# ASX Announcement



# Quarterly Activities Report for period ending 30<sup>th</sup> September 2018

# **Highlights:**

# Gabanintha Project

- Robust base case for PFS released, showing strong economic case, supporting ongoing work<sup>\*</sup>
- Drilling program undertaken to resolve key parameters required for successful and safe long-term open pit design
- Drilling completed to target a conversion of Inferred to additional Indicated resources along strike of AVL's 11km strike at Gabanintha
- New strategic tenement pegged at southern end of Gabanintha vanadium deposit
- Letter of Intent signed with German VRFB manufacturer SCHMID to explore supply of vanadium pentoxide and/or vanadium electrolyte

# VSUN Energy

- Two years' continuous uninterrupted VRFB operation at Busselton installation
- Letter of Intent signed with German VRFB manufacturer SCHMID to offer EverFlow® energy storage solutions to potential clients

# **Corporate**

- Vanadium prices exceeded 10 year high during the quarter, reaching close to US\$30/lb V<sub>2</sub>O<sub>5</sub> during the period and subsequently exceeding. Strong fundamentals for high demand and low supply in China persist
- \$343,000 raised through the exercise of 2 cent Listed Options
- Cash position of \$4.2M. Use of funds to focus on PFS deliverables and progression into DFS if appropriate.

# 31.10.2018

### ASX ANNOUNCEMENT

#### Australian Vanadium Limited

ASX: AVL FRA: JT7.F

ABN: 90 116 221 740

T: +61 8 9321 5594 F: +61 8 6268 2699 E: info@australianvanadium.com.au W: australianvanadium.com.au

#### Street Address:

Level 1, 85 Havelock Street West Perth, WA 6005

### Postal Address:

Level 1, 85 Havelock Street West Perth, WA 6005

### Projects:

Gabanintha – Vanadium Coates - Vanadium Blesberg –Feldspar/Lithium/Tantalum Nowthanna Hill - Uranium/Vanadium



\* Refer to ASX announcement dated 26<sup>th</sup> September 2018 Gabanintha Presents Robust Base Case for Pre-Feasibility Study



Activities for the September 2018 quarter for Australian Vanadium Limited ("AVL" or "the Company") are as follows:

# GABANINTHA VANADIUM PROJECT

# Release of robust base case for Pre-Feasibility Study (PFS) – Refer to Cautionary Statement at the end of this announcement.

The Company announced on 26<sup>th</sup> September 2018 that an initial vanadium production scenario had been developed for the Gabanintha Vanadium Project as part of the ongoing PFS work. For full details and disclosures refer to ASX announcement *Gabanintha Presents Robust Base Case for PFS* dated 26<sup>th</sup> September 2018. The base case demonstrated robust project fundamentals, competitive product costs and financials, with further optimisation potential. The initial base case has been developed based on an industry standard, low-risk method of beneficiation and refining.

The project uses a proposed open pit mine; crushing, milling and beneficiation plant (CMB) and refining plant, for final conversion and sale of high-quality vanadium pentoxide (V<sub>2</sub>O<sub>5</sub>) for use in steel, specialty alloys and developing energy storage markets. The initial findings are encouraging and highlight AVL's potential to become a new low-cost vanadium producer. Options analysis is being undertaken as a normal component of the PFS with the target of confirming an optimised case to be taken into DFS at a later date. In parallel with the options work, capital costs are being developed to the required accuracy level of ±25%.

The study base case for the Gabanintha pre-feasibility study consists of:

- A vanadium pentoxide (V<sub>2</sub>O<sub>5</sub>) refinery at the Gabanintha site with an annual production rate of approximately 22.5 million pounds of V<sub>2</sub>O<sub>5</sub> per annum (10,100tpa) with an initial mine life of 17 years based on existing Measured, Indicated and a portion of the Inferred Mineral Resources.
- Open pit mining and beneficiation operation producing an estimated 900,000t of magnetic concentrate at planned grade of  $1.39\% V_2O_5$  and a low  $1.5\% SiO_2$  content.
- Average mass yield from the concentrator is estimated at 62.1% for the life of mine. This is exceptionally high versus other current operating vanadium operations, allowing for a compact and effective crushing and milling operation.
- A base metals circuit will extract an estimated 1500 tpa sulphide concentrate containing cobalt, nickel, and copper<sup>1</sup>. The project viability is not dependent on the mining and sale of base metals contained in the schedule.
- Base metal sales account for less than 2% of estimated overall gross revenues for the life of the project.
- Operating expenses are currently estimated at US\$4.13/lb V<sub>2</sub>O<sub>5</sub> equivalent<sup>2</sup> (±35%), assuring a low-cost operation that will be healthy throughout the vanadium business cycles.
- Initial indicative capital costs of US\$362M (±35%).

The current project scenario utilises 43% Measured resources, 20% Indicated resources and 37% Inferred resources. The inferred resources are not a determining factor for project viability.

In Table 1 below, NPV and IRR are reported at various V<sub>2</sub>O<sub>5</sub> pricing assumptions. Assuming a V<sub>2</sub>O<sub>5</sub> price of US\$13/lb, NPV is \$1.1bn, with an IRR of 39.5%. At current market prices, NPV is \$2.37bn. Using US\$8.00/lb

<sup>&</sup>lt;sup>1</sup> Bryah Resources Limited holds the rights to nickel, copper and gold recovered from any production, however AVL will benefit from this development in processing due to its 14% holding in Bryah (ASX: BYH).

 $<sup>^2</sup>$  V<sub>2</sub>O<sub>5</sub> equivalent pricing is determined by subtracting average base metal credits from average operating expenses through the life of mine.



 $V_2O_5$ , the NPV of \$191m highlights that the project is robust and offers returns even at conservative pricing assumptions. The project breaks even at a  $V_2O_5$  price of US\$6.95/lb for the life of the project. Since the release of the referenced announcement, prices have crossed the US\$30/lb mark.

		Year 1-5	\$8/lb	\$13/lb	\$13/lb	\$20/lb
		Year 6-17	\$8/lb	\$8/lb	\$13/lb	\$20/lb
	NPV <sub>8%</sub>	M US\$	\$191	\$575	\$1,099	\$2,370
/	IRR	%	14.5%	33.6%	39.5%	69.8%
	Opex	US\$/lb	\$4.28	\$4.28	\$4.28	\$4.28
)	Opex (V <sub>2</sub> O <sub>5</sub> Equiv) <sup>2</sup>	US\$/lb	\$4.13	\$4.13	\$4.13	\$4.13
)	UDCF	M US\$	\$705	\$1,193	\$2,386	\$4,739

#### Table 1 Key Financial Metrics for Base Case

The Gabanintha vanadium project is located 740km northeast of Perth and 42km SSE of Meekatharra in the Murchison District, Western Australia. Gabanintha consists of 11 tenements covering 760 sq km. Gabanintha is held 100% by Australian Vanadium Limited, an Australian listed company. Mining Lease Application M51/878 is currently awaiting approval and covers about 70% of the mineral resource, with the balance of the inferred Mineral Resource located on E51/843, owned 100% by AVL.

The mineral deposit consists of a basal massive magnetite zone (10m - 15m in drilled thickness), containing greater than 0.8%  $V_2O_5$ , overlain by up to five lower grade mineralised magnetite banded gabbro units between 5 and 30m thick, separated by thin waste zones (<0.3%  $V_2O_5$ ). Vanadium mineralisation is found in the basal massive magnetite horizon, as well as the lower grade banded magnetite gabbro horizons overlying the main high-grade unit. (See typical cross section Figure 3).

All mineralised domains were constructed using geological information and considering a nominal cutoff for inclusion of above  $0.4\% V_2O_5$  for the low-grade ore zones and above  $0.7\% V_2O_5$  within the high-grade zone in the Mineral Resource estimate for a total resource of:

- 175.5 million tonnes at 0.77 %  $V_2O_5$  containing 1,348,300 tonnes of  $V_2O_5;$
- A discrete high-grade zone of 93.6 million tonnes at 1.00% V<sub>2</sub>O<sub>5</sub> containing 936,000t V<sub>2</sub>O<sub>5</sub>;
- Discrete low-grade zones of 77.5 million tonnes at 0.50%  $V_2O_5$  containing 384,000t  $V_2O_5$ .

Combined Measured and Indicated Mineral Resources of 34.1 million tonnes at 0.77% V<sub>2</sub>O<sub>5</sub> in low and high-grade domains containing 263,000t V<sub>2</sub>O<sub>5</sub>, suitable to underpin a long life, low-cost, high-grade feed, open-cut mining operation.

The initial Gabanintha open pit is planned to be 2,700 metres long, 380m wide and 220m deep. This layout suggests that the open pit design could be relatively efficient and access for mine scheduling should be better than average. The current estimated open pit life is 17 years. The pit designs contain approximately 22.7Mt of ore at an average grade of 1.05% V<sub>2</sub>O<sub>5</sub> and is expected to be mined along with 144Mt of waste for an overall strip ratio of 6.3. The optimisation of the pit shells uses a base price of US\$8/lb. The pit design on which the base case is considered contains 43% Measured Resources, 20% Indicated Resources and 37% Inferred Resources.

AVL's team has many years of expertise in vanadium processing design and operation globally. This expertise is critical for the best project outcome. The base case has been developed and capital and operating costs determined at a  $\pm 35\%$  level of accuracy.

The next steps in the PFS include designing and costing a number of options with the potential to improve project financial metrics. Once these options have been explored, the PFS will progress through to the establishment of a final operational design, where opex and capex will be estimated to within  $\pm 25\%$ . Major equipment Requests



for Quotation (RFQs) have been developed and have been issued, with quotations expected in the following weeks. AVL advises that the final PFS is on schedule and on budget for completion in December 2018.

### Critical Factors

Material assumptions used in the Base Case PFS report are outlined in the Material Assumptions Table of the ASX announcement Gabanintha Presents Robust Base Case for PFS dated 26th September 2018 on pages 30-34.

#### Vanadium Pricing Assumption

An indicative economic analysis of the Gabanintha vanadium project has been performed using current cost estimates at four pricing assumptions. A summary of the outcomes is presented in Table 1. Metals Bulletin (MB) published  $V_2O_5$  pricing has exceeded US\$30/lb this year. AVL believes that there is significant upside for vanadium pricing in the mid-term. However, it is the Company's view that a vanadium project must be economically viable in low priced market conditions. AVL has therefore used a price of US\$8.00/lb for mine modeling and pit optimisation. The LMB 15 year mean price is US\$8.30/lb. Figure 1 below shows the MB 15 year  $V_2O_5$  pricing.



Figure 1 LMB V<sub>2</sub>O<sub>5</sub> Midpoint Average Price



# Vanadium Recovery from Oxidised Material

See Material Assumptions Table (pg 30-34) – ASX announcement 26<sup>th</sup> September 2018, Metallurgical Factors section.

Vanadium bearing oxidised massive titaniferous magnetite occurs near surface along the entire length of the Gabanintha orebody. As such, this material will be mined early in the mine schedule. AVL has performed a limited number (6) of benchscale metallurgical tests on oxidised composite samples, for which both magnetic and gravity separation processes have demonstrated potential to upgrade vanadium. Small scale medium intensity (2600G) magnetic variability tests (122 of) have been undertaken on oxidised samples, mostly from the upper profile (within 30-40m of surface). The results indicate variation along strike in the degree and depth of oxidation and a general trend of increasing magnetic yield and improving concentrate quality with depth from surface.

For the interim, the weighted average magnetic vanadium recovery achieved in the variability tests (40% of  $V_2O_5$ ) has been applied to blocks from the upper well oxidised zone, as the basis of mine modelling. A more gradational averaging approach has been applied to estimate vanadium recovery from material in the transitional profile below using a correlation derived by reference to Satmagan<sup>3</sup> measurements. The estimated transitional zone vanadium recovery increases from 70% at the upper oxide boundary to 89% at the basal fresh rock interface.

Further variability testing is being planned to support a Definitive Feasibility Study (DFS), designed to better understand, characterise and predict the metallurgical performance of material within the weathered horizon. The Company believes that there is a significant opportunity to improve mining and milling economics once this comprehensive testing program is completed.

# Gas and Reagent Pricing

See Material Assumptions Table, ASX Announcement, 26th September (pg 30-34), Costs section.

Used both for power generation and heat for vanadium roasting, natural gas comprises 19% of the base case operating cost (opex). Likewise, the sodium reagent used for roasting accounts for another 12% of overall operating costs. Pricing estimates for natural gas are based on quotes for gas delivery to site from energy infrastructure providers; sodium roasting reagent pricing is based on market quotations. AVL believes that there is a potential to substitute lower cost sodium sources and work is underway to explore this as part of the ongoing options studies.

# Refinery Flowsheet and Design Basis

See Material Assumptions Table, ASX Announcement 26<sup>th</sup> September (pg 30-34), Process Design Criteria section.

Metallurgical testing to date has focused on characterising material types and supporting a concentrator flowsheet. No testing of the refinery flowsheet, including the roast leach extraction and purification of vanadium, has been undertaken to date. As such, the refinery is assumed to follow a typical industry proven flowsheet path for which the engineers working on the study have applied benchmark design criteria from other similar projects.

The first phase of benchscale roast and leach testing has been designed and will be applied to a fresh composite magnetic concentrate sample. Learnings from this testwork will be used to support the flowsheet and guide pilot testwork planning for a DFS.

#### Funding

The Company has funding in place to complete the PFS. This includes Cash at Bank of \$4.292m at the end of this quarter. Budget estimates from major consultants of \$1 million have been factored in for the September and December 2018 quarters and the Board is confident that sufficient funding is in place.

In the event of a positive PFS, the first funding stage will be to complete the DFS. Funding for pilot plant test work and initial stages of the DFS is expected to be provided by existing working capital and through funds raised by the exercise of listed options (AVLO, strike price 2c per share, ex 31 Dec 2018). These options are "in the money"

<sup>&</sup>lt;sup>3</sup> SATMAGAN (Saturation Magnetic Analyser) is a laboratory method to determine the proportion of magnetic iron oxide (Fe<sub>3</sub>O<sub>4</sub>) present.



and currently represent potential funds of \$7.55m for the Company. Budget estimates for the completion of this phase are not yet completed.

The Board believes that there are strong "reasonable grounds" to assume that future funding will be available for the completion of the PFS, DFS, pilot studies and pre-production capital as outlined in the September 26<sup>th</sup> ASX Announcement.



Figure 2 Infrastructure Location Diagram (Initial Proposed) Gabanintha Project



Northeast

surface

450mRL

400mRL

Top of Bedrock

Oxidatic

Base of Complete Oxidation

Base of Partial

18metres at 1.09%V205



A total of 13 drill holes were completed comprised of 3 diamond drill holes and 10 RC drill holes.

The aim of the drilling program was to resolve key parameters required for successful and safe long-term open pit design. The program incorporated:

Geotechnical data to optimise pit slope angles.

**GRC190** 

2m@0.46

35m@0.48

LG2

7m@0.50

**GRC082** 

31m@0.49

10m@0.55

22m@0.94

156m

**Inferred Base** Metal Resource

50 metres

11m@0.47

**GRC019** 

13m@0.48

10m@0.52

6m@0.49

**GRC018** 

16m@0.54

10m@0.57

17m@1.03

125m

23m@0.55

15m@0.91

96m

Footwall waste

High Grade Zone

LG3

LG2

Waste

Australian

**AUSTRALIAN VANADIUM LIMITED** 

**GABANINTHA VANADIUM PROJECT** Section GDH912-GRC191

August 2018

18m@1.09

Low Grade Ore Zones

LG8

LG7

LG4

LG5

19m@1.09

**GRC191** 

20m@1.06

Proposed

**Open Pit** 

49m

19m@1.06

36m

20m@0.54

- $\geq$ Advanced downhole telemetry to resolve structural domains at depth.
- Increased resolution of oxide, transitional and fresh mineralisation boundaries, and

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- > Hydrological testing of new and existing holes.
  - Drilling targeted a conversion of Inferred to Indicated resources.
  - Drilling increased the understanding of the cobalt and base metal resource.
  - Program focused on the development area in the northern 2km of the total 11.5km of AVL held deposit strike



Figure 4 Location Diagram of the Gabanintha Project



#### New tenement at Gabanintha

The Company announced on 10<sup>th</sup> September 2018 that it had pegged a new exploration licence adjacent to its Gabanintha vanadium mineral resource near Meekatharra, further strengthening the Company's dominant mineral rights position in the Gabanintha area, (see Figure 4)

The licence (E51/1899) lies to the south of the Company's Gabanintha vanadium-titanium-iron mineral resource and to the east of its Nowthanna Hill project which contains both uranium and vanadium. The new tenement covers an area of 49.7 square kilometres. AVL now holds over 240 square kilometres in 8 exploration licences over the Gabanintha area. Mining Licence application MLA51/878 (area over 35km<sup>2</sup>) overlies a 9.5km section of the Gabanintha vanadium deposit.

#### Letter of Intent with VRFB Producer

On 28<sup>th</sup> August 2018 AVL announced that it had signed a Letter of Intent with German VRFB manufacturer, SCHMID to explore the supply of vanadium and/or vanadium electrolyte.

AVL and SCHMID, a German manufacturer of vanadium redox flow batteries (VRFB), will explore potential supply of vanadium pentoxide and/or vanadium electrolyte. The letter has been signed on a non-binding basis and is subject to commercial competitiveness.

In parallel, AVL's 100% owned subsidiary, VSUN Energy, has signed a Letter of Intent to offer SCHMID's EverFlow<sup>®</sup>'s large scale and telecom VRFB to its potential clients.

AVL have built a relationship with SCHMID over the past three years and these Letters of Intent solidify our plans with them moving forward. VRFB manufacturers are increasingly aware it is crucial to secure an ongoing supply of vanadium and with the Gabanintha high-grade vanadium deposit moving steadily towards production, we look forward to working closely with SCHMID as a potential client. The relationship is now a two-way partnership with VSUN Energy promoting the EverFlow<sup>®</sup> VRFB systems and provides an opportunity to collaborate.





Schmid Building Integrated Energy Storage

Schmid EverFlow Compact Energy Storage

Figure 5 SCHMID EverFlow Large Scale VRFB Energy Storage





#### **VSUN ENERGY**

On 14<sup>th</sup> September 2016 AVL announced that its subsidiary, VSUN Energy, had successfully installed a 10kW/100kWh VRFB at a native tree nursery in Busselton, Western Australia. The battery has now been running the site continuously for over 2 years with no outages or required maintenance. The battery was a secondhand VRFB which demonstrates its environmental credentials as a product able to be redeployed. The vanadium electrolyte in a VRFB can be re-used at the end of the mechanical battery's life and does not require disposal.

AVL announced on 28<sup>th</sup> August 2018 that VSUN Energy had signed a Letter of Intent with German VRFB battery manufacturer, SCHMID to offer its large scale and telecom EverFlow® energy storage solutions to potential clients.

# CORPORATE

#### Vanadium Price

During the quarter, the vanadium price made significant advances, finishing close to all time highs of US27/lb V<sub>2</sub>O<sub>5</sub>. Subsequent to the end of the quarter these prices moved over US30/lb V<sub>2</sub>O<sub>5</sub>.

The underlying strength in the vanadium price has been driven by enforced changes to specific consumption of vanadium in the Chinese ferroalloy market. These changes come into full effect on 1 November and prices have been increasing significantly in 2018.

Global supplies remain very tight, with no sign that new large amounts will come on line in the next two to three years. Increases will come from the small group of existing producers. New mine production from low cost producers in the coming years is required to fill the rising demand gap.

#### Marketing

For the first time Benchmark Minerals, the highly regarded lithium ion battery raw material supply chain specialists, included vanadium in their World Tour. Vincent Algar gave the inaugural presentation which was well received in the Australian cities that the tour visited.

Vincent also presented at the World Mining Summit in Perth and the FerroAlloyNet conference in Xiamnen, China. Vincent took the time to meet with and update MOU partners, Win Win Group during the conference. AVL and Win Win will continue to exchange information and build on their relationship as they both move closer to their respective production ambitions.

Vanadium prices continue to trend steadily upwards since and recently breached US\$30/lb V2O5.

Director Daniel Harris represented the Company at the Vanitec meeting in London in early October. One of the key discussion items was the potential for leasing vanadium electrolyte, a process that would drastically reduce the cost of VRFB.

#### **Capital Raising**

During the quarter the Company received a total of \$343,000 through the exercise of 2.0 cents per share listed options (expiring December 31, 2018).



#### **Cash Position**

As at the 30<sup>th</sup> September 2018, the Company had \$4.292 million in cash and cash equivalents.

For further information, please contact:

Vincent Algar, Managing Director



Table 2 Gabanintha Project – Mineral Resource estimate by domain and resource classification using a nominal 0.4%  $V_2O_5$  wireframed cut-off for low grade and nominal 0.7%  $V_2O_5$  wireframed cut-off for high grade (total numbers may not add up due to rounding)

Zone	Classification	Mt	V2O5 %	Fe %	TiO₂ %	SiO <sub>2</sub> %	Al2O3 %	LOI %
HG 10	Measured	10.1	1.11	42.7	12.6	10.3	8.0	4.0
	Indicated	4.9	1.09	43.3	12.1	10.5	7.8	3.7
	Inferred	78.6	0.98	42.4	11.2	11.4	7.6	3.4
	Sub-total	93.6	1.00	42.5	11.4	11.3	7.6	3.5
LG 2-5	Measured	-	-	-	-	-	-	-
	Indicated	19.1	0.51	23.9	7.0	27.8	18.1	8.7
	Inferred	58.5	0.49	25.5	6.7	27.5	16.5	7.4
	Sub-total	77.5	0.50	25.1	6.8	27.5	16.9	7.7
Transported 6-8	Measured	-	-	-	-	-	-	-
	Indicated	-	-	-	-	-	-	-
	Inferred	4.3	0.65	28.1	7.2	24.7	16.7	8.5
	Sub-total	4.3	0.65	28.1	7.2	24.7	16.7	8.5
Total	Measured	10.1	1.11	42.7	12.6	10.3	8.0	4.0
	Indicated	24.0	0.63	27.9	8.0	24.2	16.0	7.7
	Inferred	141.4	0.77	35.0	9.2	18.5	11.5	5.2
	Sub-total	175.5	0.77	34.5	9.3	18.8	11.9	5.5



AVL is a diversified resource company with an integrated strategy with respect to vanadium, seeking to offer investors a unique exposure to all aspects of the vanadium value chain – from resource through to steel and energy storage opportunities.

 $\Delta$ VL is advancing the development of its 100%-owned, world-class Gabanintha vanadium project. The Gabanintha vanadium project is currently one of the highest-grade vanadium projects being advanced globally with existing Mineral Resource of 175.5Mt at 0.77% vanadium pentoxide (V<sub>2</sub>O<sub>5</sub>), made up of a Measured Mineral Resource of 10.1Mt at 1.11% V<sub>2</sub>O<sub>5</sub>, an indicated Mineral Resource of 24Mt at 0.63% V<sub>2</sub>O<sub>5</sub>, and an Inferred Mineral Resource of 141.4Mt at 0.77% V<sub>2</sub>O<sub>5</sub>, reported in compliance with the JORC Code 2012 (see AVL ASX Announcement 5<sup>th</sup> July 2018).

The Mineral Resource includes a distinct massive magnetite high-grade zone of 93.6 Mt at 1.00%  $V_2O_5$  consisting of Measured Mineral Resource of 10.1Mt at 1.11%  $V_2O_5$ , Indicated Mineral Resource of 4.9Mt at 1.09%  $V_2O_5$ , and Inferred Mineral Resource of 78.6Mt at 0.98%  $V_2O_5$ .

AVL is aiming to develop a local commercial production capacity for high-purity vanadium electrolyte, which forms a key component of vanadium redox flow batteries (VRFB). AVL, through its 100%-owned subsidiary VSUN Energy Pty Ltd, is also actively marketing VRFB in Australia.

#### Tenement Schedule

Tenement Information as Required by Listing Rule 5.3.3 For the Quarter Ended 30 September 2018							
Project	Location	Tenements	Economic Interest	Notes	Change in Quarter %		
Western Australia	Gabanintha	E51/843	100% Granted <sup>1</sup>		Nil		
1		E51/1396	100% Granted <sup>1</sup>		Nil		
		E51/1534	100% Granted <sup>1</sup>		Nil		
		E51/1576	100% Granted <sup>1</sup>		Nil		
		E51/1685	100% Granted <sup>1</sup>		Nil		
		E51/1694	100% Granted <sup>1</sup>		Nil		
1		E51/1695	100% Granted <sup>1</sup>		Nil		
		P51/2566	100% Granted <sup>1</sup>		Nil		
		P51/2567	100% Granted <sup>1</sup>		Nil		
		P51/2634	100% Granted <sup>1</sup>		Nil		
		P51/2635	0%	Surrendered	100%		
		P51/2636	0%	Surrendered	100%		
		MLA51/878		100% On application	Nil		
		E51/1899		100% On Application	Nil		
Western Australia	Nowthanna	M51/771	100% Granted		Nil		
Western Australia	Peak Hill	E52/3349	0.75% NSR Production Royalty		Nil		
Western Australia	Coates	E70-4924-I	100% Granted		Nil		
South Africa	Blesberg	(NC) 940 PR		Earning 50.03%	Nil		

Note 1: Australian Vanadium Limited retains 100% rights in V/U/Co/Cr/Ti/Li/Ta/Mn & iron ore on the Gabanintha Project. Bryah Resources Limited holds the Mineral Rights for all minerals except V/U/Co/Cr/Ti/Li/Ta/Mn & iron ore only.



#### **Cautionary Statements**

These results are based on a preliminary technical and economic study of the potential viability of developing an open pit mine and standalone vanadium plant to be constructed onsite at Australian Vanadium Limited's Gabanintha Vanadium Project. The study referred to in this announcement is based on low level technical and preliminary economic assessments and is insufficient to support estimation of ore reserves or to provide assurance of an economic development case at this stage, or to provide certainty that the conclusions of the study will be realised. The results should not be considered a profit forecast or production forecast.

The production target referred to in this report is based on 43% Measured Resources, 20% Indicated Resources and 37% Inferred Resources for the life of mine. The mine plan comprises 100% of current global Measured resources, 96% of current global Indicated resources, and 11% of current global Inferred resources. The Company has concluded that it has reasonable grounds for disclosing a production target that includes a modest amount of Inferred material. However, there is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Measured or Indicated Mineral Resources or that the production target or the economic assessment will be realised.

The study is based on the material assumptions described elsewhere in the announcement dated 26 September 2018 (table page 30-34). These include assumptions about availability of funding. While the Company considers all the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by the study will be achieved. To achieve the potential mine development outcomes indicated in the study, additional funding will be required. Investors should note that there is no certainty that the Company will be able to raise funding when needed.

However, the Company has concluded that it has a reasonable basis for providing the forward-looking statements included in this announcement and believes it has "reasonable basis" to expect it will be able to fund the development of the AVL Gabanintha Vanadium Project.

To achieve the range of outcomes indicated in this announcement, funding in the order of US\$360 million will likely be required. Investors should note that there is no certainty that Australian Vanadium Limited will be able to raise the amount of funding required or when it will be needed. It is also possible that such funding may only be available on terms that dilute or otherwise affect the value of the Company's existing shares. It is also possible that Australian Vanadium Limited value Limited could pursue other strategies to provide alternative funding options. Given the uncertainties involved, investors should not make any investment decisions based solely on the results presented in this announcement.

#### Forward Looking Statements

Some of the statements contained in this report are forward looking statements. Forward looking statements include, but are not limited to, statements concerning estimates of tonnages, expected costs, statements relating to the continued advancement of Australian Vanadium Limited's projects and other statements that are not historical facts. When used in this report, and on other published information of Australian Vanadium Limited, the words such as 'aim', 'could', 'estimate', 'expect', 'intend', 'may', 'potential', 'should' and similar expressions are forward looking statements.

Although Australian Vanadium Limited believes that the expectations reflected in the forward-looking statements are reasonable, such statements involve risks and uncertainties and no assurance can be given that the actual results will be consistent with these forward-looking statements. Various factors could cause actual results to differ from these forward-looking statements including the potential that Australian Vanadium Limited's project may experience technical, geological, metallurgical and mechanical problems, changes in vanadium price and other risks not anticipated by Australian Vanadium Limited.

Australian Vanadium Limited is pleased to report this summary of the study in a fair and balanced way and believes that it has a reasonable basis for making the forward-looking statements in this announcement, including with respect to any mining of mineralised material, modifying factors, production targets and operating cost estimates. This announcement has been compiled by Australian Vanadium Limited from the information provided by the various contributors to the announcement.



#### **Competent Person Statements – Gabanintha Project**

The information in this report that relates to Exploration Results and Exploration Targets is based on and fairly represents information and supporting documentation prepared by Mr Brian Davis (Consultant with Geologica Pty Ltd). Mr Davis is a shareholder of Australian Vanadium Limited. Mr Davis is a member of the Australian Institute of Geoscientists and has sufficient experience of relevance to the styles of mineralisation and types of deposits under consideration, and to the activities undertaken to qualify as a Competent Person as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) Australiasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Specifically, Mr Davis consents to the inclusion in this report of the matters based on his information in the form and context in which they appear.

The information in this report that relates to Mineral Resources is based on and fairly represents information compiled by Mr Lauritz Barnes, (Consultant with Trepanier Pty Ltd) and Mr Brian Davis (Consultant with Geologica Pty Ltd). Mr Davis is a shareholder of Australian Vanadium Limited. Mr Barnes and Mr Davis are members of the Australasian Institute of Mining and Metallurgy and both have sufficient experience of relevance to the styles of mineralisation and types of deposits under consideration, and to the activities undertaken to qualify as Competent Persons as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Specifically, Mr Barnes is the Competent Person for the estimation and Mr Davis is the Competent Person for the database, geological model and site visits. Mr Barnes and Mr Davis consent to the inclusion in this report of the matters based on their information in the form and context in which they appear.

The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and, in the case of estimates of Mineral Resource or Ore Reserves, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The company confirms that the form and context in which the competent person's findings are presented has not been materially modified from the original market announcement.

#### Competent Person Statement – Metallurgical Results

The information in this statement that relates to Metallurgical Results is based on information compiled by independent consulting metallurgist Brian McNab (CP. B.Sc Extractive Metallurgy), Mr McNab is a Member of The Australasian Institute of Mining and Metallurgy. Brian McNab is employed by Wood Mining and Metals. Mr McNab has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which is undertaken, 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'. Mr McNab consents to the inclusion in the report of the matters based on the information made available to him, in the form and context in which it appears.