ASX ANNOUNCEMENT 20TH AUGUST 2020

IRON-TITANIUM CO-PRODUCT SALE OPPORTUNITIES TO DIFFERENTIATE AVL

Feasibility study innovations identify multiple high-value pathways for iron co-product

KEY POINTS

- **Bankable Feasibility Study to be based on a vanadium processing plant location east of Geraldton in WA.**
- **Location offers a unique opportunity to:**
  - **Access cheaper natural gas for processing and limiting the need for new high-risk, high-cost gas pipeline infrastructure;**
  - **Create capability to produce and sell iron co-products;**
  - **Enable other downstream processing opportunities.**
- **An investigation into calcine sale opportunities has identified multiple potential revenue streams to support AVL's objective of achieving the world's lowest-cost vanadium production.**
- **Funded by a CRC-P research grant, AVL is pursuing further value addition to the iron co-product by:**
  - **Pelletising;**
  - **Upgrading iron-titanium by-products by further removal of gangue and other techniques;**
  - **Developing a processing solution for separating titanium from the calcine.**
- **Based on the PFS, the Project is forecast to produce 922,500 tonnes (dry basis) per annum of 54-55% Fe iron co-product over a 17 year mine life.**
- **Vanadium and titanium are both recognised as critical metals by Australia and its major trading partners.**

Australian Vanadium Limited (ASX: AVL, "the Company" or "AVL") is pleased to provide an update on the planned production of an iron rich co-product from its 100% owned Australian Vanadium Project ("the Project"), located at Gabanintha, south of Meekatharra in Western Australia. The proposed Project, which is currently the subject of a Bankable Feasibility Study (BFS) by the

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Company, includes open cut mining, a concentrator and a vanadium processing plant to produce approximately 10,115 tonnes of V_2O_5 flake per annum. Based on the Pre-Feasibility Study ("PFS")[1], 922,500 tonnes (dry basis) per annum of iron rich calcine material will be generated as a waste stream from vanadium processing.

Overview

AVL plans to locate its vanadium processing plant at a location 18 kilometres west of Mullewa[2] (see Figure 1). This decision, which is a variation from the base case outlined in the PFS, offers multiple opportunities to improve the financial metrics of the Project which is the focus of the current BFS work. The ability to sell the iron-calcine co-product via the Port of Geraldton arises from this plan, making AVL's Project globally unique in terms of an economic calcine sale. All other current and potential primary vanadium operations are constrained by distance and cost to ports. Iron-rich calcine is generally considered as a waste product in other projects and is stored in specially designed tailings facilities.

Vincent Algar, AVL's Managing Director comments, *"Having a vanadium processing plant located close to the coast, combined with the amount of iron rich calcine that's forecast to be generated by our Project, offers a big opportunity to unlock the value from what would otherwise be waste material. Our preliminary tests and market review support a technical path to upgrade the material to be a valuable co-product, unique to AVL's operation."*

Piloting testwork on the vanadium recovery flowsheet is underway and has enabled the production of representative samples of calcine to be used for marketing and further characterisation and metallurgical testwork. The average chemical composition forecast for the first five years of calcine production is shown in Table 1. Over the life of mine the average iron grade of the calcine is forecast to improve.

Table 1 *Average First Five Years Composition of Calcine*[a]

Element	Solid Analysis, %												
Y 0-5	Fe	Ti	TiO_2	Al	Si	Na	Cr	S	Mg	Mn	V	Ca	Ba
	54.5	8.95	14.9	1.53	0.96	0.78	0.52	0.049	0.35	0.13	0.09	0.08	0.01

a. Referenced from analysis of the Y0-5 pilot blend – Run 11 leach residue (ALS Test Number HY9003, 26/03/2020)

[1] See ASX announcement dated 19th December 2018 '*Gabanintha Pre-Feasibility Study and Maiden Ore Reserve'*

[2] See ASX announcement dated 29th October 2019 '*Option Agreement to locate Vanadium Processing Plant near Geraldton, WA' and March 2020 Quarterly Activities Report'*

A PFS trade-off study, supported by more recent investigations, has determined that sale of the calcine "as is", could improve the project economics. Sales evidence from similar material with reference to the prior 8 years of 62% Fe iron ore benchmark pricing[3] indicates that calcine sales above US$50/t (CFR China) are likely to be achievable under the majority of market conditions.

AVL has compiled preliminary market research on various product options for calcine or calcine derivatives. The outcomes will be used as part of AVL's critical metals research program, aimed at improving the efficiency of vanadium processing. AVL's A$4.9 M research initiative is partially funded by a Cooperative Research Centres Projects (CRC-P) grant from the Australian Federal Government.

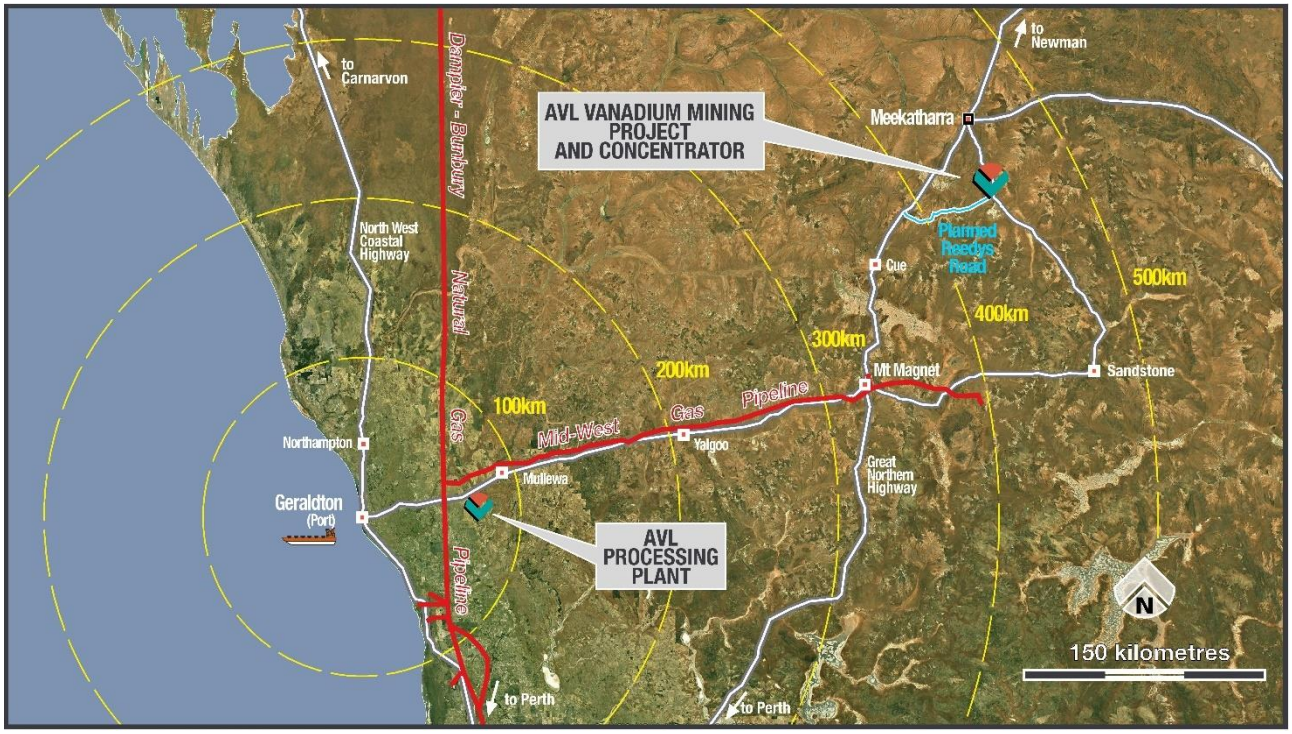

Figure 1 ***AVL Project locations diagram***

Potential Markets

Preliminary investigations identified a range of sale opportunities as listed in Table 2 in order of increasing processing intensity. An investigation into potential pricing was also conducted. As an iron ore blending component, the calcine pricing is considered limited or discounted by the titanium content. The value of ilmenite ($FeTiO_3$), a titanium feedstock, is estimated at approximately three times that of the calcine value and provides another potential processing path.

[3] https://au.investing.com/commodities/iron-ore-62-cfr-futures-historical-data

Table 2 *Potential Product Options*

Processing Required	Form of Sale Product/s	Potential Market
Nil	Calcine "as is" 54-56% Fe	• Iron producers or specialty traders (sold as a blending feedstock) or high titanium iron concentrate for blast furnace refractory protection. • Australian iron ore or concentrate producer for use as a silica blending control.
Pelletisation	8-12 mm pellets at 54-56% Fe	• High titanium iron pellet for blast furnace refractory protection.
Physical and/or pyrometallurgical separation of titanium from iron	Concentrate of 58-71% Fe grade Iron granules or powder at 90-96% Fe grade 45-92% TiO_2 products	• Moderate 58-64% Fe grade concentrate. • 90-96% Fe as merchant pig iron or iron powder. • 45-52 % TiO_2 product for sale into the ilmenite market. • Dense media for mineral separations. • 92% TiO_2 product for sale into the rutile market.

"As Is" Calcine Sale

The most desirable option is to sell the calcine "as is". Transportation will be by rail or road train 75 kilometres from the Mullewa vanadium processing site, for shipping through the Port of Geraldton. This sales path requires no additional process development for the vanadium extraction testwork program underway and minimal additional capital and operating cost for the Project.

The trading of iron ore is a multibillion-dollar industry, dominated by Australia and Brazil. As an example of the scale, in 2017 the market value for iron ore was at US$98 Billion, with Australia contributing US$48 Billion[4]. Iron ore price and volume trended steadily upwards until 2003 to 2004, thereafter the demand for steel increased dramatically in the Chinese market. Average monthly iron ore pricing for the 62% Fe fines price over the last 10 years, is shown in Figure 2. Market variations have seen this price bottom at US$40/t in 2015 and briefly pass US$180/t in February 2011. Current pricing at the time of this announcement is US$123/t, driven partly by Brazilian coronavirus related production shutdowns.

Typical iron products are categorised by chemistry and sizing to establish their selling price. Commonly discounts to the benchmark price (Platts 62% Fe Fines[5]) are applied in valuing lower quality ores and concentrates. In the case of AVL's "as-is" calcine, discounts would apply to sizing and titanium grade (see Table 1 – calcine chemistry).

It is considered possible that the calcine could be sold as a stand-alone product with its current characteristics, but at a significant discount (up to 50%) to the 62% Fe benchmark price. One scenario being considered is to use the characteristics of the product to blend/dilute high silica, low

[4] Reference: https://oec.world/en/visualize/line/hs92/export/show/all/2601/1995.2017/

[5] Reference: https://www.spglobal.com/platts/en/our-methodology/price-assessments/metals/iodex-iron-ore-metals-price-assessment

titanium fines or pellet feed. Aligning the product as a blending control for large tonnage Fe fines products would potentially allow additional value to be realised.

The Company has identified a number of potential purchasers for the calcine on an "as-is" basis and is advancing discussions with them.

Figure 2 ***Historical Iron ore pricing 62% Fe Fines CFR Tianjin port (US$/t) (https://www.marketindex.com.au/iron-ore, 2020)***

Pelletised Calcine

Pelletising is the method of agglomerating finer material into a large "pellet" by using a combination of mechanical and thermal processing (in a pelletiser) with a binding agent. In this manner, ultra-fines can be agglomerated into pellets of moderate size (6 to 12 mm diameter). This is a common path in iron ore processing. Pellets often have higher value as they lack the impurities seen in naturally occurring lump products.

The price of pellets is generally higher than that of both iron ore lump and fines. Trends of lump, fines and pellet prices compared on a value per tonne for 62% Fe low impurity (alumina, silica, sulphur and phosphorous) basis are shown in Figure 3[6].

[6] https://www.macquarie.com.au/dafiles/Internet/mgl/au/apps/retail-newsletter/docs/2018-08/DS_CommoditiesComment300818e.pdf

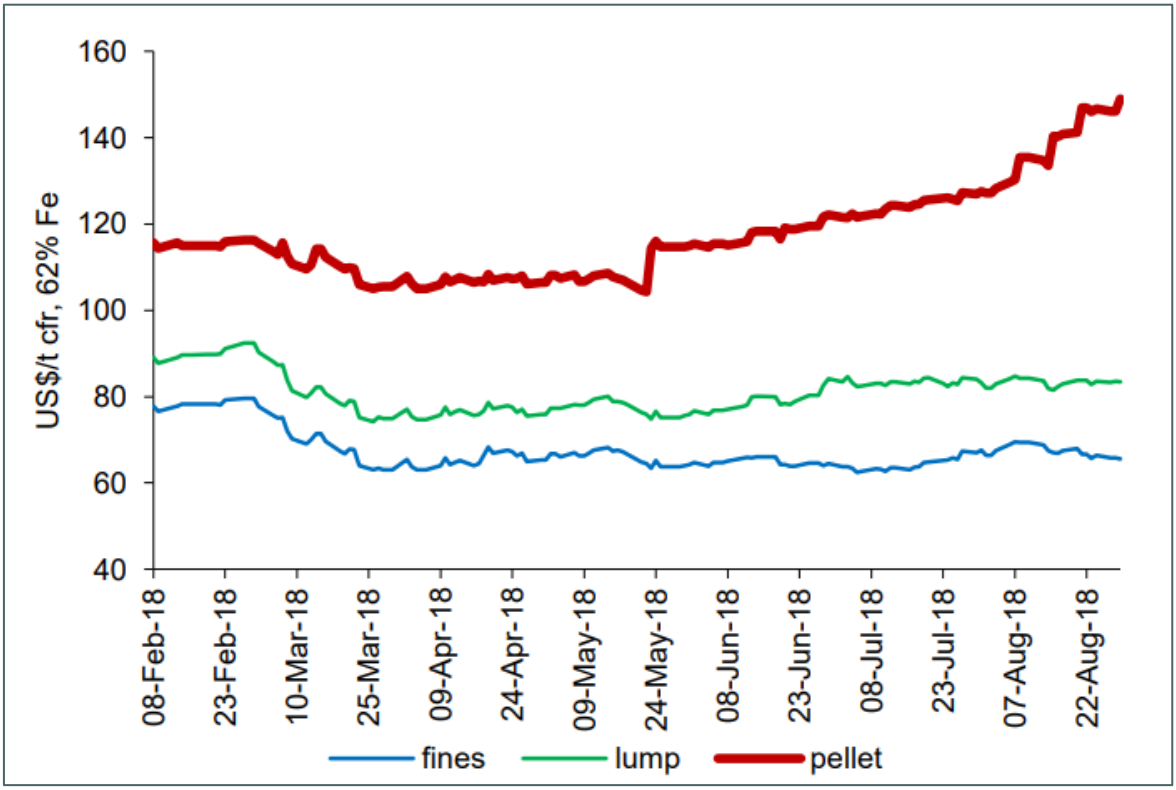

Figure 3 ***Comparative Price of Lump, Fines and Pellets in 2018 (Macquarie Group, 2018)***

Pelletising of the AVL calcine, to enhance value and saleability in the iron ore market, is considered a reasonable pursuit, particularly as lower cost natural gas is available at the relocated processing site.

As a guide to pellet value, in 2019 Vale sold 65% Fe pellets at a 40 to 55% premium (or approximately US$50/t) relative to 62% Fe fines products[7]. To better gauge the premium and resulting value of 54.5% Fe pellets, AVL has produced representative samples for supply to prospective buyers for their assessment.

The benefits of pelletisation may be equally applicable to any improved iron product quality achieved through the further processing of calcine.

[7] Figueiredo, Werner, Rocha, & Bassil, 2019

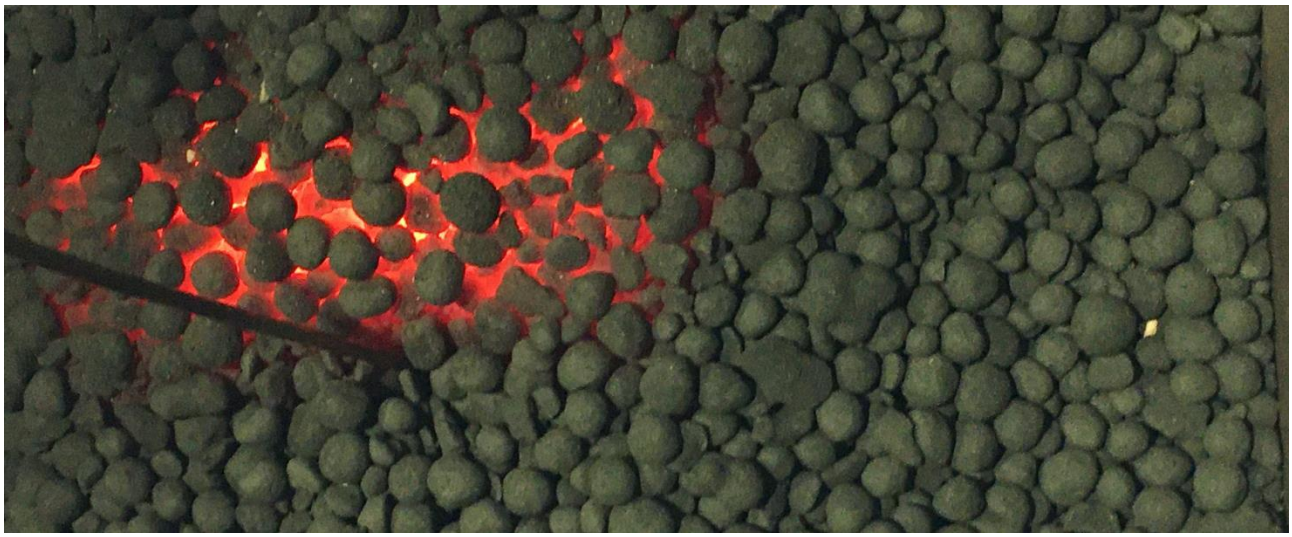

Figure 4 ***AVL Pellets cooling after thermal treatment***

Upgrading Calcine

Another potential pathway to unlock value from the iron-titanium calcine is to upgrade the calcine to a higher quality or independent higher value iron and titanium concentrates. This approach involves more capital investment, but has the obvious advantage of generating significant additional revenues.

Preliminary testwork has been undertaken by the Company to upgrade the calcine from a lower grade (<55% Fe) iron concentrate, to a higher grade (>62% Fe) iron product which could be sold at higher market value into the global iron ore market.

Samples of calcine material generated from pilot and benchscale tests have been used for the testwork. The initial work undertaken has been very successful, improving iron grades from 54% up to an average of 66%, with a maximum of 71.1% Fe. Table 3 shows the assay results of upgraded calcine from three effective sighter tests.

Table 3 ***Results of Calcine Upgrade - Benchscale Testing***

	Fe		Ti		Si		Al	
	Grade %	Recovery %	Grade %	Recovery %	Grade %	Recovery %	Grade %	Recovery %
Test 1	**67.30**	97.86	9.18	91.53	0.70	60.24	1.44	77.44
Test 2	**64.60**	97.86	9.32	98.53	1.70	62.29	2.16	76.64
Test 3	**66.20**	99.49	9.10	97.38	1.00	76.30	1.52	88.63

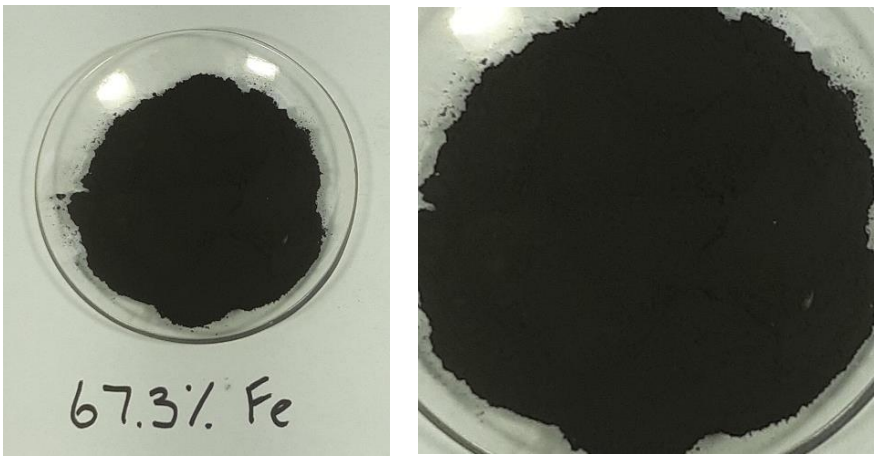

Figure 5 ***Calcine Test Program - Fine product of 67.3% Fe***

As a result of this encouraging testing, work is now underway to explore the potential to physically separate a portion of the contained titanium, which could further upgrade the calcine material and improve its value.

AVL is actively negotiating offtake agreements for vanadium produced from the Australian Vanadium Project and is working towards being in a similar position with an optimal calcine product. Co-product sales could have a positive impact on overall operating costs and therefore deliver the Company's goal to be the lowest cost new producer of vanadium in the world.

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This announcement has been approved in accordance with the Company's published continuous disclosure policy and has been approved by the Board.

COMPETENT PERSON STATEMENT – METALLURGICAL RESULTS

The information in this announcement 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 AusIMM. 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 JORC 2012 Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr McNab consents to the inclusion in the announcement of the matters based on the information made available to him, in the form and context in which it appears.

ABOUT AUSTRALIAN VANADIUM LTD

AVL is a resource company focused on 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. AVL is advancing the development of its world-class Australian Vanadium Project.

The Australian Vanadium Project is currently one of the highest-grade vanadium projects being advanced globally, with 208.2Mt at 0.74% vanadium pentoxide (V_2O_5) and containing a high-grade zone of 87.9Mt at 1.06% V_2O_5 reported in compliance with the JORC Code 2012 (see ASX announcement dated 4th March 2020 '*Total Vanadium Resource at The Australian Vanadium Project Rises to 208 Million Tonnes*').

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 Resources 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 have not been materially modified from the original market announcement.

APPENDIX 1

The Australian Vanadium 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).

	Category	Mt	V_2O_5 %	Fe %	TiO_2 %	SiO_2 %	Al_2O_3 %	LOI %
HG	Measured	10.1	1.14	43.9	13.0	9.2	7.5	3.7
	Indicated	25.1	1.10	45.4	12.5	8.5	6.5	2.9
	Inferred	52.7	1.04	44.6	11.9	9.4	6.9	3.3
	Subtotal	**87.9**	**1.06**	**44.7**	**12.2**	**9.2**	**6.8**	**3.2**
LG 2-5	Indicated	44.5	0.51	25.0	6.8	27.4	17.0	7.9
	Inferred	60.3	0.48	25.2	6.5	28.5	15.3	6.7
	Subtotal	**104.8**	**0.49**	**25.1**	**6.6**	**28.0**	**16.1**	**7.2**
Trans 6-8	Inferred	15.6	0.65	28.4	7.7	24.9	15.4	7.9
	Subtotal	**15.6**	**0.65**	**28.4**	**7.7**	**24.9**	**15.4**	**7.9**
Total	Measured	10.1	1.14	43.9	13.0	9.2	7.5	3.7
	Indicated	69.6	0.72	32.4	8.9	20.6	13.2	6.1
	Inferred	128.5	0.73	33.5	8.8	20.2	11.9	5.4
	Subtotal	**208.2**	**0.74**	**33.6**	**9.0**	**19.8**	**12.1**	**5.6**