

# RICH VANADIUM OXIDE

# A MAJOR PROJECT

# A KEY DIFFERENCE

at YOUANMI

> Barry Fehlberg oration Director



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## **BOARD OF DIRECTORS**

#### A track record of discoveries and corporate success



#### Alan Birchmore Non-Executive Chairman

AO, FAICD. Extensive international management experience in resource development including the Kalgoorlie Super Pit (Bond Gold) and Argyle Diamond Mines (Northern Mining). Founding Chairman of St Barbara Gold Mines at its ASX listing as well as Mermaid Marine Australia Ltd. More recently he was Chairman of United Minerals Corporation NL leading up to the BHP Billiton scheme of arrangement takeover in 2010.



#### Barry Fehlberg Exploration Director

BSc (Honours), MAusIMM. Geologist with 40+ years successful exploration experience for gold, base metals, diamonds, vanadium and iron ore. He led the team that discovered the Railway Iron Ore Deposit for United Minerals Corporation Ltd. This company was taken over by BHP Billiton in 2010 for \$ 204 million.



#### Matthew Hogan Managing Director

MAICD. Specialised corporate experience in resource company management and asset acquisitions / transactions. Instrumental in ASX listing of Iron Ore Holdings Limited. As Chief Executive officer of United Minerals Corporation NL he played a key role in the take over by BHP Billiton in 2010 for \$204m. Instrumental in listing Venus Metals in 2007 and assembling the substantial Youanmi tenement package.



#### Kumar Arunachalam Executive Director

MSc (Geology), MAusIMM. Geologist with 38+ years experience in geological and hydrogeological affairs. He managed all environmental studies, approvals, tenements and native title issues for United Minerals Corporation NL before becoming an Executive Director of Venus in 2011.

#### MANAGEMENT TEAM



#### Patrick Tan Company Secretary

Fellow Certified Practising Accountant and Registered Tax Agent with 30 + years experience in auditing, accounting and finance in various industries. Was Chief Financial Officer and Company Secretary for United Minerals Corporation NL. until the BHP-Billiton takeover. He has multi lingual skills and is fluent in Mandarin.



#### Dr Matthias Cornelius Exploration Consultant

Dr. Mont. MAIG MAAG. Geologist with 30+ years of experience in mineral exploration and mining in Australia and overseas. Worked for major and junior companies and the CSIRO in roles as Senior Geologist, Exploration Manager, Principal Research Scientist, Chief Geologist and, since 2015, as Consultant Geologist.



### **CORPORATE SUMMARY**

87,181,359

57,037,722

Issued Shares (ASX: VMC):

Listed Options (ASX: VMCOA):

Market Cap:

Top 20 Shareholders:

44.71% (as at 24/10/18)

Approx.\$17 million (as at 24/10/18)







NOTE: CURRENT SPOT PRICE IS US\$24/LB V2O5 FLAKE

#### VANADIUM FORWARD OUTLOOK

- A great commodity to be in
- China's vanadium production flat
- Vanadium Recovery from secondary sources forecast no growth
- New vanadium mines have long lead times to production
- Demand of the miracle new age metal forecast is for rapid growth
- Gov't requirement in China, India to upgrade rebar standards using vanadium
- Fast growing application in aerospace and defense
- Global adoption of vanadium redox battery forecast

Source: https://seekingalpha.com , October 2018





## TENEMENT BACKGROUND AT YOUANMI

- 1. Venus has major tenement control of Youanmi greenstone belt and surrounding areas.
- 2. RICH SOUTHERN CROSS VANADIUM OXIDE DEPOSIT is 90% owned by Venus.
- 3. The 1.2million ounce Youanmi Gold Mine resource (under option), lithium pegmatites, VMS zinc, sulphide nickel and copper, lateritic cobalt are all in Venus ground.

## FORWARD PROGRAM

4. 6000m RC program scheduled to end November 2018.

5. Drill program will deliver large measured resource and 100 tonne bulk sample for advanced metallurgical test work.

6. Scoping study to be completed by end November 2018.





# **RICH VANADIUM OXIDE**

## YOUANMI – THE PROJECT WITH A DIFFERENCE

1. The JORC 2012 inferred oxide resource is 110 million tonnes grading 0.3% V2O5 (Refer ASX release 6 February 2015)

2. Youanmi oxide ore different to all others – high vanadium, low iron, high clay

- **3.** Oxide ore starts at surface
- 4. Rich vanadium oxide ore high graded by simple crushing no grinding
- 5. V, Cu, Ni and Co can be successfully recovered by simple acid leaching
- 6. Venus has target\* potential for over 1 billion additional tonnes of rich vanadium oxide along 25km of strike (*Refer ASX release 6 February 2015*)

\*The potential quantity and grade of the Exploration Target is conceptual in nature, that there has been insufficient exploration to estimate a Mineral Resource and that it is uncertain if further exploration will result in the estimation of a Mineral Resource

Damien Connelly of METS inspects rich vanadium oxide ore with Exploration Director Barry Fehlberg



## **RICH VANADIUM OXIDE**



## SOUTHERN CROSS DEPOSIT

- Inferred Oxide Resource occurs over a zone 3.5km long and up to 400m wide.
- 2. Magnetic highs correlate with a high grade vanadium core zone.
- 3. Vanadium supergene enrichment occurs within completely weathered saprolite.
- 4. Vanadium values extend into fresh rock.







Magnetic grains surrounded by coarse feldspar "getting ready to go rotten"

## **RICH VANADIUM OXIDE**

## WHY THE DEPOSIT IS DIFFERENT

- 1. Vanadium mineralization occurs within magnetite grains.
- 2. Balance of rock is coarse grained feldspar containing no vanadium.
- 3. Feldspar weathers completely to clay in the saprolite zone at Youanmi.
- 4. Creates large tonnages of rich vanadium oxide soft rock which can be easily mined and cheaply beneficiated.



SOUTHERN CROSS DEPOSIT Cross Section A-A' Looking West



Refer ASX announcement dated 16/10/2018



## **RICH VANADIUM OXIDE**



Thick saprolite zones containing high grade rich vanadium oxide, No fresh rock can be seen above 60 meters depth

### **METALLURGICAL TEST RESULTS**

• METS Engineering Group, pre-eminent leaders in vanadium extraction engaged for all test work and scoping studies.

## **BENEFICIATION STUDIES**

- **1. Rich vanadium oxide** ore can be significantly beneficiated without the need for grinding avoids need for milling and associated costs.
- 2. At -1mm, 40% of mass rejected whilst recovering 80% of vanadium.
- 3. Grade of test sample increased from 0.58% V2O5 to 0.80% V2O5.
- 4. Mass rejection decreases downstream processing volume.

### **LEACH TESTS**

5. Proof-of-Concept tests showed that up to 69% of vanadium extracted using sulphuric acid from an unbeneficiated sample.

- 6. Tests all done at atmospheric pressure.
- 7. Cobalt, copper and nickel were co-extracted.

8. Extensive further work being done on beneficiated samples. Page 10

## S/L Separation Purification Vanadium Organic Purification

**Cyclone Deslime** 

# SCOPING STUDY ADVANCEMENT

**VENUS METALS CORPORATION LTD** 

Work has commenced by METS and is aiming for end November 2018 report



Crushing

# The work includes

- Literature review
- Infrastructure
- **Process Design Criteria** •
- **Process Flowsheets**
- Mass and Energy balance
- **Equipment list**
- **CAPFX** estimate
- **OPEX** estimate
- **Report Summarising and** Review

6000m RC drill out is expected to provide the measured resource estimate to support these studies

Mining



