



# MINERAL RESOURCES LIMITED

## WODGINA RESOURCE UPDATE

28 April 2017

### EXECUTIVE SUMMARY

- Further 20% increase in the hard rock Wodgina resource.
- Wodgina resource is now 120.8 MT at 1.28% Li<sub>2</sub>O.
- Exploration is continuing on site.

### RESOURCE UPDATE FOR THE WODGINA LITHIUM PROJECT

Mineral Resources Limited (ASX: MIN) (“MRL”), is pleased to announce results of recent re-sampling and infill drilling at the Wodgina Lithium Project carried out between September 2016 and April 2017.

Widenbar and Associates Pty Ltd (“Widenbar”) has reviewed the updated data as at 21 April 2017 and produced a new Mineral Resource Estimate. The Inferred mineralisation in the “Cassiterite North East” area which was identified and reported on during March 2017, has been further extended with new assay results from an additional 29 holes. This has added an extra 19.8 Mt to the previously reported 101 Mt Resource at 1.29% Li<sub>2</sub>O (refer to MIN ASX announcement dated 21/3/17). The total Indicated and Inferred Pegmatite Mineral Resource at Wodgina is now 120.8 Mt at 1.28% Li<sub>2</sub>O.

**Table 1 Wodgina Total Pegmatite Mineral Resource Estimate**

RESOURCE	Cutoff	Tonnes	Li <sub>2</sub> O	Fe	SnO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	As <sub>2</sub> O <sub>3</sub>	Ta <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Na <sub>2</sub> O	SiO <sub>2</sub>	CaO	S
CLASSIFICATION	Li <sub>2</sub> O%	(Millions)	%	%	%	%	%	%	%	%	%	%	%
INDICATED	0.50	10.93	1.44	1.65	0.03	15.91	0.002	0.03	2.69	3.58	70.58	0.66	0.19
INFERRED	0.50	109.89	1.26	1.74	0.02	15.43	0.002	0.02	2.95	3.50	71.69	0.40	0.08
TOTAL	0.50	120.81	1.28	1.73	0.02	15.48	0.002	0.02	2.93	3.51	71.59	0.43	0.09

**Table 2 Cassiterite Pit Area Pegmatite Mineral Resource Estimate**

RESOURCE	Cutoff	Tonnes	Li <sub>2</sub> O	Fe	SnO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	As <sub>2</sub> O <sub>3</sub>	Ta <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Na <sub>2</sub> O	SiO <sub>2</sub>	CaO	S
CLASSIFICATION	Li <sub>2</sub> O%	(Millions)	%	%	%	%	%	%	%	%	%	%	%
INDICATED	0.50	10.93	1.43	1.65	0.03	15.91	0.002	0.03	2.69	3.58	70.60	0.66	0.18
INFERRED	0.50	14.52	1.34	2.97	0.03	15.41	0.003	0.03	2.66	3.33	68.17	0.85	0.17
TOTAL	0.50	25.45	1.38	2.41	0.03	15.62	0.002	0.03	2.67	3.44	69.21	0.77	0.18

**Table 3 Cassiterite North East Area Pegmatite Mineral Resource Estimate**

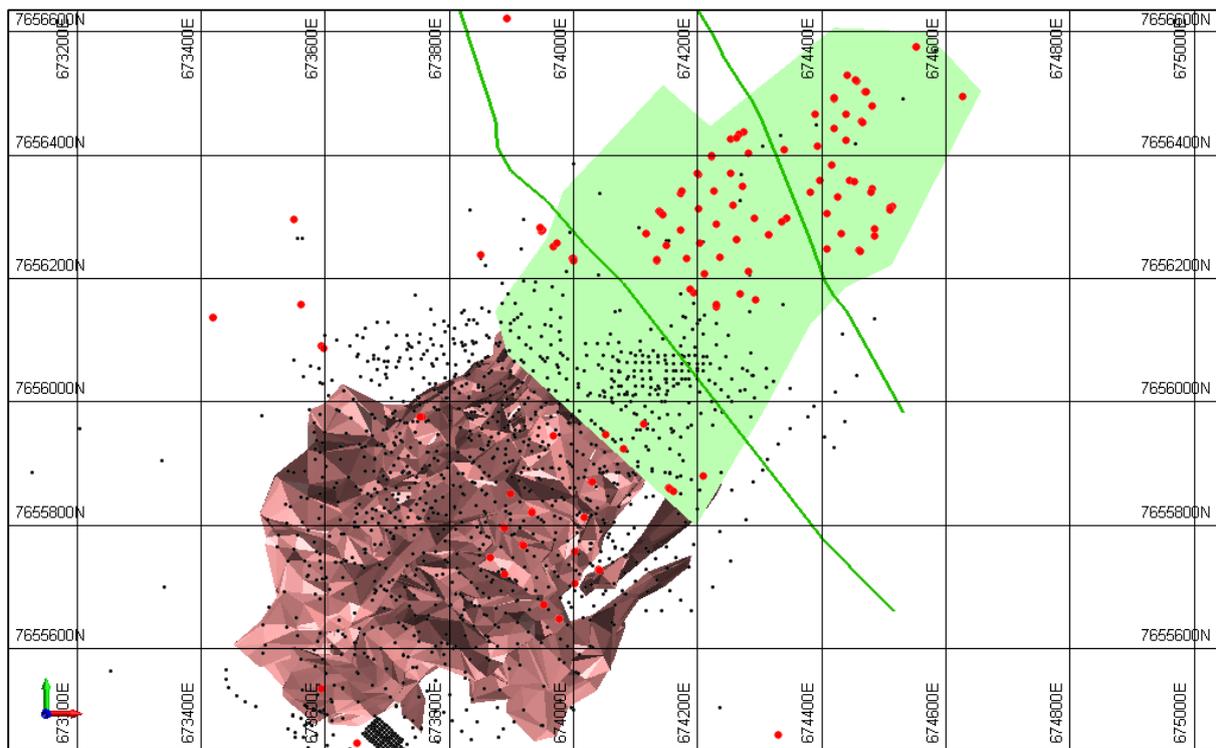
RESOURCE	Cutoff	Tonnes	Li <sub>2</sub> O	Fe	SnO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	As <sub>2</sub> O <sub>3</sub>	Ta <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Na <sub>2</sub> O	SiO <sub>2</sub>	CaO	S
CLASSIFICATION	Li <sub>2</sub> O%	(Millions)	%	%	%	%	%	%	%	%	%	%	%
INFERRED	0.50	95.37	1.25	1.55	0.02	15.44	0.001	0.01	3.00	3.53	72.23	0.34	0.06
TOTAL	0.50	95.37	1.25	1.55	0.02	15.44	0.001	0.01	3.00	3.53	72.23	0.34	0.06

Existing reverse circulation sample pulps from previous drilling programs at Wodgina have been retrieved from storage and submitted to Nagrom Laboratories for assaying for  $\text{Li}_2\text{O}$ . A total of 3,390 assays have been received.

In addition, geological logging data from 160 new RC drill holes for a total of 38,554m has been received and used in a revised interpretation at the date of this Mineral Resource Estimate; data from 12,456 assay intervals has been used in the resource calculation.

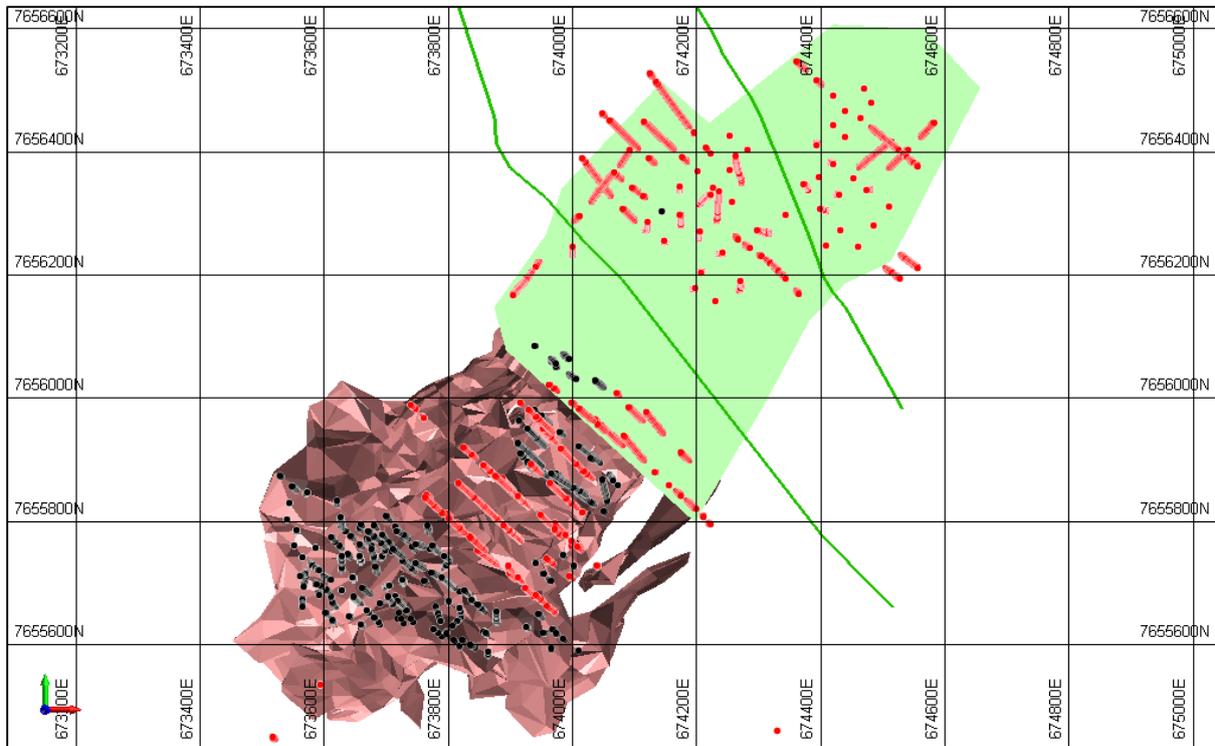
The mineralisation outlines (with the newly interpreted Cassiterite North East area shown in green), new drill hole locations (red) and historic drill hole locations (black) are shown in figure 1 below.

**Figure 1 Drill Hole Locations**

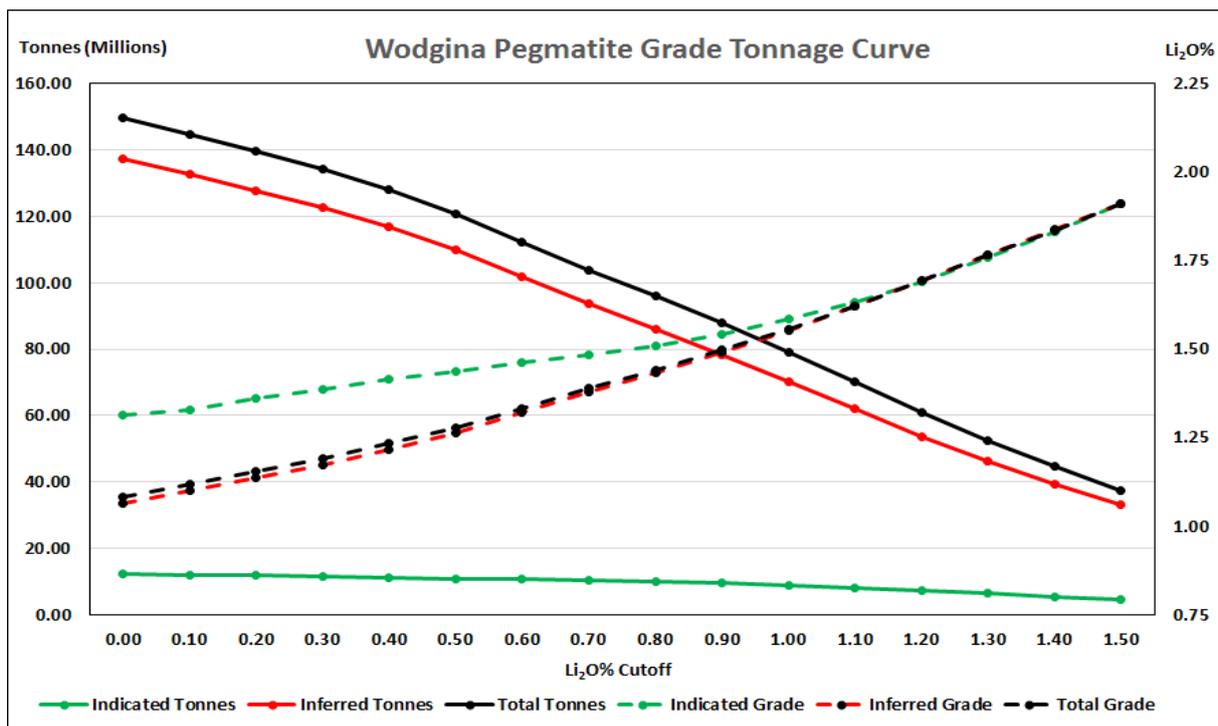


The locations of samples which were re-assayed for Li<sub>2</sub>O are shown below (black), together with the new drill hole sample locations (red).

**Figure 2 Sample Locations**



**Figure 3 Wodgina Grade-Tonnage Curve**





The Wodgina Pegmatites are contained within the former Wodgina Tantalum and Tin Project, located approximately 109 km due south of Port Hedland, in the northwest of Western Australia. The Wodgina tantalum processing plant was operated by Global Advanced Metals (GAM) from 1989 to 2012, and the pegmatites have subsequently been discovered to be rich in Lithium in the form of spodumene.

The mining operation extracted tantalum bearing pegmatite ores from the Mount Cassiterite and Tinstone open pits. The ores were crushed, milled and fed into the Wodgina plant's advanced gravity separation plant.

With recent increases in both the demand for and the price of Lithium, re-assaying of a limited number of in-situ pegmatite samples indicated the potential viability of the extraction of Lithium. It was also noted that some of the pegmatites are known to contain spodumene. Subsequently in March-April 2016, a program was instituted to retrieve as many RC pulp samples as possible from storage at Wodgina and re-assay the pegmatite zones for  $\text{Li}_2\text{O}$ .

The pegmatite mined at Mt Cassiterite has the following approximate composition:

- 50% Albite
- 20% K-feldspar
- 15% Spodumene
- 10% Quartz
- 5% Muscovite/Sericite/Zinnwaldite

In addition, it contains minor quantities of lepidolite, biotite, fluorite, white beryl and lithium phosphate minerals, with no obvious mineral zoning. The pegmatite is very hard rock, usually fresh at surface, and distinctive in outcrop. K-feldspar and spodumene exist as phenocrysts in a fine-grained (1mm) albite-quartz matrix, which is veined by 10cm thick massive quartz stringers and 1mm thick green sericite-albite veinlets. Texturally the pegmatite is extremely complex, showing evidence of multiple silicification and albitisation events.

QAQC has been carried out by the submission of a series of standards and internal laboratory repeats.  $\text{Li}_2\text{O}$  standards represent approximately 1 in 11 samples and laboratory repeats and splits approximately 1 in 10 samples. The QAQC has produced acceptable results.

Database management and validation has been carried out in Micromine 2016.1 Software; raw  $\text{Li}_2\text{O}$  ppm data was provided in Excel spreadsheet format by Nagrom Laboratories.

A detailed geological re-interpretation of the pegmatites was carried out by GAM for the Tantalum Mineral Resource Estimate carried out by Cube Consulting in September 2013. Widenbar has subsequently modified this on the basis of 27 new RC drill holes in the Cassiterite Pit area.

The February to April 2017 drilling programs have identified extensive new mineralisation beneath the "Cassiterite North East" area to the north east of Cassiterite pit. A total of 96 holes has been used to define pegmatite geology in this area, of which 58 currently have assay data available. In addition, for the current estimate, two NW-SE trending faults have been interpreted, dividing the Cassiterite North East mineralisation into three fault blocks.



The new Li<sub>2</sub>O data has been flagged with the updated pegmatite geological interpretation and statistical analysis and variography has been carried out. Assay intervals have been composited to 1m intervals. A top cut of 5% Li<sub>2</sub>O has been applied to the data.

A Kriging Neighbourhood Analysis study was carried out to optimise parameters for an Ordinary Kriging Resource estimation of Li<sub>2</sub>O. Interpolation has been carried out using an unfolding methodology that allows the search ellipses to vary with the changes in dip and plunge of the pegmatite bodies.

The block model has cell sizes of 5m (East) by 10m (North) by 2.5m (RL), with subcells to 1m x 1m x 0.5m. The block model is rotated 41° to align with the strike of the orebody.

Density data has been reviewed and in the Cassiterite Pit area has been assigned as for the previous 2013 tantalum resource model, based on geology and oxidation state. In practice all of the Li<sub>2</sub>O mineralised pegmatite remaining after mining is fresh. Analysis of new geophysical logging of the MRL drill holes has allowed a revision of the density in the Cassiterite North East area to 2.80 t/m<sup>3</sup>.

**Table 4 Density Assignment**

Material	Density (t/m <sup>3</sup> )
Fill	1.80
Oxide Waste	2.32
Transitional Waste	2.80
Fresh Waste	2.96
Oxide Pegmatite	2.30
Transitional Pegmatite	2.53
Fresh Pegmatite	2.68

Block model validation has been carried out by drill hole plan and section review of data vs model, by statistical comparison, and by sectional and plan swathe plots. All validation methods have produced acceptable results.

Figure 4 Li<sub>2</sub>O Block Model and Data on Section in centre of Cassiterite North East Area

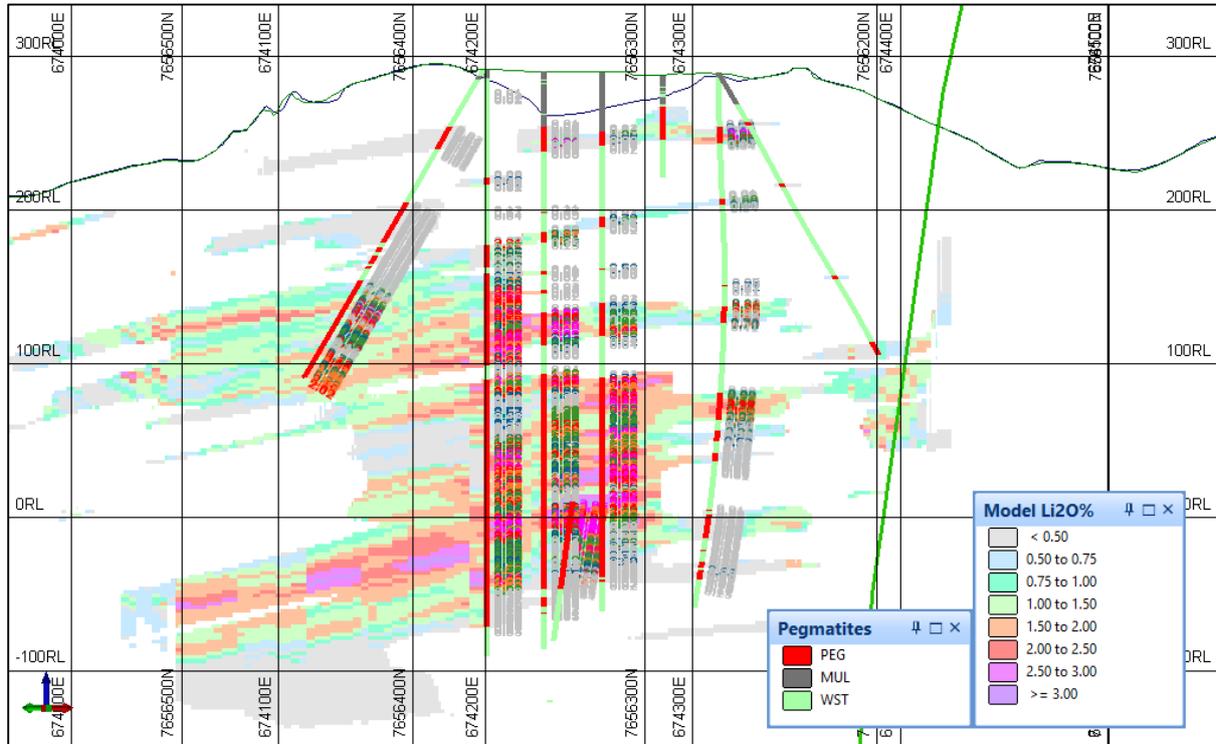


Figure 5 Li<sub>2</sub>O Model and Data on Long Section in Cassiterite North East Area, showing Fault Blocks

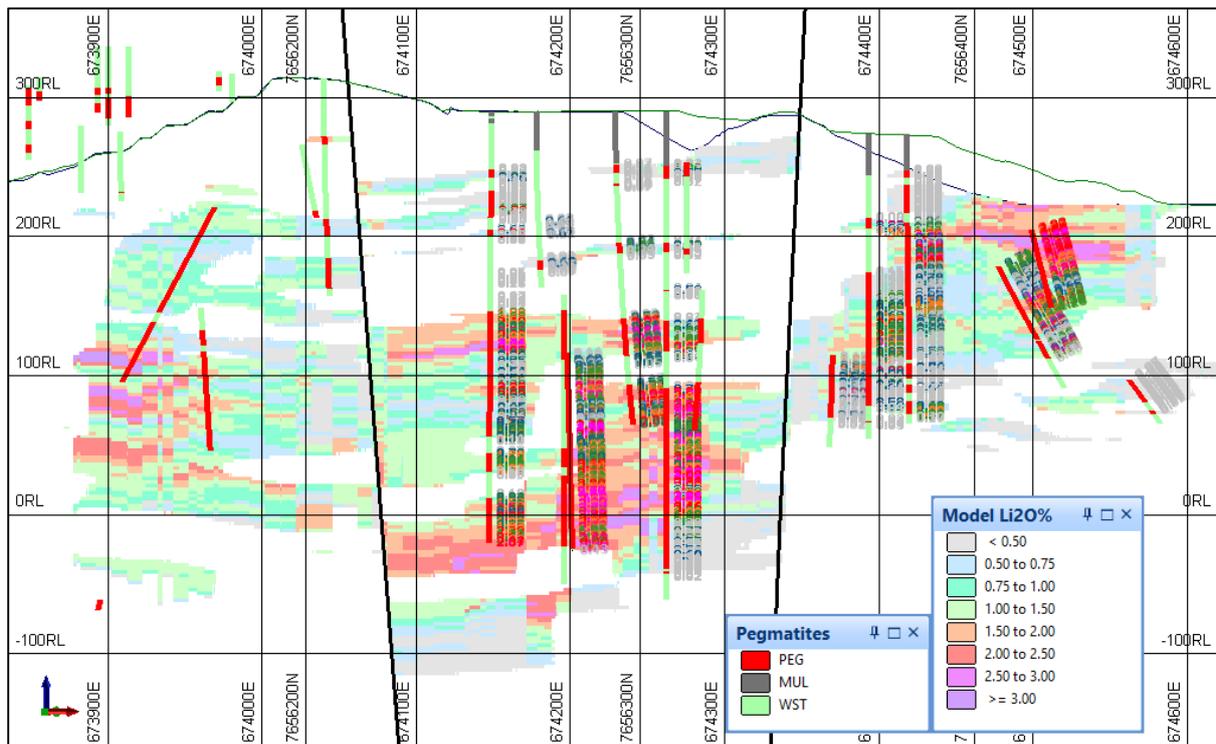
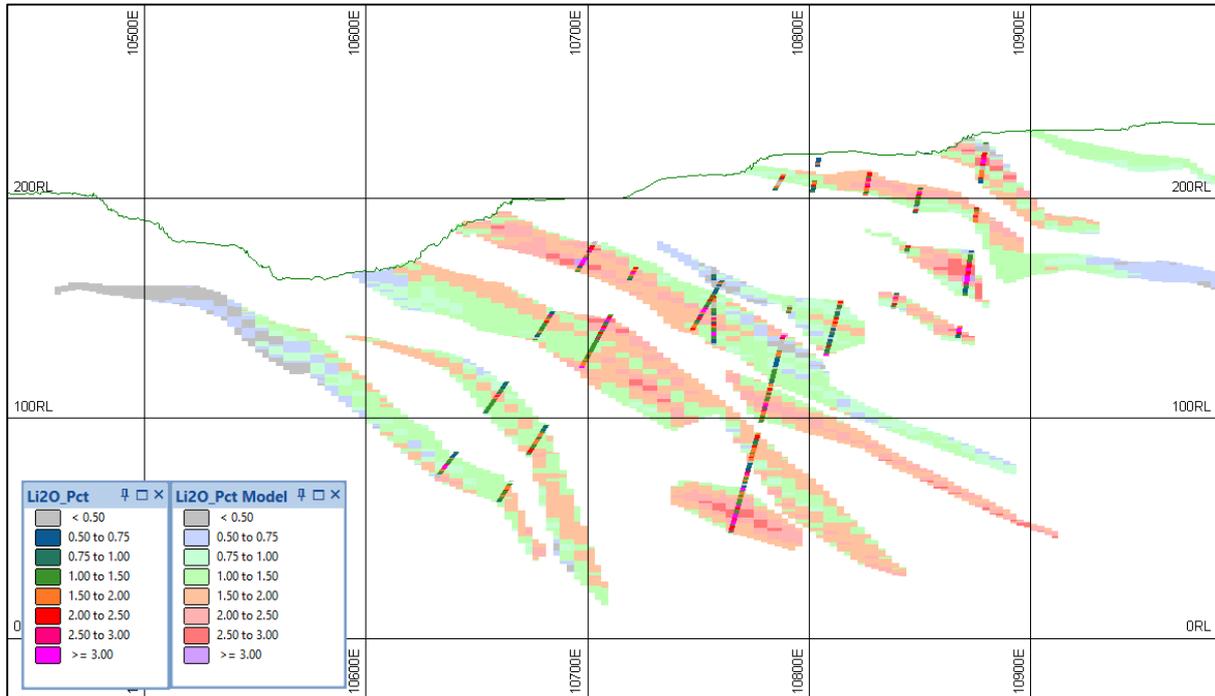


Figure 6 Li<sub>2</sub>O Block Model and Data on Section 20275 North (Cassiterite Pit Area)

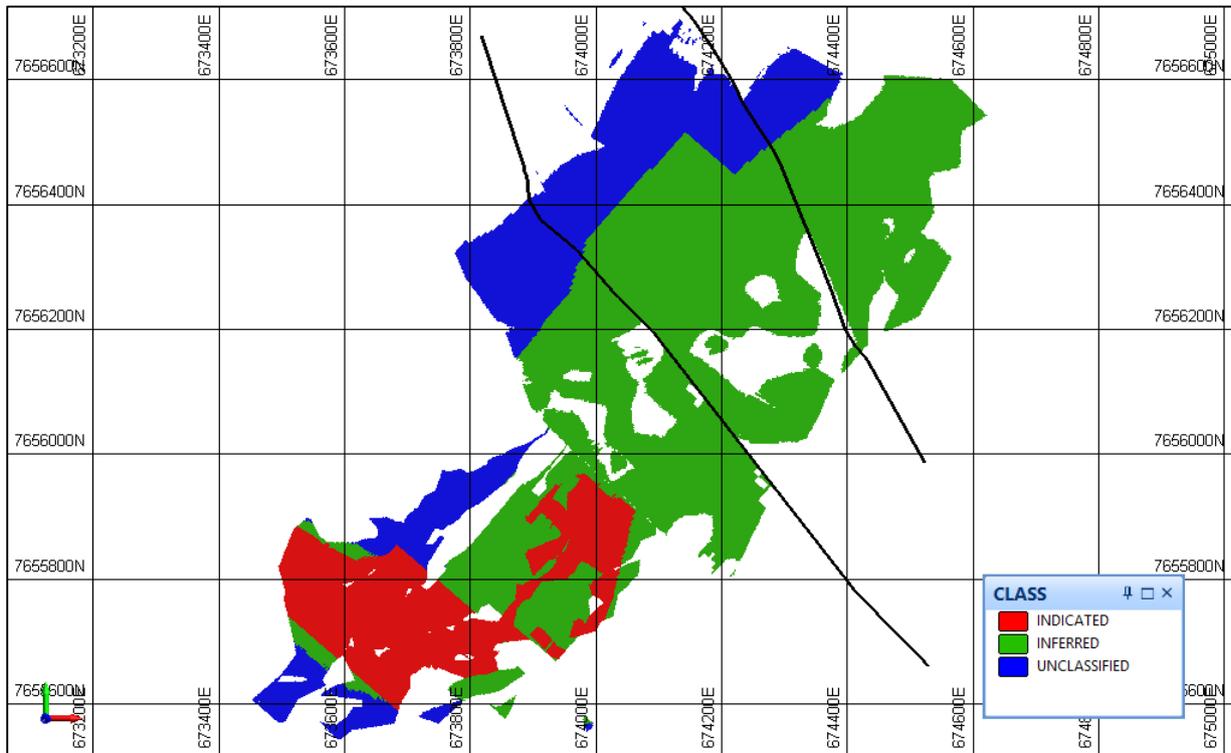


The Mineral Resource has been classified in the Indicated and Inferred categories, in accordance with the 2012 Australasian Code for Reporting of Mineral Resources and Ore Reserves (JORC Code). A range of criteria has been considered in determining this classification including:

- Grade and geological continuity
- Data quality
- Drill hole spacing
- Kriging efficiency and variance, number of samples and average distance to samples.

Final classification has resulted in the Indicated and Inferred areas illustrated below; remaining areas have not been classified but remain as Target Mineralisation.

**Figure 7 Resource Classification**



A qualitative risk assessment review has been carried out on the Mineral Resource Estimate, based on the general approach used by resource estimation practitioners and consultants to indicate in relative terms the level of risk or uncertainty that may exist with respect to resource estimation.

Relative levels of risk have been assessed as generally Low occasionally tending towards Moderate with respect to certain aspects of the estimation.

### **COMPETENT PERSON'S STATEMENT**

The information in this report that relates to Mineral Resources is based on information compiled by Mr Lynn Widenbar, a Competent Person who is a Member of the Australasian Institute of Mining and Metallurgy. Mr Widenbar is a full time employee of Widenbar and Associates Pty Ltd. Mr Widenbar has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity that is being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Minerals Resources and Ore Reserves'. Mr Widenbar consents to the inclusion in the report of the matters based on his information in the form and context that the information appears.

**JORC Code, 2012 Edition – Table 1**

Note: Table 1 relates to historical drilling, sampling and geological data based on information contained in the MRE Report, prepared by Cube Consulting in September, 2013, and recent exploration drilling completed by MRL from September 2016 to March 2017.

**Section 1 Sampling Techniques and Data** (Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
<b>Sampling techniques</b>	<ul style="list-style-type: none"> <li>Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.</li> <li>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</li> <li>Aspects of the determination of mineralisation that are Material to the Public Report.</li> <li>In cases where 'industry standard' work has been done this would be relatively simple (eg RC drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.</li> </ul>	<ul style="list-style-type: none"> <li>Samples have been derived from RC drill hole pulps stored from previous drilling campaigns.</li> <li>Historic RC chip samples were collected at 1m intervals and split with a riffle splitter prior to 2008. RC samples were split with a cone splitter after 2008, to produce a sub-sample of 3-5kg for analysis.</li> <li>Samples have also been collected from the MRL drilling campaign conducted between July 2016 and April 2017</li> <li>RC – Rig mounted cone splitter used, with samples falling through an inverted cone splitter, splitting the sample in 90/10 ratio. 10% off-split retained in a calico bag. 90% split residue stored on ground. All pegmatite intercepts sampled at 1m intervals plus 2m of adjacent waste sent for lab analysis.</li> <li>Deposits have been sampled by RC drilling.</li> </ul>
<b>Drilling techniques</b>	<ul style="list-style-type: none"> <li>Drill type (eg core, RC, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).</li> </ul>	<ul style="list-style-type: none"> <li>The original database consists of 1,691 holes of which 1,167 holes are RC, 39 holes are diamond and 155 are RAB holes. 330 holes are unknown type.</li> <li>The MRL campaign currently consists of 159 RC holes and two diamond holes.</li> <li>Samples for Li<sub>2</sub>O analysis were taken from relatively recent Historic RC drill holes.</li> <li>RC drilling was carried out using a face sampling hammer and a 142mm diameter bit.</li> </ul>
<b>Drill sample recovery</b>	<ul style="list-style-type: none"> <li>Method of recording and assessing core and chip sample recoveries and results assessed.</li> <li>Measures taken to maximise sample recovery and ensure representative nature of the samples.</li> <li>Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.</li> </ul>	<ul style="list-style-type: none"> <li>Sample recoveries for historic RC and diamond drilling are recorded on original logs but are not available in a digital format.</li> <li>Historic sample recoveries are near 100% in the pegmatite, sample loss mainly occurs in shear zones and occasionally on contacts. Most loss is recorded at the start of holes, near collars.</li> <li>MRL recoveries are almost all logged as 80%.</li> <li>There is a low probability of preferential loss of sample having an effect on the grade of pegmatites.</li> <li>RC – Approximate recoveries are recorded as a percentage based on visual and weight estimates of the sample.</li> <li>There is no known relationship between sample recovery and grade.</li> </ul>
<b>Logging</b>	<ul style="list-style-type: none"> <li>Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.</li> <li>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.</li> </ul>	<ul style="list-style-type: none"> <li>All historic holes (diamond &amp; RC) are geologically logged in as much detail as possible. Main rock type is logged and then a secondary rock type if present such as on contacts, mineralisation and any alteration as well as accessory minerals are logged in detail.</li> <li>MRL holes are logged for lithology, colour, mineralogy, grain size, texture, alteration,</li> </ul>

Criteria	JORC Code explanation	Commentary
	<ul style="list-style-type: none"> <li>The total length and percentage of the relevant intersections logged.</li> </ul>	<p>weathering and hardness.</p> <ul style="list-style-type: none"> <li>Oxidation surfaces and weathering are logged.</li> <li>Diamond holes were orientated and core logged for geotechnical qualities.</li> <li>Chip samples have been logged by qualified Geologists to a level of detail sufficient to support a MRE, mining studies and metallurgical studies.</li> <li>RC – logging was carried out on a metre by metre basis and at the time of drilling. All intervals were logged.</li> <li>Logging is qualitative and quantitative.</li> </ul>
<p><b>Sub-sampling techniques and sample preparation</b></p>	<ul style="list-style-type: none"> <li>If core, whether cut or sawn and whether quarter, half or all core taken.</li> <li>If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.</li> <li>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</li> <li>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</li> <li>Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.</li> <li>Whether sample sizes are appropriate to the grain size of the material being sampled.</li> </ul>	<ul style="list-style-type: none"> <li>Historic RC chip samples are collected at 1m intervals and split with a riffle splitter prior to 2008. RC samples were split with a cone splitter after 2008, to separate a sub-sample of 3-5kg for analysis. Occasionally the sample was &lt;1kg but generally at near surface positions.</li> <li>When moist or wet ground conditions were experienced in historic drilling, the cyclone was washed out between each sample and run further to ensure no inter-sample contamination. The rig had a dust collection system that involved the injection of water into the sample pipe before the sample reached the cyclone. This water injection prevented fines being lost out of the top of the cyclone. This system was employed to minimise dust fines being released into the atmosphere in the work area and to minimise the possibility of the sample being positively biased by the loss of the lighter minerals such as quartz, feldspar, and mica, thus effectively concentrating the heavier ore minerals such as tantalite.</li> <li>RC – Cyclone mounted cone splitter used.</li> <li>RC chips were dried at 100C. All samples below approximately 4kg were totally pulverised in LM5's to nominally 85% passing a 75µm screen. The few samples generated above 4kg were crushed to &lt;6mm and riffle split first prior to pulverisation.</li> <li>The measures taken to ensure the RC sampling is representative of the in situ material collected included the insertion of a duplicate sample at an incidence of 1 in 25.</li> <li>Commercially prepared certified reference materials (CRM) were inserted amongst the drill samples.</li> <li>For RC samples, no formal heterogeneity study has been carried out or nomographed. An informal analysis suggests that the sampling protocols currently in use are appropriate to the mineralisation encountered and should provide representative results. As such sample sizes are considered appropriate.</li> </ul>
<p><b>Quality of assay data and laboratory tests</b></p>	<ul style="list-style-type: none"> <li>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</li> <li>For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.</li> <li>Nature of quality control procedures adopted (eg standards, blanks, duplicates, external</li> </ul>	<ul style="list-style-type: none"> <li>Li<sub>2</sub>O has been assayed by ICP005 at Nagrom Laboratories.</li> <li>The original RC pulps were subject to stringent QAQC and laboratory preparation procedures and are considered reliable for the purposes for which they are being used.</li> <li>Two standards have been submitted at the rate of approximately 1 in 11 samples, and internal laboratory repeats and splits have been assayed at a rate of 1 in 10.</li> <li>The level of accuracy and precision of the assay</li> </ul>

Criteria	JORC Code explanation	Commentary
	<p>laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.</p>	<p>determination is considered to be sufficient to form the basis for the resource estimation and is reflected in the Resource classification.</p> <ul style="list-style-type: none"> <li>The lab QAQC protocols used for the RC drill samples included the insertion of a duplicate sample at an incidence of 1 in 20, one of three types of CRM's at an incidence of 1 in 10, and repeats at an incidence of 1 in 10.</li> <li>No hand held analytical instruments were used in the field.</li> <li>QAQC data is assessed on import into the database and reported yearly.</li> </ul>
<p><b>Verification of sampling and assaying</b></p>	<ul style="list-style-type: none"> <li>The verification of significant intersections by either independent or alternative company personnel.</li> <li>The use of twinned holes.</li> <li>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</li> <li>Discuss any adjustment to assay data.</li> </ul>	<ul style="list-style-type: none"> <li>Some twinned holes were originally drilled, but there are no twins available for the current Li<sub>2</sub>O assays.</li> <li>Primary data was made available in a validated access database that had been previously used for a JORC 2012 compliant MRE.</li> <li>Significant intersections not verified.</li> <li>Sample data is stored using a customised access database using semi-automated or automated data entry. Hard copies of primary data stay in the field during the exploration campaign. To be brought back to the Perth office post campaign for storage.</li> <li>No adjustments were made to the assay data.</li> </ul>
<p><b>Location of data points</b></p>	<ul style="list-style-type: none"> <li>Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.</li> <li>Specification of the grid system used.</li> <li>Quality and adequacy of topographic control.</li> </ul>	<ul style="list-style-type: none"> <li>All data used in the estimation was in MGA94; elevation is standardised to AHD.</li> <li>Historic collar locations were surveyed by a real-time differential GPS which achieves an accuracy of ± 0.01m. All down-hole survey data was converted to Wodgina Mine Grid and corrected for magnetic declination.</li> <li>For the 2010 and 2012 RC drilling, all except for a few collapsed holes were gyro surveyed to compare the data. Gyro-derived data was recorded at the surface and 5m intervals down-hole to the end of the hole. Ultimately, the gyro-surveyed data was accepted as the most-accurate of the down-hole surveys and this data was adopted into the database to project the drill hole strings.</li> <li>For earlier (pre-2008) RC drilling programs down-hole surveying took place using a single shot Eastman down-hole camera, equipped with a "high-dip" compass for all vertical holes. For diamond holes survey shots were taken every 20m and at the end of hole. The RC holes had camera shots taken at either 40m or 50m intervals, as well as the end of hole. All camera shots were taken inside the 6m stainless steel starter rod.</li> <li>Collar positions were recorded using a hand held GPS. Post-drilling collar positions were recorded using a Differential GPS. The majority of holes were drilled vertically with approximately 10 drilled at -60°.</li> <li>The grid system is MGA Zone 51 (GDA94) for horizontal data and AHD (based on AusGeoid09) for vertical data.</li> <li>Topographic control is from Digital Elevation Contours (DEM) 2016 based on 1m contour data.</li> </ul>

Criteria	JORC Code explanation	Commentary
<b>Data spacing and distribution</b>	<ul style="list-style-type: none"> <li>Data spacing for reporting of Exploration Results.</li> <li>Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.</li> <li>Whether sample compositing has been applied.</li> </ul>	<ul style="list-style-type: none"> <li>Drilling for the historic data at the Cassiterite pit is generally on a 25m by 25m grid, with some infill holes drilled as close as 10m by 10m.</li> <li>Drill spacing for the new infill data to test for Li<sub>2</sub>O is typically 25m x 25m in Cassiterite pit,</li> <li>There was a 200m gap between the two areas with no Li<sub>2</sub>O data. The recent MRL drill program has in-filled the area of missing assays to approximately 50m x 50m.</li> <li>RC holes at Cassiterite NE are generally based on 40m x 40m drill spacing.</li> <li>93% of the assays are 1m in length; 1m composites have been calculated for resource estimation.</li> <li>The data spacing and distribution is sufficient to establish geological and or grade continuity appropriate for future mineral resource and classifications to be applied.</li> <li>RC samples are composited to 1m through the mineralisation and two metres either side.</li> </ul>
<b>Orientation of data in relation to geological structure</b>	<ul style="list-style-type: none"> <li>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</li> <li>If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.</li> </ul>	<ul style="list-style-type: none"> <li>More than half the historic holes are drilled vertical and the rest varies between -50° and -80°, drilled to the east and west. The mineralised pegmatites are predominantly interpreted to be a series of flat to shallow west and east dipping lenses (on the Wodgina local grid). Holes have been orientated accordingly to intersect the mineralised pegmatites perpendicular where possible. A set of near vertical pegmatites interpreted in the western margin of the deposit have been less optimally drilled and the classification reflects this.</li> <li>The orientation of sampling is designed to be perpendicular to the main mineralisation trends where possible. MRL holes are predominantly drilled at -60° or -90° so as to intersect the local pegmatites at approximately right angles.</li> <li>The orientation achieves unbiased sampling of all possible mineralisation and the extent to which this is known.</li> </ul>
<b>Sample security</b>	<ul style="list-style-type: none"> <li>The measures taken to ensure sample security.</li> </ul>	<ul style="list-style-type: none"> <li>The historic RC samples were sourced on site from storage containers.</li> <li>Sample security is not considered an issue.</li> <li>RC – All samples are bagged in numbered calico bags, grouped into larger tied polyweave bags, and placed in a large bulka bag with a sample submission sheet. The bulka bags are transported via freight truck to Perth, with consignment note and receipted by external laboratory (NAGROM).</li> <li>All sample submissions are documented and all assays are returned via email.</li> <li>Sample pulp splits are stored in MRL facilities.</li> </ul>
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li>The results of any audits or reviews of sampling techniques and data.</li> </ul>	<ul style="list-style-type: none"> <li>Sampling procedures have been reviewed as part of the current MRL process and are considered adequate by the Competent Person.</li> <li>All recent sample data has been reviewed internally by MRL Geologists.</li> <li>No external audits have been carried out on the sample data.</li> </ul>

## Section 2 Reporting of Exploration Results (Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
<b>Mineral tenement and land tenure status</b>	<ul style="list-style-type: none"> <li>Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.</li> <li>The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.</li> </ul>	<ul style="list-style-type: none"> <li>The drilling is located on M45/50-I and M45/365-I held in the name of Wodgina Lithium a 100% subsidiary of MRL. M45/50-I is not up for renewal until 2026 and M45/365-I is not up for renewal until 2030. The tenements were previously wholly owned by Global Advanced Metals Wodgina Pty Ltd (formerly Talison Wodgina Pty Ltd).</li> <li>Wodgina is located wholly within Mining Licence M45/50, M45/353, M45/383 &amp; M45/887.</li> <li>The tenements are within the Karriyarra native title claim and are subject to the Land Use Agreement dated March 2001 between the Karriyarra People and Gwalia Tantalum Ltd (now Global Advanced Metals &amp; superceded by Wodgina Lithium).</li> <li>The tenement is in good standing and no known impediments exist.</li> </ul>
<b>Exploration done by other parties</b>	<ul style="list-style-type: none"> <li>Acknowledgment and appraisal of exploration by other parties.</li> </ul>	<ul style="list-style-type: none"> <li>The original proponent of the project, Pan West Tantalum Pty Ltd, began mining and processing tantalite ore at Wodgina in August 1989, from the Wodgina open pit.</li> <li>Drilling at Mt Cassiterite has been carried out by a number of different drilling contractors and by a variety of different methods over the years. Drilling carried out by the Pan West JV included 3,825m of air track; 1,145m of RC drilling and 204m of diamond drilling.</li> <li>Since Sons of Gwalia Ltd purchased the project in 1995, six development-drilling programs have been completed at Mt Cassiterite. The first, in 1996, involved a track mounted RC rig completing a 3,464m drilling program, a resource extension program during 1998-99 comprised 17,586m of RC drilling and 2,225m of diamond drilling, a further resource extension program in 2001 comprised 18,694m of RC drilling, A RC infill-drilling program in Mt Tinstone area was commenced in February 2002 and totalled 5,432m, further resource drilling was conducted in 2002/03 consisting of 12,805m of RC drilling, as a result of this program, an infill-drilling program was carried out which targeted the East Ridge mining area, which totalled 2,948m.</li> <li>Additional resource drilling, completed in March 2004, consisted of 3,866m RC drilling and later infill-drilled for a total of 12,930m.</li> <li>MRL has carried out RC drilling of 159 holes between September 2016 and April 2017 for a total of 38,028m.</li> <li>112 of these holes for a total of 12,456m have assay data at the date of this MRE.</li> <li>All exploration during the current reporting period was carried out by MRL.</li> </ul>
<b>Geology</b>	<ul style="list-style-type: none"> <li>Deposit type, geological setting and style of mineralisation.</li> </ul>	<ul style="list-style-type: none"> <li>The 3600-2800Ma North Pilbara basement terrane consists of a series of ovoid multiphase granitoid-gneiss domes bordered by sinuous synformal to monoclinial greenstone belts.</li> <li>The Wodgina Greenstone Belt is a north to northeast plunging synclinal structure 25km long and 5km wide, preserved as a roof pendant separating the Yule and Carlindi</li> </ul>

Criteria	JORC Code explanation	Commentary
		<p>granitoid complexes. It is composed principally of interlayered mafic and ultramafic schists and amphibolite, with subordinate komatiite, clastic sediments, BIF and chert. The komatiitic and metasedimentary units within the Wodgina area are tentatively correlated to the Kunagunarrina and Leilira Formations respectively.</p> <ul style="list-style-type: none"> <li>• Archean volcanic activity and sedimentation was followed by the intrusion of Archean granitic batholiths with consequent deformation and metamorphism of the sequence. Late stage granitic intrusions resulted in the emplacement of simple and complex pegmatite sills and barren quartz veins.</li> <li>• The Wodgina pegmatite district contains a number of prospective pegmatite groups, including the Wodgina Deposit.</li> <li>• The Wodgina lithium mineralisation is hosted within a number of sub-parallel, sub-horizontal, northeast trending pegmatite intrusive bodies with a dip at between 5° to 30° to the west-southwest.</li> <li>• At this time individual pegmatites vary in strike length from approximately 200m to 400m. The thinner near surface pegmatites vary from 10m to 30m in thickness, but vary locally from less than 2m to up to 35m thick. The massive basal pegmatite varies from 120m to 200m thick. The pegmatites intrude the mafic volcanic and metasedimentary host rocks of the surrounding greenstone belt.</li> <li>• The lithium in the Cassiterite Pit and shallower pegmatites occurs as 10 - 30 cm long grey-white spodumene crystals within medium grained pegmatites comprising primarily of quartz, feldspar, spodumene and muscovite. Typically, the spodumene crystals are oriented orthogonal to the pegmatite contacts. Some zoning of the pegmatites parallel to the contacts is observed, with higher concentrations of spodumene occurring close to the upper contact. In the massive basal pegmatite, the spodumene is distributed within fine-grained quartz, feldspar, spodumene and muscovite matrix.</li> </ul>
<p><b>Drill hole Information</b></p>	<ul style="list-style-type: none"> <li>• <i>A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:</i> <ul style="list-style-type: none"> <li>○ <i>easting and northing of the drill hole collar</i></li> <li>○ <i>elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar</i></li> <li>○ <i>dip and azimuth of the hole</i></li> <li>○ <i>down hole length and interception depth</i></li> <li>○ <i>hole length.</i></li> </ul> </li> <li>• <i>If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is.</i></li> </ul>	<ul style="list-style-type: none"> <li>• The assets of the Wodgina Tantalum Project have been held in a private equity entity since August 2007. As a result, exploration results for the Wodgina Project have not been made public since that time.</li> <li>• Collar details attached.</li> </ul>

Criteria	JORC Code explanation	Commentary
<b>Data aggregation methods</b>	<ul style="list-style-type: none"> <li><i>In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.</i></li> <li><i>Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.</i></li> <li><i>The assumptions used for any reporting of metal equivalent values should be clearly stated.</i></li> </ul>	<ul style="list-style-type: none"> <li>Reported exploration results are uncut.</li> <li>Reported aggregate Li<sub>2</sub>O intercepts based on geological intervals of continuous pegmatite greater than or equal to 2m.</li> <li>Reported aggregate Li<sub>2</sub>O intercept grades are a weighted average based on assay interval length.</li> </ul>
<b>Relationship between mineralisation widths and intercept lengths</b>	<ul style="list-style-type: none"> <li><i>These relationships are particularly important in the reporting of Exploration Results.</i></li> <li><i>If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</i></li> <li><i>If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').</i></li> </ul>	<ul style="list-style-type: none"> <li>Apparent thickness as down hole length is reported.</li> </ul>
<b>Diagrams</b>	<ul style="list-style-type: none"> <li><i>Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.</i></li> </ul>	<ul style="list-style-type: none"> <li>Appropriate maps and diagrams are included in the body of the MRE Report.</li> </ul>
<b>Balanced reporting</b>	<ul style="list-style-type: none"> <li><i>Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.</i></li> </ul>	<ul style="list-style-type: none"> <li>All holes related to the Wodgina drilling program are reported here.</li> </ul>
<b>Other substantive exploration data</b>	<ul style="list-style-type: none"> <li><i>Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.</i></li> </ul>	<ul style="list-style-type: none"> <li>No other meaningful data to report.</li> </ul>
<b>Further work</b>	<ul style="list-style-type: none"> <li><i>The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).</i></li> <li><i>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</i></li> </ul>	<ul style="list-style-type: none"> <li>Exploration drilling is ongoing.</li> <li>As part of the main document.</li> </ul>

### Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
<b>Database integrity</b>	<ul style="list-style-type: none"> <li>Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.</li> <li>Data validation procedures used.</li> </ul>	<ul style="list-style-type: none"> <li>The historic database has been previously validated for a JORC 2012 compliant MRE.</li> <li>The database has also been reviewed and validated using Micromine software.</li> <li>Raw assay files provided digitally by the laboratory have been used and imported.</li> <li>The MRL drilling data has been captured using MRL's standardised database procedures.</li> <li>No database issues have been noted.</li> </ul>
<b>Site visits</b>	<ul style="list-style-type: none"> <li>Comment on any site visits undertaken by the Competent Person and the outcome of those visits.</li> <li>If no site visits have been undertaken indicate why this is the case.</li> </ul>	<ul style="list-style-type: none"> <li>The Competent Person visited site on 22nd February 2017, and reviewed geology in the Cassiterite Pit, RC drilling, sampling and excavations in the TSF3 area.</li> </ul>
<b>Geological interpretation</b>	<ul style="list-style-type: none"> <li>Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.</li> <li>Nature of the data used and of any assumptions made.</li> <li>The effect, if any, of alternative interpretations on Mineral Resource estimation.</li> <li>The use of geology in guiding and controlling Mineral Resource estimation.</li> <li>The factors affecting continuity both of grade and geology.</li> </ul>	<ul style="list-style-type: none"> <li>Confidence in the geological interpretation is considered to be moderately high, outcrop is exposed in open pit floors and walls and drilling data at a spacing of 25x25m, which provides sufficient information to define the mineralised pegmatite lenses.</li> <li>The structural controls on the pegmatites are relatively complex resulting in folded and faulted outcomes, which prevent a high level of certainty. This is most apparent to the west where vertical pegmatites are interpreted, without appropriately orientated drilling.</li> <li>Uncertainty related to the identification of the mineralisation has been simplified by the assumption that all mineralisation is contained within pegmatite – a readily identified rock contrasting strongly with the surrounding host rocks.</li> <li>The logged, interpreted and wireframe geology has been assumed to be the mineralisation boundary.</li> </ul>
<b>Dimensions</b>	<ul style="list-style-type: none"> <li>The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.</li> </ul>	<ul style="list-style-type: none"> <li>A total of 40 separate pegmatite lenses have been interpreted. Individually they extend over strike lengths of between 100m and 1000m; with a project strike extending over 1.4km. Cross strike extents range from 50 to 300m for individual lenses, with vertical thicknesses of the lenses ranging from 5 to 50m.</li> <li>The pegmatite lenses have been interpreted to a maximum depth of 300m below the surface.</li> <li>The Li<sub>2</sub>O area of the resource consists of two main areas of the Cassiterite deposit, respectively 200m x 300m and 100m x 200m.</li> </ul>
<b>Estimation and modelling techniques</b>	<ul style="list-style-type: none"> <li>The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.</li> </ul>	<ul style="list-style-type: none"> <li>All modelling and estimation has been carried out in Micromine 2016.1 software.</li> <li>A conventional rotated, sub-celled block model framework has been set up. Cell sizes are based on approximately half to one quarter the nominal drill hole spacing. (5m East x 10m North x 2.5m RL). Sub-cells are 1m East, 1m North and 0.5m RL to provide a detailed representation of the pegmatites.</li> <li>Block model grade estimates have been generated using Ordinary Kriging</li> </ul>

Criteria	JORC Code explanation	Commentary
	<ul style="list-style-type: none"> <li><i>The availability of check estimates, previous estimates and/or mine production records and whether the MRE takes appropriate account of such data.</i></li> <li><i>The assumptions made regarding recovery of by-products.</i></li> <li><i>Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).</i></li> <li><i>In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.</i></li> <li><i>Any assumptions behind modelling of selective mining units.</i></li> <li><i>Any assumptions about correlation between variables.</i></li> <li><i>Description of how the geological interpretation was used to control the resource estimates.</i></li> <li><i>Discussion of basis for using or not using grade cutting or capping.</i></li> <li><i>The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.</i></li> </ul>	<p>interpolation. Search and sample number parameters have been set up following variography and Kriging Neighbourhood Analysis.</p> <ul style="list-style-type: none"> <li>Estimation is carried out in three passes, with a first search of 60m x 60m x 10m, a second search of 120m x 120m x 10m and a final pass of 200m x 200m x 25m.</li> <li>Primary estimation is carried out on Li<sub>2</sub>O%.</li> <li>Estimation is limited to material coded as pegmatite.</li> <li>Estimation is carried out in unfolded space.</li> <li>A top cut of 5% Li<sub>2</sub>O has been used to mitigate the effect of a small number of high grade outliers.</li> <li>Block model validation has been carried out by several methods, including: <ul style="list-style-type: none"> <li>Drill Hole Plan and Section Review</li> <li>Model versus Data Statistics by Domain</li> <li>Easting, northing and RL swathe plots</li> </ul> </li> <li>All validation methods have produced acceptable results.</li> </ul>
<b>Moisture</b>	<ul style="list-style-type: none"> <li><i>Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.</i></li> </ul>	<ul style="list-style-type: none"> <li>Tonnages are estimated on a dry basis.</li> </ul>
<b>Cut-off parameters</b>	<ul style="list-style-type: none"> <li><i>The basis of the adopted cut-off grade(s) or quality parameters applied.</i></li> </ul>	<ul style="list-style-type: none"> <li>Economic analysis is not available as yet, so the resource has been reported at a range of cut-offs.</li> </ul>
<b>Mining factors or assumptions</b>	<ul style="list-style-type: none"> <li><i>Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.</i></li> </ul>	<ul style="list-style-type: none"> <li>Mining is assumed to be by conventional open pit. No mining factors have been applied to the resource model.</li> <li>As the pegmatite lenses interpolated for Li<sub>2</sub>O have relatively limited vertical extent (generally less than 200m below the current topography) no lower limit has been placed on the likelihood of extraction.</li> </ul>
<b>Metallurgical factors or assumptions</b>	<ul style="list-style-type: none"> <li><i>The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical</i></li> </ul>	<ul style="list-style-type: none"> <li>No assumptions applied</li> </ul>

Criteria	JORC Code explanation	Commentary
	assumptions made.	
<b>Environmental factors or assumptions</b>	<ul style="list-style-type: none"> <li>Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.</li> </ul>	<ul style="list-style-type: none"> <li>The Wodgina Project is an active mining area and has a history of mining.</li> <li>No environmental assumptions have been made or considered as part of this estimate.</li> </ul>
<b>Bulk density</b>	<ul style="list-style-type: none"> <li>Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.</li> <li>The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.</li> <li>Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.</li> </ul>	<ul style="list-style-type: none"> <li>Dry Bulk density of the rock types within the estimated area has been assigned based on the division of rock type and weathering condition.</li> <li>The source data was the conclusions of the May 2006 Study by Arthur and MacDonald. In this study specific gravity determinations were obtained for over 200 different samples. These results were compared to core bulk density measurements and values used historically. The conclusion derived a table of recommended bulk density values to be used in future resource modelling work. One exception was made whereby the recommended value for transitional metasediments was lowered from 2.98 to 2.8gm/cm<sup>3</sup>. A value of 1.8gm/cm<sup>3</sup> has been assigned to unconsolidated fill within the pits.</li> <li>The assigned values adequately account for the different primary rock types and weathering state of those rocks.</li> <li>A review of MRL down hole geophysical logging data has resulted in a density of 2.80 being applied to pegmatites in the Cassiterite North East area.</li> </ul>
<b>Classification</b>	<ul style="list-style-type: none"> <li>The basis for the classification of the Mineral Resources into varying confidence categories.</li> <li>Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).</li> <li>Whether the result appropriately reflects the Competent Person's view of the deposit.</li> </ul>	<ul style="list-style-type: none"> <li>The mineral resource has been classified in the indicated and inferred categories, in accordance with the 2012 Australasian Code for Reporting of Mineral Resources and Ore Reserves (JORC Code). A range of criteria has been considered in determining this classification including: <ul style="list-style-type: none"> <li>Geological and grade continuity</li> <li>Data quality.</li> <li>Drill hole spacing.</li> <li>Modelling technique and kriging output parameters.</li> </ul> </li> <li>The Competent Person is in agreement with this classification of the resource.</li> </ul>
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li>The results of any audits or reviews of MRES.</li> </ul>	<ul style="list-style-type: none"> <li>No audits have been carried out.</li> </ul>

Criteria	JORC Code explanation	Commentary
<p><b>Discussion of relative accuracy/confidence</b></p>	<ul style="list-style-type: none"> <li>• <i>Where appropriate a statement of the relative accuracy and confidence level in the MRE using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.</i></li> <li>• <i>The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.</i></li> <li>• <i>These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.</i></li> </ul>	<ul style="list-style-type: none"> <li>• The risk assessment review which has been carried out on the Wodgina Pegmatites Li<sub>2</sub>O Resource Estimate is qualitative in nature and based on the general approach used by resource estimation practitioners and consultants to indicate in relative terms the level of risk or uncertainty that may exist with respect to resource estimation which have cumulative effects on project outcomes.</li> <li>• Relative levels of risk have been assessed as generally low occasionally tending towards moderate with respect to certain aspects of the estimation.</li> </ul>