

## Regulatory Story

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**Thor Mining PLC** - THR CLARIFICATION OF UPGRADED ORE RESERVE AT MOLYHIL  
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### **THOR MINING PLC**

#### **CLARIFICATION OF UPGRADED ORE RESERVE and EXTENDED MINELIFE**

#### **MOLYHIL TUNGSTEN PROJECT**

On 8 January 2018, the Company announced an upgraded ore reserve and extended mine life for its Molyhil Tungsten project. The following clarification release, which reproduces most of the announcement of 8 January 2018, has been made on ASX today to meet ASX guidelines in respect of reporting of reserves and resources and contains additional information which is included in the notes on the Molyhil Open Cut Ore Reserve Statement below.

The Board of Thor Mining Plc ("Thor" or the "Company") (AIM, ASX: THR), is pleased to provide a positive progress update on the Company's wholly owned proposed Molyhil tungsten/molybdenum mine in Australia's Northern Territory ("Molyhil").

In October 2017 the Company announced it had commissioned a revised Ore Reserve study to draw together the technical data from various positive work completed since the last report prepared in 2014. This report containing an Open Cut Ore Reserve Statement has now been successfully completed with positive findings increasing the overall Ore Reserve and extending the Molyhil mine life. Significantly also, a new and potentially profitable additional underground mining option has been identified, in addition to the original plan for Open Pit mining.

#### **Highlights**

- Open Cut Ore Reserve Statement, classified as probable, of 3.5 million tonnes @ 0.29%WO<sub>3</sub> & 0.12% Mo;
- Molyhil Open Cut mine life extended by 17% to 7 years;
- Additionally, significant blocks of the resource, in indicated and inferred resources category, outside and below the pit shell have been assessed and, subject to further drilling and other technical reviews, appear to warrant a subsequent underground mining operation after Open Pit mining has concluded;

- The Company is updating capital and operating cost estimates with an objective of further cost reductions and positively impacting mining and processing economics;
- Work undertaken confirms increased project viability and supports the completion of an upgraded Definitive Feasibility Study (DFS) expected in the current quarter.

**Mick Billing, Executive Chairman, commented:**

"The successful completion of the Ore Reserve Study is a very welcome development for the Molyhil project and the Company. Extending the life of the project, along with evidence that additional blocks have the potential for subsequent underground mining, is a major step forward in the commercialisation potential of Molyhil."

"The boost in grade from ore sorting is especially significant improving the already impressive grade for an open pit tungsten operation by more than 60%"

"Discussions with third parties expressing interest in the Molyhil opportunity confirmed that an extension of mine life was a key precursor to more proactive engagement and with the findings announced today we have moved solidly down that pathway. The fact that this progress has been achieved in an environment when there is an industry desire to secure reliable supplies of tungsten concentrates makes the outcomes announced today all the more timely."

"After a long development road, the board are delighted with the progress achieved of late and are focused on achieving the best commercial outcome for shareholders. As with any project on the commercialisation pathway, shareholders should note that there is no guarantee of a successful outcome."

**Molyhil Open Cut Ore Reserve Statement**

Based upon the Resources Estimate reported to the ASX & AIM on 30 January 2014, and following a re-estimate of costs and metallurgical recovery factors, mining consultancy, AVCS Pty Ltd has issued a statement of Open Cut Ore Reserve for the Molyhil deposit of 3.5 million tonnes averaging 0.29% WO<sub>3</sub> & 0.12% Mo, classified as Probable. See Table 1 and Attachment 1.

The improved outcome is largely driven by cost savings and upgraded test results of pre-concentration of ore using ore sorting technology, reported on 30 October 2017.

**Table 1: Molyhil Open Cut Ore Reserve Statement**

Classification	Reserve '000 Tonnes	WO <sub>3</sub>		Mo	
		Grade %	Tonnes	Grade %	Tonnes
<b>Probable</b>	<b>3,500</b>	<b>0.29</b>	<b>10,200</b>	<b>0.12</b>	<b>4,300</b>
<b>Total</b>	<b>3,500</b>	<b>0.29</b>	<b>10,200</b>	<b>0.12</b>	<b>4,300</b>

Notes:

- Thor Mining PLC holds 100% equity interest in this reserve.
- Estimate has been rounded to reflect accuracy.
- All estimates are on a dry tonne basis.
- The reserve is based upon the Resource Estimate reported on 30 January 2104. The Company is not aware of any changes which could affect this resource estimate.
- The statement is derived from the Indicated portion of the resource estimate only, and the Inferred portion is excluded from the calculations.

- The long-term prices used were US\$300/mtu for 65% WO<sub>3</sub> concentrate and US\$7.92/lb for Mo concentrate at an exchange rate of US\$0.75 to A\$1.00.
- The Reserve extends to a maximum depth below surface of 185 metres.
- Conventional open cut mining methods will be used. An edge dilution of 0.5m was applied to the ore boundary which was defined by a variable cutoff grade function.
- Ore processing will consist of crushing, X-Ray sorting for pre-concentration, grinding, flotation and gravity separation
- The WO<sub>3</sub> and Mo ore sort losses used was 1.0% and 6.0% respectively and the ore sort rock mass rejection rate on average is 39.3%. Post-sorting head grades are increased to an average of 0.47% WO<sub>3</sub> and 0.19% Mo.
- The WO<sub>3</sub> and Mo Processing Recovery post ore sorting used was 84.5% and 72.1% respectively.
- The mining, processing and associated activities proposed, are contained within granted leases, ML23825, ML24429, and ML25721, each of which continue until 1 May 2033.
- Thor has completed and received approval for a Public Environmental Report for the mining and processing activities proposed.
- Approval for the Mining Management Plan was granted in 2008 but was let lapse by Thor.
- The Mining Management Plan is being updated and re-drafting is near completion.

Using this Statement of Open Cut Ore Reserve, AVCS has prepared a 3 stage mining plan to provide Thor with a detailed schedule for the current estimated life of the proposed open pit operation, including tonnes of ore and waste removed and the grade of material mined and sorted. This will be incorporated into a financial model along with revised operating cost estimates, and revised capital cost estimates both currently under review.

It is expected that this process will be completed during the March quarter of 2018.

### Potential for Underground Mining at Molyhil

The study also identified portions of the Indicated and Inferred resource estimate, remaining outside the revised pit shell, which appear economic for mechanised underground mining techniques. Whilst the work required to include this material in any mine schedule is yet to be done, this represents a significant opportunity for the project and will be the subject of further investigation.

#### Enquiries:

Mick Billing	+61 (8) 7324 1935	Thor Mining PLC	Executive Chairman
Ray Ridge	+61 (8) 7324 1935	Thor Mining PLC	CFO/Company Secretary
Colin Aaronson/ Richard Tonthat	+44 (0) 207 383 5100	Grant Thornton UK LLP	Nominated Adviser
Nick Emerson	+44 (0) 1483 413 500	SI Capital Ltd	Broker
Tim Blythe/ Camilla Horsfall	+44 (0) 207 138 3222	Blytheweigh	Financial PR

Updates on the Company's activities are regularly posted on Thor's website [www.thormining.com](http://www.thormining.com), which includes a facility to register to receive these updates by email, and on the Company's twitter page @ThorMining.

### **Competent Persons Report**

The information in this report that relates to the Ore Reserves is prepared by Andrew Vidale who is a Member of The Australasian Institute of Mining and Metallurgy. Andrew Vidale is a full time employee of AVCS and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves" ("The JORC Code 2012 Edition"). Andrew Vidale consents to the inclusion of material within this report by Thor.

The information contained within this announcement is deemed to constitute inside information as stipulated under the Market Abuse Regulations (EU) No. 596/2014. Upon the publication of this announcement, this inside information is now considered to be in the public domain.

### **Molyhil - Table 1**

<b>Criteria</b>	<b>Commentary</b>
<i>Mineral Resource estimate for conversion to Ore Reserves</i>	<ul style="list-style-type: none"> <li>The Ore Reserve estimate is based on the Mineral Resource estimate prepared by Runge Pincock Minarco reported in the October to December 2013 quarterly report.</li> <li>The Mineral Resources are reported inclusive of Ore Reserves.</li> </ul>
<i>Site visits</i>	<ul style="list-style-type: none"> <li>A site visit has not been conducted by the Competent Person.</li> <li>The Competent Person is satisfied that the 3D topographic data supplied and descriptions of the site environment and expected operating conditions are adequate for the completion of appropriate mine designs and schedules and for the estimation of Ore Reserves</li> </ul>
<i>Study status</i>	<ul style="list-style-type: none"> <li>Thor Mining PLC (Thor) completed and published a Definitive Feasibility Study (DFS) in June 2012. A JORC 2004 compliant Ore Reserve was published in May 2012.</li> <li>In July 2014 Thor published an updated ore reserve following the completion of a new mine plan by AVCS. The 2014 mine planning cycle was underpinned by the inclusion of an XRT ore sorting pre-concentration stage in the processing stream and incorporated revised operating and capital cost estimates and metal prices.</li> <li>This 2017 ore reserve estimate is based on another mine planning cycle incorporating further improvements to the ore sorting model and the most recent operating and capital cost estimates and projected metal prices.</li> <li>Thor are currently reviewing capital cost estimates and all indications point to a likely reduction, however, the impact on project NPV and IRR are not expected to be significant.</li> </ul>

<b>Criteria</b>	<b>Commentary</b>
<i>Cut-off parameters</i>	<ul style="list-style-type: none"><li>• An NSR based cut-off policy has been adopted taking into consideration:<ul style="list-style-type: none"><li>○ WO<sub>3</sub> price</li><li>○ Mo price</li><li>○ Processing cost</li><li>○ Metallurgical recoveries</li><li>○ Transport cost</li><li>○ G&amp;A costs</li></ul></li><li>• Royalty to Northern Territory government and private entities were not included in the calculation of the NSR</li></ul>

Criteria	Commentary
<i>Mining factors or assumptions</i>	<ul style="list-style-type: none"> <li>• The Ore Reserve has been estimated from detailed pit designs which were based on a preferred shell chosen from a range of pit optimisation shells. The pit optimisation incorporated sensitivity analyses on mining cost, processing cost, revenue, slope angle and geo-metallurgical recovery.</li> <li>• The Ore Reserve estimate assumes conventional truck and shovel open pit mining practices, X-Ray ore sorting and conventional flotation and gravity processing practices.</li> <li>• Pit design slope parameters were sourced from a report by Pells Sullivan Meynik; "Molyhil, Geotechnical Open Pit Slope Design Aug 2012. Overall slope angles for pit optimisation were adjusted for the likely impact of ramps - these overall angles aligned well with final pit designs.</li> <li>• The resource block model provided by Thor has block dimensions of 1.25m in the east-west direction x 2.5m in the north-south direction x 2.5m in elevation.</li> <li>• A mineable resource model was prepared from the resource model, the mineable resource model incorporates estimates for mining loss and dilution, geo-metallurgical stage recoveries, costs and revenue.</li> <li>• The mining model was regularised to a 5m bench height and a value based ore selectivity analysis assuming a 5m x 5m SMU was carried out to determine ore boundaries.</li> <li>• An edge dilution of 0.5m was applied to the ore boundary.</li> <li>• The net impact<sup>[1]</sup> of regularisation, mining dilution and SMU is: <ul style="list-style-type: none"> <li>○ 102% recovery of mineralised material mass</li> <li>○ 101% mass recovery of WO<sub>3</sub> (98% head grade)</li> <li>○ 99% mass recovery of Mo (97% head grade)</li> </ul> </li> <li>• The ore reserve includes approximately 4% by mass of inferred and unclassified material as dilution.</li> <li>• The proposed pit is developed in three stages. <ul style="list-style-type: none"> <li>○ Stage 1 is approximately 70m deep, has pit floor dimensions of 140m x 35m and yields 1.1 Mt of ore.</li> <li>○ Stage 2 mining width is typically 60m to 100m with a minimum width of 25m. The final pit is approximately 130m deep, including a 5m deep "goodbye" cut which narrows to between 25m and 35m in width. A one way 15m wide ramp is used for the final 20m of the pit.</li> <li>○ Stage 3 mining width is typically 50m to 100m with a minimum width of 25m. The final pit is approximately 230m deep, including a 5m deep "goodbye" cut which narrows to between 25m and 40m in width. A one way 15m wide ramp is used for the final 25m of the pit.</li> </ul> </li> </ul>

Criteria	Commentary
<ul style="list-style-type: none"> <li>• <i>Metallurgical factors or assumptions</i></li> </ul>	<ul style="list-style-type: none"> <li>• Ore processing will consist of crushing, X-Ray sorting for pre-concentration, grinding, flotation and gravity separation. These technologies are industry standards for the type of deposit.</li> <li>• Drilling, bulk sampling and metallurgical test work by Thor has been ongoing since 2005.</li> <li>• The revised ore sorting model features grade dependent rock mass and metal reject fractions averaging: <ul style="list-style-type: none"> <li>○ 39.3% rock mass rejection</li> <li>○ 1.0% WO<sub>3</sub> loss</li> <li>○ 6.0% Mo loss</li> </ul> </li> <li>• Metallurgical recoveries average: <ul style="list-style-type: none"> <li>○ 84.5% recovery of WO<sub>3</sub> in mill feed ~ 83.7% of ROM feed</li> <li>○ 72.1% recovery of Mo in mill feed ~ 60.2% of ROM feed</li> </ul> </li> <li>• Copper is a potential penalty element in the Molybdenum concentrate. Test work indicates the copper grade will not exceed the allowable limit in previous off-take agreements hence no price penalty has been applied.</li> <li>• Molybdenum is a potential penalty element in the Scheelite concentrate. Test work indicates the molybdenum grade is likely to be above the penalty threshold. Price penalties are applied in; the calculation of NSR, the pit optimisation and the financial model based on estimates from off-take partners.</li> </ul>
<ul style="list-style-type: none"> <li>• <i>Environmental</i></li> </ul>	<ul style="list-style-type: none"> <li>• Approval for the Mining Management Plan was granted by the Northern Territory Director of Mining and Petroleum Authorisations and Evaluations in 2008 but was let lapse by Thor.</li> <li>• The Mining Management Plan was re-submitted in June 2012. Thor have been requested to conduct additional sampling in respect of waste rock characterisation, and some additional design parameters in respect of the proposed Tailings Storage Facility. Both works are in progress.</li> <li>• Geological data indicates the waste rock is not likely to be acid producing, however further studies are currently in progress on waste rock characterisation or selective placement.</li> </ul>

Criteria	Commentary
<i>Infrastructure</i>	<ul style="list-style-type: none"> <li>• Infrastructure for all activities will need to be installed/constructed before the commencement of mining.</li> <li>• Site access from the Plenty Highway will require upgrading of an existing road for both transport of construction materials and concentrate shipment. Agreements are in place with the landholder for use of this road.</li> <li>• All available space within the ML's 23825, 24429 &amp; 25721 is used for either site facilities or waste rock disposal due to the increase in pit size compared with the 2014 mine plan. Approximately 0.7Mbcm of waste is assumed to be disposed beyond the northern extend of ML24429 which is within Thor's exploration lease EL22349.</li> <li>• Tailings disposal is based on designs proposed by BTM Solutions in March 2015 in the report titled "Molyhil Tailings Storage Facility Design Review". The tailings storage facility comprises two contiguous cells approximately 12m high located to the east of the pit primarily within ML24429 but extending to south into ML25721</li> <li>• A community assessment of stakeholders was conducted in 2007. Stakeholders consulted in identifying opportunities and risks were: <ul style="list-style-type: none"> <li>○ Central Land Council (CLC)</li> <li>○ Indigenous Coordination Venture</li> <li>○ Indigenous Business and Industry Services</li> <li>○ Alice Springs Town Council</li> <li>○ Mining, Petroleum and Defence Support Group</li> <li>○ Desert Knowledge Australia</li> <li>○ Centre for Appropriate Technology</li> <li>○ Arltarlpilta Community Government Council</li> <li>○ Jinka/Jervois station</li> </ul> </li> <li>• An agreement is in place with the CLC to provide indigenous employment opportunities.</li> </ul>
<i>Costs</i>	<ul style="list-style-type: none"> <li>• Full project valuation has been conducted by Thor. The Competent Person understands that capital costs have been sourced from suppliers and contractors during the DFS process and since updated by Thor.</li> <li>• Operating costs have been based on supplier quotes and extrapolation by Thor.</li> <li>• An exchange rate of 0.75 USD/AUD has been used in the pit optimisation and calculation of the NSR.</li> <li>• Royalty to Northern Territory government and Central Land Council have been calculated in the financial model.</li> </ul>
<i>Revenue factors</i>	<ul style="list-style-type: none"> <li>• NSR calculation and pit optimisation used: <ul style="list-style-type: none"> <li>○ US\$300/mtu for WO<sub>3</sub></li> <li>○ US\$7.92/lb for Mo</li> </ul> </li> <li>• The WO<sub>3</sub> price was determined by discounting the predicted long term price of US\$350/mtu by \$50 for <sup>[2]</sup>APT.</li> <li>• The Mo price was determined by discounting the predicted long term price of <sup>[3]</sup>\$9.00/lb by 12% refining charge.</li> </ul>

<b>Criteria</b>	<b>Commentary</b>
<i>Market assessment</i>	<ul style="list-style-type: none"> <li>Neither tungsten nor molybdenum have potential substitutes for their main application and consumption for both is expected to continue to grow. Molybdenum is often a secondary product from Cu or Cu/Au mines and production can be readily turned on or off as demand and price dictates.</li> <li>Market predictions for tungsten beyond 2014 are for demand to exceed supply and price to increase.</li> <li>Market predictions for molybdenum beyond 2013 are for demand to increase with global GDP and prices increase beyond 2015.</li> </ul>
<i>Economic</i>	<ul style="list-style-type: none"> <li>Economic inputs such as foreign exchange rates, royalties, costs, discount rate etc are set by Thor and have been tested in the project valuation model.</li> <li>Project assessment by Thor indicates a very attractive positive net present value and IRR.</li> </ul>
<i>Social</i>	<ul style="list-style-type: none"> <li>Consultation has occurred with the relevant stakeholders, including aboriginal peoples who claim affinity with the land upon which the plant will be located.</li> <li>Tripartite Deed of Agreement has been executed in 2008 between the NT government, Thor, the Central Land Council and the Arrapere Group.</li> <li>Thor obtained the Aboriginal Areas Protection Authority Certificate in March 2012.</li> </ul>
<i>Classification</i>	<ul style="list-style-type: none"> <li>The entire Ore Reserve is classified as Probable.</li> <li>Only Indicated Mineral Resources were considered in the calculation of the NSR for the purposes of pit optimisation and reserves estimation.</li> <li>The Ore Reserve estimate does include minor quantities of Inferred Resources and unclassified mineralisation that have resulted from the formation of an SMU and/or inclusion of edge dilution across the Indicated Resource block boundary. This additional material is ~ 4% of the estimated reserve mass and but makes no contribution to the recovered WO<sub>3</sub> and Mo.</li> <li>No portion of the Probable Ore Reserves have been derived from Measured Resources - there are no Mineral Resources of Measured classification.</li> </ul>
<i>Audits or reviews</i>	<ul style="list-style-type: none"> <li>The Ore Reserves has not been externally audited.</li> </ul>

Criteria	Commentary
<i>Discussion of relative accuracy/confidence</i>	<ul style="list-style-type: none"> <li>The pit designs and mine schedule on which the Ore Reserve is based have been prepared to Feasibility Study level with a corresponding level of confidence.</li> <li>The mineralisation at Molyhil comprises two near vertically dipping iron rich skarn lobes in granite host rock. The defined ore boundaries are, within each lobe, continuous and in the order of 50m wide (east to west) by 100m long (north to south) for the western lobe and 40m wide (east to west) by 80 m long (north to south) for the eastern lobe overall.</li> <li>Minimum mining width across the ore zones rarely approaches the assumed SMU limit of 5m and is more typically greater than 20m.</li> <li>The external ore boundary is typically at the contact between the skarn and the host granites and thus easily visually identified. The internal waste boundaries and external boundaries that are within the skarn will require blast hole sampling and/or a field XRF for grade control.</li> <li>Mining modifying factors, pit designs and schedule reflect the scale of the intended equipment and planned operation.</li> </ul>

[1] ROM ore reserve compared with in-situ Measured and Indicated resources at 0.1% combined  $W_o_3+Mo$  cutoff within the final pit design.

[2] Reduction for refining to Ammonium Para Tungstate (APT) which is the most traded form of tungsten.

[3] Allows for refining to Mo.

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