

V

VANADIUM

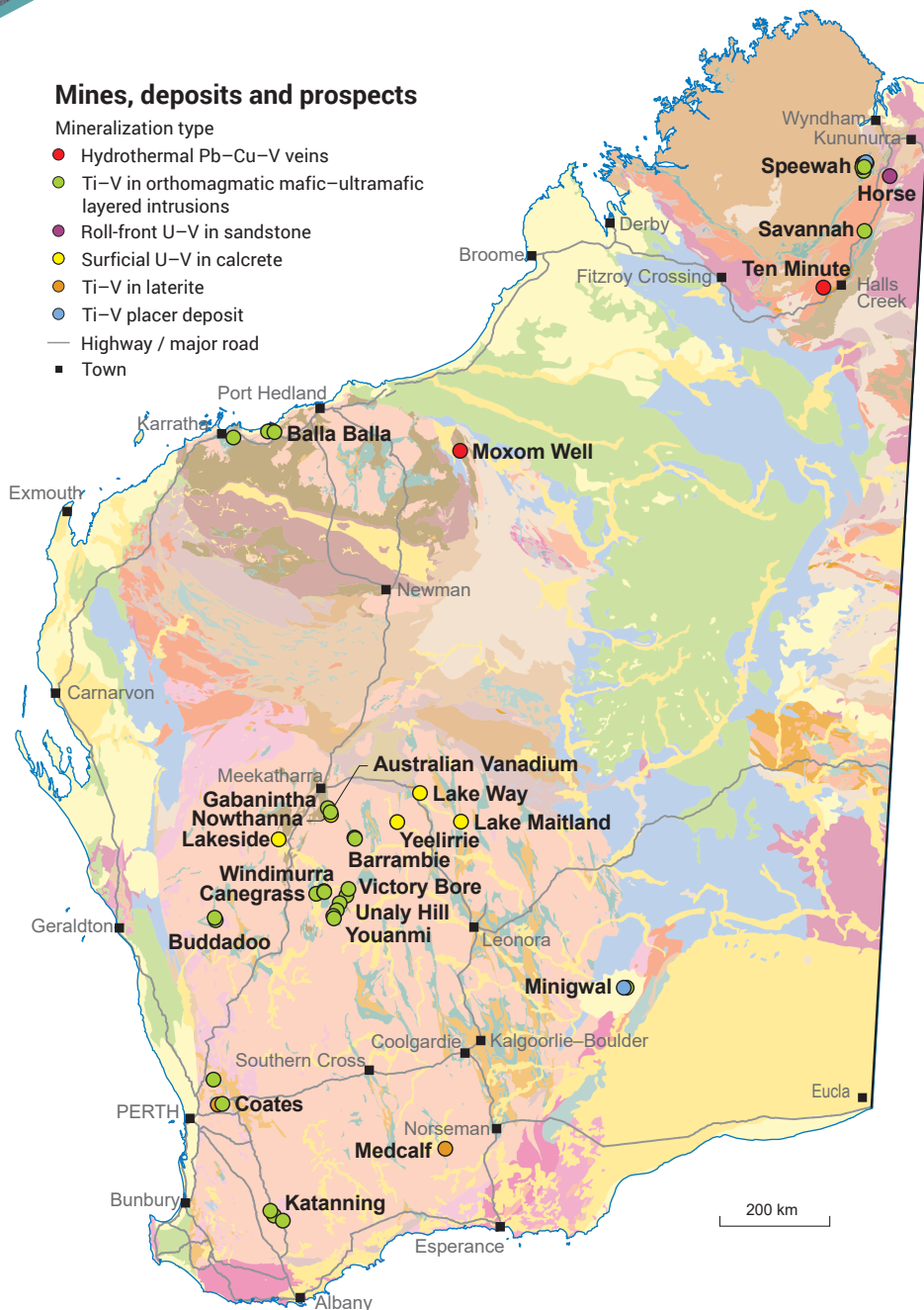
INVESTMENT OPPORTUNITIES

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

Mines, deposits and prospects

Mineralization type

- Hydrothermal Pb–Cu–V veins
- Ti–V in orthomagmatic mafic–ultramafic layered intrusions
- Roll-front U–V in sandstone
- Surficial U–V in calcrete
- Ti–V in laterite
- Ti–V placer deposit
- Highway / major road
- Town



Western Australia continues to grow into a global vanadium hub

- Historical vanadium production since 2000 is 14 100 tonnes of V_2O_5 from the Windimurra mine
- Uses for vanadium are primarily as an alloy to produce high-strength steel. Another emerging application is in redox flow batteries for energy storage uses
- Western Australia has substantial JORC-compliant resources – 24.09 Mt of contained V_2O_5

Seven projects at feasibility/pre-feasibility/scoping stages

Yilgarn Craton

- Windimurra
- Australian Vanadium
- Gabanintha
- Barrambie
- Medcalf

Kimberley Craton

- Speewah

Pilbara Craton

- Balla Balla

\$2523m*
Investment projects



3rd
Resources world ranking



5.0%
Royalty rate



(2018 calendar year)

* Includes projects planned, possible, committed or under construction as of September 2019



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

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Top vanadium projects with resources

Resources estimated according to JORC

Project	Status	Owner	Ore V ₂ O ₅ (Mt)	Av. grade V ₂ O ₅ (%)	Contained V ₂ O ₅ (kt)
Speewah	Pre-feasibility study	King River Resources	4712.0	0.30	13 922.4
Balla Balla	Feasibility study	BBI Group Pty Ltd	455.9	0.66	2 987.5
Australian Vanadium project – Gabanintha	Feasibility study	Australian Vanadium Limited	183.7	0.76	1 398.6
Barrambie	Feasibility study	Neometals Ltd	280.1	0.44	1 234.4
Windimurra	Proposed	Atlantic Ltd	234.0	0.49	1 145.5
Gabanintha	Feasibility study	Technology Metals Australia Limited	131.0	0.84	1 101.8
Victory Bore	Exploration	Surefire Resources NL	151.0	0.44	664.4
Youanmi	Exploration	Diversity Resources Pty Ltd / Lithium Australia	185.0	0.33	610.5
Canegrass	Exploration	Bluebird Battery Metals Australia Pty Ltd	79.0	0.64	503.4
Youanmi	Exploration	Venus Metals Corporation	134.7	0.34	459.3



Ti-V in orthomagmatic mafic-ultramafic layered intrusions

Summary of top vanadium resource projects

- **Windimurra** (Yilgarn): Australia's only vanadium producer between 2000–04 and 2012–14. Established mine with V₂O₅ production facility; feasibility study completed for proposed production restart in 2020 (initial mine life 27 years); reserve of 55.1 Mt at 0.5% V₂O₅
- **Speewah** (Kimberley): Australia's largest vanadiferous titanomagnetite deposit. Metallurgical testwork underway for pre-feasibility study; focus on production of high-purity vanadium electrolyte and titanium dioxide over a project mine life >100 years. The viability of producing high-purity alumina is also under review
- **Balla Balla** (Pilbara): metallurgical testwork (TIVAN process) results from Balla Balla ore; reserve of 229 Mt at 0.62% V₂O₅ (initial mine life 16 years)
- **Gabanintha/Australian Vanadium** (Yilgarn): pre-feasibility work included modelling of vanadium and titanium metal production (mine life >20 years). Possible vanadium–electrolyte pilot plant
- **Gabanintha/Technology Metals** (Yilgarn): pilot plant testwork for definitive feasibility study completed; reserve of 16.7 Mt at 0.96% V₂O₅ (mine life 13 years)
- **Barrambie** (Yilgarn): definitive feasibility study confirms high-purity vanadium pentoxide and ferrovanadium potential; plans for pilot-scale metallurgical testwork; reserve of 39.9 Mt at 0.78% V₂O₅ (mine life 20 years)
- **Medcalf** (Yilgarn): lateritic vanadium–titanium over layered sill. Pre-feasibility study supports V₂O₅ and TiO₂ production from Vesuvius, Fuji and Egmont deposits (mine life 12 years)

For more information



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Western Australia

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