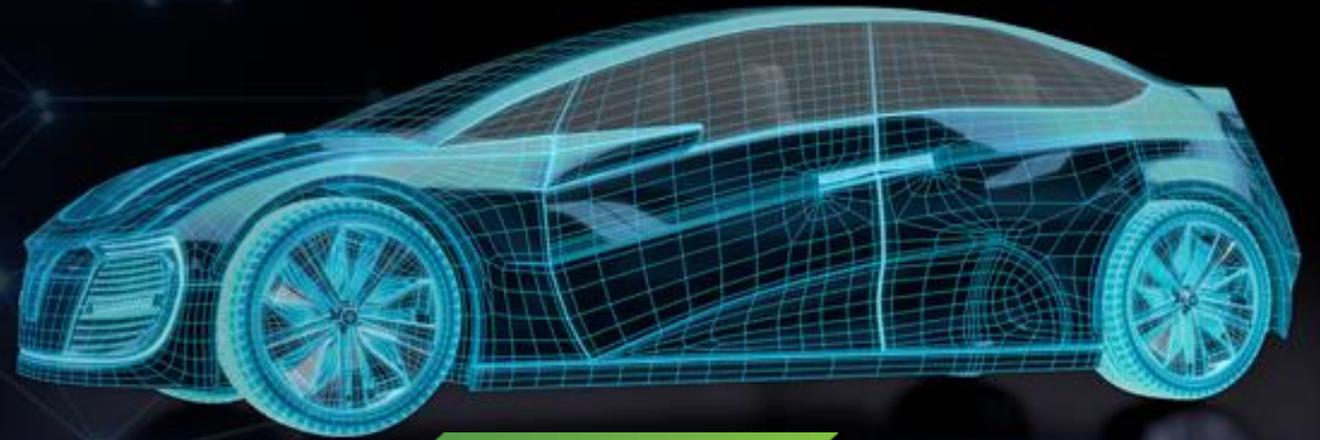




# MANGANESE MINE TO MARKET STRATEGY

APRIL 2021



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## COMPETENT PERSONS STATEMENT

The information in this Report that relates to Exploration Results and Mineral Resources of the Company is based on, and fairly represents, information and supporting documentation that has been reviewed and prepared by Robert Wason, who is a Senior Consultant - Geology at Mining Insights Pty Ltd and is a member of AusIMM.

Mr. Wason has sufficient experience, which is relevant to the style of mineralisation and type of deposit under consideration and to the activity, which they are undertaking to qualify as an Expert and Competent Person as defined under the VALMIN Code and in the 2012 Edition of the ‘Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves’ (“JORC Code 2012”). Mr. Wason consents to the inclusion in this announcement of the matters based on the information in the form and context in which they appear.

## COMMODITY THEMATIC & STRATEGIC ADVANTAGE

- ◆ Systematic shift in global manganese markets within past decade
  - ◆ Chinese domestic ore production declining combined with lower production grade
  - ◆ South Africa, the largest exporter of Manganese globally continues to face challenges with logistics, labour and fiscal regime
- ◆ EV demand driving Li-ion utilisation has significantly enhanced investor understanding the importance of manganese
  - ◆ VW announced a move to higher manganese content cathodes for volume segment
- ◆ Firebird is positioned to capitalise on projected demand and potential supply shortfall through
  - ◆ Depth of experience in Manganese industry
  - ◆ Evaluation of beneficiation processes to upgrade mineralisation
  - ◆ Significant resource expansion potential already defined based on targeting model



# BOARD & MANAGEMENT



**EVAN CRANSTON**  
Chairperson

Mr Cranston is an experienced mining executive with a background in corporate and mining law. He is the principal of corporate advisory and administration firm Konkera Corporate and has extensive experience in the areas of equity capital markets, corporate finance, structuring, asset acquisition, corporate governance and external stakeholder relations.

Mr Cranston holds both a Bachelor of Commerce and Bachelor of Laws from the University of Western Australia. He is currently the Non Executive Chairman of Carbine Resources (ASX:CRB), Vital Metals (ASX:VML), African Gold (ASX:A1G) and Benz Mining Corp (TSXV:BZ, ASX:BNZ).



**PETER ALLEN**  
Managing Director

Mr Allen is a mining executive with more than 20 years experience in marketing of manganese, lithium and a range of other commodities.

He previously held the MD of Marketing for Consolidated Minerals Limited which operates Woodie Woodie mine in WA and Nsuta Manganese mine in Ghana.

He assisted manganese focused explorer Element 25 (ASX:E25) and Gulf Manganese Corporation (ASX:GMC) with PFS & product marketing. More recently, he was the marketing manager for AVZ Minerals (ASX:AVZ), a company focused on the Manono lithium project.



**WEI LI**  
Finance Director

Mr Li qualified as Chartered Accountant with over 10 years experience in the resource industry in particular in manganese related fields. He previously managed a private manganese greenfield exploration company in the NT of Australia with funding principally from overseas.

He currently holds CFO/Commercial Manager role with Perpetual Resources Ltd (ASX:PEC) and also the CFO role for PC Gold Pty Ltd.



**ASHLEY PATTISON**  
Non-executive Director

Ashley has over 20 years' experience in the resources sector from both a corporate finance and operational perspective. Qualified as chartered accountant, he has extensive experience in operations, finance, strategy and corporate finance. Ashley has been the Managing Director of a number of listed and private mining companies over the past 10 years and also CEO of a listed mining service Company.

Ashley is currently the Executive Chairman of PC Gold Pty Ltd and is also a Non-executive director of Firefly Resources Ltd (ASX:FFR) and Macro Metals Ltd, an iron ore focused company.

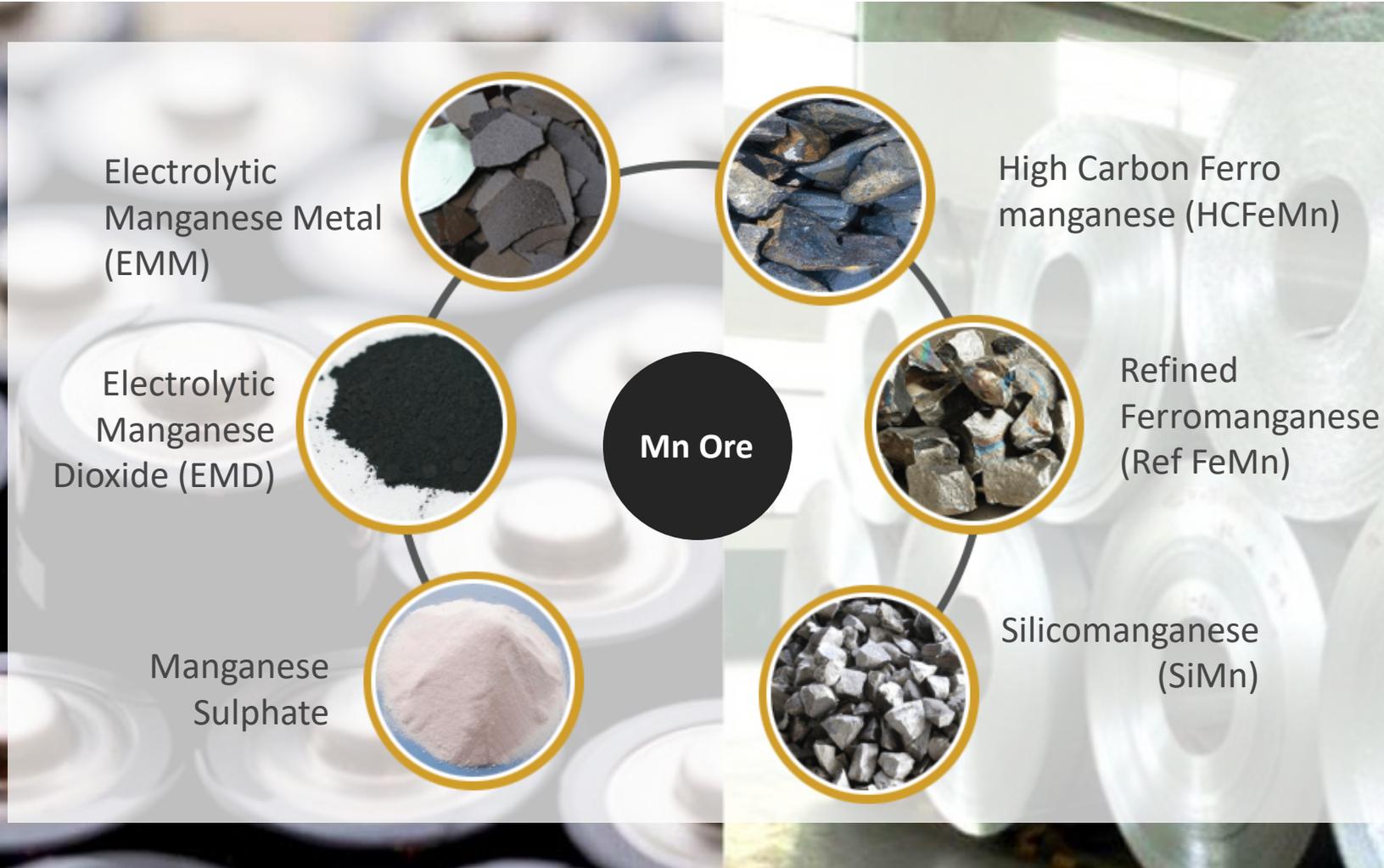
## Corporate Overview

ASX code	FRB
Share price (1-4-21)	\$0.685
Shares on issue	54.575m
Market capitalisation	37.4m
Options	8m
Performance rights	3.3m
Cash (31-3-21)	\$4.2m

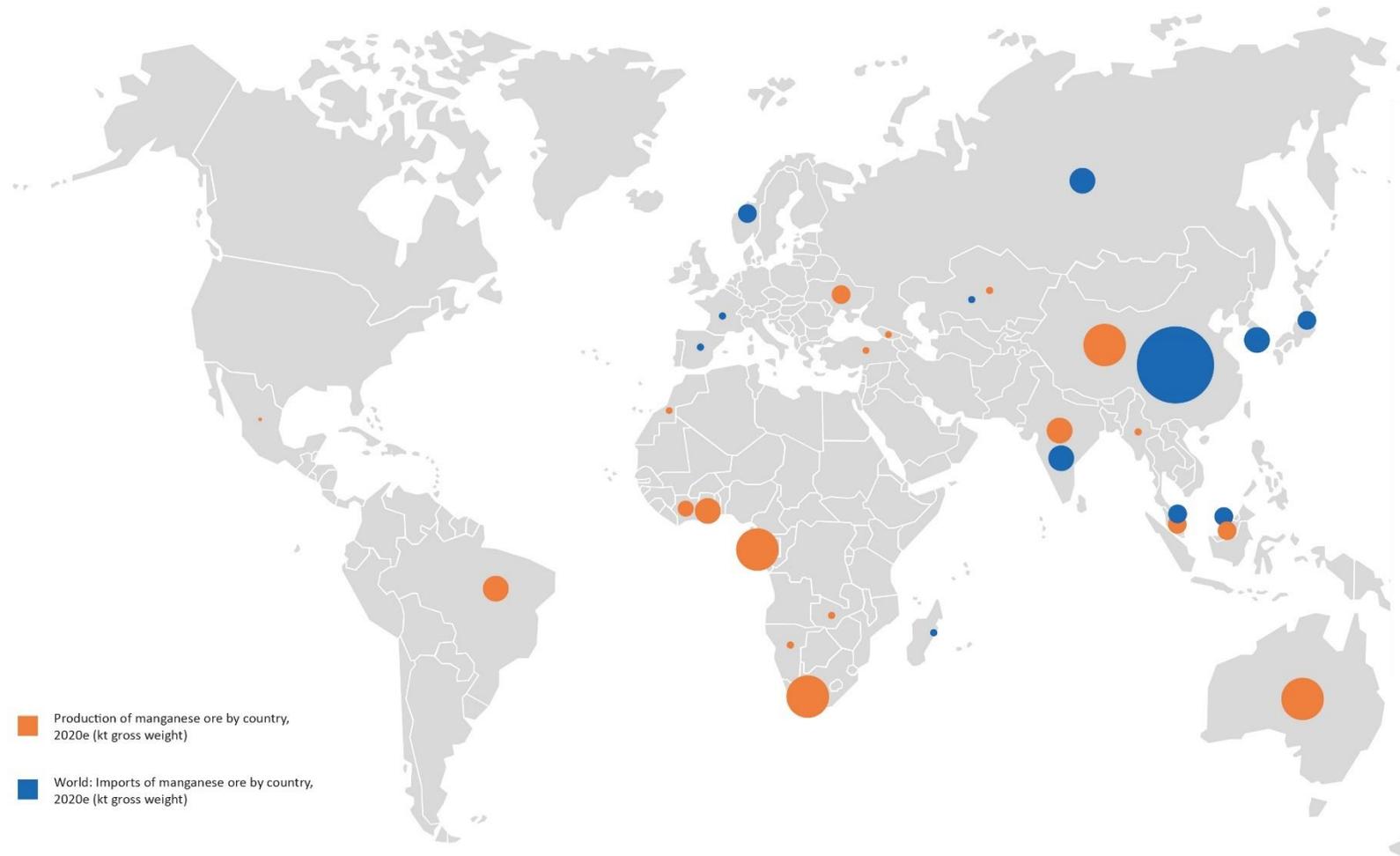
### Shareholders (31-3-21)

Tolga Kumova	10.15%
Mining Equities	6.67%
Board & management	4.35%
Top 20 shareholders	47.75%

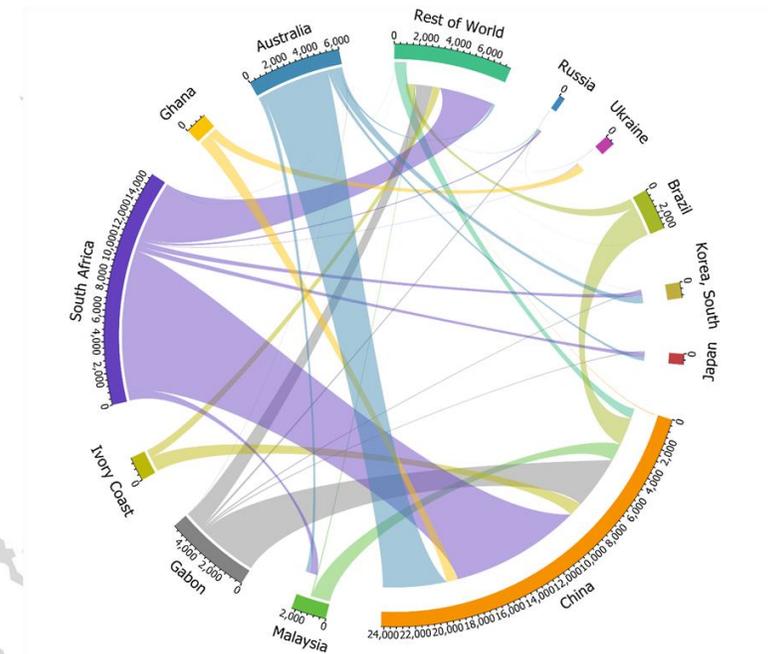
# MANGANESE MARKET



# MANGANESE SEABORNE TRADE



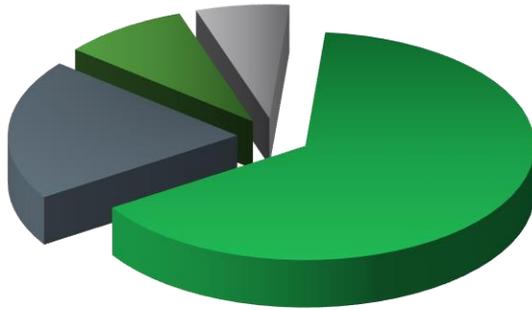
Trade flow for manganese ore, 2020e (Mt gross weight)



Source: Roskill & UN Comtrade

# MANGANESE IN STEEL

## MN CONSUMPTION IN STEEL BY PRODUCT



■ SiMn ■ HCFeMn ■ Ref FeMn ■ EMM

Source: Roskill

### FEEDSTOCK REQUIREMENTS

SiMn requires 34 – 36% Mn with 3:1 to 4:1 Mn:Fe ratio

HCFeMn requires 40% Mn with 5:1 to 7:1 Mn:Fe ratio

Refined FeMn produced using two stage production process, requires >46% Mn with Mn:Fe ratio >12:1

Electrolytic Manganese Metal EMM can utilise all grades of Mn Ore via leaching and electrolysis, typically lower grade ores are used

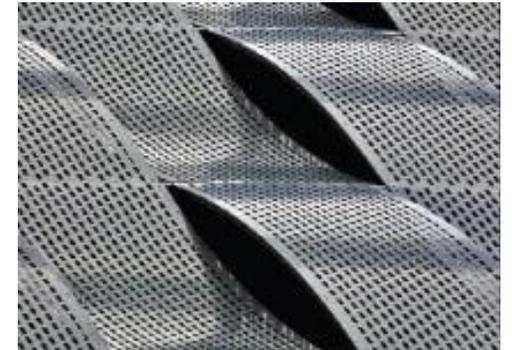
### TYPICAL SPECIFICATION

Mn 65% min, Si 17% min, C 2% max

Mn 78% min, Si 1% max, C 8% max

Mn 80% min, Si 0.5% max, C 0.5% max for Low Carbon (LC) and 1.5% max for Medium Carbon (MC)

Mn 99.7%min, C 0.04% max, S 0.05% max, P 0.005% max



## LITHIUM-ION BATTERIES – DRIVEN BY EV'S

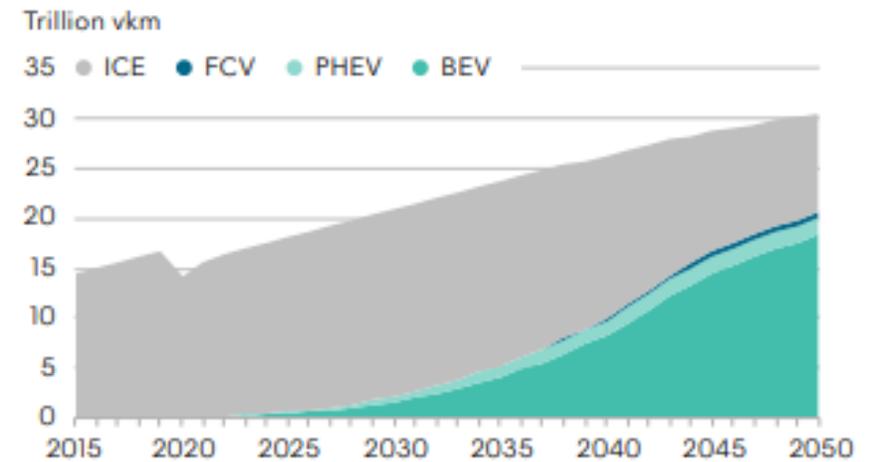


“By 2050, EVs capture 73% of all sales. They make up 54% of the global passenger-car fleet, and in some regions go higher, reaching between 56% and 80% in Europe, the U.S. and China.

By 2050 there are just above 800 million passenger EVs on the road, out of a total passenger-vehicle fleet of 1.5 billion”.

Source:- Bloomberg NEF

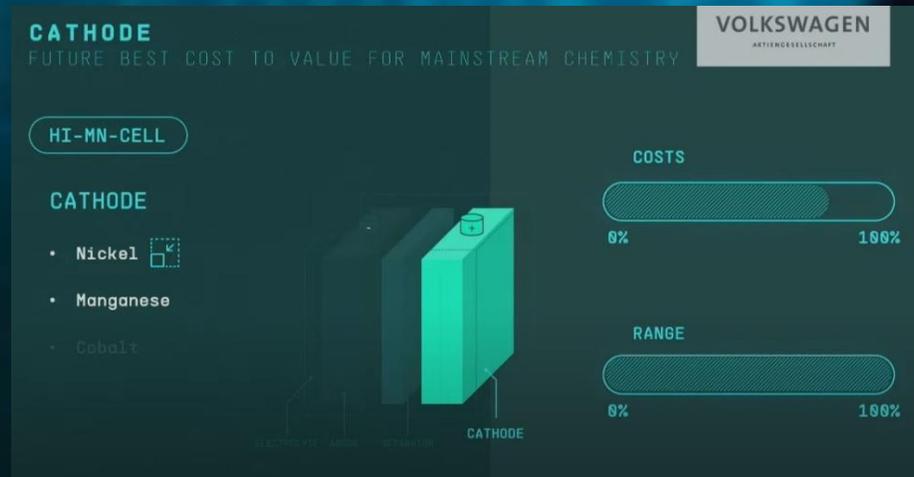
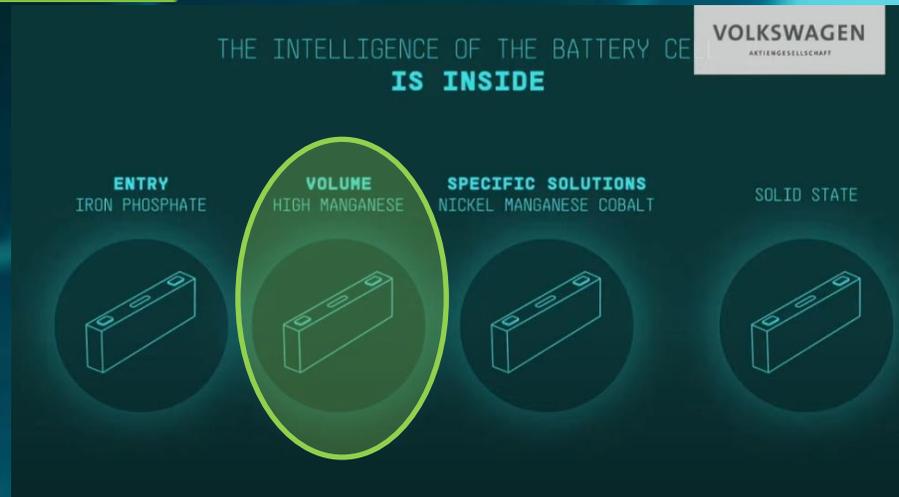
**Figure 2: Global passenger vehicle kilometers travelled, by drivetrain**

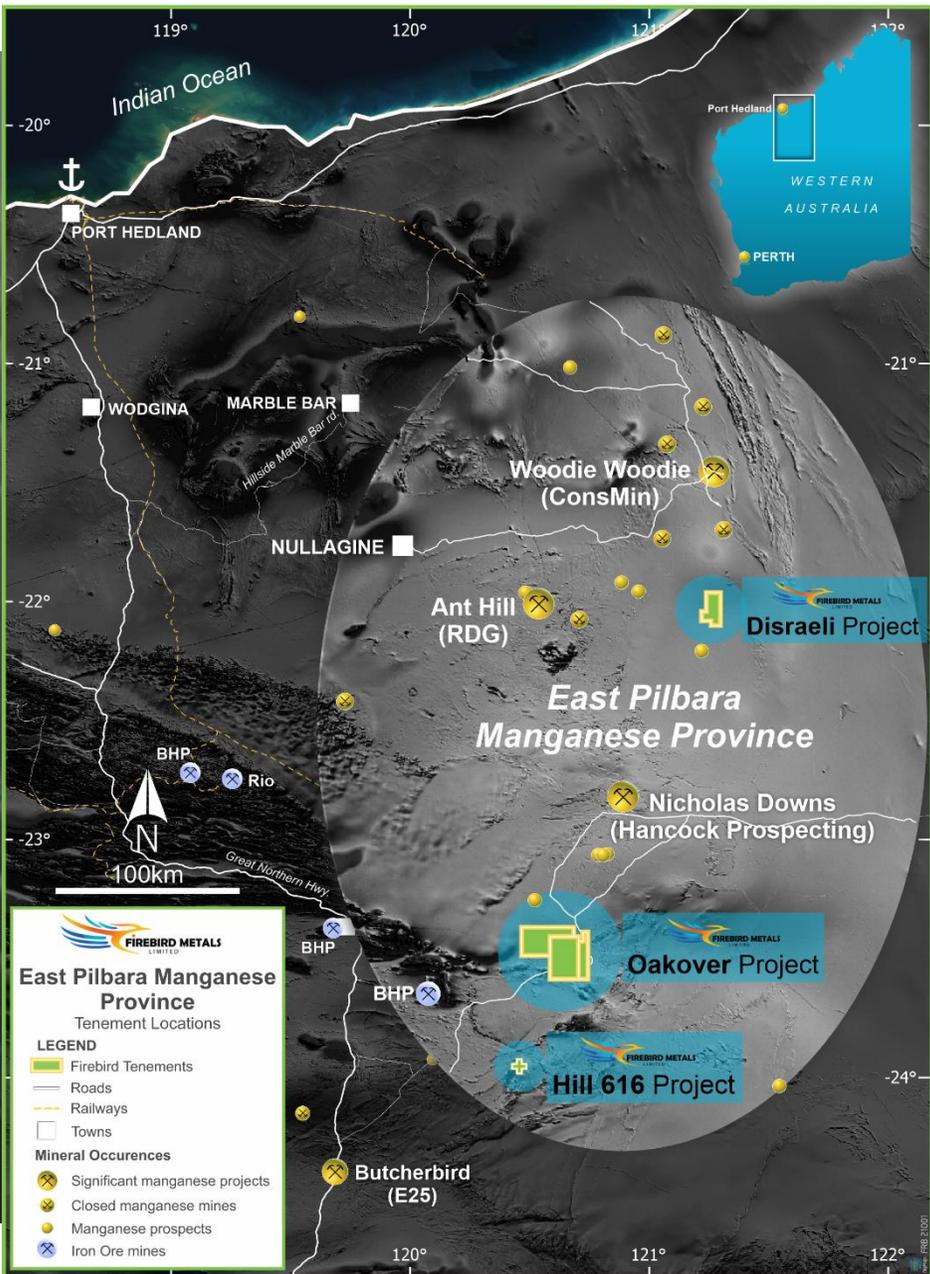


Source: BloombergNEF. Note: ICE is internal combustion engine, FCV is fuel-cell vehicle, BEV is battery-electric vehicle. PHEV is plug-in hybrid electric vehicle

# MANGANESE IN BATTERIES

- ◆ Used in either the form of Electrolytic Manganese Dioxide (EMD) or High-Purity Manganese Sulphate (HPMS).
- ◆ Battery manufacturers and EV manufacturers looking to manganese to drive down cathode costs in their ongoing expansions plan.
- ◆ Volkswagen describes Mn-rich cathodes as their preferred chemistry for their future volume segment battery at recent power day
  - ◆ Because it's cheaper
    - ◆ Less Nickel, No cobalt
    - ◆ Range is on the same level as today's state of the art technology.





## EAST PILBARA MANGANESE PROVINCE

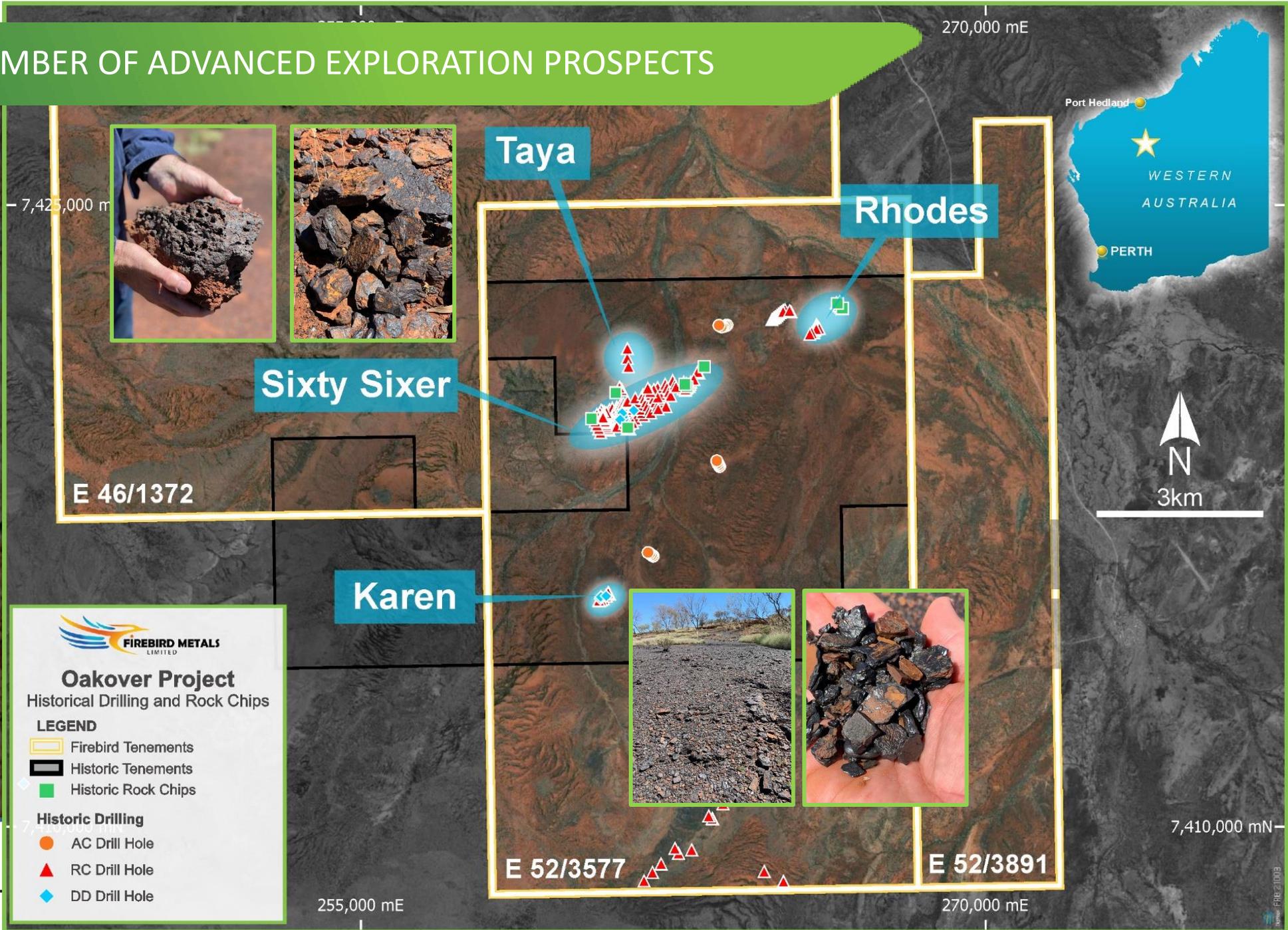
- ◆ Located in premier mining jurisdiction
- ◆ Well known manganese area
  - ◆ Woodie Woodie Mine operating since 1960's
  - ◆ Butcherbird production commencing early 2021
- ◆ Ideally located close to key steel markets of Asia

## FIREBIRD METALS

- ◆ Key Projects
  - ◆ Oakover, Hill 616 and Disraeli
- ◆ Further development via:
  - ◆ Resource infill and expansion drilling
  - ◆ Identify Direct Shipping Ore opportunities
  - ◆ Metallurgical test work targeting key products for:
    - ◆ SiMn in Steel Industry
    - ◆ Battery Industry



# OAKOVER- A NUMBER OF ADVANCED EXPLORATION PROSPECTS



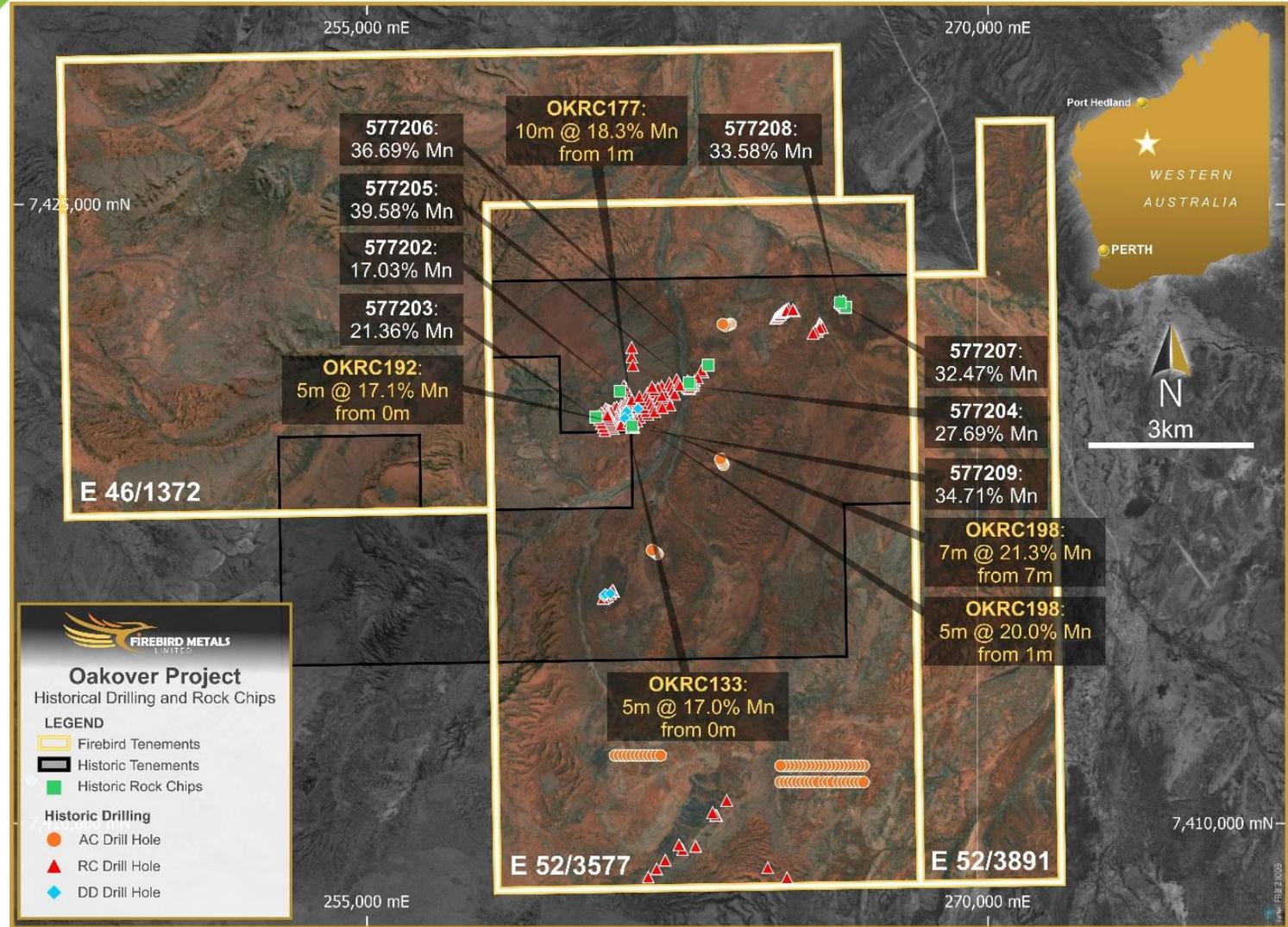
# OAKOVER- SIXTY SIXER OVERVIEW

- ◆ 90km East of Newman, >\$4m spent to date on exploration
- ◆ Near surface / shallow order body
- ◆ JORC 2012 Inferred resource of 64Mt at 10% Mn
  - ◆ Constrained by old tenement boundary

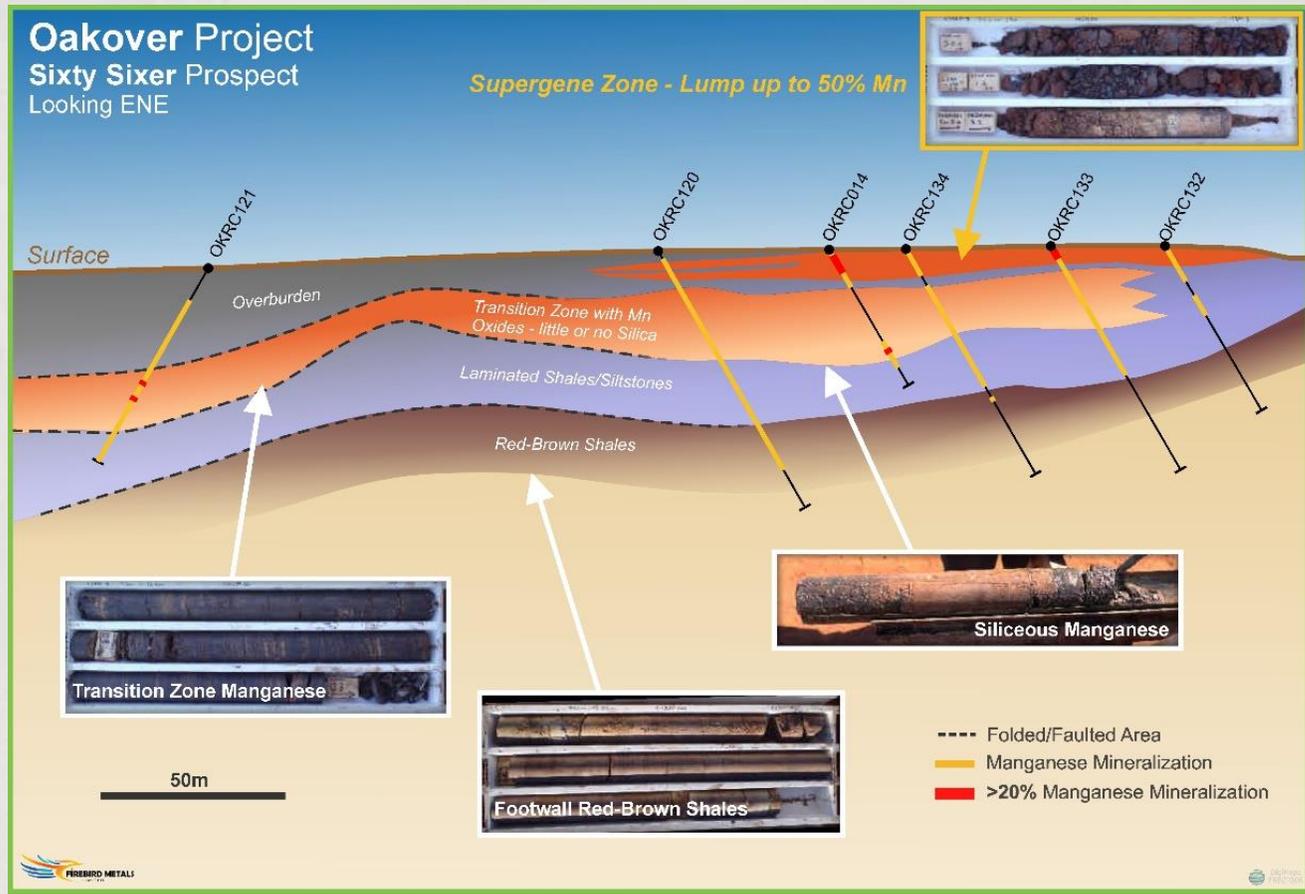
Prospect	Tonnes (Mt)	Mn%	Fe%	Al <sub>2</sub> O <sub>3</sub> %	SiO <sub>2</sub> %	Resource Category
Sixty Sixer	61	10.0	9.0	10.0	40.0	Inferred
JayEye	3	10.6	9.2	12.0	44.5	Inferred
Total	64	10	9.0	10.1	40.2	Inferred

- ◆ Infill and extensional drilling planned
- ◆ Targeting resource expansion along strike and increased definition of higher-grade domains
- ◆ Metallurgical beneficiation testing to be conducted
- ◆ Identifying DSO opportunities

Source: Firebird Prospectus dated 27/1/2021, section 5.2.



# OAKOVER – SIXTY SIXER

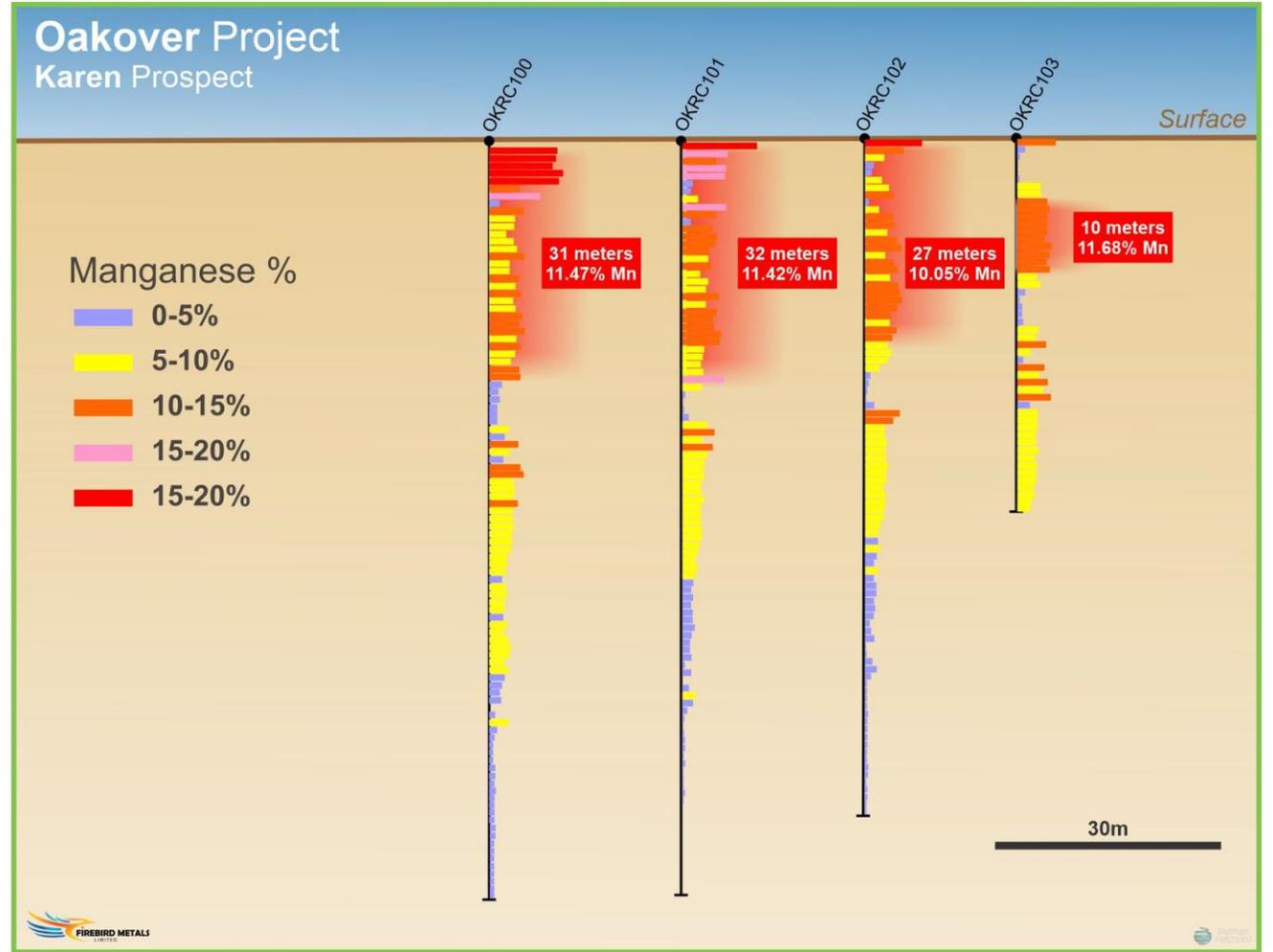


Source: Brumby Resources AGM presentation November 2011

# OAKOVER - KAREN PROSPECT



- ◆ Well-advanced exploration target
- ◆ 4 KM South of Sixty Sixer
- ◆ 13 RC holes on five cross section drilled along 400m strike length during 2011
- ◆ Mineralisation remains open along strike



# HILL 616



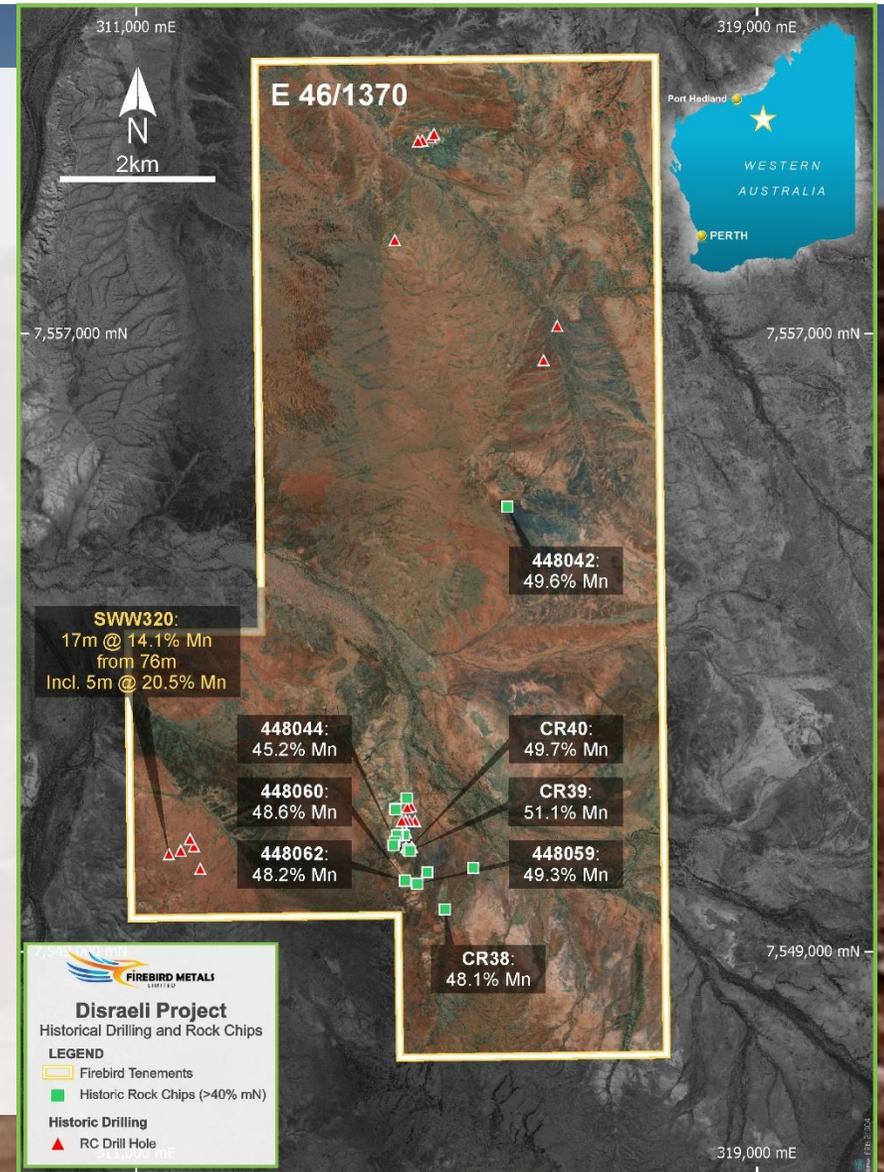
- ◆ Located 85km south east of Newman
- ◆ Previously 3,727m of drilling across a strike length of 2.6km and open along strike
- ◆ Manganese mineralisation occurs as multiple seams or bands of varying thickness
- ◆ Multiple significant rock chip samples of up to 37.6% Mn
- ◆ Follow up metallurgical test work carried out previously



Source: Firebird Prospectus dated 27/1/2021, section 5.2.2 (a)

# DISRAELI

- ◆ 50Km south of Woodie Woodie Manganese Mine
- ◆ Previous exploration suggests Manganese in this area is responsive to geophysics techniques.
- ◆ Multiple high grade rock chips of up to 51.1% Mn.
- ◆ Exploration strategy to focus on DSO type mineralization.
- ◆ Company plans to use modern geophysics technique along with geological mapping & rock chip sampling to identify further drilling targets
- ◆ Previous drilling on 2 test targets:
  - ◆ SWW320: 14.1% Mn over 17m intersection from a depth of 76m
    - ◆ including 5m with 20.5% Mn from 77m depth.
  - ◆ SWW322: 15.1% Mn over an 11m intersection from a depth of 93m
    - ◆ including 3m with 20.8% Mn from 96m depth



Source: Firebird Prospectus dated 27/1/2021, section 5.2.2 (b)

## INDICATIVE OAKOVER DEVELOPMENT TIMELINE 2021

ACCELERATED OAKOVER DEVELOPMENT TIMEFRAME									
	April	May	June	July	August	September	October	November	December
<b>Drilling &amp; resource upgrade planning</b>									
<b>Heritage</b>									
<b>Drilling</b>									
<b>Met Testing</b>									
<b>Prefeasability Study</b>									

## SUMMARY AND WAY FORWARD

- ◆ Located in premier mining jurisdiction
- ◆ Well known manganese area
- ◆ Initial focus on Oakover

### Oakover

- ◆ Near Surface / Shallow ore body
- ◆ Open along strike
- ◆ Expand the JORC 2012 Inferred resource of 64Mt at 10% Mn
- ◆ Continue previous metallurgical test work carried out, targeting key products for:
  - ◆ SiMn in Steel Industry
  - ◆ EV / Battery Industry

### Hill 616

- ◆ Near Surface / Shallow ore body
- ◆ Significant previous drilling, open along strike
- ◆ Expand and continue previous metallurgical test work carried out

### Disraeli

- ◆ High grade rock chips
- ◆ Responsive to geophysics techniques.
- ◆ Strategy to focus on DSO opportunities

Source: Firebird Prospectus dated 27/1/2021, section 5.2.

# THANK YOU



## CONTACT

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