deposit, a reaction which is expected at post-magmatic metamorphic temperatures (<650°C; London & Burt, 1982).

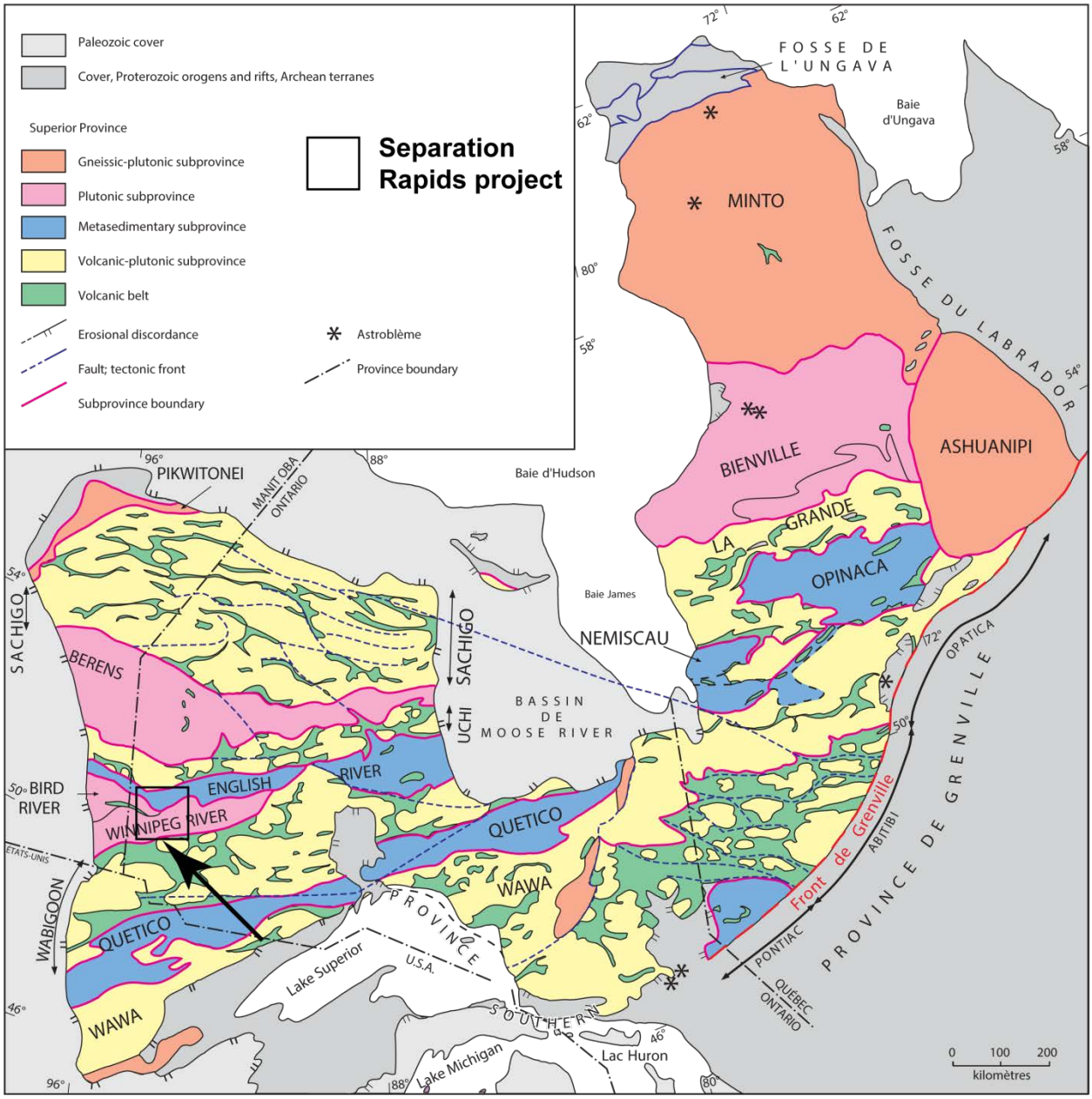

Fig. 2 Location of the project area in the Archean Superior Province. Modified from https://www.mern.gouv.qc.ca/english/mines/quebec-mines/2004-10/superior.asp.

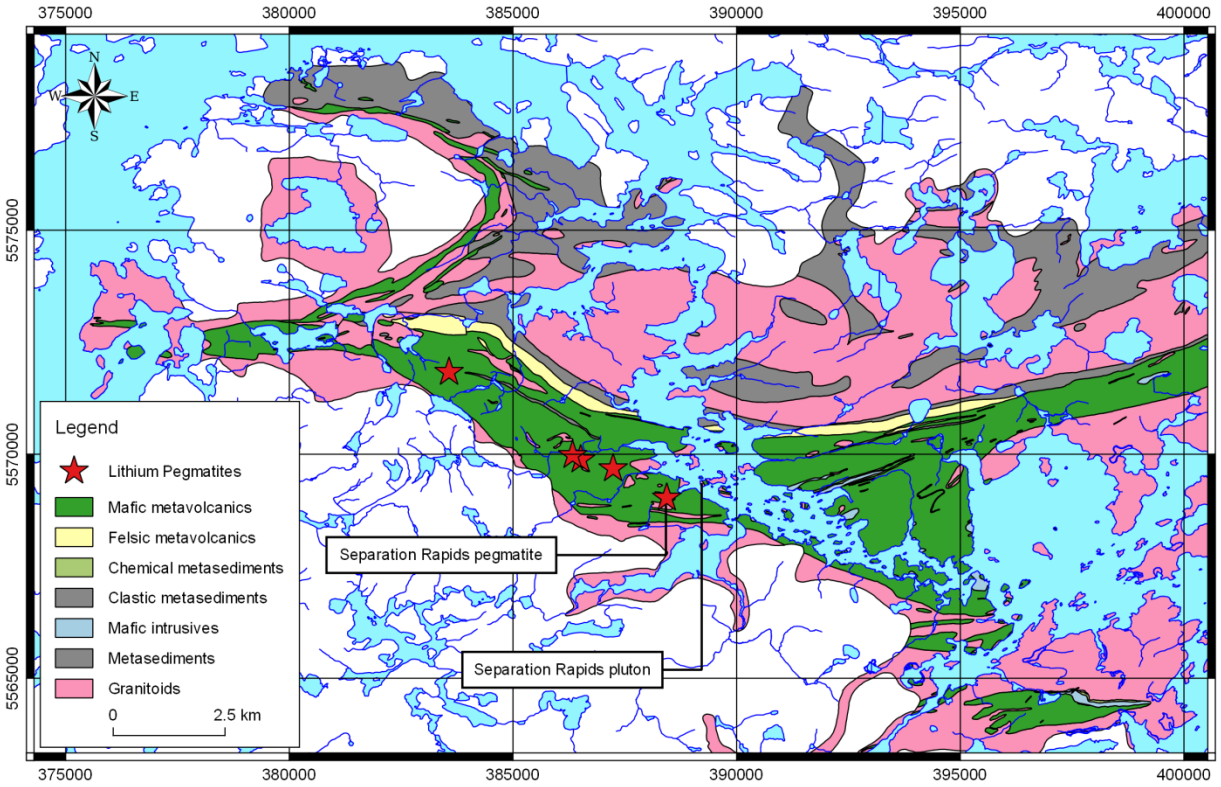

Fig. 3 Regional geology indicating the location of the Separation Rapids pegmatite. UTM NAD83 Zone 15N projection and grid. Digital map data from Blackburn et al. (2008).

The Separation Rapids lithium pegmatite generally follows a 116° strike direction that is similar to the regional strike of the amphibolite host rocks. There has been substantial ductile deformation of the Separation Rapids lithium pegmatites with evidence of polyphase folding parallel and perpendicular to the strike direction on both, large and small scales. Figure 4 shows an extreme example of the micro-folding experienced by an unmineralized albitic pegmatite.

Fig. 4 Tight isoclinal folding of an albitic dikelet (white) hosted in amphibolite (black) exhibiting thickening in the fold hinges and thinned limbs. Rock hammer for scale.

5. Diamond drilling

Avalon Advanced Materials Inc. contracted Boart Longyear of Calgary to perform the drilling in the Separation Rapids property using a Boart Longyear LF70 skid-mounted diamond drill rig.

5.1. Drill site locations

Five holes with HQ diameters, all located on Mining Lease 469, were drilled over a total cumulative drilled length of 1473 m (Table 1). These targeted the depth extension of the Separation Rapids lithium pegmatite, except for drill hole SR17-70, which targeted a magnetic low approximately along the western strike extension of the main pegmatite (Fig. 5). All drill holes are located at a sufficient distance from waterways (>30 m) and there is no risk of cuttings or muds being transported into small streams or the English River (Fig. 5). The drill hole locations were surveyed by Eric Rody of Rugged Geomatics of Kenora, certified Ontario Land Surveyor and Canada Lands Surveyor, using a Trimble RTK system consisting of two R8 receivers and high powered radio coupled to a TS2 data collector (see Appendix II for the survey data). The accuracy of the collar location surveys was estimated at 0.02 m in the vertical and horizontal directions. The starting azimuth was sighted by the geologist using a handheld compass;

the starting dip was set by the drill company. Downhole surveys were performed on all drill holes following hole completion (see Section 5.3).

Table 1: Collar locations and parameters of the holes drilled in 2017.

Hole ID	Easting [m]	Northing [m]	Elevation [m]	Length [m]	Starting azimuth	Starting dip
SR17-70	387210	5569404	342	276	180°	-45°
SR17-71	388201	5569172	365	243	180°	-55°
SR17-72	388279	5569144	355	228	180°	-55°
SR17-73	388454	5569133	344	390	165°	-63°
SR17-74	388674	5569035	326	336	180°	-70°

Coordinates are given in the UTM NAD83 Zone 15N system.

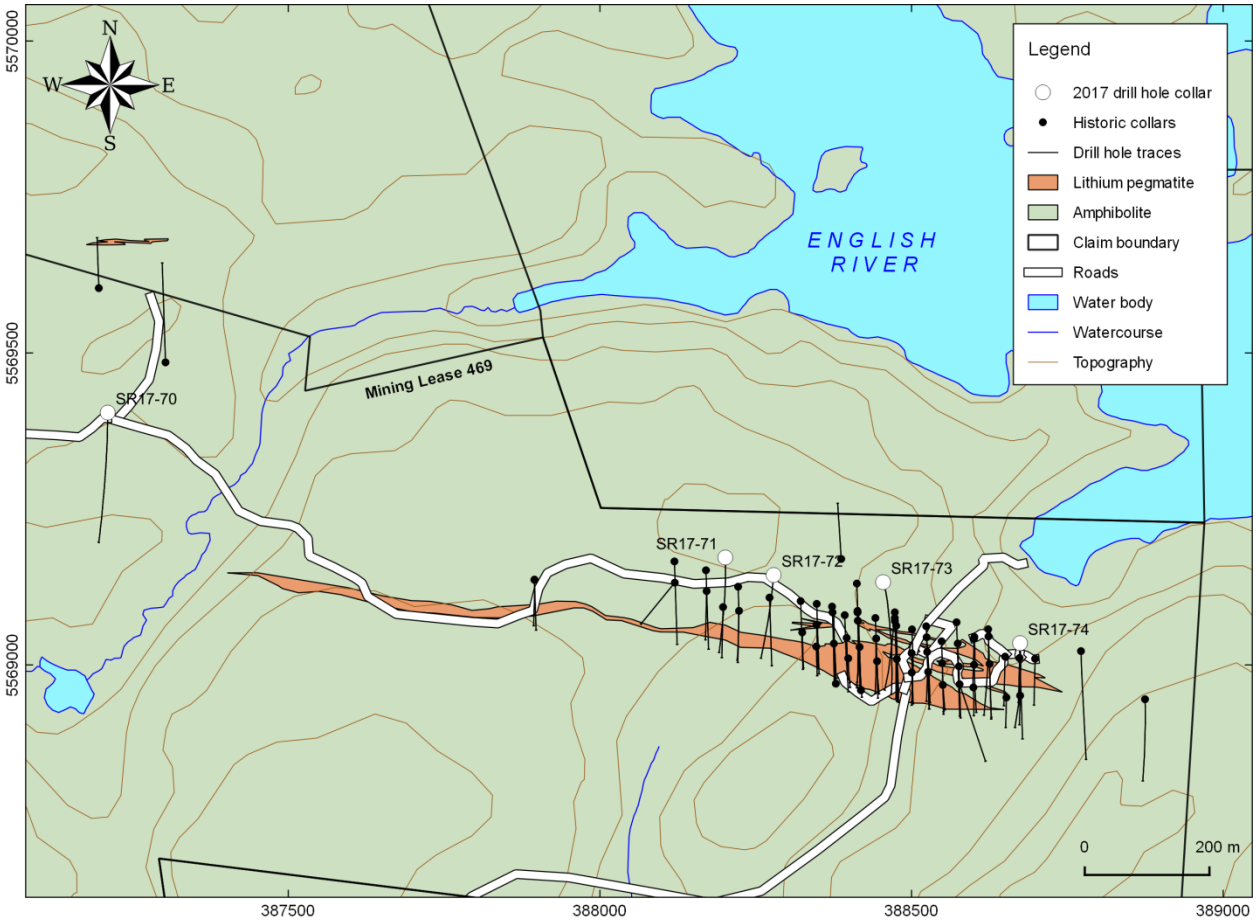

Fig. 5 Plan map of the historic and the 2017 diamond drill holes on the Separation Rapids property. The base map indicates the outcrops of lithium pegmatite, based on mapping by Avalon Ventures Ltd. (1998) and drill hole data. Coordinates: UTM NAD83 Zone 15N.

5.2. Drill hole conditions

None of the diamond drill holes intersected artesian groundwater. In drill hole SR17-71, reverse water circulation was lost during the setting of 1.5 m of casing. Drill hole SR17-73 intersected a fault zone from 319 to 352 m, which contains ground water as reported by the drill contractor. The water was not artesian and did not flow from the casing. The core was oxidised and weathered due to this water presence. All casings were left in the holes and drill holes SR17-72 and SR17-74 were sealed using aluminum screw caps to be accessible for environmental water testing purposes. Hole SR17-73 could not be capped with a screw cap due to damaged casing, but was covered with a tin can. All holes were marked using wooden pickets with reflective paint.

5.3. Downhole surveys

The downhole azimuth and inclination was surveyed using a magnetic Devishot multi-shot tool (Devico) at intervals of 6 metres (see Appendix III for the data). Measurements for which a disturbance of the normal magnetic field was indicated were removed from the data set. Magnetic reference data was obtained from the NRCAN calculator (http://geomag.nrcan.gc.ca/calc/mfcal-en.php) using the decimal degree coordinates 50.263446, -94.565650. The approximate values for the total intensity of magnetic vector and its inclination are 57100 nT and 75.2°, respectively. The following thresholds were used for deciding which data were disturbed:

- a deviation of >1000 nT for the magnetic vector
- a >1.5° deviation for the inclination of the gravity vector (indicates measurements that were taken while the instrument was moving). A 2% deviation from the drill hole average was used to eliminate potentially erroneous values.

Other outlier values were also removed, e.g, >1° variations of azimuth or dip over 6 m intervals. The measured azimuths were corrected using the magnetic declination relative to geographic north, 0.7°, and the UTM grid convergence, -1.35°. The azimuths are thus given relative to UTM grid north.

This procedure resulted in the removal of ~19% of the downhole survey data (Table 2). There was sufficient data left in all cases to confidently estimate the downhole parameters for each hole. The dips of the holes generally flattened and the azimuths curved in a dextral sense, i.e., with the drill rotation (Table

2). Verification of the downhole surveys for drill hole SR17-74 using a Reflex EZShot downhole survey tool indicates generally good reproducibility, except for a zone of magnetic disturbance (Fig. 6). As an additional quality control, the drill hole casing azimuths and dips were measured using a custom GPS apparatus by Rugged Geomatics of Kenora. The reproducibility is generally acceptable, except for drill hole SR17-73 (Table 3). This can be attributed to a disturbance of the casing by the bulldozer following drilling.

Table 2: Deviations of dip and azimuth in the surveyed drill holes

Drill hole ID	final depth [m]	no. of surveys removed of total	flattening [°] [a]	azimuth deviation [°] [a]
SR17-70	276	7 / 45	8.6	5.7
SR17-71	243	4 / 40	6.4	7.8
SR17-72	228	12 / 38	2.1	5.1
SR17-73	390	4 / 64	3.9	17.6
SR17-74	336	18 / 56	9.7	11.4

[a] Flattening of the holes and azimuth deviations calculated by subtracting the mean of the last four from the mean of the first four survey points.

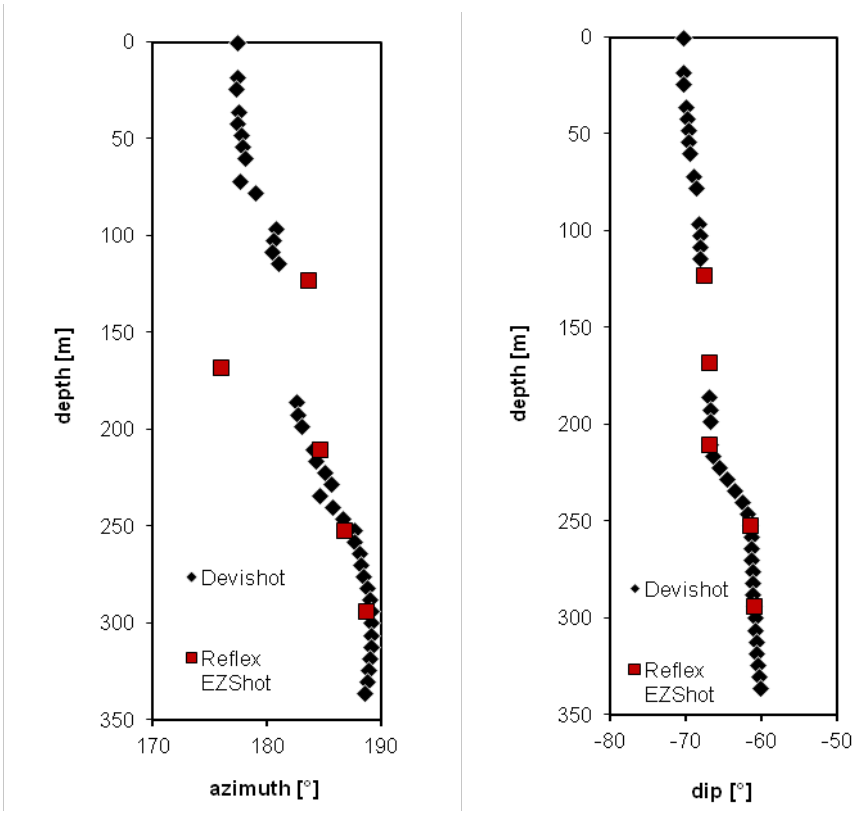

Fig. 6 Comparison between downhole surveys done using the Devishot and Reflex EZShot tools for drill hole SR17-74.

Table 3: Comparison of azimuth and dip as sighted, measured on the casing and as determined by downhole surveys

	Sighted values		measured casing		mean of first four downhole surveys	
DDH	Azimuth	dip	azimuth	dip	azimuth	dip
SR17-71	180	-55	178.5	-54.2	178.8	-54.0
SR17-72	180	-55	184.9	-54.2	185.7	-54.7
SR17-73	165	-63	160.7	-60.9	164.5	-64.9
SR17-74	180	-70	176.5	-68.9	177.4	-70.2

5.4. Drill site remediation

Following clean-up by the drill contractor, the drill sites were inspected upon completion of the holes and no pollution was observed. The drill sites that are not located on outcrop and the access trails were leveled using a bulldozer to remove disturbance in the muddy top soil. The sites were subsequently inspected and approved by the government Inspection Officer.

6. Logging procedure

As the initial step, the field geologists ensured that the drill core was in the boxes in the correct sequence, core pieces matched, and that the metre label blocks (inserted by the drillers after each run, i.e., every 3 m) were in the correct locations. This was followed by geotechnical and geological logging and measurement of the rock densities and magnetic susceptibility.

6.1. Geological Logging

The geological logging followed the previously established framework of lithological units for the Separation Rapids pegmatite (Avalon Ventures Ltd., 1998; Table 2). Segments less than 30 cm thick in apparent thickness were generally not logged as individual units.

Table 4: Lithological units in and around the Separation Rapids pegmatite (summarized from Avalon Ventures Ltd., 1998)

Lithocode			Unit Name	Notes	Distinguishing characteristics
Ovb				Overburden	
1			Amphibolite (Separation Lake Metavolcanic Belt)		
	A		Amphibolite		- Dark green-grey - Fine-grained, locally coarse, foliated and folded - Local preservation of pillow flows - Li and Cs metasomatism adjacent to pegmatite dykes: holmquistite (blue-violet acicular Li-bearing amphibole) and glimmerite (black-brown Cs-rich phlogopite).
	B		Intrusive equivalent		coarse-grained variety of the amphibolite
2			Pegmatitic granite (Winnipeg River Batholith)		- Medium-grained, locally megacrystic, massive to poorly foliated - K-feldspar, quartz, albite
3		Separation Rapids Pegmatite	Albitite	wall zone	A few cm to 15 m wide, max. length of 120 m.
	A		aplitic		grey-white to light pink Fine- to medium-grained, equigranular to seriate textures locally magmatic banding (albite-rich and K-feldspar-rich layers). - Aplitic albite is the most common constituent. abundances of albite and K-feldspar variable.
	B		mottled		mottled grey, heterogeneous, medium grained to megacrystic albite, K-feldspar in variable contents light pink-orange K-feldspar megacrystals in finer-grained albitic groundmass
4			Megacrystic K-feldspar-quartz zone		- Potassium feldspar, albite, mica - Coarse-grained, subhedral potassium feldspar megacrystals (larger than 5 mm) in a finer-grained (<2 mm) matrix of subhedral quartz, albite, potassium feldspar and minor mica. - Very minor petalite
5			Quartz-mica zone	Quartz core	- Coarse grained, dominated by dark anhedral quartz with subordinate interstitial mica and K-feldspar - No obvious petalite.
6			Petalite-bearing zone		Petalite Pegmatite
	A		Web-textured white petalite subzone (petalite - albite - K-feldspar - quartz)	possibly alteration zone?	web / net textured white petalite + coarse K-feldspar, Li-mica envelopes around K-feldspar, petalite and in the matrix (albite + quartz groundmass) in thin section: spodumene
	B		Pink petalite subzone (petalite - quartz - albite - K-feldspar - mica)		megacrystic to porphyritic textures, pink to blue petalite
	C		Cataclastic 6AB (petalite - quartz - albite - mica - K-feldspar)	possibly structural zone?	finely-banded, strongly mylonitized / cataclastic fine- to medium-grained petalite and feldspar mylonitized equivalent of 6A and 6B with coarser bands/lenses of 6A and 6B
	D		Lepidolite subzone (petalite - lepidolite (Li/Rb-rich mica)- albite - K-feldspar)	occurs in dikes along north and east of unit 6	10-25% lepidolite (purple), petalite, albite, K-feldspar, accessory fluorapatite and topaz, heterogeneous texture
7			Pegmatite granite	feldspathic wall zone	Heterogeneous, medium grained and locally containing megacrystic K-feldspar. along south contact likely equivalent to 3B/4 (possibly merge for modeling) - could be similar to the pegmatitic granite (Separation Pluton)
8			Pegmatitic granite (Separation Rapids Granite)	Unit 3e on Pedersen, 1998 map	pegmatitic granite, locally with coarse muscovite
IF			Iron formation		sulfide-enriched lenses (mostly occurs outside of the deposit area)

6.2. Geotechnical Logging

For each drill hole, the rock quality designation was recorded. For three drill holes, detailed structural logs were prepared according to guidelines recommended by DST Consulting Engineers of Thunder Bay, Ontario. The geotechnical details of the waste rock as well as mineralized rock are critically important to determine rock stability for an open pit mine. The parameters are described in detail below.

Total core recovery (TCR)

Measured length of the core that was recovered in a run, divided by the total length of the run, given in percent.

Solid core recovery (SCR)

Measured length of all core pieces that have a full diameter, divided by the total length of the run, given in percent.

Rock quality designation (RQD)

Measured length of all core pieces that have a full diameter and that are longer than 10 cm, divided by the total length of the run, given in percent.

Fracture Index (FI)

The rocks were divided into zones of similar fracture density. A new zone was started at each lithological boundary. Thin, highly fractured zones were broken out separately. The fracture index is defined as the number of fractures per interval divided by the length of the interval. In case the core is not intact (rubble, impossible to piece together), the fracture index of the zone was designated as NI, not intact. In cases where there were too many fractures to count them, the zone was designated the code HF (highly fractured) and given the number 99 as the fracture index.

Rock material Strength

Each zone of similar rock strength was classified separately, e.g., different lithologies, alteration zones or mineralogical zones, because the underlying rock properties affect the rock strength. Table 5 shows details on how the strength was determined on a scale from R0 (weak) to R6 (strong). Decimals were used (e.g., 4.5 for amphibolite).

Table 5: Rock Material Strength parameter

Grade	Descriptor	Field identification	Examples
R0	extremely weak rock	indented with thumbnail	
R1	very weak rock	crumbles under firm blows with point of pick, can be peeled with knife	
R2	weak rock	can be peeled with a knife with difficulty, shallow indentations made with firm blow of pick	
R3	medium strong rock	cannot be scraped or peeled with a knife, can be fractured with a single hammer blow	
R4	strong rock	requires more than a single hammer blow to fracture	amphibolite (planar mineral orientation allows rock to fracture along these planes of weakness)
R5	very strong rock	requires many hammer blows to fracture	unaltered granite, granitic pegmatite (interlocking grain boundaries yield high rock strength)
R6	extremely strong rock	can only be chipped with a pick	silicified rocks

Weathering

The weathering intensity was assessed on a scale from 1 (fresh) to 6 (completely weathered), as detailed in Table 6.

Table 6: Weathering grades

Grade	Descriptor	Field identification
1	Fresh	No visible sign of rock weathering.
2	Slightly weathered	Discoloration indicates weathering of rock and discontinuity faces.
3	Moderately weathered	Less than half of the rock is decomposed/disintegrated to soil.
4	Highly weathered	More than half of the rock is decomposed/disintegrated to soil.
5	Completely weathered	rock decomposed/disintegrated to soil. Original structure still largely intact.
6	Residual soil	rock converted to soil. structure and fabric destroyed.

6.3. Density

The rock density was determined for drill cores SR17-71 to -74 in 5 m intervals by weighing pieces of core approximately 15 cm in length in air and in water, and calculated using Formula 1. It was confirmed that the scale had reset to zero before each measurement.

$$\text{density} = \frac{\text{weight in air}}{\text{weight in air} - \text{weight in water}} \qquad \text{Formula 1}$$

7. Sampling

A total of 395 geochemical samples of pegmatite, granite and wall rock amphibolite were prepared using the methods outlined in the following.

7.1. Sampling methods

All lithium pegmatites (unit 6) and representative intersects of other pegmatites were sampled in continuous two-metre intervals, unless geological contacts made a shorter interval necessary. Representative 0.5 m samples of the amphibolite host rock (unit 1) were collected in drill holes SR17-71 to -74 every 5 metres. The core was split and half of the drill core was sampled. Sample numbers were written on the plastic sample bags and the corresponding tag from the sample book was placed inside the bag. The plastic bags were sealed using standard single-use zip ties. Four in-sequence 100 g pulp samples of amphibolite were blended by the laboratory to form composite samples which were then analyzed.

7.2. Sample security

Five to ten samples were placed in rice bags which were sealed using single-use zip ties and stored on private property near the project site until they were shipped to the ALS laboratories in Thunder Bay via truck operated by Manitoulin. The content of each rice bag was recorded on the bag itself and on the shipping sheets. At ALS Laboratories, staff verified the shipment contents.

7.3. Drill core storage

Following sampling the drill core was stored in racks on the project site which were sealed with plastic tarps. The core racks are located >30 m away from water bodies.

8. Analytical methods

All samples were prepared by ALS Laboratories in Thunder Bay and analyzed by ALS Laboratories in Vancouver, except for a batch of pulp duplicates which was analyzed by SGS Laboratories. The total number of analyses, including those of standards, blanks and duplicates, was 1292 (Table 7).

Table 7: Details for each analytical batch

Invoice	Certificate	Laboratory	Analytical Code	Quantity
3911420	TB17103883	ALS Canada Ltd.	ME-MS81D	267
3911420	TB17103883	ALS Canada Ltd.	F-IC881	267
3911420	TB17103883	ALS Canada Ltd.	ME-4ACD81	267
3911420	TB17103883	ALS Canada Ltd.	Li-OG63	95
3944647	TB17138018	ALS Canada Ltd.	Li-OG63	68
3938567	TB17127319	ALS Canada Ltd.	ME-MS81D	36
3938567	TB17127319	ALS Canada Ltd.	ME-IR08	97
3938567	TB17127319	ALS Canada Ltd.	Hg-MS42	36
3938567	TB17127319	ALS Canada Ltd.	F-IC881	36
3963648	TB17155276	ALS Canada Ltd.	ME-4ACD81	7
3970537	TB17160753	ALS Canada Ltd.	Li-OG63	20
3975772	TB17162674	ALS Canada Ltd.	ME-4ACD81	30
3980925	TB17167448	ALS Canada Ltd.	ABA-PKG05	10
11085205	LK1701345	SGS Canada Inc.	ICM90A	28
11085205	LK1701345	SGS Canada Inc.	ICM40B	28
			Total	1292

8.1. Pegmatites

The first step was to weigh each sample. Then the entire sample was coarse-crushed to 70% passing 6 mm, followed by crushing to minimum 90% passing 2 mm. A 1 kg split was then pulverized to >95% passing 106 µm. The crushers and pulverisers were cleaned with barren material after each sample.

The pulps were analyzed using methods ME-MS81d (via fused bead, acid digestion, major elements, Al_2O_3, BaO, CaO, Cr_2O_3, Fe_2O_3, K_2O, MgO, MnO, Na_2O, P_2O_5, SiO_2, SrO, TiO_2, LOI, by ICP-AES; trace elements, Ba, Cr, Cs, Ga, Hf, Nb, Sn, Sr, Ta, Th, U, V, W, Zr, REE, by ICP-MS and ME-4ACD81 (four acid digestion and ICP-AES analysis of Ag, As, Cd, Co, Cu, Li, Mo, Ni, Pb, Sc, Tl, Zn). Samples which contained >5000 ppm Li were re-analyzed using four-acid digestion and ICP-AES (ore grade lithium method Li-OG63).

8.2. Amphibolite wall rock

A suite of samples of the amphibolite wall rock was sampled and analyzed for environmental purposes related to handling of waste rock.

Major, minor and trace element analyses

The samples were crushed to >70% passing 2 mm and a riffle split of 250 g was pulverized to >85% passing 75 µm, followed by the following compositing and analytical scheme:

1.) Sample IDs 671826 - 671855 & 671892 - 671946

i. Analyse carbon & sulphur via ME-IR08 (Leco furnace method)

2.) Blend all samples, using subsamples, according to attached list following this procedure:

i. Make a 100 g split of each pulp using a rotary splitter
ii. Homogenize 100 g of pulp from each subsample to form a new composite sample according to the attached listing, where the composites have a sample number ending in “a”

3.) Analyze blended samples as follows:

3a.) For samples V671801a - V671825a & 671856a - 671888a

i. Carbon & sulphur via ME-IR08 (Leco furnace method)
ii. Fluorine via F-IC881 (KOH fusion and ion chromatography)
iii. Mercury via Hg-MS42 (trace level Hg by aqua regia and ICP-MS)
iv. Major & trace elements via MS81d (see section 8.1 for details)

3b.) Samples 671826a - 671854a & 671892a - 671944a (Carbon and sulphur already completed as note 1(i) above

i. Fluorine via F-IC881
ii. Mercury via Hg-MS42
iii. Major & trace elements via MS81d

Acid-base accounting analyses

Ten samples of the amphibolite were analyzed by ALS Laboratories using the acid-base accounting package ABA-PKG05. This package includes the measurement of the neutralization potential (Sobek method), total sulfur, HCl-leachable sulfate sulfur, total sulfate sulfur by carbonate leach, sulfide sulfur by difference, and inorganic carbon. The samples were a representative suite from the analytical pulps already prepared for the general analysis program.

8.3. Oxide conversion factors

The conversion factors in Table 8 were used to convert elemental concentrations to weight % oxide. The factors are the same as in Avalon Ventures Ltd. (1998).

Table 8: Element to oxide conversion factors

$Li \rightarrow Li_2O$	2.1528
$Cs \rightarrow Cs_2O$	1.06
$Rb \rightarrow Rb_2O$	1.094
$Ta \rightarrow Ta_2O_5$	1.221

9. Quality assurance and quality control (QAQC)

9.1. External standards

Avalon's standard

Avalon had previously prepared a certified analytical standard for the project utilizing rock material from the Separation Rapids deposit. This analytical standard, SR2016, was created from rock collected off the Separation Rapids deposit outcrop, prepared at CDN Laboratory in British Columbia and was subject to a Round Robin involving six independent laboratories in Canada and Australia. The certified value for the standard based on the round robin is 1.488 ± 0.039 wt. % Li_2O (1 σ).

Together with the drill core assay batches, powders of Avalon's lithium standard were analyzed (Fig. 7) with one standard inserted per 25 samples. Overall, the values range between -1.5% and +4.9% from the expected value, which exceeds the standard deviation of the inter-laboratory round robin (σ = 3.8%) by 1.1%. Batch TB17138018 shows a slightly stronger positive bias (+2.9%) compared to batch TB17103883 (+1.9%, Fig. 7). For the entire data set, there is a small positive bias in the analyses compared to the previously established standard values (+2.0%). This bias is considered by Avalon to be acceptable for resource estimation purposes.

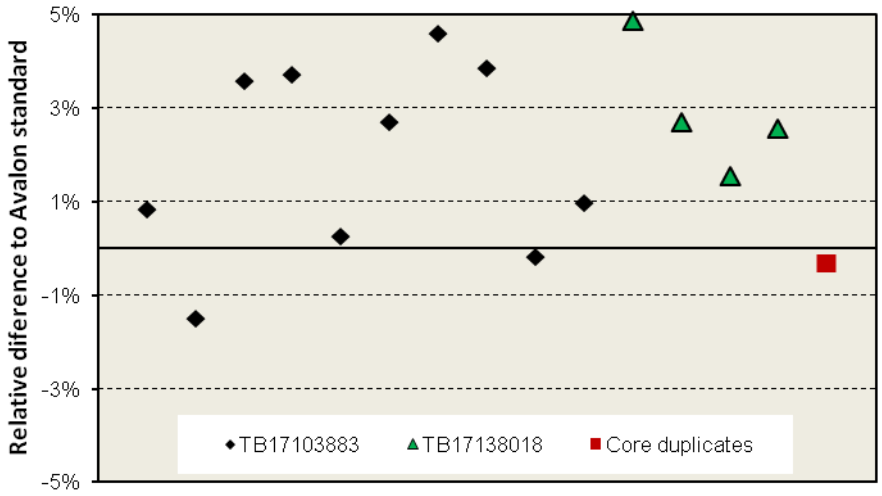

Fig. 7 Relative differences of repeat analyses of Avalon's lithium standard (N = 15) to the established inter-laboratory value. The analyses are shown in ascending sample number sequence for each batch.

Standards run by the laboratory

The quality control summaries prepared by the laboratories are included in Appendix IX. The reproducibility of the reference values for lithium in standards with ore-grade concentrations (NCSDC86303, NCSDC86304, SRM 181, SRM-183) is between -3.9% and +3.2% and averages 2.1%. For Cs, Rb and Ta, the average deviation from the reference values of standards AMIS0085, AMIS0167, AMIS0304 and SY-4 (all contain these elements in trace concentrations) is 9.7% on average, excluding the Ta concentrations measured for AMIS0304, which are 119 to 145% higher than the provisional reference value. This is likely a problem related to the provisional data of this standard, as the other standards were reproduced correctly.

9.2. Field blanks

As a field blank, inserted with every 40 samples, silica sand was used. In all field blank analyses, lithium was at or below the detection limits of the analytical methods (10 ppm for ME-MS81, 50 ppm for OG63), Rb ≤ 7.5 ppm, Cs ≤ 0.76 ppm and Ta ≤ 0.4 ppm. There is thus no evidence for contamination or sample switching.

9.3. Laboratory blanks

The laboratory blanks were at or below the detection limit for lithium via method OG63 (50 ppm), and with method ME-MS81 for Li (10 ppm), Rb (0.2 ppm) and Ta (0.1 ppm). The blanks for cesium were lower than 0.06 ppm (detection limit 0.01 ppm).

9.4. Within laboratory duplicates

The laboratories conducted duplicate analyses of prepared pulps. For lithium concentrations above 0.1 wt. %, the duplicates were reproduced with deviations from the first assay of less than 1.8%. For Rb, Cs and Ta, the deviations of the duplicate analyses are 5.3% on average and range from -4.7 to 30.6% with the largest deviations for trace concentrations. These duplicate results are considered acceptable by Avalon.

9.5. Core duplicates

Four core duplicates of medium- to high-grade samples were randomly chosen and analyzed to evaluate the reproducibility of the assay data and the presence or absence of bias in sampling, i.e., during the core splitting process. Standards and blanks in the same sample batch as the duplicates showed no values outside the acceptable range.

The duplicate assays show a good reproducibility for lithium (-8 to +3% difference between original and duplicate sample) and acceptable reproducibility for Rb, Cs and Ta (-30 to +26%) for three of the samples (Table 9). One sample (drill hole SR17-73 from 279 to 281 m) however, shows a large deviation of +63% from the original assay for lithium (the other elements show moderate deviations within the range of the other samples). Notably, this sample has a significantly lower lithium concentration than the other three samples. Inspection of the corresponding drill core photos of this samples showed coarse patchy petalite + spodumene, indicating that nuggety mineralization may be responsible for the higher lithium concentration due to sample inhomogeneity.

The data indicate that in three out of four randomly chosen medium- to high-grade core duplicate samples, there is no bias in the lithium grade due to the core splitting. However, in one of the four core

duplicates (a sample with an atypical nuggety texture), there is a significant bias with the duplicate being 63% higher than the original assay.

Table 9: Core duplicate analyses with corresponding original assays and relative deviations

			Core Duplicate analyses				Original analyses				Deviations			
Hole ID	from [m]	to [m]	Li [wt. %]	Rb [ppm]	Cs [ppm]	Ta [ppm]	Li [wt. %]	Rb [ppm]	Cs [ppm]	Ta [ppm]	Li	Rb	Cs	Ta
SR-17-71	199	201	0.879	4250	51.6	56.2	0.86	4770	51.5	67.3	2%	-11%	0%	-16%
SR-17-72	179	181	0.684	4330	52.4	70.8	0.74	4940	74.4	56	-8%	-12%	-30%	26%
SR-17-73	279	281	0.688	2630	33.3	71.2	0.423	3630	44.5	66.6	63%	-28%	-25%	7%
SR-17-74	145	147	0.844	8990	328	156	0.819	8550	318	166.5	3%	5%	3%	-6%
averages			0.774	5050	116.3	88.6	0.711	5473	122.1	89.1	15%	-11%	-13%	3%

With the exception of one outlier, the results of this work indicate that there is no significant sampling bias (Table 9). In fact, the average of the original analyses is slightly lower than the duplicate core samples (0.711 vs. 0.774 wt. %, Table 9), indicating that there was no positive bias in the sampling.

9.6. Pulp duplicates

Five Li-mineralized drill core pulp samples (Li = 0.80 - 0.92 wt. %), which were selected by Avalon, were re-analyzed in a separate assay batch by ALS Laboratories using method OG63 in batch TB17138018. The reproducibility for lithium was better than 1.2% in all cases and -0.7% on average.

9.7. Reject duplicates analyzed by the secondary laboratory

Twenty-six reject duplicates were analyzed by a secondary laboratory, SGS Canada Inc. The samples were 250 g split off the 90% passing 2 mm crushed material using a riffle splitter and then pulverized by the secondary laboratory. By using the reject material, the variance includes sample heterogeneity after the second crushing stage in addition to analytical factors. The analyses show that there is no substantial systematic bias in the lithium concentration (with an overall average difference of -1.6% relative to the primary laboratory) and that the average absolute deviation is 14%, a value deemed acceptable (Figs. 8, 9). Four outliers among the duplicates with >20% deviations (included in the calculated mean) deviate by -39%, +72%, +25% and -30% relative to the lithium assays by the primary laboratory (Figs. 8, 9).

Similarity among the other measured elements precludes the possibility that the sample were switched accidentally. Hence, the deviations are due to sample heterogeneity and measurement errors.

For Rb, there are 8 duplicate samples with deviations between 21 and 65%; one duplicate deviates by 159%. The average absolute deviation is 22%. Despite these elevated deviation values, there is no significant systematic bias; the duplicate analyses are on average -1.9% lower than those of the primary laboratory. The duplicate analyses for Cs are on average 16% lower than those by the primary laboratory and the absolute deviations average 21%. The large deviation and negative bias are likely due to the low concentrations of Cs (2.9 - 342 ppm, one sample with 2495 ppm) and possibly an analytical problem. Tantalum (also present in low concentrations, 1 - 134 ppm) is on average 1.3% lower than in the analyses by the primary lab (i.e., a very small negative bias) and the average of the absolute deviations is 30%.

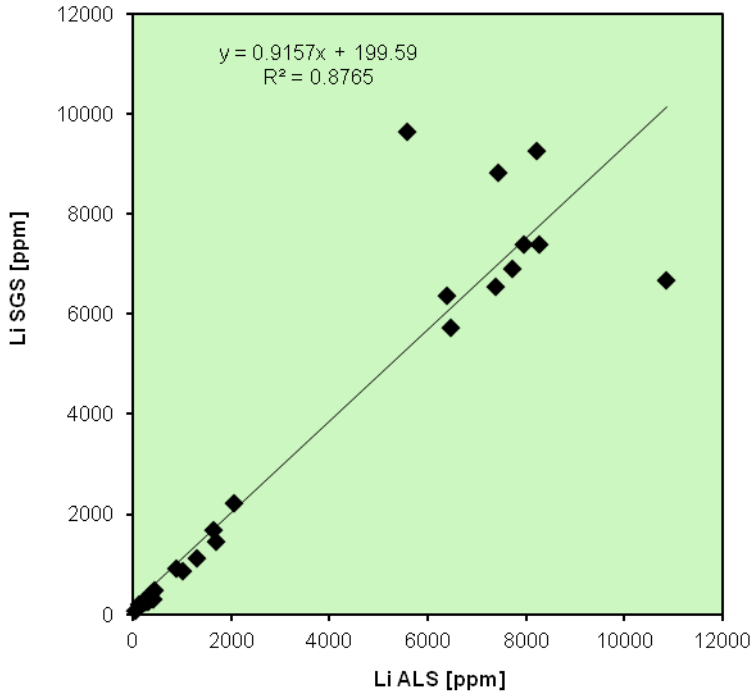

Fig. 8 Comparison between the assays of pulp duplicates analyzed by the secondary laboratory (SGS) and those analyzed by the primary laboratory (ALS).

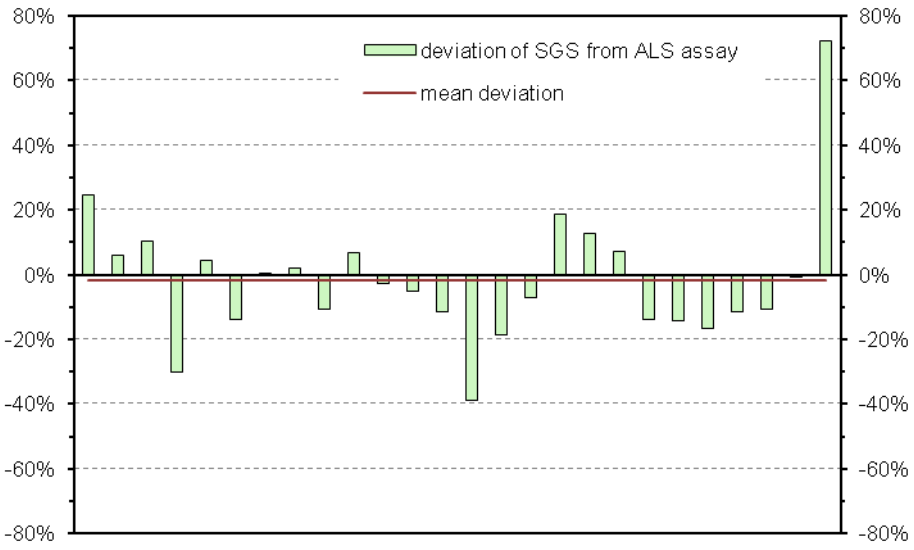

Fig. 9 Deviation of individual lithium analyses (N = 26) relative to the primary laboratory and average of all deviations. The x-axis represents the sequence of sample IDs in ascending order.

10. Drilling results

10.1. Geology

Detailed geological logs are provided in Appendix IV. Drill hole SR17-70, which tested the western strike extension of the main lithium pegmatite (Fig. 5), intersected a series of granite intrusions that are likely related to both the Winnipeg River and Separation Rapids plutons. A clear visual distinction between these two rock units is difficult due to a lack of definitive criteria. No lithium minerals or pegmatites are present in the drill core.

All four holes that were drilled into the main lithium pegmatite (SR17-71 to -74, Fig. 5) intersected the targeted depth extensions of petalite + spodumene and lepidolite + petalite pegmatite (see cross-sections in Appendix VI). Although the thickness of the pegmatite was thinner than anticipated in all cases (Appendix VI), this demonstrates excellent vertical geological continuity of the pegmatite. In addition to intersecting the main lithium pegmatite at depth, drill hole SR 17-73, the deepest hole drilled into the deposit to date, intersected a thin petalite pegmatite from 354.6 - 355.9 m which is mantled by albitite (see section 388460 East in Appendix VI). This interval follows an interval of albitic pegmatite which

contains only minor lithium mineralization. Drill hole SR17-74 in the east of the main pegmatite (Fig. 5) intersected a lithium zone (unit 6 C/A/B) from 282.7 to 306.6 m, which is significantly thicker than indicated by the previous shallower drilling on section 388675 (Appendix VI).

10.2. Geotechnical characteristics of the rocks

Geotechnical logging provides critical data for open pit and underground mine design. Hence, detailed geotechnical logs were prepared for three drill holes, in the west, east and center of the lithium pegmatite (Appendix V). Only minor to absent weathering was observed at the top of the drill holes. With rare exception, the rock material strength is strictly a function of the rock type, with the granites and granitic pegmatites being somewhat more competent than the amphibolite, which displays brittle fractures due to the foliation planes defined by oriented amphibole. Core recovery and RQD are high in all three drill holes that were studied (average solid core recoveries range from 96 to 99%, RQD from 92 to 94%, excluding a fracture zone; Table 10). Lower solid core recoveries and RQD values were only observed in a fracture zone in barren pegmatite at the bottom of drill hole SR17-73 from 319 to 352 m (Table 10). The fractures dip subparallel to the core axis in this fracture zone (see detailed log in Appendix IV). The fracture index is elevated at the top of the holes (due to surface fractures), in thin zones throughout the otherwise competent rocks, and in the deep fracture zone in drill hole SR17-73 (Fig. 10). The amphibolite has an elevated average fracture index (14.8) compared to the pegmatites (0 to 12.9) and the lithium pegmatites have the lowest fracture indices (Table 11).

Table 10: Summary of the geotechnical parameters in drill holes SR17-71, -73 and -74

	Total core recovery		Solid core recovery		RQD	
Drill hole	**minimum**	**average**	**minimum**	**average**	**minimum**	**average**
SR17-71	95%	100%	77%	96%	70%	92%
SR17-73 excluding fracture zone	94%	100%	85%	98%	62%	93%
SR17-73 fracture zone	98%	100%	69%	92%	3%	68%
SR17-74	95%	100%	85%	99%	59%	94%

Table 11: Average fracture indices (fractures per metre) for each rock unit in drill holes SR17-71, -73 and -74

Rock unit code	Lithology	Mean fracture index	No. of intervals
1	Amphibolite	14.8	252
3	Pegmatite	12.9	76
5	Pegmatite	13.3	10
6A	Lithium pegmatite	2.2	21
6B		0	1
6C		1.5	1
6D		8.3	18
7	Pegmatite	4.2	1
90	Fault zone	89.6	9

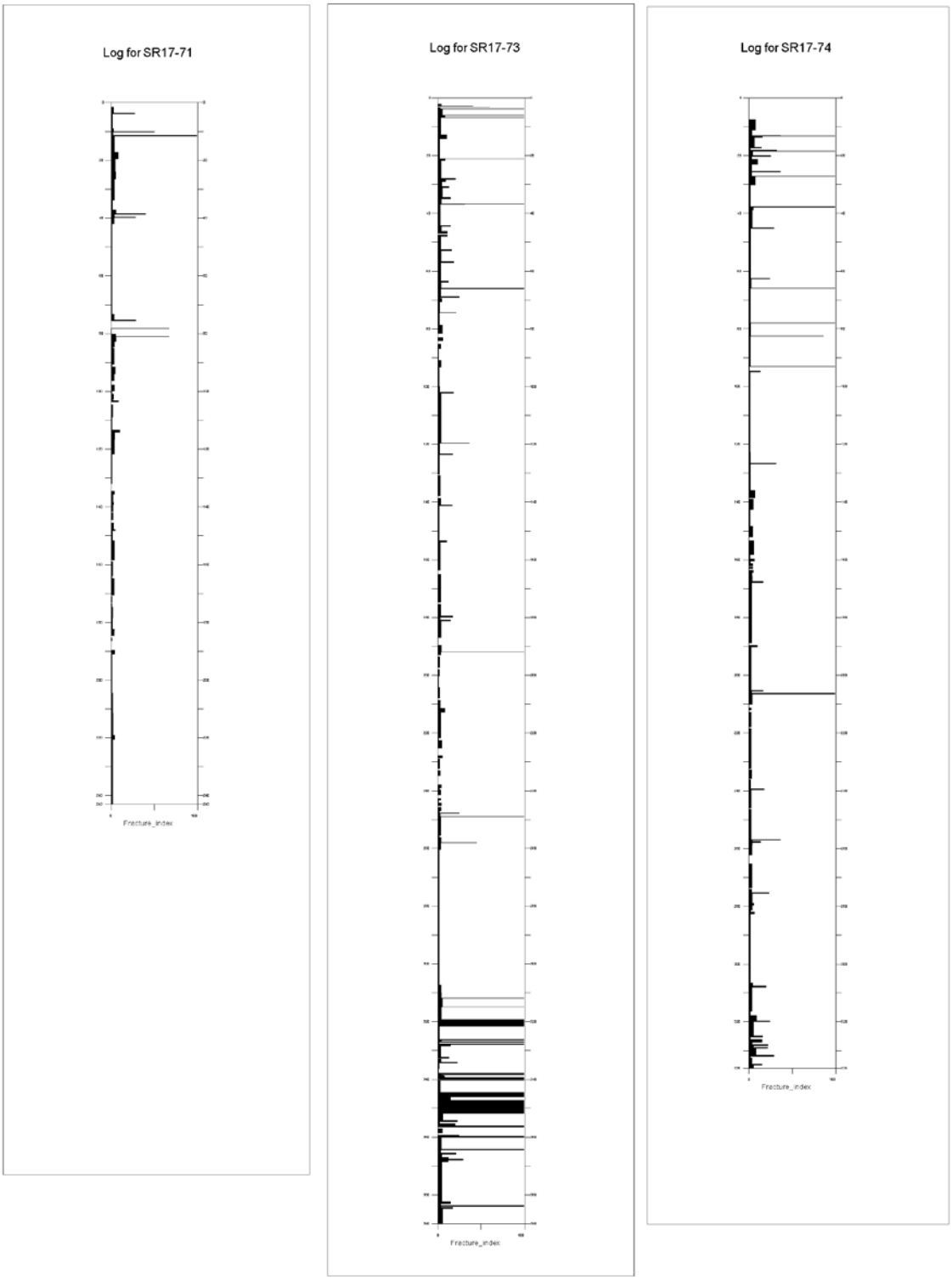

Fig. 10 Fracture index (scale: 0 to 100 fractures per metre) for the three studied drill holes in the west (SR17-71), center (SR17-73) and east of the lithium pegmatite (SR17-74).

10.3. Rock density

The rock density data are listed in Appendix VIII. Including the historic data, the density for units 6 a, b and c combined and for units 6 d and 1 were calculated (Table 12). The data are similar to previously published values (pegmatite: 2.62 t/m^3, amphibolite: 3.04 g/m^3; Avalon Advanced Materials Inc., 2016).

Table 12: Calculated mean rock densities in metric tonnes per cubic metre (t/m^3)

Rock unit	Mean density [t/m^3]	Standard deviation [t/m^3]	Number of samples
6ABC	2.65	0.10	89
6D	2.62	0.06	36
1	3.01	0.12	230

10.4. Geochemistry of the granites and pegmatites

A total of 252 granite and pegmatite samples from the five drill holes were analyzed. Although only trace levels of lithium were observed in drill hole SR17-70 (<0.06 wt. % Li_2O), rubidium is elevated in several two-mica granite intervals: 0.260 wt. % Rb_2O over 5.1 m from 11.4 - 16.5 m and 0.163 wt. % Rb_2O over 36.2 m from 106.1 to 142.2 m (Appendix VII, original assay certificates are included in Appendix IX). The latter interval was tested using two metre-long samples every six metres and was logged as Separation Rapids granite. The first interval was logged as Winnipeg River granite, but the Rb-enrichment suggests that a genetic association with the Separation Rapids pluton is more likely. The Rb-enrichment, which is similar to that of the main lithium pegmatites, indicates that there is potential for the presence of further lithium-enriched pegmatites in the vicinity of the granites intersected by drill hole SR17-70.

The significant drill hole intersects of Li-Rb pegmatite are listed in Table 13. The horizontal thickness was approximated using the collar dips and assuming that the pegmatites have a vertical dip. The grades of the intercepts are in most cases higher than the averages previously estimated for the deposit (1.29% Li_2O, 0.35% Rb_2O; Avalon Advanced Materials Inc., 2016), indicating a substantial grade increase with depth. The Rb concentrations are higher in the lepidolite-rich zones (unit 6 D) compared to the petalite-dominated units (6 A, B, C) indicating that Rb is preferentially enriched in lepidolite (Table 13).

The high lithium grades in the deep intersect of drill hole SR17-74 (1.565 wt. % Li_2O, Table 13) which grade vertically upwards into weakly mineralized pegmatite (section 388675 in Appendix VI) provide evidence for the geochemical prospectivity of the deeper parts of the pegmatite.

Table 13: Significant lithium pegmatite intersects with length-weighted average grades

Drill hole	Depth from [m]	To [m]	Apparent thickness [m]	Horizontal thickness [m]	Li_2O [wt. %]	Rb_2O [wt. %]	Rock unit
SR17-71	184.5	211.3	26.9	15.4	1.176	0.428	6 D, A
SR17-72	172.1	186.2	14.1	8.1	1.431	0.412	6 D
SR17-72	200.5	212.6	12.1	6.9	1.506	0.473	6 D, A
SR17-73	261.6	304.5	42.9	19.5	1.576	0.343	6 A
SR17-74	129.0	135.2	6.2	2.1	1.489	0.788	6 D
SR17-74	142.5	148.3	5.6	2.0	1.598	0.757	6 D
SR17-74	282.7	306.6	23.9	8.2	1.565	0.349	6 C, A, B

Other patterns in elemental concentrations in the whole rock data include an enrichment of tantalum in units 6D and 6A (91 and 83 ppm, respectively). The fluorine concentration is elevated highest in unit 6D (0.66 wt. % on average, two values >2 wt. %; Table 14) and in pegmatite dikelets crosscutting amphibolite (0.24 wt. %). Phosphorus is slightly elevated in units 6A and 6D (0.11 and 0.13 wt. %, respectively), but also in the pegmatite dikelets in amphibolite (0.13 wt. %). There are elevated tin concentrations scattered throughout the pegmatites, and unit 7 has the highest average concentration (1009 ppm), but only 3 values are included in the average.

Table 14 Fluorine concentrations in each rock unit in ppm

Rock unit	minimum	maximum	mean	σ
1	190	10600	2352	3217
2	230	730	455	187
3	120	15700	1355	2363
5	260	2630	1566	812
6A	200	9070	1959	2065
6B	560	860	710	212
6C	390	6510	3318	1709
6D	740	18200	6624	4210
7	350	890	597	273
8	100	2330	725	760
90	250	1330	908	461

10.5. Geochemistry of the amphibolite wall rock

A total of 143 samples of the wall rock amphibolite were analyzed to assist in developing the site waste rock management strategy. The full data set is provided in Appendix VII and an overview of some elements of interest is provided in Table 15.

The bulk rock sulphur concentration has a relatively low median of 0.09 wt. %. Preliminary visual observations from drill core and polished sections indicate that the most abundant sulphides are

pyrrhotite and pyrite, which occur as finely disseminated crystals, but also are locally more abundant in veins. Carbonate minerals have also been observed. Inspection of the sulphur and carbon concentrations in downhole diagrams indicates a low background concentration and localized enrichment, likely in veins (Fig. 11).

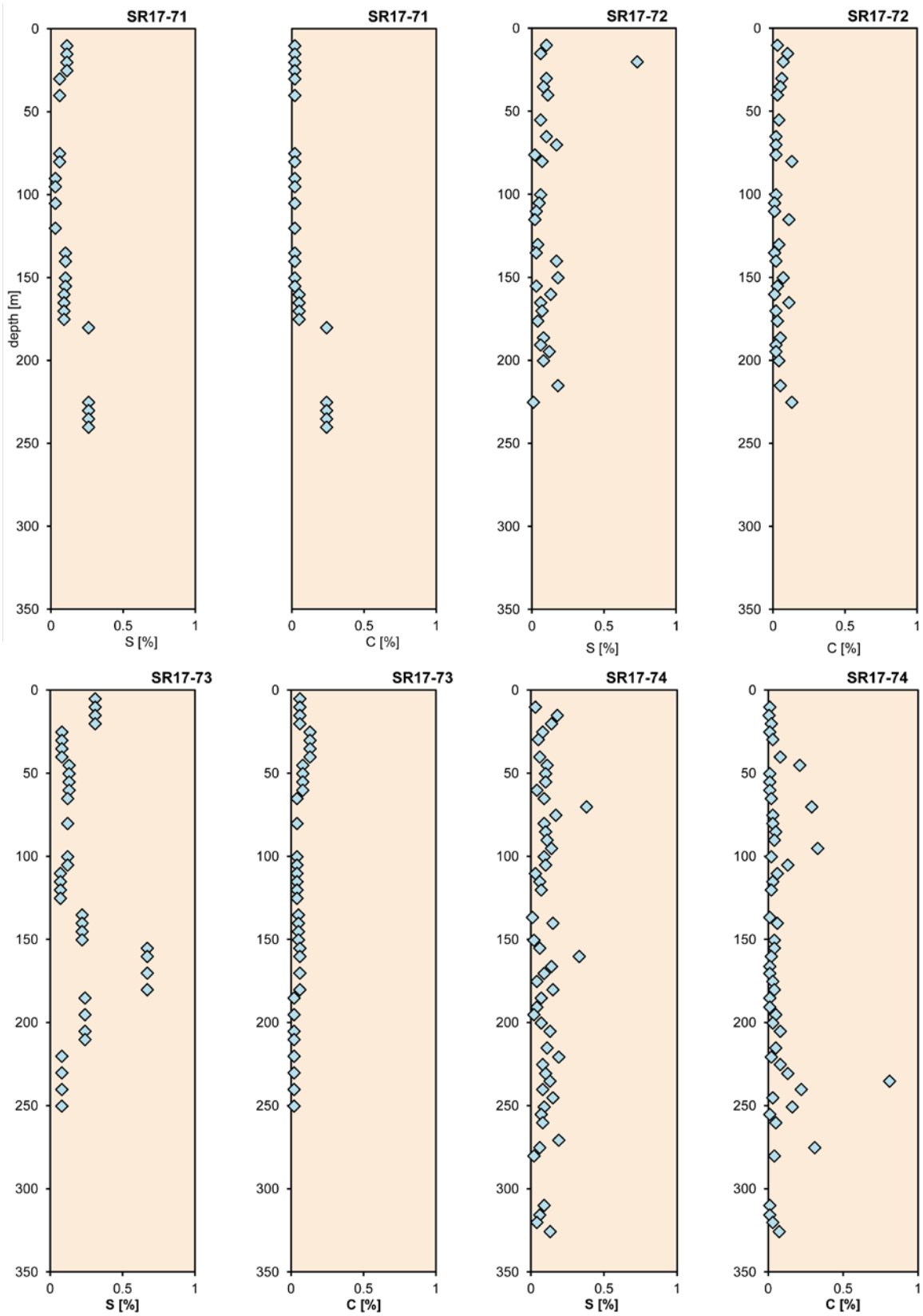

Fig. 11 Distribution of sulphur and carbon (in weight %) in the amphibolite wall rock. Note that similar values for several samples in sequence are to the analysis as composites.

Fluorine is elevated throughout the amphibolite (median 0.218 wt. %, Table 15) and is likely hosted mainly in amphibole. Mercury is below 0.04 ppm in all samples and on average below the analytical detection limit of 0.005 ppm. The average base metal concentrations are: Cu = 167 ppm, Pb ≤ 2 ppm, Zn = 97 ppm. Inspection of the geological logs and drill core photographs showed that elevated Li and Rb concentrations in the amphibolite are related to the presence of thin dikelets and veins, and pervasive alteration zones in the vicinity of the lithium pegmatites.

Table 15: Element concentrations of interest in the wall rock amphibolite

Element	minimum	maximum	mean	median
Li_2O [wt. %]	0.032	0.691	0.161	0.133
Rb_2O [wt. %]	0.000	0.207	0.049	0.038
S [wt. %]	0.01	0.73	0.13	0.09
C [wt. %]	<0.01	1.51	0.07	0.04
F [wt. %]	0.013	0.719	0.247	0.218
Hg [ppm]	<0.005	0.040	<0.005	0.005
As [ppm]	<5	222	18	<5
Cu [ppm]	45	851	167	158
Pb [ppm]	<2	2	<2	<2
Zn [ppm]	69	155	97	95
Ni [ppm]	34	168	131	133

Note: Averages calculated using half of the detection limit for those values below the limit of detection, unless the element was mostly below the detection limit. The averages were calculated by assigning each individual sample the corresponding composite value and calculating the mean of all individual samples.

In agreement with the visual observations, acid base accounting completed on ten randomly chosen samples of amphibolite indicates that most of the sulphur in the amphibolite is hosted in sulphides (Table 16). The average Neutralization Potential to Maximum Potential Acidity (NP:MPA) ratio is 15.3 (7.44 when excluding on outlier at 86.40 from the mean, Table 16), providing a strong indication that the rock is not acid generating.

Table 16: Acid base accounting for samples of the amphibolite (rock unit 1)

Sample ID	MPA [$tCaCO_3$/ 1 kt]	fizz rating	NNP [$tCaCO_3$/ 1 kt]	NP [$tCaCO_3$/ 1 kt]	pH	NP:MPA ratio	S [%] via Leco furnace	S [%] via Na_2CO_3 digestion[a]	S [%] via HCl digestion[b]	S [%] as sulphide[c]	C [%][d]	CO_2 [%][d]
V671805a	1.9	1	14	16	9.20	8.53	0.06	0.01	0.04	0.05	<0.05	<0.2
V671827	2.2	2	28	30	9.20	13.71	0.07	<0.01	<0.01	0.07	0.08	0.3
V671833	3.1	1	13	16	9.20	5.12	0.1	<0.01	0.02	0.1	<0.05	<0.2
V671855	0.3	2	27	27	9.40	86.40	0.01	<0.01	<0.01	0.01	0.12	0.4
V671872a	2.2	1	13	15	9.10	6.86	0.07	0.01	<0.01	0.06	<0.05	<0.2
V671876a	6.3	1	12	18	9.40	2.88	0.2	0.01	<0.01	0.19	0.05	0.2
V671892	0.9	1	12	13	9.00	13.87	0.03	<0.01	0.01	0.03	<0.05	<0.2
V671915	4.7	1	8	13	8.40	2.77	0.15	<0.01	0.03	0.15	0.05	0.2
V671928	3.1	1	11	14	9.00	4.48	0.1	0.01	0.03	0.09	0.05	0.2
V671930	2.5	2	20	22	8.90	8.80	0.08	<0.01	0.01	0.08	0.08	0.3

Abbreviations: MPA = maximum potential acidity, NNP = net neutralization potential, NP = neutralization potential
[a] complete dissolution of $BaSO_4$ and $SrSO_4$
[b] little to no dissolution of $BaSO_4$ and $SrSO_4$
[c] calculated by difference between HCl-leachable sulphate and total sulphur by Leco analyzer
[d] $HClO_4$ digestion and CO_2 coulometer

11. Discussion

Although the Separation Rapids lithium pegmatite thins to depth, the 2017 drill program demonstrated that the vertical geological and geochemical continuity of the lithium zones is excellent. Higher lithium and rubidium grades compared to the previous estimates for the deposit show that grade increases to depth. Previous drilling had indicated a pinch-out of the deposit to the east, and significant thinning to the west. The 2017 drilling shows that the petalite + spodumene + lepidolite deposit remains open to depth. Drill hole SR17-73, the deepest hole drilled to date indicates that the petalite pegmatite thins to depth, but barren pegmatite is continuous and thin petalite pegmatite bands occur near the bottom of the hole. A wide fracture zone intersected by drill hole SR17-73 is outside of the Li-mineralized pegmatite and below the pit design proposed in Avalon Advanced Materials Inc. (2016).

The elevated fluorine concentration in the lepidolite pegmatite (unit 6D) combined with previously reported high fluorine concentrations in lepidolite (6.80 - 7.08 wt. %, electron microprobe; internal report by Taylor, 1998) could, in addition to geological logging, provide a geochemical parameter to better delineate this rock unit. With regards to the petrogenesis of the pegmatite, an increased fluorine concentration in the melt may have favored the crystallization of lepidolite (polylithionite-trilithionite solid solution series) instead of petalite. The elevated fluorine concentration in the melt could have been derived from the pegmatite melt itself by magmatic processes (such as magma unmixing) or via partial

assimilation of the surrounding amphibolite. Alternatively, the melt was initially fluorine-enriched and lepidolite crystallization subsequently caused a depletion of the melt in fluorine.

In agreement with previous geotechnical studies, the rocks in and around the deposit are competent, with the exception of a fracture zone below the current pit design. The mercury concentration in the amphibolite wall rock (the potential waste rock in the envisaged mining operation) is below the detection limit of 0.005 ppm on average, i.e., less than approximately one tenth of the crustal abundance and does not represent an environmental concern. Relatively low concentrations of base metals also pose a low environmental risk. The average neutralization potential to maximum potential acidity ratio of 15.3 determined for the amphibolite suggests a low environmental risk of acid mine drainage as any value greater than 1 to 3 is considered indicative of safe values for prevention of acid generation (Amira International, 2002). The geotechnical parameters, and the environmental geochemistry of the mineralized rocks and waste will be discussed in detail in a separate report.

12. Recommendations

Based on the results of the drilling performed in the spring of 2017, it is recommended that the resources are updated using the new geological, geochemical and density data and that the obtained geotechnical and environmental data is evaluated in detailed studies. To validate the findings of the preliminary acid rock drainage analyses, humidity cell testing of a representative waste rock sample is planned. Further studies may also be necessary to evaluate if it is feasible to divide waste rock material based on potential acid generating properties.

The drilling indicates a significant depth potential of the Separation Rapids pegmatite based on excellent vertical geological and grade continuity. Hence, deep (>300 m to 500 m below surface) drilling would be of value to test whether the pegmatite continues, pinches out or widens with depth. In conjunction with deeper drilling, an evaluation of the economic potential of underground mining is warranted. In addition, further step-out exploration distal to the main lithium pegmatite could discover blind pegmatites. For future drilling, it is recommended that non-magnetic downhole instruments (such as a gyro) are used.

Using samples from the current drill program and historic drill core, the quantitative determination of the ore mineralogy of the different subunits of the Separation Rapids pegmatite requires follow-up work. Recommended methods include X-ray diffraction, QUEMSCAN/MLA and petrographic studies.

13. Statement of expenditures

In addition to the below summary (Table 17), a detailed statement of expenditures is filed in Form 0241E.

Table 17: Summary of expenditures

Drilling Contractor	$326,589.00	46.1%
Sample analysis	$26,796.16	3.8%
Geological supervision and support	$194,763.00	27.5%
Surveying holes	$3,180.00	0.4%
Health and Safety training and supplies	$6,353.00	0.9%
Supplies (diesel, core racks, sampling supplies, etc)	$59,180.00	8.4%
Miscellaneous transportation costs (truck rental, ATV rental, fuel, etc)	$33,517.00	4.7%
Accommodation at Silver Birch Lodge for field program and meals	$57,853.00	8.2%
Total expenditures	$708,231.16	100.0%

14. Personnel and statement of qualifications

The performed technical work was supervised by W. Mercer, J.C. Pedersen and V. Moeller; their addresses and qualifications are listed below.

William Mercer, Ph.D., P.Geo. (Ontario)

VP, Exploration

Avalon Advanced Materials Inc.

Suite 1901, 130 Adelaide Street West

Toronto, ON M5H 3P5

Tel: +1 (416) 364-4938

Statement of Qualifications

Volker Moeller, Ph.D., GIT (Ontario)

M.Sc. in Economic Geology and Structural Geology from Friedrich-Alexander University, Germany

Ph.D. in Economic Geology from McGill University

Exploration Geologist since 2008, worked in Germany, South Africa and Canada on gold, uranium, diamonds, PGE, iron ore, Ti, lead-zinc, REE, Nb, Zr, Li, W, Cu, Sn

Part-time Consulting Field Geologist at Avalon Advanced Materials Inc. since 2010

Consulting Project Geologist at Avalon Advanced Materials Inc. since 2016

Member of APGO, PDAC, SEG, GAC, CIM

APGO registration No. 10449

William Mercer, Ph.D., P.Geo. (Ontario)

B.Sc. in geology from Edinburgh University

Ph.D. in Economic Geology from McMaster University

32-year career with the Noranda/Falconbridge group, holding a series of managerial positions, working on international projects in over 30 countries, ultimately serving as Director-Geology and Geochemistry

Served as the President of the Canadian Federation of Earth Sciences (CFES), as President of the Prospectors and Developers Association (2002 to 2004), serving as an executive of the association for eight years. Member of several PDAC committees, including the Health and Safety Committee and Geoscience Committee.

Vice President Exploration at Avalon Advanced Materials since 2007, managing the exploration programs for the Nechalacho REE-Nb-Zr project, the East Kemptville Sn-Zn-Cu-(In) project and the Separation Rapids Li-Rb-(Cs)-(Ta) project, and various other exploration projects.

APGO registration No. 0186

Jens C. Pedersen, B.Sc., P.Geo. (Manitoba)

Senior Consulting Geologist

80057 St. Peter's Road

East Selkirk, MB R0E 0M0

Tel: +1 (204) 482-6947

Volker Moeller, Ph.D., G.I.T. (Ontario)

Project Geologist

Avalon Advanced Materials Inc.

Suite 1901, 130 Adelaide Street West

Toronto, ON M5H 3P5

Tel: +1 (416) 364-4938

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Appendices

I. 1 : 5,000 plan map

386500 387000 387500 388000 388500 389000 389500 390000

5575000 5570000 5565000 5560000 5555000

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ENGLISH RIVER

SR98-49 SR98-50 SR98-48 SR17-70

SR97-30 SR97-15 SR01-60 SR97-14 SR97-13 SR01-61 SR01-62 SR01-63 SR97-11 SR97-12 SR17-71 SR17-72 SR97-28 SR97-29 SR01-59 SR98-57 SR17-73 SR98-45 SR98-46 SR98-43 SR98-44 SR98-47 SR98-41 SR97-10 SR97-03 SR97-01 SR98-51 SR98-52 SR98-59 SR98-40 SR98-37 SR98-38 SR98-35 SR97-23 SR97-02 SR97-07 SR98-36 SR01-58 SR97-16 SR97-25 SR98-56 SR97-17 SR98-31 SR97-18 SR98-32 SR97-20 SR17-74 SR01-65 SR97-21 SR97-27 SR01-69 SR01-68 SR01-66 SR98-55

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AVALON
ADVANCED MATERIALS INC.

SEPARATION RAPIDS PROJECT

Plan Map

Legend

- 2017 diamond drill hole collars
- Historic diamond drill hole collars
- Drill hole traces
- Mineral claims
- Roads
- Topography
- Water course
- Water body

0 200 m

1:5.000

V. Moeller
September 25, 2017

II. Drill hole location surveys

DDH ID	Easting	Northing	Elevation
SR17-70	387210.30	5569404.48	341.58
SR17-71	388200.98	5569172.25	364.84
SR17-72	388278.53	5569144.21	355.35
SR17-73	388454.21	5569132.85	344.32
SR17-74	388673.84	5569035.01	326.34

III. Downhole surveys

SR17-70

DDH #:	SR17-70	Separation Rapids Project
Survey date:	April 10, 2017	Instrument: Devishot
Surveyed by:	Volker Moeller	Grid declination rel. to magnetic: -1.35°
Depth [m]	**Azimuth UTM NAD 83 [°]**	**Inclination [°]**
24	180.56	-44.91
30	181.98	-44.8
42	181.77	-44.36
48	179.86	-43.89
54	181	-43.84
60	181.85	-43.43
66	182.34	-43.19
72	182.82	-43.09
78	182.96	-42.84
84	182.97	-42.68
90	182.85	-42.55
96	183.07	-42.41
102	182.36	-42.23
108	183.26	-42.09
114	184.08	-41.81
120	184.08	-41.64
126	184	-41.42
132	184.23	-41.19
138	184.06	-40.99
144	184.14	-40.74
150	184.01	-40.52
156	183.03	-40.26
162	184.72	-40.18
168	185.75	-39.97
174	185.52	-39.86
180	184.99	-39.64
186	185.56	-39.4
192	185.42	-39.18
198	184.82	-38.92
216	185.05	-38.06
222	184.57	-37.8
234	187.01	-37.4
240	187.55	-37.16
246	186.48	-36.85
252	185.16	-36.47
264	186.94	-35.92
270	188.16	-35.72
276	186.88	-35.39

SR17-71

DDH #:	SR17-71	Separation Rapids Project
Survey date:	April 20, 2017	Instrument: Devishot
Surveyed by:	Volker Moeller	Grid declination rel. to magnetic: -1.35°
Depth [m]	**Azimuth UTM NAD 83 [°]**	**Inclination [°]**
15	178.99	-54.44
21	178.84	-54.24
27	178.82	-53.72
33	178.69	-53.56
39	179.63	-53.63
45	180.2	-53.61
51	180.58	-53.48
57	181.91	-53.36
63	181.66	-53.18
69	182.05	-52.83
75	182.22	-52.59
81	182.18	-52.51
87	182.45	-52.32
93	182.73	-52.15
99	182.82	-51.94
105	183.12	-51.83
111	183.56	-51.61
117	184.17	-51.28
123	184.47	-51.18
129	184.48	-50.93
135	184.58	-50.65
141	185.15	-50.32
147	185.19	-50.08
153	185.65	-49.99
159	185.7	-49.78
165	186.16	-49.58
171	186.39	-49.47
183	186.46	-48.97
189	186.06	-48.85
195	185.95	-48.54
201	185.92	-48.29
207	185.98	-48.13
213	186.11	-47.93
219	186.12	-47.65
225	187.07	-47.47
231	187.33	-47.41

SR17-72

DDH #:	SR17-72	Separation Rapids Project
Survey date:	April 24, 2017	Instrument: Devishot
Surveyed by:	Volker Moeller	Grid declination rel. to magnetic: -1.35°
Depth [m]	**Azimuth UTM NAD 83 [°]**	**Inclination [°]**
24	185.22	-54.76
30	185.81	-54.71
36	185.45	-54.67
42	186.4	-54.67
72	187.24	-54.34
78	187.19	-54.25
84	186.77	-54.03
90	189.14	-53.97
102	187.72	-53.65
108	187.72	-53.61
114	188.22	-53.59
120	188.47	-53.73
126	189.92	-53.7
132	190.1	-53.69
138	190.4	-53.67
144	190.57	-53.61
150	190.46	-53.4
156	190.74	-53.33
162	190.57	-53.23
174	190.45	-53.11
180	190.55	-52.96
186	190.65	-52.77
192	190.66	-52.61
198	190.56	-52.7
204	191.37	-52.37

SR17-73

DDH #:	SR17-73	Separation Rapids Project
Survey date:	May 3, 2017	Instrument: Devishot
Surveyed by:	Angela Martin	Grid declination rel. to magnetic: -1.35°
Depth [m]	**Azimuth UTM NAD 83 [°]**	**Inclination [°]**
12	164.59	-65.51
18	164.06	-65.4
24	163.08	-64.69
30	166.26	-64.02
36	165.98	-63.85
42	171.75	-63.72
48	167.46	-63.66
54	170.61	-63.65
60	171.52	-63.38
66	170.98	-63.45
72	172.29	-63.38
78	173.12	-63.34
84	173.67	-63.33
90	174.24	-63.22
96	174.67	-63.24
102	174.81	-63.3
108	175.01	-63.3
114	171.83	-63.19
120	172.9	-63.05
126	176.25	-63.54
132	172.18	-62.66
138	173.21	-62.57
144	175.08	-62.39
150	175.24	-62.22
156	177.23	-62.91
162	176.71	-62.83
168	174	-62.01
174	177.79	-62.61
180	173.6	-62.13
186	173.73	-62.17
192	173.94	-62.11
198	174.3	-62.07
204	174.48	-62.05
210	174.92	-61.84
216	175.07	-61.65
222	175.51	-61.56
228	175.91	-61.53
234	176.9	-61.49
240	179.76	-61.99
246	179.84	-61.94
252	179.97	-61.68
258	180.34	-61.43
264	180.37	-61.45
270	177.24	-60.79
276	180.59	-61.44
282	180.66	-61.44
288	180.74	-61.45
294	176.89	-60.9
300	177.08	-60.87
306	179.66	-61.49
312	179.47	-60.67
318	180.01	-60.62
324	180.3	-60.65
330	180.57	-60.65
348	182.51	-61.28
354	180.53	-61.68

DDH #:	SR17-73	Separation Rapids Project
366	183.31	-61.01
378	181.9	-61.52
384	182.73	-60.72
390	180.59	-60.72

SR17-74

DDH #:	SR17-74	Separation Rapids Project
Survey date:	May 11, 2017	Instrument: Devishot
Surveyed by:	Volker Moeller	Grid declination rel. to magnetic: -1.35°
Depth [m]	**Azimuth UTM NAD 83 [°]**	**Inclination [°]**
18	177.41	-70.36
24	177.26	-70.37
36	177.43	-70.07
42	177.34	-70.01
48	177.76	-69.79
54	177.84	-69.69
60	178.02	-69.65
72	177.57	-69.11
78	178.92	-68.83
96	180.81	-68.44
102	180.56	-68.3
108	180.38	-68.23
114	180.96	-68.23
186	182.52	-66.97
192	182.66	-66.91
198	183.01	-66.96
210	184.08	-66.96
216	184.26	-66.47
222	185.1	-65.77
228	185.58	-64.69
234	184.59	-63.64
240	185.76	-62.73
246	186.66	-61.97
252	187.62	-61.64
258	187.62	-61.49
264	188.06	-61.41
270	188.21	-61.39
276	188.46	-61.35
282	188.79	-61.34
288	188.98	-61.3
294	189.06	-61.15
300	189.11	-61.02
306	189.11	-60.91
312	189.08	-60.78
318	189	-60.72
324	188.89	-60.64
330	188.73	-60.48
336	188.58	-60.2

IV. Geological logs

SR17-70

DDH #:	SR17-70			Separation Rapids Project
UTM NAD83 Zone 15N		Collar dip: -45°	Drill company: Boart Longyear | Start: April 3, 2017 | Finished: April 10, 2017	
Easting:	387210.3	Collar azimuth: 180°	Logged by: Volker Moeller	
Northing:	5569404.5	Depth: 276 m	Log Date: May 25, 2017	
Elevation:	341.6	Core diameter: HQ	Mining Lease 108395 / CLM469 | Casing left in hole | Core stored on CLM469.	

From [m]	To [m]	Lithology code 1	Lithology code 2	Description
0	4.53	OVB		Overburden 0.5 m of clay-rich soil
4.53	11.4	1	1A	Amphibolite Dark grey to black with thin greenish and lighter grey bands. Some brown biotite-enriched bands. Strong foliation dipping 45° to core axis (TCA). Mineralogy: mostly black to faint greenish amphibole, very fine-grained minor sulfide (pyrite?) throughout (barely visible w. hand lens), some coarser pyrite, possibly chalcopyrite, pyrrhotite in veins.
11.4	16.65	2		Winnipeg River Granite Two-mica granite with very coarse, salmon-pink macroperthitic alkali feldspar. ~10% biotite, ~5% muscovite (greenish tint), minor garnet (wine red almandine?) throughout. Upper contact wavy-irregular, lower contact dipping 15-20 ° TCA,
16.65	39.55	1	1A	Amphibolite Continued. Minor disseminated sulfide (pyrite/pyrrhotite). 21.9 & 23.87 m Bands of fine-grained pyrrhotite, parallel to foliation. 28.68 - 28.83 m Band containing semi-massive magnetite + pyrrhotite + green amphibole/pyroxene? 32.08 m Patch containing coarse garnet (red) + green diopside? 34.43 m Dikelet, 13 cm thick with 70° upper and 50° TCA lower contact. Albite + quartz + garnet (red). Brown biotite above upper contact. 35 m Albitite dikelet, containing quartz crystals with wavy contacts, fragments of brecciated amphibolite. 35.3 - 35.8 m Abundant quartz + fluorite + chlorite + pyrrhotite veins ± chalcopyrite 36.1 Thin pyrrhotite stringer
39.55	42.7	2		Winnipeg River Granite 39.55 - 40.33 m Coarse-grained muscovite-biotite-granite, finer-grained variant of above. 40.33 - 42 m Finer-grained granite with sharp upper and gradational lower boundary. Mineralogically similar to surrounding granite, but less pink K-feldspar. 42 - 42.7 m As 39.55 - 40.33 m, but with coarse salmon-pink macroperthitic alkali feldspar
42.7	106.5	1	1A	Amphibolite Continued. Foliation dips 45 - 50° TCA (50° @ 59.6 m, 45° @ 85.4). Disseminated sulfides (mostly pyrrhotite, minor pyrite/chalcopyrite) throughout, e.g., 53.55, 56.85, 63.45, 66.4, 72.85, 81.6 m. Sulfides locally concentrated in thin bands, e.g. at 44.9 m. Note: Core jumbled up in boxes 26 (75.45 - 78.35 m, impossible to piece back together), 34 (98.6 - 101.8 m), 49.05 m Quartz lens, disseminated pyrrhotite just below. 52.1 m Finely disseminated pyrrhotite with minor chalcopyrite and greenish diopside (?) 59.8 m Pocket containing cm-size amphibole, carbonate, quartz and green diopside (?) Finer grained variants of this throughout the unit. 103.05 - 103.65 m Pyrrhotite-rich band subparallel to foliation with very minor chalcopyrite 105.25 - 105.5 m Pyrrhotite-enriched band with minor chalcopyrite Calcite veining near lower contact.

DDH #:	SR17-70			Separation Rapids Project
106.5	142.2	8		Separation Rapids Granite More felsic than the granites in the upper part of the hole. Overall phaneritic, locally granophyric texture, e.g., at 128.25, 133.45 and 138.75 m. Pink to orange K-feldspar (locally coarse, not perthitic, pink around crystal faces due to hematization), muscovite (greenish tint), quartz, red garnet (mm-size, locally enriched, e.g., at 114.1 m), only minor biotite (restricted occurrence, e.g., euhedral biotite from 112 to 113.5 m). Looks very similar (actually, indistinguishable) to the granite at the top of drill hole SR17-71.Sharp upper contact dipping 70° TCA, lower contact sharp-wavy dipping 60° TCA.Note: Core jumbled up in box 49 (142.35 -145.35). Between 108 and 117 m, the metre blocks were misplaced. 111.2 - 112.05 m Muscovite-rich band (greenish muscovite), locally grading into albitic aplite, distinctly banded with 40 - 45° TCA dip. 128 - 137.5 m Muscovite-rich (~10%), with very coarse light-gray K-feldspar and euhedral to subhedral quartz 141.65 - 142.2 m Finer-grained near the lower contact
142.2	158.55	1	1A	Amphibolite Continued. Homogeneous, minor pyrrhotite. Foliation dips 55° TCA @ 152.5 m.
158.55	160.9	8		Granite (Separation Rapids?) Medium to coarse-grained and phaneritic. Displays foliation / flow texture dipping 45° TCA (could be syn-deformational). Pinkish K-feldspar, mm-size red garnet, albitic matrix, biotite + greenish muscovite (both fine-grained). Sharp, intrusive upper and lower contacts (45 and 60° TCA, respectively).
160.9	163.3	1	1A	Amphibolite Continued. 162.28 m Quartz + albite dikelet, 1.5 cm thick, quartz core, albite rim, 50° TCA dip
163.3	164.13	8		Granite (Separation Rapids?) Similar to the above interval, but slightly more pink. Sharp 50° TCA upper contact, sharp-irregular lower contact. Aplitic from 163.75 - 164 m with flow texture.
164.13	165.35	1	1A	Amphibolite Continued. 164.5 m Small granitic dikelet
165.35	171.45	8		Granite (Separation Rapids?) Coarse-grained with medium-grained bands with albitic matrix and flow texture, red (hematized), garnet < 0.5 cm, coarse to very coarse quartz, muscovite coarse-grained and greenish, Sharp 25° TCA upper, sharp-irregular lower contact.
171.45	176.13	1	1A	Amphibolite Continued.
176.13	176.8	8		Granite (Separation Rapids?) Grey (not hematized), medium-grained, euhedral quartz, albitic matrix, flow texture. Biotite & garnet both mm-size, no apparent muscovite. Sharp-irregular contacts
176.8	182.55	1	1A	Amphibolite Continued. Foliation dips 55° TCA at 178 m. Minor pyrrhotite and pyrite.
182.55	186.06	8		Pegmatitic Granite (Separation Rapids?) Megacrystic, light salmon-pink K-feldspar (looks macroperthitic, alkali feldspar?), very coarse quartz (locally euhedral), red garnet, greenish muscovite, biotite. Quite felsic. Sharp-irregular upper, 55° TCA lower contact.
186.06	216.4	1	1A	Amphibolite Continued. Light grey 15 cm thick medium-grained granite dikelet (red garnet, muscovite, maybe biotite) 209 - 109.3 m Lighter grey bands containing abundant magnetite + minor pyrite (55° TCA dip) 209.52 m Pyrite + magnetite band

DDH #:	SR17-70			Separation Rapids Project
216.4	217.15	8		Granite (Separation Rapids?)Two dikelets:216.4 - 216.63 m: Light grey with coarse red-purple garnet, coarse quartz, K-feldspar, albite, biotite, contains an amphibolite xenolith216.63 - 217.15 m: Pink (hematized) granite, muscovite-enriched, banded at the bottom parallel to the foliation of the surrounding amphibolite.221.25 m Quartz + K-feldspar dikelet221.9 m 10 cm thick granitic dikelet containing muscovite and biotite, some pyrrhotite
217.15	222.65	1	1A	Amphibolite Continued.
222.65	223.05	8		Granite (Separation Rapids?) Light grey with coarse K-feldspar, quartz and biotite, feldspar is perthitic and locally orange.
223.05	230.85	1	1A	Amphibolite Continued. 225.85 - 226.28 m Abundant pyrrhotite + pyrite veins with quartz, chalcopyrite, green ?diopside, a bluish-grey mineral (?), 45° TCA dip 225.15 m Rusty, oxidized sulfides 223.35 - 223.77 m Abundant pyrrhotite + pyrite veins 226.5 m Patch of fine-grained native copper 225.7 m Coarsely crystalline amphibole 227.5 - 228 m Finely disseminated pyrite + pyrrhotite + native copper and light brown patched of an unknown mineral
230.85	231.9	2		Granite (Winnipeg River Granite?) Medium-grained, pink biotite granite, light grey around the outer contacts. Quite altered. Sharp-irregular contacts.
231.9	238.6	1	1A	Amphibolite Continued. 233.1 m Granitic dikelet, 20 cm thick, light grey (unaltered equivalent to 230.85 - 231.9 m?)
238.6	239.75	2		Granite (Winnipeg River Granite?) Coarse-grained, orange, coarse macroperthitic alkali feldspar (hematized), quartz, biotite, red garnet.
239.75	242.05	1	1A	Amphibolite Continued.
242.05	242.95	2		Granite (Winnipeg River Granite) Grey to pink, granophyric texture, mineralogically similar to above.
242.95	244.2	1	1A	Amphibolite Continued. 243.45 m Winnipeg River Granite dikelet, 25 cm thick, as 242.05 - 242.95 m, unaltered with slightly greenish (chloritized?) alkali feldspar.
244.2	245.2	2		Granite (Winnipeg River Granite) Medium to coarse-grained, megacrystic feldspar & quartz, feldspar is grey (altered?) to pink to greenish (chloritized?), center fine-grained, mineralogically as above.
245.2	245.7	1	1A	Amphibolite Continued.
245.7	246.23	2		Granite (Winnipeg River Granite) As 242.05 - 242.95 m.
246.23	247.2	1	1A	Amphibolite Continued. 246.55 m Winnipeg River Granite dikelet, 20 cm thick, containing very abundant biotite + pyrrhotite + chalcopyrite
247.2	247.65	2		Granite (Winnipeg River Granite) As previous.
247.65	248.35	1	1A	Amphibolite Continued. Fine pyrrhotite & chalcopyrite stringers.
248.35	249.8	2		Granite (Winnipeg River Granite) As previous. With a finer-grained aplitic segment.
249.8	250.65	1	1A	Amphibolite Continued.
250.65	253.7	2		Granite (Winnipeg River Granite) As previous.
253.7	259.4	1	1A	Amphibolite

DDH #:	SR17-70			Separation Rapids Project
				Continued. 258.35 m Winnipeg River Granite dikelet, 20 cm thick
259.4	259.75	2		Granite (Winnipeg River Granite) As previous.
259.75	260.1	1	1A	Amphibolite Continued.
260.1	260.9	2		Granite (Winnipeg River Granite) As previous.
260.9	276	1	1A	Amphibolite Continued. 270.15 m Winnipeg River Granite dikelet, 15 cm thick.

SR17-71

DDH #:	SR17-71		Separation Rapids Project
UTM NAD83 Zone 15N		Collar dip: -55°	Drill company: Boart Longyear | Start: April 16, 2017 | Finished: April 20, 2017
Easting:	388201.0	Collar azimuth: 180°	Logged by: Jens C. Pedersen / Volker Moeller / Angela Martin
Northing:	5569172.3	Depth: 243 m	Log Date: May 5, 2017
Elevation:	364.8	Core diameter: HQ	Mining Lease 108395 / CLM469 | Casing left in hole | Core stored on CLM469.

From [m]	To [m]	Lithology code 1	Lithology code 2	Description
0	1.6			Casing
1.6	9	3	B	Albite kspar mica quartz. Generally fine grained (aplitic) with common coarser sections. Light greenish grey, strongly banded (tectonic). Lightly albitic with 15% coarse white kspar phenocrysts to 4cm locally. Mica varies from light yellow green to dark green, generally muscovitic and occurs as disseminated bands in albite; 5-8% mica, generally <1mm, up to local 2cm grains. Minor fine light pink-orange garnet. Tectonic banding at 30° TCA. Lower contact 60° TCA.
9	17.4	1		Amphibolite. Dark green grey, fine grained, banded, with common 1mm to 1 cm brown black micaceous bands which are likely flattened pillow selvedges. Closer to pegmatites, mica is coarser and clearly hydrothermal. Very little discernible sulphides, <1%. Common fine internal parasitic folds particularly quartz and quartz-carbonate stringers.
17.4	17.6	3	B	Albite Kspar Mica Quartz. As previous with 1mm orange spessartine. Sharp contacts are 35° to core axis with micaceous exo-contacts. Medium grained, mottled texture.
17.6	19	1	A	As previous.
19	19.28	3	B	Albite Kspar Mica Quartz. As at 17.4-17.6. Upper contact 51° and lower contact 23° TCA with coarse phlogopite selvedge. Medium grained, mottled texture.
19.28	24	1		As previous.
24	24.2	3	A	Albitite. White, aplitic, strongly banded (tectonic) with fine grey quartz blebs, silver green mica including narrow desorbed mafic selvedge. Common fine spessartine. Contacts at 45° TCA.
24.2	24.65	1		Amphibolite. As previous.
24.65	24.78	3	A	Albitite. As previous, coarser quartz blebs give mottled texture. Contacts at 45°.
24.78	26.5	1		Amphibolite. As previous.
26.5	28.68	3	A	Albitite. Slightly greyer and coarser textured than previous, with dark mica (dark green) forming lineation parallel to tectonic fabric. Average of 8% mica. Common grey quartz interlocking with albite. Fine clear orange spessartine impart orange-pink, patchy appearance locally throughout. Black appearing mica grains commonly look like oxides, locally possibly fine brownish cassiterite, <1%. Sharp contacts at 42°.
28.68	29.5	3/1	A	Amphibolite as previous, albitic dykelets ~ 50:50.
29.5	33.8	1		Amphibolite. As previous, but with more brown-black mica, likely hydrothermal.
33.8	37.1	3	B	Albite kspar quartz mica. Similar to previous, coarse mottled texture, highly albitic, less mica, 20% coarse quartz blebs, local spessartine 1mm to 1cm. Mica varies from yellow to dark green, or 2-3%. Upper contact 32°, lower contact 24°.
37.1	42	1		Amphibolite. As previous. Albitite at 37.8 (2cm); 39.9-40.05;40.56-40.73;41.46-41.6.

DDH #:	SR17-71			Separation Rapids Project
42	73.2	3	B	Banded and mottled muscovite-biotite granitic pegmatite Grey quartz, coarse-grained white K-feldspar, biotite, mm-size pink-red garnet, greenish to yellow muscovite and light-grey albite form the matrix). Similar to the top of the hole. Overall medium to dark greenish-grey, medium- to coarse-grained and phaneritic with variably sized pegmatitic pockets. Coarse K-feldspar is locally resorbed, displays exsolution lamellae, e.g., 45.2 and 61.15 m (macroperthite?) and locally twinning. The banding dips 55° TCA near the top and throughout, 45° near 72 m, and is absent in the pegmatitic pockets. Apparently magmatic, no pressure shadows etc. Locally transitioning into granophyric textures, e.g., at 43.43 m. The pegmatitic pockets at 42.66 - 43.42 m, 44.5 - 45.65 m and 60.22 - 61.69 m display interlocking boundaries with the surrounding rock and may be a coarser, volatile-rich variant. They contain coarse muscovite, biotite, subhedral K-feldspar and quartz. Upper and lower contacts sharp-intrusive and dipping 30° TCA. 5 cm thick albitite at the lower contact. [VM]
73.2	75.67	1		Amphibolite.Dark grey to black, with greenish and brown (biotite-rich) bands. Black amphibole is the single dominant mineral. [VM]
75.67	80.09	3	A	Albitite Fine to medium-grained, white to light grey, locally yellow-green (chlorite?). Up to cm-sized subhedral garnet (pink-red) and quartz (mm to several cm in size) in a fine-grained albite matrix. Some coarse, bluish-grey K-feldspar. Sharp upper and lower contacts with dips of 35 and 20° TCA, respectively. 78.15 - 78.28 m Slivers of amphibolite with sharp contacts. [VM]
80.09	82.75	1		Amphibolite. As at 73.2-75.67 m, but crosscut by thin albitite dikelets. 81.85 m 6 cm quartz + albite dikelet 81.6 & 82.3 m Red-greenish garnet-bearing bands containing fine-grained pyrrhotite and pyrite. [VM]
82.75	83.55	3	A	Albitite. Abundant grey quartz in an albitic matrix, up to cm-size garnet, minor greenish-black biotite. [VM]
83.55	84.56	1		Amphibolite As 73.2-75.67m. [VM]
84.56	85.02	3	A	Albitite As 82.75-83.55m. [VM]
85.02	90.64	1		Amphibolite. As previous. Minor cm-thick albitic veins, boudinaged, ~35°. Lower contact sharp, ~50° TCA.
90.64	91.48	3	A	Albitite. White/light grey. Coarse, granophyric grey quartz with common medium to coarse grained pinkish garnet (weakly foliated). Biotite-rich vein (~9cm wide, glimmerite?) Sharp lower contact ~60° TCA, marked by 3 cm wide dark mica selvedge.
91.48	93.52	1		Amphibolite. As previous. Common white, albitic stringers, cm-sized.
93.52	93.95	3	A	Albitite. Same as previous, with irregular brown mica lense, ~5cm wide. Lower contact abruptly gradational (30-40° TCA).
93.95	96.22	1		Amphibolite. As previous. 94.65-94.5m: thick albitic veins and lenses with abundant fine to coarse grained garnets, foliated 35-40° TCA. Interstitial pyrrhotite, both disseminated and wispy stringers, and minor local fine chalcopyrite. Sharp lower contact @ 40° TCA.
96.22	97.7	3	A	Albitite. Same as previous. Minor subhedral, fine to coarse pink garnets (<5%). Sharp upper and lower contacts ~40° TCA.
97.7	99.88	1		Amphibolite. As previous.
99.88	101	3	A	Albitite. With 10cm wide biotite-rich vein (glimmerite?) ~50 TCA. Sharp upper contact ~ 40° TCA. Minor medium to coarse subhedral pink garnets.
101	102.71	1		Amphibolite. Same as previous. Upper contact ~35°, lower contact @ 40° TCA, sharp. 35cm of albitite mid-interval; upper contact ~20° and lower contact ~55° TCA.
102.71	103.15	3	B	Mottled albitite. Remnant, partially resorbed, greyish beige, megacrystic kspar. <5% dark green/silver/yellow mica stringers. Trace fine to medium grained pink subhedral garnets.
103.15	103.62	1		Amphibolite. Abruptly gradational upper contact (~45° TCA) with dark mica selvedge. Lower contact ~40° TCA, sharp.

DDH #:	SR17-71			Separation Rapids Project
103.62	104.65	3	B	Mottled albitite. Megacrystic to pegmatitic white kspar. Anastomosing green/silver muscovite stringers (<5%). 104.2-104.35: predominantly dark brown mica, sharp upper and lower contacts ~40° TCA. After 104.35: increase in dark green/silver mica stringers with fine to coarse, subhedral pink garnets (<15%).
104.65	108.96	1		Amphibolite. Same as previous. Lower contact abruptly gradational; marked by glimmerite selvedge (~35° TCA).
108.96	113.46	3	B	Mottled albitite. Medium to coarse granophyric quartz. Dark mica bands at: 110 (5cm wide, 30° TCA) and 110.85 (15cm wide, 60° TCA). 20-30% dark green /silver muscovite in stringers and irregular lenses. After 112: strong tectonic fabric.
113.46	114.16	1		Amphibolite. Same as previous, Lower contact sharp, marked by dark mica selvedge @ 55° TCA. Marked increase down interval of foliated, fine to medium grained biotite.
114.16	116.5	5		Quartz-mica zone. Note: sample taken for thin section at 116.15m. After 114.3: white/grey granophyric quartz becomes coarser. At 114.7: quartz is dark grey, very coarse. Also an increase in coarse green mica, which increases down interval. Minor fine to coarse grained pink garnet throughout. Lower contact sharp at 50° TCA.
116.5	121.72	1		Amphibolite. Same as previous. Note: sample for thin section taken at 128.95.
121.72	134.5	3	B	Mottled albitite. Upper contact arbitrary, defined mainly by presence of medium grained garnet and kspar, with a decrease in mafic minerals. Common green/silver mica lenses in albitic matrix; mica decreases after 123.10. Local trace cassiterite, ~1mm (e.g. 128.7).
134.5	135.75	1		Amphibolite. Same as previous.
135.75	135.87	3	A	Albitite. White, predominantly albite with disseminated fine grained amphibole and pink garnet. Upper and lower contacts sharp, @ 45° and 35° respectively.TCA.
135.87	138.4	1		Amphibolite. Same as previous. Common cm-wide bands of pyrrhotite stringers. Lower contact sharp, ~30°, with mm-sized blebs of chalcopyrite and dark mica selvedge.
138.4	139.1	6	A	Petalite sub-zone. Minor sub-rounded white kspar megacrysts with abundant aplitic albite and granophyric quartz. Possible v.c.g. petalite from 136.45 to 136.7, with local rare, holmsquistite needles, (purple). After 139.0: alternating cm-wide veins of dark green (chlorite?), albitite, and biotite. Lower contact ~40° TCA, sharp.
139.1	141.6	1		Amphibolite. Same as previous.
141.6	142	3	A	Albitite. Similar to previous, but with possible minor local petalite as irregular whitish cm-sized lenses. Thin, remnant veins and stringers of dark green mica, angle varies. Upper contact ~40°, lower contact ~30° TCA.
142	144.45	1		Amphibolite. Same as previous.
144.45	145.05	3	A	Albitite. Typical albitite unit, but mafics decreasing down interval. Minor fine to medium grained garnets throughout. Upper contact ~35° to core axis, sharp.
145.05	147.8	1		Amphibolite. This interval is characterized by abundant holmquistite (purple). Strongly foliated (as thin veinlets and laminations, ~35° TCA). Veins often boudinaged. Strong local sulphide mineralization: bleb/stringers of chalcopyrite and very fine grained pyrrhotite. The latter is disseminated throughout. Note: sample taken for thin section at 145.75.
147.8	148.2	6	A	Petalite sub-zone. Rounded megacrystic white kspar in aplitic albitite matrix with foliated, web-like white petalite veins. Common green (and minor yellow) stringers, with local remnant coarse grained dark green mica. Minor disseminated fine grained opaques. Upper contact ~40° TCA, Lower contact ~40° TCA, with dark mica exocontact.
148.2	151	1		Amphibolite. Same as previous. White albitite dikelet @ 150 (~2 cm wide, ~40° TCA, upper and lower contacts).
151	151.75	3	A	Albitite. Mm-sized, light green pseudomorphs, (some grains with green core), possible spodumene (eg. 151.50). Pink garnets, fine to medium grained, some partially replaced with dark mica.
151.75	158.5	1		Amphibolite. Same as previous. Albitite dykelets at: 157.05 (6cm wide, 40°) and 157.95 (2cm wide, 35° TCA). Lower contact sharp, with dark mica selvedge at ~35 TCA.
158.5	158.85	3	A	Albitite. Same as previous. @ 158.55: fine grained topaz; hard, blue green.

DDH #:	SR17-71			Separation Rapids Project
158.85	163.9	1		Amphibolite. Same as previous. 161.25-161.45: albitite dikelets, ~40° TCA. Strongly foliated brown mica at lower contact with multiple thin fractures, ~45° TCA.
163.9	164.85	6	A	Petalite subzone. White, web-like petalite throughout, with fine to coarse grained grey quartz crystals and thin, dark mica stringers. Local orange-stained, fine to very coarse kspar. Minor medium to coarse pink garnet, some with inclusions (qtz?).
164.85	170.6	1		Amphibolite. Same as previous. Albitite dykelets @: 166.78-166.85, 166.9-166.94, 168.8-168.9,169.57-169.62 (all ~45° TCA).
170.6	171	6	A	Petalite subzone. Same as previous. Trace fine grained topaz. Upper contact 50°, lower contact 55° TCA.
171	173.2	1		Amphibolite. Same as previous. Common thin bands of biotite parallel to foliation (50° TCA).
173.2	173.45	6	A	Petalite subzone. Predominantly albitite, with minor small lenses of petalite. Common yellow and green mica. Local medium to coarse grained pink garnets, some with inclusions. Trace local tantalum (very fine grained, acicular, dark). Possible coarse spodumene; tan, irregular grains that appear to be replacing green mica (muscovite). Upper and lower contacts ~50° TCA.
173.45	174.55	1		Amphibolite. As previous. Abundant thin and strongly foliated biotite bands.
174.55	174.75	6	A	Petalite subzone. As previous. Upper and lower contacts @ 45° TCA, sharp.
174.75	182.3	1		Amphibolite. Common fine concordant quartz stringers and lenses. No visible sulphides. 178.5-178.65: calcareous-silicate layer, concordant with diagnostic green-red and brown colour, coarse grained and siliceous.
182.3	182.8	3	B	Mottled albitite. Grey-mottled with local white aplitic albite. Trace fine white ribbony stringers likely hydrothermal spodumene. Trace brown opaques-cassiterite. Upper contact 54°, lower contact 41° TCA. 3 cm glimmerite selvedge at 182.65.
182.8	184.45	1		Amphibolite. As previous with common brown phlogopite bands. No visible sulphides. Local parasitic isoclinal folds. Common holmquistite. 183.5: 5cm albitite with coarse spessartine. Contacts at 40° TCA. Albitite vein at 184.0, 5cm.
184.45	185.35	6	A	Petalite albite quartz kspar. White, strong tectonic banding. 2cm white aplitic albite borders. Typical wavy white net-textured petalite interbanded with aplitic albite, fine quartz blebs and lenses and local deformed dark grey kspar. 184.8m: 2cm phlogopite-altered amphibole screen.
185.35	186.35	1		Amphibolite. As previous. Isolated pyrite grains <0.5%. Phlogopitic selvedge around albite veinlet at 186.0.
186.35	189.6	6	D	Petalite lepidolite albite. Strongly banded with light mauve colour, narrow lepidolite bands and patches interbanded with white to pink white petalite and aplitic albite. Local grey quartz blebs, minor randomly occurring stretched grey kspar. 186.9m: clear to yellowish aggregates of garnet, could be chrysoberyl. 187.6-187.83: amphibolite. Upper contact 47°, lower contact 58° TCA, boudinaged screen.
189.6	190.95	1		Amphibolite. As previous. Micaceous and partially hydrothermally altered. Disseminated holmquistite. 189.9-190.05: 6A; as previous, upper contact 44°, lower contact 57° TCA. 190.6: 3A (albitite), 55 cm aplitic albite, 46° contacts.
190.95	204.48	6	D	Petalite lepidolite albite. Strongly banded and mylonitic, typical 6C texture, but widely interspersed bands and patches of lepidolite designate unit as 6D. Local coarse patches of white petalite to 15cm, as at 199.5. Upper portion to 194 continuous web-textured petalite with common hydrothermal alteration along petalite cleavage (spodumene). Local orange spessartine. Unit is quite homogeneous after 194.8. 192-192.22: amphibolite (50° TCA), 192.7-193.3: amphibolite (50° TCA), 194.2-194.8: amphibolite (60° TCA).
204.48	212.4	6	A	Petalite albite kspar quartz/amphibolite. Approx 50:50 pegmatite/amphibolite. Petalite dykes are strongly albitic, locally with higher net-textured petalite content. Section is southern margin dyke swarm. Amphibolite at: 204.48 to 204.8; 205 to 206.5; 206.9 to 207; 207.6 to 207.2; 207.55 to 207.67; 207.95 to 208.25; 208.55 to 209.37; 209.55 to 209.78; 210.15 to 210.3; 210.9 to 211.3. Common phlogopitic selvedges with pegmatite (exocontact).
212.4	216.8	1		Amphibolite. Strongly foliated, homogenous, micaceous. Trace pyrite, local chalcopyrite along joints and planar fractures, <1%. Common isoclinal folding.

DDH #:	SR17-71			Separation Rapids Project
216.8	217.15	3	A	Albitite. Saccharoidal texture, common fine black to brown opaques. Contacts 52° TCA.
217.15	219.03	1		Amphibolite. As previous.
219.03	220.45	7		Pegmatitic granite. Pink, very coarse to pegmatitic, predominantly salmon pink, perthitic kspar in grey-white albitic ground mass with dark grey quartz blebs. Common dark green to yellow mica (<5%), local fine brown to black opaques including 2cm luster at upper endocontact, likely cassiterite.
220.45	243	1		Amphibolite. As previous. Quite homogeneous with only minor narrow quartz veinlets and lenses. Negligible disseminated sulphides, local cm-internals with disseminated sulphides, local cm-intervals with disseminated pyrrhotite to 2%. Overall <0.5%.

SR17-72

DDH #:	SR17-72		Separation Rapids Project
UTM NAD83 Zone 15N		Collar dip: -55°	Drill company: Boart Longyear | Start: April 21, 2017 | Finished: April 24, 2017
Easting:	388278.5	Collar azimuth: 180°	Logged by: Jens C. Pedersen / Angela Martin
Northing:	5569144.2	Depth: 228 m	Log Date: May 10, 2017
Elevation:	355.4	Core diameter: HQ	Mining Lease 108395 / CLM469 | Casing left in hole | Core stored on CLM469.

From [m]	To [m]	Lithology code 1	Lithology code 2	Description
0	6.56	1		Casing. ~20cm of amphibolite, pink granitic rubble, roots, sand and assorted pebbles. After 2: typical amphibolite unit; dark, foliated with local cm-wide, irregular albitic lenses. Relatively homogeneous.
6.56	9.48	3	B	Mottled albitite. White overall, with subangular, megacrystic kspar (beige) and coarse, fractured greyish pink quartz, in white albitic matrix. Minor yellow and dark green mica (<2%). Amphibolite dykelet at 7.7 to 7.95; contacts at 35° and 50° TCA. Upper contact ~50° TCA, lower contact irregular, sub-vertical, sharp.
9.48	23	1		Amphibolite. Same as previous. Minor sulphides; disseminated throughout, as foliated wispy stringers (pyrrhotite) and chalcopyrite on joint fractures.
23	23.45	3	B	Mottled albitite. Same as previous. Trace fine grained pink garnet. Upper contact sharp @ ~40° TCA.
23.45	24.05	5		Quartz mica zone. Dark grey/purplish quartz, fine to coarse grained and fractured, imparting a granophyric texture. Abundant fine to medium grained garnet, subhedral, pink. Minor interstitial yellow/light green mica. Highly fractured. Upper and lower contacts sharp at 45° and 45-50° TCA respectively.
24.05	24.38	3	B	Mottled albitite. Same as previous. Local fractured, dark grey pegmatitic quartz and veins.
24.38	24.7	1		Amphibolite. Same as previous. Upper contact irregular but sharp at ~30-35° TCA. Lower contact ~65° TCA.
24.7	28.5	3	B	Mottled albitite. Same as previous. Abrupt decrease in grain size towards lower contact. Lower contact ~35°, marked by fractured, dark mica exocontact.
28.5	30.7	1		Amphibolite. Same as previous, with minor local 3A dykelets. Lower contact ~40°, sharp with dark mica selvedge.
30.7	31.08	3	B	Mottled albitite. Same as previous. Lower contact sharp ~30° with dark mica selvedge.
31.08	31.4	1		Amphibolite. Same as previous, with marked increase in biotite. Lower contact sharp, irregular at ~70° TCA with lower pegmatite.
31.4	33.35	3	B	Mottled albitite. Pegmatitic white kspar and dark grey quartz with minor yellow mica. Interval is essentially an intermingling of pegmatite and biotite-rich amphibolite.
33.35	34.5	3	B	Mottled albitite with local lenses of quartz mica (vague contacts). Mineralogy same as previous, with decrease in overall crystal size. Strongly foliated. Some kspar megacrysts display rotational movement. Abundant quartz and yellow mica throughout. Upper contact ~25-30°, irregular but sharp.
34.5	44.7	1		Amphibolite. Same as previous. Very fine grained pyrrhotite finely disseminated throughout. Local thin, foliated stringers of pyrrhotite and chalcopyrite. Local, minor dikelets of albite and pegmatitic spar.
44.7	45.65	3	B	Mottled albitite. Remnant white, partially resorbed kspar and fractured, elongate dark grey quartz in white albitic matrix. Very fine grained, pink garnets in small clusters, and disseminated. Upper contact ~50° TCA, lower contact ~40° TCA. Weakly foliated.
45.65	46.7	1		Amphibolite. Same as previous. Minor very fine grained sulphides disseminated throughout, locally as wispy stringers. Lower contact ~25°.
46.7	47.55	3	B	Mottled albitite. Same as previous. Upper contact 45° and lower contact 40° TCA.
47.55	49.5	1		Amphibolite. Same as previous. Lower contact ~20°.
49.5	50	3	A	Albitite. Foliation ~40° TCA. Lower contact 40°.
50	51.4	1		Amphibolite. Abundant biotite banding (~30°). Minor albitite dykelets, cm-thick.

DDH #:	SR17-72			Separation Rapids Project
51.4	52.1	5		Quartz mica albite. Quartz-rich at top of interval with quartz decreasing downhole. Typical 3B near bottom of interval, with <5% green mica stringers, minor <1% pink medium grained garnets and 1-2% yellow mica. Lower contact sharp at 33° TCA.
52.1	52.45	1		Amphibolite. Same as previous. Lower contact at 45° TCA.
52.45	53.3	5		Quartz mica albite intermingled with albitite. Upper contact sharp @ 45°, marked by dark mica exocontact. Quartz mica unit is weakly foliated. At 54.9: predominantly albitite, contact abruptly gradational.
53.3	56.2	1		Amphibolite. Same as previous.
56.2	56.6	5		Quartz mica albite. Same as previous. Upper contact 20° TCA and lower contact ~35°.
56.6	57	1		Amphibolite. Same as previous.
57	57.7	5		Quartz mica albite with albitite sections. Unit 5 to 57.5 (30° TCA) and albitite (3a) to 57.7 (30° TCA).
57.7	59.1	1		Same as previous.
59.1	59.5	5		Same as previous. Upper contact at 35°, lower contact 35° TCA.
59.5	60.2	1		Amphibolite. Lower contact at 53° TCA; marked by dark mica selvedge.
60.2	60.65	3	B	Mottled albitite. Same as previous. Lower contact ~20-25°, with wavy, dark mica exocontacts.
60.65	61.2	1		Amphibolite. Same as previous.
61.2	61.4	5		Quartz mica albite. As previous. Lower contact 45° TCA.
61.4	65.6	1		Amphibolite. Strongly foliated, abundant biotite banding. Very fine grained pyrite and pyrrhotite disseminated throughout.
65.6	67	3	A/B	Albitite. Predominantly white albite. Upper contact 40°, lower contact ~15°, intermingled with albitic lens.
67	71.25	1		Amphibolite. Same as previous. Lower contact 35° TCA.
71.25	71.6	5		Quartz mica albite. Same as previous. Lower contact at 30° with dark mica exocontacts.
71.6	74	1		Amphibolite. Same as previous. Albitite dykelets at : 72.9 and 73.0 (5 cm wide, ~30°). After 73.15: increase in brown biotite, strongly foliated. Lower contact at 25° TCA.
74	76.1	3	B	Mottled albitite. Same as previous. Amphibole dykelet at 75.7 (contacts at 35° and 60°).
76.1	77	1		Amphibolite. Same as previous. Upper and lower contacts irregular, with dark mica exocontacts (25°).
77	78	3	B	Mottled albitite. At 77.3 to 77.5: quartz mica albite lens; upper and lower contacts @ 25 and 18° respectively. Lower contact of unit: 35°; amphibolite and quartz mica bands.
78	84	1		Amphibolite. Arbitrary boundary; amphibolite and albitite are intermingled (interbanded). Common sulphide stringers (pyrrhotite).
84	86.67	3	A	Albitite. Same as previous. Abundant cm-wide veins of green with yellow mica, sub-vertical, almost entire length of interval. Lower contact at ~45° TCA.
86.67	87.4	1		Amphibolite. Same as previous. Upper contact 45° with 12 cm wide dark mica exocontacts.
87.4	88	3	B	Mottled albitite. Same as previous. Lower contact 35°. Upper contact wavy, sharp, 30°-40° TCA.
88	89.95	5		Quartz mica albite. Predominantly medium to coarse granophyric grey quartz, with dark green and minor yellow mica lenses and stringers. Lower contact arbitrary, marked by abrupt decrease in dark mica and grey quartz, increase in albite and coarse kspar.
89.95	95.85	3	B	Mottled albitite. As previous. Lower contact: 55° TCA. At 94.2: 7cm amphibolite mica rich. Upper and lower contacts 30° and 50° TCA.
95.85	115.8	1		Amphibolite. As previous. Strong tectonic fabric. Albitite dykelets @: 97.0, 97.95, 101.0, 104.45. Common albitite banding throughout. Minor very fine grained disseminated sulphides. Biotite abundant throughout.
115.8	127.4	3	B	MOTTLED ALBITITE As previous. Local pods of coarse silver-green muscovite, overall 5-8% mica. Upper contact 40° Lower contact 30°

DDH #:	SR17-72			Separation Rapids Project
127.4	131	1		AMPHIBOLITE As previous. Greyish, bleached appearance, very chloritic, only minor phlogopitic mica. 128.9-129.05 Albitite (3a) As previous.
131	132	3	B	MOTTLED ALBITITE As previous. Local patchy dark green mica, fine spessartine. Local fine tabular brown-black tantalite, particularly at upper boundary.
132	144.2	1		AMPHIBOLITE As previous. 142.1-142.4 Albitite (3a) As previous. 143.2 3 cm albitite dykelet 143.75-143.8 Albitite (3a) as above. Strong phlogopitic exocontacts.
144.2	146.7	3	B	MOTTLED ALBITITE As previous, common fine to coarse spessartine. Fine to medium grained silver-green muscovite, average 7%. Local fine acicular tantalite.
146.7	161.4	1		AMPHIBOLITE As previous. 3A at 149.75-150.3; 157.1-157.3; 157.6.
161.4	161.9	6	A	PETALITE ALBITE PEGMATITE White with coarse blocky grey K-feldspar in albite matrix. Petalite is net-textured, white, and ribbony with schlieren texture. Local spessartine.
161.9	172.1	1		AMPHIBOLITE As previous, with decreasing chlorite and increasing phlogopite. 163.56-163.8 Siliceous alteration unit with abundant fine black amphibole aggregates. 164.95-165.05 Albitite (3a) 167.0-167.2 Albitite (3a) 168 Albitite (3a)
172.1	176.05	6	D	LEPIDOLITE PETALITE ALBITE QUARTZ K-FELDSPAR Sharp upper contact with 2 cm phlogopitic exocontact. Strongly foliated to sub-mylonitic (6C fabric), with local coarser, schlieren enclaves with rotate K-feldspar and petalite. Petalite is white and web-textured, particularly in coarser sections where it resembles 6A petalite. In mylonitic sections web texture is not discernible. Upper 80cm is white petalite (6a), with minor lepidolite. Section is light lavender coloured due to ubiquitous fine grained lepidolite in bands and aggregates, lepidolite content average 10%. Common light orange, fine to medium grained spessartine in coarser sections.
176.05	177	1		AMPHIBOLITE Fine grained, grey-green, homogeneous, not layered like previous intervals. Very little hydrothermal biotite/phlogopite.
177	186.2	6	D	LEPIDOLITE PETALITE ALBITE K-FELDSPAR QUARTZ As previous, but more consistently mylonitic and lepidolite-rich, very minor coarse grained lenses. Section is very homogeneous. Lepidolite consistently oriented along mylonitic banding planes. Average 10-12%, locally to 15%. Occasional pink petalite, generally grey and obscure. 3 cm phlogopitic screen at 177.2. Upper contact is Li-depleted, with grey K-feldspar and albite (no petalite or lepidolite). Lower endo-contact has 10cm albitic depletion zone.
186.2	196.1	1, 6	3	AMPHIBOLITE / ALBITIC DYKE SWARM Amphibolite similar to previous sections, fine grained, green-grey, with common banding. Fine grain brown phlogopitic bands and selvedges in amphibolite proximal to dykelets. Some dykelets, generally >15cm, contain white web-textured petalite at their cores. When purely albitic/feldspathic, dykelets have phlogopitic selvedges through Li-depletion of dykelets. 2.6m total core length of 3a/6a dykelets in amphibolite, varying from 1cm to 32 cm in core length.
196.1	199.9	6	D	LEPIDOLITE PETALITE ALBITE K-FELDSPAR QUARTZ PEGMATITE; As previous. Local coarser partially preserved/rotated grey-white K-feldspar. Trace fluor-apatite.
199.9	200.5	1		AMPHIBOLITE As previous. Light green-grey with very common brown hydrothermal phlogopite bands.

DDH #:	SR17-72			Separation Rapids Project
200.5	206.7	6	D	LEPIDOLITE PETALITE ALBITE K-FELDSPAR QUARTZ PEGMATITE; As previous, with more heterogeneous textures. Lepidolite average 8-10%. Local coarse unaltered white petalite to 4 cm. Petalite is white to light pink, very little web-textured petalite. Pegmatite has 2-3 cm albitic depletion haloes at contact with amphibolite screen. Conversely, amphibolite screens have 1cm hydrothermal biotite selvedges. Amphibolite at 202.6-202.77 and 203.4-203.7.
206.7	208.6	1	6A	AMPHIBOLITE/ALTIBTE PETALITE PEGMATITE Amphibolite as previous with common hydrothermal biotite. Total of 64 cm of albitic +/- petalite dykelets from 1-18cm. Where petalite present, generally in ?15cm dykelets, and as white ribbony petalite in cores.
208.6	212.6	6	D	LEPIDOLITE PETALITE ALBITE QUARTZ PEGMATITE As previous, with albitic 6a from 208.6-209.5, with narrow hydrothermally altered amphibolite inclusions, altered to medium grained phlogopite/biotite. Topaz and fluorapatite in upper albitic border zone. Petalite content is whiter and more ribbony than previous interval, commonly imparting schlieren textures. Lepidolite content consistent throughout, average 8-10%. Common fine light orange spessartine.
212.6	217.1	1		AMPHIBOLITE Finely banded and layered, as previous, common narrow bands of phlogopite. Holmquistite at 213.
217.1	220.35	7		ALBITE K-FELDSPAR QUARTZ PEGMATITE Pink, strongly banded albitic pegmatite with coarse pink myrmekitic K-feldspar. Fine green muscovite in bands and patches.
220.35	222.3	1		AMPHIBOLITE As previous, with recumbently folded quartz veins.
222.3	224.75	7	2	K-FELDSPAR BIOTITE QUARTZ PEGMATITE Grey-white, megacrystic, with common coarse interstitial and ribbony biotite. Possibly some very dark green muscovite present. Unclear whether English River or Winnipeg River domain.
224.75	228	1		AMPHIBOLITE Less layered, darker, chloritic, with little phlogopite except at 227.5, associated wit hydrothermal quartz lens.

SR17-73

DDH #:	SR17-73		Separation Rapids Project
UTM NAD83 Zone 15N		Collar dip: -63°	Drill company: Boart Longyear | Start: April 26, 2017 | Finished: May 3, 2017
Easting:	388454.2	Collar azimuth: 165°	Logged by: Volker Moeller
Northing:	5569132.9	Depth: 390 m	Log Date: May 18, 2017
Elevation:	344.3	Core diameter: HQ	Mining Lease 108395 / CLM469 | Casing left in hole | Core stored on CLM469.

From [m]	To [m]	Lithology code 1	Lithology code 2	Description
0	2.07	OVB		Overburden/Casing No overburden preserved. Casing 1.5 m + 2 ft. attachment.
2.07	69.43	1	1A	Amphibolite Black to dark brown or green, fine- to medium-grained, strongly foliated and homogeneous. Quartz-enriched bands < 1 cm. Brown biotite concentrated in cm-thick bands. The foliation dips 15° to core axis (TCA) at 57.5 m. Very fine-grained disseminated pyrrhotite. 10.65 m Quartz lens with disseminated pyrrhotite 29.9 m Albitic dikelet, 6 cm thick, contains biotite, garnet, pyrite, 25° TCA dip. 39.45 m Coarsely crystalline K-feldspar-quartz dikelet, ~20 cm thick, contains pyrite, sharp contacts dipping in opposite directions. 60 m More abundant pyrrhotite 61 - 61.3 m Pyrrhotite-bearing veins with minor pyrite 64.75 - 65.5 m Fine- to medium-grained, grey K-feldspar-albite dikelets containing garnet and biotite. Bronze-colored (likely phlogopitic) biotite around the contacts. Partial assimilation of the amphibolite is indicated.
69.43	70.75	3	3B	Granitic dikelet Light-grey and coarse-grained, grey K-feldspar, white albite (appears to replace K-feldspar), grey quartz, black biotite, red-brown garnet. Sharp-irregular wavy upper and lower contacts, no foliation. 70.4 - 70.75 m Biotite-rich wall rock assimilation zone, foliated
70.75	71.83	1	1A	Amphibolite Continued. Enriched in bronze-colored biotite and pyrrhotite.
71.83	78.8	3	3B	Pegmatite dike with three distinct subunits with sharp but conformable boundaries: 71.83 - 72.68 m Megacrystic euhedral black biotite (up to 5 cm long) in a coarsely crystalline matrix of K-feldspar, albite and quartz. The biotite abundance is a result of amphibolite assimilation into the melt? 72.68 - 76.08 m Grading from a continuation of the matrix of 71.83 - 72.68 m (without the large euhedral biotite), containing minor biotite into muscovitic below 73.2 m and increasingly quartz-rich downhole. Muscovite overgrows biotite in the transition zone. Minor garnet. Overall medium-grained. 76.08 - 78.8 m Coarsely crystalline with light-grey subhedral & megacrystic K-feldspar, coarse interstitial quartz and patches of silvery muscovite, in some cases mantled by more greenish mica. Red-brown garnets < 5 mm. Grading into gneissic textures below 78 m with stretched quartz and boudinaged K-feldspar. Sharp and wavy lower contact.
78.8	81.43	1	1A	Amphibolite As above, but no biotite and largely absent metamorphic foliation. Minor disseminated pyrite & pyrrhotite.
81.43	83.03	3	3B	Quartz-K-feldspar-muscovite-albite pegmatite Light grey and medium-grained with isolated coarse K-feldspar, red-brown garnet < 5 mm, biotite ~5 mm, greenish-silvery muscovite, probably some biotite in the matrix. Lower contact dips 45° TCA.
83.03	84.14	1	1A	Amphibolite As above.
84.14	85.19	3	3B	Medium-grained feldspathic pegmatite Contains minor muscovite and garnet, somewhat foliated. Sharp & wavy upper, sharp-irregular lower contact.
85.19	86.79	1	1A	Amphibolite As above. Abundant pyrite near the top. 86.52 m Albite + quartz dikelet, 25 cm thick.

DDH #:	SR17-73			Separation Rapids Project
86.79	91	3	3A	Albite-quartz pegmatite Medium-grained, contains greenish muscovite, cm-size red-brown garnet and accessory biotite. Quartz-rich from 88.53 - 89.50 m. 87.8 m Amphibolite xenolith, 20 cm.
91	93.26	1	1A	Amphibolite As above. Several cm-thick pegmatite dikelets with phlogopitic haloes at the bottom. 92.1 m Dikelet of unit 3B, 3 cm.
93.26	99.95	3	3B	Quartz-rich pegmatite dike Medium- to locally coarse-grained, <5% greenish-silvery muscovite, up to cm-size garnet (locally zoned with yellow core and red-brown rim, locally poikilitic). Only locally displays a foliation. Sharp lower contact dipping 40° TCA 96 - 96.8 m Very quartz-rich 98 m Coarser K-feldspar
99.95	130.39	1	1A	AmphiboliteAs above. Enriched in phlogopite in bands and zones from top to ~104 m. Otherwise homogeneous. Some quartz ± pyrrhotite veining, e.g., at 115.15 m.104.75 m Diopside (green) + garnet + quartz band117.95 m Greenish patch with diopside + calcite + quartz125.45 - 125.9 m Silicified zone with garnet, diopside, minor pyrite129.11 m Pink feldspathic dikelet, 22 cm thick, fine-grained, minor biotite, sharp contacts129. 45 m Diopside + garnet + quartz (skarn assemblage) band, 3 cm thick
130.39	130.79	3	3A	Albitic dikelet Light pink, quartz + albite + biotite, fine-grained, sharp contacts dipping 35 - 45° TCA. Biotite is aligned parallel to the 45° TCA banding in the surrounding amphibolite.
130.79	137.85	1	1A	Amphibolite As above. Minor quartz veining, rare patches containing diopside + garnet + quartz (e.g., 134.8 m) 134.7 m Thin (3 mm) pyrrhotite vein
137.85	138.72	3	3B	Granitic dikelet Light-grey, medium-grained, quartz + albite + muscovite + garnet, surrounded by 5 - 10 cm thick phlogopitic halos in the amphibolite. Sharp-irregular wavy upper and sharp 15° TCA lower contact.
138.72	155.08	1	1A	Amphibolite Continued. 143.15 - 143.65 m Abundant bronze-colored phlogopite bands. 145 m Abundant pale-grey garnet (?) 144.7 - 144.9 m Quartz-rich 152 m Boudinaged quartz bands
155.08	155.51	99		Skarn Fine-to medium-grained, light-brown garnet, green diopside, quartz, pyrrhotite. Sharp contacts parallel to the foliation in the amphibolite. 0.5% sulfide (pyrrhotite), pyrite along a fracture near the top.
155.51	163.62	1	1A	Amphibolite Continued. 163 m Feldspathic dikelet dipping 20 - 30° TCA, medium-grained, contains a crystal of arsenopyrite. Feldspar displays distinct lamellae <1 mm. Pale-pink garnet. Unidentified pale blue-grey mineral.
163.62	165.06	6	6A	Petalite pegmatite, web-textured. Distinctly foliated, medium to coarse-grained, light-grey dikelet containing abundant white web-textured petalite. Very coarse feldspar up to 5 cm, cm-size light pink-brown garnet, quartz, light-grey muscovite. Sharp contacts dipping 35° TCA.
165.06	174.72	1	1A	Amphibolite Continued.
174.72	175.47	6	6A	Petalite pegmatite, web-textured. Dikelet with up to 15 cm patches containing web-textured petalite, coarse K-feldspar, cm-size pale pink-brown garnet, fine-grained yellowish-green muscovite. The margins are albitic. The contacts are wavy and dip ~30° TCA, parallel to the foliation in the amphibolite.

DDH #:	SR17-73			Separation Rapids Project
175.47	186.89	1	1A	Amphibolite Continued. Some green diopside bands. No visible sulfide. 178.33 m Albite + K-feldspar dikelet, 6 cm true thickness containing pale pink-brown garnet and biotite. 180.16 m Quartz vein, 9 cm true thickness, boudinaged. 185.25 m Thin albitic dikelet 186 - 186.89 m Phlogopite-rich 186.05 m Band containing blue holmquistite, 5 cm thick
186.89	189.59	3	3B	K-feldspar-quartz-albite-muscovite pegmatite Coarse-grained with coarse pink garnet, no visible petalite, sharp-irregular wavy upper contact.
189.59	192.97	1	1A	Amphibolite Continued. Contains cm-size albitic dikelets. 190.53 m: 20 cm dikelet similar to 186.89 - 189.59 m, but finer-grained.
192.97	193.6	3	3B	Fine- to medium-grained dikelet albitic dikelet Contains K-feldspar, biotite, garnet, quartz.
193.6	197.36	1	1A	Amphibolite Continued.
197.36	197.98	3	3B	K-feldspar-quartz-albite-muscovite pegmatite As 186.89 - 189.59 m. Contains some green topaz (?).
197.98	200.31	1	1A	Amphibolite Continued. Euhedral holmquistite at the top along the contact to the pegmatitic dikelet. 198.95 - 199.7 m Bands enriched in fine-grained blue holmquistite.
200.31	204.23	6	6A	Petalite pegmatite, web-texturedCoarse-grained with abundant web-textured petalite. Some glassy petalite displaying prominent cleavage (~5 cm size). Contains brown muscovite, minor green topaz, pale-pink to yellowish garnet. Petalite is less abundant in the lower half.Sharp upper and lower contacts dipping 20 and 35° TCA, respectively.202.55 m Amphibolite xenolith, c. 10 cm
204.23	208	1	1A	Amphibolite Continued. 205.9 m Albitic dikelet, 5 cm thick
208	208.64	3	3B	K-feldspar-quartz-albite-garnet dikelet
208.64	221.62	1	1A	Amphibolite Continued. 209.33 m Folded quartz vein, 2 cm thick 210.32 m Holmquistite-enriched with phlogopitic bands 210.5 - 210.9, 212.53, 214.6 & 215.2 m K-feldspar-quartz-albite-biotite dikelets 211.55 & 212.1 m Fine-grained holmquistite
221.62	222.65	3	3B	Feldspathic dikelet Medium-grained and banded, K-feldspar + quartz + albite + garnet + biotite + muscovite. Sharp contacts dipping 20 - 25° TCA.
222.65	225.27	3	3B	Amphibolite Continued. 222.9 m Albitic dikelet, 3 cm thick.
225.27	227.83	6	6A	Petalite pegmatite, web-textured Albitic dike with subtle, but relatively abundant web-textured petalite. Contains pale pink-brown garnet and minor yellowish-green mica.
227.83	228.62	1	1A	Amphibolite Continued.
228.62	229	3	3B	Feldspathic dikelet Fine- to medium-grained, light grey. Contains minor greenish muscovite.
229	232.28	1	1A	Amphibolite Continued. Minor blue holmquistite and brown phlogopite. Thin feldspathic dikelets.
232.28	233.03	3	3B	Feldspathic dikelet Fine- to medium-grained with some coarse quartz. Contains pale pink-brown garnet.
233.03	234.81	1	1A	Amphibolite Continued. Foliation absent, minor phlogopite present.

DDH #:	SR17-73			Separation Rapids Project
234.81	236.86	6	6D	6D / 6A Lepidolite pegmatite with petalite pegmatite Upper half from 234.81 - 235.58 m is lepidolite-rich (purple) grading into silvery mica downhole. Overall fine-grained with coarse lepidolite. 235.58 - 236.86 m Very coarse-grained (up to 10 cm) petalite with less-pronounced web-texture (little alteration to spodumene). Petalite is largely colorless, hosted in a matrix of silvery mica + albite + quartz and displays a distinctive cleavage. Minor beige garnet. Foliation present but not prominent in this section.
236.86	237.94	6	6A	Petalite pegmatite, web-textured Medium-grained quartz-albite zone containing a 3 cm thick band of clear, faint-greenish petalite at 237.55 m. Stretched sigmoidal quartz oriented along foliation.
237.94	239.12	1	1A	Amphibolite Continued.
239.12	239.66	3	3B	Feldspathic dikelet As 228.62 - 229 & 232.28 - 233.03 m.
239.66	241.52	1	1A	Amphibolite Continued. 240.95 m Thin albitic dikelet
241.52	242.62	6	6D	Lepidolite pegmatite Feldspathic dikelet with a purple lepidolite-rich center. Some coarse petalite.
242.62	243.26	1	1A	Amphibolite Continued.
243.26	244.3	6	6D	Lepidolite pegmatite Feldspathic dikelets with a lepidolite band at 243.42 m (~6 cm) and a 25 cm amphibolite sliver at 243.7 m.
244.3	245.28	1	1A	Amphibolite Continued.
245.28	245.72	3	3A	Albitite Fine-grained dikelet, contains a fine-grained indigo-blue mineral, likely fluorapatite.
245.72	247	1	1A	Amphibolite Contains abundant albitite dikelets <5 cm.
247	247.56	6	6A	Petalite pegmatite, web-textured Albitite dikelet containing very minor pale-pink garnet, glassy petalite in a 15 cm patch in the center. Contains a thin sliver of amphibolite.
247.56	255.47	1	1A	Amphibolite Continued. Thin albitic dikelets throughout, some with holmquistite along the contacts.
255.47	256.2	3	3A	Albitite Fine-grained with some medium-grained quartz, minor pale-pink garnet. A fine-grained green clay mineral is present (illite?).
256.2	260.4	1	1A	Amphibolite Continued. Tight internal microfolding indicated by folded quartz bands/veins. Biotite-rich at the lower contact. The foliation dips 25 - 30° TCA.
260.4	261.62	6	6A	6A/3B Petalite-bearing pegmatite Albitic along the top contact, then coarse-grained with K-feldspar (~5 cm) in an albite + muscovite + K-feldspar matrix. Minor petalite, pale pink-brown garnet, greenish mica. Albitic from 261.33 - 261.62 m.

DDH #:	SR17-73			Separation Rapids Project
261.62	307.35	6	6A	Petalite pegmatite Coarse-grained with subhedral K-feldspar in a matrix of quartz, muscovite, albite, clear glassy web-textured petalite (<0.5 cm) mantled by white spodumene (?) and pale pink-brown to pale brown garnet (<2 cm, locally poikilitic, locally mantled by muscovite). Muscovite is present throughout; it can get relatively abundant, 10 - 15% (e.g., 268.8 -272.7 m & 289 - 292 m). A prominent foliation is produced by the banding of web-textured petalite and muscovite and dips 25 - 35° TCA, parallel to the amphibolite host rock. Overall, the unit is homogeneous and well-mineralized. Below 270.5 m, web-textured petalite becomes coarser-grained and locally very coarse (e.g., 274.67 m). 262.9 m Abundant green illite (?) and soft white clay mineral around a joint. Likely hydraulic weathering along a groundwater-connected fracture/joint. 264.15, 266.85 & 277.3 m Patches < 10 cm containing a fine-grained pale grey mineral, likely spodumene, intergrown with quartz (= SQI?). Distinct from the white spodumene in the web textures. Below 266 m, petalite gradually gets an orange tint which becomes more prominent downhole; around 269 m it is largely orange. This is likely related to hydrothermal alteration, as the coloration is spatially related to joints. The orange coloration fades below 269 m, but is still present until at least 283 m. 269.9 m Patches of spodumene 278.74 m Sigmoidal clast of glassy petalite in an albitic band 280.65 - 281.1 m Pale green clay mineral 292.2 m Red-colored petalite, mantled by white spodumene (= web texture) 286.4 m Foliation dips 25° TCA 290.25 - 290.73 m Semi-massive web-textured clear petalite surrounded by white spodumene 293.25 & 296.52 m Green illite (?) along fractures, together with a red clay mineral 295.25 m Amphibolite xenolith, 20 cm thick 295.55 - 295.85 m Abundant coarse (up to 10 cm) light-grey spodumene with inclusions of quartz 297.1 m Foliation dips 55° TCA Below 304.49 m sharp decrease in petalite abundance, but continuous rock & texture. Only minor petalite bands <3 mm. 306 m Foliation dips 35° TCA
307.35	309.93	5	5	Quartz-mica zone Medium-grained quartz-rich pegmatite containing silvery muscovite and minor feldspar. Sharp, non-intrusive upper contact dipping 20° TCA, somewhat gradational lower contact. Abundant light-grey spodumene bands and interstices at 308.9 and 309.75 m. 309.6 - 310.1 m Abundant red clay mineral (illite?)
309.93	319.26	3	3B	K-feldspar-quartz-muscovite granitoid Medium- to coarse-grained with a weakly developed foliation. Quartz-rich at the top. From 312 m downhole, red-orange hematization. Below 313 m distinctly more albitic and finer-grained.
319.26	321.65	90	3B	Fault Zone / Unit 3B The rock is continuous from above, but highly fractured and hematization is moderately strong. Pale-orange to grey platy silicate coatings on the joints indicate hydrothermal activity that predates later white soft clay mineral coatings. The core angles of the fractures vary from 30 to 60° TCA (locally 85° TCA), but a dominant angle is 30 - 35° TCA. Intersecting fractures are common. Rock fragments up to 20 cm, but also gravel-sized sections. The hematization (oxidized fluids) and the clay infills indicate that this fracture is connected to subsurface water (hydrostatic conditions). This is likely the zone that "made water" identified by the drillers for 315 - 318 m.
321.65	326.5	3	3B	K-feldspar-quartz-muscovite granitoid Continued. Hematized from top until 322.66 m, sharply decreased hematization below. Prominent foliation dipping ~40° TCA. K-feldspar is locally euhedral and locally coarse. Unit contains mm-size pale pink-brown garnet. 321.98 m Soft white clay gauge along a fracture 326.25 - 326.33 m Highly fractured, fracture angles ~50° TCA 323.55 - 328.8 m Massive coarse quartz with minor muscovite
326.5	327.67	5	5	Quartz-muscovite pegmatite Massive quartz and muscovite with thin bands of the above unit at the top.

DDH #:	SR17-73			Separation Rapids Project
327.67	328.56	90	5	Fault Zone Rock unit continues, but is highly fractured ranging from 25 cm to gravel-sized fragments. Beige to greenish silicate coating on some surfaces, also chloritic and clay coatings. A red clay mineral (illite?) is enriched in the quartz-mica rock. The fracture angles are ~50° TCA.
328.56	333	5	5	Quartz-muscovite pegmatite Continued. Moderately to strongly fractured.
333	336.3	3	3B	Albitic to mottled pegmatite (3B/A) Sharp, conformable boundary to the above unit, distinctly banded with abundant white albite in the matrix. 333 - 334.82 m Albitic with coarse quartz in bands 334.82 - 336.3 m Coarse euhedral K-feldspar displaying an intense blue schiller, interstitial quartz, some muscovite.
336.3	339.25	3	3A	Albitite Light grey, fine-grained, containing pale pink garnet, some silvery muscovite in patches and disseminated throughout.
339.25	339.92	90	3A	Fault Zone / 3A Rock continuous from above but highly fractured into discs 5 mm - 5 cm thick. The fractures are perpendicular to the core axis and have a thin quartz coating. Some of the discs are cemented together.
339.92	344.84	3	3A	Albitite Continued. Fine-grained muscovite is more abundant.
344.84	346.14	90	3A	Fault Zone / 3A As 339.25 - 339.92 m.
346.14	347.24	3	3A	Albitite Continued. Thin sliver of amphibolite at the top. Cm-size pink garnet is more abundant.
347.24	351.4	90	3A	Fault Zone / 3A As 339.25 - 339.92 m. Slivers of amphibolite at the top and at 348 m. Less mica downhole but the mica is gradationally becoming more purple.
351.4	351.81	90	6D	Fault Zone / 6D Continuous from above fracture albitite but enriched (~5%) in purple-silvery lepidolite.
351.81	353.7	6	6D	Lepidolite pegmatite Continuous from above, but not fractured.
353.7	354.59	3	3A	Albitite As above. Sliver of amphibolite in the lower half.
354.59	355.85	6	6A	Petalite pegmatite Fine- to medium-grained containing stringers and patches of web-textured petalite, light-pink garnet in an albitic matrix. Enriched in grey quartz towards the bottom. The petalite bands dip 20° TCA.
355.85	356.1	3	3A	Albitite with amphibolite (3A / 1) As previous with amphibolite along joints/faults subparallel TCA.
356.1	356.4	90	3A	Fault Zone / Albitite / Amphibolite
356.4	357	3	3A	Albitite
357	358.64	1	1	Amphibolite As previous, enriched in brown phlogopite at the top and bottom contacts. Abundant pyrite along a fracture at the top.
358.64	359.12	3	3B	K-feldspar-quartz-albite-garnet dikelet
359.12	359.6	1	1	Amphibolite As previous.
359.6	360	90	1	Fault Zone / Amphibolite Rubbly clay minerals. Ground water flow zone?
360	383.71	1	1	Amphibolite As previous. Rare green diopside in patches, e.g., at 374.35 m. 369.8 m Thin feldspathic dikelet, similar to 3B 379.9 m Thin K-feldspar+quartz+albite+muscovite dikelet
383.71	383.92	90	90	Fault Zone Fractured core with quartz+chlorite cement. Likely an open fracture.

DDH #:	SR17-73			Separation Rapids Project
383.92	390	1	1	Amphibolite Continued. 383.25 m Foliated bands containing garnet and diopside 386.9 m Holmquistite

SR17-74

DDH #:	SR17-74		Separation Rapids Project
UTM NAD83 Zone 15N		Collar dip: -70°	Drill company: Boart Longyear | Start: May 3, 2017 | Finished: May 11, 2017
Easting:	388673.8	Collar azimuth: 180°	Logged by: Jens C. Pedersen / Volker Moeller
Northing:	5569035.0	Depth: 336 m	Log Date: May 18, 2017
Elevation:	326.3	Core diameter: HQ	Mining Lease 108395 / CLM469 | Casing left in hole | Core stored on CLM469 .

From [m]	To [m]	Lithology code 1	Lithology code 2	Description
0	7.45	OB		OVERBURDEN Clay, cobbles, boulders at basal interface.
7.45	30.2	1		AMPHIBOLITE Dark green-grey, fine grained, homogeneous, chloritic and biotitic in narrow (1-3cm) mafic layers, likely selvedges. These selvedges generally hydrothermally altered with brown phlogopitic mica and quartz. Local holmquistite in more siliceous bands, as at 10.4 and 29. Rare disseminated pyrite or pyrrhotite grains, average <0.5% sulphides. Fine 1mm chloritic stringer with pyrrhotite to 20% at 25.5.
30.2	38.9	6	D	LEPIDOLITE PETALITE K-FELDSPAR ALBITE QUARTZ PEGMATITE Very distinct dyke with coarse patchy lepidolite, large orange spessartine, and large translucent green petalite crystals to 7cm. White aplitic and albitic with yellow-green mica and clear orange spessartine to 31, then lepidolite and petalite appear. Lower boundary also similar feldspathic border/wall zone, from 38-38.9. Unit is very albitic (aplitic) with green and white petalite throughout, white web-textured petalite mega-crysts to 10cm. Green petalite at top of section, to 32. Lepidolite throughout as pods and semi-massive patches, overall 10%. Local blue fluorapatite. K-feldspar confined to feldspathic border zones. Green fracture at t36.2 crosses petalite crystal with secondary green mineral penetrating into petalite along cleavage planes. White crusty alteration along fracture, possible cookeite. White petalite has strong web-texture typical of 6A and is likely hydrothermally altered to spodumene. Yellow-green muscovite instead of lepidolite in feldspathic wall zone. 33.0 narrow 3cm altered and replaced amphibolite
38.9	122.85	1		AMPHIBOLITE As previous. Variously layered and semi-massive, likely tuff-flow sequence, predominantly flows. Hydrothermal biotite locally in layered tuff intervals. Very little discernible sulphides, <0.5% overall. Minor aggregates associated with 3cm quartz lens, at 70.2, also narrow quartz stringers as at 71.5.
122.85	136	6	D	LEPIDOLITE PETALITE ALBITE K-FELDSPAR PEGMATITE Generally tectonically banded with coarser sections imparting mottled textures. Very micaceous after 125.5, and becoming lavender coloured after 130. From 122.85-125.5, section is albitic, with abundant albite interbanded with lesser pink to white stretched petalite, local coarse grey rotated K-feldspar, and 10% green primary spodumene (or squi after petalite) in coarse deformed light grey-green aggregates. Spodumene appears to be dominant Li-mineral in this interval. Silver-green mica bands and patches average 5-7%. Common disseminated light orange spessartine. 125.5-130.0 Strongly micaceous with coarse patches of silvery Li-mica in albite matrix, average 15-20%. Common coarse grey quartz lenses average 15%. Local grey-green fractured spodumene crysts, as at 129.5, appear primary. Only minor visible petalite. Common coarse grey K-feldspar. 130.0-135.25 Abrupt phase change, with appearance of lavender lepidolite and common coarse white net-textured petalite. Lepidolite in bands and patches to 15%, commonly mantling white petalite. Very little K-feldspar, <10%. Local blue apatite. Rusty orange mineral generally associated with rusty orange fractures, likely late stage Fe-alteration. 20-25% petalite. 131.75 3cm phlogopite selvedge (after amphibolite). 135.25-136 6A No mica, very albitic, with 3cm white aplitic border zone.
136	138.35	1		AMPHIBOLITE As previous, but strongly metasomatized (phlogopite) with coarse orange garnet in siliceous sections at 137.4. Patchy and layered magnetite at 138, associated with drag folds in amphibolite.

DDH #:	SR17-74			Separation Rapids Project
138.35	138.95	3	B	ALBITE K-FELDSPAR PEGMATITE Irregular dykelet with very good holmquistite at exocontacts. Upper contact 40 degrees, lower contact irregular and sub-parallel to core axis, with abundant phlogopite-holmquistite, with radiating holmquistite needles to 2cm internal and external to pegmatite. Broad coarse orange spessartine growing into pegmatite along amphibolite contact. Coarse patch of pyrrhotite with lesser chalcopyrite in pegmatite associated with lower contact. No mica or Li-minerals.
138.95	142.5	1		AMPHIBOLITE Highly deformed, folded, and hydrothermally altered, likely larger fold hinge. Abundant planar magnetite bands throughout, and common disseminated pyrrhotite in chloritic and siliceous alteration, average 5-7% overall. Locally abundant holmquistite and phlogopite, particularly from 141.7-142.5. Section strongly magnetic.
142.5	148.25	6	D	LEPIDOLITE PETALITE ALBITE K-FELDSPAR PEGMATITE Similar to previous. Light lavender colour in bands and patches, average 15-20%. Petalite white, net textured, average 15%. Feldspathic and siliceous with local web textured petalite, including greyish glassy spodumene to 7cm (possible squi) from 142.5-143.1. Lepidolite appears after 143.1. 146.3 4 cm coarse phlogopite selvedge after amphibolite.
148.25	152	1		AMPHIBOLITE Highly altered and deformed, as previous. Strongly magnetic. Coarse pyrrhotite associated with silica alteration. Magnetite to 149.4.
152	153.3	6	D	LEPIDOLITE PETALITE ALBITE K-FELDSPAR As previous. 15% lepidolite. 20cm albitic/feldspathic border zones.
153.3	158.2	1		AMPHIBOLITE Strongly altered, erratic foliation (folding). Local magnetite layers at 153.7. Disseminated sulphides av. 1-2%. 154 6cm irregular albitite with spectacular holmquistite and phlogopite development at exocontacts. Perfect amphibole cross-sections at footwall contact. 154.6-154.75 Albitite (3A)
158.2	159.65	6	DA	LEPIDOLITE PETALITE ALBITE QUARTZ PEGMATITE As previous. Upper half is lepidolite-rich, lower half is white petalite-rich with no lepidolite. 20% lepidolite in upper half of section, 50-60% white petalite in lower half. Local spessartine.
159.65	160.48	1		AMPHIBOLITE; Decreasing deformation and alteration.
160.48	161.35	6	A	PETALITE ALBITE QUARTZ PEGMATITE White, strongly deformed with well developed schlieren textures. <3% yellow muscovite. Sharp contacts at 40 degrees to core axis.
161.35	162.1	1		AMPHIBOLITE As previous. Very micaceous.
162.1	162.5	6	A	PETALITE ALBITE QUARTZ PEGMATITE Albitite with stretched web-textured petalite in core of dykelet. Several associated 5mm lepidolite ovoids.
162.5	163.2	1		AMPHIBOLITE As previous. Decreasing alteration. 4cm albitite dykelet at 163.
163.2	165.8	6	A	PETALITE ALBITE QUARTZ K-FELDSPAR MICA PEGMATITE Similar to last, strong ribbony banding with silver mica stringers and lenses after 165, 25% white petalite.
165.8	205.7	1		AMPHIBOLITE Homogeneous, green-grey, foliated flow with local tuff beds after 200. Fine disseminated pyrrhotite/pyrite, <0.5%. Holmquistite increasing after 204, with local indigo replacement layers up to 2cm thick. 174.5 5 cm albitite dykelet. 193.65-193.9 ALBITITE (3AB) Grey, mottled appearance.
205.7	262.15	1	3	AMPHIBOLITE/ALBITITE Amphibolite as previous, with clusters of narrow white dykelets throughout, amphibolite:albitite approximately 70:30. Amphibolite is hydrothermally altered with variable biotite, holmquistite replacement proximal to dykelets. Dykelets predominantly mottled albitite with 4 larger dykelets with ribbony white petalite in core zones. Contacts quite erratic, suggesting boudinage and folding of some dykelets. Dykelets range from 1cm to 105cm, average 15cm widths.
262.15	265.2	6	B	PETALITE ALBITE K-FELDSPAR MICA PEGMATITE Megacrystic petalite pegmatite with 40% white to orange-pink petalite in aplitic matrix. Petalite is web-textured and resembles (6A) petalite, with much of the petalite light orange-pink. Fine silver-green mica in narrow ribbony bands. Common spessartine. Aplitic border zones.

DDH #:	SR17-74			Separation Rapids Project
265.2	282.7	1	3	AMPHIBOLITE/ PETALITE-ALBITITE DYKE SWARM As previous, with 30% of unit comprised of albitic, commonly petalite-bearing pegmatite dykes and dykelets. 269-275 Abundant bleached fractures trending sub-perpendicular to core axis. Dykelets at: 269.3-269.4(3A); 271.5(3A); 273.6-273.95(6A); 278-278.15(3A); 278.9-279.6(6A); 281(3A); 282.7-281.9(3A); 282.2-282.35(3A).
282.7	306.6	6	CAB	PETALITE ALBITE K-FELDSPAR QUARTZ MICA PEGMATITE Strongly deformed, ribbony fabric, with 6C mylonitic fabric with partially preserved coarser enclaves. Locally abundant patchy silver mica at to 291.5, up to 15%. Petalite is white and pink, commonly web-textured. Spessartine commonly associated with coarse mica. Grey mottled K-feldspar megacrysts locally preserved, commonly rounded and rotated. Fine disseminated mica is silvery, average 10%, most prevalent in 6B. Greenish squi/spodumene patches at 304. Unit has light mauve hue, but no discernible lepidolite, colour due to grey-pink petalite ground mass with disseminated mica. White aplitic border zones. Pegmatite can be sub-divided based on petalite variety, into 6A (white petalite), 6B (pink petalite), with mylonitic overprint (6C).6A 282.7-293.36B 293.3-302.36A 302.3-304.46B 304.4-305.856A 305.85-306.43A 306.4-306.6
306.6	316.4	1	3	AMPHIBOLITE/ALBITITE DYKE SWARM As previous dyke swarm, with narrow albitic dykelets, commonly with white ribbony petalite cores. Very common holmquistite and phlogopite selvedges and along amphibolite layering. Amphibolite:pegmatite ratio: 65:35 320.4 Boudinaged feldspar/quartz veinlet, evidence that boudinage occurs vertically as well as laterally (photo taken). Dykelets at:307.3-307.54(6A); 309.2-309.35(6A); 309.6(3A); 311.35-311.6(3A); 312.5(3A); 312.95(3A); 313.25-313.55(6A); 314.45-314.9(6A); 315.1-315.5(6A).
316.4	317.8	6	D	LEPIDOLITE PETALITE ALBITE PEGMATITE Albitic border zones with 80cm lepidolite-rich core zone, 15% lepidolite, 15% white petalite. Strongly albitic. Irregular lower contact, upper contact at 25 degrees to core axis.
317.8	332.5	1	3	AMPHIBOLITE/ALBITITE DYKE SWARM As previous, dykelets decreasing after 325. 70:30 amphibolite:pegmatite. Decreasing hydrothermal alteration after 325. Dykelets at: 318.6-318.8(3A); 319-319.25(6A); 320.8(3A); 321.2-321.35(3A); 322(3A); 323(3A); 323.6(3A); 324.9-325.3(3A); 328(3A).
332.5	334.87	3	B	ALBITE K-FELDSPAR PEGMATITE Massive, medium to coarse grained, mottled texture, spotted appearance due to disseminated dark silvery mica, average 5%. Common fine pink spessartine.
334.87	336	1		AMPHIBOLITE Layered, chloritic, very little hydrothermal alteration.

V. Geotechnical logs

SR17-71

Core recovery and RQD			**Drill Hole:**	**SR17-71**		**Logged by:**	**V. Moeller**
Run from [m]	Run to [m]	Total core recovery (TCR) [m]	Solid core recovery (SCR) [m]	SCR > 10 cm [m]	TCR [%]	SCR [%]	RQD [%]
0	3	1.43	1.35	1.28	47.7	45.0	42.7
3	6	3.13	3.00	2.97	104.3	100.0	99.0
6	9	2.86	2.86	2.86	95.3	95.3	95.3
9	12	2.85	2.56	2.52	95.0	85.3	84.0
12	15	3.04	2.99	2.78	101.3	99.7	92.7
15	18	2.88	2.78	2.53	96.0	92.7	84.3
18	21	2.93	2.67	2.28	97.7	89.0	76.0
21	24	2.85	2.77	2.64	95.0	92.3	88.0
24	27	2.98	2.95	2.86	99.3	98.3	95.3
27	30	2.93	2.96	2.8	97.7	98.7	93.3
30	33	2.91	2.89	2.64	97.0	96.3	88.0
33	36	2.94	2.93	2.94	98.0	97.7	98.0
36	39	3.10	2.98	2.82	103.3	99.3	94.0
39	42	3.06	3.02	2.96	102.0	100.7	98.7
42	45	2.95	2.94	2.77	98.3	98.0	92.3
45	48	3.02	3.02	3.02	100.7	100.7	100.7
48	51	2.98	2.98	2.98	99.3	99.3	99.3
51	54	2.98	2.97	2.94	99.3	99.0	98.0
54	57	2.96	2.96	2.96	98.7	98.7	98.7
57	60	3.03	3.03	3.03	101.0	101.0	101.0
60	63	2.98	2.98	2.98	99.3	99.3	99.3
63	66	2.99	2.99	2.99	99.7	99.7	99.7
66	69	2.96	2.94	2.94	98.7	98.0	98.0
69	72	2.98	2.98	2.98	99.3	99.3	99.3
72	75	2.92	2.73	2.82	97.3	91.0	94.0
75	78	2.98	2.71	2.62	99.3	90.3	87.3
78	81	3.03	2.88	2.81	101.0	96.0	93.7
81	84	2.95	2.70	2.43	98.3	90.0	81.0
84	87	2.99	2.99	2.85	99.7	99.7	95.0
87	90	3.02	2.90	2.86	100.7	96.7	95.3
90	93	3.03	3.03	2.94	101.0	101.0	98.0
93	96	2.97	2.95	2.71	99.0	98.3	90.3
96	99	2.92	2.85	2.73	97.3	95.0	91.0
99	102	3.20	3.20	3.2	106.7	106.7	106.7
102	105	2.97	2.97	2.59	99.0	99.0	86.3
105	108	3.00	3.00	2.95	100.0	100.0	98.3
108	111	3.03	2.98	2.98	101.0	99.3	99.3
111	114	2.90	2.90	2.79	96.7	96.7	93.0
114	117	3.05	2.72	2.17	101.7	90.7	72.3
117	120	2.96	2.91	2.74	98.7	97.0	91.3
120	123	3.02	2.96	2.86	100.7	98.7	95.3
123	126	2.94	2.64	2.55	98.0	88.0	85.0
126	129	2.93	2.93	2.92	97.7	97.7	97.3
129	132	3.01	3.01	3.01	100.3	100.3	100.3
132	135	3.03	2.97	2.88	101.0	99.0	96.0
135	138	2.97	2.97	2.63	99.0	99.0	87.7
138	141	2.90	2.70	2.46	96.7	90.0	82.0
141	144	2.98	2.85	2.63	99.3	95.0	87.7
144	147	3.03	3.03	2.98	101.0	101.0	99.3
147	150	2.94	2.84	2.76	98.0	94.7	92.0
150	153	3.12	2.97	2.93	104.0	99.0	97.7
153	156	3.05	2.50	2.35	101.7	83.3	78.3
156	159	3.00	2.92	2.3	100.0	97.3	76.7
159	162	3.00	2.95	2.9	100.0	98.3	96.7
162	165	2.95	2.93	2.64	98.3	97.7	88.0

Core recovery and RQD			Drill Hole:	SR17-71		Logged by:	V. Moeller
Run from [m]	Run to [m]	Total core recovery (TCR) [m]	Solid core recovery (SCR) [m]	SCR > 10 cm [m]	TCR [%]	SCR [%]	RQD [%]
165	168	3.03	2.83	2.6	101.0	94.3	86.7
168	171	3.03	2.88	2.5	101.0	96.0	83.3
171	174	3.02	2.96	2.9	100.7	98.7	96.7
174	177	3.04	2.99	2.9	101.3	99.7	96.7
177	180	3.00	2.98	2.9	100.0	99.3	96.7
180	183	3.00	2.95	2.9	100.0	98.3	96.7
183	186	3.02	2.82	2.62	100.7	94.0	87.3
186	189	2.90	2.85	2.78	96.7	95.0	92.7
189	192	3.00	2.65	2.44	100.0	88.3	81.3
192	195	3.02	2.85	2.75	100.7	95.0	91.7
195	198	3.03	3.03	3	101.0	101.0	100.0
198	201	3.01	2.90	2.9	100.3	96.7	96.7
201	204	2.97	2.97	2.97	99.0	99.0	99.0
204	207	2.99	2.30	2.1	99.7	76.7	70.0
207	210	3.00	2.52	2.5	100.0	84.0	83.3
210	213	2.98	2.98	2.92	99.3	99.3	97.3
213	216	2.98	2.86	2.76	99.3	95.3	92.0
216	219	3.01	3.01	3.01	100.3	100.3	100.3
219	222	3.01	2.51	2.44	100.3	83.7	81.3
222	225	2.90	2.95	2.85	96.7	98.3	95.0
225	228	3.10	2.52	2.48	103.3	84.0	82.7
228	231	3.00	2.93	2.8	100.0	97.7	93.3
231	234	3.01	3.02	2.87	100.3	100.7	95.7
234	237	3.09	3.00	2.92	103.0	100.0	97.3
237	240	3.03	3.03	3.03	101.0	101.0	101.0
240	243	3.03	2.74	2.54	101.0	91.3	84.7

Fracture Index	Drill Hole:	SR17-71	Logged by: V. Moeller
From [m]	To [m]	No. of fractures	Fracture index
1.57	3.69	6	3
3.69	3.8	3	27
3.8	9	9	2
9	10	3	3
10	10.12	6	50
10.12	11.28	3	3
11.28	11.64	HF	99
11.64	17.25	22	4
17.25	19.45	18	8
19.45	24	23	5
24	26.5	13	5
26.5	29.5	12	4
29.5	33.8	16	4
33.8	37.1	5	2
37.1	38.5	8	6
38.5	38.6	4	40
38.6	39.66	4	4
39.66	39.8	4	29
39.8	42	7	3
42	73.2	29	1
73.2	75.23	7	3
75.23	75.54	9	29
75.54	75.67	0	0
75.67	78.19	0	0
78.19	78.28	6	67
78.28	80.09	1	1
80.09	81	5	5
81	81.06	4	67
81.06	82.75	10	6
82.75	83.55	3	4
83.55	84.56	4	4
84.56	85.02	1	2
85.02	90.64	19	3
90.64	91.48	1	1
91.48	93.52	10	5
93.52	93.95	2	5
93.95	96.22	8	4
96.22	97.7	1	1
97.7	99.88	9	4
99.88	101	1	1
101	102.71	5	3
102.71	103.15	1	2
103.15	103.62	4	9
103.62	104.65	0	0
104.65	108.96	9	2
108.96	113.46	5	1
113.46	114.16	7	10
114.16	114.3	0	0
114.3	116.08	8	4
116.08	116.52	2	5
116.52	121.72	19	4
121.72	132	8	1
132	134.5	0	0
134.5	135.75	5	4
135.75	135.87	0	0
135.87	138.4	6	2
138.4	139.1	2	3
139.1	141.6	6	2
141.6	142	0	0
142	144.45	6	2
144.45	145.5	0	0

Fracture Index	**Drill Hole:**	**SR17-71**	**Logged by: V. Moeller**
From [m]	To [m]	No. of fractures	Fracture index
145.5	147.8	7	3
147.8	148.2	2	5
148.2	151	4	1
151	151.75	1	1
151.75	158.5	26	4
158.5	158.85	0	0
158.85	163.9	9	2
163.9	164.85	1	1
164.85	170.6	20	3
170.6	171	0	0
171	173.2	2	1
173.2	173.45	0	0
173.45	174.55	1	1
174.55	174.75	0	0
174.75	178.5	8	2
178.5	182.3	6	2
182.3	182.8	2	4
182.8	184.45	6	4
184.45	185.35	0	0
185.35	186.35	1	1
186.35	187.6	0	0
187.6	187.83	0	0
187.83	189.6	0	0
189.6	190.95	6	4
190.95	204.48	12	1
204.48	211.4	13	2
211.4	219.03	17	2
219.03	220.45	6	4
220.45	243	45	2

Rock Material Strength	Drill Hole: SR17-71	Logged by: V. Moeller
From	To	Strength (R0 to R6)
1.57	4.5	4
4.5	9	5
9	10	4
10	14.1	4.5
14.1	15	4
15	17.35	4.5
17.35	17.55	5
17.55	18.95	4
18.95	19.28	5
19.28	26.5	4
26.5	29.5	5
29.5	33.8	4
33.8	37.1	5
37.1	42	4
42	73.2	5
73.2	75.23	5
75.23	75.67	4.5
75.67	80.09	5
80.09	82.75	4.5
82.75	83.55	5
83.55	84.56	4.5
84.56	85.02	5
85.02	90.64	4.5
90.64	91.48	5
91.48	93.52	4.5
93.52	93.95	5
93.95	96.22	4.5
96.22	97.7	5
97.7	99.8	4.5
99.8	101	5
101	103.62	4.5
103.62	104.65	5
104.65	108.96	4.5
108.96	113.46	5
113.46	116.52	4
116.52	121.72	4.5
121.72	132	5
132	134.5	5
134.5	135.75	4.5
135.75	135.87	5
135.87	138.4	4.5
138.4	139.1	5
139.1	141.6	4.5
141.6	142	5
142	144.45	4.5
144.45	145.5	5
145.5	147.8	4.5
147.8	148.2	5
148.2	151	4.5
151	151.75	5
151.75	158.5	4.5
158.5	158.85	5
158.85	163.9	4.5
163.9	164.85	5
164.85	170.6	4.5
170.6	171	5
171	173.2	4.5
173.2	173.45	5
173.45	174.55	4.5
174.55	174.75	5
174.75	178.5	8

Rock Material Strength	Drill Hole: SR17-71	Logged by: V. Moeller
From	To	Strength (R0 to R6)
178.5	182.3	4.5
182.3	182.8	5
182.8	184.45	4.5
184.45	185.35	5
185.35	186.35	4.5
186.35	187.6	5
187.6	187.83	4.5
187.83	189.6	5
189.6	190.95	4.5
190.95	204.48	5
204.48	211.4	4.5
211.4	219.03	4.5
219.03	220.45	5
220.45	243	4.5

Weathering	Drill Hole:	SR17-71	Logged by: V. Moeller
From [m]	To [m]	Grade (1 to 6)	Comment
0	243	1	Fresh, unweathered, occasional to no discoloration or weathering on joint surfaces.

Core recovery and RQD			**Drill Hole:**	**SR17-73**		**Logged by:**	**V. Moeller**
Run from [m]	Run to [m]	Total core recovery (TCR) [m]	Solid core recovery (SCR) [m]	SCR > 10 cm [m]	TCR [%]	SCR [%]	RQD [%]
2.07	3	0.95	0.89	0.82	102.2	95.7	88.2
3	6	2.95	2.82	2.65	98.3	94.0	88.3
6	9	3.02	2.89	2.89	100.7	96.3	96.3
9	12	3.04	2.94	2.89	101.3	98.0	96.3
12	15	3.03	2.90	2.39	101.0	96.7	79.7
15	18	2.95	2.89	2.62	98.3	96.3	87.3
18	21	3.09	3.05	2.86	103.0	101.7	95.3
21	24	2.90	2.90	2.69	96.7	96.7	89.7
24	27	2.95	2.92	2.73	98.3	97.3	91.0
27	30	2.98	2.94	2.45	99.3	98.0	81.7
30	33	3.04	3.04	2.31	101.3	101.3	77.0
33	36	2.99	2.87	2.69	99.7	95.7	89.7
36	39	3.01	2.79	2.6	100.3	93.0	86.7
39	42	2.97	2.92	2.86	99.0	97.3	95.3
42	45	2.93	2.93	2.66	97.7	97.7	88.7
45	48	3.00	3.00	2.51	100.0	100.0	83.7
48	51	2.99	2.99	2.88	99.7	99.7	96.0
51	54	2.99	2.99	2.66	99.7	99.7	88.7
54	57	3.10	3.10	2.74	103.3	103.3	91.3
57	60	2.92	2.92	2.86	97.3	97.3	95.3
60	63	3.00	2.97	2.88	100.0	99.0	96.0
63	66	2.98	2.85	2.52	99.3	95.0	84.0
66	69	2.94	2.67	2.53	98.0	89.0	84.3
69	72	2.97	2.92	2.77	99.0	97.3	92.3
72	75	3.07	2.90	2.86	102.3	96.7	95.3
75	78	2.98	2.98	2.98	99.3	99.3	99.3
78	81	3.00	2.93	2.89	100.0	97.7	96.3
81	84	3.00	2.90	2.77	100.0	96.7	92.3
84	87	3.00	3.00	2.98	100.0	100.0	99.3
87	90	2.94	2.94	2.94	98.0	98.0	98.0
90	93	3.01	3.01	3.01	100.3	100.3	100.3
93	96	3.02	2.93	2.91	100.7	97.7	97.0
96	99	2.96	2.96	2.92	98.7	98.7	97.3
99	102	3.04	2.82	2.79	101.3	94.0	93.0
102	105	2.96	2.96	2.75	98.7	98.7	91.7
105	108	3.03	3.03	2.85	101.0	101.0	95.0
108	111	2.94	2.94	2.67	98.0	98.0	89.0
111	114	2.95	2.95	2.44	98.3	98.3	81.3
114	117	3.10	3.10	2.9	103.3	103.3	96.7
117	120	3.01	3.01	2.91	100.3	100.3	97.0
120	123	2.99	2.99	2.99	99.7	99.7	99.7
123	126	2.89	2.89	2.73	96.3	96.3	91.0
126	129	3.00	3.00	2.95	100.0	100.0	98.3
129	132	3.06	3.06	3.06	102.0	102.0	102.0
132	135	2.99	2.99	2.9	99.7	99.7	96.7
135	138	3.04	3.04	3.03	101.3	101.3	101.0
138	141	2.95	2.95	2.76	98.3	98.3	92.0
141	144	2.97	2.93	2.63	99.0	97.7	87.7
144	147	3.00	3.00	2.96	100.0	100.0	98.7
147	150	2.98	2.98	2.83	99.3	99.3	94.3
150	153	2.97	2.97	2.97	99.0	99.0	99.0
153	156	2.90	2.90	2.63	96.7	96.7	87.7
156	159	3.09	3.05	2.96	103.0	101.7	98.7
159	162	3.02	3.00	2.83	100.7	100.0	94.3
162	165	3.01	3.01	3.01	100.3	100.3	100.3
165	168	2.96	2.96	2.89	98.7	98.7	96.3
168	171	2.95	2.92	2.84	98.3	97.3	94.7
171	174	3.02	3.01	2.74	100.7	100.3	91.3

Core recovery and RQD			Drill Hole:	SR17-73		Logged by:	V. Moeller
Run from [m]	Run to [m]	Total core recovery (TCR) [m]	Solid core recovery (SCR) [m]	SCR > 10 cm [m]	TCR [%]	SCR [%]	RQD [%]
174	177	3.00	3.00	2.83	100.0	100.0	94.3
177	180	2.97	2.92	2.66	99.0	97.3	88.7
180	183	2.98	2.90	2.57	99.3	96.7	85.7
183	186	3.05	3.05	2.94	101.7	101.7	98.0
186	189	3.03	3.03	2.84	101.0	101.0	94.7
189	192	3.04	3.04	2.76	101.3	101.3	92.0
192	195	2.94	2.90	2.83	98.0	96.7	94.3
195	198	3.04	3.04	3.04	101.3	101.3	101.3
198	201	3.02	3.02	3.02	100.7	100.7	100.7
201	204	3.00	3.00	3	100.0	100.0	100.0
204	207	2.99	2.99	2.99	99.7	99.7	99.7
207	210	2.98	2.98	2.91	99.3	99.3	97.0
210	213	2.94	2.70	2.53	98.0	90.0	84.3
213	216	3.04	3.04	2.86	101.3	101.3	95.3
216	219	3.00	2.92	2.6	100.0	97.3	86.7
219	222	3.04	2.89	2.89	101.3	96.3	96.3
222	225	3.00	2.97	2.97	100.0	99.0	99.0
225	228	3.01	3.01	3.01	100.3	100.3	100.3
228	231	3.05	3.05	3.05	101.7	101.7	101.7
231	234	2.97	2.97	2.97	99.0	99.0	99.0
234	237	2.95	2.95	2.95	98.3	98.3	98.3
237	240	2.98	2.98	2.96	99.3	99.3	98.7
240	243	3.02	3.02	3.02	100.7	100.7	100.7
243	246	3.01	3.01	2.99	100.3	100.3	99.7
246	249	3.07	3.07	2.88	102.3	102.3	96.0
249	252	2.93	2.93	2.88	97.7	97.7	96.0
252	255	3.06	3.06	2.76	102.0	102.0	92.0
255	258	3.01	3.01	2.68	100.3	100.3	89.3
258	261	2.96	2.96	2.7	98.7	98.7	90.0
261	264	2.96	2.96	2.96	98.7	98.7	98.7
264	267	3.00	3.00	3	100.0	100.0	100.0
267	270	3.04	3.04	2.96	101.3	101.3	98.7
270	273	3.00	3.00	3	100.0	100.0	100.0
273	276	2.91	2.91	2.9	97.0	97.0	96.7
276	279	3.05	3.05	3.04	101.7	101.7	101.3
279	282	2.98	2.98	2.98	99.3	99.3	99.3
282	285	2.99	2.99	2.99	99.7	99.7	99.7
285	288	3.01	3.01	3.01	100.3	100.3	100.3
288	291	2.95	2.95	2.95	98.3	98.3	98.3
291	294	2.90	2.90	2.9	96.7	96.7	96.7
294	297	3.01	2.90	2.82	100.3	96.7	94.0
297	300	2.90	2.90	2.9	96.7	96.7	96.7
300	303	2.95	2.95	2.9	98.3	98.3	96.7
303	306	3.10	3.10	2.98	103.3	103.3	99.3
306	309	2.81	2.75	2.55	93.7	91.7	85.0
309	312	3.10	2.90	2.71	103.3	96.7	90.3
312	315	3.04	2.98	2.7	101.3	99.3	90.0
315	318	3.02	2.93	2.64	100.7	97.7	88.0
318	321	3.00	2.49	1.9	100.0	83.0	63.3
321	324	3.00	2.54	2.21	100.0	84.7	73.7
324	327	3.03	2.85	2.76	101.0	95.0	92.0
327	330	3.00	2.79	2.38	100.0	93.0	79.3
330	333	2.96	2.95	2.76	98.7	98.3	92.0
333	336	2.98	2.98	2.7	99.3	99.3	90.0
336	339	2.95	2.84	2.81	98.3	94.7	93.7
339	342	3.00	2.81	1.89	100.0	93.7	63.0
342	345	2.96	2.93	2.63	98.7	97.7	87.7
345	348	3.00	2.70	0.48	100.0	90.0	16.0
348	351	3.00	2.06	0.1	100.0	68.7	3.3
351	354	3.00	3.08	1.97	100.0	102.7	65.7

Core recovery and RQD			**Drill Hole:**	**SR17-73**		**Logged by:**	**V. Moeller**
Run from [m]	Run to [m]	Total core recovery (TCR) [m]	Solid core recovery (SCR) [m]	SCR > 10 cm [m]	TCR [%]	SCR [%]	RQD [%]
354	357	3.00	2.64	1.85	100.0	88.0	61.7
357	360	3.00	2.56	2.41	100.0	85.3	80.3
360	363	3.22	3.22	2.92	107.3	107.3	97.3
363	366	3.02	2.95	2.52	100.7	98.3	84.0
366	369	2.94	2.75	2.02	98.0	91.7	67.3
369	372	3.00	2.98	2.6	100.0	99.3	86.7
372	375	3.02	2.82	2.46	100.7	94.0	82.0
375	378	3.05	3.05	3.05	101.7	101.7	101.7
378	381	2.93	2.93	2.66	97.7	97.7	88.7
381	384	3.02	2.80	2.12	100.7	93.3	70.7
384	387	3.02	3.02	2.47	100.7	100.7	82.3
387	390	2.97	2.95	2.72	99.0	98.3	90.7

Fracture Index	Drill Hole:	SR17-73	Logged by: V. Moeller
From [m]	To [m]	No. of fractures	Fracture index
2.07	2.8	3	4
2.8	2.9	4	40
2.9	3.3	0	0
3.3	3.35	3	60
3.35	3.69	1	3
3.69	3.74	HF	99
3.74	6	12	5
6	6.05	HF	99
6.05	6.68	5	8
6.68	6.72	HF	99
6.72	12.82	20	3
12.82	14.15	14	11
14.15	20.95	14	2
20.95	21	HF	99
21	21.7	6	9
21.7	27.9	23	4
27.9	28.19	6	21
28.19	29.07	8	9
29.07	30.62	7	5
30.62	31.09	6	13
31.09	34.33	17	5
34.33	34.95	9	15
34.95	36.63	7	4
36.63	36.67	HF	99
36.67	36.83	5	31
36.83	44.22	21	3
44.22	44.49	4	15
44.49	46.25	7	4
46.25	46.98	8	11
46.98	47.45	0	0
47.45	47.9	5	11
47.9	52.51	15	3
52.51	52.96	7	16
52.96	56.73	14	4
56.73	57	5	19
57	63.46	22	3
63.46	63.87	5	12
63.87	65.98	8	4
65.98	66.03	HF	99
66.03	68.88	9	3
68.88	69.08	5	25
69.08	69.43	1	3
69.43	70.75	6	5
70.75	74.28	8	2
74.28	74.47	4	21
74.47	78.8	8	2
78.8	81.43	13	5
81.43	83.03	0	0
83.03	84.14	7	6
84.14	85.19	0	0
85.19	86.79	5	3
86.79	91	4	1
91	93.26	8	4
93.26	99.95	10	1
99.95	101.88	4	2
101.88	102.21	6	18
102.21	119.49	64	4
119.49	119.6	4	36
119.6	123.23	8	2
123.23	123.52	5	17
123.52	130.39	12	2

130.39	130.79	0	0
130.79	137.85	19	3
137.85	138.72	0	0
138.72	141	7	3
141	141.3	5	17
141.3	153.33	13	1
153.33	153.92	6	10
153.92	163.62	24	2
163.62	165.06	0	0
165.06	174.72	31	3
174.72	175.47	0	0
175.47	179.49	13	3
179.49	179.84	6	17
179.84	180.87	3	3
180.87	181.21	5	15
181.21	186.89	21	4
186.89	189.59	1	0
189.59	191.95	10	4
191.95	192	HF	99
192	192.97	3	3
192.97	193.6	0	0
193.6	197.36	8	2
197.36	197.98	0	0
197.98	200.31	4	2
200.31	204.23	3	1
204.23	208	9	2
208	208.64	0	0
208.64	211.4	8	3
211.4	212.9	12	8
212.9	221.62	29	3
221.62	222.65	1	1
222.65	225.27	12	5
225.27	227.83	0	0
227.83	228.62	4	5
228.62	229	0	0
229	232.28	8	2
232.28	233.03	0	0
233.03	234.81	5	3
234.81	237.94	0	0
237.94	239.12	5	4
239.12	239.66	1	2
239.66	241.52	6	3
241.52	242.62	0	0
242.62	243.26	2	3
243.26	244.3	1	1
244.3	245.28	4	4
245.28	245.72	0	0
245.72	247	5	4
247	247.56	1	2
247.56	247.72	0	0
247.72	247.88	4	25
247.88	248.97	3	3
248.97	249	HF	99
249	255.47	20	3
255.47	256.2	1	1
256.2	257.91	6	4
257.91	258	4	44
258	260.41	8	3
260.41	307.35	70	1
307.35	309.93	9	3
309.93	311.82	8	4
311.82	311.9	HF	99
311.9	314.95	15	5

314.95	315	HF	99
315	319.26	17	4
319.26	321.65	HF	99
321.65	326.25	8	2
326.25	326.33	HF	99
326.33	326.5	0	0
326.5	326.97	2	4
326.97	327	HF	99
327	327.67	1	1
327.67	327.94	HF	99
327.94	328.56	9	15
328.56	332.25	11	3
332.25	332.72	6	13
332.72	333	0	0
333	334.12	4	4
334.12	334.3	4	22
334.3	336.3	3	2
336.3	337.93	1	1
337.93	337.95	HF	99
337.95	338.27	1	3
338.27	338.4	HF	99
338.4	338.7	2	7
338.7	339.25	4	7
339.25	339.92	HF	99
339.92	340.17	0	0
340.17	340.27	HF	99
340.27	344.48	12	3
344.48	344.58	HF	99
344.58	344.84	1	4
344.84	346.14	HF	99
346.14	347.24	16	15
347.24	351.81	HF	99
351.81	354.17	14	6
354.17	354.53	8	22
354.53	355.35	2	2
355.35	356.1	15	20
356.1	356.47	HF	99
356.47	357	0	0
357	358.64	8	5
358.64	359.12	0	0
359.12	359.27	0	0
359.27	359.6	8	24
359.6	360	HF	99
360	364.26	17	4
364.26	364.32	HF	99
364.32	365.52	4	3
365.52	366	10	21
366	366.89	4	4
366.89	367.55	8	12
367.55	368	13	29
368	368.5	6	12
368.5	382.32	66	5
382.32	383.07	11	15
383.07	383.71	2	3
383.71	383.92	HF	99
383.92	384.45	2	4
384.45	384.8	6	17
384.8	390	28	5

Rock Material Strength	Drill Hole: SR17-73	Logged by: V. Moeller
From	To	Strength (R0 to R6)
2.07	6.05	4.5
6.05	6.68	4
6.68	69.43	4.5
69.43	70.75	4.5
70.75	71.83	4.5
71.83	78.8	5
78.8	81.43	4.5
81.43	83.03	5
83.03	84.14	4.5
84.14	85.19	5
85.19	86.79	4.5
86.79	91	5
91	93.26	5
93.26	99.95	5
99.95	130.39	4.5
130.39	130.79	5
130.79	137.85	4.5
137.85	138.72	5
138.72	163.62	4.5
163.62	165.06	5
165.06	174.72	4.5
174.72	175.47	5
175.47	186.89	4.5
186.89	185.59	5
185.59	192.97	4.5
192.97	193.6	5
193.6	197.36	4.5
197.36	197.98	5
197.98	200.31	4.5
200.31	204.23	5
204.23	208	4.5
208	208.64	5
208.64	221.62	4.5
221.62	222.65	5
222.65	225.27	4.5
225.27	227.83	5
227.83	228.62	4.5
228.62	229	5
229	232.28	4.5
232.28	233.03	5
233.03	234.81	4.5
234.81	237.94	5
237.94	239.12	4.5
239.12	239.66	5
239.66	241.52	4.5
241.52	242.62	5
242.62	243.26	4.5
243.26	243.62	5
243.62	244.3	5
244.3	245.28	4.5
245.28	245.72	5
245.72	247	4.5
247	247.56	5
247.56	255.47	4.5
255.47	256.2	5
256.2	260.41	4.5
260.41	307.35	5
307.35	309.93	5
309.93	326.5	5
326.5	333	5
333	336.3	5
336.3	357	5

Rock Material Strength	Drill Hole: SR17-73	Logged by: V. Moeller
From	To	Strength (R0 to R6)
357	358.64	4.5
358.64	359.12	5
359.12	390	4.5

Weathering	**Drill Hole:**	**SR17-73**	**Logged by: V. Moeller**
From [m]	To [m]	Grade (1 to 6)	Comment
0	6.05	1	Orange oxidized coating on joint surfaces
6.05	6.68	2	
6.68	262.8	1	
262.8	263.06	2	greenish clay
263.06	312	1	
312	322.65	2	pervasive hematization
322.65	322	2	rubbly clay alteration along joints and fractures
322	327.67	1	
327.67	328.56	2	
328.56	332.25	1	
332.25	332.72	2	
332.72	354.17	1	
354.17	354.53	2	
354.53	355.35	1	
355.35	356.47	2	
356.47	359.6	1	
359.6	360	2	
360	367.55	1	
367.55	368	2	
368	383.71	1	
383.71	383.92	2	
383.92	390	1	

SR17-74

Core recovery and RQD			**Drill Hole:**	**SR17-74**			**Logged by:**	**V. Moeller**
Run from [m]	Run to [m]	Total core recovery (TCR) [m]	Solid core recovery (SCR) [m]	SCR > 10 cm [m]	TCR [%]	SCR [%]	RQD [%]
7.45	9	1.55	1.49	1.32	100.0	96.1	85.2
9	12	2.96	2.90	2.54	98.7	96.7	84.7
12	15	3.00	2.89	2.57	100.0	96.3	85.7
15	18	2.99	2.99	2.64	99.7	99.7	88.0
18	21	3.00	2.89	2.17	100.0	96.3	72.3
21	24	3.00	2.91	1.99	100.0	97.0	66.3
24	27	2.96	2.88	2.69	98.7	96.0	89.7
27	30	2.88	2.76	2.33	96.0	92.0	77.7
30	33	2.97	2.93	2.71	99.0	97.7	90.3
33	36	3.00	2.96	2.72	100.0	98.7	90.7
36	39	2.87	2.85	2.82	95.7	95.0	94.0
39	42	2.96	2.94	2.9	98.7	98.0	96.7
42	45	3.02	3.02	2.83	100.7	100.7	94.3
45	48	2.99	2.99	2.7	99.7	99.7	90.0
48	51	2.96	2.96	2.9	98.7	98.7	96.7
51	54	3.01	3.01	2.99	100.3	100.3	99.7
54	57	3.00	3.00	3	100.0	100.0	100.0
57	60	2.93	2.93	2.9	97.7	97.7	96.7
60	63	2.95	2.95	2.73	98.3	98.3	91.0
63	66	2.98	2.94	2.9	99.3	98.0	96.7
66	69	2.97	2.96	2.96	99.0	98.7	98.7
69	72	2.93	2.93	2.93	97.7	97.7	97.7
72	75	2.98	2.98	2.98	99.3	99.3	99.3
75	78	3.01	2.99	2.77	100.3	99.7	92.3
78	81	3.01	2.99	2.93	100.3	99.7	97.7
81	84	3.06	2.94	2.82	102.0	98.0	94.0
84	87	2.96	2.96	2.85	98.7	98.7	95.0
87	90	2.92	2.92	2.92	97.3	97.3	97.3
90	93	3.01	2.98	2.9	100.3	99.3	96.7
93	96	2.98	2.92	2.91	99.3	97.3	97.0
96	99	3.04	3.04	3.04	101.3	101.3	101.3
99	102	2.87	2.87	2.87	95.7	95.7	95.7
102	105	3.03	3.03	2.98	101.0	101.0	99.3
105	108	2.96	2.93	2.93	98.7	97.7	97.7
108	111	3.02	3.02	3.02	100.7	100.7	100.7
111	114	2.95	2.95	2.95	98.3	98.3	98.3
114	117	3.02	3.02	3.02	100.7	100.7	100.7
117	120	3.00	3.00	2.92	100.0	100.0	97.3
120	123	3.00	3.00	2.94	100.0	100.0	98.0
123	126	3.02	3.02	3.02	100.7	100.7	100.7
126	129	2.97	2.97	2.81	99.0	99.0	93.7
129	132	2.95	2.95	2.86	98.3	98.3	95.3
132	135	2.96	2.96	2.96	98.7	98.7	98.7
135	138	2.95	2.91	2.7	98.3	97.0	90.0
138	141	2.94	2.94	2.9	98.0	98.0	96.7
141	144	3.04	3.00	2.92	101.3	100.0	97.3
144	147	3.01	3.01	3.01	100.3	100.3	100.3
147	150	3.00	3.00	2.83	100.0	100.0	94.3
150	153	3.14	3.14	3.1	104.7	104.7	103.3
153	156	2.96	2.90	2.79	98.7	96.7	93.0
156	159	3.03	3.03	3	101.0	101.0	100.0
159	162	2.98	2.96	2.91	99.3	98.7	97.0
162	165	3.03	3.03	3.01	101.0	101.0	100.3
165	168	2.94	2.89	2.56	98.0	96.3	85.3
168	171	3.00	3.00	3	100.0	100.0	100.0
171	174	2.85	2.85	2.7	95.0	95.0	90.0
174	177	3.00	3.00	3	100.0	100.0	100.0
177	180	2.94	2.92	2.88	98.0	97.3	96.0

Core recovery and RQD			Drill Hole:	SR17-74		Logged by:	V. Moeller
Run from [m]	Run to [m]	Total core recovery (TCR) [m]	Solid core recovery (SCR) [m]	SCR > 10 cm [m]	TCR [%]	SCR [%]	RQD [%]
180	183	3.00	2.93	2.86	100.0	97.7	95.3
183	186	3.10	3.10	3.1	103.3	103.3	103.3
186	189	2.99	2.99	2.9	99.7	99.7	96.7
189	192	2.98	2.98	2.84	99.3	99.3	94.7
192	195	2.93	2.88	2.87	97.7	96.0	95.7
195	198	2.94	2.76	2.76	98.0	92.0	92.0
198	201	3.00	3.00	2.88	100.0	100.0	96.0
201	204	2.95	2.95	2.95	98.3	98.3	98.3
204	207	2.88	2.56	2.24	96.0	85.3	74.7
207	210	3.01	2.97	2.8	100.3	99.0	93.3
210	213	3.01	3.01	3.01	100.3	100.3	100.3
213	216	3.00	3.00	3	100.0	100.0	100.0
216	219	3.04	3.04	3.04	101.3	101.3	101.3
219	222	2.96	2.70	2.31	98.7	90.0	77.0
222	225	3.11	3.01	3	103.7	100.3	100.0
225	228	2.96	2.96	2.96	98.7	98.7	98.7
228	231	2.99	2.99	2.93	99.7	99.7	97.7
231	234	3.00	3.00	3	100.0	100.0	100.0
234	237	3.01	3.01	3.01	100.3	100.3	100.3
237	240	2.98	2.98	2.8	99.3	99.3	93.3
240	243	3.03	3.03	2.94	101.0	101.0	98.0
243	246	3.03	3.03	2.98	101.0	101.0	99.3
246	249	2.99	2.99	2.99	99.7	99.7	99.7
249	252	2.96	2.96	2.96	98.7	98.7	98.7
252	255	3.14	3.14	3.07	104.7	104.7	102.3
255	258	2.95	2.95	2.6	98.3	98.3	86.7
258	261	3.04	3.04	3.04	101.3	101.3	101.3
261	264	3.01	3.01	2.93	100.3	100.3	97.7
264	267	3.00	3.00	2.89	100.0	100.0	96.3
267	270	3.07	3.05	2.97	102.3	101.7	99.0
270	273	3.00	2.99	2.85	100.0	99.7	95.0
273	276	2.94	2.93	2.6	98.0	97.7	86.7
276	279	3.02	3.02	2.65	100.7	100.7	88.3
279	282	2.86	2.75	2.54	95.3	91.7	84.7
282	285	2.88	2.80	2.67	96.0	93.3	89.0
285	288	2.95	2.95	2.95	98.3	98.3	98.3
288	291	3.16	3.16	3.16	105.3	105.3	105.3
291	294	3.03	3.03	3.03	101.0	101.0	101.0
294	297	3.01	3.01	3.01	100.3	100.3	100.3
297	300	3.03	3.03	3.03	101.0	101.0	101.0
300	303	2.96	2.96	2.96	98.7	98.7	98.7
303	306	3.05	3.05	3.05	101.7	101.7	101.7
306	309	3.03	2.92	2.7	101.0	97.3	90.0
309	312	3.02	3.02	2.8	100.7	100.7	93.3
312	315	2.98	2.98	2.73	99.3	99.3	91.0
315	318	3.04	3.04	2.87	101.3	101.3	95.7
318	321	2.99	2.74	2.26	99.7	91.3	75.3
321	324	2.91	2.91	2.55	97.0	97.0	85.0
324	327	3.11	3.05	2.17	103.7	101.7	72.3
327	330	2.98	2.94	1.77	99.3	98.0	59.0
330	333	3.10	3.00	2.4	103.3	100.0	80.0
333	336	2.96	2.96	2.6	98.7	98.7	86.7

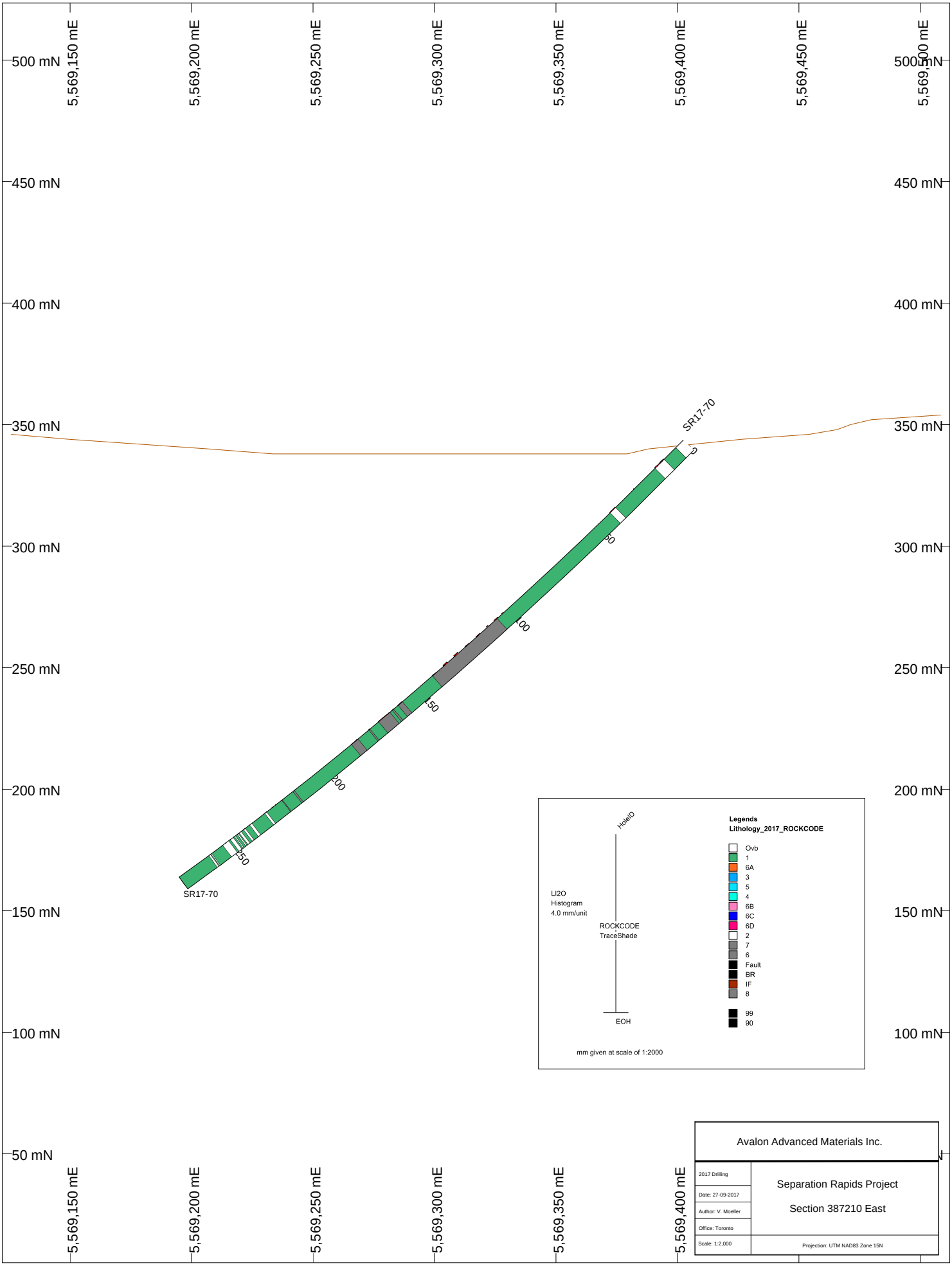
Fracture Index	Drill Hole:	SR17-74	Logged by: V. Moeller
From [m]	To [m]	No. of fractures	Fracture index
7.45	11.18	28	8
11.18	13.15	6	3
13.15	13.26	4	36
13.26	13.31	HF	99
13.31	13.64	5	15
13.64	17.15	21	6
17.15	17.5	5	14
17.5	18.21	1	1
18.21	18.43	7	32
18.43	18.47	HF	99
18.47	20.1	7	4
20.1	20.3	5	25
20.3	21.29	3	3
21.29	23.09	18	10
23.09	25.57	7	3
25.57	25.68	4	36
25.68	27.03	4	3
27.03	27.22	HF	99
27.22	30.2	21	7
30.2	37.79	12	2
37.79	37.85	HF	99
37.85	38.9	5	5
38.9	45.06	23	4
45.06	45.2	4	29
45.2	62.51	31	2
62.51	62.72	5	24
62.72	65.95	7	2
65.95	66	HF	99
66	77.95	17	1
77.95	78	HF	99
78	82.49	9	2
82.49	82.56	6	86
82.56	92.97	16	2
92.97	93	HF	99
93	94.64	1	1
94.64	94.87	3	13
94.87	122.85	31	1
122.85	126.55	5	1
126.55	126.71	5	31
126.71	136	13	1
136	138.5	17	7
138.5	138.95	0	0
138.95	142.5	16	5
142.5	148.25	5	1
148.25	152	16	4
152	153.3	0	0
153.3	158.2	27	6
158.2	159.65	1	1
159.65	160.48	5	6
160.48	161.35	1	1
161.35	162.1	3	4
162.1	162.5	0	0
162.5	163.2	3	4
163.2	163.65	0	0
163.65	164.5	4	5
164.5	165.8	4	3
165.8	167.49	6	4
167.49	167.92	7	16
167.92	188.8	62	3
188.8	189.2	0	0
189.2	189.67	0	0

Fracture Index	Drill Hole:	SR17-74	Logged by: V. Moeller
From [m]	To [m]	No. of fractures	Fracture index
189.67	190.19	5	10
190.19	205.17	34	2
205.17	205.48	5	16
205.48	206.22	2	3
206.22	206.55	HF	99
206.55	210.15	14	4
210.15	211.25	0	0
211.25	212.1	2	2
212.1	212.8	0	0
212.8	217.9	11	2
217.9	218.4	0	0
218.4	232.25	34	2
232.25	232.65	0	0
232.65	235.75	8	3
235.75	236.14	0	0
236.14	239.36	6	2
239.36	239.59	4	17
239.59	245.95	16	3
245.95	246.35	0	0
246.35	256.85	24	2
256.85	256.96	4	36
256.96	257.48	2	4
257.48	257.85	5	14
257.85	258.7	3	4
258.7	262.15	12	3
262.15	265.2	0	0
265.2	273.6	26	3
273.6	273.95	0	0
273.95	275.28	4	3
275.28	275.5	5	23
275.5	278.9	12	4
278.9	279.6	4	6
279.6	281.4	7	4
281.4	281.9	1	2
281.9	282.7	5	6
282.7	306.6	35	1
306.6	307.58	4	4
307.58	307.99	8	20
307.99	316.4	27	3
316.4	317.8	2	1
317.8	319.69	16	8
319.69	319.98	7	24
319.98	324.9	25	5
324.9	325.28	6	16
325.28	326.12	1	1
326.12	327	13	15
327	327.79	3	4
327.79	328.34	12	22
328.34	328.92	3	5
328.92	329.15	5	22
329.15	331.61	20	8
331.61	331.89	8	29
331.89	332.52	1	2
332.52	334.6	7	3
334.6	334.87	4	15
334.87	336	6	5

Rock Material Strength	Drill Hole: SR17-74	Logged by: V. Moeller
From	To	Strength (R0 to R6)
7.45	30.2	4.5
30.2	38.9	4.5
38.9	122.85	4.5
122.85	136	5
136	138.45	4.5
138.45	138.95	5
138.95	142.5	4.5
142.5	148.25	5
148.25	152	4.5
152	153.3	5
153.3	158.2	4.5
158.2	159.65	5
159.65	160.48	4.5
160.48	161.35	5
161.35	162.1	4.5
162.1	162.5	5
162.5	163.2	4.5
163.2	163.65	5
163.65	164.5	4.5
164.5	165.8	5
165.8	188.8	4.5
188.8	189.2	5
189.2	210.15	4.5
210.15	211.25	5
211.25	212.1	4.5
212.1	212.8	5
212.8	217.9	4.5
217.9	218.4	5
218.4	232.85	4.5
232.85	232.65	5
232.65	235.75	4.5
235.75	236.14	5
236.14	245.95	4.5
245.95	246.35	5
246.35	275.85	4.5
275.85	258.7	5
258.7	262.15	4.5
262.15	265.2	5
265.2	273.6	4.5
273.6	273.95	5
273.95	278.9	4.5
278.9	279.6	5
279.6	281.4	4.5
281.4	281.9	5
281.9	282.7	4.5
282.7	306.6	5
306.6	316.4	4.5
316.4	317.8	5
317.8	332.52	4.5
332.52	334.87	5
334.87	336	4.5

Weathering	Drill Hole:	SR17-74	Logged by: V. Moeller
From [m]	To [m]	Grade (1 to 6)	Comment
7.45	13.65	2	
13.65	34.22	1	
34.22	36.25	2	
36.25	130.7	1	no weathering
130.7	131.7	1	hematitic infill along joints
131.7	336	1	no weathering

VI. Drill hole cross-sections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5,569,200 mE
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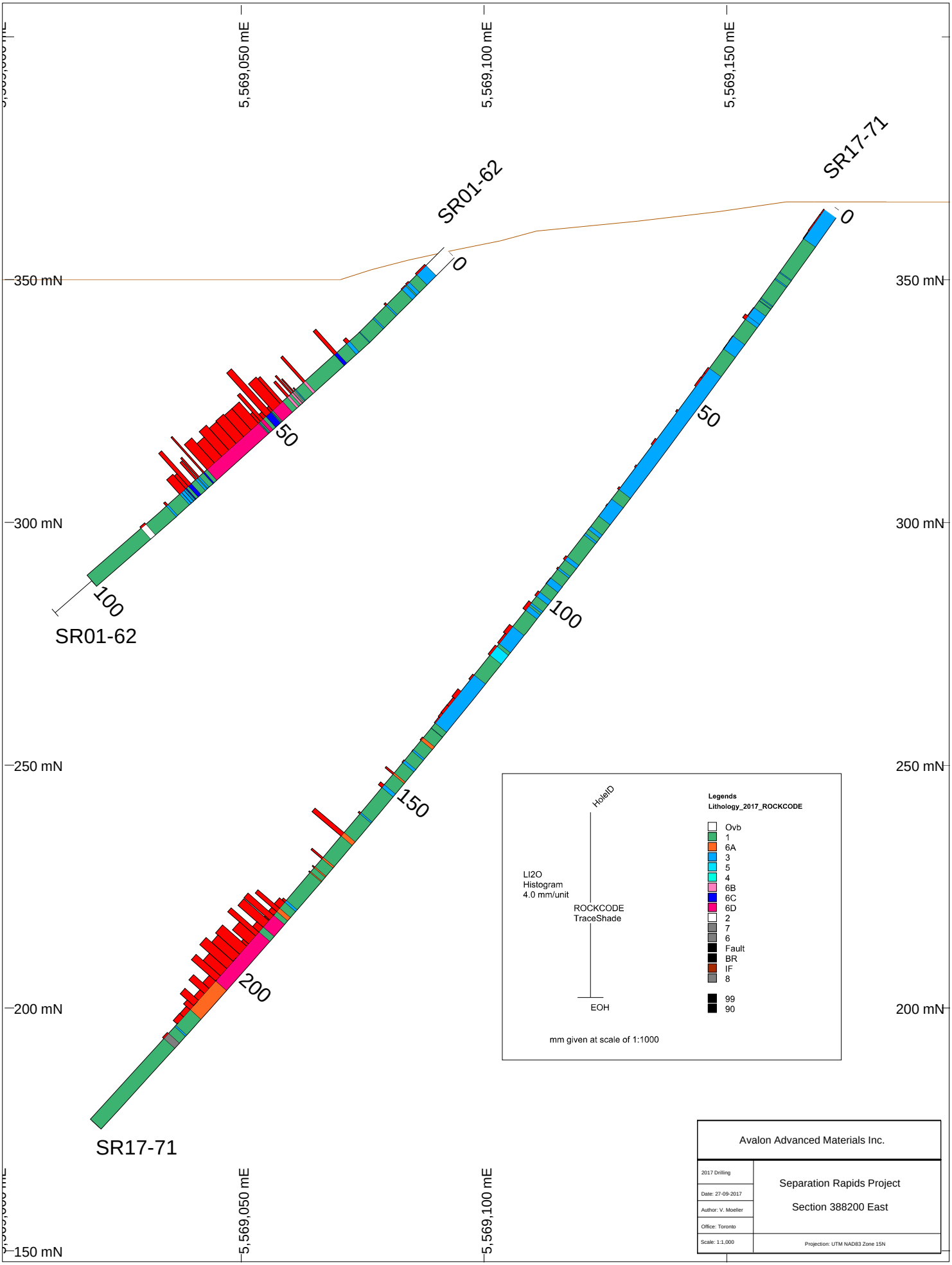
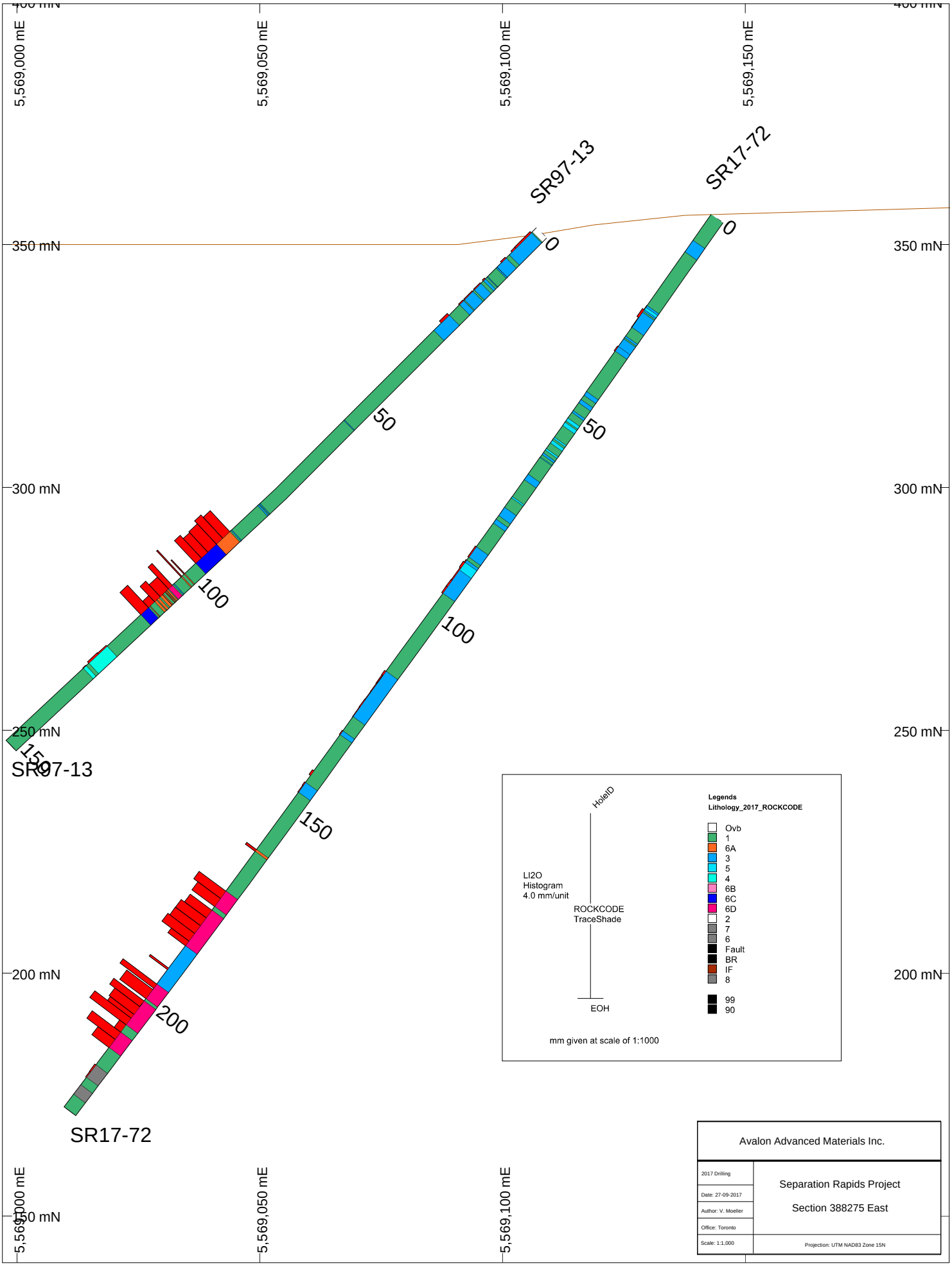
5,569,300 mE
5,569,350 mE
5,569,400 mE
5,569,450 mE
5,569,500 mE
500 mN
450 mN
400 mN
350 mN
300 mN
250 mN
200 mN
150 mN
100 mN
50 mN
SR17-70
SR17-70
0
50
100
150
200
250
HoleID
LI2O
Histogram
4.0 mm/unit
ROCKCODE
TraceShade
EOH
mm given at scale of 1:2000
Legends
Lithology_2017_ROCKCODE
Ovb
1
6A
3
5
4
6B
6C
6D
2
7
6
Fault
BR
IF
8
99
90
Avalon Advanced Materials Inc.
2017 Drilling
Date: 27-09-2017
Author: V. Moeller
Office: Toronto
Scale: 1:2,000
Separation Rapids Project
Section 387210 East
Projection: UTM NAD83 Zone 15N



Avalon Advanced Materials Inc.	
2017 Drilling	Separation Rapids Project
Date: 27-09-2017	Section 388200 East
Author: V. Moeller	
Office: Toronto	
Scale: 1:1,000	Projection: UTM NAD83 Zone 15N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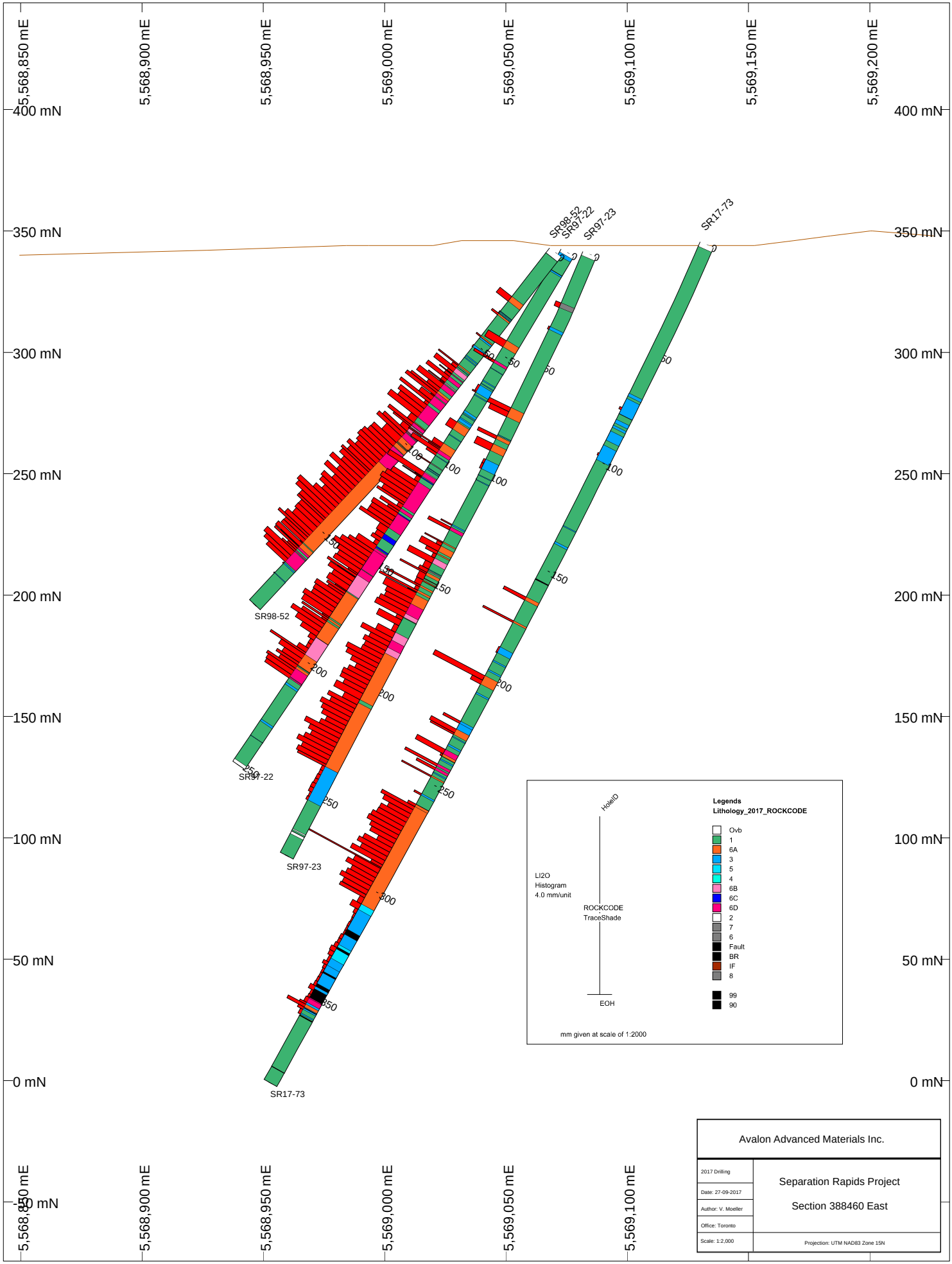
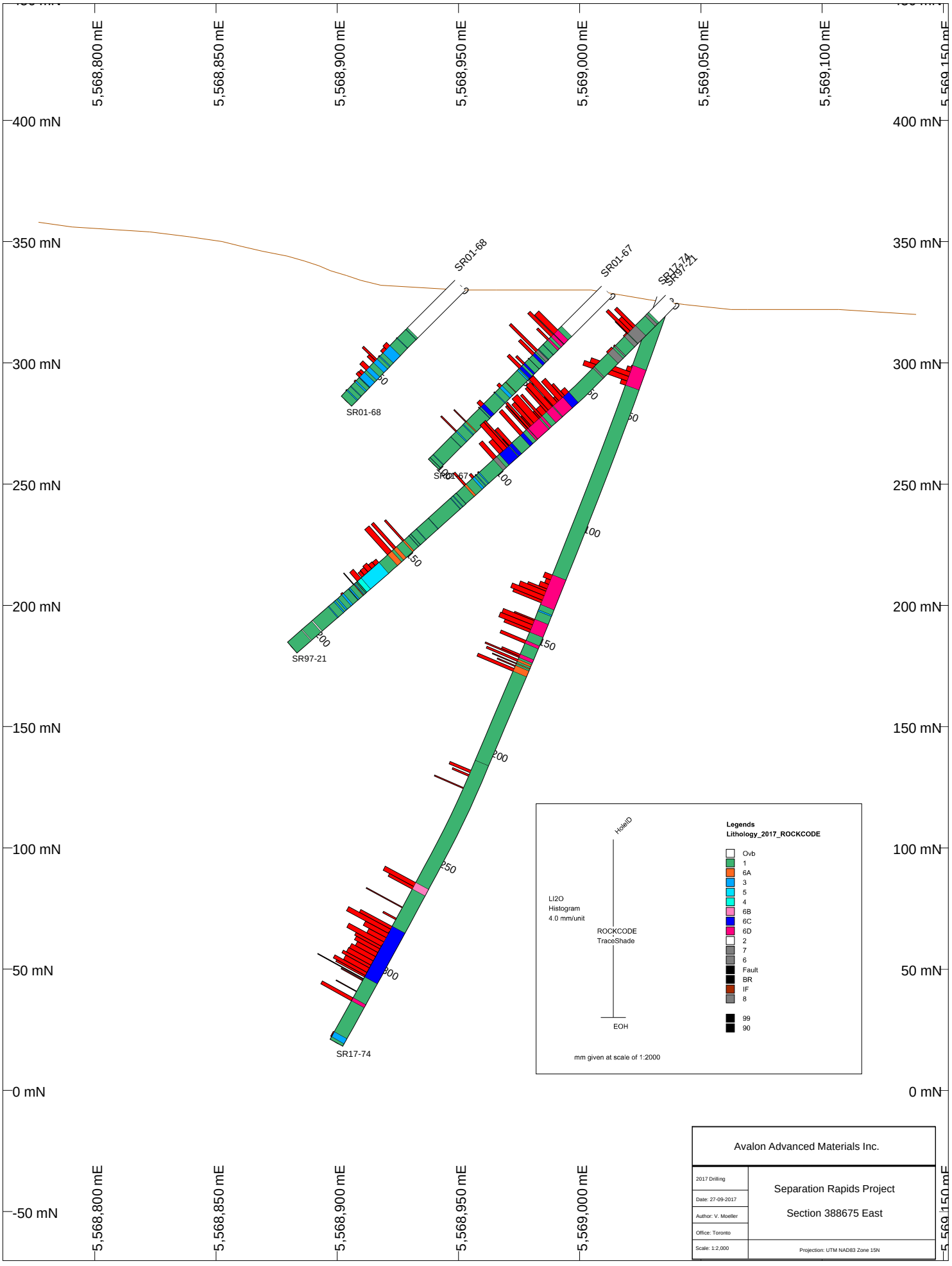
5,569,050 mE
5,569,100 mE
5,569,150 mE
350 mN
300 mN
250 mN
200 mN
150 mN
SR97-13
SR17-72
0
50
100
150
200
HoleID
LI2O
Histogram
4.0 mm/unit
ROCKCODE
TraceShade
EOH
mm given at scale of 1:1000
Legends
Lithology_2017_ROCKCODE
Ovb
1
6A
3
5
4
6B
6C
6D
2
7
6
Fault
BR
IF
8
99
90
Avalon Advanced Materials Inc.
2017 Drilling
Date: 27-09-2017
Author: V. Moeller
Office: Toronto
Scale: 1:1,000
Separation Rapids Project
Section 388275 East
Projection: UTM NAD83 Zone 15N



Avalon Advanced Materials Inc.	
2017 Drilling	Separation Rapids Project
Date: 27-09-2017	Section 388460 East
Author: V. Moeller	
Office: Toronto	
Scale: 1:2,000	Projection: UTM NAD83 Zone 15N


5,568,800 mE
5,568,850 mE
5,568,900 mE
5,568,950 mE
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5,569,050 mE
5,569,100 mE
5,569,150 mE
400 mN
350 mN
300 mN
250 mN
200 mN
150 mN
100 mN
50 mN
0 mN
-50 mN
SR01-68
SR01-67
SR17-74
SR97-21
HoleID
LI2O
Histogram
4.0 mm/unit
ROCKCODE
TraceShade
EOH
Legends
Lithology_2017_ROCKCODE
Ovb
1
6A
3
5
4
6B
6C
6D
2
7
6
Fault
BR
IF
8
99
90
mm given at scale of 1:2000
Avalon Advanced Materials Inc.
2017 Drilling
Date: 27-09-2017
Author: V. Moeller
Office: Toronto
Scale: 1:2,000
Separation Rapids Project
Section 388675 East
Projection: UTM NAD83 Zone 15N

VII. Assay tables

Pegmatites

				wt. % →																			ppm →																																						
Hole ID	Sample ID	From [m]	To [m]	Li_2O	Cs_2O	Rb_2O	Ta_2O_5	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Na_2O	K_2O	Cr_2O_3	TiO_2	MnO	P_2O_5	SrO	BaO	LOI	Total	Ba	Ce	Cr	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd	Pr	Sm	Sn	Sr	Tb	Th	Tm	U	V	W	Y	Yb	Zr	F	Ag	As	Cd	Co	Cu	Mo	Ni	Pb	Sc	Tl	Zn
SR-17-70	671001	11.4	13.4	0.041	0.010	0.248	0.003	71.5	15.55	1.89	0.97	0.27	5.24	4.15	<0.01	0.04	0.04	0.13	<0.01	<0.01	0.42	100.2	23.1	5.7	30	1.44	0.33	<0.03	46.1	1.97	0.3	0.15	1.9	0.01	75.3	3	0.85	1.98	153	15	0.38	3.69	0.03	3.46	11	3	6.9	0.28	5	730	<0.5	<5	<0.5	1	5	<1	5	10	3	20	85
SR-17-70	671002	13.4	15.4	0.030	0.006	0.270	0.004	73.2	14.95	1.35	0.33	0.04	4.89	5.03	<0.01	0.02	0.02	0.04	<0.01	<0.01	0.22	100.09	8.1	17.6	20	3.72	0.79	0.04	40.4	4.48	0.6	0.39	6.1	0.08	141	8.8	2.48	4.46	117	4.3	0.89	14.5	0.11	12.85	<5	3	17.5	0.91	11	400	<0.5	<5	<0.5	1	2	<1	<1	9	3	20	54
SR-17-70	671003	15.4	16.46	0.045	0.007	0.260	0.003	73.4	14.75	1.87	0.55	0.07	5.01	4.5	<0.01	0.02	0.07	0.13	<0.01	<0.01	0.25	100.62	5.9	5.3	20	2.12	0.66	<0.03	42.4	1.94	0.2	0.26	2	0.11	111	2.7	0.72	1.65	121	4.4	0.42	2.97	0.1	4.87	<5	2	11.9	0.93	4	600	<0.5	<5	<0.5	1	1	<1	1	10	4	20	90
SR-17-70	671004	28.65	28.9	0.032	0.003	0.007	0.000	51.3	6.96	27.5	7.48	3.82	0.59	0.49	0.01	0.66	0.15	0.16	<0.01	0.01	0.38	99.51	104	9.2	60	3.15	2.14	0.94	12.2	2.74	1.2	0.7	4.1	0.32	2.4	6.4	1.41	2.07	2	28.8	0.51	0.25	0.32	0.08	209	1	18.8	2.11	44	220	<0.5	<5	1.7	47	426	<1	44	4	19	<10	119
SR-17-70	671005	39.55	41.55	0.034	0.004	0.113	0.004	76.2	13.5	1.63	0.56	0.13	5.03	2.55	<0.01	0.03	0.05	0.05	<0.01	<0.01	0.38	100.11	5.2	24.2	30	5.11	1.72	0.03	40.1	5.33	1.5	0.68	8.1	0.31	151.5	12	3.4	5.81	63	5.7	1.07	18.2	0.29	10	<5	5	26.8	2.45	24	640	<0.5	<5	<0.5	1	5	<1	2	11	7	10	60
SR-17-70	671006	41.55	42.7	0.030	0.002	0.112	0.004	76.3	13.25	1.6	0.39	0.06	4.99	2.88	<0.01	0.02	0.05	0.04	<0.01	<0.01	0.26	99.84	2.2	25.5	20	6.15	2.11	<0.03	38.6	6.44	2	0.84	8.9	0.35	160	12.4	3.57	6.01	54	2.3	1.38	17.1	0.36	11.6	<5	4	34.4	2.76	32	470	<0.5	<5	<0.5	<1	2	<1	1	11	5	10	79
SR-17-70	671007	103.05	103.65	0.032	0.000	0.005	0.000	40.9	12.6	20.7	10.75	4.95	1.7	0.14	0.03	0.64	0.2	0.05	0.01	<0.01	3.63	96.3	26.9	6.2	260	2.69	1.71	0.63	13.7	2.21	1.1	0.57	2.4	0.22	2.1	4.8	0.97	1.5	4	70.1	0.41	0.27	0.25	0.13	255	1	15.4	1.74	39	210	<0.5	<5	0.9	87	312	<1	183	3	34	<10	93
SR-17-70	671008	106.05	108	0.032	0.002	0.199	0.002	75	14.1	1.01	0.85	0.11	3.64	4.78	<0.01	0.01	0.02	0.04	<0.01	<0.01	1.06	100.62	19.4	2.8	20	1.34	0.46	<0.03	43.4	1.16	1	0.16	0.9	0.06	78.6	1.6	0.38	1.03	69	12.2	0.25	5.98	0.06	4.71	<5	4	6.5	0.69	16	630	<0.5	<5	<0.5	1	4	<1	3	5	2	10	40
SR-17-70	671009	111.25	111.95	0.058	0.002	0.148	0.004	78.2	14.4	1.22	0.29	0.04	4.26	2.54	<0.01	0.01	0.03	0.08	<0.01	<0.01	0.84	101.91	1.7	24.4	10	5.04	1.02	<0.03	62	6.72	0.7	0.53	8	0.11	146.5	12	3.48	7.42	137	1.9	1.31	19.45	0.14	7.02	<5	9	24.5	1.15	10	1900	<0.5	<5	<0.5	<1	<1	<1	1	17	5	10	92
SR-17-70	671010	116	118	0.032	0.002	0.158	0.003	75.9	14.8	0.96	0.16	0.02	4.96	3.61	<0.01	0.01	0.08	0.04	<0.01	<0.01	0.41	100.95	1	6.3	20	1.96	0.77	<0.03	46.1	1.41	1.5	0.27	2.1	0.13	86	3	0.93	1.68	62	0.7	0.32	6.18	0.13	10.85	<5	5	11.9	1.22	20	880	<0.5	<5	<0.5	1	1	<1	1	8	2	10	54
SR-17-70	671011	122	124	0.026	0.002	0.168	0.004	75.3	14.45	1	0.17	0.02	4.89	3.51	<0.01	0.01	0.06	0.05	<0.01	<0.01	0.43	99.89	2.1	8.9	10	1.95	0.57	<0.03	50.3	2.29	1.1	0.21	2.7	0.09	107.5	4.6	1.33	3.31	74	1.2	0.46	9.82	0.08	9.44	<5	6	10.2	0.91	16	750	<0.5	<5	<0.5	<1	1	<1	<1	7	2	10	57
SR-17-70	671012	128	130	0.062	0.005	0.158	0.003	76.4	14.15	1.22	0.19	0.03	4.25	3.27	<0.01	0.01	0.1	0.03	<0.01	<0.01	0.63	100.28	1.1	12.9	10	3.2	1.4	<0.03	49.3	2.53	1.1	0.47	4.4	0.29	107.5	5.8	1.75	2.91	92	0.8	0.57	9.56	0.23	4.14	<5	7	19.2	2.32	17	2330	<0.5	<5	<0.5	2	1	<1	2	13	7	10	81
SR-17-70	671013	134	136	0.052	0.003	0.182	0.003	77	14.6	1.21	0.22	0.05	4	4.21	<0.01	0.02	0.02	0.03	<0.01	<0.01	0.64	102	1.3	15.9	10	3.89	1.18	<0.03	50.6	3.87	0.7	0.49	5.6	0.17	114	7.6	2.24	3.68	87	1	0.78	10.7	0.18	9.48	<5	7	21.2	1.47	11	2130	<0.5	<5	<0.5	<1	<1	<1	1	9	11	10	56
SR-17-70	671014	140	142.2	0.013	0.002	0.124	0.004	76.4	14.15	1.12	0.52	0.04	5.15	3.57	<0.01	0.01	0.07	0.07	<0.01	<0.01	0.13	101.23	8.7	6.2	20	1.94	0.56	<0.03	34	1.84	0.8	0.24	2.3	0.08	80.9	2.9	0.8	1.67	27	5.6	0.41	6.26	0.08	6.71	<5	3	10.9	0.89	10	370	<0.5	<5	<0.5	<1	4	1	2	8	3	10	30
SR-17-70	671015	158.55	160.9	0.011	0.001	0.095	0.004	76	14.3	1.02	0.46	0.03	4.96	3.79	<0.01	0.01	0.08	0.04	<0.01	<0.01	0.17	100.86	4.3	7.1	20	1.83	0.71	0.03	37.6	1.11	0.7	0.27	2.6	0.13	87	3	0.91	1.23	23	5.2	0.3	7.2	0.11	7.14	<5	2	11.3	1.11	11	320	<0.5	<5	<0.5	<1	1	1	<1	11	3	10	29
SR-17-70	671016	163.3	164.13	0.009	0.001	0.056	0.002	73.5	15.85	0.93	1.02	0.07	6.29	2.74	<0.01	0.01	0.08	0.03	<0.01	<0.01	0.19	100.71	8.6	15.1	30	2.63	1.38	0.04	33.3	1.98	1	0.45	5.6	0.33	66.9	6.3	1.97	2.52	9	10.8	0.45	10.4	0.26	8.47	<5	1	19.6	2.38	16	140	<0.5	<5	<0.5	<1	6	<1	1	6	3	<10	20
SR-17-70	671017	165.35	167	0.004	0.001	0.081	0.001	76.7	13.3	1.1	0.56	0.02	4.15	4.4	<0.01	<0.01	0.22	0.03	<0.01	<0.01	0.09	100.57	14.5	18.3	20	7.98	6.91	0.03	25.1	3.64	1.7	1.67	7.8	2.43	80.4	7.5	2.25	2.89	6	5.7	1.04	11.25	1.57	22.9	<5	3	55.9	14.3	30	100	<0.5	<5	<0.5	1	1	<1	<1	25	7	<10	5
SR-17-70	671018	167	169	0.015	0.002	0.090	0.001	76	13.45	1.02	0.43	0.05	3.72	5.17	<0.01	0.03	0.03	0.02	<0.01	<0.01	0.17	100.09	10.8	10.8	20	3.63	2.32	0.03	24.1	2.13	1.5	0.67	4.9	0.57	77.8	4.4	1.25	1.82	13	4.5	0.55	8.19	0.45	14.6	<5	3	22.8	3.88	29	380	<0.5	<5	<0.5	1	2	<1	<1	28	5	10	13
SR-17-70	671019	169	171.45	0.013	0.002	0.098	0.002	76.3	13.35	0.98	0.48	0.07	3.34	5.59	<0.01	0.03	0.04	0.03	<0.01	<0.01	0.3	100.51	13.1	11.7	20	3.74	2.31	0.04	25.7	2.17	0.9	0.68	5.4	0.59	75.9	4.8	1.41	1.9	14	6.9	0.56	6.51	0.46	9.18	<5	3	23.8	3.89	16	360	<0.5	<5	<0.5	<1	1	<1	<1	28	6	10	11
SR-17-70	671020	176.13	176.8	0.011	0.000	0.006	0.002	74.5	15.85	1.02	1.52	0.2	7.46	0.27	<0.01	0.02	0.09	0.02	<0.01	<0.01	0.55	101.5	8.3	14.6	20	3.02	1.49	0.11	39.7	2.34	2.5	0.45	5.4	0.44	129	6.8	1.97	3.11	8	24.7	0.53	14.3	0.3	14.15	6	2	19.5	3.14	43	220	<0.5	<5	<0.5	1	8	<1	2	6	1	<10	8
SR-17-70	671021	182.55	184	0.006	0.001	0.047	0.001	77.5	13.65	0.76	0.67	0.05	4.56	4.07	0.04	0.01	0.03	0.01	<0.01	<0.01	0.1	101.45	6.7	14.7	10	4.62	3.54	0.04	21.2	2.47	1.4	0.93	6.8	0.8	85.9	5.9	1.8	2.33	5	6.3	0.64	8.6	0.73	17.05	<5	2	24.4	5.77	28	170	<0.5	<5	<0.5	<1	1	3	<1	26	3	<10	7
SR-17-70	671022	184	186.06	0.004	0.000	0.045	0.001	75.8	14.65	0.88	0.95	0.1	4.89	4.01	<0.01	0.02	0.13	0.01	<0.01	<0.01	0.05	101.49	7.1	15.8	40	5.36	4.7	0.06	22.4	2.73	1.4	1.19	7.3	1.7	63.2	6.5	1.97	2.4	4	10	0.71	7.9	1.07	11.7	<5	1	40.9	9.76	28	200	<0.5	<5	<0.5	1	3	1	1	26	3	<10	5
SR-17-70	671023	225.85	226.28	0.006	0.001	0.002	0.000	44.8	7.36	30.5	6.87	3.79	0.97	0.4	0.02	0.8	0.64	0.07	0.01	0.02	2.11	98.36	170	18.2	130	3.59	2.37	1.34	14.8	3.53	2	0.84	8	0.36	3.4	10.7	2.39	2.7	1	78	0.57	1.03	0.36	0.43	248	1	22.9	2.26	72	340	<0.5	<5	1.2	100	618	1	81	5	22	<10	171
SR-17-70	671024	227.5	228	0.013	0.001	0.003	0.000	44.5	12.1	24.7	8.05	3.87	1.86	0.57	0.01	1.65	1	0.15	0.01	0.03	0.39	98.89	236	17.4	50	5.88	3.65	1.44	19.9	5.21	3.1	1.31	6.8	0.53	4.9	12.8	2.6	3.97	2	102	0.94	0.77	0.52	0.28	446	1	34.2	3.73	115	400	<0.5	<5	1.1	39	104	<1	43	4	37	<10	224
SR-17-70	671026	230.85	231.9	0.006	0.000	0.017	0.001	75.7	13.5	1.09	1.82	0.14	5.3	1.96	0.01	0.05	0.04	0.02	<0.01	0.01	0.95	100.59	60.2	33.1	40	10.2	8.64	0.2	23.9	5.33	1.6	2.31	13.4	2.59	99.6	14.5	4	4.67	4	46.2	1.34	17.3	1.86	24.9	9	1	68.1	15.8	37	310	<0.5	<5	<0.5	1	12	<1	<1	19	5	<10	10
SR-17-70	671027	242.05	242.95	0.006	0.001	0.044	0.000	74.8	14.7	0.84	1.4	0.09	4.95	3.37	<0.01	0.03	0.03	0.01	<0.01	<0.01	0.06	100.28	8.7	31.1	20	4.65	3.67	0.08	28.1	2.92	0.7	1.01	12.7	0.9	24.7	12.1	3.6	3.31	6	17.1	0.66	9.62	0.74	11.9	<5	1	37.2	5.87	13	230	<0.5	<5	<0.5	<1	1	<1	1	23	2	<10	7
SR-17-70	671028	252	252.5	0.006	0.001	0.052	0.000	76.1	13.35	0.69	0.94	0.04	3.83	4.63	<0.01	0.02	0.02	0.01	<0.01	<0.01	0.16	99.79	25.4	19.4	20	5.42	5.03	0.08	19.9	2.64	0.6	1.34	8.6	1.16	10.7	7.5	2.22	2.09	3	14.5	0.62	10.9	0.95	9.86	<5	1	46.1	6.93	15	260	<0.5	<5	<0.5	1	1	<1	<1	26	1	10	7
SR-17-71	671029	1.6	3	0.047	0.005	0.278	0.004	75.5	14.1	1.04	0.14	0.02	3.6	4.65	<0.01	0.01	0.05	0.05	<0.01	<0.01	0.47	99.63	3.2	7.9	10	2.27	0.54	<0.03	48.3	2.31	0.8	0.26	2.4	0.07	94.5	3.9	1.05	2.39	136	1.8	0.51	8.06	0.1	3.61	<5	5	11.7	0.64	11	760	<0.5	<5	<0.5	<1	2	<1	1	9	2	10	53
SR-17-71	671030	3	5	0.050	0.004	0.229	0.003	75.4	14.3	1.03	0.2	0.02	4.37	3.71	<0.01	0.01	0.04	0.04	<0.01	<0.01	0.48	99.6	2.2	9.6	10	2.42	0.61	<0.03	46.6	2.65	0.7	0.27	3	0.08	104	4.7	1.36	2.9	114	1.8	0.55	9.23	0.09	4.72	<5	5	12.3	0.65	10	860	<0.5	<5	<0.5	1	<1	<1	<1	4	2	10	62
SR-17-71	671031	5	7	0.054	0.007	0.265	0.003	74.9	14.8	1.13	0.26	0.05	4.28	4.29	<0.01	0.01	0.02	0.04	<0.01	<0.01	0.44	100.22	3.7	6.7	20	1.6	0.36	<0.03	48.2	1.87	0.3	0.18	2.3	0.04	88	2.9	0.87	1.89	128	3.1	0.4	5.86	0.06	3.8	<5	5	7.8	0.38	4	820	<0.5	<5	<0.5	<1	4	<1	1	10	3	20	60
SR-17-71	671032	7	9	0.030	0.006	0.205	0.004	75	14.45	1.06	0.35	0.03	5.24	3.45	<0.01	0.01	0.06	0.06	<0.01	<0.01	0.25	99.96	8.8	6.4	10	2.03	0.61	<0.03	40.9	2.01	0.6	0.24	1.9	0.09	117.5	3.1	0.91	1.89	86	5.6	0.44	8.32	0.09	6.59	<5	3	11.3	0.72	8	400	<0.5	<5	<0.5	<1	1	<1	1	13	2	10	44
SR-17-71	671033	26.5	28.6	0.022	0.007	0.041	0.004	77.2	13.45	1.12	1.09	0.16	6.34	0.31	<0.01	0.02	0.07	0.05	<0.01	<0.01	0.1	99.91	8	13.3	20	2.16	0.59	0.04	34.3	2.92	1.5	0.27	4.2	0.09	71.2	6.4	1.83	3.61	134	21.8	0.54	10.6	0.09	6.36	<5	1	11.3	0.72	18	200	<0.5	<5	<0.5	1	9	1	3	10	2	<10	32
SR-17-71	671034	28.6	29.5	0.172	0.050	0.339	0.006	60	15.35	7.55	5.61	4.2	3.32	1.57	0.02	0.44	0.16	0.08	0.01	<0.01	0.79	99.1	24.2	6	160	2.07	1.19	0.36	30.3	2.16	1.4	0.41	2.2	0.17	17.5	4.1	0.88	1.83	194	58	0.36	3.26	0.19	2.54	156	1	12.2	1.24	31	6650	<0.5	<5	0.5	30	147	<1	84	4	21	20	94
SR-17-71	671035	33.8	35	0.026	0.004	0.065	0.003	74.3	15.25	0.92	1.06	0.09	7.05	0.99	<0.01	0.01	0.18	0.04	<0.01	<0.01	0.58	100.47	3.5	5.6	20	1.69	0.54	0.04	40.6	1.42	1.5	0.24	2	0.11	34.9	2.7	0.73	1.46	27	12.6	0.32	4.93	0.1	8.4	<5	1	10.3	0.86	14	260	<0.5	<5	<0.5	1	4	1	4	10	2	<10	19
SR-17-71	671036	35	37.1	0.011	0.003	0.112	0.003	75.2	14.9	0.63	0.58	0.02	6.52	2.35	<0.01	<0.01	0.15	0.08	<0.01	<0.01	0.03	100.46	7.4	4	20	1.13	0.29	<0.03	36.1	0.86	1.4	0.14	1.3	0.05	21.9	1.9	0.52	1.08	14	8.9	0.23	2.89	0.05	5.46	<5	1	6.7	0.43	12	140	<0.5	<5	<0.5	<1	2	<1	1	7	1	10	8
SR-17-71	671037	42	43.42	0.082	0.016	0.204	0.003	75.6	12.55	1.39	0.51	0.13	4.18	3.26	<0.01	0.02	0.03	0.04	<0.01	<0.01	0.33	98.04	7	7	20	0.94	0.24	<0.03	34.8	1.29	0.7	0.11	2.4	0.03	83.6	3.2	0.94	1.73	93	8.9	0.22	8.12	0.05	6.51	<5	2	5	0.32	13	800	<0.5	<5	<0.5	1	6	<1	2	10	3	10	75
SR-17-71	671038	43.42	44.5	0.071	0.005	0.202	0.004	74.8	14.25	0.85	0.23	0.05	4.44	3.63	<0.01	0.01	0.05	0.04	<0.01	<0.01	0.46	98.81	2.6	8	20	1.51	0.48	<0.03	48.2	1.65	0.8	0.2	2.5	0.09	113	3.9	1.08	1.95	116	3.3	0.32	6.87	0.09	2.81	<5	5	8.5	0.62	12	920	<0.5	<5	<0.5	<1	1	<1	<1	10	5	10	33
SR-17-71	671039	44.5	46.65	0.088	0.009	0.311	0.002	76.5	12.95	1.23	0.12	0.08	2.78	5.59	<0.01	0.01	0.02	0.04	<0.01	<0.01	0.37	99.69	7.5	4.1	20	0.63	0.15	<0.03	39	0.9	0.5	0.07	1.4	0.02	81.7	1.9	0.56	1.05	90	3.7	0.15	4.49	0.02	2.23	<5	3	3.2	0.15	7	850	<0.5	<5	<0.5	<1	2	<1	1	14	5	20	69
SR-17-71	671041	52.75	53.25	0.078	0.003	0.233	0.004	74.4	14.45	1.04	0.16	0.02	4.32	3.77	<0.01	0.01	0.04	0.04	<0.01	<0.01	0.45	98.7	<0.5	11.4	10	2.66	0.77	<0.03	48.9	2.76	0.8	0.34	3.7	0.11	112.5	5.5	1.54	3.09	82	0.6	0.58	9.98	0.13	8.73	<5	6	14.4	0.99	11	880	<0.5	<5	<0.5	<1	1	<1	1	12	4	10	66
SR-17-71	671042	60.22	61.69	0.090	0.007	0.307	0.002	74.4	14.1	1.18	0.17	0.04	3.4	5.52	<0.01	0.01	0.02	0.04	<0.01	<0.01	0.34	99.22	4.1	4.1	10	1.2	0.3	<0.03	38.5	1.27	0.3	0.13	1.5	0.03	74.7	1.9	0.54	1.06	85	3.2	0.26	3.34	0.05	5.48	<5	3	6.5	0.31	4	820	<0.5	<5	<0.5	<1	<1	<1	<1	8	3	20	62
SR-17-71	671043	67	67.5	0.069	0.002	0.198	0.004	75.6	14	1.17	0.21	0.02	4.57	3.1	<0.01	0.01	0.05	0.05	<0.01	<0.01	0.35	99.13	<0.5	14.4	10	3.32	0.95	<0.03	46.9	3.57	0.9	0.42	4.6	0.14	102	6.7	1.93	3.73	79	0.8	0.72	11.7	0.15	11.6	<5	6	17.8	1.18	12	1060	<0.5	<5	<0.5	<1	1	<1	2	11	3	10	73
SR-17-71	671044	72.7	73.2	0.084	0.004	0.265	0.004	76.3	13.15	2.23	0.47	0.09	3.35	3.44	<0.01	0.02	0.1	0.04	<0.01	<0.01	0.53	99.72	1.9	19.5	30	4.48	1.24	<0.03	57.3	5.18	1.8	0.53	6.1	0.16	151.5	9.3	2.67	5.71	171	9.2	1.02	18.15	0.21	17.4	<5	8	23.4	1.44	24	1110	<0.5	<5	<0.5	<1	3	<1	2	22	5	10	152
SR-17-71	671045	77	77.5	0.022	0.005	0.226	0.005	74	14.95	0.61	0.22	0.03	5.99	3.52	<0.01	<0.01	0.23	0.06	<0.01	<0.01	0.01	99.62	0.8	2.8	20	0.73	0.21	<0.03	38.5	0.6	2.1	0.09	1	0.06	72.6	1.2	0.34	0.62	29	2.4	0.13	5.07	0.05	7.45	<5	2	4.5	0.43	21	190	<0.5	<5	<0.5	<1	2	1	2	8	1	10	42
SR-17-71	671046	90.64	91.48	0.095	0.015	0.183	0.008	71.8	14.25	3.58	1.84	1.29	5.23	1.03	0.01	0.13	0.38	0.05	<0.01	<0.01	0.23	99.82	4.1	22.9	70	5.76	1.4	0.1	37.5	7.32	2	0.63	7.1	0.24	89	11.2	3.15	7.69	2140	28.9	1.43	18.45	0.23	9.78	49	11	30.9	1.85	27	2770	<0.5	<5	0.5	8	54	1	27	10	7	10	176
SR-17-71	671047	93.52	93.95	0.056	0.018	0.114	0.011	70.4	15.55	2.29	2.06	0.84	6.25	0.73	0.01	0.09	0.18	0.17	0.01	<0.01	0.22	98.8	8.1	7.5	50	1.61	0.54	0.09	43.7	1.89	11	0.23	2.5	0.11	94.6	3.7	1.01	2.13	207	40.1	0.38	8.53	0.1	15.85	27	2	9.3	0.74	83	1130	<0.5	9	0.5	5	52	1	18	18	5	10	77
SR-17-71	671048	96.22	97.7	0.024	0.002	0.069	0.005	73.3	16.1	1.05	0.88	0.1	7.3	1.51	0.01	0.01	0.27	0.08	<0.01	<0.01	-0.02	100.59	3.3	5.1	30	1.61	0.43	0.04	37.1	1.37	3.7	0.19	1.6	0.11	57.4	2.4	0.67	1.36	159	14.3	0.32	5.96	0.1	11.85	<5	1	9.7	0.8	36	180	<0.5	<5	<0.5	<1	14	<1	3	9	1	<10	33
SR-17-71	671049	99.88	101	0.108	0.035	0.133	0.009	70.7	16.45	1.9	1.29	0.7	7.2	0.97	0.01	0.07	0.18	0.09	<0.01	<0.01	0.19	99.75	2.8	3.4	50	1.37	0.51	0.05	43.7	1.22	1	0.19	1.2	0.09	68.7	1.7	0.45	1.12	233	20	0.3	5.47	0.09	6.68	28	3	8.3	0.67	13	1580	<0.5	6	<0.5	5	8	<1	15	8	5	10	89
SR-17-71	671051	102.7	104.65	0.168	0.015	0.238	0.005	65.5	15.15	5.44	3.93	2.68	3.78	2.48	0.02	0.28	0.15	0.08	0.01	<0.01	0.73	100.23	7.8	5	110	1.51	0.81	0.21	32.4	1.35	1.4	0.28	1.7	0.12	81.1	3.1	0.69	1.13	93	41.9	0.26	2.98	0.14	3.63	96	3	9.1	0.85	26	4200	<0.5	<5	<0.5	18	53	<1	54	5	15	10	130
SR-17-71	671052	108.96	111	0.198	0.018	0.293	0.005	69.3	14.9	2.69	1.6	1.48	5.13	2.7	0.01	0.1	0.11	0.09	<0.01	<0.01	0.71	98.82	5.5	3.8	60	1.18	0.46	0.06	32.5	0.86	1.6	0.17	1.4	0.08	52.5	1.7	0.44	0.72	73	13.1	0.19	3.21	0.08	4.79	41	43	7	0.62	20	7460	<0.5	<5	<0.5	8	36	<1	22	6	7	10	83
SR-17-71	671053	111	113.46	0.099	0.005	0.196	0.004	78.5	12.35	1.01	0.45	0.09	4.53	2.33	<0.01	0.01	0.11	0.05	<0.01	<0.01	0.23	99.66	1.2	2.8	30	0.99	0.42	0.03	31	0.69	1	0.15	1.1	0.12	38.1	1.1	0.33	0.59	79	5.6	0.18	3.22	0.09	3.54	<5	3	6.5	0.79	11	1060	<0.5	<5	<0.5	1	3	<1	4	5	3	10	37
SR-17-71	671054	114.16	116.5	0.116	0.007	0.122	0.005	83	9.02	1.88	0.64	0.15	3.08	1.18	<0.01	0.02	0.17	0.05	<0.01	<0.01	0.39	99.58	1.5	4.1	30	1.69	0.82	<0.03	28.4	1.08	1.7	0.28	1.4	0.23	79.2	1.9	0.54	1.06	122	7.1	0.28	6.15	0.18	5.7	<5	4	11.8	1.62	23	1390	<0.5	<5	<0.5	<1	8	1	3	3	6	10	96
SR-17-71	671055	121.72	123	0.088	0.017	0.054	0.002	88	5.96	2.18	0.18	0.15	1.89	0.69	0.01	<0.01	0.18	0.02	<0.01	<0.01	0.16	99.42	<0.5	13.7	40	2.6	0.74	<0.03	19.6	3.32	1.9	0.31	4.1	0.11	43.5	7	1.87	3.79	33	2.3	0.63	8.69	0.13	4.77	<5	2	14.6	0.87	27	530	<0.5	<5	<0.5	<1	3	1	3	14	2	10	67
SR-17-71	671056	123	124	0.078	0.007	0.197	0.005	73.4	14.6	0.98	0.31	0.05	4.8	4.13	<0.01	<0.01	0.09	0.05	<0.01	<0.01	0.2	98.61	2.1	5.6	20	1	0.31	<0.03	33.3	1.05	1.5	0.13	1.9	0.07	106.5	2.3	0.72	1.21	180	3.6	0.22	4.46	0.06	7.44	<5	2	5.5	0.44	19	450	<0.5	<5	<0.5	<1	2	<1	1	10	1	20	54
SR-17-71	671057	124	126	0.078	0.007	0.197	0.005	73.4	14.6	0.98	0.31	0.05	4.8	4.13	<0.01	<0.01	0.09	0.05	<0.01	<0.01	0.2	98.61	2.1	5.6	20	1	0.31	<0.03	33.3	1.05	1.5	0.13	1.9	0.07	106.5	2.3	0.72	1.21	180	3.6	0.22	4.46	0.06	7.44	<5	2	5.5	0.44	19	450	<0.5	<5	<0.5	<1	2	<1	1	10	1	20	54
SR-17-71	671058	126	128	0.205	0.006	0.261	0.005	74.1	15.65	0.82	0.2	0.04	4.77	4.67	<0.01	<0.01	0.09	0.04	<0.01	<0.01	0.24	100.62	1	5.5	20	1.13	0.38	<0.03	36.4	0.88	1.7	0.13	2.8	0.08	91.4	2.1	0.61	0.81	200	2.1	0.21	2.89	0.07	6.9	<5	3	7.2	0.67	20	550	<0.5	<5	<0.5	<1	1	<1	1	8	2	20	55
SR-17-71	671059	128	130	0.118	0.005	0.217	0.004	74.2	15.45	0.9	0.17	0.03	5.77	3.39	<0.01	<0.01	0.05	0.02	<0.01	<0.01	0.16	100.14	0.5	10.9	30	0.64	0.23	0.03	37.5	0.8	0.8	0.1	6.1	0.05	79.5	3.7	1.14	0.97	234	1.8	0.15	3.12	0.06	6.04	<5	3	4.1	0.4	8	540	<0.5	<5	<0.5	<1	2	<1	1	6	1	10	70
SR-17-71	671060	130	132	0.123	0.005	0.206	0.005	73	15.2	0.82	0.22	0.03	5.7	3.22	<0.01	<0.01	0.05	0.02	<0.01	<0.01	0.28	98.54	<0.5	2.8	20	0.62	0.14	<0.03	37.4	0.76	0.8	0.06	1.1	0.01	107.5	1.2	0.38	0.66	285	1.8	0.11	3.05	0.03	4.81	<5	2	3.1	0.22	8	410	<0.5	<5	<0.5	<1	2	<1	1	6	<1	10	80
SR-17-71	671061	132	133	0.103	0.004	0.201	0.004	74.3	15.65	0.77	0.18	0.02	6.04	3.24	<0.01	<0.01	0.05	0.04	<0.01	<0.01	0.11	100.4	<0.5	2.4	20	0.62	0.16	<0.03	34.1	0.63	1.2	0.07	1.1	0.03	86	0.9	0.29	0.59	212	1.8	0.13	2.71	0.03	5.8	<5	3	3.2	0.25	13	390	<0.5	<5	<0.5	<1	3	<1	<1	3	<1	10	72
SR-17-71	671062	133	134.5	0.056	0.005	0.216	0.007	73.6	15.6	0.63	0.33	0.03	6.29	3.09	<0.01	<0.01	0.14	0.07	<0.01	<0.01	0.04	99.82	2.1	1.8	20	0.82	0.35	<0.03	32.4	0.56	1.2	0.11	0.8	0.09	68.6	0.7	0.22	0.49	131	5.5	0.13	2.81	0.06	5.13	<5	2	5.8	0.76	10	250	<0.5	<5	<0.5	<1	2	<1	2	6	<1	10	37
SR-17-71	671063	138.4	139.1	0.060	0.055	0.033	0.000	83.4	3.8	3.18	7.37	1.59	0.19	0.2	0.01	0.13	0.07	0.07	<0.01	<0.01	1.41	101.42	3	2.9	100	0.77	0.56	0.22	4.7	0.66	0.2	0.18	1.5	0.07	1.8	1.7	0.38	0.55	21	24.4	0.12	<0.05	0.08	<0.05	46	58	4.9	0.49	7	>20000	0.6	29	<0.5	11	167	<1	32	2	8	<10	27
SR-17-71	671064	141.6	142	0.015	0.001	0.006	0.014	75.8	15.4	0.66	0.72	0.02	7.99	0.11	<0.01	<0.01	0.13	0.03	<0.01	<0.01	0.06	100.92	<0.5	1.9	20	0.6	0.15	<0.03	37.7	0.59	0.9	0.06	1	0.02	100.5	0.7	0.21	0.45	879	17	0.13	3.81	0.02	5.44	<5	3	3.4	0.24	19	130	<0.5	<5	<0.5	<1	5	<1	2	6	<1	<10	30
SR-17-71	671065	144.45	145.05	0.047	0.007	0.140	0.007	74.9	14.45	1.32	0.83	0.08	5.96	1.83	<0.01	0.01	0.09	0.06	<0.01	<0.01	0.23	99.76	2.9	10.9	30	2.96	0.92	0.03	45.5	3.03	1.9	0.33	3.9	0.13	94.4	5.7	1.55	3.25	247	12.5	0.61	8.55	0.13	12.25	<5	3	15.1	1.08	20	360	<0.5	5	<0.5	<1	25	1	1	8	2	10	68
SR-17-71	671066	147.8	148.2	0.523	0.012	0.025	0.008	74.6	15.95	0.87	1.25	0.18	6.69	0.26	<0.01	0.01	0.02	0.09	<0.01	<0.01	0.07	99.99	3.7	3	30	0.92	0.21	0.03	35.1	1.14	1.3	0.1	1.1	0.01	58.6	1.7	0.42	1.21	298	20.5	0.21	3.4	0.03	4.84	<5	2	4.7	0.23	11	300	<0.5	5	<0.5	<1	4	<1	3	7	1	<10	23
SR-17-71	671067	151	151.75	0.239	0.012	0.152	0.008	78.1	13.45	0.98	0.93	0.21	5.6	1.43	<0.01	0.02	0.12	0.11	<0.01	<0.01	0.06	101.01	4.5	3	30	0.91	0.33	<0.03	31.6	1.19	0.9	0.1	1.3	0.04	53.2	1.6	0.42	1.33	398	13.9	0.22	3.11	0.04	3.85	6	2	5.2	0.45	10	320	<0.5	<5	<0.5	1	20	<1	4	5	1	10	29
SR-17-71	671068	158.5	158.85	0.114	0.127	0.202	0.041	68	16.45	2.55	3.6	1.26	5.85	0.82	0.01	0.13	0.05	0.48	0.01	<0.01	0.39	99.6	13.3	2.1	50	0.58	0.39	0.14	49.7	0.65	1.9	0.12	1.1	0.04	59.2	1.1	0.28	0.5	124	72.6	0.1	1.79	0.05	3.52	47	5	3.9	0.42	15	1910	<0.5	21	<0.5	9	52	1	27	<2	7	20	37
SR-17-71	671069	163.9	164.85	1.978	0.035	0.345	0.008	75.9	16.75	0.71	0.5	0.04	3.91	2.12	<0.01	<0.01	0.04	0.14	<0.01	<0.01	0.16	100.27	7.2	2.4	30	1.36	0.29	<0.03	42.5	1.84	1.3	0.12	0.9	0.03	66.9	1.3	0.32	1.43	171	10.3	0.37	1.69	0.04	4.72	<5	3	7	0.36	11	320	<0.5	9	<0.5	<1	2	1	<1	2	<1	20	55
SR-17-71	671070	170.6	171	0.732	0.037	0.284	0.010	75.2	16.5	0.74	0.81	0.06	6.37	1.58	<0.01	0.01	0.05	0.18	<0.01	<0.01	0.12	101.62	10	0.7	30	0.2	0.04	<0.03	56.2	0.15	4.2	0.01	<0.5	<0.01	36.5	0.3	0.07	0.12	354	18.8	0.04	1.49	0.01	6.42	<5	2	1.4	0.14	31	240	<0.5	6	0.7	<1	5	<1	3	3	<1	20	38
SR-17-71	671071	173.2	173.45	0.136	0.010	0.131	0.020	75.2	15.9	0.72	1.24	0.05	6.89	1.13	<0.01	<0.01	0.14	0.13	0.01	<0.01	0.2	101.61	18.2	2.5	20	1.19	0.36	0.04	47.6	1.08	1.9	0.14	1.2	0.08	99.3	1	0.31	0.85	1295	43.3	0.27	3.45	0.07	5.96	<5	3	7.6	0.77	16	200	<0.5	7	<0.5	<1	6	<1	1	6	1	10	20
SR-17-71	671072	174.55	174.75	0.086	0.022	0.039	0.060	71.8	16.25	0.79	1.83	0.22	8.33	0.2	0.01	0.03	0.03	0.69	<0.01	<0.01	0.11	100.29	17.9	<0.5	30	0.12	0.05	0.05	53.9	0.14	3.4	0.01	<0.5	<0.01	51.6	0.3	0.05	0.1	82	24.4	0.01	3.37	<0.01	9.02	10	6	0.9	0.05	22	700	<0.5	5	<0.5	<1	9	<1	6	5	1	<10	8
SR-17-71	671073	182.3	182.8	0.194	0.043	0.207	0.022	68.4	17.55	1.71	2.63	1.01	7.57	0.79	0.01	0.07	0.04	0.24	0.01	<0.01	0.89	100.92	2.6	5.1	60	1.68	0.5	0.08	54.7	2.59	2.6	0.17	1.7	0.05	62	2.8	0.78	2.39	1825	27.7	0.5	5.19	0.06	4.08	27	7	9	0.51	34	7730	<0.5	14	<0.5	5	10	<1	16	4	4	10	24

wt. % →

ppm →

Hole ID	Sample ID	From [m]	To [m]	Li_2O	Cs_2O	Rb_2O	Ta_2O_5	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Na_2O	K_2O	Cr_2O_3	TiO_2	MnO	P_2O_5	SrO	BaO	LOI	Total	Ba	Ce	Cr	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd	Pr	Sm	Sn	Sr	Tb	Th	Tm	U	V	W	Y	Yb	Zr	F	Ag	As	Cd	Co	Cu	Mo	Ni	Pb	Sc	Tl	Zn
SR-17-71	671074	182.8	184.45	0.355	0.096	0.280	0.001	50.4	15.2	10.85	10.45	7.51	1.57	0.97	0.05	0.62	0.21	0.07	0.01	<0.01	0.94	98.85	25.2	5.6	400	2.65	1.56	0.53	19.2	2.2	1.2	0.52	2.4	0.22	6.1	4.1	0.85	1.63	101	78.6	0.36	0.92	0.22	0.72	245	21	14.4	1.51	36	7590	<0.5	6	0.9	46	155	<1	139	<2	36	20	100
SR-17-71	671076	184.45	185.35	1.473	0.043	0.247	0.032	71.6	16.65	1.73	1.49	0.68	4.93	0.86	0.01	0.06	0.08	0.23	<0.01	<0.01	0.34	98.66	6	2.1	80	0.26	0.14	0.04	50.5	0.38	2.4	0.05	1.1	0.01	46.7	0.9	0.25	0.37	348	17.9	0.06	1.37	0.02	2.92	25	3	1.9	0.14	17	2960	<0.5	7	<0.5	3	14	1	13	<2	3	10	31
SR-17-71	671077	185.35	186.35	0.329	0.135	0.373	0.002	49	15.05	11.1	10.7	8.07	1.18	1.15	0.05	0.63	0.21	0.13	0.01	<0.01	0.93	98.21	10.8	4.6	400	2.28	1.56	0.52	17	1.95	1.2	0.53	1.7	0.22	3.5	3.7	0.74	1.29	29	77.3	0.34	0.27	0.22	0.12	252	9	14	1.49	33	8920	<0.5	<5	0.8	45	134	<1	142	<2	34	30	79
SR-17-71	671078	186.35	187.6	1.724	0.006	0.318	0.012	74.5	16.85	0.67	0.53	0.06	4.32	1.65	<0.01	0.01	0.23	0.11	0.01	<0.01	0.59	99.53	<0.5	0.9	30	0.09	0.03	<0.03	51.7	0.1	1.7	0.01	0.6	<0.01	28.5	0.3	0.1	0.09	288	11	0.02	1.42	<0.01	2.46	<5	2	0.9	0.09	11	3000	<0.5	<5	<0.5	<1	2	1	2	<2	<1	20	40
SR-17-71	671079	187.6	187.83	0.299	0.082	0.395	0.000	48.9	14.85	11.75	10.85	8.18	1.13	1.46	0.06	0.67	0.22	0.04	0.01	<0.01	1.2	99.32	9.2	5.6	440	2.89	1.72	0.55	16	2.08	1.2	0.6	2.1	0.28	2.1	4.5	0.92	1.6	23	83.4	0.38	0.18	0.28	<0.05	267	1	16.4	1.85	37	16700	<0.5	<5	1.1	50	182	<1	156	2	43	30	88
SR-17-71	671081	187.83	189.6	1.709	0.006	0.581	0.010	74.8	16.65	0.48	0.29	0.04	3.88	2.25	<0.01	<0.01	0.19	0.11	<0.01	<0.01	0.77	99.46	<0.5	0.8	20	0.16	0.04	<0.03	51.3	0.2	1.3	0.02	<0.5	<0.01	42	0.3	0.09	0.13	295	7.9	0.04	2.52	<0.01	3.74	<5	3	1.3	0.07	11	6470	<0.5	<5	<0.5	<1	2	1	<1	<2	<1	30	55
SR-17-71	671082	189.6	190.95	0.428	0.261	0.366	0.014	52.8	15.4	10.6	8.75	6.54	2.09	1.11	0.03	0.58	0.19	0.15	0.02	<0.01	0.96	99.22	16.7	4.7	230	2.12	1.51	0.47	24.3	1.85	1.4	0.46	1.9	0.21	18.7	3.6	0.76	1.28	77	78.2	0.31	0.69	0.21	0.89	217	7	13.1	1.35	33	10600	<0.5	45	1.2	42	115	<1	134	<2	37	20	90
SR-17-71	671083	190.95	192	1.899	0.039	0.321	0.030	74.6	16.9	0.9	0.73	0.28	4.17	1.14	<0.01	0.03	0.09	0.19	0.01	<0.01	0.58	99.62	1.5	0.8	30	0.12	0.09	<0.03	53.9	0.18	2.3	0.02	0.5	<0.01	51.3	0.5	0.11	0.15	261	15.7	0.02	2.56	<0.01	3.85	10	8	1.1	0.1	16	2710	<0.5	5	<0.5	<1	4	1	6	<2	1	20	28
SR-17-71	671084	192	194.2	1.091	0.136	0.465	0.013	62.6	16.1	5.69	4.33	3.25	3.23	1.49	0.02	0.32	0.2	0.16	0.01	<0.01	1.03	98.43	6.6	2.9	110	1.18	0.71	0.26	38.9	1.07	1.8	0.28	1.2	0.11	30.3	2.3	0.45	0.83	221	37.7	0.18	1.65	0.11	2.19	113	10	7.2	0.78	29	9210	<0.5	30	0.5	24	51	<1	73	<2	16	30	68
SR-17-71	671085	194.2	194.8	0.355	0.265	0.440	0.008	48.6	15.45	12.1	9.73	7.3	1.07	1.55	0.02	0.69	0.22	0.27	0.01	<0.01	1.1	98.11	19.4	4.7	180	2.52	1.76	0.56	20.3	2.14	1.7	0.6	1.7	0.25	7.3	4.1	0.76	1.52	55	68.3	0.38	0.25	0.25	0.17	254	1	15.1	1.69	37	11550	<0.5	27	1	52	120	<1	144	<2	38	50	94
SR-17-71	671086	194.8	197	1.638	0.004	0.511	0.009	73.4	16.8	0.56	0.22	0.04	3.97	2.41	<0.01	<0.01	0.23	0.06	<0.01	<0.01	0.78	98.47	<0.5	0.7	20	0.2	0.08	<0.03	51.3	0.27	1.5	0.02	<0.5	<0.01	62.2	0.3	0.09	0.27	293	3.7	0.05	2.66	<0.01	5.71	<5	4	1.3	0.06	12	5060	<0.5	<5	<0.5	<1	2	1	1	4	<1	30	111
SR-17-71	671087	197	199	1.479	0.004	0.511	0.008	74	16.05	0.51	0.18	0.02	3.92	2.6	<0.01	<0.01	0.22	0.07	0.01	<0.01	0.77	98.35	<0.5	1.4	20	0.51	0.1	<0.03	46.2	0.52	1.2	0.04	0.6	0.01	61.8	0.6	0.18	0.53	326	3	0.12	2.85	0.02	5.86	<5	4	2.6	0.15	12	4980	<0.5	<5	<0.5	<1	1	<1	<1	5	<1	30	104
SR-17-71	671088	199	201	1.851	0.005	0.522	0.008	74.5	16.4	0.62	0.16	0.01	3.21	2.65	<0.01	<0.01	0.21	0.06	0.01	<0.01	0.76	98.59	0.5	1.5	20	0.68	0.15	<0.03	43.7	0.78	2.1	0.08	0.7	0.02	75.7	0.7	0.17	0.58	287	5.1	0.17	2.99	0.02	6.7	<5	5	3.8	0.25	20	5000	<0.5	<5	<0.5	<1	1	<1	<1	3	<1	30	109
SR-17-71	671089	201	203	1.182	0.005	0.499	0.008	73.2	16.3	0.58	0.19	0.01	4.57	2.53	<0.01	<0.01	0.23	0.08	0.01	<0.01	0.68	98.38	<0.5	1.5	20	0.67	0.11	<0.03	50.6	0.84	2.2	0.06	0.6	0.01	75.1	0.8	0.2	0.64	357	5	0.17	4.01	0.01	7.42	<5	5	3.6	0.23	22	5130	<0.5	<5	<0.5	<1	<1	1	<1	5	<1	30	130
SR-17-71	671090	203	204.48	1.662	0.006	0.490	0.009	75.2	16.4	0.64	0.28	0.02	3.91	2.41	<0.01	<0.01	0.21	0.09	0.01	<0.01	0.47	99.64	<0.5	0.7	30	0.4	0.08	<0.03	47.8	0.48	1.6	0.04	<0.5	0.01	64.4	0.3	0.09	0.38	292	7.5	0.11	2.84	0.01	6.76	<5	4	2.6	0.18	15	3610	<0.5	<5	<0.5	<1	1	<1	<1	4	<1	30	100
SR-17-71	671091	204.48	206.5	0.437	0.190	0.370	0.010	52.9	16.25	10.6	9.52	6.19	1.84	1.25	0.04	0.65	0.22	0.15	0.01	<0.01	1.27	100.89	22.2	4.7	240	2.46	1.59	0.55	23	2.12	1.9	0.54	1.7	0.23	15.2	3.9	0.76	1.38	90	69.3	0.36	0.69	0.23	1.08	216	6	14.6	1.6	38	9070	<0.5	80	1	46	110	<1	150	<2	35	30	90
SR-17-71	671092	206.5	207.95	1.070	0.063	0.467	0.012	66	17.05	4.29	3.7	1.81	3.64	1.79	0.02	0.26	0.23	0.18	0.01	<0.01	0.75	99.73	28.3	2.4	110	1.24	0.67	0.22	46.5	1.01	4.4	0.21	1	0.09	38.9	1.6	0.37	0.8	310	34.6	0.2	2.09	0.11	5.38	86	4	7.2	0.73	39	5340	<0.5	10	0.5	17	44	<1	55	<2	12	30	77
SR-17-71	671093	207.95	209.78	0.306	0.045	0.258	0.005	55.5	15.4	9.43	8.85	3.74	2.31	1.46	0.02	0.72	0.24	0.2	0.01	0.01	1.04	98.93	50.6	6.9	120	3.1	1.8	0.63	27.1	2.58	2.8	0.62	2.6	0.24	15.7	5.2	1.01	1.67	167	60.3	0.43	1.16	0.23	2.41	234	10	15.7	1.71	55	6250	<0.5	9	0.7	40	106	1	84	<2	31	20	113
SR-17-71	671094	209.78	211.3	0.926	0.028	0.299	0.012	64.7	15.05	6.09	3.31	2.32	3.51	1.78	0.01	0.51	0.19	0.13	<0.01	<0.01	0.74	98.34	25.7	5.7	70	2.32	1.41	0.34	34.4	2.09	2.7	0.46	2.1	0.17	40.7	4.1	0.81	1.59	645	41.6	0.36	4.63	0.18	4.8	136	13	12.1	1.35	48	5620	<0.5	<5	0.5	18	55	<1	30	2	16	30	99
SR-17-71	671095	211.3	212.4	0.443	0.021	0.095	0.003	73.6	15.05	0.74	0.5	0.04	6.43	1.5	0.01	0.01	0.24	0.08	<0.01	<0.01	0.21	98.41	95.1	11.7	170	5.21	3.36	1.01	27.6	4.61	2.8	1.07	4.4	0.45	19.6	9.1	1.76	2.88	162	103	0.76	1.14	0.45	2.3	386	2	26.8	3.13	90	390	<0.5	<5	<0.5	<1	3	<1	2	5	<1	10	42
SR-17-71	671096	212.4	214.4	0.260	0.001	0.115	0.009	48.8	14.3	14.9	9.08	6.99	2.21	0.93	0.02	1.21	0.19	0.11	0.01	0.01	0.78	99.54	1.4	0.6	20	0.38	0.11	<0.03	31	0.28	2.2	0.04	<0.5	<0.01	53	0.2	0.04	0.16	469	6.7	0.04	2.28	<0.01	7.04	<5	2	2.2	0.2	21	2260	<0.5	<5	<0.5	50	77	<1	112	<2	38	<10	137
SR-17-71	671097	214.4	216.4	0.273	0.008	0.070	0.000	49	14.2	15.1	8.36	6.7	2.28	0.71	0.02	1.18	0.18	0.1	0.01	0.01	1.07	98.92	47.2	11	160	4.9	3.04	1	16.8	4.27	2.2	1	4.1	0.42	3.3	8.2	1.56	2.87	16	104	0.67	0.4	0.4	0.13	362	2	23.9	2.55	77	1170	<0.5	<5	0.6	49	186	<1	103	<2	40	<10	112
SR-17-71	671098	219.03	220.45	0.088	0.002	0.368	0.005	72.7	14.7	1.13	0.48	0.07	4.85	4.89	<0.01	0.02	0.1	0.08	0.01	<0.01	0.32	99.35	6.7	6.1	20	1.97	0.55	<0.03	38.1	2.63	0.8	0.21	2	0.06	80.4	3.2	0.83	2.39	2010	10.8	0.51	4	0.06	6.03	5	5	9.3	0.71	10	890	<0.5	<5	1.5	<1	3	1	<1	9	1	20	200
SR-17-72	671099	23	23.45	0.015	0.001	0.005	0.005	73.7	16.6	0.45	1.31	0.04	8.27	0.14	<0.01	<0.01	0.01	0.06	<0.01	<0.01	0.27	100.85	2.4	2.3	20	0.5	0.1	<0.03	37.8	0.67	8.8	0.04	0.9	<0.01	33.8	1	0.25	0.55	9	20.5	0.07	2.37	<0.01	9.7	<5	1	2.3	0.07	62	130	<0.5	<5	<0.5	<1	4	8	<1	4	<1	<10	4
SR-17-72	671101	23.45	24.05	0.017	0.002	0.031	0.002	91.9	3.4	1.71	0.34	0.09	0.85	0.39	0.01	0.01	1.17	0.03	<0.01	<0.01	0.06	99.96	1.1	1.7	50	5.87	2.86	<0.03	9.2	1.7	6.5	0.9	0.5	0.58	16.7	0.8	0.23	0.81	56	3.4	0.74	10.05	0.53	15.15	6	1	38.2	4.56	58	260	<0.5	<5	0.5	1	4	8	1	14	4	<10	23
SR-17-72	671102	24.05	26	0.105	0.017	0.165	0.002	71.3	15.7	2.84	1.42	1.2	6.42	1.42	0.01	0.15	0.21	0.08	<0.01	<0.01	0.77	101.52	5.4	5.6	70	1.93	0.81	0.03	36.1	1.66	1.1	0.28	2	0.09	21.1	2.8	0.74	1.51	58	14.6	0.32	3.69	0.09	2.97	52	1	10	1.06	15	2250	<0.5	<5	<0.5	10	74	1	25	2	8	10	76
SR-17-72	671103	26	27.5	0.013	0.004	0.165	0.001	73.9	14.95	0.54	0.43	0.02	6.26	3.4	<0.01	<0.01	0.11	0.05	<0.01	<0.01	0.24	99.9	4.1	1.8	30	0.67	0.2	<0.03	34.5	0.43	0.5	0.07	0.7	<0.01	8.2	0.7	0.2	0.34	24	6.1	0.1	1.88	<0.01	1.93	<5	2	4	0.28	6	120	<0.5	<5	<0.5	<1	2	<1	<1	2	1	10	6
SR-17-72	671104	27.5	28.5	0.017	0.006	0.183	0.003	76.2	13.9	0.96	0.52	0.04	5.19	3.13	0.01	<0.01	0.41	0.04	<0.01	<0.01	0.15	99.95	2.5	2.4	40	2.32	0.97	<0.03	32.5	0.92	0.7	0.32	0.9	0.13	54	1	0.28	0.57	40	6.9	0.27	4.44	0.12	5.01	<5	2	13.4	1.41	10	190	<0.5	5	<0.5	<1	4	2	3	9	2	10	19
SR-17-72	671105	33.35	34.5	0.052	0.008	0.125	0.003	75.5	13.9	1.42	0.9	0.2	5.75	1.47	<0.01	0.03	0.13	0.04	<0.01	<0.01	0.39	99.73	4.2	10.3	30	2.22	0.81	<0.03	40	2.1	1.8	0.29	3.5	0.14	59.5	4.8	1.38	2.35	94	15.6	0.41	12.05	0.11	11.7	9	3	11.9	1.19	21	630	<0.5	<5	<0.5	1	13	3	4	12	4	10	61
SR-17-72	671106	84	86.67	0.056	0.005	0.095	0.013	73.7	15.2	1	1.16	0.17	6.53	1.23	<0.01	0.01	0.11	0.05	<0.01	<0.01	0.39	99.55	2.7	2.7	30	0.83	0.3	<0.03	37.8	0.72	1.7	0.12	0.9	0.03	88.8	1.2	0.33	0.59	140	17.6	0.14	6.22	0.04	8.12	6	3	5	0.6	16	640	<0.5	<5	<0.5	<1	4	<1	4	9	2	<10	60
SR-17-72	671107	87.4	88	0.045	0.006	0.101	0.003	77.1	14.1	1.24	0.7	0.14	5.52	1.92	<0.01	0.01	0.07	0.05	<0.01	<0.01	0.28	101.13	1.5	6.1	20	1.32	0.33	<0.03	30.6	1.37	0.4	0.14	2.2	0.02	54.9	2.6	0.78	1.34	26	9.3	0.27	4.6	0.01	2.02	7	2	6.5	0.4	5	470	<0.5	<5	<0.5	<1	7	<1	3	8	1	10	43
SR-17-72	671108	88	89.45	0.103	0.013	0.084	0.002	90.1	5.33	2.51	0.03	0.13	0.94	1.05	<0.01	<0.01	0.2	<0.01	<0.01	<0.01	0.44	100.73	1.1	1.2	30	0.43	0.1	<0.03	19	0.4	1.2	0.06	<0.5	<0.01	36	0.6	0.15	0.25	42	0.6	0.05	3.94	<0.01	2.98	<5	2	2.5	0.13	15	830	<0.5	<5	<0.5	<1	1	1	1	7	2	<10	122
SR-17-72	671109	89.45	92.5	0.060	0.005	0.249	0.004	71.7	15.5	0.74	0.26	0.04	4.78	5.59	<0.01	<0.01	0.25	0.06	<0.01	<0.01	0.29	99.01	2.1	3	20	0.72	0.27	<0.03	30.1	0.67	0.5	0.08	1.2	<0.01	97.7	1	0.32	0.52	39	2.9	0.11	2.61	0.01	4.55	<5	2	3.7	0.32	7	390	<0.5	<5	<0.5	<1	<1	1	11	1	10	43
SR-17-72	671110	92.5	94.2	0.075	0.007	0.196	0.004	72.4	15.9	1.02	0.52	0.18	5.8	4.16	<0.01	0.02	0.16	0.07	<0.01	<0.01	0.23	100.46	1.9	3.8	30	1.84	0.73	<0.03	32.9	1.26	2.2	0.24	1.4	0.11	64	1.4	0.43	0.78	104	3.8	0.3	3.92	0.1	6.37	9	2	11	1.13	26	650	<0.5	<5	<0.5	1	4	<1	2	8	2	20	66
SR-17-72	671111	94.2	95.85	0.078	0.011	0.129	0.005	74.3	15.7	1.34	0.78	0.44	6.5	2.35	0.01	0.05	0.04	0.05	<0.01	<0.01	0.33	101.89	2.3	6	40	1.23	0.4	<0.03	30.4	1.49	0.7	0.18	2.3	0.02	96.1	2.4	0.72	1.22	47	6.4	0.27	3.07	0.03	5.23	19	7	6.6	0.48	10	1180	<0.5	<5	<0.5	2	4	<1	7	9	3	10	75
SR-17-72	671112	115.8	116.85	0.082	0.011	0.120	0.001	87.8	7.28	2.09	0.31	0.17	1.49	2.19	<0.01	0.01	0.11	0.03	<0.01	<0.01	0.38	101.86	2.8	12.6	30	3.86	1.12	<0.03	18.8	3.62	0.6	0.43	4	0.11	34.7	6.1	1.69	3.31	38	3.8	0.76	6.51	0.13	2.47	5	2	19.7	1.1	9	620	<0.5	<5	<0.5	1	4	3	4	5	2	10	77
SR-17-72	671113	116.85	119	0.062	0.006	0.155	0.003	76.5	14.25	1.03	0.38	0.04	5.1	3.35	<0.01	<0.01	0.07	0.07	<0.01	<0.01	0.41	101.2	2.8	7.2	20	0.93	0.35	<0.03	30	1.06	<0.2	0.11	2.5	0.05	74.2	3	0.86	1.26	39	4.1	0.16	2.82	0.03	1.17	<5	2	4.9	0.55	2	440	<0.5	<5	<0.5	<1	1	<1	6	2	10	50
SR-17-72	671114	119	121	0.039	0.004	0.112	0.004	76.2	15.2	0.79	0.51	0.03	6.08	2.55	<0.01	<0.01	0.04	0.07	<0.01	<0.01	0.41	101.88	2	5.7	20	1.97	0.61	<0.03	32.5	1.68	0.2	0.25	2.1	0.08	85.3	2.3	0.66	1.2	34	4.9	0.34	2.34	0.06	1.9	<5	2	10.8	0.84	4	320	<0.5	<5	<0.5	<1	1	<1	<1	8	1	<10	22
SR-17-72	671115	121	123	0.024	0.003	0.097	0.003	70.6	16.85	0.54	0.62	0.02	7.7	2.21	<0.01	<0.01	0.01	0.06	<0.01	<0.01	0.45	99.06	2.1	6.7	30	1.52	0.54	<0.03	34	1.51	0.2	0.2	2.6	0.03	77.8	2.4	0.73	1.26	29	5.4	0.3	1.96	0.05	1.45	<5	4	8.6	0.55	3	190	<0.5	<5	<0.5	<1	1	7	1	<10	16
SR-17-72	671116	123	125	0.047	0.005	0.131	0.004	73.6	16.6	0.77	0.54	0.02	7.04	2.79	<0.01	0.01	0.03	0.06	<0.01	<0.01	0.42	101.88	4.7	6.8	20	1.54	0.63	<0.03	35.8	1.55	0.4	0.2	2.6	0.07	74.1	2.7	0.82	1.12	44	5.4	0.29	2.59	0.06	2.82	<5	2	8.9	0.7	6	370	<0.5	<5	<0.5	<1	<1	1	7	1	10	28
SR-17-72	671117	125	127.45	0.030	0.007	0.153	0.004	74	15.1	0.8	0.62	0.13	5.57	3.33	<0.01	<0.01	0.01	0.04	0.07	<0.01	<0.01	0.28	99.95	6.1	6.6	20	1.59	0.46	<0.03	31.4	1.6	0.2	0.2	2.4	0.06	70.2	2.9	0.82	1.42	39	9.2	0.3	2.97	0.05	2.68	6	2	8.6	0.68	3	270	<0.5	<5	<0.5	1	5	<1	3	9	1	10	29
SR-17-72	671118	131	132	0.041	0.009	0.035	0.010	75.5	15.2	1.25	1.24	0.33	7.13	0.41	<0.01	0.03	0.07	0.09	<0.01	<0.01	0.45	101.7	5	8.9	30	1.81	0.57	<0.03	36.7	1.87	0.3	0.2	3	0.07	113.5	3.9	1.08	2.05	442	18.1	0.38	3.31	0.07	3.04	11	2	9.7	0.8	4	330	<0.5	<5	<0.5	2	29	<1	10	4	2	<10	32
SR-17-72	671119	141.2	142.4	0.095	0.017	0.082	0.017	71.1	15.85	1.24	2.17	0.47	6.76	0.6	<0.01	<0.01	0.04	0.07	0.24	0.01	<0.01	0.64	99.19	7.1	1.7	30	0.4	0.16	0.03	43.5	0.57	0.8	0.06	0.7	<0.01	72.2	0.7	0.18	0.39	311	55.1	0.08	2.27	<0.01	3.13	15	3	2.3	0.14	7	910	<0.5	45	<0.5	1	26	<1	6	4	2	10	32
SR-17-72	671121	144.2	145	0.056	0.008	0.233	0.005	75.1	15.3	0.97	0.54	0.21	5.32	3.47	<0.01	0.02	0.02	0.08	<0.01	<0.01	0.48	101.51	4.9	1.7	30	0.97	0.21	<0.03	34.4	1.11	<0.2	0.09	0.6	<0.01	73.9	0.7	0.22	0.69	122	7.7	0.21	0.66	<0.01	1.39	11	3	4.8	0.28	2	550	<0.5	<5	<0.5	1	2	<1	4	4	1	10	59
SR-17-72	671122	145	146.7	0.034	0.007	0.248	0.005	73.3	15.25	0.78	0.38	0.04	5.84	3.76	<0.01	<0.01	0.04	0.08	<0.01	<0.01	0.36	99.83	3.5	1.4	20	0.43	0.07	<0.03	34.1	0.57	<0.2	0.03	0.5	<0.01	69.9	0.6	0.17	0.56	111	4.7	0.09	1.02	<0.01	2.25	<5	2	2.1	0.07	<2	180	<0.5	<5	<0.5	<1	2	<1	2	7	<1	10	37
SR-17-72	671123	161.4	161.9	0.626	0.030	0.359	0.005	71	16.15	1.6	1.12	0.64	4.76	3.51	<0.01	0.06	0.03	0.1	<0.01	<0.01	0.55	99.52	8.9	4.5	30	1

				wt. % →																		
Hole ID	Sample ID	From [m]	To [m]	Li_2O	Cs_2O	Rb_2O	Ta_2O_5	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Na_2O	K_2O	Cr_2O_3	TiO_2	MnO	P_2O_5	SrO	BaO	LOI	Total
SR-17-73	671159	247	247.56	1.711	0.044	0.327	0.016	69.7	16.5	2.67	2.4	1.29	3.69	1.3	0.01	0.14	0.12	0.19	<0.01	<0.01	0.89	98.9
SR-17-73	671161	255.47	256.2	0.411	0.009	0.139	0.013	74.3	15.8	0.68	0.96	0.21	6.75	0.77	<0.01	0.02	0.17	0.09	<0.01	<0.01	0.44	100.19
SR-17-73	671162	260.4	261.62	0.437	0.029	0.407	0.029	73.7	15.8	1.46	0.81	0.58	5.37	2.44	<0.01	0.05	0.19	0.24	<0.01	<0.01	0.69	101.33
SR-17-73	671163	261.62	263	1.886	0.009	0.387	0.007	77	16.05	0.88	0.29	0.39	2.65	2.67	<0.01	<0.01	0.27	0.08	0.01	<0.01	1.5	101.79
SR-17-73	671164	263	265	1.649	0.006	0.415	0.008	77.3	16.45	0.66	0.21	0.11	3.54	2.86	<0.01	<0.01	0.09	0.08	<0.01	<0.01	0.54	101.84
SR-17-73	671165	265	267	1.257	0.006	0.563	0.009	74.2	16.2	0.71	0.22	0.04	3.55	3.63	<0.01	<0.01	0.1	0.11	0.01	<0.01	0.46	99.23
SR-17-73	671166	267	269	1.595	0.004	0.451	0.008	76.9	16.1	0.76	0.2	0.02	3.36	2.99	<0.01	<0.01	0.15	0.1	<0.01	<0.01	0.48	101.06
SR-17-73	671167	269	271	1.615	0.004	0.384	0.010	75.2	15.7	0.78	0.19	0.02	3.53	2.3	<0.01	<0.01	0.2	0.09	<0.01	<0.01	0.58	98.59
SR-17-73	671168	271	273	1.804	0.004	0.400	0.008	76.6	15.75	0.69	0.16	0.03	3.19	2.55	<0.01	<0.01	0.19	0.07	<0.01	<0.01	0.53	99.76
SR-17-73	671169	273	275	1.875	0.004	0.336	0.012	75.6	15.85	0.69	0.18	0.03	3.29	2.35	<0.01	<0.01	0.19	0.07	<0.01	<0.01	0.4	98.65
SR-17-73	671170	275	277	1.600	0.005	0.368	0.012	76.2	16.45	0.68	0.22	0.02	3.82	2.66	<0.01	<0.01	0.21	0.11	<0.01	<0.01	0.44	100.81
SR-17-73	671171	277	279	1.451	0.003	0.267	0.011	75.1	15.4	0.72	0.15	0.02	4.11	1.9	<0.01	<0.01	0.32	0.07	<0.01	<0.01	0.28	98.07
SR-17-73	671172	279	281	0.911	0.005	0.397	0.008	74.9	15.95	0.59	0.36	0.04	4.45	3.33	<0.01	<0.01	0.24	0.06	0.01	<0.01	0.62	100.55
SR-17-73	671173	281	283	1.591	0.004	0.323	0.005	76.3	15.35	0.69	0.24	0.03	3.34	2.53	0.01	<0.01	0.23	0.06	<0.01	<0.01	0.47	99.25
SR-17-73	671174	283	285	1.772	0.003	0.295	0.006	77.3	15.5	0.79	0.16	0.03	2.87	2.72	0.02	<0.01	0.29	0.05	<0.01	<0.01	0.19	99.92
SR-17-73	671176	285	287	1.473	0.005	0.342	0.006	75.6	15.15	0.76	0.15	0.02	3.47	2.81	0.01	<0.01	0.23	0.06	0.01	<0.01	0.34	98.61
SR-17-73	671177	287	289	1.903	0.007	0.352	0.007	75.3	15.5	0.75	0.14	0.04	2.76	2.98	0.01	<0.01	0.17	0.05	<0.01	<0.01	0.39	98.09
SR-17-73	671178	289	290.25	0.633	0.009	0.330	0.006	74.7	15.55	0.81	0.29	0.04	5.26	2.39	<0.01	0.01	0.17	0.05	<0.01	<0.01	0.75	100.02
SR-17-73	671179	290.25	290.73	4.349	0.003	0.106	0.004	76.8	17	0.96	0.09	0.06	0.5	0.63	0.01	0.01	0.08	0.04	<0.01	<0.01	0.31	96.49
SR-17-73	671180	290.73	293	1.479	0.008	0.313	0.008	76.9	15.9	0.78	0.18	0.04	3.82	2.53	<0.01	0.01	0.16	0.08	<0.01	<0.01	0.63	101.03
SR-17-73	671181	293	295	1.770	0.005	0.253	0.012	76.6	15.9	0.74	0.2	0.08	3.5	2.38	<0.01	<0.01	0.16	0.09	<0.01	<0.01	0.51	100.16
SR-17-73	671182	295	297	1.361	0.026	0.399	0.012	73	15.9	2.09	1.41	0.92	3.59	2.83	0.01	0.09	0.16	0.15	<0.01	<0.01	0.98	101.13
SR-17-73	671183	297	299	1.501	0.003	0.281	0.003	76.2	16.15	0.69	0.2	0.04	3.73	3.05	0.01	<0.01	0.26	0.05	<0.01	<0.01	0.3	100.68
SR-17-73	671184	299	301	1.709	0.002	0.236	0.005	76.8	15.45	0.88	0.18	0.02	3.31	2.48	<0.01	<0.01	0.12	0.03	<0.01	<0.01	0.35	99.62
SR-17-73	671185	301	303	1.429	0.002	0.266	0.006	76.7	15.4	0.86	0.17	0.03	3.17	3.21	0.01	<0.01	0.1	0.04	<0.01	<0.01	0.41	100.1
SR-17-73	671186	303	304.49	1.483	0.002	0.234	0.005	75.9	15.25	0.8	0.17	0.02	3.45	2.85	<0.01	<0.01	0.13	0.05	<0.01	<0.01	0.3	98.92
SR-17-73	671187	304.49	307.35	0.258	0.002	0.160	0.006	76.3	14.75	0.61	0.35	0.03	5.87	2.11	<0.01	<0.01	0.17	0.04	<0.01	<0.01	0.28	100.51
SR-17-73	671188	307.35	309.93	0.497	0.003	0.140	0.004	83.2	10.4	1.04	0.32	0.07	3.29	1.21	<0.01	0.01	0.12	0.03	<0.01	<0.01	0.58	100.27
SR-17-73	671189	309.93	312	0.177	0.003	0.125	0.004	82.1	11.3	0.8	0.63	0.03	4.57	1.55	<0.01	0.01	0.07	0.02	<0.01	<0.01	0.76	101.84
SR-17-73	671190	312	314	0.101	0.004	0.331	0.005	75.4	15.25	0.63	0.34	0.02	4.02	5.66	<0.01	<0.01	0.08	0.05	<0.01	<0.01	0.46	101.91
SR-17-73	671191	314	316	0.080	0.003	0.324	0.006	72.9	14.95	0.66	0.32	0.04	3.48	6.69	<0.01	<0.01	0.17	0.04	<0.01	<0.01	0.31	99.56
SR-17-73	671192	316	318	0.101	0.002	0.301	0.003	73.1	15.45	0.61	0.24	0.04	3.33	7.36	<0.01	<0.01	0.19	0.05	<0.01	<0.01	0.24	100.61
SR-17-73	671193	318	320	0.090	0.002	0.261	0.003	73.6	14.2	0.67	0.33	0.03	3.39	6.17	<0.01	<0.01	0.19	0.03	<0.01	<0.01	0.2	98.81
SR-17-73	671194	320	322	0.084	0.001	0.067	0.001	78.4	12.85	0.76	0.85	0.06	5.01	1.7	<0.01	<0.01	0.17	0.01	<0.01	<0.01	0.21	100.02
SR-17-73	671195	322	324	0.153	0.002	0.054	0.002	82.6	10.7	1.03	0.94	0.07	4.26	0.63	<0.01	0.02	0.11	0.01	<0.01	<0.01	0.37	100.74
SR-17-73	671196	324	326	0.146	0.001	0.028	0.001	79.2	12.7	1.08	1.28	0.09	5.46	0.62	<0.01	0.02	0.13	0.02	<0.01	<0.01	0.34	100.94
SR-17-73	671197	326	328	0.196	0.002	0.072	0.002	84.1	9.03	1.4	0.7	0.11	3.42	0.78	<0.01	0.03	0.18	0.01	<0.01	<0.01	0.36	100.12
SR-17-73	671198	328	330	0.299	0.003	0.086	0.002	89.4	5.38	1.49	0.28	0.17	1.37	0.76	<0.01	0.03	0.1	0.01	<0.01	<0.01	0.37	99.36
SR-17-73	671199	330	332	0.252	0.003	0.081	0.002	87.9	6.27	1.39	0.42	0.08	2.07	0.7	<0.01	0.03	0.14	0.03	<0.01	<0.01	0.22	99.25
SR-17-73	671202	332	334.82	0.136	0.001	0.047	0.002	79.3	11.75	1.29	1.03	0.05	5.13	0.58	<0.01	0.01	0.3	0.02	<0.01	<0.01	0.28	99.74
SR-17-73	671203	334.82	336.3	0.280	0.001	0.035	0.002	72.6	16.25	0.79	1.47	0.03	7.16	0.58	<0.01	0.01	0.09	0.02	<0.01	<0.01	0.51	99.51
SR-17-73	671204	336.3	338	0.155	0.002	0.162	0.002	75.2	14.9	0.89	0.91	0.03	5.4	3.19	<0.01	<0.01	0.27	0.03	<0.01	<0.01	0.34	101.16
SR-17-73	671205	338	340	0.112	0.002	0.430	0.004	71.4	15.7	0.74	0.22	0.02	2.57	8.77	<0.01	<0.01	0.17	0.04	<0.01	<0.01	0.31	99.94
SR-17-73	671206	340	342	0.103	0.002	0.310	0.005	72.2	15.3	0.78	0.19	0.01	4.02	6.37	<0.01	0.01	0.18	0.04	<0.01	<0.01	0.18	99.28
SR-17-73	671207	342	344	0.114	0.001	0.148	0.007	73.3	15.4	0.8	0.17	0.01	6.26	2.96	<0.01	0.01	0.13	0.04	<0.01	<0.01	0.25	99.33
SR-17-73	671208	344	346	0.140	0.001	0.185	0.005	72.8	15.55	0.66	0.16	0.01	6.34	3	<0.01	0.01	0.11	0.04	<0.01	<0.01	0.25	98.93
SR-17-73	671209	346	348	0.286	0.013	0.275	0.008	69.3	15.75	2.11	1.81	0.71	5.52	2.86	0.01	0.11	0.18	0.15	0.01	<0.01	0.59	99.11
SR-17-73	671210	348	350	0.095	0.001	0.232	0.004	73.4	15.5	0.52	0.17	0.02	6.47	3	<0.01	<0.01	0.2	0.06	<0.01	<0.01	0.3	99.64
SR-17-73	671211	350	351.4	0.112	0.001	0.300	0.006	72.9	15.45	0.52	0.12	0.02	6.25	3.01	<0.01	<0.01	0.31	0.05	<0.01	<0.01	0.32	98.95
SR-17-73	671212	351.4	353.7	0.172	0.003	0.335	0.009	73.5	15.75	0.5	0.15	0.02	6.5	2.67	<0.01	<0.01	0.23	0.06	<0.01	<0.01	0.45	99.83
SR-17-73	671213	353.7	354.59	0.364	0.017	0.577	0.007	65.6	15.75	4.26	1.71	2.03	4.3	3.55	0.02	0.26	0.22	0.08	0.01	<0.01	1.34	99.13
SR-17-73	671214	354.59	355.85	1.003	0.003	0.201	0.012	73.4	15.9	1.28	0.76	0.28	5.17	1.64	0.01	0.03	0.3	0.07	<0.01	<0.01	0.33	99.17
SR-17-73	671215	355.85	357	0.314	0.036	0.440	0.011	62.9	17.05	5.15	4.42	2.26	3.87	1.76	0.02	0.32	0.18	0.27	0.01	<0.01	1.33	99.54
SR-17-73	671216	357	359.12	0.131	0.015	0.099	0.004	58	15.3	10.15	9.25	4.65	2.11	0.72	0.03	0.62	0.24	0.08	0.01	<0.01	0.7	101.86
SR-17-74	671217	30.2	31	0.045	0.008	0.089	0.005	72.8	17.25	0.73	0.47	0.23	8.82	0.62	<0.01	0.02	0.05	0.07	<0.01	<0.01	0.3	101.36
SR-17-74	671218	31	33	0.228	0.012	0.236	0.006	74.6	16.25	0.72	0.56	0.2	6.74	1.26	<0.01	0.02	0.1	0.12	<0.01	<0.01	0.83	101.4
SR-17-74	671219	33	35	2.121	0.023	0.241	0.011	74	16.8	1.2	1.18	0.44	3.14	1.07	<0.01	0.05	0.14	0.26	<0.01	<0.01	0.98	99.26
SR-17-74	671220	35	37	2.411	0.006	0.261	0.001	76.6	16.75	0.68	0.33	0.12	2.92	1.28	<0.01	<0.01	0.21	0.2	<0.01	<0.01	1.03	100.12
SR-17-74	671221	37	38.9	0.291	0.015	0.218	0.006	72.1	17.3	1.05	1.11	0.36	7.06	1.04	<0.01	0.04	0.16	0.14	<0.01	<0.01	0.78	101.14
SR-17-74	671222	122.85	125	0.400	0.005	0.408	0.004	75.6	15.55	0.62	0.31	0.04	5.4	2.78	<0.01	0.01	0.15	0.1	0.01	<0.01	0.69	101.26
SR-17-74	671223	125	127	0.220	0.006	0.396	0.002	73.6	15.6	0.75	0.17	0.04	5.62	3.25	<0.01	<0.01	0.12	0.09	<0.01	<0.01	0.63	99.87
SR-17-74	671224	127	129	0.443	0.012	0.546	0.010	75.8	14.35	0.91	0.2	0.01	4.39	3.37	<0.01	0.01	0.1	0.14	0.01	<0.01	0.81	100.1
SR-17-74	671226	129	130	1.020	0.015	0.760	0.011	75.7	15.15	1.07	0.16	0.02	3.22	3.67	<0.01	0.01	0.18	0.09	0.01	<0.01	1.42	100.7
SR-17-74	671227	130	132	1.404	0.015	0.585	0.011	73.7	16.7	0.6	0.29	0.1	4.42	2.31	<0.01	0.01	0.13	0.15	0.01	<0.01	1.43	99.85
SR-17-74	671228	132	134	1.757	0.022	0.848	0.019	73.7	16.8	0.38	0.16	0.02	3.81	2.58	0.01	<0.01	0.12	0.17	0.01	<0.01	1.04	98.8
SR-17-74	671229	134	135.2	1.576	0.021	1.050	0.031	71.8	17.95	0.4	0.15	0.01	4.07	2.91	<0.01	<0.01	0.15	0.18	0.01	<0.01	1.07	98.7
SR-17-74	671230	142.5	143.1	1.109	0.034	0.283	0.010	78	14.95	1.59	0.65	0.47	4.34	1.02	<0.01	0.03	0.04	0.13	0.01	<0.01	0.7	101.93
SR-17-74	671231	143.1	145	1.696	0.018	0.771	0.013	72.6	16.95	0.54	0.15	0.02	3.78	2.43	<0.01	<0.01	0.13	0.11	0.01	<0.01	1.31	98.03
SR-17-74	671232	145	147	1.763	0.034	0.935	0.020	71.5	16.8	0.93	0.54	0.4	3.79	2.63	<0.01	0.05	0.12	0.18	0.01	<0.01	1.1	98.05
SR-17-74	671233	147	148.25	1.419	0.018	0.678	0.018	72.7	17.4	0.8	0.29	0.02	4.38	2.07	<0.01	<0.01	0.1	0.16	0.01	<0.01	1.26	99.19
SR-17-74	671234	152	153.3	1.393	0.030	0.619	0.011	72.3	16.85	1.28	0.81	0.38	4.24	1.64	<0.01	0.03	0.07	0.14	0.01	<0.01	1.2	98.95
SR-17-74	671235	158.2	159.05	1.008	0.007	0.638	0.008	73	17.3	0.4	0.3	0.01	5.22	2.33	<0.01	<0.01	0.3	0.1	0.01	<0.01	1.19	100.16
SR-17-74	671236	159.05	159.65	1.894	0.010	0.166	0.006	72.4	16.95	1.86	1.12	0.61	4.14	0.77	0.01	0.09	0.23	0.09	0.01	<0.01	0.54	98.82
SR-17-74	671237	160.48	161.35	1.739	0.006	0.230	0.004	74.4	16	1.41	0.71	0.31	3.66	1.51	0.01	0.05	0.06	0.05	0.01	<0.01	0.37	98.55
SR-17-74	671238	162.1	162.5	1.333	0.006	0.140	0.008	74.5	17.4	0.74	0.87	0.17	5.5	0.61	<0.01	0.02	0.04	0.06	<0.01	<0.01	0.47	100.38
SR-17-74	671239	163.2	163.65	1.005	0.009	0.088	0.003	73.4	17.6	1.21	1.19	0.42	6.8	0.47	<0.01	0.05	0.07	0.11	0.01	<0.01	0.48	101.81
SR-17-74	671241	164.5	165.8	2.011	0.006	0.197	0.005	75.6	16.6	1.3	0.36	0.09	3.29	1.42	0.01	0.01	0.11	0.07	<0.01	<0.01	0.44	99.3
SR-17-74	671242	210.15	211.25	1.163	0.006	0.156	0.007	74.7	16.45	0.83	0.74	0.13	5.82	1.01	<0.01	0.02	0.05	0.06	<0.01	<0.01	0.26	100.07
SR-17-74	671243	212.1	212.8	0.915	0.017	0.132	0.007	72.8	16.85	1.21	1.08	0.41	6.52	0.56	0.01	0.05	0.19	0.09	<0.01	<0.01	0.37	100.14

		ppm →																																						
Hole ID	Sample ID	Ba	Ce	Cr	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd	Pr	Sm	Sn	Sr	Tb	Th	Tm	U	V	W	Y	Yb	Zr	F	Ag	As	Cd	Co	Cu	Mo	Ni	Pb	Sc	Tl	Zn
SR-17-73	671159	3.2	1.8	50	0.69	0.36	0.15	52.8	0.53	3.7	0.13	0.7	0.06	40.1	1.1	0.24	0.5	649	25.3	0.11	3.43	0.05	7.1	47	5	3.5	0.45	34	6230	<0.5	26	<0.5	10	35	<1	25	4	6	20	27
SR-17-73	671161	3.4	1.1	20	0.39	0.13	0.04	49	0.41	4	0.05	0.5	0.03	43	0.6	0.15	0.45	931	20	0.09	2.43	0.02	7.92	6	3	2	0.22	33	460	<0.5	<5	<0.5	<1	3	<1	2	3	1	10	20
SR-17-73	671162	13.4	4.3	40	2.01	0.5	0.03	55.2	2.1	3.1	0.16	1.6	0.11	185.5	1.9	0.56	2.01	2740	10.1	0.49	9.09	0.1	13.45	17	5	12.3	0.65	28	2590	<0.5	5	<0.5	2	8	<1	10	8	2	30	93
SR-17-73	671163	5.6	0.8	20	0.87	0.21	0.03	38.9	0.44	2	0.04	<0.5	0.06	55	0.3	0.11	0.23	948	41.6	0.13	2.64	0.05	6.72	<5	3	5.5	0.45	22	1570	<0.5	<5	<0.5	<1	1	<1	<1	2	<1	30	77
SR-17-73	671164	3.1	0.9	20	0.37	0.09	<0.03	45.6	0.44	1.9	0.01	<0.5	0.03	59.2	0.4	0.11	0.38	816	10.1	0.06	3.62	0.01	5.85	<5	3	2.2	0.14	19	1240	<0.5	<5	<0.5	<1	<1	<1	<1	4	<1	30	86
SR-17-73	671165	<0.5	1	30	0.6	0.1	<0.03	43.5	0.59	0.4	0.02	<0.5	0.02	80.2	0.5	0.13	0.55	877	4.2	0.12	2.37	0.01	4.06	<5	4	3	0.16	4	1710	<0.5	<5	<0.5	<1	<1	<1	<1	6	<1	30	98
SR-17-73	671166	<0.5	1.1	20	0.58	0.1	<0.03	42.4	0.48	1	0.01	<0.5	0.03	58.2	0.4	0.14	0.37	663	2.5	0.11	2.25	0.02	3.23	<5	4	2.9	0.2	9	1580	<0.5	<5	<0.5	<1	<1	<1	1	2	<1	30	88
SR-17-73	671167	<0.5	0.8	40	0.64	0.13	<0.03	44.2	0.53	0.7	0.02	<0.5	0.04	84.8	0.4	0.11	0.43	649	2.1	0.12	2.9	0.03	7.38	<5	4	3.6	0.28	7	1840	<0.5	6	<0.5	<1	<1	1	1	3	<1	20	120
SR-17-73	671168	<0.5	0.5	30	0.36	0.08	<0.03	42.6	0.27	0.9	0.01	<0.5	0.03	67.8	0.2	0.05	0.21	568	4.2	0.03	2.77	0.01	5.99	<5	4	2	0.17	10	1290	<0.5	5	<0.5	<1	<1	<1	<1	2	<1	20	102
SR-17-73	671169	<0.5	0.7	50	0.43	0.08	<0.03	42.5	0.36	2	<0.01	<0.5	0.03	67.5	0.3	0.1	0.35	506	2.4	0.05	2.08	0.02	5.9	<5	3	2.2	0.15	18	1260	<0.5	<5	<0.5	<1	1	1	1	5	<1	20	100
SR-17-73	671170	<0.5	1	40	0.69	0.18	<0.03	42.7	0.74	1	0.03	<0.5	0.05	85.5	0.4	0.13	0.53	560	2.1	0.14	2.73	0.04	4.62	<5	4	4.1	0.35	14	1620	<0.5	<5	0.5	<1	1	1	1	5	<1	20	123
SR-17-73	671171	<0.5	0.8	40	0.62	0.12	<0.03	47.3	0.54	1.5	0.03	<0.5	0.03	77.3	0.4	0.11	0.34	558	2	0.1	2.93	0.04	6.74	<5	3	3.3	0.24	15	1340	<0.5	<5	<0.5	<1	<1	1	1	6	<1	10	130
SR-17-73	671172	1	1	20	0.47	0.15	<0.03	50.3	0.32	1.5	0.03	<0.5	0.03	62.5	0.5	0.15	0.33	523	4.1	0.07	2.07	0.03	7.11	<5	2	2.8	0.28	18	1290	<0.5	<5	<0.5	<1	<1	1	<1	4	<1	30	91
SR-17-73	671173	<0.5	1.2	30	0.76	0.18	<0.03	46.7	0.51	1.1	0.04	0.5	0.04	45.7	0.5	0.13	0.37	425	2.5	0.11	2.46	0.03	6.28	<5	3	4	0.3	13	1660	<0.5	<5	<0.5	<1	1	1	1	2	<1	20	108
SR-17-73	671174	<0.5	1.4	30	1.04	0.3	<0.03	42.3	0.51	0.6	0.08	0.5	0.07	73	0.5	0.17	0.33	423	1.1	0.15	1.99	0.05	4.25	<5	2	6	0.6	6	1310	<0.5	<5	<0.5	<1	1	<1	<1	5	<1	20	122
SR-17-73	671176	<0.5	1.8	30	0.98	0.48	<0.03	44	0.63	1.3	0.12	0.7	0.14	67.9	0.7	0.23	0.45	360	1.4	0.14	3.15	0.1	5.56	<5	3	6.9	1.04	14	1930	<0.5	5	<0.5	<1	3	1	3	8	1	20	105
SR-17-73	671177	0.6	2.3	40	0.85	0.47	<0.03	39.1	0.66	0.5	0.1	0.8	0.15	75.8	1	0.3	0.61	243	1.8	0.12	2.6	0.11	5.81	<5	3	5.9	1.03	5	2190	<0.5	7	<0.5	<1	1	1	1	7	1	20	89
SR-17-73	671178	<0.5	7.3	30	2.16	1.26	<0.03	45.8	1.57	0.7	0.31	2.8	0.41	95.1	3.1	0.93	1.44	131	2.1	0.34	4.34	0.27	6.01	<5	5	14.8	2.51	9	3770	<0.5	5	<0.5	<1	1	<1	<1	7	3	20	96
SR-17-73	671179	<0.5	2	40	1.67	0.76	<0.03	25.7	1.31	0.3	0.21	0.6	0.18	22.9	1.1	0.26	0.8	100	1.8	0.26	1.4	0.16	2.49	<5	3	11.1	1.32	3	1590	<0.5	<5	<0.5	<1	1	1	<1	<2	1	10	45
SR-17-73	671180	1.1	2.7	20	1.31	0.62	<0.03	40.9	0.8	1.6	0.13	1	0.17	77.5	1.1	0.33	0.77	395	2.5	0.19	3.33	0.13	5.17	<5	4	8.6	1.22	15	3330	<0.5	<5	<0.5	<1	1	<1	1	6	2	20	124
SR-17-73	671181	3.4	1.8	40	1.09	0.5	<0.03	41.4	0.72	1.9	0.11	0.7	0.14	85	0.9	0.22	0.53	467	6.6	0.18	3.54	0.1	8.66	<5	3	7.2	1.03	19	1570	<0.5	<5	<0.5	<1	<1	1	1	4	<1	10	86
SR-17-73	671182	4.9	3	60	0.81	0.32	0.05	42.8	0.78	3.8	0.07	1.2	0.08	58.3	1.6	0.39	0.88	325	11.6	0.13	2.67	0.06	8.54	37	3	5.1	0.58	37	8830	<0.5	6	<0.5	4	18	<1	16	3	5	20	105
SR-17-73	671183	1.2	1.6	30	1.07	0.64	<0.03	42	0.55	4.5	0.12	0.7	0.29	36.8	0.6	0.19	0.35	298	2.3	0.13	1.9	0.17	9.48	<5	2	7.5	1.7	43	940	<0.5	<5	<0.5	<1	1	<1	<1	7	1	20	70
SR-17-73	671184	0.7	3.7	30	1.37	0.41	<0.03	37.6	1.73	1.1	0.1	1.2	0.11	84.3	2	0.5	1.65	275	3.7	0.3	4.11	0.08	5.68	<5	3	7.4	0.82	12	1120	<0.5	<5	<0.5	<1	1	1	<1	6	1	10	93
SR-17-73	671185	0.7	1.5	30	0.78	0.19	<0.03	38	0.78	0.7	0.05	0.5	0.04	90.3	0.7	0.2	0.67	370	4.4	0.14	2.83	0.04	4.69	<5	4	4.2	0.29	10	1220	<0.5	<5	<0.5	<1	<1	1	<1	6	<1	20	116
SR-17-73	671186	0.5	1.9	40	1	0.3	<0.03	37.6	0.73	0.5	0.08	0.7	0.07	90.4	0.9	0.24	0.59	192	3.2	0.18	3.17	0.05	4.53	<5	2	6	0.52	5	940	<0.5	<5	<0.5	<1	<1	1	<1	6	<1	10	89
SR-17-73	671187	1	5.2	20	1.48	0.69	<0.03	34.8	1.11	0.4	0.17	1.9	0.24	95	2.2	0.64	1.17	257	2	0.24	4.52	0.17	5.54	<5	3	9.7	1.55	5	970	<0.5	<5	0.5	<1	<1	<1	<1	7	2	10	113
SR-17-73	671188	1.1	11.6	30	1.53	0.69	<0.03	30.8	1.35	1.3	0.19	5.2	0.28	76.4	3.7	1.26	1.62	187	2.3	0.29	6.22	0.17	4.29	<5	4	9.5	1.59	18	2630	<0.5	<5	<0.5	<1	1	<1	<1	3	6	10	126
SR-17-73	671189	3.6	3.6	20	1.47	0.78	<0.03	29.4	0.81	2.3	0.17	1.5	0.36	74.9	1.5	0.41	0.61	134	6	0.23	3.36	0.21	7.72	<5	2	9.2	2.12	31	1540	<0.5	<5	<0.5	<1	1	1	<1	3	4	10	51
SR-17-73	671190	2.6	1.8	20	0.94	0.34	<0.03	36.4	0.6	0.7	0.07	0.8	0.11	80.4	0.7	0.22	0.41	411	4.9	0.13	2.98	0.08	3.29	<5	3	5.1	0.64	8	990	<0.5	<5	<0.5	<1	1	<1	<1	6	2	20	76
SR-17-73	671191	2.9	1.2	20	1.04	0.31	<0.03	38	0.63	1.3	0.1	0.6	0.09	75.5	0.5	0.14	0.31	455	3.1	0.16	1.95	0.08	3.7	<5	2	6.2	0.7	14	500	<0.5	<5	<0.5	1	2	<1	1	6	1	20	62
SR-17-73	671192	3.4	1.8	20	0.98	0.39	<0.03	38.1	0.52	2.5	0.11	0.9	0.13	55.7	0.7	0.18	0.28	398	2.9	0.12	1.54	0.1	4.96	<5	2	6.1	0.98	27	390	<0.5	<5	<0.5	<1	1	1	1	12	1	20	39
SR-17-73	671193	7.1	1.9	20	1.13	0.61	<0.03	28.9	0.61	2	0.13	1	0.29	61.9	0.6	0.2	0.3	38	5.2	0.18	2.01	0.16	4.34	<5	2	7	1.63	24	400	<0.5	<5	<0.5	<1	1	1	<1	22	2	10	29
SR-17-73	671194	5.9	2.9	20	1.53	1.32	0.06	26.6	0.7	2	0.26	1.4	0.75	41.1	1.1	0.29	0.44	24	9.6	0.2	3.39	0.34	7.73	<5	2	10.5	4	29	250	<0.5	<5	<0.5	<1	3	<1	1	17	2	10	17
SR-17-73	671195	1.5	3.6	30	1.09	0.88	0.05	24.2	0.51	1.3	0.17	1.8	0.47	41.4	1.1	0.37	0.43	41	8.7	0.15	1.65	0.24	5.32	<5	2	7.8	2.59	20	1280	<0.5	<5	<0.5	<1	1	1	<1	10	4	10	30
SR-17-73	671196	1.2	1.9	20	0.68	0.56	<0.03	16.6	0.31	1.5	0.12	1	0.33	26.4	0.6	0.18	0.25	20	6.3	0.1	1.29	0.14	4.86	<5	1	4.6	1.74	25	1170	<0.5	<5	<0.5	<1	1	1	<1	12	3	<10	22
SR-17-73	671197	2.6	2	40	1.38	1.18	0.03	22.5	0.57	2.2	0.26	0.9	0.8	51.1	0.7	0.2	0.41	51	6.7	0.21	2.36	0.35	9.2	<5	3	9.6	3.94	40	1690	<0.5	<5	<0.5	<1	1	1	<1	12	5	10	33
SR-17-73	671198	1.1	1.1	30	0.78	0.47	<0.03	16.1	0.37	1	0.11	0.5	0.29	47.5	0.5	0.12	0.24	61	3.4	0.11	1.34	0.15	1.87	<5	3	4.5	1.59	18	2130	<0.5	<5	<0.5	<1	1	1	<1	4	4	10	38
SR-17-73	671199	1.5	1.3	30	1.25	1.12	<0.03	17.9	0.53	1.3	0.25	0.6	0.84	50.9	0.4	0.13	0.36	60	4.3	0.19	2.48	0.35	8.29	<5	2	8.7	4.13	22	2030	<0.5	<5	<0.5	<1	1	1	1	5	6	10	36
SR-17-73	671202	2.2	3	30	2.28	2.61	<0.03	26.3	0.85	2.6	0.5	1.4	2.07	30.9	0.9	0.29	0.44	36	8.1	0.32	2.18	0.87	7.96	<5	2	17.3	10.2	48	1070	<0.5	<5	<0.5	<1	1	1	<1	11	6	10	21
SR-17-73	671203	1.9	5.5	20	1.06	1.09	<0.03	35.3	0.47	0.8	0.22	2.8	0.7	23.1	1.6	0.53	0.57	23	9.7	0.14	1.96	0.32	6.3	<5	4	7.7	3.62	14	890	<0.5	5	<0.5	<1	1	<1	<1	10	2	<10	19
SR-17-73	671204	5.2	2.6	40	2	0.94	<0.03	32	1.1	1.4	0.27	1.4	0.37	61.3	0.9	0.28	0.53	29	7.2	0.35	4.14	0.23	12	<5	2	10.7	2.39	18	660	<0.5	<5	<0.5	<1	1	1	<1	17	2	10	29
SR-17-73	671205	4	1.2	10	1.43	0.52	<0.03	28.3	0.84	1.1	0.19	0.6	0.16	81.3	0.4	0.1	0.37	72	3.2	0.27	2.8	0.12	7.68	<5	2	7.8	1.06	13	640	<0.5	<5	<0.5	<1	<1	1	<1	18	1	30	54
SR-17-73	671206	1	1	10	1.02	0.2	<0.03	40.3	0.66	1.8	0.1	<0.5	0.05	82.7	0.4	0.12	0.36	384	1.5	0.21	3.53	0.04	6.59	<5	2	5	0.41	19	640	<0.5	<5	<0.5	<1	1	<1	<1	10	<1	20	84
SR-17-73	671207	<0.5	1.7	10	0.78	0.18	<0.03	43.3	0.72	1.9	0.07	0.5	0.03	102.5	0.8	0.21	0.66	406	1.1	0.18	4.1	0.02	8.94	<5	3	4	0.26	21	820	<0.5	<5	<0.5	<1	1	<1	<1	5	<1	10	95
SR-17-73	671208	0.6	1.5	10	0.64	0.12	<0.03	35.7	0.82	0.9	0.05	<0.5	0.02	60.4	0.9	0.22	0.79	249	1	0.14	2.48	0.02	4.74	<5	2	2.8	0.19	9	1010	<0.5	<5	<0.5	<1	1	1	<1	<2	<1	10	97
SR-17-73	671209	8.7	1.4	50	0.69	0.38	0.09	48.7	0.65	2	0.12	0.5	0.05	36.9	0.9	0.18	0.45	307	12.3	0.13	1.78	0.06	4.36	37	5	3.9	0.41	23	5900	<0.5	5	<0.5	7	28	1	23	2	5	20	49
SR-17-73	671210	1.1	<0.5	10	0.17	0.04	<0.03	45.6	0.14	1.3	0.01	<0.5	<0.01	31.6	0.2	0.04	0.12	328	1.9	0.03	1.19	0.01	3.33	<5	1	1.1	0.07	12	1040	<0.5	<5	<0.5	<1	<1	<1	<1	<2	<1	20	48
SR-17-73	671211	1.1	<0.5	10	0.32	0.11	<0.03	52	0.12	1	0.03	<0.5	0.02	27.9	<0.1	<0.03	0.03	348	1.2	0.06	1.1	0.02	4.08	<5	1	2	0.19	10	1330	<0.5	<5	<0.5	<1	1	<1	<1	4	<1	20	49
SR-17-73	671212	0.8	<0.5	20	0.19	0.05	<0.03	56	0.11	1.7	0.02	<0.5	0.01	52.4	0.1	<0.03	0.07	520	1.4	0.03	1.55	0.01	4.36	<5	2	1.2	0.13	15	2000	<0.5	<5	<0.5	<1	4	<1	1	5	<1	20	78
SR-17-73	671213	13.8	2	110	1.01	0.61	0.14	51	0.83	1.8	0.2	0.8	0.1	32.8	1.2	0.25	0.53	346	17.4	0.15	3.3	0.09	4.04	86	3	5.9	0.71	28	6400	<0.5	9	<0.5	17	71	<1	55	5	12	30	79
SR-17-73	671214	7	0.5	30	0.54	0.17	0.03	49.5	0.36	2	0.07	<0.5	0.03	42.8	0.3	0.06	0.18	446	10.3	0.09	3.29	0.02	5.45	10	3	2.9	0.28	20	900	<0.5	<5	0.5	2	4	<1	6	6	1	10	60
SR-17-73	671215	17.9	2.6	130	1.28	0.69	0.23	44.2	1.02	1.6	0.25	1	0.11	34.2	1.9	0.38	0.88	290	48.2	0.19	2.67	0.11	3.07	106	3	7.1	0.72	27	5070	<0.5	14	0.5	21	87	<1	68	12	14	30	58
SR-17-73	671216	24.6	5.4	260	2.56	1.61	0.5	22	2.3	1.3	0.54	1.8	0.24	25.3	4.1	0.79	1.63	23	85.8	0.42	1.19	0.25	1.33	236	1	14.4	1.6	38	2460	<0.5	8	0.6	41	88	<1	132	14	32	<10	84
SR-17-74	671217	8.3	<0.5	20	0.07	0.05	<0.03	59.9	0.1	2	0.01	<0.5	<0.01	11.4	0.2	0.05	0.07	178	8.3	0.01	2.85	<0.01	4.73	8	2	0.6	0.05	17	740	<0.5	5	<0.5	2	7	<1	4	2	1	<10	20
SR-17-74	671218	8.1	0.5	30	0.11	0.04	<0.03	48	0.1	2	0.01	<0.5	<0.01	9.6	0.2	0.04	0.11	537	15.1	0.02	1.19	0.01	4.42	6	2	0.8	0.08	15	2060	<0.5	10	<0.5	1	12	<1	3	3	1	20	25
SR-17-74	671219	6.7	0.9	30	0.32	0.13	0.05	39.6	0.28	1.3	0.04	0.5	0.02	19.1	0.4	0.1	0.26	87	22.5	0.06	4.56	0.02	9.32	15	5	2	0.2	11	7320	<0.5	18	<0.5	2	24	<1	7	<2	2	20	33
SR-17-74	671220	1.7	1.6	30	0.28	0.08	<0.03	38.4	0.24	1.5	0.03	0.9	0.02	5.9	0.3	0.14	0.29	55	6.2	0.07	1.95	0.02	2.19	<5	3	2.8	0.23	11	7570	<0.5	<5	0.5	<1	1	<1	<1	4	<1	10	29
SR-17-74	671221	5.8	1	30	0.42	0.14	0.04	64.6	0.34	2.4	0.05	<0.5	0.01	23.9	0.5	0.1	0.33	237	15.9	0.08	3.32	0.02	6.91	10	3	2.2	0.17	20	2990	<0.5	13	<0.5	1	5	<1	6	7	2	20	57
SR-17-74	671222	0.6	0.7	20	0.24	0.05	<0.03	44.8	0.25	1.4	0.02	<0.5	<0.01	20.8	0.3	0.09	0.27	143	4.7	0.05	3.55	<0.01	6.93	<5	3	1.3	0.08	11	2670	<0.5	9	<0.5	<1	2	<1	1	3	<1	20	45
SR-17-74	671223	<0.5	1.6	20	0.74	0.22	<0.03	44.6	0.6	1	0.08	0.5	0.04	29	0.8	0.21	0.6	89	1.4	0.15	3.5	0.04	2.35	<5	5	4.2	0.3	12	2260	<0.5	<5	<0.5	<1	3	<1	<1	8	1	30	55
SR-17-74	671224	<0.5	7.3	20	2.56	0.61	<0.03	50.1	2.86	1.1	0.26	2.3	0.09	78.4	3.5	0.94	2.76	147	1.5	0.58	9.62	0.11	2.94	<5	10	12.8	0.71	11	5570	<0.5	<5	<0.5	<1	1	<1	1	7	1	40	67
SR-17-74	671226	<0.5	18	20	4.33	0.93	<0.03	57.8	5.49	0.7	0.47	5.5	0.13	113.5	8.7	2.39	6.47	156	1.5	1.05	22.3	0.15	3.66	<5	13	20.9	1.12	8	12350	<0.5	<5	<0.5	<1	1	<1	1	4	2	40	99
SR-17-74	671227	2.3	1.2	20	0.23	0.06	<0.03	49.1	0.22	1.3	0.02	0.5	0.01	26	0.6	0.12	0.27	119	10.6	0.05	4.77	0.01	4.72	<5	6	1.6	0.15	10	12400	<0.5	<5	0.5	<1	1	<1	1	4	<1	40	13
SR-17-74	671228	<0.5	<0.5	20	0.15	0.04	<0.03	56.9	0.12	1.7	0.01	<0.5	0.01	34.9	0.1	0.03	0.08	228	2.9	0.03	5.09	<0.01	5.47	<5	7	1.1	0.12	13	18200	<0.5	<5	<0.5	<1	1	<1	1	6	<1	50	5
SR-17-74	671229	<0.5	<0.5	10	0.16	0.04	<0.03	69.4	0.14	4.1	0.01	<0.5	0.02	54.8	0.1	<0.03	0.1	523	4.8	0.03	6.99	0.01	7.93	<5	9	1.4	0.2	30	>20000	<0.5	<5	0.5	<1	1	<1	1	7	<1	60	8
SR-17-74	671230	27.1	0.5	40	0.25	0.08	0.04	36.3	0.2	1.1	0.03	<0.5	<0.01	18.1	0.3	0.06	0.14	61	7	0.04	2.26	<0.01	4.14	24	2	1.4	0.11	10	6280	<0.5	8	<0.5	1	1	1	5	6	1	20	12
SR-17-74	671231	<0.5	<0.5	30	0.09	<0.03	<0.03	50.6	0.06	1.6	<0.01	<0.5	<0.01	29	0.1	<0.03	0.05	127	1.9	<0.01	4.33	<0.01	7.34	<5	7	0.8	0.07	12	16150	<0.5	<5	<0.5	<1	1	<1	1	6	<1	50	22
SR-17-74	671232	0.7	0.5	30	0.3	0.14	<0.03	53.7	0.2	3	0.04	<0.5	0.01	33.5	0.4	0.05	0.12	293	7.6	0.02	4.98	0.01	6.29	18	9	2.2	0.22	24	>20000	<0.5	<5	0.5	1	1	<1	6	7	2	60	9
SR-17-74	671233	<0.5	<0.5	20	0.1	<0.03	<0.03	55.5	0.06	2.9	<0.01	<0.5	<0.01	32.1	0.1	<0.03	0.07	203	5.3	<0.01	3.77	<0.01	6.27	<5	6	1	0.08	19	12250	<0.5	<5	<0.5	<1	2	<1	1	4	<1	40	5
SR-17-74	671234	14.5	0.5	30	0.14	0.09	<0.03	48.8	0.13	2.5	<0.01	<0.5	<0.01	21.2	0.3	0.05	0.14	116	10.1	<0.01	2.97	<0.01	5.66	10	6	1.3	0.09	19	11050	<0.5	28	<0.5	2	17	<1	6	5	1	40	7
SR-17-74	671235	0.5	<0.5	10	0.14	0.03	<0.03	59.1	0.06	1.9	<0.01	<0.5	<0.01	27.7	0.2	<0.03	0.06	660	4.8	<0.01	7.8	<0.01	8.28	<5	7	1.5	0.16	14	15000	<0.5	<5	<0.5	<1	1	<1	1	4	<1	30	18
SR-17-74	671236	33.8	3	50	0.49	0.25	0.03	38.7	0.45	1	0.07	1.4	0.01	14.1	1.7	0.37	0.4	212	39.3	0.06	4.28	0.01	4.06	27	5	3.1	0.3	14	2860	<0.5	<5	<0.5	5	27	<1	13	6	3	10	29
SR-17-74	671237	21	1.1	60	0.1	0.06	<0.03	36.7	0.1	0.4	0.01	<0.5	<0.01	7.9	0.5	0.1	0.06	125	30.9	<0.01	1.3	<0.01	1.57	16	2	0.8	0.05	5	580	<0.5	8	<0.5	3	17	<1	11	4	2	10	22
SR-17-74	671238	5.1	<0.5	30	<0.05	0.04	<0.03	45.1	0.09	4.8	<0.01	<0.5	<0.01	14.3	0.2	<0.03	0.05	198	39.1	<0.01	1.59	<0.01	8.78	7	1	0.6	0.06	37	640	<0.5	<5	<0.5	1	4	<1	3	5	1	10	14
SR-17-74	671239	12.4	3.9	40	0.27	0.14	0.08	46.7	0.35	5.6	0.02	1.9	<0.01	10.9	2	0.42	0.34	141	64.4	0.02	3.16	<0.01	10.8	13	2	1.7	0.18	49	1330	<0.5	7	<0.5	3	36	1	7	10	1	10	21
SR-17-74	671241	1.9	1.3	50	0.24	0.04	<0.03	42.8	0.37	1.8	0.01	<0.5	<0.01	35.5	0.6	0.14	0.4	1015	5.6	0.04	2.03	<0.01	4.16	<5	4	1.8	0.08	14	1020	<0.5	<5	<0.5	1	2	<1	2	2	1	10	59
SR-17-74	671242	4.3	0.6	40	0.1	0.03	<0.03	50.2	0.13	3.1	<0.01	<0.5	<0.01	18.7	0.3	0.05	0.09	349	18.1	<0.01	1.85	<0.01	4.92	6	1	0.8	0.07	26	390	<0.5	6	<0.5	<1	6	<1	4	5	1	10	9
SR-17-74	671243	9	0.8	40	0.39	0.18	<0.03	50.5	0.32	1.9	0.04	<0.5	<0.01	19.4	0.5	0.08	0.27	458	23.8	0.04	1.97	<0.01	4.63	17	3	2.7	0.25	16	830	<0.5	<5	<0.5	3	8	<1	7	6	2	10	18

				wt. % →																			ppm →																																							
Hole ID	Sample ID	From [m]	To [m]	Li_2O	Cs_2O	Rb_2O	Ta_2O_5	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Na_2O	K_2O	Cr_2O_3	TiO_2	MnO	P_2O_5	SrO	BaO	LOI	Total	Ba	Ce	Cr	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd	Pr	Sm	Sn	Sr	Tb	Th	Tm	U	V	W	Y	Yb	Zr	F	Ag	As	Cd	Co	Cu	Mo	Ni	Pb	Sc	Tl	Zn
SR-17-74	671244	217.9	218.4	1.619	0.008	0.063	0.003	73.6	17.35	0.71	0.91	0.09	5.66	0.25	<0.01	0.01	0.13	0.06	<0.01	<0.01	0.19	98.96	5.1	<0.5	40	0.17	0.05	<0.03	48.3	0.12	2.9	<0.01	<0.5	<0.01	9.1	0.2	<0.03	0.1	156	18.4	0.01	2.53	<0.01	8.87	<5	1	1.2	0.1	26	310	<0.5	6	0.6	<1	5	<1	3	10	<1	<10	13
SR-17-74	671245	262.15	264	1.780	0.006	0.254	0.007	76.3	15.9	0.63	0.16	0.02	3.58	1.92	<0.01	<0.01	0.23	0.07	<0.01	<0.01	0.24	99.05	<0.5	0.8	20	0.55	0.08	<0.03	40.2	0.55	0.8	0.02	<0.5	<0.01	44.9	0.4	0.09	0.43	460	3	0.1	2.39	<0.01	6.12	<5	2	2.9	0.11	7	860	<0.5	<5	<0.5	<1	1	<1	1	3	<1	20	74
SR-17-74	671246	264	265.2	1.414	0.005	0.272	0.008	75.3	15.9	0.57	0.22	0.03	4.13	2.2	<0.01	<0.01	0.23	0.08	<0.01	<0.01	0.24	98.9	<0.5	1	20	0.47	0.07	<0.03	38.5	0.45	1.5	0.03	<0.5	<0.01	49	0.5	0.09	0.35	402	3.6	0.08	2.37	<0.01	5.99	<5	2	2.8	0.2	13	560	<0.5	<5	<0.5	<1	<1	<1	1	5	<1	20	65
SR-17-74	671247	273.6	273.95	2.112	0.013	0.019	0.024	74	17.35	0.75	1.42	0.21	4.46	0.12	<0.01	0.01	0.02	0.28	<0.01	<0.01	0.48	99.1	4.5	0.5	30	0.23	0.12	<0.03	41.5	0.27	5.7	0.02	<0.5	<0.01	79.4	0.4	0.04	0.13	313	24.5	0.01	1.8	<0.01	6.1	5	2	1.7	0.1	39	520	<0.5	9	0.8	<1	2	<1	3	5	1	<10	25
SR-17-74	671248	278.9	279.6	0.758	0.036	0.274	0.005	70.5	17.05	1.57	1.88	0.73	5.32	2.16	0.01	0.07	0.06	0.25	0.01	<0.01	0.55	100.16	4	1.1	50	0.9	0.26	0.05	40.1	0.93	4.8	0.11	<0.5	0.01	13.3	0.8	0.15	0.61	153	27.8	0.19	1.3	0.01	7.12	22	2	5	0.31	39	3760	<0.5	<5	<0.5	4	20	1	16	9	3	20	26
SR-17-74	671249	282.7	284	1.832	0.007	0.264	0.005	74.8	16.5	1.27	0.31	0.04	3.52	2.05	<0.01	0.01	0.13	0.05	<0.01	<0.01	0.48	99.16	0.6	8.6	30	2.34	0.65	<0.03	41.1	3.15	1.2	0.23	2.7	0.07	75.3	4.9	1.23	3.14	114	5.1	0.61	7.06	0.07	5.29	<5	5	13.1	0.88	11	3520	<0.5	<5	<0.5	<1	1	<1	3	6	2	10	99
SR-17-74	671251	284	286	2.454	0.008	0.377	0.003	75	17.05	1.27	0.09	0.04	1.56	3.44	0.01	0.01	0.11	0.01	0.01	<0.01	0.67	99.27	0.7	14	60	2.75	0.79	<0.03	37.3	4.32	0.6	0.32	4.3	0.07	61.4	8.2	2.07	4.89	111	1	0.69	8.53	0.07	4.49	<5	5	15	0.99	7	4180	<0.5	<5	<0.5	<1	1	<1	2	5	3	20	98
SR-17-74	671252	286	288	1.333	0.003	0.219	0.003	75.7	15.8	0.81	0.15	0.02	4.37	2.36	<0.01	<0.01	0.11	0.03	<0.01	<0.01	0.32	99.67	<0.5	1.4	20	0.75	0.23	<0.03	32.6	0.49	2.4	0.08	0.5	0.03	37.6	0.8	0.17	0.41	41	1.1	0.12	2.04	0.02	7.68	<5	2	5.1	0.47	24	1390	<0.5	<5	<0.5	<1	6	<1	2	10	1	10	71
SR-17-74	671253	288	290	0.995	0.005	0.354	0.005	73.8	16.3	0.83	0.16	0.02	4.2	3.29	<0.01	0.01	0.11	0.04	<0.01	<0.01	0.76	99.52	<0.5	14.9	20	5.07	1.46	<0.03	44.4	6.07	1.4	0.58	4.8	0.19	94.3	8	2.2	5.57	366	1.2	1.2	11.05	0.19	9.1	<5	5	29.3	1.87	14	3970	<0.5	<5	<0.5	<1	1	<1	<1	9	2	30	97
SR-17-74	671254	290	292	2.032	0.003	0.215	0.004	76.7	15.9	1.13	0.13	0.01	3.14	2	<0.01	0.01	0.08	0.03	<0.01	<0.01	0.46	99.59	<0.5	5.4	30	1.82	0.48	<0.03	34.9	2.13	1.4	0.18	1.9	0.04	93	2.7	0.74	2.12	72	0.9	0.43	4.52	0.05	7.78	<5	5	10.3	0.65	16	2480	<0.5	<5	<0.5	<1	2	<1	2	7	<1	10	91
SR-17-74	671255	292	293.3	1.485	0.003	0.237	0.006	75.1	16.6	0.53	0.13	0.01	4.6	2.34	<0.01	<0.01	0.31	0.05	<0.01	<0.01	0.34	100.01	<0.5	<0.5	20	0.42	0.1	<0.03	41.6	0.22	2.9	0.02	<0.5	<0.01	35.8	0.1	<0.03	0.06	147	4.9	0.04	1.43	<0.01	5.52	<5	1	2.6	0.16	25	1870	<0.5	<5	<0.5	<1	<1	<1	1	5	<1	10	60
SR-17-74	671256	293.3	295	1.376	0.004	0.321	0.006	75.3	16	0.64	0.12	0.01	4.07	2.67	<0.01	<0.01	0.2	0.04	<0.01	<0.01	0.54	99.59	<0.5	0.8	30	0.48	0.11	<0.03	43.5	0.35	2.5	0.03	<0.5	<0.01	59.1	0.3	0.05	0.34	368	7.5	0.06	2.44	<0.01	7.18	<5	3	2.7	0.18	22	3260	<0.5	<5	<0.5	<1	1	<1	1	5	<1	20	98
SR-17-74	671257	295	297	1.197	0.005	0.421	0.007	75.3	16.55	0.64	0.17	0.01	4.39	2.95	<0.01	<0.01	0.24	0.04	<0.01	<0.01	0.6	100.89	<0.5	1.9	30	0.66	0.16	<0.03	46.9	0.79	2.3	0.05	0.6	<0.01	74.6	1.1	0.23	0.85	355	7.4	0.14	3.5	<0.01	9.04	<5	4	3.9	0.3	22	3890	<0.5	<5	<0.5	<1	1	<1	1	7	<1	30	133
SR-17-74	671258	297	299	1.406	0.006	0.363	0.007	74.4	16.4	0.66	0.17	0.02	4.31	2.48	<0.01	<0.01	0.21	0.05	0.01	<0.01	0.74	99.45	<0.5	1.1	20	0.59	0.1	<0.03	43.1	0.56	2.4	0.03	<0.5	<0.01	63.6	0.5	0.13	0.51	428	12.7	0.11	3.39	<0.01	8.23	<5	4	3.3	0.23	23	3850	<0.5	<5	<0.5	<1	<1	<1	1	6	<1	20	113
SR-17-74	671259	299	301	1.447	0.009	0.458	0.011	71.8	17.6	0.74	0.16	0.04	4.72	2.55	<0.01	<0.01	0.27	0.03	0.01	<0.01	0.99	98.91	1.2	1.7	20	0.55	0.11	<0.03	58.9	0.67	3.7	0.04	0.6	<0.01	94	0.8	0.21	0.68	631	13.8	0.12	5	<0.01	12.5	<5	6	3.3	0.25	35	5800	<0.5	<5	<0.5	<1	1	<1	1	6	<1	20	158
SR-17-74	671260	301	302.3	1.623	0.007	0.424	0.007	73.7	17.7	0.74	0.16	0.02	4.74	2.6	<0.01	<0.01	0.2	0.05	<0.01	<0.01	0.52	100.43	<0.5	1.3	20	0.37	0.07	<0.03	51.5	0.43	3.1	0.01	0.5	<0.01	58.9	0.6	0.15	0.56	504	2.2	0.07	3.64	<0.01	8.38	<5	4	2.1	0.15	28	4060	<0.5	<5	<0.5	<1	1	<1	2	8	<1	30	115
SR-17-74	671261	302.3	304.4	1.389	0.008	0.424	0.013	73.8	16.2	0.6	0.25	0.03	4.38	3.11	<0.01	<0.01	0.11	0.05	<0.01	<0.01	0.27	98.8	1.9	2.7	20	1.26	0.28	<0.03	43.1	1.45	2.2	0.11	0.9	<0.01	101.5	1.4	0.35	1.43	885	5.1	0.3	5.42	<0.01	10.65	<5	3	6.6	0.31	19	1280	<0.5	<5	0.6	<1	1	<1	1	14	<1	30	84
SR-17-74	671262	304.4	305.85	1.892	0.008	0.482	0.009	76.2	17.25	0.63	0.17	0.06	3.91	2.53	<0.01	<0.01	0.29	0.04	0.01	<0.01	0.84	101.93	2.3	1.3	20	0.41	0.07	<0.03	49.6	0.57	2.1	0.01	0.5	<0.01	58.4	0.7	0.15	0.63	432	13	0.07	3.59	<0.01	7.28	<5	5	2.1	0.09	19	6510	<0.5	<5	<0.5	<1	1	<1	1	7	<1	30	117
SR-17-74	671263	305.85	306.6	1.686	0.006	0.261	0.012	74.6	17.2	0.78	0.46	0.04	4.86	1.95	0.01	<0.01	0.17	0.06	<0.01	<0.01	0.15	100.28	3.4	0.5	50	0.28	0.04	<0.03	45.5	0.34	1.7	0.01	<0.5	<0.01	63.4	0.3	0.06	0.25	362	10.7	0.04	3.75	<0.01	7.07	<5	3	1.7	0.1	14	390	<0.5	8	<0.5	<1	1	<1	1	11	<1	20	39
SR-17-74	671264	307.3	307.58	2.691	0.004	0.096	0.009	75.1	17.2	0.95	0.72	0.05	4.98	0.71	<0.01	<0.01	0.08	0.07	<0.01	<0.01	0.04	99.9	2.9	<0.5	40	0.05	<0.03	<0.03	52.1	0.05	3.2	<0.01	<0.5	<0.01	23.5	0.1	<0.03	<0.03	450	15.6	<0.01	2.67	<0.01	6.58	<5	3	0.6	<0.03	25	190	<0.5	8	<0.5	<1	6	<1	2	4	<1	10	11
SR-17-74	671265	307.9	308.28	1.259	0.011	0.206	0.018	70.7	17.5	0.76	1.45	0.13	5.65	1.2	0.01	0.01	0.11	0.15	<0.01	<0.01	0.35	98.02	2.6	0.5	40	0.09	0.05	0.05	64.4	0.11	2.4	<0.01	<0.5	<0.01	46.4	0.2	0.08	0.07	345	23.5	<0.01	3.5	<0.01	4.34	<5	3	0.7	0.09	17	430	<0.5	6	<0.5	<1	5	<1	2	6	<1	20	9
SR-17-74	671266	313.25	313.55	1.203	0.005	0.019	0.012	74.4	17	0.75	0.72	0.03	5.04	0.08	<0.01	<0.01	0.07	0.08	<0.01	<0.01	0.06	98.23	1	<0.5	20	0.28	0.09	0.03	56	0.25	2.2	0.01	<0.5	<0.01	49	0.1	0.07	0.16	348	14.9	0.03	2.25	<0.01	4.15	<5	2	1.7	0.18	20	190	<0.5	<5	<0.5	<1	2	1	2	5	<1	<10	14
SR-17-74	671267	316.4	317.8	1.802	0.012	0.520	0.010	74.5	17.3	0.72	0.67	0.21	5.09	1.57	<0.01	0.02	0.18	0.18	0.01	<0.01	0.7	101.15	16.5	1.5	30	0.2	0.08	0.05	61	0.21	1.9	<0.01	0.7	<0.01	32.6	0.7	0.16	0.25	319	40.1	0.01	3.43	<0.01	4.58	6	6	1.1	0.1	17	6930	<0.5	8	0.5	1	5	<1	3	4	1	30	43
SR-17-74	671268	332.5	334.8	0.050	0.001	0.073	0.002	73.2	16	0.9	1.23	0.04	6.57	2.04	<0.01	0.01	0.16	0.03	<0.01	<0.01	0.22	100.4	2.6	27	10	4.75	2.03	0.05	37.9	4.51	0.8	0.66	8.7	0.54	51.8	12.9	3.6	5.92	13	13.1	0.81	10.3	0.42	3.58	<5	2	32.9	3.94	12	210	<0.5	<5	<0.5	1	5	<1	1	11	2	<10	13

Amphibolite

				wt. % →																		ppm →																															
Hole ID	Sample ID	From [m]	To [m]	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Na_2O	K_2O	Cr_2O_3	TiO_2	MnO	P_2O_5	SrO	BaO	LOI	Total	C	S	Li	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr	Hg	F
SR-17-71	671801	10	10.5	48.7	14.4	14.15	11.75	7.37	1.41	0.24	0.04	0.87	0.21	0.06	0.01	<0.01	0.68	99.89	0.02	0.11		26.4	4.4	150	4.07	1.78	1.24	0.39	9	1.43	0.8	0.4	1.7	0.18	1.1	3.3	0.67	13.8	1.13	<1	57.8	0.1	0.28	0.24	0.15	0.21	162	1	9.9	1.11	29	<0.005	530
SR-17-71	671802	15	15.5	48.7	14.4	14.15	11.75	7.37	1.41	0.24	0.04	0.87	0.21	0.06	0.01	<0.01	0.68	99.89	0.02	0.11		26.4	4.4	150	4.07	1.78	1.24	0.39	9	1.43	0.8	0.4	1.7	0.18	1.1	3.3	0.67	13.8	1.13	<1	57.8	0.1	0.28	0.24	0.15	0.21	162	1	9.9	1.11	29	<0.005	530
SR-17-71	671803	20	20.5	48.7	14.4	14.15	11.75	7.37	1.41	0.24	0.04	0.87	0.21	0.06	0.01	<0.01	0.68	99.89	0.02	0.11		26.4	4.4	150	4.07	1.78	1.24	0.39	9	1.43	0.8	0.4	1.7	0.18	1.1	3.3	0.67	13.8	1.13	<1	57.8	0.1	0.28	0.24	0.15	0.21	162	1	9.9	1.11	29	<0.005	530
SR-17-71	671804	25	25.5	48.7	14.4	14.15	11.75	7.37	1.41	0.24	0.04	0.87	0.21	0.06	0.01	<0.01	0.68	99.89	0.02	0.11		26.4	4.4	150	4.07	1.78	1.24	0.39	9	1.43	0.8	0.4	1.7	0.18	1.1	3.3	0.67	13.8	1.13	<1	57.8	0.1	0.28	0.24	0.15	0.21	162	1	9.9	1.11	29	<0.005	530
SR-17-71	671805	30	30.5	50.7	15.05	12.35	11.1	6.96	1.58	0.78	0.04	0.73	0.2	0.12	0.01	<0.01	0.76	100.38	0.02	0.06		15.7	5.9	250	214	2.75	1.79	0.58	18.6	2.23	1.3	0.62	2.2	0.28	11.2	4.9	0.91	970	1.65	37	84.4	23.9	0.4	0.49	0.27	1.59	250	12	15.9	1.79	41	0.006	5530
SR-17-71	671806	40	40.5	50.7	15.05	12.35	11.1	6.96	1.58	0.78	0.04	0.73	0.2	0.12	0.01	<0.01	0.76	100.38	0.02	0.06		15.7	5.9	250	214	2.75	1.79	0.58	18.6	2.23	1.3	0.62	2.2	0.28	11.2	4.9	0.91	970	1.65	37	84.4	23.9	0.4	0.49	0.27	1.59	250	12	15.9	1.79	41	0.006	5530
SR-17-71	671807	75	75.5	50.7	15.05	12.35	11.1	6.96	1.58	0.78	0.04	0.73	0.2	0.12	0.01	<0.01	0.76	100.38	0.02	0.06		15.7	5.9	250	214	2.75	1.79	0.58	18.6	2.23	1.3	0.62	2.2	0.28	11.2	4.9	0.91	970	1.65	37	84.4	23.9	0.4	0.49	0.27	1.59	250	12	15.9	1.79	41	0.006	5530
SR-17-71	671808	80	80.5	50.7	15.05	12.35	11.1	6.96	1.58	0.78	0.04	0.73	0.2	0.12	0.01	<0.01	0.76	100.38	0.02	0.06		15.7	5.9	250	214	2.75	1.79	0.58	18.6	2.23	1.3	0.62	2.2	0.28	11.2	4.9	0.91	970	1.65	37	84.4	23.9	0.4	0.49	0.27	1.59	250	12	15.9	1.79	41	0.006	5530
SR-17-71	671809	90	90.5	50.1	14.45	11.85	11.3	7.76	1.3	0.44	0.04	0.69	0.19	0.08	0.01	<0.01	0.94	99.15	0.02	0.03		10.3	5.8	280	69.1	2.72	1.69	0.58	17.1	2.26	1.2	0.61	2.2	0.28	3.2	4.5	0.9	472	1.55	27	84.4	3	0.44	0.22	0.25	0.21	266	88	15.1	1.74	39	0.04	4130
SR-17-71	671810	95	95.5	50.1	14.45	11.85	11.3	7.76	1.3	0.44	0.04	0.69	0.19	0.08	0.01	<0.01	0.94	99.15	0.02	0.03		10.3	5.8	280	69.1	2.72	1.69	0.58	17.1	2.26	1.2	0.61	2.2	0.28	3.2	4.5	0.9	472	1.55	27	84.4	3	0.44	0.22	0.25	0.21	266	88	15.1	1.74	39	0.04	4130
SR-17-71	671811	105	105.5	50.1	14.45	11.85	11.3	7.76	1.3	0.44	0.04	0.69	0.19	0.08	0.01	<0.01	0.94	99.15	0.02	0.03		10.3	5.8	280	69.1	2.72	1.69	0.58	17.1	2.26	1.2	0.61	2.2	0.28	3.2	4.5	0.9	472	1.55	27	84.4	3	0.44	0.22	0.25	0.21	266	88	15.1	1.74	39	0.04	4130
SR-17-71	671812	120	120.5	50.1	14.45	11.85	11.3	7.76	1.3	0.44	0.04	0.69	0.19	0.08	0.01	<0.01	0.94	99.15	0.02	0.03		10.3	5.8	280	69.1	2.72	1.69	0.58	17.1	2.26	1.2	0.61	2.2	0.28	3.2	4.5	0.9	472	1.55	27	84.4	3	0.44	0.22	0.25	0.21	266	88	15.1	1.74	39	0.04	4130
SR-17-71	671813	135	135.5	49.7	15	13.3	11.1	7.36	1.63	0.49	0.03	0.78	0.21	0.08	0.01	<0.01	0.79	100.48	0.02	0.1		32.7	6.1	210	651	3.02	1.96	0.68	16.2	2.35	1.3	0.67	2.2	0.31	2.6	4.8	0.95	598	1.67	14	103.5	8.8	0.45	0.2	0.26	0.13	290	11	16.5	1.93	42	0.008	3530
SR-17-71	671814	140	140.5	49.7	15	13.3	11.1	7.36	1.63	0.49	0.03	0.78	0.21	0.08	0.01	<0.01	0.79	100.48	0.02	0.1		32.7	6.1	210	651	3.02	1.96	0.68	16.2	2.35	1.3	0.67	2.2	0.31	2.6	4.8	0.95	598	1.67	14	103.5	8.8	0.45	0.2	0.26	0.13	290	11	16.5	1.93	42	0.008	3530
SR-17-71	671815	150	150.5	49.7	15	13.3	11.1	7.36	1.63	0.49	0.03	0.78	0.21	0.08	0.01	<0.01	0.79	100.48	0.02	0.1		32.7	6.1	210	651	3.02	1.96	0.68	16.2	2.35	1.3	0.67	2.2	0.31	2.6	4.8	0.95	598	1.67	14	103.5	8.8	0.45	0.2	0.26	0.13	290	11	16.5	1.93	42	0.008	3530
SR-17-71	671816	155	155.5	49.7	15	13.3	11.1	7.36	1.63	0.49	0.03	0.78	0.21	0.08	0.01	<0.01	0.79	100.48	0.02	0.1		32.7	6.1	210	651	3.02	1.96	0.68	16.2	2.35	1.3	0.67	2.2	0.31	2.6	4.8	0.95	598	1.67	14	103.5	8.8	0.45	0.2	0.26	0.13	290	11	16.5	1.93	42	0.008	3530
SR-17-71	671817	160	160.5	50.4	14.55	11.7	12.5	7.36	1.63	0.17	0.05	0.67	0.2	0.05	0.01	<0.01	0.82	100.11	0.05	0.09		20.9	5.1	330	211	2.58	1.73	0.54	15.3	1.98	1	0.61	1.9	0.27	1.7	4.3	0.82	154.5	1.57	3	96.3	3.3	0.39	0.17	0.26	<0.05	260	3	14.6	1.69	36	<0.005	1770
SR-17-71	671818	165	165.5	50.4	14.55	11.7	12.5	7.36	1.63	0.17	0.05	0.67	0.2	0.05	0.01	<0.01	0.82	100.11	0.05	0.09		20.9	5.1	330	211	2.58	1.73	0.54	15.3	1.98	1	0.61	1.9	0.27	1.7	4.3	0.82	154.5	1.57	3	96.3	3.3	0.39	0.17	0.26	<0.05	260	3	14.6	1.69	36	<0.005	1770
SR-17-71	671819	170	170.5	50.4	14.55	11.7	12.5	7.36	1.63	0.17	0.05	0.67	0.2	0.05	0.01	<0.01	0.82	100.11	0.05	0.09		20.9	5.1	330	211	2.58	1.73	0.54	15.3	1.98	1	0.61	1.9	0.27	1.7	4.3	0.82	154.5	1.57	3	96.3	3.3	0.39	0.17	0.26	<0.05	260	3	14.6	1.69	36	<0.005	1770
SR-17-71	671820	175	175.5	50.4	14.55	11.7	12.5	7.36	1.63	0.17	0.05	0.67	0.2	0.05	0.01	<0.01	0.82	100.11	0.05	0.09		20.9	5.1	330	211	2.58	1.73	0.54	15.3	1.98	1	0.61	1.9	0.27	1.7	4.3	0.82	154.5	1.57	3	96.3	3.3	0.39	0.17	0.26	<0.05	260	3	14.6	1.69	36	<0.005	1770
SR-17-71	671821	180	180.5	49	13.4	17.65	9.68	4.94	2.06	0.42	0.02	1.55	0.49	0.13	0.01	0.02	0.87	100.24	0.24	0.26		149	15.1	130	5.26	5.67	3.67	1.24	19.7	4.89	2.7	1.31	5.8	0.58	4.2	11	2.24	19.1	3.82	2	110	0.4	0.86	0.59	0.51	0.18	450	20	31.5	3.8	101	0.013	460
SR-17-71	671822	225	225.5	49	13.4	17.65	9.68	4.94	2.06	0.42	0.02	1.55	0.49	0.13	0.01	0.02	0.87	100.24	0.24	0.26		149	15.1	130	5.26	5.67	3.67	1.24	19.7	4.89	2.7	1.31	5.8	0.58	4.2	11	2.24	19.1	3.82	2	110	0.4	0.86	0.59	0.51	0.18	450	20	31.5	3.8	101	0.013	460
SR-17-71	671823	230	230.5	49	13.4	17.65	9.68	4.94	2.06	0.42	0.02	1.55	0.49	0.13	0.01	0.02	0.87	100.24	0.24	0.26		149	15.1	130	5.26	5.67	3.67	1.24	19.7	4.89	2.7	1.31	5.8	0.58	4.2	11	2.24	19.1	3.82	2	110	0.4	0.86	0.59	0.51	0.18	450	20	31.5	3.8	101	0.013	460
SR-17-71	671824	235	235.5	49	13.4	17.65	9.68	4.94	2.06	0.42	0.02	1.55	0.49	0.13	0.01	0.02	0.87	100.24	0.24	0.26		149	15.1	130	5.26	5.67	3.67	1.24	19.7	4.89	2.7	1.31	5.8	0.58	4.2	11	2.24	19.1	3.82	2	110	0.4	0.86	0.59	0.51	0.18	450	20	31.5	3.8	101	0.013	460
SR-17-71	671825	240	240.5	49	13.4	17.65	9.68	4.94	2.06	0.42	0.02	1.55	0.49	0.13	0.01	0.02	0.87	100.24	0.24	0.26		149	15.1	130	5.26	5.67	3.67	1.24	19.7	4.89	2.7	1.31	5.8	0.58	4.2	11	2.24	19.1	3.82	2	110	0.4	0.86	0.59	0.51	0.18	450	20	31.5	3.8	101	0.013	460
SR-17-72	671826	10	10.5	53.5	14.6	12.05	8.23	6.15	1.8	1.47	0.03	0.83	0.21	0.13	0.01	0.01	1.07	100.09	0.03	0.1		115.5	8.6	190	189	2.72	1.74	0.68	16.7	2.26	1.3	0.6	3.5	0.28	4.2	6.3	1.28	1090	1.99	29	87.1	2.3	0.43	0.69	0.27	0.51	255	20	15.6	1.81	46	0.013	3620
SR-17-72	671827	15	15.5	53.5	14.6	12.05	8.23	6.15	1.8	1.47	0.03	0.83	0.21	0.13	0.01	0.01	1.07	100.09	0.1	0.06		115.5	8.6	190	189	2.72	1.74	0.68	16.7	2.26	1.3	0.6	3.5	0.28	4.2	6.3	1.28	1090	1.99	29	87.1	2.3	0.43	0.69	0.27	0.51	255	20	15.6	1.81	46	0.013	3620
SR-17-72	671828	20	20.5	53.5	14.6	12.05	8.23	6.15	1.8	1.47	0.03	0.83	0.21	0.13	0.01	0.01	1.07	100.09	0.07	0.73		115.5	8.6	190	189	2.72	1.74	0.68	16.7	2.26	1.3	0.6	3.5	0.28	4.2	6.3	1.28	1090	1.99	29	87.1	2.3	0.43	0.69	0.27	0.51	255	20	15.6	1.81	46	0.013	3620
SR-17-72	671829	30	30.5	53.5	14.6	12.05	8.23	6.15	1.8	1.47	0.03	0.83	0.21	0.13	0.01	0.01	1.07	100.09	0.06	0.1		115.5	8.6	190	189	2.72	1.74	0.68	16.7	2.26	1.3	0.6	3.5	0.28	4.2	6.3	1.28	1090	1.99	29	87.1	2.3	0.43	0.69	0.27	0.51	255	20	15.6	1.81	46	0.013	3620
SR-17-72	671830	35	35.5	49.8	14.5	13.45	11.8	7.79	1.42	0.41	0.04	0.81	0.22	0.07	0.01	<0.01	0.78	101.1	0.05	0.08		32.7	6.2	260	69.5	3.01	1.95	0.68	15.7	2.19	1.2	0.67	2.3	0.31	2	5	0.96	314	1.81	10	77.6	0.7	0.47	0.19	0.27	0.21	268	3	16.7	1.86	42	0.005	2700
SR-17-72	671831	40	40.5	49.8	14.5	13.45	11.8	7.79	1.42	0.41	0.04	0.81	0.22	0.07	0.01	<0.01	0.78	101.1	0.03	0.11		32.7	6.2	260	69.5	3.01	1.95	0.68	15.7	2.19	1.2	0.67	2.3	0.31	2	5	0.96	314	1.81	10	77.6	0.7	0.47	0.19	0.27	0.21	268	3	16.7	1.86	42	0.005	2700
SR-17-72	671832	55	55.5	49.8	14.5	13.45	11.8	7.79	1.42	0.41	0.04	0.81	0.22	0.07	0.01	<0.01	0.78	101.1	0.04	0.06		32.7	6.2	260	69.5	3.01	1.95	0.68	15.7	2.19	1.2	0.67	2.3	0.31	2	5	0.96	314	1.81	10	77.6	0.7	0.47	0.19	0.27	0.21	268	3	16.7	1.86	42	0.005	2700
SR-17-72	671833	65	65.5	49.8	14.5	13.45	11.8	7.79	1.42	0.41	0.04	0.81	0.22	0.07	0.01	<0.01	0.78	101.1	0.02	0.1		32.7	6.2	260	69.5	3.01	1.95	0.68	15.7	2.19	1.2	0.67	2.3	0.31	2	5	0.96	314	1.81	10	77.6	0.7	0.47	0.19	0.27	0.21	268	3	16.7	1.86	42	0.005	2700
SR-17-72	671834	70	70.5	51.6	14.45	12.5	10.7	7.57	2.04	0.4	0.04	0.74	0.2	0.07	0.01	<0.01	0.96	101.28	0.02	0.17		25	5.4	240	239	2.77	1.82	0.58	17.6	2.29	1.4	0.63	2	0.27	4	4.7	0.9	516	1.73	12	77.5	8.3	0.42	0.25	0.26	0.4	260	2	15.2	1.81	42	<0.005	2170
SR-17-72	671835	76	76.5	51.6	14.45	12.5	10.7	7.57	2.04	0.4	0.04	0.74	0.2	0.07	0.01	<0.01	0.96	101.28	0.02	0.02		25	5.4	240	239	2.77	1.82	0.58	17.6	2.29	1.4	0.63	2	0.27	4	4.7	0.9	516	1.73	12	77.5	8.3	0.42	0.25	0.26	0.4	260	2	15.2	1.81	42	<0.005	2170
SR-17-72	671836	80	80.5	51.6	14.45	12.5	10.7	7.57	2.04	0.4	0.04	0.74	0.2	0.07	0.01	<0.01	0.96	101.28	0.13	0.07		25	5.4	240	239	2.77	1.82	0.58	17.6	2.29	1.4	0.63	2	0.27	4	4.7	0.9	516	1.73	12	77.5	8.3	0.42	0.25	0.26	0.4	260	2	15.2	1.81	42	<0.005	2170
SR-17-72	671837	100	100.5	51.6	14.45	12.5	10.7	7.57	2.04	0.4	0.04	0.74	0.2	0.07	0.01	<0.01	0.96	101.28	0.02	0.06		25	5.4	240	239	2.77	1.82	0.58	17.6	2.29	1.4	0.63	2	0.27	4	4.7	0.9	516	1.73	12	77.5	8.3	0.42	0.25	0.26	0.4	260	2	15.2	1.81	42	<0.005	2170
SR-17-72	671838	105	105.5	49.9	14.85	12.6	10.4	9.18	1.48	0.63	0.04	0.69	0.18	0.04	0.01	<0.01	0.9	100.9	0.01	0.05		17.8	5.1	280	916	2.62	1.8	0.54	15.3	2.02	1	0.61	1.8	0.26	1.7	4.6	0.83	973	1.71	19	80.9	0.4	0.39	0.14	0.25	0.11	255	4	14.7	1.68	36	0.005	3640
SR-17-72	671839	110	110.5	49.9	14.85	12.6	10.4	9.18	1.48	0.63	0.04	0.69	0.18	0.04	0.01	<0.01	0.9	100.9	0.01	0.03		17.8	5.1	280	916	2.62	1.8	0.54	15.3	2.02	1	0.61	1.8	0.26	1.7	4.6	0.83	973	1.71	19	80.9	0.4	0.39	0.14	0.25	0.11	255	4	14.7	1.68	36	0.005	3640
SR-17-72	671840	115	115.5	49.9	14.85	12.6	10.4	9.18	1.48	0.63	0.04	0.69	0.18	0.04	0.01	<0.01	0.9	100.9	0.11	0.02		17.8	5.1	280	916	2.62	1.8	0.54	15.3	2.02	1	0.61	1.8	0.26	1.7	4.6	0.83	973	1.71	19	80.9	0.4	0.39	0.14	0.25	0.11	255	4	14.7	1.68	36	0.005	3640
SR-17-72	671841	130	130.5	49.9	14.85	12.6	10.4	9.18	1.48	0.63	0.04	0.69	0.18	0.04	0.01	<0.01	0.9	100.9	0.04	0.04		17.8	5.1	280	916	2.62	1.8	0.54	15.3	2.02	1	0.61	1.8	0.26	1.7	4.6	0.83	973	1.71	19	80.9	0.4	0.39	0.14	0.25	0.11	255	4	14.7	1.68	36	0.005	3640
SR-17-72	671842	135	135.5	49.9	14.05	13.3	11.4	8.12	1.38	0.17	0.04	0.74	0.2	0.05	0.01	<0.01	0.77	100.13	0.01	0.03		16.6	6	290	189.5	2.81	1.82	0.6	15	2.23	1.1	0.64	2.2	0.26	1.7	4.8	0.89	115	1.7	2	82	0.6	0.42	0.17	0.26	0.05	272	2	15.7	1.77	39	0.005	970
SR-17-72	671843	140	140.5	49.9	14.05	13.3	11.4	8.12	1.38	0.17	0.04	0.74	0.2	0.05	0.01	<0.01	0.77	100.13	0.02	0.17		16.6	6	290	189.5	2.81	1.82	0.6	15	2.23	1.1	0.64	2.2	0.26	1.7	4.8	0.89	115	1.7	2	82	0.6	0.42	0.17	0.26	0.05	272	2	15.7	1.77	39	0.005	970
SR-17-72	671844	150	150.5	49.9	14.05	13.3	11.4	8.12	1.38	0.17	0.04	0.74	0.2	0.05	0.01	<0.01	0.77	100.13	0.07	0.18		16.6	6	290	189.5	2.81	1.82	0.6	15	2.23	1.1	0.64	2.2	0.26	1.7	4.8	0.89	115	1.7	2	82	0.6	0.42	0.17	0.26	0.05	272	2	15.7	1.77	39	0.005	970
SR-17-72	671845	155	155.5	49.9	14.05	13.3	11.4	8.12	1.38	0.17	0.04	0.74	0.2	0.05	0.01	<0.01	0.77	100.13	0.03	0.03		16.6	6	290	189.5	2.81	1.82	0.6	15	2.23	1.1	0.64	2.2	0.26	1.7	4.8	0.89	115	1.7	2	82	0.6	0.42	0.17	0.26	0.05	272	2	15.7	1.77	39	0.005	970
SR-17-72	671846	160	160.5	50.8	14.65	11.4	11.85	7.29	1.78	0.18	0.05	0.65	0.2	0.08	0.01	<0.01	0.74	99.68	0.01	0.13		17.5	4.9	330	131	2.58	1.65	0.52	17.7	1.88	1.1	0.57	1.9	0.28	4.3	4	0.74	177.5	1.5	8	96.9	23.7	0.39	0.39	0.23	0.5	254	3	13.9	1.61	35	0.005	2270
SR-17-72	671847	165	165.5	50.8	14.65	11.4	11.85	7.29	1.78	0.18	0.05	0.65	0.2	0.08	0.01	<0.01	0.74	99.68	0.11	0.06		17.5	4.9	330	131	2.58	1.65	0.52	17.7	1.88	1.1	0.57	1.9	0.28	4.3	4	0.74	177.5	1.5	8	96.9	23.7	0.39	0.39	0.23	0.5	254	3	13.9	1.61	35	0.005	2270
SR-17-72	671848	170	170.5	50.8	14.65	11.4	11.85	7.29	1.78	0.18	0.05	0.65	0.2	0.08	0.01	<0.01	0.74	99.68	0.02	0.07		17.5	4.9	330	131	2.58	1.65	0.52	17.7	1.88	1.1	0.57	1.9	0.28	4.3	4	0.74	177.5	1.5	8	96.9	23.7	0.39	0.39	0.23	0.5	254	3	13.9	1.61	35	0.005	2270
SR-17-72	671849	176.1	176.6	50.8	14.65	11.4	11.85	7.29	1.78	0.18	0.05	0.65	0.2	0.08	0.01	<0.01	0.74	99.68	0.03	0.04		17.5	4.9	330	131	2.58	1.65	0.52	17.7	1.88	1.1	0.57	1.9	0.28	4.3	4	0.74	177.5	1.5	8	96.9	23.7	0.39	0.39	0.23	0.5	254	3	13.9	1.61	35	0.005	2270
SR-17-72	671850	186.2	186.7	51.1	15.5	12.5	11.4	6.94	1.36	0.42	0.04	0.74	0.21	0.08	0.01	<0.01	0.83	101.13	0.05	0.08	0.198	15.7	5.6	250	444	2.72	1.85	0.57	17.3	2.22	1.3	0.63	2	0.28	4.4	4.7	0.88	741	1.62	25	84.8	18.8	0.42	0.28	0.26	0.23	258	17	15.4	1.73	41	0.014	6170
SR-17-72	671851	190.5	191	51.1	15.5	12.5	11.4	6.94	1.36	0.42	0.04	0.74	0.21	0.08	0.01	<0.01	0.83	101.13	0.02	0.06	0.101	15.7	5.6	250	444	2.72	1.85	0.57	17.3	2.22	1.3	0.63	2	0.28	4.4	4.7	0.88	741	1.62	25	84.8	18.8	0.42	0.28	0.26	0.23	258	17	15.4	1.73	41	0.014	6170
SR-17-72	671852	194.5	195	51.1	15.5	12.5	11.4	6.94	1.36	0.42	0.04	0.74	0.21	0.08	0.01	<0.01	0.83	101.13	0.02	0.12	0.08	15.7	5.6	250	444	2.72	1.85	0.57	17.3	2.22	1.3	0.63	2	0.28	4.4	4.7	0.88	741	1.62	25	84.8	18.8	0.42	0.28	0.26	0.23	258	17	15.4	1.73	41	0.014	6170
SR-17-72	671853	200	200.5	51.1	15.5	12.5	11.4	6.94	1.36	0.42	0.04	0.74	0.21	0.08	0.01	<0.01	0.83	101.13	0.04	0.08	0.112	15.7	5.6	250	444	2.72	1.85	0.57	17.3	2.22	1.3	0.63	2	0.28	4.4	4.7	0.88	741	1.62	25	84.8	18.8	0.42	0.28	0.26	0.23	258	17	15.4	1.73	41	0.014	6170
SR-17-72	671854	215	215.5	50.3	14.5	14.85	8.43	6.38	2.95	0.55	0.02	1.27	0.21	0.11	0.01	0.01	0.73	100.32	0.05	0.18		44.8	11.8	120	7.28	4.65	3.02	1.04	18.8	3.99	2.2	1.04	4.6	0.48	3.7	8.7	1.71	120	3.09	12	111.5	0.4	0.74	0.46	0.47	0.17	360	1	26.5	3.07	78	<0.005	1470
SR-17-72	671855	225	225.5	50.3	14.5	14.85	8.43	6.38	2.95	0.55	0.02	1.27	0.21	0.11	0.01	0.01	0.73	100.32	0.13	0.01		44.8	11.8	120	7.28	4.65	3.02	1.04	18.8	3.99	2.2	1.04	4.6	0.48	3.7	8.7	1.71	120	3.09	12	111.5	0.4	0.74	0.46	0.47	0.17	360	1	26.5	3.07	78	<0.005	1470
SR-17-73	671856	5	5.5	49.5	14.95	13.35	11.5	7.8	0.82	1.12	0.04	0.76	0.23	0.06	0.01	0.02	1.29	101.45	0.06	0.31		205	6.2	270	47.3	2.86	1.79	0.66	15.9	2.34	1.2	0.68	2.4	0.3	1.7	4.9	0.95	41.3	1.67	1	58.7	0.2	0.43	0.16	0.25	0.05	273	1	16.3	1.8	41	0.006	160
SR-17-73	671857	10	10.5	49.5	14.95	13.35	11.5	7.8	0.82	1.12	0.04	0.76	0.23	0.06	0.01	0.02	1.29	101.45	0.06	0.31		205	6.2	270	47.3	2.86	1.79	0.66	15.9	2.34	1.2	0.68	2.4	0.3	1.7	4.9	0.95	41.3	1.67	1	58.7	0.2	0.43	0.16	0.25	0.05	273	1	16.3	1.8	41	0.006	160
SR-17-73	671858	15	15.5	49.5	14.95	13.35	11.5	7.8	0.82	1.12	0.04	0.76	0.23	0.06	0.01	0.02	1.29	101.45	0.06	0.31		205	6.2	270	47.3	2.86	1.79	0.66	15.9	2.34	1.2	0.68	2.4	0.3	1.7	4.9	0.95	41.3	1.67	1	58.7	0.2	0.43	0.16	0.25	0.05	273	1	16.3	1.8	41	0.006	160
SR-17-73	671859	20	20.5	49.5	14.95	13.35	11.5	7.8	0.82	1.12	0.04	0.76	0.23	0.06	0.01	0.02	1.29	101.45	0.06	0.31		205	6.2	270	47.3	2.86	1.79	0.66	15.9	2.34	1.2	0.68	2.4	0.3	1.7	4.9	0.95	41.3	1.67	1	58.7	0.2	0.43	0.16	0.25	0.05	273	1	16.3	1.8	41	0.006	160
SR-17-73	671860	25	25.5	49.3	14.55	13	12.55	7.96	1.16	0.18	0.04	0.74	0.2	0.06	0.01	<0.01	1.21	100.96	0.13	0.08		22.8	5.2	240	20.7	2.69	1.71	0.58	13.9	2.1	1.1	0.57	1.9	0.25	1.5	4.1	0.82	77	1.65	3	61.8	0.1	0.38	0.15	0.24	<0.05	242	1	14.3	1.71	36	0.005	640
SR-17-73	671861	30	30.5	49.3	14.55	13	12.55	7.96	1.16	0.18	0.04	0.74	0.2	0.06	0.01	<0.01	1.21	100.96	0.13	0.08		22.8	5.2	240	20.7	2.69	1.71	0.58	13.9	2.1	1.1	0.57	1.9	0.25	1.5	4.1	0.82	77	1.65	3	61.8	0.1	0.38	0.15	0.24	<0.05	242	1	14.3	1.71	36	0.005	640
SR-17-73	671862	35	35.5	49.3	14.55	13	12.55	7.96	1.16	0.18	0.04	0.74	0.2	0.06	0.01	<0.01	1.21	100.96	0.13	0.08		22.8	5.2	240	20.7	2.69	1.71	0.58	13.9	2.1	1.1	0.57	1.9	0.25	1.5	4.1	0.82	77	1.65	3	61.8	0.1	0.38	0.15	0.24	<0.05	242	1	14.3	1.71	36	0.005	640
SR-17-73	671863	40	40.5	49.3	14.55	13	12.55	7.96	1.16	0.18	0.04	0.74	0.2	0.06	0.01	<0.01	1.21	100.96	0.13	0.08		22.8	5.2	240	20.7	2.69	1.71	0.58	13.9	2.1	1.1	0.57	1.9	0.25	1.5	4.1	0.82	77	1.65	3	61.8	0.1	0.38	0.15	0.24	<0.05	242	1	14.3	1.71	36	0.005	640
SR-17-73	671864	45	45.5	47.2	14.8	14.15	11.45	8.34	1.74	0.53	0.04	0.85	0.22	0.06	0.01	0.01	1.06	100.46	0.08	0.13		57.6	6.6	240	101.5	3.05	2.07	0.68	15.8	2.46	1.2	0.72	2.4	0.33	1.9	5.4	1.06	59.1	1.79	1	80	0.2	0.47	0.2	0.28	0.05	286	1	17.3	2.04	46	<0.005	240
SR-17-73	671865	50	50.5	47.2	14.8	14.15	11.45	8.34	1.74	0.53	0.04	0.85	0.22	0.06	0.01	0.01	1.06	100.46	0.08	0.13		57.6	6.6	240	101.5	3.05	2.07	0.68	15.8	2.46	1.2	0.72	2.4	0.33	1.9	5.4	1.06	59.1	1.79	1	80	0.2	0.47	0.2	0.28	0.05	286	1	17.3	2.04	46	<0.005	240
SR-17-73	671866	55	55.5	47.2	14.8	14.15	11.45	8.34	1.74	0.53	0.04	0.85	0.22	0.06	0.01	0.01	1.06	100.46	0.08	0.13		57.6	6.6	240	101.5	3.05	2.07	0.68	15.8	2.46	1.2	0.72	2.4	0.33	1.9	5.4	1.06	59.1	1.79	1	80	0.2	0.47	0.2	0.28	0.05	286	1	17.3	2.04	46	<0.005	240
SR-17-73	671867	60	60.5	47.2	14.8	14.15	11.45	8.34	1.74	0.53	0.04	0.85	0.22	0.06	0.01	0.01	1.06	100.46	0.08	0.13		57.6	6.6	240	101.5	3.05	2.07	0.68	15.8	2.46	1.2	0.72	2.4	0.33	1.9	5.4	1.06	59.1	1.79	1	80	0.2	0.47	0.2	0.28	0.05	286	1	17.3	2.04	46	<0.005	240
SR-17-73	671868	65	65.5	47.6	16.45	13.75	10.05	6.68	1.44	1.4	0.03	0.85	0.24	0.1	0.01	<0.01	1.17	99.77	0.04	0.12	0.116	42	18.7	200	308	4.43	2.4	0.65	26.8	4.8	1.4	0.89	6.2	0.34	45	11.3	2.78	1895	5.17	92	83.4	12.1	0.91	5.75	0.33	0.89	280	6	23.8	2.19	48	<0.005	4510
SR-17-73	671869	80	80.5	47.6	16.45	13.75	10.05	6.68	1.44	1.4	0.03	0.85	0.24	0.1	0.01	<0.01	1.17	99.77	0.04	0.12	0.11	42	18.7	200	308	4.43	2.4	0.65	26.8	4.8	1.4	0.89	6.2	0.34	45	11.3	2.78	1895	5.17	92	83.4	12.1	0.91	5.75	0.33	0.89	280	6	23.8	2.19	48	<0.005	4510
SR-17-73	671870	100	100.5	47.6	16.45	13.75	10.05	6.68	1.44	1.4	0.03	0.85	0.24	0.1	0.01	<0.01	1.17	99.77	0.04	0.12	0.116	42	18.7	200	308	4.43	2.4	0.65	26.8	4.8	1.4	0.89	6.2	0.34	45	11.3	2.78	1895	5.17	92	83.4	12.1	0.91	5.75	0.33	0.89	280	6	23.8	2.19	48	<0.005	4510
SR-17-73	671871	105	105.5	47.6	16.45	13.75	10.05	6.68	1.44	1.4	0.03	0.85	0.24	0.1	0.01	<0.01	1.17	99.77	0.04	0.12	0.024	42	18.7	200	308	4.43	2.4	0.65	26.8	4.8	1.4	0.89	6.2	0.34	45	11.3	2.78	1895	5.17	92	83.4	12.1	0.91	5.75	0.33	0.89	280	6	23.8	2.19	48	<0.005	4510
SR-17-73	671872	110	110.5	48.8	14.35	13.65	11.3	7.35	2	0.15	0.03	0.86	0.21	0.07	0.01	<0.01	0.57	99.35	0.04	0.07		26.6	6.9	210	542	3.33	2.09	0.75	16.8	2.63	1.4	0.76	2.5	0.34	2.9	5.8	1.11	108.5	1.9	5	108.5	0.5	0.51	0.21	0.31	0.06	288	4	18.6	2.12	49	<0.005	3100
SR-17-73	671873	115	115.5	48.8	14.35	13.65	11.3	7.35	2	0.15	0.03	0.86	0.21	0.07	0.01	<0.01	0.57	99.35	0.04	0.07		26.6	6.9	210	542	3.33	2.09	0.75	16.8	2.63	1.4	0.76	2.5	0.34	2.9	5.8	1.11	108.5	1.9	5	108.5	0.5	0.51	0.21	0.31	0.06	288	4	18.6	2.12	49	<0.005	3100
SR-17-73	671874	120	120.5	48.8	14.35	13.65	11.3	7.35	2	0.15	0.03	0.86	0.21	0.07	0.01	<0.01	0.57	99.35	0.04	0.07		26.6	6.9	210	542	3.33	2.09	0.75	16.8	2.63	1.4	0.76	2.5	0.34	2.9	5.8	1.11	108.5	1.9	5	108.5	0.5	0.51	0.21	0.31	0.06	288	4	18.6	2.12	49	<0.005	3100

				wt. % →																		ppm →																															
Hole ID	Sample ID	From [m]	To [m]	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Na_2O	K_2O	Cr_2O_3	TiO_2	MnO	P_2O_5	SrO	BaO	LOI	Total	C	S	Li	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr	Hg	F
SR-17-73	671875	125	125.5	48.8	14.35	13.65	11.3	7.35	2	0.15	0.03	0.86	0.21	0.07	0.01	<0.01	0.57	99.35	0.04	0.07		26.6	6.9	210	542	3.33	2.09	0.75	16.8	2.63	1.4	0.76	2.5	0.34	2.9	5.8	1.11	108.5	1.9	5	108.5	0.5	0.51	0.21	0.31	0.06	288	4	18.6	2.12	49	<0.005	3100
SR-17-73	671876	135	135.5	53.9	14.9	12.5	7.41	6.32	2.58	1	0.03	0.89	0.17	0.12	0.01	0.03	0.56	100.42	0.05	0.22		222	9.2	200	903	2.94	1.96	0.67	16.2	2.56	1.6	0.65	3.8	0.29	3	6.3	1.35	388	2.16	3	78.5	6.4	0.46	0.45	0.29	0.13	281	1	16.9	2.02	51	0.005	1710
SR-17-73	671877	140	140.5	53.9	14.9	12.5	7.41	6.32	2.58	1	0.03	0.89	0.17	0.12	0.01	0.03	0.56	100.42	0.05	0.22		222	9.2	200	903	2.94	1.96	0.67	16.2	2.56	1.6	0.65	3.8	0.29	3	6.3	1.35	388	2.16	3	78.5	6.4	0.46	0.45	0.29	0.13	281	1	16.9	2.02	51	0.005	1710
SR-17-73	671878	145	145.5	53.9	14.9	12.5	7.41	6.32	2.58	1	0.03	0.89	0.17	0.12	0.01	0.03	0.56	100.42	0.05	0.22		222	9.2	200	903	2.94	1.96	0.67	16.2	2.56	1.6	0.65	3.8	0.29	3	6.3	1.35	388	2.16	3	78.5	6.4	0.46	0.45	0.29	0.13	281	1	16.9	2.02	51	0.005	1710
SR-17-73	671879	150	150.5	53.9	14.9	12.5	7.41	6.32	2.58	1	0.03	0.89	0.17	0.12	0.01	0.03	0.56	100.42	0.05	0.22		222	9.2	200	903	2.94	1.96	0.67	16.2	2.56	1.6	0.65	3.8	0.29	3	6.3	1.35	388	2.16	3	78.5	6.4	0.46	0.45	0.29	0.13	281	1	16.9	2.02	51	0.005	1710
SR-17-73	671880	155.08	155.51	53.2	10.85	16	10	5.9	1.37	0.19	0.02	0.62	0.18	0.14	0.01	<0.01	0.62	99.1	0.06	0.67		24.5	5.9	140	434	2.07	1.36	0.68	10.2	1.69	0.8	0.48	2.4	0.22	1.2	4.2	0.84	92.2	1.31	1	49.2	0.2	0.32	0.13	0.19	<0.05	156	2	11.6	1.26	27	0.006	1170
SR-17-73	671881	160	160.5	53.2	10.85	16	10	5.9	1.37	0.19	0.02	0.62	0.18	0.14	0.01	<0.01	0.62	99.1	0.06	0.67		24.5	5.9	140	434	2.07	1.36	0.68	10.2	1.69	0.8	0.48	2.4	0.22	1.2	4.2	0.84	92.2	1.31	1	49.2	0.2	0.32	0.13	0.19	<0.05	156	2	11.6	1.26	27	0.006	1170
SR-17-73	671882	170	170.5	53.2	10.85	16	10	5.9	1.37	0.19	0.02	0.62	0.18	0.14	0.01	<0.01	0.62	99.1	0.06	0.67		24.5	5.9	140	434	2.07	1.36	0.68	10.2	1.69	0.8	0.48	2.4	0.22	1.2	4.2	0.84	92.2	1.31	1	49.2	0.2	0.32	0.13	0.19	<0.05	156	2	11.6	1.26	27	0.006	1170
SR-17-73	671883	180	180.5	53.2	10.85	16	10	5.9	1.37	0.19	0.02	0.62	0.18	0.14	0.01	<0.01	0.62	99.1	0.06	0.67		24.5	5.9	140	434	2.07	1.36	0.68	10.2	1.69	0.8	0.48	2.4	0.22	1.2	4.2	0.84	92.2	1.31	1	49.2	0.2	0.32	0.13	0.19	<0.05	156	2	11.6	1.26	27	0.006	1170
SR-17-73	671884	185	185.5	49	14.35	14.35	9.14	8.1	1.52	0.96	0.03	0.86	0.23	0.07	0.01	0.01	0.99	99.62	0.02	0.24	0.115	79.4	6.7	200	642	3.24	2.22	0.65	16.8	2.7	1.4	0.73	2.5	0.31	3	5.3	1.08	1690	1.93	17	69.6	2.8	0.48	0.27	0.32	0.09	283	10	17.6	2.13	48	0.008	4360
SR-17-73	671885	195	195.5	49	14.35	14.35	9.14	8.1	1.52	0.96	0.03	0.86	0.23	0.07	0.01	0.01	0.99	99.62	0.02	0.24	0.321	79.4	6.7	200	642	3.24	2.22	0.65	16.8	2.7	1.4	0.73	2.5	0.31	3	5.3	1.08	1690	1.93	17	69.6	2.8	0.48	0.27	0.32	0.09	283	10	17.6	2.13	48	0.008	4360
SR-17-73	671886	205	205.5	49	14.35	14.35	9.14	8.1	1.52	0.96	0.03	0.86	0.23	0.07	0.01	0.01	0.99	99.62	0.02	0.24	0.119	79.4	6.7	200	642	3.24	2.22	0.65	16.8	2.7	1.4	0.73	2.5	0.31	3	5.3	1.08	1690	1.93	17	69.6	2.8	0.48	0.27	0.32	0.09	283	10	17.6	2.13	48	0.008	4360
SR-17-73	671887	210	210.5	49	14.35	14.35	9.14	8.1	1.52	0.96	0.03	0.86	0.23	0.07	0.01	0.01	0.99	99.62	0.02	0.24	0.114	79.4	6.7	200	642	3.24	2.22	0.65	16.8	2.7	1.4	0.73	2.5	0.31	3	5.3	1.08	1690	1.93	17	69.6	2.8	0.48	0.27	0.32	0.09	283	10	17.6	2.13	48	0.008	4360
SR-17-73	671888	220	220.5	48.8	14.75	13.7	11.1	7.7	1.65	0.3	0.03	0.86	0.21	0.11	0.01	<0.01	0.88	100.1	0.02	0.08	0.079	14.2	6.8	240	308	3.24	2.07	0.71	16.2	2.63	1.4	0.71	2.4	0.34	2.6	5.4	1.07	472	2.15	9	76.7	3.4	0.49	0.22	0.32	0.1	293	4	17.9	2.05	47	0.006	4350
SR-17-73	671889	230	230.5	48.8	14.75	13.7	11.1	7.7	1.65	0.3	0.03	0.86	0.21	0.11	0.01	<0.01	0.88	100.1	0.02	0.08	0.207	14.2	6.8	240	308	3.24	2.07	0.71	16.2	2.63	1.4	0.71	2.4	0.34	2.6	5.4	1.07	472	2.15	9	76.7	3.4	0.49	0.22	0.32	0.1	293	4	17.9	2.05	47	0.006	4350
SR-17-73	671890	240	240.5	48.8	14.75	13.7	11.1	7.7	1.65	0.3	0.03	0.86	0.21	0.11	0.01	<0.01	0.88	100.1	0.02	0.08	0.071	14.2	6.8	240	308	3.24	2.07	0.71	16.2	2.63	1.4	0.71	2.4	0.34	2.6	5.4	1.07	472	2.15	9	76.7	3.4	0.49	0.22	0.32	0.1	293	4	17.9	2.05	47	0.006	4350
SR-17-73	671891	250	250.5	48.8	14.75	13.7	11.1	7.7	1.65	0.3	0.03	0.86	0.21	0.11	0.01	<0.01	0.88	100.1	0.02	0.08	0.051	14.2	6.8	240	308	3.24	2.07	0.71	16.2	2.63	1.4	0.71	2.4	0.34	2.6	5.4	1.07	472	2.15	9	76.7	3.4	0.49	0.22	0.32	0.1	293	4	17.9	2.05	47	0.006	4350
SR-17-74	671892	10	10.5	48.9	14.05	14.05	10.25	7.77	2	0.22	0.03	0.86	0.22	0.07	0.01	<0.01	0.79	99.22	0.01	0.03		17.2	6.6	200	55.2	3.11	2.16	0.71	15.4	2.46	1.4	0.74	2.4	0.32	1.8	5.6	1.03	163	1.92	<1	86.6	0.1	0.49	0.17	0.32	0.16	279	1	17.6	2.13	47	<0.005	1240
SR-17-74	671893	15	15.5	48.9	14.05	14.05	10.25	7.77	2	0.22	0.03	0.86	0.22	0.07	0.01	<0.01	0.79	99.22	<0.01	0.18		17.2	6.6	200	55.2	3.11	2.16	0.71	15.4	2.46	1.4	0.74	2.4	0.32	1.8	5.6	1.03	163	1.92	<1	86.6	0.1	0.49	0.17	0.32	0.16	279	1	17.6	2.13	47	<0.005	1240
SR-17-74	671894	20	20.5	48.9	14.05	14.05	10.25	7.77	2	0.22	0.03	0.86	0.22	0.07	0.01	<0.01	0.79	99.22	0.02	0.14		17.2	6.6	200	55.2	3.11	2.16	0.71	15.4	2.46	1.4	0.74	2.4	0.32	1.8	5.6	1.03	163	1.92	<1	86.6	0.1	0.49	0.17	0.32	0.16	279	1	17.6	2.13	47	<0.005	1240
SR-17-74	671895	25	25.5	48.9	14.05	14.05	10.25	7.77	2	0.22	0.03	0.86	0.22	0.07	0.01	<0.01	0.79	99.22	0.01	0.08		17.2	6.6	200	55.2	3.11	2.16	0.71	15.4	2.46	1.4	0.74	2.4	0.32	1.8	5.6	1.03	163	1.92	<1	86.6	0.1	0.49	0.17	0.32	0.16	279	1	17.6	2.13	47	<0.005	1240
SR-17-74	671896	29.5	30	48.8	14	14.1	10.45	7.88	1.54	0.52	0.03	0.87	0.21	0.06	0.01	<0.01	1.26	99.73	0.03	0.05		42.7	6.7	210	224	3.18	2.16	0.69	16.5	2.76	1.3	0.72	2.4	0.33	2.6	5.6	1.02	706	1.98	11	72.2	1.7	0.5	0.21	0.32	0.08	284	6	18.1	2.19	48	0.005	2980
SR-17-74	671897	40	40.5	48.8	14	14.1	10.45	7.88	1.54	0.52	0.03	0.87	0.21	0.06	0.01	<0.01	1.26	99.73	0.08	0.06		42.7	6.7	210	224	3.18	2.16	0.69	16.5	2.76	1.3	0.72	2.4	0.33	2.6	5.6	1.02	706	1.98	11	72.2	1.7	0.5	0.21	0.32	0.08	284	6	18.1	2.19	48	0.005	2980
SR-17-74	671898	45	45.45	48.8	14	14.1	10.45	7.88	1.54	0.52	0.03	0.87	0.21	0.06	0.01	<0.01	1.26	99.73	0.21	0.11		42.7	6.7	210	224	3.18	2.16	0.69	16.5	2.76	1.3	0.72	2.4	0.33	2.6	5.6	1.02	706	1.98	11	72.2	1.7	0.5	0.21	0.32	0.08	284	6	18.1	2.19	48	0.005	2980
SR-17-74	671899	50	50.5	48.8	14	14.1	10.45	7.88	1.54	0.52	0.03	0.87	0.21	0.06	0.01	<0.01	1.26	99.73	0.01	0.1		42.7	6.7	210	224	3.18	2.16	0.69	16.5	2.76	1.3	0.72	2.4	0.33	2.6	5.6	1.02	706	1.98	11	72.2	1.7	0.5	0.21	0.32	0.08	284	6	18.1	2.19	48	0.005	2980
SR-17-74	671900	55	55.5	50.4	14	14.1	10.6	7.29	2.08	0.13	0.03	0.87	0.21	0.06	0.01	<0.01	0.77	100.55	0.01	0.1		43.8	6.7	210	61	3.16	2.05	0.68	15.5	2.57	1.3	0.71	2.5	0.3	1.9	5.6	1.03	38	2.07	1	88.4	0.2	0.45	0.19	0.33	0.05	276	1	17.4	1.95	47	<0.005	190
SR-17-74	671901	60	60.5	50.4	14	14.1	10.6	7.29	2.08	0.13	0.03	0.87	0.21	0.06	0.01	<0.01	0.77	100.55	0.01	0.04		43.8	6.7	210	61	3.16	2.05	0.68	15.5	2.57	1.3	0.71	2.5	0.3	1.9	5.6	1.03	38	2.07	1	88.4	0.2	0.45	0.19	0.33	0.05	276	1	17.4	1.95	47	<0.005	190
SR-17-74	671902	65	65.5	50.4	14	14.1	10.6	7.29	2.08	0.13	0.03	0.87	0.21	0.06	0.01	<0.01	0.77	100.55	0.02	0.09		43.8	6.7	210	61	3.16	2.05	0.68	15.5	2.57	1.3	0.71	2.5	0.3	1.9	5.6	1.03	38	2.07	1	88.4	0.2	0.45	0.19	0.33	0.05	276	1	17.4	1.95	47	<0.005	190
SR-17-74	671903	70	70.5	50.4	14	14.1	10.6	7.29	2.08	0.13	0.03	0.87	0.21	0.06	0.01	<0.01	0.77	100.55	0.29	0.38		43.8	6.7	210	61	3.16	2.05	0.68	15.5	2.57	1.3	0.71	2.5	0.3	1.9	5.6	1.03	38	2.07	1	88.4	0.2	0.45	0.19	0.33	0.05	276	1	17.4	1.95	47	<0.005	190
SR-17-74	671904	75	75.5	48	14.4	14.45	10.15	7.75	2.5	0.26	0.03	0.9	0.21	0.07	0.01	<0.01	0.54	99.27	0.03	0.17		45.2	7.4	220	22.5	3.49	2.41	0.79	17	2.73	1.5	0.79	2.6	0.35	2.1	6.4	1.17	10.5	2.25	1	110.5	0.2	0.56	0.23	0.33	0.06	325	<1	19.8	2.4	53	<0.005	130
SR-17-74	671905	80	80.5	48	14.4	14.45	10.15	7.75	2.5	0.26	0.03	0.9	0.21	0.07	0.01	<0.01	0.54	99.27	0.03	0.09		45.2	7.4	220	22.5	3.49	2.41	0.79	17	2.73	1.5	0.79	2.6	0.35	2.1	6.4	1.17	10.5	2.25	1	110.5	0.2	0.56	0.23	0.33	0.06	325	<1	19.8	2.4	53	<0.005	130
SR-17-74	671906	85	85.5	48	14.4	14.45	10.15	7.75	2.5	0.26	0.03	0.9	0.21	0.07	0.01	<0.01	0.54	99.27	0.05	0.1		45.2	7.4	220	22.5	3.49	2.41	0.79	17	2.73	1.5	0.79	2.6	0.35	2.1	6.4	1.17	10.5	2.25	1	110.5	0.2	0.56	0.23	0.33	0.06	325	<1	19.8	2.4	53	<0.005	130
SR-17-74	671907	90	90.5	48	14.4	14.45	10.15	7.75	2.5	0.26	0.03	0.9	0.21	0.07	0.01	<0.01	0.54	99.27	0.04	0.11		45.2	7.4	220	22.5	3.49	2.41	0.79	17	2.73	1.5	0.79	2.6	0.35	2.1	6.4	1.17	10.5	2.25	1	110.5	0.2	0.56	0.23	0.33	0.06	325	<1	19.8	2.4	53	<0.005	130
SR-17-74	671908	95	95.5	48.5	14.5	13.8	10.9	7.74	1.85	0.1	0.03	0.89	0.2	0.06	0.01	<0.01	0.77	99.35	0.33	0.14		21.8	7.7	210	5.28	3.29	2.17	0.73	16	2.81	1.4	0.73	3	0.34	5.2	5.9	1.17	3.6	1.97	1	96.8	0.2	0.48	0.23	0.31	0.51	296	1	18.8	2.03	49	<0.005	210
SR-17-74	671909	100	100.5	48.5	14.5	13.8	10.9	7.74	1.85	0.1	0.03	0.89	0.2	0.06	0.01	<0.01	0.77	99.35	0.02	0.09		21.8	7.7	210	5.28	3.29	2.17	0.73	16	2.81	1.4	0.73	3	0.34	5.2	5.9	1.17	3.6	1.97	1	96.8	0.2	0.48	0.23	0.31	0.51	296	1	18.8	2.03	49	<0.005	210
SR-17-74	671910	105	105.5	48.5	14.5	13.8	10.9	7.74	1.85	0.1	0.03	0.89	0.2	0.06	0.01	<0.01	0.77	99.35	0.13	0.1		21.8	7.7	210	5.28	3.29	2.17	0.73	16	2.81	1.4	0.73	3	0.34	5.2	5.9	1.17	3.6	1.97	1	96.8	0.2	0.48	0.23	0.31	0.51	296	1	18.8	2.03	49	<0.005	210
SR-17-74	671911	110.1	110.6	48.5	14.5	13.8	10.9	7.74	1.85	0.1	0.03	0.89	0.2	0.06	0.01	<0.01	0.77	99.35	0.06	0.03		21.8	7.7	210	5.28	3.29	2.17	0.73	16	2.81	1.4	0.73	3	0.34	5.2	5.9	1.17	3.6	1.97	1	96.8	0.2	0.48	0.23	0.31	0.51	296	1	18.8	2.03	49	<0.005	210
SR-17-74	671912	115	115.5	50.6	10.65	18.75	9.8	5.98	1.17	0.07	0.02	0.63	0.16	0.11	0.01	<0.01	0.12	98.07	0.03	0.06		12.8	7.4	170	4.23	2.61	1.76	0.89	12.2	2.26	0.9	0.63	3	0.29	2.2	5.3	1.05	6	1.61	1	59.9	0.1	0.41	0.16	0.25	0.05	210	6	15.6	1.74	36	<0.005	1260
SR-17-74	671913	120	120.5	50.6	10.65	18.75	9.8	5.98	1.17	0.07	0.02	0.63	0.16	0.11	0.01	<0.01	0.12	98.07	0.02	0.07		12.8	7.4	170	4.23	2.61	1.76	0.89	12.2	2.26	0.9	0.63	3	0.29	2.2	5.3	1.05	6	1.61	1	59.9	0.1	0.41	0.16	0.25	0.05	210	6	15.6	1.74	36	<0.005	1260
SR-17-74	671914	136.5	137	50.6	10.65	18.75	9.8	5.98	1.17	0.07	0.02	0.63	0.16	0.11	0.01	<0.01	0.12	98.07	0.01	0.01		12.8	7.4	170	4.23	2.61	1.76	0.89	12.2	2.26	0.9	0.63	3	0.29	2.2	5.3	1.05	6	1.61	1	59.9	0.1	0.41	0.16	0.25	0.05	210	6	15.6	1.74	36	<0.005	1260
SR-17-74	671915	140	140.5	50.6	10.65	18.75	9.8	5.98	1.17	0.07	0.02	0.63	0.16	0.11	0.01	<0.01	0.12	98.07	0.06	0.15		12.8	7.4	170	4.23	2.61	1.76	0.89	12.2	2.26	0.9	0.63	3	0.29	2.2	5.3	1.05	6	1.61	1	59.9	0.1	0.41	0.16	0.25	0.05	210	6	15.6	1.74	36	<0.005	1260
SR-17-74	671916	150.2	150.7	49.3	15.3	13.2	10.05	7.91	1.33	0.53	0.04	0.86	0.21	0.09	0.02	0.01	0.96	99.81	0.04	0.02		57.7	12.4	260	162.5	2.99	2.1	0.79	16.5	2.76	1.6	0.71	5.1	0.31	2.8	7.7	1.69	761	2.36	5	111.5	0.5	0.48	0.78	0.32	0.2	271	4	17.7	2.1	55	<0.005	4090
SR-17-74	671917	155	155.5	49.3	15.3	13.2	10.05	7.91	1.33	0.53	0.04	0.86	0.21	0.09	0.02	0.01	0.96	99.81	0.04	0.06		57.7	12.4	260	162.5	2.99	2.1	0.79	16.5	2.76	1.6	0.71	5.1	0.31	2.8	7.7	1.69	761	2.36	5	111.5	0.5	0.48	0.78	0.32	0.2	271	4	17.7	2.1	55	<0.005	4090
SR-17-74	671918	160	160.48	49.3	15.3	13.2	10.05	7.91	1.33	0.53	0.04	0.86	0.21	0.09	0.02	0.01	0.96	99.81	0.02	0.33		57.7	12.4	260	162.5	2.99	2.1	0.79	16.5	2.76	1.6	0.71	5.1	0.31	2.8	7.7	1.69	761	2.36	5	111.5	0.5	0.48	0.78	0.32	0.2	271	4	17.7	2.1	55	<0.005	4090
SR-17-74	671919	166	166.5	49.3	15.3	13.2	10.05	7.91	1.33	0.53	0.04	0.86	0.21	0.09	0.02	0.01	0.96	99.81	0.01	0.14		57.7	12.4	260	162.5	2.99	2.1	0.79	16.5	2.76	1.6	0.71	5.1	0.31	2.8	7.7	1.69	761	2.36	5	111.5	0.5	0.48	0.78	0.32	0.2	271	4	17.7	2.1	55	<0.005	4090
SR-17-74	671920	170.2	170.7	49.1	13.75	14.3	10.1	8.55	1.66	0.11	0.03	0.82	0.2	0.1	0.01	<0.01	0.51	99.24	0.01	0.09		9.5	7.3	190	121	3.21	2.09	0.8	15.3	2.58	1.3	0.69	2.7	0.32	2	5.5	1.15	58.5	1.9	1	71.4	0.1	0.46	0.2	0.33	0.05	267	20	18	1.94	44	0.01	1260
SR-17-74	671921	175	175.5	49.1	13.75	14.3	10.1	8.55	1.66	0.11	0.03	0.82	0.2	0.1	0.01	<0.01	0.51	99.24	0.03	0.04		9.5	7.3	190	121	3.21	2.09	0.8	15.3	2.58	1.3	0.69	2.7	0.32	2	5.5	1.15	58.5	1.9	1	71.4	0.1	0.46	0.2	0.33	0.05	267	20	18	1.94	44	0.01	1260
SR-17-74	671922	180	180.5	49.1	13.75	14.3	10.1	8.55	1.66	0.11	0.03	0.82	0.2	0.1	0.01	<0.01	0.51	99.24	0.04	0.15		9.5	7.3	190	121	3.21	2.09	0.8	15.3	2.58	1.3	0.69	2.7	0.32	2	5.5	1.15	58.5	1.9	1	71.4	0.1	0.46	0.2	0.33	0.05	267	20	18	1.94	44	0.01	1260
SR-17-74	671923	185	185.5	49.1	13.75	14.3	10.1	8.55	1.66	0.11	0.03	0.82	0.2	0.1	0.01	<0.01	0.51	99.24	0.01	0.07		9.5	7.3	190	121	3.21	2.09	0.8	15.3	2.58	1.3	0.69	2.7	0.32	2	5.5	1.15	58.5	1.9	1	71.4	0.1	0.46	0.2	0.33	0.05	267	20	18	1.94	44	0.01	1260
SR-17-74	671924	190.5	191	49.5	15	13.3	10.8	7.47	1.71	0.33	0.03	0.84	0.19	0.1	0.01	<0.01	0.59	99.87	0.01	0.04		29.2	6.6	210	754	3.12	2.05	0.66	17	2.52	1.4	0.72	2.3	0.33	6	5.3	1.03	623	1.87	5	99	39.8	0.47	0.27	0.29	0.12	285	4	17.2	2.04	47	<0.005	3890
SR-17-74	671925	195	195.5	49.5	15	13.3	10.8	7.47	1.71	0.33	0.03	0.84	0.19	0.1	0.01	<0.01	0.59	99.87	0.05	0.02		29.2	6.6	210	754	3.12	2.05	0.66	17	2.52	1.4	0.72	2.3	0.33	6	5.3	1.03	623	1.87	5	99	39.8	0.47	0.27	0.29	0.12	285	4	17.2	2.04	47	<0.005	3890
SR-17-74	671926	200	200.5	49.5	15	13.3	10.8	7.47	1.71	0.33	0.03	0.84	0.19	0.1	0.01	<0.01	0.59	99.87	0.03	0.07		29.2	6.6	210	754	3.12	2.05	0.66	17	2.52	1.4	0.72	2.3	0.33	6	5.3	1.03	623	1.87	5	99	39.8	0.47	0.27	0.29	0.12	285	4	17.2	2.04	47	<0.005	3890
SR-17-74	671927	205	205.5	49.5	15	13.3	10.8	7.47	1.71	0.33	0.03	0.84	0.19	0.1	0.01	<0.01	0.59	99.87	0.08	0.13		29.2	6.6	210	754	3.12	2.05	0.66	17	2.52	1.4	0.72	2.3	0.33	6	5.3	1.03	623	1.87	5	99	39.8	0.47	0.27	0.29	0.12	285	4	17.2	2.04	47	<0.005	3890
SR-17-74	671928	215	215.5	48.4	14.3	13.65	10.95	6.98	1.94	0.22	0.03	0.89	0.21	0.06	0.01	<0.01	0.76	98.4	0.05	0.11		24.1	7.1	210	737	3.25	2.19	0.76	16.3	2.76	1.4	0.77	2.6	0.35	3.9	5.9	1.13	351	2.04	12	99.1	10	0.49	0.22	0.32	0.1	308	1	19	2.19	51	<0.005	3190
SR-17-74	671929	220.5	221	48.4	14.3	13.65	10.95	6.98	1.94	0.22	0.03	0.89	0.21	0.06	0.01	<0.01	0.76	98.4	0.02	0.19		24.1	7.1	210	737	3.25	2.19	0.76	16.3	2.76	1.4	0.77	2.6	0.35	3.9	5.9	1.13	351	2.04	12	99.1	10	0.49	0.22	0.32	0.1	308	1	19	2.19	51	<0.005	3190
SR-17-74	671930	225	225.5	48.4	14.3	13.65	10.95	6.98	1.94	0.22	0.03	0.89	0.21	0.06	0.01	<0.01	0.76	98.4	0.08	0.08		24.1	7.1	210	737	3.25	2.19	0.76	16.3	2.76	1.4	0.77	2.6	0.35	3.9	5.9	1.13	351	2.04	12	99.1	10	0.49	0.22	0.32	0.1	308	1	19	2.19	51	<0.005	3190
SR-17-74	671931	230.4	230.9	48.4	14.3	13.65	10.95	6.98	1.94	0.22	0.03	0.89	0.21	0.06	0.01	<0.01	0.76	98.4	0.13	0.1		24.1	7.1	210	737	3.25	2.19	0.76	16.3	2.76	1.4	0.77	2.6	0.35	3.9	5.9	1.13	351	2.04	12	99.1	10	0.49	0.22	0.32	0.1	308	1	19	2.19	51	<0.005	3190
SR-17-74	671932	235	235.5	50.2	14.35	13.5	11.2	6.96	1.51	0.24	0.03	0.84	0.21	0.1	0.01	<0.01	1.81	100.96	0.81	0.13		21.4	6.5	190	528	2.91	1.96	0.7	16.9	2.45	1.4	0.66	2.3	0.31	4.9	5.4	1.02	410	1.85	8	82.6	23.9	0.47	0.3	0.3	0.2	272	2	17	1.99	46	<0.005	1880
SR-17-74	671933	240	240.5	50.2	14.35	13.5	11.2	6.96	1.51	0.24	0.03	0.84	0.21	0.1	0.01	<0.01	1.81	100.96	0.22	0.08		21.4	6.5	190	528	2.91	1.96	0.7	16.9	2.45	1.4	0.66	2.3	0.31	4.9	5.4	1.02	410	1.85	8	82.6	23.9	0.47	0.3	0.3	0.2	272	2	17	1.99	46	<0.005	1880
SR-17-74	671934	245	245.5	50.2	14.35	13.5	11.2	6.96	1.51	0.24	0.03	0.84	0.21	0.1	0.01	<0.01	1.81	100.96	0.03	0.15		21.4	6.5	190	528	2.91	1.96	0.7	16.9	2.45	1.4	0.66	2.3	0.31	4.9	5.4	1.02	410	1.85	8	82.6	23.9	0.47	0.3	0.3	0.2	272	2	17	1.99	46	<0.005	1880
SR-17-74	671935	250.5	251	50.2	14.35	13.5	11.2	6.96	1.51	0.24	0.03	0.84	0.21	0.1	0.01	<0.01	1.81	100.96	0.16	0.09		21.4	6.5	190	528	2.91	1.96	0.7	16.9	2.45	1.4	0.66	2.3	0.31	4.9	5.4	1.02	410	1.85	8	82.6	23.9	0.47	0.3	0.3	0.2	272	2	17	1.99	46	<0.005	1880
SR-17-74	671936	255	255.5	50	14	12.75	10.45	7.03	1.67	0.23	0.03	0.81	0.2	0.11	0.01	<0.01	2.52	99.81	0.01	0.07		18.9	6.2	210	497	2.98	2	0.61	16.3	2.31	1.3	0.66	2.2	0.28	6.6	4.9	0.96	404	1.72	13	85.9	31.1	0.44	0.27	0.28	0.23	261	3	16.4	1.9	44	<0.005	2180
SR-17-74	671937	260	260.5	50	14	12.75	10.45	7.03	1.67	0.23	0.03	0.81	0.2	0.11	0.01	<0.01	2.52	99.81	0.05	0.08		18.9	6.2	210	497	2.98	2	0.61	16.3	2.31	1.3	0.66	2.2	0.28	6.6	4.9	0.96	404	1.72	13	85.9	31.1	0.44	0.27	0.28	0.23	261	3	16.4	1.9	44	<0.005	2180
SR-17-74	671938	270.5	271	50	14	12.75	10.45	7.03	1.67	0.23	0.03	0.81	0.2	0.11	0.01	<0.01	2.52	99.81	1.51	0.19		18.9	6.2	210	497	2.98	2	0.61	16.3	2.31	1.3	0.66	2.2	0.28	6.6	4.9	0.96	404	1.72	13	85.9	31.1	0.44	0.27	0.28	0.23	261	3	16.4	1.9	44	<0.005	2180
SR-17-74	671939	275	275.5	50	14	12.75	10.45	7.03	1.67	0.23	0.03	0.81	0.2	0.11	0.01	<0.01	2.52	99.81	0.31	0.06		18.9	6.2	210	497	2.98	2	0.61	16.3	2.31	1.3	0.66	2.2	0.28	6.6	4.9	0.96	404	1.72	13	85.9	31.1	0.44	0.27	0.28	0.23	261	3	16.4	1.9	44	<0.005	2180
SR-17-74	671940	280	280.5	49	14.65	11.55	10.75	7.91	1.52	0.74	0.05	0.66	0.2	0.1	0.02	0.01	0.96	98.12	0.04	0.02	0.143	58	10.9	320	911	2.63	1.68	0.62	16.7	2.17	1.6	0.59	4.8	0.24	5.4	6.7	1.45	1290	1.81	28	124.5	24.5	0.39	0.62	0.23	0.28	242	3	14.6	1.75	44	<0.005	7190
SR-17-74	671941	309.75	310.25	49	14.65	11.55	10.75	7.91	1.52	0.74	0.05	0.66	0.2	0.1	0.02	0.01	0.96	98.12	0.01	0.09	0.19	58	10.9	320	911	2.63	1.68	0.62	16.7	2.17	1.6	0.59	4.8	0.24	5.4	6.7	1.45	1290	1.81	28	124.5	24.5	0.39	0.62	0.23	0.28	242	3	14.6	1.75	44	<0.005	7190
SR-17-74	671942	315.5	316	49	14.65	11.55	10.75	7.91	1.52	0.74	0.05	0.66	0.2	0.1	0.02	0.01	0.96	98.12	0.01	0.06	0.147	58	10.9	320	911	2.63	1.68	0.62	16.7	2.17	1.6	0.59	4.8	0.24	5.4	6.7	1.45	1290	1.81	28	124.5	24.5	0.39	0.62	0.23	0.28	242	3	14.6	1.75	44	<0.005	7190
SR-17-74	671943	320	320.5	49	14.65	11.55	10.75	7.91	1.52	0.74	0.05	0.66	0.2	0.1	0.02	0.01	0.96	98.12	0.03	0.04	0.101	58	10.9	320	911	2.63	1.68	0.62	16.7	2.17	1.6	0.59	4.8	0.24	5.4	6.7	1.45	1290	1.81	28	124.5	24.5	0.39	0.62	0.23	0.28	242	3	14.6	1.75	44	<0.005	7190

				ppm →											
Hole ID	Sample ID	From [m]	To [m]	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn
SR-17-71	671801	10	10.5	<0.5	<5	0.5	53	183	200	<1	141	2	43	<10	96
SR-17-71	671802	15	15.5	<0.5	<5	0.5	53	183	200	<1	141	2	43	<10	96
SR-17-71	671803	20	20.5	<0.5	<5	0.5	53	183	200	<1	141	2	43	<10	96
SR-17-71	671804	25	25.5	<0.5	<5	0.5	53	183	200	<1	141	2	43	<10	96
SR-17-71	671805	30	30.5												
SR-17-71	671806	40	40.5												
SR-17-71	671807	75	75.5												
SR-17-71	671808	80	80.5												
SR-17-71	671809	90	90.5	<0.5	<5	0.8	43	143	1090	1	123	<2	36	<10	81
SR-17-71	671810	95	95.5	<0.5	<5	0.8	43	143	1090	1	123	<2	36	<10	81
SR-17-71	671811	105	105.5	<0.5	<5	0.8	43	143	1090	1	123	<2	36	<10	81
SR-17-71	671812	120	120.5	<0.5	<5	0.8	43	143	1090	1	123	<2	36	<10	81
SR-17-71	671813	135	135.5	<0.5	5	0.8	49	184	950	1	130	<2	43	<10	87
SR-17-71	671814	140	140.5	<0.5	5	0.8	49	184	950	1	130	<2	43	<10	87
SR-17-71	671815	150	150.5	<0.5	5	0.8	49	184	950	1	130	<2	43	<10	87
SR-17-71	671816	155	155.5	<0.5	5	0.8	49	184	950	1	130	<2	43	<10	87
SR-17-71	671817	160	160.5	<0.5	13	0.7	44	155	500	1	136	<2	40	10	78
SR-17-71	671818	165	165.5	<0.5	13	0.7	44	155	500	1	136	<2	40	10	78
SR-17-71	671819	170	170.5	<0.5	13	0.7	44	155	500	1	136	<2	40	10	78
SR-17-71	671820	175	175.5	<0.5	13	0.7	44	155	500	1	136	<2	40	10	78
SR-17-71	671821	180	180.5	<0.5	<5	0.8	44	123	230	1	62	<2	42	<10	125
SR-17-71	671822	225	225.5	<0.5	<5	0.8	44	123	230	1	62	<2	42	<10	125
SR-17-71	671823	230	230.5	<0.5	<5	0.8	44	123	230	1	62	<2	42	<10	125
SR-17-71	671824	235	235.5	<0.5	<5	0.8	44	123	230	1	62	<2	42	<10	125
SR-17-71	671825	240	240.5	<0.5	<5	0.8	44	123	230	1	62	<2	42	<10	125
SR-17-72	671826	10	10.5												
SR-17-72	671827	15	15.5												
SR-17-72	671828	20	20.5												
SR-17-72	671829	30	30.5												
SR-17-72	671830	35	35.5	<0.5	<5	0.6	51	134	350	1	145	<2	42	10	99
SR-17-72	671831	40	40.5	<0.5	<5	0.6	51	134	350	1	145	<2	42	10	99
SR-17-72	671832	55	55.5	<0.5	<5	0.6	51	134	350	1	145	<2	42	10	99
SR-17-72	671833	65	65.5	<0.5	<5	0.6	51	134	350	1	145	<2	42	10	99
SR-17-72	671834	70	70.5	<0.5	<5	0.8	46	157	550	1	122	<2	41	<10	84
SR-17-72	671835	76	76.5	<0.5	<5	0.8	46	157	550	1	122	<2	41	<10	84
SR-17-72	671836	80	80.5	<0.5	<5	0.8	46	157	550	1	122	<2	41	<10	84
SR-17-72	671837	100	100.5	<0.5	<5	0.8	46	157	550	1	122	<2	41	<10	84
SR-17-72	671838	105	105.5	<0.5	<5	0.7	50	114	710	<1	155	<2	34	10	80
SR-17-72	671839	110	110.5	<0.5	<5	0.7	50	114	710	<1	155	<2	34	10	80
SR-17-72	671840	115	115.5	<0.5	<5	0.7	50	114	710	<1	155	<2	34	10	80
SR-17-72	671841	130	130.5	<0.5	<5	0.7	50	114	710	<1	155	<2	34	10	80
SR-17-72	671842	135	135.5	<0.5	6	<0.5	52	152	470	<1	151	<2	39	<10	89
SR-17-72	671843	140	140.5	<0.5	6	<0.5	52	152	470	<1	151	<2	39	<10	89
SR-17-72	671844	150	150.5	<0.5	6	<0.5	52	152	470	<1	151	<2	39	<10	89
SR-17-72	671845	155	155.5	<0.5	6	<0.5	52	152	470	<1	151	<2	39	<10	89
SR-17-72	671846	160	160.5	<0.5	<5	0.7	44	154	890	<1	134	<2	42	<10	78
SR-17-72	671847	165	165.5	<0.5	<5	0.7	44	154	890	<1	134	<2	42	<10	78
SR-17-72	671848	170	170.5	<0.5	<5	0.7	44	154	890	<1	134	<2	42	<10	78
SR-17-72	671849	176.1	176.6	<0.5	<5	0.7	44	154	890	<1	134	<2	42	<10	78
SR-17-72	671850	186.2	186.7												
SR-17-72	671851	190.5	191												
SR-17-72	671852	194.5	195												
SR-17-72	671853	200	200.5												
SR-17-72	671854	215	215.5	<0.5	<5	0.5	46	45	570	1	91	<2	42	<10	130
SR-17-72	671855	225	225.5	<0.5	<5	0.5	46	45	570	1	91	<2	42	<10	130
SR-17-73	671856	5	5.5	<0.5	5	0.8	55	204	380	<1	168	<2	42	10	155
SR-17-73	671857	10	10.5	<0.5	5	0.8	55	204	380	<1	168	<2	42	10	155
SR-17-73	671858	15	15.5	<0.5	5	0.8	55	204	380	<1	168	<2	42	10	155
SR-17-73	671859	20	20.5	<0.5	5	0.8	55	204	380	<1	168	<2	42	10	155
SR-17-73	671860	25	25.5	<0.5	<5	0.6	54	146	330	<1	152	<2	44	<10	97
SR-17-73	671861	30	30.5	<0.5	<5	0.6	54	146	330	<1	152	<2	44	<10	97
SR-17-73	671862	35	35.5	<0.5	<5	0.6	54	146	330	<1	152	<2	44	<10	97
SR-17-73	671863	40	40.5	<0.5	<5	0.6	54	146	330	<1	152	<2	44	<10	97
SR-17-73	671864	45	45.5	<0.5	<5	0.7	55	159	460	<1	150	<2	44	<10	104
SR-17-73	671865	50	50.5	<0.5	<5	0.7	55	159	460	<1	150	<2	44	<10	104
SR-17-73	671866	55	55.5	<0.5	<5	0.7	55	159	460	<1	150	<2	44	<10	104
SR-17-73	671867	60	60.5	<0.5	<5	0.7	55	159	460	<1	150	<2	44	<10	104
SR-17-73	671868	65	65.5												
SR-17-73	671869	80	80.5												
SR-17-73	671870	100	100.5												
SR-17-73	671871	105	105.5												
SR-17-73	671872	110	110.5	<0.5	222	0.8	51	125	330	2	138	<2	44	10	100
SR-17-73	671873	115	115.5	<0.5	222	0.8	51	125	330	2	138	<2	44	10	100
SR-17-73	671874	120	120.5	<0.5	222	0.8	51	125	330	2	138	<2	44	10	100
SR-17-73	671875	125	125.5	<0.5	222	0.8	51	125	330	2	138	<2	44	10	100
SR-17-73	671876	135	135.5	<0.5	72	0.6	54	167	800	1	129	<2	41	<10	84
SR-17-73	671877	140	140.5	<0.5	72	0.6	54	167	800	1	129	<2	41	<10	84
SR-17-73	671878	145	145.5	<0.5	72	0.6	54	167	800	1	129	<2	41	<10	84
SR-17-73	671879	150	150.5	<0.5	72	0.6	54	167	800	1	129	<2	41	<10	84
SR-17-73	671880	155.08	155.51	<0.5	67	1.1	35	851	150	1	34	2	6	<10	69

				ppm →											
Hole ID	Sample ID	From [m]	To [m]	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn
SR-17-73	671881	160	160.5	<0.5	33	0.5	45	365	620	1	112	<2	30	<10	87
SR-17-73	671882	170	170.5	<0.5	33	0.5	45	365	620	1	112	<2	30	<10	87
SR-17-73	671883	180	180.5	<0.5	33	0.5	45	365	620	1	112	<2	30	<10	87
SR-17-73	671884	185	185.5												
SR-17-73	671885	195	195.5												
SR-17-73	671886	205	205.5												
SR-17-73	671887	210	210.5												
SR-17-73	671888	220	220.5												
SR-17-73	671889	230	230.5												
SR-17-73	671890	240	240.5												
SR-17-73	671891	250	250.5												
SR-17-74	671892	10	10.5	<0.5	<5	0.8	50	170	760	<1	129	<2	42	<10	99
SR-17-74	671893	15	15.5	<0.5	<5	0.8	50	170	760	<1	129	<2	42	<10	99
SR-17-74	671894	20	20.5	<0.5	<5	0.8	50	170	760	<1	129	<2	42	<10	99
SR-17-74	671895	25	25.5	<0.5	<5	0.8	50	170	760	<1	129	<2	42	<10	99
SR-17-74	671896	29.5	30	<0.5	<5	0.9	51	161	650	<1	132	<2	40	10	99
SR-17-74	671897	40	40.5	<0.5	<5	0.9	51	161	650	<1	132	<2	40	10	99
SR-17-74	671898	45	45.45	<0.5	<5	0.9	51	161	650	<1	132	<2	40	10	99
SR-17-74	671899	50	50.5	<0.5	<5	0.9	51	161	650	<1	132	<2	40	10	99
SR-17-74	671900	55	55.5	<0.5	<5	0.7	51	197	310	1	133	<2	42	<10	99
SR-17-74	671901	60	60.5	<0.5	<5	0.7	51	197	310	1	133	<2	42	<10	99
SR-17-74	671902	65	65.5	<0.5	<5	0.7	51	197	310	1	133	<2	42	<10	99
SR-17-74	671903	70	70.5	<0.5	<5	0.7	51	197	310	1	133	<2	42	<10	99
SR-17-74	671904	75	75.5	<0.5	<5	<0.5	51	176	180	1	126	<2	43	<10	100
SR-17-74	671905	80	80.5	<0.5	<5	<0.5	51	176	180	1	126	<2	43	<10	100
SR-17-74	671906	85	85.5	<0.5	<5	<0.5	51	176	180	1	126	<2	43	<10	100
SR-17-74	671907	90	90.5	<0.5	<5	<0.5	51	176	180	1	126	<2	43	<10	100
SR-17-74	671908	95	95.5	<0.5	<5	0.5	50	160	220	<1	135	<2	42	<10	91
SR-17-74	671909	100	100.5	<0.5	<5	0.5	50	160	220	<1	135	<2	42	<10	91
SR-17-74	671910	105	105.5	<0.5	<5	0.5	50	160	220	<1	135	<2	42	<10	91
SR-17-74	671911	110.1	110.6	<0.5	<5	0.5	50	160	220	<1	135	<2	42	<10	91
SR-17-74	671912	115	115.5	<0.5	11	1.3	42	125	1360	1	106	<2	30	<10	115
SR-17-74	671913	120	120.5	<0.5	11	1.3	42	125	1360	1	106	<2	30	<10	115
SR-17-74	671914	136.5	137	<0.5	11	1.3	42	125	1360	1	106	<2	30	<10	115
SR-17-74	671915	140	140.5	<0.5	11	1.3	42	125	1360	1	106	<2	30	<10	115
SR-17-74	671916	150.2	150.7	<0.5	18	0.6	49	171	2530	<1	142	<2	37	<10	94
SR-17-74	671917	155	155.5	<0.5	18	0.6	49	171	2530	<1	142	<2	37	<10	94
SR-17-74	671918	160	160.48	<0.5	18	0.6	49	171	2530	<1	142	<2	37	<10	94
SR-17-74	671919	166	166.5	<0.5	18	0.6	49	171	2530	<1	142	<2	37	<10	94
SR-17-74	671920	170.2	170.7	<0.5	8	0.5	50	191	560	1	143	<2	38	<10	109
SR-17-74	671921	175	175.5	<0.5	8	0.5	50	191	560	1	143	<2	38	<10	109
SR-17-74	671922	180	180.5	<0.5	8	0.5	50	191	560	1	143	<2	38	<10	109
SR-17-74	671923	185	185.5	<0.5	8	0.5	50	191	560	1	143	<2	38	<10	109
SR-17-74	671924	190.5	191	<0.5	42	0.7	50	141	630	<1	145	<2	41	10	91
SR-17-74	671925	195	195.5	<0.5	42	0.7	50	141	630	<1	145	<2	41	10	91
SR-17-74	671926	200	200.5	<0.5	42	0.7	50	141	630	<1	145	<2	41	10	91
SR-17-74	671927	205	205.5	<0.5	42	0.7	50	141	630	<1	145	<2	41	10	91
SR-17-74	671928	215	215.5	<0.5	45	0.9	53	163	590	<1	128	<2	43	<10	95
SR-17-74	671929	220.5	221	<0.5	45	0.9	53	163	590	<1	128	<2	43	<10	95
SR-17-74	671930	225	225.5	<0.5	45	0.9	53	163	590	<1	128	<2	43	<10	95
SR-17-74	671931	230.4	230.9	<0.5	45	0.9	53	163	590	<1	128	<2	43	<10	95
SR-17-74	671932	235	235.5	<0.5	6	0.5	47	158	920	1	124	<2	39	<10	94
SR-17-74	671933	240	240.5	<0.5	6	0.5	47	158	920	1	124	<2	39	<10	94
SR-17-74	671934	245	245.5	<0.5	6	0.5	47	158	920	1	124	<2	39	<10	94
SR-17-74	671935	250.5	251	<0.5	6	0.5	47	158	920	1	124	<2	39	<10	94
SR-17-74	671936	255	255.5	<0.5	13	0.7	49	150	1090	1	129	<2	40	10	90
SR-17-74	671937	260	260.5	<0.5	13	0.7	49	150	1090	1	129	<2	40	10	90
SR-17-74	671938	270.5	271	<0.5	13	0.7	49	150	1090	1	129	<2	40	10	90
SR-17-74	671939	275	275.5	<0.5	13	0.7	49	150	1090	1	129	<2	40	10	90
SR-17-74	671940	280	280.5												
SR-17-74	671941	309.75	310.25												
SR-17-74	671942	315.5	316												
SR-17-74	671943	320	320.5												

VIII. Density data

SR17-71

DDH #:	SR17-70	Density	Separation Rapids Project
Depth [m]	**Dry weight [g]**	**Wet weight [g]**	**Density**
5	836.3	520	2.64
10	1347.2	903.9	3.04
15	1630.4	1092.6	3.03
20	917.9	616.7	3.05
25	1272.3	854.3	3.04
30	1629.5	1093.8	3.04
35	1278.2	790.5	2.62
40	1279.9	796.5	2.65
45	832	519.7	2.66
50	1288.5	800.9	2.64
55	953.1	592.8	2.65
60	725.9	451.2	2.64
65	1097.9	683.8	2.65
70	1146.1	712.1	2.64
75	590.9	396.3	3.04
80	1361.6	852.2	2.67
85	1089.5	681.8	2.67
90	867	582.1	3.04
95	1189.4	801.9	3.07
100	1356.9	858.8	2.72
105	808.8	542.2	3.03
110	1237.2	781.8	2.72
115	1068.4	663.9	2.64
120	1440.7	968.3	3.05
125	688.6	424.2	2.6
130	1361.8	844.2	2.63
135	354.7	228.4	2.81
140	900.4	604.1	3.04
145	726.2	452.5	2.65
150	722.6	516.8	3.51
155	863.8	577.1	3.01
160	1026.6	686.8	3.02
165	924	615.1	2.99
170	607.3	405.9	3.02
175	1242.1	828	3
180	1159.8	775.9	3.02
185	1300	832.3	2.78
190	960.5	618.3	2.81
195	858.7	527	2.59
200	1031.3	631.9	2.58
205	1172.4	772.6	2.93
210	1102.4	702.5	2.76
215	754.9	505.9	3.03
220	870.7	540.2	2.63
225	1052	702.5	3.01
230	1194.9	804	3.06
235	1274	868.6	3.14

SR17-72

DDH #:	SR17-72	Density	Separation Rapids Project
Depth [m]	**Dry weight [g]**	**Wet weight [g]**	**Density**
5	931.7	623.4	3.02
10	862.6	577.1	3.02
15	700.6	468.2	3.01
20	977.1	641.3	2.91
25	518.1	321	2.63
30	685.7	461.1	3.05
35	507.9	339.2	3.01
40	906.5	608.5	3.04
45	879.6	547.3	2.65
50	897.3	565.8	2.71
55	836.2	558.7	3.01
60	906.7	608.9	3.04
65	1171.8	788.8	3.06
70	576.7	387.2	3.04
75	492.7	304.8	2.62
80	732.7	455.9	2.65
85	1037.3	646.6	2.65
90	811.1	504.2	2.64
95	961	595	2.63
100	896.7	600.6	3.03
105	1204.9	806.1	3.02
110	509.1	342	3.05
115	1049.7	702.8	3.03
120	640.3	398.1	2.64
125	862.2	531.8	2.61
130	706.5	472.9	3.02
135	1075.3	718.6	3.01
140	1200.8	806.7	3.05
145	829.7	510.9	2.6
150	1098.7	734.3	3.02
155	1112.5	747.4	3.05
160	912	609.7	3.02
165	972	629.1	2.83
170	891.4	597	3.03
175	1003.9	628.1	2.67
180	1038.4	639.6	2.6
185	891.2	549.2	2.61
190	1009	675.7	3.03
195	1213.5	773.2	2.76
200	1078.3	722.4	3.03
205	721.1	444.2	2.6
210	687.7	422.4	2.59
215	1190.5	794.9	3.01
220	1154.3	714.5	2.62
225	1155.9	777.7	3.06

SR17-73

DDH #:	SR17-73	Density	Separation Rapids Project
Depth [m]	**Dry weight [g]**	**Wet weight [g]**	**Density**
5	628.5	418.1	2.99
10	1433.4	955.1	3
15	749.6	504.3	3.06
20	543	363.8	3.03
25	1166.1	781.9	3.04
30	718.9	477.5	2.98
35	1094	731.9	3.02
40	1335.9	890.9	3
45	637.1	430.5	3.08
50	1656.9	1126.7	3.13
55	461.6	336.8	3.7
60	666.1	446.5	3.03
65	958.5	637.1	2.98
70	1350.7	840.5	2.65
75	876.8	545.6	2.65
80	1235.2	830	3.05
85	1636	1017.2	2.64
90	1136.5	707	2.65
95	993.4	616.5	2.64
100	1402.8	940.4	3.03
105	1067.2	718	3.06
110	641.9	430.1	3.03
115	1147.9	773	3.06
120	1370	920.8	3.05
125	1693.5	1150.6	3.12
130	996.8	659	2.95
135	769	518.1	3.06
140	1159.4	774.1	3.01
145	1140.7	750.6	2.92
150	1434.9	957.1	3
155	1350.2	946.5	3.34
160	1781.4	1203.2	3.08
165	1306.4	822	2.7
170	1304.8	875.5	3.04
175	911.8	556	2.56
180	1244.3	831.6	3.02
185	1242	828.5	3
190	990.7	665.7	3.05
195	1010.4	675	3.01
200	1560.4	1045	3.03
205	1127.8	761.5	3.08
210	1236	832.5	3.06
215	881.2	582.3	2.95
220	1194.5	804.2	3.06
225	1573.9	1055.9	3.04
230	1453.1	971.6	3.02
235	1212.3	757.1	2.66
240	747.8	503.5	3.06
245	858.7	577.8	3.06
250	1387.7	934.6	3.06
255	1000.7	672.9	3.05
260	1678.7	1123.5	3.02
265	1153.5	714.9	2.63
270	1173.2	756.5	2.82
275	1010.3	638.3	2.72
280	1039.9	655.8	2.71
285	1204.5	764.6	2.74
290	1397.6	878.3	2.69

DDH #:	SR17-73	Density	Separation Rapids Project
Depth [m]	**Dry weight [g]**	**Wet weight [g]**	**Density**
295	1014.9	631.8	2.65
300	916.4	593.7	2.84
305	1063	661.5	2.65
310	738.6	464.5	2.69
315	893	552	2.62
320	873.1	540.5	2.63
325	1215.5	757.9	2.66
330	831.7	519.3	2.66
335	871	542.1	2.65
340	1218.4	750.6	2.6
345	428.9	265.6	2.63
350	856.1	530.7	2.63
355	1338	845.7	2.72
360	1233.3	814.2	2.94
365	1279.3	856.1	3.02
370	1282	854.2	3
375	1408.9	938.7	3
380	1051	700.1	3
385	1259.2	832.6	2.95
390	897.5	599.7	3.01

SR17-74

DDH #:	SR17-74	Density	Separation Rapids Project
Depth [m]	**Dry weight [g]**	**Wet weight [g]**	**Density**
10	963	644.3	3.02
15	1041.8	697.2	3.02
20	1564.2	1048.6	3.03
25	993.8	669.4	3.06
30	873	584.3	3.02
35	1419.2	870.7	2.59
40	1225.1	821.3	3.03
45	808.3	543.7	3.05
50	1245.7	838.2	3.06
55	1629.7	1094	3.04
60	1323.4	884.5	3.02
65	1166.8	786.7	3.07
70	1015.5	664.2	2.89
75	926	623.5	3.06
80	1205.5	807.3	3.03
85	1291.5	869.2	3.06
90	1179.2	790.4	3.03
95	1303	859.1	2.94
100	879.8	588.5	3.02
105	1297.5	870.3	3.04
110	1498	1005.3	3.04
115	1702.4	1143	3.04
120	1277.7	857.2	3.04
125	902.6	562.7	2.66
130	954.5	595.8	2.66
135	1202.8	756.9	2.7
140	1384.5	972.1	3.36
145	781.5	483.9	2.63
150	1420.4	933.2	2.92
155	1163.3	785.6	3.08
160	860.6	579.2	3.06
165	1289	828.9	2.8
170	1177.4	790.2	3.04
175	1173.7	787.3	3.04
180	882.4	594.3	3.06
185	1082.7	725	3.03
190	1181.1	794.7	3.06
195	1535	1025.2	3.01
200	1898	1274.4	3.04
205	1043.3	700.4	3.04
210	1062.2	675.6	2.75
215	1238.7	831.5	3.04
220	1075.7	723.3	3.05
225	963.1	645	3.03
230	1816.4	1208.2	2.99
235	1709.2	1132.1	2.96
240	796.8	536	3.06
245	1266.4	852.8	3.06
250	1525.2	1026.4	3.06
255	962.7	645.9	3.04
260	1156.5	777.4	3.05
265	1164	722.5	2.64
270	1365.6	896.4	2.91
275	1013.6	681.9	3.06
280	1113.4	748	3.05
285	1071.1	677.1	2.72
290	1661.7	1033.7	2.65
295	753.9	476.9	2.72

DDH #:	SR17-74	Density	Separation Rapids Project
Depth [m]	Dry weight [g]	Wet weight [g]	Density
300	818.5	502.1	2.59
305	969.1	586.7	2.53
310	1630	1095	3.05
315	1372.7	914.2	2.99
320	1338.8	898.1	3.04
325	1037.3	657.3	2.73
330	1616.5	1086.9	3.05
335	1499.4	1006.3	3.04

IX. Assay and quality control certificates

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

CERTIFICATE TB17103883

Project: 0518

This report is for 268 Drill Core samples submitted to our lab in Thunder Bay, ON, Canada on 26-MAY-2017.

The following have access to data associated with this certificate:

CINDY HU	BILL MERCER	

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
CRU-32	Fine Crushing 90% <2mm
SPL-21	Split sample - riffle splitter
SPL-21X	Addnl Crush Split w No Analysis
SPL-21Xd	Addnl Crush Split with No Analysis-DUP
PUL-35a	Pulv 1 kg split to 95%<106 um
CRU-QC	Crushing QC Test
PUL-QC	Pulverizing QC Test
LOG-21	Sample logging - ClientBarCode
LOG-23	Pulp Login - Rcvd with Barcode

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-ICP06	Whole Rock Package - ICP-AES	ICP-AES
OA-GRA05	Loss on Ignition at 1000C	WST-SEQ
ME-MS81	Lithium Borate Fusion ICP-MS	ICP-MS
TOT-ICP06	Total Calculation for ICP06	ICP-AES
F-IC881	F - KOH fusion and IC	
ME-4ACD81	Base Metals by 4-acid dig.	ICP-AES
Li-OG63	Ore grade Li - 4ACID	ICP-AES
ME-OG62o	Ore Grade open beaker -ICPAES	ICP-AES

To: AVALON ADVANCED MATERIALS INC.
ATTN: BILL MERCER
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

Signature:

Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671001		8.39	23.1	5.7	30	97.8	1.44	0.33	<0.03	46.1	1.97	0.3	0.15	1.9	0.01	75.3
V671002		6.62	8.1	17.6	20	55.7	3.72	0.79	0.04	40.4	4.48	0.6	0.39	6.1	0.08	141.0
V671003		5.47	5.9	5.3	20	69.0	2.12	0.66	<0.03	42.4	1.94	0.2	0.26	2.0	0.11	111.0
V671004		1.22	104.0	9.2	60	25.0	3.15	2.14	0.94	12.2	2.74	1.2	0.70	4.1	0.32	2.4
V671005		8.18	5.2	24.2	30	34.8	5.11	1.72	0.03	40.1	5.33	1.5	0.68	8.1	0.31	151.5
V671006		4.89	2.2	25.5	20	18.30	6.15	2.11	<0.03	38.6	6.44	2.0	0.84	8.9	0.35	160.0
V671007		2.65	26.9	6.2	260	3.18	2.69	1.71	0.63	13.7	2.21	1.1	0.57	2.4	0.22	2.1
V671008		6.00	19.4	2.8	20	21.2	1.34	0.46	<0.03	43.4	1.16	1.0	0.16	0.9	0.06	78.6
V671009		3.47	1.7	24.4	10	20.3	5.04	1.02	<0.03	62.0	6.72	0.7	0.53	8.0	0.11	146.5
V671010		8.43	1.0	6.3	20	16.40	1.96	0.77	<0.03	46.1	1.41	1.5	0.27	2.1	0.13	86.0
V671011		8.18	2.1	8.9	10	22.6	1.95	0.57	<0.03	50.3	2.29	1.1	0.21	2.7	0.09	107.5
V671012		8.90	1.1	12.9	10	43.5	3.20	1.40	<0.03	49.3	2.53	1.1	0.47	4.4	0.29	107.5
V671013		8.54	1.3	15.9	10	31.8	3.89	1.18	<0.03	50.6	3.87	0.7	0.49	5.6	0.17	114.0
V671014		9.16	8.7	6.2	20	20.8	1.94	0.56	<0.03	34.0	1.84	0.8	0.24	2.3	0.08	80.9
V671015		9.63	4.3	7.1	20	7.99	1.83	0.71	0.03	37.6	1.11	0.7	0.27	2.6	0.13	87.0
V671016		3.38	8.6	15.1	30	6.31	2.63	1.38	0.04	33.3	1.98	1.0	0.45	5.6	0.33	66.9
V671017		6.81	14.5	18.3	20	9.78	7.98	6.91	0.03	25.1	3.64	1.7	1.67	7.8	2.43	80.4
V671018		7.77	10.8	10.8	20	15.15	3.63	2.32	0.03	24.1	2.13	1.5	0.67	4.9	0.57	77.8
V671019		10.29	13.1	11.7	20	14.60	3.74	2.31	0.04	25.7	2.17	0.9	0.68	5.4	0.59	75.9
V671020		2.87	8.3	14.6	20	2.67	3.02	1.49	0.11	39.7	2.34	2.5	0.45	5.4	0.44	129.0
V671021		6.65	6.7	14.7	10	4.83	4.62	3.54	0.04	21.2	2.47	1.4	0.93	6.8	0.80	85.9
V671022		8.07	7.1	15.8	40	4.59	5.36	4.70	0.06	22.4	2.73	1.4	1.19	7.3	1.70	63.2
V671023		2.63	170.0	18.2	130	7.98	3.59	2.37	1.34	14.8	3.53	2.0	0.84	8.0	0.36	3.4
V671024		3.06	236	17.4	50	8.74	5.88	3.65	1.44	19.9	5.21	3.1	1.31	6.8	0.53	4.9
V671025		0.03	18.7	2.9	30	28.5	0.83	0.20	<0.03	39.3	1.05	1.4	0.08	1.1	0.04	77.6
V671026		3.93	60.2	33.1	40	3.72	10.20	8.64	0.20	23.9	5.33	1.6	2.31	13.4	2.59	99.6
V671027		3.90	8.7	31.1	20	9.08	4.65	3.67	0.08	28.1	2.92	0.7	1.01	12.7	0.90	24.7
V671028		2.17	25.4	19.4	20	11.20	5.42	5.03	0.08	19.9	2.64	0.6	1.34	8.6	1.16	10.7
V671029		5.72	3.2	7.9	10	46.3	2.27	0.54	<0.03	48.3	2.31	0.8	0.26	2.4	0.07	94.5
V671030		8.63	2.2	9.6	10	36.2	2.42	0.61	<0.03	46.6	2.65	0.7	0.27	3.0	0.08	104.0
V671031		9.21	3.7	6.7	20	62.4	1.60	0.36	<0.03	48.2	1.87	0.3	0.18	2.3	0.04	88.0
V671032		7.73	8.8	6.4	10	54.1	2.03	0.61	<0.03	40.9	2.01	0.6	0.24	1.9	0.09	117.5
V671033		8.51	8.0	13.3	20	69.8	2.16	0.59	0.04	34.3	2.92	1.5	0.27	4.2	0.09	71.2
V671034		4.87	24.2	6.0	160	474	2.07	1.19	0.36	30.3	2.16	1.4	0.41	2.2	0.17	17.5
V671035		4.71	3.5	5.6	20	39.5	1.69	0.54	0.04	40.6	1.42	1.5	0.24	2.0	0.11	34.9
V671036		8.18	7.4	4.0	20	31.3	1.13	0.29	<0.03	36.1	0.86	1.4	0.14	1.3	0.05	21.9
V671037		5.98	7.0	7.0	20	147.5	0.94	0.24	<0.03	34.8	1.29	0.7	0.11	2.4	0.03	83.6
V671038		4.49	2.6	8.0	20	51.0	1.51	0.48	<0.03	48.2	1.65	0.8	0.20	2.5	0.09	113.0
V671039		4.51	7.5	4.1	20	80.9	0.63	0.15	<0.03	39.0	0.90	0.5	0.07	1.4	0.02	81.7
V671040		0.55	28.9	5.0	10	0.21	0.25	0.17	0.06	0.4	0.22	0.9	0.05	2.4	0.04	0.4

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671001		3.0	0.85	2270	1.98	153	15.0	23.1	0.38	3.69	0.03	3.46	11	3	6.9	0.28
V671002		8.8	2.48	2470	4.46	117	4.3	31.6	0.89	14.50	0.11	12.85	<5	3	17.5	0.91
V671003		2.7	0.72	2380	1.65	121	4.4	28.1	0.42	2.97	0.10	4.87	<5	2	11.9	0.93
V671004		6.4	1.41	67.1	2.07	2	28.8	<0.1	0.51	0.25	0.32	0.08	209	1	18.8	2.11
V671005		12.0	3.40	1030	5.81	63	5.7	36.3	1.07	18.20	0.29	10.00	<5	5	26.8	2.45
V671006		12.4	3.57	1020	6.01	54	2.3	36.0	1.38	17.10	0.36	11.60	<5	4	34.4	2.76
V671007		4.8	0.97	44.0	1.50	4	70.1	<0.1	0.41	0.27	0.25	0.13	255	1	15.4	1.74
V671008		1.6	0.38	1820	1.03	69	12.2	20.0	0.25	5.98	0.06	4.71	<5	4	6.5	0.69
V671009		12.0	3.48	1350	7.42	137	1.9	35.4	1.31	19.45	0.14	7.02	<5	9	24.5	1.15
V671010		3.0	0.93	1445	1.68	62	0.7	24.2	0.32	6.18	0.13	10.85	<5	5	11.9	1.22
V671011		4.6	1.33	1540	3.31	74	1.2	31.2	0.46	9.82	0.08	9.44	<5	6	10.2	0.91
V671012		5.8	1.75	1440	2.91	92	0.8	24.6	0.57	9.56	0.23	4.14	<5	7	19.2	2.32
V671013		7.6	2.24	1665	3.68	87	1.0	22.3	0.78	10.70	0.18	9.48	<5	7	21.2	1.47
V671014		2.9	0.80	1130	1.67	27	5.6	33.4	0.41	6.26	0.08	6.71	<5	3	10.9	0.89
V671015		3.0	0.91	870	1.23	23	5.2	28.9	0.30	7.20	0.11	7.14	<5	2	11.3	1.11
V671016		6.3	1.97	509	2.52	9	10.8	13.8	0.45	10.40	0.26	8.47	<5	1	19.6	2.38
V671017		7.5	2.25	736	2.89	6	5.7	10.9	1.04	11.25	1.57	22.9	<5	3	55.9	14.30
V671018		4.4	1.25	823	1.82	13	4.5	11.3	0.55	8.19	0.45	14.60	<5	3	22.8	3.88
V671019		4.8	1.41	896	1.90	14	6.9	12.8	0.56	6.51	0.46	9.18	<5	3	23.8	3.89
V671020		6.8	1.97	55.8	3.11	8	24.7	18.9	0.53	14.30	0.30	14.15	6	2	19.5	3.14
V671021		5.9	1.80	429	2.33	5	6.3	5.5	0.64	8.60	0.73	17.05	<5	2	24.4	5.77
V671022		6.5	1.97	415	2.40	4	10.0	6.4	0.71	7.90	1.07	11.70	<5	1	40.9	9.76
V671023		10.7	2.39	20.6	2.70	1	78.0	0.2	0.57	1.03	0.36	0.43	248	1	22.9	2.26
V671024		12.8	2.60	30.3	3.97	2	102.0	0.3	0.94	0.77	0.52	0.28	446	1	34.2	3.73
V671025		1.3	0.37	3010	0.92	306	12.0	58.0	0.21	3.86	0.03	2.93	<5	4	4.2	0.27
V671026		14.5	4.00	153.5	4.67	4	46.2	4.9	1.34	17.30	1.86	24.9	9	1	68.1	15.80
V671027		12.1	3.60	398	3.31	6	17.1	2.9	0.66	9.62	0.74	11.90	<5	1	37.2	5.87
V671028		7.5	2.22	476	2.09	3	14.5	0.9	0.62	10.90	0.95	9.86	<5	1	46.1	6.93
V671029		3.9	1.05	2540	2.39	136	1.8	28.8	0.51	8.06	0.10	3.61	<5	5	11.7	0.64
V671030		4.7	1.36	2090	2.90	114	1.8	28.3	0.55	9.23	0.09	4.72	<5	5	12.3	0.65
V671031		2.9	0.87	2420	1.89	128	3.1	23.7	0.40	5.86	0.06	3.80	<5	5	7.8	0.38
V671032		3.1	0.91	1875	1.89	86	5.6	35.9	0.44	8.32	0.09	6.59	<5	3	11.3	0.72
V671033		6.4	1.83	378	3.61	134	21.8	32.5	0.54	10.60	0.09	6.36	<5	1	11.3	0.72
V671034		4.1	0.88	3100	1.83	194	58.0	47.0	0.36	3.26	0.19	2.54	156	1	12.2	1.24
V671035		2.7	0.73	592	1.46	27	12.6	25.7	0.32	4.93	0.10	8.40	<5	1	10.3	0.86
V671036		1.9	0.52	1020	1.08	14	8.9	26.2	0.23	2.89	0.05	5.46	<5	1	6.7	0.43
V671037		3.2	0.94	1865	1.73	93	8.9	23.1	0.22	8.12	0.05	6.51	<5	2	5.0	0.32
V671038		3.9	1.08	1850	1.95	116	3.3	29.9	0.32	6.87	0.09	2.81	<5	5	8.5	0.62
V671039		1.9	0.56	2840	1.05	90	3.7	17.9	0.15	4.49	0.02	2.23	<5	3	3.2	0.15
V671040		1.9	0.51	6.2	0.31	<1	6.4	0.1	0.04	0.49	0.03	0.31	<5	1	1.6	0.19

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671001		5	71.5	15.55	1.89	0.97	0.27	5.24	4.15	<0.01	0.04	0.04	0.13	<0.01	<0.01	0.42
V671002		11	73.2	14.95	1.35	0.33	0.04	4.89	5.03	<0.01	0.02	0.02	0.04	<0.01	<0.01	0.22
V671003		4	73.4	14.75	1.87	0.55	0.07	5.01	4.50	<0.01	0.02	0.07	0.13	<0.01	<0.01	0.25
V671004		44	51.3	6.96	27.5	7.48	3.82	0.59	0.49	0.01	0.66	0.15	0.16	<0.01	0.01	0.38
V671005		24	76.2	13.50	1.63	0.56	0.13	5.03	2.55	<0.01	0.03	0.05	0.05	<0.01	<0.01	0.38
V671006		32	76.3	13.25	1.60	0.39	0.06	4.99	2.88	<0.01	0.02	0.05	0.04	<0.01	<0.01	0.26
V671007		39	40.9	12.60	20.7	10.75	4.95	1.70	0.14	0.03	0.64	0.20	0.05	0.01	<0.01	3.63
V671008		16	75.0	14.10	1.01	0.85	0.11	3.64	4.78	<0.01	0.01	0.02	0.04	<0.01	<0.01	1.06
V671009		10	78.2	14.40	1.22	0.29	0.04	4.26	2.54	<0.01	0.01	0.03	0.08	<0.01	<0.01	0.84
V671010		20	75.9	14.80	0.96	0.16	0.02	4.96	3.61	<0.01	0.01	0.08	0.04	<0.01	<0.01	0.41
V671011		16	75.3	14.45	1.00	0.17	0.02	4.89	3.51	<0.01	0.01	0.06	0.05	<0.01	<0.01	0.43
V671012		17	76.4	14.15	1.22	0.19	0.03	4.25	3.27	<0.01	0.01	0.10	0.03	<0.01	<0.01	0.63
V671013		11	77.0	14.60	1.21	0.22	0.05	4.00	4.21	<0.01	0.02	0.02	0.03	<0.01	<0.01	0.64
V671014		10	76.4	14.15	1.12	0.52	0.04	5.15	3.57	<0.01	0.01	0.07	0.07	<0.01	<0.01	0.13
V671015		11	76.0	14.30	1.02	0.46	0.03	4.96	3.79	<0.01	0.01	0.08	0.04	<0.01	<0.01	0.17
V671016		16	73.5	15.85	0.93	1.02	0.07	6.29	2.74	<0.01	0.01	0.08	0.03	<0.01	<0.01	0.19
V671017		30	76.7	13.30	1.10	0.56	0.02	4.15	4.40	<0.01	<0.01	0.22	0.03	<0.01	<0.01	0.09
V671018		29	76.0	13.45	1.02	0.43	0.05	3.72	5.17	<0.01	0.03	0.03	0.02	<0.01	<0.01	0.17
V671019		16	76.3	13.35	0.98	0.48	0.07	3.34	5.59	<0.01	0.03	0.04	0.03	<0.01	<0.01	0.30
V671020		43	74.5	15.85	1.02	1.52	0.20	7.46	0.27	<0.01	0.02	0.09	0.02	<0.01	<0.01	0.55
V671021		28	77.5	13.65	0.76	0.67	0.05	4.56	4.07	0.04	0.01	0.03	0.01	<0.01	<0.01	0.10
V671022		28	75.8	14.65	0.88	0.95	0.10	4.89	4.01	<0.01	0.02	0.13	0.01	<0.01	<0.01	0.05
V671023		72	44.8	7.36	30.5	6.87	3.79	0.97	0.40	0.02	0.80	0.64	0.07	0.01	0.02	2.11
V671024		115	44.5	12.10	24.7	8.05	3.87	1.86	0.57	0.01	1.65	1.00	0.15	0.01	0.03	0.39
V671025		16	73.4	15.70	2.52	0.22	0.08	3.58	2.61	<0.01	0.01	0.16	0.05	<0.01	<0.01	0.13
V671026		37	75.7	13.50	1.09	1.82	0.14	5.30	1.96	0.01	0.05	0.04	0.02	<0.01	0.01	0.95
V671027		13	74.8	14.70	0.84	1.40	0.09	4.95	3.37	<0.01	0.03	0.03	0.01	<0.01	<0.01	0.06
V671028		15	76.1	13.35	0.69	0.94	0.04	3.83	4.63	<0.01	0.02	0.02	0.01	<0.01	<0.01	0.16
V671029		11	75.5	14.10	1.04	0.14	0.02	3.60	4.65	<0.01	0.01	0.05	0.05	<0.01	<0.01	0.47
V671030		10	75.4	14.30	1.03	0.20	0.02	4.37	3.71	<0.01	0.01	0.04	0.04	<0.01	<0.01	0.48
V671031		4	74.9	14.80	1.13	0.26	0.05	4.28	4.29	<0.01	0.01	0.02	0.04	<0.01	<0.01	0.44
V671032		8	75.0	14.45	1.06	0.35	0.03	5.24	3.45	<0.01	0.01	0.06	0.06	<0.01	<0.01	0.25
V671033		18	77.2	13.45	1.12	1.09	0.16	6.34	0.31	<0.01	0.02	0.07	0.05	<0.01	<0.01	0.10
V671034		31	60.0	15.35	7.55	5.61	4.20	3.32	1.57	0.02	0.44	0.16	0.08	0.01	<0.01	0.79
V671035		14	74.3	15.25	0.92	1.06	0.09	7.05	0.99	<0.01	0.01	0.18	0.04	<0.01	<0.01	0.58
V671036		12	75.2	14.90	0.63	0.58	0.02	6.52	2.35	<0.01	<0.01	0.15	0.08	<0.01	<0.01	0.03
V671037		13	75.6	12.55	1.39	0.51	0.13	4.18	3.26	<0.01	0.02	0.03	0.04	<0.01	<0.01	0.33
V671038		12	74.8	14.25	0.85	0.23	0.05	4.44	3.63	<0.01	0.01	0.05	0.04	<0.01	<0.01	0.46
V671039		7	76.5	12.95	1.23	0.12	0.08	2.78	5.59	<0.01	0.01	0.02	0.04	<0.01	<0.01	0.37
V671040		34	97.9	0.23	0.60	0.04	0.02	0.03	0.14	<0.01	0.01	0.01	0.01	<0.01	<0.01	-0.09

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	TOT-ICP06	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671001		100.20	730	<0.5	<5	<0.5	1	5	190	<1	5	10	3	20	85	
V671002		100.09	400	<0.5	<5	<0.5	1	2	140	<1	<1	9	3	20	54	
V671003		100.62	600	<0.5	<5	<0.5	1	1	210	<1	1	10	4	20	90	
V671004		99.51	220	<0.5	<5	1.7	47	426	150	<1	44	4	19	<10	119	
V671005		100.11	640	<0.5	<5	<0.5	1	5	160	<1	2	11	7	10	60	
V671006		99.84	470	<0.5	<5	<0.5	<1	2	140	<1	1	11	5	10	79	
V671007		96.30	210	<0.5	<5	0.9	87	312	150	<1	183	3	34	<10	93	
V671008		100.62	630	<0.5	<5	<0.5	1	4	150	<1	3	5	2	10	40	
V671009		101.91	1900	<0.5	<5	<0.5	<1	<1	270	<1	1	17	5	10	92	
V671010		100.95	880	<0.5	<5	<0.5	1	1	150	<1	1	8	2	10	54	
V671011		99.89	750	<0.5	<5	<0.5	<1	1	120	<1	<1	7	2	10	57	
V671012		100.28	2330	<0.5	<5	<0.5	2	1	290	<1	2	13	7	10	81	
V671013		102.00	2130	<0.5	<5	<0.5	<1	<1	240	<1	1	9	11	10	56	
V671014		101.23	370	<0.5	<5	<0.5	<1	4	60	1	2	8	3	10	30	
V671015		100.86	320	<0.5	<5	<0.5	<1	1	50	1	<1	11	3	10	29	
V671016		100.71	140	<0.5	<5	<0.5	<1	6	40	<1	1	6	3	<10	20	
V671017		100.57	100	<0.5	<5	<0.5	1	1	20	<1	<1	25	7	<10	5	
V671018		100.09	380	<0.5	<5	<0.5	1	2	70	<1	<1	28	5	10	13	
V671019		100.51	360	<0.5	<5	<0.5	<1	1	60	<1	<1	28	6	10	11	
V671020		101.50	220	<0.5	<5	<0.5	1	8	50	<1	2	6	1	<10	8	
V671021		101.45	170	<0.5	<5	<0.5	<1	1	30	3	<1	26	3	<10	7	
V671022		101.49	200	<0.5	<5	<0.5	1	3	20	1	1	26	3	<10	5	
V671023		98.36	340	<0.5	<5	1.2	100	618	30	1	81	5	22	<10	171	
V671024		98.89	400	<0.5	<5	1.1	39	104	60	<1	43	4	37	<10	224	
V671025		98.46	2090	<0.5	<5	<0.5	1	39	6120	6	16	7	<1	20	97	0.697
V671026		100.59	310	<0.5	<5	<0.5	1	12	30	<1	<1	19	5	<10	10	
V671027		100.28	230	<0.5	<5	<0.5	<1	1	30	<1	1	23	2	<10	7	
V671028		99.79	260	<0.5	<5	<0.5	1	1	30	<1	<1	26	1	10	7	
V671029		99.63	760	<0.5	<5	<0.5	<1	2	220	<1	1	9	2	10	53	
V671030		99.60	860	<0.5	<5	<0.5	1	<1	230	<1	<1	4	2	10	62	
V671031		100.22	820	<0.5	<5	<0.5	<1	4	250	<1	1	10	3	20	60	
V671032		99.96	400	<0.5	<5	<0.5	<1	1	140	<1	1	13	2	10	44	
V671033		99.91	200	<0.5	<5	<0.5	1	9	100	1	3	10	2	<10	32	
V671034		99.10	6650	<0.5	<5	0.5	30	147	800	<1	84	4	21	20	94	
V671035		100.47	260	<0.5	<5	<0.5	1	4	120	1	4	10	2	<10	19	
V671036		100.46	140	<0.5	<5	<0.5	<1	2	50	<1	1	7	1	10	8	
V671037		98.04	800	<0.5	<5	<0.5	1	6	380	<1	2	10	3	10	75	
V671038		98.81	920	<0.5	<5	<0.5	<1	1	330	<1	<1	10	5	10	33	
V671039		99.69	850	<0.5	<5	<0.5	<1	2	410	<1	1	14	5	20	69	
V671040		98.90	<20	<0.5	<5	<0.5	<1	1	<10	<1	1	<2	<1	<10	<2	

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671041		2.14	<0.5	11.4	10	29.8	2.66	0.77	<0.03	48.9	2.76	0.8	0.34	3.7	0.11	112.5
V671042		6.38	4.1	4.1	10	68.0	1.20	0.30	<0.03	38.5	1.27	0.3	0.13	1.5	0.03	74.7
V671043		2.04	<0.5	14.4	10	21.5	3.32	0.95	<0.03	46.9	3.57	0.9	0.42	4.6	0.14	102.0
V671044		2.45	1.9	19.5	30	37.8	4.48	1.24	<0.03	57.3	5.18	1.8	0.53	6.1	0.16	151.5
V671045		2.25	0.8	2.8	20	47.5	0.73	0.21	<0.03	38.5	0.60	2.1	0.09	1.0	0.06	72.6
V671046		3.67	4.1	22.9	70	142.0	5.76	1.40	0.10	37.5	7.32	2.0	0.63	7.1	0.24	89.0
V671047		1.74	8.1	7.5	50	168.0	1.61	0.54	0.09	43.7	1.89	11.0	0.23	2.5	0.11	94.6
V671048		5.91	3.3	5.1	30	21.7	1.61	0.43	0.04	37.1	1.37	3.7	0.19	1.6	0.11	57.4
V671049		4.81	2.8	3.4	50	332	1.37	0.51	0.05	43.7	1.22	1.0	0.19	1.2	0.09	68.7
V671050		0.03	18.6	3.4	30	27.7	1.02	0.19	<0.03	38.3	1.37	1.5	0.10	1.3	0.04	78.3
V671051		8.40	7.8	5.0	110	139.5	1.51	0.81	0.21	32.4	1.35	1.4	0.28	1.7	0.12	81.1
V671052		9.03	5.5	3.8	60	166.0	1.18	0.46	0.06	32.5	0.86	1.6	0.17	1.4	0.08	52.5
V671053		10.24	1.2	2.8	30	49.0	0.99	0.42	0.03	31.0	0.69	1.0	0.15	1.1	0.12	38.1
V671054		9.35	1.5	4.1	30	65.6	1.69	0.82	<0.03	28.4	1.08	1.7	0.28	1.4	0.23	79.2
V671055		5.49	<0.5	13.7	40	156.5	2.60	0.74	<0.03	19.6	3.32	1.9	0.31	4.1	0.11	43.5
V671056/V671057		12.25	2.1	5.6	20	61.9	1.00	0.31	<0.03	33.3	1.05	1.5	0.13	1.9	0.07	106.5
V671057		Destroyed														
V671058		8.09	1.0	5.5	20	55.5	1.13	0.38	<0.03	36.4	0.88	1.7	0.13	2.8	0.08	91.4
V671059		7.30	0.5	10.9	30	45.6	0.64	0.23	0.03	37.5	0.80	0.8	0.10	6.1	0.05	79.5
V671060		8.12	<0.5	2.8	20	46.4	0.62	0.14	<0.03	37.4	0.76	0.8	0.06	1.1	0.01	107.5
V671061		4.28	<0.5	2.4	20	39.1	0.62	0.16	<0.03	34.1	0.63	1.2	0.07	1.1	0.03	86.0
V671062		5.95	2.1	1.8	20	49.0	0.82	0.35	<0.03	32.4	0.56	1.2	0.11	0.8	0.09	68.6
V671063		3.16	3.0	2.9	100	523	0.77	0.56	0.22	4.7	0.66	0.2	0.18	1.5	0.07	1.8
V671064		1.61	<0.5	1.9	20	7.56	0.60	0.15	<0.03	37.7	0.59	0.9	0.06	1.0	0.02	100.5
V671065		2.71	2.9	10.9	30	66.4	2.96	0.92	0.03	45.5	3.03	1.9	0.33	3.9	0.13	94.4
V671066		1.95	3.7	3.0	30	116.0	0.92	0.21	0.03	35.1	1.14	1.3	0.10	1.1	0.01	58.6
V671067		2.72	4.5	3.0	30	117.0	0.91	0.33	<0.03	31.6	1.19	0.9	0.10	1.3	0.04	53.2
V671068		1.41	13.3	2.1	50	1195	0.58	0.39	0.14	49.7	0.65	1.9	0.12	1.1	0.04	59.2
V671069		4.04	7.2	2.4	30	327	1.36	0.29	<0.03	42.5	1.84	1.3	0.12	0.9	0.03	66.9
V671070		1.64	10.0	0.7	30	352	0.20	0.04	<0.03	56.2	0.15	4.2	0.01	<0.5	<0.01	36.5
V671071		1.35	18.2	2.5	20	98.2	1.19	0.36	0.04	47.6	1.08	1.9	0.14	1.2	0.08	99.3
V671072		0.93	17.9	<0.5	30	205	0.12	0.05	0.05	53.9	0.14	3.4	0.01	<0.5	<0.01	51.6
V671073		2.35	2.6	5.1	60	403	1.68	0.50	0.08	54.7	2.59	2.6	0.17	1.7	0.05	62.0
V671074		8.18	25.2	5.6	400	907	2.65	1.56	0.53	19.2	2.20	1.2	0.52	2.4	0.22	6.1
V671075		0.03	19.8	3.0	30	26.6	1.03	0.17	<0.03	39.7	1.26	1.6	0.09	1.3	0.03	74.6
V671076		3.67	6.0	2.1	80	407	0.26	0.14	0.04	50.5	0.38	2.4	0.05	1.1	0.01	46.7
V671077		5.75	10.8	4.6	400	1270	2.28	1.56	0.52	17.0	1.95	1.2	0.53	1.7	0.22	3.5
V671078		4.98	<0.5	0.9	30	54.6	0.09	0.03	<0.03	51.7	0.10	1.7	0.01	0.6	<0.01	28.5
V671079		1.55	9.2	5.6	440	769	2.89	1.72	0.55	16.0	2.08	1.2	0.60	2.1	0.28	2.1
V671080		0.45	29.2	4.5	10	0.68	0.16	0.14	0.04	0.3	0.22	0.6	0.03	2.3	0.01	<0.2

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671041		5.5	1.54	2130	3.09	82	0.6	33.0	0.58	9.98	0.13	8.73	<5	6	14.4	0.99
V671042		1.9	0.54	2810	1.06	85	3.2	16.0	0.26	3.34	0.05	5.48	<5	3	6.5	0.31
V671043		6.7	1.93	1810	3.73	79	0.8	29.9	0.72	11.70	0.15	11.60	<5	6	17.8	1.18
V671044		9.3	2.67	2420	5.71	171	9.2	35.6	1.02	18.15	0.21	17.40	<5	8	23.4	1.44
V671045		1.2	0.34	2070	0.62	29	2.4	38.7	0.13	5.07	0.05	7.45	<5	2	4.5	0.43
V671046		11.2	3.15	1675	7.69	2140	28.9	65.3	1.43	18.45	0.23	9.78	49	11	30.9	1.85
V671047		3.7	1.01	1040	2.13	207	40.1	88.3	0.38	8.53	0.10	15.85	27	2	9.3	0.74
V671048		2.4	0.67	635	1.36	159	14.3	41.3	0.32	5.96	0.10	11.85	<5	1	9.7	0.80
V671049		1.7	0.45	1220	1.12	233	20.0	74.1	0.30	5.47	0.09	6.68	28	3	8.3	0.67
V671050		1.6	0.48	2960	1.15	317	11.7	57.7	0.28	4.43	0.03	3.14	<5	4	5.1	0.28
V671051		3.1	0.69	2180	1.13	93	41.9	44.9	0.26	2.98	0.14	3.63	96	3	9.1	0.85
V671052		1.7	0.44	2680	0.72	73	13.1	41.1	0.19	3.21	0.08	4.79	41	43	7.0	0.62
V671053		1.1	0.33	1790	0.59	79	5.6	32.3	0.18	3.22	0.09	3.54	<5	3	6.5	0.79
V671054		1.9	0.54	1115	1.06	122	7.1	39.2	0.28	6.15	0.18	5.70	<5	4	11.8	1.62
V671055		7.0	1.87	496	3.79	33	2.3	13.9	0.63	8.69	0.13	4.77	<5	2	14.6	0.87
V671056/V671057		2.3	0.72	1800	1.21	180	3.6	38.1	0.22	4.46	0.06	7.44	<5	2	5.5	0.44
V671057																
V671058		2.1	0.61	2390	0.81	200	2.1	37.2	0.21	2.89	0.07	6.90	<5	3	7.2	0.67
V671059		3.7	1.14	1985	0.97	234	1.8	32.0	0.15	3.12	0.06	6.04	<5	3	4.1	0.40
V671060		1.2	0.38	1880	0.66	285	1.8	43.3	0.11	3.05	0.03	4.81	<5	2	3.1	0.22
V671061		0.9	0.29	1835	0.59	212	1.8	34.4	0.13	2.71	0.03	5.80	<5	3	3.2	0.25
V671062		0.7	0.22	1970	0.49	131	5.5	61.3	0.13	2.81	0.06	5.13	<5	2	5.8	0.76
V671063		1.7	0.38	305	0.55	21	24.4	1.3	0.12	<0.05	0.08	<0.05	46	58	4.9	0.49
V671064		0.7	0.21	51.2	0.45	879	17.0	113.0	0.13	3.81	0.02	5.44	<5	3	3.4	0.24
V671065		5.7	1.55	1280	3.25	247	12.5	53.3	0.61	8.55	0.13	12.25	<5	3	15.1	1.08
V671066		1.7	0.42	227	1.21	298	20.5	65.0	0.21	3.40	0.03	4.84	<5	2	4.7	0.23
V671067		1.6	0.42	1385	1.33	398	13.9	66.3	0.22	3.11	0.04	3.85	6	2	5.2	0.45
V671068		1.1	0.28	1850	0.50	124	72.6	339	0.10	1.79	0.05	3.52	47	5	3.9	0.42
V671069		1.3	0.32	3150	1.43	171	10.3	67.4	0.37	1.69	0.04	4.72	<5	3	7.0	0.36
V671070		0.3	0.07	2600	0.12	354	18.8	83.0	0.04	1.49	0.01	6.42	<5	2	1.4	0.14
V671071		1.0	0.31	1200	0.85	1295	43.3	163.0	0.27	3.45	0.07	5.96	<5	3	7.6	0.77
V671072		0.3	0.05	354	0.10	82	24.4	495	0.01	3.37	<0.01	9.02	10	6	0.9	0.05
V671073		2.8	0.78	1890	2.39	1825	27.7	182.5	0.50	5.19	0.06	4.08	27	7	9.0	0.51
V671074		4.1	0.85	2560	1.63	101	78.6	12.0	0.36	0.92	0.22	0.72	245	21	14.4	1.51
V671075		1.5	0.39	3300	1.08	293	11.9	55.5	0.24	3.57	0.03	2.82	<5	4	5.0	0.30
V671076		0.9	0.25	2260	0.37	348	17.9	262	0.06	1.37	0.02	2.92	25	3	1.9	0.14
V671077		3.7	0.74	3410	1.29	29	77.3	15.9	0.34	0.27	0.22	0.12	252	9	14.0	1.49
V671078		0.3	0.10	2910	0.09	288	11.0	95.4	0.02	1.42	<0.01	2.46	<5	2	0.9	0.09
V671079		4.5	0.92	3610	1.60	23	83.4	3.7	0.38	0.18	0.28	<0.05	267	1	16.4	1.85
V671080		1.6	0.46	6.7	0.31	<1	6.3	0.1	0.01	0.36	0.01	0.20	<5	<1	1.4	0.17

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671041		11	74.4	14.45	1.04	0.16	0.02	4.32	3.77	<0.01	0.01	0.04	0.04	<0.01	<0.01	0.45
V671042		4	74.4	14.10	1.18	0.17	0.04	3.40	5.52	<0.01	0.01	0.02	0.04	<0.01	<0.01	0.34
V671043		12	75.6	14.00	1.17	0.21	0.02	4.57	3.10	<0.01	0.01	0.05	0.05	<0.01	<0.01	0.35
V671044		24	76.3	13.15	2.23	0.47	0.09	3.35	3.44	<0.01	0.02	0.10	0.04	<0.01	<0.01	0.53
V671045		21	74.0	14.95	0.61	0.22	0.03	5.99	3.52	<0.01	<0.01	0.23	0.06	<0.01	<0.01	0.01
V671046		27	71.8	14.25	3.58	1.84	1.29	5.23	1.03	0.01	0.13	0.38	0.05	<0.01	<0.01	0.23
V671047		83	70.4	15.55	2.29	2.06	0.84	6.25	0.73	0.01	0.09	0.18	0.17	0.01	<0.01	0.22
V671048		36	73.3	16.10	1.05	0.88	0.10	7.30	1.51	0.01	0.01	0.27	0.08	<0.01	<0.01	-0.02
V671049		13	70.7	16.45	1.90	1.29	0.70	7.20	0.97	0.01	0.07	0.18	0.09	<0.01	<0.01	0.19
V671050		15	73.3	15.60	2.48	0.21	0.07	3.56	2.59	<0.01	0.01	0.16	0.06	<0.01	<0.01	0.05
V671051		26	65.5	15.15	5.44	3.93	2.68	3.78	2.48	0.02	0.28	0.15	0.08	0.01	<0.01	0.73
V671052		20	69.3	14.90	2.69	1.60	1.48	5.13	2.70	0.01	0.10	0.11	0.09	<0.01	<0.01	0.71
V671053		11	78.5	12.35	1.01	0.45	0.09	4.53	2.33	<0.01	0.01	0.11	0.05	<0.01	<0.01	0.23
V671054		23	83.0	9.02	1.88	0.64	0.15	3.08	1.18	<0.01	0.02	0.17	0.05	<0.01	<0.01	0.39
V671055		27	88.0	5.96	2.18	0.18	0.15	1.89	0.69	0.01	<0.01	0.18	0.02	<0.01	<0.01	0.16
V671056/V671057		19	73.4	14.60	0.98	0.31	0.05	4.80	4.13	<0.01	<0.01	0.09	0.05	<0.01	<0.01	0.20
V671057																
V671058		20	74.1	15.65	0.82	0.20	0.04	4.77	4.67	<0.01	<0.01	0.09	0.04	<0.01	<0.01	0.24
V671059		8	74.2	15.45	0.90	0.17	0.03	5.77	3.39	<0.01	<0.01	0.05	0.02	<0.01	<0.01	0.16
V671060		8	73.0	15.20	0.82	0.22	0.03	5.70	3.22	<0.01	<0.01	0.05	0.02	<0.01	<0.01	0.28
V671061		13	74.3	15.65	0.77	0.18	0.02	6.04	3.24	<0.01	<0.01	0.05	0.04	<0.01	<0.01	0.11
V671062		10	73.6	15.60	0.63	0.33	0.03	6.29	3.09	<0.01	<0.01	0.14	0.07	<0.01	<0.01	0.04
V671063		7	83.4	3.80	3.18	7.37	1.59	0.19	0.20	0.01	0.13	0.07	0.07	<0.01	<0.01	1.41
V671064		19	75.8	15.40	0.66	0.72	0.02	7.99	0.11	<0.01	<0.01	0.13	0.03	<0.01	<0.01	0.06
V671065		20	74.9	14.45	1.32	0.83	0.08	5.96	1.83	<0.01	0.01	0.09	0.06	<0.01	<0.01	0.23
V671066		11	74.6	15.95	0.87	1.25	0.18	6.69	0.26	<0.01	0.01	0.02	0.09	<0.01	<0.01	0.07
V671067		10	78.1	13.45	0.98	0.93	0.21	5.60	1.43	<0.01	0.02	0.12	0.11	<0.01	<0.01	0.06
V671068		15	68.0	16.45	2.55	3.60	1.26	5.85	0.82	0.01	0.13	0.05	0.48	0.01	<0.01	0.39
V671069		11	75.9	16.75	0.71	0.50	0.04	3.91	2.12	<0.01	<0.01	0.04	0.14	<0.01	<0.01	0.16
V671070		31	75.2	16.50	0.74	0.81	0.06	6.37	1.58	<0.01	0.01	0.05	0.18	<0.01	<0.01	0.12
V671071		16	75.2	15.90	0.72	1.24	0.05	6.89	1.13	<0.01	<0.01	0.14	0.13	0.01	<0.01	0.20
V671072		22	71.8	16.25	0.79	1.83	0.22	8.33	0.20	0.01	0.03	0.03	0.69	<0.01	<0.01	0.11
V671073		34	68.4	17.55	1.71	2.63	1.01	7.57	0.79	0.01	0.07	0.04	0.24	0.01	<0.01	0.89
V671074		36	50.4	15.20	10.85	10.45	7.51	1.57	0.97	0.05	0.62	0.21	0.07	0.01	<0.01	0.94
V671075		21	74.5	15.90	2.50	0.22	0.08	3.59	2.61	<0.01	0.01	0.16	0.05	0.01	<0.01	0.17
V671076		17	71.6	16.65	1.73	1.49	0.68	4.93	0.86	0.01	0.06	0.08	0.23	<0.01	<0.01	0.34
V671077		33	49.0	15.05	11.10	10.70	8.07	1.18	1.15	0.05	0.63	0.21	0.13	0.01	<0.01	0.93
V671078		11	74.5	16.85	0.67	0.53	0.06	4.32	1.65	<0.01	0.01	0.23	0.11	0.01	<0.01	0.59
V671079		37	48.9	14.85	11.75	10.85	8.18	1.13	1.46	0.06	0.67	0.22	0.04	0.01	<0.01	1.20
V671080		24	99.3	0.25	0.82	0.06	0.03	0.04	0.13	<0.01	0.01	0.01	0.01	<0.01	<0.01	0.04

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	TOT-ICP06	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671041		98.70	880	<0.5	<5	<0.5	<1	1	360	<1	1	12	4	10	66	
V671042		99.22	820	<0.5	<5	<0.5	<1	<1	420	<1	<1	8	3	20	62	
V671043		99.13	1060	<0.5	<5	<0.5	<1	1	320	<1	2	11	3	10	73	
V671044		99.72	1110	<0.5	<5	<0.5	<1	3	390	<1	2	22	5	10	152	
V671045		99.62	190	<0.5	<5	<0.5	<1	2	100	1	2	8	1	10	42	
V671046		99.82	2770	<0.5	<5	0.5	8	54	440	1	27	10	7	10	176	
V671047		98.80	1130	<0.5	9	0.5	5	52	260	1	18	18	5	10	77	
V671048		100.59	180	<0.5	<5	<0.5	<1	14	110	<1	3	9	1	<10	33	
V671049		99.75	1580	<0.5	6	<0.5	5	8	500	<1	15	8	5	10	89	
V671050		98.09	2130	<0.5	<5	<0.5	1	42	6190	6	19	8	<1	20	105	0.681
V671051		100.23	4200	<0.5	<5	<0.5	18	53	780	<1	54	5	15	10	130	
V671052		98.82	7460	<0.5	<5	<0.5	8	36	920	<1	22	6	7	10	83	
V671053		99.66	1060	<0.5	<5	<0.5	1	3	460	<1	4	5	3	10	37	
V671054		99.58	1390	<0.5	<5	<0.5	<1	8	540	1	3	3	6	10	96	
V671055		99.42	530	<0.5	<5	<0.5	<1	3	410	1	3	14	2	10	67	
V671056/V671057		98.61	450	<0.5	<5	<0.5	<1	2	360	<1	1	10	1	20	54	
V671057																
V671058		100.62	550	<0.5	<5	<0.5	<1	1	950	<1	1	8	2	20	55	
V671059		100.14	540	<0.5	<5	<0.5	<1	2	550	<1	1	6	1	10	70	
V671060		98.54	410	<0.5	<5	<0.5	<1	2	570	<1	1	6	<1	10	80	
V671061		100.40	390	<0.5	<5	<0.5	<1	3	480	<1	<1	3	<1	10	72	
V671062		99.82	250	<0.5	<5	<0.5	<1	2	260	<1	2	6	<1	10	37	
V671063		101.42	>20000	0.6	29	<0.5	11	167	280	<1	32	2	8	<10	27	
V671064		100.92	130	<0.5	<5	<0.5	<1	5	70	<1	2	6	<1	<10	30	
V671065		99.76	360	<0.5	5	<0.5	<1	25	220	1	1	8	2	10	68	
V671066		99.99	300	<0.5	5	<0.5	<1	4	2470	<1	3	7	1	<10	23	
V671067		101.01	320	<0.5	<5	<0.5	1	20	1070	<1	4	5	1	10	29	
V671068		99.60	1910	<0.5	21	<0.5	9	52	530	1	27	<2	7	20	37	
V671069		100.27	320	<0.5	9	<0.5	<1	2	8090	1	<1	2	<1	20	55	0.919
V671070		101.62	240	<0.5	6	0.7	<1	5	3640	<1	3	3	<1	20	38	
V671071		101.61	200	<0.5	7	<0.5	<1	6	630	<1	1	6	1	10	20	
V671072		100.29	700	<0.5	5	<0.5	<1	9	420	<1	6	5	1	<10	8	
V671073		100.92	7730	<0.5	14	<0.5	5	10	930	<1	16	4	4	10	24	
V671074		98.85	7590	<0.5	6	0.9	46	155	1710	<1	139	<2	36	20	100	
V671075		99.80	2120	<0.5	<5	<0.5	1	41	6240	7	16	4	<1	20	104	0.716
V671076		98.66	2960	<0.5	7	<0.5	3	14	6210	1	13	<2	3	10	31	0.684
V671077		98.21	8920	<0.5	<5	0.8	45	134	1590	<1	142	<2	34	30	79	
V671078		99.53	3000	<0.5	<5	<0.5	<1	2	7260	1	2	<2	<1	20	40	0.801
V671079		99.32	16700	<0.5	<5	1.1	50	182	1570	<1	156	2	43	30	88	
V671080		100.70	<20	<0.5	<5	<0.5	1	2	10	1	<1	2	<1	<10	<2	

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671081		6.91	<0.5	0.8	20	52.2	0.16	0.04	<0.03	51.3	0.20	1.3	0.02	<0.5	<0.01	42.0
V671082		6.67	16.7	4.7	230	2460	2.12	1.51	0.47	24.3	1.85	1.4	0.46	1.9	0.21	18.7
V671083		4.50	1.5	0.8	30	372	0.12	0.09	<0.03	53.9	0.18	2.3	0.02	0.5	<0.01	51.3
V671084		9.82	6.6	2.9	110	1280	1.18	0.71	0.26	38.9	1.07	1.8	0.28	1.2	0.11	30.3
V671085		2.96	19.4	4.7	180	2500	2.52	1.76	0.56	20.3	2.14	1.7	0.60	1.7	0.25	7.3
V671086		9.11	<0.5	0.7	20	39.2	0.20	0.08	<0.03	51.3	0.27	1.5	0.02	<0.5	<0.01	62.2
V671087		7.89	<0.5	1.4	20	40.3	0.51	0.10	<0.03	46.2	0.52	1.2	0.04	0.6	0.01	61.8
V671088		7.66	0.5	1.5	20	51.5	0.68	0.15	<0.03	43.7	0.78	2.1	0.08	0.7	0.02	75.7
V671089		7.67	<0.5	1.5	20	42.5	0.67	0.11	<0.03	50.6	0.84	2.2	0.06	0.6	0.01	75.1
V671090		5.55	<0.5	0.7	30	57.6	0.40	0.08	<0.03	47.8	0.48	1.6	0.04	<0.5	0.01	64.4
V671091		9.34	22.2	4.7	240	1790	2.46	1.59	0.55	23.0	2.12	1.9	0.54	1.7	0.23	15.2
V671092		5.56	28.3	2.4	110	593	1.24	0.67	0.22	46.5	1.01	4.4	0.21	1.0	0.09	38.9
V671093		8.95	50.6	6.9	120	421	3.10	1.80	0.63	27.1	2.58	2.8	0.62	2.6	0.24	15.7
V671094		6.51	25.7	5.7	70	266	2.32	1.41	0.34	34.4	2.09	2.7	0.46	2.1	0.17	40.7
V671095		4.40	95.1	11.7	170	196.5	5.21	3.36	1.01	27.6	4.61	2.8	1.07	4.4	0.45	19.6
V671096		7.02	1.4	0.6	20	12.30	0.38	0.11	<0.03	31.0	0.28	2.2	0.04	<0.5	<0.01	53.0
V671097		11.72	47.2	11.0	160	75.7	4.90	3.04	1.00	16.8	4.27	2.2	1.00	4.1	0.42	3.3
V671098		6.19	6.7	6.1	20	14.95	1.97	0.55	<0.03	38.1	2.63	0.8	0.21	2.0	0.06	80.4
V671099		2.00	2.4	2.3	20	5.52	0.50	0.10	<0.03	37.8	0.67	8.8	0.04	0.9	<0.01	33.8
V671100		0.03	19.3	2.8	30	25.9	0.94	0.14	<0.03	35.3	1.11	1.4	0.08	1.0	<0.01	75.1
V671101		2.46	1.1	1.7	50	21.3	5.87	2.86	<0.03	9.2	1.70	6.5	0.90	0.5	0.58	16.7
V671102		8.15	5.4	5.6	70	163.5	1.93	0.81	0.03	36.1	1.66	1.1	0.28	2.0	0.09	21.1
V671103		5.44	4.1	1.8	30	39.6	0.67	0.20	<0.03	34.5	0.43	0.5	0.07	0.7	<0.01	8.2
V671104		3.82	2.5	2.4	40	55.6	2.32	0.97	<0.03	32.5	0.92	0.7	0.32	0.9	0.13	54.0
V671105		4.69	4.2	10.3	30	75.7	2.22	0.81	<0.03	40.0	2.10	1.8	0.29	3.5	0.14	59.5
V671106		10.86	2.7	2.7	30	51.7	0.83	0.30	<0.03	37.8	0.72	1.7	0.12	0.9	0.03	88.8
V671107		2.53	1.5	6.1	20	53.2	1.32	0.33	<0.03	30.6	1.37	0.4	0.14	2.2	0.02	54.9
V671108		5.79	1.1	1.2	30	121.5	0.43	0.10	<0.03	19.0	0.40	1.2	0.06	<0.5	<0.01	36.0
V671109		12.07	2.1	3.0	20	46.9	0.72	0.27	<0.03	30.1	0.67	0.5	0.08	1.2	<0.01	97.7
V671110		7.36	1.9	3.8	30	61.7	1.84	0.73	<0.03	32.9	1.26	2.2	0.24	1.4	0.11	64.0
V671111		6.87	2.3	6.0	40	101.0	1.23	0.40	<0.03	30.4	1.49	0.7	0.18	2.3	0.02	96.1
V671112		4.21	2.8	12.6	30	104.0	3.86	1.12	<0.03	18.8	3.62	0.6	0.43	4.0	0.11	34.7
V671113		8.55	2.8	7.2	20	58.8	0.93	0.35	<0.03	30.0	1.06	<0.2	0.11	2.5	0.05	74.2
V671114		7.71	2.0	5.7	20	37.9	1.97	0.61	<0.03	32.5	1.68	0.2	0.25	2.1	0.08	85.3
V671115		8.63	2.1	6.7	30	28.2	1.52	0.54	<0.03	34.0	1.51	0.2	0.20	2.6	0.03	77.8
V671116		8.00	4.7	6.8	20	48.7	1.54	0.63	<0.03	35.8	1.55	0.4	0.20	2.6	0.07	74.1
V671117		10.39	6.1	6.6	20	69.3	1.59	0.46	<0.03	31.4	1.60	0.2	0.20	2.4	0.06	70.2
V671118		4.44	5.0	8.9	30	82.6	1.81	0.57	<0.03	36.7	1.87	0.3	0.20	3.0	0.07	113.5
V671119		1.34	7.1	1.7	30	161.0	0.40	0.16	0.03	43.5	0.57	0.8	0.06	0.7	<0.01	72.2
V671120		0.46	28.5	4.3	10	0.18	0.16	0.12	<0.03	0.5	0.24	0.6	0.03	2.1	<0.01	0.3

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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Finalized Date: 27-JUN-2017
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CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671081		0.3	0.09	5310	0.13	295	7.9	80.5	0.04	2.52	<0.01	3.74	<5	3	1.3	0.07
V671082		3.6	0.76	3350	1.28	77	78.2	115.5	0.31	0.69	0.21	0.89	217	7	13.1	1.35
V671083		0.5	0.11	2930	0.15	261	15.7	244	0.02	2.56	<0.01	3.85	10	8	1.1	0.10
V671084		2.3	0.45	4250	0.83	221	37.7	104.5	0.18	1.65	0.11	2.19	113	10	7.2	0.78
V671085		4.1	0.76	4020	1.52	55	68.3	63.4	0.38	0.25	0.25	0.17	254	1	15.1	1.69
V671086		0.3	0.09	4670	0.27	293	3.7	71.9	0.05	2.66	<0.01	5.71	<5	4	1.3	0.06
V671087		0.6	0.18	4670	0.53	326	3.0	63.2	0.12	2.85	0.02	5.86	<5	4	2.6	0.15
V671088		0.7	0.17	4770	0.58	287	5.1	67.3	0.17	2.99	0.02	6.70	<5	5	3.8	0.25
V671089		0.8	0.20	4560	0.64	357	5.0	62.8	0.17	4.01	0.01	7.42	<5	5	3.6	0.23
V671090		0.3	0.09	4480	0.38	292	7.5	74.9	0.11	2.84	0.01	6.76	<5	4	2.6	0.18
V671091		3.9	0.76	3380	1.38	90	69.3	85.6	0.36	0.69	0.23	1.08	216	6	14.6	1.60
V671092		1.6	0.37	4270	0.80	310	34.6	97.8	0.20	2.09	0.11	5.38	86	4	7.2	0.73
V671093		5.2	1.01	2360	1.67	167	60.3	39.5	0.43	1.16	0.23	2.41	234	10	15.7	1.71
V671094		4.1	0.81	2730	1.59	645	41.6	95.4	0.36	4.63	0.18	4.80	136	13	12.1	1.35
V671095		9.1	1.76	871	2.88	162	103.0	23.9	0.76	1.14	0.45	2.30	386	2	26.8	3.13
V671096		0.2	0.04	1055	0.16	469	6.7	74.4	0.04	2.28	<0.01	7.04	<5	2	2.2	0.20
V671097		8.2	1.56	641	2.87	16	104.0	0.3	0.67	0.40	0.40	0.13	362	2	23.9	2.55
V671098		3.2	0.83	3360	2.39	2010	10.8	43.4	0.51	4.00	0.06	6.03	5	5	9.3	0.71
V671099		1.0	0.25	45.8	0.55	9	20.5	41.1	0.07	2.37	<0.01	9.70	<5	1	2.3	0.07
V671100		1.3	0.35	2870	0.90	292	10.9	59.7	0.20	3.99	<0.01	2.83	5	3	4.1	0.24
V671101		0.8	0.23	284	0.81	56	3.4	16.8	0.74	10.05	0.53	15.15	6	1	38.2	4.56
V671102		2.8	0.74	1510	1.51	58	14.6	14.7	0.32	3.69	0.09	2.97	52	1	10.0	1.06
V671103		0.7	0.20	1510	0.34	24	6.1	6.2	0.10	1.88	<0.01	1.93	<5	2	4.0	0.28
V671104		1.0	0.28	1675	0.57	40	6.9	23.2	0.27	4.44	0.12	5.01	<5	2	13.4	1.41
V671105		4.8	1.38	1140	2.35	94	15.6	27.1	0.41	12.05	0.11	11.70	9	3	11.9	1.19
V671106		1.2	0.33	868	0.59	140	17.6	108.5	0.14	6.22	0.04	8.12	6	3	5.0	0.60
V671107		2.6	0.78	924	1.34	26	9.3	25.4	0.27	4.60	0.01	2.02	7	2	6.5	0.40
V671108		0.6	0.15	766	0.25	42	0.6	13.7	0.05	3.94	<0.01	2.98	<5	2	2.5	0.13
V671109		1.0	0.32	2280	0.52	39	2.9	33.6	0.11	2.61	0.01	4.55	<5	2	3.7	0.32
V671110		1.4	0.43	1795	0.78	104	3.8	31.6	0.30	3.92	0.10	6.37	9	2	11.0	1.13
V671111		2.4	0.72	1180	1.22	47	6.4	38.0	0.27	3.07	0.03	5.23	19	7	6.6	0.48
V671112		6.1	1.69	1095	3.31	38	3.8	12.2	0.76	6.51	0.13	2.47	5	2	19.7	1.10
V671113		3.0	0.86	1415	1.26	39	4.1	27.8	0.16	2.82	0.03	1.17	<5	2	4.9	0.55
V671114		2.3	0.66	1020	1.20	34	4.9	28.9	0.34	2.34	0.06	1.90	<5	2	10.8	0.84
V671115		2.4	0.73	887	1.26	29	5.4	27.1	0.30	1.96	0.05	1.45	<5	4	8.6	0.55
V671116		2.7	0.82	1200	1.12	44	5.4	34.6	0.29	2.59	0.06	2.82	<5	2	8.9	0.70
V671117		2.9	0.82	1395	1.42	39	9.2	34.6	0.30	2.97	0.05	2.68	6	2	8.6	0.68
V671118		3.9	1.08	324	2.05	442	18.1	83.5	0.38	3.31	0.07	3.04	11	2	9.7	0.80
V671119		0.7	0.18	746	0.39	311	55.1	136.0	0.08	2.27	<0.01	3.13	15	3	2.3	0.14
V671120		1.5	0.40	2.9	0.26	<1	6.2	0.1	<0.01	0.32	<0.01	0.20	<5	<1	1.2	0.11

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671081		11	74.8	16.65	0.48	0.29	0.04	3.88	2.25	<0.01	<0.01	0.19	0.11	<0.01	<0.01	0.77
V671082		33	52.8	15.40	10.60	8.75	6.54	2.09	1.11	0.03	0.58	0.19	0.15	0.02	<0.01	0.96
V671083		16	74.6	16.90	0.90	0.73	0.28	4.17	1.14	<0.01	0.03	0.09	0.19	0.01	<0.01	0.58
V671084		29	62.6	16.10	5.69	4.33	3.25	3.23	1.49	0.02	0.32	0.20	0.16	0.01	<0.01	1.03
V671085		37	48.6	15.45	12.10	9.73	7.30	1.07	1.55	0.02	0.69	0.22	0.27	0.01	<0.01	1.10
V671086		12	73.4	16.80	0.56	0.22	0.04	3.97	2.41	<0.01	<0.01	0.23	0.06	<0.01	<0.01	0.78
V671087		12	74.0	16.05	0.51	0.18	0.02	3.92	2.60	<0.01	<0.01	0.22	0.07	0.01	<0.01	0.77
V671088		20	74.5	16.40	0.62	0.16	0.01	3.21	2.65	<0.01	<0.01	0.21	0.06	0.01	<0.01	0.76
V671089		22	73.2	16.30	0.58	0.19	0.01	4.57	2.53	<0.01	<0.01	0.23	0.08	0.01	<0.01	0.68
V671090		15	75.2	16.40	0.64	0.28	0.02	3.91	2.41	<0.01	<0.01	0.21	0.09	0.01	<0.01	0.47
V671091		38	52.9	16.25	10.60	9.52	6.19	1.84	1.25	0.04	0.65	0.22	0.15	0.01	<0.01	1.27
V671092		39	66.0	17.05	4.29	3.70	1.81	3.64	1.79	0.02	0.26	0.23	0.18	0.01	<0.01	0.75
V671093		55	55.5	15.40	9.43	8.85	3.74	2.31	1.46	0.02	0.72	0.24	0.20	0.01	0.01	1.04
V671094		48	64.7	15.05	6.09	3.31	2.32	3.51	1.78	0.01	0.51	0.19	0.13	<0.01	<0.01	0.74
V671095		90	73.6	15.05	0.74	0.50	0.04	6.43	1.50	0.01	0.01	0.24	0.08	<0.01	<0.01	0.21
V671096		21	48.8	14.30	14.90	9.08	6.99	2.21	0.93	0.02	1.21	0.19	0.11	0.01	0.01	0.78
V671097		77	49.0	14.20	15.10	8.36	6.70	2.28	0.71	0.02	1.18	0.18	0.10	0.01	0.01	1.07
V671098		10	72.7	14.70	1.13	0.48	0.07	4.85	4.89	<0.01	0.02	0.10	0.08	0.01	<0.01	0.32
V671099		62	73.7	16.60	0.45	1.31	0.04	8.27	0.14	<0.01	<0.01	0.01	0.06	<0.01	<0.01	0.27
V671100		16	75.2	15.40	2.42	0.20	0.07	3.54	2.55	<0.01	0.01	0.15	0.06	<0.01	<0.01	0.14
V671101		58	91.9	3.40	1.71	0.34	0.09	0.85	0.39	0.01	0.01	1.17	0.03	<0.01	<0.01	0.06
V671102		15	71.3	15.70	2.84	1.42	1.20	6.42	1.42	0.01	0.15	0.21	0.08	<0.01	<0.01	0.77
V671103		6	73.9	14.95	0.54	0.43	0.02	6.26	3.40	<0.01	<0.01	0.11	0.05	<0.01	<0.01	0.24
V671104		10	76.2	13.30	0.96	0.52	0.04	5.19	3.13	0.01	<0.01	0.41	0.04	<0.01	<0.01	0.15
V671105		21	75.5	13.90	1.42	0.90	0.20	5.75	1.47	<0.01	0.03	0.13	0.04	<0.01	<0.01	0.39
V671106		16	73.7	15.20	1.00	1.16	0.17	6.53	1.23	<0.01	0.01	0.11	0.05	<0.01	<0.01	0.39
V671107		5	77.1	14.10	1.24	0.70	0.14	5.52	1.92	<0.01	0.01	0.07	0.05	<0.01	<0.01	0.28
V671108		15	90.1	5.33	2.51	0.03	0.13	0.94	1.05	<0.01	<0.01	0.20	<0.01	<0.01	<0.01	0.44
V671109		7	71.7	15.50	0.74	0.26	0.04	4.78	5.59	<0.01	<0.01	0.05	0.06	<0.01	<0.01	0.29
V671110		26	72.4	15.90	1.02	0.52	0.18	5.80	4.16	<0.01	0.02	0.16	0.07	<0.01	<0.01	0.23
V671111		10	74.3	15.70	1.34	0.78	0.44	6.50	2.35	0.01	0.05	0.04	0.05	<0.01	<0.01	0.33
V671112		9	87.8	7.28	2.09	0.31	0.17	1.49	2.19	<0.01	0.01	0.11	0.03	<0.01	<0.01	0.38
V671113		2	76.5	14.25	1.03	0.38	0.04	5.10	3.35	<0.01	<0.01	0.07	0.07	<0.01	<0.01	0.41
V671114		4	76.2	15.20	0.79	0.51	0.03	6.08	2.55	<0.01	<0.01	0.04	0.07	<0.01	<0.01	0.41
V671115		3	70.6	16.85	0.54	0.62	0.02	7.70	2.21	<0.01	<0.01	0.01	0.06	<0.01	<0.01	0.45
V671116		6	73.6	16.60	0.77	0.54	0.02	7.04	2.79	<0.01	0.01	0.03	0.06	<0.01	<0.01	0.42
V671117		3	74.0	15.10	0.80	0.62	0.13	5.57	3.33	<0.01	0.01	0.04	0.07	<0.01	<0.01	0.28
V671118		4	75.5	15.20	1.25	1.24	0.33	7.13	0.41	<0.01	0.03	0.07	0.09	<0.01	<0.01	0.45
V671119		7	71.1	15.85	1.24	2.17	0.47	6.76	0.60	<0.01	0.04	0.07	0.24	0.01	<0.01	0.64
V671120		23	99.3	0.23	0.77	0.05	0.02	0.04	0.13	<0.01	0.01	0.01	0.01	<0.01	<0.01	-0.07

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	TOT-ICP06	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671081		99.46	6470	<0.5	<5	<0.5	<1	2	7420	1	<1	<2	<1	30	55	0.794
V671082		99.22	10600	<0.5	45	1.2	42	115	2190	<1	134	<2	37	40	85	
V671083		99.62	2710	<0.5	5	<0.5	<1	4	8170	1	6	<2	1	20	28	0.882
V671084		98.43	9210	<0.5	30	0.5	24	51	4870	<1	73	<2	16	30	68	
V671085		98.11	11550	<0.5	27	1.0	52	120	1800	<1	144	<2	38	50	94	
V671086		98.47	5060	<0.5	<5	<0.5	<1	2	6900	1	1	4	<1	30	111	0.761
V671087		98.35	4980	<0.5	<5	<0.5	<1	1	6330	<1	<1	5	<1	30	104	0.687
V671088		98.59	5000	<0.5	<5	<0.5	<1	1	7810	<1	<1	3	<1	30	109	0.860
V671089		98.38	5130	<0.5	<5	<0.5	<1	<1	5000	1	<1	5	<1	30	130	0.549
V671090		99.64	3610	<0.5	<5	<0.5	<1	1	6820	<1	<1	4	<1	30	100	0.772
V671091		100.89	9070	<0.5	80	1.0	46	110	2270	<1	150	<2	35	30	90	
V671092		99.73	5340	<0.5	10	0.5	17	44	4650	<1	55	<2	12	30	77	
V671093		98.93	6250	<0.5	9	0.7	40	106	1590	1	84	<2	31	20	113	
V671094		98.34	5620	<0.5	<5	0.5	18	55	4250	<1	30	2	16	30	99	
V671095		98.41	390	<0.5	<5	<0.5	<1	3	2150	<1	2	5	<1	10	42	
V671096		99.54	2260	<0.5	<5	<0.5	50	77	1270	<1	112	<2	38	<10	137	
V671097		98.92	1170	<0.5	<5	0.6	49	186	1350	<1	103	<2	40	<10	112	
V671098		99.35	890	<0.5	<5	1.5	<1	3	410	1	<1	9	1	20	200	
V671099		100.85	130	<0.5	<5	<0.5	<1	4	70	8	<1	4	<1	<10	4	
V671100		99.74	2140	<0.5	<5	<0.5	<1	42	6230	7	18	4	<1	20	104	0.717
V671101		99.96	260	<0.5	<5	0.5	1	4	80	8	1	14	4	<10	23	
V671102		101.52	2250	<0.5	<5	<0.5	10	74	490	1	25	2	8	10	76	
V671103		99.90	120	<0.5	<5	<0.5	<1	2	60	<1	<1	2	1	10	6	
V671104		99.95	190	<0.5	5	<0.5	<1	4	80	2	3	9	2	10	19	
V671105		99.73	630	<0.5	<5	<0.5	1	13	240	3	4	12	4	10	61	
V671106		99.55	640	<0.5	<5	<0.5	<1	4	260	<1	4	9	2	<10	60	
V671107		101.13	470	<0.5	<5	<0.5	<1	7	210	<1	3	8	1	10	43	
V671108		100.73	830	<0.5	<5	<0.5	<1	1	480	1	1	7	2	<10	122	
V671109		99.01	390	<0.5	<5	<0.5	<1	<1	280	<1	1	11	1	10	43	
V671110		100.46	650	<0.5	<5	<0.5	1	4	350	<1	2	8	2	20	66	
V671111		101.89	1180	<0.5	<5	<0.5	2	4	360	<1	7	9	3	10	75	
V671112		101.86	620	<0.5	<5	<0.5	1	4	380	3	4	5	2	10	77	
V671113		101.20	440	<0.5	<5	<0.5	<1	1	290	<1	<1	6	2	10	50	
V671114		101.88	320	<0.5	<5	<0.5	<1	1	180	<1	<1	8	1	<10	22	
V671115		99.06	190	<0.5	<5	<0.5	<1	<1	110	<1	1	7	1	<10	16	
V671116		101.88	370	<0.5	<5	<0.5	<1	<1	220	<1	1	7	1	10	28	
V671117		99.95	270	<0.5	<5	<0.5	1	5	140	<1	3	9	1	10	29	
V671118		101.70	330	<0.5	<5	<0.5	2	29	190	<1	10	4	2	<10	32	
V671119		99.19	910	<0.5	45	<0.5	1	26	440	<1	6	4	2	10	32	
V671120		100.50	<20	<0.5	<5	<0.5	<1	1	<10	1	1	<2	<1	<10	<2	

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671121		3.59	4.9	1.7	30	72.5	0.97	0.21	<0.03	34.4	1.11	<0.2	0.09	0.6	<0.01	73.9
V671122		6.49	3.5	1.4	20	63.2	0.43	0.07	<0.03	34.1	0.57	<0.2	0.03	0.5	<0.01	69.9
V671123		1.70	8.9	4.5	30	286	1.96	0.42	<0.03	35.2	2.41	0.4	0.18	1.3	0.01	44.9
V671124		7.25	3.1	<0.5	60	26.3	0.60	0.22	<0.03	47.1	0.22	1.7	0.08	<0.5	0.02	41.5
V671125		0.03	19.5	3.4	30	26.4	0.92	0.17	<0.03	36.7	1.32	1.4	0.08	1.2	<0.01	72.6
V671126		9.43	1.0	0.6	30	40.4	0.26	0.05	<0.03	47.2	0.25	2.4	0.02	<0.5	<0.01	44.7
V671127		8.20	<0.5	0.7	20	38.4	0.23	0.06	<0.03	49.8	0.29	1.6	0.03	<0.5	0.01	52.8
V671128		8.16	<0.5	0.7	20	74.4	0.26	0.06	<0.03	53.4	0.32	2.6	0.02	<0.5	0.02	49.9
V671129		8.21	<0.5	1.1	30	59.9	0.42	0.08	<0.03	47.0	0.54	2.2	0.04	<0.5	0.02	60.4
V671130		8.51	<0.5	1.7	20	66.6	0.72	0.13	<0.03	48.2	0.91	2.8	0.06	0.5	0.02	63.0
V671131		5.14	0.8	1.6	20	64.6	0.62	0.10	<0.03	55.3	0.73	1.6	0.06	0.6	0.04	76.3
V671132		1.85	7.6	1.7	100	2380	0.89	0.61	0.16	43.5	0.75	3.6	0.19	0.6	0.09	47.8
V671133		4.31	4.2	1.2	40	263	0.45	0.21	0.05	52.5	0.41	1.9	0.06	0.5	0.03	45.2
V671134		9.01	<0.5	0.8	20	97.4	0.59	0.13	<0.03	47.6	0.54	1.9	0.05	<0.5	0.03	89.1
V671135		6.34	1.0	<0.5	20	72.4	0.16	0.08	<0.03	50.0	0.16	1.3	0.02	<0.5	0.01	43.0
V671136		8.28	12.0	2.2	100	126.5	1.15	0.69	0.20	35.7	0.91	1.2	0.21	0.8	0.11	31.5
V671137		3.90	<0.5	0.7	10	67.2	0.29	0.07	<0.03	45.3	0.34	1.0	0.02	<0.5	0.01	53.0
V671138		6.66	<0.5	0.9	20	60.1	0.38	0.07	<0.03	44.2	0.46	2.0	0.03	<0.5	0.01	50.9
V671139		9.52	64.6	3.8	190	801	2.03	1.30	0.38	28.1	1.63	1.8	0.43	1.4	0.18	17.7
V671140		8.21	4.0	1.5	40	313	0.82	0.24	0.03	51.9	0.86	3.0	0.09	0.5	0.03	78.1
V671141		8.87	5.4	1.5	40	20.6	0.71	0.20	0.03	43.7	0.76	3.5	0.08	0.5	0.03	76.8
V671142		7.27	1.2	2.5	20	8.36	1.58	0.32	<0.03	36.8	1.34	1.4	0.14	0.9	0.07	80.2
V671143		5.58	2.4	5.6	40	21.6	1.61	0.34	<0.03	31.8	2.72	0.5	0.16	1.8	0.08	71.4
V671144		4.42	10.5	1.3	20	124.0	0.25	0.06	0.03	28.1	0.30	0.3	0.02	0.5	0.01	22.4
V671145		4.18	10.8	2.2	20	27.4	1.89	0.98	0.03	35.8	0.62	0.4	0.32	0.9	0.21	17.7
V671146		6.42	4.3	2.1	30	107.0	0.69	0.27	0.03	31.5	0.53	0.4	0.08	0.8	0.05	52.5
V671147		3.32	2.1	0.5	20	73.6	0.25	0.08	<0.03	41.6	0.18	0.2	0.02	<0.5	0.02	25.2
V671148		11.30	1.5	5.1	20	48.9	1.99	0.61	0.04	41.4	1.83	0.5	0.24	1.8	0.09	91.5
V671149		9.01	1.2	2.1	30	46.2	0.53	0.08	<0.03	36.3	1.22	0.4	0.04	0.6	0.01	57.5
V671150		0.03	17.5	2.6	30	25.5	0.84	0.20	<0.03	37.1	1.08	1.5	0.08	0.9	0.03	69.5
V671151		7.90	16.2	1.6	40	185.0	0.84	0.32	0.11	45.3	0.86	1.3	0.13	0.6	0.06	60.0
V671152		4.42	4.6	0.9	20	76.8	0.61	0.26	0.03	43.9	0.42	3.9	0.08	<0.5	0.09	54.8
V671153		6.39	2.3	<0.5	30	134.0	0.30	0.08	<0.03	50.6	0.18	3.4	0.03	<0.5	0.03	21.2
V671154		3.63	1.6	0.8	30	124.5	0.18	0.08	0.03	50.9	0.28	1.6	0.02	<0.5	0.01	35.8
V671155		8.42	1.4	0.8	20	107.5	0.34	0.07	<0.03	43.4	0.37	1.1	0.03	<0.5	0.02	47.6
V671156		4.62	7.9	2.3	80	75.6	0.85	0.46	0.23	47.9	0.75	1.8	0.16	0.9	0.07	29.3
V671157		4.31	1.4	<0.5	20	274	0.14	0.03	<0.03	52.5	0.15	2.6	0.01	<0.5	0.01	41.4
V671158		4.40	4.2	2.0	70	420	0.96	0.63	0.20	45.9	0.79	3.4	0.20	0.7	0.09	49.2
V671159		2.39	3.2	1.8	50	418	0.69	0.36	0.15	52.8	0.53	3.7	0.13	0.7	0.06	40.1
V671160		0.48	24.8	4.8	10	0.76	0.22	0.14	0.05	0.4	0.27	0.7	0.04	2.3	0.02	0.3

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671121		0.7	0.22	2130	0.69	122	7.7	44.3	0.21	0.66	<0.01	1.39	11	3	4.8	0.28
V671122		0.6	0.17	2270	0.56	111	4.7	44.5	0.09	1.02	<0.01	2.25	<5	2	2.1	0.07
V671123		2.2	0.61	3280	2.21	245	23.8	39.8	0.48	3.66	0.02	1.30	26	2	8.2	0.40
V671124		0.1	<0.03	2650	0.08	433	6.4	71.2	0.08	1.30	<0.01	4.75	<5	1	4.2	0.34
V671125		1.6	0.44	2940	1.30	317	11.2	57.0	0.26	4.63	<0.01	2.96	5	4	4.3	0.19
V671126		0.2	0.05	2730	0.13	380	7.8	48.1	0.04	3.97	<0.01	6.71	<5	4	1.7	0.11
V671127		0.3	0.10	4260	0.25	420	3.8	79.0	0.06	3.16	0.01	7.01	<5	3	1.2	0.08
V671128		0.3	0.09	4940	0.32	411	2.4	56.0	0.06	3.30	0.01	8.17	<5	6	1.3	0.11
V671129		0.6	0.15	4490	0.61	396	1.8	61.2	0.12	3.98	0.02	8.07	<5	6	2.0	0.15
V671130		0.9	0.24	4860	0.94	371	2.7	58.1	0.19	3.92	0.03	8.44	<5	6	3.2	0.24
V671131		0.7	0.21	4440	0.73	508	8.6	135.0	0.16	4.70	0.02	8.33	<5	4	2.9	0.21
V671132		1.4	0.27	7910	0.55	188	43.9	367	0.14	1.80	0.09	5.60	88	4	5.1	0.60
V671133		0.6	0.14	5210	0.35	354	12.0	165.0	0.08	3.57	0.03	4.95	19	6	2.3	0.26
V671134		0.4	0.10	4970	0.43	310	9.0	134.5	0.13	3.52	0.02	6.18	<5	6	2.9	0.20
V671135		0.2	0.04	5920	0.14	278	7.6	78.9	0.04	3.10	<0.01	3.97	5	5	1.0	0.10
V671136		1.8	0.32	3470	0.68	431	22.3	75.9	0.17	2.09	0.09	2.48	92	18	6.0	0.69
V671137		0.3	0.10	5790	0.39	285	2.4	78.5	0.07	3.90	0.01	5.26	<5	7	1.3	0.10
V671138		0.4	0.13	4680	0.47	350	2.9	64.7	0.11	3.42	0.02	5.89	<5	4	1.8	0.13
V671139		3.0	0.58	2730	1.11	86	77.6	87.7	0.29	1.28	0.19	1.90	204	3	10.4	1.32
V671140		0.9	0.23	5460	0.81	455	8.3	97.6	0.19	3.53	0.03	6.18	17	7	3.6	0.28
V671141		0.9	0.23	3410	0.68	2070	10.0	84.1	0.16	2.84	0.03	8.78	<5	4	3.5	0.27
V671142		1.2	0.35	1295	1.00	528	1.7	33.2	0.33	3.23	0.06	5.86	<5	3	6.8	0.54
V671143		3.3	0.82	1870	2.78	489	5.1	37.5	0.46	4.19	0.06	2.75	<5	2	7.1	0.62
V671144		0.6	0.16	3810	0.31	67	5.2	14.6	0.05	2.63	0.01	2.59	<5	3	1.1	0.06
V671145		0.8	0.25	1485	0.38	58	9.2	10.0	0.25	4.77	0.20	10.80	<5	2	12.8	1.79
V671146		1.0	0.30	2110	0.49	359	14.3	41.4	0.12	2.83	0.04	3.13	<5	2	4.0	0.39
V671147		0.2	0.05	2050	0.08	183	9.2	62.3	0.05	1.85	0.01	1.08	<5	2	1.4	0.12
V671148		2.5	0.70	718	1.53	387	9.9	64.0	0.42	6.07	0.10	5.78	<5	5	11.4	0.77
V671149		1.1	0.32	2430	1.20	370	5.4	45.6	0.17	3.12	0.01	2.07	<5	3	2.4	0.13
V671150		1.2	0.37	3040	1.02	341	10.9	59.4	0.24	3.90	0.05	3.04	<5	4	3.9	0.26
V671151		1.0	0.24	1920	0.74	227	27.0	107.0	0.18	3.59	0.04	3.22	28	6	4.6	0.36
V671152		0.5	0.13	1885	0.32	524	11.5	67.8	0.12	2.81	0.05	8.35	10	3	4.0	0.67
V671153		0.1	0.04	3050	0.12	494	10.4	60.4	0.06	2.44	0.01	11.25	5	2	1.8	0.18
V671154		0.3	0.10	772	0.28	398	13.7	64.0	0.04	1.69	0.01	2.91	11	3	1.0	0.08
V671155		0.3	0.10	4930	0.32	336	13.1	79.1	0.09	1.59	0.01	3.42	<5	3	2.0	0.15
V671156		1.6	0.33	352	0.61	139	45.3	188.0	0.15	3.36	0.07	8.38	52	2	4.6	0.49
V671157		0.1	0.05	5530	0.14	163	12.2	148.5	0.04	3.84	<0.01	7.78	<5	12	0.7	0.05
V671158		1.6	0.31	3330	0.62	159	38.6	274	0.16	2.42	0.09	8.13	81	3	5.5	0.69
V671159		1.1	0.24	2990	0.50	649	25.3	133.0	0.11	3.43	0.05	7.10	47	5	3.5	0.45
V671160		1.9	0.50	7.5	0.29	<1	5.8	0.4	0.04	0.52	0.02	0.28	<5	<1	1.3	0.14

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671121		2	75.1	15.30	0.97	0.54	0.21	5.32	3.47	<0.01	0.02	0.02	0.08	<0.01	<0.01	0.48
V671122		<2	73.3	15.25	0.78	0.38	0.04	5.84	3.76	<0.01	<0.01	0.04	0.08	<0.01	<0.01	0.36
V671123		6	71.0	16.15	1.60	1.12	0.64	4.76	3.51	<0.01	0.06	0.03	0.10	<0.01	<0.01	0.55
V671124		15	75.6	15.85	0.86	0.35	0.03	3.78	1.87	0.01	<0.01	0.34	0.07	<0.01	<0.01	0.27
V671125		16	75.7	15.50	2.45	0.20	0.07	3.56	2.56	<0.01	0.01	0.15	0.06	<0.01	<0.01	0.15
V671126		23	75.7	16.35	0.83	0.38	0.02	4.78	1.78	<0.01	<0.01	0.26	0.10	<0.01	<0.01	0.43
V671127		12	74.7	16.35	0.56	0.17	0.01	4.32	2.32	<0.01	<0.01	0.22	0.07	<0.01	<0.01	0.69
V671128		21	74.0	16.70	0.58	0.14	0.03	3.99	2.40	<0.01	0.01	0.30	0.05	<0.01	<0.01	0.79
V671129		19	74.8	16.35	0.63	0.15	0.01	3.89	2.28	<0.01	<0.01	0.24	0.06	<0.01	<0.01	0.64
V671130		23	75.3	16.45	0.56	0.13	0.01	3.68	2.44	<0.01	<0.01	0.23	0.06	<0.01	<0.01	0.75
V671131		14	74.3	16.35	0.63	0.35	0.02	4.79	2.31	<0.01	<0.01	0.23	0.13	<0.01	<0.01	0.73
V671132		27	65.3	17.20	4.02	3.12	2.42	4.36	1.79	0.01	0.24	0.11	0.42	0.01	<0.01	1.32
V671133		26	72.7	16.70	1.28	0.89	0.32	3.85	1.90	0.01	0.05	0.23	0.25	0.01	<0.01	0.69
V671134		16	74.5	16.45	0.61	0.33	0.03	3.92	2.17	<0.01	<0.01	0.21	0.14	0.01	<0.01	0.83
V671135		9	74.2	16.30	0.67	0.36	0.07	3.16	2.34	<0.01	0.01	0.17	0.12	<0.01	<0.01	0.60
V671136		19	66.8	16.15	4.95	4.06	1.51	2.27	1.63	0.02	0.25	0.24	0.10	<0.01	<0.01	0.64
V671137		8	73.9	16.55	0.59	0.20	0.02	3.74	2.95	<0.01	<0.01	0.25	0.10	0.01	<0.01	0.72
V671138		16	75.2	16.20	0.64	0.21	0.01	2.73	2.24	<0.01	<0.01	0.21	0.08	<0.01	<0.01	0.57
V671139		33	58.3	16.05	8.36	7.76	3.77	2.61	1.03	0.03	0.51	0.16	0.15	0.01	0.01	0.69
V671140		26	72.8	16.75	1.39	0.39	0.37	3.43	2.69	<0.01	0.05	0.28	0.10	0.01	<0.01	0.76
V671141		28	76.2	16.05	1.00	0.35	0.07	4.54	2.30	<0.01	<0.01	0.16	0.09	<0.01	<0.01	0.63
V671142		16	74.0	15.40	1.20	0.21	0.02	6.11	3.28	<0.01	0.01	0.10	0.03	<0.01	<0.01	0.16
V671143		5	75.0	15.30	0.98	0.33	0.05	4.78	5.28	0.01	0.01	0.06	0.04	<0.01	<0.01	0.14
V671144		3	77.6	12.55	1.02	0.18	0.09	2.21	6.19	<0.01	<0.01	0.04	0.04	<0.01	<0.01	0.48
V671145		4	75.0	14.75	0.98	0.54	0.06	5.25	3.00	<0.01	<0.01	0.53	0.03	<0.01	<0.01	0.51
V671146		4	74.9	15.75	1.09	0.53	0.15	4.03	2.61	<0.01	0.02	0.17	0.04	<0.01	<0.01	0.25
V671147		2	76.4	16.40	0.83	0.46	0.13	4.39	1.20	<0.01	0.01	0.35	0.06	<0.01	<0.01	0.20
V671148		5	76.6	14.50	1.02	0.86	0.09	6.41	0.83	<0.01	0.01	0.13	0.04	<0.01	<0.01	0.31
V671149		3	76.2	16.30	1.16	0.22	0.04	1.81	1.95	<0.01	0.01	0.10	0.04	<0.01	<0.01	0.27
V671150		15	74.9	15.80	2.51	0.21	0.07	3.59	2.60	<0.01	0.01	0.16	0.05	<0.01	<0.01	0.07
V671151		14	72.3	16.20	1.91	1.80	0.69	5.78	0.85	0.01	0.09	0.07	0.19	<0.01	<0.01	0.65
V671152		37	74.1	15.90	0.94	0.79	0.23	5.62	1.31	<0.01	0.03	0.19	0.07	<0.01	<0.01	0.44
V671153		28	75.2	15.70	0.81	0.45	0.14	4.21	2.03	<0.01	0.02	0.31	0.08	<0.01	<0.01	0.20
V671154		13	74.6	16.45	0.96	0.87	0.29	5.80	0.48	<0.01	0.03	0.05	0.11	<0.01	<0.01	0.32
V671155		10	75.3	15.90	0.57	0.29	<0.01	3.70	2.51	<0.01	<0.01	0.19	0.13	<0.01	<0.01	0.58
V671156		18	64.0	18.55	2.58	10.95	1.10	1.18	0.17	0.01	0.15	0.08	0.46	<0.01	<0.01	0.87
V671157		18	74.1	17.10	0.59	0.50	0.10	4.47	1.50	<0.01	0.01	0.08	0.21	0.01	<0.01	0.77
V671158		29	65.5	17.10	4.05	3.65	2.04	4.77	1.02	0.01	0.24	0.09	0.66	0.01	<0.01	0.83
V671159		34	69.7	16.50	2.67	2.40	1.29	3.69	1.30	0.01	0.14	0.12	0.19	<0.01	<0.01	0.89
V671160		23	97.6	0.22	0.63	0.05	0.02	0.03	0.15	<0.01	0.01	0.01	<0.01	<0.01	<0.01	-0.06

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	TOT-ICP06	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671121		101.51	550	<0.5	<5	<0.5	1	2	260	<1	4	4	1	10	59	
V671122		99.83	180	<0.5	<5	<0.5	<1	2	160	<1	2	7	<1	10	37	
V671123		99.52	970	<0.5	16	<0.5	4	13	2900	<1	10	7	4	20	52	
V671124		99.03	1510	<0.5	<5	<0.5	<1	2	7280	<1	1	2	<1	10	43	0.794
V671125		100.41	2140	<0.5	<5	<0.5	1	43	6330	7	18	8	<1	20	107	0.693
V671126		100.63	1680	<0.5	<5	<0.5	<1	1	6150	<1	1	8	<1	10	81	0.671
V671127		99.41	4590	<0.5	<5	<0.5	<1	1	6140	<1	1	6	<1	30	102	0.644
V671128		98.99	8110	<0.5	<5	<0.5	<1	1	6630	<1	1	5	<1	30	121	0.740
V671129		99.05	6860	<0.5	<5	<0.5	<1	1	6700	1	1	4	<1	20	100	0.745
V671130		99.61	6440	<0.5	<5	<0.5	<1	1	7140	<1	1	7	<1	30	87	0.802
V671131		99.84	4440	<0.5	<5	<0.5	<1	1	4550	<1	1	7	<1	20	121	
V671132		100.32	15700	<0.5	5	1.0	14	29	4960	<1	52	4	12	70	32	
V671133		98.88	7680	<0.5	7	0.6	3	17	7610	<1	12	5	3	30	62	1.005
V671134		99.20	5800	<0.5	<5	1.0	<1	8	7040	<1	1	7	<1	40	96	0.774
V671135		98.00	7140	<0.5	<5	<0.5	<1	4	7880	<1	2	4	1	40	40	0.902
V671136		98.62	6670	<0.5	21	0.6	17	104	6570	<1	55	4	13	20	74	0.747
V671137		99.03	7160	<0.5	<5	<0.5	<1	1	6360	<1	2	6	<1	40	101	0.707
V671138		98.09	4670	<0.5	<5	<0.5	<1	1	9460	<1	1	3	<1	30	88	1.085
V671139		99.44	5330	<0.5	5	0.6	35	106	1960	<1	113	5	26	20	68	
V671140		99.02	6510	<0.5	<5	<0.5	3	4	7730	1	7	<2	2	40	130	0.856
V671141		101.39	2430	<0.5	<5	<0.5	<1	4	4610	<1	2	5	<1	20	108	
V671142		100.52	550	<0.5	<5	<0.5	<1	2	310	1	2	<2	<1	10	70	
V671143		101.98	350	<0.5	<5	<0.5	<1	1	240	<1	1	11	1	10	57	
V671144		100.40	630	<0.5	5	<0.5	<1	1	580	1	<1	7	1	30	31	
V671145		100.65	300	<0.5	11	0.5	<1	20	310	6	<1	13	3	10	33	
V671146		99.54	310	<0.5	13	<0.5	1	2	5110	1	3	4	1	10	59	0.582
V671147		100.43	250	<0.5	8	<0.5	<1	4	7230	1	4	2	<1	10	20	0.814
V671148		100.80	370	<0.5	5	<0.5	<1	1	310	<1	1	5	1	10	50	
V671149		98.10	480	<0.5	6	<0.5	<1	2	>10000	<1	2	<2	<1	20	103	1.340
V671150		99.97	2120	<0.5	<5	<0.5	1	43	6290	7	18	4	<1	20	104	0.710
V671151		100.54	2540	<0.5	40	<0.5	4	7	2780	<1	12	5	4	10	69	
V671152		99.62	600	<0.5	6	<0.5	1	6	4150	<1	5	4	1	10	43	
V671153		99.15	330	<0.5	5	<0.5	1	6	6090	<1	4	4	1	20	24	0.679
V671154		99.96	630	<0.5	22	<0.5	2	5	5670	<1	5	<2	1	10	16	0.633
V671155		99.17	3150	<0.5	6	<0.5	<1	1	6730	<1	<1	3	<1	40	85	0.756
V671156		100.10	1650	<0.5	42	0.6	10	4	530	<1	25	4	6	<10	74	
V671157		99.44	7420	<0.5	<5	0.8	<1	7	7350	1	2	4	<1	40	9	0.866
V671158		99.97	5640	<0.5	<5	0.8	14	43	4550	<1	43	<2	11	30	29	
V671159		98.90	6230	<0.5	26	<0.5	10	35	7120	<1	25	4	6	20	27	0.795
V671160		98.66	<20	<0.5	<5	<0.5	<1	1	10	1	1	<2	<1	<10	<2	

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671161		3.25	3.4	1.1	20	88.9	0.39	0.13	0.04	49.0	0.41	4.0	0.05	0.5	0.03	43.0
V671162		5.08	13.4	4.3	40	272	2.01	0.50	0.03	55.2	2.10	3.1	0.16	1.6	0.11	185.5
V671163		5.39	5.6	0.8	20	88.3	0.87	0.21	0.03	38.9	0.44	2.0	0.04	<0.5	0.06	55.0
V671164		7.91	3.1	0.9	20	52.6	0.37	0.09	<0.03	45.6	0.44	1.9	0.01	<0.5	0.03	59.2
V671165		8.34	<0.5	1.0	30	53.4	0.60	0.10	<0.03	43.5	0.59	0.4	0.02	<0.5	0.02	80.2
V671166		8.53	<0.5	1.1	20	42.0	0.58	0.10	<0.03	42.4	0.48	1.0	0.01	<0.5	0.03	58.2
V671167		8.65	<0.5	0.8	40	38.2	0.64	0.13	<0.03	44.2	0.53	0.7	0.02	<0.5	0.04	84.8
V671168		8.24	<0.5	0.5	30	39.4	0.36	0.08	<0.03	42.6	0.27	0.9	0.01	<0.5	0.03	67.8
V671169		8.11	<0.5	0.7	50	36.6	0.43	0.08	<0.03	42.5	0.36	2.0	<0.01	<0.5	0.03	67.5
V671170		7.98	<0.5	1.0	40	42.6	0.69	0.18	<0.03	42.7	0.74	1.0	0.03	<0.5	0.05	85.5
V671171		9.22	<0.5	0.8	40	28.8	0.62	0.12	<0.03	47.3	0.54	1.5	0.03	<0.5	0.03	77.3
V671172		7.77	1.0	1.0	20	44.5	0.47	0.15	<0.03	50.3	0.32	1.5	0.03	<0.5	0.03	62.5
V671173		8.05	<0.5	1.2	30	42.2	0.76	0.18	<0.03	46.7	0.51	1.1	0.04	0.5	0.04	45.7
V671174		8.83	<0.5	1.4	30	32.8	1.04	0.30	<0.03	42.3	0.51	0.6	0.08	0.5	0.07	73.0
V671175		0.03	18.8	2.5	30	23.9	0.86	0.17	<0.03	40.5	1.01	1.5	0.05	0.9	0.04	73.6
V671176		8.56	<0.5	1.8	30	51.3	0.98	0.48	<0.03	44.0	0.63	1.3	0.12	0.7	0.14	67.9
V671177		8.74	0.6	2.3	40	65.1	0.85	0.47	<0.03	39.1	0.66	0.5	0.10	0.8	0.15	75.8
V671178		5.20	<0.5	7.3	30	81.1	2.16	1.26	<0.03	45.8	1.57	0.7	0.31	2.8	0.41	95.1
V671179		2.73	<0.5	2.0	40	30.2	1.67	0.76	<0.03	25.7	1.31	0.3	0.21	0.6	0.18	22.9
V671180		9.72	1.1	2.7	20	75.1	1.31	0.62	<0.03	40.9	0.80	1.6	0.13	1.0	0.17	77.5
V671181		7.66	3.4	1.8	40	46.0	1.09	0.50	<0.03	41.4	0.72	1.9	0.11	0.7	0.14	85.0
V671182		8.78	4.9	3.0	60	242	0.81	0.32	0.05	42.8	0.78	3.8	0.07	1.2	0.08	58.3
V671183		8.68	1.2	1.6	30	33.0	1.07	0.64	<0.03	42.0	0.55	4.5	0.12	0.7	0.29	36.8
V671184		8.31	0.7	3.7	30	21.6	1.37	0.41	<0.03	37.6	1.73	1.1	0.10	1.2	0.11	84.3
V671185		8.14	0.7	1.5	30	22.5	0.78	0.19	<0.03	38.0	0.78	0.7	0.05	0.5	0.04	90.3
V671186		5.85	0.5	1.9	40	20.9	1.00	0.30	<0.03	37.6	0.73	0.5	0.08	0.7	0.07	90.4
V671187		11.80	1.0	5.2	20	19.10	1.48	0.69	<0.03	34.8	1.11	0.4	0.17	1.9	0.24	95.0
V671188		10.55	1.1	11.6	30	27.3	1.53	0.69	<0.03	30.8	1.35	1.3	0.19	5.2	0.28	76.4
V671189		8.48	3.6	3.6	20	26.7	1.47	0.78	<0.03	29.4	0.81	2.3	0.17	1.5	0.36	74.9
V671190		8.38	2.6	1.8	20	34.0	0.94	0.34	<0.03	36.4	0.60	0.7	0.07	0.8	0.11	80.4
V671191		8.05	2.9	1.2	20	24.4	1.04	0.31	<0.03	38.0	0.63	1.3	0.10	0.6	0.09	75.5
V671192		8.11	3.4	1.8	20	21.1	0.98	0.39	<0.03	38.1	0.52	2.5	0.11	0.9	0.13	55.7
V671193		7.27	7.1	1.9	20	22.0	1.13	0.61	<0.03	28.9	0.61	2.0	0.13	1.0	0.29	61.9
V671194		7.49	5.9	2.9	20	9.05	1.53	1.32	0.06	26.6	0.70	2.0	0.26	1.4	0.75	41.1
V671195		8.95	1.5	3.6	30	14.85	1.09	0.88	0.05	24.2	0.51	1.3	0.17	1.8	0.47	41.4
V671196		8.77	1.2	1.9	20	8.15	0.68	0.56	<0.03	16.6	0.31	1.5	0.12	1.0	0.33	26.4
V671197		8.26	2.6	2.0	40	21.6	1.38	1.18	0.03	22.5	0.57	2.2	0.26	0.9	0.80	51.1
V671198		8.90	1.1	1.1	30	29.8	0.78	0.47	<0.03	16.1	0.37	1.0	0.11	0.5	0.29	47.5
V671199		8.18	1.5	1.3	30	25.4	1.25	1.12	<0.03	17.9	0.53	1.3	0.25	0.6	0.84	50.9
V671200		0.03	19.4	2.9	30	24.5	0.80	0.13	<0.03	39.6	0.95	1.4	0.06	1.1	0.03	76.1

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671161		0.6	0.15	1275	0.45	931	20.0	105.5	0.09	2.43	0.02	7.92	6	3	2.0	0.22
V671162		1.9	0.56	3720	2.01	2740	10.1	234	0.49	9.09	0.10	13.45	17	5	12.3	0.65
V671163		0.3	0.11	3540	0.23	948	41.6	60.4	0.13	2.64	0.05	6.72	<5	3	5.5	0.45
V671164		0.4	0.11	3790	0.38	816	10.1	65.9	0.06	3.62	0.01	5.85	<5	3	2.2	0.14
V671165		0.5	0.13	5150	0.55	877	4.2	74.7	0.12	2.37	0.01	4.06	<5	4	3.0	0.16
V671166		0.4	0.14	4120	0.37	663	2.5	62.2	0.11	2.25	0.02	3.23	<5	4	2.9	0.20
V671167		0.4	0.11	3510	0.43	649	2.1	79.0	0.12	2.90	0.03	7.38	<5	4	3.6	0.28
V671168		0.2	0.05	3660	0.21	568	4.2	66.1	0.03	2.77	0.01	5.99	<5	4	2.0	0.17
V671169		0.3	0.10	3070	0.35	506	2.4	94.5	0.05	2.08	0.02	5.90	<5	3	2.2	0.15
V671170		0.4	0.13	3360	0.53	560	2.1	101.5	0.14	2.73	0.04	4.62	<5	4	4.1	0.35
V671171		0.4	0.11	2440	0.34	558	2.0	89.8	0.10	2.93	0.04	6.74	<5	3	3.3	0.24
V671172		0.5	0.15	3630	0.33	523	4.1	66.6	0.07	2.07	0.03	7.11	<5	2	2.8	0.28
V671173		0.5	0.13	2950	0.37	425	2.5	42.8	0.11	2.46	0.03	6.28	<5	3	4.0	0.30
V671174		0.5	0.17	2700	0.33	423	1.1	51.6	0.15	1.99	0.05	4.25	<5	2	6.0	0.60
V671175		1.3	0.33	3020	0.86	307	11.6	57.4	0.17	3.97	0.03	2.80	<5	4	4.1	0.28
V671176		0.7	0.23	3130	0.45	360	1.4	50.5	0.14	3.15	0.10	5.56	<5	3	6.9	1.04
V671177		1.0	0.30	3220	0.61	243	1.8	60.4	0.12	2.60	0.11	5.81	<5	3	5.9	1.03
V671178		3.1	0.93	3020	1.44	131	2.1	51.5	0.34	4.34	0.27	6.01	<5	5	14.8	2.51
V671179		1.1	0.26	971	0.80	100	1.8	35.8	0.26	1.40	0.16	2.49	<5	3	11.1	1.32
V671180		1.1	0.33	2860	0.77	395	2.5	62.0	0.19	3.33	0.13	5.17	<5	4	8.6	1.22
V671181		0.9	0.22	2310	0.53	467	6.6	101.5	0.18	3.54	0.10	8.66	<5	3	7.2	1.03
V671182		1.6	0.39	3650	0.88	325	11.6	97.1	0.13	2.67	0.06	8.54	37	3	5.1	0.58
V671183		0.6	0.19	2570	0.35	298	2.3	26.2	0.13	1.90	0.17	9.48	<5	2	7.5	1.70
V671184		2.0	0.50	2160	1.65	275	3.7	42.1	0.30	4.11	0.08	5.68	<5	3	7.4	0.82
V671185		0.7	0.20	2430	0.67	370	4.4	47.6	0.14	2.83	0.04	4.69	<5	4	4.2	0.29
V671186		0.9	0.24	2140	0.59	192	3.2	44.5	0.18	3.17	0.05	4.53	<5	2	6.0	0.52
V671187		2.2	0.64	1460	1.17	257	2.0	48.3	0.24	4.52	0.17	5.54	<5	3	9.7	1.55
V671188		3.7	1.26	1280	1.62	187	2.3	31.3	0.29	6.22	0.17	4.29	<5	4	9.5	1.59
V671189		1.5	0.41	1140	0.61	134	6.0	31.8	0.23	3.36	0.21	7.72	<5	2	9.2	2.12
V671190		0.7	0.22	3030	0.41	411	4.9	44.1	0.13	2.98	0.08	3.29	<5	3	5.1	0.64
V671191		0.5	0.14	2960	0.31	455	3.1	46.0	0.16	1.95	0.08	3.70	<5	2	6.2	0.70
V671192		0.7	0.18	2750	0.28	398	2.9	24.6	0.12	1.54	0.10	4.96	<5	2	6.1	0.98
V671193		0.6	0.20	2390	0.30	38	5.2	21.2	0.18	2.01	0.16	4.34	<5	2	7.0	1.63
V671194		1.1	0.29	609	0.44	24	9.6	11.1	0.20	3.39	0.34	7.73	<5	2	10.5	4.00
V671195		1.1	0.37	491	0.43	41	8.7	12.8	0.15	1.65	0.24	5.32	<5	2	7.8	2.59
V671196		0.6	0.18	259	0.25	20	6.3	7.2	0.10	1.29	0.14	4.86	<5	1	4.6	1.74
V671197		0.7	0.20	656	0.41	51	6.7	17.3	0.21	2.36	0.35	9.20	<5	3	9.6	3.94
V671198		0.5	0.12	784	0.24	61	3.4	16.9	0.11	1.34	0.15	1.87	<5	3	4.5	1.59
V671199		0.4	0.13	743	0.36	60	4.3	19.1	0.19	2.48	0.35	8.29	<5	2	8.7	4.13
V671200		1.5	0.38	2870	1.00	295	11.2	56.2	0.19	4.38	0.03	2.83	<5	4	3.5	0.24

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671161		33	74.3	15.80	0.68	0.96	0.21	6.75	0.77	<0.01	0.02	0.17	0.09	<0.01	<0.01	0.44
V671162		28	73.7	15.80	1.46	0.81	0.58	5.37	2.44	<0.01	0.05	0.19	0.24	<0.01	<0.01	0.69
V671163		22	77.0	16.05	0.88	0.29	0.39	2.65	2.67	<0.01	<0.01	0.27	0.08	0.01	<0.01	1.50
V671164		19	77.3	16.45	0.66	0.21	0.11	3.54	2.86	<0.01	<0.01	0.09	0.08	<0.01	<0.01	0.54
V671165		4	74.2	16.20	0.71	0.22	0.04	3.55	3.63	<0.01	<0.01	0.10	0.11	0.01	<0.01	0.46
V671166		9	76.9	16.10	0.76	0.20	0.02	3.36	2.99	<0.01	<0.01	0.15	0.10	<0.01	<0.01	0.48
V671167		7	75.2	15.70	0.78	0.19	0.02	3.53	2.30	<0.01	<0.01	0.20	0.09	<0.01	<0.01	0.58
V671168		10	76.6	15.75	0.69	0.16	0.03	3.19	2.55	<0.01	<0.01	0.19	0.07	<0.01	<0.01	0.53
V671169		18	75.6	15.85	0.69	0.18	0.03	3.29	2.35	<0.01	<0.01	0.19	0.07	<0.01	<0.01	0.40
V671170		14	76.2	16.45	0.68	0.22	0.02	3.82	2.66	<0.01	<0.01	0.21	0.11	<0.01	<0.01	0.44
V671171		15	75.1	15.40	0.72	0.15	0.02	4.11	1.90	<0.01	<0.01	0.32	0.07	<0.01	<0.01	0.28
V671172		18	74.9	15.95	0.59	0.36	0.04	4.45	3.33	<0.01	<0.01	0.24	0.06	0.01	<0.01	0.62
V671173		13	76.3	15.35	0.69	0.24	0.03	3.34	2.53	0.01	<0.01	0.23	0.06	<0.01	<0.01	0.47
V671174		6	77.3	15.50	0.79	0.16	0.03	2.87	2.72	0.02	<0.01	0.29	0.05	<0.01	<0.01	0.19
V671175		16	74.6	15.40	2.39	0.20	0.07	3.51	2.52	<0.01	0.01	0.15	0.06	<0.01	<0.01	0.05
V671176		14	75.6	15.15	0.76	0.15	0.02	3.47	2.81	0.01	<0.01	0.23	0.06	0.01	<0.01	0.34
V671177		5	75.3	15.50	0.75	0.14	0.04	2.76	2.98	0.01	<0.01	0.17	0.05	<0.01	<0.01	0.39
V671178		9	74.7	15.55	0.81	0.29	0.04	5.26	2.39	<0.01	0.01	0.17	0.05	<0.01	<0.01	0.75
V671179		3	76.8	17.00	0.96	0.09	0.06	0.50	0.63	0.01	0.01	0.08	0.04	<0.01	<0.01	0.31
V671180		15	76.9	15.90	0.78	0.18	0.04	3.82	2.53	<0.01	0.01	0.16	0.08	<0.01	<0.01	0.63
V671181		19	76.6	15.90	0.74	0.20	0.08	3.50	2.38	<0.01	<0.01	0.16	0.09	<0.01	<0.01	0.51
V671182		37	73.0	15.90	2.09	1.41	0.92	3.59	2.83	0.01	0.09	0.16	0.15	<0.01	<0.01	0.98
V671183		43	76.2	16.15	0.69	0.20	0.04	3.73	3.05	0.01	<0.01	0.26	0.05	<0.01	<0.01	0.30
V671184		12	76.8	15.45	0.88	0.18	0.02	3.31	2.48	<0.01	<0.01	0.12	0.03	<0.01	<0.01	0.35
V671185		10	76.7	15.40	0.86	0.17	0.03	3.17	3.21	0.01	<0.01	0.10	0.04	<0.01	<0.01	0.41
V671186		5	75.9	15.25	0.80	0.17	0.02	3.45	2.85	<0.01	<0.01	0.13	0.05	<0.01	<0.01	0.30
V671187		5	76.3	14.75	0.61	0.35	0.03	5.87	2.11	<0.01	<0.01	0.17	0.04	<0.01	<0.01	0.28
V671188		18	83.2	10.40	1.04	0.32	0.07	3.29	1.21	<0.01	0.01	0.12	0.03	<0.01	<0.01	0.58
V671189		31	82.1	11.30	0.80	0.63	0.03	4.57	1.55	<0.01	0.01	0.07	0.02	<0.01	<0.01	0.76
V671190		8	75.4	15.25	0.63	0.34	0.02	4.02	5.66	<0.01	<0.01	0.08	0.05	<0.01	<0.01	0.46
V671191		14	72.9	14.95	0.66	0.32	0.04	3.48	6.69	<0.01	<0.01	0.17	0.04	<0.01	<0.01	0.31
V671192		27	73.1	15.45	0.61	0.24	0.04	3.33	7.36	<0.01	<0.01	0.19	0.05	<0.01	<0.01	0.24
V671193		24	73.6	14.20	0.67	0.33	0.03	3.39	6.17	<0.01	<0.01	0.19	0.03	<0.01	<0.01	0.20
V671194		29	78.4	12.85	0.76	0.85	0.06	5.01	1.70	<0.01	<0.01	0.17	0.01	<0.01	<0.01	0.21
V671195		20	82.6	10.70	1.03	0.94	0.07	4.26	0.63	<0.01	0.02	0.11	0.01	<0.01	<0.01	0.37
V671196		25	79.2	12.70	1.08	1.28	0.09	5.46	0.62	<0.01	0.02	0.13	0.02	<0.01	<0.01	0.34
V671197		40	84.1	9.03	1.40	0.70	0.11	3.42	0.78	<0.01	0.03	0.18	0.01	<0.01	<0.01	0.36
V671198		18	89.4	5.38	1.49	0.28	0.17	1.37	0.76	<0.01	0.03	0.10	0.01	<0.01	<0.01	0.37
V671199		22	87.9	6.27	1.39	0.42	0.08	2.07	0.70	<0.01	0.03	0.14	0.03	<0.01	<0.01	0.22
V671200		17	73.5	15.35	2.52	0.21	0.07	3.65	2.60	<0.01	0.01	0.16	0.06	0.01	<0.01	0.02

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	TOT-ICP06	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671161		100.19	460	<0.5	<5	<0.5	<1	3	2010	<1	2	3	1	10	20	
V671162		101.33	2590	<0.5	5	<0.5	2	8	2080	<1	10	8	2	30	93	
V671163		101.79	1570	<0.5	<5	<0.5	<1	1	7820	<1	<1	2	<1	30	77	0.876
V671164		101.84	1240	<0.5	<5	<0.5	<1	<1	7030	<1	<1	4	<1	30	86	0.766
V671165		99.23	1710	<0.5	<5	<0.5	<1	<1	5210	<1	<1	6	<1	30	98	0.584
V671166		101.06	1580	<0.5	<5	<0.5	<1	<1	6530	<1	1	2	<1	30	88	0.741
V671167		98.59	1840	<0.5	6	<0.5	<1	<1	6490	1	1	3	<1	20	120	0.750
V671168		99.76	1290	<0.5	5	<0.5	<1	<1	6920	<1	<1	2	<1	20	102	0.838
V671169		98.65	1260	<0.5	<5	<0.5	<1	1	7490	1	1	5	<1	20	100	0.871
V671170		100.81	1620	<0.5	<5	0.5	<1	1	6390	1	1	5	<1	20	123	0.743
V671171		98.07	1340	<0.5	<5	<0.5	<1	<1	5930	1	1	6	<1	10	130	0.674
V671172		100.55	1290	<0.5	<5	<0.5	<1	<1	4320	1	<1	4	<1	30	91	
V671173		99.25	1660	<0.5	<5	<0.5	<1	1	6440	1	1	2	<1	20	108	0.739
V671174		99.92	1310	<0.5	<5	<0.5	<1	1	7610	<1	<1	5	<1	20	122	0.823
V671175		98.96	2130	<0.5	<5	<0.5	1	41	6200	7	17	5	<1	20	104	0.723
V671176		98.61	1930	<0.5	5	<0.5	<1	3	5840	1	3	8	1	20	105	0.684
V671177		98.09	2190	<0.5	7	<0.5	<1	1	7410	1	1	7	1	20	89	0.884
V671178		100.02	3770	<0.5	5	<0.5	<1	1	2940	<1	<1	7	3	20	96	
V671179		96.49	1590	<0.5	<5	<0.5	<1	1	>10000	1	<1	<2	1	10	45	2.020
V671180		101.03	3330	<0.5	<5	<0.5	<1	1	5970	<1	1	6	2	20	124	0.687
V671181		100.16	1570	<0.5	<5	<0.5	<1	<1	6760	1	1	4	<1	10	86	0.822
V671182		101.13	8830	<0.5	6	<0.5	4	18	5560	<1	16	3	5	20	105	0.632
V671183		100.68	940	<0.5	<5	<0.5	<1	1	5860	<1	<1	7	1	20	70	0.697
V671184		99.62	1120	<0.5	<5	<0.5	<1	1	6600	1	<1	6	1	10	93	0.794
V671185		100.10	1220	<0.5	<5	<0.5	<1	<1	5570	1	<1	6	<1	20	116	0.664
V671186		98.92	940	<0.5	<5	<0.5	<1	<1	5840	1	<1	6	<1	10	89	0.689
V671187		100.51	970	<0.5	<5	0.5	<1	<1	1200	<1	<1	7	2	10	113	
V671188		100.27	2630	<0.5	<5	<0.5	<1	1	2290	<1	<1	3	6	10	126	
V671189		101.84	1540	<0.5	<5	<0.5	<1	1	820	1	<1	3	4	10	51	
V671190		101.91	990	<0.5	<5	<0.5	<1	1	470	<1	<1	6	2	20	76	
V671191		99.56	500	<0.5	<5	<0.5	1	2	370	<1	1	6	1	20	62	
V671192		100.61	390	<0.5	<5	<0.5	<1	1	470	1	1	12	1	20	39	
V671193		98.81	400	<0.5	<5	<0.5	<1	1	420	1	<1	22	2	10	29	
V671194		100.02	250	<0.5	<5	<0.5	<1	3	390	<1	1	17	2	10	17	
V671195		100.74	1280	<0.5	<5	<0.5	<1	1	710	1	<1	10	4	10	30	
V671196		100.94	1170	<0.5	<5	<0.5	<1	1	680	1	<1	12	3	<10	22	
V671197		100.12	1690	<0.5	<5	<0.5	<1	1	880	1	<1	12	5	10	33	
V671198		99.36	2130	<0.5	<5	<0.5	<1	1	1310	1	<1	4	4	10	38	
V671199		99.25	2030	<0.5	<5	<0.5	<1	1	1170	1	1	5	6	10	36	
V671200		98.16	2080	<0.5	<5	<0.5	<1	41	6160	7	16	4	<1	20	103	0.718

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671201		0.45	29.3	4.5	10	0.04	0.21	0.14	0.04	0.5	0.19	0.7	0.03	2.2	0.02	<0.2
V671202		11.55	2.2	3.0	30	13.50	2.28	2.61	<0.03	26.3	0.85	2.6	0.50	1.4	2.07	30.9
V671203		6.19	1.9	5.5	20	13.65	1.06	1.09	<0.03	35.3	0.47	0.8	0.22	2.8	0.70	23.1
V671204		7.29	5.2	2.6	40	20.1	2.00	0.94	<0.03	32.0	1.10	1.4	0.27	1.4	0.37	61.3
V671205		7.77	4.0	1.2	10	23.0	1.43	0.52	<0.03	28.3	0.84	1.1	0.19	0.6	0.16	81.3
V671206		8.25	1.0	1.0	10	14.45	1.02	0.20	<0.03	40.3	0.66	1.8	0.10	<0.5	0.05	82.7
V671207		8.67	<0.5	1.7	10	7.25	0.78	0.18	<0.03	43.3	0.72	1.9	0.07	0.5	0.03	102.5
V671208		6.65	0.6	1.5	10	10.80	0.64	0.12	<0.03	35.7	0.82	0.9	0.05	<0.5	0.02	60.4
V671209		8.05	8.7	1.4	50	119.5	0.69	0.38	0.09	48.7	0.65	2.0	0.12	0.5	0.05	36.9
V671210		5.63	1.1	<0.5	10	10.45	0.17	0.04	<0.03	45.6	0.14	1.3	0.01	<0.5	<0.01	31.6
V671211		3.20	1.1	<0.5	10	12.95	0.32	0.11	<0.03	52.0	0.12	1.0	0.03	<0.5	0.02	27.9
V671212		10.28	0.8	<0.5	20	28.0	0.19	0.05	<0.03	56.0	0.11	1.7	0.02	<0.5	0.01	52.4
V671213		3.59	13.8	2.0	110	160.5	1.01	0.61	0.14	51.0	0.83	1.8	0.20	0.8	0.10	32.8
V671214		5.68	7.0	0.5	30	28.9	0.54	0.17	0.03	49.5	0.36	2.0	0.07	<0.5	0.03	42.8
V671215		4.29	17.9	2.6	130	335	1.28	0.69	0.23	44.2	1.02	1.6	0.25	1.0	0.11	34.2
V671216		10.45	24.6	5.4	260	137.5	2.56	1.61	0.50	22.0	2.30	1.3	0.54	1.8	0.24	25.3
V671217		3.07	8.3	<0.5	20	71.5	0.07	0.05	<0.03	59.9	0.10	2.0	0.01	<0.5	<0.01	11.4
V671218		8.62	8.1	0.5	30	110.5	0.11	0.04	<0.03	48.0	0.10	2.0	0.01	<0.5	<0.01	9.6
V671219		8.74	6.7	0.9	30	220	0.32	0.13	0.05	39.6	0.28	1.3	0.04	0.5	0.02	19.1
V671220		8.31	1.7	1.6	30	60.7	0.28	0.08	<0.03	38.4	0.24	1.5	0.03	0.9	0.02	5.9
V671221		8.06	5.8	1.0	30	145.5	0.42	0.14	0.04	64.6	0.34	2.4	0.05	<0.5	0.01	23.9
V671222		8.85	0.6	0.7	20	50.9	0.24	0.05	<0.03	44.8	0.25	1.4	0.02	<0.5	<0.01	20.8
V671223		8.18	<0.5	1.6	20	53.9	0.74	0.22	<0.03	44.6	0.60	1.0	0.08	0.5	0.04	29.0
V671224		8.28	<0.5	7.3	20	108.5	2.56	0.61	<0.03	50.1	2.86	1.1	0.26	2.3	0.09	78.4
V671225		0.04	18.9	2.5	30	24.0	0.83	0.15	<0.03	38.1	0.96	1.6	0.07	0.9	0.03	70.6
V671226		4.09	<0.5	18.0	20	138.5	4.33	0.93	<0.03	57.8	5.49	0.7	0.47	5.5	0.13	113.5
V671227		7.81	2.3	1.2	20	140.0	0.23	0.06	<0.03	49.1	0.22	1.3	0.02	0.5	0.01	26.0
V671228		8.29	<0.5	<0.5	20	209	0.15	0.04	<0.03	56.9	0.12	1.7	0.01	<0.5	0.01	34.9
V671229		5.09	<0.5	<0.5	10	201	0.16	0.04	<0.03	69.4	0.14	4.1	0.01	<0.5	0.02	54.8
V671230		2.64	27.1	0.5	40	324	0.25	0.08	0.04	36.3	0.20	1.1	0.03	<0.5	<0.01	18.1
V671231		7.42	<0.5	<0.5	30	174.0	0.09	<0.03	<0.03	50.6	0.06	1.6	<0.01	<0.5	<0.01	29.0
V671232		8.04	0.7	0.5	30	318	0.30	0.14	<0.03	53.7	0.20	3.0	0.04	<0.5	0.01	33.5
V671233		4.69	<0.5	<0.5	20	165.5	0.10	<0.03	<0.03	55.5	0.06	2.9	<0.01	<0.5	<0.01	32.1
V671234		5.64	14.5	0.5	30	286	0.14	0.09	<0.03	48.8	0.13	2.5	<0.01	<0.5	<0.01	21.2
V671235		4.15	0.5	<0.5	10	66.9	0.14	0.03	<0.03	59.1	0.06	1.9	<0.01	<0.5	<0.01	27.7
V671236		2.60	33.8	3.0	50	92.8	0.49	0.25	0.03	38.7	0.45	1.0	0.07	1.4	0.01	14.1
V671237		3.60	21.0	1.1	60	58.7	0.10	0.06	<0.03	36.7	0.10	0.4	0.01	<0.5	<0.01	7.9
V671238		1.77	5.1	<0.5	30	53.7	<0.05	0.04	<0.03	45.1	0.09	4.8	<0.01	<0.5	<0.01	14.3
V671239		1.98	12.4	3.9	40	84.6	0.27	0.14	0.08	46.7	0.35	5.6	0.02	1.9	<0.01	10.9
V671240		0.41	31.1	4.5	10	0.13	0.18	0.11	<0.03	0.6	0.18	0.6	0.02	2.3	<0.01	0.2

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671201		1.6	0.44	3.4	0.31	<1	6.4	0.1	0.03	0.49	0.02	0.21	<5	<1	1.2	0.16
V671202		0.9	0.29	433	0.44	36	8.1	13.7	0.32	2.18	0.87	7.96	<5	2	17.3	10.20
V671203		1.6	0.53	321	0.57	23	9.7	17.0	0.14	1.96	0.32	6.30	<5	4	7.7	3.62
V671204		0.9	0.28	1485	0.53	29	7.2	19.0	0.35	4.14	0.23	12.00	<5	2	10.7	2.39
V671205		0.4	0.10	3930	0.37	72	3.2	31.6	0.27	2.80	0.12	7.68	<5	2	7.8	1.06
V671206		0.4	0.12	2830	0.36	384	1.5	39.0	0.21	3.53	0.04	6.59	<5	2	5.0	0.41
V671207		0.8	0.21	1350	0.66	406	1.1	58.4	0.18	4.10	0.02	8.94	<5	3	4.0	0.26
V671208		0.9	0.22	1695	0.79	249	1.0	43.4	0.14	2.48	0.02	4.74	<5	2	2.8	0.19
V671209		0.9	0.18	2510	0.45	307	12.3	64.3	0.13	1.78	0.06	4.36	37	5	3.9	0.41
V671210		0.2	0.04	2120	0.12	328	1.9	33.6	0.03	1.19	0.01	3.33	<5	1	1.1	0.07
V671211		<0.1	<0.03	2740	0.03	348	1.2	45.1	0.06	1.10	0.02	4.08	<5	1	2.0	0.19
V671212		0.1	<0.03	3060	0.07	520	1.4	77.7	0.03	1.55	0.01	4.36	<5	2	1.2	0.13
V671213		1.2	0.25	5270	0.53	346	17.4	55.5	0.15	3.30	0.09	4.04	86	3	5.9	0.71
V671214		0.3	0.06	1840	0.18	446	10.3	96.1	0.09	3.29	0.02	5.45	10	3	2.9	0.28
V671215		1.9	0.38	4020	0.88	290	48.2	86.2	0.19	2.67	0.11	3.07	106	3	7.1	0.72
V671216		4.1	0.79	902	1.63	23	85.8	30.2	0.42	1.19	0.25	1.33	236	1	14.4	1.60
V671217		0.2	0.05	811	0.07	178	8.3	41.7	0.01	2.85	<0.01	4.73	8	2	0.6	0.05
V671218		0.2	0.04	2160	0.11	537	15.1	47.5	0.02	1.19	0.01	4.42	6	2	0.8	0.08
V671219		0.4	0.10	2200	0.26	87	22.5	88.5	0.06	4.56	0.02	9.32	15	5	2.0	0.20
V671220		0.3	0.14	2390	0.29	55	6.2	9.2	0.07	1.95	0.02	2.19	<5	3	2.8	0.23
V671221		0.5	0.10	1995	0.33	237	15.9	49.1	0.08	3.32	0.02	6.91	10	3	2.2	0.17
V671222		0.3	0.09	3730	0.27	143	4.7	29.0	0.05	3.55	<0.01	6.93	<5	3	1.3	0.08
V671223		0.8	0.21	3620	0.60	89	1.4	20.2	0.15	3.50	0.04	2.35	<5	5	4.2	0.30
V671224		3.5	0.94	4990	2.76	147	1.5	81.5	0.58	9.62	0.11	2.94	<5	10	12.8	0.71
V671225		1.1	0.31	2790	0.86	298	10.7	53.5	0.21	3.86	0.03	2.73	<5	4	3.9	0.26
V671226		8.7	2.39	6950	6.47	156	1.5	87.4	1.05	22.3	0.15	3.66	<5	13	20.9	1.12
V671227		0.6	0.12	5350	0.27	119	10.6	93.0	0.05	4.77	0.01	4.72	<5	6	1.6	0.15
V671228		0.1	0.03	7750	0.08	228	2.9	153.0	0.03	5.09	<0.01	5.47	<5	7	1.1	0.12
V671229		0.1	<0.03	9600	0.10	523	4.8	255	0.03	6.99	0.01	7.93	<5	9	1.4	0.20
V671230		0.3	0.06	2590	0.14	61	7.0	83.0	0.04	2.26	<0.01	4.14	24	2	1.4	0.11
V671231		0.1	<0.03	7050	0.05	127	1.9	106.5	<0.01	4.33	<0.01	7.34	<5	7	0.8	0.07
V671232		0.4	0.05	8550	0.12	293	7.6	166.5	0.02	4.98	0.01	6.29	18	9	2.2	0.22
V671233		0.1	<0.03	6200	0.07	203	5.3	145.5	<0.01	3.77	<0.01	6.27	<5	6	1.0	0.08
V671234		0.3	0.05	5660	0.14	116	10.1	90.9	<0.01	2.97	<0.01	5.66	10	6	1.3	0.09
V671235		0.2	<0.03	5830	0.06	660	4.8	65.7	<0.01	7.80	<0.01	8.28	<5	7	1.5	0.16
V671236		1.7	0.37	1515	0.40	212	39.3	53.0	0.06	4.28	0.01	4.06	27	5	3.1	0.30
V671237		0.5	0.10	2100	0.06	125	30.9	33.5	<0.01	1.30	<0.01	1.57	16	2	0.8	0.05
V671238		0.2	<0.03	1280	0.05	198	39.1	65.4	<0.01	1.59	<0.01	8.78	7	1	0.6	0.06
V671239		2.0	0.42	803	0.34	141	64.4	26.5	0.02	3.16	<0.01	10.80	13	2	1.7	0.18
V671240		1.6	0.41	4.9	0.23	<1	6.9	0.1	<0.01	0.38	<0.01	0.20	<5	1	1.3	0.14

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
V671201		32	99.1	0.23	1.05	0.05	0.02	0.04	0.16	<0.01	0.01	0.01	<0.01	<0.01	<0.01	-0.18	
V671202		48	79.3	11.75	1.29	1.03	0.05	5.13	0.58	<0.01	0.01	0.30	0.02	<0.01	<0.01	0.28	
V671203		14	72.6	16.25	0.79	1.47	0.03	7.16	0.58	<0.01	0.01	0.09	0.02	<0.01	<0.01	0.51	
V671204		18	75.2	14.90	0.89	0.91	0.03	5.40	3.19	<0.01	<0.01	0.27	0.03	<0.01	<0.01	0.34	
V671205		13	71.4	15.70	0.74	0.22	0.02	2.57	8.77	<0.01	<0.01	0.17	0.04	<0.01	<0.01	0.31	
V671206		19	72.2	15.30	0.78	0.19	0.01	4.02	6.37	<0.01	0.01	0.18	0.04	<0.01	<0.01	0.18	
V671207		21	73.3	15.40	0.80	0.17	0.01	6.26	2.96	<0.01	0.01	0.13	0.04	<0.01	<0.01	0.25	
V671208		9	72.8	15.55	0.66	0.16	0.01	6.34	3.00	<0.01	0.01	0.11	0.04	<0.01	<0.01	0.25	
V671209		23	69.3	15.75	2.11	1.81	0.71	5.52	2.86	0.01	0.11	0.18	0.15	0.01	<0.01	0.59	
V671210		12	73.4	15.50	0.52	0.17	0.02	6.47	3.00	<0.01	<0.01	0.20	0.06	<0.01	<0.01	0.30	
V671211		10	72.9	15.45	0.52	0.12	0.02	6.25	3.01	<0.01	<0.01	0.31	0.05	<0.01	<0.01	0.32	
V671212		15	73.5	15.75	0.50	0.15	0.02	6.50	2.67	<0.01	<0.01	0.23	0.06	<0.01	<0.01	0.45	
V671213		28	65.6	15.75	4.26	1.71	2.03	4.30	3.55	0.02	0.26	0.22	0.08	0.01	<0.01	1.34	
V671214		20	73.4	15.90	1.28	0.76	0.28	5.17	1.64	0.01	0.03	0.30	0.07	<0.01	<0.01	0.33	
V671215		27	62.9	17.05	5.15	4.42	2.26	3.87	1.76	0.02	0.32	0.18	0.27	0.01	<0.01	1.33	
V671216		38	58.0	15.30	10.15	9.25	4.65	2.11	0.72	0.03	0.62	0.24	0.08	0.01	<0.01	0.70	
V671217		17	72.8	17.25	0.73	0.47	0.23	8.82	0.62	<0.01	0.02	0.05	0.07	<0.01	<0.01	0.30	
V671218		15	74.6	16.25	0.72	0.56	0.20	6.74	1.26	<0.01	0.02	0.10	0.12	<0.01	<0.01	0.83	
V671219		11	74.0	16.80	1.20	1.18	0.44	3.14	1.07	<0.01	0.05	0.14	0.26	<0.01	<0.01	0.98	
V671220		11	76.6	16.75	0.68	0.33	0.12	2.92	1.28	<0.01	<0.01	0.21	0.20	<0.01	<0.01	1.03	
V671221		20	72.1	17.30	1.05	1.11	0.36	7.06	1.04	<0.01	0.04	0.16	0.14	<0.01	<0.01	0.78	
V671222		11	75.6	15.55	0.62	0.31	0.04	5.40	2.78	<0.01	0.01	0.15	0.10	0.01	<0.01	0.69	
V671223		12	73.6	15.60	0.75	0.17	0.04	5.62	3.25	<0.01	<0.01	0.12	0.09	<0.01	<0.01	0.63	
V671224		11	75.8	14.35	0.91	0.20	0.01	4.39	3.37	<0.01	0.01	0.10	0.14	0.01	<0.01	0.81	
V671225		19	74.5	15.25	2.45	0.21	0.07	3.58	2.51	<0.01	0.01	0.15	0.06	<0.01	<0.01	0.20	
V671226		8	75.7	15.15	1.07	0.16	0.02	3.22	3.67	<0.01	0.01	0.18	0.09	0.01	<0.01	1.42	
V671227		10	73.7	16.70	0.60	0.29	0.10	4.42	2.31	<0.01	0.01	0.13	0.15	0.01	<0.01	1.43	
V671228		13	73.7	16.80	0.38	0.16	0.02	3.81	2.58	0.01	<0.01	0.12	0.17	0.01	<0.01	1.04	
V671229		30	71.8	17.95	0.40	0.15	0.01	4.07	2.91	<0.01	<0.01	0.15	0.18	0.01	<0.01	1.07	
V671230		10	78.0	14.95	1.59	0.65	0.47	4.34	1.02	<0.01	0.03	0.04	0.13	0.01	<0.01	0.70	
V671231		12	72.6	16.95	0.54	0.15	0.02	3.78	2.43	<0.01	<0.01	0.13	0.11	0.01	<0.01	1.31	
V671232		24	71.5	16.80	0.93	0.54	0.40	3.79	2.63	<0.01	0.05	0.12	0.18	0.01	<0.01	1.10	
V671233		19	72.7	17.40	0.80	0.29	0.02	4.38	2.07	<0.01	<0.01	0.10	0.16	0.01	<0.01	1.26	
V671234		19	72.3	16.85	1.28	0.81	0.38	4.24	1.64	<0.01	0.03	0.07	0.14	0.01	<0.01	1.20	
V671235		14	73.0	17.30	0.40	0.30	0.01	5.22	2.33	<0.01	<0.01	0.30	0.10	0.01	<0.01	1.19	
V671236		14	72.4	16.95	1.86	1.12	0.61	4.14	0.77	0.01	0.09	0.23	0.09	0.01	<0.01	0.54	
V671237		5	74.4	16.00	1.41	0.71	0.31	3.66	1.51	0.01	0.05	0.06	0.05	0.01	<0.01	0.37	
V671238		37	74.5	17.40	0.74	0.87	0.17	5.50	0.61	<0.01	0.02	0.04	0.06	<0.01	<0.01	0.47	
V671239		49	73.4	17.60	1.21	1.19	0.42	6.80	0.47	<0.01	0.05	0.07	0.11	0.01	<0.01	0.48	
V671240		28	100.0	0.28	0.92	0.05	0.02	0.04	0.16	<0.01	0.01	0.01	<0.01	<0.01	<0.01	-0.07	

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	TOT-ICP06	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671201		100.49	<20	<0.5	<5	<0.5	<1	1	10	1	1	<2	<1	<10	<2	
V671202		99.74	1070	<0.5	<5	<0.5	<1	1	630	1	<1	11	6	10	21	
V671203		99.51	890	<0.5	5	<0.5	<1	1	1290	<1	<1	10	2	<10	19	
V671204		101.16	660	<0.5	<5	<0.5	<1	1	720	1	<1	17	2	10	29	
V671205		99.94	640	<0.5	<5	<0.5	<1	<1	520	1	<1	18	1	30	54	
V671206		99.28	640	<0.5	<5	<0.5	<1	1	480	<1	<1	10	<1	20	84	
V671207		99.33	820	<0.5	<5	<0.5	<1	1	530	<1	<1	5	<1	10	95	
V671208		98.93	1010	<0.5	<5	<0.5	<1	1	650	1	<1	<2	<1	10	97	
V671209		99.11	5900	<0.5	5	<0.5	7	28	1330	1	23	2	5	20	49	
V671210		99.64	1040	<0.5	<5	<0.5	<1	<1	440	<1	<1	<2	<1	20	48	
V671211		98.95	1330	<0.5	<5	<0.5	<1	1	520	<1	<1	4	<1	20	49	
V671212		99.83	2000	<0.5	<5	<0.5	<1	4	800	<1	1	5	<1	20	78	
V671213		99.13	6400	<0.5	9	<0.5	17	71	1710	<1	55	5	12	30	79	
V671214		99.17	900	<0.5	<5	0.5	2	4	4050	<1	6	6	1	10	60	
V671215		99.54	5070	<0.5	14	0.5	21	87	1410	<1	68	12	14	30	58	
V671216		101.86	2460	<0.5	8	0.6	41	88	590	<1	132	14	32	<10	84	
V671217		101.36	740	<0.5	5	<0.5	2	7	200	<1	4	2	1	<10	20	
V671218		101.40	2060	<0.5	10	<0.5	1	12	1060	<1	3	3	1	20	25	
V671219		99.26	7320	<0.5	18	<0.5	2	24	8380	<1	7	<2	2	20	33	0.985
V671220		100.12	7570	<0.5	<5	0.5	<1	1	9340	<1	<1	4	<1	10	29	1.120
V671221		101.14	2990	<0.5	13	<0.5	1	5	1340	<1	6	7	2	20	57	
V671222		101.26	2670	<0.5	9	<0.5	<1	2	1820	<1	1	3	<1	20	45	
V671223		99.87	2260	<0.5	<5	<0.5	<1	3	1000	<1	<1	8	1	30	55	
V671224		100.10	5570	<0.5	<5	<0.5	<1	1	2040	<1	1	7	1	40	67	
V671225		98.99	2180	<0.5	<5	<0.5	1	42	6170	7	19	6	<1	20	103	0.690
V671226		100.70	12350	<0.5	<5	<0.5	<1	1	4450	<1	1	4	2	40	99	
V671227		99.85	12400	<0.5	<5	0.5	<1	1	5870	<1	1	4	<1	40	13	0.652
V671228		98.80	18200	<0.5	<5	<0.5	<1	1	7150	<1	1	6	<1	50	5	0.816
V671229		98.70	>20000	<0.5	<5	0.5	<1	1	6390	<1	1	7	<1	60	8	0.732
V671230		101.93	6280	<0.5	8	<0.5	1	1	4520	1	5	6	1	20	12	
V671231		98.03	16150	<0.5	<5	<0.5	<1	1	6800	<1	1	6	<1	50	22	0.788
V671232		98.05	>20000	<0.5	<5	0.5	1	1	7150	<1	6	7	2	60	9	0.819
V671233		99.19	12250	<0.5	<5	<0.5	<1	2	5900	<1	1	4	<1	40	5	0.659
V671234		98.95	11050	<0.5	28	<0.5	2	17	5750	<1	6	5	1	40	7	0.647
V671235		100.16	15000	<0.5	<5	<0.5	<1	1	4070	<1	1	4	<1	30	18	
V671236		98.82	2860	<0.5	<5	<0.5	5	27	7810	<1	13	6	3	10	29	0.880
V671237		98.55	580	<0.5	8	<0.5	3	17	7130	<1	11	4	2	10	22	0.808
V671238		100.38	640	<0.5	<5	<0.5	1	4	5510	<1	3	5	1	10	14	0.619
V671239		101.81	1330	<0.5	7	<0.5	3	36	4340	1	7	10	1	10	21	
V671240		101.42	<20	<0.5	<5	<0.5	<1	3	<10	1	2	3	<1	<10	2	

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671241		6.71	1.9	1.3	50	57.4	0.24	0.04	<0.03	42.8	0.37	1.8	0.01	<0.5	<0.01	35.5
V671242		4.66	4.3	0.6	40	58.7	0.10	0.03	<0.03	50.2	0.13	3.1	<0.01	<0.5	<0.01	18.7
V671243		2.93	9.0	0.8	40	160.5	0.39	0.18	<0.03	50.5	0.32	1.9	0.04	<0.5	<0.01	19.4
V671244		2.03	5.1	<0.5	40	76.0	0.17	0.05	<0.03	48.3	0.12	2.9	<0.01	<0.5	<0.01	9.1
V671245		7.34	<0.5	0.8	20	57.0	0.55	0.08	<0.03	40.2	0.55	0.8	0.02	<0.5	<0.01	44.9
V671246		4.58	<0.5	1.0	20	51.8	0.47	0.07	<0.03	38.5	0.45	1.5	0.03	<0.5	<0.01	49.0
V671247		1.53	4.5	0.5	30	119.5	0.23	0.12	<0.03	41.5	0.27	5.7	0.02	<0.5	<0.01	79.4
V671248		3.00	4.0	1.1	50	341	0.90	0.26	0.05	40.1	0.93	4.8	0.11	<0.5	0.01	13.3
V671249		5.36	0.6	8.6	30	66.8	2.34	0.65	<0.03	41.1	3.15	1.2	0.23	2.7	0.07	75.3
V671250		0.03	19.5	3.2	30	27.1	0.81	0.19	<0.03	35.4	1.02	1.2	0.07	1.2	<0.01	64.7
V671251		8.67	0.7	14.0	60	76.2	2.75	0.79	<0.03	37.3	4.32	0.6	0.32	4.3	0.07	61.4
V671252		9.16	<0.5	1.4	20	32.4	0.75	0.23	<0.03	32.6	0.49	2.4	0.08	0.5	0.03	37.6
V671253		8.48	<0.5	14.9	20	51.8	5.07	1.46	<0.03	44.4	6.07	1.4	0.58	4.8	0.19	94.3
V671254		9.74	<0.5	5.4	30	31.9	1.82	0.48	<0.03	34.9	2.13	1.4	0.18	1.9	0.04	93.0
V671255		5.37	<0.5	<0.5	20	28.6	0.42	0.10	<0.03	41.6	0.22	2.9	0.02	<0.5	<0.01	35.8
V671256		7.69	<0.5	0.8	30	34.7	0.48	0.11	<0.03	43.5	0.35	2.5	0.03	<0.5	<0.01	59.1
V671257		8.74	<0.5	1.9	30	45.3	0.66	0.16	<0.03	46.9	0.79	2.3	0.05	0.6	<0.01	74.6
V671258		8.78	<0.5	1.1	20	54.2	0.59	0.10	<0.03	43.1	0.56	2.4	0.03	<0.5	<0.01	63.6
V671259		7.79	1.2	1.7	20	87.2	0.55	0.11	<0.03	58.9	0.67	3.7	0.04	0.6	<0.01	94.0
V671260		5.67	<0.5	1.3	20	65.3	0.37	0.07	<0.03	51.5	0.43	3.1	0.01	0.5	<0.01	58.9
V671261		8.81	1.9	2.7	20	78.7	1.26	0.28	<0.03	43.1	1.45	2.2	0.11	0.9	<0.01	101.5
V671262		6.44	2.3	1.3	20	80.0	0.41	0.07	<0.03	49.6	0.57	2.1	0.01	0.5	<0.01	58.4
V671263		3.26	3.4	0.5	50	55.6	0.28	0.04	<0.03	45.5	0.34	1.7	0.01	<0.5	<0.01	63.4
V671264		1.54	2.9	<0.5	40	36.3	0.05	<0.03	<0.03	52.1	0.05	3.2	<0.01	<0.5	<0.01	23.5
V671265		1.52	2.6	0.5	40	100.0	0.09	0.05	0.05	64.4	0.11	2.4	<0.01	<0.5	<0.01	46.4
V671266		1.16	1.0	<0.5	20	48.9	0.28	0.09	0.03	56.0	0.25	2.2	0.01	<0.5	<0.01	49.0
V671267		6.06	16.5	1.5	30	116.5	0.20	0.08	0.05	61.0	0.21	1.9	<0.01	0.7	<0.01	32.6
V671268		9.38	2.6	27.0	10	7.56	4.75	2.03	0.05	37.9	4.51	0.8	0.66	8.7	0.54	51.8

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671241		0.6	0.14	1800	0.40	1015	5.6	43.5	0.04	2.03	<0.01	4.16	<5	4	1.8	0.08
V671242		0.3	0.05	1430	0.09	349	18.1	55.3	<0.01	1.85	<0.01	4.92	6	1	0.8	0.07
V671243		0.5	0.08	1205	0.27	458	23.8	54.5	0.04	1.97	<0.01	4.63	17	3	2.7	0.25
V671244		0.2	<0.03	578	0.10	156	18.4	26.7	0.01	2.53	<0.01	8.87	<5	1	1.2	0.10
V671245		0.4	0.09	2320	0.43	460	3.0	57.7	0.10	2.39	<0.01	6.12	<5	2	2.9	0.11
V671246		0.5	0.09	2490	0.35	402	3.6	64.0	0.08	2.37	<0.01	5.99	<5	2	2.8	0.20
V671247		0.4	0.04	177.5	0.13	313	24.5	194.5	0.01	1.80	<0.01	6.10	5	2	1.7	0.10
V671248		0.8	0.15	2500	0.61	153	27.8	42.0	0.19	1.30	0.01	7.12	22	2	5.0	0.31
V671249		4.9	1.23	2410	3.14	114	5.1	40.4	0.61	7.06	0.07	5.29	<5	5	13.1	0.88
V671250		1.6	0.43	2800	1.05	306	11.5	54.8	0.19	4.39	<0.01	2.93	<5	4	4.3	0.28
V671251		8.2	2.07	3450	4.89	111	1.0	21.3	0.69	8.53	0.07	4.49	<5	5	15.0	0.99
V671252		0.8	0.17	2000	0.41	41	1.1	24.1	0.12	2.04	0.02	7.68	<5	2	5.1	0.47
V671253		8.0	2.20	3240	5.57	366	1.2	44.2	1.20	11.05	0.19	9.10	<5	5	29.3	1.87
V671254		2.7	0.74	1965	2.12	72	0.9	36.7	0.43	4.52	0.05	7.78	<5	5	10.3	0.65
V671255		0.1	<0.03	2170	0.06	147	4.9	46.0	0.04	1.43	<0.01	5.52	<5	1	2.6	0.16
V671256		0.3	0.05	2930	0.34	368	7.5	50.6	0.06	2.44	<0.01	7.18	<5	3	2.7	0.18
V671257		1.1	0.23	3850	0.85	355	7.4	59.9	0.14	3.50	<0.01	9.04	<5	4	3.9	0.30
V671258		0.5	0.13	3320	0.51	428	12.7	58.3	0.11	3.39	<0.01	8.23	<5	4	3.3	0.23
V671259		0.8	0.21	4190	0.68	631	13.8	89.7	0.12	5.00	<0.01	12.50	<5	6	3.3	0.25
V671260		0.6	0.15	3880	0.56	504	2.2	57.6	0.07	3.64	<0.01	8.38	<5	4	2.1	0.15
V671261		1.4	0.35	3880	1.43	885	5.1	109.0	0.30	5.42	<0.01	10.65	<5	3	6.6	0.31
V671262		0.7	0.15	4410	0.63	432	13.0	70.6	0.07	3.59	<0.01	7.28	<5	5	2.1	0.09
V671263		0.3	0.06	2390	0.25	362	10.7	99.7	0.04	3.75	<0.01	7.07	<5	3	1.7	0.10
V671264		0.1	<0.03	877	<0.03	450	15.6	73.1	<0.01	2.67	<0.01	6.58	<5	3	0.6	<0.03
V671265		0.2	0.08	1885	0.07	345	23.5	151.5	<0.01	3.50	<0.01	4.34	<5	3	0.7	0.09
V671266		0.1	0.07	177.0	0.16	348	14.9	96.0	0.03	2.25	<0.01	4.15	<5	2	1.7	0.18
V671267		0.7	0.16	4750	0.25	319	40.1	79.1	0.01	3.43	<0.01	4.58	6	6	1.1	0.10
V671268		12.9	3.60	667	5.92	13	13.1	13.8	0.81	10.30	0.42	3.58	<5	2	32.9	3.94

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671241		14	75.6	16.60	1.30	0.36	0.09	3.29	1.42	0.01	0.01	0.11	0.07	<0.01	<0.01	0.44
V671242		26	74.7	16.45	0.83	0.74	0.13	5.82	1.01	<0.01	0.02	0.05	0.06	<0.01	<0.01	0.26
V671243		16	72.8	16.85	1.21	1.08	0.41	6.52	0.56	0.01	0.05	0.19	0.09	<0.01	<0.01	0.37
V671244		26	73.6	17.35	0.71	0.91	0.09	5.66	0.25	<0.01	0.01	0.13	0.06	<0.01	<0.01	0.19
V671245		7	76.3	15.90	0.63	0.16	0.02	3.58	1.92	<0.01	<0.01	0.23	0.07	<0.01	<0.01	0.24
V671246		13	75.3	15.90	0.57	0.22	0.03	4.13	2.20	<0.01	<0.01	0.23	0.08	<0.01	<0.01	0.24
V671247		39	74.0	17.35	0.75	1.42	0.21	4.46	0.12	<0.01	0.01	0.02	0.28	<0.01	<0.01	0.48
V671248		39	70.5	17.05	1.57	1.88	0.73	5.32	2.16	0.01	0.07	0.06	0.25	0.01	<0.01	0.55
V671249		11	74.8	16.50	1.27	0.31	0.04	3.52	2.05	<0.01	0.01	0.13	0.05	<0.01	<0.01	0.48
V671250		14	74.8	15.75	2.47	0.21	0.07	3.58	2.58	<0.01	0.01	0.16	0.05	<0.01	<0.01	0.11
V671251		7	75.0	17.05	1.27	0.09	0.04	1.56	3.44	0.01	0.01	0.11	0.01	0.01	<0.01	0.67
V671252		24	75.7	15.80	0.81	0.15	0.02	4.37	2.36	<0.01	<0.01	0.11	0.03	<0.01	<0.01	0.32
V671253		14	73.8	16.30	0.83	0.16	0.02	4.20	3.29	<0.01	0.01	0.11	0.04	<0.01	<0.01	0.76
V671254		16	76.7	15.90	1.13	0.13	0.01	3.14	2.00	<0.01	0.01	0.08	0.03	<0.01	<0.01	0.46
V671255		25	75.1	16.60	0.53	0.13	0.01	4.60	2.34	<0.01	<0.01	0.31	0.05	<0.01	<0.01	0.34
V671256		22	75.3	16.00	0.64	0.12	0.01	4.07	2.67	<0.01	<0.01	0.20	0.04	<0.01	<0.01	0.54
V671257		22	75.3	16.55	0.64	0.17	0.01	4.39	2.95	<0.01	<0.01	0.24	0.04	<0.01	<0.01	0.60
V671258		23	74.4	16.40	0.66	0.17	0.02	4.31	2.48	<0.01	<0.01	0.21	0.05	0.01	<0.01	0.74
V671259		35	71.8	17.60	0.74	0.16	0.04	4.72	2.55	<0.01	<0.01	0.27	0.03	0.01	<0.01	0.99
V671260		28	73.7	17.70	0.74	0.16	0.02	4.74	2.60	<0.01	<0.01	0.20	0.05	<0.01	<0.01	0.52
V671261		19	73.8	16.20	0.60	0.25	0.03	4.38	3.11	<0.01	<0.01	0.11	0.05	<0.01	<0.01	0.27
V671262		19	76.2	17.25	0.63	0.17	0.06	3.91	2.53	<0.01	<0.01	0.29	0.04	0.01	<0.01	0.84
V671263		14	74.6	17.20	0.78	0.46	0.04	4.86	1.95	0.01	<0.01	0.17	0.06	<0.01	<0.01	0.15
V671264		25	75.1	17.20	0.95	0.72	0.05	4.98	0.71	<0.01	<0.01	0.08	0.07	<0.01	<0.01	0.04
V671265		17	70.7	17.50	0.76	1.45	0.13	5.65	1.20	0.01	0.01	0.11	0.15	<0.01	<0.01	0.35
V671266		20	74.4	17.00	0.75	0.72	0.03	5.04	0.08	<0.01	<0.01	0.07	0.08	<0.01	<0.01	0.06
V671267		17	74.5	17.30	0.72	0.67	0.21	5.09	1.57	<0.01	0.02	0.18	0.18	0.01	<0.01	0.70
V671268		12	73.2	16.00	0.90	1.23	0.04	6.57	2.04	<0.01	0.01	0.16	0.03	<0.01	<0.01	0.22

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	TOT-ICP06	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671241		99.30	1020	<0.5	<5	<0.5	1	2	7930	<1	2	2	1	10	59	0.934
V671242		100.07	390	<0.5	6	<0.5	<1	6	4550	<1	4	5	1	10	9	
V671243		100.14	830	<0.5	<5	<0.5	3	8	4150	<1	7	6	2	10	18	
V671244		98.96	310	<0.5	6	0.6	<1	5	6580	<1	3	10	<1	<10	13	0.752
V671245		99.05	860	<0.5	<5	<0.5	<1	1	7120	<1	1	3	<1	20	74	0.827
V671246		98.90	560	<0.5	<5	<0.5	<1	<1	5630	<1	1	5	<1	20	65	0.657
V671247		99.10	520	<0.5	9	0.8	<1	2	8560	<1	3	5	1	<10	25	0.981
V671248		100.16	3760	<0.5	<5	<0.5	4	20	3520	1	16	9	3	20	26	
V671249		99.16	3520	<0.5	<5	<0.5	<1	1	7830	<1	3	6	2	10	99	0.851
V671250		99.79	2230	<0.5	<5	<0.5	1	43	6320	7	18	7	<1	30	106	0.698
V671251		99.27	4180	<0.5	<5	<0.5	<1	1	10000	<1	2	5	3	20	98	1.140
V671252		99.67	1390	<0.5	<5	<0.5	<1	6	5770	<1	2	10	1	10	71	0.619
V671253		99.52	3970	<0.5	<5	<0.5	<1	1	4170	<1	<1	9	2	30	97	
V671254		99.59	2480	<0.5	<5	<0.5	<1	2	8130	<1	2	7	<1	10	91	0.944
V671255		100.01	1870	<0.5	<5	<0.5	<1	<1	5260	<1	1	5	<1	10	60	0.690
V671256		99.59	3260	<0.5	<5	<0.5	<1	1	5530	<1	1	5	<1	20	98	0.639
V671257		100.89	3890	<0.5	<5	<0.5	<1	1	4910	<1	1	7	<1	30	133	
V671258		99.45	3850	<0.5	<5	<0.5	<1	<1	5800	<1	1	6	<1	20	113	0.653
V671259		98.91	5800	<0.5	<5	<0.5	<1	1	5940	<1	1	6	<1	20	158	0.672
V671260		100.43	4060	<0.5	<5	<0.5	<1	1	6510	<1	2	8	<1	30	115	0.754
V671261		98.80	1280	<0.5	<5	0.6	<1	1	5670	<1	1	14	<1	30	84	0.645
V671262		101.93	6510	<0.5	<5	<0.5	<1	1	7590	<1	1	7	<1	30	117	0.879
V671263		100.28	390	<0.5	8	<0.5	<1	1	6680	<1	1	11	<1	20	39	0.783
V671264		99.90	190	<0.5	8	<0.5	<1	6	7840	<1	2	4	<1	10	11	1.250
V671265		98.02	430	<0.5	6	<0.5	<1	5	5250	<1	2	6	<1	20	9	0.585
V671266		98.23	190	<0.5	<5	<0.5	<1	2	8740	1	2	5	<1	<10	14	0.559
V671267		101.15	6930	<0.5	8	0.5	1	5	7380	<1	3	4	1	30	43	0.837
V671268		100.40	210	<0.5	<5	<0.5	1	5	230	<1	1	11	2	<10	13	

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17103883

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:				
	CRU-32	CRU-QC	LOG-21	LOG-23
	PUL-35a	PUL-QC	SPL-21	SPL-21X
	SPL-21Xd	WEI-21		

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:				
	F-IC881	Li-OG63	ME-4ACD81	ME-ICP06
	ME-MS81	ME-OG62o	OA-GRA05	TOT-ICP06

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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

CERTIFICATE TB17127319

Project: 0518

This report is for 179 Drill Core samples submitted to our lab in Thunder Bay, ON, Canada on 23-JUN-2017.

The following have access to data associated with this certificate:

CINDY HU	BILL MERCER	VOLKER MOELLER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-24	Pulp Login - Rcd w/o Barcode
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um
LOG-21	Sample logging - ClientBarCode
SPL-22	Split sample - rotary splitter
CRU-QC	Crushing QC Test
PUL-QC	Pulverizing QC Test

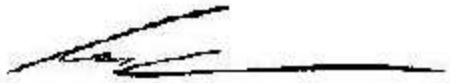
ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-ICP06	Whole Rock Package - ICP-AES	ICP-AES
OA-GRA05	Loss on Ignition at 1000C	WST-SEQ
ME-MS81	Lithium Borate Fusion ICP-MS	ICP-MS
TOT-ICP06	Total Calculation for ICP06	ICP-AES
C-IR07	Total Carbon (Leco)	LECO
S-IR08	Total Sulphur (Leco)	LECO
Hg-MS42	Trace Hg by ICPMS	ICP-MS
F-IC881	F - KOH fusion and IC	

To: AVALON ADVANCED MATERIALS INC.
ATTN: BILL MERCER
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature: 
Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671801		2.35														
V671802		2.55														
V671803		2.40														
V671804		2.83														
V671801a			26.4	4.4	150	4.07	1.78	1.24	0.39	9.0	1.43	0.8	0.40	1.7	0.18	1.1
V671805		2.22														
V671806		2.68														
V671807		3.05														
V671808		2.21														
V671805a			15.7	5.9	250	214	2.75	1.79	0.58	18.6	2.23	1.3	0.62	2.2	0.28	11.2
V671809		2.60														
V671810		2.42														
V671811		2.55														
V671812		3.25														
V671809a			10.3	5.8	280	69.1	2.72	1.69	0.58	17.1	2.26	1.2	0.61	2.2	0.28	3.2
V671813		2.68														
V671814		2.41														
V671815		2.27														
V671816		2.54														
V671813a			32.7	6.1	210	651	3.02	1.96	0.68	16.2	2.35	1.3	0.67	2.2	0.31	2.6
V671817		2.50														
V671818		2.19														
V671819		2.69														
V671820		2.48														
V671817a			20.9	5.1	330	211	2.58	1.73	0.54	15.3	1.98	1.0	0.61	1.9	0.27	1.7
V671821		2.42														
V671822		2.35														
V671823		2.40														
V671824		3.11														
V671825		2.76														
V671821a			149.0	15.1	130	5.26	5.67	3.67	1.24	19.7	4.89	2.7	1.31	5.8	0.58	4.2
V671826		2.36														
V671827		2.50														
V671828		2.50														
V671829		2.48														
V671826a			115.5	8.6	190	189.0	2.72	1.74	0.68	16.7	2.26	1.3	0.60	3.5	0.28	4.2
V671830		2.81														
V671831		2.38														
V671832		2.79														
V671833		2.81														

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2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671801																
V671802																
V671803																
V671804																
V671801a		3.3	0.67	13.8	1.13	<1	57.8	0.1	0.28	0.24	0.15	0.21	162	1	9.9	1.11
V671805																
V671806																
V671807																
V671808																
V671805a		4.9	0.91	970	1.65	37	84.4	23.9	0.40	0.49	0.27	1.59	250	12	15.9	1.79
V671809																
V671810																
V671811																
V671812																
V671809a		4.5	0.90	472	1.55	27	84.4	3.0	0.44	0.22	0.25	0.21	266	88	15.1	1.74
V671813																
V671814																
V671815																
V671816																
V671813a		4.8	0.95	598	1.67	14	103.5	8.8	0.45	0.20	0.26	0.13	290	11	16.5	1.93
V671817																
V671818																
V671819																
V671820																
V671817a		4.3	0.82	154.5	1.57	3	96.3	3.3	0.39	0.17	0.26	<0.05	260	3	14.6	1.69
V671821																
V671822																
V671823																
V671824																
V671825																
V671821a		11.0	2.24	19.1	3.82	2	110.0	0.4	0.86	0.59	0.51	0.18	450	20	31.5	3.80
V671826																
V671827																
V671828																
V671829																
V671826a		6.3	1.28	1090	1.99	29	87.1	2.3	0.43	0.69	0.27	0.51	255	20	15.6	1.81
V671830																
V671831																
V671832																
V671833																

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2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671801																
V671802																
V671803																
V671804																
V671801a		29	48.7	14.40	14.15	11.75	7.37	1.41	0.24	0.04	0.87	0.21	0.06	0.01	<0.01	0.68
V671805																
V671806																
V671807																
V671808																
V671805a		41	50.7	15.05	12.35	11.10	6.96	1.58	0.78	0.04	0.73	0.20	0.12	0.01	<0.01	0.76
V671809																
V671810																
V671811																
V671812																
V671809a		39	50.1	14.45	11.85	11.30	7.76	1.30	0.44	0.04	0.69	0.19	0.08	0.01	<0.01	0.94
V671813																
V671814																
V671815																
V671816																
V671813a		42	49.7	15.00	13.30	11.10	7.36	1.63	0.49	0.03	0.78	0.21	0.08	0.01	<0.01	0.79
V671817																
V671818																
V671819																
V671820																
V671817a		36	50.4	14.55	11.70	12.50	7.36	1.63	0.17	0.05	0.67	0.20	0.05	0.01	<0.01	0.82
V671821																
V671822																
V671823																
V671824																
V671825																
V671821a		101	49.0	13.40	17.65	9.68	4.94	2.06	0.42	0.02	1.55	0.49	0.13	0.01	0.02	0.87
V671826																
V671827																
V671828																
V671829																
V671826a		46	53.5	14.60	12.05	8.23	6.15	1.80	1.47	0.03	0.83	0.21	0.13	0.01	0.01	1.07
V671830																
V671831																
V671832																
V671833																

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North Vancouver BC V7H 0A7
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www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method Analyte Units LOR	TOT-ICP06 Total % 0.01	C-IR07 C % 0.01	S-IR08 S % 0.01	Hg-MS42 Hg ppm 0.005	F-IC881 F ppm 20
V671801						
V671802						
V671803						
V671804						
V671801a		99.89	0.02	0.11	<0.005	530
V671805						
V671806						
V671807						
V671808						
V671805a		100.38	0.02	0.06	0.006	5530
V671809						
V671810						
V671811						
V671812						
V671809a		99.15	0.02	0.03	0.040	4130
V671813						
V671814						
V671815						
V671816						
V671813a		100.48	0.02	0.10	0.008	3530
V671817						
V671818						
V671819						
V671820						
V671817a		100.11	0.05	0.09	<0.005	1770
V671821						
V671822						
V671823						
V671824						
V671825						
V671821a		100.24	0.24	0.26	0.013	460
V671826			0.03	0.10		
V671827			0.10	0.06		
V671828			0.07	0.73		
V671829			0.06	0.10		
V671826a		100.09			0.013	3620
V671830			0.05	0.08		
V671831			0.03	0.11		
V671832			0.04	0.06		
V671833			0.02	0.10		

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TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671830a			32.7	6.2	260	69.5	3.01	1.95	0.68	15.7	2.19	1.2	0.67	2.3	0.31	2.0
V671834		2.46														
V671835		2.65														
V671836		2.80														
V671837		1.94														
V671834a			25.0	5.4	240	239	2.77	1.82	0.58	17.6	2.29	1.4	0.63	2.0	0.27	4.0
V671838		2.42														
V671839		2.63														
V671840		2.86														
V671841		2.44														
V671838a			17.8	5.1	280	916	2.62	1.80	0.54	15.3	2.02	1.0	0.61	1.8	0.26	1.7
V671842		3.12														
V671843		2.01														
V671844		2.53														
V671845		2.99														
V671842a			16.6	6.0	290	189.5	2.81	1.82	0.60	15.0	2.23	1.1	0.64	2.2	0.26	1.7
V671846		2.47														
V671847		2.13														
V671848		3.38														
V671849		3.57														
V671846a			17.5	4.9	330	131.0	2.58	1.65	0.52	17.7	1.88	1.1	0.57	1.9	0.28	4.3
V671850		3.26														
V671851		3.72														
V671852		2.47														
V671853		2.77														
V671850a			15.7	5.6	250	444	2.72	1.85	0.57	17.3	2.22	1.3	0.63	2.0	0.28	4.4
V671854		2.45														
V671855		2.39														
V671854a			44.8	11.8	120	7.28	4.65	3.02	1.04	18.8	3.99	2.2	1.04	4.6	0.48	3.7
V671856		2.59														
V671857		2.49														
V671858		2.63														
V671859		2.26														
V671856a			205	6.2	270	47.3	2.86	1.79	0.66	15.9	2.34	1.2	0.68	2.4	0.30	1.7
V671860		3.15														
V671861		2.39														
V671862		2.62														
V671863		2.48														
V671860a			22.8	5.2	240	20.7	2.69	1.71	0.58	13.9	2.10	1.1	0.57	1.9	0.25	1.5
V671864		3.40														

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North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671830a V671834 V671835 V671836 V671837		5.0	0.96	314	1.81	10	77.6	0.7	0.47	0.19	0.27	0.21	268	3	16.7	1.86
V671834a V671838 V671839 V671840 V671841		4.7	0.90	516	1.73	12	77.5	8.3	0.42	0.25	0.26	0.40	260	2	15.2	1.81
V671838a V671842 V671843 V671844 V671845		4.6	0.83	973	1.71	19	80.9	0.4	0.39	0.14	0.25	0.11	255	4	14.7	1.68
V671842a V671846 V671847 V671848 V671849		4.8	0.89	115.0	1.70	2	82.0	0.6	0.42	0.17	0.26	0.05	272	2	15.7	1.77
V671846a V671850 V671851 V671852 V671853		4.0	0.74	177.5	1.50	8	96.9	23.7	0.39	0.39	0.23	0.50	254	3	13.9	1.61
V671850a V671854 V671855 V671854a V671856		4.7 8.7	0.88 1.71	741 120.0	1.62 3.09	25 12	84.8 111.5	18.8 0.4	0.42 0.74	0.28 0.46	0.26 0.47	0.23 0.17	258 360	17 1	15.4 26.5	1.73 3.07
V671857 V671858 V671859 V671856a V671860		4.9	0.95	41.3	1.67	1	58.7	0.2	0.43	0.16	0.25	0.05	273	1	16.3	1.80
V671861 V671862 V671863 V671860a V671864		4.1	0.82	77.0	1.65	3	61.8	0.1	0.38	0.15	0.24	<0.05	242	1	14.3	1.71

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671830a V671834 V671835 V671836 V671837		42	49.8	14.50	13.45	11.80	7.79	1.42	0.41	0.04	0.81	0.22	0.07	0.01	<0.01	0.78
V671834a V671838 V671839 V671840 V671841		42	51.6	14.45	12.50	10.70	7.57	2.04	0.40	0.04	0.74	0.20	0.07	0.01	<0.01	0.96
V671838a V671842 V671843 V671844 V671845		36	49.9	14.85	12.60	10.40	9.18	1.48	0.63	0.04	0.69	0.18	0.04	0.01	<0.01	0.90
V671842a V671846 V671847 V671848 V671849		39	49.9	14.05	13.30	11.40	8.12	1.38	0.17	0.04	0.74	0.20	0.05	0.01	<0.01	0.77
V671846a V671850 V671851 V671852 V671853		35	50.8	14.65	11.40	11.85	7.29	1.78	0.18	0.05	0.65	0.20	0.08	0.01	<0.01	0.74
V671850a V671854 V671855 V671854a V671856		41 78	51.1 50.3	15.50 14.50	12.50 14.85	11.40 8.43	6.94 6.38	1.36 2.95	0.42 0.55	0.04 0.02	0.74 1.27	0.21 0.21	0.08 0.11	0.01 0.01	<0.01 0.01	0.83 0.73
V671857 V671858 V671859 V671856a V671860		41	49.5	14.95	13.35	11.50	7.80	0.82	1.12	0.04	0.76	0.23	0.06	0.01	0.02	1.29
V671861 V671862 V671863 V671860a V671864		36	49.3	14.55	13.00	12.55	7.96	1.16	0.18	0.04	0.74	0.20	0.06	0.01	<0.01	1.21

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North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method Analyte Units LOR	TOT-ICP06 Total % 0.01	C-IR07 C % 0.01	S-IR08 S % 0.01	Hg-MS42 Hg ppm 0.005	F-IC881 F ppm 20
V671830a		101.10			0.005	2700
V671834			0.02	0.17		
V671835			0.02	0.02		
V671836			0.13	0.07		
V671837			0.02	0.06		
V671834a		101.28			<0.005	2170
V671838			0.01	0.05		
V671839			0.01	0.03		
V671840			0.11	0.02		
V671841			0.04	0.04		
V671838a		100.90			0.005	3640
V671842			0.01	0.03		
V671843			0.02	0.17		
V671844			0.07	0.18		
V671845			0.03	0.03		
V671842a		100.13			0.005	970
V671846			0.01	0.13		
V671847			0.11	0.06		
V671848			0.02	0.07		
V671849			0.03	0.04		
V671846a		99.68			0.005	2270
V671850			0.05	0.08		
V671851			0.02	0.06		
V671852			0.02	0.12		
V671853			0.04	0.08		
V671850a		101.13			0.014	6170
V671854			0.05	0.18		
V671855			0.13	0.01		
V671854a		100.32			<0.005	1470
V671856						
V671857						
V671858						
V671859						
V671856a		101.45	0.06	0.31	0.006	160
V671860						
V671861						
V671862						
V671863						
V671860a		100.96	0.13	0.08	0.005	640
V671864						

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CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671865		2.68														
V671866		3.48														
V671867		2.59														
V671864a			57.6	6.6	240	101.5	3.05	2.07	0.68	15.8	2.46	1.2	0.72	2.4	0.33	1.9
V671868		2.78														
V671869		3.36														
V671870		2.78														
V671871		2.54														
V671868a			42.0	18.7	200	308	4.43	2.40	0.65	26.8	4.80	1.4	0.89	6.2	0.34	45.0
V671872		2.80														
V671873		3.05														
V671874		2.43														
V671875		2.58														
V671872a			26.6	6.9	210	542	3.33	2.09	0.75	16.8	2.63	1.4	0.76	2.5	0.34	2.9
V671876		2.34														
V671877		3.00														
V671878		2.63														
V671879		2.40														
V671876a			222	9.2	200	903	2.94	1.96	0.67	16.2	2.56	1.6	0.65	3.8	0.29	3.0
V671880		2.37														
V671881		2.32														
V671882		2.44														
V671883		2.80														
V671880a			24.5	5.9	140	434	2.07	1.36	0.68	10.2	1.69	0.8	0.48	2.4	0.22	1.2
V671884		3.10														
V671885		2.38														
V671886		1.99														
V671887		2.87														
V671884a			79.4	6.7	200	642	3.24	2.22	0.65	16.8	2.70	1.4	0.73	2.5	0.31	3.0
V671888		2.52														
V671889		2.23														
V671890		3.21														
V671891		2.67														
V671888a			14.2	6.8	240	308	3.24	2.07	0.71	16.2	2.63	1.4	0.71	2.4	0.34	2.6
V671892		2.66														
V671893		2.73														
V671894		2.70														
V671895		2.50														
V671892a			17.2	6.6	200	55.2	3.11	2.16	0.71	15.4	2.46	1.4	0.74	2.4	0.32	1.8
V671896		2.59														

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method Analyte Units LOR	ME-MS81 Nd ppm 0.1	ME-MS81 Pr ppm 0.03	ME-MS81 Rb ppm 0.2	ME-MS81 Sm ppm 0.03	ME-MS81 Sn ppm 1	ME-MS81 Sr ppm 0.1	ME-MS81 Ta ppm 0.1	ME-MS81 Tb ppm 0.01	ME-MS81 Th ppm 0.05	ME-MS81 Tm ppm 0.01	ME-MS81 U ppm 0.05	ME-MS81 V ppm 5	ME-MS81 W ppm 1	ME-MS81 Y ppm 0.5	ME-MS81 Yb ppm 0.03
V671865 V671866 V671867 V671864a V671868		5.4	1.06	59.1	1.79	1	80.0	0.2	0.47	0.20	0.28	0.05	286	1	17.3	2.04
V671869 V671870 V671871 V671868a V671872		11.3	2.78	1895	5.17	92	83.4	12.1	0.91	5.75	0.33	0.89	280	6	23.8	2.19
V671873 V671874 V671875 V671872a V671876		5.8	1.11	108.5	1.90	5	108.5	0.5	0.51	0.21	0.31	0.06	288	4	18.6	2.12
V671877 V671878 V671879 V671876a V671880		6.3	1.35	388	2.16	3	78.5	6.4	0.46	0.45	0.29	0.13	281	1	16.9	2.02
V671881 V671882 V671883 V671880a V671884		4.2	0.84	92.2	1.31	1	49.2	0.2	0.32	0.13	0.19	<0.05	156	2	11.6	1.26
V671885 V671886 V671887 V671884a V671888		5.3	1.08	1690	1.93	17	69.6	2.8	0.48	0.27	0.32	0.09	283	10	17.6	2.13
V671889 V671890 V671891 V671888a V671892		5.4	1.07	472	2.15	9	76.7	3.4	0.49	0.22	0.32	0.10	293	4	17.9	2.05
V671893 V671894 V671895 V671892a V671896		5.6	1.03	163.0	1.92	<1	86.6	0.1	0.49	0.17	0.32	0.16	279	1	17.6	2.13

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North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671865 V671866 V671867 V671864a V671868		46	47.2	14.80	14.15	11.45	8.34	1.74	0.53	0.04	0.85	0.22	0.06	0.01	0.01	1.06
V671869 V671870 V671871 V671868a V671872		48	47.6	16.45	13.75	10.05	6.68	1.44	1.40	0.03	0.85	0.24	0.10	0.01	<0.01	1.17
V671873 V671874 V671875 V671872a V671876		49	48.8	14.35	13.65	11.30	7.35	2.00	0.15	0.03	0.86	0.21	0.07	0.01	<0.01	0.57
V671877 V671878 V671879 V671876a V671880		51	53.9	14.90	12.50	7.41	6.32	2.58	1.00	0.03	0.89	0.17	0.12	0.01	0.03	0.56
V671881 V671882 V671883 V671880a V671884		27	53.2	10.85	16.00	10.00	5.90	1.37	0.19	0.02	0.62	0.18	0.14	0.01	<0.01	0.62
V671885 V671886 V671887 V671884a V671888		48	49.0	14.35	14.35	9.14	8.10	1.52	0.96	0.03	0.86	0.23	0.07	0.01	0.01	0.99
V671889 V671890 V671891 V671888a V671892		47	48.8	14.75	13.70	11.10	7.70	1.65	0.30	0.03	0.86	0.21	0.11	0.01	<0.01	0.88
V671893 V671894 V671895 V671892a V671896		47	48.9	14.05	14.05	10.25	7.77	2.00	0.22	0.03	0.86	0.22	0.07	0.01	<0.01	0.79

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North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
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Project: 0518

CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method Analyte Units LOR	TOT-ICP06 Total % 0.01	C-IR07 C % 0.01	S-IR08 S % 0.01	Hg-MS42 Hg ppm 0.005	F-IC881 F ppm 20
V671865 V671866 V671867 V671864a V671868		100.46	0.08	0.13	<0.005	240
V671869 V671870 V671871 V671868a V671872		99.77	0.04	0.12	<0.005	4510
V671873 V671874 V671875 V671872a V671876		99.35	0.04	0.07	<0.005	3100
V671877 V671878 V671879 V671876a V671880		100.42	0.05	0.22	0.005	1710
V671881 V671882 V671883 V671880a V671884		99.10	0.06	0.67	0.006	1170
V671885 V671886 V671887 V671884a V671888		99.62	0.02	0.24	0.008	4360
V671889 V671890 V671891 V671888a V671892		100.10	0.02 0.01	0.08 0.03	0.006	4350
V671893 V671894 V671895 V671892a V671896		99.22	<0.01 0.02 0.01 0.03	0.18 0.14 0.08 0.05	<0.005	1240

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CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671897		2.53														
V671898		2.37														
V671899		2.37														
V671896a			42.7	6.7	210	224	3.18	2.16	0.69	16.5	2.76	1.3	0.72	2.4	0.33	2.6
V671900		2.49														
V671901		2.92														
V671902		2.80														
V671903		2.94														
V671900a			43.8	6.7	210	61.0	3.16	2.05	0.68	15.5	2.57	1.3	0.71	2.5	0.30	1.9
V671904		2.31														
V671905		2.20														
V671906		1.89														
V671907		2.35														
V671904a			45.2	7.4	220	22.5	3.49	2.41	0.79	17.0	2.73	1.5	0.79	2.6	0.35	2.1
V671908		2.37														
V671909		2.36														
V671910		2.42														
V671911		2.29														
V671908a			21.8	7.7	210	5.28	3.29	2.17	0.73	16.0	2.81	1.4	0.73	3.0	0.34	5.2
V671912		2.23														
V671913		2.07														
V671914		2.87														
V671915		2.67														
V671912a			12.8	7.4	170	4.23	2.61	1.76	0.89	12.2	2.26	0.9	0.63	3.0	0.29	2.2
V671916		2.15														
V671917		2.60														
V671918		3.00														
V671919		2.53														
V671916a			57.7	12.4	260	162.5	2.99	2.10	0.79	16.5	2.76	1.6	0.71	5.1	0.31	2.8
V671920		2.49														
V671921		2.12														
V671922		2.24														
V671923		2.74														
V671920a			9.5	7.3	190	121.0	3.21	2.09	0.80	15.3	2.58	1.3	0.69	2.7	0.32	2.0
V671924		2.17														
V671925		2.53														
V671926		1.99														
V671927		2.56														
V671924a			29.2	6.6	210	754	3.12	2.05	0.66	17.0	2.52	1.4	0.72	2.3	0.33	6.0
V671928		2.87														

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Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671897 V671898 V671899 V671896a V671900		5.6	1.02	706	1.98	11	72.2	1.7	0.50	0.21	0.32	0.08	284	6	18.1	2.19
V671901 V671902 V671903 V671900a V671904		5.6	1.03	38.0	2.07	1	88.4	0.2	0.45	0.19	0.33	0.05	276	1	17.4	1.95
V671905 V671906 V671907 V671904a V671908		6.4	1.17	10.5	2.25	1	110.5	0.2	0.56	0.23	0.33	0.06	325	<1	19.8	2.40
V671909 V671910 V671911 V671908a V671912		5.9	1.17	3.6	1.97	1	96.8	0.2	0.48	0.23	0.31	0.51	296	1	18.8	2.03
V671913 V671914 V671915 V671912a V671916		5.3	1.05	6.0	1.61	1	59.9	0.1	0.41	0.16	0.25	0.05	210	6	15.6	1.74
V671917 V671918 V671919 V671916a V671920		7.7	1.69	761	2.36	5	111.5	0.5	0.48	0.78	0.32	0.20	271	4	17.7	2.10
V671921 V671922 V671923 V671920a V671924		5.5	1.15	58.5	1.90	1	71.4	0.1	0.46	0.20	0.33	0.05	267	20	18.0	1.94
V671925 V671926 V671927 V671924a V671928		5.3	1.03	623	1.87	5	99.0	39.8	0.47	0.27	0.29	0.12	285	4	17.2	2.04

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671897 V671898 V671899 V671896a V671900		48	48.8	14.00	14.10	10.45	7.88	1.54	0.52	0.03	0.87	0.21	0.06	0.01	<0.01	1.26
V671901 V671902 V671903 V671900a V671904		47	50.4	14.00	14.10	10.60	7.29	2.08	0.13	0.03	0.87	0.21	0.06	0.01	<0.01	0.77
V671905 V671906 V671907 V671904a V671908		53	48.0	14.40	14.45	10.15	7.75	2.50	0.26	0.03	0.90	0.21	0.07	0.01	<0.01	0.54
V671909 V671910 V671911 V671908a V671912		49	48.5	14.50	13.80	10.90	7.74	1.85	0.10	0.03	0.89	0.20	0.06	0.01	<0.01	0.77
V671913 V671914 V671915 V671912a V671916		36	50.6	10.65	18.75	9.80	5.98	1.17	0.07	0.02	0.63	0.16	0.11	0.01	<0.01	0.12
V671917 V671918 V671919 V671916a V671920		55	49.3	15.30	13.20	10.05	7.91	1.33	0.53	0.04	0.86	0.21	0.09	0.02	0.01	0.96
V671921 V671922 V671923 V671920a V671924		44	49.1	13.75	14.30	10.10	8.55	1.66	0.11	0.03	0.82	0.20	0.10	0.01	<0.01	0.51
V671925 V671926 V671927 V671924a V671928		47	49.5	15.00	13.30	10.80	7.47	1.71	0.33	0.03	0.84	0.19	0.10	0.01	<0.01	0.59

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
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North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method Analyte Units LOR	TOT-ICP06 Total % 0.01	C-IR07 C % 0.01	S-IR08 S % 0.01	Hg-MS42 Hg ppm 0.005	F-IC881 F ppm 20
V671897			0.08	0.06		
V671898			0.21	0.11		
V671899			0.01	0.10		
V671896a		99.73			0.005	2980
V671900			0.01	0.10		
V671901			0.01	0.04		
V671902			0.02	0.09		
V671903			0.29	0.38		
V671900a		100.55			<0.005	190
V671904			0.03	0.17		
V671905			0.03	0.09		
V671906			0.05	0.10		
V671907			0.04	0.11		
V671904a		99.27			<0.005	130
V671908			0.33	0.14		
V671909			0.02	0.09		
V671910			0.13	0.10		
V671911			0.06	0.03		
V671908a		99.35			<0.005	210
V671912			0.03	0.06		
V671913			0.02	0.07		
V671914			0.01	0.01		
V671915			0.06	0.15		
V671912a		98.07			<0.005	1260
V671916			0.04	0.02		
V671917			0.04	0.06		
V671918			0.02	0.33		
V671919			0.01	0.14		
V671916a		99.81			<0.005	4090
V671920			0.01	0.09		
V671921			0.03	0.04		
V671922			0.04	0.15		
V671923			0.01	0.07		
V671920a		99.24			0.010	1260
V671924			0.01	0.04		
V671925			0.05	0.02		
V671926			0.03	0.07		
V671927			0.08	0.13		
V671924a		99.87			<0.005	3890
V671928			0.05	0.11		

***** See Appendix Page for comments regarding this certificate *****

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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671929		2.58														
V671930		2.60														
V671931		2.32														
V671928a			24.1	7.1	210	737	3.25	2.19	0.76	16.3	2.76	1.4	0.77	2.6	0.35	3.9
V671932		2.51														
V671933		2.61														
V671934		2.83														
V671935		2.87														
V671932a			21.4	6.5	190	528	2.91	1.96	0.70	16.9	2.45	1.4	0.66	2.3	0.31	4.9
V671936		2.69														
V671937		2.71														
V671938		2.12														
V671939		3.01														
V671936a			18.9	6.2	210	497	2.98	2.00	0.61	16.3	2.31	1.3	0.66	2.2	0.28	6.6
V671940		2.84														
V671941		2.54														
V671942		2.60														
V671943		2.31														
V671940a			58.0	10.9	320	911	2.63	1.68	0.62	16.7	2.17	1.6	0.59	4.8	0.24	5.4

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North Vancouver BC V7H 0A7
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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671929 V671930 V671931 V671928a V671932		5.9	1.13	351	2.04	12	99.1	10.0	0.49	0.22	0.32	0.10	308	1	19.0	2.19
V671933 V671934 V671935 V671932a V671936		5.4	1.02	410	1.85	8	82.6	23.9	0.47	0.30	0.30	0.20	272	2	17.0	1.99
V671937 V671938 V671939 V671936a V671940		4.9	0.96	404	1.72	13	85.9	31.1	0.44	0.27	0.28	0.23	261	3	16.4	1.90
V671941 V671942 V671943 V671940a		6.7	1.45	1290	1.81	28	124.5	24.5	0.39	0.62	0.23	0.28	242	3	14.6	1.75

***** See Appendix Page for comments regarding this certificate *****

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North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671929 V671930 V671931 V671928a V671932		51	48.4	14.30	13.65	10.95	6.98	1.94	0.22	0.03	0.89	0.21	0.06	0.01	<0.01	0.76
V671933 V671934 V671935 V671932a V671936		46	50.2	14.35	13.50	11.20	6.96	1.51	0.24	0.03	0.84	0.21	0.10	0.01	<0.01	1.81
V671937 V671938 V671939 V671936a V671940		44	50.0	14.00	12.75	10.45	7.03	1.67	0.23	0.03	0.81	0.20	0.11	0.01	<0.01	2.52
V671941 V671942 V671943 V671940a		44	49.0	14.65	11.55	10.75	7.91	1.52	0.74	0.05	0.66	0.20	0.10	0.02	0.01	0.96

***** See Appendix Page for comments regarding this certificate *****

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North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	TOT-ICP06	C-IR07	S-IR08	Hg-MS42	F-IC881
	Analyte	Total	C	S	Hg	F
	Units	%	%	%	ppm	ppm
	LOR	0.01	0.01	0.01	0.005	20
V671929			0.02	0.19		
V671930			0.08	0.08		
V671931			0.13	0.10		
V671928a		98.40			<0.005	3190
V671932			0.81	0.13		
V671933			0.22	0.08		
V671934			0.03	0.15		
V671935			0.16	0.09		
V671932a		100.96			<0.005	1880
V671936			0.01	0.07		
V671937			0.05	0.08		
V671938			1.51	0.19		
V671939			0.31	0.06		
V671936a		99.81			<0.005	2180
V671940			0.04	0.02		
V671941			0.01	0.09		
V671942			0.01	0.06		
V671943			0.03	0.04		
V671940a		98.12			<0.005	7190

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17127319

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:				
	CRU-31	CRU-QC	LOG-21	LOG-24
	PUL-31	PUL-QC	SPL-21	SPL-22
	WEI-21			

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:				
	C-IR07	F-IC881	Hg-MS42	ME-ICP06
	ME-MS81	OA-GRA05	S-IR08	TOT-ICP06

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 12-JUL-2017
Account: OPG

CERTIFICATE TB17138018

Project: 0518

This report is for 68 Drill Core samples submitted to our lab in Thunder Bay, ON, Canada on 6-JUL-2017.

The following have access to data associated with this certificate:

CINDY HU	BILL MERCER	VOLKER MOELLER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
FND-02	Find Sample for Addn Analysis

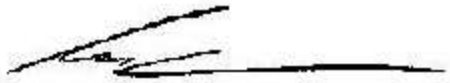
ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
Li-OG63	Ore grade Li - 4ACID	ICP-AES
ME-OG62o	Ore Grade open beaker -ICPAES	ICP-AES

To: AVALON ADVANCED MATERIALS INC.
ATTN: BILL MERCER
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature: 
Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 12-JUL-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17138018

Sample Description	Method	Li-OG63
	Analyte	Li
	Units	%
	LOR	0.005
V671066		0.243
V671067		0.111
V671068		0.053
V671069		0.909
V671070		0.340
V671071		0.063
V671072		0.040
V671073		0.090
V671074		0.165
V671075		0.725
V671076		0.677
V671077		0.153
V671078		0.805
V671079		0.139
V671082		0.199
V671083		0.877
V671084		0.507
V671085		0.165
V671091		0.203
V671092		0.497
V671093		0.142
V671094		0.430
V671095		0.206
V671096		0.121
V671097		0.127
V671100		0.710
V671123		0.291
V671131		0.521
V671132		0.546
V671139		0.192
V671140		0.846
V671141		0.511
V671151		0.272
V671152		0.452
V671156		0.052
V671158		0.502
V671161		0.191
V671162		0.203
V671172		0.423
V671178		0.294

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 12-JUL-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17138018

Sample Description	Method Analyte Units LOR	Li-OG63 Li % 0.005
V671187		0.120
V671188		0.231
V671197		0.091
V671198		0.139
V671199		0.117
V671200		0.702
V671203		0.130
V671209		0.133
V671213		0.169
V671214		0.466
V671215		0.146
V671216		0.061
V671217		0.021
V671218		0.106
V671221		0.135
V671222		0.186
V671223		0.102
V671224		0.206
V671225		0.709
V671226		0.474
V671230		0.515
V671235		0.468
V671239		0.467
V671242		0.540
V671243		0.425
V671248		0.352
V671253		0.462
V671257		0.556

***** See Appendix Page for comments regarding this certificate *****

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2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 12-JUL-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17138018

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
	FND-02	Li-OG63	ME-OG62o

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 1-AUG-2017
Account: OPG

CERTIFICATE TB17155276

Project: 0518

This report is for 7 Drill Core samples submitted to our lab in Thunder Bay, ON, Canada on 27-JUL-2017.

The following have access to data associated with this certificate:

CINDY HU	BILL MERCER	VOLKER MOELLER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
FND-02	Find Sample for Addn Analysis

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-4ACD81	Base Metals by 4-acid dig.	ICP-AES

To: AVALON ADVANCED MATERIALS INC.
ATTN: BILL MERCER
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:

Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 1-AUG-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17155276

Sample Description	Method	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81
	Analyte	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	5	0.5	1	1	10	1	1	2	1	10	2
V671805a		<0.5	<5	0.6	49	159	460	<1	131	<2	37	10	94
V671826a		<0.5	5	0.6	49	132	520	<1	117	<2	37	10	130
V671850a		<0.5	36	0.5	50	145	1250	<1	157	<2	38	10	88
V671868a		<0.5	12	0.5	46	136	870	3	124	<2	39	10	161
V671884a		<0.5	228	0.8	53	198	1640	<1	132	<2	35	10	145
V671888a		<0.5	24	<0.5	51	148	1050	1	134	<2	40	<10	93
V671940a		<0.5	11	0.5	44	129	1420	<1	131	<2	30	10	83

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 1-AUG-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17155276

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Applies to Method: Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.
FND-02 ME-4ACD81

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 11-AUG-2017
Account: OPG

CERTIFICATE TB17160753

Project: 0518

This report is for 20 Drill Core samples submitted to our lab in Thunder Bay, ON, Canada on 2-AUG-2017.

The following have access to data associated with this certificate:

CINDY HU	BILL MERCER	VOLKER MOELLER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
FND-02	Find Sample for Addn Analysis
FND-02a	Find Sample at Branch Lab

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
Li-OG63	Ore grade Li - 4ACID	ICP-AES
ME-OG62o	Ore Grade open beaker -ICPAES	ICP-AES

To: AVALON ADVANCED MATERIALS INC.
ATTN: CINDY HU
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:

Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 11-AUG-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17160753

Sample Description	Method Analyte Units LOR	Li-OG63 Li % 0.005
V671850		0.198
V671851		0.101
V671852		0.080
V671853		0.112
V671868		0.116
V671869		0.110
V671870		0.116
V671871		0.024
V671884		0.115
V671885		0.321
V671886		0.119
V671887		0.114
V671888		0.079
V671889		0.207
V671890		0.071
V671891		0.051
V671940		0.143
V671941		0.190
V671942		0.147
V671943		0.101

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 11-AUG-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17160753

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Applies to Method: Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada
FND-02a

Applies to Method: Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.
FND-02 Li-OG63 ME-OG62o

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 14-AUG-2017
Account: OPG

CERTIFICATE TB17162674

Project: 0518

This report is for 30 Drill Core samples submitted to our lab in Thunder Bay, ON, Canada on 4-AUG-2017.

The following have access to data associated with this certificate:

CINDY HU	BILL MERCER	VOLKER MOELLER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
FND-02	Find Sample for Addn Analysis

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-4ACD81	Base Metals by 4-acid dig.	ICP-AES

To: AVALON ADVANCED MATERIALS INC.
ATTN: BILL MERCER
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:

Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 14-AUG-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17162674

Sample Description	Method	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81
	Analyte	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	5	0.5	1	1	10	1	1	2	1	10	2
V671801a		<0.5	<5	0.5	53	183	200	<1	141	2	43	<10	96
V671809a		<0.5	<5	0.8	43	143	1090	1	123	<2	36	<10	81
V671813a		<0.5	5	0.8	49	184	950	1	130	<2	43	<10	87
V671817a		<0.5	13	0.7	44	155	500	1	136	<2	40	10	78
V671821a		<0.5	<5	0.8	44	123	230	1	62	<2	42	<10	125
V671830a		<0.5	<5	0.6	51	134	350	1	145	<2	42	10	99
V671834a		<0.5	<5	0.8	46	157	550	1	122	<2	41	<10	84
V671838a		<0.5	<5	0.7	50	114	710	<1	155	<2	34	10	80
V671842a		<0.5	6	<0.5	52	152	470	<1	151	<2	39	<10	89
V671846a		<0.5	<5	0.7	44	154	890	<1	134	<2	42	<10	78
V671854a		<0.5	<5	0.5	46	45	570	1	91	<2	42	<10	130
V671856a		<0.5	5	0.8	55	204	380	<1	168	<2	42	10	155
V671860a		<0.5	<5	0.6	54	146	330	<1	152	<2	44	<10	97
V671864a		<0.5	<5	0.7	55	159	460	<1	150	<2	44	<10	104
V671872a		<0.5	222	0.8	51	125	330	2	138	<2	44	10	100
V671876a		<0.5	72	0.6	54	167	800	1	129	<2	41	<10	84
V671880		<0.5	67	1.1	35	851	150	1	34	2	6	<10	69
V671880a		<0.5	33	0.5	45	365	620	1	112	<2	30	<10	87
V671892a		<0.5	<5	0.8	50	170	760	<1	129	<2	42	<10	99
V671896a		<0.5	<5	0.9	51	161	650	<1	132	<2	40	10	99
V671900a		<0.5	<5	0.7	51	197	310	1	133	<2	42	<10	99
V671904a		<0.5	<5	<0.5	51	176	180	1	126	<2	43	<10	100
V671908a		<0.5	<5	0.5	50	160	220	<1	135	<2	42	<10	91
V671912a		<0.5	11	1.3	42	125	1360	1	106	<2	30	<10	115
V671916a		<0.5	18	0.6	49	171	2530	<1	142	<2	37	<10	94
V671920a		<0.5	8	0.5	50	191	560	1	143	<2	38	<10	109
V671924a		<0.5	42	0.7	50	141	630	<1	145	<2	41	10	91
V671928a		<0.5	45	0.9	53	163	590	<1	128	<2	43	<10	95
V671932a		<0.5	6	0.5	47	158	920	1	124	<2	39	<10	94
V671936a		<0.5	13	0.7	49	150	1090	1	129	<2	40	10	90

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 14-AUG-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17162674

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:	
FND-02	ME-4ACD81

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 24-AUG-2017
Account: OPG

CERTIFICATE TB17167448

Project: 0518

This report is for 10 Drill Core samples submitted to our lab in Thunder Bay, ON, Canada on 10-AUG-2017.

The following have access to data associated with this certificate:

CINDY HU	BILL MERCER	VOLKER MOELLER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
FND-02	Find Sample for Addn Analysis

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
S-CAL06	Sulfide Sulfur (calculated)	LECO
S-GRA06	Sulfate Sulfur-carbonate leach	WST-SEQ
C-GAS05	Inorganic Carbon (CO2)	
S-GRA06a	Sulfate Sulfur (HCl leachable)	WST-SEQ

To: AVALON ADVANCED MATERIALS INC.
ATTN: CINDY HU
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:

Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 24-AUG-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17167448

Sample Description	Method	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08	OA-ELE07	OA-VOL08	S-IR08	S-GRA06	S-GRA06a	S-CAL06	C-GAS05	C-GAS05
	Analyte	MPA	FIZZ RAT	NNP	NP	pH	Ratio (N	S	S	S	S	C	CO2
	Units	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity	%	%	%	%	%	%
	LOR	0.3	1	1	1	0.1	0.01	0.01	0.01	0.01	0.01	0.05	0.2
V671805a		1.9	1	14	16	9.2	8.53	0.06	0.01	0.04	0.05	<0.05	<0.2
V671827		2.2	2	28	30	9.2	13.71	0.07	<0.01	<0.01	0.07	0.08	0.3
V671833		3.1	1	13	16	9.2	5.12	0.10	<0.01	0.02	0.10	<0.05	<0.2
V671855		0.3	2	27	27	9.4	86.40	0.01	<0.01	<0.01	0.01	0.12	0.4
V671872a		2.2	1	13	15	9.1	6.86	0.07	0.01	<0.01	0.06	<0.05	<0.2
V671876a		6.3	1	12	18	9.4	2.88	0.20	0.01	<0.01	0.19	0.05	0.2
V671892		0.9	1	12	13	9.0	13.87	0.03	<0.01	0.01	0.03	<0.05	<0.2
V671915		4.7	1	8	13	8.4	2.77	0.15	<0.01	0.03	0.15	0.05	0.2
V671928		3.1	1	11	14	9.0	4.48	0.10	0.01	0.03	0.09	0.05	0.2
V671930		2.5	2	20	22	8.9	8.80	0.08	<0.01	0.01	0.08	0.08	0.3

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 24-AUG-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17167448

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
C-GAS05	FND-02	OA-ELE07	OA-VOL08
S-CAL06	S-GRA06	S-GRA06a	S-IR08

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

CERTIFICATE TB17180529

Project: 0518

This report is for 305 Rock samples submitted to our lab in Thunder Bay, ON, Canada on 25-AUG-2017.

The following have access to data associated with this certificate:

CINDY HU	BILL MERCER	VOLKER MOELLER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
SPL-21X	Addnl Crush Split w No Analysis
SPL-21Xd	Addnl Crush Split with No Analysis-DUP
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um
LOG-21	Sample logging - ClientBarCode
CRU-QC	Crushing QC Test
PUL-QC	Pulverizing QC Test
LOG-23	Pulp Login - Rcvd with Barcode

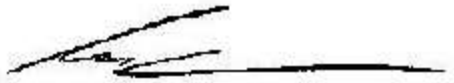
ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-ICP06	Whole Rock Package - ICP-AES	ICP-AES
OA-GRA05	Loss on Ignition at 1000C	WST-SEQ
ME-MS81	Lithium Borate Fusion ICP-MS	ICP-MS
TOT-ICP06	Total Calculation for ICP06	ICP-AES
ME-4ACD81	Base Metals by 4-acid dig.	ICP-AES
Li-OG63	Ore grade Li - 4ACID	ICP-AES
ME-OG62o	Ore Grade open beaker -ICPAES	ICP-AES

To: AVALON ADVANCED MATERIALS INC.
ATTN: BILL MERCER
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature: 

Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671351		1.19	19.0	11.0	60	10.60	3.73	2.06	0.12	31.6	2.61	1.1	0.62	4.1	0.46	35.8
V671352		0.71	20.9	7.2	330	13.05	3.58	2.28	0.73	17.5	3.02	1.6	0.76	2.5	0.31	1.9
V671353		0.76	54.3	6.7	400	29.9	3.35	2.47	0.66	16.7	2.83	1.3	0.75	2.6	0.36	1.5
V671354		1.19	21.4	8.3	420	2.02	2.13	1.50	0.60	12.5	1.62	1.1	0.45	3.9	0.21	1.5
V671355		1.01	532	33.2	130	9.26	2.22	1.36	0.86	22.2	2.37	3.5	0.47	17.2	0.17	5.3
V671356		0.42	46.2	27.9	10	23.4	8.05	4.74	0.10	22.7	5.06	2.1	1.64	11.7	0.63	21.3
V671357		0.87	19.0	5.7	90	2.94	3.04	1.94	0.54	10.8	2.59	1.0	0.69	2.1	0.26	1.2
V671358		0.57	42.1	46.6	10	13.50	14.30	8.29	0.11	21.1	7.95	4.1	2.86	18.2	1.25	31.1
V671359		0.90	37.1	9.8	170	0.94	4.39	2.90	0.89	18.4	3.59	1.9	0.96	3.6	0.40	2.5
V671360		0.85	55.1	6.1	470	0.95	2.96	1.74	0.60	17.5	2.33	1.3	0.60	2.4	0.23	1.6
V671361		0.51	80.3	13.1	80	3.53	6.29	4.26	1.36	22.6	5.72	3.3	1.42	4.4	0.58	4.7
V671362		0.76	30.2	7.0	290	1.74	2.75	1.80	0.61	16.0	2.21	1.1	0.61	2.7	0.28	1.6
V671363		0.40	208	69.8	10	16.00	12.90	7.21	0.24	17.8	8.69	3.7	2.66	28.1	0.73	31.9
V671364		0.81	262	79.0	20	6.19	7.47	4.79	0.37	23.9	6.62	6.6	1.63	38.8	0.68	24.5
V671365		0.50	794	30.2	10	8.06	4.36	2.56	0.80	20.1	3.03	9.3	0.95	16.3	0.35	17.5
V671366		0.62	442	73.3	10	7.02	4.08	2.62	1.08	21.4	4.42	10.9	0.89	41.9	0.38	19.0
V671367		0.90	988	67.8	10	6.40	3.75	2.27	1.51	21.2	4.12	10.4	0.83	37.8	0.33	20.6
V671368		0.60	509	97.2	10	10.60	7.42	4.86	0.94	20.7	7.17	8.6	1.60	48.6	0.62	19.0
V671369		0.84	228	65.6	20	6.87	7.08	4.81	0.26	21.4	6.43	7.1	1.57	31.4	0.75	22.9
V671370		0.61	274	58.9	10	7.03	4.96	3.05	0.61	17.3	4.60	6.2	0.98	29.1	0.36	16.6
V671371		1.17	97.5	57.2	10	15.70	7.70	3.95	0.14	22.4	6.34	3.7	1.42	22.5	0.48	30.6
V671372		0.78	31.0	17.6	10	25.8	5.74	3.08	0.10	22.8	3.44	1.2	1.11	8.0	0.44	13.7
V671373		0.74	59.8	6.0	450	1.47	2.93	1.91	0.56	15.4	2.20	1.2	0.61	2.1	0.26	1.4
V671374		0.46	55.5	6.3	450	2.34	3.12	2.13	0.66	17.3	2.53	1.2	0.66	2.4	0.27	1.5
V671375		1.15	89.8	15.3	630	1.04	2.96	1.66	0.69	14.3	2.88	2.0	0.60	6.5	0.18	3.6
V671376		1.27	53.8	9.6	170	4.14	4.69	2.88	0.92	19.8	3.69	2.1	0.96	3.2	0.39	2.5
V671377		1.20	118.0	8.4	180	6.18	4.49	2.94	0.93	20.6	3.64	2.1	0.98	3.0	0.43	2.6
V671378		0.93	42.1	18.5	10	31.7	5.90	3.15	0.07	23.8	3.36	1.7	1.13	7.8	0.39	33.0
V671379		0.56	165.5	71.3	10	22.6	8.65	4.80	0.15	20.7	6.64	4.4	1.64	28.5	0.57	48.9
V671380		0.32	132.5	27.9	230	8.42	2.67	1.84	0.91	18.1	2.78	2.0	0.56	13.8	0.26	3.1
V671381		1.21	28.1	6.0	20	5.20	1.50	1.04	0.07	10.0	0.97	0.6	0.31	2.7	0.20	6.0
V671382		0.91	405	64.1	20	6.67	5.76	3.82	0.91	16.2	5.04	8.3	1.22	32.3	0.61	17.1
V671383		1.02	612	41.3	20	9.37	3.47	2.82	0.90	16.9	2.93	7.7	0.83	23.7	0.44	16.0
V671384		0.71	234	84.9	10	20.9	17.15	8.15	0.40	26.4	12.80	2.2	3.16	39.0	0.72	38.7
V671385		0.86	841	33.9	30	5.31	2.63	1.76	0.70	18.8	2.02	6.7	0.58	17.8	0.32	12.0
V671386		0.20	190.0	63.1	10	61.4	14.20	6.23	0.23	23.3	10.45	1.8	2.56	28.4	0.59	38.6
V671387		0.75	340	28.6	70	4.09	6.38	4.07	1.53	19.7	6.27	3.8	1.34	10.5	0.54	10.9
V671388		0.48	993	73.5	10	2.63	7.07	4.59	0.76	20.3	6.28	8.0	1.52	34.9	0.70	22.2
V671389		0.67	50.9	14.2	80	3.14	5.10	3.13	1.08	27.0	4.78	2.4	1.12	5.2	0.48	34.3
V671390		0.75	90.4	10.3	240	0.82	3.78	2.53	1.01	19.4	3.45	1.8	0.84	3.9	0.36	6.4

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671351		5.4	1.45	196.5	2.83	1	44.1	6.6	0.62	7.16	0.37	2.30	32	2	24.1	3.17
V671352		5.8	1.14	22.5	2.11	9	105.0	<0.1	0.54	0.32	0.33	0.09	280	50	19.0	2.14
V671353		5.2	1.03	104.5	1.74	13	68.7	<0.1	0.49	0.34	0.33	0.12	273	3	18.6	2.49
V671354		4.9	1.03	6.2	1.26	1	36.1	<0.1	0.30	1.00	0.20	0.31	188	<1	13.2	1.39
V671355		13.4	3.63	68.6	2.63	2	379	<0.1	0.36	4.29	0.18	1.32	154	1	11.1	1.34
V671356		11.5	3.26	570	3.72	9	13.8	3.3	1.24	17.60	0.69	86.8	<5	2	48.9	4.51
V671357		4.7	0.92	9.2	1.68	17	45.0	<0.1	0.46	0.18	0.25	0.22	176	<1	16.9	1.80
V671358		18.4	5.34	582	5.89	6	12.5	2.7	2.04	27.1	1.28	11.75	<5	1	84.5	8.47
V671359		8.0	1.46	5.2	2.68	1	153.5	<0.1	0.69	0.37	0.41	0.16	342	<1	23.7	2.59
V671360		4.9	0.92	9.1	1.74	1	105.5	<0.1	0.42	0.31	0.24	0.13	274	<1	14.6	1.62
V671361		11.1	2.19	28.0	4.17	2	87.5	<0.1	0.89	0.68	0.63	0.35	437	<1	33.6	3.83
V671362		5.0	1.00	3.4	1.64	2	74.0	<0.1	0.42	0.52	0.26	0.08	254	<1	14.8	1.72
V671363		26.0	7.09	418	7.19	8	21.6	2.6	1.87	39.3	0.93	34.5	<5	1	76.0	5.56
V671364		30.1	8.57	182.5	7.20	5	51.8	2.7	1.16	33.2	0.65	8.84	9	1	41.9	4.74
V671365		9.0	2.51	269	2.48	4	45.3	0.7	0.62	19.95	0.33	4.26	<5	<1	21.6	2.22
V671366		27.4	7.62	173.0	4.85	4	68.3	0.9	0.70	18.45	0.33	3.98	5	4	22.2	2.40
V671367		25.7	7.07	206	4.84	4	67.8	1.2	0.59	14.55	0.29	2.22	<5	1	17.6	2.13
V671368		38.0	10.40	160.0	7.65	5	35.7	1.4	1.17	19.85	0.63	4.91	<5	<1	40.8	4.14
V671369		26.8	7.40	316	6.29	8	46.1	2.5	1.18	36.0	0.71	10.10	7	1	41.5	5.10
V671370		22.3	6.28	165.5	4.74	3	57.5	1.2	0.77	17.40	0.37	5.08	<5	<1	24.8	2.40
V671371		20.3	5.74	496	6.19	4	15.6	2.5	1.24	32.9	0.56	9.76	<5	1	42.3	3.70
V671372		6.9	1.91	384	2.37	10	13.0	2.8	0.86	9.57	0.45	5.38	<5	1	34.7	3.16
V671373		4.4	0.88	8.4	1.59	1	110.5	<0.1	0.43	0.31	0.24	0.14	245	<1	15.2	1.70
V671374		4.8	0.97	7.7	1.76	1	72.8	<0.1	0.46	0.27	0.28	0.16	279	<1	16.6	1.84
V671375		9.9	2.15	12.0	2.53	2	333	<0.1	0.46	0.76	0.21	0.17	249	1	13.8	1.40
V671376		7.7	1.54	24.6	2.57	2	72.7	<0.1	0.69	0.35	0.38	0.14	353	<1	23.3	2.75
V671377		7.3	1.36	45.3	2.74	3	91.8	<0.1	0.63	0.29	0.40	0.10	329	1	23.3	2.78
V671378		7.4	2.16	762	2.54	9	11.0	5.8	0.86	12.55	0.47	7.59	<5	1	32.6	2.88
V671379		26.0	7.79	769	6.83	8	18.9	5.4	1.38	41.8	0.61	23.9	<5	1	50.0	4.21
V671380		12.5	3.32	83.5	2.74	3	155.5	0.2	0.48	2.73	0.27	0.80	238	205	15.8	1.77
V671381		2.6	0.74	148.0	0.89	2	17.4	3.2	0.21	3.59	0.19	2.22	<5	1	10.1	1.47
V671382		27.3	7.48	113.5	5.60	3	185.5	1.3	0.91	15.05	0.57	3.35	13	2	33.4	3.93
V671383		14.4	4.31	199.5	2.84	3	126.0	1.2	0.51	16.75	0.43	3.81	13	2	22.7	2.90
V671384		35.7	10.15	433	10.35	14	41.9	6.4	2.78	30.0	1.08	15.45	<5	2	96.4	5.81
V671385		10.4	3.17	114.0	2.07	3	209	1.0	0.37	15.50	0.25	3.98	45	2	15.1	1.76
V671386		26.9	7.55	754	8.23	21	24.2	9.7	2.37	22.1	0.82	14.20	<5	2	80.7	4.66
V671387		19.5	4.19	44.1	5.31	2	192.0	0.8	1.01	4.97	0.58	1.44	383	1	34.8	3.80
V671388		28.6	7.93	167.0	6.00	5	32.0	1.7	1.13	21.7	0.70	5.58	<5	2	42.0	4.48
V671389		11.0	2.24	22.3	3.49	19	41.4	7.8	0.83	0.62	0.49	0.70	356	2	29.8	3.28
V671390		8.8	1.65	6.3	2.79	1	129.5	0.3	0.61	0.42	0.36	0.16	367	1	21.1	2.27

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671351		18	73.2	14.65	2.49	2.77	0.92	4.93	0.93	0.01	0.11	0.17	0.22	<0.01	<0.01	0.49
V671352		55	47.7	15.10	13.20	11.75	7.01	1.46	0.18	0.04	0.88	0.20	0.06	0.01	<0.01	0.72
V671353		43	47.4	15.55	16.00	11.20	4.30	1.32	0.43	0.05	0.72	0.53	0.05	<0.01	0.01	0.79
V671354		39	37.1	10.45	39.1	4.51	4.67	0.41	0.24	0.05	0.49	1.93	0.03	<0.01	<0.01	1.03
V671355		132	62.6	16.85	9.33	2.81	2.57	2.15	2.12	0.02	0.65	0.12	0.08	0.04	0.06	1.78
V671356		41	77.3	13.55	1.15	0.77	0.08	4.09	4.18	<0.01	0.03	0.05	0.03	<0.01	0.01	0.34
V671357		33	48.1	7.61	15.65	19.30	8.16	0.71	0.25	0.01	0.54	0.66	0.06	<0.01	<0.01	0.17
V671358		87	77.3	13.05	1.69	0.64	0.10	3.57	4.77	<0.01	0.05	0.07	0.04	<0.01	0.01	0.21
V671359		68	47.7	13.65	14.40	11.70	5.72	2.53	0.33	0.02	1.12	0.23	0.09	0.02	<0.01	0.51
V671360		41	52.9	16.75	9.02	11.80	4.74	1.90	0.23	0.06	0.75	0.20	0.06	0.01	0.01	0.67
V671361		113	51.8	14.05	15.20	10.20	3.97	1.83	0.39	0.01	1.71	0.27	0.14	0.01	0.01	0.73
V671362		37	47.9	15.95	12.50	10.90	7.92	1.93	0.13	0.04	0.69	0.20	0.05	0.01	<0.01	0.49
V671363		98	77.8	11.80	1.77	0.30	0.19	2.49	5.50	<0.01	0.10	0.02	0.03	<0.01	0.03	0.46
V671364		200	74.4	13.20	2.66	1.85	0.51	3.79	2.34	<0.01	0.15	0.07	0.04	<0.01	0.03	0.83
V671365		307	78.4	11.35	1.94	0.23	0.33	1.96	5.56	<0.01	0.12	0.02	0.01	<0.01	0.09	0.64
V671366		366	77.1	11.60	2.21	1.19	0.53	2.99	2.81	<0.01	0.15	0.03	0.02	0.01	0.05	0.66
V671367		390	76.7	11.85	1.54	0.54	0.19	2.42	4.98	<0.01	0.15	0.03	0.02	0.01	0.12	0.80
V671368		285	78.0	12.00	2.26	1.22	0.31	3.52	2.53	<0.01	0.12	0.10	0.02	<0.01	0.06	0.39
V671369		189	76.3	12.80	2.16	0.62	0.50	2.58	5.72	<0.01	0.12	0.05	0.02	<0.01	0.03	0.70
V671370		197	78.5	12.45	2.11	2.25	0.30	3.32	1.82	<0.01	0.14	0.04	0.02	0.01	0.04	0.96
V671371		88	77.0	13.10	1.59	0.65	0.13	3.20	4.82	<0.01	0.07	0.04	0.01	<0.01	0.01	0.42
V671372		25	77.1	12.95	1.00	0.91	0.04	4.04	3.52	<0.01	0.02	0.04	0.02	<0.01	<0.01	0.20
V671373		41	53.5	16.15	10.35	12.20	4.61	1.52	0.14	0.06	0.71	0.21	0.05	0.01	0.01	0.79
V671374		41	49.9	15.85	12.35	12.40	6.10	1.79	0.18	0.06	0.74	0.25	0.05	0.01	0.01	0.80
V671375		65	59.4	9.80	9.94	11.10	4.66	2.29	0.24	0.08	1.07	0.32	0.08	0.04	0.01	0.53
V671376		70	46.6	14.40	15.85	12.75	7.80	1.43	0.23	0.02	1.17	0.22	0.08	0.01	0.01	1.08
V671377		71	47.4	16.65	16.40	10.90	5.08	2.50	0.52	0.02	1.23	0.26	0.08	0.01	0.01	0.79
V671378		34	75.0	13.85	1.09	0.55	0.10	3.58	5.67	<0.01	0.03	0.03	0.03	<0.01	<0.01	0.62
V671379		115	76.1	12.75	1.70	0.49	0.17	3.02	5.06	<0.01	0.09	0.03	0.04	<0.01	0.02	0.64
V671380		79	56.5	15.85	12.35	6.99	4.07	1.11	0.73	0.03	0.84	0.26	0.09	0.02	0.02	1.44
V671381		11	89.4	6.76	0.75	0.33	0.09	2.44	1.48	<0.01	0.01	0.02	<0.01	<0.01	<0.01	0.39
V671382		323	77.8	11.55	3.15	1.72	0.55	3.38	1.30	<0.01	0.23	0.10	0.04	0.02	0.04	0.58
V671383		301	76.3	12.95	2.27	1.66	0.24	3.80	2.62	<0.01	0.27	0.04	0.04	0.01	0.07	0.47
V671384		63	72.4	14.95	1.68	0.66	0.24	3.77	5.26	<0.01	0.10	0.03	0.03	0.01	0.03	0.82
V671385		279	70.6	14.00	5.27	2.73	1.20	3.03	2.60	<0.01	0.39	0.08	0.09	0.03	0.09	1.21
V671386		46	73.6	13.80	1.86	0.62	0.15	3.52	5.40	<0.01	0.08	0.03	0.03	<0.01	0.02	0.37
V671387		142	53.8	12.65	13.50	8.28	4.51	1.66	1.00	0.01	1.73	0.25	0.17	0.02	0.04	1.86
V671388		245	77.6	12.15	2.13	0.37	0.47	2.44	5.80	<0.01	0.11	0.03	0.01	<0.01	0.11	0.63
V671389		87	48.2	11.90	20.1	11.10	3.97	1.10	0.33	0.01	1.26	0.43	0.22	<0.01	0.01	0.75
V671390		61	51.4	15.75	13.85	11.10	3.54	2.33	0.16	0.03	1.28	0.25	0.08	0.02	0.01	0.58

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	TOT-ICP06	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671351		100.89	<0.5	<5	<0.5	6	27	60	<1	18	7	6	<10	34	
V671352		98.31	<0.5	<5	<0.5	51	112	190	<1	141	<2	41	<10	108	
V671353		98.35	<0.5	113	0.6	60	130	210	<1	171	<2	50	<10	222	
V671354		100.01	<0.5	1125	<0.5	12	26	40	<1	37	3	32	<10	171	
V671355		101.18	<0.5	42	<0.5	16	59	140	1	35	10	20	<10	110	
V671356		101.58	<0.5	36	<0.5	<1	1	40	<1	3	40	2	<10	39	
V671357		101.22	<0.5	<5	0.6	34	3	30	<1	70	<2	23	<10	92	
V671358		101.50	<0.5	10	<0.5	<1	1	60	<1	1	46	3	10	57	
V671359		98.02	<0.5	<5	<0.5	47	129	40	<1	78	<2	45	<10	119	
V671360		99.10	<0.5	<5	<0.5	53	121	30	<1	171	<2	45	<10	79	
V671361		100.32	<0.5	5	<0.5	45	119	50	1	52	<2	48	<10	140	
V671362		98.71	<0.5	<5	<0.5	57	127	40	<1	177	<2	35	<10	94	
V671363		100.49	<0.5	64	<0.5	1	2	40	1	2	61	3	10	46	
V671364		99.87	<0.5	10	<0.5	1	16	60	1	6	31	4	<10	123	
V671365		100.65	<0.5	10	<0.5	<1	5	50	1	1	29	1	<10	59	
V671366		99.35	<0.5	<5	<0.5	<1	6	50	<1	4	23	2	<10	90	
V671367		99.35	<0.5	<5	<0.5	<1	2	40	<1	1	35	1	<10	40	
V671368		100.53	<0.5	7	<0.5	<1	4	50	3	3	23	1	<10	87	
V671369		101.60	<0.5	7	<0.5	1	6	50	1	2	51	4	10	65	
V671370		101.96	<0.5	9	<0.5	1	1	40	<1	2	19	2	<10	77	
V671371		101.04	<0.5	13	<0.5	<1	1	90	<1	<1	45	3	<10	54	
V671372		99.84	<0.5	10	<0.5	<1	<1	40	<1	<1	35	2	10	23	
V671373		100.31	<0.5	6	<0.5	54	80	30	<1	173	<2	40	<10	129	
V671374		100.49	<0.5	6	<0.5	49	203	40	<1	164	<2	46	<10	88	
V671375		99.56	<0.5	5	<0.5	61	84	20	<1	181	6	33	<10	72	
V671376		101.65	<0.5	6	<0.5	47	67	60	1	78	<2	38	<10	136	
V671377		101.85	<0.5	6	<0.5	56	54	60	<1	117	<2	41	10	116	
V671378		100.55	<0.5	5	<0.5	<1	1	30	<1	1	38	2	10	36	
V671379		100.11	<0.5	9	<0.5	<1	3	90	<1	1	52	3	10	65	
V671380		100.30	<0.5	78	0.5	52	161	50	1	146	2	31	<10	154	
V671381		101.67	<0.5	<5	<0.5	<1	1	40	1	1	8	1	<10	7	
V671382		100.46	<0.5	<5	<0.5	1	9	50	1	3	17	4	<10	78	
V671383		100.74	<0.5	689	<0.5	<1	8	30	<1	2	20	4	10	51	
V671384		99.98	<0.5	164	<0.5	1	2	30	<1	3	37	3	<10	66	
V671385		101.32	<0.5	15	<0.5	2	18	50	3	6	19	7	<10	77	
V671386		99.48	<0.5	53	<0.5	<1	1	40	<1	2	42	2	10	64	
V671387		99.48	<0.5	40	0.5	31	11	50	<1	34	3	34	10	180	
V671388		101.85	<0.5	25	<0.5	<1	4	70	<1	<1	22	1	<10	72	
V671389		99.38	<0.5	24	0.5	42	80	60	<1	41	<2	31	<10	189	
V671390		100.38	<0.5	5	<0.5	58	155	40	<1	118	<2	42	<10	120	

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671391		0.57	56.8	22.5	10	10.10	4.28	3.02	0.10	19.6	2.52	2.7	0.93	10.1	0.49	12.6
V671392		0.66	199.0	70.8	10	22.7	7.35	3.30	0.22	22.2	7.25	4.2	1.21	31.2	0.33	55.9
V671393		0.73	12.4	15.3	20	16.70	2.57	1.12	0.10	27.9	1.94	0.6	0.42	7.6	0.10	28.1
V671394		0.73	388	5.1	380	12.20	2.36	1.58	0.52	14.0	2.19	1.1	0.52	1.8	0.24	1.4
V671395		0.69	137.0	10.7	200	14.95	4.23	2.60	1.06	18.4	3.81	2.2	0.92	4.0	0.41	3.0
V671396		0.81	18.4	32.0	10	9.24	9.70	4.37	<0.03	38.1	5.51	3.8	1.63	10.1	0.72	123.5
V671397		0.90	98.9	5.4	390	32.9	2.65	1.54	0.66	13.8	2.25	1.1	0.61	2.1	0.26	1.5
V671398		0.87	84.3	4.8	370	608	2.82	1.88	0.49	16.7	2.46	1.0	0.58	1.6	0.28	2.2
V671399		0.77	102.0	22.9	60	23.2	7.52	4.76	2.15	20.2	7.14	4.0	1.62	8.9	0.73	5.7
V671400		0.68	61.0	6.9	310	4.82	3.74	2.09	0.80	16.6	3.04	1.7	0.78	2.3	0.34	1.7
V671401		0.54	60.6	8.5	120	5.07	4.30	2.78	0.99	18.1	3.64	1.9	0.89	3.0	0.39	2.2
V671402		0.73	37.9	6.8	260	1.74	3.27	2.13	0.85	17.4	3.04	1.5	0.75	2.4	0.30	1.5
V671403		0.77	36.4	7.2	360	1.10	3.61	2.38	0.83	16.5	2.84	1.5	0.78	2.6	0.34	1.4
V671404		0.83	38.5	8.3	120	1.35	3.90	2.54	1.00	18.3	3.61	1.8	0.86	2.8	0.36	2.2
V671405		1.00	29.3	8.9	160	1.62	4.10	2.61	0.93	17.8	3.53	1.8	0.90	3.3	0.40	2.1
V671406		0.92	30.9	17.2	420	0.79	2.78	1.56	0.93	15.2	3.03	1.7	0.56	7.5	0.21	3.6
V671407		0.99	54.4	14.2	50	1.17	6.52	4.61	1.35	20.3	5.57	3.1	1.43	5.1	0.67	5.2
V671408		0.75	19.1	9.1	180	2.53	3.98	2.62	0.93	19.3	3.62	1.8	0.92	3.4	0.38	2.1
V671409		0.81	51.8	8.6	340	0.50	3.84	2.49	0.87	18.2	3.33	1.6	0.85	3.3	0.37	2.0
V671410		0.61	544	85.2	10	9.86	6.42	4.32	1.33	20.0	6.30	8.0	1.41	42.7	0.67	18.8
V671411		0.61	1055	80.1	10	3.37	6.04	4.02	0.94	19.5	5.48	8.2	1.36	36.7	0.63	18.7
V671412		0.98	449	50.3	50	6.74	3.42	2.25	0.89	20.8	3.46	5.7	0.73	25.3	0.38	14.6
V671413		0.43	1080	60.0	10	6.55	5.99	4.23	1.05	19.1	4.35	8.1	1.33	27.6	0.59	18.1
V671414		0.62	890	99.3	10	3.69	6.33	3.73	1.28	17.8	6.29	7.4	1.33	50.4	0.56	17.5
V671415		0.80	900	101.0	10	16.20	7.03	4.43	1.32	22.3	6.74	8.6	1.50	49.2	0.60	19.9
V671416		0.50	901	83.5	10	3.97	7.64	5.11	1.28	22.8	6.23	9.4	1.70	41.9	0.73	20.8
V671417		1.22	85.8	16.8	70	0.92	5.76	3.84	1.37	20.7	5.15	3.1	1.28	6.3	0.54	5.6
V671418		0.86	202	78.5	10	18.60	8.31	4.83	0.18	21.3	6.22	4.4	1.64	32.9	0.66	54.8
V671419		1.21	176.5	94.5	10	10.50	9.98	5.34	0.25	22.3	7.93	5.0	1.94	41.9	0.69	37.8
V671420		0.82	43.2	6.6	410	2.51	2.76	1.86	0.68	16.6	2.25	1.1	0.62	2.5	0.30	2.1
V671421		0.29	3.7	4.8	10	137.0	1.41	0.55	<0.03	19.6	0.75	0.2	0.26	2.6	0.06	8.5
V671422		0.43	12.1	5.3	10	70.9	1.73	0.51	0.03	36.6	1.16	0.8	0.24	2.1	0.03	47.2
V671423		0.54	9.9	14.1	10	93.7	3.44	0.86	<0.03	40.5	2.84	7.2	0.39	4.2	0.06	91.6
V671424		0.71	23.2	20.2	10	100.5	6.89	3.96	0.07	25.0	3.78	1.5	1.32	8.5	0.57	19.9
V671425		0.73	125.5	13.2	150	1.73	5.25	3.47	1.27	23.0	4.70	2.7	1.15	5.0	0.51	4.3
V671426		0.50	19.8	21.3	10	34.1	5.33	2.94	0.06	28.4	3.31	1.6	1.07	9.3	0.52	17.8
V671427		0.61	97.2	12.0	200	2.57	5.77	4.05	1.34	23.2	4.77	2.9	1.29	4.5	0.57	4.8
V671428		0.94	54.2	7.1	260	12.05	3.81	2.39	0.77	20.9	2.75	1.2	0.78	2.9	0.39	3.0
V671429		0.55	26.7	6.2	200	3.27	2.83	2.02	0.64	17.4	2.60	1.1	0.67	2.2	0.28	1.6
V671430		0.63	19.7	5.1	380	1.42	2.38	1.64	0.52	14.9	2.14	1.0	0.58	1.7	0.24	1.4

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671391		8.1	2.54	421	2.44	5	10.3	2.5	0.61	20.5	0.48	29.9	<5	1	28.0	3.40
V671392		27.2	8.21	812	7.24	8	22.2	6.1	1.28	45.4	0.42	31.4	5	1	40.1	2.36
V671393		5.6	1.66	333	1.75	8	7.6	3.4	0.43	5.95	0.13	3.10	<5	1	15.3	0.92
V671394		4.5	0.86	27.9	1.48	1	71.7	0.1	0.36	0.33	0.25	0.19	240	1	13.7	1.55
V671395		8.7	1.72	94.9	3.17	3	114.5	0.3	0.73	0.50	0.40	0.19	317	1	23.8	2.48
V671396		15.7	4.26	532	5.93	5	6.9	23.9	1.44	13.65	0.72	7.05	<5	2	58.9	5.36
V671397		4.7	0.92	60.8	1.75	13	75.9	0.2	0.40	0.21	0.26	0.10	250	1	15.3	1.74
V671398		4.2	0.84	1615	1.70	67	39.6	2.1	0.41	0.21	0.27	0.08	247	1	16.0	1.69
V671399		17.5	3.54	36.5	5.61	2	60.3	0.4	1.25	0.84	0.75	0.28	496	2	41.9	4.45
V671400		6.2	1.22	20.0	2.36	1	88.2	0.1	0.58	0.27	0.33	0.08	307	1	19.9	2.22
V671401		7.9	1.49	12.1	2.62	1	114.0	0.2	0.69	0.31	0.40	0.08	327	1	22.9	2.58
V671402		5.8	1.10	6.2	1.97	1	76.7	0.1	0.56	0.24	0.33	0.06	302	<1	19.0	2.25
V671403		6.1	1.20	6.5	2.02	1	96.8	0.1	0.55	0.27	0.35	0.09	300	1	19.6	2.10
V671404		7.7	1.43	15.4	2.54	1	101.5	0.1	0.66	0.30	0.38	0.09	325	1	22.1	2.38
V671405		7.7	1.45	11.4	2.61	1	106.5	0.1	0.64	0.31	0.41	0.37	325	2	22.8	2.41
V671406		10.8	2.43	12.3	2.78	1	84.5	0.2	0.49	0.74	0.23	0.13	238	1	14.5	1.47
V671407		12.1	2.30	14.7	3.96	6	79.8	0.3	1.05	0.61	0.69	0.22	428	3	38.5	4.54
V671408		7.7	1.56	6.3	2.46	1	112.0	0.1	0.62	0.31	0.40	0.11	339	1	22.7	2.57
V671409		7.6	1.46	12.7	2.62	1	105.5	0.1	0.58	0.30	0.38	0.08	324	1	21.7	2.30
V671410		34.5	9.82	113.5	6.81	3	115.0	1.4	1.08	18.95	0.62	3.88	12	2	37.1	4.17
V671411		30.0	8.28	141.0	5.70	4	84.0	1.5	0.98	19.30	0.64	4.54	7	2	35.5	4.12
V671412		21.4	5.94	135.0	4.12	6	166.0	1.7	0.59	16.60	0.37	4.38	74	2	20.0	2.41
V671413		23.5	6.36	223	4.78	4	26.5	1.5	0.83	21.0	0.63	5.80	<5	1	38.3	4.04
V671414		39.5	11.00	121.0	7.20	4	50.4	1.3	1.01	17.90	0.53	4.37	9	3	36.8	3.41
V671415		39.3	10.50	221	7.32	7	132.5	1.5	1.10	20.1	0.64	4.56	<5	1	41.5	4.25
V671416		32.2	8.72	135.0	6.36	4	97.8	1.7	1.10	21.6	0.77	5.20	<5	2	48.7	5.16
V671417		13.8	2.60	14.6	3.97	1	126.5	0.7	0.88	0.79	0.51	0.20	395	2	33.8	3.59
V671418		28.2	8.34	725	6.70	7	24.6	4.5	1.24	48.0	0.72	16.00	<5	1	51.4	4.51
V671419		38.1	10.90	654	8.74	4	25.1	3.9	1.55	52.2	0.76	38.4	<5	3	60.6	5.04
V671420		5.5	1.01	19.1	1.70	5	112.5	0.3	0.42	0.41	0.28	0.18	292	1	17.3	1.86
V671421		1.3	0.45	472	0.49	19	6.1	5.6	0.19	2.89	0.07	1.06	<5	3	7.9	0.72
V671422		2.1	0.60	199.5	1.04	699	6.2	93.7	0.30	11.25	0.06	3.20	<5	3	9.7	0.55
V671423		6.8	1.90	219	3.12	1350	3.0	92.2	0.68	27.7	0.10	19.75	<5	7	18.4	0.88
V671424		8.4	2.27	797	2.92	17	11.4	6.6	1.00	12.00	0.59	5.35	<5	3	42.6	3.99
V671425		11.1	2.06	7.2	3.56	2	113.5	0.5	0.79	0.65	0.50	0.26	443	<1	31.0	3.38
V671426		8.6	2.51	594	3.03	13	11.8	7.5	0.79	13.70	0.51	3.54	<5	2	32.6	3.85
V671427		9.8	1.92	15.0	3.48	1	135.0	0.4	0.86	0.68	0.56	0.21	517	<1	34.7	3.71
V671428		5.8	1.11	46.4	2.07	7	97.7	0.5	0.47	0.32	0.35	0.14	333	1	22.3	2.41
V671429		5.3	0.95	4.5	1.85	1	103.0	0.1	0.46	0.19	0.28	0.13	280	1	17.1	2.01
V671430		4.2	0.79	2.0	1.45	1	98.7	0.1	0.35	0.14	0.22	0.05	253	1	14.5	1.71

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671391		61	78.2	12.40	1.12	0.74	0.07	4.00	3.18	<0.01	0.02	0.06	0.02	<0.01	0.01	0.74
V671392		113	76.6	13.20	1.83	0.61	0.15	3.34	4.84	<0.01	0.10	0.02	0.03	<0.01	0.02	0.60
V671393		13	78.4	13.25	1.22	0.97	0.06	5.30	1.96	<0.01	0.04	0.03	0.02	<0.01	<0.01	0.54
V671394		36	49.6	15.60	12.80	9.00	7.24	2.31	0.31	0.06	0.69	0.36	0.05	0.01	0.04	0.66
V671395		76	48.4	14.90	15.25	10.10	4.06	2.08	0.55	0.03	1.28	0.45	0.09	0.01	0.02	0.83
V671396		59	76.6	14.05	1.52	0.25	0.04	4.35	3.65	<0.01	<0.01	0.17	0.03	<0.01	<0.01	0.51
V671397		36	49.4	15.25	14.25	10.75	6.96	0.91	0.31	0.06	0.68	0.38	0.04	0.01	0.01	0.90
V671398		35	45.4	14.20	15.65	10.20	8.28	0.90	1.60	0.05	0.62	0.45	0.05	<0.01	0.01	1.06
V671399		141	53.8	15.20	23.3	1.09	2.57	0.17	0.44	0.01	2.15	1.06	0.17	0.01	0.01	1.08
V671400		57	48.4	14.80	13.60	11.60	6.34	1.42	0.32	0.04	0.92	0.21	0.06	0.01	0.01	1.14
V671401		65	48.0	14.25	15.15	9.84	7.55	2.07	0.28	0.02	1.10	0.21	0.08	0.01	0.01	0.75
V671402		51	49.7	15.60	13.55	11.90	4.67	1.48	0.26	0.04	0.91	0.25	0.06	0.01	<0.01	0.75
V671403		48	51.7	15.95	12.70	11.50	4.75	1.41	0.29	0.05	0.83	0.20	0.05	0.01	<0.01	0.97
V671404		65	46.7	14.00	14.75	10.35	7.36	2.12	0.33	0.02	1.11	0.22	0.08	0.01	<0.01	1.05
V671405		62	50.7	14.90	12.90	11.70	4.02	1.27	0.26	0.02	1.07	0.19	0.07	0.01	<0.01	1.48
V671406		63	46.3	8.92	20.3	10.85	8.01	1.05	0.25	0.06	0.99	0.37	0.08	0.01	<0.01	0.84
V671407		106	41.6	11.35	23.4	9.51	5.29	1.84	0.44	0.01	1.57	0.42	0.15	0.01	0.01	2.69
V671408		62	49.5	14.60	13.95	10.70	6.53	1.44	0.22	0.02	0.98	0.19	0.08	0.01	<0.01	1.24
V671409		58	47.6	15.95	12.60	12.00	5.63	1.67	0.32	0.04	0.96	0.18	0.07	0.01	0.01	1.22
V671410		277	75.7	11.85	2.40	1.97	2.07	2.62	1.80	<0.01	0.18	0.03	0.03	0.01	0.06	1.12
V671411		292	76.7	11.95	2.45	1.14	0.48	2.83	3.65	<0.01	0.17	0.05	0.02	0.01	0.11	0.74
V671412		199	69.2	13.40	4.36	3.28	1.24	2.20	3.41	0.01	0.50	0.12	0.11	0.02	0.05	2.84
V671413		273	78.2	11.45	1.88	0.31	0.54	1.36	6.69	<0.01	0.12	0.03	0.02	<0.01	0.12	0.51
V671414		251	77.4	11.30	2.53	0.43	0.48	3.04	4.13	<0.01	0.20	0.03	0.03	0.01	0.10	0.53
V671415		295	76.3	12.20	2.34	2.42	0.70	0.82	5.93	<0.01	0.14	0.06	0.01	0.01	0.10	0.84
V671416		324	75.4	13.05	2.72	2.63	1.18	1.99	3.16	<0.01	0.14	0.07	0.01	0.01	0.10	1.20
V671417		114	49.5	12.60	19.80	10.95	3.41	1.03	0.28	0.01	1.74	0.53	0.15	0.01	0.01	0.19
V671418		127	76.7	13.05	1.97	0.60	0.15	3.16	5.00	<0.01	0.09	0.03	0.03	<0.01	0.02	0.53
V671419		139	74.7	13.05	1.84	0.76	0.15	2.99	5.24	<0.01	0.10	0.03	0.03	<0.01	0.02	0.57
V671420		40	49.7	16.15	14.65	11.85	5.23	1.37	0.33	0.06	0.73	0.42	0.04	0.01	<0.01	0.57
V671421		4	83.8	10.20	0.58	0.48	0.03	4.42	0.96	<0.01	0.01	0.02	0.01	<0.01	<0.01	0.34
V671422		5	73.0	16.05	0.44	0.73	0.03	8.27	0.42	<0.01	<0.01	0.03	0.20	<0.01	<0.01	0.33
V671423		53	74.4	15.75	0.53	0.37	0.01	8.37	0.44	<0.01	<0.01	0.06	0.14	<0.01	<0.01	0.36
V671424		27	77.8	13.50	1.03	0.70	0.04	4.13	3.87	<0.01	0.02	0.08	0.03	<0.01	<0.01	0.52
V671425		93	50.1	15.80	15.10	10.45	2.85	1.56	0.31	0.02	1.45	0.60	0.10	0.01	0.01	0.26
V671426		24	75.0	13.65	0.88	0.76	0.07	4.05	3.92	<0.01	0.01	0.06	0.02	<0.01	<0.01	0.60
V671427		110	53.4	15.10	15.90	7.24	2.84	2.42	0.48	0.03	1.59	0.57	0.13	0.01	0.01	0.04
V671428		47	49.0	17.10	14.10	10.60	3.38	1.42	0.56	0.03	0.66	0.28	0.04	0.01	0.01	1.04
V671429		38	50.4	14.10	12.75	11.35	7.16	2.02	0.12	0.03	0.70	0.21	0.05	0.01	<0.01	0.96
V671430		35	49.8	14.40	11.80	12.20	7.40	2.12	0.08	0.05	0.66	0.20	0.04	0.01	<0.01	0.74

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	TOT-ICP06	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671391		100.56	<0.5	8	<0.5	<1	2	50	<1	2	31	3	<10	21	
V671392		101.34	<0.5	5	<0.5	1	1	100	2	3	49	3	10	69	
V671393		101.79	<0.5	<5	<0.5	<1	1	60	<1	2	20	2	<10	38	
V671394		98.73	<0.5	<5	<0.5	48	21	50	<1	157	<2	38	<10	97	
V671395		98.05	<0.5	18	<0.5	47	22	70	<1	99	<2	38	<10	120	
V671396		101.17	<0.5	103	<0.5	<1	1	20	<1	2	9	7	<10	98	
V671397		99.91	<0.5	229	<0.5	50	21	60	<1	171	<2	43	<10	106	
V671398		98.47	<0.5	532	0.5	47	1	280	<1	152	<2	36	20	117	
V671399		101.06	<0.5	5	<0.5	20	49	70	<1	25	<2	51	10	96	
V671400		98.87	<0.5	7	<0.5	46	47	60	<1	118	3	37	<10	109	
V671401		99.32	<0.5	<5	<0.5	53	57	30	<1	118	<2	36	<10	72	
V671402		99.18	<0.5	12	<0.5	54	46	20	<1	147	<2	42	10	109	
V671403		100.41	<0.5	6	<0.5	41	19	30	<1	144	<2	39	<10	74	
V671404		98.10	<0.5	<5	<0.5	41	17	30	<1	93	<2	34	<10	86	
V671405		98.59	<0.5	<5	<0.5	50	32	30	<1	109	<2	44	<10	59	
V671406		98.03	<0.5	<5	0.5	65	<1	20	<1	155	<2	29	<10	90	
V671407		98.29	<0.5	<5	<0.5	42	61	50	<1	41	2	41	<10	112	
V671408		99.46	<0.5	<5	<0.5	48	291	30	<1	108	<2	40	<10	87	
V671409		98.26	<0.5	<5	<0.5	49	107	20	<1	127	<2	43	<10	81	
V671410		99.84	<0.5	<5	<0.5	1	6	60	3	2	28	2	<10	81	
V671411		100.30	<0.5	33	<0.5	1	13	30	<1	2	23	2	<10	81	
V671412		100.74	<0.5	7	<0.5	8	73	40	2	13	36	10	<10	190	
V671413		101.23	<0.5	<5	<0.5	<1	3	40	<1	2	23	1	10	75	
V671414		100.21	<0.5	36	<0.5	1	6	40	1	3	24	2	<10	69	
V671415		101.87	<0.5	8	<0.5	1	2	40	<1	1	29	1	<10	99	
V671416		101.66	<0.5	<5	<0.5	<1	2	50	<1	<1	24	2	<10	120	
V671417		100.21	<0.5	105	<0.5	46	90	40	<1	39	<2	40	<10	131	
V671418		101.33	<0.5	6	<0.5	<1	1	70	<1	2	48	3	<10	69	
V671419		99.48	<0.5	<5	<0.5	<1	4	60	1	1	66	3	10	42	
V671420		101.11	<0.5	5	<0.5	46	31	100	<1	156	<2	41	<10	83	
V671421		100.85	<0.5	9	<0.5	<1	1	190	<1	1	9	<1	10	18	
V671422		99.50	<0.5	16	<0.5	<1	<1	110	<1	1	8	<1	<10	21	
V671423		100.43	<0.5	14	<0.5	<1	<1	250	<1	2	7	1	<10	18	
V671424		101.72	<0.5	16	<0.5	<1	1	380	<1	<1	30	2	10	35	
V671425		98.62	<0.5	30	<0.5	48	28	80	<1	100	<2	43	<10	147	
V671426		99.02	<0.5	<5	<0.5	<1	1	60	<1	1	27	2	<10	19	
V671427		99.76	<0.5	36	<0.5	38	75	20	<1	68	<2	46	10	95	
V671428		98.23	<0.5	7	<0.5	53	484	170	<1	139	<2	38	10	110	
V671429		99.86	<0.5	6	<0.5	46	92	40	<1	126	<2	41	<10	100	
V671430		99.50	<0.5	7	<0.5	44	128	20	<1	134	<2	33	<10	79	

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671431		1.12	18.9	6.0	210	0.76	3.03	1.98	0.62	16.2	2.51	1.2	0.71	2.2	0.27	1.7
V671432		0.61	57.7	6.2	220	4.04	2.95	1.98	0.68	18.1	2.42	1.2	0.66	2.5	0.30	2.3
V671433		0.73	41.8	8.1	330	1.24	3.53	2.37	0.94	18.7	2.97	1.5	0.76	3.1	0.33	2.4
V671434		0.95	73.3	13.9	120	2.69	5.47	3.49	1.26	20.9	4.41	2.7	1.24	5.2	0.51	4.3
V671435		0.77	42.2	8.4	170	1.05	3.75	2.20	0.81	20.2	3.07	1.7	0.82	2.9	0.33	2.4
V671436		0.90	41.8	6.4	310	1.17	3.12	2.08	0.80	19.3	2.53	1.3	0.67	2.3	0.32	2.1
V671437		0.60	31.3	40.2	10	4.63	9.13	8.58	0.12	23.4	4.81	0.5	2.27	17.7	1.88	7.3
V671438		0.92	22.6	8.1	290	0.67	3.90	2.51	0.79	18.9	3.09	1.5	0.84	3.0	0.37	2.3
V671439		0.70	20.2	6.2	210	0.77	2.87	2.05	0.60	17.0	2.56	1.2	0.66	2.2	0.28	1.7
V671440		0.75	23.1	5.5	410	1.22	2.70	1.79	0.60	15.9	2.25	1.0	0.61	2.0	0.25	1.4
V671441		0.88	62.9	10.3	520	34.3	3.26	2.27	0.87	16.3	2.77	1.3	0.74	4.2	0.32	3.0
V671442		0.74	33.1	6.2	470	4.58	2.93	2.03	0.68	18.3	2.54	1.1	0.67	2.2	0.30	1.7
V671443		1.02	78.5	7.1	350	8.33	3.53	2.35	0.96	18.5	2.99	1.5	0.72	2.4	0.33	2.7
V671444		0.62	51.5	7.5	380	1.70	3.55	2.30	0.74	18.6	2.96	1.3	0.81	2.8	0.37	2.1
V671445		0.77	43.6	26.0	10	7.88	21.1	16.60	0.14	37.5	10.65	2.9	4.87	9.8	3.08	22.9
V671446		0.90	39.0	15.7	70	9.24	7.43	4.92	1.34	24.4	5.93	3.3	1.70	5.8	0.72	5.6
V671447		1.29	326	23.2	260	15.75	2.87	1.85	0.86	21.0	2.48	2.3	0.57	11.3	0.25	3.7
V671448		1.03	7.4	10.3	30	1.87	1.62	1.27	0.56	4.2	1.57	0.3	0.41	5.7	0.19	0.5
V671449		0.67	113.5	5.2	370	102.5	2.51	1.72	0.58	14.7	2.01	1.1	0.53	1.9	0.23	1.4
V671450		0.90	14.3	11.5	10	13.75	2.91	1.25	0.10	20.9	2.42	1.9	0.48	4.1	0.20	20.2
V671551		0.85	72.1	9.3	340	8.57	3.00	2.05	0.71	17.8	2.92	1.5	0.66	3.2	0.29	2.1
V671552		0.81	35.4	7.5	340	2.61	3.26	2.19	0.78	15.7	2.74	1.4	0.74	2.6	0.36	1.9
V671553		0.52	11.6	12.0	10	125.5	4.14	2.31	0.08	21.4	2.50	0.7	0.84	4.9	0.32	26.5
V671554		0.80	108.0	13.4	490	5.19	5.96	4.17	1.44	30.5	5.11	2.7	1.42	4.8	0.62	3.7
V671555		0.83	129.5	6.6	290	13.10	3.47	2.04	0.88	17.7	2.79	1.5	0.78	2.1	0.33	2.4
V671556		0.75	28.5	11.6	90	3.28	4.85	3.33	0.97	18.5	3.85	2.3	1.00	4.6	0.48	3.2
V671557		0.78	19.4	40.2	10	196.0	6.95	3.20	0.07	23.9	5.03	1.1	1.23	17.7	0.35	36.9
V671558		0.70	18.8	5.6	230	1.51	2.92	2.02	0.62	14.9	2.31	1.1	0.64	2.0	0.28	1.6
V671559		0.52	16.3	5.8	350	2.31	2.89	1.78	0.68	14.8	2.32	1.1	0.64	2.1	0.30	1.6
V671560		0.38	7.7	18.4	10	3.25	4.17	2.24	0.11	28.7	2.69	1.3	0.77	6.4	0.43	106.5
V671561		0.46	14.0	5.4	340	2.02	2.74	1.80	0.55	14.3	2.39	1.1	0.61	1.9	0.28	1.5
V671562		0.81	13.6	7.6	280	6.28	3.15	2.17	0.83	16.0	2.62	1.4	0.73	2.8	0.33	2.1
V671563		0.68	17.1	7.5	260	23.1	3.10	2.16	0.81	16.3	3.00	1.5	0.77	2.6	0.36	2.0
V671564		0.56	23.6	5.2	180	5.34	2.63	1.94	0.58	14.7	2.15	1.1	0.60	1.8	0.28	1.5
V671565		0.75	37.9	8.0	250	11.35	3.26	2.20	0.74	15.7	2.69	1.5	0.74	3.0	0.33	2.0
V671566		0.68	26.8	7.7	300	2.10	3.55	2.36	0.82	17.7	2.89	1.6	0.77	2.7	0.37	2.1
V671567		0.88	130.5	7.1	310	111.0	3.14	1.94	0.72	17.2	2.66	1.3	0.65	2.6	0.29	1.7
V671568		0.67	61.6	7.0	380	1.24	2.25	1.41	0.58	14.1	1.94	1.2	0.54	2.6	0.23	3.6
V671569		1.01	207	4.8	350	57.7	2.35	1.64	0.67	17.5	1.97	1.4	0.57	1.7	0.23	2.4
V671570		1.05	18.6	7.1	310	3.52	3.06	2.06	0.65	15.9	2.73	1.3	0.74	2.5	0.32	2.2

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671431		5.1	0.91	4.2	1.99	1	119.5	0.1	0.45	0.19	0.28	0.05	298	1	17.3	2.01
V671432		5.0	0.96	29.1	1.81	6	98.6	0.2	0.44	0.21	0.29	0.10	333	1	18.3	2.07
V671433		6.7	1.25	11.4	2.10	1	99.0	0.2	0.53	0.31	0.33	0.10	344	<1	20.9	2.25
V671434		11.0	2.16	21.4	3.53	1	86.6	0.3	0.85	0.71	0.51	0.24	427	1	32.4	3.50
V671435		7.1	1.28	16.4	2.35	1	97.1	0.1	0.55	0.29	0.33	0.07	327	2	20.0	2.27
V671436		5.4	0.97	14.8	1.93	1	97.7	0.2	0.45	0.24	0.30	0.11	361	1	18.8	1.89
V671437		15.7	4.54	165.0	4.10	1	28.6	0.6	1.13	23.6	1.59	6.43	<5	1	81.0	12.95
V671438		6.9	1.24	5.3	2.43	1	105.0	0.1	0.58	0.28	0.33	0.10	305	<1	21.5	2.42
V671439		5.0	0.92	2.8	1.83	<1	88.2	0.1	0.43	0.21	0.29	0.06	301	1	17.4	2.06
V671440		4.5	0.86	7.2	1.57	1	73.2	0.1	0.42	0.17	0.28	0.05	269	1	15.8	1.77
V671441		7.2	1.44	507	2.25	4	99.0	0.2	0.49	1.01	0.31	0.10	334	<1	19.1	2.02
V671442		4.9	0.96	10.7	1.72	1	112.5	0.1	0.46	0.19	0.28	0.06	292	1	17.0	1.99
V671443		6.2	1.14	11.6	2.20	<1	115.0	0.2	0.53	0.29	0.32	0.11	337	<1	20.1	2.11
V671444		6.2	1.21	8.6	2.16	1	91.9	0.2	0.54	0.28	0.32	0.11	349	<1	21.3	2.18
V671445		12.8	3.30	511	6.46	3	47.0	7.2	2.85	22.2	2.90	8.24	7	1	165.0	21.0
V671446		12.6	2.35	13.4	4.50	1	120.0	0.4	1.12	0.78	0.70	0.23	498	1	41.8	4.70
V671447		11.0	2.73	58.4	2.50	1	176.0	0.3	0.44	2.71	0.27	0.83	309	1	16.4	1.76
V671448		5.1	1.12	4.1	1.27	5	14.7	0.1	0.27	0.42	0.17	0.46	42	10	13.2	1.14
V671449		4.4	0.80	262	1.70	3	92.7	0.1	0.39	0.21	0.26	0.10	243	1	13.5	1.62
V671450		5.6	1.43	65.6	2.21	3	27.4	5.0	0.50	7.85	0.22	4.43	<5	1	16.9	1.34
V671551		7.3	1.44	35.8	2.46	1	45.3	0.2	0.48	0.29	0.30	0.14	288	<1	15.1	1.83
V671552		6.2	1.21	6.9	1.93	2	147.0	0.2	0.51	0.27	0.32	0.12	256	1	18.2	2.13
V671553		4.9	1.35	1285	2.21	21	6.7	11.8	0.67	10.90	0.37	3.59	<5	2	26.5	2.29
V671554		11.6	2.15	10.9	3.70	1	227	0.3	0.93	0.49	0.66	0.18	486	1	35.0	3.80
V671555		6.6	1.07	20.7	2.32	1	76.5	0.2	0.52	0.26	0.36	0.09	273	1	19.8	2.05
V671556		9.4	1.77	3.1	2.88	<1	76.9	0.2	0.72	0.39	0.49	0.14	321	<1	26.5	2.83
V671557		16.1	4.65	1170	5.03	37	10.4	12.3	1.17	19.85	0.47	21.3	<5	3	39.6	2.42
V671558		5.0	0.95	10.5	1.83	<1	104.5	0.2	0.41	0.23	0.32	0.15	254	1	16.3	1.85
V671559		5.4	0.92	18.7	1.79	15	65.7	0.2	0.41	0.22	0.28	0.13	252	1	16.1	1.68
V671560		8.6	2.25	22.3	3.48	2	36.0	60.3	0.67	9.61	0.43	4.42	<5	2	25.7	3.03
V671561		4.8	0.92	9.1	1.57	1	66.0	0.3	0.40	0.17	0.31	0.12	241	1	15.4	1.73
V671562		6.0	1.19	17.7	1.97	3	83.8	0.2	0.48	0.32	0.33	0.12	250	1	18.7	2.14
V671563		6.6	1.20	37.1	2.40	2	201	0.2	0.56	0.22	0.34	0.08	264	1	19.2	2.06
V671564		4.6	0.83	16.8	1.69	1	74.3	0.1	0.43	0.14	0.30	0.06	253	1	15.4	1.81
V671565		6.6	1.22	38.3	2.16	6	67.5	0.2	0.50	0.29	0.33	0.11	246	1	19.1	2.00
V671566		7.0	1.22	8.5	2.24	1	113.0	0.2	0.54	0.30	0.37	0.09	281	1	20.6	2.09
V671567		5.7	1.10	109.5	2.07	5	110.0	0.2	0.50	0.22	0.33	0.10	266	1	17.8	1.90
V671568		5.5	1.05	8.8	1.75	1	134.5	0.2	0.38	0.29	0.22	0.07	239	1	13.0	1.40
V671569		4.3	0.77	69.9	1.63	<1	157.0	0.2	0.37	0.25	0.26	0.11	280	1	14.0	1.52
V671570		6.2	1.02	19.8	2.35	2	89.8	0.2	0.50	0.26	0.31	0.08	257	1	18.4	1.93

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671431		41	49.2	14.15	12.70	12.65	7.27	1.58	0.13	0.03	0.72	0.21	0.06	0.02	<0.01	0.51
V671432		46	45.7	15.15	13.25	14.85	6.82	0.67	0.24	0.03	0.72	0.22	0.06	0.01	0.01	1.71
V671433		55	48.4	15.05	13.30	12.55	6.33	1.93	0.30	0.04	0.90	0.22	0.06	0.01	<0.01	0.61
V671434		100	48.3	13.55	14.85	10.20	5.79	2.29	0.58	0.01	1.41	0.20	0.11	0.01	0.01	0.85
V671435		58	48.8	14.60	13.80	11.30	6.23	2.49	0.39	0.02	0.98	0.22	0.08	0.01	<0.01	0.75
V671436		45	48.6	15.00	12.50	10.45	7.33	2.38	0.36	0.04	0.82	0.18	0.06	0.01	<0.01	1.03
V671437		17	75.0	13.60	0.97	1.45	0.12	4.74	2.58	<0.01	0.06	0.02	0.03	<0.01	<0.01	0.28
V671438		56	48.7	14.60	13.60	11.60	6.74	1.62	0.20	0.04	0.93	0.20	0.07	0.01	<0.01	0.67
V671439		41	48.4	14.25	12.95	12.25	6.88	1.60	0.12	0.03	0.73	0.20	0.05	0.01	<0.01	0.82
V671440		36	48.7	14.30	11.85	12.70	8.27	1.65	0.19	0.05	0.67	0.21	0.04	0.01	<0.01	0.89
V671441		46	44.6	15.15	13.85	9.93	10.00	1.35	1.63	0.06	0.80	0.21	0.05	0.01	0.01	1.28
V671442		41	48.7	14.60	12.90	11.85	7.75	1.38	0.20	0.06	0.72	0.20	0.05	0.01	<0.01	1.22
V671443		57	52.1	15.95	12.05	9.65	3.74	2.17	0.33	0.04	0.95	0.21	0.06	0.01	0.01	0.94
V671444		50	51.7	15.75	12.70	10.95	3.98	1.04	0.26	0.04	0.82	0.27	0.06	0.01	0.01	0.62
V671445		61	70.4	18.30	0.85	2.13	0.14	6.23	2.75	<0.01	0.02	0.09	0.03	<0.01	<0.01	0.53
V671446		124	50.2	14.20	21.0	6.00	3.10	1.79	0.33	0.01	1.95	0.60	0.16	0.01	<0.01	-0.20
V671447		89	56.8	16.90	12.50	3.78	4.33	1.78	1.57	0.03	0.88	0.20	0.08	0.02	0.04	1.88
V671448		13	26.1	1.81	42.9	4.09	4.49	0.12	0.15	<0.01	0.09	0.14	0.02	<0.01	<0.01	18.15
V671449		38	51.9	16.45	11.15	9.77	5.58	2.67	0.55	0.06	0.72	0.27	0.06	0.01	0.01	0.81
V671450		21	83.3	10.65	0.82	1.37	0.11	4.49	0.28	<0.01	0.02	0.07	0.01	<0.01	<0.01	0.36
V671551		48	66.3	18.05	10.65	0.85	1.74	1.11	1.07	0.05	0.97	0.20	0.02	<0.01	0.01	0.91
V671552		47	49.0	14.55	14.20	11.40	7.84	1.70	0.16	0.05	0.88	0.21	0.06	0.01	<0.01	0.95
V671553		10	77.9	13.10	0.66	0.55	0.07	3.91	4.15	<0.01	0.02	0.02	0.03	<0.01	<0.01	0.42
V671554		91	49.5	15.15	13.35	10.05	7.39	2.01	0.22	0.04	0.92	0.20	0.06	0.02	0.01	0.77
V671555		56	52.9	16.55	13.15	8.93	4.38	3.17	0.44	0.05	1.04	0.25	0.06	0.01	0.01	0.77
V671556		79	50.2	14.95	16.20	6.14	8.58	1.66	0.06	0.01	1.39	0.18	0.11	0.01	<0.01	-0.02
V671557		21	79.0	12.95	1.20	0.74	0.08	4.83	1.90	<0.01	0.04	0.04	0.04	<0.01	<0.01	0.49
V671558		39	48.5	14.80	12.90	9.91	8.65	1.70	0.10	0.03	0.74	0.22	0.05	0.01	<0.01	0.51
V671559		39	49.0	14.70	12.35	11.45	8.58	1.83	0.18	0.05	0.75	0.19	0.04	<0.01	<0.01	0.77
V671560		15	76.2	14.40	1.14	1.89	0.09	6.19	0.21	<0.01	0.01	0.24	0.02	<0.01	<0.01	0.15
V671561		37	51.5	14.50	11.75	10.45	8.98	1.99	0.09	0.05	0.72	0.18	0.05	0.01	<0.01	0.70
V671562		50	51.0	15.90	12.85	12.05	4.63	0.92	0.22	0.04	0.89	0.19	0.08	0.01	<0.01	0.54
V671563		51	50.7	15.65	13.05	8.70	8.12	2.26	0.09	0.04	0.99	0.17	0.07	0.03	<0.01	0.53
V671564		39	50.6	14.25	12.75	11.65	7.38	1.73	0.25	0.03	0.75	0.20	0.05	0.01	<0.01	1.03
V671565		49	47.4	13.35	14.90	12.70	7.36	1.04	0.27	0.04	0.88	0.28	0.06	<0.01	<0.01	0.85
V671566		55	51.5	16.55	12.80	11.15	4.12	1.50	0.29	0.04	1.01	0.24	0.07	0.01	<0.01	0.27
V671567		46	52.6	16.05	10.75	11.15	5.29	1.50	0.52	0.05	0.85	0.22	0.05	0.01	0.01	0.66
V671568		39	61.8	16.40	6.47	9.74	2.59	1.87	0.18	0.06	0.74	0.16	0.04	0.02	0.01	0.23
V671569		46	59.1	17.05	9.13	6.49	2.13	2.60	1.21	0.05	0.90	0.19	0.05	0.02	0.02	0.80
V671570		45	50.1	14.50	13.35	11.40	7.30	1.22	0.19	0.05	0.87	0.19	0.06	0.01	<0.01	0.64

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	TOT-ICP06	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671431		99.23	<0.5	7	<0.5	49	119	20	<1	142	<2	44	<10	97	
V671432		99.44	<0.5	<5	<0.5	38	114	40	<1	118	<2	43	10	92	
V671433		99.70	<0.5	<5	<0.5	50	78	30	<1	144	<2	37	<10	101	
V671434		98.16	<0.5	5	<0.5	41	4	20	<1	74	<2	41	10	90	
V671435		99.67	<0.5	<5	<0.5	52	24	20	<1	123	<2	39	<10	91	
V671436		98.76	<0.5	<5	<0.5	44	123	30	<1	93	10	40	<10	90	
V671437		98.85	<0.5	<5	<0.5	1	1	20	<1	1	24	1	<10	13	
V671438		98.98	<0.5	5	<0.5	45	171	20	<1	116	<2	38	<10	89	
V671439		98.29	<0.5	<5	<0.5	48	139	30	<1	134	<2	34	<10	89	
V671440		99.53	<0.5	10	0.5	43	85	30	<1	140	2	38	<10	113	
V671441		98.93	<0.5	<5	<0.5	56	109	170	<1	186	<2	27	10	102	
V671442		99.64	<0.5	21	0.5	49	137	40	<1	156	<2	39	<10	84	
V671443		98.21	<0.5	21	<0.5	40	67	30	<1	125	<2	36	<10	87	
V671444		98.21	<0.5	38	<0.5	57	22	170	<1	178	<2	41	<10	93	
V671445		101.47	<0.5	9	<0.5	<1	2	80	<1	3	27	2	<10	10	
V671446		99.15	<0.5	49	<0.5	55	68	150	<1	72	<2	45	<10	171	
V671447		100.79	<0.5	23	0.5	42	144	190	1	108	10	35	10	155	
V671448		98.06	0.6	13	1.1	63	86	20	2	228	5	6	<10	129	
V671449		100.01	<0.5	19	0.7	54	54	110	<1	166	5	44	10	82	
V671450		101.48	<0.5	<5	<0.5	1	6	30	<1	1	14	2	<10	24	
V671551		101.93	<0.5	6	<0.5	58	58	480	<1	135	6	49	<10	35	
V671552		101.01	<0.5	11	0.7	51	55	180	<1	149	6	44	<10	121	
V671553		100.83	<0.5	5	<0.5	<1	1	430	<1	2	32	1	10	28	
V671554		99.69	<0.5	7	0.6	50	107	20	<1	125	7	40	<10	104	
V671555		101.71	<0.5	9	<0.5	41	65	40	<1	101	9	42	10	98	
V671556		99.47	<0.5	9	1.0	51	18	30	<1	85	8	41	<10	145	
V671557		101.31	<0.5	13	<0.5	<1	1	360	<1	<1	26	3	10	76	
V671558		98.12	<0.5	<5	0.6	58	83	100	<1	162	5	44	10	101	
V671559		99.89	<0.5	5	0.7	54	12	130	<1	148	3	44	<10	94	
V671560		100.54	<0.5	<5	<0.5	1	6	40	<1	2	34	4	<10	7	
V671561		100.97	<0.5	<5	0.5	51	105	140	<1	150	6	42	<10	77	
V671562		99.32	<0.5	29	0.7	56	101	300	<1	174	2	45	<10	108	
V671563		100.40	<0.5	7	0.5	53	200	470	1	133	4	40	<10	96	
V671564		100.68	<0.5	<5	0.5	50	286	140	1	136	5	47	10	112	
V671565		99.13	<0.5	<5	1.1	48	143	120	<1	122	8	39	<10	174	
V671566		99.55	<0.5	<5	<0.5	54	136	80	<1	145	2	42	<10	99	
V671567		99.71	<0.5	<5	0.6	65	118	90	<1	185	3	46	10	116	
V671568		100.31	<0.5	6	<0.5	52	70	60	<1	154	<2	42	<10	77	
V671569		99.74	<0.5	6	<0.5	52	84	200	<1	168	7	37	<10	97	
V671570		99.88	<0.5	<5	0.5	55	186	90	1	142	3	44	<10	102	

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671571		0.83	26.3	6.7	150	1.59	3.12	2.09	0.71	15.5	2.47	1.2	0.78	2.4	0.34	1.9
V671572		0.88	20.9	5.8	170	0.74	2.94	1.93	0.61	14.2	2.30	1.2	0.64	2.0	0.31	1.6
V671573		0.79	25.1	4.8	250	2.29	2.25	1.56	0.59	13.6	1.89	1.0	0.50	1.7	0.24	1.2
V671574		0.55	30.8	5.5	170	3.04	2.54	1.86	0.57	14.9	2.23	1.1	0.62	2.0	0.27	1.4
V671575		0.97	25.6	5.8	330	1.00	2.57	1.97	0.62	14.4	2.33	1.1	0.63	2.0	0.29	1.5
V671576		0.35	3.5	5.7	10	9.64	2.26	1.17	<0.03	23.3	0.98	0.2	0.37	2.8	0.21	44.2
V671577		0.89	25.0	6.6	250	1.09	2.93	1.97	0.66	13.5	2.39	1.2	0.65	2.5	0.28	1.9
V671578		1.07	44.0	5.3	360	4.97	2.42	1.80	0.61	14.7	2.04	1.0	0.58	1.9	0.27	1.8
V671579		0.77	20.9	5.9	180	0.71	2.87	1.90	0.68	14.8	2.08	1.1	0.61	2.1	0.29	1.5
V671580		0.92	109.5	8.4	300	1.69	3.52	2.27	0.78	17.4	2.92	1.4	0.79	3.2	0.38	2.1
V671581		0.36	25.3	11.1	10	5.65	3.34	1.92	0.06	28.2	1.85	2.6	0.63	4.3	0.42	15.5
V671582		0.62	14.0	14.2	20	20.8	3.32	1.14	0.09	42.2	3.07	3.2	0.43	4.6	0.22	109.5
V671583		0.94	29.9	7.7	320	6.64	3.31	2.28	0.71	18.2	3.00	1.7	0.79	3.0	0.33	2.3
V671584		0.57	28.5	6.2	250	2.07	2.89	2.01	0.60	17.0	2.40	1.2	0.64	2.3	0.27	1.8
V671585		0.49	65.7	8.3	180	2.23	3.85	2.39	0.81	18.6	3.27	1.7	0.86	3.0	0.34	2.3
V671586		0.79	303	16.8	60	29.2	6.88	4.56	1.56	23.7	5.97	3.8	1.57	5.9	0.64	5.8
V671587		0.56	220	17.3	60	14.60	6.78	4.38	1.31	23.3	5.83	3.6	1.47	6.3	0.61	5.4
V671588		0.55	39.7	11.1	160	4.28	4.57	3.06	0.97	19.8	3.84	2.2	1.00	4.0	0.41	3.3
V671589		1.14	22.8	9.7	30	20.4	1.87	1.12	0.11	31.2	1.17	1.1	0.37	3.9	0.31	27.9
V671590		0.73	25.7	6.6	250	3.20	3.23	2.15	0.69	17.2	2.44	1.5	0.74	2.3	0.32	1.9
V671591		0.77	28.6	7.4	340	1.20	3.38	2.25	0.68	18.1	2.96	1.5	0.79	2.7	0.35	2.2
V671592		0.63	102.5	4.5	270	49.4	2.33	1.50	0.49	14.4	1.82	1.0	0.50	1.7	0.21	1.2
V671593		0.60	28.9	5.9	220	3.34	2.85	1.92	0.56	16.4	2.53	1.2	0.63	1.9	0.29	1.6
V671594		0.64	19.3	5.3	370	0.86	2.55	1.79	0.47	15.2	2.19	1.2	0.60	1.9	0.25	1.3
V671595		0.70	27.1	5.5	480	2.57	2.64	1.64	0.58	16.1	2.30	1.1	0.57	2.0	0.27	1.4
V671596		0.79	52.4	5.5	230	5.41	2.96	1.99	0.58	15.9	2.61	1.2	0.64	2.0	0.27	1.4
V671597		0.68	55.8	5.1	460	11.20	2.55	1.55	0.54	14.5	2.11	1.2	0.60	1.8	0.25	1.3
V671598		0.91	4.5	11.3	20	15.50	3.26	0.91	<0.03	44.4	3.27	1.1	0.40	3.5	0.09	101.0
V671599		0.76	14.8	7.1	180	2.00	3.28	2.04	0.68	18.3	2.73	1.5	0.70	2.6	0.31	2.2
V671600		0.83	23.5	5.7	260	0.90	2.65	1.72	0.57	15.9	2.26	1.1	0.57	2.0	0.23	1.7
V671601		0.60	28.7	5.4	400	2.38	2.91	1.78	0.56	15.1	2.03	1.0	0.59	1.9	0.23	1.4
V671602		0.78	16.9	5.4	280	0.81	2.86	1.78	0.58	15.8	2.47	1.2	0.60	1.8	0.24	1.6
V671603		0.58	26.3	6.3	390	2.68	3.50	2.27	0.68	16.6	2.75	1.4	0.75	2.0	0.32	1.8
V671604		0.57	29.3	6.9	340	1.63	3.64	2.29	0.78	17.6	2.75	1.5	0.75	2.4	0.32	2.0
V671605		0.76	33.4	6.5	250	1.72	3.10	2.00	0.65	16.8	2.55	1.3	0.71	2.3	0.29	1.7
V671606		0.85	206	9.9	160	16.05	4.42	2.70	0.96	20.5	3.64	2.3	0.92	3.3	0.38	3.7
V671607		0.80	134.5	16.4	50	1.49	6.42	4.10	1.44	21.9	5.53	3.3	1.40	5.9	0.61	5.0
V671608		0.68	172.5	14.0	60	1.17	6.28	4.08	1.34	22.0	5.57	3.3	1.41	4.4	0.55	5.1
V671609		0.60	32.8	11.5	130	0.89	4.84	3.20	1.08	19.9	4.11	2.5	1.07	4.2	0.45	3.4
V671610		0.53	34.3	10.9	170	1.97	4.62	2.73	0.89	22.4	3.81	2.1	0.96	3.7	0.44	3.0

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671571		5.7	1.01	25.6	1.91	1	86.0	0.1	0.46	0.22	0.29	0.10	280	1	18.5	2.14
V671572		5.3	0.95	3.5	1.64	1	73.6	0.1	0.44	0.18	0.30	0.06	249	1	16.5	1.79
V671573		4.3	0.77	5.4	1.41	<1	78.2	0.1	0.35	0.13	0.25	<0.05	211	1	13.0	1.55
V671574		5.1	0.92	8.1	1.73	<1	63.4	0.1	0.41	0.17	0.26	0.05	246	1	15.5	1.59
V671575		4.9	0.88	8.5	1.62	<1	76.2	0.1	0.43	0.20	0.27	0.06	255	<1	15.9	1.78
V671576		1.6	0.61	659	0.53	5	4.4	7.4	0.33	1.70	0.22	1.94	<5	1	14.6	1.58
V671577		5.7	1.02	7.3	1.84	<1	75.8	0.1	0.44	0.21	0.30	0.08	237	<1	16.8	2.00
V671578		4.5	0.85	49.1	1.60	3	98.0	0.2	0.37	0.14	0.26	0.11	236	<1	14.7	1.78
V671579		5.2	0.88	3.6	1.74	1	92.1	0.1	0.42	0.15	0.28	0.06	262	1	16.3	1.74
V671580		7.0	1.21	14.4	2.36	1	111.0	0.2	0.51	0.27	0.35	0.08	282	1	20.8	2.29
V671581		5.1	1.30	49.3	1.91	2	13.4	7.2	0.49	11.30	0.36	2.22	<5	1	21.6	2.79
V671582		7.0	1.97	77.3	3.80	7	28.5	85.5	0.67	11.50	0.20	4.36	5	2	18.2	1.63
V671583		6.1	1.18	29.8	2.03	1	91.6	0.4	0.53	0.28	0.34	0.07	291	1	19.8	2.15
V671584		4.7	0.94	21.4	1.82	1	86.8	0.3	0.45	0.25	0.28	0.06	296	1	16.7	1.95
V671585		6.9	1.28	18.7	2.28	2	76.0	0.3	0.58	0.26	0.35	0.07	323	2	20.7	2.29
V671586		13.6	2.64	70.9	4.37	1	134.0	0.4	1.10	0.73	0.64	0.23	507	1	39.4	4.33
V671587		13.0	2.66	57.7	4.45	2	132.5	0.5	1.03	0.71	0.61	0.20	504	2	38.0	4.16
V671588		9.0	1.69	8.2	2.81	1	117.0	0.3	0.74	0.48	0.35	0.13	337	1	25.6	2.77
V671589		3.8	1.05	248	1.19	5	27.0	5.5	0.25	4.92	0.22	4.33	46	1	12.1	1.89
V671590		5.3	1.01	11.6	2.04	1	84.3	0.4	0.50	0.25	0.31	0.08	308	1	18.9	2.16
V671591		6.1	1.16	5.3	1.98	1	102.5	0.2	0.52	0.27	0.30	0.08	303	1	19.1	2.05
V671592		3.6	0.68	92.2	1.23	1	83.8	0.1	0.35	0.12	0.19	<0.05	240	1	12.8	1.36
V671593		4.9	0.94	7.6	1.69	<1	83.9	0.2	0.44	0.18	0.27	0.08	293	1	16.7	1.90
V671594		4.6	0.83	4.0	1.56	1	68.1	0.1	0.41	0.17	0.25	<0.05	292	1	15.3	1.70
V671595		4.6	0.81	4.0	1.62	1	121.0	0.2	0.39	0.15	0.26	0.06	297	1	15.1	1.67
V671596		4.7	0.88	2.6	1.72	1	140.0	0.1	0.41	0.15	0.27	0.05	296	1	17.0	1.93
V671597		4.3	0.82	31.7	1.43	1	79.2	0.1	0.37	0.14	0.27	<0.05	278	<1	14.9	1.74
V671598		5.6	1.51	963	3.44	21	3.7	77.4	0.69	8.69	0.11	5.11	<5	2	17.5	0.83
V671599		5.5	1.09	8.8	1.79	1	130.0	0.4	0.48	0.19	0.30	0.07	311	1	18.2	2.09
V671600		4.7	0.90	7.3	1.67	5	81.0	0.2	0.43	0.17	0.23	0.06	276	<1	15.1	1.66
V671601		4.3	0.80	3.5	1.69	<1	80.2	0.1	0.42	0.15	0.25	<0.05	283	1	15.4	1.70
V671602		4.6	0.89	4.9	1.86	<1	83.8	0.1	0.38	0.14	0.27	<0.05	283	1	15.3	1.72
V671603		5.2	1.00	10.6	2.03	1	108.5	0.2	0.49	0.19	0.31	0.06	291	1	19.9	2.17
V671604		5.9	1.10	4.5	2.10	1	76.9	0.2	0.53	0.24	0.31	0.17	300	1	20.0	2.16
V671605		5.1	1.00	8.5	1.82	1	97.6	0.2	0.47	0.23	0.30	0.06	296	1	17.5	1.95
V671606		7.8	1.56	84.2	2.92	2	102.0	0.3	0.67	0.41	0.39	0.13	384	1	22.8	2.62
V671607		12.7	2.51	17.6	4.02	3	91.7	0.4	0.99	0.63	0.60	0.21	439	1	35.4	4.02
V671608		12.3	2.35	16.0	4.30	1	122.0	0.3	0.97	0.71	0.59	0.23	485	2	35.3	3.85
V671609		9.1	1.78	5.7	3.04	1	120.5	0.3	0.75	0.54	0.50	0.13	377	1	27.5	3.12
V671610		8.2	1.68	8.9	2.79	1	116.5	0.2	0.69	0.43	0.42	0.11	365	1	25.1	2.87

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671571		43	49.8	14.30	13.25	10.40	7.87	1.84	0.23	0.02	0.83	0.21	0.06	0.01	<0.01	0.95
V671572		39	50.6	14.00	13.10	9.72	8.65	1.75	0.13	0.03	0.77	0.20	0.04	0.01	<0.01	0.63
V671573		31	50.7	14.75	11.05	11.40	8.18	1.80	0.14	0.04	0.63	0.19	0.04	0.01	<0.01	1.01
V671574		38	49.8	14.05	12.95	10.25	8.81	1.46	0.12	0.03	0.72	0.20	0.04	0.01	<0.01	0.97
V671575		37	50.1	13.95	11.90	11.05	7.69	1.34	0.11	0.05	0.71	0.18	0.05	0.01	<0.01	0.92
V671576		3	77.2	12.60	1.08	0.38	0.07	4.58	3.67	<0.01	0.01	0.14	0.03	<0.01	<0.01	0.02
V671577		41	48.6	14.00	13.00	12.45	8.08	1.24	0.12	0.04	0.77	0.22	0.06	0.01	<0.01	0.80
V671578		34	48.5	14.15	12.60	12.45	8.54	1.07	0.39	0.05	0.64	0.22	0.04	0.01	<0.01	0.88
V671579		38	48.8	13.75	12.35	13.05	6.74	1.68	0.10	0.03	0.71	0.22	0.05	0.01	<0.01	0.51
V671580		54	46.9	14.90	12.15	15.80	4.66	1.68	0.26	0.04	0.92	0.36	0.08	0.01	0.01	0.29
V671581		42	75.2	14.60	1.29	1.32	0.07	6.58	0.38	<0.01	<0.01	0.21	0.02	<0.01	<0.01	0.36
V671582		35	75.0	15.30	0.99	1.31	0.09	7.34	0.25	<0.01	0.01	0.25	0.03	<0.01	<0.01	0.18
V671583		54	48.4	14.85	13.15	10.50	7.13	2.26	0.26	0.04	0.92	0.19	0.06	0.01	<0.01	1.14
V671584		40	48.0	14.75	13.05	10.95	7.38	1.88	0.32	0.03	0.80	0.21	0.05	0.01	<0.01	1.03
V671585		56	49.4	15.00	13.85	11.75	5.53	2.01	0.54	0.02	1.01	0.21	0.07	0.01	0.01	0.65
V671586		123	47.2	14.10	18.50	8.55	5.23	2.69	0.83	0.01	2.01	0.30	0.16	0.02	0.03	0.66
V671587		118	53.2	13.80	12.60	6.62	3.19	3.65	0.65	0.01	1.90	0.31	0.16	0.02	0.03	2.81
V671588		78	50.8	14.40	14.25	9.78	6.90	2.78	0.23	0.02	1.27	0.15	0.08	0.01	<0.01	0.70
V671589		25	69.2	16.45	2.97	2.60	0.83	5.76	1.15	<0.01	0.21	0.07	0.12	<0.01	<0.01	0.43
V671590		48	49.4	14.75	14.00	11.75	7.14	1.58	0.29	0.03	0.88	0.20	0.05	0.01	<0.01	0.98
V671591		51	48.9	15.80	13.30	12.55	6.45	2.18	0.20	0.04	0.95	0.21	0.07	0.01	<0.01	0.57
V671592		31	48.7	15.05	14.80	8.45	10.40	0.90	0.61	0.03	0.63	0.21	0.03	0.01	0.01	1.88
V671593		40	48.5	14.75	12.95	10.60	8.28	1.52	0.15	0.03	0.73	0.19	0.05	0.01	<0.01	1.16
V671594		37	51.3	14.20	13.00	11.20	7.87	1.60	0.13	0.05	0.75	0.19	0.05	0.01	<0.01	0.89
V671595		36	50.3	14.55	11.45	13.25	6.92	1.57	0.10	0.06	0.66	0.20	0.04	0.01	<0.01	0.83
V671596		38	50.2	14.60	13.30	12.00	7.31	1.90	0.16	0.03	0.77	0.20	0.05	0.02	0.01	0.79
V671597		34	48.2	14.60	12.85	12.95	8.41	1.44	0.26	0.05	0.68	0.22	0.04	0.01	0.01	1.06
V671598		11	72.3	16.40	1.05	0.35	0.05	6.80	3.10	<0.01	0.01	0.09	0.06	<0.01	<0.01	0.23
V671599		47	49.8	14.55	14.60	12.00	6.78	1.19	0.16	0.02	0.86	0.21	0.05	0.01	<0.01	0.91
V671600		37	48.2	14.30	13.15	11.25	7.55	1.62	0.13	0.03	0.73	0.20	0.06	0.01	<0.01	0.95
V671601		36	50.6	14.35	12.35	11.20	8.12	1.52	0.20	0.05	0.71	0.19	0.05	0.01	<0.01	0.79
V671602		38	49.1	14.05	13.55	11.15	7.79	1.74	0.14	0.03	0.76	0.20	0.04	0.01	<0.01	0.75
V671603		44	48.1	14.05	14.55	10.70	7.48	2.19	0.13	0.05	0.83	0.21	0.06	0.01	<0.01	0.90
V671604		50	47.8	15.95	12.30	12.40	6.57	1.54	0.20	0.04	0.93	0.20	0.07	0.01	<0.01	0.81
V671605		45	49.4	14.35	13.50	10.60	7.02	1.95	0.23	0.03	0.82	0.18	0.06	0.01	<0.01	1.06
V671606		80	52.2	15.85	12.25	8.14	3.70	3.18	0.57	0.02	1.44	0.27	0.11	0.01	0.02	0.68
V671607		110	44.6	12.05	23.1	9.54	4.16	1.79	0.40	0.01	1.68	0.70	0.14	0.01	0.01	0.19
V671608		112	49.8	13.00	18.55	8.63	3.36	2.43	0.37	0.01	1.75	0.58	0.13	0.01	0.02	0.33
V671609		81	50.1	14.10	14.70	9.76	5.86	2.18	0.27	0.02	1.34	0.18	0.12	0.02	<0.01	0.64
V671610		72	48.3	14.85	14.25	10.50	5.67	1.94	0.27	0.02	1.26	0.18	0.08	0.02	<0.01	0.76

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	TOT-ICP06	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671571		99.77	<0.5	<5	0.6	50	311	100	<1	112	6	45	10	96	
V671572		99.63	<0.5	<5	0.6	52	67	70	1	140	4	45	10	89	
V671573		99.94	<0.5	6	0.6	50	58	30	<1	144	4	38	<10	79	
V671574		99.41	<0.5	5	0.6	50	62	60	<1	161	6	38	<10	98	
V671575		98.06	<0.5	<5	0.7	48	123	60	<1	128	3	42	<10	85	
V671576		99.78	<0.5	<5	<0.5	1	4	20	<1	2	15	3	10	9	
V671577		99.39	<0.5	<5	0.8	52	54	30	<1	148	<2	42	<10	104	
V671578		99.54	<0.5	<5	0.7	49	124	40	<1	141	4	42	<10	96	
V671579		98.00	<0.5	7	0.6	52	104	30	<1	143	5	45	<10	100	
V671580		98.06	<0.5	<5	0.5	56	107	30	<1	150	4	44	10	130	
V671581		100.03	<0.5	<5	<0.5	1	3	40	<1	1	15	5	<10	11	
V671582		100.75	<0.5	<5	<0.5	1	2	30	<1	<1	11	1	<10	11	
V671583		98.91	<0.5	<5	0.5	57	129	30	<1	143	<2	28	10	111	
V671584		98.46	<0.5	<5	0.5	53	78	20	<1	140	<2	38	10	98	
V671585		100.06	<0.5	<5	0.5	54	112	20	<1	115	<2	43	<10	92	
V671586		100.29	<0.5	<5	0.6	46	52	110	<1	37	<2	48	<10	107	
V671587		98.95	<0.5	<5	<0.5	50	27	80	<1	51	<2	47	<10	83	
V671588		101.37	<0.5	<5	<0.5	46	19	30	<1	96	3	39	<10	113	
V671589		99.79	<0.5	<5	<0.5	7	6	100	<1	16	12	8	<10	67	
V671590		101.06	0.5	<5	0.9	50	148	30	<1	115	2	44	<10	99	
V671591		101.23	<0.5	<5	<0.5	52	41	30	<1	133	<2	43	10	87	
V671592		101.71	<0.5	<5	0.7	58	138	70	<1	196	<2	29	<10	110	
V671593		98.92	<0.5	7	0.7	56	107	20	<1	149	2	29	<10	96	
V671594		101.24	<0.5	<5	<0.5	49	175	40	<1	107	<2	38	<10	81	
V671595		99.94	<0.5	34	0.6	51	117	10	<1	148	<2	47	<10	82	
V671596		101.34	<0.5	7	0.5	56	123	20	<1	139	<2	48	<10	95	
V671597		100.78	<0.5	<5	0.6	52	127	110	<1	146	5	42	<10	99	
V671598		100.44	<0.5	<5	<0.5	<1	12	30	<1	<1	23	4	<10	29	
V671599		101.14	<0.5	<5	<0.5	62	260	80	<1	177	<2	40	<10	92	
V671600		98.18	<0.5	63	<0.5	61	80	80	<1	189	2	36	<10	95	
V671601		100.14	<0.5	6	0.7	51	202	10	<1	138	<2	36	<10	108	
V671602		99.31	<0.5	<5	0.5	60	136	40	<1	185	<2	31	<10	98	
V671603		99.26	<0.5	<5	0.5	57	<1	80	<1	174	<2	37	<10	111	
V671604		98.82	<0.5	<5	<0.5	50	20	20	<1	147	<2	40	<10	90	
V671605		99.21	<0.5	<5	0.6	47	63	20	<1	117	2	43	<10	83	
V671606		98.44	<0.5	<5	0.6	36	19	40	<1	66	2	46	<10	100	
V671607		98.38	<0.5	<5	0.8	50	3	40	<1	39	<2	42	<10	198	
V671608		98.97	<0.5	<5	0.6	42	9	30	<1	45	<2	45	<10	134	
V671609		99.29	<0.5	<5	0.5	49	81	30	<1	82	<2	43	<10	111	
V671610		98.10	<0.5	<5	<0.5	52	184	20	<1	110	<2	43	10	126	

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671611		0.70	173.0	17.9	60	19.75	6.36	3.80	1.37	22.2	5.74	3.4	1.42	6.9	0.56	5.1
V671612		0.61	59.8	12.2	160	0.73	5.07	3.14	1.11	19.7	4.43	2.5	1.09	4.4	0.46	3.4
V671613		0.78	43.1	14.1	150	2.04	5.09	3.35	1.14	22.8	4.49	3.0	1.14	5.4	0.46	4.5
V671614		1.01	72.2	8.6	140	1.35	3.74	2.44	0.82	18.2	3.17	1.7	0.80	3.2	0.32	2.3
V671615		0.61	53.5	6.5	270	1.72	3.25	2.11	0.70	17.5	2.73	1.5	0.73	2.3	0.31	1.9
V671616		0.63	23.8	5.6	320	0.30	3.16	2.07	0.62	16.5	2.34	1.3	0.69	1.8	0.28	1.6
V671617		0.81	31.1	6.2	290	0.59	3.23	2.19	0.67	14.9	2.47	1.2	0.71	2.4	0.32	1.8
V671618		0.71	14.1	4.5	320	1.04	2.32	1.57	0.46	14.1	1.89	0.9	0.51	1.7	0.22	1.1
V671619		0.95	27.8	5.9	350	18.45	3.02	1.95	0.55	14.2	2.60	1.2	0.64	2.1	0.28	1.8
V671620		0.73	29.7	5.8	220	0.99	2.80	1.88	0.67	14.6	2.56	1.1	0.60	2.2	0.28	1.5
V671621		0.51	50.4	7.0	280	0.41	3.59	2.22	0.65	15.6	2.99	1.5	0.72	2.5	0.30	2.1
V671622		0.71	20.5	6.4	320	0.54	3.22	2.07	0.66	15.5	2.69	1.5	0.69	2.3	0.32	1.9
V671623		0.83	183.0	5.8	240	23.5	3.30	2.17	0.61	17.7	2.94	1.3	0.74	2.2	0.29	1.9
V671624		0.46	4.6	0.7	10	2.34	0.54	0.15	<0.03	29.4	0.24	0.8	0.07	<0.5	0.03	42.2
V671625		0.75	47.1	7.0	230	5.84	3.51	2.05	0.67	15.9	2.89	1.4	0.73	2.8	0.34	2.3
V671626		0.77	49.7	10.6	160	2.06	4.98	3.18	0.97	18.1	3.92	2.0	1.05	4.0	0.44	3.0
V671627		0.31	10.1	1.0	10	6.58	0.18	0.14	0.09	58.5	0.18	1.0	0.04	0.5	0.03	8.5
V671628		0.80	58.8	8.9	170	1.00	3.84	2.44	0.75	15.9	3.15	1.6	0.76	3.2	0.35	6.1
V671629		0.74	171.5	7.8	170	8.95	3.72	2.29	0.85	17.0	3.09	1.7	0.72	2.9	0.35	2.8
V671630		0.67	43.8	16.0	60	0.23	6.51	4.23	1.25	19.8	5.70	2.9	1.39	6.0	0.60	5.1
V671631		0.83	415	31.3	60	16.95	5.37	3.23	1.39	20.2	5.15	3.0	1.09	14.3	0.44	5.3
V671632		1.06	75.8	6.6	200	9.64	3.69	2.52	0.74	17.6	2.75	1.5	0.80	2.4	0.33	2.4
V671633		0.59	281	5.8	470	22.9	3.42	2.52	0.63	15.8	2.99	1.2	0.80	2.0	0.32	1.8
V671634		1.12	44.1	6.0	460	2.74	2.86	1.97	0.67	15.3	2.40	1.2	0.65	2.2	0.26	1.7
V671635		0.79	59.7	6.4	340	0.69	3.49	2.17	0.73	17.7	2.75	1.4	0.66	2.1	0.29	2.0
V671636		0.52	70.9	10.3	40	132.0	3.18	1.27	0.08	36.9	2.56	1.2	0.47	4.1	0.16	63.5
V671637		0.84	203	6.6	360	12.85	5.15	3.48	0.75	18.7	4.07	1.6	1.15	2.2	0.50	2.6
V671638		0.45	24.6	14.0	10	31.2	2.84	0.96	0.05	26.6	2.34	0.4	0.38	6.1	0.08	52.7
V671639		0.52	26.5	5.7	230	1.55	3.12	2.08	0.61	15.3	2.74	1.2	0.69	2.0	0.29	1.8
V671640		0.58	2.8	5.8	10	5.10	2.54	1.10	<0.03	33.1	1.92	0.7	0.38	2.4	0.20	13.7
V671641		0.60	31.5	5.9	250	3.72	3.40	2.25	0.64	16.3	2.69	1.2	0.70	2.2	0.30	1.9
V671642		0.75	21.0	5.9	230	3.33	3.02	2.08	0.62	15.5	2.52	1.1	0.69	2.1	0.29	1.7
V671643		0.82	65.3	6.5	390	687	3.63	2.21	0.69	27.1	2.77	1.5	0.70	2.2	0.31	8.2
V671644		0.47	33.8	1.2	10	5.97	0.16	0.06	0.06	70.6	0.14	1.9	0.02	0.8	0.02	45.8
V671645		0.74	17.8	5.8	420	4.34	2.95	2.02	0.65	16.9	2.62	1.3	0.67	2.2	0.31	2.2
V671646		0.38	12.1	4.6	380	10.90	2.75	1.71	0.44	13.4	2.16	0.9	0.57	1.7	0.25	1.5
V671647		0.56	8.0	2.5	20	87.8	0.68	0.37	0.26	53.2	0.60	4.8	0.13	1.0	0.05	46.7
V671648		0.69	24.4	6.3	330	3.78	3.35	2.19	0.67	16.4	2.83	1.3	0.76	2.1	0.29	2.0
V671649		0.52	14.8	1.5	10	12.40	0.37	0.11	0.11	51.2	0.42	2.9	0.05	0.6	0.03	26.7
V671650		0.72	19.0	5.4	200	53.0	2.73	1.70	0.55	15.4	2.43	1.1	0.60	2.0	0.25	1.8

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671611		12.9	2.61	50.4	4.30	1	103.5	0.4	0.99	0.67	0.57	0.23	486	1	34.1	3.77
V671612		9.5	1.83	2.8	3.28	1	135.0	0.3	0.73	0.47	0.45	0.15	370	1	28.2	2.97
V671613		10.2	2.08	5.9	3.28	1	119.0	0.3	0.81	0.70	0.49	0.19	411	2	29.5	3.39
V671614		6.8	1.32	6.3	2.46	1	123.0	0.2	0.58	0.34	0.35	0.06	302	1	21.6	2.32
V671615		5.5	1.07	5.2	1.87	1	93.9	0.2	0.48	0.21	0.31	0.05	288	1	18.3	2.13
V671616		5.0	0.91	4.2	1.89	1	86.6	0.1	0.45	0.20	0.26	0.05	287	1	17.0	1.92
V671617		5.6	0.98	11.9	2.01	1	72.5	0.2	0.42	0.28	0.26	0.13	251	1	16.5	1.97
V671618		3.8	0.72	12.3	1.51	1	90.8	0.1	0.31	0.14	0.22	0.05	214	55	12.7	1.43
V671619		5.0	0.93	193.5	1.88	24	74.8	2.3	0.45	0.22	0.28	1.79	266	1	15.9	1.92
V671620		5.2	0.93	5.2	1.83	1	67.2	0.1	0.44	0.15	0.25	0.06	260	1	15.3	1.65
V671621		6.5	1.15	2.2	2.31	<1	106.5	0.1	0.53	0.25	0.30	0.06	278	2	18.6	2.18
V671622		5.6	1.02	4.5	1.93	1	84.4	0.1	0.48	0.21	0.29	0.08	280	1	17.6	1.97
V671623		5.6	1.01	115.0	1.98	2	54.8	0.1	0.45	0.15	0.29	0.07	324	1	18.3	2.13
V671624		0.3	0.08	925	0.17	164	3.5	15.2	0.09	0.51	0.03	1.22	<5	1	3.0	0.21
V671625		5.7	1.03	47.2	1.91	1	98.6	0.1	0.50	0.25	0.32	0.06	300	1	18.4	2.12
V671626		8.7	1.64	12.3	3.12	1	123.5	0.2	0.71	0.31	0.43	0.12	348	1	25.5	2.81
V671627		0.5	0.11	130.0	0.16	20	19.7	11.4	0.03	0.76	0.01	1.31	<5	1	1.2	0.15
V671628		7.4	1.30	11.1	2.25	1	71.0	0.2	0.54	0.35	0.33	0.11	301	<1	19.4	2.17
V671629		6.5	1.17	24.8	2.25	<1	107.5	0.1	0.51	0.30	0.31	0.11	307	1	19.2	2.26
V671630		12.7	2.43	3.9	4.34	1	174.0	0.3	1.00	0.62	0.54	0.19	447	1	34.7	3.85
V671631		18.6	4.06	88.8	4.86	1	289	0.3	0.84	2.77	0.44	0.74	367	1	26.9	2.99
V671632		5.5	1.03	166.0	2.07	3	119.5	0.2	0.54	0.25	0.35	0.16	330	1	19.6	2.29
V671633		5.3	0.95	27.8	1.90	1	65.3	0.1	0.54	0.21	0.29	0.08	329	1	20.5	2.17
V671634		4.9	0.92	6.8	1.70	<1	85.2	0.1	0.45	0.23	0.24	0.07	304	<1	15.8	1.93
V671635		5.6	0.96	7.5	1.96	5	106.0	0.1	0.52	0.23	0.29	0.06	328	1	17.4	2.06
V671636		4.9	1.32	1070	2.22	30	22.2	56.7	0.60	8.06	0.16	4.80	27	2	17.1	1.05
V671637		6.5	1.12	35.9	2.39	1	68.4	0.3	0.70	0.32	0.45	0.07	392	1	29.1	3.21
V671638		5.5	1.59	471	2.18	7	9.9	8.9	0.48	9.84	0.17	3.50	<5	1	13.1	0.82
V671639		5.1	0.93	22.3	1.58	3	122.0	0.1	0.43	0.23	0.30	0.07	322	1	17.1	1.98
V671640		2.4	0.66	68.8	1.36	2	8.9	4.5	0.47	6.15	0.19	2.49	<5	1	16.8	1.48
V671641		4.9	0.93	3.8	1.85	1	87.6	0.1	0.46	0.20	0.29	0.12	346	1	17.3	1.97
V671642		5.0	0.89	12.2	1.66	1	98.4	0.1	0.38	0.20	0.30	0.05	310	<1	16.6	1.85
V671643		6.0	1.01	3010	2.12	146	92.8	2.8	0.51	0.29	0.30	0.18	328	1	18.3	2.01
V671644		0.4	0.10	17.8	0.16	306	81.3	263	0.03	2.36	0.02	2.85	<5	3	1.0	0.08
V671645		5.2	0.89	16.4	1.84	4	70.0	0.4	0.43	0.24	0.24	0.07	267	2	16.3	1.79
V671646		4.2	0.79	29.3	1.53	3	68.4	0.7	0.38	0.19	0.25	0.07	271	1	14.1	1.58
V671647		1.5	0.34	163.0	0.56	4	81.3	390	0.13	2.26	0.05	3.98	8	2	3.9	0.33
V671648		5.6	0.94	7.5	1.78	1	115.0	0.7	0.50	0.18	0.32	0.06	329	1	18.2	2.04
V671649		0.8	0.23	40.7	0.42	22	31.9	89.6	0.07	2.26	0.02	2.57	5	1	2.2	0.22
V671650		4.6	0.85	160.0	1.77	6	69.6	1.1	0.42	0.18	0.23	0.05	287	10	14.7	1.82

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671611		113	48.6	13.30	16.45	7.24	6.03	2.23	0.94	0.01	1.84	0.18	0.13	0.01	0.02	1.49
V671612		80	48.0	14.50	14.75	9.91	5.87	2.75	0.25	0.02	1.33	0.20	0.10	0.02	0.01	0.48
V671613		101	47.0	14.85	15.95	13.95	2.89	1.60	0.18	0.02	1.58	0.28	0.12	0.01	<0.01	1.35
V671614		56	46.9	13.70	15.35	11.35	6.46	2.15	0.21	0.02	0.99	0.25	0.07	0.02	0.01	0.66
V671615		49	51.1	15.40	12.15	11.60	5.01	1.79	0.31	0.03	0.91	0.22	0.05	0.01	0.01	0.61
V671616		43	48.4	14.95	13.35	10.50	8.07	1.87	0.12	0.04	0.78	0.20	0.05	0.01	<0.01	0.98
V671617		43	49.2	14.25	12.30	12.05	7.59	1.27	0.32	0.04	0.73	0.20	0.05	0.01	<0.01	0.83
V671618		30	52.7	13.65	10.40	14.25	6.66	0.69	0.11	0.05	0.54	0.20	0.03	0.01	<0.01	0.55
V671619		39	49.8	14.45	12.55	11.35	8.04	1.46	0.59	0.05	0.72	0.19	0.06	0.01	<0.01	1.06
V671620		37	51.0	13.35	13.35	10.80	7.66	1.41	0.16	0.03	0.68	0.21	0.04	0.01	<0.01	0.78
V671621		53	49.7	14.90	12.95	10.70	7.39	2.47	0.12	0.04	0.91	0.17	0.06	0.01	0.01	0.57
V671622		47	49.7	14.50	12.35	10.80	8.28	1.73	0.17	0.04	0.75	0.17	0.05	0.01	<0.01	0.86
V671623		52	46.4	13.55	17.00	11.05	6.99	1.01	0.57	0.03	0.77	0.29	0.05	0.01	0.02	2.02
V671624		9	75.9	14.05	0.57	0.21	0.03	5.86	2.78	<0.01	0.01	0.08	0.05	<0.01	<0.01	0.31
V671625		48	49.6	14.30	13.60	10.10	7.35	2.10	0.36	0.03	0.80	0.20	0.06	0.01	0.01	1.64
V671626		71	48.1	15.30	13.40	11.30	5.83	2.09	0.28	0.02	1.14	0.22	0.09	0.02	0.01	0.89
V671627		12	72.8	16.45	0.52	0.85	0.05	8.19	0.35	<0.01	0.01	0.06	0.13	<0.01	<0.01	0.32
V671628		53	47.5	14.50	15.45	10.80	6.17	1.69	0.31	0.02	0.90	0.45	0.08	0.01	0.01	0.68
V671629		53	43.7	14.85	18.80	10.60	6.02	1.37	0.37	0.02	0.92	0.73	0.08	0.01	0.02	0.55
V671630		111	48.2	12.10	19.70	8.94	4.16	2.43	0.15	0.01	1.58	0.56	0.14	0.02	<0.01	0.28
V671631		117	55.7	13.95	13.55	5.31	2.93	2.58	1.55	0.01	1.27	0.30	0.18	0.03	0.04	1.62
V671632		53	47.7	14.70	13.60	8.78	8.43	2.13	1.44	0.02	0.89	0.17	0.07	0.01	0.01	1.18
V671633		43	47.3	16.15	18.45	8.02	6.19	1.15	0.34	0.06	0.72	0.49	0.03	0.01	0.03	0.22
V671634		40	54.3	15.70	10.40	11.25	5.00	1.57	0.18	0.05	0.68	0.28	0.05	0.01	<0.01	0.60
V671635		51	56.2	16.50	9.01	10.30	3.01	1.51	0.14	0.04	0.87	0.19	0.06	0.02	0.01	0.45
V671636		16	73.5	14.60	1.37	1.46	0.28	5.13	2.71	<0.01	0.08	0.06	0.08	<0.01	0.01	0.28
V671637		60	49.4	15.55	15.85	9.34	5.02	1.35	0.89	0.04	0.92	0.32	0.06	0.01	0.02	0.84
V671638		9	77.2	14.10	1.16	0.72	0.07	5.38	2.79	<0.01	0.02	0.03	0.04	<0.01	<0.01	0.22
V671639		41	49.6	14.00	12.95	12.30	7.56	1.57	0.20	0.03	0.72	0.21	0.04	0.01	<0.01	0.79
V671640		12	72.8	16.30	0.76	1.13	0.03	7.97	0.53	<0.01	<0.01	0.07	0.04	<0.01	<0.01	0.14
V671641		44	48.8	14.70	13.45	12.50	7.79	1.33	0.17	0.03	0.77	0.24	0.05	0.01	<0.01	1.14
V671642		40	49.3	13.85	12.60	11.95	7.25	1.69	0.12	0.03	0.71	0.19	0.05	0.01	<0.01	0.73
V671643		50	48.6	15.30	13.50	9.87	7.22	1.56	1.34	0.05	0.85	0.22	0.06	0.02	0.01	0.81
V671644		17	73.3	15.65	1.07	1.90	0.12	7.12	0.12	<0.01	0.01	0.11	0.20	0.01	<0.01	0.13
V671645		49	51.2	14.70	13.05	10.95	7.05	1.39	0.13	0.05	0.76	0.16	0.09	0.01	<0.01	1.01
V671646		34	50.1	14.85	13.00	12.75	7.88	1.24	0.14	0.05	0.71	0.19	0.05	0.01	<0.01	0.91
V671647		28	69.3	18.15	0.72	5.50	0.24	5.21	0.21	<0.01	0.02	0.01	0.48	0.01	<0.01	0.35
V671648		47	48.2	14.40	13.50	12.05	7.31	1.21	0.09	0.04	0.79	0.21	0.06	0.01	<0.01	0.68
V671649		26	74.0	15.70	0.87	1.67	0.05	7.26	0.19	<0.01	0.01	0.09	0.08	<0.01	<0.01	0.31
V671650		37	49.1	14.50	12.95	10.70	9.46	1.57	0.21	0.02	0.63	0.19	0.05	0.01	<0.01	1.06

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	TOT-ICP06	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671611		98.47	<0.5	<5	0.8	54	41	60	<1	49	2	47	<10	146	
V671612		98.19	<0.5	<5	0.5	52	54	20	<1	99	3	36	<10	114	
V671613		99.78	0.5	<5	0.7	33	222	10	<1	44	3	48	<10	102	
V671614		98.14	<0.5	<5	0.8	58	95	10	<1	101	2	42	10	127	
V671615		99.20	<0.5	<5	0.5	54	10	30	<1	142	<2	44	<10	96	
V671616		99.32	<0.5	<5	0.6	55	102	40	<1	161	<2	44	<10	98	
V671617		98.84	<0.5	<5	0.7	53	122	40	<1	156	<2	42	<10	96	
V671618		99.84	<0.5	<5	0.6	46	54	100	<1	129	<2	39	<10	77	
V671619		100.33	<0.5	<5	0.9	46	162	100	<1	130	3	32	<10	85	
V671620		99.48	<0.5	11	0.9	54	245	50	1	150	5	32	<10	128	
V671621		100.00	<0.5	5	0.7	53	46	40	1	138	5	31	<10	101	
V671622		99.41	<0.5	<5	0.6	51	126	50	1	145	4	31	10	90	
V671623		99.76	<0.5	5	0.8	55	333	140	<1	108	2	44	10	122	
V671624		99.85	<0.5	<5	<0.5	<1	1	20	<1	<1	6	<1	10	24	
V671625		100.16	<0.5	<5	0.8	54	94	90	<1	137	<2	32	10	82	
V671626		98.69	<0.5	<5	0.6	51	54	70	<1	103	9	37	<10	112	
V671627		99.73	<0.5	<5	<0.5	<1	1	180	<1	1	6	<1	10	8	
V671628		98.57	<0.5	<5	0.9	48	254	60	<1	100	4	43	<10	118	
V671629		98.04	<0.5	<5	0.6	62	18	40	<1	118	4	47	10	134	
V671630		98.27	<0.5	5	0.8	40	54	20	<1	41	6	40	<10	150	
V671631		99.02	<0.5	<5	0.7	30	31	50	1	27	9	34	10	116	
V671632		99.13	<0.5	<5	0.9	55	16	90	1	122	8	24	10	136	
V671633		99.16	<0.5	<5	0.7	54	149	90	<1	182	7	37	<10	114	
V671634		100.07	<0.5	13	<0.5	56	93	60	<1	180	6	46	10	93	
V671635		98.31	<0.5	16	0.5	60	98	80	1	183	2	47	<10	122	
V671636		99.56	<0.5	18	<0.5	4	14	80	1	19	12	5	10	37	
V671637		99.61	<0.5	<5	0.5	63	190	130	<1	164	6	43	<10	153	
V671638		101.73	<0.5	<5	<0.5	<1	8	70	<1	6	40	2	10	49	
V671639		99.98	<0.5	<5	0.5	54	52	100	1	148	4	39	<10	102	
V671640		99.77	<0.5	<5	<0.5	<1	2	30	<1	3	16	1	<10	10	
V671641		100.98	<0.5	<5	0.8	52	114	90	<1	136	2	48	<10	101	
V671642		98.48	<0.5	<5	0.5	54	58	80	<1	139	4	44	10	91	
V671643		99.41	<0.5	5	0.9	54	40	370	1	147	2	43	20	255	
V671644		99.74	<0.5	16	<0.5	<1	16	40	<1	5	8	1	<10	42	
V671645		100.55	<0.5	<5	0.7	52	153	100	<1	148	7	39	<10	97	
V671646		101.88	<0.5	<5	0.5	51	89	120	1	157	4	41	<10	93	
V671647		100.20	<0.5	<5	<0.5	1	14	90	<1	8	8	1	10	8	
V671648		98.55	<0.5	5	0.6	57	140	110	<1	154	5	39	<10	101	
V671649		100.23	<0.5	6	<0.5	<1	4	40	<1	<1	8	<1	<10	4	
V671650		100.45	<0.5	5	<0.5	59	143	170	1	225	2	36	10	88	

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671651		1.08	39.6	4.7	190	27.2	2.26	1.62	0.50	12.5	1.81	1.0	0.52	1.7	0.23	1.4
V671652		0.66	39.7	10.0	30	45.2	6.79	4.50	1.34	27.3	5.63	3.6	1.42	3.1	0.62	9.1
V671653		0.73	99.2	8.4	160	1.82	3.67	2.47	0.70	16.9	2.88	1.4	0.83	3.0	0.35	1.8
V671654		0.52	64.2	7.8	170	2.06	3.60	2.29	0.75	18.0	2.76	1.5	0.78	2.8	0.34	2.0
V671655		0.43	196.5	5.6	410	10.25	2.47	1.68	0.58	15.8	1.95	1.1	0.55	1.9	0.24	1.4
V671656		0.49	303	69.2	10	4.59	2.03	0.65	0.34	21.7	3.73	4.4	0.30	29.7	0.02	11.6
V671657		0.60	349	85.3	10	3.43	2.90	1.44	0.36	18.7	3.80	4.7	0.51	38.1	0.12	10.3
V671658		0.56	454	59.2	20	5.79	2.03	1.20	0.32	23.2	3.00	6.5	0.41	27.1	0.15	12.4
V671659		1.14	156.5	9.2	30	2.26	3.02	3.14	0.19	17.2	1.18	3.9	0.87	5.0	0.48	1.0
V671660		0.52	640	166.5	20	2.63	3.16	1.09	0.74	24.2	4.80	9.7	0.50	79.5	0.06	13.6
V671661		0.69	29.7	9.9	10	16.55	2.68	2.00	0.06	20.1	1.72	0.6	0.61	4.3	0.33	16.6
V671662		0.34	6.3	8.5	10	3.71	0.32	0.12	0.03	22.3	0.42	<0.2	0.05	3.7	<0.01	16.1
V671663		0.67	75.9	3.6	20	15.30	0.55	0.21	<0.03	32.1	0.62	<0.2	0.08	1.2	0.01	65.3
V671664		0.87	10.1	9.5	10	13.90	1.68	0.40	<0.03	30.5	1.60	0.4	0.21	3.5	0.03	51.5
V671665		1.02	4.4	5.8	10	36.1	2.74	2.34	<0.03	20.9	0.95	1.6	0.64	2.6	0.64	24.9
V671666		1.21	21.6	6.6	10	15.65	1.66	0.47	<0.03	33.8	1.66	0.5	0.22	2.3	0.04	83.4
V671667		1.06	27.6	5.2	10	17.25	1.98	0.65	<0.03	31.2	1.57	0.4	0.24	1.8	0.05	75.7
V671668		1.33	32.8	5.7	50	45.9	1.75	0.82	0.12	28.9	1.63	0.5	0.29	2.0	0.08	59.7
V671669		1.91	26.1	4.9	20	15.75	2.11	0.54	<0.03	40.0	1.81	0.6	0.21	1.6	0.05	81.9
V671670		0.84	30.6	5.1	<10	0.10	0.16	0.15	0.05	0.4	0.24	1.1	0.05	2.5	0.01	<0.2
V671671		1.91	24.3	4.0	20	13.95	1.31	0.32	<0.03	36.6	1.40	0.5	0.19	1.4	0.04	68.4
V671672		2.00	28.3	3.5	20	5.89	1.00	0.32	<0.03	42.5	1.04	1.0	0.12	1.2	0.05	65.8
V671673		2.11	30.2	5.0	20	5.78	1.39	0.42	<0.03	46.0	1.55	0.8	0.16	1.6	0.06	70.5
V671674		1.69	42.9	3.2	10	12.40	0.68	0.20	<0.03	38.7	0.60	0.4	0.07	1.1	0.04	51.8
V671675		0.85	29.3	2.3	10	22.8	0.29	0.12	<0.03	37.8	0.33	0.3	0.05	0.7	0.01	31.4
V671676		0.03	18.7	3.1	30	26.3	0.95	0.19	<0.03	39.9	1.17	1.5	0.09	1.2	0.02	76.3
V671677		0.61	25.6	1.5	10	12.90	0.83	0.23	<0.03	39.5	0.64	1.1	0.11	0.5	0.05	59.5
V671678		0.79	18.1	3.6	10	24.3	1.39	0.36	<0.03	40.7	1.14	0.7	0.17	1.2	0.06	82.1
V671679		0.43	23.5	5.7	20	13.25	2.05	0.70	0.04	39.4	1.74	0.7	0.26	1.8	0.10	77.9
V671680		0.77	17.7	2.9	10	16.95	1.60	0.80	<0.03	28.4	0.89	0.4	0.27	1.1	0.15	89.2
V671681		0.69	39.6	3.4	20	19.15	0.94	0.74	0.15	22.5	0.40	0.9	0.23	1.7	0.15	12.9
V671682		0.59	36.8	16.8	10	5.97	2.11	1.63	0.08	31.3	1.54	0.4	0.38	6.9	0.38	46.3
V671683		0.94	14.1	3.7	10	18.85	2.01	1.96	<0.03	26.4	0.61	1.7	0.47	1.7	1.19	28.7
V671684		0.22	72.8	15.7	50	11.85	3.93	1.47	0.13	34.5	3.43	1.3	0.53	5.0	0.21	63.7
V671685		1.16	41.2	18.2	10	42.4	3.65	1.77	0.22	37.0	2.69	2.1	0.62	7.1	0.33	20.8
V671686		0.86	21.8	7.0	10	58.4	2.35	1.24	0.03	18.5	1.33	0.2	0.42	3.2	0.18	32.6
V671687		0.56	12.7	4.2	20	1.80	1.68	0.52	0.07	39.3	1.26	0.8	0.23	1.6	0.10	33.7
V671688		0.65	8.6	7.5	20	50.8	2.12	0.74	0.06	25.3	1.60	0.7	0.31	3.5	0.09	55.3
V671689		0.46	15.6	5.9	10	70.1	1.88	0.70	0.07	47.4	1.63	4.0	0.25	2.2	0.08	42.6
V671690		0.74	9.3	20.6	10	15.80	6.05	2.68	0.05	45.7	3.88	2.9	1.01	7.0	0.50	141.5

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671651		4.3	0.77	328	1.38	3	53.4	0.1	0.33	0.15	0.21	<0.05	233	<1	13.8	1.40
V671652		10.8	1.77	104.5	4.72	11	85.9	7.6	1.04	0.71	0.61	0.23	485	1	40.1	4.17
V671653		6.8	1.37	16.6	2.36	1	70.1	0.3	0.54	0.26	0.32	0.08	306	<1	21.7	2.37
V671654		6.2	1.17	6.4	2.16	1	83.4	0.2	0.52	0.23	0.32	0.11	316	1	20.9	2.22
V671655		4.7	0.88	26.7	1.67	1	100.5	0.1	0.37	0.17	0.21	0.17	278	1	14.3	1.59
V671656		28.7	8.16	260	6.16	2	87.7	0.5	0.46	32.2	0.05	5.95	9	1	8.1	0.33
V671657		33.4	9.66	270	6.52	3	83.2	0.8	0.52	34.9	0.16	8.57	12	1	15.5	1.22
V671658		25.3	7.12	369	4.71	5	83.5	1.0	0.36	45.4	0.15	6.58	17	1	12.2	1.12
V671659		3.3	0.98	115.5	1.01	1	68.0	0.2	0.29	2.42	0.52	11.35	5	3	26.6	3.75
V671660		59.7	17.80	175.5	9.64	1	157.5	0.7	0.65	45.7	0.09	7.80	30	1	15.2	0.58
V671661		4.5	1.20	1175	1.48	7	11.3	2.6	0.34	4.96	0.34	1.61	<5	1	21.3	2.39
V671662		2.8	0.88	59.4	0.70	24	10.2	7.0	0.08	1.23	<0.01	0.93	<5	1	1.4	0.13
V671663		1.9	0.48	1280	0.86	178	5.5	23.2	0.11	2.66	0.02	1.62	<5	2	3.0	0.32
V671664		3.9	1.18	909	1.94	35	2.4	16.4	0.33	5.27	0.05	9.78	<5	2	7.2	0.45
V671665		2.2	0.67	520	0.83	14	3.4	6.4	0.31	3.05	0.50	3.48	<5	1	20.8	4.24
V671666		3.2	0.97	907	1.75	518	10.0	39.4	0.35	6.10	0.06	5.47	<5	2	8.7	0.49
V671667		2.5	0.66	1195	1.64	118	5.9	23.1	0.39	4.92	0.08	6.54	<5	2	9.1	0.62
V671668		2.9	0.72	1020	1.40	89	19.9	22.8	0.36	3.12	0.11	3.25	38	1	10.8	0.80
V671669		2.6	0.68	1265	1.86	228	8.2	41.1	0.38	6.10	0.07	5.72	<5	1	10.1	0.70
V671670		1.9	0.55	4.3	0.34	<1	6.6	0.1	0.03	0.57	0.01	0.29	<5	<1	1.6	0.16
V671671		1.7	0.50	1765	1.18	233	10.1	31.1	0.29	3.43	0.04	4.07	<5	2	7.3	0.44
V671672		1.4	0.43	1700	1.16	326	9.1	36.0	0.23	3.86	0.04	4.21	<5	1	5.9	0.45
V671673		2.2	0.69	2230	1.61	311	16.4	43.5	0.30	4.93	0.05	19.25	<5	2	8.1	0.59
V671674		1.5	0.38	2350	0.83	248	21.1	26.6	0.12	2.29	0.02	80.7	<5	1	3.4	0.34
V671675		1.2	0.32	3060	0.53	206	17.3	20.6	0.08	2.07	<0.01	32.6	<5	1	1.8	0.21
V671676		1.6	0.42	2850	1.00	315	11.8	55.0	0.24	4.22	0.01	3.10	<5	4	4.8	0.30
V671677		0.7	0.17	2950	0.49	308	12.0	46.0	0.17	2.67	0.02	3.55	<5	1	5.5	0.38
V671678		1.5	0.45	1465	0.88	286	3.1	40.4	0.28	4.87	0.05	7.77	<5	2	7.7	0.54
V671679		2.9	0.76	1070	1.67	184	13.0	36.1	0.38	5.40	0.10	8.26	14	6	12.5	0.83
V671680		1.3	0.34	1090	0.70	89	4.2	31.7	0.25	4.03	0.14	7.05	<5	1	11.1	1.28
V671681		1.2	0.35	328	0.41	4	45.8	1.2	0.11	4.95	0.13	1.82	9	1	7.1	0.96
V671682		6.3	1.86	85.0	1.97	4	36.6	5.5	0.35	4.48	0.29	5.66	5	1	14.7	2.53
V671683		1.3	0.44	858	0.48	9	5.1	2.5	0.19	1.98	0.53	2.37	<5	1	18.8	6.69
V671684		7.5	2.10	202	3.71	10	51.2	19.0	0.71	7.19	0.22	2.55	39	1	21.5	1.37
V671685		8.2	2.24	198.5	3.11	7	42.2	18.1	0.54	7.31	0.29	3.46	8	1	22.3	2.37
V671686		2.8	0.81	617	1.26	14	8.8	5.9	0.33	3.12	0.18	2.40	<5	1	14.4	1.20
V671687		1.6	0.50	12.4	0.67	4	16.7	18.3	0.33	4.14	0.10	1.23	<5	1	9.2	0.90
V671688		2.7	0.83	453	1.29	5	8.5	7.4	0.40	5.84	0.10	4.72	27	1	9.3	0.69
V671689		2.7	0.74	117.5	1.31	9	24.2	102.0	0.35	4.55	0.09	2.36	<5	1	10.2	0.74
V671690		10.1	2.69	171.0	4.10	8	12.2	28.6	0.98	14.45	0.47	5.32	<5	2	35.4	3.82

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671651		35	45.9	14.90	14.35	10.75	8.67	0.96	0.81	0.03	0.80	0.19	0.06	0.01	0.01	1.13
V671652		130	50.5	12.05	17.45	8.38	4.25	1.98	0.30	<0.01	1.85	0.26	0.18	0.01	<0.01	0.91
V671653		50	45.4	13.30	18.55	10.35	6.50	1.36	0.34	0.02	0.83	0.56	0.05	0.01	0.01	1.07
V671654		53	46.8	13.85	16.60	10.90	6.70	1.56	0.21	0.02	0.86	0.50	0.07	0.01	0.01	0.67
V671655		41	50.5	15.00	11.15	11.10	7.58	1.51	0.28	0.05	0.70	0.20	0.05	0.01	0.02	1.21
V671656		143	73.9	13.70	1.83	0.67	0.27	2.96	5.85	<0.01	0.19	0.01	0.14	0.01	0.03	0.21
V671657		158	74.9	13.50	1.78	0.58	0.24	2.92	5.43	<0.01	0.19	0.02	0.13	0.01	0.04	0.52
V671658		243	73.3	14.55	1.33	0.96	0.29	3.74	5.03	<0.01	0.25	0.03	0.17	0.01	0.05	1.42
V671659		118	76.3	13.45	1.83	0.89	0.27	3.26	3.87	<0.01	0.02	0.07	0.10	0.01	0.02	0.60
V671660		373	71.7	14.60	3.02	1.55	0.67	3.40	4.53	<0.01	0.48	0.02	0.22	0.02	0.07	0.52
V671661		13	75.3	13.95	0.88	0.26	0.05	2.76	7.50	<0.01	0.02	0.01	0.02	<0.01	<0.01	0.10
V671662		3	75.7	15.45	0.62	0.81	0.05	7.61	0.42	<0.01	<0.01	0.02	0.01	<0.01	<0.01	0.38
V671663		<2	74.7	15.90	0.84	0.21	0.05	3.23	2.28	<0.01	<0.01	0.05	0.03	<0.01	0.01	0.82
V671664		6	74.9	15.10	1.02	0.22	0.04	6.05	2.63	<0.01	<0.01	0.05	0.03	<0.01	<0.01	0.38
V671665		27	82.7	10.30	1.34	0.33	0.14	3.06	2.67	<0.01	<0.01	0.13	0.01	<0.01	<0.01	0.33
V671666		8	76.0	15.00	1.02	0.39	0.07	4.58	2.38	<0.01	<0.01	0.06	0.03	<0.01	<0.01	0.56
V671667		8	76.2	15.55	0.87	0.17	0.07	3.01	2.91	<0.01	<0.01	0.05	0.03	<0.01	<0.01	0.58
V671668		11	71.7	15.35	2.47	1.53	0.97	3.76	2.48	0.01	0.11	0.11	0.02	<0.01	<0.01	0.73
V671669		9	76.0	15.40	0.87	0.25	0.06	3.74	3.05	<0.01	0.01	0.05	0.04	<0.01	<0.01	0.50
V671670		47	98.7	0.24	0.51	0.04	0.02	0.02	0.14	<0.01	0.01	0.01	0.01	<0.01	<0.01	-0.02
V671671		7	75.2	15.55	0.72	0.21	0.04	2.94	3.54	<0.01	0.01	0.04	0.03	<0.01	<0.01	0.38
V671672		14	76.5	15.20	1.06	0.17	0.03	3.73	2.51	<0.01	<0.01	0.07	0.03	<0.01	<0.01	0.48
V671673		10	76.3	15.35	1.15	0.23	0.03	4.57	2.58	<0.01	0.01	0.06	0.04	<0.01	<0.01	0.39
V671674		6	76.0	15.60	0.74	0.14	0.03	2.39	2.84	<0.01	<0.01	0.05	0.03	<0.01	0.01	0.40
V671675		4	74.1	16.10	0.51	0.20	0.02	3.22	3.65	<0.01	<0.01	0.03	0.04	0.01	<0.01	0.28
V671676		18	74.3	15.25	2.48	0.20	0.07	3.50	2.51	<0.01	0.01	0.15	0.05	<0.01	<0.01	0.12
V671677		13	75.0	15.65	0.63	0.17	0.02	3.67	3.47	<0.01	<0.01	0.08	0.03	0.01	<0.01	0.18
V671678		9	75.6	15.20	0.91	0.20	0.05	3.85	2.48	<0.01	<0.01	0.05	0.02	<0.01	<0.01	0.37
V671679		11	75.5	15.25	1.13	0.92	0.17	5.65	1.95	<0.01	0.03	0.06	0.03	<0.01	<0.01	0.45
V671680		7	74.7	15.50	0.73	0.18	0.04	4.48	2.60	<0.01	<0.01	0.04	0.02	<0.01	<0.01	0.36
V671681		25	77.4	12.55	1.13	1.67	0.26	3.07	3.32	<0.01	0.04	0.03	<0.01	<0.01	<0.01	0.40
V671682		12	72.2	16.35	1.20	1.83	0.18	6.60	0.99	<0.01	0.04	0.05	0.02	<0.01	<0.01	0.31
V671683		33	74.2	13.95	0.92	0.19	0.02	3.38	6.59	<0.01	<0.01	0.24	0.03	<0.01	<0.01	0.10
V671684		25	72.5	15.05	2.56	2.26	0.75	5.10	1.11	0.01	0.14	0.03	0.05	0.01	0.01	1.03
V671685		27	75.7	14.30	0.88	1.72	0.12	5.75	1.09	<0.01	0.03	0.05	0.03	<0.01	<0.01	0.23
V671686		3	82.2	9.96	0.87	0.55	0.10	3.12	3.01	<0.01	0.03	0.02	0.02	<0.01	<0.01	0.14
V671687		10	71.2	17.20	0.95	1.28	0.05	8.24	0.16	<0.01	<0.01	0.21	0.04	<0.01	<0.01	0.13
V671688		12	76.6	12.00	2.31	1.42	0.97	3.78	2.53	<0.01	0.06	0.04	0.03	<0.01	<0.01	0.71
V671689		31	69.6	18.50	0.37	1.58	0.03	8.62	0.67	<0.01	<0.01	0.01	0.12	<0.01	<0.01	0.11
V671690		43	67.3	19.55	1.55	1.24	0.18	8.29	0.89	<0.01	0.01	0.10	0.03	<0.01	<0.01	1.03

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	TOT-ICP06	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671651		98.57	<0.5	<5	0.6	57	110	170	<1	154	5	33	10	109	
V671652		98.12	<0.5	5	0.9	41	45	250	1	24	6	43	<10	146	
V671653		98.35	<0.5	<5	1.0	44	99	160	<1	83	3	40	10	143	
V671654		98.76	<0.5	<5	0.6	59	114	20	<1	109	5	34	10	122	
V671655		99.36	<0.5	<5	0.5	52	82	60	<1	173	11	42	10	93	
V671656		99.77	<0.5	<5	<0.5	2	1	20	<1	2	46	2	<10	51	
V671657		100.26	<0.5	<5	<0.5	2	3	30	<1	4	47	3	<10	40	
V671658		101.13	<0.5	<5	<0.5	2	2	60	1	2	21	3	10	19	
V671659		100.69	<0.5	<5	<0.5	1	5	20	5	4	45	6	<10	13	
V671660		100.80	<0.5	<5	<0.5	4	1	30	<1	6	40	5	10	74	
V671661		100.85	<0.5	<5	<0.5	<1	1	60	<1	1	52	2	10	12	
V671662		101.07	<0.5	<5	<0.5	<1	1	90	<1	<1	12	<1	<10	12	
V671663		98.12	<0.5	6	<0.5	<1	2	9100	<1	<1	10	1	10	37	0.923
V671664		100.42	<0.5	5	<0.5	<1	1	740	<1	<1	12	1	10	25	
V671665		101.01	<0.5	<5	<0.5	<1	1	210	<1	1	19	4	10	28	
V671666		100.09	<0.5	5	<0.5	<1	6	3110	<1	<1	12	1	10	49	
V671667		99.44	<0.5	6	<0.5	<1	3	7290	<1	<1	10	1	10	40	0.768
V671668		99.24	<0.5	5	<0.5	7	19	4020	<1	20	13	6	10	49	
V671669		99.97	<0.5	<5	<0.5	1	4	5210	1	2	11	1	10	34	0.528
V671670		99.68	<0.5	<5	<0.5	<1	1	10	<1	2	<2	<1	<10	<2	
V671671		98.66	<0.5	<5	<0.5	<1	3	7120	<1	1	8	1	20	40	0.731
V671672		99.78	<0.5	<5	<0.5	<1	3	5720	<1	<1	9	1	10	36	0.589
V671673		100.71	<0.5	<5	<0.5	<1	3	3960	<1	1	9	1	10	35	
V671674		98.23	<0.5	<5	<0.5	<1	3	9420	<1	<1	7	1	20	43	0.981
V671675		98.16	<0.5	5	<0.5	<1	4	7480	<1	1	10	<1	20	43	0.763
V671676		98.64	<0.5	<5	<0.5	1	42	6770	7	18	11	<1	20	104	0.709
V671677		98.91	<0.5	6	<0.5	<1	1	6010	<1	<1	7	1	20	27	0.647
V671678		98.73	<0.5	7	<0.5	<1	2	6090	<1	1	7	1	10	55	0.624
V671679		101.14	<0.5	<5	<0.5	1	6	2090	<1	2	11	2	10	41	
V671680		98.65	<0.5	6	<0.5	<1	2	5660	<1	1	9	2	10	36	0.576
V671681		99.87	<0.5	<5	<0.5	3	2	50	<1	4	22	2	10	18	
V671682		99.77	<0.5	9	<0.5	2	2	60	<1	2	27	3	10	25	
V671683		99.62	<0.5	<5	<0.5	<1	1	20	<1	<1	20	2	10	4	
V671684		100.61	<0.5	10	<0.5	5	14	90	1	15	11	7	<10	18	
V671685		99.90	<0.5	11	<0.5	1	7	60	<1	1	21	2	<10	13	
V671686		100.02	<0.5	9	<0.5	1	2	120	<1	<1	20	2	10	18	
V671687		99.46	<0.5	<5	<0.5	1	4	20	<1	<1	9	2	<10	7	
V671688		100.45	<0.5	<5	<0.5	5	22	70	<1	8	18	4	10	214	
V671689		99.61	<0.5	<5	<0.5	<1	1	10	1	1	11	<1	<10	6	
V671690		100.17	<0.5	<5	<0.5	1	2	50	<1	<1	17	4	10	42	

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671691		0.57	5.9	10.9	10	16.60	3.84	1.50	<0.03	29.3	2.33	0.4	0.61	5.2	0.15	103.0
V671692		0.82	4.5	8.9	10	21.8	2.28	1.14	<0.03	25.1	1.31	0.7	0.37	4.0	0.20	55.5
V671693		0.69	32.0	21.0	10	8.06	6.77	4.82	0.08	20.4	3.90	1.3	1.53	9.4	0.78	15.6
V671694		0.81	7.9	2.7	10	17.60	2.18	0.84	0.04	21.8	0.79	3.5	0.30	1.3	0.21	40.6
V671695		0.32	5.3	3.7	10	3.07	0.53	0.31	0.09	37.4	0.48	0.5	0.11	1.6	0.09	27.1
V671696		0.40	58.1	11.1	20	8.28	0.83	0.63	0.06	23.6	0.83	0.9	0.17	5.6	0.22	40.6
V671697		0.77	26.5	11.6	20	55.4	3.68	1.33	0.10	47.4	3.28	3.1	0.57	4.5	0.17	96.6
V671698		0.52	8.0	18.0	10	25.1	4.95	2.52	0.04	22.4	3.13	3.2	0.89	7.3	0.53	12.5
V671699		1.47	48.4	21.4	10	4.06	6.76	2.29	0.13	45.1	4.56	1.3	1.08	9.3	0.21	120.0
V671700		1.58	44.7	11.8	20	49.4	2.90	1.00	0.03	29.3	2.25	0.7	0.49	5.5	0.07	116.5
V671701		0.78	2.6	9.7	20	34.7	1.44	0.59	0.04	36.6	1.61	1.4	0.23	3.7	0.10	55.2
V671702		0.95	3.1	7.1	10	7.63	1.39	0.63	0.03	33.9	1.05	4.7	0.22	2.9	0.13	4.1
V671703		0.75	50.3	3.9	90	1880	1.50	0.61	0.15	52.8	1.26	1.6	0.26	1.5	0.09	104.5
V671704		2.90	8.5	4.3	20	6.89	1.49	0.65	<0.03	19.4	1.06	0.2	0.26	1.9	0.12	34.6
V671705		0.98	32.5	3.5	10	4.67	0.57	0.37	0.12	52.6	0.31	0.3	0.13	1.7	0.13	62.4
V671706		0.47	14.4	9.4	10	7.55	2.67	1.11	0.13	26.1	1.59	0.4	0.45	4.7	0.14	9.7
V671707		0.37	46.8	3.0	10	4.93	0.92	0.27	0.10	45.4	0.81	3.4	0.11	1.1	0.05	73.6
V671708		0.53	33.3	38.2	40	25.1	8.78	5.30	0.12	27.9	5.42	1.3	1.87	14.9	0.81	28.2
V671709		0.89	16.3	11.2	10	20.8	3.66	2.26	0.07	20.1	1.88	0.7	0.69	5.2	0.44	13.4
V671710		1.21	104.5	77.7	50	27.9	9.99	4.56	0.24	29.6	8.34	0.4	1.92	37.1	0.36	41.3
V671711		1.05	196.0	3.3	10	5.61	0.90	0.59	0.10	17.1	0.56	0.2	0.21	2.0	0.13	5.5
V671712		0.44	27.7	25.8	40	23.8	9.47	9.15	0.14	31.7	4.19	1.6	2.60	11.9	1.88	50.9
V671713		0.66	13.4	12.4	10	109.0	3.58	1.63	<0.03	36.5	2.49	1.9	0.60	5.4	0.30	74.7
V671714		0.48	270	6.4	440	23.0	2.78	2.03	0.69	17.6	2.54	1.3	0.70	2.5	0.29	2.3
V671951		1.99	20.1	0.7	10	13.60	0.25	0.08	<0.03	38.6	0.26	0.4	0.03	<0.5	0.02	60.6
V671952		2.29	22.6	0.7	10	18.05	0.28	0.10	<0.03	38.4	0.23	0.4	0.03	<0.5	0.03	48.1
V671953		0.52	34.1	<0.5	10	8.56	0.22	0.10	<0.03	45.5	0.11	1.2	0.03	<0.5	0.03	38.1
V671954		2.78	4.8	16.6	10	306	3.42	1.54	0.04	33.2	2.44	1.2	0.57	7.3	0.19	40.4
V671955		0.13	5.0	1.3	10	4.90	0.59	0.14	<0.03	41.7	0.41	1.2	0.05	0.5	0.04	101.0
V671956		2.47	12.6	30.4	10	302	7.95	3.52	0.07	33.8	5.19	1.5	1.33	13.4	0.35	35.6
V671957		0.95	9.4	18.2	30	14.20	5.57	4.39	0.03	24.3	3.13	1.6	1.18	7.6	1.15	49.5
V671958		1.27	6.1	9.8	10	2.15	1.92	1.41	0.05	23.1	1.00	0.2	0.39	4.4	0.45	11.3
V671959		0.67	58.4	4.1	10	6.10	0.71	0.58	0.12	22.2	0.41	0.8	0.12	2.2	0.17	7.8
V671960		1.88	28.9	15.8	30	1.77	2.77	2.15	0.15	21.8	1.73	1.4	0.61	7.2	0.56	8.2
V671961		1.59	147.0	41.1	20	5.56	4.79	4.24	0.26	19.6	2.88	3.2	1.14	18.9	0.86	8.7
V671962		1.98	368	109.5	20	2.72	3.70	1.92	0.42	22.2	4.76	6.4	0.65	49.8	0.24	17.3
V671963		1.35	287	103.5	20	6.14	7.26	5.61	0.35	17.4	6.17	8.1	1.62	46.6	1.16	14.6
V671964		1.10	721	194.0	20	5.82	16.35	8.88	0.69	24.1	13.55	10.1	3.20	86.9	1.07	37.8
V671965		1.35	13.0	6.1	40	3.68	2.45	1.39	0.04	29.0	1.04	1.7	0.42	2.4	0.45	43.0
V671966		2.91	5.0	1.7	40	9.85	0.73	0.29	<0.03	36.7	0.40	1.6	0.09	0.6	0.05	46.5

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671691		3.7	1.09	374	1.60	11	1.7	11.8	0.65	8.97	0.24	11.05	<5	1	20.4	1.29
V671692		3.3	0.94	624	1.22	11	2.2	7.4	0.34	6.29	0.22	8.92	<5	1	12.6	1.23
V671693		8.6	2.43	719	3.11	5	13.9	2.0	1.06	15.05	0.83	3.64	<5	1	46.5	6.04
V671694		0.9	0.29	244	0.36	31	9.7	23.5	0.32	5.97	0.18	2.52	<5	1	14.3	1.55
V671695		1.4	0.44	51.4	0.58	1	22.4	4.4	0.11	2.23	0.06	1.51	<5	1	3.5	0.55
V671696		4.2	1.23	625	1.14	2	18.1	2.4	0.14	5.22	0.13	1.70	<5	1	5.0	1.28
V671697		5.0	1.53	226	3.44	3	82.7	161.0	0.78	8.50	0.18	5.11	8	1	18.0	1.49
V671698		7.8	2.14	227	3.15	4	10.2	4.8	0.80	10.70	0.46	4.99	<5	1	29.0	3.55
V671699		8.7	2.66	269	3.66	12	31.3	21.5	1.20	12.80	0.34	7.30	<5	3	33.8	1.97
V671700		4.3	1.35	832	1.75	19	10.5	118.0	0.56	7.08	0.11	5.16	<5	6	15.0	0.54
V671701		4.2	1.17	191.5	1.85	10	11.1	10.5	0.30	6.81	0.09	1.87	7	1	7.9	0.71
V671702		2.7	0.81	74.9	0.91	4	12.4	3.4	0.23	3.73	0.11	2.11	<5	<1	7.9	0.85
V671703		1.8	0.51	1980	1.11	28	59.2	48.1	0.26	12.10	0.09	5.14	75	2	6.9	0.64
V671704		1.7	0.46	728	0.85	13	1.7	8.1	0.28	3.64	0.13	2.24	<5	2	9.2	0.91
V671705		1.3	0.37	317	0.43	9	44.0	3.1	0.08	1.40	0.10	2.92	<5	3	4.3	0.83
V671706		3.6	1.02	237	1.14	2	16.1	3.2	0.41	3.66	0.16	2.87	<5	<1	15.2	0.96
V671707		1.6	0.42	10.3	0.81	1	43.2	374	0.18	0.89	0.04	1.56	<5	1	4.2	0.35
V671708		14.2	4.19	228	5.31	3	35.0	30.6	1.40	15.70	0.80	5.52	17	1	54.7	6.24
V671709		4.4	1.22	624	1.41	4	9.7	2.3	0.46	6.48	0.36	2.30	<5	1	22.9	2.75
V671710		30.4	9.10	327	8.54	1	43.0	5.7	1.77	31.0	0.56	5.14	23	1	55.3	3.22
V671711		1.3	0.36	292	0.54	2	15.8	1.4	0.14	0.90	0.10	0.55	<5	1	9.3	0.88
V671712		9.6	2.82	334	3.35	9	31.1	4.0	1.20	10.40	1.75	5.00	31	1	70.9	13.30
V671713		5.8	1.59	1225	2.38	70	8.5	45.8	0.65	11.65	0.25	10.85	<5	3	19.7	1.98
V671714		5.1	1.08	37.3	2.04	1	256	0.3	0.44	0.34	0.29	0.17	266	1	16.8	2.09
V671951		0.3	0.10	2950	0.27	221	14.6	51.0	0.07	1.68	0.01	1.02	<5	3	1.3	0.09
V671952		0.3	0.09	3390	0.18	203	18.2	52.2	0.07	3.50	0.02	1.85	<5	2	1.9	0.20
V671953		0.1	0.03	161.0	0.09	182	8.6	100.0	0.05	2.81	0.03	0.96	<5	2	1.5	0.20
V671954		6.8	1.96	809	2.45	79	6.8	28.3	0.55	10.35	0.22	3.20	<5	8	19.4	1.33
V671955		0.6	0.15	26.9	0.39	612	2.2	167.5	0.12	8.44	0.03	9.13	<5	5	2.8	0.20
V671956		12.6	3.56	1420	4.18	80	10.0	17.8	1.25	18.45	0.45	11.60	<5	9	44.4	2.83
V671957		8.0	2.24	276	2.88	9	7.0	10.4	0.71	11.25	0.87	3.76	13	1	40.3	6.69
V671958		3.8	1.06	159.5	0.97	1	12.8	1.9	0.22	3.64	0.30	1.01	<5	1	15.9	2.89
V671959		1.4	0.39	384	0.34	3	24.6	1.1	0.06	3.28	0.09	1.16	<5	1	5.4	1.10
V671960		6.3	1.73	125.5	1.83	2	27.2	1.1	0.37	7.70	0.40	2.63	<5	1	20.3	3.25
V671961		16.8	4.70	299	3.53	3	46.1	1.1	0.59	22.0	0.78	18.65	5	1	35.9	5.77
V671962		44.6	12.45	335	7.64	5	74.2	1.2	0.59	49.0	0.26	6.39	14	<1	19.2	1.87
V671963		41.0	11.80	433	8.30	5	49.9	2.1	1.05	53.4	0.93	8.79	8	7	48.7	7.48
V671964		81.2	22.5	272	16.60	8	122.5	2.2	2.59	69.8	1.27	8.59	25	1	91.7	8.07
V671965		2.6	0.74	584	0.86	169	9.5	19.9	0.32	4.65	0.30	4.50	<5	1	18.2	3.36
V671966		0.8	0.20	1695	0.37	419	1.5	32.1	0.09	1.03	0.03	1.75	<5	1	5.2	0.63

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671691		7	77.9	13.20	1.43	0.50	0.11	5.08	2.48	<0.01	0.03	0.02	0.02	<0.01	<0.01	0.44
V671692		11	76.3	13.90	1.22	0.50	0.09	4.40	4.30	<0.01	0.03	0.02	0.02	<0.01	<0.01	0.56
V671693		27	75.8	13.60	0.92	0.44	0.09	2.93	6.29	<0.01	0.02	0.01	0.03	<0.01	<0.01	0.26
V671694		36	81.9	11.15	1.06	0.88	0.04	4.35	1.43	<0.01	<0.01	0.31	0.02	<0.01	<0.01	0.02
V671695		11	72.6	17.95	0.34	2.09	0.01	7.66	0.84	<0.01	<0.01	0.01	0.05	<0.01	<0.01	0.05
V671696		25	74.7	14.30	0.83	0.24	0.14	2.36	7.87	<0.01	0.04	0.02	0.04	<0.01	0.01	0.36
V671697		24	70.9	17.40	1.41	2.46	0.22	7.20	0.41	<0.01	0.03	0.14	0.24	0.01	<0.01	0.38
V671698		46	78.2	13.00	0.86	1.06	0.04	5.35	1.43	<0.01	0.01	0.14	0.03	<0.01	<0.01	0.11
V671699		23	66.0	21.8	1.63	1.00	0.17	6.68	2.37	<0.01	0.05	0.07	0.08	<0.01	0.01	1.43
V671700		9	77.3	13.65	0.76	0.37	0.08	3.42	5.37	<0.01	0.06	0.01	0.07	<0.01	<0.01	0.40
V671701		15	73.8	16.30	1.32	1.37	0.14	7.15	0.85	<0.01	0.03	0.09	0.07	<0.01	<0.01	0.01
V671702		55	72.7	16.70	0.43	1.48	0.01	7.61	0.66	<0.01	<0.01	0.04	0.05	<0.01	<0.01	1.03
V671703		31	63.9	18.00	4.97	2.59	1.79	6.04	1.60	0.01	0.24	0.09	0.16	<0.01	<0.01	0.56
V671704		3	84.5	8.31	0.67	0.09	0.03	1.53	4.23	<0.01	0.01	0.01	0.03	<0.01	<0.01	0.20
V671705		4	73.7	15.00	1.64	1.40	0.12	3.45	3.92	<0.01	0.05	0.07	0.02	0.01	<0.01	0.60
V671706		7	75.2	15.30	0.57	1.15	0.03	6.00	2.45	<0.01	0.01	0.01	0.03	<0.01	<0.01	0.13
V671707		18	70.1	17.35	0.36	1.39	0.02	8.66	0.26	<0.01	<0.01	0.01	0.27	0.01	0.01	0.13
V671708		15	70.3	15.55	2.10	2.49	0.41	5.21	1.47	<0.01	0.08	0.09	0.06	<0.01	<0.01	0.38
V671709		13	76.2	13.40	0.75	0.56	0.04	3.15	5.57	<0.01	0.02	0.03	0.04	<0.01	<0.01	0.38
V671710		8	68.7	16.70	3.20	2.55	0.69	5.03	2.27	0.01	0.14	0.11	0.04	<0.01	0.01	0.60
V671711		3	78.3	11.90	0.65	0.22	0.05	2.41	6.26	<0.01	0.04	0.01	0.01	<0.01	0.02	0.10
V671712		36	70.3	14.65	4.34	1.79	0.65	4.92	1.62	<0.01	0.36	0.06	0.03	<0.01	<0.01	0.35
V671713		29	77.9	13.60	1.03	0.44	0.06	4.87	2.28	<0.01	0.01	0.04	0.04	<0.01	<0.01	0.50
V671714		41	51.9	17.40	12.85	9.49	3.28	2.30	0.37	0.06	0.78	0.48	0.06	0.03	0.03	0.14
V671951		3	75.7	15.30	0.58	0.22	0.04	2.94	2.56	<0.01	<0.01	0.11	0.08	<0.01	<0.01	0.60
V671952		4	75.9	15.40	0.44	0.14	0.04	2.69	2.86	<0.01	<0.01	0.23	0.06	<0.01	<0.01	0.43
V671953		8	77.1	16.75	0.42	0.06	0.03	2.53	0.21	<0.01	0.01	0.12	0.03	<0.01	<0.01	0.17
V671954		17	78.7	12.95	0.72	0.49	0.02	5.28	1.12	<0.01	0.01	0.08	0.06	<0.01	<0.01	0.53
V671955		6	70.5	18.05	0.68	0.27	0.01	10.10	0.19	<0.01	<0.01	0.01	0.09	<0.01	<0.01	-0.02
V671956		30	77.5	14.05	0.98	0.72	0.05	5.27	1.87	<0.01	0.02	0.05	0.08	<0.01	<0.01	0.41
V671957		34	76.1	13.60	2.22	1.01	0.25	5.19	2.01	<0.01	0.10	0.08	0.02	<0.01	<0.01	0.31
V671958		6	76.4	14.55	0.77	1.23	0.02	5.90	1.83	<0.01	0.02	0.14	0.02	<0.01	<0.01	0.07
V671959		13	76.2	13.20	0.75	0.49	0.04	3.33	5.72	<0.01	0.03	0.02	0.05	<0.01	0.01	-0.04
V671960		35	77.2	13.95	0.91	1.49	0.07	5.24	1.92	<0.01	0.05	0.02	0.04	<0.01	<0.01	0.11
V671961		90	77.2	13.00	1.18	0.64	0.14	3.19	5.17	<0.01	0.08	0.02	0.05	0.01	0.02	0.22
V671962		223	74.7	13.75	2.06	0.83	0.34	3.11	5.38	<0.01	0.25	0.03	0.09	0.01	0.04	0.31
V671963		240	76.2	12.15	1.58	0.11	0.19	1.54	7.42	<0.01	0.14	0.02	0.07	0.01	0.03	0.07
V671964		387	73.0	14.15	2.79	0.96	0.59	3.09	5.29	<0.01	0.42	0.03	0.07	0.02	0.08	0.48
V671965		25	79.1	13.25	0.99	0.45	0.04	5.71	1.32	0.01	<0.01	0.29	0.03	<0.01	<0.01	0.12
V671966		18	76.0	15.45	0.81	0.13	0.03	3.31	3.08	0.01	<0.01	0.21	0.05	<0.01	<0.01	0.22

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	TOT-ICP06	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671691		101.21	<0.5	6	<0.5	<1	5	80	<1	<1	23	2	<10	93	
V671692		101.34	<0.5	<5	<0.5	<1	1	110	<1	1	35	3	10	65	
V671693		100.39	<0.5	<5	<0.5	1	1	40	<1	<1	43	2	10	17	
V671694		101.16	<0.5	<5	<0.5	<1	6	40	<1	<1	22	1	<10	6	
V671695		101.60	<0.5	<5	<0.5	<1	2	10	<1	<1	10	<1	<10	<2	
V671696		100.91	<0.5	<5	<0.5	1	1	20	<1	<1	32	2	10	11	
V671697		100.80	<0.5	5	<0.5	<1	9	80	5	4	26	4	10	33	
V671698		100.23	<0.5	<5	<0.5	<1	1	40	<1	<1	26	2	10	13	
V671699		101.29	<0.5	19	<0.5	1	2	20	<1	1	21	8	<10	25	
V671700		101.49	<0.5	<5	<0.5	<1	<1	10	<1	2	26	2	10	10	
V671701		101.13	<0.5	6	<0.5	1	1	100	<1	5	19	2	<10	73	
V671702		100.71	<0.5	<5	<0.5	<1	1	40	<1	<1	18	1	<10	3	
V671703		99.95	<0.5	826	<0.5	15	15	400	<1	31	31	13	10	139	
V671704		99.61	<0.5	5	<0.5	<1	2	30	<1	<1	18	3	10	14	
V671705		99.98	<0.5	<5	<0.5	<1	4	70	<1	<1	35	2	10	34	
V671706		100.88	<0.5	9	<0.5	<1	1	10	<1	<1	26	<1	<10	14	
V671707		98.57	<0.5	<5	<0.5	<1	1	20	<1	<1	11	<1	<10	2	
V671708		98.14	<0.5	10	<0.5	4	9	70	<1	11	27	5	10	47	
V671709		100.14	<0.5	5	<0.5	<1	<1	30	<1	1	43	2	10	15	
V671710		100.05	<0.5	5	<0.5	4	8	50	<1	8	39	6	10	51	
V671711		99.97	<0.5	<5	<0.5	<1	<1	50	1	<1	10	2	<10	6	
V671712		99.07	<0.5	6	<0.5	7	<1	190	<1	9	20	17	<10	36	
V671713		100.77	<0.5	<5	<0.5	1	<1	300	<1	<1	13	3	10	64	
V671714		99.17	<0.5	237	0.7	79	5	160	<1	226	6	43	<10	97	
V671951		98.13	<0.5	<5	<0.5	<1	<1	7870	<1	<1	7	<1	20	112	0.806
V671952		98.19	<0.5	<5	<0.5	<1	<1	8520	<1	<1	8	<1	30	84	0.841
V671953		97.43	<0.5	<5	<0.5	<1	2	>10000	<1	<1	5	<1	<10	11	1.615
V671954		99.96	<0.5	13	<0.5	<1	1	510	<1	1	12	1	10	82	
V671955		99.88	<0.5	<5	<0.5	<1	1	30	<1	1	9	<1	<10	2	
V671956		101.00	<0.5	13	<0.5	<1	<1	300	<1	1	28	2	10	78	
V671957		100.89	<0.5	<5	<0.5	3	1	110	<1	10	20	8	<10	61	
V671958		100.95	<0.5	<5	<0.5	<1	1	10	<1	<1	16	1	<10	8	
V671959		99.80	<0.5	<5	<0.5	<1	1	20	<1	<1	35	1	<10	13	
V671960		101.00	<0.5	<5	<0.5	<1	1	20	<1	<1	26	1	<10	17	
V671961		100.92	<0.5	5	<0.5	1	2	30	<1	1	57	2	10	26	
V671962		100.90	<0.5	<5	<0.5	2	4	50	<1	2	38	4	10	59	
V671963		99.53	<0.5	<5	<0.5	1	18	50	3	19	79	3	<10	49	
V671964		100.97	<0.5	<5	<0.5	4	7	40	5	5	35	2	<10	86	
V671965		101.31	<0.5	<5	<0.5	<1	2	1230	1	2	10	1	<10	23	
V671966		99.30	<0.5	<5	<0.5	1	1	7190	1	2	5	<1	10	65	0.743

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671967		1.90	2.5	0.8	10	23.3	0.18	0.08	<0.03	43.8	0.24	2.6	0.01	<0.5	<0.01	32.4
V671968		0.89	2.3	11.7	10	37.5	4.11	1.31	<0.03	54.2	3.01	2.5	0.52	3.7	0.34	108.0
V671969		1.34	3.4	4.8	20	32.4	2.13	0.63	<0.03	95.5	1.57	0.6	0.28	1.6	0.10	163.0
V671970		0.71	3.1	1.8	10	18.25	0.68	0.23	<0.03	56.0	0.53	3.7	0.07	0.6	0.03	12.8
V671971		0.93	12.5	18.1	10	34.7	5.35	1.69	<0.03	40.9	4.03	0.6	0.73	7.0	0.17	79.6
V671972		2.03	4.7	16.9	10	11.50	4.53	1.50	<0.03	29.0	3.27	0.5	0.66	6.6	0.14	34.9
V671973		1.31	54.9	35.8	20	33.2	7.54	3.53	0.10	26.5	5.28	2.6	1.35	15.2	0.37	38.8
V671974		0.54	1.9	16.3	10	15.60	3.48	1.24	<0.03	56.8	3.14	0.4	0.46	5.7	0.18	122.0
V671975		0.42	2.4	19.3	10	12.20	5.35	2.15	<0.03	45.8	3.96	0.8	0.77	7.0	0.39	96.7
V671976		0.23	3.3	9.7	10	32.3	1.83	1.01	<0.03	20.4	1.30	2.4	0.34	4.3	0.23	18.7
V671977		0.69	15.0	24.2	10	25.3	6.03	2.86	0.06	25.5	4.00	2.2	1.01	10.1	0.49	43.8
V671978		0.29	4.9	11.2	10	9.86	2.91	1.19	<0.03	41.6	2.17	0.4	0.43	4.8	0.16	93.3
V671979		0.33	5.5	18.8	10	6.24	3.77	1.95	<0.03	29.2	2.70	0.6	0.62	7.7	0.39	62.7
V671980		0.22	2.6	2.0	10	1120	0.96	0.21	<0.03	57.9	1.01	2.1	0.07	0.6	0.02	144.5
V671981		0.63	4.2	5.8	10	469	12.80	1.97	<0.03	67.2	8.06	36.7	1.10	1.6	0.13	248
V671982		1.03	2.1	3.3	10	12.90	1.18	0.33	<0.03	41.3	0.90	1.3	0.13	1.0	0.04	83.0
V671983		1.31	0.5	1.4	10	11.65	0.48	0.10	<0.03	35.0	0.59	2.2	0.03	0.5	<0.01	59.1
V671984		2.57	<0.5	1.4	10	20.5	0.76	0.12	<0.03	38.2	0.81	<0.2	0.04	0.5	<0.01	54.2
V671985		0.81	6.0	1.4	10	38.4	0.85	0.33	<0.03	33.8	0.43	1.8	0.11	0.5	0.09	19.0
V671986		0.75	49.6	9.7	20	19.25	5.99	4.61	0.09	22.1	2.81	1.0	1.25	4.2	0.88	53.1
V671987		0.27	6.1	0.9	20	3.28	0.34	0.16	<0.03	32.0	0.29	0.5	0.03	<0.5	0.01	45.2
V671988		0.54	44.1	10.4	20	44.3	2.35	0.82	0.24	39.9	2.11	2.1	0.30	3.4	0.10	69.1
V671989		0.10	54.1	1.0	30	18.50	0.62	0.23	<0.03	20.9	0.40	<0.2	0.06	<0.5	0.01	44.5
V671990		0.16	8.4	6.9	10	12.70	0.94	0.29	<0.03	28.1	1.03	0.6	0.10	2.6	0.02	94.0
V671991		1.11	5.0	5.7	10	13.05	1.22	0.37	<0.03	35.0	0.96	0.2	0.16	2.1	0.04	83.4

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671967		0.4	0.11	1245	0.20	475	14.5	73.5	0.03	2.74	<0.01	2.93	<5	2	1.6	0.06
V671968		5.8	1.62	2020	3.52	129	2.6	36.7	0.72	15.40	0.24	9.30	<5	5	22.9	2.24
V671969		2.4	0.65	2240	1.40	395	1.5	35.5	0.34	7.41	0.11	7.76	<5	13	12.0	0.90
V671970		0.8	0.27	1080	0.46	68	2.9	6.4	0.10	2.01	0.02	2.27	<5	2	4.1	0.31
V671971		7.5	2.25	780	3.70	34	1.0	10.8	0.90	13.15	0.24	3.74	<5	5	26.3	1.66
V671972		6.9	2.00	831	2.77	14	1.4	6.3	0.75	11.20	0.20	4.99	<5	2	23.3	1.42
V671973		14.8	4.05	829	4.50	17	10.6	6.3	1.16	20.6	0.48	14.05	<5	2	42.8	3.26
V671974		7.5	2.17	1235	3.32	86	0.8	26.4	0.62	10.30	0.20	2.02	<5	8	19.3	1.50
V671975		9.0	2.54	832	3.68	52	0.8	21.1	0.82	11.40	0.37	4.90	<5	5	30.2	2.84
V671976		3.7	1.07	674	1.29	6	2.9	4.5	0.28	13.40	0.15	12.25	<5	1	10.3	1.52
V671977		9.9	2.80	257	3.64	4	11.5	7.1	0.91	16.80	0.48	11.45	<5	1	33.5	3.47
V671978		4.3	1.29	736	1.97	44	2.4	18.6	0.48	5.80	0.18	3.03	<5	2	16.7	1.50
V671979		7.4	2.22	585	2.49	7	3.6	8.3	0.57	10.80	0.31	6.31	<5	1	21.2	2.75
V671980		1.3	0.32	3390	1.11	209	4.4	258	0.20	1.80	0.02	7.26	<5	10	4.9	0.36
V671981		3.9	0.97	1670	5.02	653	7.9	519	2.66	16.30	0.23	32.7	<5	9	69.6	1.73
V671982		1.6	0.46	2250	1.10	105	4.3	36.5	0.19	4.63	0.04	1.87	<5	4	6.6	0.54
V671983		0.6	0.20	1690	0.59	17	9.8	61.9	0.09	1.73	<0.01	3.42	<5	1	3.2	0.21
V671984		0.8	0.19	2480	0.54	78	17.1	28.1	0.12	2.99	<0.01	1.87	<5	3	3.0	0.16
V671985		0.7	0.19	1070	0.34	84	8.3	18.6	0.10	1.76	0.05	2.77	<5	1	5.6	0.70
V671986		4.7	1.21	587	2.06	3	22.4	5.6	0.73	15.75	0.81	11.35	11	2	27.4	6.60
V671987		0.4	0.12	1365	0.22	229	2.6	19.7	0.02	1.15	<0.01	2.03	<5	1	2.4	0.21
V671988		4.9	1.31	189.0	2.04	14	180.5	110.5	0.41	4.88	0.13	5.28	9	2	11.4	0.82
V671989		0.4	0.11	629	0.26	26	35.0	18.7	0.07	1.35	0.01	2.88	<5	2	3.2	0.23
V671990		2.9	0.87	476	1.28	12	4.6	31.8	0.19	3.93	0.04	2.39	<5	2	4.7	0.28
V671991		2.4	0.71	1095	1.02	46	4.4	32.6	0.24	3.74	0.05	1.43	<5	1	6.6	0.45

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671967		23	74.1	16.00	0.69	0.62	0.01	6.99	1.58	<0.01	<0.01	0.08	0.07	0.01	<0.01	0.02
V671968		36	75.9	14.65	1.33	0.23	0.04	4.75	3.26	<0.01	0.01	0.31	0.04	<0.01	<0.01	0.44
V671969		10	81.8	11.85	1.42	0.10	0.10	1.71	2.79	<0.01	0.02	0.16	0.02	<0.01	<0.01	1.13
V671970		39	72.6	17.40	0.70	0.24	0.02	8.10	2.23	<0.01	<0.01	0.25	0.07	<0.01	<0.01	0.10
V671971		12	77.1	13.75	1.46	0.37	0.06	3.93	3.00	<0.01	0.02	0.03	0.03	<0.01	<0.01	0.77
V671972		10	75.2	14.60	1.17	0.37	0.03	3.87	5.16	<0.01	0.01	0.07	0.06	<0.01	<0.01	0.22
V671973		60	77.9	13.45	1.49	0.48	0.09	3.21	4.74	<0.01	0.05	0.05	0.04	<0.01	0.01	0.46
V671974		8	79.7	12.80	1.53	0.14	0.06	2.80	3.39	<0.01	0.02	0.02	0.03	<0.01	<0.01	0.96
V671975		13	77.0	14.30	1.47	0.29	0.05	5.06	2.48	<0.01	0.02	0.04	0.04	<0.01	<0.01	0.60
V671976		50	78.6	12.80	0.81	0.51	0.03	4.07	4.27	<0.01	0.01	0.03	0.02	<0.01	<0.01	0.12
V671977		48	76.7	13.70	1.83	1.33	0.10	5.52	1.32	<0.01	0.02	0.16	0.02	<0.01	<0.01	0.08
V671978		7	74.5	14.25	1.69	0.41	0.09	4.32	3.42	<0.01	0.03	0.02	0.04	<0.01	<0.01	0.80
V671979		12	76.6	13.85	1.23	0.54	0.06	4.32	4.62	<0.01	0.02	0.04	0.02	<0.01	<0.01	0.13
V671980		12	78.1	14.05	0.91	0.22	0.04	5.49	1.40	<0.01	0.03	0.24	0.03	<0.01	<0.01	1.23
V671981		198	71.5	16.55	0.92	0.42	0.01	7.29	0.82	<0.01	0.02	1.35	0.07	<0.01	<0.01	0.46
V671982		16	75.9	15.70	1.03	0.15	0.04	2.54	2.84	<0.01	0.01	0.08	0.03	<0.01	<0.01	0.41
V671983		22	75.0	15.35	0.60	0.32	0.02	4.72	2.14	<0.01	<0.01	0.26	0.10	0.01	<0.01	0.11
V671984		2	75.3	15.85	0.83	0.17	0.02	2.71	3.00	<0.01	0.01	0.03	0.04	0.01	<0.01	0.42
V671985		23	77.8	13.20	0.85	0.45	0.04	5.50	2.42	<0.01	<0.01	0.24	0.04	<0.01	<0.01	0.14
V671986		23	76.2	13.70	1.32	1.11	0.24	3.78	4.30	<0.01	0.04	0.04	<0.01	<0.01	0.01	0.32
V671987		8	75.3	14.70	0.71	0.17	0.01	5.57	3.90	<0.01	<0.01	0.06	0.04	<0.01	<0.01	0.09
V671988		24	74.0	15.75	1.24	2.90	0.36	5.38	0.86	<0.01	0.03	0.05	0.13	0.02	0.01	0.43
V671989		3	77.2	16.15	2.02	0.09	0.06	0.92	1.63	<0.01	<0.01	0.03	<0.01	<0.01	0.01	-0.03
V671990		10	77.6	14.25	1.09	0.31	0.03	5.84	1.36	<0.01	<0.01	0.05	0.02	<0.01	<0.01	0.19
V671991		3	73.3	15.55	0.57	0.39	0.03	6.05	3.13	<0.01	<0.01	0.04	0.04	<0.01	<0.01	0.22

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	TOT-ICP06	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671967		100.17	<0.5	<5	<0.5	<1	1	1140	<1	3	6	<1	10	10	
V671968		100.96	<0.5	<5	<0.5	<1	<1	250	<1	<1	11	5	10	28	
V671969		101.10	<0.5	<5	<0.5	<1	<1	510	<1	<1	5	17	10	67	
V671970		101.71	<0.5	<5	<0.5	<1	1	40	<1	1	5	1	<10	9	
V671971		100.52	<0.5	<5	<0.5	<1	1	220	<1	<1	13	10	10	69	
V671972		100.76	<0.5	<5	<0.5	<1	1	80	<1	2	28	3	10	37	
V671973		101.97	<0.5	<5	<0.5	<1	1	180	<1	2	43	3	<10	64	
V671974		101.45	<0.5	<5	<0.5	<1	1	320	<1	2	12	18	10	63	
V671975		101.35	<0.5	<5	<0.5	<1	1	170	<1	1	11	8	10	49	
V671976		101.27	<0.5	<5	<0.5	<1	1	80	1	1	31	1	10	15	
V671977		100.78	<0.5	<5	<0.5	1	3	80	<1	2	28	4	<10	43	
V671978		99.57	<0.5	<5	<0.5	<1	2	90	<1	2	18	11	10	55	
V671979		101.43	<0.5	<5	<0.5	<1	1	60	<1	1	29	5	<10	38	
V671980		101.74	<0.5	<5	<0.5	<1	<1	1500	<1	1	8	1	20	34	
V671981		99.41	<0.5	12	<0.5	<1	<1	590	<1	2	26	<1	10	21	
V671982		98.73	<0.5	<5	<0.5	<1	1	8570	1	<1	6	1	20	58	0.849
V671983		98.63	<0.5	<5	<0.5	<1	<1	5570	<1	1	9	<1	10	19	0.614
V671984		98.39	<0.5	<5	<0.5	<1	1	8340	<1	<1	5	<1	20	43	0.844
V671985		100.68	<0.5	<5	<0.5	1	4	90	<1	2	5	1	10	18	
V671986		101.06	<0.5	<5	<0.5	3	3	50	<1	2	32	3	10	17	
V671987		100.55	<0.5	<5	<0.5	1	1	20	<1	1	4	<1	10	62	
V671988		101.16	<0.5	21	<0.5	1	13	190	<1	5	19	2	<10	49	
V671989		98.08	<0.5	7	<0.5	<1	4	>10000	1	2	8	1	<10	13	1.650
V671990		100.74	<0.5	<5	<0.5	<1	2	2540	<1	1	5	1	<10	14	
V671991		99.32	<0.5	<5	<0.5	<1	<1	220	<1	1	11	1	<10	36	

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www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:				
	CRU-31	CRU-QC	LOG-21	LOG-23
	PUL-31	PUL-QC	SPL-21	SPL-21X
	SPL-21Xd	WEI-21		

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:				
	Li-OG63	ME-4ACD81	ME-ICP06	ME-MS81
	ME-OG62o	OA-GRA05	TOT-ICP06	

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Finalized Date: 17-SEP-2017
Account: OPG

CERTIFICATE TB17180529

Project: 0518

This report is for 305 Rock samples submitted to our lab in Thunder Bay, ON, Canada on 25-AUG-2017.

The following have access to data associated with this certificate:

CINDY HU	BILL MERCER	VOLKER MOELLER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
SPL-21X	Addnl Crush Split w No Analysis
SPL-21Xd	Addnl Crush Split with No Analysis-DUP
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um
LOG-21	Sample logging - ClientBarCode
CRU-QC	Crushing QC Test
PUL-QC	Pulverizing QC Test
LOG-23	Pulp Login - Rcvd with Barcode

ANALYTICAL PROCEDURES

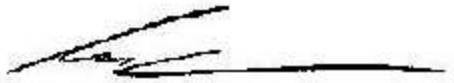
ALS CODE	DESCRIPTION	INSTRUMENT
ME-ICP06	Whole Rock Package - ICP-AES	ICP-AES
OA-GRA05	Loss on Ignition at 1000C	WST-SEQ
ME-MS81	Lithium Borate Fusion ICP-MS	ICP-MS
TOT-ICP06	Total Calculation for ICP06	ICP-AES
ME-4ACD81	Base Metals by 4-acid dig.	ICP-AES
Li-OG63	Ore grade Li - 4ACID	ICP-AES
ME-OG62o	Ore Grade open beaker -ICPAES	ICP-AES

To: AVALON ADVANCED MATERIALS INC.
ATTN: CINDY HU
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:



Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671351		1.19	19.0	11.0	60	10.60	3.73	2.06	0.12	31.6	2.61	1.1	0.62	4.1	0.46	35.8
V671352		0.71	20.9	7.2	330	13.05	3.58	2.28	0.73	17.5	3.02	1.6	0.76	2.5	0.31	1.9
V671353		0.76	54.3	6.7	400	29.9	3.35	2.47	0.66	16.7	2.83	1.3	0.75	2.6	0.36	1.5
V671354		1.19	21.4	8.3	420	2.02	2.13	1.50	0.60	12.5	1.62	1.1	0.45	3.9	0.21	1.5
V671355		1.01	532	33.2	130	9.26	2.22	1.36	0.86	22.2	2.37	3.5	0.47	17.2	0.17	5.3
V671356		0.42	46.2	27.9	10	23.4	8.05	4.74	0.10	22.7	5.06	2.1	1.64	11.7	0.63	21.3
V671357		0.87	19.0	5.7	90	2.94	3.04	1.94	0.54	10.8	2.59	1.0	0.69	2.1	0.26	1.2
V671358		0.57	42.1	46.6	10	13.50	14.30	8.29	0.11	21.1	7.95	4.1	2.86	18.2	1.25	31.1
V671359		0.90	37.1	9.8	170	0.94	4.39	2.90	0.89	18.4	3.59	1.9	0.96	3.6	0.40	2.5
V671360		0.85	55.1	6.1	470	0.95	2.96	1.74	0.60	17.5	2.33	1.3	0.60	2.4	0.23	1.6
V671361		0.51	80.3	13.1	80	3.53	6.29	4.26	1.36	22.6	5.72	3.3	1.42	4.4	0.58	4.7
V671362		0.76	30.2	7.0	290	1.74	2.75	1.80	0.61	16.0	2.21	1.1	0.61	2.7	0.28	1.6
V671363		0.40	208	69.8	10	16.00	12.90	7.21	0.24	17.8	8.69	3.7	2.66	28.1	0.73	31.9
V671364		0.81	262	79.0	20	6.19	7.47	4.79	0.37	23.9	6.62	6.6	1.63	38.8	0.68	24.5
V671365		0.50	794	30.2	10	8.06	4.36	2.56	0.80	20.1	3.03	9.3	0.95	16.3	0.35	17.5
V671366		0.62	442	73.3	10	7.02	4.08	2.62	1.08	21.4	4.42	10.9	0.89	41.9	0.38	19.0
V671367		0.90	988	67.8	10	6.40	3.75	2.27	1.51	21.2	4.12	10.4	0.83	37.8	0.33	20.6
V671368		0.60	509	97.2	10	10.60	7.42	4.86	0.94	20.7	7.17	8.6	1.60	48.6	0.62	19.0
V671369		0.84	228	65.6	20	6.87	7.08	4.81	0.26	21.4	6.43	7.1	1.57	31.4	0.75	22.9
V671370		0.61	274	58.9	10	7.03	4.96	3.05	0.61	17.3	4.60	6.2	0.98	29.1	0.36	16.6
V671371		1.17	97.5	57.2	10	15.70	7.70	3.95	0.14	22.4	6.34	3.7	1.42	22.5	0.48	30.6
V671372		0.78	31.0	17.6	10	25.8	5.74	3.08	0.10	22.8	3.44	1.2	1.11	8.0	0.44	13.7
V671373		0.74	59.8	6.0	450	1.47	2.93	1.91	0.56	15.4	2.20	1.2	0.61	2.1	0.26	1.4
V671374		0.46	55.5	6.3	450	2.34	3.12	2.13	0.66	17.3	2.53	1.2	0.66	2.4	0.27	1.5
V671375		1.15	89.8	15.3	630	1.04	2.96	1.66	0.69	14.3	2.88	2.0	0.60	6.5	0.18	3.6
V671376		1.27	53.8	9.6	170	4.14	4.69	2.88	0.92	19.8	3.69	2.1	0.96	3.2	0.39	2.5
V671377		1.20	118.0	8.4	180	6.18	4.49	2.94	0.93	20.6	3.64	2.1	0.98	3.0	0.43	2.6
V671378		0.93	42.1	18.5	10	31.7	5.90	3.15	0.07	23.8	3.36	1.7	1.13	7.8	0.39	33.0
V671379		0.56	165.5	71.3	10	22.6	8.65	4.80	0.15	20.7	6.64	4.4	1.64	28.5	0.57	48.9
V671380		0.32	132.5	27.9	230	8.42	2.67	1.84	0.91	18.1	2.78	2.0	0.56	13.8	0.26	3.1
V671381		1.21	28.1	6.0	20	5.20	1.50	1.04	0.07	10.0	0.97	0.6	0.31	2.7	0.20	6.0
V671382		0.91	405	64.1	20	6.67	5.76	3.82	0.91	16.2	5.04	8.3	1.22	32.3	0.61	17.1
V671383		1.02	612	41.3	20	9.37	3.47	2.82	0.90	16.9	2.93	7.7	0.83	23.7	0.44	16.0
V671384		0.71	234	84.9	10	20.9	17.15	8.15	0.40	26.4	12.80	2.2	3.16	39.0	0.72	38.7
V671385		0.86	841	33.9	30	5.31	2.63	1.76	0.70	18.8	2.02	6.7	0.58	17.8	0.32	12.0
V671386		0.20	190.0	63.1	10	61.4	14.20	6.23	0.23	23.3	10.45	1.8	2.56	28.4	0.59	38.6
V671387		0.75	340	28.6	70	4.09	6.38	4.07	1.53	19.7	6.27	3.8	1.34	10.5	0.54	10.9
V671388		0.48	993	73.5	10	2.63	7.07	4.59	0.76	20.3	6.28	8.0	1.52	34.9	0.70	22.2
V671389		0.67	50.9	14.2	80	3.14	5.10	3.13	1.08	27.0	4.78	2.4	1.12	5.2	0.48	34.3
V671390		0.75	90.4	10.3	240	0.82	3.78	2.53	1.01	19.4	3.45	1.8	0.84	3.9	0.36	6.4

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Finalized Date: 17-SEP-2017
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CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671351		5.4	1.45	196.5	2.83	1	44.1	6.6	0.62	7.16	0.37	2.30	32	2	24.1	3.17
V671352		5.8	1.14	22.5	2.11	9	105.0	<0.1	0.54	0.32	0.33	0.09	280	50	19.0	2.14
V671353		5.2	1.03	104.5	1.74	13	68.7	<0.1	0.49	0.34	0.33	0.12	273	3	18.6	2.49
V671354		4.9	1.03	6.2	1.26	1	36.1	<0.1	0.30	1.00	0.20	0.31	188	<1	13.2	1.39
V671355		13.4	3.63	68.6	2.63	2	379	<0.1	0.36	4.29	0.18	1.32	154	1	11.1	1.34
V671356		11.5	3.26	570	3.72	9	13.8	3.3	1.24	17.60	0.69	86.8	<5	2	48.9	4.51
V671357		4.7	0.92	9.2	1.68	17	45.0	<0.1	0.46	0.18	0.25	0.22	176	<1	16.9	1.80
V671358		18.4	5.34	582	5.89	6	12.5	2.7	2.04	27.1	1.28	11.75	<5	1	84.5	8.47
V671359		8.0	1.46	5.2	2.68	1	153.5	<0.1	0.69	0.37	0.41	0.16	342	<1	23.7	2.59
V671360		4.9	0.92	9.1	1.74	1	105.5	<0.1	0.42	0.31	0.24	0.13	274	<1	14.6	1.62
V671361		11.1	2.19	28.0	4.17	2	87.5	<0.1	0.89	0.68	0.63	0.35	437	<1	33.6	3.83
V671362		5.0	1.00	3.4	1.64	2	74.0	<0.1	0.42	0.52	0.26	0.08	254	<1	14.8	1.72
V671363		26.0	7.09	418	7.19	8	21.6	2.6	1.87	39.3	0.93	34.5	<5	1	76.0	5.56
V671364		30.1	8.57	182.5	7.20	5	51.8	2.7	1.16	33.2	0.65	8.84	9	1	41.9	4.74
V671365		9.0	2.51	269	2.48	4	45.3	0.7	0.62	19.95	0.33	4.26	<5	<1	21.6	2.22
V671366		27.4	7.62	173.0	4.85	4	68.3	0.9	0.70	18.45	0.33	3.98	5	4	22.2	2.40
V671367		25.7	7.07	206	4.84	4	67.8	1.2	0.59	14.55	0.29	2.22	<5	1	17.6	2.13
V671368		38.0	10.40	160.0	7.65	5	35.7	1.4	1.17	19.85	0.63	4.91	<5	<1	40.8	4.14
V671369		26.8	7.40	316	6.29	8	46.1	2.5	1.18	36.0	0.71	10.10	7	1	41.5	5.10
V671370		22.3	6.28	165.5	4.74	3	57.5	1.2	0.77	17.40	0.37	5.08	<5	<1	24.8	2.40
V671371		20.3	5.74	496	6.19	4	15.6	2.5	1.24	32.9	0.56	9.76	<5	1	42.3	3.70
V671372		6.9	1.91	384	2.37	10	13.0	2.8	0.86	9.57	0.45	5.38	<5	1	34.7	3.16
V671373		4.4	0.88	8.4	1.59	1	110.5	<0.1	0.43	0.31	0.24	0.14	245	<1	15.2	1.70
V671374		4.8	0.97	7.7	1.76	1	72.8	<0.1	0.46	0.27	0.28	0.16	279	<1	16.6	1.84
V671375		9.9	2.15	12.0	2.53	2	333	<0.1	0.46	0.76	0.21	0.17	249	1	13.8	1.40
V671376		7.7	1.54	24.6	2.57	2	72.7	<0.1	0.69	0.35	0.38	0.14	353	<1	23.3	2.75
V671377		7.3	1.36	45.3	2.74	3	91.8	<0.1	0.63	0.29	0.40	0.10	329	1	23.3	2.78
V671378		7.4	2.16	762	2.54	9	11.0	5.8	0.86	12.55	0.47	7.59	<5	1	32.6	2.88
V671379		26.0	7.79	769	6.83	8	18.9	5.4	1.38	41.8	0.61	23.9	<5	1	50.0	4.21
V671380		12.5	3.32	83.5	2.74	3	155.5	0.2	0.48	2.73	0.27	0.80	238	205	15.8	1.77
V671381		2.6	0.74	148.0	0.89	2	17.4	3.2	0.21	3.59	0.19	2.22	<5	1	10.1	1.47
V671382		27.3	7.48	113.5	5.60	3	185.5	1.3	0.91	15.05	0.57	3.35	13	2	33.4	3.93
V671383		14.4	4.31	199.5	2.84	3	126.0	1.2	0.51	16.75	0.43	3.81	13	2	22.7	2.90
V671384		35.7	10.15	433	10.35	14	41.9	6.4	2.78	30.0	1.08	15.45	<5	2	96.4	5.81
V671385		10.4	3.17	114.0	2.07	3	209	1.0	0.37	15.50	0.25	3.98	45	2	15.1	1.76
V671386		26.9	7.55	754	8.23	21	24.2	9.7	2.37	22.1	0.82	14.20	<5	2	80.7	4.66
V671387		19.5	4.19	44.1	5.31	2	192.0	0.8	1.01	4.97	0.58	1.44	383	1	34.8	3.80
V671388		28.6	7.93	167.0	6.00	5	32.0	1.7	1.13	21.7	0.70	5.58	<5	2	42.0	4.48
V671389		11.0	2.24	22.3	3.49	19	41.4	7.8	0.83	0.62	0.49	0.70	356	2	29.8	3.28
V671390		8.8	1.65	6.3	2.79	1	129.5	0.3	0.61	0.42	0.36	0.16	367	1	21.1	2.27

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671351		18	73.2	14.65	2.49	2.77	0.92	4.93	0.93	0.01	0.11	0.17	0.22	<0.01	<0.01	0.49
V671352		55	47.7	15.10	13.20	11.75	7.01	1.46	0.18	0.04	0.88	0.20	0.06	0.01	<0.01	0.72
V671353		43	47.4	15.55	16.00	11.20	4.30	1.32	0.43	0.05	0.72	0.53	0.05	<0.01	0.01	0.79
V671354		39	37.1	10.45	39.1	4.51	4.67	0.41	0.24	0.05	0.49	1.93	0.03	<0.01	<0.01	1.03
V671355		132	62.6	16.85	9.33	2.81	2.57	2.15	2.12	0.02	0.65	0.12	0.08	0.04	0.06	1.78
V671356		41	77.3	13.55	1.15	0.77	0.08	4.09	4.18	<0.01	0.03	0.05	0.03	<0.01	0.01	0.34
V671357		33	48.1	7.61	15.65	19.30	8.16	0.71	0.25	0.01	0.54	0.66	0.06	<0.01	<0.01	0.17
V671358		87	77.3	13.05	1.69	0.64	0.10	3.57	4.77	<0.01	0.05	0.07	0.04	<0.01	0.01	0.21
V671359		68	47.7	13.65	14.40	11.70	5.72	2.53	0.33	0.02	1.12	0.23	0.09	0.02	<0.01	0.51
V671360		41	52.9	16.75	9.02	11.80	4.74	1.90	0.23	0.06	0.75	0.20	0.06	0.01	0.01	0.67
V671361		113	51.8	14.05	15.20	10.20	3.97	1.83	0.39	0.01	1.71	0.27	0.14	0.01	0.01	0.73
V671362		37	47.9	15.95	12.50	10.90	7.92	1.93	0.13	0.04	0.69	0.20	0.05	0.01	<0.01	0.49
V671363		98	77.8	11.80	1.77	0.30	0.19	2.49	5.50	<0.01	0.10	0.02	0.03	<0.01	0.03	0.46
V671364		200	74.4	13.20	2.66	1.85	0.51	3.79	2.34	<0.01	0.15	0.07	0.04	<0.01	0.03	0.83
V671365		307	78.4	11.35	1.94	0.23	0.33	1.96	5.56	<0.01	0.12	0.02	0.01	<0.01	0.09	0.64
V671366		366	77.1	11.60	2.21	1.19	0.53	2.99	2.81	<0.01	0.15	0.03	0.02	0.01	0.05	0.66
V671367		390	76.7	11.85	1.54	0.54	0.19	2.42	4.98	<0.01	0.15	0.03	0.02	0.01	0.12	0.80
V671368		285	78.0	12.00	2.26	1.22	0.31	3.52	2.53	<0.01	0.12	0.10	0.02	<0.01	0.06	0.39
V671369		189	76.3	12.80	2.16	0.62	0.50	2.58	5.72	<0.01	0.12	0.05	0.02	<0.01	0.03	0.70
V671370		197	78.5	12.45	2.11	2.25	0.30	3.32	1.82	<0.01	0.14	0.04	0.02	0.01	0.04	0.96
V671371		88	77.0	13.10	1.59	0.65	0.13	3.20	4.82	<0.01	0.07	0.04	0.01	<0.01	0.01	0.42
V671372		25	77.1	12.95	1.00	0.91	0.04	4.04	3.52	<0.01	0.02	0.04	0.02	<0.01	<0.01	0.20
V671373		41	53.5	16.15	10.35	12.20	4.61	1.52	0.14	0.06	0.71	0.21	0.05	0.01	0.01	0.79
V671374		41	49.9	15.85	12.35	12.40	6.10	1.79	0.18	0.06	0.74	0.25	0.05	0.01	0.01	0.80
V671375		65	59.4	9.80	9.94	11.10	4.66	2.29	0.24	0.08	1.07	0.32	0.08	0.04	0.01	0.53
V671376		70	46.6	14.40	15.85	12.75	7.80	1.43	0.23	0.02	1.17	0.22	0.08	0.01	0.01	1.08
V671377		71	47.4	16.65	16.40	10.90	5.08	2.50	0.52	0.02	1.23	0.26	0.08	0.01	0.01	0.79
V671378		34	75.0	13.85	1.09	0.55	0.10	3.58	5.67	<0.01	0.03	0.03	0.03	<0.01	<0.01	0.62
V671379		115	76.1	12.75	1.70	0.49	0.17	3.02	5.06	<0.01	0.09	0.03	0.04	<0.01	0.02	0.64
V671380		79	56.5	15.85	12.35	6.99	4.07	1.11	0.73	0.03	0.84	0.26	0.09	0.02	0.02	1.44
V671381		11	89.4	6.76	0.75	0.33	0.09	2.44	1.48	<0.01	0.01	0.02	<0.01	<0.01	<0.01	0.39
V671382		323	77.8	11.55	3.15	1.72	0.55	3.38	1.30	<0.01	0.23	0.10	0.04	0.02	0.04	0.58
V671383		301	76.3	12.95	2.27	1.66	0.24	3.80	2.62	<0.01	0.27	0.04	0.04	0.01	0.07	0.47
V671384		63	72.4	14.95	1.68	0.66	0.24	3.77	5.26	<0.01	0.10	0.03	0.03	0.01	0.03	0.82
V671385		279	70.6	14.00	5.27	2.73	1.20	3.03	2.60	<0.01	0.39	0.08	0.09	0.03	0.09	1.21
V671386		46	73.6	13.80	1.86	0.62	0.15	3.52	5.40	<0.01	0.08	0.03	0.03	<0.01	0.02	0.37
V671387		142	53.8	12.65	13.50	8.28	4.51	1.66	1.00	0.01	1.73	0.25	0.17	0.02	0.04	1.86
V671388		245	77.6	12.15	2.13	0.37	0.47	2.44	5.80	<0.01	0.11	0.03	0.01	<0.01	0.11	0.63
V671389		87	48.2	11.90	20.1	11.10	3.97	1.10	0.33	0.01	1.26	0.43	0.22	<0.01	0.01	0.75
V671390		61	51.4	15.75	13.85	11.10	3.54	2.33	0.16	0.03	1.28	0.25	0.08	0.02	0.01	0.58

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	TOT-ICP06	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671351		100.89	<0.5	<5	<0.5	6	27	60	<1	18	7	6	<10	34	
V671352		98.31	<0.5	<5	<0.5	51	112	190	<1	141	<2	41	<10	108	
V671353		98.35	<0.5	113	0.6	60	130	210	<1	171	<2	50	<10	222	
V671354		100.01	<0.5	1125	<0.5	12	26	40	<1	37	3	32	<10	171	
V671355		101.18	<0.5	42	<0.5	16	59	140	1	35	10	20	<10	110	
V671356		101.58	<0.5	36	<0.5	<1	1	40	<1	3	40	2	<10	39	
V671357		101.22	<0.5	<5	0.6	34	3	30	<1	70	<2	23	<10	92	
V671358		101.50	<0.5	10	<0.5	<1	1	60	<1	1	46	3	10	57	
V671359		98.02	<0.5	<5	<0.5	47	129	40	<1	78	<2	45	<10	119	
V671360		99.10	<0.5	<5	<0.5	53	121	30	<1	171	<2	45	<10	79	
V671361		100.32	<0.5	5	<0.5	45	119	50	1	52	<2	48	<10	140	
V671362		98.71	<0.5	<5	<0.5	57	127	40	<1	177	<2	35	<10	94	
V671363		100.49	<0.5	64	<0.5	1	2	40	1	2	61	3	10	46	
V671364		99.87	<0.5	10	<0.5	1	16	60	1	6	31	4	<10	123	
V671365		100.65	<0.5	10	<0.5	<1	5	50	1	1	29	1	<10	59	
V671366		99.35	<0.5	<5	<0.5	<1	6	50	<1	4	23	2	<10	90	
V671367		99.35	<0.5	<5	<0.5	<1	2	40	<1	1	35	1	<10	40	
V671368		100.53	<0.5	7	<0.5	<1	4	50	3	3	23	1	<10	87	
V671369		101.60	<0.5	7	<0.5	1	6	50	1	2	51	4	10	65	
V671370		101.96	<0.5	9	<0.5	1	1	40	<1	2	19	2	<10	77	
V671371		101.04	<0.5	13	<0.5	<1	1	90	<1	<1	45	3	<10	54	
V671372		99.84	<0.5	10	<0.5	<1	<1	40	<1	<1	35	2	10	23	
V671373		100.31	<0.5	6	<0.5	54	80	30	<1	173	<2	40	<10	129	
V671374		100.49	<0.5	6	<0.5	49	203	40	<1	164	<2	46	<10	88	
V671375		99.56	<0.5	5	<0.5	61	84	20	<1	181	6	33	<10	72	
V671376		101.65	<0.5	6	<0.5	47	67	60	1	78	<2	38	<10	136	
V671377		101.85	<0.5	6	<0.5	56	54	60	<1	117	<2	41	10	116	
V671378		100.55	<0.5	5	<0.5	<1	1	30	<1	1	38	2	10	36	
V671379		100.11	<0.5	9	<0.5	<1	3	90	<1	1	52	3	10	65	
V671380		100.30	<0.5	78	0.5	52	161	50	1	146	2	31	<10	154	
V671381		101.67	<0.5	<5	<0.5	<1	1	40	1	1	8	1	<10	7	
V671382		100.46	<0.5	<5	<0.5	1	9	50	1	3	17	4	<10	78	
V671383		100.74	<0.5	689	<0.5	<1	8	30	<1	2	20	4	10	51	
V671384		99.98	<0.5	164	<0.5	1	2	30	<1	3	37	3	<10	66	
V671385		101.32	<0.5	15	<0.5	2	18	50	3	6	19	7	<10	77	
V671386		99.48	<0.5	53	<0.5	<1	1	40	<1	2	42	2	10	64	
V671387		99.48	<0.5	40	0.5	31	11	50	<1	34	3	34	10	180	
V671388		101.85	<0.5	25	<0.5	<1	4	70	<1	<1	22	1	<10	72	
V671389		99.38	<0.5	24	0.5	42	80	60	<1	41	<2	31	<10	189	
V671390		100.38	<0.5	5	<0.5	58	155	40	<1	118	<2	42	<10	120	

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671391		0.57	56.8	22.5	10	10.10	4.28	3.02	0.10	19.6	2.52	2.7	0.93	10.1	0.49	12.6
V671392		0.66	199.0	70.8	10	22.7	7.35	3.30	0.22	22.2	7.25	4.2	1.21	31.2	0.33	55.9
V671393		0.73	12.4	15.3	20	16.70	2.57	1.12	0.10	27.9	1.94	0.6	0.42	7.6	0.10	28.1
V671394		0.73	388	5.1	380	12.20	2.36	1.58	0.52	14.0	2.19	1.1	0.52	1.8	0.24	1.4
V671395		0.69	137.0	10.7	200	14.95	4.23	2.60	1.06	18.4	3.81	2.2	0.92	4.0	0.41	3.0
V671396		0.81	18.4	32.0	10	9.24	9.70	4.37	<0.03	38.1	5.51	3.8	1.63	10.1	0.72	123.5
V671397		0.90	98.9	5.4	390	32.9	2.65	1.54	0.66	13.8	2.25	1.1	0.61	2.1	0.26	1.5
V671398		0.87	84.3	4.8	370	608	2.82	1.88	0.49	16.7	2.46	1.0	0.58	1.6	0.28	2.2
V671399		0.77	102.0	22.9	60	23.2	7.52	4.76	2.15	20.2	7.14	4.0	1.62	8.9	0.73	5.7
V671400		0.68	61.0	6.9	310	4.82	3.74	2.09	0.80	16.6	3.04	1.7	0.78	2.3	0.34	1.7
V671401		0.54	60.6	8.5	120	5.07	4.30	2.78	0.99	18.1	3.64	1.9	0.89	3.0	0.39	2.2
V671402		0.73	37.9	6.8	260	1.74	3.27	2.13	0.85	17.4	3.04	1.5	0.75	2.4	0.30	1.5
V671403		0.77	36.4	7.2	360	1.10	3.61	2.38	0.83	16.5	2.84	1.5	0.78	2.6	0.34	1.4
V671404		0.83	38.5	8.3	120	1.35	3.90	2.54	1.00	18.3	3.61	1.8	0.86	2.8	0.36	2.2
V671405		1.00	29.3	8.9	160	1.62	4.10	2.61	0.93	17.8	3.53	1.8	0.90	3.3	0.40	2.1
V671406		0.92	30.9	17.2	420	0.79	2.78	1.56	0.93	15.2	3.03	1.7	0.56	7.5	0.21	3.6
V671407		0.99	54.4	14.2	50	1.17	6.52	4.61	1.35	20.3	5.57	3.1	1.43	5.1	0.67	5.2
V671408		0.75	19.1	9.1	180	2.53	3.98	2.62	0.93	19.3	3.62	1.8	0.92	3.4	0.38	2.1
V671409		0.81	51.8	8.6	340	0.50	3.84	2.49	0.87	18.2	3.33	1.6	0.85	3.3	0.37	2.0
V671410		0.61	544	85.2	10	9.86	6.42	4.32	1.33	20.0	6.30	8.0	1.41	42.7	0.67	18.8
V671411		0.61	1055	80.1	10	3.37	6.04	4.02	0.94	19.5	5.48	8.2	1.36	36.7	0.63	18.7
V671412		0.98	449	50.3	50	6.74	3.42	2.25	0.89	20.8	3.46	5.7	0.73	25.3	0.38	14.6
V671413		0.43	1080	60.0	10	6.55	5.99	4.23	1.05	19.1	4.35	8.1	1.33	27.6	0.59	18.1
V671414		0.62	890	99.3	10	3.69	6.33	3.73	1.28	17.8	6.29	7.4	1.33	50.4	0.56	17.5
V671415		0.80	900	101.0	10	16.20	7.03	4.43	1.32	22.3	6.74	8.6	1.50	49.2	0.60	19.9
V671416		0.50	901	83.5	10	3.97	7.64	5.11	1.28	22.8	6.23	9.4	1.70	41.9	0.73	20.8
V671417		1.22	85.8	16.8	70	0.92	5.76	3.84	1.37	20.7	5.15	3.1	1.28	6.3	0.54	5.6
V671418		0.86	202	78.5	10	18.60	8.31	4.83	0.18	21.3	6.22	4.4	1.64	32.9	0.66	54.8
V671419		1.21	176.5	94.5	10	10.50	9.98	5.34	0.25	22.3	7.93	5.0	1.94	41.9	0.69	37.8
V671420		0.82	43.2	6.6	410	2.51	2.76	1.86	0.68	16.6	2.25	1.1	0.62	2.5	0.30	2.1
V671421		0.29	3.7	4.8	10	137.0	1.41	0.55	<0.03	19.6	0.75	0.2	0.26	2.6	0.06	8.5
V671422		0.43	12.1	5.3	10	70.9	1.73	0.51	0.03	36.6	1.16	0.8	0.24	2.1	0.03	47.2
V671423		0.54	9.9	14.1	10	93.7	3.44	0.86	<0.03	40.5	2.84	7.2	0.39	4.2	0.06	91.6
V671424		0.71	23.2	20.2	10	100.5	6.89	3.96	0.07	25.0	3.78	1.5	1.32	8.5	0.57	19.9
V671425		0.73	125.5	13.2	150	1.73	5.25	3.47	1.27	23.0	4.70	2.7	1.15	5.0	0.51	4.3
V671426		0.50	19.8	21.3	10	34.1	5.33	2.94	0.06	28.4	3.31	1.6	1.07	9.3	0.52	17.8
V671427		0.61	97.2	12.0	200	2.57	5.77	4.05	1.34	23.2	4.77	2.9	1.29	4.5	0.57	4.8
V671428		0.94	54.2	7.1	260	12.05	3.81	2.39	0.77	20.9	2.75	1.2	0.78	2.9	0.39	3.0
V671429		0.55	26.7	6.2	200	3.27	2.83	2.02	0.64	17.4	2.60	1.1	0.67	2.2	0.28	1.6
V671430		0.63	19.7	5.1	380	1.42	2.38	1.64	0.52	14.9	2.14	1.0	0.58	1.7	0.24	1.4

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671391		8.1	2.54	421	2.44	5	10.3	2.5	0.61	20.5	0.48	29.9	<5	1	28.0	3.40
V671392		27.2	8.21	812	7.24	8	22.2	6.1	1.28	45.4	0.42	31.4	5	1	40.1	2.36
V671393		5.6	1.66	333	1.75	8	7.6	3.4	0.43	5.95	0.13	3.10	<5	1	15.3	0.92
V671394		4.5	0.86	27.9	1.48	1	71.7	0.1	0.36	0.33	0.25	0.19	240	1	13.7	1.55
V671395		8.7	1.72	94.9	3.17	3	114.5	0.3	0.73	0.50	0.40	0.19	317	1	23.8	2.48
V671396		15.7	4.26	532	5.93	5	6.9	23.9	1.44	13.65	0.72	7.05	<5	2	58.9	5.36
V671397		4.7	0.92	60.8	1.75	13	75.9	0.2	0.40	0.21	0.26	0.10	250	1	15.3	1.74
V671398		4.2	0.84	1615	1.70	67	39.6	2.1	0.41	0.21	0.27	0.08	247	1	16.0	1.69
V671399		17.5	3.54	36.5	5.61	2	60.3	0.4	1.25	0.84	0.75	0.28	496	2	41.9	4.45
V671400		6.2	1.22	20.0	2.36	1	88.2	0.1	0.58	0.27	0.33	0.08	307	1	19.9	2.22
V671401		7.9	1.49	12.1	2.62	1	114.0	0.2	0.69	0.31	0.40	0.08	327	1	22.9	2.58
V671402		5.8	1.10	6.2	1.97	1	76.7	0.1	0.56	0.24	0.33	0.06	302	<1	19.0	2.25
V671403		6.1	1.20	6.5	2.02	1	96.8	0.1	0.55	0.27	0.35	0.09	300	1	19.6	2.10
V671404		7.7	1.43	15.4	2.54	1	101.5	0.1	0.66	0.30	0.38	0.09	325	1	22.1	2.38
V671405		7.7	1.45	11.4	2.61	1	106.5	0.1	0.64	0.31	0.41	0.37	325	2	22.8	2.41
V671406		10.8	2.43	12.3	2.78	1	84.5	0.2	0.49	0.74	0.23	0.13	238	1	14.5	1.47
V671407		12.1	2.30	14.7	3.96	6	79.8	0.3	1.05	0.61	0.69	0.22	428	3	38.5	4.54
V671408		7.7	1.56	6.3	2.46	1	112.0	0.1	0.62	0.31	0.40	0.11	339	1	22.7	2.57
V671409		7.6	1.46	12.7	2.62	1	105.5	0.1	0.58	0.30	0.38	0.08	324	1	21.7	2.30
V671410		34.5	9.82	113.5	6.81	3	115.0	1.4	1.08	18.95	0.62	3.88	12	2	37.1	4.17
V671411		30.0	8.28	141.0	5.70	4	84.0	1.5	0.98	19.30	0.64	4.54	7	2	35.5	4.12
V671412		21.4	5.94	135.0	4.12	6	166.0	1.7	0.59	16.60	0.37	4.38	74	2	20.0	2.41
V671413		23.5	6.36	223	4.78	4	26.5	1.5	0.83	21.0	0.63	5.80	<5	1	38.3	4.04
V671414		39.5	11.00	121.0	7.20	4	50.4	1.3	1.01	17.90	0.53	4.37	9	3	36.8	3.41
V671415		39.3	10.50	221	7.32	7	132.5	1.5	1.10	20.1	0.64	4.56	<5	1	41.5	4.25
V671416		32.2	8.72	135.0	6.36	4	97.8	1.7	1.10	21.6	0.77	5.20	<5	2	48.7	5.16
V671417		13.8	2.60	14.6	3.97	1	126.5	0.7	0.88	0.79	0.51	0.20	395	2	33.8	3.59
V671418		28.2	8.34	725	6.70	7	24.6	4.5	1.24	48.0	0.72	16.00	<5	1	51.4	4.51
V671419		38.1	10.90	654	8.74	4	25.1	3.9	1.55	52.2	0.76	38.4	<5	3	60.6	5.04
V671420		5.5	1.01	19.1	1.70	5	112.5	0.3	0.42	0.41	0.28	0.18	292	1	17.3	1.86
V671421		1.3	0.45	472	0.49	19	6.1	5.6	0.19	2.89	0.07	1.06	<5	3	7.9	0.72
V671422		2.1	0.60	199.5	1.04	699	6.2	93.7	0.30	11.25	0.06	3.20	<5	3	9.7	0.55
V671423		6.8	1.90	219	3.12	1350	3.0	92.2	0.68	27.7	0.10	19.75	<5	7	18.4	0.88
V671424		8.4	2.27	797	2.92	17	11.4	6.6	1.00	12.00	0.59	5.35	<5	3	42.6	3.99
V671425		11.1	2.06	7.2	3.56	2	113.5	0.5	0.79	0.65	0.50	0.26	443	<1	31.0	3.38
V671426		8.6	2.51	594	3.03	13	11.8	7.5	0.79	13.70	0.51	3.54	<5	2	32.6	3.85
V671427		9.8	1.92	15.0	3.48	1	135.0	0.4	0.86	0.68	0.56	0.21	517	<1	34.7	3.71
V671428		5.8	1.11	46.4	2.07	7	97.7	0.5	0.47	0.32	0.35	0.14	333	1	22.3	2.41
V671429		5.3	0.95	4.5	1.85	1	103.0	0.1	0.46	0.19	0.28	0.13	280	1	17.1	2.01
V671430		4.2	0.79	2.0	1.45	1	98.7	0.1	0.35	0.14	0.22	0.05	253	1	14.5	1.71

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671391		61	78.2	12.40	1.12	0.74	0.07	4.00	3.18	<0.01	0.02	0.06	0.02	<0.01	0.01	0.74
V671392		113	76.6	13.20	1.83	0.61	0.15	3.34	4.84	<0.01	0.10	0.02	0.03	<0.01	0.02	0.60
V671393		13	78.4	13.25	1.22	0.97	0.06	5.30	1.96	<0.01	0.04	0.03	0.02	<0.01	<0.01	0.54
V671394		36	49.6	15.60	12.80	9.00	7.24	2.31	0.31	0.06	0.69	0.36	0.05	0.01	0.04	0.66
V671395		76	48.4	14.90	15.25	10.10	4.06	2.08	0.55	0.03	1.28	0.45	0.09	0.01	0.02	0.83
V671396		59	76.6	14.05	1.52	0.25	0.04	4.35	3.65	<0.01	<0.01	0.17	0.03	<0.01	<0.01	0.51
V671397		36	49.4	15.25	14.25	10.75	6.96	0.91	0.31	0.06	0.68	0.38	0.04	0.01	0.01	0.90
V671398		35	45.4	14.20	15.65	10.20	8.28	0.90	1.60	0.05	0.62	0.45	0.05	<0.01	0.01	1.06
V671399		141	53.8	15.20	23.3	1.09	2.57	0.17	0.44	0.01	2.15	1.06	0.17	0.01	0.01	1.08
V671400		57	48.4	14.80	13.60	11.60	6.34	1.42	0.32	0.04	0.92	0.21	0.06	0.01	0.01	1.14
V671401		65	48.0	14.25	15.15	9.84	7.55	2.07	0.28	0.02	1.10	0.21	0.08	0.01	0.01	0.75
V671402		51	49.7	15.60	13.55	11.90	4.67	1.48	0.26	0.04	0.91	0.25	0.06	0.01	<0.01	0.75
V671403		48	51.7	15.95	12.70	11.50	4.75	1.41	0.29	0.05	0.83	0.20	0.05	0.01	<0.01	0.97
V671404		65	46.7	14.00	14.75	10.35	7.36	2.12	0.33	0.02	1.11	0.22	0.08	0.01	<0.01	1.05
V671405		62	50.7	14.90	12.90	11.70	4.02	1.27	0.26	0.02	1.07	0.19	0.07	0.01	<0.01	1.48
V671406		63	46.3	8.92	20.3	10.85	8.01	1.05	0.25	0.06	0.99	0.37	0.08	0.01	<0.01	0.84
V671407		106	41.6	11.35	23.4	9.51	5.29	1.84	0.44	0.01	1.57	0.42	0.15	0.01	0.01	2.69
V671408		62	49.5	14.60	13.95	10.70	6.53	1.44	0.22	0.02	0.98	0.19	0.08	0.01	<0.01	1.24
V671409		58	47.6	15.95	12.60	12.00	5.63	1.67	0.32	0.04	0.96	0.18	0.07	0.01	0.01	1.22
V671410		277	75.7	11.85	2.40	1.97	2.07	2.62	1.80	<0.01	0.18	0.03	0.03	0.01	0.06	1.12
V671411		292	76.7	11.95	2.45	1.14	0.48	2.83	3.65	<0.01	0.17	0.05	0.02	0.01	0.11	0.74
V671412		199	69.2	13.40	4.36	3.28	1.24	2.20	3.41	0.01	0.50	0.12	0.11	0.02	0.05	2.84
V671413		273	78.2	11.45	1.88	0.31	0.54	1.36	6.69	<0.01	0.12	0.03	0.02	<0.01	0.12	0.51
V671414		251	77.4	11.30	2.53	0.43	0.48	3.04	4.13	<0.01	0.20	0.03	0.03	0.01	0.10	0.53
V671415		295	76.3	12.20	2.34	2.42	0.70	0.82	5.93	<0.01	0.14	0.06	0.01	0.01	0.10	0.84
V671416		324	75.4	13.05	2.72	2.63	1.18	1.99	3.16	<0.01	0.14	0.07	0.01	0.01	0.10	1.20
V671417		114	49.5	12.60	19.80	10.95	3.41	1.03	0.28	0.01	1.74	0.53	0.15	0.01	0.01	0.19
V671418		127	76.7	13.05	1.97	0.60	0.15	3.16	5.00	<0.01	0.09	0.03	0.03	<0.01	0.02	0.53
V671419		139	74.7	13.05	1.84	0.76	0.15	2.99	5.24	<0.01	0.10	0.03	0.03	<0.01	0.02	0.57
V671420		40	49.7	16.15	14.65	11.85	5.23	1.37	0.33	0.06	0.73	0.42	0.04	0.01	<0.01	0.57
V671421		4	83.8	10.20	0.58	0.48	0.03	4.42	0.96	<0.01	0.01	0.02	0.01	<0.01	<0.01	0.34
V671422		5	73.0	16.05	0.44	0.73	0.03	8.27	0.42	<0.01	<0.01	0.03	0.20	<0.01	<0.01	0.33
V671423		53	74.4	15.75	0.53	0.37	0.01	8.37	0.44	<0.01	<0.01	0.06	0.14	<0.01	<0.01	0.36
V671424		27	77.8	13.50	1.03	0.70	0.04	4.13	3.87	<0.01	0.02	0.08	0.03	<0.01	<0.01	0.52
V671425		93	50.1	15.80	15.10	10.45	2.85	1.56	0.31	0.02	1.45	0.60	0.10	0.01	0.01	0.26
V671426		24	75.0	13.65	0.88	0.76	0.07	4.05	3.92	<0.01	0.01	0.06	0.02	<0.01	<0.01	0.60
V671427		110	53.4	15.10	15.90	7.24	2.84	2.42	0.48	0.03	1.59	0.57	0.13	0.01	0.01	0.04
V671428		47	49.0	17.10	14.10	10.60	3.38	1.42	0.56	0.03	0.66	0.28	0.04	0.01	0.01	1.04
V671429		38	50.4	14.10	12.75	11.35	7.16	2.02	0.12	0.03	0.70	0.21	0.05	0.01	<0.01	0.96
V671430		35	49.8	14.40	11.80	12.20	7.40	2.12	0.08	0.05	0.66	0.20	0.04	0.01	<0.01	0.74

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	TOT-ICP06	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671391		100.56	<0.5	8	<0.5	<1	2	50	<1	2	31	3	<10	21	
V671392		101.34	<0.5	5	<0.5	1	1	100	2	3	49	3	10	69	
V671393		101.79	<0.5	<5	<0.5	<1	1	60	<1	2	20	2	<10	38	
V671394		98.73	<0.5	<5	<0.5	48	21	50	<1	157	<2	38	<10	97	
V671395		98.05	<0.5	18	<0.5	47	22	70	<1	99	<2	38	<10	120	
V671396		101.17	<0.5	103	<0.5	<1	1	20	<1	2	9	7	<10	98	
V671397		99.91	<0.5	229	<0.5	50	21	60	<1	171	<2	43	<10	106	
V671398		98.47	<0.5	532	0.5	47	1	280	<1	152	<2	36	20	117	
V671399		101.06	<0.5	5	<0.5	20	49	70	<1	25	<2	51	10	96	
V671400		98.87	<0.5	7	<0.5	46	47	60	<1	118	3	37	<10	109	
V671401		99.32	<0.5	<5	<0.5	53	57	30	<1	118	<2	36	<10	72	
V671402		99.18	<0.5	12	<0.5	54	46	20	<1	147	<2	42	10	109	
V671403		100.41	<0.5	6	<0.5	41	19	30	<1	144	<2	39	<10	74	
V671404		98.10	<0.5	<5	<0.5	41	17	30	<1	93	<2	34	<10	86	
V671405		98.59	<0.5	<5	<0.5	50	32	30	<1	109	<2	44	<10	59	
V671406		98.03	<0.5	<5	0.5	65	<1	20	<1	155	<2	29	<10	90	
V671407		98.29	<0.5	<5	<0.5	42	61	50	<1	41	2	41	<10	112	
V671408		99.46	<0.5	<5	<0.5	48	291	30	<1	108	<2	40	<10	87	
V671409		98.26	<0.5	<5	<0.5	49	107	20	<1	127	<2	43	<10	81	
V671410		99.84	<0.5	<5	<0.5	1	6	60	3	2	28	2	<10	81	
V671411		100.30	<0.5	33	<0.5	1	13	30	<1	2	23	2	<10	81	
V671412		100.74	<0.5	7	<0.5	8	73	40	2	13	36	10	<10	190	
V671413		101.23	<0.5	<5	<0.5	<1	3	40	<1	2	23	1	10	75	
V671414		100.21	<0.5	36	<0.5	1	6	40	1	3	24	2	<10	69	
V671415		101.87	<0.5	8	<0.5	1	2	40	<1	1	29	1	<10	99	
V671416		101.66	<0.5	<5	<0.5	<1	2	50	<1	<1	24	2	<10	120	
V671417		100.21	<0.5	105	<0.5	46	90	40	<1	39	<2	40	<10	131	
V671418		101.33	<0.5	6	<0.5	<1	1	70	<1	2	48	3	<10	69	
V671419		99.48	<0.5	<5	<0.5	<1	4	60	1	1	66	3	10	42	
V671420		101.11	<0.5	5	<0.5	46	31	100	<1	156	<2	41	<10	83	
V671421		100.85	<0.5	9	<0.5	<1	1	190	<1	1	9	<1	10	18	
V671422		99.50	<0.5	16	<0.5	<1	<1	110	<1	1	8	<1	<10	21	
V671423		100.43	<0.5	14	<0.5	<1	<1	250	<1	2	7	1	<10	18	
V671424		101.72	<0.5	16	<0.5	<1	1	380	<1	<1	30	2	10	35	
V671425		98.62	<0.5	30	<0.5	48	28	80	<1	100	<2	43	<10	147	
V671426		99.02	<0.5	<5	<0.5	<1	1	60	<1	1	27	2	<10	19	
V671427		99.76	<0.5	36	<0.5	38	75	20	<1	68	<2	46	10	95	
V671428		98.23	<0.5	7	<0.5	53	484	170	<1	139	<2	38	10	110	
V671429		99.86	<0.5	6	<0.5	46	92	40	<1	126	<2	41	<10	100	
V671430		99.50	<0.5	7	<0.5	44	128	20	<1	134	<2	33	<10	79	

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671431		1.12	18.9	6.0	210	0.76	3.03	1.98	0.62	16.2	2.51	1.2	0.71	2.2	0.27	1.7
V671432		0.61	57.7	6.2	220	4.04	2.95	1.98	0.68	18.1	2.42	1.2	0.66	2.5	0.30	2.3
V671433		0.73	41.8	8.1	330	1.24	3.53	2.37	0.94	18.7	2.97	1.5	0.76	3.1	0.33	2.4
V671434		0.95	73.3	13.9	120	2.69	5.47	3.49	1.26	20.9	4.41	2.7	1.24	5.2	0.51	4.3
V671435		0.77	42.2	8.4	170	1.05	3.75	2.20	0.81	20.2	3.07	1.7	0.82	2.9	0.33	2.4
V671436		0.90	41.8	6.4	310	1.17	3.12	2.08	0.80	19.3	2.53	1.3	0.67	2.3	0.32	2.1
V671437		0.60	31.3	40.2	10	4.63	9.13	8.58	0.12	23.4	4.81	0.5	2.27	17.7	1.88	7.3
V671438		0.92	22.6	8.1	290	0.67	3.90	2.51	0.79	18.9	3.09	1.5	0.84	3.0	0.37	2.3
V671439		0.70	20.2	6.2	210	0.77	2.87	2.05	0.60	17.0	2.56	1.2	0.66	2.2	0.28	1.7
V671440		0.75	23.1	5.5	410	1.22	2.70	1.79	0.60	15.9	2.25	1.0	0.61	2.0	0.25	1.4
V671441		0.88	62.9	10.3	520	34.3	3.26	2.27	0.87	16.3	2.77	1.3	0.74	4.2	0.32	3.0
V671442		0.74	33.1	6.2	470	4.58	2.93	2.03	0.68	18.3	2.54	1.1	0.67	2.2	0.30	1.7
V671443		1.02	78.5	7.1	350	8.33	3.53	2.35	0.96	18.5	2.99	1.5	0.72	2.4	0.33	2.7
V671444		0.62	51.5	7.5	380	1.70	3.55	2.30	0.74	18.6	2.96	1.3	0.81	2.8	0.37	2.1
V671445		0.77	43.6	26.0	10	7.88	21.1	16.60	0.14	37.5	10.65	2.9	4.87	9.8	3.08	22.9
V671446		0.90	39.0	15.7	70	9.24	7.43	4.92	1.34	24.4	5.93	3.3	1.70	5.8	0.72	5.6
V671447		1.29	326	23.2	260	15.75	2.87	1.85	0.86	21.0	2.48	2.3	0.57	11.3	0.25	3.7
V671448		1.03	7.4	10.3	30	1.87	1.62	1.27	0.56	4.2	1.57	0.3	0.41	5.7	0.19	0.5
V671449		0.67	113.5	5.2	370	102.5	2.51	1.72	0.58	14.7	2.01	1.1	0.53	1.9	0.23	1.4
V671450		0.90	14.3	11.5	10	13.75	2.91	1.25	0.10	20.9	2.42	1.9	0.48	4.1	0.20	20.2
V671551		0.85	72.1	9.3	340	8.57	3.00	2.05	0.71	17.8	2.92	1.5	0.66	3.2	0.29	2.1
V671552		0.81	35.4	7.5	340	2.61	3.26	2.19	0.78	15.7	2.74	1.4	0.74	2.6	0.36	1.9
V671553		0.52	11.6	12.0	10	125.5	4.14	2.31	0.08	21.4	2.50	0.7	0.84	4.9	0.32	26.5
V671554		0.80	108.0	13.4	490	5.19	5.96	4.17	1.44	30.5	5.11	2.7	1.42	4.8	0.62	3.7
V671555		0.83	129.5	6.6	290	13.10	3.47	2.04	0.88	17.7	2.79	1.5	0.78	2.1	0.33	2.4
V671556		0.75	28.5	11.6	90	3.28	4.85	3.33	0.97	18.5	3.85	2.3	1.00	4.6	0.48	3.2
V671557		0.78	19.4	40.2	10	196.0	6.95	3.20	0.07	23.9	5.03	1.1	1.23	17.7	0.35	36.9
V671558		0.70	18.8	5.6	230	1.51	2.92	2.02	0.62	14.9	2.31	1.1	0.64	2.0	0.28	1.6
V671559		0.52	16.3	5.8	350	2.31	2.89	1.78	0.68	14.8	2.32	1.1	0.64	2.1	0.30	1.6
V671560		0.38	7.7	18.4	10	3.25	4.17	2.24	0.11	28.7	2.69	1.3	0.77	6.4	0.43	106.5
V671561		0.46	14.0	5.4	340	2.02	2.74	1.80	0.55	14.3	2.39	1.1	0.61	1.9	0.28	1.5
V671562		0.81	13.6	7.6	280	6.28	3.15	2.17	0.83	16.0	2.62	1.4	0.73	2.8	0.33	2.1
V671563		0.68	17.1	7.5	260	23.1	3.10	2.16	0.81	16.3	3.00	1.5	0.77	2.6	0.36	2.0
V671564		0.56	23.6	5.2	180	5.34	2.63	1.94	0.58	14.7	2.15	1.1	0.60	1.8	0.28	1.5
V671565		0.75	37.9	8.0	250	11.35	3.26	2.20	0.74	15.7	2.69	1.5	0.74	3.0	0.33	2.0
V671566		0.68	26.8	7.7	300	2.10	3.55	2.36	0.82	17.7	2.89	1.6	0.77	2.7	0.37	2.1
V671567		0.88	130.5	7.1	310	111.0	3.14	1.94	0.72	17.2	2.66	1.3	0.65	2.6	0.29	1.7
V671568		0.67	61.6	7.0	380	1.24	2.25	1.41	0.58	14.1	1.94	1.2	0.54	2.6	0.23	3.6
V671569		1.01	207	4.8	350	57.7	2.35	1.64	0.67	17.5	1.97	1.4	0.57	1.7	0.23	2.4
V671570		1.05	18.6	7.1	310	3.52	3.06	2.06	0.65	15.9	2.73	1.3	0.74	2.5	0.32	2.2

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671431		5.1	0.91	4.2	1.99	1	119.5	0.1	0.45	0.19	0.28	0.05	298	1	17.3	2.01
V671432		5.0	0.96	29.1	1.81	6	98.6	0.2	0.44	0.21	0.29	0.10	333	1	18.3	2.07
V671433		6.7	1.25	11.4	2.10	1	99.0	0.2	0.53	0.31	0.33	0.10	344	<1	20.9	2.25
V671434		11.0	2.16	21.4	3.53	1	86.6	0.3	0.85	0.71	0.51	0.24	427	1	32.4	3.50
V671435		7.1	1.28	16.4	2.35	1	97.1	0.1	0.55	0.29	0.33	0.07	327	2	20.0	2.27
V671436		5.4	0.97	14.8	1.93	1	97.7	0.2	0.45	0.24	0.30	0.11	361	1	18.8	1.89
V671437		15.7	4.54	165.0	4.10	1	28.6	0.6	1.13	23.6	1.59	6.43	<5	1	81.0	12.95
V671438		6.9	1.24	5.3	2.43	1	105.0	0.1	0.58	0.28	0.33	0.10	305	<1	21.5	2.42
V671439		5.0	0.92	2.8	1.83	<1	88.2	0.1	0.43	0.21	0.29	0.06	301	1	17.4	2.06
V671440		4.5	0.86	7.2	1.57	1	73.2	0.1	0.42	0.17	0.28	0.05	269	1	15.8	1.77
V671441		7.2	1.44	507	2.25	4	99.0	0.2	0.49	1.01	0.31	0.10	334	<1	19.1	2.02
V671442		4.9	0.96	10.7	1.72	1	112.5	0.1	0.46	0.19	0.28	0.06	292	1	17.0	1.99
V671443		6.2	1.14	11.6	2.20	<1	115.0	0.2	0.53	0.29	0.32	0.11	337	<1	20.1	2.11
V671444		6.2	1.21	8.6	2.16	1	91.9	0.2	0.54	0.28	0.32	0.11	349	<1	21.3	2.18
V671445		12.8	3.30	511	6.46	3	47.0	7.2	2.85	22.2	2.90	8.24	7	1	165.0	21.0
V671446		12.6	2.35	13.4	4.50	1	120.0	0.4	1.12	0.78	0.70	0.23	498	1	41.8	4.70
V671447		11.0	2.73	58.4	2.50	1	176.0	0.3	0.44	2.71	0.27	0.83	309	1	16.4	1.76
V671448		5.1	1.12	4.1	1.27	5	14.7	0.1	0.27	0.42	0.17	0.46	42	10	13.2	1.14
V671449		4.4	0.80	262	1.70	3	92.7	0.1	0.39	0.21	0.26	0.10	243	1	13.5	1.62
V671450		5.6	1.43	65.6	2.21	3	27.4	5.0	0.50	7.85	0.22	4.43	<5	1	16.9	1.34
V671551		7.3	1.44	35.8	2.46	1	45.3	0.2	0.48	0.29	0.30	0.14	288	<1	15.1	1.83
V671552		6.2	1.21	6.9	1.93	2	147.0	0.2	0.51	0.27	0.32	0.12	256	1	18.2	2.13
V671553		4.9	1.35	1285	2.21	21	6.7	11.8	0.67	10.90	0.37	3.59	<5	2	26.5	2.29
V671554		11.6	2.15	10.9	3.70	1	227	0.3	0.93	0.49	0.66	0.18	486	1	35.0	3.80
V671555		6.6	1.07	20.7	2.32	1	76.5	0.2	0.52	0.26	0.36	0.09	273	1	19.8	2.05
V671556		9.4	1.77	3.1	2.88	<1	76.9	0.2	0.72	0.39	0.49	0.14	321	<1	26.5	2.83
V671557		16.1	4.65	1170	5.03	37	10.4	12.3	1.17	19.85	0.47	21.3	<5	3	39.6	2.42
V671558		5.0	0.95	10.5	1.83	<1	104.5	0.2	0.41	0.23	0.32	0.15	254	1	16.3	1.85
V671559		5.4	0.92	18.7	1.79	15	65.7	0.2	0.41	0.22	0.28	0.13	252	1	16.1	1.68
V671560		8.6	2.25	22.3	3.48	2	36.0	60.3	0.67	9.61	0.43	4.42	<5	2	25.7	3.03
V671561		4.8	0.92	9.1	1.57	1	66.0	0.3	0.40	0.17	0.31	0.12	241	1	15.4	1.73
V671562		6.0	1.19	17.7	1.97	3	83.8	0.2	0.48	0.32	0.33	0.12	250	1	18.7	2.14
V671563		6.6	1.20	37.1	2.40	2	201	0.2	0.56	0.22	0.34	0.08	264	1	19.2	2.06
V671564		4.6	0.83	16.8	1.69	1	74.3	0.1	0.43	0.14	0.30	0.06	253	1	15.4	1.81
V671565		6.6	1.22	38.3	2.16	6	67.5	0.2	0.50	0.29	0.33	0.11	246	1	19.1	2.00
V671566		7.0	1.22	8.5	2.24	1	113.0	0.2	0.54	0.30	0.37	0.09	281	1	20.6	2.09
V671567		5.7	1.10	109.5	2.07	5	110.0	0.2	0.50	0.22	0.33	0.10	266	1	17.8	1.90
V671568		5.5	1.05	8.8	1.75	1	134.5	0.2	0.38	0.29	0.22	0.07	239	1	13.0	1.40
V671569		4.3	0.77	69.9	1.63	<1	157.0	0.2	0.37	0.25	0.26	0.11	280	1	14.0	1.52
V671570		6.2	1.02	19.8	2.35	2	89.8	0.2	0.50	0.26	0.31	0.08	257	1	18.4	1.93

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671431		41	49.2	14.15	12.70	12.65	7.27	1.58	0.13	0.03	0.72	0.21	0.06	0.02	<0.01	0.51
V671432		46	45.7	15.15	13.25	14.85	6.82	0.67	0.24	0.03	0.72	0.22	0.06	0.01	0.01	1.71
V671433		55	48.4	15.05	13.30	12.55	6.33	1.93	0.30	0.04	0.90	0.22	0.06	0.01	<0.01	0.61
V671434		100	48.3	13.55	14.85	10.20	5.79	2.29	0.58	0.01	1.41	0.20	0.11	0.01	0.01	0.85
V671435		58	48.8	14.60	13.80	11.30	6.23	2.49	0.39	0.02	0.98	0.22	0.08	0.01	<0.01	0.75
V671436		45	48.6	15.00	12.50	10.45	7.33	2.38	0.36	0.04	0.82	0.18	0.06	0.01	<0.01	1.03
V671437		17	75.0	13.60	0.97	1.45	0.12	4.74	2.58	<0.01	0.06	0.02	0.03	<0.01	<0.01	0.28
V671438		56	48.7	14.60	13.60	11.60	6.74	1.62	0.20	0.04	0.93	0.20	0.07	0.01	<0.01	0.67
V671439		41	48.4	14.25	12.95	12.25	6.88	1.60	0.12	0.03	0.73	0.20	0.05	0.01	<0.01	0.82
V671440		36	48.7	14.30	11.85	12.70	8.27	1.65	0.19	0.05	0.67	0.21	0.04	0.01	<0.01	0.89
V671441		46	44.6	15.15	13.85	9.93	10.00	1.35	1.63	0.06	0.80	0.21	0.05	0.01	0.01	1.28
V671442		41	48.7	14.60	12.90	11.85	7.75	1.38	0.20	0.06	0.72	0.20	0.05	0.01	<0.01	1.22
V671443		57	52.1	15.95	12.05	9.65	3.74	2.17	0.33	0.04	0.95	0.21	0.06	0.01	0.01	0.94
V671444		50	51.7	15.75	12.70	10.95	3.98	1.04	0.26	0.04	0.82	0.27	0.06	0.01	0.01	0.62
V671445		61	70.4	18.30	0.85	2.13	0.14	6.23	2.75	<0.01	0.02	0.09	0.03	<0.01	<0.01	0.53
V671446		124	50.2	14.20	21.0	6.00	3.10	1.79	0.33	0.01	1.95	0.60	0.16	0.01	<0.01	-0.20
V671447		89	56.8	16.90	12.50	3.78	4.33	1.78	1.57	0.03	0.88	0.20	0.08	0.02	0.04	1.88
V671448		13	26.1	1.81	42.9	4.09	4.49	0.12	0.15	<0.01	0.09	0.14	0.02	<0.01	<0.01	18.15
V671449		38	51.9	16.45	11.15	9.77	5.58	2.67	0.55	0.06	0.72	0.27	0.06	0.01	0.01	0.81
V671450		21	83.3	10.65	0.82	1.37	0.11	4.49	0.28	<0.01	0.02	0.07	0.01	<0.01	<0.01	0.36
V671551		48	66.3	18.05	10.65	0.85	1.74	1.11	1.07	0.05	0.97	0.20	0.02	<0.01	0.01	0.91
V671552		47	49.0	14.55	14.20	11.40	7.84	1.70	0.16	0.05	0.88	0.21	0.06	0.01	<0.01	0.95
V671553		10	77.9	13.10	0.66	0.55	0.07	3.91	4.15	<0.01	0.02	0.02	0.03	<0.01	<0.01	0.42
V671554		91	49.5	15.15	13.35	10.05	7.39	2.01	0.22	0.04	0.92	0.20	0.06	0.02	0.01	0.77
V671555		56	52.9	16.55	13.15	8.93	4.38	3.17	0.44	0.05	1.04	0.25	0.06	0.01	0.01	0.77
V671556		79	50.2	14.95	16.20	6.14	8.58	1.66	0.06	0.01	1.39	0.18	0.11	0.01	<0.01	-0.02
V671557		21	79.0	12.95	1.20	0.74	0.08	4.83	1.90	<0.01	0.04	0.04	0.04	<0.01	<0.01	0.49
V671558		39	48.5	14.80	12.90	9.91	8.65	1.70	0.10	0.03	0.74	0.22	0.05	0.01	<0.01	0.51
V671559		39	49.0	14.70	12.35	11.45	8.58	1.83	0.18	0.05	0.75	0.19	0.04	<0.01	<0.01	0.77
V671560		15	76.2	14.40	1.14	1.89	0.09	6.19	0.21	<0.01	0.01	0.24	0.02	<0.01	<0.01	0.15
V671561		37	51.5	14.50	11.75	10.45	8.98	1.99	0.09	0.05	0.72	0.18	0.05	0.01	<0.01	0.70
V671562		50	51.0	15.90	12.85	12.05	4.63	0.92	0.22	0.04	0.89	0.19	0.08	0.01	<0.01	0.54
V671563		51	50.7	15.65	13.05	8.70	8.12	2.26	0.09	0.04	0.99	0.17	0.07	0.03	<0.01	0.53
V671564		39	50.6	14.25	12.75	11.65	7.38	1.73	0.25	0.03	0.75	0.20	0.05	0.01	<0.01	1.03
V671565		49	47.4	13.35	14.90	12.70	7.36	1.04	0.27	0.04	0.88	0.28	0.06	<0.01	<0.01	0.85
V671566		55	51.5	16.55	12.80	11.15	4.12	1.50	0.29	0.04	1.01	0.24	0.07	0.01	<0.01	0.27
V671567		46	52.6	16.05	10.75	11.15	5.29	1.50	0.52	0.05	0.85	0.22	0.05	0.01	0.01	0.66
V671568		39	61.8	16.40	6.47	9.74	2.59	1.87	0.18	0.06	0.74	0.16	0.04	0.02	0.01	0.23
V671569		46	59.1	17.05	9.13	6.49	2.13	2.60	1.21	0.05	0.90	0.19	0.05	0.02	0.02	0.80
V671570		45	50.1	14.50	13.35	11.40	7.30	1.22	0.19	0.05	0.87	0.19	0.06	0.01	<0.01	0.64

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	TOT-ICP06	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671431		99.23	<0.5	7	<0.5	49	119	20	<1	142	<2	44	<10	97	
V671432		99.44	<0.5	<5	<0.5	38	114	40	<1	118	<2	43	10	92	
V671433		99.70	<0.5	<5	<0.5	50	78	30	<1	144	<2	37	<10	101	
V671434		98.16	<0.5	5	<0.5	41	4	20	<1	74	<2	41	10	90	
V671435		99.67	<0.5	<5	<0.5	52	24	20	<1	123	<2	39	<10	91	
V671436		98.76	<0.5	<5	<0.5	44	123	30	<1	93	10	40	<10	90	
V671437		98.85	<0.5	<5	<0.5	1	1	20	<1	1	24	1	<10	13	
V671438		98.98	<0.5	5	<0.5	45	171	20	<1	116	<2	38	<10	89	
V671439		98.29	<0.5	<5	<0.5	48	139	30	<1	134	<2	34	<10	89	
V671440		99.53	<0.5	10	0.5	43	85	30	<1	140	2	38	<10	113	
V671441		98.93	<0.5	<5	<0.5	56	109	170	<1	186	<2	27	10	102	
V671442		99.64	<0.5	21	0.5	49	137	40	<1	156	<2	39	<10	84	
V671443		98.21	<0.5	21	<0.5	40	67	30	<1	125	<2	36	<10	87	
V671444		98.21	<0.5	38	<0.5	57	22	170	<1	178	<2	41	<10	93	
V671445		101.47	<0.5	9	<0.5	<1	2	80	<1	3	27	2	<10	10	
V671446		99.15	<0.5	49	<0.5	55	68	150	<1	72	<2	45	<10	171	
V671447		100.79	<0.5	23	0.5	42	144	190	1	108	10	35	10	155	
V671448		98.06	0.6	13	1.1	63	86	20	2	228	5	6	<10	129	
V671449		100.01	<0.5	19	0.7	54	54	110	<1	166	5	44	10	82	
V671450		101.48	<0.5	<5	<0.5	1	6	30	<1	1	14	2	<10	24	
V671551		101.93	<0.5	6	<0.5	58	58	480	<1	135	6	49	<10	35	
V671552		101.01	<0.5	11	0.7	51	55	180	<1	149	6	44	<10	121	
V671553		100.83	<0.5	5	<0.5	<1	1	430	<1	2	32	1	10	28	
V671554		99.69	<0.5	7	0.6	50	107	20	<1	125	7	40	<10	104	
V671555		101.71	<0.5	9	<0.5	41	65	40	<1	101	9	42	10	98	
V671556		99.47	<0.5	9	1.0	51	18	30	<1	85	8	41	<10	145	
V671557		101.31	<0.5	13	<0.5	<1	1	360	<1	<1	26	3	10	76	
V671558		98.12	<0.5	<5	0.6	58	83	100	<1	162	5	44	10	101	
V671559		99.89	<0.5	5	0.7	54	12	130	<1	148	3	44	<10	94	
V671560		100.54	<0.5	<5	<0.5	1	6	40	<1	2	34	4	<10	7	
V671561		100.97	<0.5	<5	0.5	51	105	140	<1	150	6	42	<10	77	
V671562		99.32	<0.5	29	0.7	56	101	300	<1	174	2	45	<10	108	
V671563		100.40	<0.5	7	0.5	53	200	470	1	133	4	40	<10	96	
V671564		100.68	<0.5	<5	0.5	50	286	140	1	136	5	47	10	112	
V671565		99.13	<0.5	<5	1.1	48	143	120	<1	122	8	39	<10	174	
V671566		99.55	<0.5	<5	<0.5	54	136	80	<1	145	2	42	<10	99	
V671567		99.71	<0.5	<5	0.6	65	118	90	<1	185	3	46	10	116	
V671568		100.31	<0.5	6	<0.5	52	70	60	<1	154	<2	42	<10	77	
V671569		99.74	<0.5	6	<0.5	52	84	200	<1	168	7	37	<10	97	
V671570		99.88	<0.5	<5	0.5	55	186	90	1	142	3	44	<10	102	

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671571		0.83	26.3	6.7	150	1.59	3.12	2.09	0.71	15.5	2.47	1.2	0.78	2.4	0.34	1.9
V671572		0.88	20.9	5.8	170	0.74	2.94	1.93	0.61	14.2	2.30	1.2	0.64	2.0	0.31	1.6
V671573		0.79	25.1	4.8	250	2.29	2.25	1.56	0.59	13.6	1.89	1.0	0.50	1.7	0.24	1.2
V671574		0.55	30.8	5.5	170	3.04	2.54	1.86	0.57	14.9	2.23	1.1	0.62	2.0	0.27	1.4
V671575		0.97	25.6	5.8	330	1.00	2.57	1.97	0.62	14.4	2.33	1.1	0.63	2.0	0.29	1.5
V671576		0.35	3.5	5.7	10	9.64	2.26	1.17	<0.03	23.3	0.98	0.2	0.37	2.8	0.21	44.2
V671577		0.89	25.0	6.6	250	1.09	2.93	1.97	0.66	13.5	2.39	1.2	0.65	2.5	0.28	1.9
V671578		1.07	44.0	5.3	360	4.97	2.42	1.80	0.61	14.7	2.04	1.0	0.58	1.9	0.27	1.8
V671579		0.77	20.9	5.9	180	0.71	2.87	1.90	0.68	14.8	2.08	1.1	0.61	2.1	0.29	1.5
V671580		0.92	109.5	8.4	300	1.69	3.52	2.27	0.78	17.4	2.92	1.4	0.79	3.2	0.38	2.1
V671581		0.36	25.3	11.1	10	5.65	3.34	1.92	0.06	28.2	1.85	2.6	0.63	4.3	0.42	15.5
V671582		0.62	14.0	14.2	20	20.8	3.32	1.14	0.09	42.2	3.07	3.2	0.43	4.6	0.22	109.5
V671583		0.94	29.9	7.7	320	6.64	3.31	2.28	0.71	18.2	3.00	1.7	0.79	3.0	0.33	2.3
V671584		0.57	28.5	6.2	250	2.07	2.89	2.01	0.60	17.0	2.40	1.2	0.64	2.3	0.27	1.8
V671585		0.49	65.7	8.3	180	2.23	3.85	2.39	0.81	18.6	3.27	1.7	0.86	3.0	0.34	2.3
V671586		0.79	303	16.8	60	29.2	6.88	4.56	1.56	23.7	5.97	3.8	1.57	5.9	0.64	5.8
V671587		0.56	220	17.3	60	14.60	6.78	4.38	1.31	23.3	5.83	3.6	1.47	6.3	0.61	5.4
V671588		0.55	39.7	11.1	160	4.28	4.57	3.06	0.97	19.8	3.84	2.2	1.00	4.0	0.41	3.3
V671589		1.14	22.8	9.7	30	20.4	1.87	1.12	0.11	31.2	1.17	1.1	0.37	3.9	0.31	27.9
V671590		0.73	25.7	6.6	250	3.20	3.23	2.15	0.69	17.2	2.44	1.5	0.74	2.3	0.32	1.9
V671591		0.77	28.6	7.4	340	1.20	3.38	2.25	0.68	18.1	2.96	1.5	0.79	2.7	0.35	2.2
V671592		0.63	102.5	4.5	270	49.4	2.33	1.50	0.49	14.4	1.82	1.0	0.50	1.7	0.21	1.2
V671593		0.60	28.9	5.9	220	3.34	2.85	1.92	0.56	16.4	2.53	1.2	0.63	1.9	0.29	1.6
V671594		0.64	19.3	5.3	370	0.86	2.55	1.79	0.47	15.2	2.19	1.2	0.60	1.9	0.25	1.3
V671595		0.70	27.1	5.5	480	2.57	2.64	1.64	0.58	16.1	2.30	1.1	0.57	2.0	0.27	1.4
V671596		0.79	52.4	5.5	230	5.41	2.96	1.99	0.58	15.9	2.61	1.2	0.64	2.0	0.27	1.4
V671597		0.68	55.8	5.1	460	11.20	2.55	1.55	0.54	14.5	2.11	1.2	0.60	1.8	0.25	1.3
V671598		0.91	4.5	11.3	20	15.50	3.26	0.91	<0.03	44.4	3.27	1.1	0.40	3.5	0.09	101.0
V671599		0.76	14.8	7.1	180	2.00	3.28	2.04	0.68	18.3	2.73	1.5	0.70	2.6	0.31	2.2
V671600		0.83	23.5	5.7	260	0.90	2.65	1.72	0.57	15.9	2.26	1.1	0.57	2.0	0.23	1.7
V671601		0.60	28.7	5.4	400	2.38	2.91	1.78	0.56	15.1	2.03	1.0	0.59	1.9	0.23	1.4
V671602		0.78	16.9	5.4	280	0.81	2.86	1.78	0.58	15.8	2.47	1.2	0.60	1.8	0.24	1.6
V671603		0.58	26.3	6.3	390	2.68	3.50	2.27	0.68	16.6	2.75	1.4	0.75	2.0	0.32	1.8
V671604		0.57	29.3	6.9	340	1.63	3.64	2.29	0.78	17.6	2.75	1.5	0.75	2.4	0.32	2.0
V671605		0.76	33.4	6.5	250	1.72	3.10	2.00	0.65	16.8	2.55	1.3	0.71	2.3	0.29	1.7
V671606		0.85	206	9.9	160	16.05	4.42	2.70	0.96	20.5	3.64	2.3	0.92	3.3	0.38	3.7
V671607		0.80	134.5	16.4	50	1.49	6.42	4.10	1.44	21.9	5.53	3.3	1.40	5.9	0.61	5.0
V671608		0.68	172.5	14.0	60	1.17	6.28	4.08	1.34	22.0	5.57	3.3	1.41	4.4	0.55	5.1
V671609		0.60	32.8	11.5	130	0.89	4.84	3.20	1.08	19.9	4.11	2.5	1.07	4.2	0.45	3.4
V671610		0.53	34.3	10.9	170	1.97	4.62	2.73	0.89	22.4	3.81	2.1	0.96	3.7	0.44	3.0

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671571		5.7	1.01	25.6	1.91	1	86.0	0.1	0.46	0.22	0.29	0.10	280	1	18.5	2.14
V671572		5.3	0.95	3.5	1.64	1	73.6	0.1	0.44	0.18	0.30	0.06	249	1	16.5	1.79
V671573		4.3	0.77	5.4	1.41	<1	78.2	0.1	0.35	0.13	0.25	<0.05	211	1	13.0	1.55
V671574		5.1	0.92	8.1	1.73	<1	63.4	0.1	0.41	0.17	0.26	0.05	246	1	15.5	1.59
V671575		4.9	0.88	8.5	1.62	<1	76.2	0.1	0.43	0.20	0.27	0.06	255	<1	15.9	1.78
V671576		1.6	0.61	659	0.53	5	4.4	7.4	0.33	1.70	0.22	1.94	<5	1	14.6	1.58
V671577		5.7	1.02	7.3	1.84	<1	75.8	0.1	0.44	0.21	0.30	0.08	237	<1	16.8	2.00
V671578		4.5	0.85	49.1	1.60	3	98.0	0.2	0.37	0.14	0.26	0.11	236	<1	14.7	1.78
V671579		5.2	0.88	3.6	1.74	1	92.1	0.1	0.42	0.15	0.28	0.06	262	1	16.3	1.74
V671580		7.0	1.21	14.4	2.36	1	111.0	0.2	0.51	0.27	0.35	0.08	282	1	20.8	2.29
V671581		5.1	1.30	49.3	1.91	2	13.4	7.2	0.49	11.30	0.36	2.22	<5	1	21.6	2.79
V671582		7.0	1.97	77.3	3.80	7	28.5	85.5	0.67	11.50	0.20	4.36	5	2	18.2	1.63
V671583		6.1	1.18	29.8	2.03	1	91.6	0.4	0.53	0.28	0.34	0.07	291	1	19.8	2.15
V671584		4.7	0.94	21.4	1.82	1	86.8	0.3	0.45	0.25	0.28	0.06	296	1	16.7	1.95
V671585		6.9	1.28	18.7	2.28	2	76.0	0.3	0.58	0.26	0.35	0.07	323	2	20.7	2.29
V671586		13.6	2.64	70.9	4.37	1	134.0	0.4	1.10	0.73	0.64	0.23	507	1	39.4	4.33
V671587		13.0	2.66	57.7	4.45	2	132.5	0.5	1.03	0.71	0.61	0.20	504	2	38.0	4.16
V671588		9.0	1.69	8.2	2.81	1	117.0	0.3	0.74	0.48	0.35	0.13	337	1	25.6	2.77
V671589		3.8	1.05	248	1.19	5	27.0	5.5	0.25	4.92	0.22	4.33	46	1	12.1	1.89
V671590		5.3	1.01	11.6	2.04	1	84.3	0.4	0.50	0.25	0.31	0.08	308	1	18.9	2.16
V671591		6.1	1.16	5.3	1.98	1	102.5	0.2	0.52	0.27	0.30	0.08	303	1	19.1	2.05
V671592		3.6	0.68	92.2	1.23	1	83.8	0.1	0.35	0.12	0.19	<0.05	240	1	12.8	1.36
V671593		4.9	0.94	7.6	1.69	<1	83.9	0.2	0.44	0.18	0.27	0.08	293	1	16.7	1.90
V671594		4.6	0.83	4.0	1.56	1	68.1	0.1	0.41	0.17	0.25	<0.05	292	1	15.3	1.70
V671595		4.6	0.81	4.0	1.62	1	121.0	0.2	0.39	0.15	0.26	0.06	297	1	15.1	1.67
V671596		4.7	0.88	2.6	1.72	1	140.0	0.1	0.41	0.15	0.27	0.05	296	1	17.0	1.93
V671597		4.3	0.82	31.7	1.43	1	79.2	0.1	0.37	0.14	0.27	<0.05	278	<1	14.9	1.74
V671598		5.6	1.51	963	3.44	21	3.7	77.4	0.69	8.69	0.11	5.11	<5	2	17.5	0.83
V671599		5.5	1.09	8.8	1.79	1	130.0	0.4	0.48	0.19	0.30	0.07	311	1	18.2	2.09
V671600		4.7	0.90	7.3	1.67	5	81.0	0.2	0.43	0.17	0.23	0.06	276	<1	15.1	1.66
V671601		4.3	0.80	3.5	1.69	<1	80.2	0.1	0.42	0.15	0.25	<0.05	283	1	15.4	1.70
V671602		4.6	0.89	4.9	1.86	<1	83.8	0.1	0.38	0.14	0.27	<0.05	283	1	15.3	1.72
V671603		5.2	1.00	10.6	2.03	1	108.5	0.2	0.49	0.19	0.31	0.06	291	1	19.9	2.17
V671604		5.9	1.10	4.5	2.10	1	76.9	0.2	0.53	0.24	0.31	0.17	300	1	20.0	2.16
V671605		5.1	1.00	8.5	1.82	1	97.6	0.2	0.47	0.23	0.30	0.06	296	1	17.5	1.95
V671606		7.8	1.56	84.2	2.92	2	102.0	0.3	0.67	0.41	0.39	0.13	384	1	22.8	2.62
V671607		12.7	2.51	17.6	4.02	3	91.7	0.4	0.99	0.63	0.60	0.21	439	1	35.4	4.02
V671608		12.3	2.35	16.0	4.30	1	122.0	0.3	0.97	0.71	0.59	0.23	485	2	35.3	3.85
V671609		9.1	1.78	5.7	3.04	1	120.5	0.3	0.75	0.54	0.50	0.13	377	1	27.5	3.12
V671610		8.2	1.68	8.9	2.79	1	116.5	0.2	0.69	0.43	0.42	0.11	365	1	25.1	2.87

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671571		43	49.8	14.30	13.25	10.40	7.87	1.84	0.23	0.02	0.83	0.21	0.06	0.01	<0.01	0.95
V671572		39	50.6	14.00	13.10	9.72	8.65	1.75	0.13	0.03	0.77	0.20	0.04	0.01	<0.01	0.63
V671573		31	50.7	14.75	11.05	11.40	8.18	1.80	0.14	0.04	0.63	0.19	0.04	0.01	<0.01	1.01
V671574		38	49.8	14.05	12.95	10.25	8.81	1.46	0.12	0.03	0.72	0.20	0.04	0.01	<0.01	0.97
V671575		37	50.1	13.95	11.90	11.05	7.69	1.34	0.11	0.05	0.71	0.18	0.05	0.01	<0.01	0.92
V671576		3	77.2	12.60	1.08	0.38	0.07	4.58	3.67	<0.01	0.01	0.14	0.03	<0.01	<0.01	0.02
V671577		41	48.6	14.00	13.00	12.45	8.08	1.24	0.12	0.04	0.77	0.22	0.06	0.01	<0.01	0.80
V671578		34	48.5	14.15	12.60	12.45	8.54	1.07	0.39	0.05	0.64	0.22	0.04	0.01	<0.01	0.88
V671579		38	48.8	13.75	12.35	13.05	6.74	1.68	0.10	0.03	0.71	0.22	0.05	0.01	<0.01	0.51
V671580		54	46.9	14.90	12.15	15.80	4.66	1.68	0.26	0.04	0.92	0.36	0.08	0.01	0.01	0.29
V671581		42	75.2	14.60	1.29	1.32	0.07	6.58	0.38	<0.01	<0.01	0.21	0.02	<0.01	<0.01	0.36
V671582		35	75.0	15.30	0.99	1.31	0.09	7.34	0.25	<0.01	0.01	0.25	0.03	<0.01	<0.01	0.18
V671583		54	48.4	14.85	13.15	10.50	7.13	2.26	0.26	0.04	0.92	0.19	0.06	0.01	<0.01	1.14
V671584		40	48.0	14.75	13.05	10.95	7.38	1.88	0.32	0.03	0.80	0.21	0.05	0.01	<0.01	1.03
V671585		56	49.4	15.00	13.85	11.75	5.53	2.01	0.54	0.02	1.01	0.21	0.07	0.01	0.01	0.65
V671586		123	47.2	14.10	18.50	8.55	5.23	2.69	0.83	0.01	2.01	0.30	0.16	0.02	0.03	0.66
V671587		118	53.2	13.80	12.60	6.62	3.19	3.65	0.65	0.01	1.90	0.31	0.16	0.02	0.03	2.81
V671588		78	50.8	14.40	14.25	9.78	6.90	2.78	0.23	0.02	1.27	0.15	0.08	0.01	<0.01	0.70
V671589		25	69.2	16.45	2.97	2.60	0.83	5.76	1.15	<0.01	0.21	0.07	0.12	<0.01	<0.01	0.43
V671590		48	49.4	14.75	14.00	11.75	7.14	1.58	0.29	0.03	0.88	0.20	0.05	0.01	<0.01	0.98
V671591		51	48.9	15.80	13.30	12.55	6.45	2.18	0.20	0.04	0.95	0.21	0.07	0.01	<0.01	0.57
V671592		31	48.7	15.05	14.80	8.45	10.40	0.90	0.61	0.03	0.63	0.21	0.03	0.01	0.01	1.88
V671593		40	48.5	14.75	12.95	10.60	8.28	1.52	0.15	0.03	0.73	0.19	0.05	0.01	<0.01	1.16
V671594		37	51.3	14.20	13.00	11.20	7.87	1.60	0.13	0.05	0.75	0.19	0.05	0.01	<0.01	0.89
V671595		36	50.3	14.55	11.45	13.25	6.92	1.57	0.10	0.06	0.66	0.20	0.04	0.01	<0.01	0.83
V671596		38	50.2	14.60	13.30	12.00	7.31	1.90	0.16	0.03	0.77	0.20	0.05	0.02	0.01	0.79
V671597		34	48.2	14.60	12.85	12.95	8.41	1.44	0.26	0.05	0.68	0.22	0.04	0.01	0.01	1.06
V671598		11	72.3	16.40	1.05	0.35	0.05	6.80	3.10	<0.01	0.01	0.09	0.06	<0.01	<0.01	0.23
V671599		47	49.8	14.55	14.60	12.00	6.78	1.19	0.16	0.02	0.86	0.21	0.05	0.01	<0.01	0.91
V671600		37	48.2	14.30	13.15	11.25	7.55	1.62	0.13	0.03	0.73	0.20	0.06	0.01	<0.01	0.95
V671601		36	50.6	14.35	12.35	11.20	8.12	1.52	0.20	0.05	0.71	0.19	0.05	0.01	<0.01	0.79
V671602		38	49.1	14.05	13.55	11.15	7.79	1.74	0.14	0.03	0.76	0.20	0.04	0.01	<0.01	0.75
V671603		44	48.1	14.05	14.55	10.70	7.48	2.19	0.13	0.05	0.83	0.21	0.06	0.01	<0.01	0.90
V671604		50	47.8	15.95	12.30	12.40	6.57	1.54	0.20	0.04	0.93	0.20	0.07	0.01	<0.01	0.81
V671605		45	49.4	14.35	13.50	10.60	7.02	1.95	0.23	0.03	0.82	0.18	0.06	0.01	<0.01	1.06
V671606		80	52.2	15.85	12.25	8.14	3.70	3.18	0.57	0.02	1.44	0.27	0.11	0.01	0.02	0.68
V671607		110	44.6	12.05	23.1	9.54	4.16	1.79	0.40	0.01	1.68	0.70	0.14	0.01	0.01	0.19
V671608		112	49.8	13.00	18.55	8.63	3.36	2.43	0.37	0.01	1.75	0.58	0.13	0.01	0.02	0.33
V671609		81	50.1	14.10	14.70	9.76	5.86	2.18	0.27	0.02	1.34	0.18	0.12	0.02	<0.01	0.64
V671610		72	48.3	14.85	14.25	10.50	5.67	1.94	0.27	0.02	1.26	0.18	0.08	0.02	<0.01	0.76

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	TOT-ICP06	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671571		99.77	<0.5	<5	0.6	50	311	100	<1	112	6	45	10	96	
V671572		99.63	<0.5	<5	0.6	52	67	70	1	140	4	45	10	89	
V671573		99.94	<0.5	6	0.6	50	58	30	<1	144	4	38	<10	79	
V671574		99.41	<0.5	5	0.6	50	62	60	<1	161	6	38	<10	98	
V671575		98.06	<0.5	<5	0.7	48	123	60	<1	128	3	42	<10	85	
V671576		99.78	<0.5	<5	<0.5	1	4	20	<1	2	15	3	10	9	
V671577		99.39	<0.5	<5	0.8	52	54	30	<1	148	<2	42	<10	104	
V671578		99.54	<0.5	<5	0.7	49	124	40	<1	141	4	42	<10	96	
V671579		98.00	<0.5	7	0.6	52	104	30	<1	143	5	45	<10	100	
V671580		98.06	<0.5	<5	0.5	56	107	30	<1	150	4	44	10	130	
V671581		100.03	<0.5	<5	<0.5	1	3	40	<1	1	15	5	<10	11	
V671582		100.75	<0.5	<5	<0.5	1	2	30	<1	<1	11	1	<10	11	
V671583		98.91	<0.5	<5	0.5	57	129	30	<1	143	<2	28	10	111	
V671584		98.46	<0.5	<5	0.5	53	78	20	<1	140	<2	38	10	98	
V671585		100.06	<0.5	<5	0.5	54	112	20	<1	115	<2	43	<10	92	
V671586		100.29	<0.5	<5	0.6	46	52	110	<1	37	<2	48	<10	107	
V671587		98.95	<0.5	<5	<0.5	50	27	80	<1	51	<2	47	<10	83	
V671588		101.37	<0.5	<5	<0.5	46	19	30	<1	96	3	39	<10	113	
V671589		99.79	<0.5	<5	<0.5	7	6	100	<1	16	12	8	<10	67	
V671590		101.06	0.5	<5	0.9	50	148	30	<1	115	2	44	<10	99	
V671591		101.23	<0.5	<5	<0.5	52	41	30	<1	133	<2	43	10	87	
V671592		101.71	<0.5	<5	0.7	58	138	70	<1	196	<2	29	<10	110	
V671593		98.92	<0.5	7	0.7	56	107	20	<1	149	2	29	<10	96	
V671594		101.24	<0.5	<5	<0.5	49	175	40	<1	107	<2	38	<10	81	
V671595		99.94	<0.5	34	0.6	51	117	10	<1	148	<2	47	<10	82	
V671596		101.34	<0.5	7	0.5	56	123	20	<1	139	<2	48	<10	95	
V671597		100.78	<0.5	<5	0.6	52	127	110	<1	146	5	42	<10	99	
V671598		100.44	<0.5	<5	<0.5	<1	12	30	<1	<1	23	4	<10	29	
V671599		101.14	<0.5	<5	<0.5	62	260	80	<1	177	<2	40	<10	92	
V671600		98.18	<0.5	63	<0.5	61	80	80	<1	189	2	36	<10	95	
V671601		100.14	<0.5	6	0.7	51	202	10	<1	138	<2	36	<10	108	
V671602		99.31	<0.5	<5	0.5	60	136	40	<1	185	<2	31	<10	98	
V671603		99.26	<0.5	<5	0.5	57	<1	80	<1	174	<2	37	<10	111	
V671604		98.82	<0.5	<5	<0.5	50	20	20	<1	147	<2	40	<10	90	
V671605		99.21	<0.5	<5	0.6	47	63	20	<1	117	2	43	<10	83	
V671606		98.44	<0.5	<5	0.6	36	19	40	<1	66	2	46	<10	100	
V671607		98.38	<0.5	<5	0.8	50	3	40	<1	39	<2	42	<10	198	
V671608		98.97	<0.5	<5	0.6	42	9	30	<1	45	<2	45	<10	134	
V671609		99.29	<0.5	<5	0.5	49	81	30	<1	82	<2	43	<10	111	
V671610		98.10	<0.5	<5	<0.5	52	184	20	<1	110	<2	43	10	126	

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671611		0.70	173.0	17.9	60	19.75	6.36	3.80	1.37	22.2	5.74	3.4	1.42	6.9	0.56	5.1
V671612		0.61	59.8	12.2	160	0.73	5.07	3.14	1.11	19.7	4.43	2.5	1.09	4.4	0.46	3.4
V671613		0.78	43.1	14.1	150	2.04	5.09	3.35	1.14	22.8	4.49	3.0	1.14	5.4	0.46	4.5
V671614		1.01	72.2	8.6	140	1.35	3.74	2.44	0.82	18.2	3.17	1.7	0.80	3.2	0.32	2.3
V671615		0.61	53.5	6.5	270	1.72	3.25	2.11	0.70	17.5	2.73	1.5	0.73	2.3	0.31	1.9
V671616		0.63	23.8	5.6	320	0.30	3.16	2.07	0.62	16.5	2.34	1.3	0.69	1.8	0.28	1.6
V671617		0.81	31.1	6.2	290	0.59	3.23	2.19	0.67	14.9	2.47	1.2	0.71	2.4	0.32	1.8
V671618		0.71	14.1	4.5	320	1.04	2.32	1.57	0.46	14.1	1.89	0.9	0.51	1.7	0.22	1.1
V671619		0.95	27.8	5.9	350	18.45	3.02	1.95	0.55	14.2	2.60	1.2	0.64	2.1	0.28	1.8
V671620		0.73	29.7	5.8	220	0.99	2.80	1.88	0.67	14.6	2.56	1.1	0.60	2.2	0.28	1.5
V671621		0.51	50.4	7.0	280	0.41	3.59	2.22	0.65	15.6	2.99	1.5	0.72	2.5	0.30	2.1
V671622		0.71	20.5	6.4	320	0.54	3.22	2.07	0.66	15.5	2.69	1.5	0.69	2.3	0.32	1.9
V671623		0.83	183.0	5.8	240	23.5	3.30	2.17	0.61	17.7	2.94	1.3	0.74	2.2	0.29	1.9
V671624		0.46	4.6	0.7	10	2.34	0.54	0.15	<0.03	29.4	0.24	0.8	0.07	<0.5	0.03	42.2
V671625		0.75	47.1	7.0	230	5.84	3.51	2.05	0.67	15.9	2.89	1.4	0.73	2.8	0.34	2.3
V671626		0.77	49.7	10.6	160	2.06	4.98	3.18	0.97	18.1	3.92	2.0	1.05	4.0	0.44	3.0
V671627		0.31	10.1	1.0	10	6.58	0.18	0.14	0.09	58.5	0.18	1.0	0.04	0.5	0.03	8.5
V671628		0.80	58.8	8.9	170	1.00	3.84	2.44	0.75	15.9	3.15	1.6	0.76	3.2	0.35	6.1
V671629		0.74	171.5	7.8	170	8.95	3.72	2.29	0.85	17.0	3.09	1.7	0.72	2.9	0.35	2.8
V671630		0.67	43.8	16.0	60	0.23	6.51	4.23	1.25	19.8	5.70	2.9	1.39	6.0	0.60	5.1
V671631		0.83	415	31.3	60	16.95	5.37	3.23	1.39	20.2	5.15	3.0	1.09	14.3	0.44	5.3
V671632		1.06	75.8	6.6	200	9.64	3.69	2.52	0.74	17.6	2.75	1.5	0.80	2.4	0.33	2.4
V671633		0.59	281	5.8	470	22.9	3.42	2.52	0.63	15.8	2.99	1.2	0.80	2.0	0.32	1.8
V671634		1.12	44.1	6.0	460	2.74	2.86	1.97	0.67	15.3	2.40	1.2	0.65	2.2	0.26	1.7
V671635		0.79	59.7	6.4	340	0.69	3.49	2.17	0.73	17.7	2.75	1.4	0.66	2.1	0.29	2.0
V671636		0.52	70.9	10.3	40	132.0	3.18	1.27	0.08	36.9	2.56	1.2	0.47	4.1	0.16	63.5
V671637		0.84	203	6.6	360	12.85	5.15	3.48	0.75	18.7	4.07	1.6	1.15	2.2	0.50	2.6
V671638		0.45	24.6	14.0	10	31.2	2.84	0.96	0.05	26.6	2.34	0.4	0.38	6.1	0.08	52.7
V671639		0.52	26.5	5.7	230	1.55	3.12	2.08	0.61	15.3	2.74	1.2	0.69	2.0	0.29	1.8
V671640		0.58	2.8	5.8	10	5.10	2.54	1.10	<0.03	33.1	1.92	0.7	0.38	2.4	0.20	13.7
V671641		0.60	31.5	5.9	250	3.72	3.40	2.25	0.64	16.3	2.69	1.2	0.70	2.2	0.30	1.9
V671642		0.75	21.0	5.9	230	3.33	3.02	2.08	0.62	15.5	2.52	1.1	0.69	2.1	0.29	1.7
V671643		0.82	65.3	6.5	390	687	3.63	2.21	0.69	27.1	2.77	1.5	0.70	2.2	0.31	8.2
V671644		0.47	33.8	1.2	10	5.97	0.16	0.06	0.06	70.6	0.14	1.9	0.02	0.8	0.02	45.8
V671645		0.74	17.8	5.8	420	4.34	2.95	2.02	0.65	16.9	2.62	1.3	0.67	2.2	0.31	2.2
V671646		0.38	12.1	4.6	380	10.90	2.75	1.71	0.44	13.4	2.16	0.9	0.57	1.7	0.25	1.5
V671647		0.56	8.0	2.5	20	87.8	0.68	0.37	0.26	53.2	0.60	4.8	0.13	1.0	0.05	46.7
V671648		0.69	24.4	6.3	330	3.78	3.35	2.19	0.67	16.4	2.83	1.3	0.76	2.1	0.29	2.0
V671649		0.52	14.8	1.5	10	12.40	0.37	0.11	0.11	51.2	0.42	2.9	0.05	0.6	0.03	26.7
V671650		0.72	19.0	5.4	200	53.0	2.73	1.70	0.55	15.4	2.43	1.1	0.60	2.0	0.25	1.8

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671611		12.9	2.61	50.4	4.30	1	103.5	0.4	0.99	0.67	0.57	0.23	486	1	34.1	3.77
V671612		9.5	1.83	2.8	3.28	1	135.0	0.3	0.73	0.47	0.45	0.15	370	1	28.2	2.97
V671613		10.2	2.08	5.9	3.28	1	119.0	0.3	0.81	0.70	0.49	0.19	411	2	29.5	3.39
V671614		6.8	1.32	6.3	2.46	1	123.0	0.2	0.58	0.34	0.35	0.06	302	1	21.6	2.32
V671615		5.5	1.07	5.2	1.87	1	93.9	0.2	0.48	0.21	0.31	0.05	288	1	18.3	2.13
V671616		5.0	0.91	4.2	1.89	1	86.6	0.1	0.45	0.20	0.26	0.05	287	1	17.0	1.92
V671617		5.6	0.98	11.9	2.01	1	72.5	0.2	0.42	0.28	0.26	0.13	251	1	16.5	1.97
V671618		3.8	0.72	12.3	1.51	1	90.8	0.1	0.31	0.14	0.22	0.05	214	55	12.7	1.43
V671619		5.0	0.93	193.5	1.88	24	74.8	2.3	0.45	0.22	0.28	1.79	266	1	15.9	1.92
V671620		5.2	0.93	5.2	1.83	1	67.2	0.1	0.44	0.15	0.25	0.06	260	1	15.3	1.65
V671621		6.5	1.15	2.2	2.31	<1	106.5	0.1	0.53	0.25	0.30	0.06	278	2	18.6	2.18
V671622		5.6	1.02	4.5	1.93	1	84.4	0.1	0.48	0.21	0.29	0.08	280	1	17.6	1.97
V671623		5.6	1.01	115.0	1.98	2	54.8	0.1	0.45	0.15	0.29	0.07	324	1	18.3	2.13
V671624		0.3	0.08	925	0.17	164	3.5	15.2	0.09	0.51	0.03	1.22	<5	1	3.0	0.21
V671625		5.7	1.03	47.2	1.91	1	98.6	0.1	0.50	0.25	0.32	0.06	300	1	18.4	2.12
V671626		8.7	1.64	12.3	3.12	1	123.5	0.2	0.71	0.31	0.43	0.12	348	1	25.5	2.81
V671627		0.5	0.11	130.0	0.16	20	19.7	11.4	0.03	0.76	0.01	1.31	<5	1	1.2	0.15
V671628		7.4	1.30	11.1	2.25	1	71.0	0.2	0.54	0.35	0.33	0.11	301	<1	19.4	2.17
V671629		6.5	1.17	24.8	2.25	<1	107.5	0.1	0.51	0.30	0.31	0.11	307	1	19.2	2.26
V671630		12.7	2.43	3.9	4.34	1	174.0	0.3	1.00	0.62	0.54	0.19	447	1	34.7	3.85
V671631		18.6	4.06	88.8	4.86	1	289	0.3	0.84	2.77	0.44	0.74	367	1	26.9	2.99
V671632		5.5	1.03	166.0	2.07	3	119.5	0.2	0.54	0.25	0.35	0.16	330	1	19.6	2.29
V671633		5.3	0.95	27.8	1.90	1	65.3	0.1	0.54	0.21	0.29	0.08	329	1	20.5	2.17
V671634		4.9	0.92	6.8	1.70	<1	85.2	0.1	0.45	0.23	0.24	0.07	304	<1	15.8	1.93
V671635		5.6	0.96	7.5	1.96	5	106.0	0.1	0.52	0.23	0.29	0.06	328	1	17.4	2.06
V671636		4.9	1.32	1070	2.22	30	22.2	56.7	0.60	8.06	0.16	4.80	27	2	17.1	1.05
V671637		6.5	1.12	35.9	2.39	1	68.4	0.3	0.70	0.32	0.45	0.07	392	1	29.1	3.21
V671638		5.5	1.59	471	2.18	7	9.9	8.9	0.48	9.84	0.17	3.50	<5	1	13.1	0.82
V671639		5.1	0.93	22.3	1.58	3	122.0	0.1	0.43	0.23	0.30	0.07	322	1	17.1	1.98
V671640		2.4	0.66	68.8	1.36	2	8.9	4.5	0.47	6.15	0.19	2.49	<5	1	16.8	1.48
V671641		4.9	0.93	3.8	1.85	1	87.6	0.1	0.46	0.20	0.29	0.12	346	1	17.3	1.97
V671642		5.0	0.89	12.2	1.66	1	98.4	0.1	0.38	0.20	0.30	0.05	310	<1	16.6	1.85
V671643		6.0	1.01	3010	2.12	146	92.8	2.8	0.51	0.29	0.30	0.18	328	1	18.3	2.01
V671644		0.4	0.10	17.8	0.16	306	81.3	263	0.03	2.36	0.02	2.85	<5	3	1.0	0.08
V671645		5.2	0.89	16.4	1.84	4	70.0	0.4	0.43	0.24	0.24	0.07	267	2	16.3	1.79
V671646		4.2	0.79	29.3	1.53	3	68.4	0.7	0.38	0.19	0.25	0.07	271	1	14.1	1.58
V671647		1.5	0.34	163.0	0.56	4	81.3	390	0.13	2.26	0.05	3.98	8	2	3.9	0.33
V671648		5.6	0.94	7.5	1.78	1	115.0	0.7	0.50	0.18	0.32	0.06	329	1	18.2	2.04
V671649		0.8	0.23	40.7	0.42	22	31.9	89.6	0.07	2.26	0.02	2.57	5	1	2.2	0.22
V671650		4.6	0.85	160.0	1.77	6	69.6	1.1	0.42	0.18	0.23	0.05	287	10	14.7	1.82

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671611		113	48.6	13.30	16.45	7.24	6.03	2.23	0.94	0.01	1.84	0.18	0.13	0.01	0.02	1.49
V671612		80	48.0	14.50	14.75	9.91	5.87	2.75	0.25	0.02	1.33	0.20	0.10	0.02	0.01	0.48
V671613		101	47.0	14.85	15.95	13.95	2.89	1.60	0.18	0.02	1.58	0.28	0.12	0.01	<0.01	1.35
V671614		56	46.9	13.70	15.35	11.35	6.46	2.15	0.21	0.02	0.99	0.25	0.07	0.02	0.01	0.66
V671615		49	51.1	15.40	12.15	11.60	5.01	1.79	0.31	0.03	0.91	0.22	0.05	0.01	0.01	0.61
V671616		43	48.4	14.95	13.35	10.50	8.07	1.87	0.12	0.04	0.78	0.20	0.05	0.01	<0.01	0.98
V671617		43	49.2	14.25	12.30	12.05	7.59	1.27	0.32	0.04	0.73	0.20	0.05	0.01	<0.01	0.83
V671618		30	52.7	13.65	10.40	14.25	6.66	0.69	0.11	0.05	0.54	0.20	0.03	0.01	<0.01	0.55
V671619		39	49.8	14.45	12.55	11.35	8.04	1.46	0.59	0.05	0.72	0.19	0.06	0.01	<0.01	1.06
V671620		37	51.0	13.35	13.35	10.80	7.66	1.41	0.16	0.03	0.68	0.21	0.04	0.01	<0.01	0.78
V671621		53	49.7	14.90	12.95	10.70	7.39	2.47	0.12	0.04	0.91	0.17	0.06	0.01	0.01	0.57
V671622		47	49.7	14.50	12.35	10.80	8.28	1.73	0.17	0.04	0.75	0.17	0.05	0.01	<0.01	0.86
V671623		52	46.4	13.55	17.00	11.05	6.99	1.01	0.57	0.03	0.77	0.29	0.05	0.01	0.02	2.02
V671624		9	75.9	14.05	0.57	0.21	0.03	5.86	2.78	<0.01	0.01	0.08	0.05	<0.01	<0.01	0.31
V671625		48	49.6	14.30	13.60	10.10	7.35	2.10	0.36	0.03	0.80	0.20	0.06	0.01	0.01	1.64
V671626		71	48.1	15.30	13.40	11.30	5.83	2.09	0.28	0.02	1.14	0.22	0.09	0.02	0.01	0.89
V671627		12	72.8	16.45	0.52	0.85	0.05	8.19	0.35	<0.01	0.01	0.06	0.13	<0.01	<0.01	0.32
V671628		53	47.5	14.50	15.45	10.80	6.17	1.69	0.31	0.02	0.90	0.45	0.08	0.01	0.01	0.68
V671629		53	43.7	14.85	18.80	10.60	6.02	1.37	0.37	0.02	0.92	0.73	0.08	0.01	0.02	0.55
V671630		111	48.2	12.10	19.70	8.94	4.16	2.43	0.15	0.01	1.58	0.56	0.14	0.02	<0.01	0.28
V671631		117	55.7	13.95	13.55	5.31	2.93	2.58	1.55	0.01	1.27	0.30	0.18	0.03	0.04	1.62
V671632		53	47.7	14.70	13.60	8.78	8.43	2.13	1.44	0.02	0.89	0.17	0.07	0.01	0.01	1.18
V671633		43	47.3	16.15	18.45	8.02	6.19	1.15	0.34	0.06	0.72	0.49	0.03	0.01	0.03	0.22
V671634		40	54.3	15.70	10.40	11.25	5.00	1.57	0.18	0.05	0.68	0.28	0.05	0.01	<0.01	0.60
V671635		51	56.2	16.50	9.01	10.30	3.01	1.51	0.14	0.04	0.87	0.19	0.06	0.02	0.01	0.45
V671636		16	73.5	14.60	1.37	1.46	0.28	5.13	2.71	<0.01	0.08	0.06	0.08	<0.01	0.01	0.28
V671637		60	49.4	15.55	15.85	9.34	5.02	1.35	0.89	0.04	0.92	0.32	0.06	0.01	0.02	0.84
V671638		9	77.2	14.10	1.16	0.72	0.07	5.38	2.79	<0.01	0.02	0.03	0.04	<0.01	<0.01	0.22
V671639		41	49.6	14.00	12.95	12.30	7.56	1.57	0.20	0.03	0.72	0.21	0.04	0.01	<0.01	0.79
V671640		12	72.8	16.30	0.76	1.13	0.03	7.97	0.53	<0.01	<0.01	0.07	0.04	<0.01	<0.01	0.14
V671641		44	48.8	14.70	13.45	12.50	7.79	1.33	0.17	0.03	0.77	0.24	0.05	0.01	<0.01	1.14
V671642		40	49.3	13.85	12.60	11.95	7.25	1.69	0.12	0.03	0.71	0.19	0.05	0.01	<0.01	0.73
V671643		50	48.6	15.30	13.50	9.87	7.22	1.56	1.34	0.05	0.85	0.22	0.06	0.02	0.01	0.81
V671644		17	73.3	15.65	1.07	1.90	0.12	7.12	0.12	<0.01	0.01	0.11	0.20	0.01	<0.01	0.13
V671645		49	51.2	14.70	13.05	10.95	7.05	1.39	0.13	0.05	0.76	0.16	0.09	0.01	<0.01	1.01
V671646		34	50.1	14.85	13.00	12.75	7.88	1.24	0.14	0.05	0.71	0.19	0.05	0.01	<0.01	0.91
V671647		28	69.3	18.15	0.72	5.50	0.24	5.21	0.21	<0.01	0.02	0.01	0.48	0.01	<0.01	0.35
V671648		47	48.2	14.40	13.50	12.05	7.31	1.21	0.09	0.04	0.79	0.21	0.06	0.01	<0.01	0.68
V671649		26	74.0	15.70	0.87	1.67	0.05	7.26	0.19	<0.01	0.01	0.09	0.08	<0.01	<0.01	0.31
V671650		37	49.1	14.50	12.95	10.70	9.46	1.57	0.21	0.02	0.63	0.19	0.05	0.01	<0.01	1.06

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	TOT-ICP06	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671611		98.47	<0.5	<5	0.8	54	41	60	<1	49	2	47	<10	146	
V671612		98.19	<0.5	<5	0.5	52	54	20	<1	99	3	36	<10	114	
V671613		99.78	0.5	<5	0.7	33	222	10	<1	44	3	48	<10	102	
V671614		98.14	<0.5	<5	0.8	58	95	10	<1	101	2	42	10	127	
V671615		99.20	<0.5	<5	0.5	54	10	30	<1	142	<2	44	<10	96	
V671616		99.32	<0.5	<5	0.6	55	102	40	<1	161	<2	44	<10	98	
V671617		98.84	<0.5	<5	0.7	53	122	40	<1	156	<2	42	<10	96	
V671618		99.84	<0.5	<5	0.6	46	54	100	<1	129	<2	39	<10	77	
V671619		100.33	<0.5	<5	0.9	46	162	100	<1	130	3	32	<10	85	
V671620		99.48	<0.5	11	0.9	54	245	50	1	150	5	32	<10	128	
V671621		100.00	<0.5	5	0.7	53	46	40	1	138	5	31	<10	101	
V671622		99.41	<0.5	<5	0.6	51	126	50	1	145	4	31	10	90	
V671623		99.76	<0.5	5	0.8	55	333	140	<1	108	2	44	10	122	
V671624		99.85	<0.5	<5	<0.5	<1	1	20	<1	<1	6	<1	10	24	
V671625		100.16	<0.5	<5	0.8	54	94	90	<1	137	<2	32	10	82	
V671626		98.69	<0.5	<5	0.6	51	54	70	<1	103	9	37	<10	112	
V671627		99.73	<0.5	<5	<0.5	<1	1	180	<1	1	6	<1	10	8	
V671628		98.57	<0.5	<5	0.9	48	254	60	<1	100	4	43	<10	118	
V671629		98.04	<0.5	<5	0.6	62	18	40	<1	118	4	47	10	134	
V671630		98.27	<0.5	5	0.8	40	54	20	<1	41	6	40	<10	150	
V671631		99.02	<0.5	<5	0.7	30	31	50	1	27	9	34	10	116	
V671632		99.13	<0.5	<5	0.9	55	16	90	1	122	8	24	10	136	
V671633		99.16	<0.5	<5	0.7	54	149	90	<1	182	7	37	<10	114	
V671634		100.07	<0.5	13	<0.5	56	93	60	<1	180	6	46	10	93	
V671635		98.31	<0.5	16	0.5	60	98	80	1	183	2	47	<10	122	
V671636		99.56	<0.5	18	<0.5	4	14	80	1	19	12	5	10	37	
V671637		99.61	<0.5	<5	0.5	63	190	130	<1	164	6	43	<10	153	
V671638		101.73	<0.5	<5	<0.5	<1	8	70	<1	6	40	2	10	49	
V671639		99.98	<0.5	<5	0.5	54	52	100	1	148	4	39	<10	102	
V671640		99.77	<0.5	<5	<0.5	<1	2	30	<1	3	16	1	<10	10	
V671641		100.98	<0.5	<5	0.8	52	114	90	<1	136	2	48	<10	101	
V671642		98.48	<0.5	<5	0.5	54	58	80	<1	139	4	44	10	91	
V671643		99.41	<0.5	5	0.9	54	40	370	1	147	2	43	20	255	
V671644		99.74	<0.5	16	<0.5	<1	16	40	<1	5	8	1	<10	42	
V671645		100.55	<0.5	<5	0.7	52	153	100	<1	148	7	39	<10	97	
V671646		101.88	<0.5	<5	0.5	51	89	120	1	157	4	41	<10	93	
V671647		100.20	<0.5	<5	<0.5	1	14	90	<1	8	8	1	10	8	
V671648		98.55	<0.5	5	0.6	57	140	110	<1	154	5	39	<10	101	
V671649		100.23	<0.5	6	<0.5	<1	4	40	<1	<1	8	<1	<10	4	
V671650		100.45	<0.5	5	<0.5	59	143	170	1	225	2	36	10	88	

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671651		1.08	39.6	4.7	190	27.2	2.26	1.62	0.50	12.5	1.81	1.0	0.52	1.7	0.23	1.4
V671652		0.66	39.7	10.0	30	45.2	6.79	4.50	1.34	27.3	5.63	3.6	1.42	3.1	0.62	9.1
V671653		0.73	99.2	8.4	160	1.82	3.67	2.47	0.70	16.9	2.88	1.4	0.83	3.0	0.35	1.8
V671654		0.52	64.2	7.8	170	2.06	3.60	2.29	0.75	18.0	2.76	1.5	0.78	2.8	0.34	2.0
V671655		0.43	196.5	5.6	410	10.25	2.47	1.68	0.58	15.8	1.95	1.1	0.55	1.9	0.24	1.4
V671656		0.49	303	69.2	10	4.59	2.03	0.65	0.34	21.7	3.73	4.4	0.30	29.7	0.02	11.6
V671657		0.60	349	85.3	10	3.43	2.90	1.44	0.36	18.7	3.80	4.7	0.51	38.1	0.12	10.3
V671658		0.56	454	59.2	20	5.79	2.03	1.20	0.32	23.2	3.00	6.5	0.41	27.1	0.15	12.4
V671659		1.14	156.5	9.2	30	2.26	3.02	3.14	0.19	17.2	1.18	3.9	0.87	5.0	0.48	1.0
V671660		0.52	640	166.5	20	2.63	3.16	1.09	0.74	24.2	4.80	9.7	0.50	79.5	0.06	13.6
V671661		0.69	29.7	9.9	10	16.55	2.68	2.00	0.06	20.1	1.72	0.6	0.61	4.3	0.33	16.6
V671662		0.34	6.3	8.5	10	3.71	0.32	0.12	0.03	22.3	0.42	<0.2	0.05	3.7	<0.01	16.1
V671663		0.67	75.9	3.6	20	15.30	0.55	0.21	<0.03	32.1	0.62	<0.2	0.08	1.2	0.01	65.3
V671664		0.87	10.1	9.5	10	13.90	1.68	0.40	<0.03	30.5	1.60	0.4	0.21	3.5	0.03	51.5
V671665		1.02	4.4	5.8	10	36.1	2.74	2.34	<0.03	20.9	0.95	1.6	0.64	2.6	0.64	24.9
V671666		1.21	21.6	6.6	10	15.65	1.66	0.47	<0.03	33.8	1.66	0.5	0.22	2.3	0.04	83.4
V671667		1.06	27.6	5.2	10	17.25	1.98	0.65	<0.03	31.2	1.57	0.4	0.24	1.8	0.05	75.7
V671668		1.33	32.8	5.7	50	45.9	1.75	0.82	0.12	28.9	1.63	0.5	0.29	2.0	0.08	59.7
V671669		1.91	26.1	4.9	20	15.75	2.11	0.54	<0.03	40.0	1.81	0.6	0.21	1.6	0.05	81.9
V671670		0.84	30.6	5.1	<10	0.10	0.16	0.15	0.05	0.4	0.24	1.1	0.05	2.5	0.01	<0.2
V671671		1.91	24.3	4.0	20	13.95	1.31	0.32	<0.03	36.6	1.40	0.5	0.19	1.4	0.04	68.4
V671672		2.00	28.3	3.5	20	5.89	1.00	0.32	<0.03	42.5	1.04	1.0	0.12	1.2	0.05	65.8
V671673		2.11	30.2	5.0	20	5.78	1.39	0.42	<0.03	46.0	1.55	0.8	0.16	1.6	0.06	70.5
V671674		1.69	42.9	3.2	10	12.40	0.68	0.20	<0.03	38.7	0.60	0.4	0.07	1.1	0.04	51.8
V671675		0.85	29.3	2.3	10	22.8	0.29	0.12	<0.03	37.8	0.33	0.3	0.05	0.7	0.01	31.4
V671676		0.03	18.7	3.1	30	26.3	0.95	0.19	<0.03	39.9	1.17	1.5	0.09	1.2	0.02	76.3
V671677		0.61	25.6	1.5	10	12.90	0.83	0.23	<0.03	39.5	0.64	1.1	0.11	0.5	0.05	59.5
V671678		0.79	18.1	3.6	10	24.3	1.39	0.36	<0.03	40.7	1.14	0.7	0.17	1.2	0.06	82.1
V671679		0.43	23.5	5.7	20	13.25	2.05	0.70	0.04	39.4	1.74	0.7	0.26	1.8	0.10	77.9
V671680		0.77	17.7	2.9	10	16.95	1.60	0.80	<0.03	28.4	0.89	0.4	0.27	1.1	0.15	89.2
V671681		0.69	39.6	3.4	20	19.15	0.94	0.74	0.15	22.5	0.40	0.9	0.23	1.7	0.15	12.9
V671682		0.59	36.8	16.8	10	5.97	2.11	1.63	0.08	31.3	1.54	0.4	0.38	6.9	0.38	46.3
V671683		0.94	14.1	3.7	10	18.85	2.01	1.96	<0.03	26.4	0.61	1.7	0.47	1.7	1.19	28.7
V671684		0.22	72.8	15.7	50	11.85	3.93	1.47	0.13	34.5	3.43	1.3	0.53	5.0	0.21	63.7
V671685		1.16	41.2	18.2	10	42.4	3.65	1.77	0.22	37.0	2.69	2.1	0.62	7.1	0.33	20.8
V671686		0.86	21.8	7.0	10	58.4	2.35	1.24	0.03	18.5	1.33	0.2	0.42	3.2	0.18	32.6
V671687		0.56	12.7	4.2	20	1.80	1.68	0.52	0.07	39.3	1.26	0.8	0.23	1.6	0.10	33.7
V671688		0.65	8.6	7.5	20	50.8	2.12	0.74	0.06	25.3	1.60	0.7	0.31	3.5	0.09	55.3
V671689		0.46	15.6	5.9	10	70.1	1.88	0.70	0.07	47.4	1.63	4.0	0.25	2.2	0.08	42.6
V671690		0.74	9.3	20.6	10	15.80	6.05	2.68	0.05	45.7	3.88	2.9	1.01	7.0	0.50	141.5

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671651		4.3	0.77	328	1.38	3	53.4	0.1	0.33	0.15	0.21	<0.05	233	<1	13.8	1.40
V671652		10.8	1.77	104.5	4.72	11	85.9	7.6	1.04	0.71	0.61	0.23	485	1	40.1	4.17
V671653		6.8	1.37	16.6	2.36	1	70.1	0.3	0.54	0.26	0.32	0.08	306	<1	21.7	2.37
V671654		6.2	1.17	6.4	2.16	1	83.4	0.2	0.52	0.23	0.32	0.11	316	1	20.9	2.22
V671655		4.7	0.88	26.7	1.67	1	100.5	0.1	0.37	0.17	0.21	0.17	278	1	14.3	1.59
V671656		28.7	8.16	260	6.16	2	87.7	0.5	0.46	32.2	0.05	5.95	9	1	8.1	0.33
V671657		33.4	9.66	270	6.52	3	83.2	0.8	0.52	34.9	0.16	8.57	12	1	15.5	1.22
V671658		25.3	7.12	369	4.71	5	83.5	1.0	0.36	45.4	0.15	6.58	17	1	12.2	1.12
V671659		3.3	0.98	115.5	1.01	1	68.0	0.2	0.29	2.42	0.52	11.35	5	3	26.6	3.75
V671660		59.7	17.80	175.5	9.64	1	157.5	0.7	0.65	45.7	0.09	7.80	30	1	15.2	0.58
V671661		4.5	1.20	1175	1.48	7	11.3	2.6	0.34	4.96	0.34	1.61	<5	1	21.3	2.39
V671662		2.8	0.88	59.4	0.70	24	10.2	7.0	0.08	1.23	<0.01	0.93	<5	1	1.4	0.13
V671663		1.9	0.48	1280	0.86	178	5.5	23.2	0.11	2.66	0.02	1.62	<5	2	3.0	0.32
V671664		3.9	1.18	909	1.94	35	2.4	16.4	0.33	5.27	0.05	9.78	<5	2	7.2	0.45
V671665		2.2	0.67	520	0.83	14	3.4	6.4	0.31	3.05	0.50	3.48	<5	1	20.8	4.24
V671666		3.2	0.97	907	1.75	518	10.0	39.4	0.35	6.10	0.06	5.47	<5	2	8.7	0.49
V671667		2.5	0.66	1195	1.64	118	5.9	23.1	0.39	4.92	0.08	6.54	<5	2	9.1	0.62
V671668		2.9	0.72	1020	1.40	89	19.9	22.8	0.36	3.12	0.11	3.25	38	1	10.8	0.80
V671669		2.6	0.68	1265	1.86	228	8.2	41.1	0.38	6.10	0.07	5.72	<5	1	10.1	0.70
V671670		1.9	0.55	4.3	0.34	<1	6.6	0.1	0.03	0.57	0.01	0.29	<5	<1	1.6	0.16
V671671		1.7	0.50	1765	1.18	233	10.1	31.1	0.29	3.43	0.04	4.07	<5	2	7.3	0.44
V671672		1.4	0.43	1700	1.16	326	9.1	36.0	0.23	3.86	0.04	4.21	<5	1	5.9	0.45
V671673		2.2	0.69	2230	1.61	311	16.4	43.5	0.30	4.93	0.05	19.25	<5	2	8.1	0.59
V671674		1.5	0.38	2350	0.83	248	21.1	26.6	0.12	2.29	0.02	80.7	<5	1	3.4	0.34
V671675		1.2	0.32	3060	0.53	206	17.3	20.6	0.08	2.07	<0.01	32.6	<5	1	1.8	0.21
V671676		1.6	0.42	2850	1.00	315	11.8	55.0	0.24	4.22	0.01	3.10	<5	4	4.8	0.30
V671677		0.7	0.17	2950	0.49	308	12.0	46.0	0.17	2.67	0.02	3.55	<5	1	5.5	0.38
V671678		1.5	0.45	1465	0.88	286	3.1	40.4	0.28	4.87	0.05	7.77	<5	2	7.7	0.54
V671679		2.9	0.76	1070	1.67	184	13.0	36.1	0.38	5.40	0.10	8.26	14	6	12.5	0.83
V671680		1.3	0.34	1090	0.70	89	4.2	31.7	0.25	4.03	0.14	7.05	<5	1	11.1	1.28
V671681		1.2	0.35	328	0.41	4	45.8	1.2	0.11	4.95	0.13	1.82	9	1	7.1	0.96
V671682		6.3	1.86	85.0	1.97	4	36.6	5.5	0.35	4.48	0.29	5.66	5	1	14.7	2.53
V671683		1.3	0.44	858	0.48	9	5.1	2.5	0.19	1.98	0.53	2.37	<5	1	18.8	6.69
V671684		7.5	2.10	202	3.71	10	51.2	19.0	0.71	7.19	0.22	2.55	39	1	21.5	1.37
V671685		8.2	2.24	198.5	3.11	7	42.2	18.1	0.54	7.31	0.29	3.46	8	1	22.3	2.37
V671686		2.8	0.81	617	1.26	14	8.8	5.9	0.33	3.12	0.18	2.40	<5	1	14.4	1.20
V671687		1.6	0.50	12.4	0.67	4	16.7	18.3	0.33	4.14	0.10	1.23	<5	1	9.2	0.90
V671688		2.7	0.83	453	1.29	5	8.5	7.4	0.40	5.84	0.10	4.72	27	1	9.3	0.69
V671689		2.7	0.74	117.5	1.31	9	24.2	102.0	0.35	4.55	0.09	2.36	<5	1	10.2	0.74
V671690		10.1	2.69	171.0	4.10	8	12.2	28.6	0.98	14.45	0.47	5.32	<5	2	35.4	3.82

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671651		35	45.9	14.90	14.35	10.75	8.67	0.96	0.81	0.03	0.80	0.19	0.06	0.01	0.01	1.13
V671652		130	50.5	12.05	17.45	8.38	4.25	1.98	0.30	<0.01	1.85	0.26	0.18	0.01	<0.01	0.91
V671653		50	45.4	13.30	18.55	10.35	6.50	1.36	0.34	0.02	0.83	0.56	0.05	0.01	0.01	1.07
V671654		53	46.8	13.85	16.60	10.90	6.70	1.56	0.21	0.02	0.86	0.50	0.07	0.01	0.01	0.67
V671655		41	50.5	15.00	11.15	11.10	7.58	1.51	0.28	0.05	0.70	0.20	0.05	0.01	0.02	1.21
V671656		143	73.9	13.70	1.83	0.67	0.27	2.96	5.85	<0.01	0.19	0.01	0.14	0.01	0.03	0.21
V671657		158	74.9	13.50	1.78	0.58	0.24	2.92	5.43	<0.01	0.19	0.02	0.13	0.01	0.04	0.52
V671658		243	73.3	14.55	1.33	0.96	0.29	3.74	5.03	<0.01	0.25	0.03	0.17	0.01	0.05	1.42
V671659		118	76.3	13.45	1.83	0.89	0.27	3.26	3.87	<0.01	0.02	0.07	0.10	0.01	0.02	0.60
V671660		373	71.7	14.60	3.02	1.55	0.67	3.40	4.53	<0.01	0.48	0.02	0.22	0.02	0.07	0.52
V671661		13	75.3	13.95	0.88	0.26	0.05	2.76	7.50	<0.01	0.02	0.01	0.02	<0.01	<0.01	0.10
V671662		3	75.7	15.45	0.62	0.81	0.05	7.61	0.42	<0.01	<0.01	0.02	0.01	<0.01	<0.01	0.38
V671663		<2	74.7	15.90	0.84	0.21	0.05	3.23	2.28	<0.01	<0.01	0.05	0.03	<0.01	0.01	0.82
V671664		6	74.9	15.10	1.02	0.22	0.04	6.05	2.63	<0.01	<0.01	0.05	0.03	<0.01	<0.01	0.38
V671665		27	82.7	10.30	1.34	0.33	0.14	3.06	2.67	<0.01	<0.01	0.13	0.01	<0.01	<0.01	0.33
V671666		8	76.0	15.00	1.02	0.39	0.07	4.58	2.38	<0.01	<0.01	0.06	0.03	<0.01	<0.01	0.56
V671667		8	76.2	15.55	0.87	0.17	0.07	3.01	2.91	<0.01	<0.01	0.05	0.03	<0.01	<0.01	0.58
V671668		11	71.7	15.35	2.47	1.53	0.97	3.76	2.48	0.01	0.11	0.11	0.02	<0.01	<0.01	0.73
V671669		9	76.0	15.40	0.87	0.25	0.06	3.74	3.05	<0.01	0.01	0.05	0.04	<0.01	<0.01	0.50
V671670		47	98.7	0.24	0.51	0.04	0.02	0.02	0.14	<0.01	0.01	0.01	0.01	<0.01	<0.01	-0.02
V671671		7	75.2	15.55	0.72	0.21	0.04	2.94	3.54	<0.01	0.01	0.04	0.03	<0.01	<0.01	0.38
V671672		14	76.5	15.20	1.06	0.17	0.03	3.73	2.51	<0.01	<0.01	0.07	0.03	<0.01	<0.01	0.48
V671673		10	76.3	15.35	1.15	0.23	0.03	4.57	2.58	<0.01	0.01	0.06	0.04	<0.01	<0.01	0.39
V671674		6	76.0	15.60	0.74	0.14	0.03	2.39	2.84	<0.01	<0.01	0.05	0.03	<0.01	0.01	0.40
V671675		4	74.1	16.10	0.51	0.20	0.02	3.22	3.65	<0.01	<0.01	0.03	0.04	0.01	<0.01	0.28
V671676		18	74.3	15.25	2.48	0.20	0.07	3.50	2.51	<0.01	0.01	0.15	0.05	<0.01	<0.01	0.12
V671677		13	75.0	15.65	0.63	0.17	0.02	3.67	3.47	<0.01	<0.01	0.08	0.03	0.01	<0.01	0.18
V671678		9	75.6	15.20	0.91	0.20	0.05	3.85	2.48	<0.01	<0.01	0.05	0.02	<0.01	<0.01	0.37
V671679		11	75.5	15.25	1.13	0.92	0.17	5.65	1.95	<0.01	0.03	0.06	0.03	<0.01	<0.01	0.45
V671680		7	74.7	15.50	0.73	0.18	0.04	4.48	2.60	<0.01	<0.01	0.04	0.02	<0.01	<0.01	0.36
V671681		25	77.4	12.55	1.13	1.67	0.26	3.07	3.32	<0.01	0.04	0.03	<0.01	<0.01	<0.01	0.40
V671682		12	72.2	16.35	1.20	1.83	0.18	6.60	0.99	<0.01	0.04	0.05	0.02	<0.01	<0.01	0.31
V671683		33	74.2	13.95	0.92	0.19	0.02	3.38	6.59	<0.01	<0.01	0.24	0.03	<0.01	<0.01	0.10
V671684		25	72.5	15.05	2.56	2.26	0.75	5.10	1.11	0.01	0.14	0.03	0.05	0.01	0.01	1.03
V671685		27	75.7	14.30	0.88	1.72	0.12	5.75	1.09	<0.01	0.03	0.05	0.03	<0.01	<0.01	0.23
V671686		3	82.2	9.96	0.87	0.55	0.10	3.12	3.01	<0.01	0.03	0.02	0.02	<0.01	<0.01	0.14
V671687		10	71.2	17.20	0.95	1.28	0.05	8.24	0.16	<0.01	<0.01	0.21	0.04	<0.01	<0.01	0.13
V671688		12	76.6	12.00	2.31	1.42	0.97	3.78	2.53	<0.01	0.06	0.04	0.03	<0.01	<0.01	0.71
V671689		31	69.6	18.50	0.37	1.58	0.03	8.62	0.67	<0.01	<0.01	0.01	0.12	<0.01	<0.01	0.11
V671690		43	67.3	19.55	1.55	1.24	0.18	8.29	0.89	<0.01	0.01	0.10	0.03	<0.01	<0.01	1.03

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	TOT-ICP06	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671651		98.57	<0.5	<5	0.6	57	110	170	<1	154	5	33	10	109	
V671652		98.12	<0.5	5	0.9	41	45	250	1	24	6	43	<10	146	
V671653		98.35	<0.5	<5	1.0	44	99	160	<1	83	3	40	10	143	
V671654		98.76	<0.5	<5	0.6	59	114	20	<1	109	5	34	10	122	
V671655		99.36	<0.5	<5	0.5	52	82	60	<1	173	11	42	10	93	
V671656		99.77	<0.5	<5	<0.5	2	1	20	<1	2	46	2	<10	51	
V671657		100.26	<0.5	<5	<0.5	2	3	30	<1	4	47	3	<10	40	
V671658		101.13	<0.5	<5	<0.5	2	2	60	1	2	21	3	10	19	
V671659		100.69	<0.5	<5	<0.5	1	5	20	5	4	45	6	<10	13	
V671660		100.80	<0.5	<5	<0.5	4	1	30	<1	6	40	5	10	74	
V671661		100.85	<0.5	<5	<0.5	<1	1	60	<1	1	52	2	10	12	
V671662		101.07	<0.5	<5	<0.5	<1	1	90	<1	<1	12	<1	<10	12	
V671663		98.12	<0.5	6	<0.5	<1	2	9100	<1	<1	10	1	10	37	0.923
V671664		100.42	<0.5	5	<0.5	<1	1	740	<1	<1	12	1	10	25	
V671665		101.01	<0.5	<5	<0.5	<1	1	210	<1	1	19	4	10	28	
V671666		100.09	<0.5	5	<0.5	<1	6	3110	<1	<1	12	1	10	49	
V671667		99.44	<0.5	6	<0.5	<1	3	7290	<1	<1	10	1	10	40	0.768
V671668		99.24	<0.5	5	<0.5	7	19	4020	<1	20	13	6	10	49	
V671669		99.97	<0.5	<5	<0.5	1	4	5210	1	2	11	1	10	34	0.528
V671670		99.68	<0.5	<5	<0.5	<1	1	10	<1	2	<2	<1	<10	<2	
V671671		98.66	<0.5	<5	<0.5	<1	3	7120	<1	1	8	1	20	40	0.731
V671672		99.78	<0.5	<5	<0.5	<1	3	5720	<1	<1	9	1	10	36	0.589
V671673		100.71	<0.5	<5	<0.5	<1	3	3960	<1	1	9	1	10	35	
V671674		98.23	<0.5	<5	<0.5	<1	3	9420	<1	<1	7	1	20	43	0.981
V671675		98.16	<0.5	5	<0.5	<1	4	7480	<1	1	10	<1	20	43	0.763
V671676		98.64	<0.5	<5	<0.5	1	42	6770	7	18	11	<1	20	104	0.709
V671677		98.91	<0.5	6	<0.5	<1	1	6010	<1	<1	7	1	20	27	0.647
V671678		98.73	<0.5	7	<0.5	<1	2	6090	<1	1	7	1	10	55	0.624
V671679		101.14	<0.5	<5	<0.5	1	6	2090	<1	2	11	2	10	41	
V671680		98.65	<0.5	6	<0.5	<1	2	5660	<1	1	9	2	10	36	0.576
V671681		99.87	<0.5	<5	<0.5	3	2	50	<1	4	22	2	10	18	
V671682		99.77	<0.5	9	<0.5	2	2	60	<1	2	27	3	10	25	
V671683		99.62	<0.5	<5	<0.5	<1	1	20	<1	<1	20	2	10	4	
V671684		100.61	<0.5	10	<0.5	5	14	90	1	15	11	7	<10	18	
V671685		99.90	<0.5	11	<0.5	1	7	60	<1	1	21	2	<10	13	
V671686		100.02	<0.5	9	<0.5	1	2	120	<1	<1	20	2	10	18	
V671687		99.46	<0.5	<5	<0.5	1	4	20	<1	<1	9	2	<10	7	
V671688		100.45	<0.5	<5	<0.5	5	22	70	<1	8	18	4	10	214	
V671689		99.61	<0.5	<5	<0.5	<1	1	10	1	1	11	<1	<10	6	
V671690		100.17	<0.5	<5	<0.5	1	2	50	<1	<1	17	4	10	42	

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671691		0.57	5.9	10.9	10	16.60	3.84	1.50	<0.03	29.3	2.33	0.4	0.61	5.2	0.15	103.0
V671692		0.82	4.5	8.9	10	21.8	2.28	1.14	<0.03	25.1	1.31	0.7	0.37	4.0	0.20	55.5
V671693		0.69	32.0	21.0	10	8.06	6.77	4.82	0.08	20.4	3.90	1.3	1.53	9.4	0.78	15.6
V671694		0.81	7.9	2.7	10	17.60	2.18	0.84	0.04	21.8	0.79	3.5	0.30	1.3	0.21	40.6
V671695		0.32	5.3	3.7	10	3.07	0.53	0.31	0.09	37.4	0.48	0.5	0.11	1.6	0.09	27.1
V671696		0.40	58.1	11.1	20	8.28	0.83	0.63	0.06	23.6	0.83	0.9	0.17	5.6	0.22	40.6
V671697		0.77	26.5	11.6	20	55.4	3.68	1.33	0.10	47.4	3.28	3.1	0.57	4.5	0.17	96.6
V671698		0.52	8.0	18.0	10	25.1	4.95	2.52	0.04	22.4	3.13	3.2	0.89	7.3	0.53	12.5
V671699		1.47	48.4	21.4	10	4.06	6.76	2.29	0.13	45.1	4.56	1.3	1.08	9.3	0.21	120.0
V671700		1.58	44.7	11.8	20	49.4	2.90	1.00	0.03	29.3	2.25	0.7	0.49	5.5	0.07	116.5
V671701		0.78	2.6	9.7	20	34.7	1.44	0.59	0.04	36.6	1.61	1.4	0.23	3.7	0.10	55.2
V671702		0.95	3.1	7.1	10	7.63	1.39	0.63	0.03	33.9	1.05	4.7	0.22	2.9	0.13	4.1
V671703		0.75	50.3	3.9	90	1880	1.50	0.61	0.15	52.8	1.26	1.6	0.26	1.5	0.09	104.5
V671704		2.90	8.5	4.3	20	6.89	1.49	0.65	<0.03	19.4	1.06	0.2	0.26	1.9	0.12	34.6
V671705		0.98	32.5	3.5	10	4.67	0.57	0.37	0.12	52.6	0.31	0.3	0.13	1.7	0.13	62.4
V671706		0.47	14.4	9.4	10	7.55	2.67	1.11	0.13	26.1	1.59	0.4	0.45	4.7	0.14	9.7
V671707		0.37	46.8	3.0	10	4.93	0.92	0.27	0.10	45.4	0.81	3.4	0.11	1.1	0.05	73.6
V671708		0.53	33.3	38.2	40	25.1	8.78	5.30	0.12	27.9	5.42	1.3	1.87	14.9	0.81	28.2
V671709		0.89	16.3	11.2	10	20.8	3.66	2.26	0.07	20.1	1.88	0.7	0.69	5.2	0.44	13.4
V671710		1.21	104.5	77.7	50	27.9	9.99	4.56	0.24	29.6	8.34	0.4	1.92	37.1	0.36	41.3
V671711		1.05	196.0	3.3	10	5.61	0.90	0.59	0.10	17.1	0.56	0.2	0.21	2.0	0.13	5.5
V671712		0.44	27.7	25.8	40	23.8	9.47	9.15	0.14	31.7	4.19	1.6	2.60	11.9	1.88	50.9
V671713		0.66	13.4	12.4	10	109.0	3.58	1.63	<0.03	36.5	2.49	1.9	0.60	5.4	0.30	74.7
V671714		0.48	270	6.4	440	23.0	2.78	2.03	0.69	17.6	2.54	1.3	0.70	2.5	0.29	2.3
V671951		1.99	20.1	0.7	10	13.60	0.25	0.08	<0.03	38.6	0.26	0.4	0.03	<0.5	0.02	60.6
V671952		2.29	22.6	0.7	10	18.05	0.28	0.10	<0.03	38.4	0.23	0.4	0.03	<0.5	0.03	48.1
V671953		0.52	34.1	<0.5	10	8.56	0.22	0.10	<0.03	45.5	0.11	1.2	0.03	<0.5	0.03	38.1
V671954		2.78	4.8	16.6	10	306	3.42	1.54	0.04	33.2	2.44	1.2	0.57	7.3	0.19	40.4
V671955		0.13	5.0	1.3	10	4.90	0.59	0.14	<0.03	41.7	0.41	1.2	0.05	0.5	0.04	101.0
V671956		2.47	12.6	30.4	10	302	7.95	3.52	0.07	33.8	5.19	1.5	1.33	13.4	0.35	35.6
V671957		0.95	9.4	18.2	30	14.20	5.57	4.39	0.03	24.3	3.13	1.6	1.18	7.6	1.15	49.5
V671958		1.27	6.1	9.8	10	2.15	1.92	1.41	0.05	23.1	1.00	0.2	0.39	4.4	0.45	11.3
V671959		0.67	58.4	4.1	10	6.10	0.71	0.58	0.12	22.2	0.41	0.8	0.12	2.2	0.17	7.8
V671960		1.88	28.9	15.8	30	1.77	2.77	2.15	0.15	21.8	1.73	1.4	0.61	7.2	0.56	8.2
V671961		1.59	147.0	41.1	20	5.56	4.79	4.24	0.26	19.6	2.88	3.2	1.14	18.9	0.86	8.7
V671962		1.98	368	109.5	20	2.72	3.70	1.92	0.42	22.2	4.76	6.4	0.65	49.8	0.24	17.3
V671963		1.35	287	103.5	20	6.14	7.26	5.61	0.35	17.4	6.17	8.1	1.62	46.6	1.16	14.6
V671964		1.10	721	194.0	20	5.82	16.35	8.88	0.69	24.1	13.55	10.1	3.20	86.9	1.07	37.8
V671965		1.35	13.0	6.1	40	3.68	2.45	1.39	0.04	29.0	1.04	1.7	0.42	2.4	0.45	43.0
V671966		2.91	5.0	1.7	40	9.85	0.73	0.29	<0.03	36.7	0.40	1.6	0.09	0.6	0.05	46.5

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671691		3.7	1.09	374	1.60	11	1.7	11.8	0.65	8.97	0.24	11.05	<5	1	20.4	1.29
V671692		3.3	0.94	624	1.22	11	2.2	7.4	0.34	6.29	0.22	8.92	<5	1	12.6	1.23
V671693		8.6	2.43	719	3.11	5	13.9	2.0	1.06	15.05	0.83	3.64	<5	1	46.5	6.04
V671694		0.9	0.29	244	0.36	31	9.7	23.5	0.32	5.97	0.18	2.52	<5	1	14.3	1.55
V671695		1.4	0.44	51.4	0.58	1	22.4	4.4	0.11	2.23	0.06	1.51	<5	1	3.5	0.55
V671696		4.2	1.23	625	1.14	2	18.1	2.4	0.14	5.22	0.13	1.70	<5	1	5.0	1.28
V671697		5.0	1.53	226	3.44	3	82.7	161.0	0.78	8.50	0.18	5.11	8	1	18.0	1.49
V671698		7.8	2.14	227	3.15	4	10.2	4.8	0.80	10.70	0.46	4.99	<5	1	29.0	3.55
V671699		8.7	2.66	269	3.66	12	31.3	21.5	1.20	12.80	0.34	7.30	<5	3	33.8	1.97
V671700		4.3	1.35	832	1.75	19	10.5	118.0	0.56	7.08	0.11	5.16	<5	6	15.0	0.54
V671701		4.2	1.17	191.5	1.85	10	11.1	10.5	0.30	6.81	0.09	1.87	7	1	7.9	0.71
V671702		2.7	0.81	74.9	0.91	4	12.4	3.4	0.23	3.73	0.11	2.11	<5	<1	7.9	0.85
V671703		1.8	0.51	1980	1.11	28	59.2	48.1	0.26	12.10	0.09	5.14	75	2	6.9	0.64
V671704		1.7	0.46	728	0.85	13	1.7	8.1	0.28	3.64	0.13	2.24	<5	2	9.2	0.91
V671705		1.3	0.37	317	0.43	9	44.0	3.1	0.08	1.40	0.10	2.92	<5	3	4.3	0.83
V671706		3.6	1.02	237	1.14	2	16.1	3.2	0.41	3.66	0.16	2.87	<5	<1	15.2	0.96
V671707		1.6	0.42	10.3	0.81	1	43.2	374	0.18	0.89	0.04	1.56	<5	1	4.2	0.35
V671708		14.2	4.19	228	5.31	3	35.0	30.6	1.40	15.70	0.80	5.52	17	1	54.7	6.24
V671709		4.4	1.22	624	1.41	4	9.7	2.3	0.46	6.48	0.36	2.30	<5	1	22.9	2.75
V671710		30.4	9.10	327	8.54	1	43.0	5.7	1.77	31.0	0.56	5.14	23	1	55.3	3.22
V671711		1.3	0.36	292	0.54	2	15.8	1.4	0.14	0.90	0.10	0.55	<5	1	9.3	0.88
V671712		9.6	2.82	334	3.35	9	31.1	4.0	1.20	10.40	1.75	5.00	31	1	70.9	13.30
V671713		5.8	1.59	1225	2.38	70	8.5	45.8	0.65	11.65	0.25	10.85	<5	3	19.7	1.98
V671714		5.1	1.08	37.3	2.04	1	256	0.3	0.44	0.34	0.29	0.17	266	1	16.8	2.09
V671951		0.3	0.10	2950	0.27	221	14.6	51.0	0.07	1.68	0.01	1.02	<5	3	1.3	0.09
V671952		0.3	0.09	3390	0.18	203	18.2	52.2	0.07	3.50	0.02	1.85	<5	2	1.9	0.20
V671953		0.1	0.03	161.0	0.09	182	8.6	100.0	0.05	2.81	0.03	0.96	<5	2	1.5	0.20
V671954		6.8	1.96	809	2.45	79	6.8	28.3	0.55	10.35	0.22	3.20	<5	8	19.4	1.33
V671955		0.6	0.15	26.9	0.39	612	2.2	167.5	0.12	8.44	0.03	9.13	<5	5	2.8	0.20
V671956		12.6	3.56	1420	4.18	80	10.0	17.8	1.25	18.45	0.45	11.60	<5	9	44.4	2.83
V671957		8.0	2.24	276	2.88	9	7.0	10.4	0.71	11.25	0.87	3.76	13	1	40.3	6.69
V671958		3.8	1.06	159.5	0.97	1	12.8	1.9	0.22	3.64	0.30	1.01	<5	1	15.9	2.89
V671959		1.4	0.39	384	0.34	3	24.6	1.1	0.06	3.28	0.09	1.16	<5	1	5.4	1.10
V671960		6.3	1.73	125.5	1.83	2	27.2	1.1	0.37	7.70	0.40	2.63	<5	1	20.3	3.25
V671961		16.8	4.70	299	3.53	3	46.1	1.1	0.59	22.0	0.78	18.65	5	1	35.9	5.77
V671962		44.6	12.45	335	7.64	5	74.2	1.2	0.59	49.0	0.26	6.39	14	<1	19.2	1.87
V671963		41.0	11.80	433	8.30	5	49.9	2.1	1.05	53.4	0.93	8.79	8	7	48.7	7.48
V671964		81.2	22.5	272	16.60	8	122.5	2.2	2.59	69.8	1.27	8.59	25	1	91.7	8.07
V671965		2.6	0.74	584	0.86	169	9.5	19.9	0.32	4.65	0.30	4.50	<5	1	18.2	3.36
V671966		0.8	0.20	1695	0.37	419	1.5	32.1	0.09	1.03	0.03	1.75	<5	1	5.2	0.63

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671691		7	77.9	13.20	1.43	0.50	0.11	5.08	2.48	<0.01	0.03	0.02	0.02	<0.01	<0.01	0.44
V671692		11	76.3	13.90	1.22	0.50	0.09	4.40	4.30	<0.01	0.03	0.02	0.02	<0.01	<0.01	0.56
V671693		27	75.8	13.60	0.92	0.44	0.09	2.93	6.29	<0.01	0.02	0.01	0.03	<0.01	<0.01	0.26
V671694		36	81.9	11.15	1.06	0.88	0.04	4.35	1.43	<0.01	<0.01	0.31	0.02	<0.01	<0.01	0.02
V671695		11	72.6	17.95	0.34	2.09	0.01	7.66	0.84	<0.01	<0.01	0.01	0.05	<0.01	<0.01	0.05
V671696		25	74.7	14.30	0.83	0.24	0.14	2.36	7.87	<0.01	0.04	0.02	0.04	<0.01	0.01	0.36
V671697		24	70.9	17.40	1.41	2.46	0.22	7.20	0.41	<0.01	0.03	0.14	0.24	0.01	<0.01	0.38
V671698		46	78.2	13.00	0.86	1.06	0.04	5.35	1.43	<0.01	0.01	0.14	0.03	<0.01	<0.01	0.11
V671699		23	66.0	21.8	1.63	1.00	0.17	6.68	2.37	<0.01	0.05	0.07	0.08	<0.01	0.01	1.43
V671700		9	77.3	13.65	0.76	0.37	0.08	3.42	5.37	<0.01	0.06	0.01	0.07	<0.01	<0.01	0.40
V671701		15	73.8	16.30	1.32	1.37	0.14	7.15	0.85	<0.01	0.03	0.09	0.07	<0.01	<0.01	0.01
V671702		55	72.7	16.70	0.43	1.48	0.01	7.61	0.66	<0.01	<0.01	0.04	0.05	<0.01	<0.01	1.03
V671703		31	63.9	18.00	4.97	2.59	1.79	6.04	1.60	0.01	0.24	0.09	0.16	<0.01	<0.01	0.56
V671704		3	84.5	8.31	0.67	0.09	0.03	1.53	4.23	<0.01	0.01	0.01	0.03	<0.01	<0.01	0.20
V671705		4	73.7	15.00	1.64	1.40	0.12	3.45	3.92	<0.01	0.05	0.07	0.02	0.01	<0.01	0.60
V671706		7	75.2	15.30	0.57	1.15	0.03	6.00	2.45	<0.01	0.01	0.01	0.03	<0.01	<0.01	0.13
V671707		18	70.1	17.35	0.36	1.39	0.02	8.66	0.26	<0.01	<0.01	0.01	0.27	0.01	0.01	0.13
V671708		15	70.3	15.55	2.10	2.49	0.41	5.21	1.47	<0.01	0.08	0.09	0.06	<0.01	<0.01	0.38
V671709		13	76.2	13.40	0.75	0.56	0.04	3.15	5.57	<0.01	0.02	0.03	0.04	<0.01	<0.01	0.38
V671710		8	68.7	16.70	3.20	2.55	0.69	5.03	2.27	0.01	0.14	0.11	0.04	<0.01	0.01	0.60
V671711		3	78.3	11.90	0.65	0.22	0.05	2.41	6.26	<0.01	0.04	0.01	0.01	<0.01	0.02	0.10
V671712		36	70.3	14.65	4.34	1.79	0.65	4.92	1.62	<0.01	0.36	0.06	0.03	<0.01	<0.01	0.35
V671713		29	77.9	13.60	1.03	0.44	0.06	4.87	2.28	<0.01	0.01	0.04	0.04	<0.01	<0.01	0.50
V671714		41	51.9	17.40	12.85	9.49	3.28	2.30	0.37	0.06	0.78	0.48	0.06	0.03	0.03	0.14
V671951		3	75.7	15.30	0.58	0.22	0.04	2.94	2.56	<0.01	<0.01	0.11	0.08	<0.01	<0.01	0.60
V671952		4	75.9	15.40	0.44	0.14	0.04	2.69	2.86	<0.01	<0.01	0.23	0.06	<0.01	<0.01	0.43
V671953		8	77.1	16.75	0.42	0.06	0.03	2.53	0.21	<0.01	0.01	0.12	0.03	<0.01	<0.01	0.17
V671954		17	78.7	12.95	0.72	0.49	0.02	5.28	1.12	<0.01	0.01	0.08	0.06	<0.01	<0.01	0.53
V671955		6	70.5	18.05	0.68	0.27	0.01	10.10	0.19	<0.01	<0.01	0.01	0.09	<0.01	<0.01	-0.02
V671956		30	77.5	14.05	0.98	0.72	0.05	5.27	1.87	<0.01	0.02	0.05	0.08	<0.01	<0.01	0.41
V671957		34	76.1	13.60	2.22	1.01	0.25	5.19	2.01	<0.01	0.10	0.08	0.02	<0.01	<0.01	0.31
V671958		6	76.4	14.55	0.77	1.23	0.02	5.90	1.83	<0.01	0.02	0.14	0.02	<0.01	<0.01	0.07
V671959		13	76.2	13.20	0.75	0.49	0.04	3.33	5.72	<0.01	0.03	0.02	0.05	<0.01	0.01	-0.04
V671960		35	77.2	13.95	0.91	1.49	0.07	5.24	1.92	<0.01	0.05	0.02	0.04	<0.01	<0.01	0.11
V671961		90	77.2	13.00	1.18	0.64	0.14	3.19	5.17	<0.01	0.08	0.02	0.05	0.01	0.02	0.22
V671962		223	74.7	13.75	2.06	0.83	0.34	3.11	5.38	<0.01	0.25	0.03	0.09	0.01	0.04	0.31
V671963		240	76.2	12.15	1.58	0.11	0.19	1.54	7.42	<0.01	0.14	0.02	0.07	0.01	0.03	0.07
V671964		387	73.0	14.15	2.79	0.96	0.59	3.09	5.29	<0.01	0.42	0.03	0.07	0.02	0.08	0.48
V671965		25	79.1	13.25	0.99	0.45	0.04	5.71	1.32	0.01	<0.01	0.29	0.03	<0.01	<0.01	0.12
V671966		18	76.0	15.45	0.81	0.13	0.03	3.31	3.08	0.01	<0.01	0.21	0.05	<0.01	<0.01	0.22

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	TOT-ICP06	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671691		101.21	<0.5	6	<0.5	<1	5	80	<1	<1	23	2	<10	93	
V671692		101.34	<0.5	<5	<0.5	<1	1	110	<1	1	35	3	10	65	
V671693		100.39	<0.5	<5	<0.5	1	1	40	<1	<1	43	2	10	17	
V671694		101.16	<0.5	<5	<0.5	<1	6	40	<1	<1	22	1	<10	6	
V671695		101.60	<0.5	<5	<0.5	<1	2	10	<1	<1	10	<1	<10	<2	
V671696		100.91	<0.5	<5	<0.5	1	1	20	<1	<1	32	2	10	11	
V671697		100.80	<0.5	5	<0.5	<1	9	80	5	4	26	4	10	33	
V671698		100.23	<0.5	<5	<0.5	<1	1	40	<1	<1	26	2	10	13	
V671699		101.29	<0.5	19	<0.5	1	2	20	<1	1	21	8	<10	25	
V671700		101.49	<0.5	<5	<0.5	<1	<1	10	<1	2	26	2	10	10	
V671701		101.13	<0.5	6	<0.5	1	1	100	<1	5	19	2	<10	73	
V671702		100.71	<0.5	<5	<0.5	<1	1	40	<1	<1	18	1	<10	3	
V671703		99.95	<0.5	826	<0.5	15	15	400	<1	31	31	13	10	139	
V671704		99.61	<0.5	5	<0.5	<1	2	30	<1	<1	18	3	10	14	
V671705		99.98	<0.5	<5	<0.5	<1	4	70	<1	<1	35	2	10	34	
V671706		100.88	<0.5	9	<0.5	<1	1	10	<1	<1	26	<1	<10	14	
V671707		98.57	<0.5	<5	<0.5	<1	1	20	<1	<1	11	<1	<10	2	
V671708		98.14	<0.5	10	<0.5	4	9	70	<1	11	27	5	10	47	
V671709		100.14	<0.5	5	<0.5	<1	<1	30	<1	1	43	2	10	15	
V671710		100.05	<0.5	5	<0.5	4	8	50	<1	8	39	6	10	51	
V671711		99.97	<0.5	<5	<0.5	<1	<1	50	1	<1	10	2	<10	6	
V671712		99.07	<0.5	6	<0.5	7	<1	190	<1	9	20	17	<10	36	
V671713		100.77	<0.5	<5	<0.5	1	<1	300	<1	<1	13	3	10	64	
V671714		99.17	<0.5	237	0.7	79	5	160	<1	226	6	43	<10	97	
V671951		98.13	<0.5	<5	<0.5	<1	<1	7870	<1	<1	7	<1	20	112	0.806
V671952		98.19	<0.5	<5	<0.5	<1	<1	8520	<1	<1	8	<1	30	84	0.841
V671953		97.43	<0.5	<5	<0.5	<1	2	>10000	<1	<1	5	<1	<10	11	1.615
V671954		99.96	<0.5	13	<0.5	<1	1	510	<1	1	12	1	10	82	
V671955		99.88	<0.5	<5	<0.5	<1	1	30	<1	1	9	<1	<10	2	
V671956		101.00	<0.5	13	<0.5	<1	<1	300	<1	1	28	2	10	78	
V671957		100.89	<0.5	<5	<0.5	3	1	110	<1	10	20	8	<10	61	
V671958		100.95	<0.5	<5	<0.5	<1	1	10	<1	<1	16	1	<10	8	
V671959		99.80	<0.5	<5	<0.5	<1	1	20	<1	<1	35	1	<10	13	
V671960		101.00	<0.5	<5	<0.5	<1	1	20	<1	<1	26	1	<10	17	
V671961		100.92	<0.5	5	<0.5	1	2	30	<1	1	57	2	10	26	
V671962		100.90	<0.5	<5	<0.5	2	4	50	<1	2	38	4	10	59	
V671963		99.53	<0.5	<5	<0.5	1	18	50	3	19	79	3	<10	49	
V671964		100.97	<0.5	<5	<0.5	4	7	40	5	5	35	2	<10	86	
V671965		101.31	<0.5	<5	<0.5	<1	2	1230	1	2	10	1	<10	23	
V671966		99.30	<0.5	<5	<0.5	1	1	7190	1	2	5	<1	10	65	0.743

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	WEI-21	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Recvd Wt.	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb
	Units	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.02	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2
V671967		1.90	2.5	0.8	10	23.3	0.18	0.08	<0.03	43.8	0.24	2.6	0.01	<0.5	<0.01	32.4
V671968		0.89	2.3	11.7	10	37.5	4.11	1.31	<0.03	54.2	3.01	2.5	0.52	3.7	0.34	108.0
V671969		1.34	3.4	4.8	20	32.4	2.13	0.63	<0.03	95.5	1.57	0.6	0.28	1.6	0.10	163.0
V671970		0.71	3.1	1.8	10	18.25	0.68	0.23	<0.03	56.0	0.53	3.7	0.07	0.6	0.03	12.8
V671971		0.93	12.5	18.1	10	34.7	5.35	1.69	<0.03	40.9	4.03	0.6	0.73	7.0	0.17	79.6
V671972		2.03	4.7	16.9	10	11.50	4.53	1.50	<0.03	29.0	3.27	0.5	0.66	6.6	0.14	34.9
V671973		1.31	54.9	35.8	20	33.2	7.54	3.53	0.10	26.5	5.28	2.6	1.35	15.2	0.37	38.8
V671974		0.54	1.9	16.3	10	15.60	3.48	1.24	<0.03	56.8	3.14	0.4	0.46	5.7	0.18	122.0
V671975		0.42	2.4	19.3	10	12.20	5.35	2.15	<0.03	45.8	3.96	0.8	0.77	7.0	0.39	96.7
V671976		0.23	3.3	9.7	10	32.3	1.83	1.01	<0.03	20.4	1.30	2.4	0.34	4.3	0.23	18.7
V671977		0.69	15.0	24.2	10	25.3	6.03	2.86	0.06	25.5	4.00	2.2	1.01	10.1	0.49	43.8
V671978		0.29	4.9	11.2	10	9.86	2.91	1.19	<0.03	41.6	2.17	0.4	0.43	4.8	0.16	93.3
V671979		0.33	5.5	18.8	10	6.24	3.77	1.95	<0.03	29.2	2.70	0.6	0.62	7.7	0.39	62.7
V671980		0.22	2.6	2.0	10	1120	0.96	0.21	<0.03	57.9	1.01	2.1	0.07	0.6	0.02	144.5
V671981		0.63	4.2	5.8	10	469	12.80	1.97	<0.03	67.2	8.06	36.7	1.10	1.6	0.13	248
V671982		1.03	2.1	3.3	10	12.90	1.18	0.33	<0.03	41.3	0.90	1.3	0.13	1.0	0.04	83.0
V671983		1.31	0.5	1.4	10	11.65	0.48	0.10	<0.03	35.0	0.59	2.2	0.03	0.5	<0.01	59.1
V671984		2.57	<0.5	1.4	10	20.5	0.76	0.12	<0.03	38.2	0.81	<0.2	0.04	0.5	<0.01	54.2
V671985		0.81	6.0	1.4	10	38.4	0.85	0.33	<0.03	33.8	0.43	1.8	0.11	0.5	0.09	19.0
V671986		0.75	49.6	9.7	20	19.25	5.99	4.61	0.09	22.1	2.81	1.0	1.25	4.2	0.88	53.1
V671987		0.27	6.1	0.9	20	3.28	0.34	0.16	<0.03	32.0	0.29	0.5	0.03	<0.5	0.01	45.2
V671988		0.54	44.1	10.4	20	44.3	2.35	0.82	0.24	39.9	2.11	2.1	0.30	3.4	0.10	69.1
V671989		0.10	54.1	1.0	30	18.50	0.62	0.23	<0.03	20.9	0.40	<0.2	0.06	<0.5	0.01	44.5
V671990		0.16	8.4	6.9	10	12.70	0.94	0.29	<0.03	28.1	1.03	0.6	0.10	2.6	0.02	94.0
V671991		1.11	5.0	5.7	10	13.05	1.22	0.37	<0.03	35.0	0.96	0.2	0.16	2.1	0.04	83.4

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Nd	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.1	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03
V671967		0.4	0.11	1245	0.20	475	14.5	73.5	0.03	2.74	<0.01	2.93	<5	2	1.6	0.06
V671968		5.8	1.62	2020	3.52	129	2.6	36.7	0.72	15.40	0.24	9.30	<5	5	22.9	2.24
V671969		2.4	0.65	2240	1.40	395	1.5	35.5	0.34	7.41	0.11	7.76	<5	13	12.0	0.90
V671970		0.8	0.27	1080	0.46	68	2.9	6.4	0.10	2.01	0.02	2.27	<5	2	4.1	0.31
V671971		7.5	2.25	780	3.70	34	1.0	10.8	0.90	13.15	0.24	3.74	<5	5	26.3	1.66
V671972		6.9	2.00	831	2.77	14	1.4	6.3	0.75	11.20	0.20	4.99	<5	2	23.3	1.42
V671973		14.8	4.05	829	4.50	17	10.6	6.3	1.16	20.6	0.48	14.05	<5	2	42.8	3.26
V671974		7.5	2.17	1235	3.32	86	0.8	26.4	0.62	10.30	0.20	2.02	<5	8	19.3	1.50
V671975		9.0	2.54	832	3.68	52	0.8	21.1	0.82	11.40	0.37	4.90	<5	5	30.2	2.84
V671976		3.7	1.07	674	1.29	6	2.9	4.5	0.28	13.40	0.15	12.25	<5	1	10.3	1.52
V671977		9.9	2.80	257	3.64	4	11.5	7.1	0.91	16.80	0.48	11.45	<5	1	33.5	3.47
V671978		4.3	1.29	736	1.97	44	2.4	18.6	0.48	5.80	0.18	3.03	<5	2	16.7	1.50
V671979		7.4	2.22	585	2.49	7	3.6	8.3	0.57	10.80	0.31	6.31	<5	1	21.2	2.75
V671980		1.3	0.32	3390	1.11	209	4.4	258	0.20	1.80	0.02	7.26	<5	10	4.9	0.36
V671981		3.9	0.97	1670	5.02	653	7.9	519	2.66	16.30	0.23	32.7	<5	9	69.6	1.73
V671982		1.6	0.46	2250	1.10	105	4.3	36.5	0.19	4.63	0.04	1.87	<5	4	6.6	0.54
V671983		0.6	0.20	1690	0.59	17	9.8	61.9	0.09	1.73	<0.01	3.42	<5	1	3.2	0.21
V671984		0.8	0.19	2480	0.54	78	17.1	28.1	0.12	2.99	<0.01	1.87	<5	3	3.0	0.16
V671985		0.7	0.19	1070	0.34	84	8.3	18.6	0.10	1.76	0.05	2.77	<5	1	5.6	0.70
V671986		4.7	1.21	587	2.06	3	22.4	5.6	0.73	15.75	0.81	11.35	11	2	27.4	6.60
V671987		0.4	0.12	1365	0.22	229	2.6	19.7	0.02	1.15	<0.01	2.03	<5	1	2.4	0.21
V671988		4.9	1.31	189.0	2.04	14	180.5	110.5	0.41	4.88	0.13	5.28	9	2	11.4	0.82
V671989		0.4	0.11	629	0.26	26	35.0	18.7	0.07	1.35	0.01	2.88	<5	2	3.2	0.23
V671990		2.9	0.87	476	1.28	12	4.6	31.8	0.19	3.93	0.04	2.39	<5	2	4.7	0.28
V671991		2.4	0.71	1095	1.02	46	4.4	32.6	0.24	3.74	0.05	1.43	<5	1	6.6	0.45

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05
	Analyte	Zr	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI
	Units	ppm	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V671967		23	74.1	16.00	0.69	0.62	0.01	6.99	1.58	<0.01	<0.01	0.08	0.07	0.01	<0.01	0.02
V671968		36	75.9	14.65	1.33	0.23	0.04	4.75	3.26	<0.01	0.01	0.31	0.04	<0.01	<0.01	0.44
V671969		10	81.8	11.85	1.42	0.10	0.10	1.71	2.79	<0.01	0.02	0.16	0.02	<0.01	<0.01	1.13
V671970		39	72.6	17.40	0.70	0.24	0.02	8.10	2.23	<0.01	<0.01	0.25	0.07	<0.01	<0.01	0.10
V671971		12	77.1	13.75	1.46	0.37	0.06	3.93	3.00	<0.01	0.02	0.03	0.03	<0.01	<0.01	0.77
V671972		10	75.2	14.60	1.17	0.37	0.03	3.87	5.16	<0.01	0.01	0.07	0.06	<0.01	<0.01	0.22
V671973		60	77.9	13.45	1.49	0.48	0.09	3.21	4.74	<0.01	0.05	0.05	0.04	<0.01	0.01	0.46
V671974		8	79.7	12.80	1.53	0.14	0.06	2.80	3.39	<0.01	0.02	0.02	0.03	<0.01	<0.01	0.96
V671975		13	77.0	14.30	1.47	0.29	0.05	5.06	2.48	<0.01	0.02	0.04	0.04	<0.01	<0.01	0.60
V671976		50	78.6	12.80	0.81	0.51	0.03	4.07	4.27	<0.01	0.01	0.03	0.02	<0.01	<0.01	0.12
V671977		48	76.7	13.70	1.83	1.33	0.10	5.52	1.32	<0.01	0.02	0.16	0.02	<0.01	<0.01	0.08
V671978		7	74.5	14.25	1.69	0.41	0.09	4.32	3.42	<0.01	0.03	0.02	0.04	<0.01	<0.01	0.80
V671979		12	76.6	13.85	1.23	0.54	0.06	4.32	4.62	<0.01	0.02	0.04	0.02	<0.01	<0.01	0.13
V671980		12	78.1	14.05	0.91	0.22	0.04	5.49	1.40	<0.01	0.03	0.24	0.03	<0.01	<0.01	1.23
V671981		198	71.5	16.55	0.92	0.42	0.01	7.29	0.82	<0.01	0.02	1.35	0.07	<0.01	<0.01	0.46
V671982		16	75.9	15.70	1.03	0.15	0.04	2.54	2.84	<0.01	0.01	0.08	0.03	<0.01	<0.01	0.41
V671983		22	75.0	15.35	0.60	0.32	0.02	4.72	2.14	<0.01	<0.01	0.26	0.10	0.01	<0.01	0.11
V671984		2	75.3	15.85	0.83	0.17	0.02	2.71	3.00	<0.01	0.01	0.03	0.04	0.01	<0.01	0.42
V671985		23	77.8	13.20	0.85	0.45	0.04	5.50	2.42	<0.01	<0.01	0.24	0.04	<0.01	<0.01	0.14
V671986		23	76.2	13.70	1.32	1.11	0.24	3.78	4.30	<0.01	0.04	0.04	<0.01	<0.01	0.01	0.32
V671987		8	75.3	14.70	0.71	0.17	0.01	5.57	3.90	<0.01	<0.01	0.06	0.04	<0.01	<0.01	0.09
V671988		24	74.0	15.75	1.24	2.90	0.36	5.38	0.86	<0.01	0.03	0.05	0.13	0.02	0.01	0.43
V671989		3	77.2	16.15	2.02	0.09	0.06	0.92	1.63	<0.01	<0.01	0.03	<0.01	<0.01	0.01	-0.03
V671990		10	77.6	14.25	1.09	0.31	0.03	5.84	1.36	<0.01	<0.01	0.05	0.02	<0.01	<0.01	0.19
V671991		3	73.3	15.55	0.57	0.39	0.03	6.05	3.13	<0.01	<0.01	0.04	0.04	<0.01	<0.01	0.22

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	TOT-ICP06	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Total	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.01	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
V671967		100.17	<0.5	<5	<0.5	<1	1	1140	<1	3	6	<1	10	10	
V671968		100.96	<0.5	<5	<0.5	<1	<1	250	<1	<1	11	5	10	28	
V671969		101.10	<0.5	<5	<0.5	<1	<1	510	<1	<1	5	17	10	67	
V671970		101.71	<0.5	<5	<0.5	<1	1	40	<1	1	5	1	<10	9	
V671971		100.52	<0.5	<5	<0.5	<1	1	220	<1	<1	13	10	10	69	
V671972		100.76	<0.5	<5	<0.5	<1	1	80	<1	2	28	3	10	37	
V671973		101.97	<0.5	<5	<0.5	<1	1	180	<1	2	43	3	<10	64	
V671974		101.45	<0.5	<5	<0.5	<1	1	320	<1	2	12	18	10	63	
V671975		101.35	<0.5	<5	<0.5	<1	1	170	<1	1	11	8	10	49	
V671976		101.27	<0.5	<5	<0.5	<1	1	80	1	1	31	1	10	15	
V671977		100.78	<0.5	<5	<0.5	1	3	80	<1	2	28	4	<10	43	
V671978		99.57	<0.5	<5	<0.5	<1	2	90	<1	2	18	11	10	55	
V671979		101.43	<0.5	<5	<0.5	<1	1	60	<1	1	29	5	<10	38	
V671980		101.74	<0.5	<5	<0.5	<1	<1	1500	<1	1	8	1	20	34	
V671981		99.41	<0.5	12	<0.5	<1	<1	590	<1	2	26	<1	10	21	
V671982		98.73	<0.5	<5	<0.5	<1	1	8570	1	<1	6	1	20	58	0.849
V671983		98.63	<0.5	<5	<0.5	<1	<1	5570	<1	1	9	<1	10	19	0.614
V671984		98.39	<0.5	<5	<0.5	<1	1	8340	<1	<1	5	<1	20	43	0.844
V671985		100.68	<0.5	<5	<0.5	1	4	90	<1	2	5	1	10	18	
V671986		101.06	<0.5	<5	<0.5	3	3	50	<1	2	32	3	10	17	
V671987		100.55	<0.5	<5	<0.5	1	1	20	<1	1	4	<1	10	62	
V671988		101.16	<0.5	21	<0.5	1	13	190	<1	5	19	2	<10	49	
V671989		98.08	<0.5	7	<0.5	<1	4	>10000	1	2	8	1	<10	13	1.650
V671990		100.74	<0.5	<5	<0.5	<1	2	2540	<1	1	5	1	<10	14	
V671991		99.32	<0.5	<5	<0.5	<1	<1	220	<1	1	11	1	<10	36	

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
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North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

CERTIFICATE OF ANALYSIS TB17180529

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:				
	CRU-31	CRU-QC	LOG-21	LOG-23
	PUL-31	PUL-QC	SPL-21	SPL-21X
	SPL-21Xd	WEI-21		

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:				
	Li-OG63	ME-4ACD81	ME-ICP06	ME-MS81
	ME-OG62o	OA-GRA05	TOT-ICP06	

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

QC CERTIFICATE TB17103883

Project: 0518

This report is for 268 Drill Core samples submitted to our lab in Thunder Bay, ON, Canada on 26-MAY-2017.

The following have access to data associated with this certificate:

CINDY HU	BILL MERCER	

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
CRU-32	Fine Crushing 90% <2mm
SPL-21	Split sample - riffle splitter
SPL-21X	Addnl Crush Split w No Analysis
SPL-21Xd	Addnl Crush Split with No Analysis-DUP
PUL-35a	Pulv 1 kg split to 95%<106 um
CRU-QC	Crushing QC Test
PUL-QC	Pulverizing QC Test
LOG-21	Sample logging - ClientBarCode
LOG-23	Pulp Login - Rcvd with Barcode

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-ICP06	Whole Rock Package - ICP-AES	ICP-AES
OA-GRA05	Loss on Ignition at 1000C	WST-SEQ
ME-MS81	Lithium Borate Fusion ICP-MS	ICP-MS
TOT-ICP06	Total Calculation for ICP06	ICP-AES
F-IC881	F - KOH fusion and IC	
ME-4ACD81	Base Metals by 4-acid dig.	ICP-AES
Li-OG63	Ore grade Li - 4ACID	ICP-AES
ME-OG62o	Ore Grade open beaker -ICPAES	ICP-AES

To: AVALON ADVANCED MATERIALS INC.
ATTN: BILL MERCER
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

Signature:

Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

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TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
STANDARDS																
AMIS0085																
Target Range - Lower Bound																
Upper Bound																
AMIS0085		373	82.0	600	4.59	11.00	8.80	1.00	14.9	7.80	5.1	2.69	40.9	1.49	11.6	30.1
AMIS0085		361	72.2	580	4.10	11.45	8.84	0.92	13.1	7.43	4.7	2.52	36.4	1.37	10.8	27.0
AMIS0085		354	70.3	600	4.28	10.35	8.20	0.91	12.7	7.01	4.6	2.52	37.7	1.28	10.0	28.2
Target Range - Lower Bound																
Upper Bound																
AMIS0085																
Target Range - Lower Bound																
Upper Bound																
AMIS0167																
AMIS0167																
AMIS0167																
Target Range - Lower Bound																
Upper Bound																
AMIS0167		80.5	45.2	420	1.16	6.03	3.14	0.71	3.3	5.03	2.8	1.12	23.1	0.30	4.3	18.5
AMIS0167		88.7	46.7	450	1.27	6.06	3.15	0.73	3.6	4.92	2.8	1.18	23.7	0.35	4.4	19.1
Target Range - Lower Bound																
Upper Bound																
AMIS0167																
AMIS0167																
AMIS0167																
AMIS0167																
Target Range - Lower Bound																
Upper Bound																
AMIS0185																
AMIS0185																
AMIS0185																
AMIS0185																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
STANDARDS																
AMIS0085																
Target Range - Lower Bound																
Upper Bound																
AMIS0085		8.77	239	6.80	3	110.0	1.7	1.58	57.3	1.38	279	30	2	75.3	9.64	174
AMIS0085		7.85	217	6.47	3	99.5	1.5	1.61	50.4	1.37	265	32	2	68.0	9.20	162
AMIS0085		7.94	209	6.55	3	103.0	1.6	1.43	51.7	1.28	268	29	2	70.2	8.90	158
Target Range - Lower Bound																
Upper Bound																
AMIS0085																
Target Range - Lower Bound																
Upper Bound																
AMIS0167																
AMIS0167																
AMIS0167																
Target Range - Lower Bound																
Upper Bound																
AMIS0167		5.01	18.6	4.59	2	18.6	1.8	0.96	46.8	0.39	484	63	1	23.6	2.83	98
AMIS0167		5.11	20.0	4.80	2	19.4	1.8	0.97	52.2	0.44	465	62	1	24.6	2.65	108
Target Range - Lower Bound																
Upper Bound																
AMIS0167																
AMIS0167																
AMIS0167																
AMIS0167																
Target Range - Lower Bound																
Upper Bound																
AMIS0185																
AMIS0185																
AMIS0185																
AMIS0185																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
STANDARDS																
AMIS0085		70.4	10.95	3.38	3.19	1.71	1.70	4.55	0.08	0.21	0.06	0.08	0.01	0.04		
Target Range - Lower Bound		69.0	10.60	3.33	3.12	1.64	1.62	4.48	0.05	0.18	0.04	0.05	<0.01	0.02		
Upper Bound		72.1	11.35	3.67	3.44	1.86	1.84	4.90	0.10	0.24	0.09	0.10	0.03	0.06		
AMIS0085		71.9	11.25	3.54	3.28	1.78	1.77	4.81	0.08	0.21	0.07	0.08	0.01	0.04		
AMIS0085		69.8	10.60	3.39	3.18	1.71	1.76	4.60	0.08	0.21	0.07	0.07	0.01	0.04		
AMIS0085		71.5	11.10	3.45	3.19	1.74	1.75	4.67	0.08	0.21	0.07	0.07	0.01	0.04		
Target Range - Lower Bound		69.0	10.60	3.33	3.12	1.64	1.62	4.48	0.05	0.18	0.04	0.05	<0.01	0.02		
Upper Bound		72.1	11.35	3.67	3.44	1.86	1.84	4.90	0.10	0.24	0.09	0.10	0.03	0.06		
AMIS0085		71.7	10.95	3.49	3.25	1.80	1.77	4.66	0.08	0.21	0.07	0.07	0.01	0.04		100.64
Target Range - Lower Bound		69.0	10.60	3.33	3.12	1.64	1.62	4.48	0.05	0.18	0.04	0.05	<0.01	0.02		97.99
Upper Bound		72.1	11.35	3.67	3.44	1.86	1.84	4.90	0.10	0.24	0.09	0.10	0.03	0.06		>102.00
AMIS0167		92.0	2.45	3.35	0.13	0.23	0.08	0.49	0.06	0.14	0.02	0.03	<0.01	0.01		
AMIS0167		90.8	2.45	3.33	0.13	0.23	0.09	0.49	0.06	0.14	0.02	0.04	<0.01	0.01		
AMIS0167		92.0	2.43	3.39	0.13	0.23	0.08	0.49	0.06	0.14	0.02	0.04	<0.01	0.01		
Target Range - Lower Bound		89.6	2.29	3.28	0.10	0.21	0.06	0.45	0.03	0.12	<0.01	<0.01	<0.01	<0.01		
Upper Bound		93.3	2.55	3.62	0.16	0.27	0.12	0.55	0.08	0.18	0.04	0.05	0.02	0.02		
AMIS0167																
AMIS0167																
Target Range - Lower Bound																
Upper Bound																
AMIS0167		93.1	2.50	3.50	0.14	0.25	0.09	0.50	0.06	0.15	0.02	0.03	<0.01	0.01		101.97
AMIS0167		93.4	2.48	3.41	0.13	0.24	0.08	0.51	0.06	0.15	0.02	0.04	<0.01	0.01		>102.00
AMIS0167		91.8	2.42	3.40	0.12	0.23	0.09	0.49	0.06	0.15	0.02	0.03	<0.01	0.01		100.44
AMIS0167		90.6	2.44	3.41	0.13	0.23	0.09	0.49	0.06	0.15	0.02	0.03	<0.01	0.01		99.28
Target Range - Lower Bound		89.6	2.29	3.28	0.10	0.21	0.06	0.45	0.03	0.12	<0.01	<0.01	<0.01	<0.01		97.99
Upper Bound		93.3	2.55	3.62	0.16	0.27	0.12	0.55	0.08	0.18	0.04	0.05	0.02	0.02		>102.00
AMIS0185															21.1	
AMIS0185															21.3	
AMIS0185															21.3	
AMIS0185															21.2	
Target Range - Lower Bound															20.1	
Upper Bound															22.3	

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
STANDARDS																
AMIS0085																
Target Range - Lower Bound																
Upper Bound																
AMIS0085																
AMIS0085																
AMIS0085																
Target Range - Lower Bound																
Upper Bound																
AMIS0085																
Target Range - Lower Bound																
Upper Bound																
AMIS0167																
AMIS0167																
AMIS0167																
Target Range - Lower Bound																
Upper Bound																
AMIS0167																
AMIS0167																
Target Range - Lower Bound																
Upper Bound																
AMIS0167																
AMIS0167																
AMIS0167																
AMIS0167																
Target Range - Lower Bound																
Upper Bound																
AMIS0185																
AMIS0185																
AMIS0185																
AMIS0185																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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North Vancouver BC V7H 0A7
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TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
STANDARDS																
AMIS0286																
AMIS0286																
AMIS0286																
AMIS0286																
AMIS0286																
Target Range - Lower Bound																
Upper Bound																
AMIS0304																
Target Range - Lower Bound																
Upper Bound																
AMIS0304		2430	8150	90	0.45	124.0	31.9	143.0	52.9	324	26.4	17.15	3330	1.90	>2500	3780
AMIS0304		2650	8190	100	0.38	142.0	36.4	147.5	56.0	352	26.0	17.90	3320	1.97	>2500	3740
AMIS0304		2780	8560	110	0.41	140.5	36.7	159.5	57.9	358	29.2	19.20	3710	2.07	>2500	4140
AMIS0304		2520	7770	90	0.40	127.5	32.2	137.5	49.2	321	26.3	16.70	3330	1.86	>2500	3620
AMIS0304		2610	8100	90	0.35	126.0	31.7	142.0	54.4	315	26.2	16.60	3310	1.99	>2500	3700
Target Range - Lower Bound		2340	7280	70	0.35	119.0	30.6	135.0	47.8	309	25.0	16.20	3250	1.83	4670	3610
Upper Bound		2860	8900	120	0.45	145.5	37.4	165.0	58.7	377	31.0	19.80	3970	2.26	>2500	4410
CCU-1e																
CCU-1e																
CCU-1e																
CCU-1e																
Target Range - Lower Bound																
Upper Bound																
CDN-W-4																
CDN-W-4																
CDN-W-4																
CDN-W-4																
Target Range - Lower Bound																
Upper Bound																
MRGeo08																
MRGeo08																
MRGeo08																
MRGeo08																
MRGeo08																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
STANDARDS																
AMIS0286																
AMIS0286																
AMIS0286																
AMIS0286																
AMIS0286																
Target Range - Lower Bound																
Upper Bound																
AMIS0304																
Target Range - Lower Bound																
Upper Bound																
AMIS0304		992	11.2	560	24	3320	11.9	31.8	422	3.33	22.8	368	5	388	15.55	1100
AMIS0304		992	10.6	562	23	3310	12.9	35.1	427	3.47	22.2	378	5	387	16.30	1140
AMIS0304		>1000	11.3	595	26	3730	13.3	35.8	463	3.60	24.1	375	6	430	17.35	1200
AMIS0304		995	11.0	555	23	3300	11.9	33.1	417	3.39	21.7	371	5	380	15.65	1090
AMIS0304		1000	10.2	576	24	3270	12.0	31.3	422	3.48	21.9	370	5	383	16.65	1150
Target Range - Lower Bound		925	9.3	543	22	3060	11.1	30.8	406	3.14	21.6	331	3	369	15.25	1005
Upper Bound		>1000	11.8	664	29	3740	13.8	37.7	496	3.86	26.5	415	7	452	18.75	1230
CCU-1e																
CCU-1e																
CCU-1e																
CCU-1e																
Target Range - Lower Bound																
Upper Bound																
CDN-W-4																
CDN-W-4																
CDN-W-4																
CDN-W-4																
Target Range - Lower Bound																
Upper Bound																
MRGeo08																
MRGeo08																
MRGeo08																
MRGeo08																
MRGeo08																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
STANDARDS																
AMIS0286															7.62	
AMIS0286															7.65	
AMIS0286															7.50	
AMIS0286															7.70	
AMIS0286															7.81	
Target Range - Lower Bound															7.25	
Upper Bound															8.03	
AMIS0304		12.45	1.54	20.8	28.4	2.75	0.09	0.28	0.01	1.72	0.45	18.25	0.41	0.29		
Target Range - Lower Bound		11.90	1.42	20.3	27.7	2.72	0.06	0.25	<0.01	1.69	0.41	17.80	0.36	0.25		
Upper Bound		12.75	1.62	21.6	29.3	3.02	0.12	0.31	0.03	1.91	0.51	18.90	0.44	0.31		
AMIS0304		12.10	1.54	21.3	28.3	2.78	0.10	0.28	0.01	1.74	0.46	17.95	0.41	0.29		
AMIS0304		12.35	1.50	20.9	28.1	2.73	0.10	0.28	0.01	1.70	0.45	18.40	0.41	0.29		
AMIS0304																
AMIS0304																
AMIS0304																
Target Range - Lower Bound																
Upper Bound																
CCU-1e																
CCU-1e																
CCU-1e																
CCU-1e																
Target Range - Lower Bound																
Upper Bound																
CDN-W-4															4.17	
CDN-W-4															4.39	
CDN-W-4															4.41	
CDN-W-4															4.28	
Target Range - Lower Bound															4.17	
Upper Bound															4.63	
MRGeo08																
MRGeo08																
MRGeo08																
MRGeo08																
MRGeo08																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
STANDARDS															
AMIS0286															
AMIS0286															
AMIS0286															
AMIS0286															
AMIS0286															
Target Range - Lower Bound															
Upper Bound															
AMIS0304															
Target Range - Lower Bound															
Upper Bound															
AMIS0304															
AMIS0304															
AMIS0304															
AMIS0304															
AMIS0304															
Target Range - Lower Bound															
Upper Bound															
CCU-1e		280													
CCU-1e		270													
CCU-1e		240													
CCU-1e		290													
Target Range - Lower Bound		200													
Upper Bound		310													
CDN-W-4															
CDN-W-4															
CDN-W-4															
CDN-W-4															
Target Range - Lower Bound															
Upper Bound															
MRGeo08			4.2	31	2.2	20	614	30	14	694	1075	10	<10	806	
MRGeo08			4.7	32	2.4	22	655	30	15	737	1145	12	<10	832	
MRGeo08			4.7	31	2.6	21	646	30	14	737	1150	11	<10	836	
MRGeo08			4.5	29	2.2	20	599	50	13	686	1060	10	<10	778	
MRGeo08			4.7	32	2.3	21	640	30	14	727	1130	11	<10	810	
Target Range - Lower Bound			3.2	21	1.1	17	586	<10	12	621	969	10	<10	722	
Upper Bound			5.7	45	3.4	23	676	50	18	761	1190	15	20	886	

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
STANDARDS																
NCSDC86303																
NCSDC86303																
Target Range - Lower Bound																
Upper Bound																
NCSDC86304																
NCSDC86304																
Target Range - Lower Bound																
Upper Bound																
OGGeo08																
OGGeo08																
OGGeo08																
OGGeo08																
Target Range - Lower Bound																
Upper Bound																
OREAS 146																
OREAS 146																
OREAS 146																
Target Range - Lower Bound																
Upper Bound																
OREAS 146		>10000	4960	180	0.55	245	92.1	132.0	30.8	370	4.6	39.5	2610	6.61	400	2310
OREAS 146		>10000	4590	180	0.57	216	80.7	118.0	29.1	327	4.1	34.9	2420	6.14	400	2080
OREAS 146		>10000	4490	190	0.59	236	87.3	130.5	30.5	356	4.5	38.0	2370	6.44	397	2110
OREAS 146		>10000	4850	190	0.50	223	82.8	132.0	31.3	332	4.2	33.5	2570	6.47	411	2260
Target Range - Lower Bound		11450	4220	160	0.47	202	78.3	114.5	26.2	323	3.6	33.1	2260	5.66	349	1965
Upper Bound		>10000	5160	220	0.59	246	95.7	139.5	32.2	395	4.8	40.5	2760	6.94	427	2400
OREAS 602																
OREAS 602																
OREAS 602																
OREAS 602																
OREAS 602																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
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North Vancouver BC V7H 0A7
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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
STANDARDS																
NCSDC86303																
NCSDC86303																
Target Range - Lower Bound																
Upper Bound																
NCSDC86304																
NCSDC86304																
Target Range - Lower Bound																
Upper Bound																
OGGeo08																
OGGeo08																
OGGeo08																
OGGeo08																
Target Range - Lower Bound																
Upper Bound																
OREAS 146																
OREAS 146																
OREAS 146																
Target Range - Lower Bound																
Upper Bound																
OREAS 146		572	29.1	476	49	3210	4.5	48.1	954	10.30	2.86	182	31	940	57.1	243
OREAS 146		527	28.0	446	44	2960	4.1	42.9	939	9.70	2.43	154	28	864	50.5	235
OREAS 146		547	28.5	444	41	3200	4.0	46.3	821	10.35	2.46	145	27	973	52.4	236
OREAS 146		561	26.8	465	48	3270	4.4	42.7	891	9.92	2.48	145	29	943	51.7	251
Target Range - Lower Bound		493	23.7	397	40	2790	3.6	42.5	813	8.90	2.37	140	25	814	48.1	204
Upper Bound		603	29.5	485	52	3410	4.6	51.9	993	10.90	3.01	182	33	996	58.9	254
OREAS 602																
OREAS 602																
OREAS 602																
OREAS 602																
OREAS 602																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
STANDARDS																
NCSDC86303																
NCSDC86303																
Target Range - Lower Bound																
Upper Bound																
NCSDC86304																
NCSDC86304																
Target Range - Lower Bound																
Upper Bound																
OGGeo08																
OGGeo08																
OGGeo08																
OGGeo08																
Target Range - Lower Bound																
Upper Bound																
OREAS 146		20.0	3.04	28.2	17.75	6.91	0.31	1.29	0.03	1.41	2.48	0.54	0.38	1.53		
OREAS 146		20.0	3.07	28.6	17.80	7.04	0.31	1.31	0.03	1.42	2.51	0.53	0.39	1.53		
OREAS 146		20.0	3.00	28.6	17.60	7.06	0.31	1.30	0.03	1.41	2.49	0.53	0.38	1.51		
Target Range - Lower Bound		19.50	2.82	27.5	16.75	6.59	0.26	1.19	<0.01	1.35	2.30	0.49	0.33	1.39		
Upper Bound		20.7	3.12	29.1	17.85	7.15	0.34	1.37	0.05	1.53	2.56	0.59	0.41	1.59		
OREAS 146		20.1	3.02	28.7	17.45	6.88	0.31	1.30	0.03	1.40	2.47	0.52	0.38	1.52		
OREAS 146																
OREAS 146																
OREAS 146																
Target Range - Lower Bound																
Upper Bound																
OREAS 602																
OREAS 602																
OREAS 602																
OREAS 602																
OREAS 602																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
STANDARDS															
NCSDC86303															0.207
NCSDC86303															0.217
Target Range - Lower Bound															0.201
Upper Bound															0.226
NCSDC86304															1.085
NCSDC86304															1.080
Target Range - Lower Bound															1.022
Upper Bound															1.106
OGGeo08			18.5	115	17.8	92	7840	30	860	8290	6890	8	<10	6730	
OGGeo08			21.5	118	20.1	105	8880	40	943	9450	7830	10	<10	7520	
OGGeo08			21.2	127	19.7	101	8720	40	936	9170	7630	9	<10	7370	
OGGeo08			19.7	118	18.4	95	8090	30	873	8580	7230	9	<10	6970	
Target Range - Lower Bound			17.7	102	16.2	86	7800	<10	841	8000	6510	8	<10	6500	
Upper Bound			22.7	136	21.0	108	8980	50	1030	9770	7970	13	20	7950	
OREAS 146															
OREAS 146															
OREAS 146															
Target Range - Lower Bound															
Upper Bound															
OREAS 146															
OREAS 146															
OREAS 146															
OREAS 146															
Target Range - Lower Bound															
Upper Bound															
OREAS 602			>100	663	25.1	10	5100	20	4	62	1035	4	<10	4200	
OREAS 602			>100	678	25.8	10	5210	10	4	61	1045	4	<10	4180	
OREAS 602			>100	684	26.7	11	5360	10	5	63	1085	4	<10	4300	
OREAS 602			>100	677	26.3	10	5220	30	5	66	1040	4	<10	4200	
OREAS 602			>100	704	26.3	10	5280	20	5	62	1075	4	<10	4240	
Target Range - Lower Bound			107.5	579	21.7	7	4790	<10	2	53	918	2	<10	3770	
Upper Bound			100.0	719	27.7	12	5510	40	7	67	1125	6	20	4610	

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
STANDARDS																
OREAS-105																
Target Range - Lower Bound																
Upper Bound																
OREAS-105		694	123.5	50	2.18	12.10	7.33	1.53	26.7	13.05	6.7	2.58	51.5	1.05	42.0	66.8
OREAS-105		712	115.0	50	2.01	13.40	8.17	1.42	24.6	13.40	6.4	2.62	47.8	1.05	41.0	62.2
OREAS-105		682	112.0	60	2.15	12.15	7.74	1.50	24.0	13.05	6.7	2.58	49.4	0.97	37.7	63.9
OREAS-105		767	123.5	60	2.35	13.15	8.16	1.58	28.7	13.65	7.2	2.69	54.4	1.08	44.7	68.7
OREAS-105		711	115.5	60	1.95	11.70	7.06	1.42	26.6	11.90	6.5	2.39	48.3	1.06	40.8	62.0
Target Range - Lower Bound		632	105.0	40	1.96	10.95	6.72	1.32	24.3	11.65	5.6	2.19	45.4	0.88	36.9	57.8
Upper Bound		774	129.0	80	2.42	13.45	8.28	1.68	29.9	14.35	7.2	2.69	56.6	1.10	45.6	70.8
OREAS-14P																
Target Range - Lower Bound																
Upper Bound																
OREAS-45b																
OREAS-45b																
OREAS-45b																
OREAS-45b																
Target Range - Lower Bound																
Upper Bound																
SARM-1																
SARM-1																
SARM-1																
SARM-1																
Target Range - Lower Bound																
Upper Bound																
SARM-3																
SARM-3																
SARM-3																
SARM-3																
Target Range - Lower Bound																
Upper Bound																
SARM-43																
SARM-43																
SARM-43																
SARM-43																
SARM-43																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
STANDARDS																
OREAS-105																
Target Range - Lower Bound																
Upper Bound																
OREAS-105		16.15	108.5	15.05	9	93.5	4.4	2.05	380	1.10	542	29	3	67.0	7.14	242
OREAS-105		14.85	103.0	14.80	9	87.8	4.6	2.21	369	1.12	545	30	3	61.9	7.22	234
OREAS-105		15.05	101.5	14.45	10	92.3	4.6	2.03	381	1.06	544	27	3	65.3	7.35	230
OREAS-105		16.85	115.0	16.25	10	98.8	4.7	2.31	403	1.23	578	31	3	70.0	7.86	255
OREAS-105		15.05	103.0	15.10	9	88.3	4.3	1.89	371	1.15	534	29	3	62.6	7.22	237
Target Range - Lower Bound		14.35	94.8	13.30	8	85.3	4.3	1.95	332	1.02	479	19	<1	57.9	6.54	208
Upper Bound		17.65	116.5	16.30	13	104.5	5.5	2.41	406	1.26	585	43	5	71.9	8.06	259
OREAS-14P																
Target Range - Lower Bound																
Upper Bound																
OREAS-45b																
OREAS-45b																
OREAS-45b																
OREAS-45b																
Target Range - Lower Bound																
Upper Bound																
SARM-1																
SARM-1																
SARM-1																
SARM-1																
Target Range - Lower Bound																
Upper Bound																
SARM-3																
SARM-3																
SARM-3																
SARM-3																
Target Range - Lower Bound																
Upper Bound																
SARM-43																
SARM-43																
SARM-43																
SARM-43																
SARM-43																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
STANDARDS																
OREAS-105		70.5	13.60	2.67	1.39	0.77	4.90	2.23	0.01	0.40	0.02	0.34	0.01	0.08		
Target Range - Lower Bound																
Upper Bound																
OREAS-105		70.7	14.25	2.84	1.44	0.81	5.16	2.37	0.01	0.42	0.02	0.35	0.01	0.08		
OREAS-105		73.5	14.15	2.83	1.45	0.81	5.17	2.33	0.01	0.42	0.02	0.37	0.01	0.08		
OREAS-105		72.0	14.20	2.84	1.46	0.80	5.11	2.30	0.01	0.42	0.02	0.36	0.01	0.08		
OREAS-105																
OREAS-105																
Target Range - Lower Bound																
Upper Bound																
OREAS-14P		19.50	4.41	52.2	1.37	0.48	0.80	1.08	0.01	0.40	0.08	0.12	0.01	0.04		95.93
Target Range - Lower Bound		19.20	4.07	51.8	1.30	0.42	0.72	0.97	<0.01	0.37	0.05	0.10	<0.01	<0.01		97.99
Upper Bound		20.4	4.47	54.3	1.48	0.51	0.84	1.12	0.02	0.45	0.11	0.16	0.03	0.06		>102.00
OREAS-45b																
OREAS-45b																
OREAS-45b																
OREAS-45b																
Target Range - Lower Bound																
Upper Bound																
SARM-1																
SARM-1																
SARM-1																
SARM-1																
Target Range - Lower Bound																
Upper Bound																
SARM-3																
SARM-3																
SARM-3																
SARM-3																
Target Range - Lower Bound																
Upper Bound																
SARM-43															48.1	
SARM-43															48.3	
SARM-43															48.0	
SARM-43															47.7	
SARM-43															48.1	
Target Range - Lower Bound															45.7	
Upper Bound															50.5	

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
STANDARDS															
OREAS-105															
Target Range - Lower Bound															
Upper Bound															
OREAS-105															
OREAS-105															
OREAS-105															
OREAS-105															
OREAS-105															
Target Range - Lower Bound															
Upper Bound															
OREAS-14P															
Target Range - Lower Bound															
Upper Bound															
OREAS-45b			<0.5	13	<0.5	85	504	20	2	274	23	49	<10	193	
OREAS-45b			<0.5	13	<0.5	91	537	20	2	297	25	55	<10	204	
OREAS-45b			<0.5	14	<0.5	90	532	20	3	292	24	53	<10	203	
OREAS-45b			<0.5	11	<0.5	83	492	20	2	271	29	50	<10	182	
Target Range - Lower Bound			<0.5	<5	<0.5	76	484	<10	<1	251	21	44	<10	174	
Upper Bound			1.2	23	1.1	95	560	30	3	309	31	56	20	218	
SARM-1		4160													
SARM-1		4150													
SARM-1		4080													
SARM-1		4170													
Target Range - Lower Bound		3760													
Upper Bound		4640													
SARM-3		4050													
SARM-3		4010													
SARM-3		4040													
SARM-3		4050													
Target Range - Lower Bound		3940													
Upper Bound		4860													
SARM-43															
SARM-43															
SARM-43															
SARM-43															
SARM-43															
Target Range - Lower Bound															
Upper Bound															

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
STANDARDS																
SRM 181																
SRM 181																
Target Range - Lower Bound																
Upper Bound																
SRM-183																
SRM-183																
Target Range - Lower Bound																
Upper Bound																
SRM88B																
Target Range - Lower Bound																
Upper Bound																
SRM88B		4.5	3.8	10	0.15	0.56	0.45	0.13	0.6	0.60	<0.2	0.14	5.1	0.05	0.3	3.2
SRM88B		5.2	3.5	10	0.13	0.78	0.40	0.07	0.3	0.61	<0.2	0.12	4.8	0.01	0.3	2.8
SRM88B		4.4	3.4	10	0.13	0.55	0.39	0.08	0.3	0.54	<0.2	0.13	4.8	0.03	0.4	3.0
Target Range - Lower Bound																
Upper Bound																
SRM88B																
Target Range - Lower Bound																
Upper Bound																
SY-4																
SY-4																
SY-4																
Target Range - Lower Bound																
Upper Bound																
SY-4		331	130.5	10	1.60	20.0	15.60	1.99	37.5	15.20	11.7	4.70	59.6	2.13	13.9	59.0
SY-4		344	122.0	10	1.39	18.45	14.35	1.84	36.4	13.75	10.8	4.31	56.9	2.14	13.7	55.8
SY-4		307	112.5	10	1.34	17.25	13.35	1.79	31.9	13.05	9.9	4.04	54.9	1.91	11.8	51.6
SY-4		347	123.5	10	1.48	19.00	14.10	2.01	37.7	13.65	11.3	4.15	59.1	2.29	14.0	59.2
Target Range - Lower Bound		306	109.5	<10	1.34	16.35	12.75	1.77	31.4	12.55	9.8	3.86	51.7	1.88	11.5	51.2
Upper Bound		375	134.5	30	1.66	20.1	15.65	2.23	38.6	15.45	12.4	4.74	64.3	2.32	14.5	62.8
SY-4																
SY-4																
SY-4																
SY-4																
Target Range - Lower Bound																
Upper Bound																
TDB-1																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

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North Vancouver BC V7H 0A7
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Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
STANDARDS																
SRM 181																
SRM 181																
Target Range - Lower Bound																
Upper Bound																
SRM-183																
SRM-183																
Target Range - Lower Bound																
Upper Bound																
SRM88B																
Target Range - Lower Bound																
Upper Bound																
SRM88B		0.84	2.8	0.52	<1	65.3	<0.1	0.08	0.29	0.05	0.14	<5	<1	8.0	0.31	4
SRM88B		0.76	2.7	0.51	<1	62.1	<0.1	0.07	0.23	0.02	0.11	<5	<1	7.5	0.32	5
SRM88B		0.76	2.9	0.39	<1	63.2	0.1	0.07	0.24	0.05	0.10	<5	<1	7.6	0.28	6
Target Range - Lower Bound																
Upper Bound																
SRM88B																
Target Range - Lower Bound																
Upper Bound																
SY-4																
SY-4																
SY-4																
Target Range - Lower Bound																
Upper Bound																
SY-4		14.95	58.0	13.25	8	1220	0.8	2.84	1.19	2.33	0.94	7	<1	122.5	16.25	582
SY-4		14.30	51.1	12.90	8	1160	0.8	2.66	1.16	2.26	0.84	6	<1	112.0	14.75	589
SY-4		13.65	50.1	11.60	6	1075	0.7	2.37	1.40	2.07	0.93	<5	<1	106.5	13.55	525
SY-4		14.60	55.7	13.10	8	1270	0.9	2.52	1.24	2.40	0.81	7	1	121.5	15.50	639
Target Range - Lower Bound		13.45	49.3	11.40	6	1070	0.7	2.33	1.11	2.06	0.66	<5	<1	106.5	13.30	523
Upper Bound		16.55	60.7	14.00	10	1310	1.1	2.87	1.47	2.54	0.94	18	3	131.5	16.30	643
SY-4																
SY-4																
SY-4																
SY-4																
Target Range - Lower Bound																
Upper Bound																
TDB-1																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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North Vancouver BC V7H 0A7
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TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
STANDARDS																
SRM 181																
SRM 181																
Target Range - Lower Bound																
Upper Bound																
SRM-183																
SRM-183																
Target Range - Lower Bound																
Upper Bound																
SRM88B		1.12	0.33	0.27	30.2	20.7	0.02	0.10	<0.01	0.01	0.02	0.01	0.01	<0.01		
Target Range - Lower Bound		1.05	0.30	0.24	29.1	20.4	<0.01	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Upper Bound		1.21	0.37	0.31	30.8	21.7	0.05	0.13	0.03	0.04	0.04	0.03	0.03	0.03		
SRM88B		1.12	0.31	0.29	30.5	21.1	0.03	0.10	<0.01	0.01	0.02	0.01	0.01	<0.01		
SRM88B		1.11	0.31	0.28	30.4	20.9	0.03	0.10	<0.01	0.01	0.02	0.01	<0.01	<0.01		
SRM88B		1.10	0.31	0.28	30.0	20.5	0.03	0.10	<0.01	0.01	0.02	<0.01	0.01	<0.01		
Target Range - Lower Bound		1.05	0.30	0.24	29.1	20.4	<0.01	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Upper Bound		1.21	0.37	0.31	30.8	21.7	0.05	0.13	0.03	0.04	0.04	0.03	0.03	0.03		
SRM88B		1.09	0.30	0.28	29.8	21.1	0.03	0.09	<0.01	0.01	0.02	0.01	0.01	<0.01		99.72
Target Range - Lower Bound		1.05	0.30	0.24	29.1	20.4	<0.01	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		97.99
Upper Bound		1.21	0.37	0.31	30.8	21.7	0.05	0.13	0.03	0.04	0.04	0.03	0.03	0.03		>102.00
SY-4		49.3	20.9	6.12	8.11	0.51	7.07	1.63	<0.01	0.28	0.11	0.12	0.14	0.04		
SY-4		49.6	21.1	6.22	8.08	0.52	7.09	1.65	<0.01	0.28	0.11	0.13	0.15	0.04		
SY-4		50.1	20.8	6.16	8.05	0.52	7.16	1.66	<0.01	0.28	0.11	0.12	0.14	0.04		
Target Range - Lower Bound		48.7	20.1	5.95	7.74	0.49	6.81	1.56	<0.01	0.25	0.08	0.10	0.11	<0.01		
Upper Bound		51.1	21.3	6.47	8.36	0.59	7.39	1.76	0.03	0.32	0.13	0.16	0.17	0.06		
SY-4		51.0	21.2	6.22	8.11	0.51	7.15	1.67	<0.01	0.28	0.11	0.12	0.14	0.04		
SY-4																
SY-4																
SY-4																
Target Range - Lower Bound																
Upper Bound																
SY-4		50.6	20.5	6.14	7.90	0.51	7.08	1.64	<0.01	0.30	0.11	0.13	0.15	0.04		99.66
SY-4		49.3	20.8	6.23	8.04	0.52	7.07	1.65	<0.01	0.28	0.10	0.13	0.14	0.04		98.86
SY-4		49.4	20.4	6.25	8.11	0.51	7.15	1.66	<0.01	0.28	0.11	0.13	0.15	0.04		98.75
SY-4		50.9	20.6	6.18	8.07	0.51	7.18	1.63	<0.01	0.28	0.11	0.12	0.15	0.04		100.33
Target Range - Lower Bound		48.7	20.1	5.95	7.74	0.49	6.81	1.56	<0.01	0.25	0.08	0.10	0.11	<0.01		97.99
Upper Bound		51.1	21.3	6.47	8.36	0.59	7.39	1.76	0.03	0.32	0.13	0.16	0.17	0.06		>102.00
TDB-1																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
STANDARDS																
SRM 181																2.920
SRM 181																2.950
Target Range - Lower Bound																2.861
Upper Bound																3.079
SRM-183																1.855
SRM-183																1.880
Target Range - Lower Bound																1.838
Upper Bound																1.982
SRM88B																
Target Range - Lower Bound																
Upper Bound																
SRM88B																
SRM88B																
SRM88B																
Target Range - Lower Bound																
Upper Bound																
SRM88B																
Target Range - Lower Bound																
Upper Bound																
SY-4																
SY-4																
SY-4																
Target Range - Lower Bound																
Upper Bound																
SY-4																
SY-4																
SY-4																
SY-4																
Target Range - Lower Bound																
Upper Bound																
SY-4																
SY-4																
SY-4																
SY-4																
Target Range - Lower Bound																
Upper Bound																
TDB-1		430														

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

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Finalized Date: 27-JUN-2017
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QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
STANDARDS																
TDB-1																
TDB-1																
TDB-1																
Target Range - Lower Bound																
Upper Bound																
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
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BLANK																
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Target Range - Lower Bound																
Upper Bound																
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BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

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QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
STANDARDS																
TDB-1																
TDB-1																
TDB-1																
Target Range - Lower Bound																
Upper Bound																
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
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BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
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Target Range - Lower Bound																
Upper Bound																
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BLANK																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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Finalized Date: 27-JUN-2017
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Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
STANDARDS																
TDB-1																
TDB-1																
TDB-1																
Target Range - Lower Bound																
Upper Bound																
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
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BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
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BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

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QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
STANDARDS															
TDB-1		420													
TDB-1		410													
TDB-1		420													
Target Range - Lower Bound		340													
Upper Bound		460													
BLANKS															
BLANK		<20													
BLANK		<20													
BLANK		<20													
BLANK		<20													
BLANK		<20													
BLANK		<20													
BLANK		<20													
BLANK		<20													
Target Range - Lower Bound		<20													
Upper Bound		40													
BLANK															<0.005
BLANK															<0.005
BLANK															<0.005
BLANK															<0.005
Target Range - Lower Bound															<0.005
Upper Bound															0.010
BLANK			<0.5	<5	<0.5	1	<1	<10	<1	<1	<2	<1	<10	<2	
BLANK			<0.5	<5	<0.5	1	<1	<10	<1	<1	<2	<1	<10	<2	
BLANK			<0.5	<5	<0.5	<1	<1	<10	<1	1	<2	<1	<10	<2	
BLANK			<0.5	<5	<0.5	<1	<1	<10	<1	<1	<2	<1	<10	<2	
BLANK			<0.5	<5	<0.5	<1	<1	<10	<1	<1	<2	<1	<10	<2	
BLANK			<0.5	<5	<0.5	<1	<1	<10	<1	<1	<2	<1	<10	<2	
BLANK			<0.5	<5	<0.5	<1	<1	<10	<1	<1	<2	<1	<10	<2	
BLANK			<0.5	<5	<0.5	<1	<1	<10	<1	1	<2	<1	<10	<2	
BLANK			<0.5	<5	<0.5	<1	<1	<10	<1	1	<2	<1	<10	<2	
Target Range - Lower Bound			<0.5	<5	<0.5	<1	<1		<1	<1	<2			<2	
Upper Bound			1.0	10	1.0	2	2		2	2	4			4	

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
		BLANKS														
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		0.5	<0.5	<10	<0.01	<0.05	<0.03	<0.03	0.2	<0.05	<0.2	<0.01	<0.5	<0.01	<0.2	<0.1
BLANK		0.6	<0.5	10	<0.01	<0.05	<0.03	<0.03	0.1	<0.05	<0.2	<0.01	<0.5	<0.01	<0.2	<0.1
BLANK		<0.5	<0.5	<10	<0.01	<0.05	<0.03	<0.03	<0.1	<0.05	<0.2	<0.01	<0.5	<0.01	<0.2	<0.1
BLANK		0.5	<0.5	10	0.06	<0.05	<0.03	<0.03	0.2	<0.05	<0.2	0.01	<0.5	0.01	<0.2	<0.1
BLANK		<0.5	<0.5	10	0.02	<0.05	<0.03	<0.03	<0.1	<0.05	<0.2	0.01	<0.5	0.02	<0.2	<0.1
BLANK		3.4	<0.5	<10	0.02	<0.05	<0.03	<0.03	0.1	<0.05	<0.2	0.01	<0.5	0.01	<0.2	<0.1
BLANK		1.2	<0.5	<10	0.02	<0.05	<0.03	<0.03	0.1	<0.05	<0.2	<0.01	<0.5	<0.01	<0.2	<0.1
BLANK		<0.5	<0.5	<10	0.02	<0.05	0.05	0.03	<0.1	0.07	<0.2	0.02	<0.5	0.01	<0.2	<0.1
BLANK		0.9	<0.5	<10	0.02	<0.05	0.05	<0.03	<0.1	<0.05	<0.2	0.01	<0.5	0.07	<0.2	<0.1
Target Range - Lower Bound		<0.5	<0.5	<10	<0.01	<0.05	<0.03	<0.03	<0.1	<0.05	<0.2	<0.01	<0.5	<0.01	<0.2	<0.1
Upper Bound		1.0	1.0	20	0.02	0.10	0.06	0.06	0.2	0.10	0.4	0.02	1.0	0.02	0.4	0.2
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<0.03	<0.2	<0.03	<1	0.1	<0.1	<0.01	<0.05	<0.01	<0.05	<5	1	<0.5	<0.03	<2
BLANK		<0.03	<0.2	<0.03	<1	0.1	<0.1	<0.01	<0.05	<0.01	<0.05	<5	<1	<0.5	<0.03	<2
BLANK		<0.03	<0.2	<0.03	<1	0.2	<0.1	<0.01	<0.05	<0.01	<0.05	<5	<1	<0.5	<0.03	<2
BLANK		<0.03	<0.2	0.03	<1	0.2	<0.1	0.01	<0.05	0.01	<0.05	<5	<1	<0.5	<0.03	<2
BLANK		<0.03	<0.2	<0.03	<1	<0.1	<0.1	<0.01	<0.05	0.02	<0.05	<5	1	<0.5	<0.03	<2
BLANK		<0.03	<0.2	0.05	<1	<0.1	<0.1	0.01	<0.05	0.01	<0.05	<5	1	<0.5	0.04	<2
BLANK		0.03	<0.2	0.05	<1	<0.1	<0.1	<0.01	<0.05	0.01	<0.05	<5	1	<0.5	<0.03	<2
BLANK		0.03	<0.2	0.05	<1	0.1	<0.1	0.02	<0.05	<0.01	<0.05	<5	1	<0.5	0.03	<2
BLANK		<0.03	<0.2	0.03	<1	0.2	0.1	<0.01	<0.05	0.07	<0.05	<5	<1	<0.5	0.06	<2
Target Range - Lower Bound		<0.03	<0.2	<0.03	<1	<0.1	<0.1	<0.01	<0.05	<0.01	<0.05	<5	<1	<0.5	<0.03	<2
Upper Bound		0.06	0.4	0.06	2	0.2	0.2	0.02	0.10	0.02	0.10	10	2	1.0	0.06	4
BLANK																
BLANK																
BLANK																
BLANK																
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BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
BLANKS																
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Target Range - Lower Bound		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Upper Bound		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02		
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BLANK																
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK															0.00	
BLANK															-0.02	
BLANK															-0.02	
BLANK															0.01	
BLANK															-0.02	
BLANK															-0.01	
BLANK															-0.01	
BLANK															0.00	
BLANK															0.01	
Target Range - Lower Bound															<0.01	
Upper Bound															0.02	
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.04
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.02
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
Target Range - Lower Bound		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Upper Bound		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02		

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
								BLANKS							
BLANK															
BLANK															
BLANK															
BLANK															
Target Range - Lower Bound															
Upper Bound															
BLANK															
BLANK															
BLANK															
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BLANK															
BLANK															
BLANK															
BLANK															
BLANK															
Target Range - Lower Bound															
Upper Bound															
BLANK															
BLANK															
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BLANK															
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Target Range - Lower Bound															
Upper Bound															
BLANK															
BLANK															
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BLANK															
BLANK															
Target Range - Lower Bound															
Upper Bound															

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

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North Vancouver BC V7H 0A7
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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
		DUPLICATES														
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671010																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671011																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671032		8.8	6.4	10	54.1	2.03	0.61	<0.03	40.9	2.01	0.6	0.24	1.9	0.09	117.5	3.1
DUP		8.2	8.7	20	54.0	2.04	0.58	0.03	41.0	2.52	0.7	0.26	2.6	0.10	111.5	4.3
Target Range - Lower Bound		7.6	6.7	<10	51.3	1.88	0.54	<0.03	38.8	2.10	0.4	0.23	1.6	0.08	108.5	3.4
Upper Bound		9.4	8.4	20	56.8	2.19	0.65	0.06	43.1	2.43	0.9	0.27	2.9	0.11	120.5	4.0
V671040																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671046																
DUP																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

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Finalized Date: 27-JUN-2017
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Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671010																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671011																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671032		0.91	1875	1.89	86	5.6	35.9	0.44	8.32	0.09	6.59	<5	3	11.3	0.72	8
DUP		1.19	1850	2.97	73	5.7	34.2	0.49	9.54	0.09	6.64	<5	3	11.3	0.69	11
Target Range - Lower Bound		0.97	1770	2.28	75	5.3	33.2	0.43	8.43	0.08	6.23	<5	2	10.2	0.64	7
Upper Bound		1.13	1955	2.58	84	6.0	36.9	0.50	9.43	0.10	7.00	10	4	12.4	0.77	12
V671040																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671046																
DUP																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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North Vancouver BC V7H 0A7
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Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL															3.09	
DUP															3.00	
Target Range - Lower Bound															2.96	
Upper Bound															3.13	
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671010																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671011															0.43	
DUP															0.40	
Target Range - Lower Bound															0.39	
Upper Bound															0.44	
V671032		75.0	14.45	1.06	0.35	0.03	5.24	3.45	<0.01	0.01	0.06	0.06	<0.01	<0.01		
DUP		74.5	14.40	1.07	0.35	0.04	5.20	3.46	<0.01	0.01	0.05	0.05	<0.01	<0.01		
Target Range - Lower Bound		72.9	14.05	1.03	0.33	0.02	5.08	3.36	<0.01	<0.01	0.04	0.04	<0.01	<0.01		
Upper Bound		76.6	14.80	1.10	0.37	0.05	5.36	3.55	0.02	0.02	0.07	0.07	0.02	0.02		
V671040																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671046																
DUP																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

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North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
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Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
DUPLICATES															
ORIGINAL															0.060
DUP															0.062
Target Range - Lower Bound															0.054
Upper Bound															0.068
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL			<0.5	<5	<0.5	84	52	20	<1	716	<2	25	<10	71	
DUP			<0.5	<5	0.5	85	51	20	<1	715	<2	21	<10	70	
Target Range - Lower Bound			<0.5	<5	<0.5	79	49	<10	<1	679	<2	21	<10	65	
Upper Bound			1.0	10	1.0	90	54	30	2	752	4	25	20	76	
V671010		880													
DUP		850													
Target Range - Lower Bound		800													
Upper Bound		930													
V671011															
DUP															
Target Range - Lower Bound															
Upper Bound															
V671032															
DUP															
Target Range - Lower Bound															
Upper Bound															
V671040			<0.5	<5	<0.5	<1	1	<10	<1	1	<2	<1	<10	<2	
DUP			<0.5	<5	<0.5	<1	1	<10	<1	1	2	<1	<10	<2	
Target Range - Lower Bound			<0.5	<5	<0.5	<1	<1	<10	<1	<1	<2	<1	<10	<2	
Upper Bound			1.0	10	1.0	2	2	20	2	2	4	2	20	4	
V671046		2770													
DUP		2800													
Target Range - Lower Bound		2630													
Upper Bound		2940													

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
DUPLICATES																
V671047 DUP																
Target Range - Lower Bound																
Upper Bound																
V671067 DUP		4.5	3.0	30	117.0	0.91	0.33	<0.03	31.6	1.19	0.9	0.10	1.3	0.04	53.2	1.6
		4.6	2.9	30	121.0	1.06	0.25	<0.03	32.8	1.23	0.9	0.10	1.1	0.05	61.9	1.6
Target Range - Lower Bound		3.8	2.3	20	113.0	0.89	0.25	<0.03	30.5	1.10	0.7	0.09	0.6	0.03	54.5	1.4
Upper Bound		5.3	3.6	40	125.0	1.08	0.33	0.06	33.9	1.32	1.1	0.12	1.8	0.06	60.6	1.8
V671077 DUP																
Target Range - Lower Bound																
Upper Bound																
V671083 DUP																
Target Range - Lower Bound																
Upper Bound																
V671084 DUP																
Target Range - Lower Bound																
Upper Bound																
V671089 DUP																
Target Range - Lower Bound																
Upper Bound																
V671102 DUP		5.4	5.6	70	163.5	1.93	0.81	0.03	36.1	1.66	1.1	0.28	2.0	0.09	21.1	2.8
		5.9	5.1	70	169.0	1.93	0.88	0.03	38.0	1.60	0.9	0.29	1.8	0.11	19.0	2.5
Target Range - Lower Bound		4.9	4.6	60	158.0	1.78	0.77	<0.03	35.1	1.50	0.8	0.26	1.3	0.09	18.8	2.4
Upper Bound		6.4	6.1	80	174.5	2.08	0.92	0.06	39.0	1.76	1.3	0.31	2.5	0.12	21.3	2.9
V671113 DUP																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
DUPLICATES																
V671047 DUP																
Target Range - Lower Bound																
Upper Bound																
V671067 DUP		0.42	1385	1.33	398	13.9	66.3	0.22	3.11	0.04	3.85	6	2	5.2	0.45	10
		0.41	1425	1.31	405	14.9	78.8	0.25	2.44	0.04	4.26	6	3	5.7	0.45	17
Target Range - Lower Bound		0.36	1335	1.22	380	13.6	68.8	0.21	2.59	0.03	3.80	<5	<1	4.7	0.40	11
Upper Bound		0.47	1475	1.42	423	15.2	76.3	0.26	2.96	0.05	4.31	10	4	6.2	0.50	16
V671077 DUP																
Target Range - Lower Bound																
Upper Bound																
V671083 DUP																
Target Range - Lower Bound																
Upper Bound																
V671084 DUP																
Target Range - Lower Bound																
Upper Bound																
V671089 DUP																
Target Range - Lower Bound																
Upper Bound																
V671102 DUP		0.74	1510	1.51	58	14.6	14.7	0.32	3.69	0.09	2.97	52	1	10.0	1.06	15
		0.63	1565	1.46	63	15.0	19.2	0.31	3.72	0.10	6.23	55	1	11.0	0.98	14
Target Range - Lower Bound		0.62	1460	1.38	56	14.0	16.0	0.29	3.47	0.08	4.32	46	<1	9.5	0.94	12
Upper Bound		0.75	1615	1.59	65	15.6	17.9	0.34	3.94	0.11	4.88	61	2	11.5	1.10	17
V671113 DUP																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
DUPLICATES																
V671047															0.22	
DUP															0.23	
Target Range - Lower Bound															0.21	
Upper Bound															0.24	
V671067		78.1	13.45	0.98	0.93	0.21	5.60	1.43	<0.01	0.02	0.12	0.11	<0.01	<0.01		
DUP		77.8	13.30	0.96	0.91	0.21	5.55	1.42	<0.01	0.02	0.12	0.10	<0.01	<0.01		
Target Range - Lower Bound		76.0	13.05	0.94	0.89	0.19	5.43	1.38	<0.01	<0.01	0.11	0.09	<0.01	<0.01		
Upper Bound		79.9	13.70	1.00	0.95	0.23	5.72	1.47	0.02	0.03	0.13	0.12	0.02	0.02		
V671077																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671083																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671084															1.03	
DUP															1.01	
Target Range - Lower Bound															0.98	
Upper Bound															1.06	
V671089																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671102		71.3	15.70	2.84	1.42	1.20	6.42	1.42	0.01	0.15	0.21	0.08	<0.01	<0.01		
DUP		71.3	15.75	2.85	1.40	1.21	6.42	1.44	0.01	0.15	0.21	0.08	<0.01	<0.01		
Target Range - Lower Bound		69.5	15.30	2.76	1.36	1.16	6.25	1.38	<0.01	0.14	0.19	0.07	<0.01	<0.01		
Upper Bound		73.1	16.15	2.93	1.46	1.25	6.59	1.48	0.02	0.16	0.23	0.09	0.02	0.02		
V671113																
DUP																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
DUPLICATES															
V671047															
DUP															
Target Range - Lower Bound															
Upper Bound															
V671067															
DUP															
Target Range - Lower Bound															
Upper Bound															
V671077			<0.5	<5	0.8	45	134	1590	<1	142	<2	34	30	79	
DUP			<0.5	<5	0.6	46	135	1600	<1	143	<2	37	20	81	
Target Range - Lower Bound			<0.5	<5	<0.5	42	129	1510	<1	134	<2	33	<10	74	
Upper Bound			1.0	10	1.0	49	140	1680	2	151	4	38	40	86	
V671083		2710													
DUP		2700													
Target Range - Lower Bound		2550													
Upper Bound		2860													
V671084															
DUP															
Target Range - Lower Bound															
Upper Bound															
V671089															0.549
DUP															0.553
Target Range - Lower Bound															0.532
Upper Bound															0.570
V671102															
DUP															
Target Range - Lower Bound															
Upper Bound															
V671113			<0.5	<5	<0.5	<1	1	290	<1	<1	6	2	10	50	
DUP			<0.5	<5	<0.5	<1	1	300	1	1	6	2	10	50	
Target Range - Lower Bound			<0.5	<5	<0.5	<1	<1	270	<1	<1	4	<1	<10	46	
Upper Bound			1.0	10	1.0	2	2	320	2	2	8	3	20	55	

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
DUPLICATES																
V671119																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671120																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671134																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671136		12.0	2.2	100	126.5	1.15	0.69	0.20	35.7	0.91	1.2	0.21	0.8	0.11	31.5	1.8
DUP		12.3	2.2	100	128.0	1.19	0.74	0.19	35.6	0.95	1.4	0.24	0.8	0.12	30.2	1.8
Target Range - Lower Bound		11.0	1.6	90	121.0	1.06	0.65	0.16	33.8	0.83	1.0	0.20	<0.5	0.10	29.1	1.6
Upper Bound		13.3	2.8	120	133.5	1.28	0.78	0.23	37.5	1.03	1.6	0.25	1.0	0.13	32.6	2.0
V671149																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671155																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671156																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671171		<0.5	0.8	40	28.8	0.62	0.12	<0.03	47.3	0.54	1.5	0.03	<0.5	0.03	77.3	0.4
DUP		<0.5	0.8	40	29.6	0.51	0.15	<0.03	50.2	0.48	1.2	0.02	<0.5	0.03	82.4	0.4
Target Range - Lower Bound		<0.5	<0.5	30	27.7	0.49	0.10	<0.03	46.2	0.43	1.1	<0.01	<0.5	0.02	75.7	0.3
Upper Bound		1.0	1.0	50	30.7	0.64	0.17	0.06	51.3	0.59	1.6	0.04	1.0	0.04	84.0	0.5

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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North Vancouver BC V7H 0A7
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QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
DUPLICATES																
V671119 DUP																
Target Range - Lower Bound																
Upper Bound																
V671120 DUP																
Target Range - Lower Bound																
Upper Bound																
V671134 DUP																
Target Range - Lower Bound																
Upper Bound																
V671136		0.32	3470	0.68	431	22.3	75.9	0.17	2.09	0.09	2.48	92	18	6.0	0.69	19
DUP		0.33	3510	0.74	510	22.8	75.5	0.17	1.97	0.10	2.79	93	21	6.3	0.82	19
Target Range - Lower Bound		0.28	3320	0.64	446	21.3	71.8	0.15	1.88	0.08	2.45	83	18	5.3	0.69	16
Upper Bound		0.37	3660	0.78	495	23.8	79.6	0.19	2.18	0.11	2.82	102	21	7.0	0.82	22
V671149 DUP																
Target Range - Lower Bound																
Upper Bound																
V671155 DUP																
Target Range - Lower Bound																
Upper Bound																
V671156 DUP																
Target Range - Lower Bound																
Upper Bound																
V671171		0.11	2440	0.34	558	2.0	89.8	0.10	2.93	0.04	6.74	<5	3	3.3	0.24	15
DUP		0.11	2550	0.31	521	2.0	95.8	0.11	3.15	0.03	7.08	<5	3	3.3	0.27	12
Target Range - Lower Bound		0.07	2370	0.28	512	1.8	88.1	0.09	2.84	0.02	6.51	<5	2	2.6	0.21	11
Upper Bound		0.15	2620	0.37	567	2.2	97.5	0.12	3.24	0.05	7.31	10	4	4.0	0.30	16

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

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North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
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Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
DUPLICATES																
V671119																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671120															-0.07	
DUP															-0.07	
Target Range - Lower Bound															-0.08	
Upper Bound															-0.06	
V671134																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671136		66.8	16.15	4.95	4.06	1.51	2.27	1.63	0.02	0.25	0.24	0.10	<0.01	<0.01		
DUP		66.9	16.20	4.97	4.05	1.52	2.28	1.63	0.02	0.25	0.24	0.11	0.01	<0.01		
Target Range - Lower Bound		65.2	15.75	4.83	3.94	1.47	2.21	1.58	<0.01	0.23	0.22	0.09	<0.01	<0.01		
Upper Bound		68.5	16.60	5.09	4.17	1.56	2.34	1.68	0.03	0.27	0.26	0.12	0.02	0.02		
V671149																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671155																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671156															0.87	
DUP															0.86	
Target Range - Lower Bound															0.83	
Upper Bound															0.90	
V671171		75.1	15.40	0.72	0.15	0.02	4.11	1.90	<0.01	<0.01	0.32	0.07	<0.01	<0.01		
DUP		75.1	15.45	0.71	0.15	0.02	4.11	1.92	<0.01	<0.01	0.31	0.06	<0.01	<0.01		
Target Range - Lower Bound		73.2	15.05	0.69	0.14	<0.01	4.00	1.85	<0.01	<0.01	0.30	0.05	<0.01	<0.01		
Upper Bound		77.0	15.80	0.74	0.16	0.03	4.22	1.97	0.02	0.02	0.33	0.08	0.02	0.02		

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
DUPLICATES															
V671119		910													
DUP		900													
Target Range - Lower Bound		840													
Upper Bound		970													
V671120															
DUP															
Target Range - Lower Bound															
Upper Bound															
V671134															0.774
DUP															0.781
Target Range - Lower Bound															0.753
Upper Bound															0.802
V671136															
DUP															
Target Range - Lower Bound															
Upper Bound															
V671149			<0.5	6	<0.5	<1	2	>10000	<1	2	<2	<1	20	103	
DUP			<0.5	5	<0.5	<1	1	>10000	1	1	3	<1	20	100	
Target Range - Lower Bound			<0.5	<5	<0.5	<1	<1	9490	<1	<1	<2	<1	<10	94	
Upper Bound			1.0	10	1.0	2	2	>10000	2	2	4	2	30	109	
V671155		3150													
DUP		3140													
Target Range - Lower Bound		2970													
Upper Bound		3320													
V671156															
DUP															
Target Range - Lower Bound															
Upper Bound															
V671171															
DUP															
Target Range - Lower Bound															
Upper Bound															

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
DUPLICATES																
V671179 DUP																
Target Range - Lower Bound																
Upper Bound																
V671185 DUP																
Target Range - Lower Bound																
Upper Bound																
V671191 DUP																
Target Range - Lower Bound																
Upper Bound																
V671192 DUP																
Target Range - Lower Bound																
Upper Bound																
V671205		4.0	1.2	10	23.0	1.43	0.52	<0.03	28.3	0.84	1.1	0.19	0.6	0.16	81.3	0.4
DUP		4.6	1.1	20	25.3	1.43	0.53	<0.03	29.6	0.82	2.3	0.19	0.6	0.17	95.5	0.4
Target Range - Lower Bound		3.6	0.6	<10	22.9	1.31	0.47	<0.03	27.4	0.74	1.4	0.17	<0.5	0.15	83.8	0.3
Upper Bound		5.0	1.7	20	25.4	1.55	0.58	0.06	30.5	0.92	2.0	0.21	1.0	0.18	93.0	0.5
V671221 DUP																
Target Range - Lower Bound																
Upper Bound																
V671224 DUP																
Target Range - Lower Bound																
Upper Bound																
V671227 DUP																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
DUPLICATES																
V671179 DUP																
Target Range - Lower Bound																
Upper Bound																
V671185 DUP																
Target Range - Lower Bound																
Upper Bound																
V671191 DUP																
Target Range - Lower Bound																
Upper Bound																
V671192 DUP																
Target Range - Lower Bound																
Upper Bound																
V671205		0.10	3930	0.37	72	3.2	31.6	0.27	2.80	0.12	7.68	<5	2	7.8	1.06	13
DUP		0.12	4250	0.34	80	3.6	36.6	0.28	2.92	0.11	8.78	<5	2	8.1	1.13	59
Target Range - Lower Bound		0.07	3890	0.31	71	3.1	32.3	0.25	2.67	0.10	7.77	<5	<1	7.1	1.01	32
Upper Bound		0.15	4290	0.40	81	3.7	35.9	0.30	3.05	0.13	8.69	10	3	8.8	1.18	40
V671221 DUP																
Target Range - Lower Bound																
Upper Bound																
V671224 DUP																
Target Range - Lower Bound																
Upper Bound																
V671227 DUP																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
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Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
DUPLICATES																
V671179		76.8	17.00	0.96	0.09	0.06	0.50	0.63	0.01	0.01	0.08	0.04	<0.01	<0.01		
DUP		77.7	17.20	0.97	0.14	0.06	0.52	0.66	0.01	<0.01	0.08	0.05	<0.01	<0.01		
Target Range - Lower Bound		75.3	16.65	0.93	0.10	0.05	0.49	0.62	<0.01	<0.01	0.07	0.03	<0.01	<0.01		
Upper Bound		79.2	17.55	1.00	0.13	0.07	0.53	0.67	0.02	0.02	0.09	0.06	0.02	0.02		
V671185																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671191																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671192															0.24	
DUP															0.23	
Target Range - Lower Bound															0.22	
Upper Bound															0.25	
V671205		71.4	15.70	0.74	0.22	0.02	2.57	8.77	<0.01	<0.01	0.17	0.04	<0.01	<0.01		
DUP		71.7	15.85	0.73	0.21	0.02	2.58	8.84	<0.01	<0.01	0.17	0.04	<0.01	<0.01		
Target Range - Lower Bound		69.8	15.35	0.71	0.20	<0.01	2.50	8.57	<0.01	<0.01	0.16	0.03	<0.01	<0.01		
Upper Bound		73.3	16.20	0.76	0.23	0.03	2.65	9.04	0.02	0.02	0.18	0.05	0.02	0.02		
V671221																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671224		75.8	14.35	0.91	0.20	0.01	4.39	3.37	<0.01	0.01	0.10	0.14	0.01	<0.01		
DUP		77.4	14.60	0.92	0.21	0.01	4.50	3.44	<0.01	0.01	0.10	0.14	0.01	<0.01		
Target Range - Lower Bound		74.7	14.10	0.88	0.19	<0.01	4.32	3.31	<0.01	<0.01	0.09	0.13	<0.01	<0.01		
Upper Bound		78.5	14.85	0.95	0.22	0.02	4.57	3.50	0.02	0.02	0.11	0.15	0.02	0.02		
V671227																
DUP																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
DUPLICATES															
V671179 DUP															
Target Range - Lower Bound															
Upper Bound															
V671185			<0.5	<5	<0.5	<1	<1	5570	1	<1	6	<1	20	116	
V671185 DUP			<0.5	<5	<0.5	<1	<1	5960	<1	<1	7	<1	20	125	
Target Range - Lower Bound			<0.5	<5	<0.5	<1	<1	5470	<1	<1	4	<1	<10	112	
Upper Bound			1.0	10	1.0	2	2	6060	2	2	9	2	30	129	
V671191		500													
V671191 DUP		530													
Target Range - Lower Bound		470													
Upper Bound		560													
V671192 DUP															
Target Range - Lower Bound															
Upper Bound															
V671205 DUP															
Target Range - Lower Bound															
Upper Bound															
V671221			<0.5	13	<0.5	1	5	1340	<1	6	7	2	20	57	
V671221 DUP			<0.5	12	<0.5	1	6	1330	<1	7	7	2	10	56	
Target Range - Lower Bound			<0.5	7	<0.5	<1	4	1260	<1	5	5	<1	<10	52	
Upper Bound			1.0	18	1.0	2	7	1410	2	8	9	3	20	61	
V671224 DUP															
Target Range - Lower Bound															
Upper Bound															
V671227		12400													
V671227 DUP		12700													
Target Range - Lower Bound		11900													
Upper Bound		13200													

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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North Vancouver BC V7H 0A7
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TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
DUPLICATES																
V671228																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671240		31.1	4.5	10	0.13	0.18	0.11	<0.03	0.6	0.18	0.6	0.02	2.3	<0.01	0.2	1.6
DUP		31.7	4.7	20	0.13	0.18	0.12	<0.03	0.6	0.20	0.7	0.02	2.4	<0.01	0.3	1.8
Target Range - Lower Bound		29.3	3.9	<10	0.11	0.12	0.08	<0.03	0.5	0.13	0.4	<0.01	1.7	<0.01	<0.2	1.5
Upper Bound		33.5	5.3	20	0.15	0.24	0.15	0.06	0.7	0.25	0.9	0.03	3.0	0.02	0.4	1.9
V671254																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671257																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671263																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671264																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671268		2.6	27.0	10	7.56	4.75	2.03	0.05	37.9	4.51	0.8	0.66	8.7	0.54	51.8	12.9
DUP		2.3	28.6	10	7.65	3.54	1.63	0.05	37.5	4.03	0.8	0.50	9.2	0.45	54.6	14.2
Target Range - Lower Bound		1.8	25.9	<10	7.21	3.89	1.71	<0.03	35.7	4.01	0.6	0.54	8.0	0.46	50.3	12.8
Upper Bound		3.1	29.7	20	8.00	4.40	1.95	0.06	39.7	4.53	1.0	0.62	9.9	0.53	56.1	14.3
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
DUPLICATES																
V671228 DUP																
Target Range - Lower Bound																
Upper Bound																
V671240 DUP		0.41	4.9	0.23	<1	6.9	0.1	<0.01	0.38	<0.01	0.20	<5	1	1.3	0.14	28
		0.44	5.8	0.27	<1	6.8	0.2	<0.01	0.48	<0.01	0.21	<5	1	1.4	0.14	31
Target Range - Lower Bound		0.37	4.9	0.21	<1	6.4	<0.1	<0.01	0.36	<0.01	0.14	<5	<1	0.8	0.10	26
Upper Bound		0.48	5.8	0.29	2	7.3	0.2	0.02	0.50	0.02	0.27	10	2	1.9	0.18	33
V671254 DUP																
Target Range - Lower Bound																
Upper Bound																
V671257 DUP																
Target Range - Lower Bound																
Upper Bound																
V671263 DUP																
Target Range - Lower Bound																
Upper Bound																
V671264 DUP																
Target Range - Lower Bound																
Upper Bound																
V671268 DUP		3.60	667	5.92	13	13.1	13.8	0.81	10.30	0.42	3.58	<5	2	32.9	3.94	12
		3.97	660	6.09	15	12.5	15.4	0.65	10.65	0.36	3.79	<5	1	24.3	3.34	13
Target Range - Lower Bound		3.57	630	5.67	12	12.1	13.8	0.68	9.90	0.36	3.45	<5	<1	26.7	3.43	10
Upper Bound		4.00	697	6.34	16	13.5	15.4	0.78	11.05	0.42	3.92	10	2	30.5	3.85	15
ORIGINAL DUP																
Target Range - Lower Bound																
Upper Bound																

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

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QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
DUPLICATES																
V671228															1.04	
DUP															1.01	
Target Range - Lower Bound															0.99	
Upper Bound															1.06	
V671240		100.0	0.28	0.92	0.05	0.02	0.04	0.16	<0.01	0.01	0.01	<0.01	<0.01	<0.01		
DUP		100.0	0.27	0.91	0.05	0.02	0.05	0.15	<0.01	0.01	0.01	<0.01	<0.01	<0.01		
Target Range - Lower Bound		97.5	0.26	0.88	0.04	<0.01	0.03	0.14	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Upper Bound		100.0	0.29	0.95	0.06	0.03	0.06	0.17	0.02	0.02	0.02	0.02	0.02	0.02		
V671254																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671257																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671263																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671264															0.04	
DUP															0.04	
Target Range - Lower Bound															0.03	
Upper Bound															0.05	
V671268		73.2	16.00	0.90	1.23	0.04	6.57	2.04	<0.01	0.01	0.16	0.03	<0.01	<0.01		
DUP		72.6	15.90	0.93	1.22	0.05	6.56	2.02	<0.01	0.02	0.17	0.04	<0.01	<0.01		
Target Range - Lower Bound		71.1	15.55	0.88	1.18	0.03	6.39	1.97	<0.01	<0.01	0.15	0.02	<0.01	<0.01		
Upper Bound		74.7	16.35	0.95	1.27	0.06	6.74	2.09	0.02	0.02	0.18	0.05	0.02	0.02		
ORIGINAL		51.5	13.20	14.85	7.31	4.53	3.22	0.33	<0.01	1.32	0.22	0.10	0.01	0.01		
DUP		51.8	13.20	14.85	7.31	4.54	3.27	0.37	<0.01	1.32	0.23	0.11	0.01	0.01		
Target Range - Lower Bound		50.3	12.85	14.45	7.12	4.41	3.15	0.33	<0.01	1.28	0.21	0.09	<0.01	<0.01		
Upper Bound		53.0	13.55	15.25	7.50	4.66	3.34	0.37	0.02	1.36	0.24	0.12	0.02	0.02		

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
DUPLICATES															
V671228															
DUP															
Target Range - Lower Bound															
Upper Bound															
V671240															
DUP															
Target Range - Lower Bound															
Upper Bound															
V671254															0.944
DUP															0.961
Target Range - Lower Bound															0.924
Upper Bound															0.981
V671257			<0.5	<5	<0.5	<1	1	4910	<1	1	7	<1	30	133	
DUP			<0.5	<5	<0.5	<1	2	4830	<1	1	6	<1	20	131	
Target Range - Lower Bound			<0.5	<5	<0.5	<1	<1	4620	<1	<1	4	<1	<10	123	
Upper Bound			1.0	10	1.0	2	2	5120	2	2	9	2	40	141	
V671263		390													
DUP		400													
Target Range - Lower Bound		360													
Upper Bound		430													
V671264															
DUP															
Target Range - Lower Bound															
Upper Bound															
V671268															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL			<0.5	<5	<0.5	43	159	10	<1	28	<2	40	<10	110	
DUP			<0.5	<5	0.6	46	168	10	<1	28	3	42	<10	115	
Target Range - Lower Bound			<0.5	<5	<0.5	41	157	<10	<1	26	<2	38	<10	105	
Upper Bound			1.0	10	1.0	48	170	20	2	30	4	44	20	120	

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
DUPLICATES																
ORIGINAL		192.0	26.3	50	1.07	6.02	3.58	1.68	24.9	5.69	3.5	1.18	11.2	0.49	5.9	17.9
DUP		185.0	26.3	40	1.09	5.66	3.35	1.52	24.5	5.54	3.5	1.13	11.1	0.49	5.8	17.8
Target Range - Lower Bound		178.5	24.5	30	1.02	5.50	3.26	1.49	23.4	5.28	3.1	1.09	10.1	0.46	5.4	16.9
Upper Bound		198.5	28.1	60	1.14	6.18	3.67	1.71	26.0	5.95	3.9	1.22	12.2	0.52	6.3	18.8
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
PREP DUPLICATES																
V671054		1.5	4.1	30	65.6	1.69	0.82	<0.03	28.4	1.08	1.7	0.28	1.4	0.23	79.2	1.9
V671054 PREP DUP		1.9	4.2	20	59.2	1.63	0.82	<0.03	28.5	1.03	1.3	0.23	1.4	0.23	75.9	2.1
V671107		1.5	6.1	20	53.2	1.32	0.33	<0.03	30.6	1.37	0.4	0.14	2.2	0.02	54.9	2.6
V671107 PREP DUP		2.0	5.8	20	52.9	1.40	0.39	<0.03	34.7	1.39	0.4	0.14	2.2	0.02	57.0	2.3
V671161		3.4	1.1	20	88.9	0.39	0.13	0.04	49.0	0.41	4.0	0.05	0.5	0.03	43.0	0.6
V671161 PREP DUP		4.1	1.0	20	78.7	0.39	0.12	0.03	56.2	0.36	4.1	0.01	<0.5	<0.01	43.9	0.4
V671214		7.0	0.5	30	28.9	0.54	0.17	0.03	49.5	0.36	2.0	0.07	<0.5	0.03	42.8	0.3
V671214 PREP DUP		5.2	0.5	30	25.6	0.45	0.14	0.05	46.9	0.30	1.6	0.03	<0.5	<0.01	49.5	0.3
V671267		16.5	1.5	30	116.5	0.20	0.08	0.05	61.0	0.21	1.9	<0.01	0.7	<0.01	32.6	0.7
V671267 PREP DUP		13.1	1.3	20	106.0	0.19	0.05	0.03	58.6	0.17	2.0	<0.01	0.6	<0.01	35.5	0.6

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
DUPLICATES																
ORIGINAL		3.90	17.5	4.94	1	134.0	0.2	0.95	0.89	0.50	0.36	415	180	31.2	3.25	129
DUP		3.89	17.5	4.93	1	131.5	0.2	0.96	1.01	0.48	0.39	399	487	30.5	3.36	125
Target Range - Lower Bound		3.67	16.4	4.66	<1	126.0	<0.1	0.90	0.85	0.46	0.31	382	316	28.8	3.11	119
Upper Bound		4.12	18.6	5.21	2	139.5	0.3	1.01	1.05	0.52	0.44	432	351	32.9	3.50	135
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
PREP DUPLICATES																
V671054		0.54	1115	1.06	122	7.1	39.2	0.28	6.15	0.18	5.70	<5	4	11.8	1.62	23
V671054 PREP DUP		0.58	1090	1.13	101	6.5	34.6	0.25	5.55	0.13	5.19	<5	4	11.4	1.70	16
V671107		0.78	924	1.34	26	9.3	25.4	0.27	4.60	0.01	2.02	7	2	6.5	0.40	5
V671107 PREP DUP		0.74	1015	1.32	28	9.4	28.6	0.26	4.49	0.02	2.01	<5	2	7.9	0.53	5
V671161		0.15	1275	0.45	931	20.0	105.5	0.09	2.43	0.02	7.92	6	3	2.0	0.22	33
V671161 PREP DUP		0.14	1585	0.35	944	20.9	93.7	0.06	2.27	<0.01	7.81	<5	3	2.4	0.19	37
V671214		0.06	1840	0.18	446	10.3	96.1	0.09	3.29	0.02	5.45	10	3	2.9	0.28	20
V671214 PREP DUP		0.08	1720	0.21	412	10.0	97.7	0.05	2.59	<0.01	4.64	8	3	2.6	0.26	15
V671267		0.16	4750	0.25	319	40.1	79.1	0.01	3.43	<0.01	4.58	6	6	1.1	0.10	17
V671267 PREP DUP		0.15	4720	0.13	287	37.6	88.0	<0.01	3.20	<0.01	4.00	<5	6	1.0	0.07	17

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
DUPLICATES																
ORIGINAL		49.5	13.25	14.55	8.64	4.48	2.36	0.58	0.01	1.73	0.19	0.15	0.01	0.02		
DUP		49.8	13.25	15.30	8.66	4.52	2.37	0.58	0.05	1.72	0.19	0.14	0.01	0.02		
Target Range - Lower Bound		48.4	12.90	14.55	8.42	4.38	2.30	0.56	0.02	1.67	0.18	0.13	<0.01	<0.01		
Upper Bound		50.9	13.60	15.30	8.88	4.62	2.43	0.60	0.04	1.78	0.20	0.16	0.02	0.03		
ORIGINAL		30.3	5.80	2.56	32.8	4.71	6.12	0.47	0.01	0.25	0.04	0.05	0.06	0.02		
DUP		29.9	5.58	2.68	33.4	4.75	5.97	0.53	0.01	0.31	0.04	0.05	0.06	0.03		
Target Range - Lower Bound		29.3	5.54	2.54	32.3	4.60	5.88	0.48	<0.01	0.26	0.03	0.04	0.05	<0.01		
Upper Bound		30.9	5.84	2.70	33.9	4.86	6.21	0.52	0.02	0.30	0.05	0.06	0.07	0.04		
PREP DUPLICATES																
V671054		83.0	9.02	1.88	0.64	0.15	3.08	1.18	<0.01	0.02	0.17	0.05	<0.01	<0.01	0.39	99.58
V671054 PREP DUP		84.5	8.79	2.06	0.65	0.16	3.00	1.19	<0.01	0.02	0.17	0.05	<0.01	<0.01	0.37	100.96
V671107		77.1	14.10	1.24	0.70	0.14	5.52	1.92	<0.01	0.01	0.07	0.05	<0.01	<0.01	0.28	101.13
V671107 PREP DUP		75.3	14.00	1.24	0.69	0.14	5.48	2.04	<0.01	0.01	0.07	0.05	<0.01	<0.01	0.15	99.17
V671161		74.3	15.80	0.68	0.96	0.21	6.75	0.77	<0.01	0.02	0.17	0.09	<0.01	<0.01	0.44	100.19
V671161 PREP DUP		74.2	15.75	0.59	0.86	0.17	6.79	0.89	<0.01	0.01	0.17	0.11	<0.01	<0.01	0.39	99.93
V671214		73.4	15.90	1.28	0.76	0.28	5.17	1.64	0.01	0.03	0.30	0.07	<0.01	<0.01	0.33	99.17
V671214 PREP DUP		73.9	16.10	1.22	0.74	0.27	5.11	1.60	<0.01	0.02	0.29	0.08	<0.01	<0.01	0.31	99.64
V671267		74.5	17.30	0.72	0.67	0.21	5.09	1.57	<0.01	0.02	0.18	0.18	0.01	<0.01	0.70	101.15
V671267 PREP DUP		72.8	16.90	0.74	0.65	0.17	4.85	1.58	<0.01	0.02	0.17	0.17	0.01	<0.01	0.65	98.71

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

Sample Description	Method	F-IC881	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	F	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	20	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
DUPLICATES															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
PREP DUPLICATES															
V671054		1390	<0.5	<5	<0.5	<1	8	540	1	3	3	6	10	96	
V671054 PREP DUP		1430	<0.5	<5	<0.5	1	9	540	1	3	6	6	10	94	
V671107		470	<0.5	<5	<0.5	<1	7	210	<1	3	8	1	10	43	
V671107 PREP DUP		460	<0.5	<5	<0.5	<1	6	220	<1	3	8	1	<10	43	
V671161		460	<0.5	<5	<0.5	<1	3	2010	<1	2	3	1	10	20	
V671161 PREP DUP		380	<0.5	<5	<0.5	<1	2	2020	<1	2	4	<1	10	18	
V671214		900	<0.5	<5	0.5	2	4	4050	<1	6	6	1	10	60	
V671214 PREP DUP		830	<0.5	<5	<0.5	1	4	4160	<1	6	6	1	10	58	
V671267		6930	<0.5	8	0.5	1	5	7380	<1	3	4	1	30	43	0.837
V671267 PREP DUP		7370	<0.5	10	<0.5	<1	4	7510	<1	3	8	1	20	41	0.874

Comments: Blended 400g sample V671057 with sample V671056. Fully combined samples V671056 and V671056 and analyze as one.

***** See Appendix Page for comments regarding this certificate *****

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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 27-JUN-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17103883

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:				
	CRU-32	CRU-QC	LOG-21	LOG-23
	PUL-35a	PUL-QC	SPL-21	SPL-21X
	SPL-21Xd	WEI-21		

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:				
	F-IC881	Li-OG63	ME-4ACD81	ME-ICP06
	ME-MS81	ME-OG62o	OA-GRA05	TOT-ICP06

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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

QC CERTIFICATE TB17127319

Project: 0518

This report is for 179 Drill Core samples submitted to our lab in Thunder Bay, ON, Canada on 23-JUN-2017.

The following have access to data associated with this certificate:

CINDY HU	BILL MERCER	VOLKER MOELLER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-24	Pulp Login - Rcd w/o Barcode
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um
LOG-21	Sample logging - ClientBarCode
SPL-22	Split sample - rotary splitter
CRU-QC	Crushing QC Test
PUL-QC	Pulverizing QC Test

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-ICP06	Whole Rock Package - ICP-AES	ICP-AES
OA-GRA05	Loss on Ignition at 1000C	WST-SEQ
ME-MS81	Lithium Borate Fusion ICP-MS	ICP-MS
TOT-ICP06	Total Calculation for ICP06	ICP-AES
C-IR07	Total Carbon (Leco)	LECO
S-IR08	Total Sulphur (Leco)	LECO
Hg-MS42	Trace Hg by ICPMS	ICP-MS
F-IC881	F - KOH fusion and IC	

To: AVALON ADVANCED MATERIALS INC.
ATTN: BILL MERCER
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:

Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
STANDARDS																
AMIS0085																
AMIS0085																
AMIS0085																
Target Range - Lower Bound																
Upper Bound																
AMIS0167																
Target Range - Lower Bound																
Upper Bound																
AMIS0185																
Target Range - Lower Bound																
Upper Bound																
AMIS0304		2560	8000	90	0.37	127.0	33.0	141.5	49.6	320	26.0	17.75	3320	2.02	>2500	3670
Target Range - Lower Bound		2340	7280	70	0.35	119.0	30.6	135.0	47.8	309	25.0	16.20	3250	1.83	4670	3610
Upper Bound		2860	8900	120	0.45	145.5	37.4	165.0	58.7	377	31.0	19.80	3970	2.26	>2500	4410
AMIS0304																
Target Range - Lower Bound																
Upper Bound																
CCU-1e																
CCU-1e																
Target Range - Lower Bound																
Upper Bound																
CDN-W-4																
Target Range - Lower Bound																
Upper Bound																
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
STANDARDS																
AMIS0085																
AMIS0085																
AMIS0085																
Target Range - Lower Bound																
Upper Bound																
AMIS0167																
Target Range - Lower Bound																
Upper Bound																
AMIS0185																
Target Range - Lower Bound																
Upper Bound																
AMIS0304		973	9.8	575	23	3220	12.5	33.5	417	3.37	22.1	368	5	382	15.95	1110
Target Range - Lower Bound		925	9.3	543	22	3060	11.1	30.8	406	3.14	21.6	331	3	369	15.25	1005
Upper Bound		>1000	11.8	664	29	3740	13.8	37.7	496	3.86	26.5	415	7	452	18.75	1230
AMIS0304																
Target Range - Lower Bound																
Upper Bound																
CCU-1e																
CCU-1e																
Target Range - Lower Bound																
Upper Bound																
CDN-W-4																
Target Range - Lower Bound																
Upper Bound																
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																

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Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
STANDARDS																
AMIS0085		72.2	11.05	3.49	3.32	1.76	1.74	4.65	0.08	0.21	0.07	0.07	0.01	0.04		101.23
AMIS0085		74.9	11.25	3.58	3.31	1.77	1.81	4.79	0.08	0.22	0.07	0.07	0.01	0.04		>102.00
AMIS0085		70.3	10.75	3.57	3.20	1.75	1.73	4.57	0.08	0.21	0.07	0.07	0.01	0.04		98.89
Target Range - Lower Bound		69.0	10.60	3.33	3.12	1.64	1.62	4.48	0.05	0.18	0.04	0.05	<0.01	0.02		97.99
Upper Bound		72.1	11.35	3.67	3.44	1.86	1.84	4.90	0.10	0.24	0.09	0.10	0.03	0.06		>102.00
AMIS0167		94.2	2.43	3.41	0.13	0.26	0.08	0.49	0.06	0.14	0.02	0.04	<0.01	0.01		>102.00
Target Range - Lower Bound		89.6	2.29	3.28	0.10	0.21	0.06	0.45	0.03	0.12	<0.01	<0.01	<0.01	<0.01		97.99
Upper Bound		93.3	2.55	3.62	0.16	0.27	0.12	0.55	0.08	0.18	0.04	0.05	0.02	0.02		>102.00
AMIS0185															21.2	
Target Range - Lower Bound															20.1	
Upper Bound															22.3	
AMIS0304																
Target Range - Lower Bound																
Upper Bound																
AMIS0304		12.50	1.54	21.4	29.1	2.86	0.10	0.28	0.01	1.75	0.46	18.15	0.41	0.29		96.59
Target Range - Lower Bound		11.90	1.42	20.3	27.7	2.72	0.06	0.25	<0.01	1.69	0.41	17.80	0.36	0.25		
Upper Bound		12.75	1.62	21.6	29.3	3.02	0.12	0.31	0.03	1.91	0.51	18.90	0.44	0.31		
CCU-1e																
CCU-1e																
Target Range - Lower Bound																
Upper Bound																
CDN-W-4															4.50	
Target Range - Lower Bound															4.17	
Upper Bound															4.63	
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																

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ALS Canada Ltd.
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North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method / Analyte / Units / LOR	C-IR07 C % 0.01	S-IR08 S % 0.01	Hg-MS42 Hg ppm 0.005	F-IC881 F ppm 20
		STANDARDS			
AMIS0085					
AMIS0085					
AMIS0085					
Target Range - Lower Bound					
Upper Bound					
AMIS0167					
Target Range - Lower Bound					
Upper Bound					
AMIS0185					
Target Range - Lower Bound					
Upper Bound					
AMIS0304					
Target Range - Lower Bound					
Upper Bound					
AMIS0304					
Target Range - Lower Bound					
Upper Bound					
CCU-1e					300
CCU-1e					250
Target Range - Lower Bound					200
Upper Bound					310
CDN-W-4					
Target Range - Lower Bound					
Upper Bound					
DS-1		3.11			
Target Range - Lower Bound		3.01			
Upper Bound		3.25			
DS-1		3.10	2.75		
DS-1			2.68		
Target Range - Lower Bound			2.51		
Upper Bound			2.71		
GS310-10		1.09	0.26		
GS310-10		1.07	0.25		
Target Range - Lower Bound		1.03	0.25		
Upper Bound		1.13	0.29		

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QC CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
STANDARDS																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
NCS 73317a																
NCS 73317a																
Target Range - Lower Bound																
Upper Bound																
OREAS 146																
Target Range - Lower Bound																
Upper Bound																
OREAS 602																
OREAS 602																
Target Range - Lower Bound																
Upper Bound																
OREAS-105		674	113.5	50	2.01	11.95	7.15	1.42	25.6	12.45	6.3	2.55	48.0	1.02	38.9	60.0
Target Range - Lower Bound		632	105.0	40	1.96	10.95	6.72	1.32	24.3	11.65	5.6	2.19	45.4	0.88	36.9	57.8
Upper Bound		774	129.0	80	2.42	13.45	8.28	1.68	29.9	14.35	7.2	2.69	56.6	1.10	45.6	70.8
OREAS-105																
Target Range - Lower Bound																
Upper Bound																
SARM-3																
Target Range - Lower Bound																
Upper Bound																
SRM88B																
SRM88B																
SRM88B																
Target Range - Lower Bound																
Upper Bound																
SY-4																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
STANDARDS																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
NCS 73317a																
NCS 73317a																
Target Range - Lower Bound																
Upper Bound																
OREAS 146																
Target Range - Lower Bound																
Upper Bound																
OREAS 602																
OREAS 602																
Target Range - Lower Bound																
Upper Bound																
OREAS-105		14.60	99.4	14.45	8	86.2	4.4	2.04	354	1.08	508	29	3	61.2	7.24	224
Target Range - Lower Bound		14.35	94.8	13.30	8	85.3	4.3	1.95	332	1.02	479	19	<1	57.9	6.54	208
Upper Bound		17.65	116.5	16.30	13	104.5	5.5	2.41	406	1.26	585	43	5	71.9	8.06	259
OREAS-105																
Target Range - Lower Bound																
Upper Bound																
SARM-3																
Target Range - Lower Bound																
Upper Bound																
SRM88B																
SRM88B																
SRM88B																
Target Range - Lower Bound																
Upper Bound																
SY-4																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
STANDARDS																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
NCS 73317a																
NCS 73317a																
Target Range - Lower Bound																
Upper Bound																
OREAS 146		20.2	2.98	28.4	17.15	7.01	0.30	1.26	0.03	1.38	2.42	0.51	0.37	1.51		92.87
Target Range - Lower Bound		19.50	2.82	27.5	16.75	6.59	0.26	1.19	<0.01	1.35	2.30	0.49	0.33	1.39		97.99
Upper Bound		20.7	3.12	29.1	17.85	7.15	0.34	1.37	0.05	1.53	2.56	0.59	0.41	1.59		>102.00
OREAS 602																
OREAS 602																
Target Range - Lower Bound																
Upper Bound																
OREAS-105																
Target Range - Lower Bound																
Upper Bound																
OREAS-105		73.0	14.35	2.87	1.48	0.81	5.20	2.34	0.01	0.42	0.02	0.35	0.01	0.08		100.94
Target Range - Lower Bound																
Upper Bound																
SARM-3																
Target Range - Lower Bound																
Upper Bound																
SRM88B		1.20	0.33	0.29	30.9	21.4	0.03	0.10	<0.01	0.02	0.02	<0.01	0.01	<0.01		101.28
SRM88B		1.20	0.34	0.30	31.0	21.4	0.04	0.09	<0.01	0.02	0.02	0.01	<0.01	<0.01		101.40
SRM88B		1.12	0.32	0.30	30.0	21.4	0.03	0.11	<0.01	0.02	0.02	<0.01	<0.01	<0.01		100.30
Target Range - Lower Bound		1.05	0.30	0.24	29.1	20.4	<0.01	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		97.99
Upper Bound		1.21	0.37	0.31	30.8	21.7	0.05	0.13	0.03	0.04	0.04	0.03	0.03	0.03		>102.00
SY-4		49.8	20.4	6.17	7.87	0.52	7.10	1.63	<0.01	0.28	0.11	0.13	0.14	0.04		98.75
Target Range - Lower Bound		48.7	20.1	5.95	7.74	0.49	6.81	1.56	<0.01	0.25	0.08	0.10	0.11	<0.01		97.99
Upper Bound		51.1	21.3	6.47	8.36	0.59	7.39	1.76	0.03	0.32	0.13	0.16	0.17	0.06		>102.00

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North Vancouver BC V7H 0A7
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Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method / Analyte / Units / LOR	C-IR07 C % 0.01	S-IR08 S % 0.01	Hg-MS42 Hg ppm 0.005	F-IC881 F ppm 20
		STANDARDS			
GS313-8		0.94			
Target Range - Lower Bound		0.90			
Upper Bound		0.98			
GS313-8		0.93	1.23		
GS313-8			1.25		
Target Range - Lower Bound			1.19		
Upper Bound			1.29		
MA-1b		2.39	1.21		
MA-1b		2.39	1.16		
Target Range - Lower Bound		2.34	1.12		
Upper Bound		2.54	1.22		
NCS 73317a				1.645	
NCS 73317a				1.630	
Target Range - Lower Bound				1.505	
Upper Bound				1.855	
OREAS 146					
Target Range - Lower Bound					
Upper Bound					
OREAS 602				0.781	
OREAS 602				0.766	
Target Range - Lower Bound				0.706	
Upper Bound				0.874	
OREAS-105					
Target Range - Lower Bound					
Upper Bound					
OREAS-105					
Target Range - Lower Bound					
Upper Bound					
SARM-3					4280
Target Range - Lower Bound					3940
Upper Bound					4860
SRM88B					
SRM88B					
SRM88B					
Target Range - Lower Bound					
Upper Bound					
SY-4					
Target Range - Lower Bound					
Upper Bound					

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QC CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
BLANKS																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		1.2	<0.5	<10	0.02	<0.05	<0.03	<0.03	<0.1	<0.05	<0.2	0.01	<0.5	0.02	<0.2	<0.1
Target Range - Lower Bound		<0.5	<0.5	<10	<0.01	<0.05	<0.03	<0.03	<0.1	<0.05	<0.2	<0.01	<0.5	<0.01	<0.2	<0.1
Upper Bound		1.0	1.0	20	0.02	0.10	0.06	0.06	0.2	0.10	0.4	0.02	1.0	0.02	0.4	0.2
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
BLANKS																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<0.03	<0.2	0.03	<1	0.2	<0.1	0.01	<0.05	0.02	<0.05	<5	1	<0.5	0.03	<2
Target Range - Lower Bound		<0.03	<0.2	<0.03	<1	<0.1	<0.1	<0.01	<0.05	<0.01	<0.05	<5	<1	<0.5	<0.03	<2
Upper Bound		0.06	0.4	0.06	2	0.2	0.2	0.02	0.10	0.02	0.10	10	2	1.0	0.06	4
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
BLANKS																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK															0.02	
Target Range - Lower Bound															<0.01	
Upper Bound															0.02	
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
BLANK		0.03	0.01	<0.01	0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.07
BLANK		<0.01	0.01	0.01	0.01	<0.01	0.01	0.03	<0.01	<0.01	<0.01	0.01	<0.01	<0.01		0.08
BLANK		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
Target Range - Lower Bound		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Upper Bound		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02		

***** See Appendix Page for comments regarding this certificate *****

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2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method / Analyte / Units / LOR	C-IR07 C % 0.01	S-IR08 S % 0.01	Hg-MS42 Hg ppm 0.005	F-IC881 F ppm 20
		BLANKS			
BLANK		<0.01			
Target Range - Lower Bound		<0.01			
Upper Bound		0.02			
BLANK					<20
BLANK					<20
Target Range - Lower Bound					<20
Upper Bound					40
BLANK				<0.005	
BLANK				<0.005	
Target Range - Lower Bound				<0.005	
Upper Bound				0.010	
BLANK					
Target Range - Lower Bound					
Upper Bound					
BLANK					
Target Range - Lower Bound					
Upper Bound					
BLANK		<0.01	<0.01		
BLANK		<0.01	0.01		
BLANK		<0.01	<0.01		
BLANK			<0.01		
Target Range - Lower Bound			<0.01		
Upper Bound			0.02		
BLANK					
BLANK					
BLANK					
BLANK					
Target Range - Lower Bound					
Upper Bound					

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TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
		DUPLICATES														
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671813a																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671838a		17.8	5.1	280	916	2.62	1.80	0.54	15.3	2.02	1.0	0.61	1.8	0.26	1.7	4.6
DUP		17.6	5.0	280	895	2.44	1.71	0.56	15.1	2.18	1.1	0.58	1.8	0.28	1.7	4.3
Target Range - Lower Bound		16.3	4.3	260	860	2.35	1.64	0.49	14.3	1.95	0.8	0.56	1.2	0.25	1.4	4.1
Upper Bound		19.1	5.8	300	951	2.71	1.87	0.61	16.1	2.26	1.3	0.63	2.4	0.29	2.0	4.8
V671845																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671908																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671943																
DUP																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

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Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671813a																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671838a		0.83	973	1.71	19	80.9	0.4	0.39	0.14	0.25	0.11	255	4	14.7	1.68	36
DUP		0.78	943	1.62	19	79.1	0.5	0.40	0.15	0.24	0.05	252	5	14.5	1.69	36
Target Range - Lower Bound		0.73	910	1.55	17	75.9	0.3	0.37	0.09	0.22	<0.05	236	3	13.4	1.57	32
Upper Bound		0.88	1005	1.78	21	84.1	0.6	0.42	0.20	0.27	0.10	271	6	15.8	1.80	40
V671845																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671908																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671943																
DUP																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

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North Vancouver BC V7H 0A7
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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		51.3	7.77	9.68	5.15	23.2	0.86	0.27	0.48	0.48	0.16	0.08	0.01	0.01		
DUP		51.3	7.75	9.69	5.13	23.1	0.86	0.28	0.48	0.48	0.16	0.08	0.01	0.01		
Target Range - Lower Bound		50.0	7.56	9.43	5.00	22.6	0.83	0.26	0.46	0.46	0.15	0.07	<0.01	<0.01		
Upper Bound		52.6	7.96	9.94	5.28	23.7	0.89	0.29	0.50	0.50	0.17	0.09	0.02	0.02		
ORIGINAL		67.6	15.20	4.03	3.62	1.32	4.45	2.69	<0.01	0.47	0.09	0.20	0.08	0.12		
DUP		66.0	14.90	3.84	3.48	1.29	4.36	2.63	<0.01	0.46	0.07	0.19	0.08	0.11		
Target Range - Lower Bound		65.1	14.65	3.83	3.45	1.26	4.28	2.58	<0.01	0.44	0.07	0.18	0.07	0.10		
Upper Bound		68.5	15.45	4.04	3.65	1.35	4.53	2.74	0.02	0.49	0.09	0.21	0.09	0.13		
V671813a																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671838a		49.9	14.85	12.60	10.40	9.18	1.48	0.63	0.04	0.69	0.18	0.04	0.01	<0.01	0.90	100.90
DUP		49.5	14.70	12.55	10.30	9.12	1.47	0.65	0.04	0.68	0.18	0.04	0.01	<0.01	0.92	100.16
Target Range - Lower Bound		48.4	14.40	12.25	10.10	8.91	1.43	0.61	0.03	0.66	0.17	0.03	<0.01	<0.01	0.88	98.01
Upper Bound		51.0	15.15	12.90	10.60	9.39	1.52	0.67	0.05	0.71	0.19	0.05	0.02	0.02	0.94	>102.00
V671845																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671908																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671943																
DUP																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

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North Vancouver BC V7H 0A7
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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method / Analyte / Units / LOR	C-IR07 C % 0.01	S-IR08 S % 0.01	Hg-MS42 Hg ppm 0.005	F-IC881 F ppm 20
		DUPLICATES			
ORIGINAL				0.598	
DUP				0.630	
Target Range - Lower Bound				0.578	
Upper Bound				0.650	
ORIGINAL					
DUP					
Target Range - Lower Bound					
Upper Bound					
ORIGINAL					
DUP					
Target Range - Lower Bound					
Upper Bound					
V671813a					3530
DUP					3570
Target Range - Lower Bound					3350
Upper Bound					3750
V671838a					3640
DUP					3570
Target Range - Lower Bound					3400
Upper Bound					3810
V671845		0.03	0.03		
DUP		0.04	0.03		
Target Range - Lower Bound		0.02	0.02		
Upper Bound		0.05	0.04		
V671908		0.33	0.14		
DUP		0.32	0.13		
Target Range - Lower Bound		0.31	0.12		
Upper Bound		0.34	0.15		
V671943		0.03	0.04		
DUP		0.03	0.04		
Target Range - Lower Bound		0.02	0.03		
Upper Bound		0.04	0.05		

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TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
PREP DUPLICATES																
V671912																
V671912 PREP DUP																

***** See Appendix Page for comments regarding this certificate *****

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North Vancouver BC V7H 0A7
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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
PREP DUPLICATES																
V671912																
V671912 PREP DUP																

***** See Appendix Page for comments regarding this certificate *****

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TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		50.0	10.55	10.05	10.35	11.10	2.09	1.06	0.06	0.84	0.17	0.08	0.05	0.04		
DUP		50.7	10.65	10.20	10.50	11.25	2.11	1.06	0.06	0.85	0.17	0.08	0.05	0.04		
Target Range - Lower Bound		49.1	10.35	9.86	10.15	10.90	2.04	1.02	0.05	0.81	0.16	0.07	0.04	0.03		
Upper Bound		51.6	10.90	10.40	10.70	11.45	2.16	1.10	0.07	0.88	0.18	0.09	0.06	0.05		
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
PREP DUPLICATES																
V671912																
V671912 PREP DUP																

***** See Appendix Page for comments regarding this certificate *****

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TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17127319

Sample Description	Method / Analyte / Units / LOR	C-IR07 C % 0.01	S-IR08 S % 0.01	Hg-MS42 Hg ppm 0.005	F-IC881 F ppm 20
DUPLICATES					
ORIGINAL		0.03	0.43		
DUP		0.03	0.43		
Target Range - Lower Bound		0.02	0.41		
Upper Bound		0.04	0.45		
ORIGINAL					
DUP					
Target Range - Lower Bound					
Upper Bound					
ORIGINAL				1.310	
DUP				1.245	
Target Range - Lower Bound				1.210	
Upper Bound				1.345	
PREP DUPLICATES					
V671912		0.03	0.06		
V671912 PREP DUP		0.04	0.07		

***** See Appendix Page for comments regarding this certificate *****

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TORONTO ON M5H 3P5

Finalized Date: 25-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17127319

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:				
	CRU-31	CRU-QC	LOG-21	LOG-24
	PUL-31	PUL-QC	SPL-21	SPL-22
	WEI-21			

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:				
	C-IR07	F-IC881	Hg-MS42	ME-ICP06
	ME-MS81	OA-GRA05	S-IR08	TOT-ICP06

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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 12-JUL-2017
Account: OPG

QC CERTIFICATE TB17138018

Project: 0518

This report is for 68 Drill Core samples submitted to our lab in Thunder Bay, ON, Canada on 6-JUL-2017.

The following have access to data associated with this certificate:

CINDY HU	BILL MERCER	VOLKER MOELLER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
FND-02	Find Sample for Addn Analysis

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
Li-OG63	Ore grade Li - 4ACID	ICP-AES
ME-OG62o	Ore Grade open beaker -ICPAES	ICP-AES

To: AVALON ADVANCED MATERIALS INC.
ATTN: BILL MERCER
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:

Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 12-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17138018

Sample Description	Method Analyte Units LOR	Li-OG63 Li % 0.005
STANDARDS		
NCSDC86303		0.206
NCSDC86303		0.220
Target Range - Lower Bound		0.201
Upper Bound		0.226
NCSDC86304		1.080
Target Range - Lower Bound		1.022
Upper Bound		1.106
SRM 181		2.940
Target Range - Lower Bound		2.861
Upper Bound		3.079
SRM-183		1.895
SRM-183		1.880
Target Range - Lower Bound		1.838
Upper Bound		1.982
BLANKS		
BLANK		<0.005
BLANK		<0.005
BLANK		<0.005
Target Range - Lower Bound		<0.005
Upper Bound		0.010
DUPLICATES		
ORIGINAL		0.118
DUP		0.120
Target Range - Lower Bound		0.111
Upper Bound		0.127
V671083		0.877
DUP		0.864
Target Range - Lower Bound		0.844
Upper Bound		0.897

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 12-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17138018

Sample Description	Method Analyte Units LOR	Li-OG63 Li % 0.005
		DUPLICATES
V671216		0.061
DUP		0.061
Target Range - Lower Bound		0.054
Upper Bound		0.068

***** See Appendix Page for comments regarding this certificate *****

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2103 Dollarton Hwy
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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 12-JUL-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17138018

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Applies to Method:

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

FND-02 Li-OG63 ME-OG62o

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 1-AUG-2017
Account: OPG

QC CERTIFICATE TB17155276

Project: 0518

This report is for 7 Drill Core samples submitted to our lab in Thunder Bay, ON, Canada on 27-JUL-2017.

The following have access to data associated with this certificate:

CINDY HU	BILL MERCER	VOLKER MOELLER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
FND-02	Find Sample for Addn Analysis

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-4ACD81	Base Metals by 4-acid dig.	ICP-AES

To: AVALON ADVANCED MATERIALS INC.
ATTN: BILL MERCER
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:

Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 1-AUG-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17155276

Sample Description	Method	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81
	Analyte	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	5	0.5	1	1	10	1	1	2	1	10	2
STANDARDS													
AMIS0343		<0.5	14	<0.5	2	50	6950	3	12	6	<1	30	78
AMIS0343		<0.5	17	<0.5	2	53	6910	4	15	8	<1	30	81
Target Range - Lower Bound		<0.5	<5	<0.5	<1	47	6300	<1	11	<2	<1	<10	70
Upper Bound		1.1	24	1.0	5	56	7730	6	17	10	2	50	90
OGGeo08		19.9	118	18.1	97	8100	30	894	8670	7210	9	<10	6950
Target Range - Lower Bound		17.7	102	16.2	86	7800	<10	841	8000	6510	8	<10	6500
Upper Bound		22.7	136	21.0	108	8980	50	1030	9770	7970	13	20	7950
BLANKS													
BLANK		<0.5	<5	<0.5	1	<1	<10	<1	<1	<2	<1	<10	<2
Target Range - Lower Bound		<0.5	<5	<0.5	<1	<1		<1	<1	<2			<2
Upper Bound		1.0	10	1.0	2	2		2	2	4			4
DUPLICATES													
ORIGINAL		<0.5	871	0.9	4	30	<10	<1	4	11	3	<10	239
DUP		<0.5	810	0.9	5	33	<10	1	7	17	3	<10	238
Target Range - Lower Bound		<0.5	793	<0.5	3	29	<10	<1	4	11	2	<10	225
Upper Bound		1.0	888	1.0	6	34	20	2	7	17	4	20	252

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 1-AUG-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17155276

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Applies to Method:

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

FND-02 ME-4ACD81

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 11-AUG-2017
Account: OPG

QC CERTIFICATE TB17160753

Project: 0518

This report is for 20 Drill Core samples submitted to our lab in Thunder Bay, ON, Canada on 2-AUG-2017.

The following have access to data associated with this certificate:

CINDY HU	BILL MERCER	VOLKER MOELLER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
FND-02	Find Sample for Addn Analysis
FND-02a	Find Sample at Branch Lab

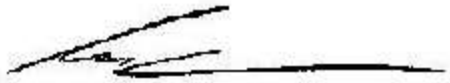
ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
Li-OG63	Ore grade Li - 4ACID	ICP-AES
ME-OG62o	Ore Grade open beaker -ICPAES	ICP-AES

To: AVALON ADVANCED MATERIALS INC.
ATTN: CINDY HU
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature: 
Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 11-AUG-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17160753

Sample Description	Method	Li-OG63
	Analyte	Li
	Units	%
	LOR	0.005
STANDARDS		
NCSDC86303		0.220
NCSDC86303		0.213
Target Range - Lower Bound		0.201
Upper Bound		0.226
SRM-183		1.915
SRM-183		1.895
Target Range - Lower Bound		1.838
Upper Bound		1.982
BLANKS		
BLANK		<0.005
BLANK		<0.005
Target Range - Lower Bound		<0.005
Upper Bound		0.010
DUPLICATES		
ORIGINAL		0.111
DUP		0.113
Target Range - Lower Bound		0.104
Upper Bound		0.120
ORIGINAL		0.070
DUP		0.069
Target Range - Lower Bound		0.063
Upper Bound		0.076

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 11-AUG-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17160753

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Applies to Method: Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada
FND-02a

Applies to Method: Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.
FND-02 Li-OG63 ME-OG62o

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 14-AUG-2017
Account: OPG

QC CERTIFICATE TB17162674

Project: 0518

This report is for 30 Drill Core samples submitted to our lab in Thunder Bay, ON, Canada on 4-AUG-2017.

The following have access to data associated with this certificate:

CINDY HU	BILL MERCER	VOLKER MOELLER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
FND-02	Find Sample for Addn Analysis

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-4ACD81	Base Metals by 4-acid dig.	ICP-AES

To: AVALON ADVANCED MATERIALS INC.
ATTN: BILL MERCER
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:

Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 14-AUG-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17162674

Sample Description	Method	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81
	Analyte	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	5	0.5	1	1	10	1	1	2	1	10	2
STANDARDS													
AMIS0343		<0.5	12	<0.5	1	54	7180	4	12	5	<1	30	80
AMIS0343		<0.5	12	<0.5	3	52	7370	3	11	7	<1	30	81
Target Range - Lower Bound		<0.5	<5	<0.5	<1	47	6300	<1	11	<2	<1	<10	70
Upper Bound		1.1	24	1.0	5	56	7730	6	17	10	2	50	90
OGGeo08		21.0	122	20.0	98	8480	30	948	9060	7510	10	<10	7460
OGGeo08		21.1	131	20.1	103	8800	40	948	9290	7760	10	<10	7460
Target Range - Lower Bound		17.7	102	16.2	86	7800	<10	841	8000	6510	8	<10	6500
Upper Bound		22.7	136	21.0	108	8980	50	1030	9770	7970	13	20	7950
BLANKS													
BLANK		<0.5	<5	<0.5	<1	<1	<10	<1	<1	<2	<1	<10	<2
BLANK		<0.5	<5	<0.5	<1	<1	<10	<1	<1	<2	<1	<10	<2
Target Range - Lower Bound		<0.5	<5	<0.5	<1	<1		<1	<1	<2			<2
Upper Bound		1.0	10	1.0	2	2		2	2	4			4
DUPLICATES													
ORIGINAL		<0.5	<5	0.7	18	43	10	1	10	8	6	<10	83
DUP		<0.5	<5	<0.5	20	39	10	1	10	8	6	<10	81
Target Range - Lower Bound		<0.5	<5	<0.5	17	39	<10	<1	9	6	5	<10	76
Upper Bound		1.0	10	1.0	21	43	20	2	12	10	7	20	88
ORIGINAL		<0.5	<5	<0.5	5	73	20	2	<1	2	1	<10	56
DUP		<0.5	<5	<0.5	4	80	20	1	<1	<2	1	<10	58
Target Range - Lower Bound		<0.5	<5	<0.5	3	73	<10	<1	<1	<2	<1	<10	52
Upper Bound		1.0	10	1.0	6	80	30	2	2	4	2	20	62

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 14-AUG-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17162674

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:	
FND-02	ME-4ACD81

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 24-AUG-2017
Account: OPG

QC CERTIFICATE TB17167448

Project: 0518

This report is for 10 Drill Core samples submitted to our lab in Thunder Bay, ON, Canada on 10-AUG-2017.

The following have access to data associated with this certificate:

CINDY HU	BILL MERCER	VOLKER MOELLER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
FND-02	Find Sample for Addn Analysis

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
S-CAL06	Sulfide Sulfur (calculated)	LECO
S-GRA06	Sulfate Sulfur-carbonate leach	WST-SEQ
C-GAS05	Inorganic Carbon (CO2)	
S-GRA06a	Sulfate Sulfur (HCl leachable)	WST-SEQ

To: AVALON ADVANCED MATERIALS INC.
ATTN: CINDY HU
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:

Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 24-AUG-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17167448

Sample Description	Method	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08	OA-ELE07	OA-VOL08	S-IR08	S-GRA06	S-GRA06a	S-CAL06	C-GAS05	C-GAS05
	Analyte	MPA	FIZZ RAT	NNP	NP	pH	Ratio (N	S	S	S	S	C	CO2
	Units	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity	%	%	%	%	%	%
	LOR	0.3	1	1	1	0.1	0.01	0.01	0.01	0.01	0.01	0.05	0.2
STANDARDS													
Buffer pH6						6.0							
Buffer pH6						6.1							
Target Range - Lower Bound						5.3							
Upper Bound						6.7							
CO-ASSAY												0.48	1.8
Target Range - Lower Bound												0.42	1.5
Upper Bound												0.64	2.4
GS310-10								0.26					
Target Range - Lower Bound								0.25					
Upper Bound								0.29					
KZK-1		25.0	2	36	61		2.44						
Target Range - Lower Bound		22.9		30	54		2.18						
Upper Bound		27.1		38	64		2.54						
MA-1b								1.16					
Target Range - Lower Bound								1.12					
Upper Bound								1.22					
MA-2c												1.52	5.6
Target Range - Lower Bound												1.50	5.5
Upper Bound												1.84	6.8
NBM-1		8.8	2	42	51		5.83						
Target Range - Lower Bound		7.8		37	45		5.26						
Upper Bound		9.7		47	54		6.08						
UTS-1									0.87				
Target Range - Lower Bound									0.83				
Upper Bound									0.93				
UTS-1										0.87			
UTS-1										0.89			
UTS-1										0.88			
UTS-1										0.89			
Target Range - Lower Bound										0.81			
Upper Bound										0.95			
UTS-4									1.73				
Target Range - Lower Bound									1.64				
Upper Bound									1.84				
UTS-4										1.76			
UTS-4										1.76			
Target Range - Lower Bound										1.61			
Upper Bound										1.87			

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 24-AUG-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17167448

Sample Description	Method	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08	OA-ELE07	OA-VOL08	S-IR08	S-GRA06	S-GRA06a	S-CAL06	C-GAS05	C-GAS05
	Analyte	MPA	FIZZ RAT	NNP	NP	pH	Ratio (N	S	S	S	S	C	CO2
	Units	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity	%	%	%	%	%	%
	LOR	0.3	1	1	1	0.1	0.01	0.01	0.01	0.01	0.01	0.05	0.2
BLANKS													
BLANK												<0.05	<0.2
Target Range - Lower Bound												<0.05	<0.2
Upper Bound												0.10	0.4
BLANK						6.4							
Target Range - Lower Bound						5.5							
Upper Bound						6.9							
BLANK									<0.01				
Target Range - Lower Bound									<0.01				
Upper Bound									0.02				
BLANK										<0.01			
BLANK										<0.01			
BLANK										<0.01			
Target Range - Lower Bound										<0.01			
Upper Bound										0.02			
BLANK								0.01					
Target Range - Lower Bound								<0.01					
Upper Bound								0.02					
DUPLICATES													
V671827										<0.01			
DUP										0.01			
Target Range - Lower Bound										<0.01			
Upper Bound										0.02			
V671833		3.1	1	13	16	9.2	5.12			0.02			
DUP		3.1	1	12	15	9.2	4.80			0.02			
Target Range - Lower Bound		2.6	<1	11	14	8.6	4.70			<0.01			
Upper Bound		3.6	2	14	17	9.8	5.22			0.03			
V671915										0.03			
DUP										0.02			
Target Range - Lower Bound										<0.01			
Upper Bound										0.04			

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 24-AUG-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17167448

Sample Description	Method	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08	OA-ELE07	OA-VOL08	S-IR08	S-GRA06	S-GRA06a	S-CAL06	C-GAS05	C-GAS05
	Analyte	MPA	FIZZ RAT	NNP	NP	pH	Ratio (N	S	S	S	S	C	CO2
	Units	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity	%	%	%	%	%	%
	LOR	0.3	1	1	1	0.1	0.01	0.01	0.01	0.01	0.01	0.05	0.2
DUPLICATES													
V671930								0.08					
DUP								0.09					
Target Range - Lower Bound								0.07					
Upper Bound								0.10					
ORIGINAL												<0.05	<0.2
DUP												<0.05	<0.2
Target Range - Lower Bound												<0.05	<0.2
Upper Bound												0.10	0.4
ORIGINAL									<0.01		0.22		
DUP									<0.01		0.23		
Target Range - Lower Bound									<0.01		0.21		
Upper Bound									0.02		0.24		

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 24-AUG-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17167448

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
C-GAS05	FND-02	OA-ELE07	OA-VOL08
S-CAL06	S-GRA06	S-GRA06a	S-IR08

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

QC CERTIFICATE TB17180529

Project: 0518

This report is for 305 Rock samples submitted to our lab in Thunder Bay, ON, Canada on 25-AUG-2017.

The following have access to data associated with this certificate:

CINDY HU	BILL MERCER	VOLKER MOELLER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
SPL-21X	Addnl Crush Split w No Analysis
SPL-21Xd	Addnl Crush Split with No Analysis-DUP
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um
LOG-21	Sample logging - ClientBarCode
CRU-QC	Crushing QC Test
PUL-QC	Pulverizing QC Test
LOG-23	Pulp Login - Rcvd with Barcode

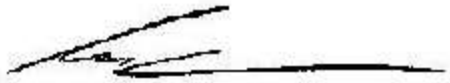
ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-ICP06	Whole Rock Package - ICP-AES	ICP-AES
OA-GRA05	Loss on Ignition at 1000C	WST-SEQ
ME-MS81	Lithium Borate Fusion ICP-MS	ICP-MS
TOT-ICP06	Total Calculation for ICP06	ICP-AES
ME-4ACD81	Base Metals by 4-acid dig.	ICP-AES
Li-OG63	Ore grade Li - 4ACID	ICP-AES
ME-OG62o	Ore Grade open beaker -ICPAES	ICP-AES

To: AVALON ADVANCED MATERIALS INC.
ATTN: BILL MERCER
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature: 

Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

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QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
STANDARDS																
AMIS0085		373	73.5	580	4.24	10.70	8.15	0.99	13.7	7.56	4.7	2.49	37.4	1.35	11.3	29.8
AMIS0085		384	78.8	510	4.09	10.65	8.62	0.97	13.3	6.89	4.6	2.60	40.1	1.41	10.8	30.8
AMIS0085		364	73.5	630	4.18	11.75	8.81	0.89	14.1	7.74	4.5	2.65	37.2	1.42	11.6	29.3
AMIS0085		362	70.9	530	4.06	10.50	8.42	0.92	14.2	6.85	4.7	2.67	37.9	1.35	10.2	26.2
AMIS0085		362	76.8	620	4.08	11.40	8.71	0.97	15.3	7.21	4.9	2.59	38.8	1.41	12.6	29.7
Target Range - Lower Bound																
Upper Bound																
AMIS0085																
Target Range - Lower Bound																
Upper Bound																
AMIS0167		82.1	46.0	470	1.04	6.29	3.33	0.67	3.3	5.25	2.6	1.17	23.4	0.32	4.3	18.5
AMIS0167		85.1	47.8	480	1.20	6.01	2.98	0.83	3.7	4.84	2.5	1.14	24.5	0.31	4.8	20.1
AMIS0167		84.9	45.6	460	1.12	5.87	3.17	0.68	3.5	4.79	2.7	1.12	23.0	0.29	4.6	18.4
AMIS0167		82.9	46.6	430	1.06	5.84	3.23	0.67	3.3	4.56	2.7	1.08	23.5	0.30	4.4	18.9
AMIS0167		84.7	45.8	440	0.96	6.10	3.09	0.75	3.5	4.82	2.7	1.09	23.6	0.30	4.9	18.9
Target Range - Lower Bound																
Upper Bound																
AMIS0167																
AMIS0167																
Target Range - Lower Bound																
Upper Bound																
AMIS0185																
AMIS0185																
AMIS0185																
AMIS0185																
Target Range - Lower Bound																
Upper Bound																
AMIS0286																
AMIS0286																
AMIS0286																
AMIS0286																
AMIS0286																
Target Range - Lower Bound																
Upper Bound																

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North Vancouver BC V7H 0A7
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Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
STANDARDS																
AMIS0085		8.43	239	7.16	3	106.5	1.6	1.57	54.9	1.36	283	24	2	68.5	8.88	161
AMIS0085		8.48	220	6.94	3	104.5	1.6	1.49	54.5	1.46	266	21	2	69.7	9.01	156
AMIS0085		7.96	233	7.12	3	105.0	1.5	1.62	53.0	1.35	259	28	2	71.9	9.60	164
AMIS0085		7.93	216	6.41	3	100.5	1.6	1.51	50.7	1.32	254	21	2	64.4	9.59	153
AMIS0085		8.26	228	6.52	4	106.0	1.6	1.47	54.3	1.41	273	22	2	73.0	9.55	164
Target Range - Lower Bound																
Upper Bound																
AMIS0085																
Target Range - Lower Bound																
Upper Bound																
AMIS0167		5.12	16.9	4.97	2	19.4	1.4	0.99	48.9	0.47	472	55	1	24.5	2.66	103
AMIS0167		5.36	19.0	4.67	1	20.7	1.8	0.97	51.6	0.43	546	69	1	25.9	2.70	107
AMIS0167		5.12	16.4	4.37	2	18.8	1.8	0.96	47.8	0.42	463	57	1	24.4	2.42	99
AMIS0167		5.13	16.1	4.84	1	19.8	1.7	0.88	48.6	0.40	495	56	2	24.8	2.45	105
AMIS0167		5.00	17.7	4.75	3	19.0	1.9	0.92	47.2	0.42	492	60	1	24.3	2.58	114
Target Range - Lower Bound																
Upper Bound																
AMIS0167																
AMIS0167																
Target Range - Lower Bound																
Upper Bound																
AMIS0185																
AMIS0185																
AMIS0185																
AMIS0185																
Target Range - Lower Bound																
Upper Bound																
AMIS0286																
AMIS0286																
AMIS0286																
AMIS0286																
AMIS0286																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
STANDARDS																
AMIS0085		73.1	11.05	3.53	3.31	1.77	1.75	4.63	0.08	0.21	0.07	0.07	0.01	0.04		
AMIS0085		69.8	10.80	3.37	3.23	1.70	1.71	4.58	0.08	0.21	0.07	0.07	0.01	0.04		
AMIS0085		71.1	10.80	3.39	3.16	1.71	1.71	4.52	0.08	0.20	0.07	0.07	0.01	0.04		
AMIS0085		69.6	10.60	3.38	3.18	1.66	1.66	4.56	0.08	0.20	0.06	0.07	0.01	0.04		
AMIS0085		70.0	10.80	3.37	3.20	1.70	1.64	4.50	0.08	0.21	0.06	0.07	0.01	0.04		
Target Range -	Lower Bound	69.0	10.60	3.33	3.12	1.64	1.62	4.48	0.05	0.18	0.04	0.05	<0.01	0.02		
	Upper Bound	72.1	11.35	3.67	3.44	1.86	1.84	4.90	0.10	0.24	0.09	0.10	0.03	0.06		
AMIS0085		71.9	10.85	3.39	3.14	1.75	1.74	4.72	0.08	0.21	0.06	0.07	0.01	0.04		100.50
Target Range -	Lower Bound	69.0	10.60	3.33	3.12	1.64	1.62	4.48	0.05	0.18	0.04	0.05	<0.01	0.02		97.99
	Upper Bound	72.1	11.35	3.67	3.44	1.86	1.84	4.90	0.10	0.24	0.09	0.10	0.03	0.06		>102.00
AMIS0167		91.5	2.46	3.40	0.13	0.24	0.08	0.50	0.06	0.14	0.02	0.03	<0.01	0.01		
AMIS0167		91.1	2.43	3.28	0.13	0.23	0.08	0.48	0.06	0.14	0.02	0.03	<0.01	0.01		
AMIS0167		92.1	2.45	3.35	0.14	0.23	0.09	0.49	0.06	0.14	0.02	0.03	<0.01	0.01		
AMIS0167		92.4	2.40	3.34	0.13	0.23	0.08	0.47	0.06	0.14	0.02	0.04	<0.01	0.01		
AMIS0167		92.6	2.44	3.37	0.13	0.23	0.09	0.51	0.06	0.14	0.02	0.05	<0.01	0.01		
Target Range -	Lower Bound	89.6	2.29	3.28	0.10	0.21	0.06	0.45	0.03	0.12	<0.01	<0.01	<0.01	<0.01		
	Upper Bound	93.3	2.55	3.62	0.16	0.27	0.12	0.55	0.08	0.18	0.04	0.05	0.02	0.02		
AMIS0167		93.3	2.46	3.41	0.11	0.24	0.07	0.50	0.06	0.14	0.02	0.03	<0.01	0.01		101.97
AMIS0167		92.5	2.42	3.39	0.11	0.23	0.08	0.48	0.06	0.14	0.02	0.03	<0.01	0.01		101.09
Target Range -	Lower Bound	89.6	2.29	3.28	0.10	0.21	0.06	0.45	0.03	0.12	<0.01	<0.01	<0.01	<0.01		97.99
	Upper Bound	93.3	2.55	3.62	0.16	0.27	0.12	0.55	0.08	0.18	0.04	0.05	0.02	0.02		>102.00
AMIS0185															21.1	
AMIS0185															21.4	
AMIS0185															21.2	
AMIS0185															21.2	
Target Range -	Lower Bound														20.1	
	Upper Bound														22.3	
AMIS0286															7.65	
AMIS0286															7.85	
AMIS0286															7.91	
AMIS0286															7.62	
AMIS0286															7.75	
Target Range -	Lower Bound														7.25	
	Upper Bound														8.03	

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Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
STANDARDS														
AMIS0085														
AMIS0085														
AMIS0085														
AMIS0085														
AMIS0085														
Target Range - Lower Bound														
Upper Bound														
AMIS0085														
Target Range - Lower Bound														
Upper Bound														
AMIS0167														
AMIS0167														
AMIS0167														
AMIS0167														
AMIS0167														
Target Range - Lower Bound														
Upper Bound														
AMIS0167														
AMIS0167														
Target Range - Lower Bound														
Upper Bound														
AMIS0185														
AMIS0185														
AMIS0185														
AMIS0185														
Target Range - Lower Bound														
Upper Bound														
AMIS0286														
AMIS0286														
AMIS0286														
AMIS0286														
AMIS0286														
Target Range - Lower Bound														
Upper Bound														

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Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
STANDARDS																
AMIS0304		2680	8110	100	0.44	128.0	33.0	150.5	48.2	348	26.3	17.30	3340	1.94	>2500	4000
AMIS0304		2760	8620	90	0.47	129.0	33.2	151.0	45.2	330	26.8	17.70	3560	1.99	>2500	4210
AMIS0304		2800	8520	100	0.39	145.0	37.2	146.5	50.4	374	28.3	19.05	3510	2.02	>2500	4190
AMIS0304		2720	8050	90	0.47	129.0	33.9	150.0	49.1	338	27.4	18.80	3500	2.01	>2500	3810
AMIS0304		2740	8540	110	0.38	138.0	33.8	147.5	49.5	347	29.2	17.35	3510	2.01	>2500	4100
AMIS0304		2610	7990	90	0.37	128.5	32.2	139.0	48.3	323	26.3	16.95	3270	1.88	>2500	3850
Target Range - Lower Bound		2340	7280	70	0.35	119.0	30.6	135.0	47.8	309	25.0	16.20	3250	1.83	4670	3610
Upper Bound		2860	8900	120	0.45	145.5	37.4	165.0	58.7	377	31.0	19.80	3970	2.26	>2500	4410
AMIS0343																
AMIS0343																
AMIS0343																
AMIS0343																
AMIS0343																
AMIS0343																
Target Range - Lower Bound																
Upper Bound																
CDN-W-4																
CDN-W-4																
CDN-W-4																
CDN-W-4																
Target Range - Lower Bound																
Upper Bound																
MRGeo08																
MRGeo08																
MRGeo08																
MRGeo08																
Target Range - Lower Bound																
Upper Bound																
NCSDC86303																
Target Range - Lower Bound																
Upper Bound																
NCSDC86304																
NCSDC86304																
Target Range - Lower Bound																
Upper Bound																

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	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
STANDARDS																
AMIS0304		>1000	10.9	591	24	3500	12.8	34.9	450	3.31	22.9	376	5	388	15.55	1110
AMIS0304		>1000	10.0	617	24	3500	12.5	33.6	449	3.46	23.4	331	5	400	15.55	1110
AMIS0304		>1000	10.9	621	26	3540	12.2	36.7	468	3.53	23.4	388	5	422	17.45	1185
AMIS0304		>1000	10.5	604	24	3490	12.8	35.4	436	3.56	23.0	355	5	390	17.15	1125
AMIS0304		>1000	10.9	588	26	3610	13.1	33.5	452	3.45	23.5	372	5	425	16.40	1180
AMIS0304		976	10.2	566	23	3300	11.8	33.2	423	3.18	21.6	342	5	396	15.35	1095
Target Range - Lower Bound		925	9.3	543	22	3060	11.1	30.8	406	3.14	21.6	331	3	369	15.25	1005
Upper Bound		>1000	11.8	664	29	3740	13.8	37.7	496	3.86	26.5	415	7	452	18.75	1230
AMIS0343																
AMIS0343																
AMIS0343																
AMIS0343																
AMIS0343																
AMIS0343																
Target Range - Lower Bound																
Upper Bound																
CDN-W-4																
CDN-W-4																
CDN-W-4																
CDN-W-4																
Target Range - Lower Bound																
Upper Bound																
MRGeo08																
MRGeo08																
MRGeo08																
MRGeo08																
Target Range - Lower Bound																
Upper Bound																
NCSDC86303																
Target Range - Lower Bound																
Upper Bound																
NCSDC86304																
NCSDC86304																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
STANDARDS																
AMIS0304		12.15	1.52	21.4	28.8	2.78	0.10	0.27	0.01	1.71	0.45	18.25	0.42	0.28		
AMIS0304		12.35	1.50	20.5	27.7	2.76	0.10	0.27	0.01	1.73	0.44	17.95	0.41	0.28		
AMIS0304		12.75	1.56	21.6	28.7	2.87	0.10	0.28	0.01	1.72	0.45	18.00	0.42	0.29		
AMIS0304		12.00	1.52	20.8	28.6	2.75	0.10	0.28	0.01	1.71	0.44	18.05	0.40	0.28		
AMIS0304		12.05	1.52	20.7	28.2	2.74	0.09	0.28	0.01	1.71	0.44	17.95	0.40	0.28		
AMIS0304																
Target Range - Lower Bound																
Upper Bound																
AMIS0343																
AMIS0343																
AMIS0343																
AMIS0343																
AMIS0343																
AMIS0343																
Target Range - Lower Bound																
Upper Bound																
CDN-W-4															4.41	
CDN-W-4															4.46	
CDN-W-4															4.56	
CDN-W-4															4.36	
Target Range - Lower Bound															4.17	
Upper Bound															4.63	
MRGeo08																
MRGeo08																
MRGeo08																
MRGeo08																
Target Range - Lower Bound																
Upper Bound																
NCSDC86303																
Target Range - Lower Bound																
Upper Bound																
NCSDC86304																
NCSDC86304																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
STANDARDS														
AMIS0304														
AMIS0304														
AMIS0304														
AMIS0304														
AMIS0304														
AMIS0304														
Target Range - Lower Bound														
Upper Bound														
AMIS0343		<0.5	15	<0.5	1	52	7250	3	14	6	<1	30	84	
AMIS0343		<0.5	12	<0.5	1	50	6860	3	13	6	<1	40	78	
AMIS0343		<0.5	13	<0.5	2	55	7430	4	10	6	<1	40	86	
AMIS0343		<0.5	15	<0.5	1	55	6950	3	14	7	<1	40	82	
AMIS0343		<0.5	16	<0.5	2	54	7070	4	13	11	<1	40	82	
AMIS0343		<0.5	14	<0.5	1	51	7250	3	13	8	<1	40	83	
Target Range - Lower Bound		<0.5	<5	<0.5	<1	47	6300	<1	11	<2	<1	<10	70	
Upper Bound		1.1	24	1.0	5	56	7730	6	17	10	2	50	90	
CDN-W-4														
CDN-W-4														
CDN-W-4														
CDN-W-4														
Target Range - Lower Bound														
Upper Bound														
MRGeo08		4.3	34	2.1	20	637	30	14	718	1105	11	10	832	
MRGeo08		4.7	37	2.3	21	639	30	14	720	1095	11	<10	822	
MRGeo08		4.8	35	2.3	21	654	40	15	722	1100	11	10	835	
MRGeo08		4.5	35	2.3	20	617	30	15	704	1080	10	<10	810	
Target Range - Lower Bound		3.2	21	1.1	17	586	<10	12	621	969	10	<10	722	
Upper Bound		5.7	45	3.4	23	676	50	18	761	1190	15	20	886	
NCSDC86303														0.208
Target Range - Lower Bound														0.201
Upper Bound														0.226
NCSDC86304														1.065
NCSDC86304														1.030
Target Range - Lower Bound														1.022
Upper Bound														1.106

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
STANDARDS																
OGGeo08																
OGGeo08																
OGGeo08																
OGGeo08																
OGGeo08																
OGGeo08																
Target Range - Lower Bound																
Upper Bound																
OREAS 146		>10000	4690	210	0.47	233	87.8	121.5	28.3	361	4.5	38.9	2460	6.53	399	2200
OREAS 146		>10000	5010	210	0.56	224	84.8	139.0	30.6	346	4.2	37.1	2660	6.41	406	2370
OREAS 146		>10000	4600	210	0.47	217	82.1	119.0	27.9	330	4.1	36.0	2410	5.91	425	2120
OREAS 146		>10000	5000	210	0.52	219	84.5	125.0	28.8	326	4.1	35.9	2590	6.16	426	2300
OREAS 146		>10000	4890	210	0.51	239	87.8	134.0	28.1	360	4.7	38.5	2630	6.63	424	2340
OREAS 146		>10000	4690	180	0.51	212	80.4	120.5	25.0	326	3.7	35.6	2450	5.95	393	2230
Target Range - Lower Bound		11450	4220	160	0.47	202	78.3	114.5	26.2	323	3.6	33.1	2260	5.66	349	1965
Upper Bound		>10000	5160	220	0.59	246	95.7	139.5	32.2	395	4.8	40.5	2760	6.94	427	2400
OREAS 602																
OREAS 602																
OREAS 602																
OREAS 602																
Target Range - Lower Bound																
Upper Bound																
OREAS-105		679	109.5	50	1.98	11.35	7.10	1.40	24.4	12.20	6.0	2.34	45.8	0.91	39.6	64.3
OREAS-105		735	120.0	50	1.99	11.70	7.12	1.34	24.6	11.70	6.1	2.53	49.8	1.00	38.2	66.4
OREAS-105		718	118.0	40	2.04	13.00	7.63	1.38	25.1	13.45	6.7	2.68	49.0	0.99	40.2	68.0
OREAS-105		681	110.0	50	1.98	11.45	7.10	1.40	26.5	12.20	6.2	2.49	48.6	0.94	37.9	58.4
OREAS-105		722	123.5	60	2.10	12.90	8.16	1.43	29.8	12.40	6.8	2.47	51.1	1.02	41.7	68.8
OREAS-105		711	117.0	50	2.07	12.25	7.47	1.48	27.7	12.90	6.5	2.53	48.7	1.06	40.6	65.5
Target Range - Lower Bound		632	105.0	40	1.96	10.95	6.72	1.32	24.3	11.65	5.6	2.19	45.4	0.88	36.9	57.8
Upper Bound		774	129.0	80	2.42	13.45	8.28	1.68	29.9	14.35	7.2	2.69	56.6	1.10	45.6	70.8
SARM-43																
SARM-43																
SARM-43																
SARM-43																
SARM-43																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
STANDARDS																
OGGeo08																
OGGeo08																
OGGeo08																
OGGeo08																
OGGeo08																
OGGeo08																
Target Range - Lower Bound																
Upper Bound																
OREAS 146		548	25.4	469	47	3140	4.0	47.8	907	10.05	2.58	149	29	916	51.7	235
OREAS 146		594	29.2	450	45	3360	4.3	44.6	990	9.83	2.88	180	29	970	51.0	243
OREAS 146		537	24.6	432	45	3050	4.3	44.0	878	9.38	2.53	152	28	899	49.0	217
OREAS 146		585	28.1	462	47	3310	4.2	43.0	958	9.73	2.61	165	28	967	52.0	249
OREAS 146		572	26.9	466	50	3260	4.6	46.8	935	10.55	2.79	164	31	958	53.2	264
OREAS 146		547	24.6	441	44	3110	3.9	43.7	882	9.46	2.44	142	26	902	49.6	220
Target Range - Lower Bound		493	23.7	397	40	2790	3.6	42.5	813	8.90	2.37	140	25	814	48.1	204
Upper Bound		603	29.5	485	52	3410	4.6	51.9	993	10.90	3.01	182	33	996	58.9	254
OREAS 602																
OREAS 602																
OREAS 602																
OREAS 602																
Target Range - Lower Bound																
Upper Bound																
OREAS-105		15.30	104.0	14.85	11	87.3	4.7	1.99	375	1.03	541	27	3	58.7	6.66	216
OREAS-105		15.35	98.6	15.45	10	87.0	4.4	2.07	379	1.11	543	26	3	60.5	6.88	220
OREAS-105		15.30	101.5	15.85	11	87.8	4.4	2.11	391	1.05	550	24	3	62.9	7.01	227
OREAS-105		14.65	99.6	15.00	9	85.9	4.4	1.98	354	1.07	508	28	3	58.2	6.90	211
OREAS-105		16.00	111.0	15.60	11	95.6	4.8	2.06	393	1.11	561	31	3	67.9	7.26	240
OREAS-105		15.20	106.0	15.35	9	90.7	4.4	2.06	384	1.12	547	27	3	65.0	7.37	231
Target Range - Lower Bound		14.35	94.8	13.30	8	85.3	4.3	1.95	332	1.02	479	19	<1	57.9	6.54	208
Upper Bound		17.65	116.5	16.30	13	104.5	5.5	2.41	406	1.26	585	43	5	71.9	8.06	259
SARM-43																
SARM-43																
SARM-43																
SARM-43																
SARM-43																
Target Range - Lower Bound																
Upper Bound																

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
STANDARDS																
OGGeo08																
OGGeo08																
OGGeo08																
OGGeo08																
OGGeo08																
OGGeo08																
Target Range - Lower Bound																
Upper Bound																
OREAS 146		20.1	3.10	28.9	17.90	7.06	0.32	1.30	0.03	1.43	2.53	0.55	0.39	1.56		
OREAS 146		20.1	2.99	28.3	17.10	6.84	0.32	1.27	0.03	1.38	2.44	0.53	0.38	1.49		
OREAS 146		19.95	2.99	28.1	16.90	6.64	0.30	1.24	0.02	1.37	2.40	0.51	0.38	1.42		
OREAS 146		19.95	3.00	28.2	16.85	6.70	0.31	1.26	0.02	1.36	2.39	0.52	0.38	1.48		
OREAS 146		20.3	3.00	27.8	17.40	6.91	0.31	1.28	0.03	1.40	2.47	0.53	0.39	1.53		
OREAS 146																
Target Range - Lower Bound																
Upper Bound																
OREAS 602																
OREAS 602																
OREAS 602																
OREAS 602																
Target Range - Lower Bound																
Upper Bound																
OREAS-105		70.4	13.65	2.79	1.43	0.79	4.97	2.23	0.01	0.40	0.02	0.35	0.01	0.08		
OREAS-105		72.3	13.75	2.73	1.42	0.80	5.07	2.30	0.01	0.42	0.02	0.36	0.01	0.08		
OREAS-105		72.9	13.95	2.79	1.41	0.80	4.95	2.23	0.01	0.40	0.02	0.34	0.01	0.07		
OREAS-105		70.6	13.90	2.78	1.45	0.80	4.97	2.27	0.01	0.41	0.02	0.34	0.01	0.08		
OREAS-105		71.9	14.25	2.81	1.45	0.80	4.99	2.30	0.01	0.42	0.02	0.35	0.01	0.08		
OREAS-105																
Target Range - Lower Bound																
Upper Bound																
SARM-43															47.9	
SARM-43															47.8	
SARM-43															47.9	
SARM-43															47.5	
SARM-43															47.5	
Target Range - Lower Bound															45.7	
Upper Bound															50.5	

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
STANDARDS														
OGGeo08		20.0	110	19.4	100	8560	30	923	8980	7540	10	<10	7340	
OGGeo08		20.1	122	19.2	98	8450	40	913	8870	7430	9	10	7240	
OGGeo08		20.9	124	19.5	101	8720	30	925	9160	7640	10	<10	7280	
OGGeo08		20.4	127	19.4	100	8640	30	924	9090	7450	10	<10	7270	
OGGeo08		20.7	126	19.7	100	8620	30	921	9150	7490	9	10	7330	
OGGeo08		19.7	122	18.5	97	8300	30	896	8710	7220	9	10	6960	
Target Range - Lower Bound		17.7	102	16.2	86	7800	<10	841	8000	6510	8	<10	6500	
Upper Bound		22.7	136	21.0	108	8980	50	1030	9770	7970	13	20	7950	
OREAS 146														
OREAS 146														
OREAS 146														
OREAS 146														
OREAS 146														
OREAS 146														
Target Range - Lower Bound														
Upper Bound														
OREAS 602		>100	672	25.6	9	5020	20	4	61	1020	4	<10	4140	
OREAS 602		>100	715	26.4	11	5400	20	5	63	1080	5	10	4360	
OREAS 602		>100	697	26.0	11	5320	20	5	68	1070	4	<10	4280	
OREAS 602		>100	680	25.5	10	5150	20	5	63	1035	4	<10	4190	
Target Range - Lower Bound		107.5	579	21.7	7	4790	<10	2	53	918	2	<10	3770	
Upper Bound		100.0	719	27.7	12	5510	40	7	67	1125	6	20	4610	
OREAS-105														
OREAS-105														
OREAS-105														
OREAS-105														
OREAS-105														
OREAS-105														
Target Range - Lower Bound														
Upper Bound														
SARM-43														
SARM-43														
SARM-43														
SARM-43														
SARM-43														
Target Range - Lower Bound														
Upper Bound														

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
STANDARDS																
SRM-183																
Target Range - Lower Bound																
Upper Bound																
SRM88B		6.6	3.4	10	0.19	0.65	0.42	0.11	0.5	0.64	<0.2	0.14	4.8	0.04	<0.2	3.2
SRM88B		4.9	3.4	<10	0.16	0.52	0.38	0.11	0.4	0.56	<0.2	0.14	4.6	0.04	0.2	3.1
SRM88B		3.9	3.3	<10	0.17	0.67	0.47	0.10	0.2	0.51	<0.2	0.14	4.5	0.03	0.3	3.1
SRM88B		3.7	3.4	10	0.15	0.61	0.42	0.12	0.8	0.58	<0.2	0.16	4.8	0.05	0.3	2.9
SRM88B		5.3	3.4	40	0.16	0.68	0.44	0.11	0.4	0.61	<0.2	0.14	4.7	0.03	0.3	2.8
Target Range - Lower Bound																
Upper Bound																
SRM88B																
Target Range - Lower Bound																
Upper Bound																
SY-4		301	114.0	20	1.43	18.05	14.30	1.78	36.5	13.70	11.6	4.46	53.0	1.99	12.5	52.3
SY-4		334	126.0	10	1.65	17.55	14.50	1.99	36.8	13.10	11.5	4.32	59.3	2.06	13.3	60.3
SY-4		340	121.0	20	1.59	18.60	14.55	1.88	38.0	14.10	11.5	4.38	56.0	2.05	14.1	56.3
SY-4		337	127.5	10	1.63	17.90	14.90	1.82	37.5	13.80	11.4	4.24	59.7	2.02	14.2	59.1
SY-4		330	120.0	20	1.50	18.50	14.20	1.86	37.5	14.00	10.8	4.56	57.0	2.19	12.8	56.6
SY-4		345	125.0	20	1.52	18.30	14.30	1.87	38.7	14.20	10.2	4.53	57.4	2.14	13.0	58.7
Target Range - Lower Bound		306	109.5	<10	1.34	16.35	12.75	1.77	31.4	12.55	9.8	3.86	51.7	1.88	11.5	51.2
Upper Bound		375	134.5	30	1.66	20.1	15.65	2.23	38.6	15.45	12.4	4.74	64.3	2.32	14.5	62.8
SY-4																
SY-4																
Target Range - Lower Bound																
Upper Bound																
BLANKS																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
STANDARDS																
SRM-183																
Target Range - Lower Bound																
Upper Bound																
SRM88B		0.86	3.0	0.53	<1	64.6	<0.1	0.08	0.30	0.05	0.16	<5	<1	7.6	0.29	4
SRM88B		0.77	2.7	0.48	<1	61.6	<0.1	0.10	0.25	0.06	0.18	<5	<1	7.2	0.29	5
SRM88B		0.75	2.5	0.53	<1	57.7	<0.1	0.09	0.26	0.04	0.10	<5	<1	7.2	0.29	4
SRM88B		0.78	3.1	0.53	<1	62.2	<0.1	0.08	0.28	0.06	0.13	<5	<1	7.2	0.28	5
SRM88B		0.71	2.9	0.44	<1	61.9	<0.1	0.08	0.26	0.05	0.15	<5	1	7.6	0.31	4
Target Range - Lower Bound																
Upper Bound																
SRM88B																
Target Range - Lower Bound																
Upper Bound																
SY-4		13.70	49.4	13.10	8	1140	0.4	2.62	1.31	2.11	0.91	5	<1	107.5	13.75	614
SY-4		15.45	55.6	13.45	8	1235	0.9	2.55	1.32	2.11	0.93	<5	<1	116.5	14.55	626
SY-4		14.55	52.0	13.05	8	1205	0.9	2.72	1.15	2.25	0.73	7	<1	115.5	14.60	583
SY-4		15.35	52.2	13.25	8	1280	0.8	2.56	1.33	2.28	0.83	5	1	121.0	14.95	617
SY-4		14.40	51.7	12.65	8	1180	0.8	2.67	1.01	2.26	0.66	6	1	112.5	14.45	574
SY-4		14.80	52.8	12.90	8	1235	0.7	2.67	1.29	2.22	0.74	5	1	115.5	15.05	551
Target Range - Lower Bound		13.45	49.3	11.40	6	1070	0.7	2.33	1.11	2.06	0.66	<5	<1	106.5	13.30	523
Upper Bound		16.55	60.7	14.00	10	1310	1.1	2.87	1.47	2.54	0.94	18	3	131.5	16.30	643
SY-4																
SY-4																
Target Range - Lower Bound																
Upper Bound																
BLANKS																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
STANDARDS																
SRM-183																
Target Range - Lower Bound																
Upper Bound																
SRM88B		1.15	0.33	0.29	30.7	21.1	0.03	0.10	<0.01	0.01	0.02	<0.01	0.01	<0.01		
SRM88B		1.14	0.32	0.28	30.6	21.1	0.03	0.10	<0.01	0.02	0.02	<0.01	0.01	<0.01		
SRM88B		1.16	0.33	0.27	30.0	21.1	0.03	0.10	<0.01	0.01	0.02	<0.01	0.01	<0.01		
SRM88B		1.15	0.34	0.27	30.7	20.8	0.03	0.10	<0.01	0.01	0.02	0.01	0.01	<0.01		
SRM88B		1.13	0.33	0.28	30.3	20.8	0.03	0.10	<0.01	0.01	0.02	<0.01	0.01	<0.01		
Target Range - Lower Bound		1.05	0.30	0.24	29.1	20.4	<0.01	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Upper Bound		1.21	0.37	0.31	30.8	21.7	0.05	0.13	0.03	0.04	0.04	0.03	0.03	0.03		
SRM88B		1.12	0.31	0.26	30.3	20.8	0.03	0.10	<0.01	0.01	0.02	0.01	0.01	<0.01		99.95
Target Range - Lower Bound		1.05	0.30	0.24	29.1	20.4	<0.01	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		97.99
Upper Bound		1.21	0.37	0.31	30.8	21.7	0.05	0.13	0.03	0.04	0.04	0.03	0.03	0.03		>102.00
SY-4		50.3	20.6	6.21	7.94	0.50	6.92	1.61	<0.01	0.27	0.11	0.11	0.14	0.04		
SY-4		49.4	20.4	6.14	7.84	0.50	6.99	1.60	<0.01	0.28	0.11	0.12	0.14	0.04		
SY-4		50.4	20.9	6.32	8.11	0.50	7.33	1.62	<0.01	0.28	0.11	0.12	0.14	0.04		
SY-4		48.7	20.3	6.15	7.75	0.50	6.87	1.59	<0.01	0.28	0.10	0.12	0.14	0.04		
SY-4		50.1	20.6	6.09	7.93	0.51	7.07	1.63	<0.01	0.28	0.11	0.12	0.15	0.04		
SY-4																
Target Range - Lower Bound																
Upper Bound																
SY-4		49.4	20.7	6.24	8.03	0.52	7.03	1.65	<0.01	0.27	0.10	0.12	0.14	0.04		98.80
SY-4		49.6	20.6	6.26	7.99	0.51	7.02	1.61	<0.01	0.27	0.10	0.12	0.14	0.04		98.82
Target Range - Lower Bound		48.7	20.1	5.95	7.74	0.49	6.81	1.56	<0.01	0.25	0.08	0.10	0.11	<0.01		97.99
Upper Bound		51.1	21.3	6.47	8.36	0.59	7.39	1.76	0.03	0.32	0.13	0.16	0.17	0.06		>102.00
BLANKS																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
STANDARDS														
SRM-183														1.875
Target Range - Lower Bound														1.838
Upper Bound														1.982
SRM88B														
SRM88B														
SRM88B														
SRM88B														
SRM88B														
Target Range - Lower Bound														
Upper Bound														
SRM88B														
Target Range - Lower Bound														
Upper Bound														
SY-4														
SY-4														
SY-4														
SY-4														
SY-4														
SY-4														
Target Range - Lower Bound														
Upper Bound														
SY-4														
SY-4														
Target Range - Lower Bound														
Upper Bound														
BLANKS														
BLANK														<0.005
BLANK														<0.005
BLANK														<0.005
Target Range - Lower Bound														<0.005
Upper Bound														0.010

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Finalized Date: 17-SEP-2017
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Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
		BLANKS														
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BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<0.5	<0.5	10	0.02	<0.05	0.03	<0.03	0.1	<0.05	<0.2	0.01	<0.5	0.01	<0.2	<0.1
BLANK		1.6	<0.5	<10	0.02	<0.05	<0.03	<0.03	0.1	<0.05	<0.2	<0.01	<0.5	<0.01	0.3	<0.1
BLANK		3.4	<0.5	<10	0.01	<0.05	<0.03	<0.03	<0.1	<0.05	<0.2	<0.01	<0.5	<0.01	0.2	<0.1
BLANK		0.8	<0.5	<10	<0.01	<0.05	<0.03	<0.03	<0.1	<0.05	<0.2	<0.01	<0.5	<0.01	<0.2	<0.1
BLANK		1.0	<0.5	10	<0.01	<0.05	<0.03	<0.03	<0.1	<0.05	<0.2	<0.01	<0.5	<0.01	<0.2	<0.1
BLANK		<0.5	<0.5	<10	<0.01	<0.05	<0.03	<0.03	<0.1	<0.05	<0.2	<0.01	<0.5	<0.01	<0.2	<0.1
BLANK		0.7	<0.5	<10	0.01	<0.05	<0.03	<0.03	0.1	<0.05	<0.2	0.02	<0.5	0.02	<0.2	<0.1
BLANK		2.7	<0.5	<10	0.01	<0.05	<0.03	<0.03	0.3	<0.05	<0.2	<0.01	<0.5	<0.01	<0.2	<0.1
BLANK		0.9	<0.5	<10	0.03	<0.05	0.03	0.03	<0.1	<0.05	<0.2	0.01	<0.5	0.01	<0.2	<0.1
BLANK		1.2	<0.5	<10	0.02	<0.05	<0.03	<0.03	<0.1	<0.05	<0.2	<0.01	<0.5	<0.01	<0.2	<0.1
BLANK		<0.5	<0.5	<10	0.02	<0.05	0.03	<0.03	<0.1	<0.05	<0.2	0.02	<0.5	0.02	<0.2	<0.1
BLANK		0.9	<0.5	<10	<0.01	<0.05	<0.03	<0.03	<0.1	<0.05	<0.2	<0.01	<0.5	<0.01	<0.2	<0.1
Target Range - Lower Bound		<0.5	<0.5	<10	<0.01	<0.05	<0.03	<0.03	<0.1	<0.05	<0.2	<0.01	<0.5	<0.01	<0.2	<0.1
Upper Bound		1.0	1.0	20	0.02	0.10	0.06	0.06	0.2	0.10	0.4	0.02	1.0	0.02	0.4	0.2
BLANK																
BLANK																
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BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
		BLANKS														
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<0.03	<0.2	0.04	<1	0.2	<0.1	0.02	<0.05	0.02	<0.05	<5	<1	<0.5	0.06	<2
BLANK		<0.03	<0.2	<0.03	<1	<0.1	<0.1	<0.01	<0.05	<0.01	<0.05	<5	1	<0.5	<0.03	<2
BLANK		<0.03	0.2	<0.03	<1	0.6	<0.1	<0.01	<0.05	<0.01	<0.05	<5	<1	<0.5	<0.03	<2
BLANK		<0.03	<0.2	<0.03	<1	0.1	<0.1	<0.01	<0.05	0.01	<0.05	<5	1	<0.5	<0.03	<2
BLANK		<0.03	<0.2	<0.03	<1	0.1	<0.1	<0.01	<0.05	<0.01	<0.05	<5	2	<0.5	<0.03	<2
BLANK		<0.03	<0.2	<0.03	<1	<0.1	<0.1	<0.01	<0.05	<0.01	<0.05	<5	1	<0.5	<0.03	<2
BLANK		<0.03	<0.2	0.05	<1	<0.1	0.1	0.01	<0.05	0.01	<0.05	<5	1	<0.5	<0.03	<2
BLANK		<0.03	<0.2	<0.03	<1	<0.1	<0.1	<0.01	<0.05	<0.01	<0.05	<5	1	<0.5	<0.03	<2
BLANK		0.04	<0.2	0.03	<1	<0.1	<0.1	<0.01	<0.05	0.01	<0.05	<5	<1	<0.5	<0.03	<2
BLANK		<0.03	<0.2	<0.03	<1	<0.1	<0.1	<0.01	<0.05	<0.01	<0.05	<5	<1	<0.5	<0.03	<2
BLANK		<0.03	<0.2	0.03	<1	<0.1	<0.1	0.02	<0.05	0.02	<0.05	<5	<1	<0.5	0.05	<2
BLANK		<0.03	<0.2	<0.03	<1	0.1	0.1	<0.01	<0.05	<0.01	<0.05	<5	<1	<0.5	<0.03	<2
Target Range - Lower Bound		<0.03	<0.2	<0.03	<1	<0.1	<0.1	<0.01	<0.05	<0.01	<0.05	<5	<1	<0.5	<0.03	<2
Upper Bound		0.06	0.4	0.06	2	0.2	0.2	0.02	0.10	0.02	0.10	10	2	1.0	0.06	4
BLANK																
BLANK																
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Target Range - Lower Bound																
Upper Bound																
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QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
BLANKS																
BLANK																
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BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BLANK		<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BLANK		<0.01	0.01	<0.01	0.02	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BLANK		<0.01	<0.01	0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BLANK		<0.01	0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BLANK		<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BLANK		<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BLANK		<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BLANK		<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK															-0.01	
BLANK															0.00	
BLANK															0.02	
BLANK															0.00	
BLANK															0.01	
BLANK															0.01	
BLANK															0.00	
BLANK															0.00	
BLANK															-0.01	
Target Range - Lower Bound															<0.01	
Upper Bound															0.02	
BLANK		<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
BLANKS														
BLANK		<0.5	<5	<0.5	<1	<1	<10	<1	<1	<2	<1	<10	<2	
BLANK		<0.5	<5	<0.5	<1	<1	<10	<1	<1	<2	<1	<10	<2	
BLANK		<0.5	<5	<0.5	<1	<1	<10	<1	<1	<2	<1	<10	<2	
BLANK		<0.5	<5	<0.5	<1	<1	<10	<1	<1	<2	<1	<10	<2	
BLANK		<0.5	<5	<0.5	<1	1	<10	1	<1	2	<1	<10	2	
BLANK		<0.5	<5	<0.5	<1	<1	<10	<1	<1	<2	<1	<10	<2	
BLANK		<0.5	<5	<0.5	<1	<1	<10	<1	<1	<2	<1	<10	<2	
BLANK		<0.5	<5	<0.5	<1	<1	<10	<1	<1	<2	<1	<10	<2	
BLANK		<0.5	<5	<0.5	<1	<1	<10	<1	2	<2	<1	<10	<2	
BLANK		<0.5	<5	<0.5	<1	<1	<10	<1	2	<2	<1	<10	<2	
Target Range - Lower Bound		<0.5	<5	<0.5	<1	<1		<1	<1	<2			<2	
Upper Bound		1.0	10	1.0	2	2		2	2	4			4	
BLANK														
BLANK														
BLANK														
BLANK														
BLANK														
BLANK														
BLANK														
BLANK														
BLANK														
BLANK														
BLANK														
Target Range - Lower Bound														
Upper Bound														
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BLANK														
BLANK														
BLANK														
BLANK														
BLANK														
Target Range - Lower Bound														
Upper Bound														
BLANK														
BLANK														

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
BLANKS																
BLANK																
Target Range - Lower Bound																
Upper Bound																
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671353		54.3	6.7	400	29.9	3.35	2.47	0.66	16.7	2.83	1.3	0.75	2.6	0.36	1.5	5.2
DUP		54.7	6.7	400	30.2	3.44	2.33	0.67	16.9	2.54	1.3	0.79	2.6	0.34	1.5	5.3
Target Range - Lower Bound		51.3	5.9	370	28.5	3.18	2.25	0.60	15.9	2.50	1.0	0.72	2.0	0.32	1.2	4.9
Upper Bound		57.7	7.5	430	31.6	3.61	2.55	0.73	17.7	2.87	1.6	0.82	3.2	0.38	1.8	5.6
V671357																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671384																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671388		993	73.5	10	2.63	7.07	4.59	0.76	20.3	6.28	8.0	1.52	34.9	0.70	22.2	28.6
DUP		1015	74.1	10	2.73	6.95	4.88	0.71	20.2	6.19	8.1	1.52	35.3	0.70	21.7	29.1
Target Range - Lower Bound		953	69.6	<10	2.54	6.61	4.47	0.67	19.1	5.87	7.4	1.43	32.8	0.66	20.7	27.3
Upper Bound		1055	78.0	20	2.82	7.41	5.00	0.80	21.4	6.60	8.7	1.61	37.4	0.75	23.2	30.4

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
BLANKS																
BLANK																
Target Range - Lower Bound																
Upper Bound																
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671353		1.03	104.5	1.74	13	68.7	<0.1	0.49	0.34	0.33	0.12	273	3	18.6	2.49	43
DUP		1.01	107.5	1.91	13	69.6	<0.1	0.52	0.34	0.33	0.15	273	4	19.3	2.40	44
Target Range - Lower Bound		0.94	100.5	1.70	11	65.6	<0.1	0.47	0.27	0.30	0.08	254	2	17.5	2.29	39
Upper Bound		1.10	111.5	1.95	15	72.7	0.2	0.54	0.41	0.36	0.19	292	5	20.4	2.60	48
V671357																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671384																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671388		7.93	167.0	6.00	5	32.0	1.7	1.13	21.7	0.70	5.58	<5	2	42.0	4.48	245
DUP		8.16	167.5	6.20	5	31.7	1.7	1.13	22.2	0.67	5.67	<5	2	41.7	4.63	241
Target Range - Lower Bound		7.61	158.5	5.77	4	30.2	1.5	1.06	20.8	0.64	5.29	<5	<1	39.3	4.30	229
Upper Bound		8.48	176.0	6.44	6	33.5	1.9	1.20	23.1	0.73	5.96	10	3	44.4	4.81	257

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
BLANKS																
BLANK		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01		0.01
Target Range - Lower Bound		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Upper Bound		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02		
DUPLICATES																
ORIGINAL		75.4	15.50	1.17	0.24	0.40	0.04	3.48	<0.01	0.27	<0.01	0.09	<0.01	0.31		
DUP		76.0	15.65	1.18	0.25	0.40	0.06	3.58	<0.01	0.28	<0.01	0.08	<0.01	0.32		
Target Range - Lower Bound		73.8	15.20	1.14	0.23	0.38	0.04	3.43	<0.01	0.26	<0.01	0.07	<0.01	0.30		
Upper Bound		77.6	15.95	1.21	0.26	0.42	0.06	3.63	0.02	0.29	0.02	0.10	0.02	0.33		
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		86.7	4.51	5.12	0.13	0.29	0.44	1.24	0.01	0.17	0.05	0.01	<0.01	0.02		
DUP		87.2	4.57	5.07	0.13	0.29	0.45	1.31	0.01	0.18	0.05	0.01	0.01	0.02		
Target Range - Lower Bound		84.8	4.42	4.96	0.12	0.27	0.42	1.23	<0.01	0.16	0.04	<0.01	<0.01	<0.01		
Upper Bound		89.1	4.66	5.23	0.14	0.31	0.47	1.32	0.02	0.19	0.06	0.02	0.02	0.03		
V671353		47.4	15.55	16.00	11.20	4.30	1.32	0.43	0.05	0.72	0.53	0.05	<0.01	0.01		
DUP		48.7	16.00	16.35	11.40	4.40	1.35	0.45	0.05	0.73	0.54	0.05	0.01	0.01		
Target Range - Lower Bound		46.8	15.35	15.75	11.00	4.23	1.29	0.42	0.04	0.70	0.51	0.04	<0.01	<0.01		
Upper Bound		49.3	16.20	16.60	11.60	4.47	1.38	0.46	0.06	0.75	0.56	0.06	0.02	0.02		
V671357															0.17	
DUP															0.18	
Target Range - Lower Bound															0.16	
Upper Bound															0.19	
V671384																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671388		77.6	12.15	2.13	0.37	0.47	2.44	5.80	<0.01	0.11	0.03	0.01	<0.01	0.11		
DUP		73.5	11.70	2.04	0.34	0.44	2.34	5.58	<0.01	0.10	0.03	<0.01	0.01	0.11		
Target Range - Lower Bound		73.7	11.60	2.02	0.34	0.43	2.32	5.54	<0.01	0.09	0.02	<0.01	<0.01	0.10		
Upper Bound		77.4	12.25	2.15	0.37	0.48	2.46	5.84	0.02	0.12	0.04	0.02	0.02	0.12		

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
BLANKS														
BLANK														
Target Range - Lower Bound														
Upper Bound														
DUPLICATES														
ORIGINAL														
DUP														
Target Range - Lower Bound														
Upper Bound														
ORIGINAL														0.864
DUP														0.863
Target Range - Lower Bound														0.837
Upper Bound														0.890
ORIGINAL														
DUP														
Target Range - Lower Bound														
Upper Bound														
V671353														
DUP														
Target Range - Lower Bound														
Upper Bound														
V671357														
DUP														
Target Range - Lower Bound														
Upper Bound														
V671384		<0.5	164	<0.5	1	2	30	<1	3	37	3	<10	66	
DUP		<0.5	167	<0.5	1	2	30	<1	1	36	3	<10	66	
Target Range - Lower Bound		<0.5	152	<0.5	<1	<1	20	<1	<1	33	2	<10	61	
Upper Bound		1.0	179	1.0	2	3	40	2	3	40	4	20	71	
V671388														
DUP														
Target Range - Lower Bound														
Upper Bound														

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
DUPLICATES																
V671393 DUP																
Target Range - Lower Bound																
Upper Bound																
V671420 DUP																
Target Range - Lower Bound																
Upper Bound																
V671422		12.1	5.3	10	70.9	1.73	0.51	0.03	36.6	1.16	0.8	0.24	2.1	0.03	47.2	2.1
DUP		12.4	5.4	10	76.8	1.64	0.44	<0.03	37.8	1.07	0.7	0.21	2.3	0.05	43.9	2.1
Target Range - Lower Bound		11.1	4.6	<10	70.1	1.55	0.42	<0.03	35.2	1.01	0.5	0.20	1.6	0.03	43.1	1.9
Upper Bound		13.4	6.1	20	77.6	1.82	0.53	0.06	39.2	1.22	1.0	0.25	2.8	0.05	48.0	2.3
V671429 DUP																
Target Range - Lower Bound																
Upper Bound																
V671435		42.2	8.4	170	1.05	3.75	2.20	0.81	20.2	3.07	1.7	0.82	2.9	0.33	2.4	7.1
DUP		42.3	7.6	150	1.05	3.37	2.20	0.73	19.0	2.78	1.5	0.72	2.7	0.30	2.3	6.0
Target Range - Lower Bound		39.6	7.1	140	0.99	3.33	2.06	0.70	18.5	2.73	1.3	0.72	2.2	0.29	2.0	6.1
Upper Bound		44.9	8.9	180	1.11	3.79	2.34	0.84	20.7	3.12	1.9	0.82	3.4	0.34	2.7	7.0
V671556 DUP																
Target Range - Lower Bound																
Upper Bound																
V671557		19.4	40.2	10	196.0	6.95	3.20	0.07	23.9	5.03	1.1	1.23	17.7	0.35	36.9	16.1
DUP		20.1	34.8	10	202	7.31	3.42	0.08	25.1	4.96	1.2	1.31	15.4	0.36	39.5	14.3
Target Range - Lower Bound		18.3	35.1	<10	189.0	6.72	3.11	0.04	23.2	4.70	0.9	1.20	15.2	0.33	36.1	14.3
Upper Bound		21.2	39.9	20	209	7.54	3.51	0.11	25.8	5.29	1.4	1.34	17.9	0.38	40.3	16.1
V671565 DUP																
Target Range - Lower Bound																
Upper Bound																

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
DUPLICATES																
V671393 DUP																
Target Range - Lower Bound																
Upper Bound																
V671420 DUP																
Target Range - Lower Bound																
Upper Bound																
V671422		0.60	199.5	1.04	699	6.2	93.7	0.30	11.25	0.06	3.20	<5	3	9.7	0.55	5
DUP		0.63	230	1.02	646	6.5	90.3	0.31	13.05	0.06	3.47	<5	4	10.1	0.49	6
Target Range - Lower Bound		0.55	204	0.95	638	5.9	87.3	0.28	11.50	0.05	3.12	<5	2	8.9	0.46	3
Upper Bound		0.68	226	1.11	707	6.8	96.7	0.33	12.80	0.07	3.55	10	5	10.9	0.58	8
V671429 DUP																
Target Range - Lower Bound																
Upper Bound																
V671435		1.28	16.4	2.35	1	97.1	0.1	0.55	0.29	0.33	0.07	327	2	20.0	2.27	58
DUP		1.20	15.8	2.25	2	90.3	0.3	0.50	0.27	0.29	0.05	306	1	18.5	2.04	56
Target Range - Lower Bound		1.15	15.1	2.16	<1	88.9	<0.1	0.49	0.22	0.28	<0.05	296	<1	17.8	2.02	52
Upper Bound		1.33	17.1	2.45	2	98.5	0.3	0.56	0.34	0.34	0.10	337	2	20.7	2.29	62
V671556 DUP																
Target Range - Lower Bound																
Upper Bound																
V671557		4.65	1170	5.03	37	10.4	12.3	1.17	19.85	0.47	21.3	<5	3	39.6	2.42	21
DUP		4.01	1255	4.87	40	11.5	10.7	1.19	18.60	0.45	22.6	<5	4	42.8	2.87	22
Target Range - Lower Bound		4.08	1150	4.67	36	10.3	10.8	1.11	18.20	0.43	20.8	<5	2	38.6	2.48	18
Upper Bound		4.58	1275	5.23	41	11.6	12.2	1.25	20.2	0.49	23.1	10	5	43.8	2.81	25
V671565 DUP																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
DUPLICATES																
V671393															0.54	
DUP															0.58	
Target Range - Lower Bound															0.54	
Upper Bound															0.58	
V671420																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671422		73.0	16.05	0.44	0.73	0.03	8.27	0.42	<0.01	<0.01	0.03	0.20	<0.01	<0.01		
DUP		73.6	16.20	0.47	0.73	0.04	8.40	0.43	<0.01	0.01	0.03	0.20	<0.01	<0.01		
Target Range - Lower Bound		71.5	15.70	0.43	0.70	0.02	8.12	0.40	<0.01	<0.01	0.02	0.19	<0.01	<0.01		
Upper Bound		75.1	16.55	0.48	0.76	0.05	8.55	0.45	0.02	0.02	0.04	0.22	0.02	0.02		
V671429															0.96	
DUP															0.92	
Target Range - Lower Bound															0.91	
Upper Bound															0.97	
V671435																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671556																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671557		79.0	12.95	1.20	0.74	0.08	4.83	1.90	<0.01	0.04	0.04	0.04	<0.01	<0.01		
DUP		79.3	13.10	1.19	0.73	0.08	4.90	1.93	<0.01	0.04	0.04	0.03	<0.01	<0.01		
Target Range - Lower Bound		77.2	12.70	1.16	0.71	0.07	4.73	1.86	<0.01	0.03	0.03	0.02	<0.01	<0.01		
Upper Bound		81.1	13.35	1.23	0.76	0.09	5.00	1.97	0.02	0.05	0.05	0.05	0.02	0.02		
V671565															0.85	
DUP															0.80	
Target Range - Lower Bound															0.79	
Upper Bound															0.86	

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
DUPLICATES														
V671393 DUP														
Target Range - Lower Bound														
Upper Bound														
V671420 DUP		<0.5	5	<0.5	46	31	100	<1	156	<2	41	<10	83	
		<0.5	<5	<0.5	49	31	100	<1	161	<2	42	<10	84	
Target Range - Lower Bound		<0.5	<5	<0.5	44	29	90	<1	150	<2	38	<10	77	
Upper Bound		1.0	10	1.0	51	33	120	2	167	4	45	20	90	
V671422 DUP														
Target Range - Lower Bound														
Upper Bound														
V671429 DUP														
Target Range - Lower Bound														
Upper Bound														
V671435 DUP														
Target Range - Lower Bound														
Upper Bound														
V671556 DUP		<0.5	9	1.0	51	18	30	<1	85	8	41	<10	145	
		<0.5	<5	0.7	51	17	30	<1	86	8	42	<10	146	
Target Range - Lower Bound		<0.5	<5	<0.5	47	16	20	<1	80	6	38	<10	136	
Upper Bound		1.0	10	1.0	55	19	40	2	91	10	45	20	155	
V671557 DUP														
Target Range - Lower Bound														
Upper Bound														
V671565 DUP														
Target Range - Lower Bound														
Upper Bound														

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
DUPLICATES																
V671591		28.6	7.4	340	1.20	3.38	2.25	0.68	18.1	2.96	1.5	0.79	2.7	0.35	2.2	6.1
DUP		28.2	7.4	340	1.23	3.50	2.19	0.72	18.0	2.82	1.5	0.75	2.8	0.33	2.0	6.0
Target Range - Lower Bound		26.5	6.5	310	1.14	3.22	2.08	0.64	17.0	2.70	1.2	0.72	2.1	0.31	1.8	5.6
Upper Bound		30.3	8.3	370	1.29	3.66	2.36	0.77	19.1	3.08	1.8	0.82	3.4	0.37	2.4	6.5
V671592																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671601																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671626		49.7	10.6	160	2.06	4.98	3.18	0.97	18.1	3.92	2.0	1.05	4.0	0.44	3.0	8.7
DUP		50.9	10.7	170	2.11	5.12	3.08	1.06	19.4	4.25	2.0	1.04	4.0	0.43	3.0	8.7
Target Range - Lower Bound		47.3	9.6	150	1.97	4.75	2.94	0.93	17.7	3.83	1.7	0.98	3.3	0.40	2.7	8.2
Upper Bound		53.3	11.7	180	2.20	5.35	3.32	1.10	19.8	4.34	2.3	1.11	4.7	0.47	3.4	9.2
V671628																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671637																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671660		640	166.5	20	2.63	3.16	1.09	0.74	24.2	4.80	9.7	0.50	79.5	0.06	13.6	59.7
DUP		622	160.5	40	2.51	3.36	1.13	0.66	23.9	4.67	9.4	0.48	75.9	0.04	13.2	57.7
Target Range - Lower Bound		599	155.0	20	2.43	3.05	1.02	0.64	22.7	4.45	8.9	0.46	73.3	0.04	12.5	55.7
Upper Bound		663	172.0	40	2.71	3.47	1.20	0.77	25.4	5.02	10.2	0.52	82.1	0.06	14.3	61.7
V671664																
DUP																
Target Range - Lower Bound																
Upper Bound																

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
DUPLICATES																
V671591		1.16	5.3	1.98	1	102.5	0.2	0.52	0.27	0.30	0.08	303	1	19.1	2.05	51
DUP		1.17	5.5	1.98	1	102.5	0.2	0.53	0.25	0.32	0.08	302	1	19.3	2.27	52
Target Range - Lower Bound		1.08	4.9	1.85	<1	97.3	<0.1	0.49	0.20	0.28	<0.05	282	<1	17.7	2.02	47
Upper Bound		1.25	5.9	2.11	2	107.5	0.3	0.56	0.32	0.34	0.10	323	2	20.7	2.30	56
V671592																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671601																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671626		1.64	12.3	3.12	1	123.5	0.2	0.71	0.31	0.43	0.12	348	1	25.5	2.81	71
DUP		1.63	13.3	2.91	1	127.5	0.2	0.73	0.32	0.44	0.11	383	1	26.4	2.83	73
Target Range - Lower Bound		1.52	12.0	2.83	<1	119.0	<0.1	0.67	0.25	0.40	0.06	342	<1	24.2	2.65	66
Upper Bound		1.75	13.6	3.20	2	132.0	0.3	0.77	0.38	0.47	0.17	389	2	27.7	2.99	78
V671628																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671637																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671660		17.80	175.5	9.64	1	157.5	0.7	0.65	45.7	0.09	7.80	30	1	15.2	0.58	373
DUP		17.35	172.0	8.88	1	155.5	0.7	0.65	44.4	0.11	7.85	30	1	15.1	0.58	359
Target Range - Lower Bound		16.65	165.0	8.77	<1	148.5	0.6	0.61	42.7	0.09	7.38	24	<1	13.9	0.52	346
Upper Bound		18.50	182.5	9.75	2	164.5	0.8	0.69	47.4	0.12	8.27	37	2	16.4	0.64	386
V671664																
DUP																
Target Range - Lower Bound																
Upper Bound																

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
DUPLICATES																
V671591		48.9	15.80	13.30	12.55	6.45	2.18	0.20	0.04	0.95	0.21	0.07	0.01	<0.01		
DUP		48.2	15.65	13.10	12.20	6.40	2.16	0.19	0.04	0.93	0.20	0.06	0.01	<0.01		
Target Range - Lower Bound		47.3	15.30	12.85	12.05	6.25	2.11	0.18	0.03	0.91	0.19	0.05	<0.01	<0.01		
Upper Bound		49.8	16.15	13.55	12.70	6.60	2.23	0.21	0.05	0.97	0.22	0.08	0.02	0.02		
V671592																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671601															0.79	
DUP															0.81	
Target Range - Lower Bound															0.77	
Upper Bound															0.83	
V671626		48.1	15.30	13.40	11.30	5.83	2.09	0.28	0.02	1.14	0.22	0.09	0.02	0.01		
DUP		48.8	15.35	13.50	11.35	5.89	2.10	0.28	0.02	1.14	0.22	0.08	0.01	0.01		
Target Range - Lower Bound		47.2	14.95	13.10	11.05	5.70	2.03	0.26	<0.01	1.10	0.20	0.07	<0.01	<0.01		
Upper Bound		49.7	15.70	13.80	11.60	6.02	2.16	0.30	0.03	1.18	0.24	0.10	0.02	0.02		
V671628																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671637															0.84	
DUP															0.86	
Target Range - Lower Bound															0.82	
Upper Bound															0.88	
V671660		71.7	14.60	3.02	1.55	0.67	3.40	4.53	<0.01	0.48	0.02	0.22	0.02	0.07		
DUP		70.8	14.45	2.96	1.50	0.66	3.40	4.52	<0.01	0.48	0.02	0.22	0.02	0.07		
Target Range - Lower Bound		69.5	14.15	2.91	1.48	0.64	3.31	4.40	<0.01	0.46	<0.01	0.20	<0.01	0.06		
Upper Bound		73.0	14.90	3.07	1.57	0.69	3.50	4.65	0.02	0.50	0.03	0.24	0.03	0.08		
V671664																
DUP																
Target Range - Lower Bound																
Upper Bound																

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
DUPLICATES														
V671591 DUP														
Target Range - Lower Bound														
Upper Bound														
V671592		<0.5	<5	0.7	58	138	70	<1	196	<2	29	<10	110	
V671592 DUP		<0.5	<5	0.6	59	139	70	<1	194	<2	31	10	110	
Target Range - Lower Bound		<0.5	<5	<0.5	55	133	60	<1	184	<2	28	<10	103	
Upper Bound		1.0	10	1.0	62	144	80	2	206	4	33	20	118	
V671601 DUP														
Target Range - Lower Bound														
Upper Bound														
V671626 DUP														
Target Range - Lower Bound														
Upper Bound														
V671628		<0.5	<5	0.9	48	254	60	<1	100	4	43	<10	118	
V671628 DUP		<0.5	<5	0.7	47	255	60	1	108	12	43	<10	121	
Target Range - Lower Bound		<0.5	<5	<0.5	44	245	50	<1	98	6	40	<10	112	
Upper Bound		1.0	10	1.0	51	264	70	2	110	10	46	20	127	
V671637 DUP														
Target Range - Lower Bound														
Upper Bound														
V671660 DUP														
Target Range - Lower Bound														
Upper Bound														
V671664		<0.5	5	<0.5	<1	1	740	<1	<1	12	1	10	25	
V671664 DUP		<0.5	<5	<0.5	<1	1	750	<1	1	13	1	10	26	
Target Range - Lower Bound		<0.5	<5	<0.5	<1	<1	700	<1	<1	10	<1	<10	22	
Upper Bound		1.0	10	1.0	2	2	790	2	2	15	2	20	29	

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ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
DUPLICATES																
V671673																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671678																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671695		5.3	3.7	10	3.07	0.53	0.31	0.09	37.4	0.48	0.5	0.11	1.6	0.09	27.1	1.4
DUP		7.2	4.0	10	3.29	0.63	0.30	0.08	39.7	0.50	0.8	0.09	1.7	0.09	41.0	1.5
Target Range - Lower Bound		5.4	3.2	<10	3.01	0.50	0.26	0.05	36.5	0.42	0.4	0.09	1.1	0.08	32.1	1.3
Upper Bound		7.1	4.5	20	3.35	0.66	0.35	0.12	40.6	0.56	0.9	0.12	2.2	0.10	36.0	1.6
V671698		8.0	18.0	10	25.1	4.95	2.52	0.04	22.4	3.13	3.2	0.89	7.3	0.53	12.5	7.8
DUP		8.1	25.2	10	26.4	5.09	2.59	0.04	23.2	3.88	3.2	0.92	10.1	0.59	14.2	10.5
Target Range - Lower Bound		7.1	20.0	<10	24.5	4.72	2.40	<0.03	21.6	3.28	2.8	0.85	7.8	0.52	12.5	8.6
Upper Bound		9.0	23.2	20	27.0	5.32	2.71	0.06	24.0	3.73	3.6	0.96	9.6	0.60	14.2	9.7
V671700																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671703																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671709																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671965		13.0	6.1	40	3.68	2.45	1.39	0.04	29.0	1.04	1.7	0.42	2.4	0.45	43.0	2.6
DUP		8.4	6.0	10	3.48	2.38	1.38	<0.03	26.9	0.89	1.5	0.40	2.2	0.44	39.5	2.2
Target Range - Lower Bound		9.7	5.2	<10	3.39	2.24	1.29	<0.03	26.5	0.87	1.3	0.38	1.7	0.41	39.0	2.2
Upper Bound		11.7	6.9	40	3.77	2.59	1.48	0.06	29.4	1.06	1.9	0.44	2.9	0.48	43.5	2.6

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
DUPLICATES																
V671673 DUP																
Target Range - Lower Bound																
Upper Bound																
V671678 DUP																
Target Range - Lower Bound																
Upper Bound																
V671695		0.44	51.4	0.58	1	22.4	4.4	0.11	2.23	0.06	1.51	<5	1	3.5	0.55	11
DUP		0.48	53.9	0.66	1	24.1	6.1	0.11	2.35	0.05	1.63	<5	1	3.4	0.64	18
Target Range - Lower Bound		0.41	49.8	0.56	<1	22.0	4.9	0.09	2.13	0.04	1.44	<5	<1	2.8	0.54	12
Upper Bound		0.51	55.5	0.68	2	24.5	5.6	0.13	2.45	0.07	1.70	10	2	4.1	0.65	17
V671698		2.14	227	3.15	4	10.2	4.8	0.80	10.70	0.46	4.99	<5	1	29.0	3.55	46
DUP		3.02	235	4.19	3	10.8	5.9	0.85	14.25	0.47	5.33	<5	1	30.6	3.83	46
Target Range - Lower Bound		2.42	219	3.46	2	9.9	5.0	0.77	11.80	0.43	4.85	<5	<1	27.8	3.48	42
Upper Bound		2.74	243	3.88	5	11.1	5.7	0.88	13.15	0.50	5.47	10	2	31.8	3.90	50
V671700 DUP																
Target Range - Lower Bound																
Upper Bound																
V671703 DUP																
Target Range - Lower Bound																
Upper Bound																
V671709 DUP																
Target Range - Lower Bound																
Upper Bound																
V671965		0.74	584	0.86	169	9.5	19.9	0.32	4.65	0.30	4.50	<5	1	18.2	3.36	25
DUP		0.69	558	0.95	161	8.2	17.0	0.29	4.58	0.31	4.25	<5	1	16.7	3.13	22
Target Range - Lower Bound		0.65	542	0.83	156	8.3	17.4	0.28	4.33	0.28	4.11	<5	<1	16.1	3.05	20
Upper Bound		0.78	600	0.98	174	9.4	19.5	0.33	4.90	0.33	4.64	10	2	18.8	3.44	27

***** See Appendix Page for comments regarding this certificate *****

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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
DUPLICATES																
V671673															0.39	
DUP															0.38	
Target Range - Lower Bound															0.37	
Upper Bound															0.40	
V671678																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671695		72.6	17.95	0.34	2.09	0.01	7.66	0.84	<0.01	<0.01	0.01	0.05	<0.01	<0.01		
DUP		70.1	17.40	0.36	2.01	0.01	7.40	0.80	<0.01	<0.01	0.01	0.05	<0.01	<0.01		
Target Range - Lower Bound		69.6	17.20	0.33	1.99	<0.01	7.33	0.79	<0.01	<0.01	<0.01	0.04	<0.01	<0.01		
Upper Bound		73.1	18.15	0.37	2.11	0.02	7.73	0.85	0.02	0.02	0.02	0.06	0.02	0.02		
V671698																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671700																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671703		63.9	18.00	4.97	2.59	1.79	6.04	1.60	0.01	0.24	0.09	0.16	<0.01	<0.01		
DUP		63.6	18.05	5.05	2.58	1.80	6.03	1.60	0.01	0.24	0.09	0.15	0.01	<0.01		
Target Range - Lower Bound		62.1	17.55	4.87	2.51	1.74	5.87	1.55	<0.01	0.22	0.08	0.14	<0.01	<0.01		
Upper Bound		65.4	18.50	5.15	2.66	1.85	6.20	1.65	0.02	0.26	0.10	0.17	0.02	0.02		
V671709															0.38	
DUP															0.36	
Target Range - Lower Bound															0.35	
Upper Bound															0.39	
V671965		79.1	13.25	0.99	0.45	0.04	5.71	1.32	0.01	<0.01	0.29	0.03	<0.01	<0.01		
DUP		79.3	13.30	0.92	0.44	0.03	5.76	1.33	<0.01	<0.01	0.29	0.03	<0.01	<0.01		
Target Range - Lower Bound		77.2	12.95	0.92	0.42	0.02	5.58	1.28	<0.01	<0.01	0.27	0.02	<0.01	<0.01		
Upper Bound		81.2	13.60	0.99	0.47	0.05	5.89	1.37	0.02	0.02	0.31	0.04	0.02	0.02		

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To: AVALON ADVANCED MATERIALS INC.
130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
DUPLICATES														
V671673 DUP														
Target Range - Lower Bound														
Upper Bound														
V671678 DUP														0.624
														0.624
Target Range - Lower Bound														0.603
Upper Bound														0.645
V671695 DUP														
Target Range - Lower Bound														
Upper Bound														
V671698 DUP														
Target Range - Lower Bound														
Upper Bound														
V671700 DUP		<0.5	<5	<0.5	<1	<1	10	<1	2	26	2	10	10	
		<0.5	<5	<0.5	<1	1	20	<1	1	29	2	10	11	
Target Range - Lower Bound		<0.5	<5	<0.5	<1	<1	<10	<1	<1	24	<1	<10	8	
Upper Bound		1.0	10	1.0	2	2	20	2	2	31	3	20	13	
V671703 DUP														
Target Range - Lower Bound														
Upper Bound														
V671709 DUP														
Target Range - Lower Bound														
Upper Bound														
V671965 DUP														
Target Range - Lower Bound														
Upper Bound														

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TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Ba	Ce	Cr	Cs	Dy	Er	Eu	Ga	Gd	Hf	Ho	La	Lu	Nb	Nd
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.5	0.5	10	0.01	0.05	0.03	0.03	0.1	0.05	0.2	0.01	0.5	0.01	0.2	0.1
DUPLICATES																
V671972																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671981																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671983																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671991		5.0	5.7	10	13.05	1.22	0.37	<0.03	35.0	0.96	0.2	0.16	2.1	0.04	83.4	2.4
DUP		4.9	5.3	30	13.20	1.18	0.31	<0.03	36.1	0.94	<0.2	0.13	1.9	0.04	102.5	2.3
Target Range - Lower Bound		4.2	4.7	<10	12.45	1.09	0.29	<0.03	33.7	0.85	<0.2	0.13	1.4	0.03	88.1	2.1
Upper Bound		5.7	6.3	30	13.80	1.31	0.39	0.06	37.4	1.05	0.4	0.16	2.6	0.05	97.8	2.6
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81
	Analyte	Pr	Rb	Sm	Sn	Sr	Ta	Tb	Th	Tm	U	V	W	Y	Yb	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.03	0.2	0.03	1	0.1	0.1	0.01	0.05	0.01	0.05	5	1	0.5	0.03	2
DUPLICATES																
V671972																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671981																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671983																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671991		0.71	1095	1.02	46	4.4	32.6	0.24	3.74	0.05	1.43	<5	1	6.6	0.45	3
DUP		0.63	1115	0.87	41	4.5	38.3	0.23	3.65	0.04	1.27	<5	1	6.1	0.37	2
Target Range - Lower Bound		0.61	1050	0.87	40	4.1	33.6	0.21	3.46	0.03	1.23	<5	<1	5.5	0.36	<2
Upper Bound		0.73	1160	1.02	47	4.8	37.3	0.26	3.93	0.06	1.47	10	2	7.2	0.46	4
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

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130 ADELAIDE ST. W, SUITE 1901
TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	OA-GRA05	TOT-ICP06
	Analyte	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Total
	Units	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
DUPLICATES																
V671972																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671981															0.46	
DUP															0.43	
Target Range - Lower Bound															0.42	
Upper Bound															0.47	
V671983																
DUP																
Target Range - Lower Bound																
Upper Bound																
V671991		73.3	15.55	0.57	0.39	0.03	6.05	3.13	<0.01	<0.01	0.04	0.04	<0.01	<0.01		
DUP		73.9	15.65	0.63	0.39	0.03	6.06	3.14	<0.01	<0.01	0.03	0.03	<0.01	<0.01		
Target Range - Lower Bound		71.8	15.20	0.58	0.37	0.02	5.89	3.05	<0.01	<0.01	0.02	0.02	<0.01	<0.01		
Upper Bound		75.5	16.00	0.63	0.41	0.04	6.22	3.22	0.02	0.02	0.05	0.05	0.02	0.02		
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

Sample Description	Method	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	ME-4ACD81	Li-OG63
	Analyte	Ag	As	Cd	Co	Cu	Li	Mo	Ni	Pb	Sc	Tl	Zn	Li
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.5	5	0.5	1	1	10	1	1	2	1	10	2	0.005
DUPLICATES														
V671972		<0.5	<5	<0.5	<1	1	80	<1	2	28	3	10	37	
DUP		<0.5	<5	<0.5	<1	4	70	<1	<1	28	3	10	36	
Target Range - Lower Bound		<0.5	<5	<0.5	<1	<1	60	<1	<1	25	2	<10	33	
Upper Bound		1.0	10	1.0	2	4	90	2	2	31	4	20	40	
V671981														
DUP														
Target Range - Lower Bound														
Upper Bound														
V671983														0.614
DUP														0.573
Target Range - Lower Bound														0.574
Upper Bound														0.613
V671991														
DUP														
Target Range - Lower Bound														
Upper Bound														
ORIGINAL		<0.5	<5	0.6	30	21	10	1	52	3	38	<10	140	
DUP		<0.5	<5	<0.5	32	21	10	<1	54	3	39	10	143	
Target Range - Lower Bound		<0.5	<5	<0.5	28	19	<10	<1	49	<2	36	<10	132	
Upper Bound		1.0	10	1.0	34	23	20	2	57	4	41	20	151	
ORIGINAL		9.9	<5	<0.5	<1	2	10	<1	3	3	<1	<10	8730	
DUP		9.9	<5	<0.5	<1	2	10	<1	4	3	<1	<10	8430	
Target Range - Lower Bound		8.9	<5	<0.5	<1	<1	<10	<1	2	<2	<1	<10	8150	
Upper Bound		10.9	10	1.0	2	3	20	2	5	4	2	20	9010	

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TORONTO ON M5H 3P5

Finalized Date: 17-SEP-2017
Account: OPG

Project: 0518

QC CERTIFICATE OF ANALYSIS TB17180529

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:				
	CRU-31	CRU-QC	LOG-21	LOG-23
	PUL-31	PUL-QC	SPL-21	SPL-21X
	SPL-21Xd	WEI-21		

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:				
	Li-OG63	ME-4ACD81	ME-ICP06	ME-MS81
	ME-OG62o	OA-GRA05	TOT-ICP06	

Certificate of Analysis

Work Order : LK1701345

[Report File No.: 0000011411]

To: **CHRIS WILDMAN**
AVALON ADVANCED MATERIALS INC
130 ADELAIDE ST WEST
SUITE 1901
TORONTO ON M5H 3P5

Date: Aug 18, 2017

P.O. No.	:	-
Project No.	:	-
No. Of Samples	:	28
Date Submitted	:	Jul 14, 2017
Report Comprises	:	Pages 1 to 15 (Inclusive of Cover Sheet)

Distribution of unused material:
To Be Determined:

Comments:

Control quality assays - not suitable for commercial exchange

Certified By :

Debbie Waldon
Project Coordinator

SGS Minerals Services (Lakefield) is accredited by Standards Council of Canada (SCC) and conforms to the requirements of ISO/IEC 17025 for specific tests as indicated on the scope of accreditation to be found at http://www.scc.ca/en/programs/lab/mineral.shtml

Report Footer:

L.N.R.	= Listed not received	I.S.	= Insufficient Sample
n.a.	= Not applicable	--	= No result

*INF = Composition of this sample makes detection impossible by this method

M after a result denotes ppb to ppm conversion, % denotes ppm to % conversion

Methods marked with an asterisk (e.g. *NAA08V) were subcontracted

Elements marked with the @ symbol (e.g. @Cu) denote assays performed using accredited test methods

For solid samples: Unless otherwise noted, all GT_ tests are reported on a dried at 105°C basis. Other tests are performed on an as received basis unless otherwise indicated. Exceptions will be marked. For example rec (e.g. Cu rec) indicates the results are reported on an as received basis or dry (e.g. Cu dry) indicates the results are reported on a dried basis.

Element	@Al	@Ba	@Be	@Ca	@Cr	@Cu	@Fe	@K
Method	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A
Detection Limit	0.01	10	5	0.1	10	10	0.01	0.1
Units	%	ppm	ppm	%	ppm	ppm	%	%
671000	8.21	19	149	0.1	26	44	1.82	2.2
671010	7.84	<10	<5	0.1	108	<10	0.59	2.9
671020	8.39	<10	6	1.0	130	10	0.54	0.2
671031	8.14	<10	<5	0.2	100	<10	0.82	3.7
671042	7.94	<10	<5	0.2	136	<10	0.57	4.2
671053	7.34	<10	34	0.3	147	<10	0.47	1.4
671063	1.91	<10	47	5.7	280	112	1.67	0.1
671073	9.51	<10	103	1.7	115	13	0.81	0.6
671085	8.50	18	38	7.2	224	117	8.68	1.4
671090	8.23	19	146	0.2	25	45	1.80	2.2
671095	8.17	<10	184	0.3	132	<10	0.27	1.3
671106	8.22	<10	81	0.8	152	<10	0.52	1.0
671116	8.79	<10	14	0.4	104	<10	0.33	2.3
671128	8.66	<10	161	<0.1	144	<10	0.23	2.1
671138	8.83	<10	129	0.1	109	<10	0.20	2.6
671148	8.27	<10	54	0.5	143	<10	0.34	2.2
671159	8.81	<10	141	1.7	150	31	1.48	1.0
671170	8.57	<10	172	0.1	229	<10	0.26	1.9
671181	8.03	<10	106	0.1	178	<10	0.27	2.0
671191	8.14	<10	167	0.3	141	<10	0.27	5.9
671203	9.07	<10	43	1.1	159	<10	0.28	0.5
671213	8.82	12	134	1.2	200	67	2.67	3.1
671223	8.38	<10	51	0.1	142	<10	0.34	2.8
671234	8.66	14	155	0.6	158	15	0.73	1.4
671245	8.34	<10	120	0.1	134	<10	0.20	2.0
671256	8.74	<10	158	<0.1	156	<10	0.22	2.0
671266	8.82	<10	167	0.5	62	<10	0.57	<0.1
671270	8.21	18	143	0.1	25	59	1.82	2.2
*Rep 671270	8.10	19	142	0.1	28	45	1.80	2.2

Element	@Li	@Mg	@Mn	@Ni	@P	@Sc	Si	@Sr
Method	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A
Detection Limit	10	0.01	10	5	0.01	5	0.1	10
Units	ppm	%	ppm	ppm	%	ppm	%	ppm
671000	6780	0.04	1195	21	0.03	<5	>30.0	43
671010	176	0.01	499	7	0.02	<5	>30.0	16
671020	52	0.11	619	11	0.01	<5	>30.0	24
671031	268	0.03	239	<5	0.02	<5	>30.0	30
671042	293	0.02	180	7	0.02	<5	>30.0	29
671053	436	0.02	1066	5	0.02	<5	>30.0	20
671063	222	0.79	497	29	0.04	5	>30.0	24
671073	837	0.43	235	17	0.09	<5	>30.0	42
671085	1544	4.52	1733	130	0.12	41	23.6	115
671090	6728	0.05	1205	21	0.03	<5	>30.0	45
671095	2135	0.02	2062	6	0.03	<5	>30.0	26
671106	240	0.10	797	7	0.02	<5	>30.0	27
671116	197	0.01	165	<5	0.02	<5	>30.0	19
671128	6595	0.02	1968	8	0.03	<5	>30.0	50
671138	6805	<0.01	1835	6	0.04	<5	>30.0	67
671148	249	0.03	1405	6	0.03	<5	>30.0	31
671159	7303	0.65	1000	25	0.09	<5	>30.0	59
671170	8908	0.01	1227	8	0.04	<5	>30.0	35
671181	8822	0.06	863	7	0.04	<5	>30.0	34
671191	431	0.01	1004	7	0.02	<5	>30.0	37
671203	1082	0.02	786	10	<0.01	<5	>30.0	16
671213	1475	1.13	1793	54	0.03	11	29.9	75
671223	892	0.03	954	9	0.03	<5	>30.0	42
671234	5483	0.21	537	12	0.08	<5	>30.0	74
671245	7424	0.01	1637	7	0.03	<5	>30.0	36
671256	6541	<0.01	2361	6	0.02	<5	26.6	43
671266	9364	0.02	558	9	0.03	<5	>30.0	20
671270	6823	0.05	1196	20	0.03	<5	>30.0	45
*Rep 671270	6687	0.04	1192	24	0.03	<5	>30.0	45

Element	@Ti	@V	@Zn	@Ag	@As	@Bi	@Cd	@Ce
Method	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A
Detection Limit	0.01	5	5	1	5	0.1	0.2	0.1
Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
671000	<0.01	<5	103	<1	<5	3.4	0.4	3.1
671010	<0.01	<5	66	<1	<5	7.5	<0.2	7.0
671020	0.01	6	8	<1	<5	<0.1	<0.2	10.8
671031	<0.01	<5	72	<1	<5	9.6	<0.2	7.9
671042	<0.01	<5	42	<1	<5	9.9	<0.2	7.4
671053	<0.01	<5	35	<1	<5	2.4	<0.2	3.9
671063	0.06	39	22	<1	32	1.2	<0.2	1.7
671073	0.03	23	30	<1	7	0.3	<0.2	4.5
671085	0.44	264	93	<1	26	0.3	0.7	5.2
671090	<0.01	<5	101	<1	<5	3.4	<0.2	2.8
671095	<0.01	<5	62	<1	<5	0.1	0.6	0.9
671106	<0.01	<5	60	<1	<5	2.2	<0.2	2.4
671116	<0.01	<5	28	<1	<5	0.2	<0.2	7.5
671128	<0.01	<5	106	<1	<5	4.1	0.3	0.8
671138	<0.01	<5	96	<1	<5	3.7	<0.2	0.9
671148	<0.01	<5	130	<1	<5	0.9	<0.2	5.1
671159	0.08	41	28	<1	30	0.1	0.6	1.6
671170	<0.01	<5	96	<1	<5	2.1	0.5	1.1
671181	<0.01	<5	94	<1	<5	1.9	<0.2	2.5
671191	<0.01	<5	97	<1	<5	0.2	0.3	1.6
671203	<0.01	<5	21	<1	<5	<0.1	<0.2	5.0
671213	0.14	81	77	<1	<5	0.4	0.3	1.9
671223	<0.01	<5	59	<1	<5	6.6	0.2	1.4
671234	0.02	10	7	<1	22	1.1	0.3	0.7
671245	<0.01	<5	113	<1	<5	2.7	<0.2	0.7
671256	<0.01	<5	86	<1	<5	2.8	<0.2	0.8
671266	<0.01	<5	19	<1	<5	0.6	<0.2	0.4
671270	<0.01	<5	102	<1	<5	3.4	0.2	3.1
*Rep 671270	<0.01	<5	101	<1	<5	3.5	<0.2	3.0

Element	@Co	@Cs	@Dy	@Er	@Eu	@Ga	@Gd	@Ge
Method	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A
Detection Limit	0.5	0.1	0.05	0.05	0.05	1	0.05	1
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
671000	1.3	24.3	0.81	0.19	<0.05	40	0.96	4
671010	<0.5	13.2	1.82	0.64	<0.05	49	1.45	3
671020	1.3	2.9	3.26	1.72	0.14	41	2.43	3
671031	<0.5	42.7	2.04	0.47	<0.05	52	2.36	3
671042	<0.5	46.1	1.57	0.39	<0.05	39	1.73	3
671053	<0.5	30.9	1.44	0.62	<0.05	34	0.80	4
671063	8.7	288	0.58	0.39	0.17	4	0.50	5
671073	4.1	263	1.95	0.47	0.07	57	2.27	7
671085	51.8	2495	2.67	1.61	0.56	21	2.09	6
671090	1.3	24.8	0.89	0.18	<0.05	40	1.01	4
671095	<0.5	14.6	0.60	0.18	<0.05	47	0.38	5
671106	1.1	46.3	0.77	0.27	<0.05	42	0.55	5
671116	<0.5	43.2	1.67	0.52	<0.05	36	1.53	3
671128	<0.5	61.2	0.30	0.06	<0.05	55	0.33	5
671138	<0.5	64.2	0.41	0.07	<0.05	57	0.53	5
671148	<0.5	54.3	2.01	0.49	<0.05	45	1.70	4
671159	7.8	342	0.61	0.30	0.13	60	0.58	7
671170	<0.5	40.7	0.47	0.12	<0.05	41	0.45	5
671181	<0.5	53.1	0.71	0.29	<0.05	38	0.62	4
671191	<0.5	27.1	1.15	0.31	<0.05	36	0.75	4
671203	<0.5	13.2	1.05	1.02	<0.05	35	0.47	3
671213	16.7	140	1.03	0.60	0.16	51	0.74	4
671223	<0.5	47.6	0.82	0.20	<0.05	44	0.55	5
671234	2.2	237	0.25	0.13	<0.05	56	0.21	10
671245	<0.5	55.1	0.50	0.08	<0.05	45	0.40	4
671256	<0.5	27.6	0.82	0.20	<0.05	51	0.51	5
671266	<0.5	46.4	0.21	0.07	<0.05	55	0.17	6
671270	1.3	24.5	1.04	0.23	<0.05	39	1.23	4
*Rep 671270	1.3	24.3	0.91	0.19	<0.05	39	1.09	4

Element	@Hf	@Ho	@In	@La	@Lu	@Mo	@Nb	@Nd
Method	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A
Detection Limit	1	0.05	0.2	0.1	0.05	2	1	0.1
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
671000	1	0.08	<0.2	1.2	<0.05	7	71	1.5
671010	1	0.26	<0.2	2.2	0.16	<2	103	3.4
671020	3	0.56	<0.2	4.2	0.52	<2	138	5.2
671031	<1	0.21	<0.2	2.6	0.09	<2	95	3.9
671042	<1	0.18	<0.2	2.6	0.07	2	70	3.4
671053	1	0.22	<0.2	1.5	0.17	<2	51	1.5
671063	<1	0.13	<0.2	0.7	0.08	4	2	1.2
671073	2	0.19	<0.2	1.5	0.12	<2	57	2.5
671085	1	0.56	<0.2	1.9	0.28	<2	5	4.4
671090	2	0.08	<0.2	1.1	0.05	7	76	1.4
671095	4	0.07	<0.2	0.3	0.06	<2	67	0.4
671106	1	0.10	<0.2	0.8	0.10	<2	89	1.0
671116	<1	0.21	<0.2	2.9	0.11	<2	85	3.1
671128	2	<0.05	<0.2	0.3	<0.05	<2	57	0.4
671138	2	<0.05	<0.2	0.3	<0.05	<2	66	0.5
671148	<1	0.23	<0.2	1.7	0.12	<2	77	2.4
671159	4	0.12	<0.2	0.6	0.07	<2	46	1.1
671170	<1	<0.05	<0.2	0.4	<0.05	4	56	0.5
671181	1	0.08	<0.2	0.9	0.09	<2	78	1.1
671191	1	0.12	<0.2	0.7	0.08	2	97	0.6
671203	1	0.23	<0.2	2.6	0.72	2	21	1.5
671213	2	0.22	<0.2	0.8	0.10	<2	32	1.2
671223	1	0.09	<0.2	0.5	0.07	<2	25	0.8
671234	4	<0.05	<0.2	0.3	<0.05	2	27	0.5
671245	1	<0.05	<0.2	0.2	<0.05	<2	42	0.4
671256	3	0.08	<0.2	0.2	0.05	2	54	0.5
671266	3	<0.05	<0.2	0.1	<0.05	<2	39	0.2
671270	2	0.09	<0.2	1.1	0.06	7	74	1.5
*Rep 671270	1	0.08	<0.2	1.2	0.05	7	75	1.5

Element	@Pb	@Pr	@Rb	@Sb	@Sm	@Sn	@Ta	@Tb
Method	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A
Detection Limit	5	0.05	0.2	0.1	0.1	1	0.5	0.05
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
671000	7	0.38	3045	0.4	0.9	287	57.4	0.18
671010	8	0.98	1348	<0.1	1.8	60	27.0	0.29
671020	10	1.45	50.9	0.1	2.6	6	18.4	0.58
671031	7	1.12	2540	<0.1	2.3	120	25.2	0.44
671042	9	0.95	2463	<0.1	1.8	65	17.2	0.31
671053	6	0.48	1348	<0.1	0.6	45	28.7	0.21
671063	<5	0.23	162	15.5	0.4	20	1.2	0.07
671073	5	0.63	1346	0.4	2.1	1764	168	0.49
671085	<5	0.84	4143	0.5	1.5	58	42.5	0.36
671090	7	0.36	3087	0.4	0.9	290	63.0	0.20
671095	7	0.11	1537	<0.1	0.3	668	95.8	0.11
671106	21	0.32	859	0.1	0.5	99	94.5	0.12
671116	7	0.92	1192	0.1	1.3	37	37.4	0.32
671128	<5	0.11	4736	<0.1	0.3	347	71.1	0.05
671138	<5	0.13	5864	<0.1	0.5	284	92.9	0.10
671148	8	0.69	1955	0.3	1.4	298	68.9	0.36
671159	6	0.23	2749	0.3	0.4	454	116	0.10
671170	5	0.15	2921	<0.1	0.5	512	74.5	0.10
671181	6	0.31	2451	<0.1	0.7	334	82.5	0.13
671191	9	0.19	3211	<0.1	0.3	363	69.4	0.21
671203	16	0.51	328	<0.1	0.5	21	17.1	0.14
671213	6	0.27	5320	0.1	0.4	339	63.7	0.15
671223	8	0.21	3877	0.3	0.4	68	19.5	0.15
671234	7	0.09	6069	0.2	0.2	124	123	<0.05
671245	<5	0.12	2976	<0.1	0.4	380	54.9	0.11
671256	5	0.11	2972	0.1	0.4	263	36.8	0.16
671266	5	0.05	183	0.3	0.2	348	82.4	<0.05
671270	7	0.42	3097	0.4	1.1	316	60.4	0.24
*Rep 671270	7	0.41	3092	0.4	1.0	274	62.7	0.21

Element	@Th	@Tl	@Tm	@U	@W	@Y	@Yb	@Zr
Method	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A	GE_ICM90A
Detection Limit	0.1	0.5	0.05	0.05	1	0.5	0.1	0.5
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
671000	4.0	19.2	<0.05	2.98	3	3.9	0.3	14.5
671010	7.1	7.2	0.14	10.4	5	10.2	1.1	20.7
671020	15.0	<0.5	0.37	15.0	2	21.2	3.5	35.6
671031	7.0	15.0	0.08	4.05	5	8.9	0.5	6.5
671042	5.1	16.4	0.06	6.17	3	7.7	0.4	5.7
671053	4.5	8.4	0.13	4.99	2	8.9	1.2	12.3
671063	0.1	1.5	0.05	<0.05	61	3.5	0.4	5.9
671073	4.4	9.8	0.07	4.40	5	8.9	0.5	14.2
671085	0.3	44.6	0.25	0.16	1	14.7	1.6	38.6
671090	4.1	19.2	<0.05	3.06	3	4.2	0.3	17.0
671095	3.5	9.0	<0.05	10.9	2	3.7	0.4	36.3
671106	6.7	5.3	0.06	8.84	2	4.3	0.5	13.5
671116	2.7	7.6	0.10	3.03	2	9.6	0.7	6.2
671128	3.7	27.0	<0.05	8.17	4	1.2	<0.1	14.9
671138	3.8	36.0	<0.05	5.55	4	2.2	0.1	16.8
671148	6.5	12.5	0.10	6.69	2	11.3	0.7	4.3
671159	4.2	21.9	0.05	8.32	5	3.7	0.4	38.4
671170	3.1	18.8	<0.05	4.63	3	2.8	0.3	6.2
671181	2.6	15.2	0.06	6.81	2	4.2	0.6	13.3
671191	2.8	19.6	0.07	4.90	1	5.9	0.6	12.8
671203	2.0	1.9	0.32	7.90	3	7.7	3.8	22.2
671213	2.3	33.5	0.11	4.39	2	5.9	0.6	25.7
671223	3.2	25.1	<0.05	3.80	4	4.4	0.3	9.8
671234	4.2	36.6	<0.05	5.94	5	1.4	0.2	28.0
671245	2.4	18.1	<0.05	5.95	1	2.3	0.1	10.1
671256	2.9	16.4	<0.05	9.35	2	4.5	0.4	32.9
671266	2.8	1.3	<0.05	5.42	<1	1.0	<0.1	22.8
671270	4.4	19.2	<0.05	3.06	3	4.6	0.3	17.1
*Rep 671270	4.3	19.4	<0.05	3.21	4	4.1	0.3	15.4

Element	@Ag	@Al	@Ba	@Ca	@Cr	@Cu	@Fe	@K
Method	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B
Detection Limit	0.02	0.01	1	0.01	1	0.5	0.01	0.01
Units	ppm	%	ppm	%	ppm	ppm	%	%
671000	0.35	7.61	18	0.15	12	40.8	1.67	2.05
671010	0.30	7.28	1	0.12	34	2.3	0.54	2.70
671020	0.25	7.84	7	1.04	54	9.9	0.48	0.22
671031	0.17	7.49	4	0.17	48	2.8	0.76	3.65
671042	0.21	7.28	4	0.18	85	2.5	0.50	3.91
671053	0.17	6.96	<1	0.33	60	2.6	0.44	1.38
671063	0.07	1.90	2	5.37	125	113	1.56	0.11
671073	0.22	8.92	3	1.62	54	12.2	0.75	0.54
671085	0.19	7.97	17	6.53	147	107	7.91	1.36
671090	0.33	7.63	18	0.15	14	41.0	1.66	2.09
671095	0.09	7.57	2	0.32	38	3.1	0.24	1.23
671106	0.06	7.69	3	0.80	63	7.7	0.48	0.97
671116	0.21	8.26	3	0.40	84	2.3	0.30	2.22
671128	0.14	7.68	<1	0.10	29	4.7	0.20	1.98
671138	0.17	7.71	<1	0.14	26	2.6	0.17	2.45
671148	0.05	7.82	6	0.55	80	3.4	0.31	2.18
671159	0.10	8.23	3	1.64	77	28.6	1.34	0.94
671170	0.10	8.07	<1	0.15	60	2.8	0.24	1.76
671181	0.06	7.49	5	0.13	76	2.2	0.24	1.84
671191	0.12	7.47	2	0.27	62	4.2	0.23	5.51
671203	0.04	8.11	2	1.02	40	2.3	0.23	0.46
671213	0.19	8.05	11	1.13	86	59.0	2.40	2.90
671223	0.06	7.45	<1	0.12	55	4.4	0.29	2.61
671234	<0.02	7.96	14	0.61	62	13.4	0.65	1.36
671245	0.12	7.75	<1	0.11	59	1.4	0.17	1.86
671256	0.15	7.74	<1	0.09	32	2.0	0.18	1.88
671266	0.10	9.23	<1	0.54	43	3.3	0.51	0.07
671270	0.30	7.61	18	0.15	13	41.4	1.66	2.10
*Rep 671270	0.28	7.78	19	0.15	13	41.5	1.69	2.11

Element	@Li	@Mg	@Mn	@Na	@Ni	@P	@S	@Sr
Method	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B
Detection Limit	1	0.01	2	0.01	0.5	50	0.01	0.5
Units	ppm	%	ppm	%	ppm	ppm	%	ppm
671000	6706	0.04	1127	2.56	16.9	263	<0.01	41.3
671010	187	<0.01	490	3.47	1.3	198	<0.01	14.3
671020	53	0.10	612	5.47	3.9	103	0.01	24.9
671031	276	0.03	236	2.97	1.2	212	<0.01	28.0
671042	293	0.02	162	2.97	2.2	222	<0.01	28.8
671053	480	0.02	990	4.17	2.1	172	<0.01	18.1
671063	241	0.77	478	0.12	24.3	411	0.02	22.6
671073	904	0.43	241	5.69	12.7	1037	<0.01	39.8
671085	1681	4.33	1595	0.80	119	1285	0.05	106
671090	6896	0.04	1144	2.47	17.0	279	<0.01	42.0
671095	2201	0.02	1842	4.54	2.3	370	<0.01	24.2
671106	253	0.09	776	4.72	5.0	254	0.01	25.3
671116	209	0.01	152	4.94	1.6	283	<0.01	16.8
671128	6544	0.02	1872	2.87	3.1	318	<0.01	48.0
671138	6654	<0.01	1699	2.65	1.9	500	<0.01	60.7
671148	252	0.03	1319	4.58	3.2	315	<0.01	30.4
671159	7386	0.63	905	2.90	20.6	1008	0.02	54.5
671170	8819	0.01	1133	2.43	4.4	506	<0.01	31.2
671181	9258	0.06	836	2.06	2.3	472	<0.01	31.4
671191	397	0.01	974	2.54	2.5	251	<0.01	33.9
671203	1119	0.02	660	5.10	2.6	99	<0.01	12.7
671213	1452	1.05	1745	3.05	46.5	335	0.03	69.5
671223	852	0.03	899	3.97	1.8	355	<0.01	38.5
671234	5721	0.20	514	3.24	7.5	892	0.04	72.7
671245	7377	0.01	1494	2.50	1.9	304	<0.01	32.9
671256	6348	<0.01	2145	2.90	2.7	163	<0.01	39.6
671266	9624	0.02	522	3.53	2.4	396	<0.01	17.9
671270	6884	0.04	1154	2.50	17.3	270	<0.01	42.0
*Rep 671270	7031	0.04	1164	2.50	17.2	272	<0.01	42.8

Element	@Ti	@V	@Zn	@Zr	@As	@Be	@Bi	@Cd
Method	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B
Detection Limit	0.01	2	1	0.5	1	0.1	0.04	0.02
Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
671000	<0.01	3	95	15.8	2	109	3.32	<0.02
671010	<0.01	<2	55	23.9	<1	2.5	7.02	<0.02
671020	0.01	5	8	34.8	1	6.4	0.11	0.04
671031	<0.01	<2	65	6.4	1	3.9	9.66	<0.02
671042	<0.01	<2	41	6.2	2	4.2	7.84	<0.02
671053	<0.01	<2	36	14.5	3	22.9	1.75	<0.02
671063	0.06	36	19	2.0	31	44.8	1.20	0.19
671073	0.03	20	22	8.5	6	63.8	0.23	0.28
671085	0.39	252	79	10.3	33	34.3	0.34	0.67
671090	<0.01	3	94	14.3	1	93.3	3.19	0.11
671095	<0.01	<2	33	29.5	<1	96.6	0.17	0.26
671106	<0.01	4	57	15.0	5	52.7	2.56	0.12
671116	<0.01	<2	25	7.3	2	12.2	0.18	<0.02
671128	<0.01	<2	103	15.3	<1	66.9	3.42	<0.02
671138	<0.01	<2	92	13.0	<1	56.8	3.25	0.21
671148	<0.01	<2	38	6.7	5	30.6	0.82	0.18
671159	0.07	38	20	39.8	18	72.2	0.12	0.27
671170	<0.01	<2	98	4.4	2	93.6	1.67	0.15
671181	<0.01	<2	92	11.1	<1	53.7	1.72	0.12
671191	<0.01	<2	54	11.0	<1	118	0.22	<0.02
671203	<0.01	<2	17	22.5	<1	34.7	0.11	0.03
671213	0.13	74	67	15.3	5	68.5	0.39	0.09
671223	<0.01	<2	56	7.6	2	29.5	5.64	0.12
671234	0.02	9	7	13.3	29	66.7	1.33	0.15
671245	<0.01	<2	56	10.0	<1	59.0	2.61	0.14
671256	<0.01	<2	82	27.2	<1	77.7	3.19	0.14
671266	<0.01	<2	12	17.8	2	105	0.63	0.29
671270	<0.01	3	96	14.7	1	87.2	3.39	0.06
*Rep 671270	<0.01	3	98	16.5	<1	85.2	3.36	<0.02

Element	@Ce	@Co	@Cs	@Ga	@Hf	@In	@La	@Lu
Method	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B
Detection Limit	0.05	0.1	1	0.1	0.02	0.02	0.1	0.01
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
671000	2.61	1.4	26	37.4	1.58	<0.02	1.0	0.03
671010	7.07	0.2	14	44.8	1.60	0.02	2.3	0.14
671020	10.2	1.7	3	38.6	2.26	<0.02	3.4	0.34
671031	6.81	0.4	44	45.0	0.49	0.06	2.3	0.04
671042	5.35	0.4	49	35.3	0.44	0.05	1.9	0.03
671053	3.56	0.4	33	31.4	1.24	0.05	1.3	0.13
671063	1.29	7.6	300	4.0	0.10	<0.02	0.6	0.06
671073	3.63	3.9	274	49.1	1.01	<0.02	1.2	0.04
671085	5.04	51.8	>1000	19.2	0.61	0.05	1.8	0.24
671090	2.49	1.4	24	35.2	1.34	<0.02	0.9	0.03
671095	0.74	0.4	16	40.9	3.44	<0.02	0.3	0.05
671106	2.42	1.1	47	36.2	1.63	0.03	0.9	0.07
671116	6.06	0.2	46	32.1	0.59	<0.02	2.3	0.05
671128	0.57	0.4	62	48.1	1.76	<0.02	0.2	<0.01
671138	0.58	0.2	70	52.7	1.52	<0.02	0.2	0.01
671148	4.79	0.5	58	36.6	0.62	<0.02	1.6	0.09
671159	1.49	7.3	353	52.0	4.80	<0.02	0.6	0.06
671170	0.92	0.3	42	36.2	0.54	<0.02	0.3	0.04
671181	1.23	0.3	54	33.9	1.19	<0.02	0.4	0.06
671191	1.45	0.3	29	31.0	1.09	<0.02	0.6	0.07
671203	4.69	0.4	14	30.8	1.45	<0.02	2.3	0.53
671213	1.74	16.0	147	45.1	1.54	<0.02	0.7	0.09
671223	0.96	0.3	50	38.0	0.82	<0.02	0.3	0.03
671234	0.53	2.7	247	49.4	1.79	<0.02	0.2	0.02
671245	0.67	0.2	57	38.5	1.20	<0.02	0.2	0.02
671256	1.01	0.2	28	42.8	3.14	<0.02	0.4	0.04
671266	0.10	0.4	43	49.0	2.17	<0.02	<0.1	0.01
671270	2.83	1.4	25	34.5	1.42	<0.02	1.0	0.04
*Rep 671270	2.98	1.4	26	35.5	1.52	<0.02	1.2	0.03

Element	@Mo	@Nb	@Pb	@Rb	@Sb	@Sc	@Se	@Sn
Method	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B
Detection Limit	0.05	0.1	0.5	0.2	0.05	0.5	2	0.3
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
671000	7.25	76.8	7.2	2972	0.40	<0.5	<2	49.2
671010	0.23	111	8.2	1277	<0.05	3.2	<2	65.4
671020	1.89	133	10.3	51.5	0.06	1.8	<2	5.1
671031	0.22	98.6	7.2	2362	<0.05	2.9	<2	121
671042	2.21	83.0	9.6	2358	0.05	2.7	<2	58.9
671053	0.42	58.7	6.4	1307	0.06	2.9	<2	49.8
671063	3.95	1.9	0.6	142	17.7	6.8	<2	21.1
671073	0.21	63.2	5.2	1298	0.39	3.9	<2	33.5
671085	1.00	7.2	2.9	3979	0.47	46.2	<2	59.4
671090	6.76	74.2	6.8	2886	0.38	<0.5	<2	46.6
671095	0.34	72.6	7.3	1436	<0.05	<0.5	<2	31.2
671106	1.97	90.9	8.0	811	0.18	1.8	<2	48.5
671116	0.30	84.6	7.4	1126	0.09	1.4	<2	36.7
671128	2.08	55.3	4.7	4374	<0.05	<0.5	<2	45.9
671138	0.26	66.1	4.7	5715	<0.05	<0.5	<2	54.4
671148	2.02	77.1	8.4	1858	0.18	1.5	<2	34.4
671159	0.31	34.8	6.7	2486	0.27	6.0	<2	22.1
671170	3.59	63.6	5.0	2786	0.06	<0.5	<2	54.1
671181	0.38	68.5	5.7	2305	<0.05	0.8	<2	46.2
671191	2.22	81.2	9.3	2926	<0.05	1.1	<2	30.9
671203	2.71	22.6	15.6	285	0.07	2.5	<2	18.9
671213	0.31	34.5	5.8	4926	0.12	13.0	<2	42.6
671223	0.29	25.2	7.2	3516	0.23	<0.5	<2	49.8
671234	2.25	19.4	5.9	5566	0.09	1.5	<2	53.2
671245	0.30	45.0	4.3	2804	<0.05	<0.5	<2	33.4
671256	2.27	53.5	5.2	2654	<0.05	<0.5	<2	50.4
671266	0.68	36.5	5.0	115	0.26	<0.5	<2	6.6
671270	6.92	78.4	6.9	2854	0.37	<0.5	<2	45.7
*Rep 671270	7.17	78.1	7.3	2984	0.37	<0.5	<2	46.9

Element	@Ta	@Tb	@Te	@Th	@Tl	@U	@W	@Y
Method	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B	GE_ICM40B
Detection Limit	0.05	0.05	0.05	0.2	0.02	0.05	0.1	0.1
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
671000	51.5	0.15	<0.05	4.6	19.6	3.17	4.0	2.8
671010	25.9	0.27	<0.05	8.3	7.13	11.5	5.6	9.5
671020	19.0	0.32	<0.05	14.8	0.51	16.8	1.7	11.8
671031	25.3	0.32	0.07	7.6	15.1	4.44	5.4	6.3
671042	22.3	0.18	<0.05	5.7	16.8	6.67	3.2	4.2
671053	34.5	0.14	<0.05	5.1	8.79	5.73	2.5	6.2
671063	0.94	0.08	0.08	<0.2	1.41	<0.05	67.3	3.5
671073	134	0.24	<0.05	4.4	9.87	4.22	7.2	4.4
671085	48.5	0.37	0.09	0.3	46.5	0.20	1.8	15.2
671090	52.5	0.13	<0.05	4.4	19.4	3.07	3.9	2.7
671095	85.7	0.08	<0.05	3.9	9.37	12.1	2.4	2.9
671106	90.5	0.10	<0.05	7.7	5.40	9.42	3.1	3.9
671116	33.4	0.12	<0.05	2.7	7.63	3.62	2.0	3.5
671128	56.2	<0.05	<0.05	3.7	26.4	8.08	4.1	0.7
671138	84.5	0.06	<0.05	3.8	36.8	5.19	4.6	1.3
671148	52.4	0.25	<0.05	7.4	12.8	5.57	2.5	7.8
671159	96.4	0.11	<0.05	4.6	21.8	9.72	5.0	3.8
671170	77.9	0.08	<0.05	3.3	19.3	5.08	3.2	2.2
671181	52.2	0.11	<0.05	2.4	15.0	6.52	2.6	3.0
671191	42.0	0.20	<0.05	3.1	20.1	5.01	1.5	5.7
671203	18.7	0.10	<0.05	2.1	1.83	8.03	2.3	5.8
671213	64.0	0.15	<0.05	2.4	33.6	4.51	2.9	6.0
671223	14.5	0.11	<0.05	3.0	24.8	3.84	4.4	3.0
671234	57.6	<0.05	0.11	2.5	35.5	6.35	4.9	1.2
671245	48.7	0.09	<0.05	3.0	18.1	6.26	1.6	1.9
671256	42.7	0.14	<0.05	3.4	16.4	10.0	2.6	3.2
671266	60.9	<0.05	<0.05	0.9	1.11	5.25	1.3	0.4
671270	53.4	0.15	<0.05	4.8	19.2	3.07	3.8	2.6
*Rep 671270	53.0	0.14	<0.05	4.8	19.4	3.21	3.6	2.8

Element	@Yb	WtG
Method	GE_ICM40B	G_WGH79
Detection Limit	0.1	0
Units	ppm	g
671000	0.2	25.7
671010	1.0	256
671020	2.4	275
671031	0.4	276
671042	0.2	248
671053	0.8	254
671063	0.4	290
671073	0.3	297
671085	1.6	236
671090	0.2	25.4
671095	0.3	268
671106	0.5	247
671116	0.4	236
671128	<0.1	223
671138	<0.1	250
671148	0.6	267
671159	0.4	264
671170	0.2	248
671181	0.4	282
671191	0.5	272
671203	2.8	263
671213	0.7	260
671223	0.2	254
671234	0.1	251
671245	0.1	249
671256	0.3	256
671266	<0.1	250
671270	0.2	25.2
*Rep 671270	0.2	