DEVELOPING GROWTH

Results for the six months ending
30 June 2019

www.bushveldminerals.com
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The technical information contained within this presentation has been reviewed and approved by Professor Richard Viljoen. Professor Richard Viljoen has more than 30 years' experience in the mining industry, including 15 years as chief consulting geologist for Gold Fields of South Africa. Notable past experience includes the development of significant mines including Northam Platinum and the Leeudoorn and Tarkwa gold mines, identifying and developing a significant platinum deposit in the Bushveld Complex for Akanani Resources as well as acting as consultant for exploration and mining companies in Canada, Mexico, Venezuela, India and China in the fields of base metals, gold and platinum. Professor Richard Viljoen has extensive experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined under the JORC Code (2012). Professor Richard Viljoen consents to the inclusion in this presentation of the matters based on his information in the form and context in which it appears. Presentation of data unless specified otherwise: variance analysis relates to the relative performance of Bushveld Minerals and/or its operations during the 2019 financial year.
Company overview

A low cost, vertically integrated primary vanadium producer

- Largest primary vanadium resource base in the world (~550 Mt) with tier 1 V₂O₅ grades
- 3 deposits, well serviced with logistics infrastructure

The Group is targeting a production >8,400 mtVp.a and a nameplate capacity of 10,000 mtVp.a. within the next 5 years

An energy storage solutions provider, exclusively focused on vanadium based energy storage systems

- Electrolyte manufacturing
- Leverages own primary vanadium processing facilities
- 2018 production ~ 2,560 mtV, targeting growth to 8,400mtV
- Focus on expansion and enhancement of brownfield operations

- Electroryte manufacturing
- VRFB Assembly & manufacturing for large-scale energy storage mandates
- Research and development in cooperation with local and international institutes
- Create a business model for electrolyte supply

- MW scale energy storage project development
- Direct sales into large mandates/tenders
- Deployment models include PPAs, leasing models, IPP Investment

Targeting initial 200MWh of electrolyte p.a.

Targeting 1,000 MWh opportunities by 2020
Solid H1 results, underpinned by Vametco’s strong performance

Consolidated Results US$ million

<table>
<thead>
<tr>
<th></th>
<th>H1 2019</th>
<th>H1 2018</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (mtV)</td>
<td>1,392</td>
<td>1,360</td>
<td>2.4%</td>
</tr>
<tr>
<td>Revenue</td>
<td>78.0</td>
<td>83.7</td>
<td>-6.8%</td>
</tr>
<tr>
<td>LMB average price (kg/V)</td>
<td>56.3</td>
<td>65.5</td>
<td>-14.0%</td>
</tr>
<tr>
<td>EBITDA</td>
<td>41.0</td>
<td>42.8</td>
<td>-4.2%</td>
</tr>
<tr>
<td>Operating Profit</td>
<td>37.5</td>
<td>42.2</td>
<td>-11.1%</td>
</tr>
<tr>
<td>Profit After Tax</td>
<td>30.8</td>
<td>28.5</td>
<td>8.1%</td>
</tr>
<tr>
<td>Free Cash Flow¹</td>
<td>23.3</td>
<td>16.4</td>
<td>42.1%</td>
</tr>
<tr>
<td>Net Cash Balance</td>
<td>66.1</td>
<td>35.3</td>
<td>87.3%</td>
</tr>
<tr>
<td>Attrib. Earnings Per Share (cents)</td>
<td>1.92</td>
<td>1.57</td>
<td>22.3%</td>
</tr>
</tbody>
</table>

1. Free cash flow: comprises net operating cash flows less net investing cash flows
Bushveld Vanadium
Bushveld Vanadium overview

1. Vametco
   - Primary vanadium mine and plant.
   - Production of 2,560 mtV in 2018
   - 2019e 2,800-2,900 mtV
   - Production of > 4,200 mtVp.a. to be achieved post completion of Phase 3 of the Expansion project
   - 186.7 Mt Resource, 48.4 Mt reserve grade of 1.98% V₂O₅ in magnetite
   - Life of Mine of 27 years

2. Brits
   - Outcropping, strike extension of the Vametco mine
   - Maiden Mineral resource contains 66.8 Mt resource of 1.58% V₂O₅ in magnetite
   - Provides the potential for additional ore feed for Vametco and Vanchem

3. Vanchem (conditional acquisition)
   - Low cost primary vanadium processing facility
   - Currently producing circa 80mtV per month using 1 of the 3 kilns
   - Production of 4,200 mtVp.a. to be achieved post completion of a 5 year refurbishment programme

4. Mokopane
   - 298 Mt JORC resource, vanadium in-magnetite grades of 1.75% V₂O₅
   - Mokopane to become a primary source of feedstock for Vanchem and supply dry magnetic separated ore

- High grade ore for primary vanadium mining & processing (1.58% - 2.02% V₂O₅ in magnetite grades)
- Largest primary high grade vanadium resource base in the world (~550 Mt)
- Low cost vanadium processing facilities
Vametco: solid operational and financial performance despite a weaker vanadium price

Operational and financial highlights for Vametco (on a 100% basis)\(^1\)

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
<th>H1CY19</th>
<th>H1CY18</th>
<th>Variance (%)</th>
<th>CY18</th>
<th>CY17</th>
<th>CY16</th>
<th>CY19 Guidance</th>
<th>H1CY19 vs H1CY18 Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vanadium produced</td>
<td>(mtV)</td>
<td>1,392</td>
<td>1,360</td>
<td>2.4%</td>
<td>2,560</td>
<td>2,649</td>
<td>2,856</td>
<td>2800-2900</td>
<td>Transformation programme successfully delivering higher production rates ▪ Q2 2019 recorded the highest quarterly production rate in over two years</td>
</tr>
<tr>
<td>LMB Prices w.a.(^2)</td>
<td>US$/kgV</td>
<td>56.3</td>
<td>65.5</td>
<td>-13.9%</td>
<td>81.2</td>
<td>32.6</td>
<td>18.5</td>
<td>▪ LMB weighted average price for the period ▪ Vametco’s realised price is based on the prior month’s average price, which is higher than the quoted LMB price</td>
<td></td>
</tr>
<tr>
<td>Revenue</td>
<td>US$ million</td>
<td>74.3</td>
<td>81.2</td>
<td>-8.6%</td>
<td>183.0</td>
<td>71.9</td>
<td>51.7</td>
<td>▪ H1 2019: higher realised prices offset lower sales in the period</td>
<td></td>
</tr>
<tr>
<td>EBITDA</td>
<td>US$ million</td>
<td>42.3</td>
<td>42.4</td>
<td>0%</td>
<td>108.3</td>
<td>23.9</td>
<td>3.3</td>
<td>-</td>
<td>supported by lower costs</td>
</tr>
<tr>
<td>EBITDA margin</td>
<td>%</td>
<td>57</td>
<td>52</td>
<td>-</td>
<td>59</td>
<td>33.2</td>
<td>6.4</td>
<td>▪ Weaker ZAR relative to the USD ▪ Higher volumes ▪ Cost reduction initiatives</td>
<td></td>
</tr>
<tr>
<td>Production cash costs(^3)</td>
<td>US$/kg V</td>
<td>19.2</td>
<td>20.2</td>
<td>-5%</td>
<td>19.7</td>
<td>16.6</td>
<td>12.9</td>
<td>18.90-19.50</td>
<td></td>
</tr>
</tbody>
</table>

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1. Based on provisional, unaudited estimates. Bushveld’s net attributable interest in Vametco is 74%.
2. The vanadium price is based on the FeV mid weighted average price for the period, published by Metal Bulletin. Vametco realised price is based on the prior month’s average price.
3. Excludes depreciation, royalties, selling, general & administrative expenses.
A diagnostic review completed in Q4 2018 identified four areas of focus to improve performance:

- Stabilise and improve production;
- Maintain cost efficiency;
- Invest capital efficiently; and
- Improve organisational health
Vametco: taking care of people and the environment

Human Resources Development

- Vametco has recorded 5.376 million Fatality Free Shifts
- Successfully completed wage negotiations with AMCU for 1 July 2019 to 20 June 2022
- ESOP scheme under negotiation aimed at aligning the interests of the workforce with operational targets
- Progressing on Employees’ Financial Wellness Programme

Environmental Management

- New tailings dump completed to prevent groundwater contamination and rehabilitated current tailings dams to eliminate fall-out dust
- Embarked on the installation of an off-gas scrubber to reduce dust emissions
- Objective is to align our Environmental Management Systems with international standards, including those of the International Finance Corporation and ISO 14001:2015
- Targeting ISO 14001 certification by Q3 2020
Brits: exploration progress

- A Maiden Mineral Resource statement for Brits was published in H1 2019

- Indicated and Inferred Resource of 66.8 Mt (100% Gross Basis) with 41.8 Mt (62.5% Net Attributable Basis)

- Average grade of 1.58% $V_2O_5$ in magnetite for 175,400 tonnes of contained vanadium across the 3 seams

- Scope for additional ore feed for the Vametco plant and, if required, concentrate feed for the Vanchem plant
Vanchem: acquisition on track

- Announced the conditional acquisition of Vanchem on 1 May 2019 for a total of US$68 million
- Acquisition is on track to be completed on the 31 October 2019
- Unconditional approval received from the Competition Commission of South Africa
- Good progress on achieving:
  - Cession of specific commercial agreements; and
  - South African Reserve Bank approval
- Negotiations with local banks for debt facilities are progressing
- The acquisition is consistent with Bushveld Minerals’ growth strategy: production of >8,400 mtVp.a within the next 5 years, through targeting brownfield processing infrastructure
• Mokopane is intended to become a primary source of feedstock for Vanchem

• The Mokopane-Vanchem business model will create a fully-integrated business in a shorter time and at a lower cost than developing Mokopane as a standalone operation

• A definitive feasibility study has commenced for the development of the Mokopane mine

• Securing a New Order Mining Right for the project

• The options remain of:
  ▪ supplying ore to other primary or secondary producers worldwide; and/or
  ▪ developing Mokopane into an integrated mine and processing plant

<table>
<thead>
<tr>
<th>2016 PFS</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mineral Resource</td>
<td>Mt</td>
<td>298</td>
</tr>
<tr>
<td>Ore Reserve</td>
<td>Mt</td>
<td>28.5</td>
</tr>
<tr>
<td>Grade (in-situ)</td>
<td>%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Grade (in-magnetite)</td>
<td>%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Assumed vanadium price</td>
<td>US$/kg FeV</td>
<td>33</td>
</tr>
<tr>
<td>Initial Capital Costs</td>
<td>US$ m</td>
<td>298</td>
</tr>
<tr>
<td>NPV @ 9% real</td>
<td>US$ m</td>
<td>418</td>
</tr>
<tr>
<td>IRR real</td>
<td>%</td>
<td>25%</td>
</tr>
</tbody>
</table>
Bushveld Energy overview

Bushveld Energy Mandate

1. Address Africa’s electricity shortage through cost-effective storage
2. Advance South Africa’s industrialisation through value adding manufacturing
3. Augment vanadium applications in high technology fields

An energy storage solutions provider, exclusively focused on vanadium-based energy storage systems

**ELECTROLYTE**
- Electrolyte manufacturing
- Leverages own primary processing capacity and knowledge for low cost production
- Create business models for electrolyte supply

**MANUFACTURING**
- Vanadium Redox Flow Battery Assembly & manufacturing for large-scale energy storage mandates
- Research and development in cooperation with local and international institutes

**DEPLOYMENT**
- MW scale energy storage project development
- Direct Sales into large mandates/tenders
- Deployment models include PPAs, leasing models, IPP Investment

Targeting initial 200MWh of electrolyte p.a.
Targeting 1,000 MWh opportunities by 2020

All initiatives have low capital requirements - <20% of capex required for the mine and processing facilities
Bushveld Energy: progress on projects

Electrolyte Plant
• The Environmental Impact Assessment passed public participation
• Received Environmental Authorisation
• The first batch of electrolyte was successfully produced using Vametco's feedstock, with the samples being sent to vanadium battery companies for testing

Vanadium electrolyte rental model
• Implementation of the first rental contract was announced with Avalon Battery Corporation and its customer Sandbar

Eskom VRFB project
• The VRFB installed with Eskom was commissioned and is operating fully

Vametco-based Solar Mini-Grid Project
• Commenced an Environmental Assessment
• Completed a grid connection
• Completed geotechnical studies
• Procurement commences in Q3 2019
Bushveld Energy’s electrolyte rental model exploits the value of the vanadium in the battery

- In both very large and very small VRFBs, the vanadium is stored in special purpose tanks, separated from other equipment;
- This makes legal ownership and collateral tracking much easier than for minerals in other products;

**Benefits of vanadium rental for VRFB include:**
- Significantly lower and predictable capex for the electrolyte
- Manageable annual fee is added to the battery’s maintenance costs
- Overall lower total cost of ownership / levelized cost

**Financial Institution**
- Advances a credit facility to Intermediary
- Pays interest on the credit facility
- Settles the outstanding loan at contract termination
- Converts vanadium into electrolyte
- Supplies vanadium under rental contract
- Recovers vanadium at contract expiration

**Intermediary Special Purpose Lease Co.**
- Delivers required vanadium units to the Intermediary
- Pays nominal upfront deposit for electrolyte
- Pays annual rental fee for the electrolyte (covering interest payments and a price risk premium)

**Miner/Producer Vametco**
- Converts vanadium into electrolyte
- Supplies vanadium under rental contract
- Recovers vanadium at contract expiration
- Pays cash for the supplied vanadium units at market rates

**VRFB customer (Offtaker)**
- Pays interest on the credit facility
- Settles the outstanding loan at contract termination
- Converts vanadium into electrolyte
- Supplies vanadium under rental contract

**Bushveld Energy Achievements**
- First rental deployed with Avalon Battery in the US
- Negotiating larger rental agreements in Africa, Asia, Europe and North America
- Negotiations under way with external commercial debt providers to support the structure
- Early stage design and development

**Source:** Bushveld Energy
Bushveld Energy is building a commercial hybrid solar PV plus VRFB mini-grid in South Africa

**Project context**

- A grid-connected mine in South Africa consuming ~12MW on a flat hourly profile
- The mine enjoys some of the cheapest electricity prices, based on Eskom’s Megaflex tariff
- The tariff is higher in the morning and early evening, medium during the day and lowest at night
- The Eskom tariff is expected to increase by at least 25% over the next 3 years and reliability of supply is deteriorating

**Project design and financials**

**Project design**

- 1 MW mini-grid consisting of 2.5 MW DC PV and 1MW/4MWh VRFB energy storage
- Mini-grid sized to stay under the regulatory licensing requirement and only provides ~8% of the mine’s energy
- Economics are based on cheaper solar energy, avoiding peak tariff times, reducing demand charges and charging the VRFB twice per day (from PV in the day and cheap grid energy at night)
- Mine signs 20-year PPA for energy provided by the mini-grid that offsets grid energy and tariff costs

**Project financials**

- Funded with 65% debt from a South African bank
- Equity IRR in mid teens, despite higher than typical equity portion
- Excludes carbon credits benefits

Source: Bushveld Energy
At another commercial project under development, stacking the values from multiple benefits is key to viability.

Illustrative example of value “stacking” to quantify total value

Preliminary results of analysis

2MW of PV with 5MWh storage offsets over $700k in energy costs

<table>
<thead>
<tr>
<th>Value Stream</th>
<th>Total Value</th>
<th>USD per annum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Stream 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value Stream 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value Stream 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value Stream 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Insights from case study:
- Adding long duration BESS to PV doubles the savings to the customer
- The importance of including BESS increases to de-risk changes in future tariff design
- This project could be structured as an IPP, with an energy sale to the customer, earning an IRR of over 15%

Source: LAZARD'S LEVELIZED COST OF STORAGE—VERSION 2.0

1 VRFB can achieve peak power of 600kW for the first 1200kW of discharge
Source: SAB; Bushveld Energy
Vanadium market dynamics
Ferrovanadium price overview

Russia’s vanadium material disappeared, the market price moved up and thereafter Russia restarted production.

Advent of grade 3 rebar in China. The new standard forced Chinese rebar producers to start using vanadium (grade 3) for high strength rebar applications.

Problems with production of electrical power and resulting load shedding in South Africa negatively impacted vanadium production leading to the 2008 price spike.

China’s High-strength rebar standard came into effect in November 2018. In preparation of the new standard mills were building up their inventories.

Highveld Steel & Vanadium stops production.

Reduction due to seasonality, destocking, tolerance period, substitution and opportunistic producers.

Bushveld’s high-grade, long-life, low-cost assets and vertical integration strategy places it in a strong position throughout the commodity cycle.

Source: Bushveld Minerals, Metal Bulletin 30 September 2019
Temporary contributors to the FeV price retraction: The “tolerance period”

- China's new rebar standards introduced in November 2018 were not immediately enforced
- The Chinese government introduced a “tolerance period” and was not stringent in ensuring that the mills were complying
- Chinese rebar producers are required to renew their licences if there is a change in standards
- The issuing of new licences took place through June and July. Post-July all producers were bound to the terms of their new licence, which necessitates complying with the new standards
- A nationwide inspection was launched in July, with the larger mills complying with the standard. It will be completed in September.
- \( \text{V}_2\text{O}_5 \) August production from China was 5,287mtV (23% increase y/y) while total \( \text{V}_2\text{O}_5 \) consumed was 6,461mtV (32% increase y/y)
  - A deficit of more than 1,000mtV was recorded in August and a similar dynamic was shown in July and June

Source: Bushveld Minerals, BMO
Temporary contributors to the FeV price retraction: Substitution

- A big contributor to the price decrease was increased FeNb imports into China, suggesting greater substitution of FeV in grade III rebar at an >US$100/kgV FeV price
  - At a US$100/kgV price, the contribution of FeV to the cost of rebar was ~7%
- China imported 45% more FeNb in 2018 than in 2017 (35,737mt in 2018 compared to 24,644mt in 2017)
- Much of the substitution is price elastic
  - At current FeV prices the incentive to substitute FeNb with FeV is significantly diminished
- FeNb exports from Brazil were down from a monthly average of 3,734mt in Q3 19 to 2,480mt in August as FeV prices became more competitive
- As FeV prices normalize, FeV is expected to regain market share lost to FeNb, as FeV offers several advantages over FeNb in steel applications

Source: Bushveld Mineral analysis, Bloomberg, BMO, Metal Bulletin 27 September 2019, Roskill
Temporary contributors to the FeV price retraction: “Opportunistic producers”

Chinese co-production
- The rise in iron ore prices has incentivised some domestic Chinese vanadium-bearing magnetite production to return through co-production
  - The high price for haematite seaborne iron ore rallied above the breakeven price of most domestic mines, reaching highs of >US$100/Mt
- Chinese ore can only make up 35% of the steelmaking mix as sulphur levels are much higher in magnetite ore
- Stringent regulations by the Chinese government to curb emissions from the steel industry
  - The environmental restrictions will cap mining from domestic magnetite ore
- Current iron ore and steel dynamics suggest steel mills producing vanadium slag are close to full capacity

Chinese stone-coal production
- Increased production from restarted Chinese stone coal mines (~4,000 mtV in 2018)
- The stone coal mines producing the extra volumes require new permits, which are difficult to get without installing cleaner processing facilities
- Stone coal production was down 1.2% y/y in 2Q19

Source: Bushveld Minerals, BMO, Roskill
Vanadium: demand robust, supply constrained

Demand

• Robust growing vanadium demand anchored to the steel market, driven mainly by regulations in China and emerging markets developments
• Significant upside from stationary energy storage applications.

Supply

• Concentrated and constrained supply
• Dominated by co-production, which is constrained by:
  ▪ A subdued steel market outlook, and
  ▪ capped upside capacity
• Limited greenfield supply outlook

• The vanadium market is in a structural deficit, underpinned by robust and growing demand amidst concentrated and constrained supply with limited new capacity
• Existing primary vanadium producers are best-suited to deliver new supply

*Roskill forecasts assume that all announced projects under development will come into production
Priorities and strategy
Priorities for 2019/2020

**Bushveld Vanadium**
- Continued focus on operational excellence across the business
- Vametco is on track to achieve its production target of 2,800-2,900 mtV and cost guidance of US$18.90/KgV to US$19.50/KgV
- Complete the Vanchem acquisition on 31 October 2019
- Commence the 5-year refurbishment programme at Vanchem to achieve production of >4,200 mtVp.a.
- Continue to build a strong cooperative relationship with the workforce and local communities

**Bushveld Energy**

**Electrolyte**
- Obtain approvals for the construction of the electrolyte plant and commence production
- Implement additional electrolyte rental contracts

**VRFB manufacturing**
- Deploy VRFBs and partnerships with VRFB manufacturers
- Direct sales and project development (provide storage solutions and develop business case)
- Invest in VRFB original equipment manufacturers
Our 3- to 5-year vanadium strategy

Bushveld Vanadium

• Strengthen our position as a leading vanadium producer with a diversified product offering
• Focus on operational excellence
• Achieve a sustainable production run rate of 4,200 mtVp.a. at Vametco during 2022
• Complete the Vanchem refurbishment programme and achieve steady state production of >4,200 mtVp.a. within the next 5 years
• Build a vanadium platform capable of producing >8,400 mtVp.a
• Continue pursuing value-accretive growth opportunities

2018
- Vametco produced 2,560mtV

2019
- October 2019: Conditional acquisition of Vanchem, transaction to conclude on 30 October
- Vametco to achieve a production of 2,800 - 2,900 mtV
- Commence Vanchem’s refurbishment

2020
- Vametco to achieve a steady state production of 3,400 mtVp.a. during 2020

2022
- Vametco to achieve a steady state production of 4,200 mtVp.a. during 2022

2024
- Achieve a production platform of > 8,400 mtVp.a, with Vametco producing >4,200 mtVp.a. and Vanchem 4,200 mtVpa
Our 3- to 5-year energy strategy

Electrolyte
• Achieve steady-state operations at the electrolyte plant and grow production from initial 200MWh p.a. to match market growth
• Implementation of a vanadium electrolyte investment vehicle to support large-scale vanadium electrolyte rentals globally

VRFB manufacturing
• Implement selective, high-upside investments in the VRFB supply chain, including VRFB OEMs
• Develop business case for local VRFB assembly in South Africa

Deployment
• Participate in the 1400MWh Eskom battery procurement programme and other African projects within the Wold Bank’s 17.5GWh energy storage roll-out programme
• Include the Company’s VRFB offering in forthcoming rounds of the Renewable Energy Independent Power Producer procurement programme
• Develop up to 5 off-grid or behind-the-meter battery sites per annum
• Secure partial self supply of electricity at all Bushveld operations in South Africa
The Bushveld Minerals investment case

- **Compelling commodity** anchored to steel with burgeoning demand from energy storage
- **Large, high-grade, low-cost primary** vanadium assets
- Largest primary vanadium resource base of ~550Mt grading 1.58-2.02% $V_2O_5$
- After completing the Vanchem acquisition, Bushveld Minerals will own 2 of the world’s 4 existing primary vanadium production processing facilities
- Within the next 5 years Bushveld Minerals aims to strengthen its position as one of the leading primary vanadium producers
- Productivity initiatives designed to make Bushveld Minerals one of the lowest cost producers of vanadium
- Bushveld Energy is one of the leading players in the energy storage market
- Bushveld Minerals will offer a diversified product offering for the steel and chemical industries and energy storage
- Bushveld Minerals’ vertical integration strategy provides a natural hedge against vanadium price volatility as well as a diversified revenue stream
- **Driving innovation** across the vanadium value chain
Bushveld Minerals: share ownership and performance

BMN Share Price (30 September 2019) 21.75p
Basic Ordinary Shares 1,119,727,953
Market Capitalisation £255 million

<table>
<thead>
<tr>
<th>Top Shareholders</th>
<th># shares</th>
<th>% ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Hargreaves Lansdown Asset Mgt</td>
<td>199,397,154</td>
<td>17.81</td>
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<td>2 Halifax Share Dealing</td>
<td>114,878,440</td>
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<td>3 Interactive Investor</td>
<td>107,777,527</td>
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<td>4 Acacia Resources Limited</td>
<td>70,598,644</td>
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<td>5 Orange Trust</td>
<td>64,011,966</td>
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<table>
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<th>Top Institutional Shareholders</th>
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<td>1 Invesco Perpetual Asset Mgt</td>
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<td>2 Jarvis Investment Mgt</td>
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<td>3 Oppenheimer Funds</td>
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<td>4 Canaccord Genuity Wealth Mgt</td>
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<td>5 Raymond James Investment Services</td>
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<td>6 Standard Life Wealth</td>
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<td>7 FIL Investment International</td>
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Directors’ Ownership

<table>
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<tr>
<th># shares</th>
<th>% ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bushveld Minerals Ltd Directors &amp; Related Holding(s)</td>
<td>31,731,667</td>
</tr>
</tbody>
</table>

Bushveld Minerals Coverage

- BMO Bank of Montreal: Overweight
- SPANEL: Overweight
- MACQUARIE: Overweight
- finnCap: Overweight
- PEEL HUNT: Overweight
- Alternative Resource Capital: Overweight

Bushveld Minerals: Board of Directors

Ian Watson
Independent
Non-Executive Chairman

Fortune Mojapelo
Chief Executive Officer

Michael Kirkwood
Independent
Non-Executive Director

Anthony Viljoen
Non-Executive Director

Jeremy Friedlander
Independent
Non-Executive Director

Tanya Chikanza
Finance Director
Vanadium production methods (1/2)

Co-product slag is currently the source of most vanadium supply, but the future lies with primary vanadium ore feedstock.

STEEL PLANT CO-PRODUCTION FLOWSHEET (70% of Global Vanadium Feedstock Production)
- DRI + EAF/Blast furnace
- V recovery - Ladle furnace
- BOF + Steel Casters
- Salt Roast Processing

SALT ROAST FLOWSHEET (18% of Global Vanadium Feedstock Production)
- Salt Roasting
- Leaching & purification
- FeV/NV production

There are several greenfield vanadium projects exploring hydrometallurgical processing methods to produce iron, vanadium and titanium. None of these is yet in commercial production.

Source: Bushveld Minerals
There are several greenfield vanadium projects exploring hydrometallurgical processing methods to produce iron, vanadium and titanium. None of these is yet in commercial production.

- Grade a key barrier to entry
- Three operating primary producers – two in SA and one in Brazil
- Vanadium is the primary driver of economics
- Financing is a challenge even for quality greenfield projects

Co-product slag is currently the source of most vanadium supply, but the future lies with primary vanadium ore feedstock.

STEEL PLANT CO-PRODUCTION FLOWSHEET (70% of Global Vanadium Feedstock Production)

- Steel and iron ore are the primary drivers of economics
- Capex is key barrier to entry - 5x more than primary producers
- Concentrated in China and Russia, mostly co-production
- Process produces a vanadium slag further processed into vanadium through primary process

SALT ROAST FLOWSHEET (18% of Global Vanadium Feedstock Production)

- There are several greenfield vanadium projects exploring hydrometallurgical processing methods to produce iron, vanadium and titanium. None of these is yet in commercial production.
Vametco: reserves and resources

### Vametco Mineral Resource at a cut-off grade of 20% magnetite, 29 March 2019 – Gross
(Bushveld Minerals ownership is 74%)

<table>
<thead>
<tr>
<th>Class</th>
<th>Seam Name</th>
<th>Tonnes (Millions)</th>
<th>(V_2O_5) grade of whole rock</th>
<th>Magnetite grade of whole rock</th>
<th>(V_2O_5) grade of magnetite</th>
<th>Tonnes (V_2O_5) in magnetite (Thousands)</th>
<th>Tonnes V in magnetite (Thousands)</th>
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<tbody>
<tr>
<td>Indicated</td>
<td>Upper</td>
<td>5.7</td>
<td>1.44</td>
<td>65.9</td>
<td>1.78</td>
<td>67.0</td>
<td>37.5</td>
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<tr>
<td></td>
<td>Intermediate</td>
<td>28.7</td>
<td>0.68</td>
<td>32.7</td>
<td>1.91</td>
<td>179.2</td>
<td>100.4</td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td>109.4</td>
<td>0.72</td>
<td>32.4</td>
<td>2.03</td>
<td>719.7</td>
<td>403.1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>143.8</td>
<td>0.74</td>
<td>33.8</td>
<td>2.00</td>
<td>965.9</td>
<td>541.1</td>
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<td>Inferred</td>
<td>Upper</td>
<td>10.5</td>
<td>1.46</td>
<td>63.5</td>
<td>1.75</td>
<td>116.3</td>
<td>65.1</td>
</tr>
<tr>
<td></td>
<td>Intermediate</td>
<td>7.0</td>
<td>0.67</td>
<td>32.1</td>
<td>1.92</td>
<td>43.4</td>
<td>24.3</td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td>25.4</td>
<td>0.74</td>
<td>31.3</td>
<td>2.00</td>
<td>158.5</td>
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<td>Total</td>
<td>42.9</td>
<td>0.90</td>
<td>39.3</td>
<td>1.92</td>
<td>318.2</td>
<td>178.2</td>
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<td>Indicated and Inferred</td>
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<td>16.2</td>
<td>1.45</td>
<td>64.3</td>
<td>1.76</td>
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<td>35.7</td>
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<td>32.6</td>
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<td>222.6</td>
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<td>134.8</td>
<td>0.72</td>
<td>32.1</td>
<td>2.03</td>
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<td>Total</td>
<td>186.7</td>
<td>0.78</td>
<td>35.0</td>
<td>1.98</td>
<td>1,284.1</td>
<td>719.3</td>
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### Vametco Ore Reserves, 29 March 2019 – Gross (Bushveld Minerals ownership is 74%)

<table>
<thead>
<tr>
<th>Class</th>
<th>Seam Name</th>
<th>Tonnes (Millions)</th>
<th>(V_2O_5) grade of whole rock</th>
<th>Magnetite grade of whole rock</th>
<th>(V_2O_5) grade of magnetite</th>
<th>Tonnes (V_2O_5) in magnetite (Thousands)</th>
<th>Tonnes V in magnetite (Thousands)</th>
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<tr>
<td>Probable</td>
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<td>0.58</td>
<td>27.3</td>
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<td></td>
<td>Intermediate</td>
<td>7.23</td>
<td>0.53</td>
<td>23.7</td>
<td>1.89</td>
<td>32.3</td>
<td>18.1</td>
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<td></td>
<td>Lower</td>
<td>40.23</td>
<td>0.63</td>
<td>29.4</td>
<td>2.05</td>
<td>242.1</td>
<td>135.6</td>
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<td></td>
<td>Total</td>
<td>48.43</td>
<td>0.62</td>
<td>28.5</td>
<td>2.02</td>
<td>279.1</td>
<td>156.3</td>
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</table>

- Ore Reserves have more than doubled to 279,100 tonnes \(V_2O_5\) in magnetite.
- Grade has increased by 3% to 2.02% \(V_2O_5\).
- Updated Resource and Reserve statements with 31% and 85% growth in resources and reserves respectively.
- Resource 186.7Mt average grade 1.98% \(V_2O_5\) in concentrate.
- Reserves 48.43Mt average grade 2.02% \(V_2O_5\) in concentrate.
- Average magnetite content of 35% and 28.5% in the resources and reserves respectively.
- Magnetite Content % increase in the Ore Reserves from 26.8% to 28.5% is a result of the increase in Magnetite content in the Mineral Resources.
### Brits Vanadium Mineral Resource at a cut-off grade of 20% magnetite, 18 June 2019 - Gross Basis (Bushveld Minerals ownership is 62.5%)

<table>
<thead>
<tr>
<th>Class</th>
<th>Seam Name</th>
<th>Tonnes (Millions)</th>
<th>V$_2$O$_5$ grade of whole rock</th>
<th>Magnetite grade of whole rock</th>
<th>V$_2$O$_5$ grade of magnetite</th>
<th>Tonnes V$_2$O$_5$ in magnetite (Thousands)</th>
<th>Tonnes V in magnetite (Thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper</td>
<td></td>
<td>2.0</td>
<td>0.66</td>
<td>43.64</td>
<td>1.51</td>
<td>13.4</td>
<td>7.5</td>
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<td>Intermediate</td>
<td>1.9</td>
<td>0.47</td>
<td>21.52</td>
<td>1.75</td>
<td>7.0</td>
<td>3.9</td>
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<td>Lower</td>
<td>41.0</td>
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<td>1.59</td>
<td>185.9</td>
<td>104.2</td>
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<td></td>
<td>Total</td>
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<td>28.94</td>
<td>1.59</td>
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<tr>
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<td>7.1</td>
<td>0.65</td>
<td>43.89</td>
<td>1.50</td>
<td>46.7</td>
<td>26.2</td>
</tr>
<tr>
<td></td>
<td>Intermediate</td>
<td>0.4</td>
<td>0.44</td>
<td>21.13</td>
<td>1.85</td>
<td>1.4</td>
<td>0.8</td>
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<td></td>
<td>Lower</td>
<td>14.5</td>
<td>0.50</td>
<td>26.09</td>
<td>1.55</td>
<td>58.8</td>
<td>32.9</td>
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<tr>
<td></td>
<td>Total</td>
<td>22.0</td>
<td>0.55</td>
<td>31.78</td>
<td>1.54</td>
<td>106.9</td>
<td>59.9</td>
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<tr>
<td>Upper</td>
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<td>21.46</td>
<td>1.76</td>
<td>8.4</td>
<td>4.7</td>
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<td>Lower</td>
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<td>27.90</td>
<td>1.58</td>
<td>244.6</td>
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<td>0.56</td>
<td>29.87</td>
<td>1.58</td>
<td>313.2</td>
<td>175.4</td>
</tr>
</tbody>
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### Mokopane: reserves and resources

- The Mokopane project has a 298 Mt JORC-compliant Resource, including 28.5 Mt Reserves and a weighted average V$_2$O$_5$ grade of 1.41% in-situ and 1.75% in magnetite. Bushveld Minerals ownership is 64%.
Vametco 2018 cost position

Source: Roskill, Bushveld Minerals
Participating in the circular economy

- The VRFB is designed to last for 20 years or more, meaning that fewer batteries need to be deployed than its lithium counterparts.

- The unique technical design of this flow battery allows for full reusability of the chemical electrolyte in the battery once the electrical and mechanical components wear out. That means that even after the 20-year lifetime of the battery is reached, the electrolyte can be redeployed into another battery.

- The electrolyte can be easily reprocessed by existing vanadium processing facilities at minimal cost into products such as ferrovanadium and vanadium-pentoxide for use in high-strength steels and specialty alloys & chemicals.

- Vanadium electrolyte is primarily made of water, allowing for easier processing than from other compound states.

- Only one mineral is extracted from vanadium electrolyte, whereas lithium, nickel, manganate, cobalt, etc. need to be separated out in a lithium battery.

- These opportunities may make vanadium the most circular economy-friendly mineral.

Source: Bushveld Minerals
Electrolyte rental is implemented in three phases

**Design**

1. **Bushveld balance sheet supported**
   - Initial rents to be funded by Bushveld Minerals (Bushveld) for ease, timeliness and to de-risk the product
   - Bushveld can use own funds or a third-party finance provider to support product, focusing on small / medium sized transactions
   - Lease pricing and structure designed to fit that of a bank-financed SPV from start
   - Process focused on getting parameters of lease correct (financial model, legal contract, tax implications, partners, initial customers)

2. **Bank financed SPV**
   - Role of Bushveld as funder is replaced by a commercial bank or development funder
   - Uses an evergreen facility with automatic renewal assuming continued adherence to loan covenants
   - Bushveld will continue to control vanadium redeployment back into the market at end of battery life
   - Heavily-leveraged facility for low-risk counterparties with medium to large installations
   - Strict risk assessment

3. **Vanadium investment product**
   - Vanadium-based fund product that allows investors to invest directly in vanadium prices
   - Fund’s balance sheet consists of vanadium contained in electrolyte deployed across different sites and VRFB technologies
   - Fund includes an annuity-style revenue stream tied to the vanadium lease
   - Fund portfolio structure further de-risks location or end-user specific risks
   - Potential for very large size, far exceeding bank lending capacities

**Current status**

- First rental deployed with Avalon Battery in the US
- Negotiating larger rental agreements in Africa, Asia, Europe and North America

- Negotiations under way with external commercial debt providers to support the structure

- Early stage design and development

Source: Bushveld Minerals
Bushveld Minerals Corporate Video: https://www.brrmedia.co.uk/broadcasts/5a5626af9ed50c2f9b04679c/bushveld-minerals-an-emerging-integrated-vanadium-producer
Vanadium 101 Webinar: https://edge.media-server.com/m6/p/i2wo6bk9
Energy Storage 101 Webinar: http://webcasting.brrmedia.co.uk/broadcast/5bd2eae5b01efb6b20c2f9eb/5bd348eba21632633b00003d