



# AVL Signs Joint Venture with Ultra Power Systems on Coates Vanadium Project

*Vanadium deposit to be explored primarily for application in vanadium redox flow batteries*

## Highlights:

- **Joint Venture Agreement signed with vertically integrated electrochemical processing and energy storage technology company Ultra Power Systems Ltd (UPS) to evaluate AVL's Coates Vanadium Project.**
- **UPS aims to produce vanadium electrolyte using a combination of a unique processing route and high-density vanadium electrolyte production.**
- **AVL has signed a JV to create value for shareholders by;**
  - **Monetising a secondary asset and;**
  - **Testing processing technology focused on enhancing the uptake of vanadium redox flow batteries in Australia.**
- **Agreement allows for AVL to receive either \$500,000 or equivalent shares in UPS.**

Australian Vanadium Limited (ASX: AVL, "the Company" or "AVL") is pleased to announce that it has signed a Joint Venture agreement with private company Ultra Power Systems Limited ("UPS") to develop the Coates Vanadium Project near Perth.

The Coates deposit is situated approximately 35km east of the Perth metropolitan area in the Shire of Wundowie (see Figure 1).

The agreement allows UPS the exclusive right to earn a 49% legal and beneficial interest in the tenement on a \$5,000 signing fee, followed by \$50,000 being spent on exploration on the tenement within the first 12 months of the agreement and \$150,000 being spent during the first 24 months. When the obligations outlined above have been fulfilled, the agreement allows for UPS to acquire AVL's Joint Venture interest for a sum of \$500,000 or shares in UPS, at the election of AVL.

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ASX ANNOUNCEMENT

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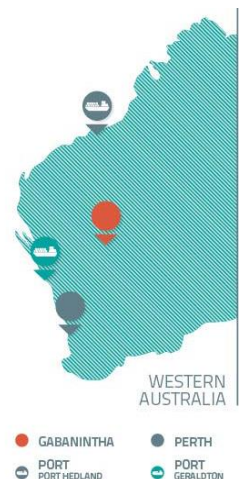
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Projects:

The Australian Vanadium Project – Vanadium  
Blesberg, South Africa – Feldspar  
Nowthanna Hill – Uranium/Vanadium  
Coates – Vanadium



The geology of the Coates deposit is unique and shows that vanadiferous magnetite is developed from the weathering profile of an underlying gabbro in a laterite outcrop on a ridge. The Coates Gabbro is about 1 km long and up to 600 m wide.

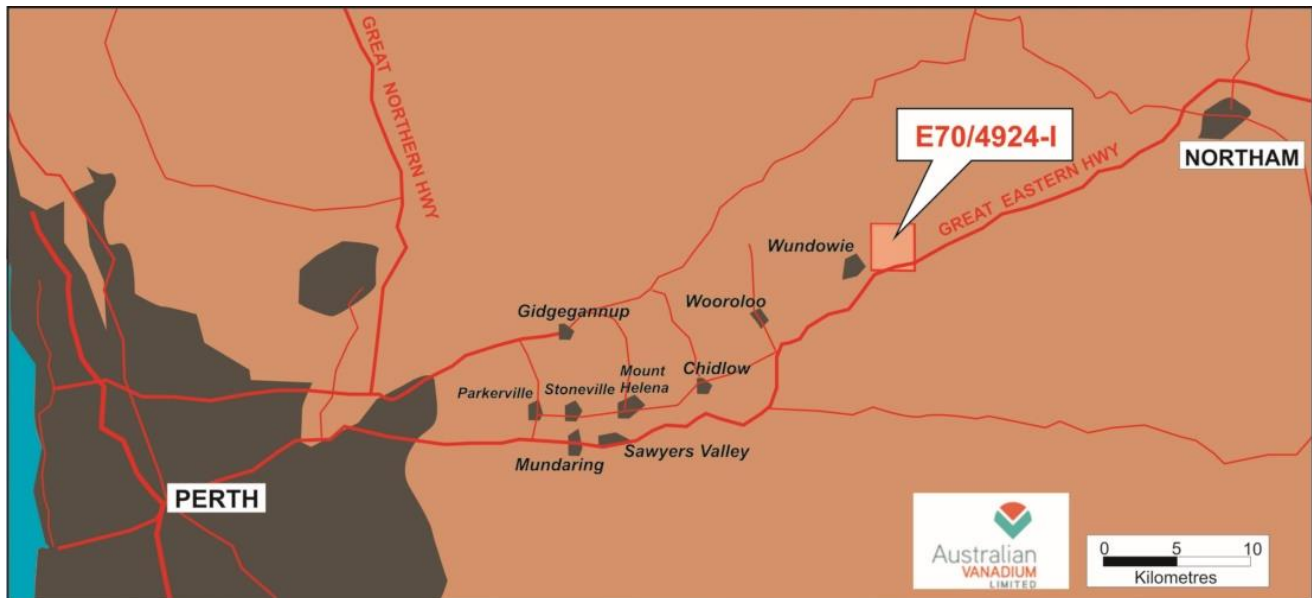


Figure 1 Coates Tenement Location

Exploration at Coates was undertaken in the 1970s after its discovery in the early 1960s.

Previous metallurgical test results indicate that a 58% recovery of vanadium at an approximate grade of 1.4%  $V_2O_5$ , 3%  $TiO_2$ , 67% Fe grade with 8%  $SiO_2$  is achievable from an ore assaying 0.54%  $V_2O_5$ , 4.75%  $TiO_2$ , 25% Fe and 29%  $SiO_2$ . Due to the historical nature of the resources stated above they are not reported in compliance with the 2012 JORC Code.

Metallurgical testwork was completed by AMDEL laboratories in 1975 on samples from the Coates deposit with favourable results. Mining plans had also previously been produced by Agnew Clough Ltd on the Coates vanadium deposit, although no significant mining was undertaken (see ASX announcement dated 18<sup>th</sup> July 2017 for further information).

UPS is a private company which has secured a licence to Pacific Northwest National Laboratory's (PNNL) generation 3 vanadium electrolyte production. UPS is the only company outside the United States to obtain this licence, which is the third and final licence in the world. The generation 3 electrolyte has a higher density than the standard generation 1 used by most VRFB manufacturers. This allows the product to have a smaller footprint and operate in a wider temperature range without the need for heating and cooling, from  $-40^{\circ}C$  to  $+50^{\circ}C$ .

In addition, UPS holds the exclusive Australian option to license the VanadiumCorp Electrochem Processing Technology (VEPT). VEPT enables the recovery of valuable by-products during the vanadium processing route with minimal carbon production and minimal waste.

UPS will test material from the Coates Vanadium Project and if that proves successful, will test the low grade (<0.5% V<sub>2</sub>O<sub>5</sub>) mineralisation from AVL's Australian Vanadium Project using the VEPT process. UPS aims to produce vanadium electrolyte and manufacture VRFBs in Western Australia. The mutual goals of the two companies are complementary from a business perspective.

AVL's Managing Director Vincent Algar comments, *"Having a deposit so close to Perth will enable the testing of both the VEPT process and production of generation 3 electrolyte at a relatively low cost. AVL looks forward to developing the relationship with UPS further as we advance the vanadium industry in Western Australia."*

Brad Appleyard, Managing Director of Ultra Power Systems Pty Ltd states, *"We are excited to commercialise VEPT exclusively in the mining friendly and vanadium-rich jurisdiction of Australia. With strong channel partners, investors and government support we intend to establish the leading integrated solution for vanadium batteries worldwide. Stationary battery storage is the key to a successful transformation of the energy industry into one based on renewable energy. Vanadium Redox Flow Batteries are the cleanest and most effective such technology available today. The central role played by the electrolyte in these batteries provides UPS with an opportunity to play a key role in the power industry well into the future"*.

Adriaan Bakker, President and CEO of VanadiumCorp states *"This is an exciting time to establish an integrated and sustainable supply chain for vanadium battery production in Australia. Western Australia is home to the most significant vanadium-titanium-iron resources on earth as well as strong government support for recovering key battery materials sustainably."*

For further information, please contact:

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### **About Australian Vanadium**

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 183.6Mt at 0.76% vanadium pentoxide ( $V_2O_5$ ), containing a high-grade zone of 96.7Mt at 1%  $V_2O_5$  with an Ore Reserve of 9.82Mt at 1.07%  $V_2O_5$  Proved and 8.42Mt at 1.01%  $V_2O_5$  Probable Resource, reported in compliance with the JORC Code 2012 (see ASX announcement dated 19 December 2018 ‘Gabanintha Pre-Feasibility Study and Maiden Ore Reserve’)

AVL has developed a local production capacity for high-purity vanadium electrolyte, which forms a key component of VRFB.

AVL, through its 100%-owned subsidiary VSUN Energy Pty Ltd, is actively marketing VRFB in Australia.

### **About Ultra Power Systems**

Ultra Power Systems Limited was formed for the purpose of offering next generation power and storage system solutions to capital conscious clients. The company intends to provide brand and generation agnostic solutions according to a customer’s needs, but with the core provision of a third-generation VRFB, which represents a transformational catalyst to enable the vision of blended power supply inputs on micro- and mega-grids.

### **About VanadiumCorp**

VanadiumCorp Resource Inc. ([www.vanadiumcorp.com](http://www.vanadiumcorp.com)) plans to develop VEPT in Canada and co-license the VEPT for targeted global jurisdictions to directly recover battery grade vanadium precursors for preparing the VanadiumCorp Electrolyte™ and coproducts such as ferrous sulfate and titanium dioxide from many sources. Jointly developed and owned with Electrochem, this innovative chemical process allows for integrated and low carbon footprint recovery of vanadium needed on a global scale from vanadiferous titanomagnetite “VTM”, magnetite, hematite as well as steel slags, calcine and oil residues.

### **About Electrochem**

Electrochem Technologies & Materials Inc. is a private Canadian corporation that invents, develops, patents, scales-up and commercialises proprietary chemical, metallurgical and electrochemical technologies that are innovative, and sustainable. The company also manufactures industrial electrodes, recycles rare earths from fluorescent lamps phosphors and produces tantalum and tungsten fine chemicals at its production facilities in Boucherville. Electrochem currently owns fourteen patents worldwide.

### **Competent Person Statement – Exploration Results**

*The information in this statement that relates to Exploration Results is based on information compiled by independent consulting geologist Brian Davis BSc DipEd who is a Member of The Australian Institute of Mining and Metallurgy and the Australian Institute of Geoscientists and is employed by Geologica Pty Ltd.*

*Brian Davis 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. Davis 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.*