

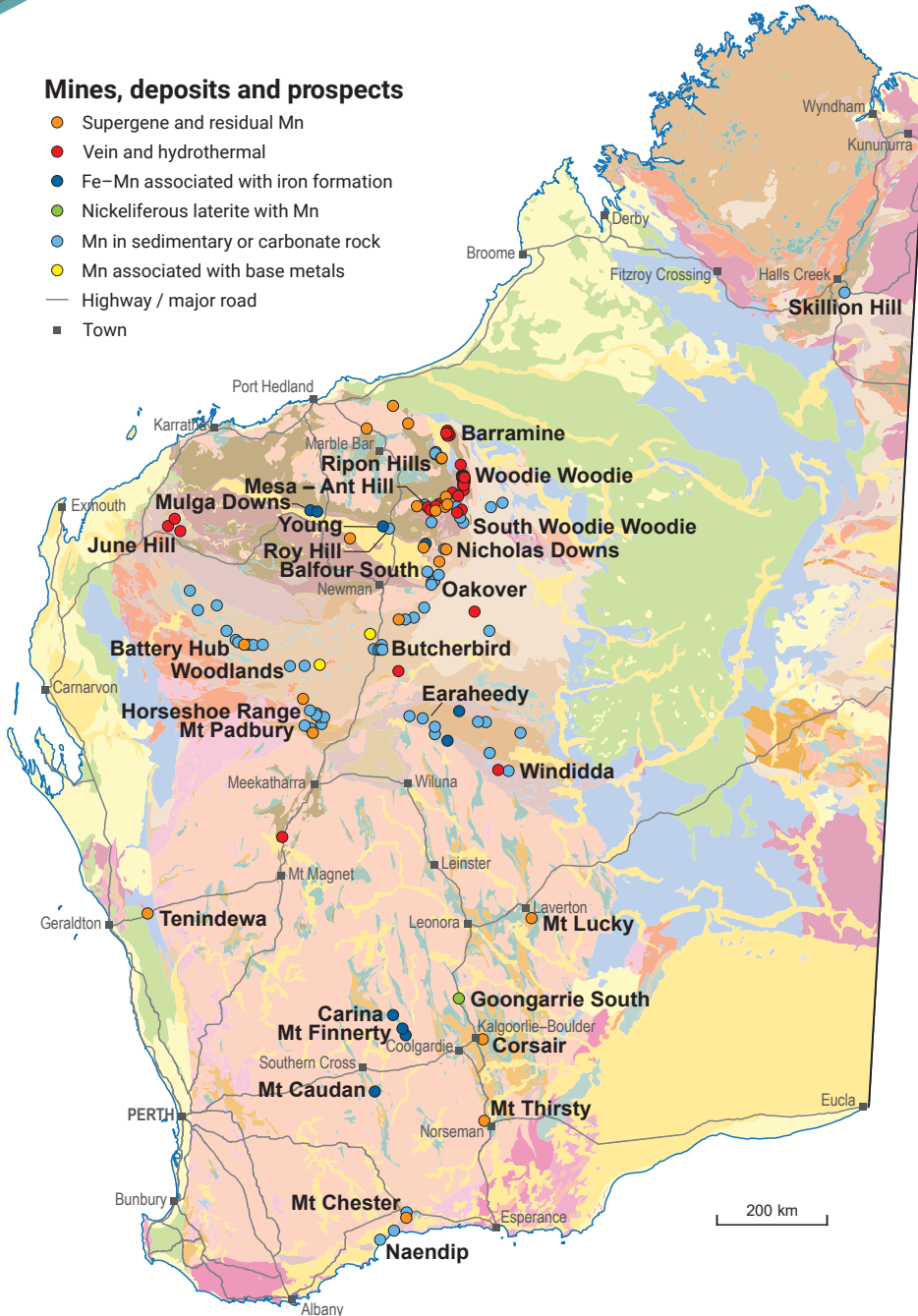
MANGANESE

INVESTMENT OPPORTUNITIES

WORLD-CLASS RESOURCE PROVINCE | SECURE INVESTMENT LOCATION
WORLD-LEADING GEOSCIENTIFIC DATA | GLOBAL MINING SERVICES INDUSTRY

Mines, deposits and prospects

- Supergene and residual Mn
- Vein and hydrothermal
- Fe-Mn associated with iron formation
- Nickeliferous laterite with Mn
- Mn in sedimentary or carbonate rock
- Mn associated with base metals
- Highway / major road
- Town



Western Australia has a 50-year history of producing metallurgical-grade manganese

- The State has a long history of manganese mining, with a total of 14.22 Mt manganese ore produced since 1948. Woodie Woodie has been producing high-grade manganese since the 1950s
- Western Australian current mineral resources contain over 61 Mt of manganese, which is an essential alloy in the steel making process
- The Butcherbird Project is the largest onshore resource in Australia across seven deposits with a mine proposed at Yanneri Ridge
- Further drilling at Bryah Basin has extended known mineralization of the Horseshoe South historical mine, which is currently under review for redevelopment

553 234 t
Tonnes sold



522
Full-time employees



8th
Production world ranking



7.5%
Royalty rate



(2019–20 financial year)



Manganese resources ranked by average grade Mn >9%

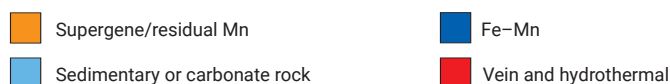
Resources estimated according to JORC 2012

Project	Status	Owner	Resources (Mt)	Av. grade (% Mn)	Contained Mn (kt)	Resource date
Butcherbird	Pre-feasibility	Element 25	262.8	9.94	26 129.6	16/04/2019
Woodie Woodie	Operating	Consolidated Minerals*	48.5	30.60	14 841.0	31/12/2015
Oakover	Scoping	Firefly Resources	64.0	10.03	6418.0	08/06/2012
Nicholas Downs [#]	Care and maintenance	Hancock Prospecting	19.5	27.17	5298.2	17/07/1998
Balfour South	Proposed	Consolidated Minerals*	21.6	19.40	4190.4	10/12/2018
South Woodie Woodie	Proposed	Bardoc Gold / Planet Mining	14.2	13.33	1897.7	14/03/2012
Mesa JV – Ant Hill	Care and maintenance	Resource Development Group	7.8	20.95	1634.1	31/12/2019
Earaheedy	Exploration	Zenith Minerals	4.0	20.04	801.6	30/04/2015
Elsa Mary	Proposed	Sinosteel Midwest	1.0	22.14	217.1	01/07/2009
Horseshoe Range	Proposed	Horseshoe Manganese	0.9	20.83	178.1	14/04/2011
TOTAL			444.3		61 605.8	

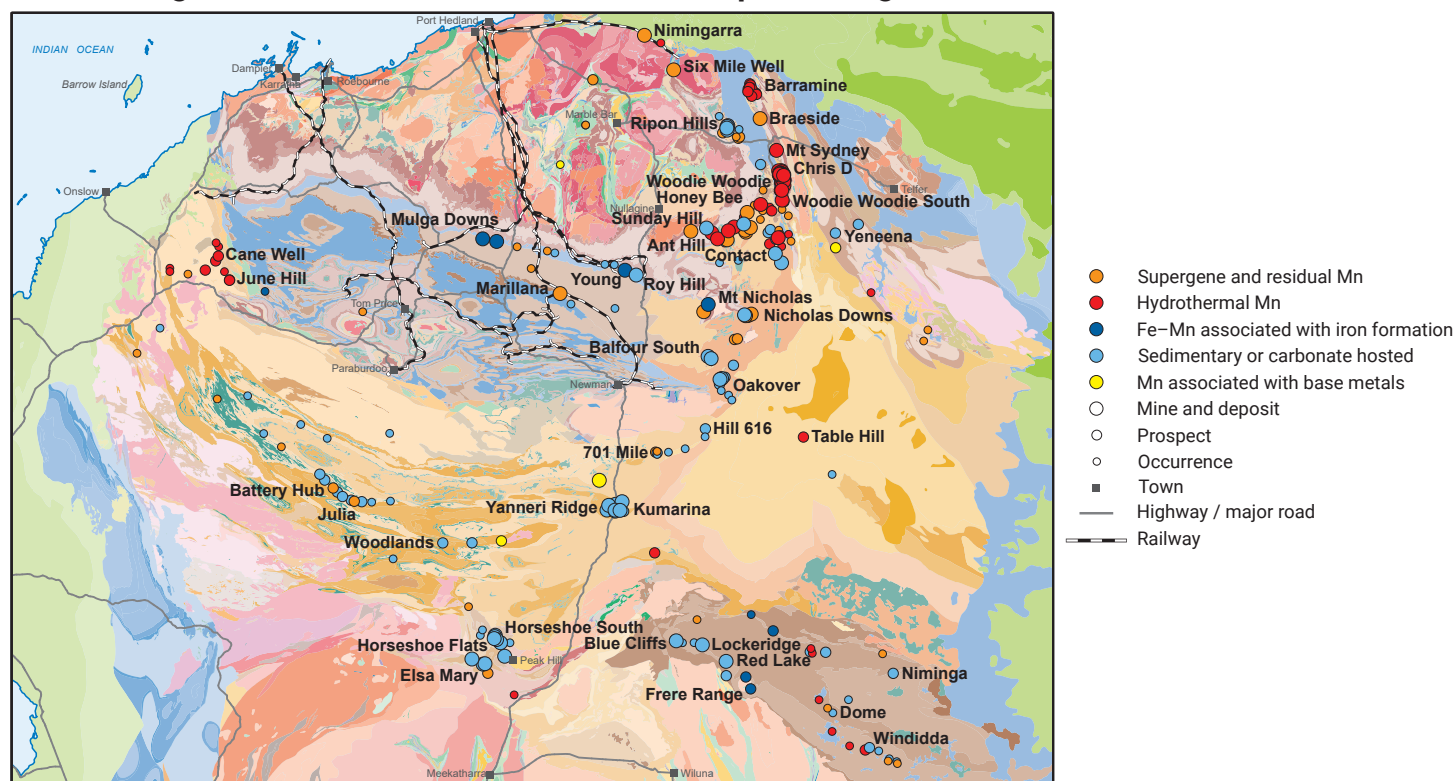
* Parent – Ningxia Tianyuan Manganese Industry Co

[#] Resource pre-dates JORC

Resource estimates have been rounded



Manganese mineralization – Pilbara and Capricorn regions



For more information

 Geological Survey of Western Australia www.dmirs.wa.gov.au/gswa
MINEDEX www.dmirs.wa.gov.au/minedex
GeoVIEW.WA www.dmirs.wa.gov.au/geoview

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Government of Western Australia
 Department of Mines, Industry Regulation and Safety

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Geological Survey of Western Australia

