



**Manuka Resources Limited**  
**Investor Presentation**

**December 2022**

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## Australia – Cobar Basin

- Silver and gold at Wonawinta and Mt Boppy
- Exceptional exploration potential within the Cobar Basin
- Valuable production infrastructure, strategically located
- Poised for silver open-pit mining restart, following recent disruption of Covid and La Nina-induced wet weather
- Exposure to strengthening gold and silver prices. Targeting >2.3Mozpa Ag for annualised revenues of >A\$75m, based on current silver price of US\$22.4/oz



## NEW ZEALAND – Taranaki Green VTM Project

- World class tier 1 project
- Offshore vanadium titano-magnetite project, west coast, North Island
- Lowest quartile CO2 emissions for bulk project

# Highlights

The Wonawinta Project is in a world-class mineral district, the Cobar Basin, an area tightly held with established producers

- ✓ Includes a processing plant with an historical nameplate capacity of 850ktpa (with capacity increasing to 1.1Mtpa)<sup>1</sup>, mine camp, and all necessary supporting infrastructure. The processing plant has an estimated replacement value of ~\$100m
- ✓ Scale and quality of infrastructure de-risks growth compared to peers, particularly in the current high inflationary environment and with extended regularly approval timeframes for greenfields mining infrastructure
- ✓ Potential for the Wonawinta plant to form part of Cobar regional consolidation (Metals Acquisition Corp recently announced terms for its US\$1.1bn acquisition of the CSA mine in Cobar)
- ✓ The mining lease contains an estimated resource of 51moz of silver and 207kt of lead, predominately oxides
- ✓ The 900km<sup>2</sup> exploration licences owned by the company provide exceptional exploration opportunities in the near term

Wonawinta mining re-start and exposure to strengthening silver price

- ✓ After the disruption of Covid and La Nina-induced wet weather across 2020 – 2022, Manuka is poised to recommence open pit mining of silver
- ✓ The silver price has increased approx 20% over the last month to reach US\$22.4/oz (A\$33.5/oz)
- ✓ Targeting annual production of ~2.3Moz of silver at which annual Wonawinta revenues would exceed A\$75m at the prevailing silver price. Potential for gold credits with silver production to further increase revenue

Mt Boppy – high grade gold with above-ground infrastructure and exploration upside

- ✓ Open at depth, Mt Boppy has a resource of 282kt at 4.95g/t Au (~45koz)
- ✓ Provides significant expansion potential at depths, previously untested, to increase both resources and grade and drive efficiencies
- ✓ Manuka plans to increase resources to 100koz (3 years at 30kozpa) with 2023 exploration targeting mineralisation at between 250 – 300 metres
- ✓ The project is fully approved with mine camp, tailings storage facility and power

Taranaki Green VTM Project

- ✓ Recent NZ acquisition provides low-cost optionality for delivery of high quality iron, titanium and vanadium, important building-blocks for a decarbonising economy

1. Recent addition of 400KW regrind mill to existing primary ball mill increases Wonawinta plant capacity to 1.1Mtpa

# Corporate Overview

ASX: MKR

Share price (14 November 2022)	A\$0.16
Shares on issue	466m
Market capitalisation (undiluted)	A\$75m
Options (exp. April and July 2023 @ 25c)	22.25m
Options (exp. March 2023 @ 50c)	32m
Options (exp. December 2024 @ 35c)	12m
Total debt (as at 30 June 2022)	~A\$11.5m
Cash at bank (as at 30 September 2022)	~A\$0.5m

## Current secured financing

- Lender: TransAsia
- Maturity date of September 2023
- Interest: 12.5% (\$240k/quarter)
- No amortisation prior to maturity
- Refinancing options being assessed



*“Manuka intends to grow shareholder value by optimising quality resource assets. The emerging green energy fuelled global economy is providing such opportunities.”*

# Board of Directors & Management

(the management team has a combined shareholding in Manuka Resources exceeding 30%)



**Dennis Karp – Executive Chairman**

Dennis commenced his career in the Australian financial markets in 1983. He was the Head of Trading at HSBC Australia prior to joining Tennant Limited in 1997, one of Australia's largest physical commodities trading companies with operations in Asia and Europe. He was a principal shareholder of Tennant Metals until 2010, and a director until December 2014,

He led the syndicate which purchased the Manuka assets in 2016. He holds a Bachelor of Commerce from the University of Cape Town



**Alan Eggers – Executive Director**

Alan is a geologist with over 40 years of local and international experience. He brings with him exceptional commercial expertise and was a founding director of Summit Resources Ltd which they built from listing on the NZX in 1987 into an ASX top 200 company and an ultimate takeover by Paladin Energy for A\$1.2B in 2007. He holds a number of private directorships.

Alan holds Bachelor of Science, Honours and Masters of Science degrees from Victoria University of Wellington. He's a Fellow of the Society of Economic Geologists, a member of AusIMM and Australian Institute of Geoscientists



**Anthony McPaul – Non-Executive Director**

Tony is a senior mining executive with over 35 years' experience in mining operations and mineral processing, (both underground and opencut operations). He was most recently the general manager for Newcrest's Cadia Valley Operations, in Orange NSW, and formally retired from Newcrest in 2016.

Tony has sat on a range of Boards and industry bodies including the Minerals Council Executive Committee and Mineral Industry Advisory Council. He qualified in automotive engineering from Goulburn TAFE.



**John Seton – Non-Executive Director**

John is an Auckland based lawyer with extensive experience in commercial law and the mineral resources sector. He was a director of Summit Resources Limited until its sale in 2007, as well as being a director of a number of other ASX and NZX listed private companies. He was a former Chairman of the Vietnam/New Zealand Business Council.

John holds a Bachelor of Laws from Victoria University, Wellington, and a Masters of Law (Honours) from the University of Auckland and is a Chartered Fellow of the New Zealand Institute of Directors.



**Toni Gilholme – Company Secretary & Financial Controller**

Toni is an experienced Financial Controller and a Chartered Accountant with over 15 years experience in Financial Accounting and Company Secretarial matters as well as an additional 10 years of experience in a variety of roles in Public Practice. She has worked in a range of senior positions both in the UK and in Australia and has a strong focus on efficiency gains through improving processes and strengthening internal controls.

She holds a Bachelor of Business from the University of Technology, Sydney



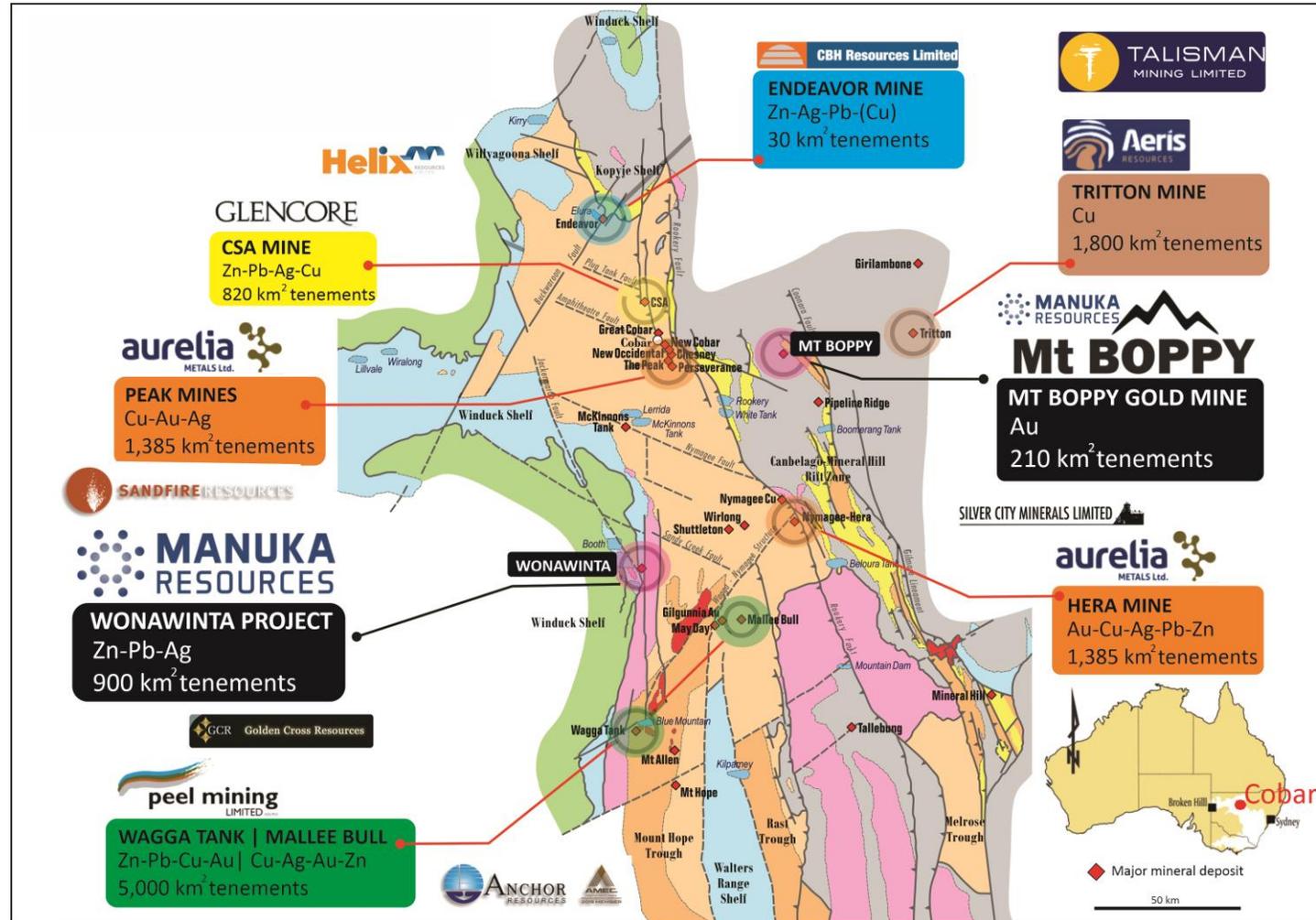
**Haydn Lynch – Chief Operating Officer**

Over 25 years of experience in M&A, financial markets and private equity, and with a substantive track record in the origination and execution of domestic and cross-border transactions in metals & mining in Australia, Africa, Japan, China, and Mongolia.

Senior management experience includes Bankers Trust Australia, Investec Bank, RBC Capital Markets and Southern Cross Equities. Haydn has degrees in Mechanical Engineering and Economics from the University of Qld and a Masters in Commerce from the University of New South Wales.

# Cobar Basin

Manuka owns strategic tenements and valuable infrastructure (historical nameplate processing of 850ktpa, representing approx 15% of regional nameplate plant capacity)



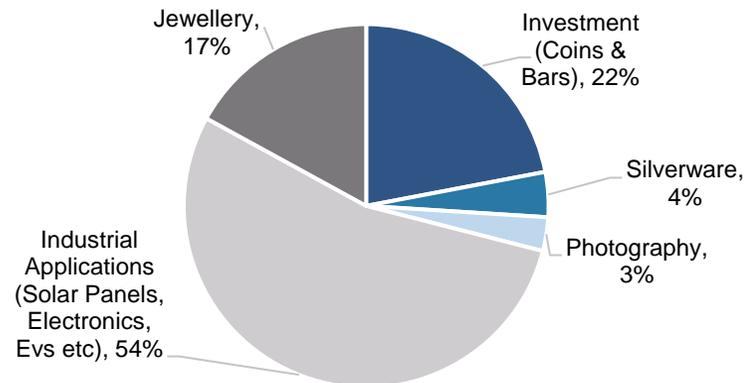
# Recent Silver Price Movement

The price of silver (US\$) has increased 20% over the last 30 days

## Performance of the Silver and MKR Share Price<sup>1</sup>



## Silver Use



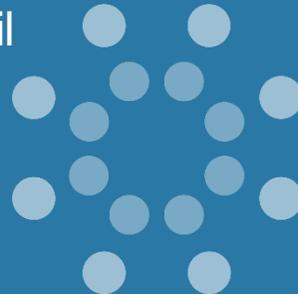
## Demand for Silver

- **Substantial demand for silver in a growing market with deficit expected to reach approximately 200Moz in 2022<sup>2</sup>**
  - Physical silver supply is approx 1,000Mozpa while demand is approx 1,200Mozpa
- **Used in most electronics, for water purification, robotics, industrial automation, aerospace, pharmaceuticals, and biosciences**
- Antibacterial, antiviral and antifungal properties
- Despite silver being an integral component to the adoption of solar power, 5G electronics and EV investment, when compared to certain other electrification commodities, the price of silver has yet to see a material re-setting in price
- **Based on annual production of 2.3Moz Ag from a restart of open-pit mining, every US\$1 increase in silver price would result in an increase in MKR profit of approx A\$3.4m (excluding expected gold credits) and approx A\$4.0m (including expected gold credits)**

1. Bloomberg as at 5 December 2022.  
2. The Silver Institute.

# Silver Production at Wonawinta

- Wonawinta produced **approx. 3.0Moz silver during 2012-2015**
- JORC mineral resource estimate following **extensive infill drilling ~51Moz silver** (also 207Kt Pb included as silver equivalent)<sup>1</sup>. Silver resources (excluding lead) equivalent to approximately **634koz Au**
- **Plant capacity now expanded beyond the historical nameplate capacity of 850kt pa to 1.1Mtpa**, following significant refurbishment in early 2020, addition of regrind mill in Sept. 2022 and inclusion of modular elution circuit installed for gold phase (currently removed from flowsheet)
- Fully approved with 84 person mine camp, office infrastructure, TSF and water supply
- Commenced silver production on 31 March 2022 on 515kt stockpiles containing 70g/t Ag\* (to continue until Feb 2023 and produce ~800koz Ag)



1. Refer ASX releases dated 1 April 2021



# Wonawinta Mining Recommencement

Following the 2020 – 2022 disruption from COVID and La Niña-induced wet weather, Manuka is poised to recommence open-pit silver mining in 2Q CY23 by re-entering existing open pits to produce at 2.3 Moz Ag pa (plus potential for additional gold credits)

## Project testwork

- ✓ Project and testwork completed
- ✓ Metallurgy and plant have been optimised
- ✓ No overburden – accessing existing open pits, proximate to the Wonawinta plant

## Plant optimisation

- ✓ Inserted second ball mill and circuit to increase plant throughput
- ✓ Plant capacity increase from historical nameplate of 850ktpa to 1.1Mtpa
- ✓ Throughput increased from 70k pm to 95-100k pm in full production



## Favourable silver price backdrop

- ✓ Material increase in silver price over the last 30 days
- ✓ Positive outlook for silver over medium to long term with clean energy demand drivers and expected deficit

## Minimal capital requirement

- ✓ Capital requirement expected to be approx A\$2m to restart expanded Wonawinta plant production

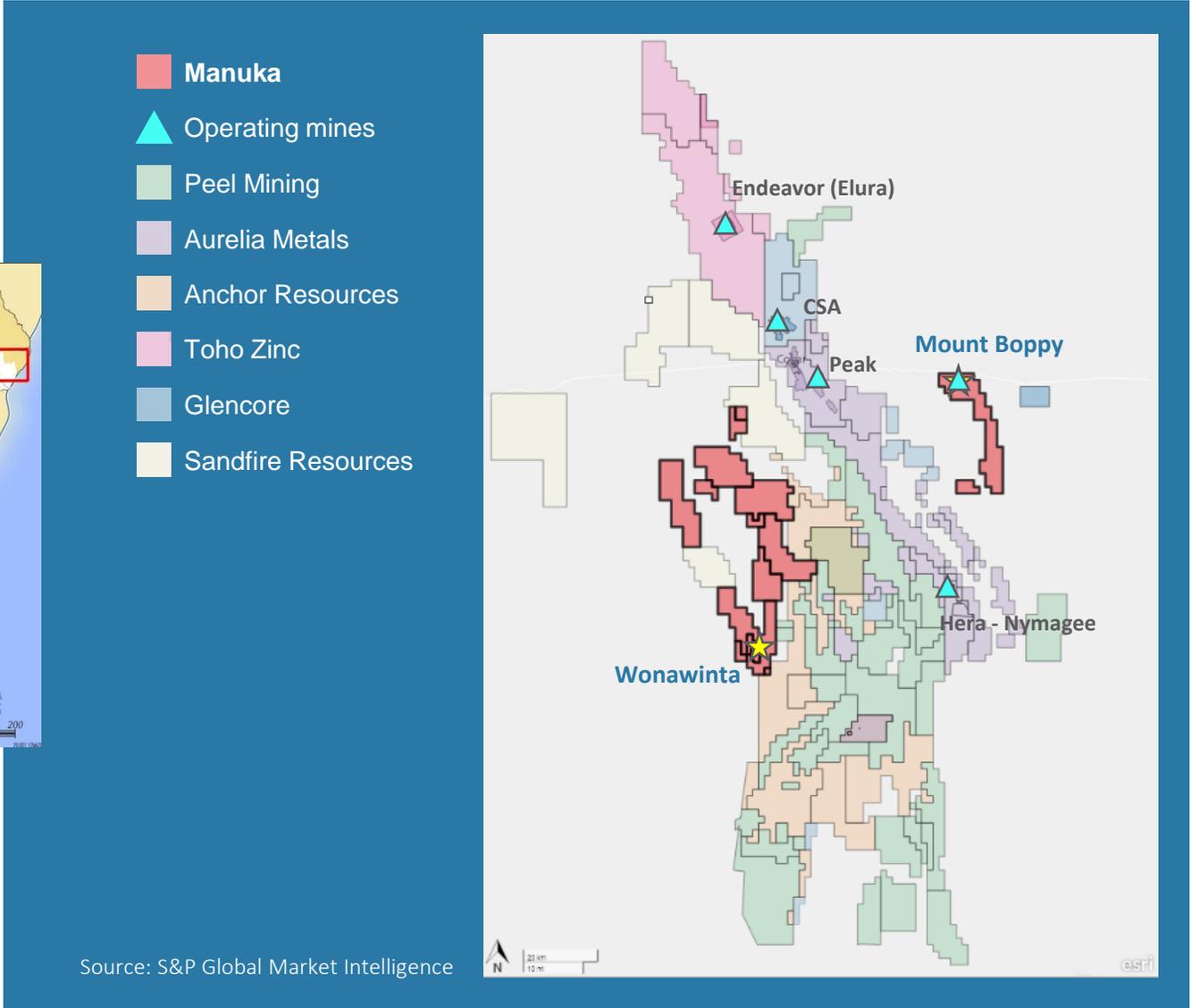
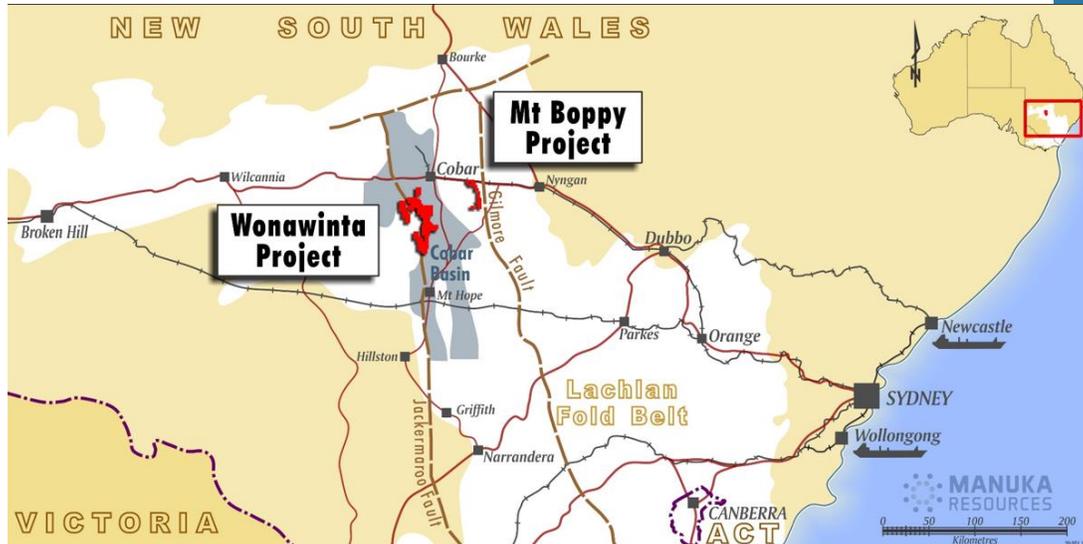
## Wonawinta silver revenue sensitivities assuming 2.3Mozpa Ag (A\$m)

		AUD / USD		
		0.625	0.675	0.725
Silver price (US\$/oz)	20	73.6	68.1	63.4
	21	77.3	71.5	66.6
	22	81.0	75.0	69.8
	23	84.6	78.4	73.0
	24	88.3	81.8	76.1
	25	92.0	85.2	79.3

# Major Producers and Substantial Discoveries Within Cobar Basin

Manuka has a substantial tenement holding

- Comprehensive exploration target review is currently underway, with expected completion in December 2022



Source: S&P Global Market Intelligence

# Wonawinta Tenements – Exploration Targets 2023

2023 exploration activities - primarily focussed on the following:

**1. McKinnons and McKinnons North**

Targeting: gold mineralisation – 3 geophysical targets to be drilled  
 Objective: grow previous opencut mine (produced 150koz @2.6g/t Au)  
 Activity: combine RC and DD drill programs, targeting mineralisation between 50m – 200m deep

**2. Gundaroo and De Nardi targets**

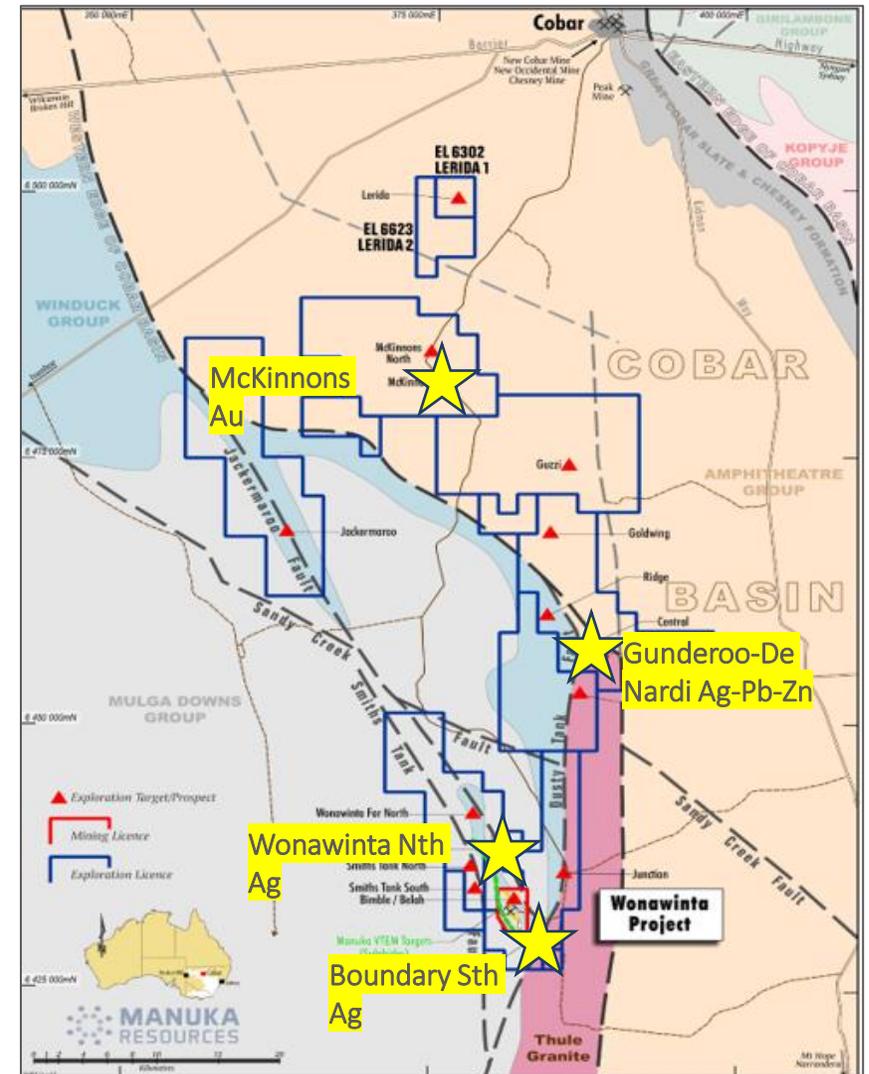
Targeting: looking to establish mineral resource on known mineralisation (silver, lead, zinc)  
 Activity: combine RC and DD in-fill drilling and ore body targeting programs between 100m – 300m

**3. Wonawinta North**

Targeting: extension of Wonawinta silver, estimated resource on existing drilling (already completed)  
 Activity: predominantly RC drilling, some DD, 50m – 150m deep)

**4. Boundary South**

Targeting: define indicated resource (from inferred category)  
 Objective: grow silver oxides and sulphides  
 Activity: predominantly RC drilling, some DD to 100m deep



# A Very Deep Basin

The Wonawinta project at only 60m deep is far shallower than the depths of major producing mines in the Cobar Basin

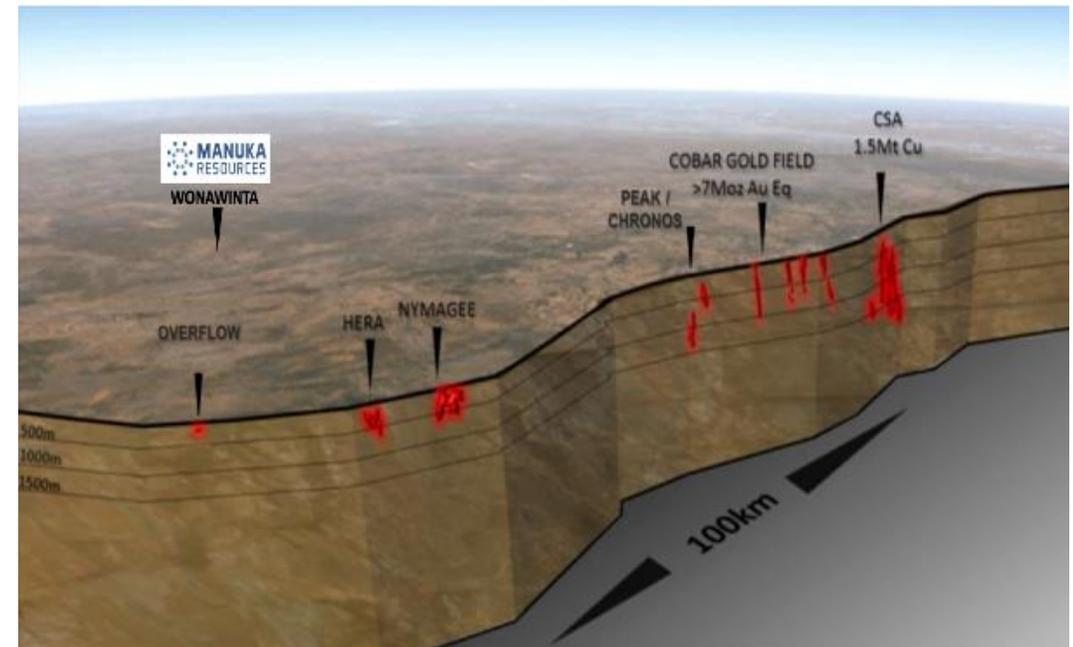
## The major producers in the Cobar Basin all operate at substantial depth:

- CSA copper gold mine (Glencore owned) >2.0km deep
- Peak gold / base metals mine (Aurelia Metals owned) >1.0km deep
- Endeavor lead, zinc, silver mine (now on C&M) >1km deep

## Wonawinta silver oxide project is just 60m deep

### Wonawinta Deeps ‘proof-of-concept’ diamond drill program, initially drilled in Feb 2021 successfully highlights lead-zinc-silver mineralisation over 3km strike<sup>1</sup>

- 18 hole 5,000m drilling program (2,400mt diamond drill) drilled beneath existing open pits over 3km in length, supports existence of lead-zinc-silver sulphide mineralisation with Mississippi Valley Type (MVT) affinities
- The 3km strike (beneath the pits) is part of a total 15km strike length along the Winduck Shelf strata held by Manuka on western flank of Cobar Basin
- Geophysics survey commenced in May 2022 along entire Wonawinta Trend. Initial indications very promising. To be followed by further drilling in Sept quarter
- Mineralisation intervals to date include:
  - 4m @3.20% Pb, 3.20% Zn, and 63g/t Ag\*
  - 5m @1.7% Pb, 0.82% Zn, and 128 g/t Ag\*



1. Refer ASX release dated 1 June 2021

# Mt Boppy

**Mt Boppy historically produced 500koz @ 15g/t**

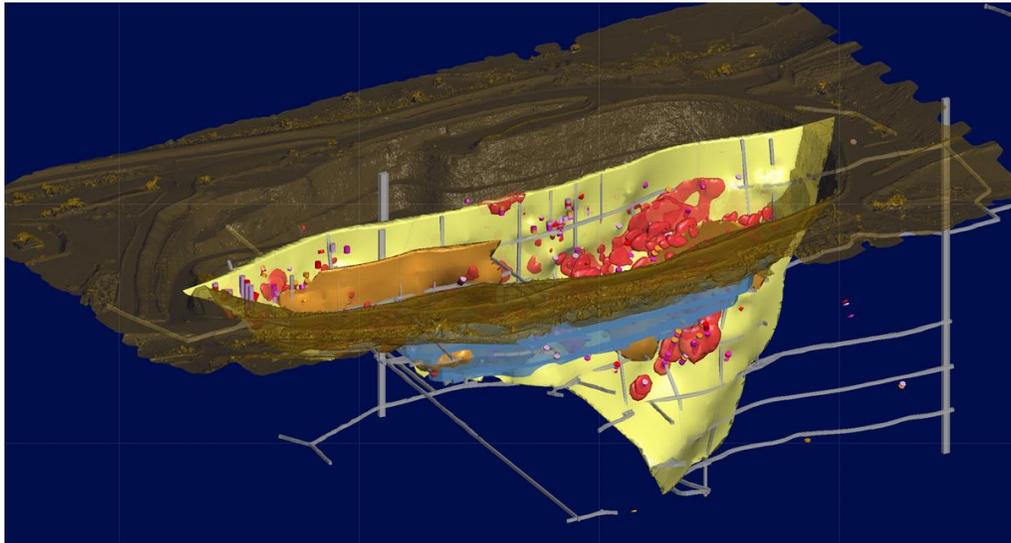
Manuka commenced production of Mt Boppy in April 2020. At the time of our IPO, we estimated Phase 1 production of 22-24koz Au but have delivered >41koz (560kt @ 3g/t)

**Higher grades and plant operating efficiencies combine to drive Phase 1 production to nearly double original forecast<sup>1</sup>**

Mt Boppy is open at depth with possible along-strike extensions to the North and South. The project is fully approved with mine camp, tailings storage facility and power

Updated resource of ~45koz at 4.95g/t Au<sup>1</sup>

**Targeting >100koz Au resource expansion during 2023 (equating to 3 years of production @ ~30koz Au pa) by drilling beneath the recently mined pit shell to depths of 250 – 300m**



Perspective view looking south-east. West Lode is shown in orange, East Lode shown in yellow and current pit design in blue, and high-grade zone (5 g/t Au) shown in red. Historical workings are shown in grey



1. Refer ASX releases dated 4 March 2022

# Mt Boppy Tenements – exploration targets 2023

2023 Exploration activities to be focussed on the following:

## 1. Mt Boppy (beneath recently mined pit shell)

Targeting: resource expansion within existing ML

Objective: grow existing resource >100koz Au

Activity: combine RC and DD drill programs, targeting mineralisation between 250m – 300m deep

## 2. Central Structural Zone

Targeting: gold (primary), zinc, copper

Objective: confirm structural trends and ore body geometry within central corridor

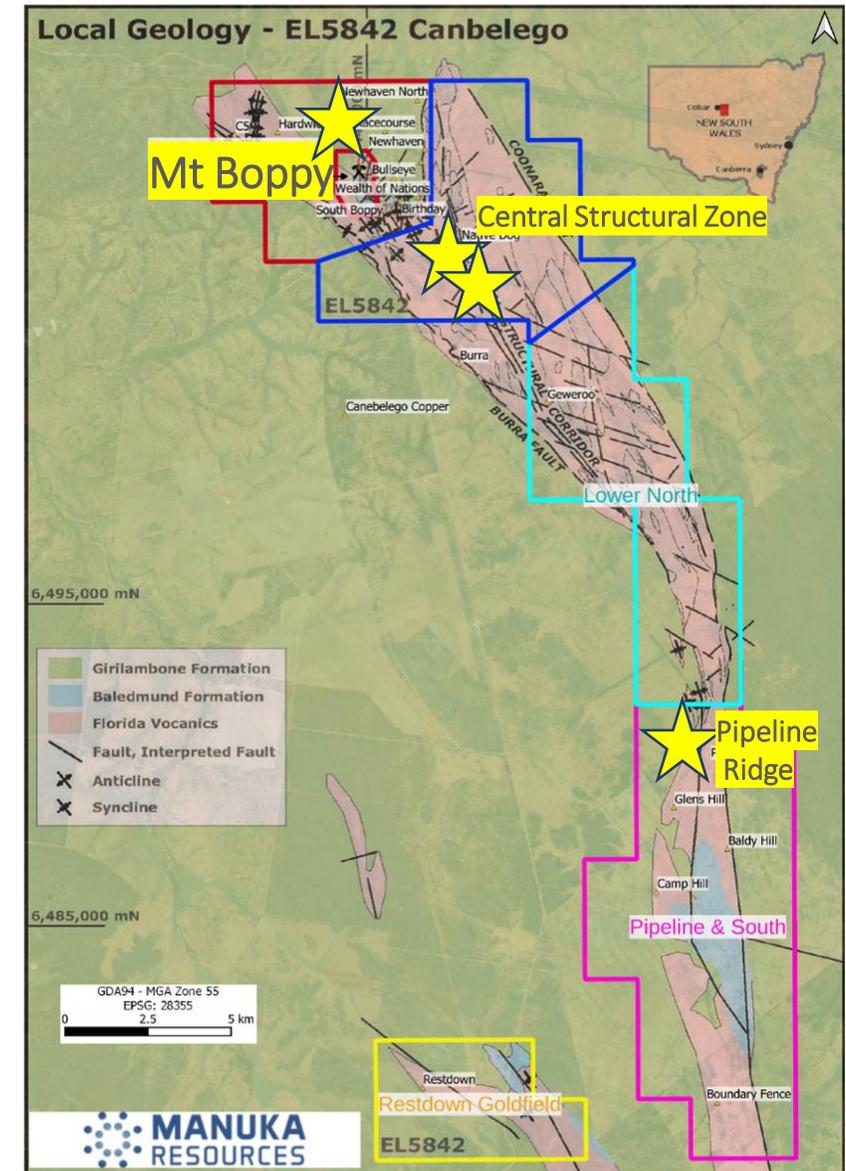
Activity: combine RC and DD drill programs between 50m – 300m

## 3. Pipeline Ridge

Targeting: existing resource estimated at 210koz Au @2.4g/t Au

Objective: evaluate for gold, copper, zinc and lead

Activity: in-fill diamond drilling



# Taranaki Green VTM Project

(Vanadium, titano-magnetite)

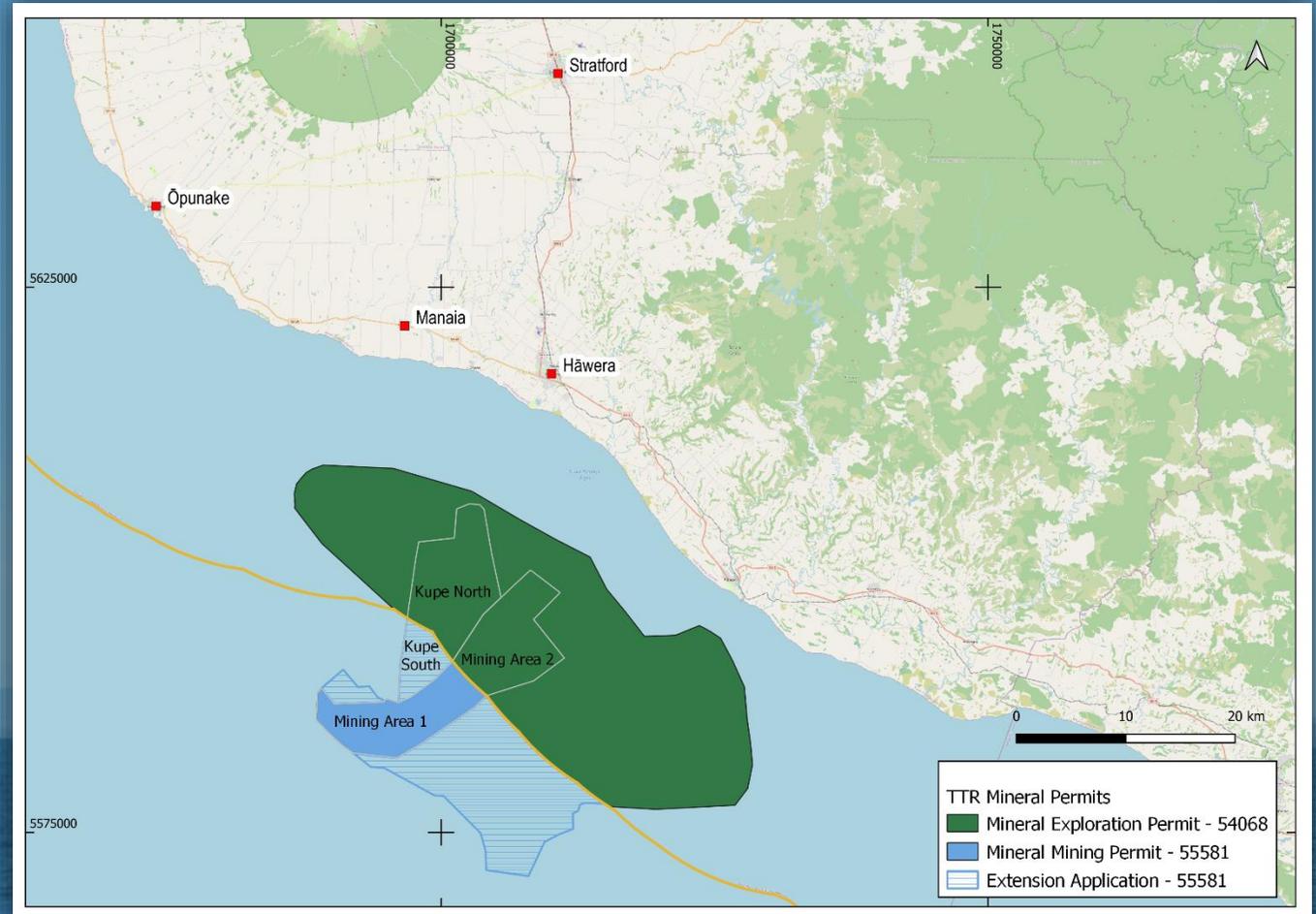
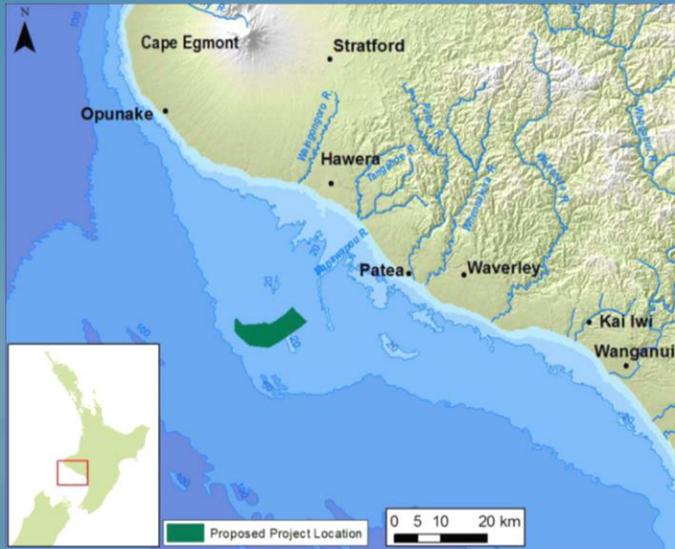
Manuka 100% owner - completed Nov 2022

- Offshore Vanadium Titaniferous Iron Sands
- West Coast, North Island, New Zealand
- World class project



# Taranaki Green VTM Project: Location

Located outside territorial waters, in exclusive economic zone (EEZ)



# Taranaki Green VTM Project: Iron Sands Project



Forecast to be in the bottom quartile of the global iron ore operating cost curve



Mining licence approved for recovery of 5Mt of iron ore per annum for minimum 20-year life of mine



VTM Concentrate Grade  
 0.5%V<sub>2</sub>O<sub>5</sub> 8.5%TiO<sub>2</sub> 56% - 57%Fe



Total 3.8Bt JORC Resource Base\*

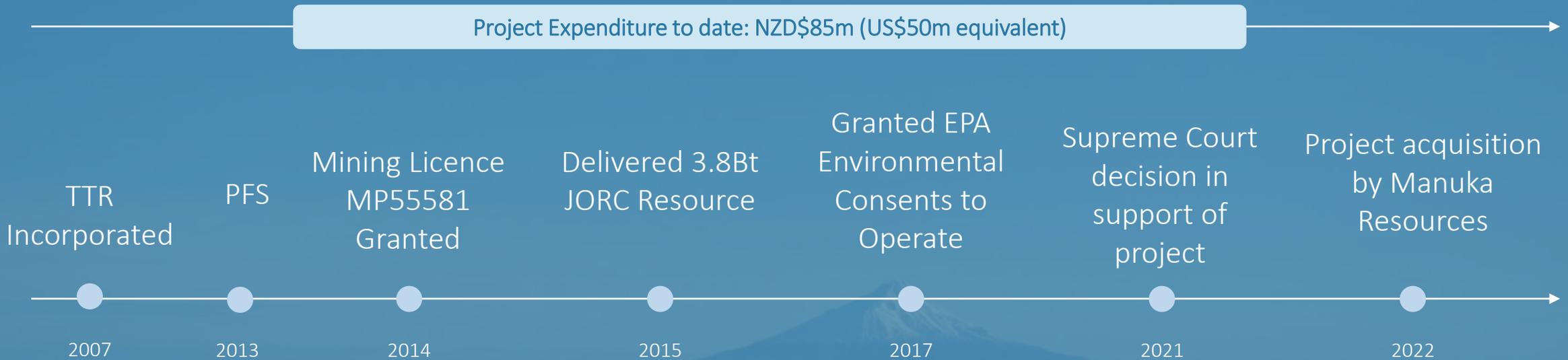


Anticipated lowest quartile CO<sub>2</sub> emitter for iron ore producers

- ✓ World class JORC resource 3.8bt vanadium, titanium and magnetite (iron ore)
- ✓ Targeted lowest quartile carbon emissions\* of Fe producers globally (62kg CO<sub>2</sub>/t vs 125-250kg CO<sub>2</sub>/t)
- ✓ Anticipated lowest quartile costs for Fe producers\* US\$20-23/t FOB (PFS 2013 adj. inflation) excluding credits from vanadium or titanium
- ✓ Located within NZ EEZ (exclusive economic zone targeting gas, oil, mining)
- ✓ NZD\$85m invested to date (>US\$50m)
- ✓ Mining Licence granted 2014 (MP55581) – 5Mt pa production for 20 years
- ✓ Granted initial EPA environmental consents to operate in 2017 with final review process underway, post New Zealand High Court directions hearing
- ✓ New Zealand government focused on implementing mining code subject to appropriate environmental safeguards
- ✓ 0.5% V<sub>2</sub>O<sub>5</sub> = 55 million pounds/year of vanadium pentoxide in concentrate. Metallurgical test work completed to date recovers ~84%

# Taranaki Green VTM History

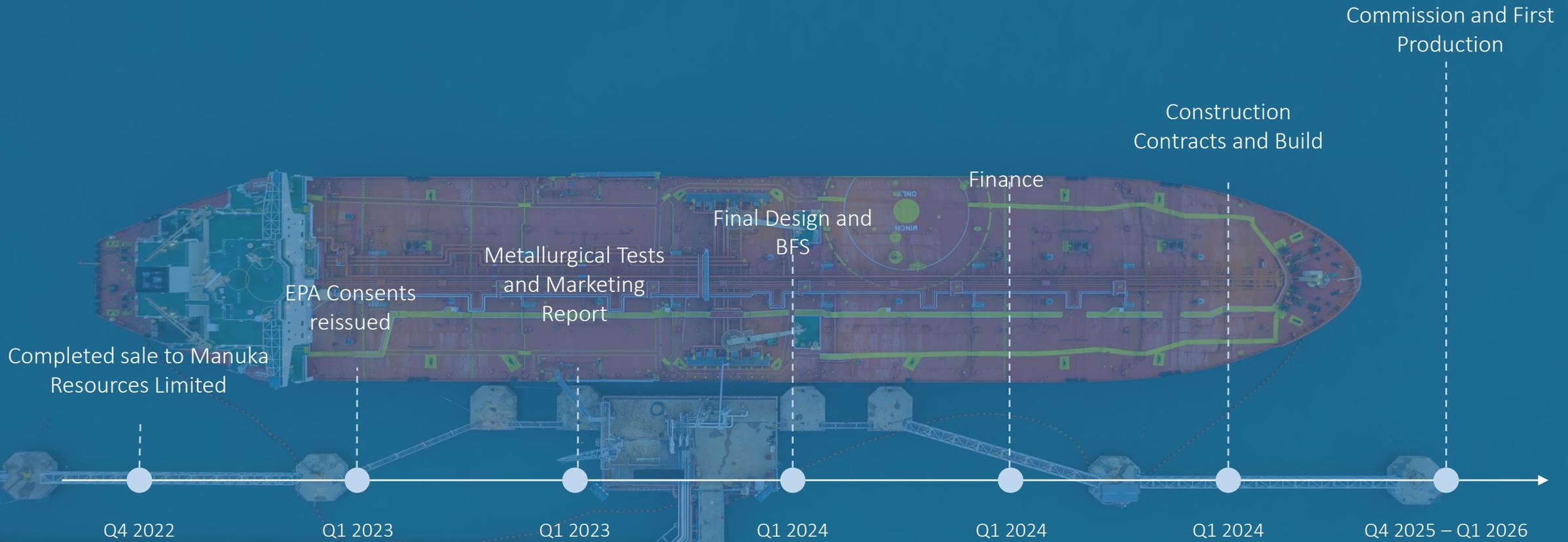
Initial Objective: To discover and develop VTM (vanadium titano-magnetite) Iron Sands Project offshore North Island, NZ



Final EPA approval and BFS required to commence finance, commissioning and concentrate production

Operation deploys existing mineral recovery and shipping technologies

# Taranaki Green VTM Project Expected Timeline



Assumes all relevant New Zealand regulatory permits are obtained

# Appendix



# Taranaki Green VTM Project: Environment



- Operation has small environmental footprint with only 300m x 900m area of disturbance at any time
- Very low carbon emissions compared to other hard rock iron ore deposits with no:
  - Heavy machinery mining fleet
  - Open pits
  - Waste dumps
  - Haul roads
  - Grinding circuits
  - Railroad or ports
- No chemical additives in processing or tailings
- Natural processes deliver rapid rehabilitation of mined areas
- Short term confined environmental impact with rapid recovery
- No impact on fish, whales or dolphins
- No legacy issues with rehabilitation part of recovery process
- Taranaki VTM concentrate has 11lbs/tonne vanadium and 8.5% titanium metal in concentrate
- Fe, V and Ti metals in demand for the “green economy” and renewable energy
- High grade steel, alloys, batteries, solar and wind technology, electronics, health, science, aerospace and white goods

# Resources Summary

On 29 July 2022, a Resource Update was announced for the Mt Boppy gold project through the ASX. On 1 April 2021, a Resource Upgrade was provided for Wonawinta Silver Project reflecting a 43% increase in the Measured and Indicated Resource Categories.

## Mineral Resource Summary 19 May 2022 Mt Boppy Resources

Resource Category	Tonnes	Grade Au (g/t)	Contained gold ounces
Measured	106,850	5.25	18,020
Indicated	150,000	4.85	24,700
Inferred	17,000	3.93	2,100
<b>Total</b>	<b>281,850</b>	<b>4.95</b>	<b>44,820</b>

## JORC Resources Wonawinta Silver Project as at 1 April 2021\*

Resource Category	Material (Mt)	Ag (g/t)	Ag Moz	Pb (%)	Pb kt
Measured	1.1	47.3	1.65	0.69	7.5
Indicated	12.3	45.5	18.04	0.83	102.8
Inferred	24.9	39	31.25	0.39	96.9
<b>Total</b>	<b>38.3</b>	<b>41.3</b>	<b>50.94</b>	<b>0.54</b>	<b>207.2</b>
Stockpile	0.515	70	1.16		

# Vanadium Overview

A Critical Mineral	Global Prod. (V <sub>2</sub> O <sub>5</sub> )	Why Vanadium for utility/grid storage*?	
		<u>Vanadium</u>	<u>Lithium</u>
Vanadium is deemed a critical mineral in: USA, EU & Australia	Annual production~115,000t/yr Historical growth 3%p.a. Demand prediction – double 5yrs	Safety: Non-flammable, not susceptible to thermic reactions, no health risk from chemistry involved	40 known fires** at large scale li-ion battery storage systems. Complex release of gases complicates extinguishing
Historically used to strengthen steel (1kg vanadium doubles tensile strength of steel) - military & aeronautical applications	Vanadium producer regions 1. China ~55% 2. Russia ~20% 3. Brazil ~15% 4. South Africa ~10%	Environment: VRFB release 78% less emissions than li-ion in manufacturing process. Vanadium fully recyclable	Larger carbon footprint than vanadium battery in manufacturing. Lithium battery waste growing at 20%p.a. - CSIRO
Vanadium flow batteries now utility/grid storage medium of choice (gaining similar status in grid storage to that what lithium holds in mobility storage)	New Zealand has potential to become 3 <sup>rd</sup> largest producer through Manuka's VTM project (>20,000t / 55 million lbs vanadium p.a. in concentrate = ~15% of global production)	Lifespan: 100% of vanadium electrolyte reusable at end of life. 20 year long-life battery. Can be scaled - modular	Expectations are 8–10 year lifespan. Recycling more complicated (currently only 10% of li-ion batteries recycled in Aust. – CSIRO)

\*Siecap – Why vanadium redox flow batteries will be the future of grid-scale energy storage 24-8-2022

\*\* Paul Christensen – Professor of electrochemistry at Newcastle University

# Taranaki Green VTM Project: Key Highlights

An emerging vanadium, titanium and iron ore project with a substantial resource. Lowest quartile cost and CO2 emissions for bulk projects, presents potential to realise greater value over medium to long term

<p>✓ <b>Early mover advantage</b> on bulk, scalable marine mining IP</p>	<p>✓ <b>Low sovereign risk</b> low-royalty regime</p>	<p>✓ <b>Experienced board and management</b> operating to the highest governance standards</p>	<p>✓ <b>DeBeers Marine SA +30 years experience</b> operating partner</p>
<p>✓ <b>Technology solution (IHC)</b> has cross commodity application in heavy mineral marine deposits</p>	<p>✓ <b>Bulk shipping freight advantage</b> located close to markets</p>	<p>✓ <b>TTR iron sands lowest carbon intensity</b> 62kgCO2/t versus 120-250kgCO2/t for competitors world wide</p>	<p>✓ <b>New Zealand is well placed</b> to develop a new long-term export industry</p>
<p>✓ <b>Large scale resources</b> with further potential to acquire acreage worldwide</p>	<p>✓ <b>Low capital intensity infrastructure</b> advantage over land based deposits</p>	<p>✓ <b>Low site operating costs</b> no drill and blast, trucking, rail or port costs, rehabilitation, no waste dumps, or legacy issues</p>	<p>✓ <b>STB has low capex and opex advantages</b> of being entirely marine-based operation</p>

# Taranaki Green VTM Project: JORC Resource Estimates

STB Mineral Resource Estimates					
	Mineral Resources			Concentrate	
	Cut-Off Grade	Mt	Fe <sub>2</sub> O <sub>3</sub> %	Mt	Fe %
Mining Area Stage 1	3.5% DTR*	1,043	11.28	75	56.31
Kupe Blocks North & South	3.5% DTR*	655	10.97	45	56.73
Mining Area Stage 2 & Outside 1 & 2	7.5% Fe <sub>2</sub> O <sub>3</sub>	2,137	9.66		

- DTR is David Tube Recovery of the magnetic fraction of the sample
- DTR Estimate is based on analytical DTR and calculated DTR values
- JORC (2012) compliant



# Integrate Mining Vessel (IMV)



Length 335m

Breadth 60m

Depth 26.25m

Design Draught 12m

Technology has been developed and utilised by De Beers Marine for over 40 years in their mining for diamonds off west coast of Southern Africa. De Beers Marine have provided a commissioning and operating solution for the first two years of production, also providing us with an option for extension. This is a tried and tested recovery solution. See YouTube hyperlink below.

# Summary of estimated concentrate costs

## Commodity Prices 5 September 2022

- Iron Ore (62%Fe): US\$105t
- Vanadium Pentoxide: US\$7.50lb
- Titanium Dioxide: US\$3,200t

## Taranaki Green VTM Metal Concentrate Value per Tonne

- Iron Ore (57%Fe): US\$89.25 (15% discount)
- Vanadium (0.5%): US\$82.50
- Titanium (8.5%): US\$272

Summary Estimated Operating Costs (C1) of STB Project (subject to completion of BFS).  
(Based on 72% operational availability after allowing for inclement weather in South Taranaki Bight.)

4.9Mtpa (concentrate production scenario)**	\$US	Unit cost/tonne (concentrate) \$	Percentage %
Labour	23,790,000	4.86	24%
Fuel*	32,079,661	6.55	33%
Maintenance	14,375,000	3.00	15%
FSO Operation	13,415,000	3.00	14%
Consumables	5,000,000	1.00	5%
Insurance	5,000,000	1.00	5%
Sales costs	4,900,000	1.00	5%
<b>Total</b>	<b>98,559,661</b>	<b>\$20.41</b>	<b>100%</b>

\*based on IFO380 bunker fuel at 26 July 2022 of US\$495.50/t ex Singapore

\*\* subject to validation in BFS

Manuka envisages the Taranaki Project being a low cost producer with C1 costs approximately US\$20 - US\$23<sup>[1]</sup> per tonne of concentrate.

<sup>[1]</sup> Based upon the TTR PFS (2013) updated to 2022 economics  
See ASX release 1 August 2022