**TECHNOLOGY**
METALS AUSTRALIA LIMITED

## ASX Announcement

## 21 August 2019

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**Directors**

Michael Fry:
**Chairman**

Ian Prentice:
**Managing Director**

Sonu Cheema:
**Director and Company Secretary**

**Issued Capital**

87,554,167 ("TMT") Fully Paid Ordinary Shares

14,888,750 – Quoted Options ("TMTO") exercisable at $0.40 on or before 24 May 2020

20,598,334 – Unquoted Options – various exercise prices and dates

**ASX Code: TMT, TMTO**
**FRA Code: TN6**

VANITEC
TRANSFORMING POSSIBILITIES

AMEC

# GABANINTHA VANADIUM PROJECT DEFINITIVE FEASIBILITY STUDY

## +16 YEAR MINE LIFE AT LOWEST QUARTILE CASH COSTS OF US$4.04/LB $V_2O_5$

## PROJECT ORE RESERVE UPDATED TO PROVEN AND PROBABLE 29.6MT AT 0.88% $V_2O_5$

Definitive Feasibility Study (DFS) confirms the Gabanintha Vanadium Project to be a high value, long life, low cost technically robust Project.

| | | | |
|---|---|---|---|
| MASSIVE MAGNETITE RESOURCE<br>71.2Mt<br>@ 1.1% $V_2O_5$ | MINING RESERVE<br>29.6Mt<br>@ 0.88% $V_2O_5$ | PROCESSING PLANT<br>SALT ROAST WATER LEACH<br>27.9Mlb<br>12,800t<br>$V_2O_5$ pa | MINE LIFE<br>+16years |
| OPEX<br>US$4.04<br>/ lb $V_2O_5$ | PRE PRODUCTION CAPITAL COSTS<br>US$318M<br>A$454M | PRE TAX $NPV_{8\%}$<br>US$924M<br>A$1,320M<br>IRR 34% | PAYBACK<br><3.2years |

AUD/USD 0.70, US$10.88/lb long term $V_2O_5$ price, estimate confidence level of -5% to +15%

**Cautionary Statement**

*The DFS referred to in this announcement is based upon a JORC Compliant Mineral Resource Estimate (ASX: Gabanintha Northern Block Resource Upgrade: 29 March 2019) (inclusive of the updated Proven and Probable Ore Reserve referred to in this announcement). Mineralisation to be mined in the DFS schedule includes 2% Inferred Mineral Resources in the first 12 years of production and a total 17% Inferred Mineral Resources over the life of mine. There is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources or that the production target itself will be realised. The inclusion of the Inferred Mineral Resources in the production schedule is not anticipated to impact materially on the Project's economic viability.*

*The Ore Reserves and Mineral Resource Estimate underpinning the DFS have been prepared by Competent Persons with Competent Person' Statements attached.*

*Process and engineering designs for the DFS were developed to support capital and operating estimates to an accuracy of -5% to +15%. Key assumptions that the DFS was based on (including those defined as Material Assumptions under ASX Listing Rule 5.9.1) are outlined in the body of this announcement and Appendix 1. TMT believes the production target, forecast financial information derived from that target and other forward-looking statements included in this announcement are based on reasonable grounds.*

*Several key steps need to be completed in order to bring Gabanintha into production. Many of these steps are referred to in this announcement. Investors should note that if there are delays associated with completion of those steps, outcomes may not yield the expected results (including the timing and quantum of estimated revenues and cash flows).The economic outcomes associated with the DFS are based on certain assumptions made for commodity prices, exchange rates and other economic variables, which are not within the Company's control and subject to change. Changes in such assumptions may have a material impact on the economic outcomes.*

*To develop the Project as per the assumptions set out in the DFS will require additional capital. Investors should note that any failure to precure the required additional capital may result in a delay or change in nature and scale of the Project.*

## EXECUTIVE SUMMARY

### ROBUST PROJECT PARAMETERS

- Project metrics compare very favourably to global vanadium producers with lowest quartile life of mine cash costs of US$4.04/lb $V_2O_5$.
- Industry leading end-to-end vanadium recovery of 77% on fresh massive ore with class leading 71% mass recovery to magnetic concentrate.
- Average annual production of 27.9 Mlb $V_2O_5$ – would establish Gabanintha as the World's largest primary vanadium producer.
- Critical pilot scale kiln roast test work completed by industry leading kiln supplier, FLSmidth Inc.
- Average feed grade of +1.0% $V_2O_5$ for first 12 years – one of the World's highest grade operations.
- Conservative +two-year throughput and recovery ramp up assumptions.

### STRONG ECONOMICS

- Life of mine EBITDA estimate of A$4.1 Bn.
- Estimated A$1.09 Bn free cash flow generated in the first six years of operation.
- Pre-tax $NPV_{8\%}$ of US$924m (A$1,320m) and IRR of 34% at average LOM pricing of US$10.88/lb $V_2O_5$.
- 15-year historical average price of US$8.78/lb* $V_2O_5$ delivers pre-tax $NPV_{8\%}$ of US$464m (A$663m) and IRR of 21%.
- Pre-production process plant capital of US$318m (A$454m) with 3.2 year payback.

### OFFTAKE STRATEGY WELL PROGRESSED

- MOU signed with CNMC Ningxia Orient Group Company Ltd, a controlled subsidiary of China Nonferrous Metal Mining (Group) Co. Ltd.
- Discussions indicate a high level of interest in securing supply of $V_2O_5$ from a primary mining source in a stable jurisdiction such as Western Australia.

### STRUCTURAL CHANGE IN VANADIUM INDUSTRY

- Demand growth driven by China's enhanced quality standards for construction steel requiring increased consumption of vanadium.
- Supply impacted by industry consolidation / rationalisation and Chinese environmental restrictions.
- Vanadium market deficit requires new primary production to support demand growth.

### NEXT STEPS

- Progress offtake and finance discussions.
- Advance environmental approvals and Mining Lease grant.
- Commence FEED study.
- Target investment decision by beginning of Q2 2020.

**Managing Director Ian Prentice commented:** "The very high quality Gabanintha Vanadium Project DFS has generated an outstanding result delivering lowest quartile operating costs over a long initial mine life at a scale that will make the Project the largest single primary vanadium producer in the World. Delivery of this study is a key milestone in progression of discussions with prospective development partners that the Company has engaged with over the past 12 to 18 months."

* Chinese $V_2O_5$ spot price range of US$8.40 to US$9.00/lb as at 15 August 2019 (source FerroAlloyNet)

## FEASIBILITY STUDY OUTCOMES

Technology Metals Australia Limited (ASX: **TMT**) ("**Technology Metals**" or the "**Company**") is pleased to announce the results of the definitive feasibility study ("**DFS**") on its 100% owned Gabanintha Vanadium Project ("**GVP"** or the **"Project**") in Western Australia. The DFS is based on the development of an open pit mining operation, crushing, milling, magnetic separation, salt roasting – water leaching and chemical process plant to produce high purity (+99%) vanadium pentoxide ($V_2O_5$) product for use in the steel, specialty alloy, chemical and battery markets.

The GVP DFS confirms the Project to be a long life, low cost, high value, relatively low risk and technically strong development opportunity with a proposed average production rate of 27.9 Mlbpa (12,800tpa) high purity $V_2O_5$ product over a +16 year operating life. The peak steady state production rate is proposed to be around 30.0 to 31.0 Mlbpa (13,700 to 14,200tpa) which would establish the GVP as the World's largest primary production vanadium producer. The DFS has been developed to a confidence level of -5% to +15%.

Life of mine cash operating costs (C1) are estimated at a highly competitive, lowest quartile US$4.04/lb $V_2O_5$ with all in costs (AIC) including start up and sustaining capital of US$5.75/lb $V_2O_5$. Figure 1 highlights the competitive advantage that these low cash operating costs provide relative to the global vanadium industry (black dots represent existing $V_2O_5$ producers) and provides confidence that the GVP will be sustained through vanadium price cycles. The figure also highlights the spread of cash costs across the varying $V_2O_5$ supply sources, with Chinese Stone Coal supply identified as being relatively high cost.

TMT's operating costs do not incorporate any revenue benefits that may be generated from by-product credits, such as base metal production as the study work on this product stream has not been completed to a DFS level.

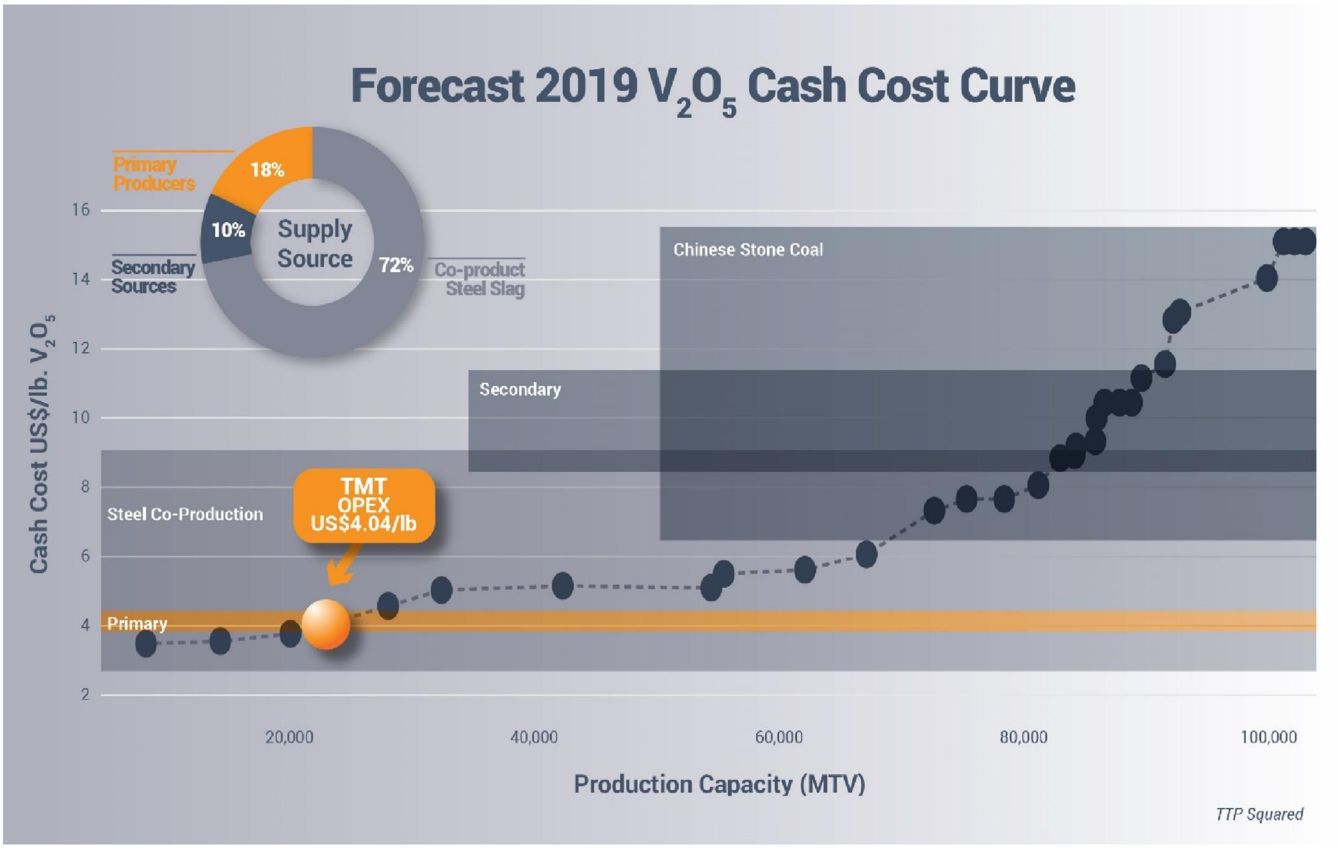


**Figure 1**: Vanadium Pentoxide Industry Cash Cost Curve (2019)

Metallurgical test work completed as part of the DFS highlights the industry leading vanadium recoveries of the massive magnetite hosted mineralisation at GVP, with an end-to-end recovery of 77% for the undiluted massive fresh ore, which forms the majority of process plant feed for the first 12 years of the proposed operation. The massive transitional ore, which has been used as the basis of design for the processing plant and represents about 50% of plant feed for the first three years, after which it rapidly reduces to less than 5% of feed, has an end-to-end recovery of 55%.

The high recoveries at GVP are driven by the unique geological attributes of the ore body, with:

1. Coarse grain size of the high-grade massive magnetite ore allows efficient liberation of deleterious minerals during the beneficiation stage at a coarse grind size, allowing more cost effective magnetic beneficiation and processing through the salt roast stage;
2. Very shallow oxidation of the ore body enabling excellent recoveries from fresh ore early in the mine life – limited losses at the beneficiation stage distinguishes GVP from most existing operations and other potential development projects; and
3. Excellent continuity of the high-grade massive magnetite ore, which also demonstrates outstanding consistency of width and grade, providing for simple and low cost mining.

The DFS mining and production schedule is based on the updated Ore Reserve of 29.6 Mt at a mined (diluted) grade of 0.88% vanadium pentoxide ($V_2O_5$) (see Table 1). The Company engaged CSA Global to provide an Ore Reserve statement prepared by a Competent Person in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code (2012 Edition)). The Ore Reserve estimate was based on the Measured and Indicated Mineral Resource of 30.0 Mt at 0.9% $V_2O_5$ located within the Northern Block of tenements at Gabanintha, as reported to the ASX on 29 March 2019). This updated Ore Reserve represents a very high +98% tonnage conversion from Measured and Indicated Resource to Proven and Probable Reserve. This Ore Reserve updates the maiden Ore Reserve statement reported by TMT on 21 June 2018.

**Table 1:** Ore Reserve Estimate July 2019

| Reserve Category | Tonnes (Mt) | Grade $V_2O_5$% | Contained $V_2O_5$ Tonnes (Mt) |
|---|---|---|---|
| Proven | 1.1 | 0.96 | 0.01 |
| Probable | 28.5 | 0.88 | 0.25 |
| **Total** | **29.6** | **0.88** | **0.26** |

- *Note: Includes allowance for mining recovery (98% for massive magnetite ore and 95% for banded and disseminated ore) and mining dilution applied as a 1 metre dilution skin; resulting in a North Pit dilution for massive magnetite ore of 13% at 0.45% $V_2O_5$, and North Pit dilution for banded and disseminated ore of 29% at 0.0% $V_2O_5$; a Central Pit dilution for massive magnetite ore of 10% at 0.46% $V_2O_5$, and Central Pit dilution for banded and disseminated ore of 20% at 0.0% $V_2O_5$.)*
- *Rounding errors may occur*

The total Gabanintha Vanadium Project comprises a global Measured, Indicated and Inferred Mineral Resource of 131 Mt at 0.9% $V_2O_5$, containing an outstanding continuous high-grade component of 71.2 Mt at 1.1% $V_2O_5$ (see Table 5).

The mineralisation to be mined in the DFS schedule is 35.7 Mt at 0.83% $V_2O_5$ with the inclusion of 2% Inferred Mineral Resources in the first 12 years of production and a total 17% Inferred Mineral Resources over the life of mine (see Figure 2). Please note that there is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources or that the production target itself will be realised. The inclusion of the Inferred Mineral Resources in the production schedule is not anticipated to impact materially on the project economic viability. The mine plan revolves around the development of two open pits mined in three stages; the North Pit and the Central Pit.

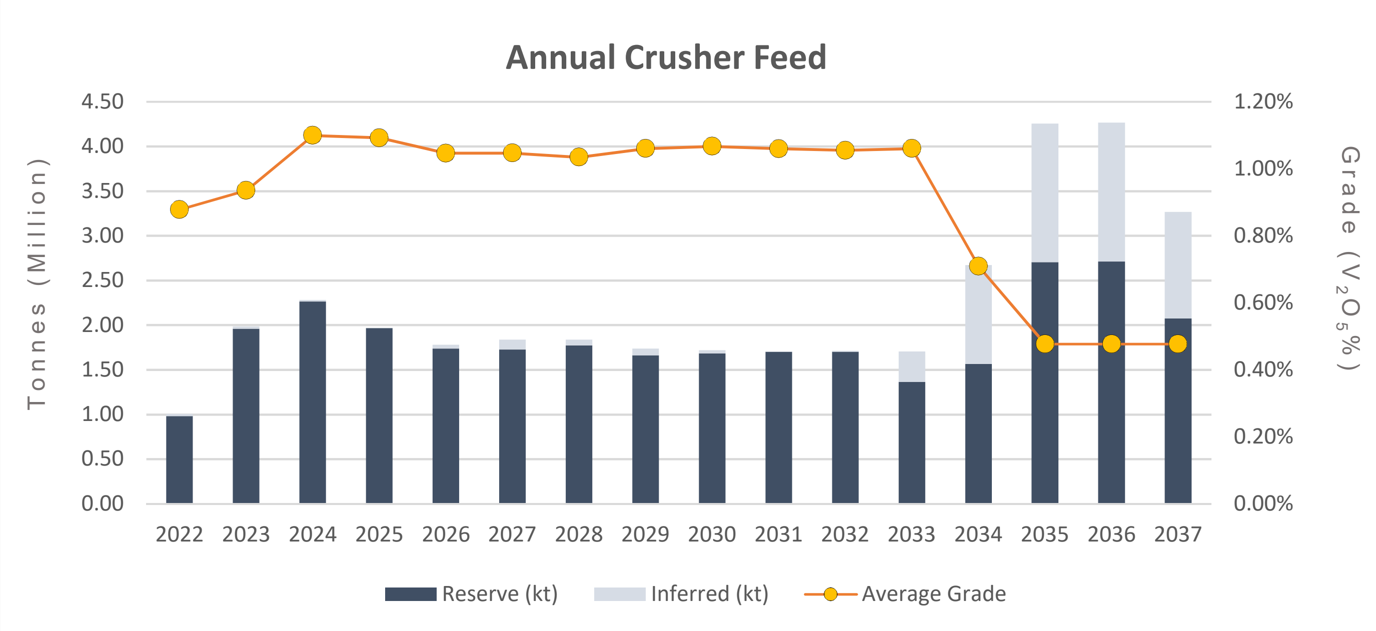


**Figure 2**: Annual Crusher Feed Showing Feed Grade and Tonnage plus Distribution of Inferred Mineral Resources (Process feed post 2033 sourced from low grade stockpiles built up over LOM)

Metallurgical and pilot scale testwork (see the Processing/Metallurgical Testwork section on page 19) during the DFS study has shown that the GVP ore is suited to processing via the salt roast / water leach process flow sheet similar to what is currently operating at Largo Resources' Maracas Menchen vanadium mine in Brazil. Testwork has also confirmed the ability to produce a high purity (>99%) $V_2O_5$ product which may be amenable for the premium vanadium market.

Affordable and reliable supply of natural gas for power generation and heating was identified to be of key importance for the GVP, with TMT entering in to an MOU with a gas infrastructure group (see the Supporting Infrastructure section on page 24) in relation to the construction of a natural gas pipeline under a build, own and operate agreement with TMT to become a Foundation Customer for the new pipeline.

It is anticipated that production from the Project will commence in 2022, with the application of a conservative ramp up period based on achieving overall plant design capacity of 85% after two years, with the final 15% realised in the third year, and vanadium recovery increasing to full design recovery by the beginning of the third year. The ramp up assumptions incorporate recent historic knowledge, industry recognised McNulty start up curves based on analysis of other operations ramp up performance and industry experience.

The DFS was completed on behalf of the Company by Wave International ("**Wave**"), an independent resource development / engineering consultant, as the lead process and project development consultant supported by a range of industry leading consultants with considerable expertise in their fields.

The other consultants involved in the preparation of the DFS include:

- METS Engineering for metallurgical testwork, product assessment and mineral processing;
  - laboratory and bench scale testwork completed at ALS in Perth, and
  - pilot scale kiln roast testwork undertaken by FLSmidth in the USA.
- CSA Global for resource and mining study work, involving the generation of open pit designs, mining and production schedules, mining capital and operating cost estimates, and an updated ore reserve estimate, supported by;
  - Mine Geotech for open pit geotechnical inputs for CSA Global.
- Integrate Sustainability for environmental, heritage, health, safety and statutory approvals advice and assistance, supported by a range of industry specific consultants, including;
  - AQ2 for project water supply and pit dewatering,
  - Hydrologia for surface water assessment, and
  - Biologic Environmental Survey for flora, fauna and subterranean fauna.

Tables 2 and 3 provide a summary of the key physical, operating and financial assumptions and outputs on which the DFS and Ore Reserves are based, whilst Figure 3 shows the proposed GVP site layout.

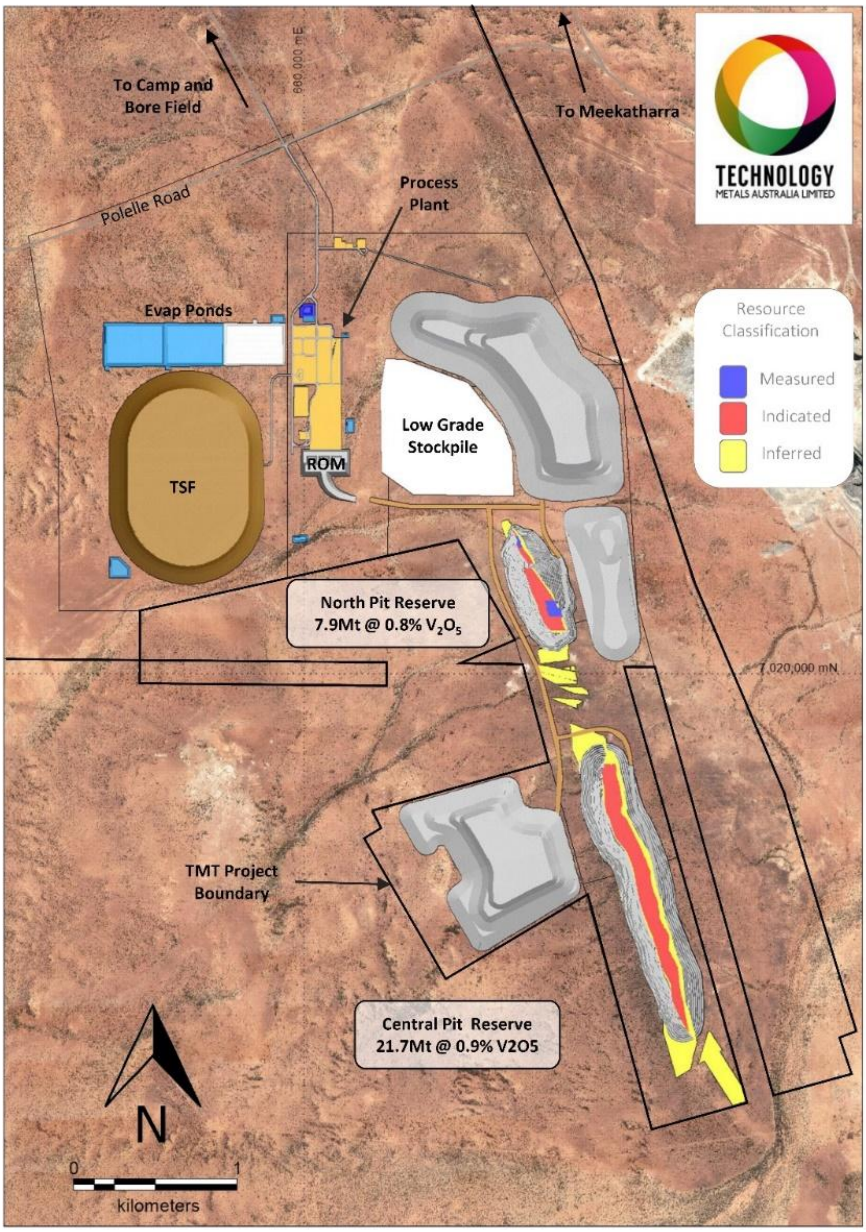


**Figure 3:** Gabanintha Project – Site Layout

**Table 2**: Gabanintha DFS – Material Physical Assumptions and Anticipated Outputs

**PRODUCTION**

| Key Metric | Unit | DFS |
|---|---|---|
| **Average $V_2O_5$ Production Rate** | Mlb Per Annum | **27.9** |
| **Targeted Production Commencement** | Year | **2022** |
| **Estimated Mine / Processing Life** | Years | **+16** |
| **Life of Mine Production** | Mlb $V_2O_5$ | **447.1** |
| **Processing Rate – ROM (Yrs 1 – 12)** | Mtpa | **1.7 - 2.3** |
| **Estimated mineralisation to be mined** | Mt | **35.7** |
| **Average LOM Strip Ratio** | | **4.3** |
| **Average Diluted Mining Grade (LOM)** | % $V_2O_5$ | **0.83** |
| **Average Plant Feed Grade (Yrs 1 -12)** | % $V_2O_5$ | **1.04** |
| **Average Yield to Mag Con (Yrs 1 – 12)**[1] | % | **71** |
| **Average V Recovery (Yrs 1 – 12)** [1] | % | **70** |

1 – Includes two year ramp up period, and blended transitional / partly oxidised feed in the early years

The GVP DFS provides an anticipated pre-tax net present value at a real 8% discount rate ($NPV_{8\%}$) in the region of $1,320 million over a projected +16 year mine life, with an IRR of 34%, based on a forecast life of mine average $V_2O_5$ prices of US$10.88/lb. This delivers a rapid capital payback of around three years, inclusive of the +2 years ramp up period.

Pre-production process plant capital costs are estimated at $454 million, inclusive of detailed design engineering work (FEED study), early works ordering of long lead time items, process plant construction, supporting infrastructure, EPCM, owners' costs, purchase of initial reagents, consumables and spare parts, commissioning and contingency (see Table 11).

TMT is a small market capitalisation company and does not currently have the financial capacity to internally fund 100% of the development of the GVP. External funding in the form of a mix of debt, JV interest, direct project investment and/or equity will be required. The Company has engaged financial advisers to assist in evaluation of the various financing strategies and to engage with prospective strategic investors, financiers and offtake partners. The Company believes that it has a reasonable basis to assume that project financing will be successful.

Pre-production mining capital is estimated at $16 million, predominantly consisting of mining contractor mobilisation and establishment costs (see Table 12). Stage 2 deferred capital expenditure of $64 million, which is designed to provide benefits to reagent consumption and vanadium recovery, is proposed once the project is in positive cashflow. There will also be working capital required up to and during the commissioning and the initial ramp up phase prior to generation of positive cashflow.

**Table 3**: Gabanintha DFS – Material Financial Assumptions and Anticipated Outputs

**PROJECT FINANCIALS**

| Key Metric | Unit | DFS |
|---|---|---|
| **Long Term Commodity Price Forecast[1]** | US$/lb $V_2O_5$ | **10.88** |
| **Exchange Rate Assumption** | A$: US$ | **0.70** |
| **Total Revenue** | A$m | **7,019** |
| **Total EBITDA** | A$m | **4,063** |
| **Average Annual EBITDA (Steady State)** | A$m | **268** |
| **Total Pre-Production Process Plant Capex[2]** | A$m | **454** |
| **Total Stage 2 / Deferred Capex[3]** | A$m | **64** |
| **Total Operating Expenditure** | A$m | **2,957** |
| **Average Operating Costs** | US$/lb $V_2O_5$ | **4.04** |
| **Average All in Sustaining Costs** | US$/lb $V_2O_5$ | **5.75** |
| **Discount Rate Assumption** | % | **8** |
| **Net Present Value 8% Discount Rate (pre-tax)** | A$m | **1,320** |
| **Internal Rate of Return (pre-tax)** | % | **34.2** |
| **Net Present Value 8% Discount Rate (post-tax)** | A$m | **870** |
| **Internal Rate of Return (post-tax)** | % | **27.3** |
| **Anticipated Payback on Capital** | Years | **3.2** |

1 – US$10.59/lb $V_2O_5$ from 2028

2 – Includes A$49.5m contingency, A$64.9m EPCM, $13.9m owners and indirect costs. Does not include $16.0m mining pre-production capital.

3 – includes crystallisation and ion exchange plants to reduce reagent (salt) consumption and increase recovery

The DFS indicates that the GVP generates significant levels of annual cashflow at the forecast vanadium pricing, with approximately $1.09 billion of free cash flow generated over the first six years of the operation. Table 4 shows project metrics at a range of vanadium price assumptions, including the June 2018 PFS price assumptions and a flat US$8.78/lb $V_2O_5$. The flat pricing scenario reflects the average historical price of $V_2O_5$ over the past 15 years (April 2004 to March 2019) (source: TTP Squared) and approximates current $V_2O_5$ market prices.

**Table 4**: Gabanintha DFS – Financial Metrics at Various Commodity Price Assumptions

| **$V_2O_5$ Pricing Scenarios** | Unit | **Flat[1]** | **DFS** | **PFS[2]** |
|---|---|---|---|---|
| | | **US$8.78/lb** | **US$10.88/lb** | **US$12.82/lb** |
| **Total Revenue** | A$m | 5,665 | **7,019** | 8,270 |
| **Total EBITDA** | A$m | 2,776 | **4,063** | 5,250 |
| **$NPV_{8\%}$ After Tax** | A$m | 409 | **870** | 1,246 |
| **IRR After Tax** | % | 17.1 | **27.3** | 32.4 |
| **$NPV_{8\%}$ Before Tax** | A$m | 663 | **1,320** | 1,860 |
| **IRR Before Tax** | % | 21.0 | **34.2** | 40.2 |
| **Free Cash – Year 1 - 6** | A$m | 629 | **1,044** | 1,347 |

1 – Historical 15 year mean vanadium pentoxide price from April 2004 to March 2019 (source: TTP Squared)

2 – PFS pricing averages US$12.82 over the operating life (as per ASX release 21 June 2018)

The estimated life of mine revenue projections from the DFS are based on forecast $V_2O_5$ sales prices sourced from Roskill Consulting Group Ltd (Roskill). Roskill, which has been completing research on the global vanadium industry since the 1970's, has concluded that the vanadium market has entered into a period of structural deficit.

Roskill has developed a range of vanadium price forecasts for the outlook period from 2018 to 2028 based on its demand and supply forecasts. Roskill expect the vanadium market to remain in deficit until the mid-2020's as demand is set to increase considerably while supply will remain tight. Supply response is forecast to emerge from 2024, subject to the presence of "incentive pricing", when forecast new "greenfields" supply begins to generate a moderate surplus.

TMT's Preferred Case vanadium pricing scenario for the GVP DFS is based on implementation of the new Chinese rebar standards over 2019 / 2020 with limited supply response from co-production, as it is governed by iron and steel market dynamics. This scenario also factors in limited near term response from primary and secondary sources, other than potentially from Chinese stone coal operations (environmental permits allowing), with primary producers responding to market demand by 2024 subject to the forecast "incentive pricing". Figure 4 provides a vanadium market outlook to 2025 (source: TTP Squared Inc.) showing the emerging supply – demand deficit and highlighting the need for the development of new primary production to meet the growing demand.

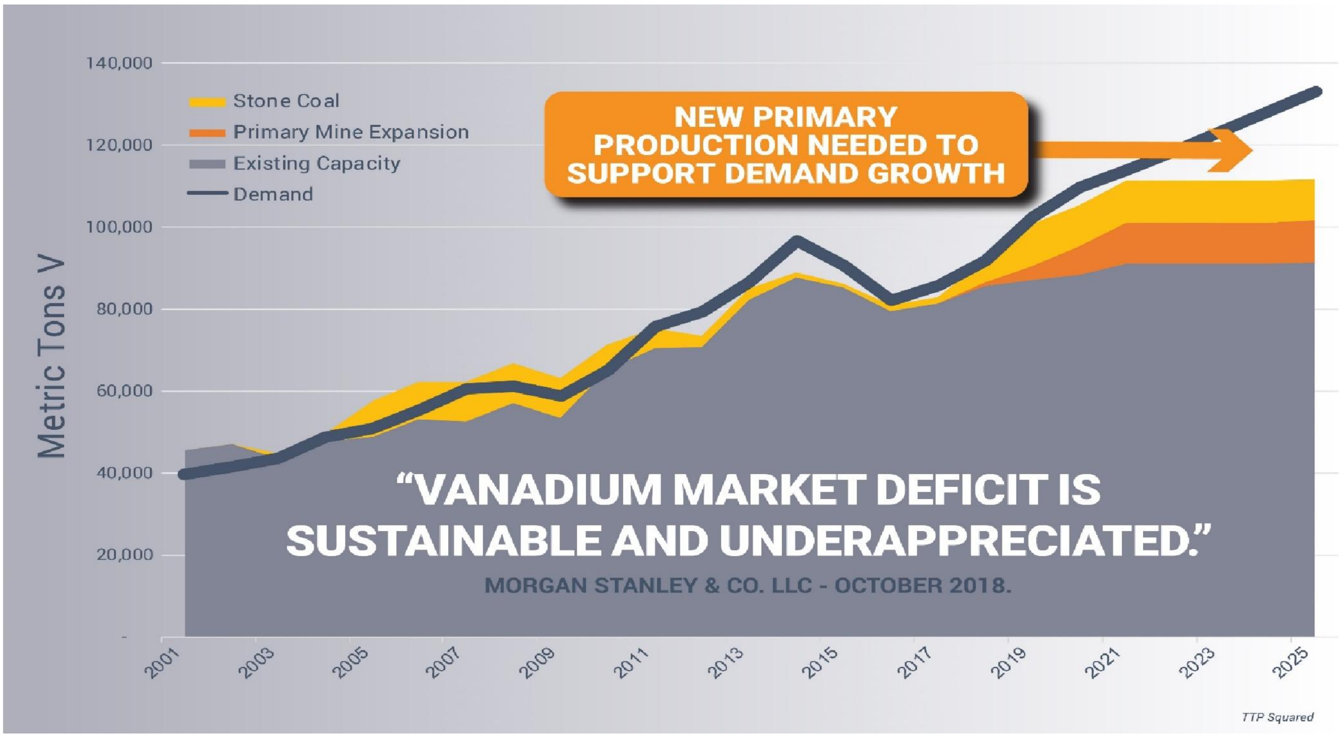


**Figure 4:** Vanadium Market Outlook

TMT believes that Roskill's high case outlook is required as a minimum to provide the "incentive pricing" to support development of "greenfields" vanadium primary producers and the level of vanadium supply required to meet the expected demand growth. This is supported by the data in Figure 1, TTP Squared Inc.'s 2019 forecast cash cost curve, which shows that 10 to 15% of 2019 production would be operating at cash costs in excess of the long term vanadium price forecast in the Preferred Case pricing outlook scenario.

The vanadium market experienced a period of increasing prices in 2016 based around the structural changes in the supply side of the vanadium industry, driven by consolidation of production particularly with mature assets in South Africa being closed or placed on care and maintenance, and increasing demand. The price increases accelerated in 2018 as China implemented environmental regulations that impacted on supply and invoked improved quality standards for construction steel that require an increased consumption of vanadium.

Vanadium prices subsequently normalized in the first half of 2019 as the industry absorbed the recent changes to the supply and consumption parameters and time was taken to adopt the improved quality standards for construction steel in China. As the adoption of the new quality standards accelerate in the near term and the environmental regulations continue to be enforced, it is expected that vanadium prices will return to a range of US$10 – 15/lb $V_2O_5$ from recent lows of US$7.50 – 8.00/lb. This expected $V_2O_5$ price recovery is demonstrated by the Chinese $V_2O_5$ prices of US$8.40 to US$9.00/lb as at 15 August 2019 (source: FerroAlloyNet).

A sensitivity analysis completed by Wave (see Figure 5) shows the key sensitivities to the DFS financial projections are commodity price, ore grade and exchange rate, indicating high leverage to vanadium price and quantity of vanadium sold. The GVP DFS is relatively insensitive to capital and operating expenditure.

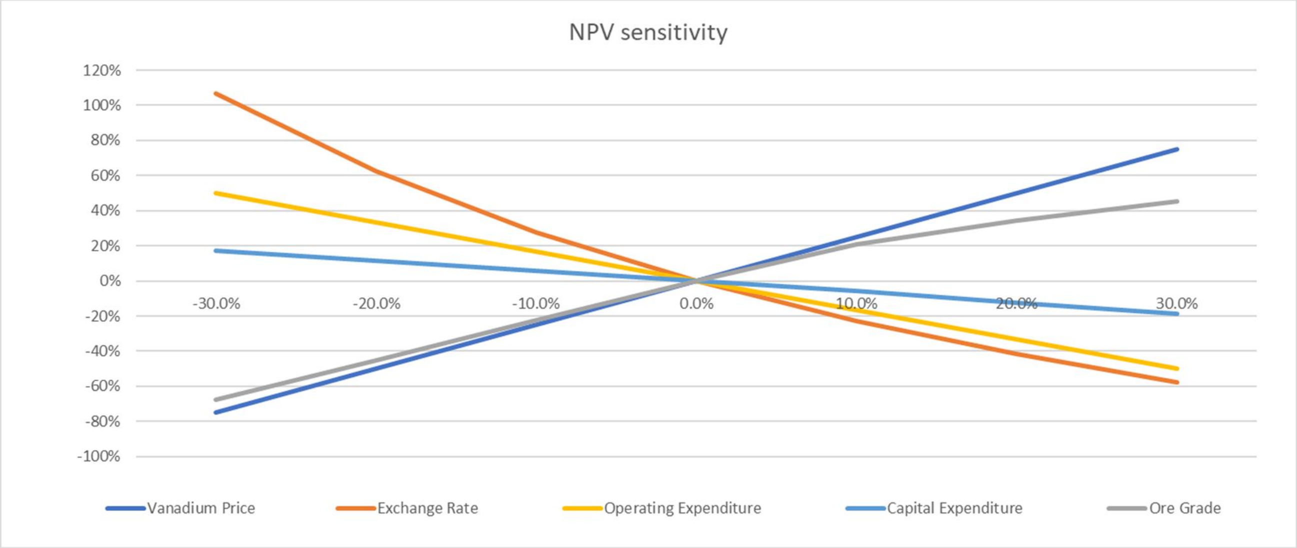


**Figure 5**: NPV Sensitivity Spider Chart

## OFFTAKE / PRODUCT MARKETING

The Company's strategy is to secure medium to long term off-take agreements over the majority of its forecast vanadium production from GVP, aiming to establish a diversified customer base across both geographic location and vanadium industry, albeit that there is an expectation that the majority of production in the near to mid-term will be supplied to the steel industry. The DFS is informed by the Memorandum of Understanding (**MOU**) with CNMC Ningxia Orient Group Company Ltd, market research commissioned from Roskill and TTP Squared Inc's forecast cash cost curve (see Figure 1).

A series of discussions have been held with vanadium end-users across a range of industry sectors, with groups in mainland China, Japan, India and Europe, with a view to forming long term strategic alliances and negotiating formal vanadium off-take arrangements. Samples of GVP's high purity (+99%) $V_2O_5$ have been sent to a number of interested parties, with subsequent discussions confirming that the high purity product would be suitable for the range of end-users, possibly attracting a premium to the modelled 98% $V_2O_5$ price.

Discussions have indicated a high level of interest in securing supply of vanadium pentoxide from a primary mining source such as GVP, with security of supply from a stable jurisdiction such as Western Australia a key consideration.

The most advanced of these discussions has delivered an MOU with CNMC Ningxia Orient Group Company Ltd, a controlled subsidiary of China Nonferrous Metal Mining (Group) Co. Ltd. This MOU establishes a framework for a binding vanadium pentoxide offtake agreement, with agreed key terms including an initial minimum annual quantity of 2,000tpa $V_2O_5$, pricing to be negotiated incorporating a floor and ceiling pricing structure with a minimum three-year term and an option for an additional three years.

The GVP DFS is based on the production of high purity vanadium pentoxide (flake and/or high purity powder), however TMT is also assessing the possibility of adding a ferrovanadium circuit to the processing plant to further diversify its product stream.

TMT sees the current and future substantial supply shortages, combined with the rapid demand growth anticipated in the coming decade, as underpinning the economic opportunity and viability of the Gabanintha project.

## INDICATIVE PROJECT TIMELINE

An indicative project implementation schedule has been developed based on the longest lead path activities to highlight the critical path items. The timeline contemplates the commencement of the GVP FEED study in late 2019 leading to a conditional FID early in the June quarter 2020. Critical path items have been identified as the ordering of long lead items, including the roasting kiln, the receipt of environmental and operating approvals, mining tenure and delivery of gas supply.

*Subject to Board Approval
**Subject to Final Investment Decision

**Figure 6**: Indicative Implementation Timetable

## FURTHER PROJECT ENHANCEMENT OPPORTUNITIES

The Company believes that there is significant opportunity to enhance the GVP further during the implementation phase and in the early stages of operations through:

- Conversion of the high-grade inferred component of the Northern Block Mineral Resources to the Indicated category along strike and down dip from the current mine plan, thereby extending the processing period of high-grade reserves beyond year 12 and deferring the processing of lower grade stockpiles;
- Conversion of some of the Southern Tenement Mineral Resource of 21.5Mt at 0.9% $V_2O_5$ to the Indicated category to provide additional high-grade Ore Reserves, as well as potentially increasing the size of the overall Southern Tenement Mineral Resource;
- Confirmation of delivery of a high purity (+99%) $V_2O_5$ product at a commercial scale, thereby enabling product sales into the premium vanadium market and attracting premium pricing in excess of the prices assumed in the DFS financial model;
- Exploring the option of producing ferro vanadium (FeV) to broaden the customer base through additional engineering design work;
- Further develop the potential to extract a base metal concentrate (Co-Ni-Cu) from the non-magnetic tailings stream, which has been confirmed at a scoping level (supported by the definition of the maiden Inferred base metal resource estimate) will require additional metallurgical testwork and engineering design work; and
- Assess the opportunity to extract a titanium dioxide and/or high-grade iron ore product from the roasting kiln calcine product which will require research and evaluation of alternative processing options for this waste stream.

## MINERAL RESOURCES

The GVP hosts a global Measured, Indicated and Inferred Mineral Resource estimate of 131.0 Mt at 0.9% $V_2O_5$ and contains an outstanding high-grade component of 71.2 Mt at 1.1% $V_2O_5$. The Global Mineral Resource estimate is divided between the Northern Block of tenements Measured, Indicated and Inferred Resource estimate of 109.5 Mt at 0.8% $V_2O_5$ and the Southern Tenement Inferred Resource estimate of 21.5 Mt at 0.9% $V_2O_5$.

**Table 5**: Global Mineral Resource estimate for the GVP as at 27th March 2019

| Material Type | Classification | Tonnage (Mt) | $V_2O_5$% | Fe% | $Al_2O_3$% | $SiO_2$% | $TiO_2$% | LOI% | P% | S% |
|---|---|---|---|---|---|---|---|---|---|---|
| Massive Magnetite | **Measured (North)** | **1.2** | **1.0** | **44.7** | **6.2** | **10.4** | **11.4** | **0.0** | **0.009** | **0.2** |
| | **Indicated (North)** | **18.5** | **1.1** | **49.1** | **5.2** | **5.8** | **12.9** | **-0.1** | **0.007** | **0.2** |
| | Inferred (North) | 41 | 1.1 | 47.7 | 5.6 | 7.1 | 12.6 | 0.3 | 0.008 | 0.2 |
| | Inferred (South) | 10.4 | 1.1 | 49.1 | 4.9 | 5.9 | 12.6 | -0.4 | 0.004 | 0.3 |
| | **Total Inferred** | **51.5** | **1.1** | **48.0** | **5.5** | **6.9** | **12.6** | **0.1** | **0.007** | **0.2** |
| | **Massive Global** | **71.2** | **1.1** | **48.2** | **5.4** | **6.7** | **12.7** | **0.1** | **0.007** | **0.2** |
| Disseminated / Banded Magnetite | **Indicated (North)** | **10.3** | **0.6** | **28.6** | **13.1** | **25.5** | **7.5** | **3.0** | **0.030** | **0.2** |
| | Inferred (North) | 38.5 | 0.5 | 27.1 | 12.7 | 27.4 | 6.9 | 3.3 | 0.027 | 0.2 |
| | Inferred (South) | 11.1 | 0.6 | 30.2 | 11.9 | 23.4 | 7.7 | 2.4 | 0.012 | 0.4 |
| | **Total Inferred** | **49.6** | **0.6** | **27.8** | **12.5** | **26.5** | **7.1** | **3.1** | **0.024** | **0.2** |
| | **Diss / Band Global** | **59.9** | **0.6** | **27.9** | **12.6** | **26.4** | **7.2** | **3.1** | **0.025** | **0.2** |
| **Combined** | **Measured+ Indicated+Inferred** | **131** | **0.9** | **39.0** | **8.7** | **15.7** | **10.1** | **1.4** | **0.015** | **0.2** |

*Note: The Mineral Resource was estimated within constraining wireframe solids using a nominal 0.9% $V_2O_5$ lower cut-off grade for the basal massive magnetite zone and using a nominal 0.4% $V_2O_5$ lower cut-off grade for the banded and disseminated mineralisation zones. The Mineral Resource is quoted from all classified blocks within these wireframe solids above a lower cut-off grade of 0.4% $V_2O_5$. Differences may occur due to rounding.

The GVP DFS focused on the Northern Block of tenements which contains a Measured and Indicated Mineral Resource of 30.0 Mt at 0.9% $V_2O_5$, including a Measured Resource estimate of 1.2Mt at 1.0% $V_2O_5$.

## ORE RESERVE ESTIMATION PROCESS

The format of the following description of the Ore Reserve estimation process is based on the requirements of the Australian Stock Exchange (ASX) Chapter 5, Paragraph 5.9 Requirements applicable to reports of Ore Reserves for material mining projects, sub-paragraph 5.9.1 relating to the components of a market announcement.

### Material assumptions and outcomes from the Definitive Feasibility Study and optimisation study, including economic assumptions

Appropriate studies for the development of the Gabanintha Vanadium Project have been undertaken by Technology Metals, and a number of suitably qualified independent consultants, experts and contracting firms. All studies are at least at a Definitive Feasibility Study (DFS) level standard of confidence.

The DFS was completed in July 2019 under the direction of Technology Metals. Wave International was appointed by Technology Metals to prepare a DFS for the Northern Block of tenements of the 100% owned Gabanintha Vanadium Project (the Project). The DFS targets a production rate of 13 kt per year of $V_2O_5$ product over a 16-year life of mine (LOM). This DFS forms the basis for this Ore Reserve estimate.

The DFS schedule is largely based on the Measured and Indicated Mineral Resource of 30.1 Mt @ 0.9% $V_2O_5$ and delivers a total inventory of 35.7 Mt @ 0.83% $V_2O_5$ after considering cut-off grades, mine dilution, and mining recovery (and includes 17% Inferred Mineral Resource). The first 11.9 years of the life of mine includes 2% Inferred Mineral Resources as run of mine (ROM) processing feed.

The majority of the Inferred Mineral Resource included in the ROM feed is within the banded and disseminated material which is processed in the final four years of the mine life.

The KOP Ventures Pty Ltd, a wholly owned subsidiary of Technology Metals, is the owner of all tenements associated with the Project.

The outcome of the DFS has been to demonstrate that the project currently meets the investment criteria of Technology Metals to progress the project to the next stage of development.

### Criteria used for classification, including classification of Mineral Resources on which Ore Reserves are based and confidence in modifying factors

The Gabanintha Northern Block deposit Mineral Resource estimate has been classified using guiding principles contained in the JORC Code (2012 Edition). Please see ASX announcement 29 Mar 2019 for details relating to the Mineral Resource Estimate, and related JORC Table 1, sections 1, 2, and 3.

In the Competent Person's opinion, mineralised material that has been classified as Measured and Indicated is sufficiently informed by adequately detailed and reliable geological and sampling data, including surface mapping, geophysical modelling, drillhole sample assay results, drillhole logging and density measurements, to assume geological and mineralisation continuity between data points.

The remaining mineralised material that has been classified as Inferred were considered by the Competent Person to be informed by more limited geological and sampling data sufficient to imply but not verify geological and grade continuity between data points.

The first 11.9 years of the life of mine production includes 2% of Inferred Mineral Resource. The majority of the Inferred Mineral Resource within the life of mine production is processed in the final four years of the mine life, well after the Project payback period. Therefore, the Project is not dependent on the inclusion of the Inferred Mineral Resource to achieve economic viability. The total Inferred Mineral Resource included within the life of mine production is 17% and not considered a material proportion of the total production feed.

### Mining method selection and other mining assumptions, including mine recovery factors and mining dilution factors

Open cut mining using a typical conventional truck and excavator approach has been selected for the Gabanintha Project. The open pit mining equipment selected during this study is matched to the proposed scale and selectivity of this operation.

Detailed pit designs have been prepared based on the results of the pit shell optimisations and incorporating appropriate wall angles, geotechnical berms, minimum mining widths, and access ramps appropriate for the equipment selected. The optimisation results show flat cash curves, indicating that the optimisation is Mineral Resource constrained. This indicates that the economic open pit may get larger if the deposit continues at depth and possibly along strike as the confidence in the Mineral Resource is increased. As the size of the pit is not constrained by economics, a pit shell with a Revenue Factor of 1.00 has been selected as the basis of the pit designs.

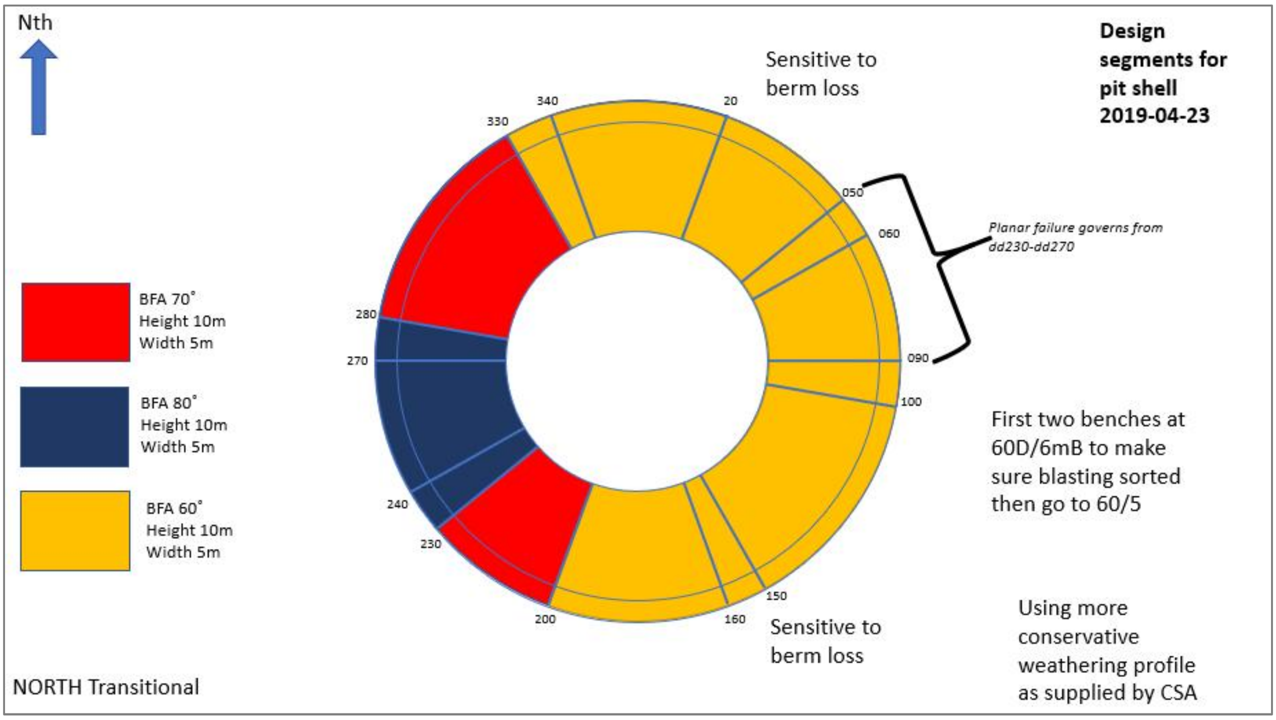
Geotechnical parameters used in the DFS mining study have been based on estimates following analysis of 6,507 m of diamond drill logging and relevant RC drill data. The geotechnical analysis comprised the consideration of geotechnical domains, weathering profiles, factor of safety, probability of failure, geological structure, wedge and planar failure modes. Further geotechnical analysis is required before the final pit design. The available geotechnical information and subsequent design criteria used for this estimate are considered to be within a reasonable range for an open pit of these dimensions and location.

Mining dilution has been applied using the skins methodology. A dilution skin of 1 metre was applied to the Mineral Resource wireframes and mining dilution applied as a 1 metre dilution skin.

The resulting North Pit dilution for massive magnetite ore is 13% at 0.45% $V_2O_5$, and North Pit dilution for banded and disseminated ore is 29% at 0.0% $V_2O_5$. The resulting Central Pit dilution for massive magnetite ore is 10% at 0.46% $V_2O_5$, and Central Pit dilution for banded and disseminated ore is 20% at 0.0% $V_2O_5$. A 98% mining recovery has been applied to all massive magnetite ore and a 95% mining recovery was applied to all banded and disseminated ore.

## PIT DESIGN PARAMETERS

Pit designs have been prepared for both the North Pit and the Central Pit with geotechnical parameters as provided by MineGeoTech, shown in Figure 7, Figure 8, Figure 9 and Figure 10.



Sensitive to berm loss

**Design segments for pit shell 2019-04-23**

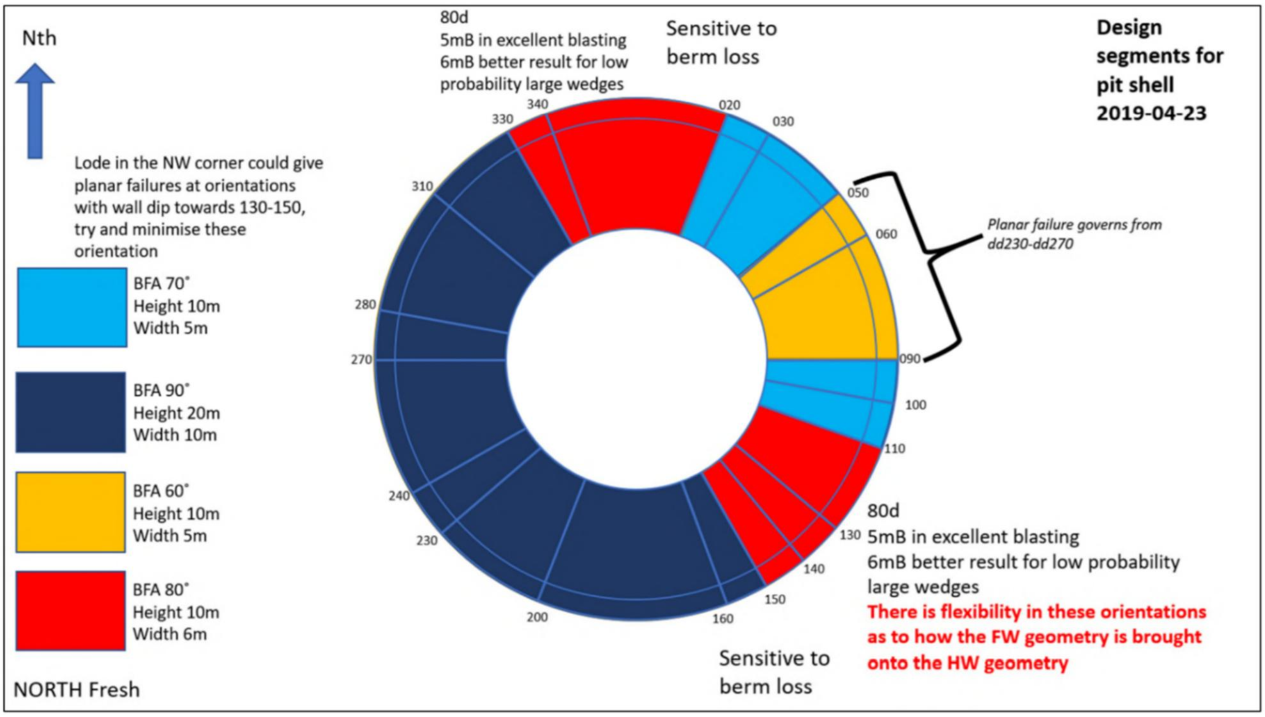
*Planar failure governs from dd230-dd270*

First two benches at 60D/6mB to make sure blasting sorted then go to 60/5

Sensitive to berm loss

Using more conservative weathering profile as supplied by CSA

**Figure 7:** North Pit transitional geotechnical parameters



80d
5mB in excellent blasting
6mB better result for low probability large wedges

Sensitive to berm loss

**Design segments for pit shell 2019-04-23**

Lode in the NW corner could give planar failures at orientations with wall dip towards 130-150, try and minimise these orientation

*Planar failure governs from dd230-dd270*

80d
5mB in excellent blasting
6mB better result for low probability large wedges
**There is flexibility in these orientations as to how the FW geometry is brought onto the HW geometry**

Sensitive to berm loss

**Figure 8:** North Pit fresh geotechnical parameters

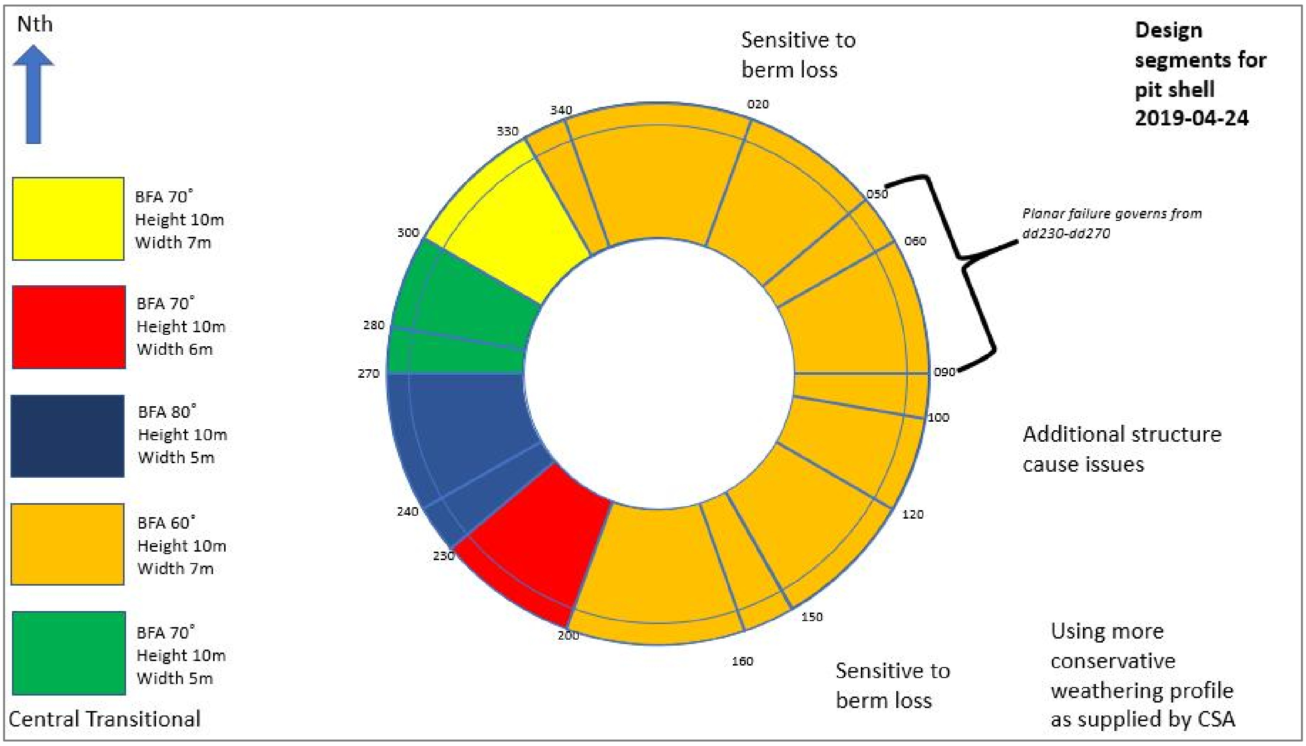


**Figure 9**: Central Pit transitional geotechnical parameters

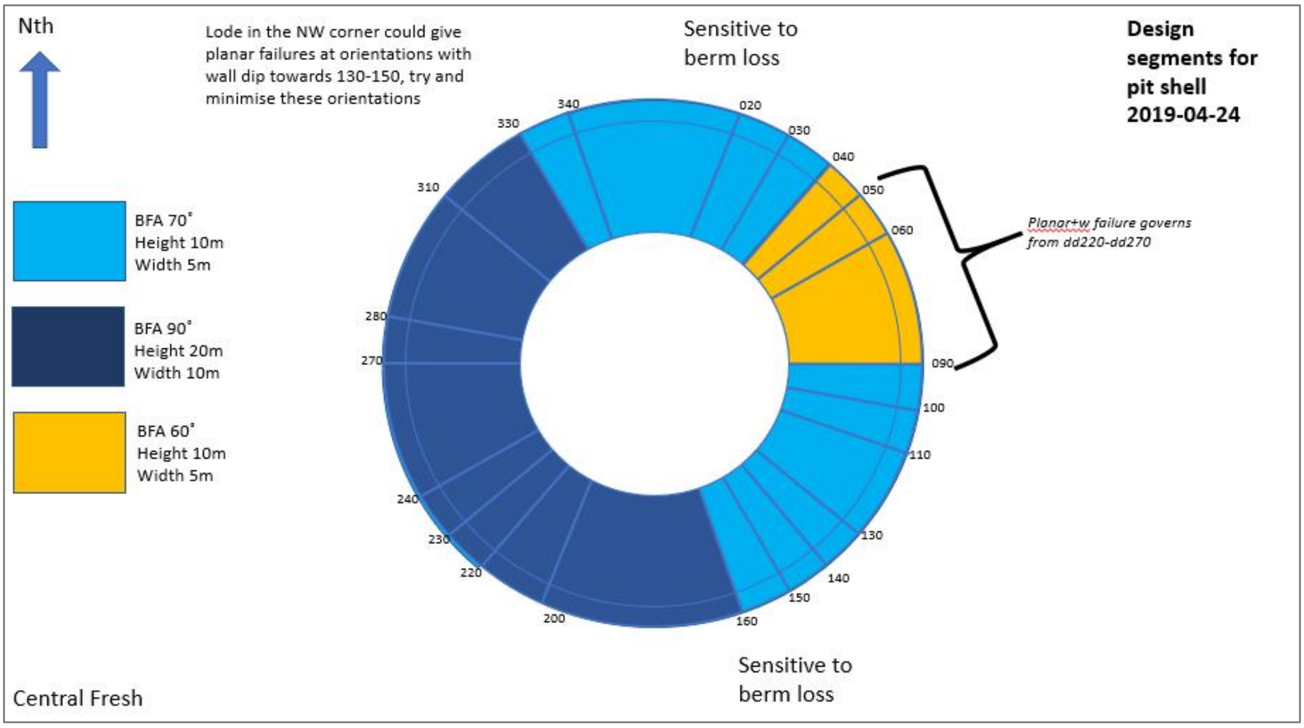


**Figure 10:** Central Pit fresh geotechnical parameters

Ramps have been designed with the following characteristics:

- The dual lane ramps are 25.3 m wide to allow for safe passage of the selected trucks with an allowance for a bund wall on the open side of the ramp and a drain on the inner side.
- The single lane ramps are 15.3 m wide and are utilised for the final 30 vertical metres in the central pit and 50 vertical metres in the north pit. A passing lane has been designed every 20 vertical metres and there will be a minimum number of trucks operating in these mining areas. Reducing the ramp width save significant waste stripping.
- Gradient of 1:10 for all dual lane ramps and single lane ramp in the central pit.
- Gradient of 1:9 for the north pit single lane ramp.
- Ramps are located in the footwall to reduce waste stripping.
- Ramps exit the pit crest in the direction of both the rom and waste rock dumps.

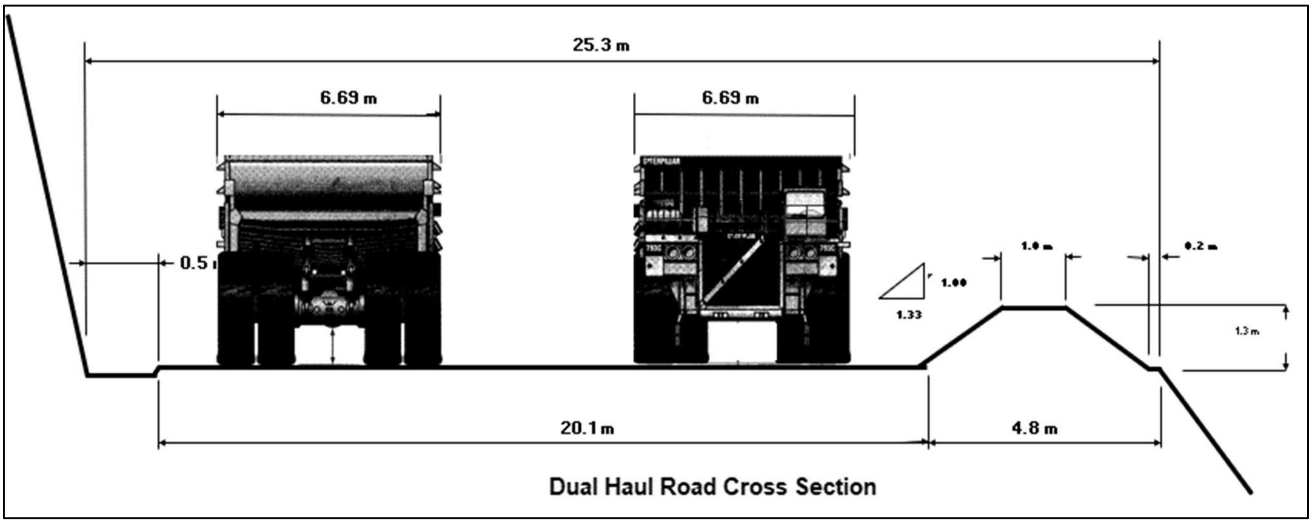


**Figure 11**: Dual lane haul road width determination

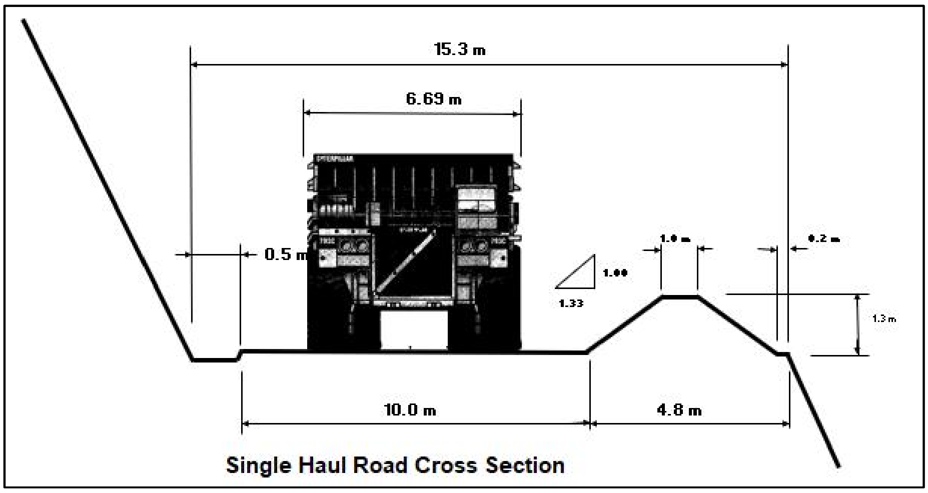


**Figure 12:** Single lane haul road width determination

Pits have been designed to have a minimum mining width of 25 m and staged cutbacks a minimum of 30 m width.

All pits are within reasonable distance from the existing tenement boundaries.

## FINAL PIT DESIGNS

Figure 13 shows views of the final pit designs for the North Pit and Central Pit respectively.

The North Pit mine will extract resources between the surface and the base of the open pit at the 290 RL, a depth of 180 m. The final pit floor is at the 295 RL and a 5 m goodbye cut has been designed. Access to the full pit depth is via a dual-lane ramp starting in the footwall, with one pass through the hangingwall before becoming a single lane footwall ramp at the 345 RL.

The base of the Central Pit is at the 295 RL, a depth of 190 m. The final pit floor is at the 300 RL and a 5 m goodbye cut has been designed. Access to the full pit depth is via a footwall ramp. The ramp is dual lane from the surface to the 340 RL. At the 340 RL the ramp becomes single lane to the final pit depth.

The designed overall wall angle and inter-ramp slope angles for all quadrants of the two pits are within the preliminary geotechnical recommendations.

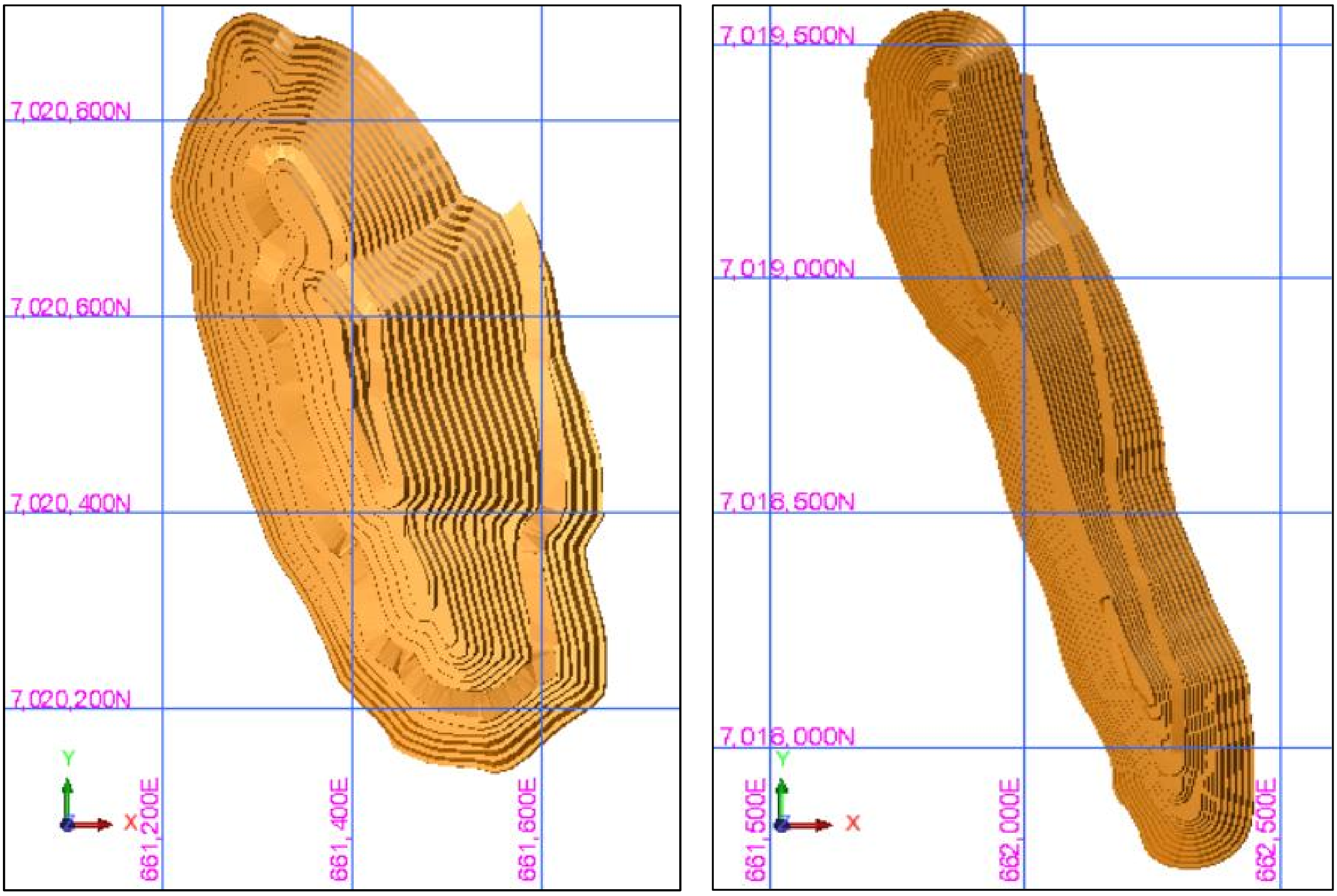


**Figure 13:** North Pit (left) and Central Pit (right) final designs

Waste rock dumps have been designed within the tenement boundaries and with the following concave final rehabilitated slope angles as described in Table 6, as recommended by Integrate Sustainability.

**Table 6:** Final rehabilitated waste rock dump slope angles

| Waste rock dump height | Slope angle |
|---|---|
| 0–20 vertical metres | 10° |
| 20–30 vertical metres | 15° |
| 30–40 vertical metres | 18° |

Four locations have been identified for waste rock:

1. The North Waste Rock Dump
2. The East Waste Rock Dump
3. The Central Waste Rock Dump
4. The North Pit Backfill.

Refer to Figure 3 for the location of each waste rock dump with respect to the pits and the ROM pad.

**Processing recovery method selected and other processing assumptions, including recovery factors applied and allowances made for deleterious elements**

Refer to Processing / Metallurgical Testwork section on page 19 and Process Design section on page 21 as well as the detail in Appendix 1, JORC Table 1, Section 4.

## Processing Recoveries Applied

Processing recoveries are based on Davis Tube Recovery (DTR) results estimated within the block model to represent the Low Intensity Magnetic Separation (LIMS) process.

## Basis of cut-off grade applied

The cut-off between ore and waste has been determined by net value per block. A total block revenue is estimated for each block within the block model, accounting for total vanadium recovered to a payable product as well as the vanadium product price. Total block costs are estimated for all operating costs to the point of sale including processing, product haulage, crusher feed, general and administration, ore differential, sustaining capital, selling costs, and grade control costs. The total block revenue minus the total block costs estimate the net value per block. Any block returning a positive net value has been defined as "ore" for the purposes of pit design and production scheduling.

## Estimating methodology

The modifying factors used to estimate the Gabanintha Ore Reserve are informed and bound by the findings of the DFS.

Whittle$^{TM}$ pit optimisation software has been used to identify the preferred pit shell on which the pit design was based for the recovery of transitional and fresh Measured and Indicated Mineral Resources. The mine design and subsequent mining and production schedule is based on the specific cut-off values and production criteria of the planned operation.

Capital and operating costs estimated to a DFS level of confidence have been applied to the planned activities. The revenue assumptions are based on forward-looking Vanadium Pentoxide prices from Roskill Consulting Group Pty Ltd (Roskill 2019).

Table 7 outlines the LOM revenue per pound of $V_2O_5$ that is modelled in US dollars. The exchange rate has been modelled at a flat rate of AU$1.00 = US$0.70.

**Table 7**: Definitive Feasibility Study US$ revenue per pound of $V_2O_5$

| Year | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | +2028 |
|---|---|---|---|---|---|---|---|---|
| Real$^{2019}$ US$ / lb $V_2O_5$ | $17.71 | $16.54 | $10.99 | $10.86 | $10.54 | $10.57 | $10.59 | $10.59 |

The financial model for the Gabanintha DFS indicates a net present value (NPV) after tax at a discount of 8% (EBITDA basis) of approximately AU$870 million with an internal rate of return of 27.3%. These results meet the investment criteria for Technology Metals to pursue the next stage of project development.

The sensitivity analysis completed in the DFS indicates that the project results remain favourable when the key project parameters (revenue, exchange rate, grade, capital and operating costs) are individually flexed to plus and minus 20% of the DFS average values.

**Material modifying factors, including status of environmental approvals, mining tenements and approvals, other government factors and infrastructure requirements for selected mining method and transport to market**

Refer to Tailings Management section on page 22, Supporting Infrastructure section on page 24, Water Supply and Dewatering section on page 25, Environmental Assessment and Approvals section on page 26 and Tenure section on page 27, as well as the detail in Appendix 1, JORC Table 1, Section 4.

## PROCESSING / METALLURGICAL TESTWORK

Metallurgical testwork in support of the GVP DFS consisted of comminution, beneficiation, roasting and leaching and precipitation; ranging from bench, batch through to pilot scale. The majority of samples for the testwork programs were taken from material drilled in two programs in 2018; the diamond drilling for metallurgical, resource and geotechnical purposes across the proposed North and Central pits, and the bulk sample drilling program restricted to the North Pit. Grind liberation testwork was completed on diamond core for the PFS drilling program.

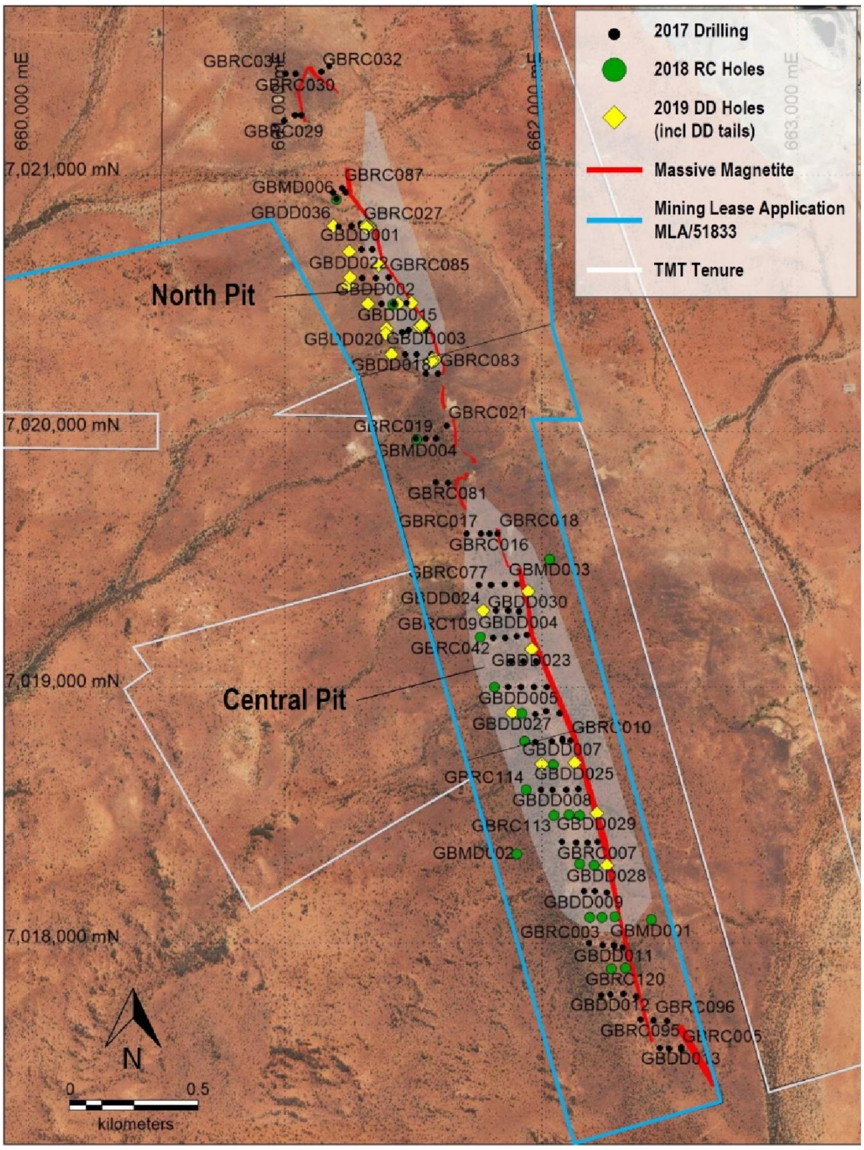


**Figure 14**: Location of Resource and Metallurgical Drilling for the GVP DFS

Davis Tube Recovery (DTR) testing was undertaken on a total of 478 composites across the extent of the Northern Block of tenements Resource, with 322 from the Central Pit and 156 from the North Pit. Of the 478 samples, 109 from the Central Pit and 61 from the North Pit were determined to be representative of the massive magnetite unit. These DTR results were used to determine mass recoveries and compositions of magnetic concentrates and tailings throughout the resource, including recovery of vanadium into the concentrate.

A 14.2 tonne bulk sample was collected from the North Pit area using wide diameter diamond drilling. The bulk sample consisted of a blend of transitional massive magnetite mineralisation, fresh massive magnetite mineralisation, transitional hangingwall banded mineralisation, fresh hangingwall banded mineralisation and fresh footwall banded mineralisation.

This sample was processed through sighter scale and subsequent pilot plant scale crushing, milling (grinding) and magnetic beneficiation to generate high quality magnetic concentrates for subsequent roast – leach testwork.

Initial sighter scale batch testwork was completed by Metso Minerals on a 156kg sample of magnetic concentrate, with the subsequent pilot plant scale testwork completed on 7.5 tonnes of magnetic concentrate averaging 1.36% $V_2O_5$, 1.2% $SiO_2$ and 3.15% $Al_2O_3$. This magnetic concentrate was sent to FLSmidth Inc, in Pennsylvania, USA, who are kiln experts with recent experience in the design and installation of roasting kilns for vanadium operations.

FLSmidth conducted a series of smaller scale batch rotary kiln tests to confirm operating parameters and reagent dosage prior to commencement of the pilot scale rotary kiln phase of the test work. The pilot scale rotary kiln test work, utilising a 9.8m long by 0.9m in diameter rotary kiln, enabled continuous processing of a magnetic concentrate with several salt blends to provide measurement of key factors such as salt dosage, vanadium solubility / recovery and estimated residence times. This work indicated vanadium solubility / recovery rates of between 84.9% and 90.7%, with an average of 88.6%. Based on this data, a vanadium solubility / recovery rate of 85% was confirmed for use in the DFS.

A total of 90 roast and leach tests have now been undertaken across a range of different magnetic composites, providing key knowledge for the DFS for a variety of different ore type and feed blends.

The combination of metallurgical testwork, industry knowledge and allowance for upscaling has led Wave to define vanadium recovery assumptions for the various ore types for the GVP, with this data being used in the DFS. Table 8 shows the recovery assumptions through each stage of the plant process for the two key material types, massive transitional magnetite and massive fresh magnetite.

**Table 8**: Vanadium Recovery Assumptions - Undiluted

| Material Type | Massive Transitional | Massive Fresh |
|---|---|---|
| **Beneficiation (%)** | 67 | 95 |
| **Roast-Leach (%)** | 85 | 85 |
| **De-silication (%)** | 99.9 | 99.9 |
| **AMV and De-ammoniation[1] (%)** | 95.7 | 95.7 |
| **Flake Preparation and Packaging (%)** | 99.9 | 99.9 |
| **Total Plant Recovery[2] (%)** | **55** | **77** |

1 – increases to 99% recovery post installation of Ion Exchange

2 – based on undiluted, 100% material type feed

The downstream processing or precipitation phase of the metallurgical testwork program, utilising leach liquors generated from various roast and leach tests, has consistently produced quantities of high purity vanadium pentoxide ($V_2O_5$), with purity results ranging from +99% through to 99.7% $V_2O_5$ at extremely low impurity levels (see Table 9). The testwork results confirm the opportunity to produce vanadium pentoxide at GVP that would be similar to, or better than, the quality of high purity product coming from existing suppliers. This highlights the scope to supply $V_2O_5$ into the premium markets, thereby potentially attracting premium pricing.

**Table 9:** Typical Vanadium Pentoxide Purity Results

Final Product Assays and Indicative Impurities (%)*

| $V_2O_5$ | $MnO_2$ | $SiO_2$ | $Fe_2O_3$ | $Al_2O_3$ | $P_2O_5$ | $SO_3$ | $Na_2O$ | $Cr_2O_3$ | $K_2O$ |
|---|---|---|---|---|---|---|---|---|---|
| 99.53 | <0.02 | <0.01 | 0.03 | <0.02 | <0.02 | 0.15 | 0.02 | 0.03 | <0.01 |

* based on TMT final product sample A18725

## PROCESS DESIGN

The GVP processing plant has been designed on the basis of production of around 13,000tpa vanadium pentoxide ($V_2O_5$) flake from magnetite ore bearing vanadium, with a focus on industry leading environmental management in process design, whilst maximising vanadium recoveries at competitive operating costs. The process design is based on 100% feed of Massive Transitional ore, which requires additional crushing, grinding and beneficiation capacity than the higher yielding Massive Fresh ore, providing plant sizing flexibility for various ore feed scenarios. Plant feed for the first 12 years is dominated by the higher yielding Massive Fresh ore, with Massive Transitional ore representing about 50% of plant feed for the first three years, after which it rapidly reduces to less than 5% of feed.

The process, as illustrated in the Schematic Flow Sheet Block Diagram in Figure 15, can be considered in six discrete stages:

1. **Crushing & Screening** – ROM ore is crushed down to an 80% passing size of 8mm. Allowance has been made for Coarse Dry Magnetic Separation to remove coarsely liberated gangue from the vanadium-bearing magnetite required with additional crushing capacity in future when processing lower grade disseminated ore;

2. **Grinding & Wet Magnetic Separation** – the -8mm material is ground down to an 80% passing size of 0.25mm, followed by wet magnetic separation to remove finely liberated gangue from the vanadium-bearing magnetite;

3. **Roasting** – the vanadium-bearing magnetite concentrate is mixed with a sodium-based salt and roasted at approximately 1,200°C to convert the vanadium pentoxide in the ore to water soluble sodium metavanadate. Data generated from the pilot scale rotary kiln test work has been used by FLSmidth to assist in engineering design, sizing and cost estimate studies for the "roasting" section of the processing circuit;

4. **Leaching & Precipitation** – the sodium metavanadate is leached out of the roasted product with water followed by re-precipitation of the vanadium in the form of ammonium metavanadate;

5. **De-ammoniation & Calcination** – the ammonia is removed from the precipitated product to form a vanadium pentoxide powder. This powder is further melted and cooled down to produce the final vanadium pentoxide flake product;

6. **Packaging** – the final processing stage to package the saleable product to meet the requirements for offtake.

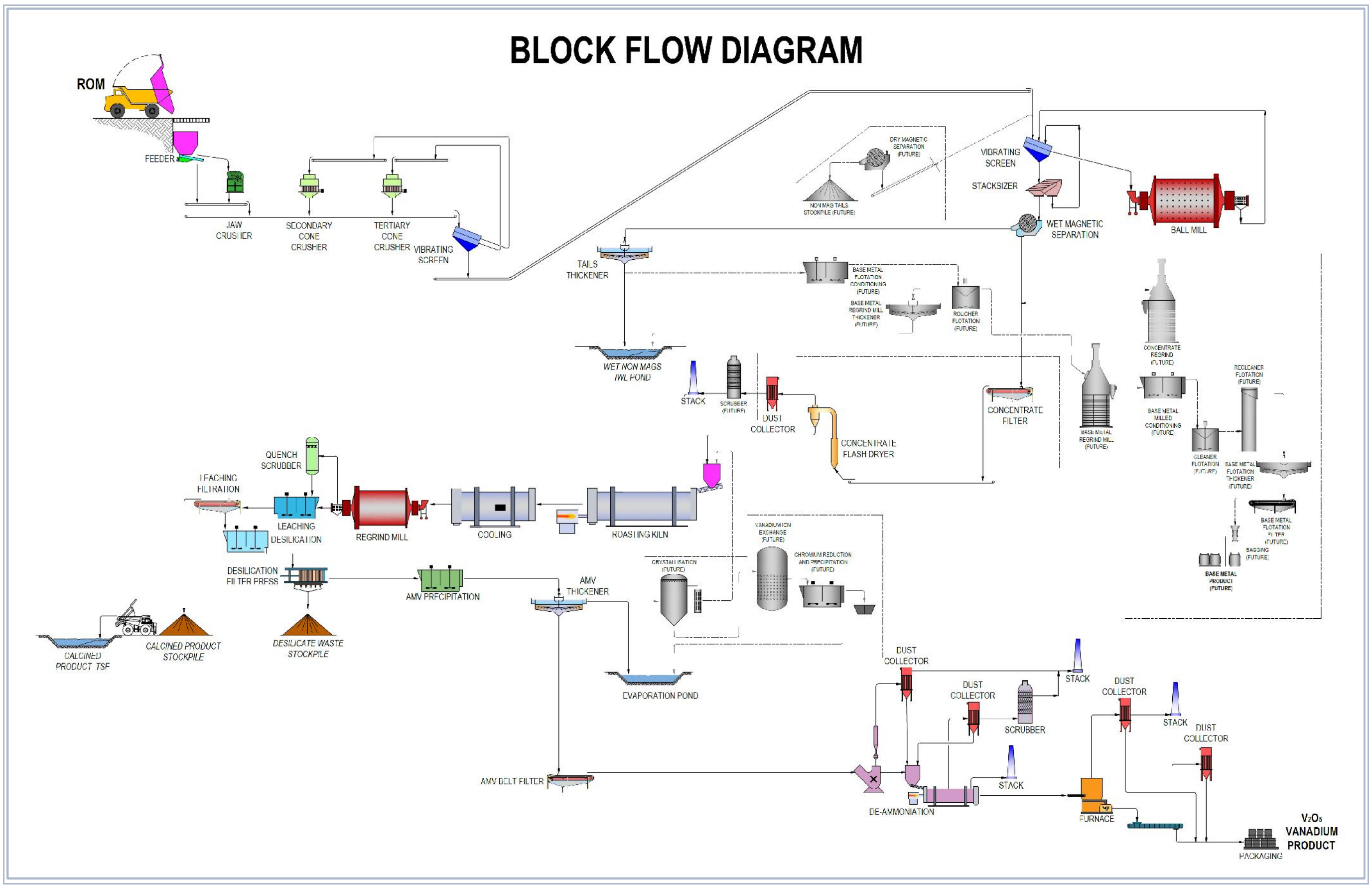


**Figure 15**: Schematic Flow Sheet Block Diagram

Production is anticipated to commence in mid-2022, followed by a conservative ramp up period based on achieving overall plant availability of 85% after two years and vanadium recovery increasing to full design recovery by the beginning of the third year. The final 15% of plant availability is anticipated to be realised in the third year.

It is expected that the process will be supplemented within the first five years of operation with the installation of a crystallisation plant, ion exchange and de-chrome circuits. A base metal concentrate circuit to potentially extract cobalt, copper and nickel from the tailings stream of the magnetic separation circuit may also be included in the process post start up but does not form part of the DFS.

## TAILINGS MANAGEMENT

The GVP tailings storage facility (TSF) is proposed to be an integrated waste landform (IWL) (see Figure 16) designed as a two cell facility to receive all wet and dry processing waste / tailings. The wet cell will store Wet Magnetically Separated (WMS) tailings pumped as a slurry to the cell (south cell). The dry cell will store Calcine Product (CP), Desilicate (DS) tailings, and Process Salt (SALT) harvested from the evaporation ponds / crystallisation cells (north cell).

Wet tailings, to be pumped at 55% solids to a fully lined cell, will be produced at rates ranging from 0.3 Mtpa to 0.8 Mtpa in years 1-12, and at rates ranging from 1.0 to 2.4 Mtpa in years 13-17. The wet cell will be initially constructed to 8 m height to store the first two years and two months of production. The wet cell will be subsequently raised in 2.5 m lifts in a downstream manner to a design maximum height of 40.5 m to store the 15.1 Mt of wet tailings over the life of mine (LOM). The downstream raise design ensures a safe and stable IWL capable of resisting the maximum credible design events during operation and post closure.

The fully lined wet cell will be surrounded by a mass waste rock embankment capable of being safely overtopped at any time during its design life, whilst also being able to safely store the Probable Maximum Precipitation (PMP) event throughout its design life and being able to safely resist the Probable Maximum

Flood (PMF) event without releasing tailings, or compromising the integrity of the TSF. The wet cell is designed as no release facility with all surface water collected at a centrally located rock ring and returned to the processing circuit.

Dry tailings, which will be trucked to the dry cell and compacted to a minimum of 95% Standard Maximum Dry Density to ensure they form a safe and stable structure capable of resisting the maximum credible design events during operation and post closure, Dry tailings will be consistently produced at 1.5 Mtpa over the LOM, with 21 Mt of calcined dry tailings and 2.3 Mt of Process Salt waste.

The base of the dry cell will be lined to mitigate seepage to the environment, with perimeter lining up to a level equivalent to the height required to store the run-off and infiltration from a PMP or PMF event. The liner has been chosen to effectively eliminate potential seepage, with the tailings to be placed directly in the liner, raising in an upstream direction.

The initial dry cell, which shall share a common east-west wall with the wet cell, shall only form part of the whole dry cell, as dry stacking allows progressive expansion. The dry cell shall be a no release facility with all surface and seepage water collected and returned to the processing circuit or used for dust suppression on the dry cell. The perimeter and exterior of the compacted tailings will consist of free draining, durable rock fill, which will provide the required resistance to erosion from wind and water, inclusive of the PMF and PMP events.

A perimeter drain and rock embankment shall be constructed and lined to fully contain any seepage or rainfall run-off from the dry stacked tailings. The drain will lead to a sump and standpipe for water trucks to maintain dust suppression on the dry stack.

The IWL design is capable of storing all tailings for the Project LOM and can be expanded to hold additional tailings without amending the footprint of the facility should the LOM be extended.

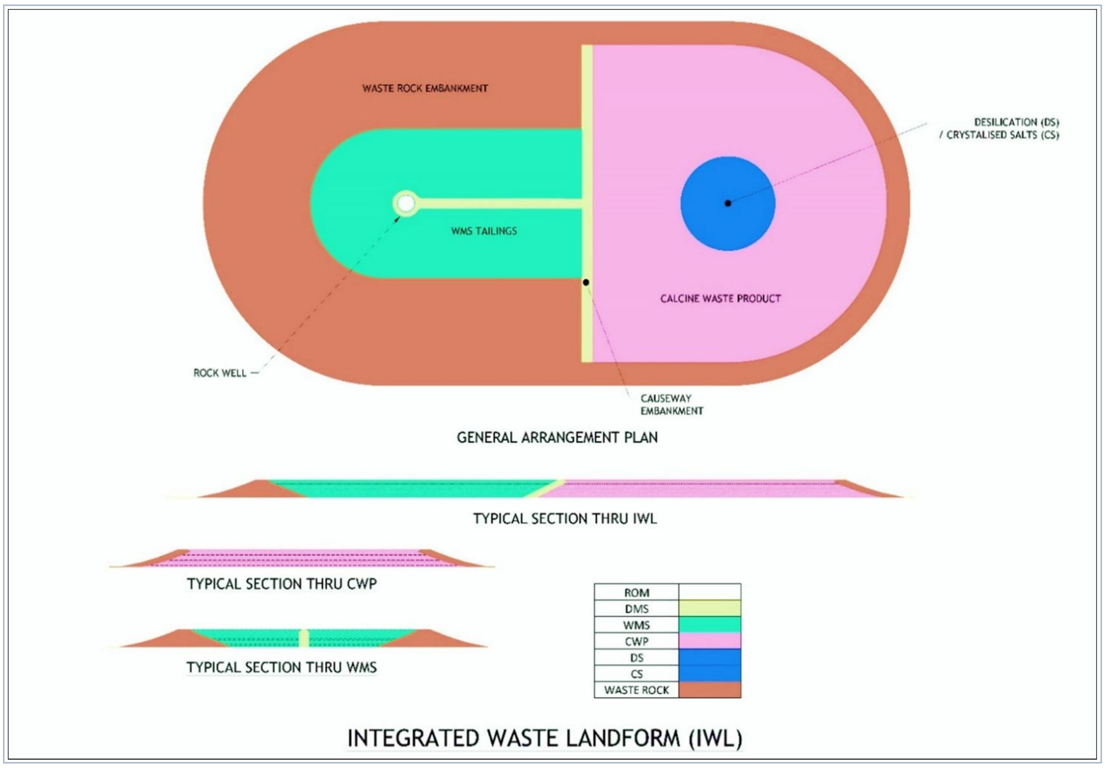


**Figure 16**: GVP IWL Schematic Concept Diagram

The proposed IWL aims to provide for the safe and economic storage of processing waste throughout the Project life through the construction of an erosion-resistant structure that minimizes impacts to the environment. The design of the wet cell incorporates additional waste rock progressively during operations to increase the wall stability, while also assisting with reducing closure costs.

## SUPPORTING INFRASTRUCTURE

The majority of local infrastructure required to construct, support and maintain the GVP will be supplied as part of the Project's development. Design and development of infrastructure will be staged to ensure items required to support the construction works are in place and commissioned at an early stage and/or that temporary facilities are in place for initial requirements.

The main exception to this will be the use of the existing access road from Meekatharra, with the Meekatharra – Sandstone Road passing close by the GVP, and the Meekatharra airport.

### Roads and Airport

The GVP is located to the south east of Meekatharra, the largest urban centre in the Murchison region, which is easily accessed with excellent sealed highways from Perth in the south, Geraldton in the west south west and Port Hedland in the north. Meekatharra is also serviced by a regional airport with an all-weather sealed runway suitable for landing large aircraft. It is intended that the GVP workforce will be flown into Meekatharra and transported to and from site by bus.

The Meekatharra Sandstone Road, a dual lane unsealed road maintained by the local Shire, passes near by the GVP and will be the main access route for personnel and equipment to site from the north via Meekatharra. The DFS includes an allowance to assist in the maintenance of the Meekatharra Sandstone road between GVP and Meekatharra.

Access from the Meekatharra Sandstone road to the entrance to the site will be along a 2km section of the existing Nannine – Polelle Road which will need to be upgraded to accommodate the additional volume and weight of traffic. A network of new roads will need to be constructed to provide access within the Project area, including the Main Access Road, Village Access Road, Borefields Road and Track, TSF Access, In-Plant Roads and other minor roads and tracks.

### Gas Supply

The DFS proposes to use natural gas as the heating energy used in the roasting kiln and other parts of the process circuit and for electricity generation. The GVP's expected maximum and average daily consumption of natural gas is 10.67 and 6.28 Terajoules respectively. It is proposed that natural gas will be supplied to GVP under a Build Own Operate (BOO) agreement.

TMT has entered into a Memorandum of Understanding (**MOU**) with DDG Operations Pty Limited (DDG), part of the Australian Gas Infrastructure Group (AGIG), to co-operate in the joint conduct of investigations (FEED study) in relation to the construction of a natural gas pipeline from the AGIG owned and operated Dampier Bunbury Natural gas Pipeline. The MOU contemplates TMT becoming a Foundation Customer for the new pipeline, with DDG to build, own and operate the pipeline in return for TMT entering into an annual take or pay tariff over a period to be agreed between the parties.

AGIG provided DFS pricing for the BOO supply of gas infrastructure to the site.

### Power Supply

It is proposed that the main electrical power for the GVP will be provided from a standalone gas power station generating power requirements for the main process plant and non-process infrastructure. The-site based Build Own Operate (BOO) natural gas fired power station is capable of providing the maximum power demand of 19MW using gas fuelled reciprocating engine powered generators.

The Accommodation Village and Borefield pumping facility are proposed to be standalone diesel generating sets until overhead distributed power is installed.

### Accommodation Village

The on-site workforce for the GVP operations is expected to average 242 persons over the first 10 years of the Project, with this workforce to be accommodated in a self-contained accommodation village located to the north of the processing facility. A new build 300-man accommodation village, complete with appropriate supporting and leisure facilities, has been proposed for the purpose of the DFS, although a 400-man accommodation village utilising pre-owned accommodation will be considered for project execution.

The workforce during the construction phase is expected to peak at above 500 persons and be in excess of 300 persons for approximately 8 months. Overflow during this phase has been accounted for in temporary accommodation and offsite accommodation in the region.

## WATER SUPPLY AND DEWATERING

The GVP water balance requires 3Gl per annum to satisfy processing, potable supply and dust-suppression, with an initial water source identified within a paleochannel located to the north west of the processing facility covered by Miscellaneous Licence L51/102. Groundwater quality in the area is classified as fresh to brackish, with total dissolved solids (TDS) ranging between 375 and 3,600 mg/L, although concentrations of up to 10,000mg/L have been recorded more regionally or at depth. The bore water as indicatively tested indicates a low salinity and low particulate composition which is to the benefit of the Project.

The DFS borefield consists of 12 production bores located along the strike length of the paleochannel, with a combined yield of 9,000 kL/d.

The water supply, storage and distribution will generally consist of the borefield, remote borefield storage tank and pumps, raw water storage at the village, raw water and process water storage at the processing facility, as well as raw water storage at the mining services area. Water delivered via the bores shall be filtered in various stages to achieve the water quality levels required for plant and personnel use, including reverse osmosis plants located next to each raw water storage tank at the village and processing plant to enable the required production of potable water to be provided.

Groundwater in the vicinity of the mining areas is relatively shallow (ranging between 450 and 485mRL) with estimated permeability for deeper fractured basement ranging between 0.3 m/d and 16 m/d, with a mean adopted value of 1 m/d. Although the permeability of this unit is relatively high, the fractures have been found to occur at discrete intervals, thereby resulting in a low overall transmissivity.

Dewatering bores will be established on the perimeter of the designed open pits, but due to the low overall transmissivity, it is proposed that most of the dewatering will be managed by the use of in-pit sumps to collect both groundwater in flows as well as any rainfall flows in to the open pits. This water will then be pumped to settling ponds and/or utilised for dust suppression on haul roads.

Construction water is expected to be sourced from initial open pit dewatering and/or refurbishment of existing fractured rock production bores in the immediate vicinity of the process facility.

A Licence to Construct or Alter Well (26D) was granted by DWER on 10th September 2018 to allow for the construction of exploration, production and monitoring wells associated with the proposed borefield, dewatering and groundwater monitoring.

## ENVIRONMENTAL ASSESSMENT AND APPROVALS

The primary Environmental approvals process for the GVP commenced with the referral of the Project to the Department of Water and Environment Regulation (DWER) EPA Services Unit (EPA) under the Environmental Protection Act Part IV (EP Act) approval process which occurred in November 2018. The EPA decision to assess the Project under Part IV of the EP Act via an *Environmental Review with No Public Comment* was released in January 2019. The EPA are preparing the Environmental Scoping Document which will define the proposed specific requirements of the Environmental Review. The Scoping Document will include the preliminary key environmental factors to be addressed and the required further work (including studies and investigations) that needs to be carried out in support of the Environmental Review. It is envisaged that the first draft of the Environmental Review document will be lodged in Q4 2019.

A number of environmental baseline surveys have been completed, or are underway, across the GVP in support of the Environmental Review. These include:

- Terrestrial Flora and Vegetation, Terrestrial Fauna and Short-Range Endemic Invertebrates,
- Subterranean Fauna,
- Hydrology and hydrogeology (surface water, water supply and mine dewatering),
- Soil and landforms.
- Material Characterisation – Mining and Processing waste,
- Aboriginal Heritage - Archaeology and Ethnography,
- Desktop air quality and greenhouse gas emissions, and
- Health and hygiene.

Information obtained during the baseline assessment has been and will be used to finalise the design, construction, operation and closure of the Project.

Completed flora surveys have indicated that the condition of vegetation within the Project area ranges from completely degraded to very good with majority in a good to very good condition. Vegetation is dominated by low mulga woodlands, hummock grasslands, saltbush shrublands and Samphire shrublands. No federal or state listed threatened flora species were identified as occurring in or near the study area. Six priority listed taxa were identified, however the presence of these taxa is not expected to have a material impact on the Project development. Two introduced taxa have been recorded. Neither taxa are considered to be significant environmental weeds, with no Weeds of National Significance or Declared Plant Pests recorded.

Desktop fauna reviews identified 288 species of vertebrate fauna which have previously been recorded and/or have the potential to occur within the Project area. Of the 288 species, 33 are of conservation significance. Completed fauna surveys have identified 89 species within the Project. Two of the 33 identified conservation significant species were previously recorded within the Project area during 2017 and 2018, being the Long-tailed Dunnart and the Peregrine Falcon. Of the remaining species, none were determined to be highly likely or likely to occur based on the habitats present within the Project area, with four species assessed as 'possible to occur'. The Long-tailed Dunnart may be impacted by disturbances to the Rocky Outcrops habitat as the species is most likely restricted to this habitat within the Project Area; however there is extensive areas of this habitat type in the broader region.

A single phase (wet season – August 2018) subterranean fauna survey sampled 72 bores and drill holes within, and surrounding, the proposed main mining area. This survey returned a total of 150 subterranean fauna samples, comprising 51 stygofauna and 99 troglofauna samples. A second phase of sampling was undertaken between March and May 2019, with results unavailable at the time of completing the DFS. The Murchison region is a known 'hotspot' of subterranean fauna biodiversity and endemism.

The GVP was also surveyed for Short Range Endemic invertebrate fauna, with 64 invertebrate specimens collected. The Project area appears to represent common and widespread habitats, which occur across the diverse Murchison bioregion.

Key environmental factors to be addressed under the Scoping Document are expected to include Flora and Vegetation, Subterranean Fauna, Terrestrial Environmental Quality and Inland Waters. Information from the environmental baseline surveys and required subsequent surveys will be incorporated into the preparation of the Environmental Review document.

Preparation of the Mining Proposal, Mine Closure Plan, Works Approvals applications are anticipated to commence at the end of Q3 2019. TMT will be required to comply with the WA *Mining Rehabilitation Fund Act 2012*. Site specific disturbance data will be reported annually by 30 June each year. Disturbance data is used to calculate the Rehabilitation Liability Estimate (RLE).

No Commonwealth environmental approval is envisaged for the Project as no Matter of National Significance has been observed during baseline studies.

TMT will implement an Environmental Management System (EMS) that is aligned with the principle of International Standard in Environmental Management System ISO 14001.

## TENURE

The GVP tenure is owned 100% by The KOP Ventures Pty Ltd, a wholly owned subsidiary of TMT. The Project originally consisted of seven granted tenements; six tenements representing the Northern Block of tenement and the single Southern Tenement.

Land access approvals for the proposed mining development commenced in March 2018 with the lodgement of additional tenure in the form of Mining Lease application M51/883 over the Northern Block of tenements and Mining Lease application M51/884 over the Southern Tenement.

Miscellaneous licence applications for site access, camp, water supply areas and other supporting activities were lodged in December 2018 (L51/101) and April 2019 (L51/102), along with the lodgement in December 2018 of General-Purpose licence applications (G51/29 and G51/30).

Miscellaneous licence L51/101 (June 2019) and General-Purpose licence G51/29 (July 2019) have now been granted. The remaining three applications required to construct the Project, including M51/883, are pending as of 30 July 2019. Table 10 summarises the status of the tenure covering the Northern Block and the proposed GVP development area.

**Table 10:** GVP Northern Block of Tenements – Live and Pending

| TENEMENT ID | STATUS | MANAGER | HOLDER | AREA | UNIT | GRANT DATE | APPLICATION DATE | EXPIRY DATE |
|---|---|---|---|---|---|---|---|---|
| M51/0883 | Pending | Technology Metals Australia Ltd | The KOP Ventures P/L | 611 | HA | | 27/03/2018 | |
| G51/30 | Pending | Technology Metals Australia Ltd | The KOP Ventures P/L | 385 | HA | | 20/12/2018 | |
| G51/29 | Live | Technology Metals Australia Ltd | The KOP Ventures P/L | 110 | HA | 30/07/2019 | 20/12/2018 | 29/07/2040 |
| L51/101 | Live | Technology Metals Australia Ltd | The KOP Ventures P/L | 169 | HA | 05/06/2019 | 19/12/2018 | 04/06/2040 |
| L51/102 | Pending | Technology Metals Australia Ltd | The KOP Ventures P/L | 801 | HA | | 10/04/2019 | |
| E51/1818 | Live | Technology Metals Australia Ltd | The KOP Ventures P/L | 41 | SB | 23/02/2018 | 20/02/2017 | 22/02/2023 |
| E51/1510 | Live | Technology Metals Australia Ltd | The KOP Ventures P/L | 1 | SB | 2/07/2012 | 17/10/2011 | 1/07/2022 |
| P51/2785 | Live | Technology Metals Australia Ltd | The KOP Ventures P/L | 19 | HA | 8/05/2013 | 29/02/2012 | 7/05/2021 |
| P51/2930 | Live | Technology Metals Australia Ltd | The KOP Ventures P/L | 110 | HA | 6/11/2015 | 14/01/2015 | 5/11/2019 |
| P51/2943 | Live | Technology Metals Australia Ltd | The KOP Ventures P/L | 94 | HA | 3/12/2015 | 25/03/2015 | 2/12/2019 |
| P51/2944 | Live | Technology Metals Australia Ltd | The KP Ventures P/L | 100 | HA | 3/12/2015 | 25/03/2015 | 2/12/2019 |

* - Table does not include the Southern Tenement (P51/2942 (Live)/ M51/884 (Pending))

The GVP is located within the Yugunga-Nya Claimant Group (Y-N Group) native title claim area. Whilst the claim is yet to be determined, the Y-N Group has the right to object to any mining tenement proposed for the claim area. TMT has had ongoing discussions with the Y-N Group, however, due to changes in the Y-N Group's legal representation that occurred over the course of the first half of 2019, a Mining agreement has not yet been completed.

TMT is now in direct discussions with the Y-N Group's newly appointed representatives with regard to concluding a suitable Mining agreement.

TMT had entered into an Exploration Heritage Agreement with the Y-N Group's previous representative body, and under that agreement has completed three heritage surveys with representatives from the Y-N Group. These surveys facilitated the timely progress of exploration and development activities completed to date.

In addition to the heritage surveys, TMT has completed a search of the Department of Planning, Lands and Heritage's (DPLH) Aboriginal Heritage Inquiry System (AHIS) which shows that no registered sites occur within the Project tenements. There are however sites known to occur within 10km of the Project.

## CAPITAL COST ESTIMATE

The capital cost estimate to construct a new processing facility and all supporting infrastructure for GVP, including all direct and indirect costs, is a bottom up estimate with work broken down into components and estimate of capital assigned to each component based on preliminary design and market information incorporating third party vendor quotes. The capital cost estimate is approximately A$453.8 million. This estimate includes a weighted contingency of 12.2%, which equates to A$49.5 million and EPCM costs of A$63.0 million.

The costs have been estimated to an overall accuracy of -5% to +15%. Table 11 below summarises the key components of the capital cost estimate.

**Table 11:** GVP Pre Production Process Plant Capital Expenditure

| Major Area Description | | Total (A$) |
|---|---|---|
| 10 000 | Mining | 185,107 |
| 20 000 | Process Plant | 169,269,827 |
| 50 000 | Tailings Facility | 21,568,006 |
| 60 000 | Infrastructure | 45,940,142 |
| 70 000 | Services | 28,660,977 |
| 80 000 | Other Items (Spares, First Fills etc.) | 6,354,685 |
| 90 000 | Indirects (EPCM, Owners Costs, Insurances etc.) | 132,341,850 |
| **CAPEX EXCLUDING CONTINGENCY** | | **$404,320,593** |
| **CONTINGENCY** | | **$49,485,583** |
| **CAPEX INCLUDING CONTINGENCY** | | **$453,806,176** |

1 – does not include mining contractor establishment capital etc.

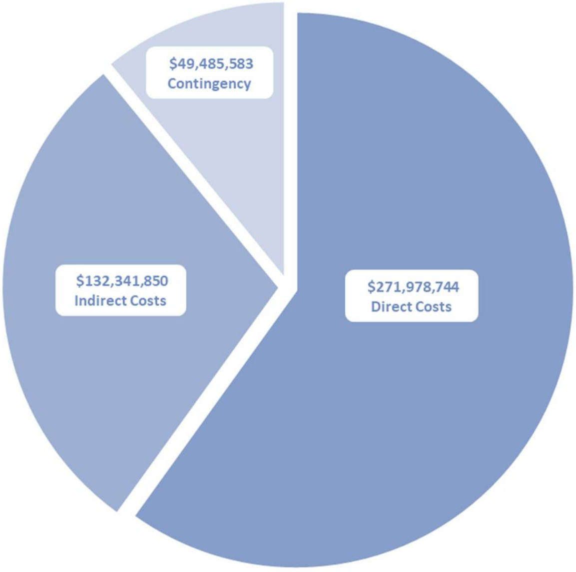


**Figure 17**: GVP Capital Cost Estimate Breakdown

Stage 2 capital expenditure of $64 million, which includes the addition of a crystalliser, ion exchange and de-chrome circuit designed to provide benefits to reagent consumption and vanadium recovery, is proposed for year 3 of the operation, once the project is in positive cashflow. There will also be a working capital requirement during the commissioning and initial ramp up phase prior to the project being cashflow positive.

Pre-production mining capital is estimated at $16 million, including mining contractor mobilisation and establishment of $11.5 million and initial clearing and grubbing of mining areas at $2.4 million. Table 12 below summarises the pre-production mining capital expenditure.

**Table 12:** GVP Pre Production Mining Capital Expenditure

| Major Area Description | Total (A$) |
|---|---:|
| Mobilisation and Establishment | 11,481,084 |
| ROM and Skyway Construction | 200,581 |
| Haul Road Construction | 902,000 |
| Geotechnical | 550,000 |
| Dewatering Infrastructure | 47,127 |
| Surface Water Infrastructure | 409,092 |
| Clearing and Grubbing | 2,443,424 |
| **TOTAL PRE-PRODUCTION MINING CAPEX** | **$16,033,308** |

## OPERATING COST ESTIMATE

The GVP DFS life of mine operating cost estimate is approximately US$4.04/lb $V_2O_5$ at a 10 – 15% accuracy. The operating cost includes all activities relating to the mining, extraction, processing and transportation to the destination of handover for the final vanadium product. Contribution of each major operating cost area is presented in Figure 18 and Table 13 shows annual average operating costs.

As shown in Table 13, Mining is the biggest single contributor to operating costs at 31%, followed by reagents and consumables (24%) and natural gas (17%).

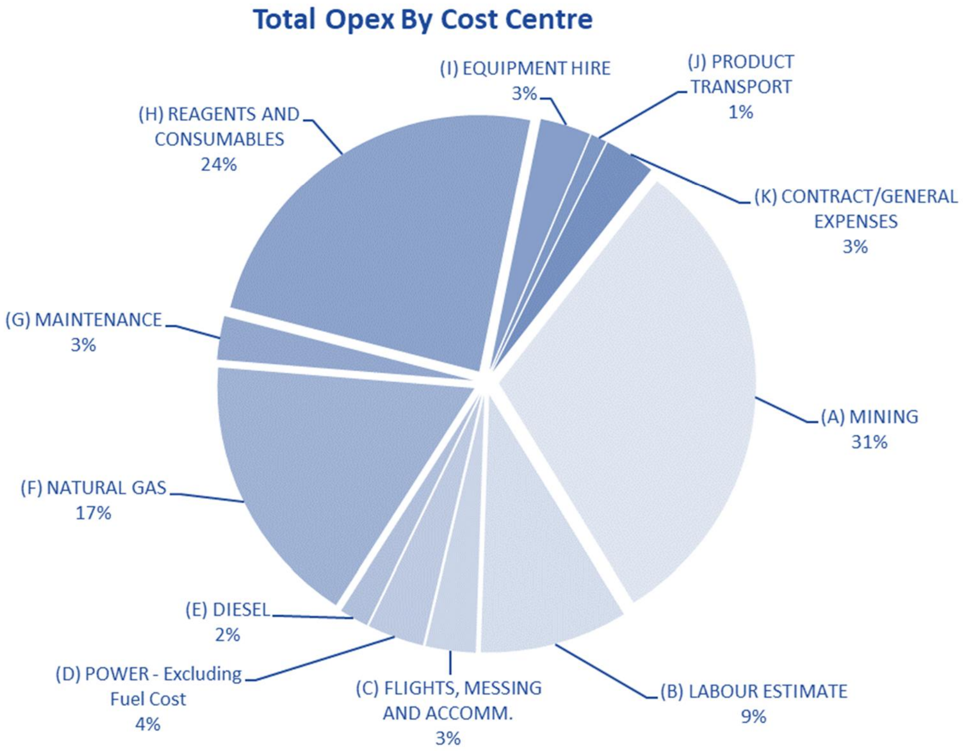


**Figure 18:** GVP Operating Cost Estimate Breakdown by Area

**Table 13**: GVP Annual Average Operating Cost Estimate

| | Cost Centre | % | Cost (A$m)/yr | USD$/lb $V_2O_5$ | A$/t ore |
|---|---|---|---|---|---|
| A | Mining | 31% | 51.1 | 1.30 | 22.3 |
| B | Labour Estimate | 9% | 15.5 | 0.38 | 6.8 |
| C | Flights, Messing and Accommodation | 3% | 5.2 | 0.13 | 2.3 |
| D | Power- Excluding Fuel Cost | 4% | 5.9 | 0.14 | 2.6 |
| E | Diesel | 2% | 3.0 | 0.05 | 1.3 |
| F | Natural Gas | 17% | 28.7 | 0.70 | 12.5 |
| G | Maintenance | 3% | 4.6 | 0.08 | 2.0 |
| H | Reagents and Consumables | 24% | 40.2 | 0.96 | 17.6 |
| I | Equipment Hire | 3% | 5.3 | 0.13 | 2.3 |
| J | Product Transport | 1% | 1.7 | 0.04 | 0.7 |
| K | Contract/General Expenses | 3% | 5.3 | 0.13 | 2.3 |
| **TOTAL** | | **100%** | **166.5** | **4.04** | **72.7** |

## FUNDING

TMT is a small market capitalisation company and does not currently have the financial capacity to internally fund 100% of the development of the GVP. External funding in the form of a mix of debt, JV interest, direct project investment and/or equity will be required. The Company has engaged financial advisers to assist in evaluation of the various financing strategies and to engage with prospective strategic investors and offtake partners. TMT's aim is to maximise the opportunities for funding the development whilst minimising dilution for existing shareholders, albeit that shareholders should be aware that further equity funding may be required to continue to progress the development.

TMT and its advisors have had initial discussions with potential strategic investors, financiers and offtake partners, highlighted by the MOU the Company has entered in to with CNMNC, and these discussions will progress further following the release of this technically and financially robust DFS. There is scope for a range of JV opportunities on the Project, through engineering / EPC, build own operate transfer, product offtake etc that have been identified and will be vigorously pursued by the Company and its advisers. The Company has engaged with Government supported debt providers both on the infrastructure construction side and plant and equipment procurement packages, as well as early discussions with commercial banks.

The robust outlook for the vanadium market, given the recent structural change in the industry, and a high level of industry interest in the GVP and the Company's activities, supports the Company's view that there is a reasonable basis that the GVP can be successfully funded.

## FUTURE WORK

The Company's activities post the delivery of the GVP DFS and leading into the implementation of the FEED study and the development of the Project will be focused on:

- Progressing environmental activities required to support the completion and lodgement of the first draft of the Environmental Review document;
- Additional water definition and evaluation work to identify the location of the initial production bores and to provide input for the first draft of the Environmental Review document;
- Ongoing discussions with the Yugunga-Nya Claimant Group and its representatives to progress a suitable Mining agreement and the timely grant of the GVP Mining Leases;
- Engagement with strategic investors and financiers with regard to defining appropriate Project funding mechanisms;
- Continued engagement with potential offtake partners and industry participants with regard to progressing binding offtake agreements and securing funding support for the development of the GVP; and
- Early engagement with suppliers of long lead processing plant equipment, including the kiln, in order to enable early completion of FEED studies.

## About Vanadium

Vanadium is a hard, silvery grey, ductile and malleable speciality metal with a resistance to corrosion, good structural strength and stability against alkalis, acids and salt water. The elemental metal is rarely found in nature. The main use of vanadium is in the steel industry where it is primarily used in metal alloys such as rebar and structural steel, high speed tools, titanium alloys and aircraft. The addition of a small amount of vanadium can increase steel strength by up to 100% and reduces weight by up to 30%. Vanadium high-carbon steel alloys contain in the order of 0.15 to 0.25% vanadium while high-speed tool steels, used in surgical instruments and speciality tools, contain in the range of 1 to 5% vanadium content. Global economic growth and increased intensity of use of vanadium in steel in developing countries will drive near term growth in vanadium demand.

An emerging and likely very significant use for vanadium is the rapidly developing energy storage (battery) sector with the expanding use and increasing penetration of the vanadium redox batteries (“**VRB’s”**). VRB’s are a rechargeable flow battery that uses vanadium in different oxidation states to store energy, using the unique ability of vanadium to exist in solution in four different oxidation states. VRB’s provide an efficient storage and re-supply solution for renewable energy – being able to time-shift large amounts of previously generated energy for later use – ideally suited to micro-grid to large scale energy storage solutions (grid stabilisation). Some of the unique advantages of VRB’s are:

- a lifespan of 20 years with very high cycle life (up to 20,000 cycles) and no capacity loss,
- rapid recharge and discharge,
- easily scalable into large MW applications,
- excellent long term charge retention,
- improved safety (non-flammable) compared to Li-ion batteries, and
- can discharge to 100% with no damage.

Global economic growth and increased intensity of use of vanadium in steel in developing countries will drive near term growth in vanadium demand.

*For, and on behalf of, the Board of the Company,*

Ian Prentice
**Managing Director**
**Technology Metals Australia Limited**

**- ENDS -**

## About Technology Metals Australia Limited

**Technology Metals Australia Limited (ASX: TMT)** was incorporated on 20 May 2016 for the primary purpose of identifying exploration projects in Australia and overseas with the aim of discovering commercially significant mineral deposits. The Company's primary exploration focus has been on the Gabanintha Vanadium Project located 40 km south east of Meekatharra in the mid-west region of Western Australia with the aim to develop this project to potentially supply high-quality $V_2O_5$ flake product to both the steel market and the emerging vanadium redox battery (VRB) market.

The Project consists of nine granted tenements and four applications (including two Mining Leases) divided between the Northern Block of Tenements (11 tenements) and the Southern Tenement (2 tenements). Vanadium mineralisation is hosted by a north west – south east trending layered mafic igneous unit with a distinct magnetic signature. Mineralisation at Gabanintha is similar to the Windimurra Vanadium Deposit, located 270km to the south, and the Barrambie Vanadium-Titanium Deposit, located 155km to the south east. The key difference between Gabanintha and these deposits is the consistent presence of the high-grade massive vanadium – titanium – magnetite basal unit, which results in an overall higher grade for the Gabanintha Vanadium Project.

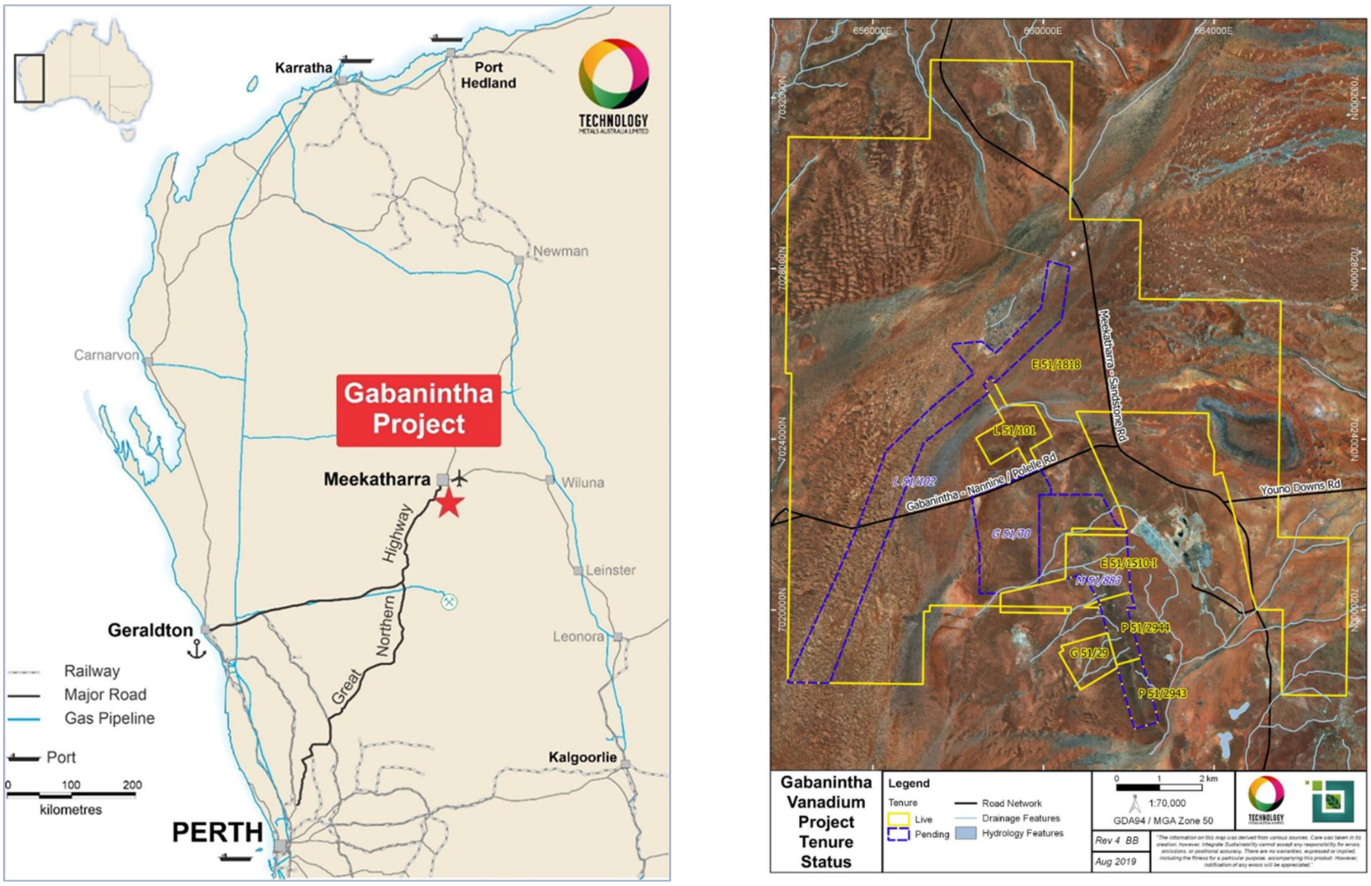


**Figure 19:** GVP Location and Tenure

Data from the Company's 2017 and 2018 drilling programs including 111 RC holes and 53 HQ and PQ diamond holes at the Northern Block and 23 RC holes (for 2,232 m) at the Southern Tenement) has been used by independent geological consultants CSA Global to generate a global Inferred and Indicated Mineral Resource estimate, reported in accordance with the JORC Code 2012 edition, for the Project. The Resource estimate confirms the position of the Gabanintha Vanadium Project as one of the highest grade vanadium projects in the world.

**Table 14**: Global Mineral Resource estimate for the Gabanintha Vanadium Project as at 27 March 2019

| Material Type | Classification | Tonnage (Mt) | $V_2O_5$ % | Fe% | $Al_2O_3$ % | $SiO_2$ % | $TiO_2$ % | LOI % | P% | S% |
|---|---|---|---|---|---|---|---|---|---|---|
| Massive Magnetite | **Measured (North)** | **1.2** | **1.0** | **44.7** | **6.2** | **10.4** | **11.4** | **0.0** | **0.009** | **0.2** |
| | **Indicated (North)** | **18.5** | **1.1** | **49.1** | **5.2** | **5.8** | **12.9** | **-0.1** | **0.007** | **0.2** |
| | Inferred (North) | 41.0 | 1.1 | 47.7 | 5.6 | 7.1 | 12.6 | 0.3 | 0.008 | 0.2 |
| | Inferred (South) | 10.4 | 1.1 | 49.1 | 4.9 | 5.9 | 12.6 | -0.4 | 0.004 | 0.3 |
| | **Total Inferred** | **51.5** | **1.1** | **48.0** | **5.5** | **6.9** | **12.6** | **0.1** | **0.007** | **0.2** |
| | **Massive Global** | **71.2** | **1.1** | **48.2** | **5.4** | **6.7** | **12.7** | **0.1** | **0.007** | **0.2** |
| Disseminated / Banded Magnetite | **Indicated (North)** | **10.3** | **0.6** | **28.6** | **13.1** | **25.5** | **7.5** | **3.0** | **0.030** | **0.2** |
| | Inferred (North) | 38.5 | 0.5 | 27.1 | 12.7 | 27.4 | 6.9 | 3.3 | 0.027 | 0.2 |
| | Inferred (South) | 11.1 | 0.6 | 30.2 | 11.9 | 23.4 | 7.7 | 2.4 | 0.012 | 0.4 |
| | **Total Inferred** | **49.6** | **0.6** | **27.8** | **12.5** | **26.5** | **7.1** | **3.1** | **0.024** | **0.2** |
| | **Diss / Band Global** | **59.9** | **0.6** | **27.9** | **12.6** | **26.4** | **7.2** | **3.1** | **0.025** | **0.2** |
| **Combined** | **Global Combined** | **131** | **0.9** | **39.0** | **8.7** | **15.7** | **10.1** | **1.4** | **0.015** | **0.2** |

* Note: The Mineral Resource was estimated within constraining wireframe solids using a nominal 0.9% $V_2O_5$ lower cut-off grade for the basal massive magnetite zone and using a nominal 0.4% $V_2O_5$ lower cut-off grade for the banded and disseminated mineralisation zones. The Mineral Resource is quoted from all classified blocks within these wireframe solids above a lower cut-off grade of 0.4% $V_2O_5$. Differences may occur due to rounding

Data from the global Mineral Resource and the recently completed DFS on the GVP were used by independent consultants CSA Global to generate a Proven and Probable Ore Reserve estimate based on the Measured and Indicated Mineral Resource of 30.1 Mt at 0.9% $V_2O_5$ located within the Northern Block of tenements at Gabanintha.

**Table 15**: Ore Reserve Estimate as at 31 May 2018

| Reserve Category | Tonnes (Mt) | Grade $V_2O_5$% | Contained $V_2O_5$ Tonnes (Mt) |
|---|---|---|---|
| Proven | 1.1 | 0.96 | 0.01 |
| Probable | 28.5 | 0.88 | 0.25 |
| **Total** | 29.6 | **0.88** | **0.26** |

- *Note: Includes allowance for mining recovery (98% for massive magnetite ore and 95% for banded and disseminated ore) and mining dilution applied as a 1 metre dilution skin; resulting in a North Pit dilution for massive magnetite ore of 13% at 0.45% $V_2O_5$, and North Pit dilution for banded and disseminated ore of 29% at 0.0% $V_2O_5$; a Central Pit dilution for massive magnetite ore of 10% at 0.46% $V_2O_5$, and Central Pit dilution for banded and disseminated ore of 20% at 0.0% $V_2O_5$.)*
- *Rounding errors may occur*

| ***Capital Structure*** | |
|---|---|
| *Fully Paid Ordinary Shares on Issue* | *87.554m* |
| *Unquoted Options ($0.25 – 31/12/19 expiry)* | *14.59m* |
| *Unquoted Options ($0.35 – 12/01/21 expiry)* | *2.75m* |
| *Quoted Options ($0.40 – 24/05/20 expiry)* | *14.889m* |
| *Unquoted Options ($0.40 – 24/05/20 expiry)* | *3.258m* |

### *Forward-Looking Statements*

*This document includes forward-looking statements. Forward-looking statements include, but are not limited to, statements concerning Technology Metal Australia Limited's planned exploration programs, corporate activities and any, and all, statements that are not historical facts. When used in this document, words such as "could," "plan," "estimate," "expect," "intend," "may", "potential," "should" and similar expressions are forward-looking statements. Technology Metal Australia Limited believes that it has a reasonable basis for its forward-looking statements; however, forward-looking statements involve risks and uncertainties and no assurance can be given that actual future results will be consistent with these forward-looking statements. All figures presented in this document are unaudited and this document does not contain any forecasts of profitability or loss.*

### *Competent Persons Statement*

*The information in this report that relates to Exploration Results are based on information compiled by Mr Ian Prentice. Mr Prentice is Managing Director of the Company and a member of the Australian Institute of Mining and Metallurgy. Mr Prentice has sufficient experience relevant to the styles of mineralisation and types of deposits which are covered in this report and to the activity which they are undertaking 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' ("**JORC Code**"). Mr Prentice consents to the inclusion in this report of the matters based on his information in the form and context in which it appears.*

*The information in this report that relates to Mineral Resources is based on information compiled by Mr Grant Louw. Mr Louw is a Principal Consultant with CSA Global and a Member of the Australian Institute of Geoscientists. Mr Louw has sufficient experience relevant to the styles of mineralisation and types of deposits which are covered in this report and to the activity which he is undertaking 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' ("**JORC Code**"). Mr Louw consents to the inclusion in this report of the matters based on his information in the form and context in which it appears.*

*The information that relates to Ore Reserves is based on information compiled by Mr Daniel Grosso and reviewed by Mr Karl van Olden, both employees of CSA Global Pty Ltd. Mr van Olden takes overall responsibility for the Report as Competent Person. Mr van Olden is a Fellow of The Australasian Institute of Mining and Metallurgy and has sufficient experience, which is relevant to the style of mineralisation and type of deposit under consideration, and to the activity he is undertaking, to qualify as Competent Person in terms of the JORC (2012 Edition). The Competent Person, Karl van Olden has reviewed the Ore Reserve statement and given permission for the publication of this information in the form and context within which it appears.*

*The information in this report that relates to the Processing and Metallurgy for the Gabanintha project is based on and fairly represents, information and supporting documentation compiled by Mr Brett Morgan and reviewed by Mr Damian Connelly, both employees of METS Engineering Group Pty Ltd. Mr Connelly takes overall responsibility for the Report as Competent Person. Mr Connelly is a Fellow of The Australasian Institute of Mining and Metallurgy and has sufficient experience, which is 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 in the 2012 edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. The Competent Person, Damian Connelly consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.*

# Appendix 1: JORC 2012 Table 1 Sections 1 to 4

## Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

| Criteria | Commentary |
|---|---|
| ***Sampling techniques*** | • Reverse circulation drilling was sampled on a 1m basis. Each metre drilled was cone split off the rig cyclone, with two 2-3kg sub-samples collected for each metre.<br>• One primary sub-sample was selected for assay from each metre.<br>• Secondary sub-samples were submitted for analysis for every 20th sample, thereby duplicating the primary sub-sample.<br>• Reverse circulation drill holes were analysed for magnetic susceptibility by either a KT-9 or KT-10 magnetic susceptibility meter on a 1m basis.<br>• Diamond Drilling was undertaken on PQ and HQ size using triple tube drilling in the oxidised rock and conventional double tube in fresh rock to ensure maximum recovery and representivity.<br>• Except where geotechnical samples were taken, core was sampled on a 1m or 0.5m basis.<br>• Core was cut using diamond blade core saw into quarter (PQ and HQ) or 1/6th slices (PQ in kiln sample only). Duplicate samples were taken from the remaining ¾ or 5/6th core original samples by a second cut representing equal mass to the original.<br>• Samples were taken from the same side of the orientation line throughout each hole. For un-oriented core, samples were selected from a consistent side of the core.<br>• Core was measured on a 20cm basis by a KT-10 Plus magnetic susceptibility meter.<br>• All Samples are analysed by XRF spectrometry following digestion and Fused Disk preparation.<br>• Blanks and Certified Reference Materials (CRM) were inserted at a rate of 1:50 and 1:20 samples, respectively. CRMs were produced from mineralized material sourced from TMT's Gabanintha deposit and certified by a commercial CRM vendor.<br>• Where possible, diamond drill holes and selected reverse circulation drill holes were probed via downhole Televiewer probe and selected drill holes probed with down hole magnetic susceptibility sonde.<br>• QEM Scan was used to confirm that vanadium is hosted within titanomagnetite minerals within the host gabbro. |
| ***Drilling techniques*** | • Reverse circulation drilling completed with 143mm face-sampling hammer<br>• PQ2/3 sized drill core was selected for metallurgical reasons and HQ2 core was selected for diamond tails and Geotechnical holes. |
| ***Drill sample recovery*** | • Sample recovery was assessed based on the estimated bulk sample collected for each metre. Each bag was not weighed. For 1 in 3 holes a spring gauge was used to ensure the cone split remained within the 2 to 3 Kg range.<br>• Poor sample recovery or quality (wet, etc) was recorded in logging sheets.<br>• Weights of primary and secondary sub-samples were compared to check variability.<br>• There does not appear to be any relationship between recovery and grade in the "massive" mineralisation.<br>• Recovery was maximised in diamond drilling by using triple tube in weathered rock. Core recovery was assessed by measuring expected and recovered core and losses were logged where noted. Core recovery exceeded 98%. |

| Criteria | Commentary |
|---|---|
| ***Logging*** | • All chips and core have been qualitatively geologically logged to a minimum interval length and precision sufficient for calculation of a mineral resource.<br>• All core holes have been logged by an independent geotechnical consultant.<br>• Drill chips for every metre were collected in trays and photographed.<br>• All diamond core has been photographed to a high resolution for electronic storage prior to sampling.<br>• Where possible, diamond drill holes and selected reverse circulation drill holes were probed via downhole Televiewer probe and selected drill holes probed with down hole magnetic susceptibility sonde.<br>• Geotechnical logging was undertaken on all diamond holes within proposed pit boundaries. Geotechnical studies are underway to optimise wall angles on proposed pits |
| ***Sub-sampling techniques and sample preparation*** | • Core was sampled on ¼ basis except metallurgical holes which were sampled by 1/6th slices. Some sections of whole core were selected for geotechnical or metallurgical sampling and are noted as such.<br>• Reverse circulation sampling was cone split off the rig to approximate 4-5% of the bulk sample mass (2-3kg). This is considered appropriate to the material being sampled.<br>• Duplicate sampling was undertaken at a rate of 1 per 20 samples to monitor recoveries and repeatability of all sampling.<br>• RC was sampled by duplicates taken from secondary sub-samples cone split from the rig cyclone.<br>• Core was duplicate sampled by assaying a second ¼ (HQ and PQ) or 1/6th of the core (only PQ holes used for metallurgical kiln testing properties).<br>• Samples presented to the laboratory were split to <2kg and pulverised to 95% passing 75 microns. 30g of pulverised material was split and presented for assay.<br>• Davis Tube Recovery (DTR) tests were completed on selected 4m composites of mineralised intervals defined by assay data |
| ***Quality of assay data and laboratory tests*** | • Pulverised samples from every metre were fused with a lithium borate flux and cast in to disks and analysed by XRF spectrometry – method FB1/XRF77. In addition LOI was completed by Gravimetric analysis.<br>• This is considered to approximate a total analysis method.<br>• Davis Tube Recovery (DTR) was performed via compositing pulverised sample rejects, by a commercial laboratory.<br>• Field duplicates (at least 1 duplicate sample for every 20 samples analysed), laboratory check samples and standards are considered to be suitable quality control procedures.<br>• Quality control procedures demonstrate acceptable levels of accuracy and precision have been achieved. CRM materials inserted to the sample stream at the laboratory have performed acceptably, and field duplicate samples have performed well. Batches of samples are periodically sent for check assay by an umpire laboratory. |

| Criteria | Commentary |
|---|---|
| ***Verification of sampling and assaying*** | • Logging was completed onto paper and transcribed or digitally captured in the field<br>• All logging and sampling information has been captured into a commercially supplied database.<br>• Assay data was supplied in electronic format<br>• Data has been subjected to QAQC cross-checks and verification by company personnel prior to acceptance into the database.<br>• Significant intersections were correlated with mineralised zones as defined from geological logging.<br>• All significant intersections were verified by an independent geologist as well as the Competent Person.<br>• The estimation of significant intersections has been verified by alternate company personnel.<br>• There were no adjustments to assay data.<br>• 2 RC holes have been twinned by diamond holes. |
| ***Location of data points*** | • The grid system used for collar positions is MGA94 – Zone 50.<br>• A 2017 50cm resolution digital elevation model and high-resolution aerial photogrammetric survey was used for topographic survey control<br>• Planned hole collar positions were located in the field using hand held GPS.<br>• Final hole collar positions were surveyed using differential RTK GPS with an accuracy of ±5cm horizontally and ±10cm vertically.<br>• Down hole deflections were measured using an Axis CHAMP north-seeking gyroscope every 30m down hole and near the collar.<br>• Downhole magnetic susceptibility and Televiewer data was captured on a <1cm accuracy down hole |
| ***Data spacing and distribution*** | • The drill data is on nominal 100m line spacing with holes located every 50m along the drill lines.<br>• Detailed airborne magnetics supports strike and down dip continuity assumptions of the massive magnetite zone which is known to host high-grade mineralisation.<br>• This continuity has been additionally supported by drilling data.<br>• Data is considered appropriate for use in estimating a Mineral Resource.<br>• No sample compositing is used in primary assay except for DTR recovery testing |
| ***Orientation of data in relation to geological structure*** | • The drilling has been completed at an orientation that would have been unlikely to have introduced a sampling bias. The drill holes are drilled orthogonal to the measured strike +-10°, the apparent thickness is estimated 0.85 X the true thickness, drill deviations were not noticeably higher through the mineralised zone. 21 vertical PQ diamond holes associated with metallurgical kiln property sampling approximate 2.5x true widths |

| Criteria | Commentary |
|---|---|
| ***Sample security*** | • RC Samples were collected in polyweave bags, sealed securely and transported by Company personnel until handover to a commercial transport company, which delivered the samples by road transport to the laboratory.<br>• Drill core samples were transported to the commercial laboratory as whole core by registered consignment and tray numbers confirmed by personnel in the laboratory core yard. All core from the current program was labelled with non degrading metal tags. |
| ***Audits or reviews*** | • A representative from the independent geological consultants, CSA Global, visited the site during the infill and extensional drilling program and reported drilling and sampling procedures and practices to be acceptable.<br>• Apart from umpire assay and use of experienced field geologists (all >20yrs experience) to supervise sampling, no written audits have been completed to date. Data Validation is done by a supervising geologist, database geologist and a Resource consultant all independent and contracted to the company. |

## Section 2 – Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

| Criteria | Commentary |
|---|---|
| ***Mineral tenement and land tenure status*** | • The areas drilled are located on current Prospecting Licences 51/2942, 51/2943 and 51/2944 and Exploration Licence 51/1510).<br>• The tenements are granted and held by The KOP Ventures Pty Ltd, a wholly owned subsidiary of Technology Metals Australia Limited. |
| ***Exploration done by other parties*** | • Reverse circulation drilling was completed in 1998 by Intermin Resources NL under an option agreement on tenements held by Oakland Nominees Pty Ltd – consisting of GRC9801 to GRC9805 (on Prospecting Licences 51/2164) and GRC9815 to GRC9817 (on Prospecting Licence 51/2183).<br>• The areas drilled are located on current Prospecting Licences 51/2943 (GRC9801, GRC9802), 51/2944 (GRC9803, GRC9804, GRC9805) and 51/2942 (GRC9815 to GRC9817) held by The KOP Ventures Pty Ltd, a wholly owned subsidiary of Technology Metals Australia Limited.<br>• Exploration prior to this drilling included geological mapping and limited rock chip sampling completed across a zone of outcropping vanadiferous titanomagnetite layered mafic igneous unit by various parties. |
| ***Geology*** | • The Gabanintha vanadium deposit is of a layered igneous intrusive type, hosted within a gabbro intrusion assigned to the Archaean Meeline Suite. |
| ***Drill hole Information*** | • Not relevant. Exploration results are not being reported. Mineral Resources are being disclosed (see Section 3).<br>• All relevant material from previous drilling has been reported to the ASX on the following dates: 9th March 2017, 4th April 2017, 19th April 2017, 31st August 2017, 14th September 2017, 18th October 2017, 7th December 2017, 5 October 2018, 8 November 2018, 20 December 2018 and 30 January 2019. |

| Criteria | Commentary |
|---|---|
| ***Data aggregation methods*** | • Not relevant. Exploration results are not being reported. Mineral Resources are being disclosed (See Section 3). |
| ***Relationship between mineralisation widths and intercept lengths*** | • Not relevant. Exploration results are not being reported. Mineral Resources are being disclosed (See Section 3). |
| ***Diagrams*** | • Appropriate diagrams contained in the report to which this Table 1 applies. |
| ***Balanced reporting*** | • Not relevant. Exploration results are not being reported. Mineral Resources are being disclosed (See Section 3). |
| ***Other substantive exploration data*** | • Geophysical data in the form of aero magnetic data assists the geological interpretation of the main high magnetite unit and highlights offsets due to faults and or dykes. Historic drilling data is not used due to uncertainty in location and orientation<br>• Oxidation state has been modelled based on geological logging and geometallurgical characterisation<br>• Bulk density estimates have been completed on diamond core samples of fresh, transitional and oxidised material based on 654 measurements from 45 of 47 holes<br>• Bulk density measurements are a mixture of caliper and immersion methods.<br>• Metallurgical test work and bulk sampling results indicate amenability of magnetite concentrates to conventional roast leach processing (See ASX Release 12th December 2018 – Outstanding Gabanintha Metallurgical Results)<br>• Low values of deleterious elements (As, Mo, Cr) are associated with mineralisation<br>• Groundwater quality is suitable for use in mine planning and processing |
| ***Further work*** | • Samples from diamond drilling have been collected to enable further metallurgical testing of the different grades and types of mineralisation encountered in the drilling, including bulk samples for vendor kiln property testwork.<br>• Diamond drilling has also been used to gather geotechnical data relevant to open pit mine design parameters.<br>• A program of drilling is due to start shorty in the adjacent exploration licence focused on water exploration. |

## Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

| Criteria | Commentary |
|---|---|
| ***Database integrity*** | • Drilling data is stored in a DataShed database system which is an industry best practise relational geological database. Data that has been entered to this database is cross checked by independent geological contracting staff to ensure accuracy. CSA Global has been provided with a number of pdf format assay certificates from the laboratory and completed its own checks, finding that all checked assay data was correctly captured in the relevant database table.<br>• Data used in the Mineral Resource estimate is sourced from a database export. Relevant tables from the database are exported to MS Excel format and converted to csv format for import into Datamine Studio RM software.<br>• Validation of the data import include checks for overlapping intervals, missing survey data, missing assay data, missing lithological data, and missing collars. |
| ***Site visits*** | • A two-day site visit was completed by a CSA Global staff member in August 2017 while drilling was in progress. The site visit confirmed that industry best practice procedures are in place and being followed, with drilling, sampling and logging practice being observed. Drill collar locations have been captured by hand held GPS confirming their stated survey locations. Mineralisation outcrop extents were followed, with measurements taken confirming the interpreted strike and dip.<br>• A two-day site visit was completed by a CSA Global staff member in October 2018 while drilling was in progress. The site visit confirmed that industry best practice procedures are in place and being followed, with drilling, sampling, density measurement and logging practice being observed. Drill collar locations have been captured by hand held GPS confirming their stated survey locations. |
| ***Geological interpretation*** | • Based on surface geological and structural mapping, drill hole logging and sample analysis data and geophysical TMI data, the geology and mineral distribution of the massive V-Ti-magnetite zone appears to be relatively consistent through the interpreted strike length of the deposit. Cross-cutting faults and dykes, interpreted from the drill hole and magnetic data and surface mapping have been modelled. These features displace the mineralisation as shown in the diagrams in the body of this report. Drill hole logging has shown some narrow quartz porphyry units which have been modelled, cutting through the mineralisation on some sections. In the hangingwall and footwall of the massive magnetite zone, the mineralised units are defined at a nominal 0.4% $V_2O_5$ lower cutoff grade and a nominal minimum 3 m downhole continuity. The geological and grade continuity of some of these zones is not as well understood as the massive magnetite unit, however drill sample analysis demonstrates consistent zones of more disseminated (and / or banded) magnetite mineralisation existing in the hanging wall and foot wall of the massive unit along strike and on section. Weathering surfaces for the base of complete oxidation (BOCO) and top of fresh rock (TOFR) have been generated based on a combination of drill hole logging, magnetic susceptibility readings and sample analysis results. A partially mineralised cover sequence is interpreted as depleting the top few metres of the model interpreted based on lithological logging of the drilling. |

| Criteria | Commentary |
|---|---|
|  | • Surface mapping, drill hole intercept logging, sample analysis results and TMI data have formed the basis of the geological and mineralisation interpretations. Assumptions have been made on the depth and strike extent of the mineralisation based on the drilling and geophysical data, as documented further on in this table. Based on the currently available information contained in the drilling data, surface mapping and the geophysical data, the assumption has been made that the hanging wall and foot wall disseminated mineralisation lenses that are in the same stratigraphic position relative to the massive magnetite are related and are grouped together as the same zones for estimation purposes.<br>• The extents of the modelled mineralisation zones are constrained by the available drill and geophysical data. Alternative interpretations are not expected to have a significant influence on the global Mineral Resource estimate.<br>• The continuity of the geology and mineralisation can be identified and traced between drill holes by visual, geophysical and geochemical characteristics. In parts of the modelled area, additional data is required to more accurately model the effect of any potential structural or other influences on the modelled mineralised units, Confidence in the grade and geological continuity is reflected in the Mineral Resource classification. |
| ***Dimensions*** | • The modelled mineralisation strikes approximately 160° to 340°, dipping on average about 60° towards 250°, with a modelled strike extent of approximately 4.6 km. The stratiform massive magnetite unit has a true thickness varying between 7 m and 25 m. The interpreted disseminated mineralisation lenses appear to be better developed in the southern half of the modelled area, with cumulative true thickness of the order of 45 m in the south from up to six lenses, reducing to roughly 25 m in the northern third from four to five lenses and approximately 8 m from one lens in the extreme north of the deposit. The massive magnetite outcrops and has been mapped along the strike extent and has been extended to a maximum of approximately 300 m below topographic surface or nominally 120 m down dip of the deepest drill hole intersections. The strike extent is extended a nominal 200 m, or half the nominal drill section spacing, past the last drilling section in the south to the intersection with the tenement boundary based on the surface mapping and geophysical data extents. In the north the mineralisation is terminated nominally 50 m past drilling based on the surface mapping extents of the outcropping mineralisation. The northern most lens of the modelled massive magnetite mineralisation has the down dip extent limited to a nominal 40 m down dip of drill section data, or 150 m below topographic surface, due to the greater geological uncertainty. The immediate hangingwall disseminated mineralisation zone above the massive magnetite is considered to be the most consistent of the disseminated magnetite zones and is modelled nominally 80 m down dip of the deepest drill intersections or nominally 260 m below topographic surface. The lenses further up in the hanging wall are not as clearly constrained and understood, mostly due to lower drill coverage at depth, and therefore the down dip extent is successively reduced upwards in the sequence as can be seen in the representative cross section in the body of this report. Given the continuity defined over the drilled extents (fence line spacings of mostly 100 m) and being additionally informed by the magnetics (TMI), these extrapolation extents are considered reasonable. |

| Criteria | Commentary |
|---|---|
| ***Estimation and modelling techniques*** | • The Mineral Resource estimate was completed in Datamine Studio RM software using the ordinary kriging (OK) estimation method, with an inverse distance weighting to the power of two (IDW) estimation method also completed for validation purposes. Estimations were completed for $V_2O_5$, Fe and contaminant elements, $TiO_2$, $Al_2O_3$, $SiO_2$, P and S, and loss on ignition at 1000°C (LOI). In addition, the base metals Co, Cu and Ni have been modelled and are separately reported due to the significant difference in processing for these elements, being they are likely to be beneficiated from the non-magnetic tailings stream and testing the viability of this process step is at a relatively early stage. Due to the mineralised zones being cut by and / or offset by faults and dykes the mineralisation interpretation consists of 12 massive magnetite and 36 disseminated magnetite mineralisation lenses. These are grouped together using a numeric zone code as the massive magnetite lenses, or for the disseminated mineralisation lenses they grouped together based on stratigraphic position in the hangingwall or footwall relative to the massive magnetite. These lens groupings are then further split based on the weathering surface interpretations into oxide, transition and fresh materials. The preliminary statistical analysis completed on the massive magnetite and stratigraphically relative grouped disseminated magnetite domains showed that for the some of the combined mineralisation / weathering state domain groupings there were not sufficient samples to complete a robust grade estimation. As a result, due to insufficient data points for the oxide massive magnetite, the oxide material was combined with transitional to form one estimation domain. Similarly, in the footwall disseminated magnetite domains, the oxide and transition zones are grouped together. All data in the upper most hangingwall disseminated unit is combined into a single domain. This has resulted in 17 separate estimation domains being defined with hard boundaries being used between the defined combined weathering and mineralisation estimation domains. A detailed statistical analysis was completed for each of the defined mineralisation / weathering state estimation domains. This analysis showed that for some grade variables occasional outlier grades existed and, in the CP's opinion, these required balancing cuts to prevent estimation bias associated with outlier values. For the massive magnetite top cuts were applied to $Al_2O_3$, P, S and $SiO_2$ in the combined weathered domain, and for $Al_2O_3$, Co, Cu, Ni, P and $SiO_2$ in the fresh domain as listed in the relevant table in the body of this report. For the disseminated magnetite domains, various elements required top cutting as listed in the relevant table in the body of this report. Drill spacing is nominally 40 m to 5 0m on sections spaced 100 m or 200 m apart. Maximum extrapolation away from data points is to 200 m in the south and up to 120m down dip. Kriging neighbourhood analysis (KNA) was used in conjunction with the modelled variogram ranges and consideration of the drill coverage to inform the search parameters. Search ellipse extents are set to 275 m along strike, 230 m down dip and 20 m across dip, ensuring that the majority of the block estimates find sufficient data to be completed in the first search volume. The search volume was doubled for the second search pass and increased 20-fold for the third search pass to ensure all block were estimated. A maximum of 8 samples per hole, with a minimum of 15 and a maximum of 36 samples are allowed for a block estimate in the first search pass, reducing to a minimum of 12 samples and a maximum 30 samples for the second pass, and the maximum was then further reduced to maximum 24 samples for the final pass.<br>• The IDW check estimate results produced comparable results with a less than 0.1% difference in global $V_2O_5$ grade. |

| Criteria | Commentary |
|---|---|
| | • By-product recovery of the base metals Co, Cu and Ni is considered to be a possible option at this stage. Metallurgical testing has demonstrated that a base metal concentrate with up to 10% to 15% can be produced by flotation methods from the non-magnetic tailing stream produced during beneficiation of the primary commodity – vanadium bearing magnetite. These base metals have therefore been estimated into the block model using the same search and variogram parameters as used for the other estimated elements.<br>• Potentially deleterious P and S have been estimated<br>• A volume block model with parent block sizes of 50 m (N) by 10 m (E) by 5 m (RL) was constructed using Datamine Studio Software. Minimum sub cells down to 2.5 m (N) by 2.5 m (E) by 2.5 m (RL) were allowed for domain volume resolution. Drill spacing is nominally 40 m to 50 m across strike on west to east sections spaced either 100 m or 200 m apart north to south.<br>• No assumptions have been made regarding selective mining units at this stage.<br>• A strong positive correlation exists between Fe and $V_2O_5$ and $TiO_2$ and a strong negative correlation between Fe and $Al_2O_3$, $SiO_2$ and LOI.<br>• The separate interpreted mineralisation zones domained based on the geological, geochemical and geophysical data, and further domained by weathering state have been separately estimated using hard boundaries between domains. The model is depleted by fault zones, intrusive dykes, cross cutting quartz porphyries and surficial colluvium zones that have been interpreted based on the geological, geochemical and geophysical data.<br>• Block model validation has been completed by statistical comparison of drill sample grades with the OK and IDW check estimate results for each estimation zone. Visual validation of grade trends along the drill sections was completed and trend plots comparing drill sample grades and model grades for northings, eastings and elevation were completed. These checks show reasonable comparison between estimated block grades and drill sample grades, with differences in block model grade compared to the drill sample data for $V_2O_5$ primarily attributable to volume variance and estimation smoothing effects.<br>• With no mining having taken place there is no reconciliation data available to test the model against. |
| ***Moisture*** | • Tonnages have been estimated on a dry, in situ, basis. |
| ***Cut-off parameters*** | • The adopted lower cut-off grade for reporting of 0.4% $V_2O_5$ is supported by the metallurgical results and conceptual pit optimisation study as being reasonable. |
| ***Mining factors or assumptions*** | • It has been assumed that these deposits are amenable to open cut mining methods and are economic to exploit to the depths currently modelled using the cut-off grade applied. No assumptions regarding minimum mining widths and dilution have been made. |
| ***Metallurgical factors or assumptions*** | • Metallurgical amenability has been assessed based on results from TMT's ongoing detailed metallurgical testwork program from its Northern Tenement Block.<br>• The work conducted since the previous Northern Block Mineral Resource estimate release (TMT: ASX announcement March 7, 2018) has consisted of: |

| Criteria | Commentary |
|---|---|
| | o Comminution testwork on a number of sections of full core sampled from the August-November 2018 drilling program;<br>o DTR testwork on composites from 2017 drilling program samples;<br>o Magnetic beneficiation testwork, and<br>o Preparation of magnetic concentrate for kiln vendor testwork.<br>• The magnetic beneficiation testwork consisted of low intensity magnetic separation (LIMS) on the two composite samples (massive fresh and massive transitional (the significant ore types) at five nominal grind sizes of P80 passing 150, 250, 500, 750 and 1000 microns undertaken by a triple pass methodology at 1200 Gauss.<br>• The results for the fresh massive showed that grades of 1.25% to 1.34% $V_2O_5$ reported to a magnetic concentrate across the grind size range, with iron grades ranging between 55.3% and 58.1%. The massive fresh material showed a mass recovery ranging from 75.4% to 79.9% reporting to the magnetic concentrate, with vanadium recoveries ranging from 95.3% to 96.2%.<br>• The results for the transition massive showed that grades of 1.27% to 1.32% $V_2O_5$ reported to a magnetic concentrate across the grind size range, with iron grades ranging between 54.5% and 56.2%. The massive transition material showed a mass recovery ranging from 58.1% to 66.2% reporting to the magnetic concentrate, with vanadium recoveries ranging from 67.6% to 74.0%.<br>• There was a very high rejection of gangue minerals from both of the composites, with $SiO_2$ grades in the magnetic concentrates ranged from 0.8% to 2.9% in the massive fresh and 0.9% to 1.6% in the massive transitional, with $Al_2O_3$ ranging from 3.0% to 3.7% in the massive fresh and from 3.0% to 3.4% in the massive transitional.<br>• DTR testwork has given average head grades, concentrate grades, recoveries and mass yields across the Proposed North Pit and Central Pit as shown below. |

| Ore Type: | Massive | | | Disseminated / Banded | | |
|---|---|---|---|---|---|---|
| Oxidation type | Oxide | Trans | Fresh | Oxide | Trans | Fresh |
| Head grade $V_2O_5$% | 1.11 | 1.15 | 1.08 | 0.55 | 0.55 | 0.52 |
| DTR Magnetic Weight Recovery (Yield) % | 59.5 | 61 | 78 | 8 | 16.4 | 35.6 |
| DTR grade $V_2O_5$% | 1.34 | 1.35 | 1.32 | 1.28 | 1.28 | 1.14 |
| DTR $V_2O_5$ Recovery % (Magnetic con) | 72.9 | 73.2 | 95.1 | 37.7 | 53.4 | 76 |

- Selected samples from the bulk sample drilling conducted in October 2018 were sent to Perth for generation of magnetic concentrate for preliminary kiln vendor testing. The samples were selected to be representative across the anticipated first 2 years of production with a head grade of approximately 1.01% $V_2O_5$. These samples were crushed and milled to a P80 of 250 microns before being subject to triple pass LIMS.
- The results indicate that 95.3% of the vanadium was recovered into a concentrate with a grade of 1.34% $V_2O_5$ and a mass recovery of 72.0%. There was high gangue rejection with a $SiO_2$ grade of 1.56% and $Al_2O_3$ grade of 3.28%.

| Criteria | Commentary |
|---|---|
| | • The sample has undergone a bulk leach process in which the leach liquor generated will be used for optimisation of the downstream processes and generation of product samples. Previous work has shown the ability to undertake the necessary downstream process in order to produce $V_2O_5$ flake grading at 99.53% purity with a recovery of greater than 98% from solution (TMT: ASX announcement September 12th 2018).<br>• Based on the DTR results, kiln vendor roast work and leaching and assumed recoveries for downstream processes the following recovery factors have been estimated for each composite type:<br>o Massive fresh – 74.5%<br>o Massive transitional – 57.3%<br>o Massive oxide – 57.1%<br>o Disseminated/Banded fresh – 59.5%<br>o Disseminated/Banded transitional – 41.8%<br>o Disseminated/Banded oxide – 29.5%.<br>• Further beneficiation work is underway on the remaining samples from the bulk drilling program to produce a bulk sample for additional kiln vendor testing.<br>• Multi-element analysis of the drill samples at Gabanintha has highlighted the presence of elevated base metal sulphides associated with portions of the fresh vanadium bearing magnetite mineralisation; specifically, cobalt, nickel and copper sulphides.<br>• Analysis indicates that the majority of the base metal sulphides report to the non-magnetic fraction from the LIMS process designed to beneficiate the vanadium mineralisation in to a magnetic concentrate.<br>• A number of representative samples of the non-magnetic fraction from the LIMS have been subjected to a range of bench scale flotation tests to investigate how this material may respond to conventional base metal flotation. The testwork program consisted of bulk rougher flotation to confirm the amenity of the material to flotation, followed by cleaner flotation trials of the rougher concentrate to optimise grade of the combined base metals.<br>• The representative sample subjected to the bulk rougher flotation tests, the non - magnetic fraction from the LIMS, represented 25.6% of the overall LIMS feed. The overall LIMS feed graded 0.026% Co, 0.116% Ni and 0.03% Cu. The non-magnetic fraction upgraded the base metal content to 0.062% Co, 0.21% Ni and 0.093% Cu. Bench scale testing concentrate grades ranged up to 1.84% Co (at up to 76.9% recovery), up to 3.14% Ni (at up to 56.2% recovery) and 4.77% Cu (at up to 94.84% recovery). These concentrates represented mass pulls between 4.1% and 12.5% of the non - magnetic fraction feed material.<br>• The bulk rougher float test utilised a 13.5kg sample of the non-magnetic fraction from the LIMS, with three concentrates collected at varying time intervals through the flotation process (Figure 1). Each of the concentrates were dried and assayed prior to being recombined for cleaner flotation testwork. The recombined concentrate contained 1.11% Co (at 66.96% recovery), 2.39% Ni (at 40.24% recovery) and 2.51% Cu (at 94.84% recovery). The combined concentrate represented a mass pull of 3.5% of the non - magnetic fraction feed material and represents 0.9% of the overall LIMS feed. |

| Criteria | Commentary |
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| | • The recombined bulk rougher concentrate was then subjected to cleaner flotation tests that generated base metal cleaner concentrates with combined base metal content between 10 and 15%, containing up to 2.31% Co, 4.47% Ni and 9.50% Cu.<br>• Significant scope for optimisation of cobalt and nickel recovery at the rougher flotation stage has been identified, including an initial desliming stage to remove fine gangue mineral particles prior to flotation. If successful in rejection of a significant portion of the silica, alumina and magnesium gangue, this step may enable generation of a cleaner concentrate with 15 – 20% combined base metal grades. In addition, the final cleaner flotation concentrates contain significant proportions of pyrite, which if rejected could elevate combined base metal grades in concentrate to in excess of 20%. Test work will continue on available non- magnetic fraction from the LIMS to optimise the processing and maximise base metal recoveries and combined grades in concentrate. |
| ***Environmental factors or assumptions*** | • Definitive feasibility study level work has been finalised by the company regarding waste disposal options. The work has identified suitable areas for waste landforms and contains appropriate volumes for waste disposal in tailings storage and waste rock dumps. Waste disposal will not present a significant barrier to exploitation of the deposit, and that any disposal and potential environmental impacts will be correctly managed as required under the regulatory permitting conditions.<br>• |
| ***Bulk density*** | • Density measurements by caliper method have been completed for 177 samples, and by weight in air, weight in water method for 267 samples across a range of material types from the drill core in the Northern Tenement Block. A total of 92 samples have been measured using both methods and show a very good correlation between the two measurement methods with a mean density of 3.12 $t/m^3$ for caliper method versus 3.15 $t/m^3$ for the weight in air weight in water method.<br>• The density measurement result data has been separated by weathering state into oxide, transition and fresh, and further by mineralisation type into waste, disseminated mineralisation and massive mineralisation. The means of the measured densities from these various domains have been applied to the appropriate domains in the block model as follows:<br>o Massive magnetite mineralisation mean density in $t/m^3$:<br>o Oxide: 3.83; Transition: 4.0; Fresh: 4.36<br>o Disseminated magnetite mineralisation mean density in $t/m^3$:<br>o Hangingwall Layer 1 - Oxide: 2.85; Transition: 3.1; Fresh: 3.99<br>o Hangingwall Layers 2 to 5 Oxide: 2.15; Transition: 3.1; Fresh: 3.27<br>o Footwall Layer 1 Oxide: 2.34; Transition: 3.1; Fresh: 4.14. |
| ***Classification*** | • Classification of the Mineral Resource was carried out taking into account the level of geological understanding of the deposit, quantity, quality and reliability of sampling data assumptions of continuity and drill hole spacing.<br>• The Mineral Resource estimate has been classified in accordance with the JORC Code, 2012 Edition using a qualitative approach. All factors that have been considered have been adequately communicated in Section 1 and Section 3 of this Table. |

| Criteria | Commentary |
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| | • The Mineral Resource is classified as a Measured Mineral Resource for those volumes where in the Competent Person's opinion there is detailed and reliable, geological and sampling evidence, which are sufficient to confirm geological and mineralisation continuity.<br>• Measured Mineral Resources are reported for portions of the transitional and fresh materials in the massive magnetite unit where in addition to surface mapping, and geophysical TMI modelling, the resource definition drill data results from diamond drill core (HQ) and reverse circulation drilling are supplemented by the geological logging and chemical analysis results (using 1 m sample intervals) obtained from close spaced large diameter diamond drill core (PQ) that was drilled primarily for bulk sample collection purposes. The confidence in grade and geological continuity is highest in these zones and variation from the interpreted geological and the estimated grade continuity is expected to be minimal.<br>• The Mineral Resource is classified as an Indicated Mineral Resource for those volumes where in the Competent Person's opinion there is adequately detailed and reliable, geological and sampling evidence, which are sufficient to assume geological and mineralisation continuity.<br>• Indicated Mineral Resources are reported for portions of the transitional and fresh materials in the massive magnetite and the immediate hangingwall disseminated magnetite unit. The confidence in grade and geological continuity is considered to be good for these zones, based on the kriging slope of regression results, the nominal drill section spacing of 100 m spacing, geophysical (TMI) modelling continuity and surface mapping.<br>• The Mineral Resource is classified as an Inferred Mineral Resource where the model volumes are, in the Competent Person's opinion, considered to have more limited geological and sampling evidence, which are sufficient to imply but not verify geological and mineralisation continuity.<br>• Inferred Mineral Resources are reported for all massive magnetite oxide material, the volumes of the massive magnetite and it's immediate hangingwall disseminated unit not classified as Indicated. This is generally for the extrapolated zones of these units down dip and along strike, or in the central area drilled on 200 m fence line spacing, where there appears to be greater structural complexity, and in the extreme north where possible structural influences on the geological and grade continuity are not well understood at this stage. For all remaining hanging wall disseminated mineralisation lenses and the foot wall unit there is a generally lower confidence in the geological and grade continuity due to along strike and down dip variability seen from the drill analysis result data and hence these zones are also classified as Inferred pending further information being collected.<br>• Inferred Mineral Resources are reported for base metals only from within the higher confidence Measured and Indicated portion of the unweathered massive magnetite material.<br>• Multi-element analysis of the drill samples at Gabanintha has highlighted the presence of elevated base metal sulphides associated with portions of the unweathered vanadium bearing magnetite mineralisation, specifically Co, Ni and Cu sulphides. Analysis showed that the majority of the base metal sulphides contained within the V-Ti-Fe magnetite mineralisation report to the non-magnetic (tailings) fraction resulting from the Low Intensity Magnetic Separation (LIMS) process designed to beneficiate the vanadium mineralisation into a magnetic concentrate. The |

| Criteria | Commentary |
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| | base metal recovery testwork focused on this tailings fraction. The unweathered massive magnetite material has higher in situ base metal grades than other materials in the deposit and processing of the tailings stream from this material incurs no additional mining and grinding costs.<br>• The base metals MRE is classified as Inferred reflecting a lower confidence due to the relatively early stage of metallurgical testing for the potential beneficiation of these metals into a by-product revenue stream.<br>• The Mineral Resource estimate appropriately reflects the view of the Competent Person. |
| ***Audits or reviews*** | • Internal audits and peer review were completed by CSA Global which verified and considered the technical inputs, methodology, parameters and results of the estimate. No external audits have been undertaken. |
| ***Discussion of relative accuracy/ confidence*** | • The relative accuracy of the Mineral Resource estimate is reflected in the reporting of the Mineral Resource as per the guidelines of the 2012 JORC Code.<br>• The Mineral Resource statement relates to global estimates of in situ tonnes and grade.<br>• No mining has taken place at this deposit to allow reconciliation with production data. |

## Section 4 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2 and section3, also apply to this section.)

| Criteria | JORC Code explanation | Commentary |
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| **Mineral Resource estimate for conversion to Ore Reserves** | • *Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.*<br>• *Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.* | • The Mineral Resource estimate was completed by Grant Louw of CSA Global. The MRE report is titled R327.2019 - Technology Metals Gabanintha North MRE Report. July 2019.<br>• The Mineral Resource estimate is reported inclusive of the Ore Reserve estimate. |
| **Site visits** | • *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*<br>• *If no site visits have been undertaken indicate why this is the case.* | • A two-day site visit has been completed by a CSA Global staff member in August 2017 while drilling was in progress. The site visit confirmed that industry best practice procedures are in place and being followed, with drilling, sampling and logging practice being observed. Drill collar locations have been captured by handheld GPS confirming their stated survey locations. Mineralisation outcrop extents were followed, with measurements taken confirming the interpreted strike and dip.<br>• A two-day site visit was completed by a CSA Global staff member in October 2018 while drilling was in progress. The site visit confirmed that industry best practice procedures are in place and being followed, with drilling, sampling, density measurement and logging practice being observed. Drill collar locations have been captured by handheld GPS confirming their stated |

| Criteria | JORC Code explanation | Commentary |
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| | | survey locations. The site visit included inspection of the proposed pit areas, waste rock dumps, processing, and non-processing infrastructure.<br>• Based on these site-visits, a further site visit to the as-yet undeveloped site was considered unnecessary for the purposes of the Ore Reserve estimate. |
| **Study status** | • *The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.*<br>• *The Code requires that a study to at least Prefeasibility Study level has been undertaken to convert Mineral Resources to Ore Reserves. Such studies will have been carried out and will have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.* | • A Definitive Feasibility Study (DFS) has been prepared and will be released at a similar time to this Ore Reserve estimate by Technology Metals.<br>• The DFS was completed in July 2019 under the direction of Technology Metals. Wave International was appointed by Technology Metals to prepare a DFS for the Northern Block of tenements of the 100% owned Gabanintha Vanadium Project (the Project). The DFS targets a production rate of 13 kt per year of $V_2O_5$ product over a 16-year life of mine (LOM). The DFS has been developed to a confidence level of -10% to +15%. This DFS forms the basis for this Ore Reserve estimate.<br>• The work undertaken to date has addressed all material Modifying Factors required for the conversion of a Mineral Resources estimate into an Ore Reserve estimate and has shown that the mine plan is technically feasible and economically viable. |
| **Cut-off parameters** | • *The basis of the cut-off grade(s) or quality parameters applied.* | • The cut-off between ore and waste has been determined by net value per block. A total block revenue is estimated for each block within the block model, accounting for total vanadium recovered to a payable product as well as the vanadium product price. Total block costs are estimated for all operating costs to the point of sale included processing, product haulage, crusher feed, general and administration, ore differential, sustaining capital, selling costs, and grade control costs. The total block revenue minus the total block costs estimate the net value per block. Any block returning a positive net value has been defined as “ore” for the purposes of pit design and production scheduling. |
| **Mining factors or assumptions** | • *The method and assumptions used as reported in the Pre-*<br>• *Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).* | Input parameters for pit optimisations and subsequent financial modelling were; mining costs based on mining contract rates; mineral processing costs and recoveries both from the DFS.<br>All other project modifying factors and costs are described in the DFS.<br>The revenue assumptions are based on forward-looking Vanadium Pentoxide prices from Roskill Consulting Group Pty Ltd. |

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<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
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<li><em>The choice, nature and appropriateness of the selected mining method(s) and other mining parameters including associated design issues such as pre-strip, access, etc. The assumptions made regarding geotechnical parameters (eg pit slopes, stope sizes, etc), grade control and pre-production drilling.</em></li>
<li><em>The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).</em></li>
<li><em>The mining dilution factors used.</em></li>
<li><em>The mining recovery factors used.</em></li>
<li><em>Any minimum mining widths used.</em></li>
<li><em>The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.</em></li>
<li><em>The infrastructure requirements of the selected mining methods.</em></li>
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<p>The LOM revenue per pound of $V_2O_5$ is modelled in the table below:</p>
<table>
<tr><th>Year</th><th>2022</th><th>2023</th><th>2024</th><th>2025</th><th>2026</th><th>2027</th><th>2028</th><th>+2028</th></tr>
<tr><td>Real$^{2019}$ US$/lb $V_2O_5$</td><td>$17.71</td><td>$16.54</td><td>$10.99</td><td>$10.86</td><td>$10.54</td><td>$10.57</td><td>$10.59</td><td>$10.59</td></tr>
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<p>The exchange rate has been modelled at a flat rate of AU$1.00 = US$0.70.</p>
<p>Geotechnical analysis has been undertaken by MineGeotech. The Mine designs in the DFS have been based on the advice from the geotechnical analysis.</p>
<p>The proposed pit slopes are considered likely to be stable for the current pit designs over the mine life.</p>
<p>The Mineral Resource model was estimated by CSA Global. The Resource Block Model was used for optimization and mine planning after inclusion of additional attributes.</p>
<p>Mining dilution has been applied using the skins methodology. A dilution skin of 1 metre was applied to the Mineral Resource wireframes. and mining dilution applied as a 1 metre dilution skin. The resulting North Pit dilution for massive magnetite ore is 13% at 0.45% $V_2O_5$, and North Pit dilution for banded and disseminated ore is 29% at 0.0% $V_2O_5$. The resulting Central Pit dilution for massive magnetite ore is 10% at 0.46% $V_2O_5$, and Central Pit dilution for banded and disseminated ore is 20% at 0.0% $V_2O_5$. A 98% mining recovery has been applied to all massive magnetite ore and a 95% mining recovery was applied to all banded and disseminated ore.</p>
<p>A minimum mining width of 25 m has been adopted for the mine design.</p>
<p>Inferred Mineral Resources have been included in the mine designs for the DFS. The total LOM content of Inferred Mineral Resources in the mining plan is 17%. This material occurs throughout the life of the operation due to the geometry of the deposit, the Resource classification criteria and the mining schedule. The first 11.9 years of the life of mine includes 2% Inferred Mineral Resources as run of mine (ROM) processing feed. The majority of the Inferred Mineral Resource included in the ROM feed over the life of mine is within the banded and disseminated material which is processed in the final four years of the mine life.</p>
<p>The Ore Reserves in this statement have been reported exclusive of the Inferred component of the LOM Plan. This component is considered immaterial to the economic viability of the project.</p>
<p>LOM scenarios have been completed without value from the Inferred portion and the project remains economically viable.</p>
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| Criteria | JORC Code explanation | Commentary |
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| **Metallurgical factors or assumptions** | - *The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.*<br>- *Whether the metallurgical process is well-tested technology or novel in nature.*<br>- *The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.*<br>- *Any assumptions or allowances made for deleterious elements.*<br>- *The existence of any bulk sample or pilot scale test work and the degree to which such samples are considered representative of the orebody as a whole.*<br>- *For minerals that are defined by a specification, has the ore reserve estimation been based on the appropriate mineralogy to meet the specifications?* | METALLURGICAL TESTWORK<br>The metallurgical testwork for each of the plant areas of comminution, beneficiation, roasting and leaching, and precipitation are summarised below:<br>• COMMINUTION<br>o Crushing Work index (CWi)<br>o Uniaxial Compressive Strength (UCS)<br>o JK Drop-Weight<br>o Sag Mill Comminution (SMC) test<br>o Abrasion index (Ai)<br>o Run of Mine (ROM) Materials Handling<br>o Bond Ball Mill Work Index (BWi)<br>• BENEFICIATION<br>o Dry Magnetic Separation (DMS)<br>o Davis Tube Recovery (DTR)<br>o Grind Liberation<br>o Preparation of kiln vendor scouting sample<br>o Preparation of the pilot kiln vendor sample<br>o Variability testwork<br>o Derrick screening testwork<br>o Wet Low Intensity Magnetic Separation (LIMS) capacity verification<br>o Magnetic concentrate filtration<br>o Non-magnetic thickening<br>o Magnetic concentrate materials handling<br>• ROAST AND LEACH<br>o ALS Muffle furnace<br>o Metso batch kiln<br>o FLSmidth batch and pilot kiln<br>• PRECIPITATION CIRCUIT<br>o Desilication optimisation |

| Criteria | JORC Code explanation | Commentary |
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| | | ○ AMV precipitation optimisation.<br>DESIGN BASIS<br>The plant basis of design was developed using the metallurgical testwork results and standard industry assumptions for retention times and stockpile capacities made by competent engineers to align with the plant operating philosophy. Process engineers involved with this area of design have experience in vanadium processing operations.<br>The plant basis of design is to produce approximately 13 kt/a of $V_2O_5$flake from magnetite ore bearing vanadium. The process can be broken down into six stages, summarised as follows:<br>1. Crushing & Screening – ROM ore is crushed down to an 80% passing size of 8mm. Allowance for Coarse Dry Magnetic Separation to remove coarsely liberated gangue from the vanadium-bearing magnetite may be required in future<br>2. Grinding & Wet Magnetic Separation – the -8mm concentrate is ground down to an 80% passing size of 0.25mm, followed by wet magnetic separation to remove finely liberated gangue from the vanadium-bearing magnetite<br>3. Roasting – the vanadium-bearing magnetite concentrate is mixed with a sodium-based salt and roasted to convert the vanadium pentoxide in the ore to water soluble sodium metavanadate<br>4. Leaching & Precipitation – the sodium metavanadate is leached out of the roasted product with water followed by re-precipitation of the vanadium in the form of ammonium metavanadate<br>5. De-ammoniation & Calcination – the ammonia is removed from the precipitated product to form a vanadium pentoxide powder. This powder is further melted and cooled down to produce the final vanadium pentoxide flake product<br>6. Packaging – the final processing stage to package the saleable product to meet the requirements for offtake<br>The process will be supplemented within the first 5 years of operation with the installation of a crystallization plant, ion exchange and de-chrome circuits.<br>PROCESSING RECOVERIES APPLIED<br>Processing recoveries are based on Davis Tube Recovery (DTR) results estimated within the block model to represent the Low Intensity Magnetic Separation (LIMS) process. The following recoveries were applied for the rest of the processing circuit:<br>• 85% RECOVERY FOR ROASTING |

| Criteria | JORC Code explanation | Commentary |
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| | | - 99% RECOVERY FOR LEACH/DESILICATION<br>- 95.7% RECOVERY OF AMV TO DE-AMMONIATION PRIOR TO THE ION EXCHANGE INSTALLATION IN YEAR 3-5, 99% RECOVERY FOR AMV TO DE-AMMONIATION POST ION EXCHANGE INSTALLATION<br>- 99% RECOVERY FOR FLAKE PREPARATION. |
| **Environmental** | - *The status of studies of potential environmental impacts of the mining and processing operation. Details of waste rock characterisation and the consideration of potential sites, status of design options considered and, where applicable, the status of approvals for process residue storage and waste dumps should be reported.* | SOCIAL ENVIRONMENT<br>- Mining Leases were first taken out in the Gabanintha area in 1895 and the town of Gabanintha was gazetted in 1898. Today the region is dominated by pastoral activities and mineral extraction.<br>- The Project is located on Polelle and Yarrabubba Pastoral Stations, with the homestead of Polelle being 7km east of M51/883 and Yarrabubba homestead 14km south-east of M51/884. A portion of M51/883 is on Common Reserve 10597 with other reserves associated with the historical townships of Gabanintha and Polelle.<br>- The Gabanintha Vanadium Project is located within the Yugunga-Nya Native Title Claim area (WC1999/046). The claim was lodged in 1999 and is yet to be determined by the Native Title Tribunal. TMT had a Heritage Agreement with Yamatji Marlpa Aboriginal Corporation (YMAC) as an agent for the Yugunga-Nya Claimant Group, which covers the process for commissioning heritage surveys, survey methodologies and how heritage information will be protected. Unfortunately, due to changes in legal representation the current agreement is no longer valid and will need to be replaced. A draft Project Cultural Heritage Management Plan has been developed and will be finalised with input from Yugunga-Nya in 2019.<br>AIR QUALITY AND NOISE<br>- Whilst the Project has the potential to generate the following emissions it is unlikely, given the remote location, that these emissions will impact any sensitive receptors. Emission types include<br>o Ammonia ($NH_3$)<br>o Oxides of nitrogen (NOx)<br>o Particulates (as $PM_{10}$ and $PM_{2.5}$)<br>o Vanadium pentoxide ($V_2O_5$)<br>o Sulphur dioxide ($SO_2$). |

| Criteria | JORC Code explanation | Commentary |
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| | | - Similarly, noise is unlikely to affect any sensitive receptors, with the closest receptors being the homesteads associated with the Polelle (7km) and Yarrabubba (14km) Pastoral Stations. |
| **Infrastructure** | - *The existence of appropriate infrastructure: availability of land for plant development, power, water, transportation*<br>- *(particularly for bulk commodities), labour, accommodation; or the ease with which the infrastructure can be provided, or accessed.* | - The Gabanintha Vanadium Project is located 40km south east of Meekatharra in the mid-west region of Western Australia. A suitable airfield for Fly-in-fly-out (FIFO) labour out of Perth Western Australia is located at Meekatharra. Intermittent mobile network coverage is available on site, this will be complimented with a communication provider mobile booster station.<br>- Project support infrastructure includes:<br>o Water supply, treatment and reticulation<br>o Site preperation, bulk earthworks and drainage<br>o Fuel supply, storage and distribution facilities for Diesel Fuel and Natural Gas<br>o Power generation and distribution<br>o Civil and earthworks including Bulk Earthworks, Hydrology/Drainage and Roads<br>o Plant buildings and strctures including reagent and explosives storage<br>o Accommodation facilities and structures for operational personnel<br>- The water supply, storage and distribution will generally consist of the borefield, remote borefield storage tank and pumps, raw water storage at the village, raw water and process water storage at the processing facility, as well as raw water storage at the mining services area.<br>- A site raw water pond shall serve as reserve capacity for the site.<br>- Reverse osmosis plants shall be located next to each raw water storage tank at the village and processing plant to enable the required production of potable water to be provided.<br>- Fuel for the Project will be a combination of natural gas supplied by a natural gas pipeline and trucked diesel fuel.<br>- The main electrical power for the Project will be provided from a standalone power station, generating power requirements for the main process plant and non-process infrastructure. |
| **Costs** | - *The derivation of, or assumptions made, regarding projected capital costs in the study.* | - The capital cost estimate (CCE) for the Gabanintha project DFS is an estimate with an accuracy range of approximately -5% to +15% based on the accuracy levels as defined by the American Association of Cost Engineers' |

| Criteria | JORC Code explanation | Commentary |
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| | - *The methodology used to estimate operating costs.*<br>- *Allowances made for the content of deleterious elements.*<br>- *The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.*<br>- *The source of exchange rates used in the study.*<br>- *Derivation of transportation charges.*<br>- *The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.*<br>- *The allowances made for royalties payable, both Government and private.* | (AACE) Cost Estimation Classification System (As Applied for the Mining and Mineral Processing Industries).<br>- The capital cost estimate is a bottom up estimate, as far as practically possible, generated from preliminary design and market information. A small percentage (4.7%) were priced on industry norms and typical estimating factors.<br>- The DFS operating cost estimate (OPEX) was developed as a "bottom-up" estimate over a 16-year mine life to obtain average operating costs. All significant and measurable items are itemised. However, smaller items are factored as per industry practice. The level of effort for each of the line items meets the estimate as defined by the American Association of Cost Engineers and the extent of work performed allows for a -15% +15% accuracy.<br>- The OPEX was generated utilising the information from the mass balance, direct process engineering input for heat loading and reagent usage, mining operating costs and the equipment maintenance aligned with the CAPEX equipment. The organisational chart was developed with TMT and the wages were sought from the Wave data base in conjunction with recognised industry sources. The manning, inclusive of mining contractor personnel, was used to derive flights and accommodation costs.<br>- An electrical power load list was calculated using equipment size and expected run hours for each piece of equipment to establish power generation requirements for the project. A formal market request to provide power generation for the required load was distributed to tender for a Build-Own-Operate power which has been used to calculate power costs and fuel gas consumption.<br>- Reagent usage was calculated from pilot/bench scale test work and METSIM modelling software. Reagent (including transport) costs were obtained from supplier's budget quotations.<br>- Transport costs were calculated by a specialist logistics consultant who was engaged to price the cost of product transport and back haulage.<br>- Mining costs have been developed based on a mining contractor operation with Q2 2019 rates tendered by contractors to implement the mining schedule.<br>- Royalties have been applied at a rate of 5% on Revenue.<br>- An exchange rate of AU$1.00=US$0.70 has been applied throughout the financial evaluation of the Project<br>- The selling costs applied in the financial model include transport from Gabanintha to Fremantle Port based on a Free Onboard (FOB) price. |

| Criteria | JORC Code explanation | Commentary |
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| **Revenue factors** | • *The derivation of, or assumptions made regarding revenue factors including head grade, metal or commodity price(s) exchange rates, transportation and treatment charges, penalties, net smelter returns, etc.*<br>• *The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.* | • The grade of the process feed and metal content is supported by the information in the Mineral Resource estimate and driven by the mining and production schedule.<br>• Processing recoveries are based on Davis Tube Recovery (DTR) results estimated within the block model to represent the Low Intensity Magnetic Separation (LIMS) process, 85% recovery for Roasting, 99% recovery for Leach/Desilication, 95.7% recovery of AMV to De-Ammoniation prior to the Ion Exchange installation in year 2, 99% recovery for AMV to De-Ammoniation post Ion Exchange Installation, and 99% recovery for Flake Preparation. The cumulative processing recovery is approximately 81% pre Ion Exchange Installation and approximately 84% post Ion Exchange Installation.<br>• Technology Metals has based the revenue projections in the financial model on forecast prices from Roskill Consulting Group Pty Ltd a UK based market research company specialising in providing comprehensive research on the supply, demand and price trends for metals and minerals markets.<br>• These price forecasts is based on a 2019/2020 roll out of the new Chinese rebar standards and limited supply side response until new primary producer "greenfields" development enter the market. This scenario sees elevated vanadium pentoxide prices in the period up to 2024 and then prices ranging between US10.99/lb and US$10.54 out to 2028. TMT believe that this scenario is required as a minimum to provide the "incentive pricing" to support development of "greenfields" vanadium primary producers and the level of vanadium supply required to meet the expected demand growth.<br>• The pricing for $V_2O_5$ used in the DFS financial model is for delivery of the product to a Fremantle Port based on an FOB price. |
| **Market assessment** | • *The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.*<br>• *A customer and competitor analysis along with the identification of likely market windows for the product.*<br>• *Price and volume forecasts and the basis for these forecasts.*<br>• *For industrial minerals the customer specification, testing and* | • The Company's strategy with regard to product marketing is to secure medium to long term off-take agreements over the majority of its forecast vanadium production, aiming to establish a diversified customer base across both geographic location and vanadium industry. TMT has conducted a series of discussions with vanadium market participants and end-users in both the steel industry, the VRB / electrolyte sector, specialty alloy / chemical industry and metal traders with a view to forming long term strategic alliances and negotiating formal vanadium off-take arrangements. As part of this process samples of high purity final vanadium pentoxide product have been sent to a number of these parties, confirming the exceptional purity of the Gabanintha vanadium product and its suitability for the range of end-users.<br>• The Company has prepared and circulated a number of draft MOU's and Term Sheets to facilitate ongoing discussions with a range of parties. In May |

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| | *acceptance requirements prior to a supply contract.* | 2019 TMT entered into a Memorandum of Understanding (MOU) with CNMC Ningxia Orient Group Company Ltd, a controlled subsidiary of China Nonferrous Metal Mining (Group) Co. Ltd. The MOU establishes a framework for a binding vanadium pentoxide offtake agreement, with agreed key terms including an initial minimum annual quantity of 2,000 Tpa $V_2O_5$, pricing to be negotiated based on the Metal Bulletin $V_2O_5$ Pricing Index (or similar) incorporating a floor and ceiling pricing structure with a minimum three year term and an option for an additional three years.<br>• Discussions with potential customers have indicated a high level of interest in securing supply of vanadium pentoxide from a primary mining source such as Gabanintha, with security of supply from a stable jurisdiction such as Western Australia a key consideration.<br>• The Company's strategy with regard to product marketing is to secure medium to long term off-take agreements over the majority of its forecast vanadium production from Gabanintha.<br>• Pricing strategy will be determined in conjunction with negotiation of offtake agreements but is expected to use moving average prices over a set contract period based on reference prices.<br>• Commentary suggests that China intends to sell more high-end technologically advanced final products and less of the underlying components. The expectation is that most of the raw materials will remain in China for Chinese manufacturers to utilise, particularly vanadium where China produces 57% of global supply of vanadium products across the supply-chain. It is this dynamic that makes it crucial for non-Chinese manufacturers to secure vanadium sources outside of China. With the Gabanintha production plant in Australia, the company is poised to benefit from this new arrangement of the global supply chain. |
| **Economic** | • *The inputs to the economic analysis to produce the net present value (NPV) in the study, the source and confidence of these economic inputs including estimated inflation, discount rate, etc.*<br>• *NPV ranges and sensitivity to variations in the significant assumptions and inputs.* | • The economic analysis is based on capital cost estimates described in the DFS and cash flows driven by the production schedule.<br>• The cash flow projections include: initial and sustaining capital estimates; mining, processing and concentrate logistics costs to the customer; revenue estimates based on concentrate pricing adjusted for fees, charges and royalties; and a 8% discount factor.<br>• The sensitivity analysis completed in the DFS indicates that the project results remain favourable when the key project parameters (revenue, exchange rate, grade, metallurgical recovery, capital and operating costs) are individually flexed to plus and minus 20% of the DFS average values. |

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| **Social** | - *The status of agreements with key stakeholders and matters leading to social licence to operate.* | - The site is in a remote region that has hosted multiple mining projects. However, over time the larger project footprint may have a marginal impact on pastoral leases. The company has established a process of stakeholder engagement and will continue to pro-actively manage this. |
| **Other** | - *To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:*<br>- *Any identified material naturally occurring risks.*<br>- *The status of material legal agreements and marketing arrangements.*<br>- *The status of governmental agreements and approvals*<br>- *critical to the viability of the project, such as mineral tenement status, and government and statutory approvals. There must be reasonable grounds to expect that all necessary Government approvals will be received within the timeframes anticipated in the Pre-Feasibility or Feasibility study. Highlight and discuss the materiality of any unresolved matter that is dependent on a third party on which extraction of the reserve is contingent.* | - No material naturally occurring risks have been identified.<br>- Early stage discussions have been established with potential clients for the project. In May 2019 TMT entered into a Memorandum of Understanding (MOU) with CNMC Ningxia Orient Group Company Ltd, a controlled subsidiary of China Nonferrous Metal Mining (Group) Co. Ltd. The MOU establishes a framework for a binding vanadium pentoxide offtake agreement, with agreed key terms including an initial minimum annual quantity of 2,000 Tpa $V_2O_5$, pricing to be negotiated based on the Metal Bulletin $V_2O_5$ Pricing Index (or similar) incorporating a floor and ceiling pricing structure with a minimum three year term and an option for an additional three years.<br>- TMT has applied for a mining tenement, two general purpose leases and two miscellaneous licences. TMT's tenements have either been granted or are currently being progressed with the expectation that these will be granted.<br>- There are no apparent impediments to obtaining all government approvals required for the Gabanintha Vanadium Project. |
| **Classification** | - *The basis for the classification of the Ore Reserves into varying confidence categories.*<br>- *Whether the result appropriately reflects the Competent Person's view of the deposit.*<br>- *The proportion of Probable Ore Reserves that have been derived* | - Proven Ore Reserves were estimated from Measured Resources and Probable Ore Reserves were estimated from Indicated Resources as per the JORC (2012) guidelines.<br>- Four (4) % of Ore Reserves have been based on Measured Mineral Resources.<br>- Mr Karl van Olden, the Competent Person for this Ore Reserve estimation has reviewed the work undertaken to date and considers that it is sufficiently detailed and relevant to the deposit to allow those Ore Reserves derived from Indicated Mineral Resources to be classified as Probable, and Ore Reserves derived from Measured to be classified as Proven. |

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| | *from Measured Mineral Resources (if any).* | |
| **Audits or reviews** | - *The results of any audits or reviews of Ore Reserve estimates.* | - The DFS has been internally reviewed by Technology Metals and Wave. The Mineral Resource estimate, mine design, scheduling, and mining cost model has been subject to internal peer review processes by CSA Global. No material flaws have been identified and the Ore Reserve basis of estimate is considered appropriate for a DFS level of study.<br>- No independent external audits or reviews have been completed on the current Gabanintha Vanadium project DFS. |
| **Discussion of relative accuracy/ confidence** | - *Where appropriate a statement of the relative accuracy and confidence level in the Ore Reserve estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the reserve within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors which could affect the relative accuracy and confidence of the estimate.*<br>- *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.*<br>- *Accuracy and confidence discussions should extend to specific discussions of any applied* | - This Ore Reserve estimate is supported by the Gabanintha Vanadium Project DFS completed in July 2019.<br>- The Gabanintha Vanadium Project has an IRR and NPV which makes it robust in terms of cost variations. The Project is most sensitive to price variations for the $V_2O_5$ product.<br>- All estimates are based on local costs in Australia dollars. Standard industry practices have been used in the estimation process.<br>- Capital and operating expenditure estimates are considered to be within -5% /+15% accuracy.<br>- There has been no production at the project to date, so no comprehensive comparison or reconciliation of data has been made. |

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| | *Modifying Factors that may have a material impact on Ore Reserve viability, or for which there are remaining areas of uncertainty at the current study stage.*<br>• *It is recognised that this may not be possible or appropriate in all circumstances. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.* | |