

## Quarterly Activities Report for period ending September 30<sup>th</sup> 2016

### Highlights:

- » AVL and VSUN successfully completed first installation of GILDEMEISTER FB10-100 CellCube on rural property in south Western Australia.
- » Pilot vanadium electrolyte plant due to arrive in November.
- » Latest Concept Study activity completed on the Gabanintha vanadium project. Results of Concept Study have satisfied the Board to advance the project with further key studies.
- » New key studies to commence include roast-leach metallurgical work, resource update, detailed mining study, hydrology study, environmental studies and permitting work.
- » Pit optimisation modelling conducted as part of Concept Study recorded very positive results including:
  - a preliminary open pit shell extending for approximately 4.3 kilometres long within the northern part of the resource area;
  - an estimated 45.3 Mt of Mineral Resources falling within the open pit shell, and
  - 100% of Measured and 99% of Indicated Mineral Resources captured within the open pit shell.
- » VSUN VRFB sales pipeline continues to grow with 70 prospects under consideration.

### AVL advances integration strategy in September Quarter

Activities for the September 2016 quarter, for Australian Vanadium Limited ("AVL" or "the Company") are as follows.

#### CellCube Installation

During the quarter VSUN Pty Ltd, a wholly-owned subsidiary of AVL, successfully installed the first Vanadium Redox Flow Battery (VRFB) energy storage system in Western Australia on a rural property near Busselton.

This is the first time a VRFB system has been commissioned in the state and the development is an example of the wave of new energy storage options now available, as the renewable energy sector continues to diversify.

The energy storage system, a CellCube FB10-100, was constructed by world-leading flow battery manufacturer GILDEMEISTER Energy Storage GmbH in a facility close to Vienna, Austria and then shipped to WA.

27.10.2016

### ASX ANNOUNCEMENT

#### Australian Vanadium Limited

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#### Projects:

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Gabanintha Gold, Copper



GILDEMEISTER has invested 15 years of research and development into its vanadium flow technology battery systems, which have been commercially available for seven years. GILDEMEISTER has installed more than 100 systems globally– establishing itself as the provider of the world’s most commercially advanced flow battery.

The FB 10-100 CellCube can deliver 10kW of power and stores 100kWh of energy. It is a fully integrated containerised VRFB system which includes 3-phase capability, and is the first of its kind to be installed in Western Australia.

The CellCube was installed along with a 15kW solar PV (photovoltaic) system delivered by VSUN partner, Sun Connect Pty Ltd. The VRFB system will allow the client to store their unused solar energy and use it when solar power is unavailable. The client is expecting to be up to 90% self-sufficient for their power needs. Since installation, the client has not used grid power at all, with all power to the site being provided by the CellCube and the solar power system that feeds it. The client is progressively ramping up usage now that the installation is bedded down and all systems tested.

Installation of the first CellCube VRFB system provides the Company with an opportunity to showcase the technology to potential customers in a typical Australian rural application (see Figure 1).



Figure 1 – CellCube and solar PV panel array installed at a rural property in south Western Australia.

## Sales Leads Update

As anticipated the installation of the first CellCube has raised general awareness of VRFB systems in the market place. It is also providing the Company with real time data on the performance of the VRFB which is critical in demonstrating the system’s capabilities to prospective clients. Increased volumes of project valuations have been requested from the VSUN team and the recruitment process for a technical sales manager is well advanced. The potential sales leads currently being pursued has grown from 35 leads (June Quarterly report) to 70 leads at the date of this report. These leads are actively being managed and progressed by the sales and technical team and are reviewed weekly.

All leads are for the potential sale of CellCube systems and, in some cases, include solar PV systems. Emphasis in these leads continues to be for large CellCube systems (FB 250kw-1000Kwh and larger). Interest in multiple smaller units is also growing as the capabilities of the systems become acknowledged.

The CellCube product family includes 10kW, 20kW, 30kW and 250kW power delivery storage systems which can store between 40kWh and 2000kWh in a modular plug-and-play container sized design. The systems are ideal for commercial and grid-scale applications with a need for long duration energy storage (from 2 hours to 10 hours). The systems are scalable beyond 250kW power/2000kWh of storage in multiples of the existing range.

VSUN participates in the sale of CellCube systems on a commission basis. In addition, VSUN is actively developing the service skills to support local VRB installations. This is anticipated to bring in additional revenues over time as the number of installation and service opportunities arises. Due to the long expected life of a CellCube VRFB, on-site service visits are anticipated to be less than twice annually after the installation is bedded down, with most management being able to be conducted via internet with remote monitoring and control.

### **Vanadium Electrolyte Pilot Plant**

As per the ASX announcement dated 7<sup>th</sup> June 2016, AVL has purchased a pilot vanadium electrolyte plant from C-Tech Innovation Limited in the United Kingdom.

The installation of the pilot vanadium electrolyte plant will enable AVL to develop unique vanadium electrolyte production expertise and capability within Australia. The company aims to develop both stand-alone and mine-attached vanadium electrolyte capacity to support the growing demand in the VRFB sector.

The pilot plant will be used to test and verify the production of vanadium electrolyte products that are suitable and approved for use in third party VRFB systems being sold in Australia, New Zealand, the Pacific and Asia. C-Tech Innovation Limited recently completed construction of the pilot plant and shipped it from the United Kingdom. The plant is due to arrive in Perth in early November 2016.

The pilot plant will be located within a laboratory facility at a Western Australia university. Installing the pilot plant at a university provides a cost-effective solution and represents an excellent opportunity for collaboration between the commercial and educational fields in this technology space.

Ongoing discussions on the future sale and distribution of vanadium electrolyte continue with numerous VRFB manufacturers including GILDEMEISTER, who are experiencing rapid growth in demand for their storage systems.

AVL has commenced sourcing low-cost, high quality vanadium pentoxide ( $V_2O_5$ ) for quality testing purposes from a wide variety of global sources including Brazil, China and Africa. The Company has already sourced material from six international sources for the pilot test work. A ready supply of  $V_2O_5$  will enable AVL to rapidly develop commercial electrolyte production to support local and regional VRFB sales and service the anticipated rapid growth in large-scale stationary energy storage market development.

In the longer term the Company aims to supply its own vanadium pentoxide from the high grade Gabanintha project for use in the production of vanadium electrolyte.

### **Gabanintha Engineering Concept Study Update**

*The Concept Study referred to in this report is based on low-level technical and 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 Concept Study will be realised.*

In the past year, the Company has reported encouraging results from various studies undertaken on the Gabanintha project including:

- a significant increase in the quality of the  $V_2O_5$  inventory following completion of a revised Mineral Resources estimate (refer to YRR ASX Announcement dated 10 November 2015), and
- outstanding results from metallurgical testwork (refer to AVL ASX announcement dated 7 December 2015).

From the results of work completed to date, the Company is satisfied it has established that additional work on the project is justified. The major objective of the Company with respect to the project will now be to understand the risk framework for project development and establish key project timelines and funding pathways.



Several studies have been successfully conducted on the Gabanintha project since its acquisition in 2007 by AVL (formerly YRR), including:

- 2009 - Concept Study (Battery Limits Pty Ltd (BL))
- 2011 - Resource Estimate (CSA Global Pty Ltd)
- 2014 - Concept Study, Update-1 (BL)
- 2015 - Mineral Resource Estimate (AMC)
- 2015 - Metallurgical Test work (Bureau Veritas and BL)
- 2016 - Petrographic and mineralogical study (CET-UWA)
- 2016 - Concept Study, Update-2 (BL)

The most recent activity has been a pit optimisation exercise based on the revised Mineral Resource estimate for internal management purposes using parameters derived from the extensive available information. The modifying factors listed in Appendix 1 were considered and taken into account. The results of the pit optimisation study are very positive and support further work.

Following the positive outcome from the pit optimisation work and the updated Concept Study, and when all previous studies are also considered, the Company is satisfied it can justify advancing the project towards development by the completion of a range of more in-depth studies. These studies will include:

- resource update using the latest material density information and weathering surface interpretations;
- detailed mining design and schedule;
- further analysis and sampling of existing diamond core drilling for metallurgical testing designed to confirm metal recovery and concentrate grade and finalise process design inputs. This work will focus on roast and leach test work of magnetic ore concentrates;
- assessment of water supply requirements and geohydrology of the project development area;
- environmental risk evaluations including additional baseline studies, and
- assessment of permitting and government approval requirements and timelines.

An indicative timeline for the completion of these activities is set out in Table 1 below.

Finalisation of the new work will allow the Company to determine a project feasibility study and construction timeline that will be dependent on prevailing vanadium market conditions. Much of the recent Concept Study work undertaken to date has been completed to a quality that it can be incorporated into the feasibility study.

DESCRIPTION	MONTH									
	Oct 16	Nov 16	Dec 16	Jan 17	Feb 17	Mar 17	Apr 17	May 17	Jun 17	Jul 17
Resource Update										
Mine Design										
Metallurgical Test Program										
Water Supply & Hydrology Studies										
Environmental Studies										
Environmental & Permitting Review										
Marketing and Offtake negotiations										

Table 1. Indicative Timeline of Activities

## Concept Study Outcomes

The updated Concept Study (nominal  $\pm 50\%$  accuracy) examined the feasibility of producing vanadium in the form of vanadium pentoxide ( $V_2O_5$ ) from the Gabanintha project. The results build on the original Concept Study which was updated in August 2014 and after new drilling and metallurgical testwork programs were completed by the Company in 2015.

For this updated study the proposed beneficiation process involves feed preparation and beneficiation, roasting, leaching, solids/liquid separation, desilication, ammonium vanadate (AMV) precipitation, and deammoniation to produce high grade vanadium pentoxide (see Figure 2). Additional options considered capital costs of a concentrate only option as well as the inclusion in the plant design of a vanadium electrolyte plant.

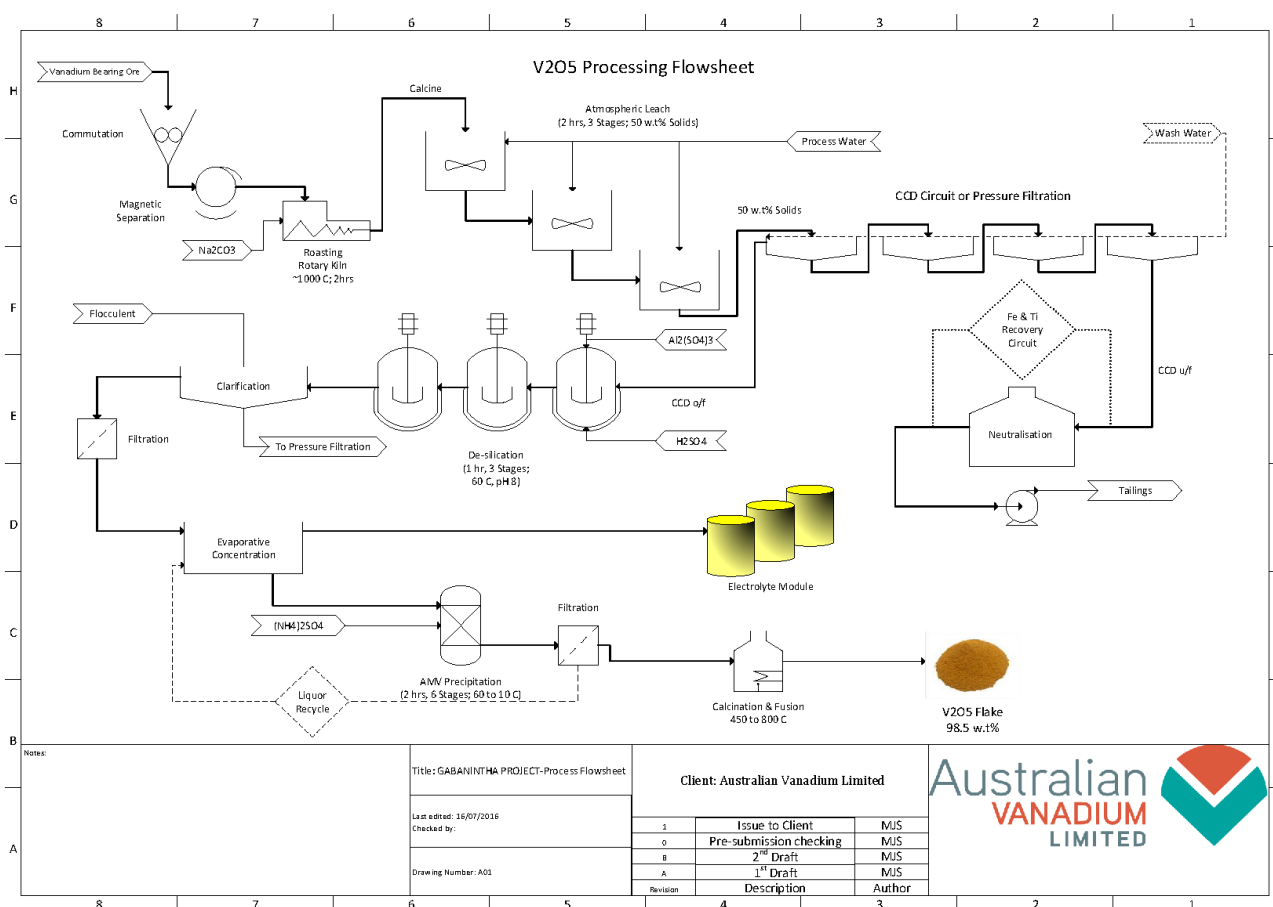


Figure 2 Proposed Initial Process Flowsheet for Gabanintha Vanadium Project

The Concept Study found that the production cases considered were potentially economically viable while treating feed material containing up to 50% oxide and low grades (0.5%  $V_2O_5$ ) with beneficiation pre-treatment. The study considered the effects of lower (0.92%  $V_2O_5$ ) and higher feed grades (1.1%  $V_2O_5$ ).

The addition of an electrolyte plant facility was considered to have strong economics based on the assumptions and warranted future inclusion in design work for Gabanintha and as a stand-alone study.

The following conclusions were made from the Study:

- based on a significant proportion of oxide feed and using preliminary testwork beneficiation data, a project to produce  $V_2O_5$  at Gabanintha is potentially economically feasible at a range of production rates similar to those rates considered in previous studies. However, the lower throughput rates are marginal and more sensitive to head grade;
- beneficiation prior to vanadium recovery provides a significant grade boost in processing oxide and transitional ore and is more attractive than processing un-beneficiated low grade ore through the plant;

- the key operational assumptions including roasting time, leaching, reagent consumption and recovery will require validation through additional testwork;
- there is potential to significantly increase recovery in the roast leach step and reduce reagent consumption however, this will need to be substantiated through testwork;
- the tailings residue contains high Ti and Fe values and has the potential to be reprocessed to produce saleable titanium oxide and iron oxide products;
- the use of second-hand equipment, particularly from the nearby ferro-vanadium Windimurra Project has the potential to reduce capital cost, and
- the impact of electrolyte production shows strong economics based on the assumptions used with potentially robust operating cost margins.

Recommendations from the study for further work include:

1. Future test work samples should be selected that define the domains and identify the ore most likely to be mined initially at high grade.
2. A mining schedule and mining cost estimates should be developed.
3. Metallurgical testwork programs should be developed that assess the amenability of different domains and mineralogy to be beneficiated.
4. Metallurgical testwork should be undertaken to prove up the proposed process routes using drill core, both in terms of beneficiation and vanadium pentoxide recovery and possible electrolyte production.
5. A detailed financial model should be developed to assess the impact of feed grade and ore types, mining costs, metallurgical recoveries and capital costs, and product types and prices to assist in optimising project size and configuration.
6. Metallurgical sighter testwork could be developed to consider recovery of Ti and Fe values from leach residue.
7. Further marketing information should be gathered that provides confidence in the tonnage of  $V_2O_5$  that can be supplied to the market. The production and marketability of electrolyte vanadium products that attract premium prices requires further investigation.
8. Planning for a prefeasibility study should commence to consider production of:
  - a. vanadium oxide
  - b. vanadium electrolyte, and
  - c. Recovery of saleable Ti and Fe products from tailings residue.
9. Review opportunities to procure equipment from or collaborate with the nearby Windimurra project.

The completed Concept Study was able to consider key findings from other studies as set out below.

*The Concept Study referred to in this report is based on low-level technical and 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 Concept Study will be realised.*

### **Mineralogy and Petrology Study**

A mineralogy and petrology study of samples of diamond drill core from Gabanintha was conducted by the Centre for Exploration Targeting (CET) at the University of WA in 2015. 19 core samples were examined and analysed in detail by petrologists from the CET. Key findings were:

- results show magnetic separation techniques will be applicable for both high-grade and low-grade ores.
- titanomagnetite is dominant as the ore mineral and oxidises to martite (hematite) in the weathering profile, maintaining the same crystal structure and all its associated vanadium.
- the oxidised materials, contain significant relict magnetite remaining partially magnetic, making magnetic separation techniques applicable in the high-grade oxide material; and
- magnetite particles in the low-grade samples (magnetite gabbro) show high vanadium content, supporting the view that magnetic separation of low grade ores may yield significant additional vanadium units.

The high quality and very detailed mineralogy information gives the Company an important micro-level understanding of the mineralised material at Gabanintha. The findings provided confirmation that the project demonstrates favourable mineral characteristics for vanadium extraction.

### **Metallurgical Test Work**

Following the completion in 2015 of diamond and reverse circulation (RC) drilling programs, the Company completed a series of detailed tests on composite RC samples comprised of oxide, transition and fresh material from low grade (disseminated) and high grade (massive) mineralisation at Gabanintha.

The tests reported outstanding results, returning high recovery rates from the fresh, transitional and oxide material, further demonstrating the project's strong potential for both low capital and operating costs. The test results also show that the silica content of the material was easily removed and there were strong recovery rates for titanium, a potentially valuable by-product.

The metallurgical tests involved crushing and grinding samples to various parameters and analysis of recoveries from all material types using gravity and magnetic separation methods, to establish suitable processing plant options. The tests performed included Grind Size Distribution, Davis Tube Recovery (DTR), Low Intensity Magnetic Separation (LIMS), Wet High Intensity Magnetic Separation (WHIMS), Heavy Liquid Separation (HLS) and Wilfley Table techniques.

Key technical findings of the test work include:

- magnetic separation tests indicate that both Low Grade (LG) and High Grade (HG) partly oxidised and fresh samples can be effectively upgraded to concentrates of up to 1.5% V<sub>2</sub>O<sub>5</sub>.
- totally oxidised samples yield a high quality iron-vanadium-titanium concentrate when using high intensity magnetic separation (mass recovery ranges between 30% and 85% and V<sub>2</sub>O<sub>5</sub> recovery ranges between 30% to 90%).
- magnetic recovery of LG samples is impressive with 32% to 62% of mass recovered and 70% to 85% of the V<sub>2</sub>O<sub>5</sub> reporting to concentrate at a coarse grind size, and
- magnetic recovery from HG samples is excellent at 75% to 82% of mass recovered and 82% to 95% of the V<sub>2</sub>O<sub>5</sub> reporting to concentrate at a coarse grind size using low intensity magnetic separation.

### **Pit Optimisation Study**

A mining consultant was engaged by AVL to undertake a Pit Optimisation Study using the 2015 Mineral Resource block model for the Gabanintha deposit. The Mineral Resource estimation was carried out by Australian Mining Consultants in 2015 and there has been no material change to the Mineral Resource since that time.

The total Measured, Indicated and Inferred Mineral Resource in both the high and low grade domains is **91.4 Mt @ 0.82% V<sub>2</sub>O<sub>5</sub>**. The Mineral Resource was reported above a 0.3% V<sub>2</sub>O<sub>5</sub> cut-off as shown in Table 2.

<b>Table 2</b> <b>Gabanintha Project</b> <b>2015 Mineral Resource Estimation</b>						
	<b>High Grade</b>		<b>Low Grade</b>		<b>Total</b>	
<b>Category</b>	<b>Material (Mt)</b>	<b>V<sub>2</sub>O<sub>5</sub> %</b>	<b>Material (Mt)</b>	<b>V<sub>2</sub>O<sub>5</sub> %</b>	<b>Material (Mt)</b>	<b>V<sub>2</sub>O<sub>5</sub> %</b>
Measured	7.0	1.09	-	-	7.0	1.09
Indicated	4.3	1.07	13.4	0.55	17.8	0.68
Inferred	45.5	0.97	21.1	0.53	66.7	0.83
<b>TOTAL</b>	<b>56.8</b>	<b>1.00</b>	<b>34.6</b>	<b>0.53</b>	<b>91.4</b>	<b>0.82</b>

The purpose of the study was to identify the mining potential and development opportunities using internally generated economic parameters. The study investigated the economic potential for mining the deposit within the northern resource area using open-cut methods and applying the most current economic inputs, selling prices, recoveries, operating costs and associated parameters derived from the Concept Study report.



The modelling generated several open pit shells over the northern resource area with the optimal pit shell (Pit 9) encompassing 45.3Mt @ 0.80% V<sub>2</sub>O<sub>5</sub>. This amount of material represents approximately 49.6% of the total 2015 Mineral Resource Estimate including 100% of the Measured and 99% of the Indicated Mineral Resource. Measured and Indicated Mineral Resources represent 54% of the total Mineral Resource material within the pit shell (see Figure 3). The pit optimisation model results are summarised in Table 3 below.

The modelled pit shell is approximately 4,300 metres long, up to 350m wide and up to 160m deep and in addition to the 45.3 Mt of mineralised material for processing contains approximately 86.8 Mt of waste material.

The results of the pit optimisation modelling combined with the earlier components of the Concept Study have demonstrated that the Gabanintha project has robust project fundamentals with acceptable levels of technical risk. Accordingly, the Company has decided to advance the Gabanintha project by the commencement of a number of key studies as mentioned above.

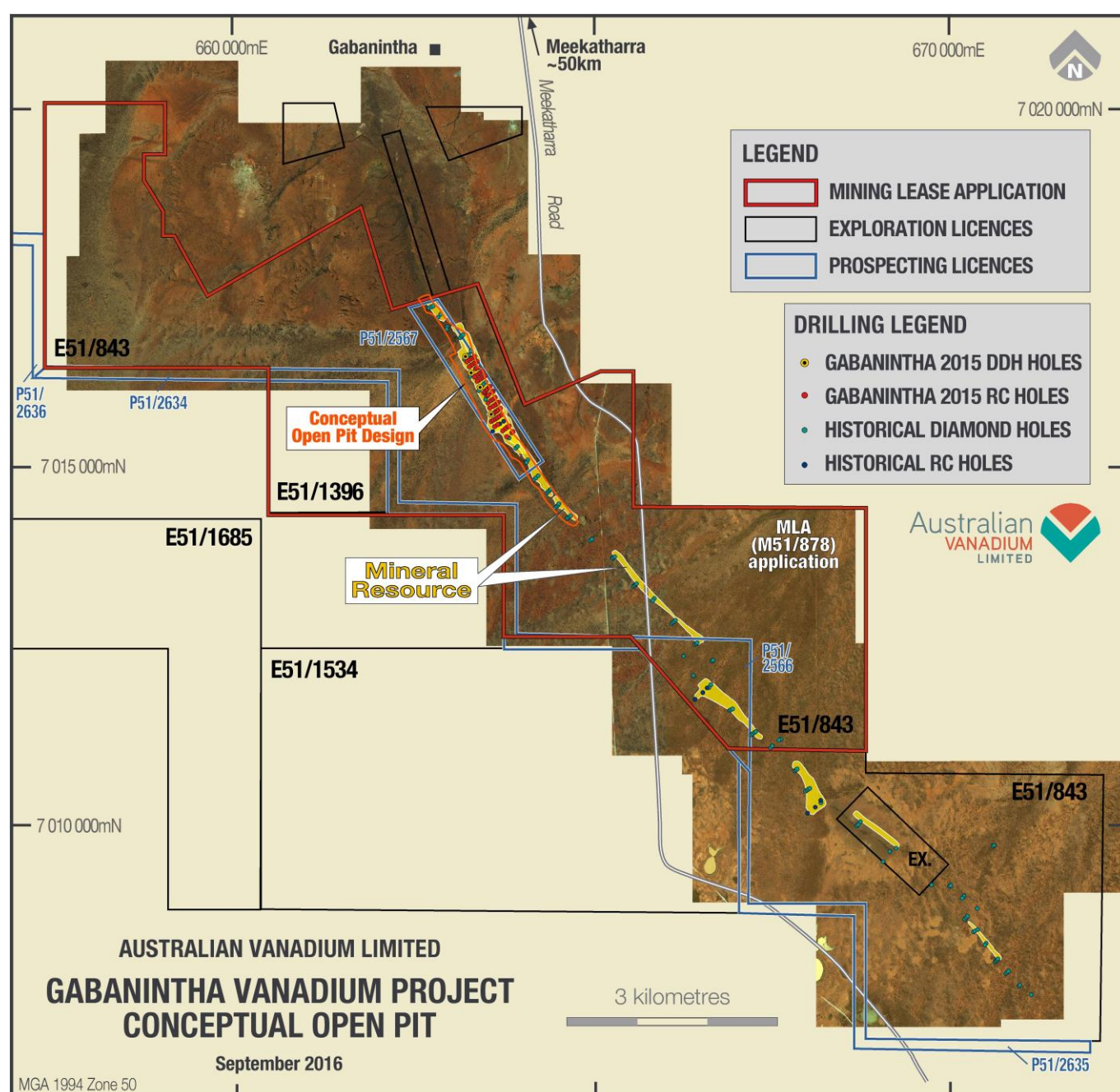


Figure 3 - Resource location and Pit Optimisation Model Pit Shell Outline



**Table 3**  
**Gabanintha Project**  
**Pit Optimisation Modelling – Pit Shell 9**

	High Grade		Low Grade		Total		Distrib %	Portion of 2015 Min. Res. %
Category	Material (Mt)	V <sub>2</sub> O <sub>5</sub> %	Material (Mt)	V <sub>2</sub> O <sub>5</sub> %	Material (Mt)	V <sub>2</sub> O <sub>5</sub> %		
Measured	7.0	1.09	-	-	7.0	1.09	15%	100%
Indicated	4.2	1.07	13.4	0.55	17.6	0.67	39%	99%
Inferred	12.2	1.00	8.5	0.53	20.7	0.81	46%	31%
<b>TOTAL</b>	<b>23.4</b>	<b>1.04</b>	<b>21.9</b>	<b>0.54</b>	<b>45.3</b>	<b>0.80</b>	<b>100%</b>	<b>49.6%</b>

The Company will report the findings of the studies in accordance with the current reporting requirements for production targets and forward looking statements.

## Corporate

### *Cash Position*

As at the 30 September 2016, the Company had \$3.574 million in cash and cash equivalents.

### *Capital Raising*

During the quarter a total of 82,175,615 unlisted options with an exercise price of 1.4712 cents each were exercised, raising a total of \$1,208,968 for the Company.

### *Company Presentations and Conference Attendance*

During the Quarter the Company attended and presented at a number of industry conferences. These included:

- Nextek Conference - Perth
- National AIE Energy Conference – Perth
- Vanitec Energy Storage Committee (ESC) - London
- Resource and Renewable brokers and fund manager – London
- VSUN presentations - Tasmania (Burnie and Hobart).

The Company played a major role in the inaugural Vanitec ESC meeting held in London. The meeting attracted 55 participants from the vanadium-only flow battery industry. Topics of discussion included vanadium flow demand, health and safety and standards for electrolyte quality. The strong interest and identification of real and significant demand for vanadium flow battery systems at the grid connected level across the globe was of significant value to AVL and all those attending who have the common goal of advancing the use of vanadium. Emerging technologies that improve the performance of Li-Ion systems and use vanadium materials in cathode production are of additional interest and further support new and existing vanadium production.

During the December quarter the Company will present at:

- Low Emission and Technology Minerals Conference - Perth (15-16 November)
- Australian Utility Week - Sydney (29-30 November) in conjunction with GILDEMEISTER Energy Storage GmbH

For further information, please contact:

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## Tenement Schedule

Tenement Information as Required by Listing Rule 5.3.3 For the Quarter Ended 30 September 2016					
Project	Location	Tenements	Economic Interest	Notes	Change in Quarter %
Western Australia	Gabanintha	E51/843	100% Granted		Nil
		E51/1396	100% Granted		Nil
		E51/1534	100% Granted		Nil
		E51/1576	100% Granted		Nil
		E51/1685	100% Granted		Nil
		P51/2566	100% Granted		Nil
		P51/2567	100% Granted		Nil
		P51/2634	100% Granted		Nil
		P51/2635	100% Granted		Nil
		P51/2636	100% Granted		Nil
		MLA51/878		100% On application	Nil
Western Australia	Nowthanna	MLA51/771		100% On application	Nil
Western Australia	Peak Hill	E52/3349	100% Granted		Nil

## About Australian Vanadium Limited

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.

AVL is advancing the development of its 100%-owned, world-class Gabanintha vanadium project. Gabanintha is currently one of the highest-grade vanadium projects being advanced globally with Measured, Indicated and Inferred Resources of 91.4Mt, grading 0.82% V<sub>2</sub>O<sub>5</sub> and containing a discrete high-grade zone of 56.8Mt, grading 1.0% V<sub>2</sub>O<sub>5</sub> reported in compliance with the JORC Code 2012 (ASX Announcement 10 November 2015).

AVL also aims to develop a local production capacity for high-purity vanadium electrolyte, which forms a key component of vanadium redox flow batteries. The Company has recently purchased a vanadium electrolyte pilot plant from C-Tech Innovation Limited, a research, technology and innovation organisation based in the UK. C-Tech Innovation Limited has developed technologies for electrochemical preparation of vanadium electrolyte as well as many other chemical and electrochemical technologies.

This purchase will enable AVL to develop unique vanadium electrolyte production expertise and capability in Australia, through both stand-alone and planned mine-attached facilities. The pilot plant will be used to test and verify the production of vanadium electrolyte products that are suitable and approved for use in third party VRFB products being sold in Australia, New Zealand, the Pacific and Asia.

AVL, through its 100%-owned subsidiary VSUN Pty Ltd, is also actively marketing VRFB in Australia through a distribution agreement with world-leading flow battery manufacturer, GILDEMEISTER Energy Storage GmbH.

## Concept Study Parameters – Cautionary Statement

*The Concept Study in this report (nominal +/- 50% accuracy) is based on low-level technical and 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 current conclusions of the Concept Study will be realised. There is a moderate level of geological confidence associated with Measured Indicated and Inferred Mineral Resources and there is no certainty that further exploration and development work will result in the estimation of Ore Reserves or that the production target itself will be realised. The Company advises the Concept Study results and production targets reflected in this announcement are highly preliminary in nature as conclusions are drawn from the average grade of Measured, Indicated and Inferred Resources. A generic mining cost per tonne of material moved and an average resource grade has been used to determine overall mining and processing costs as opposed to a detailed mining block model evaluation to produce a detailed mining schedule.*

## Competent Person References

### Competent Person Statement – Metallurgical Results

*The information in this statement that relates to Metallurgical Results is based on information compiled by independent consulting metallurgist David Pass B.Sc. (Hons), Mr Pass is a Member of The Australian Institute of Mining and Metallurgy. David Pass is employed by Battery Limits Pty Ltd Mr Pass 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. Pass 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".*

### Competent Person Statement – Mineral Resource Estimation

*The information relating to the Gabanintha Project 2015 Mineral Resource estimate reported in this announcement is based on information compiled by Mr John Tyrrell. Mr Tyrrell is a Member of The Australian Institute of Mining and Metallurgy (AusIMM) and a full time employee of AMC (AMC Consultants Pty Ltd). Mr Tyrrell has more than 25 years' experience in the field of Mineral Resource Estimation. He has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and in resource model development 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. Tyrrell 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.*

*The information is extracted from the report entitled "Substantial high-grade vanadium resource highlights Gabanintha's world-class potential" released to ASX on 10 November 2015 and is available on the company website at [www.australianvanadium.com.au](http://www.australianvanadium.com.au).*

*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.*

## Forward Looking Statements

*This announcement may contain certain "forward-looking statements" which may not have been based solely on historical facts, but rather may be based on the Company's current expectations about future events and results. Where the Company expresses or implies an expectation or belief as to future events or results, such expectation or belief is expressed in good faith and believed to have a reasonable basis. However, forward looking statements are subject to risks, uncertainties, assumptions and other factors which could cause actual results to differ materially from future results expressed, projected or implied by such forward-looking statements. Such risks include, but are not limited to Resource risk, metal price volatility, currency fluctuations, increased production costs and variances in ore grade or recovery rates from those assumed in mining plans, as well as political and operational risks in the countries and states in which we sell our product to, and government regulation and judicial outcomes. For more detailed discussion of such risks and other factors, see the Company's Annual Reports, as well as the Companies other filings. Readers should not place undue reliance on forward looking information. The Company does not undertake any obligation to release publicly any revisions to any "forward looking statement" to reflect events or circumstances after the date of this announcement, or to reflect the occurrence of unanticipated events, except as may be required under applicable securities laws.*

**Appendix 1: Modifying Factors Applied to the Gabanintha Resources  
and in relation to the Updated Concept Study**

Criteria	Explanation
<i>Mineral Resource Estimation for conversion to Ore Reserves</i>	<ul style="list-style-type: none"> <li>The Mineral Resource estimation was carried out by Australian Mining Consultants in 2015 and there has been no material change to the Mineral Resource since that time.</li> <li>The total Measured, Indicated and Inferred Mineral Resource in both the high and low grade domains is 91.4 Mt @ 0.82% V<sub>2</sub>O<sub>5</sub>. The Mineral Resource was reported above a 0.3% V<sub>2</sub>O<sub>5</sub> cut-off as shown in Table 2.</li> <li>Study work to date has not been completed to the required standard of a PFS to allow the determination of Ore Reserves</li> </ul>
<i>Site visits</i>	Site Visits have been undertaken by the Competent persons
<i>Study status</i>	<ul style="list-style-type: none"> <li>The Gabanintha Project has been the subject of a number of concept studies. These were previously conducted on different bases focusing on magnetite concentrate production and then more recently, finished vanadium products.</li> <li>The current Concept Study in this report (nominal +/- 50% accuracy) is based on low-level technical and 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 current conclusions of the Concept Study will be realised. There is a moderate level of geological confidence associated with Measured Indicated and Inferred Mineral Resources and there is no certainty that further exploration and development work will result in the estimation of Ore Reserves or that the production target itself will be realised. The Company advises the Concept Study results and production targets reflected in this announcement are highly preliminary in nature as conclusions are drawn from the average grade of Measured, Indicated and Inferred Resources. A generic mining cost per tonne of material moved and an average resource grade has been used to determine overall mining and processing costs as opposed to a detailed mining block model evaluation to produce a detailed mining schedule.</li> </ul>
<i>Cut-off parameters</i>	The Mineral Resource is reported above a 0.3% V <sub>2</sub> O <sub>5</sub> cut-off. In the concept pit used in this report a cut-off grade of 0.5% V <sub>2</sub> O <sub>5</sub> was used.
<i>Mining factors and assumptions</i>	<ul style="list-style-type: none"> <li>Assumed excavator load operation by open pit and haulage to stockpiles within 1 kilometre of pit.</li> <li>Open pit mining method, appropriate to 45-50° westerly dipping magnetite and magnetite gabbro horizons. Deposits exposed from surface elevation.</li> <li>A 45° concept pit slope is used in the pit optimization shell.</li> <li>A mining dilution of 5% and a mining recovery of 95% were used in the pit optimization shell.</li> <li>54% of the pit optimization shell contains Measured and Inferred Mineral Resources. The balance of the resources in the shell are inferred and are mostly in the Low Grade orebody domains. They partially contribute to the economic pit shell.</li> <li>The Open cut mining method will require the establishment of suitable mine infrastructure and availability of mining equipment.</li> </ul>



Criteria	Explanation
<i>Metallurgical factors and assumptions</i>	<ul style="list-style-type: none"> <li>For this updated study the proposed beneficiation process involves feed preparation and beneficiation, roasting, leaching, solids/liquid separation, desilication, ammonium vanadate (AMV) precipitation, and deammoniation to produce high grade vanadium pentoxide (see Figure 1).</li> <li>The process being considered for the processing of Gabanintha is well understood and widely implemented in the processing of vanadium-iron-titanium deposits of a similar nature.</li> <li>Metallurgical work to date has been conducted on RC and diamond core. Work has been restricted to physical beneficiation studies and has not included studies of roast and leach test recovery.</li> <li>Deleterious elements were routinely determined during the assay process for all samples within the resource estimation. Sulphur, phosphorus, lead, copper and zinc are not sufficiently abundant to cause economic or environmental issues. Amounts of silica, iron and aluminium are high enough in the gangue material to allow a classification into Low Grade and High Grade ore.</li> <li>No bulk sample testing or pilot scale plant test work has been conducted for the Gabanintha Project.</li> </ul>
<i>Environmental</i>	First pass flora and fauna field studies have been conducted at Gabanintha. Additional work is planned to address detailed baseline flora and fauna studies. Hydrological, geotechnical studies are also to be commenced.
<i>Infrastructure</i>	Gabanintha is located 35km south of Meekatharra on the unsealed Meekatharra-Sandstone Road. The road bisects the project, passing to the south of the proposed optimisation pit shell. Power and water infrastructure is not present at or near the site.
<i>Costs</i>	<ul style="list-style-type: none"> <li>Cost assumptions have been made by the consultants using available industry standard information.</li> <li>For the pit optimisation shells these include ore and waste mining costs, and processing cost in line with those generated by the Battery Limits Concept Study report to the Directors of Australian Vanadium Limited.</li> </ul>
<i>Revenue Factors</i>	The current market price for vanadium pentoxide was used in the pit optimisation.
<i>Market assessment</i>	Vanadium is used primarily in steel markets in the production of HSLA steel products and specialised steels. Steel markets have been relatively depressed in recent years and this has been reflected in vanadium product pricing. Loss of primary production in the last 18 months has led to a steady reduction of inventories, and consequent modest price increases as steel market demand has remained steady. New demand for vanadium products are occurring with the rapid development of energy storage devices (vanadium redox flow batteries). Rapid growth in energy storage is occurring as part of the increase in deployment of global renewable energy supply. The Company assessment is for the steady increase in demand for primary vanadium for a prolonged period.
<i>Economic</i>	The Company is prevented from discussing production targets and forecasting financial information.
<i>Social</i>	The Company has commenced discussions with the Native Title claimant groups and has conducted site clearance work. Further negotiations and presentations are required.

Criteria	Explanation
<i>Other</i>	The Company has applied for a mining lease (M51/878) over the established mineral resource.
<i>Classification</i>	No ore reserves have yet been defined or classified.
<i>Audits or reviews</i>	<p>The resource was completed by independent experts and then reviewed recently by company geologists. This resulted in the identification of areas where more drilling is needed in order to upgrade to Measured Mineral Resource category.</p> <p>No ore reserve audits have been conducted.</p>
<i>Discussion of relative accuracy/confidence</i>	<ul style="list-style-type: none"> <li>Table 2 shows the distribution of classified Mineral Resources at Gabanintha. Insufficient study work to the level of a PFS study have been undertaken to allow the definition of Mineral Reserves.</li> <li>The resource estimate is considered to be in accordance with the relative degree of confidence expected of mineralisation in the categories of Measured and Indicated Mineral Resources. The techniques and methods were of sufficient quality and rigour to ensure that the resulting estimate fairly represented the nature of the mineralised body. Accuracies and degrees of confidence cannot reliably be ascribed to such an estimate since all the inherent assumptions made when completing an estimate will have their own margins of error or reliability. For example, an individual element assay may have an inherent variability constrained by the laboratory methods used or the element assayed (some are notoriously difficult to assay) such that the assay should be stated in terms of +/- 5% for some and +/- 20% for others. Similarly, the statistical variance of all the methods used in resource estimation should also be stated to arrive at a global variance factor for the whole resource.</li> <li>The Updated Concept Study applies to the identified resource portion located over 4.3 kilometres of strike in the northern part of the Gabanintha Vanadium deposit where a preliminary pit shell has been calculated over the Measured and Indicated wireframes used for resource estimation.</li> </ul>