



Arafura Resources Limited

Up and coming supplier of NdPr to permanent magnets used in the growing clean energy industry

July 2018

Noosa Mining & Exploration Investor Conference

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The information in this presentation that relates to Exploration Results or Mineral Resources is based on information compiled by Mr Kelvin Hussey BSc (Hons). Mr Hussey is a Member of the Australian Institute of Geoscientists and he has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code)". Mr Hussey consents to the inclusion in this presentation of the matters based on his information in the form and context in which it appears.

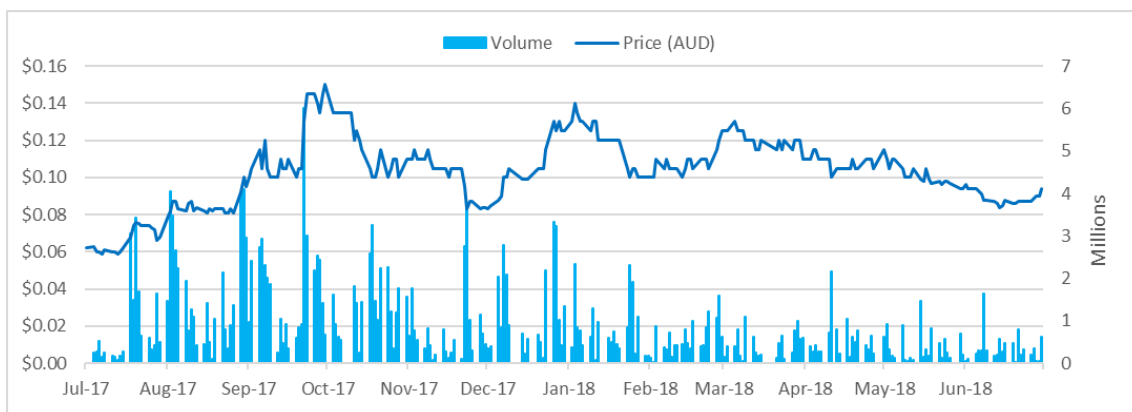
Mr Hussey is a full-time employee of Arafura Resources.

Company Snapshot

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- ASX listed company developing the **Nolans Rare Earths Project** in the Northern Territory, a **long-life** mining and chemical processing operation
- Arafura has the capability of meeting **5-10% of global demand for NdPr**
- Nolans has been afforded **major project status** by the Northern Territory and Australian governments
- Nolans has **environmental approval** and is in **advanced feasibility**

ASX Code	ARU
Share Price (16-Jul-18)	A\$0.094
Issued Shares	575.8m
Market Cap	A\$54.1m
Cash (31-Mar-18)	A\$10.7m
Debt	Nil
Enterprise Value	A\$43.4m



Shareholder Spread	
JP Morgan Nominees	21.34%
ECE Nolans Investment (China)	19.05%
Citicorp Nominees	2.05%
HSBC Custody Nominees	1.54%
BNP Paribas Nominees	0.92%

NdPr Market Update

Secure Supplier of NdPr to Permanent Magnets Used in Clean Energy

- **NdPr Oxide is a key component** in the manufacture of high-strength NdFeB permanent magnets used in electric vehicles (EVs), wind turbines, portable electronic devices, and many industrial applications
- EVs use an additional **1 kg of NdPr per electric drive motor** over a standard vehicle's use of 0.7 kg
- NdPr accounts for 26.4% of Nolans rare earths composition by volume and **85% by value**
- China has been the dominant NdPr producer but recently analysts are forecasting **China to become a net importer**
- Structural changes are being implemented in China to **weed out illegal operators, close unsustainable operations**, and push bigger players to consolidate

NdFeB Magnet Vital To Automotive Market

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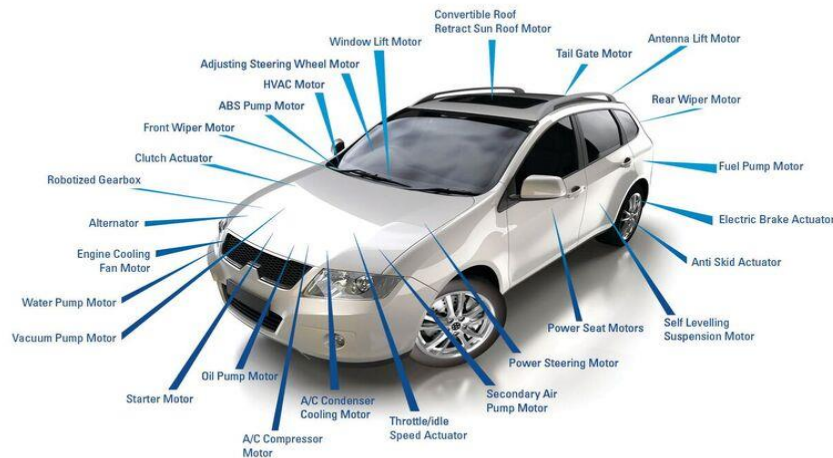
25,000 tonnes NdFeB magnets used in 2016 automotive market growing at 9% CAGR (total market 135,000 tonnes)

EVs and hybrids represent additional growth through Permanent Magnet Synchronous Motors (PMSM)

PMSM is dominant drive train technology for EVs

Recent announcements include:

- Most auto makers have EV targets of 10-60% by 2025
- Tesla moving to PMSM for mass produced Model 3
- Toyota to sell more than 10 EV models in 2020s and have EV versions of every Toyota and Lexus model by 2025 (Dec 2017)
- Ford increasing planned investment in EVs from US\$4.5 billion to US\$11 billion by 2022 and to introduce 16 EVs and 23 hybrid and plug-in hybrid models (Jan 2018)
- EV demand forecasts range from 'big' to 'very big' (HSBC Mar 2018)
- OPEC raises forecast global EV sales in 2040 from 50 million to 250 million; Bloomberg forecasts 500 million (Mar 2018)



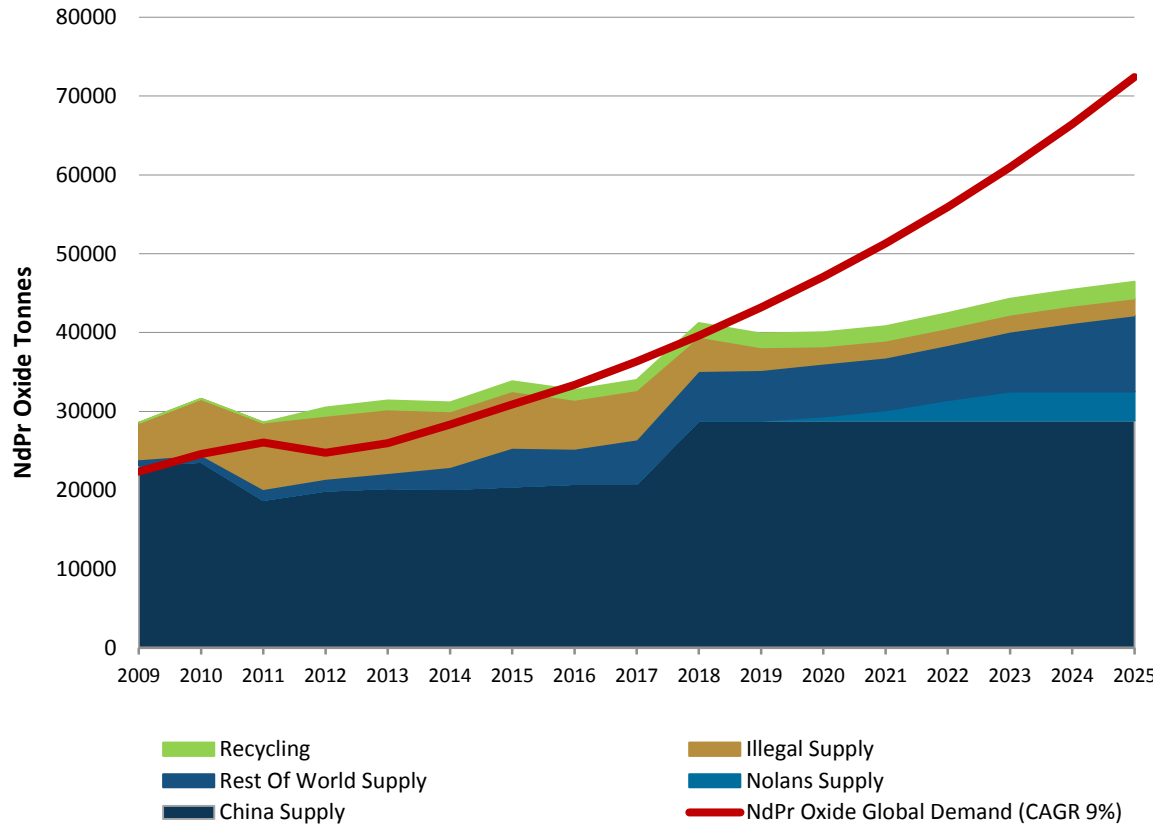
EV Drivetrain: Additional 1 kg of NdPr



NdPr Market Growth Driven By NdFeB Magnets

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NdPr Oxide Supply & Demand

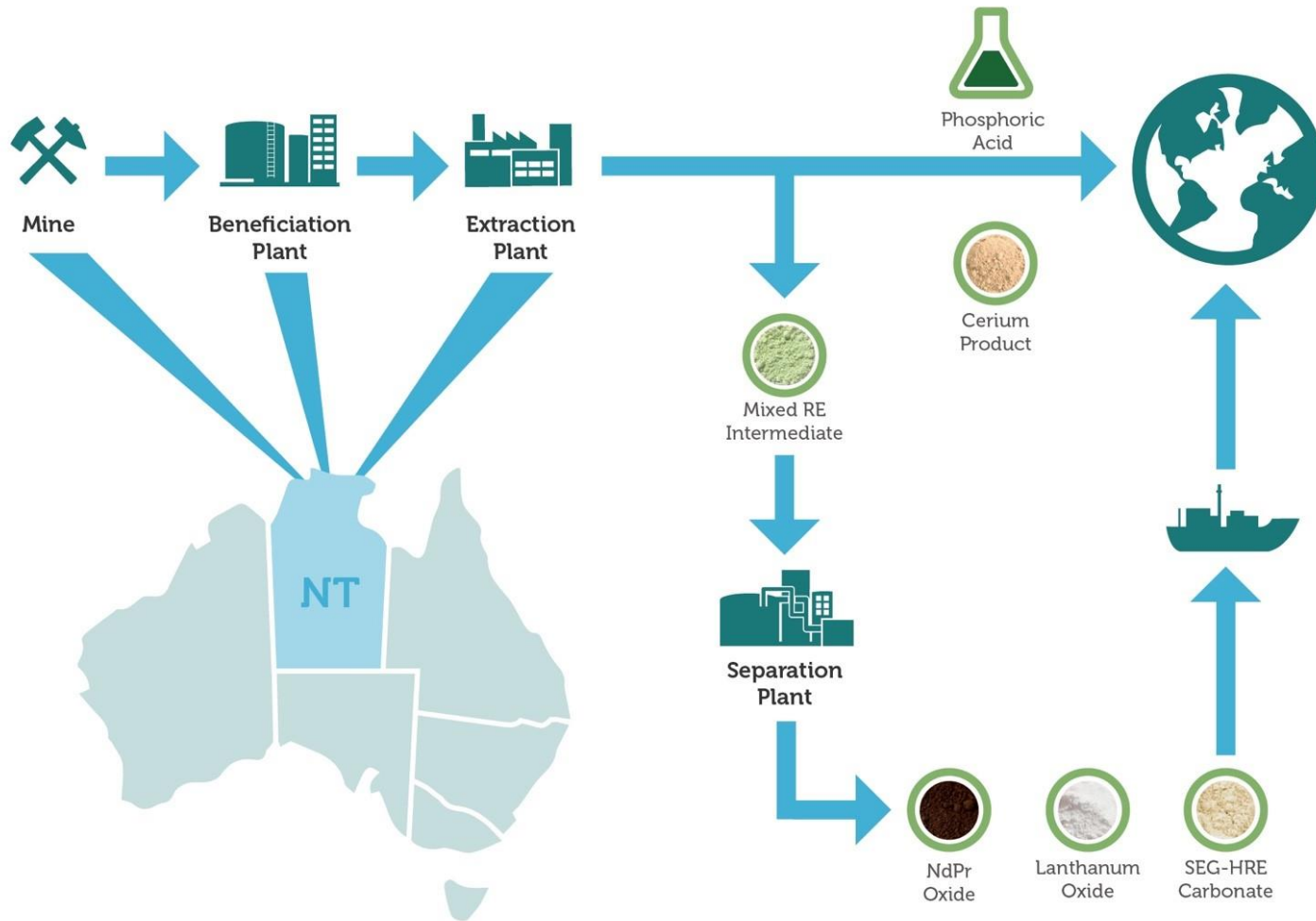


- EV sales 1.2 million in 2017 growing to 1.6 million in 2018; estimated global sales of 25 million by 2025⁽¹⁾
- NdFeB magnet growth at **9% CAGR**
- Additional NdPr Oxide supply of **4,000 tonnes p.a. required** to meet growing demand
- Unsustainable by China to maintain additional supply year-on-year
- **Additional non-Chinese supply required** to meet demand

(1) <https://www.forbes.com/sites/sarwantsingh/2018/04/03/global-electric-vehicle-market-looks-to-fire-on-all-motors-in-2018/#4b12259a2927>

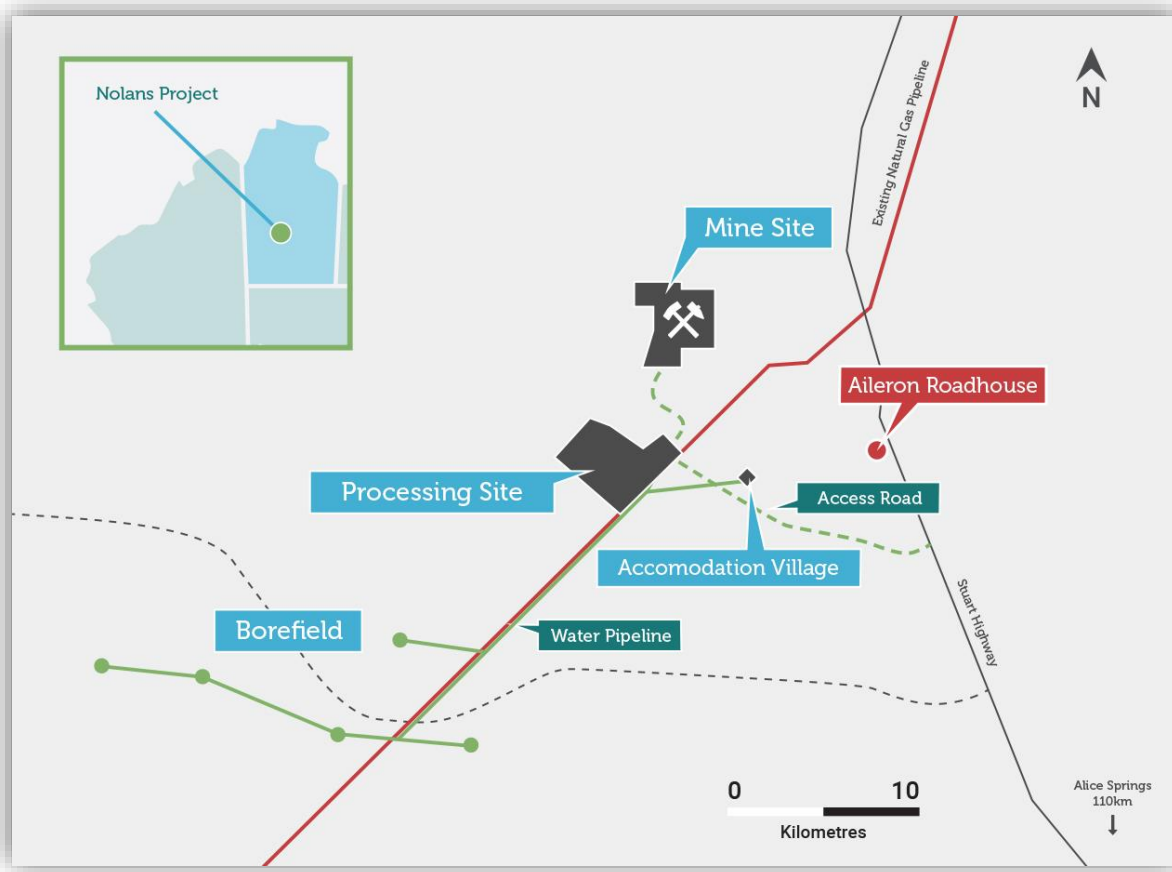
Nolans Project

Project Configuration



Close To Key Infrastructure

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- Stuart Highway – **10 km east**
- Alice Springs railyard, airport and other services – **135 km south**
- Amadeus natural gas pipeline – **adjacent to project site**
- Water supply – **30 km south**
- Tailings and process wastes **remain at site**

Flowsheet Piloting

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Beneficiation Pilot Plant



Bulk Pre-Leach Pilot Plant



- Program **reduces execution risk** by addressing all key engineering and operational considerations prior to commissioning of the commercial facility
- Draws on independent expert advice from **specialist consultants and equipment vendors**

Phase 1
Beneficiation

- ✓ 5,000 kg high-phosphate concentrate
- ✓ >82% NdPr recovery
- ✓ >90% P₂O₅ recovery
- ✓ Met performance objectives

Phase 2
Phosphate Extraction

- ✓ Merchant grade phosphoric acid suitable for fertilizers
- ✓ 3% TREO losses to gypsum waste
- ✓ Met performance objectives

Phase 3
Bulk Pre-Leach

- ✓ 2,000 kg pre-leach residue
- ✓ Met performance objectives

Phase 4
Acid Bake

- Pre-commissioning commenced

Phases 5 & 6
Rare Earth Processing

- Pilot setup and operation scheduled

Phase 7
Rare Earth Separation

- Planning well advanced



Phosphate Extraction Pilot Plant



Acid Bake Pilot Plant

Definitive Feasibility Study

- ✓ **Director appointment:** Mark Southey, previously WorleyParsons Group Managing Director for Minerals, Metals and Chemicals
- ✓ **Nolans Project Manager appointment:** Stewart Watkins, chemical engineer (AusIMM) 25 years experience
- ✓ **DFS Lead Engineering Study Manager appointment:** **HATCH**
- ✓ **Process design commenced:** engineering study expected completion in 2018

- Process design criteria, PFDs and mechanical equipment list issued for use for the DFS
- Underway
 - Layouts of process plant
 - Energy demand finalised and commenced discussions with Power and Water Corporation
 - Tailings impoundment designs and planning for site geotechnical program
- Awarded
 - Mine planning: Mining Plus
 - Transport and logistics study: Qube Bulk
 - Water supply study and design: GHD and Ride Consulting
 - HR study: Strategic Human Resources

Project Metrics

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- **Ultra competitive operating costs**
US\$6.23/kg TREO or US\$24.38/kg NdPr oxide – lowest amongst peers
- Phosphoric acid recovered to **reduce commodity risk**
- **High rare earths recovery**
- NdPr oxide price **US\$53.00/kg**

Refer Arafura ASX release 7 June 2017 for additional and qualifying information on the Mineral Resources that underpin the production target and provides the material assumptions on which the production target is based

The Company confirms that all material assumptions underpinning the forecast financial information derived from its 14,000 tpa TREO production target and the production target itself, continue to apply and have not materially changed since the 7 June 2017 ASX release

Based on 14,000 tpa TREO production processing Measured and Indicated Mineral Resources as per Appendix A

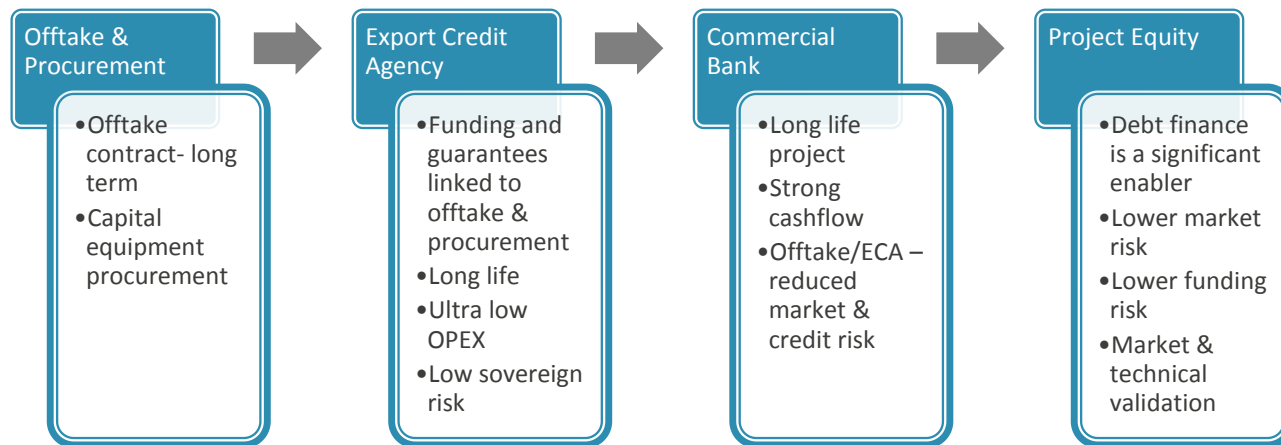
NdPr oxide price as at 28 June 2018

Mining & Processing		
ROM feed (tpa)	525,000	
Mine life (years)	30+	
Recovery (ROM to final product)	Total RE	76%
	NdPr	75%
	La	75%
	SEG-HRE	68%
Production		
TREO equivalent (tpa)	14,000	
NdPr oxide (tpa)	3,600	
La oxide (tpa)	2,660	
SEG-HRE carbonate (tpa TREO equivalent)	660	
Phosphoric Acid (tpa MGA)	110,000	
Financial		
Capital cost (US\$m)	\$680	
Operating cost (US\$m pa)	\$125	
Operating cost (US\$/ kg TREO)	\$8.89	
Operating cost (US\$/ kg TREO; less credit phos acid)	\$6.23	
Operating cost (US\$/ kg NdPr; less credit phos acid)	\$24.38	

Project Funding Strategy

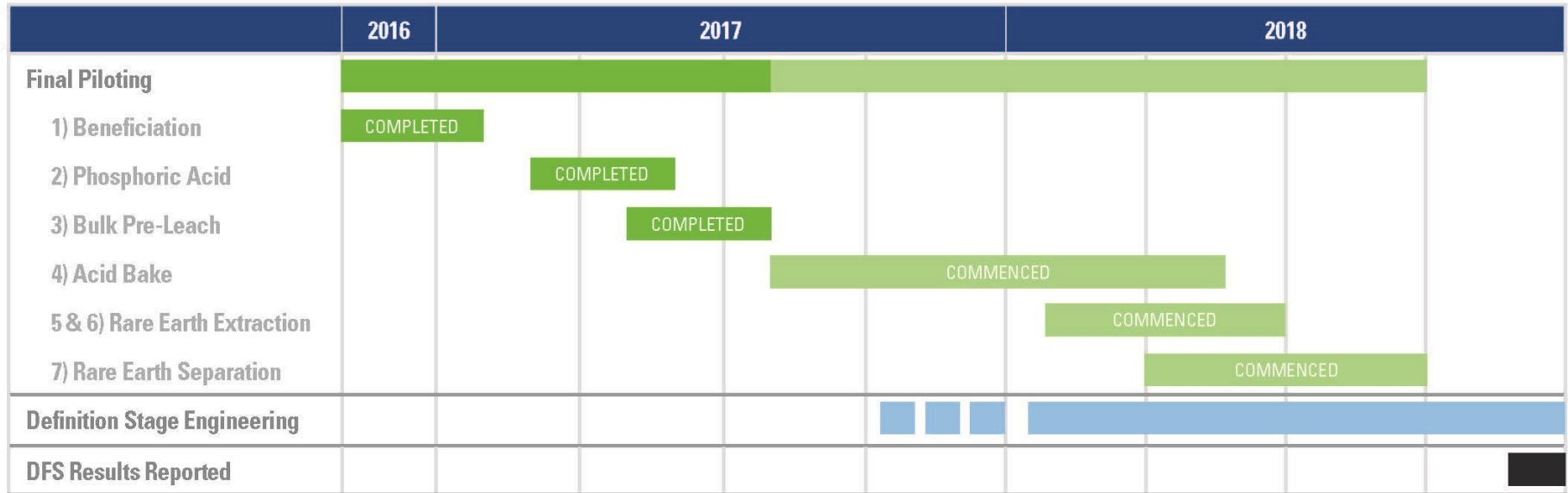
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- **Advancement of environmental approval critical enabler** for engagement with offtakers, financiers and Export Credit Agencies (ECA)
- ECAs are key to providing government-backed funding and guarantees, leveraged against the strategic link to NdFeB magnet production
- ECA funding linked to offtake arrangements, capital equipment supply, and construction
- ECA-linked project finance is a catalyst to attract equity at corporate and/or project level
- Project sell down may also be a source of project equity



Timeline & Targets

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2018 targets include:

- Advancing **NdPr offtake arrangements**
- Completing the **DFS and definition stage engineering**
- Engaging with **strategic partners for capital equipment procurement and project funding**

Summary

Why Arafura?

Attribute	Arafura
High-growth and high-value NdFeB permanent magnet focus	✓
NdPr production planned to coincide with projected supply gap	✓
Low production cost to remain competitive in a cyclical downturn	✓
Located in a jurisdiction with low geopolitical risk and with strategic support	✓
Long-life, low-risk resource with planned output that supports >20 years of production	✓
Close to vital transport, energy and water infrastructure	✓
Environmental approval secured	✓
Dedicated team that has developed an efficient, high-recovery flowsheet now in final piloting phase	✓



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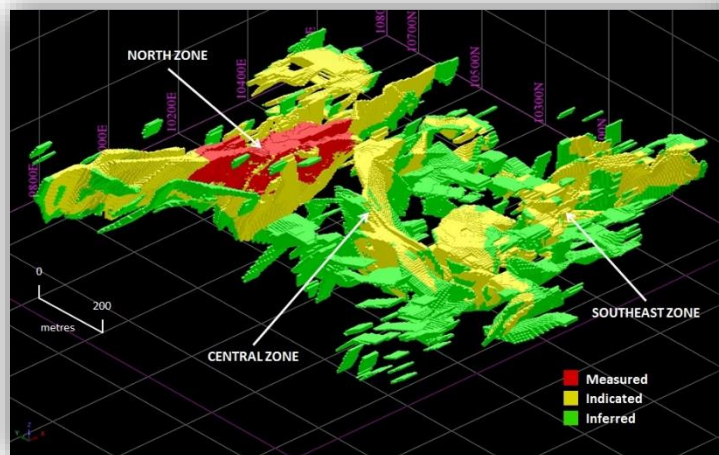
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Appendices

Appendix A: Mineral Resources

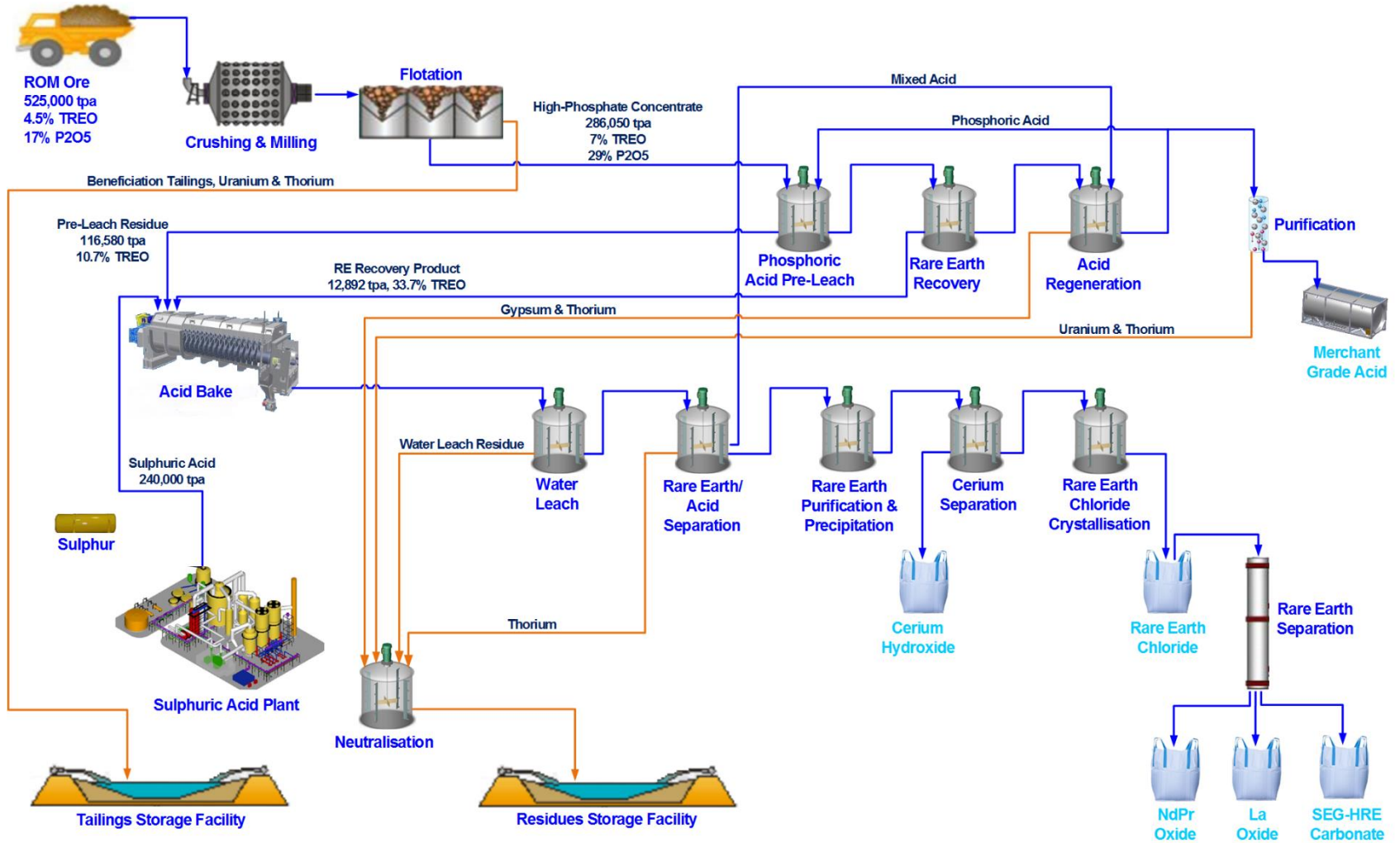
RESOURCES	TONNES (m)	RARE EARTHS TREO %	PHOSPHATE P ₂ O ₅ %	NdPr Enrichment %
Measured	4.9	3.2	13	26.1
Indicated	30	2.7	12	26.4
Inferred	21	2.3	10	26.5
TOTAL	56	2.6	11	26.4

1% TREO cut-off grade. Numbers may not compute exactly due to rounding. "NdPr enrichment" is the proportion of TREO comprising Nd₂O₃ and Pr₆O₁₁.



- **Low resource risk** via extensive drilling and detailed material type studies
- Mineralization **at surface** and **open at depth**, below 215m
- 90,000 metres of drilling
- Amenable to **low-cost open cut** mining and standard beneficiation techniques
- Apatite is the most abundant REE-bearing mineral

Appendix B: Process Flowsheet

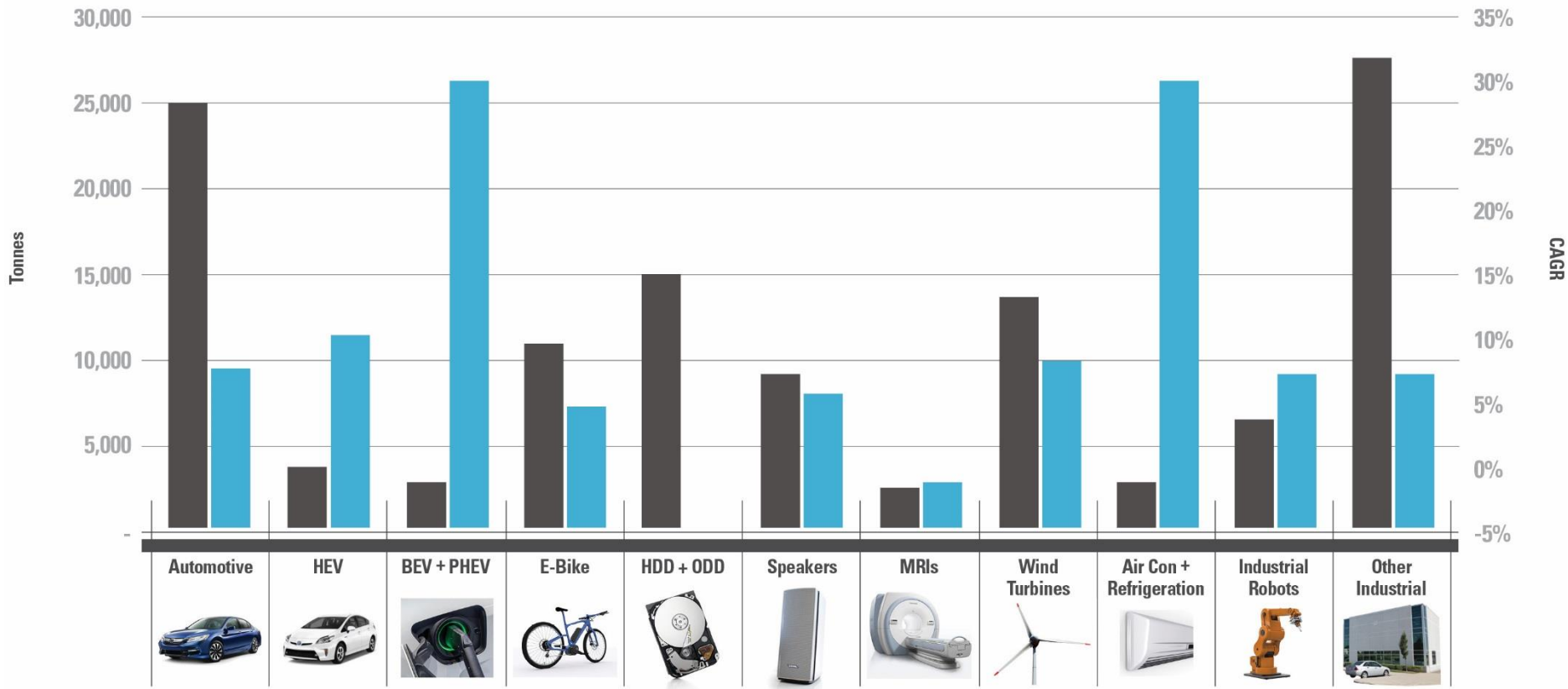


Where indicated, process flows are being used in the DFS. TREO and P₂O₅ grades are from the pilot program.

Appendix C: Established Markets & Growing Applications

NdFeB Magnet Volume & Forecast Growth

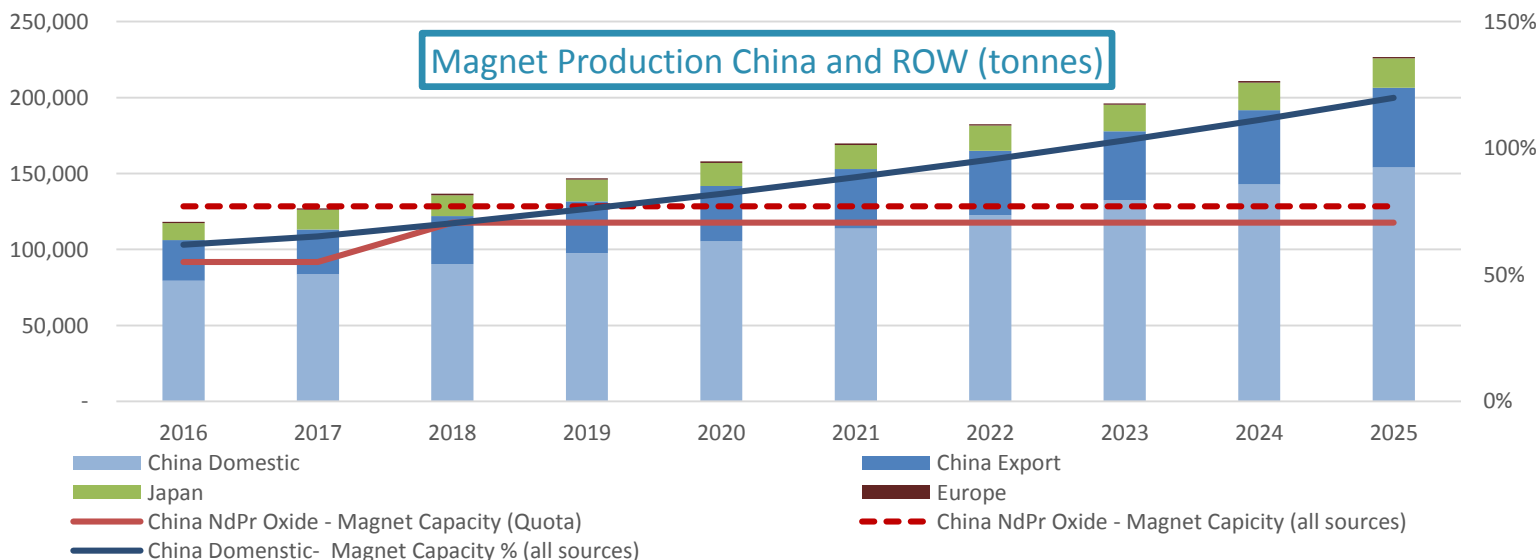
■ NdFeB Magnet Tonnes 2016
■ Forecast CAGR% 2025



Source: Adamas Intelligence, Arnold Magnetic Technologies, Japanese industry participants, Roskill

Appendix D: Emerging Demand Dynamic – China 2025 Strategy

- **China’s domestic NdPr consumption will increase** as it pursues clean energy objectives and global leadership in EV manufacturing
- Expect to see Chinese investment in producers operating outside the quota, to bring them to a sustainable operating standard. This will have a **flow-on impact for operating costs** and will need to compete with capital demands for other downstream value-add opportunities.
- Chinese NdFeB magnet manufacturers to **expand production 30-50% over the next 5 years** targeting export markets
- Chinese (non-SOE / private) NdFeB magnet manufacturers with large export sales are **advancing long-term non-China offtake** to diversify NdPr supply, sometimes at the request of OEMs
- **In the early 2020s China will become a net importer of NdPr**



Source: ACREI, Argus Metals and industry sources

Appendix E: Board



IAN KOWALICK
NON-EXECUTIVE CHAIRMAN

Ian Kowalick has qualifications in science, engineering, economics, and finance. From 1995 to 2000, he held the most senior management position in the South Australian public sector, and is currently the Chairman of the South Australian Forestry Corporation Board. Ian is a board member of the Northern Territory Power and Water Corporation.



TERRY GROSE
NON-EXECUTIVE DIRECTOR

Terry Grose has a strong commercial background gained over 30 years as a senior business executive, consultant, and director, in Australia and internationally. Terry worked in Hong Kong for over a decade in a senior financial role before establishing his own business, Grose International, a commercial and financial consultancy with clients throughout Asia.



GAVIN LOCKYER
MANAGING DIRECTOR

Gavin Lockyer's diverse, global experience has provided management and leadership opportunities in a range of disciplines including; Accounting, Financial & Investment Banking, Major Resource Development & Operations, and Global Bank Treasuries. Over the past 20 years his career has exposed him to business practices in North America, Europe, and Australasia.



QUANSHENG ZHANG
NON-EXECUTIVE DIRECTOR

Quansheng Zhang holds a Doctoral degree in Engineering and a Masters degree in Geophysical Prospecting. He is based in Nanjing in the Peoples Republic of China and is the General Manager of Hong Kong East China Non-Ferrous Mineral Resources Co Ltd (HKECE). Quansheng has over 30 years of mineral prospecting and exploration experience, and expertise in mineral resource surveys and geophysics.



CHRIS TONKIN
NON-EXECUTIVE DIRECTOR

Chris Tonkin has over 35 years' experience as a senior business executive with a broad industry background in business generation, management, and strategy development. He is a member of Arafura Resources' Remuneration and Nomination and Audit and Risk Committees and is also Chairman of Lakes Oil NL.



MARK SOUTHEY
NON-EXECUTIVE DIRECTOR

Mark Southey has previously held senior executive positions with Honeywell and ABB both in Australia and internationally, and more recently was part of the global executive leadership team within WorleyParsons, where he held the position of Group Managing Director for the Minerals, Metals and Chemicals Sector.

Appendix F: Management



RICHARD BRESCIANINI
GENERAL MANAGER EXPLORATION & DEVELOPMENT

Richard has over 30 years' experience in the minerals industry. He worked with BHP Minerals on base and precious metals exploration programs throughout Australasia and North America, contributing to significant economic discoveries at Eloise (copper-gold) and Cannington (silver-lead-zinc). Thereafter he led the Northern Territory Government's Geological Survey as its Director from 2003 to 2007 before joining Arafura.



LLOYD KAISER
GENERAL MANAGER SALES, MARKETING & TECHNOLOGY DEVELOPMENT

Lloyd has more than 10 years' experience in the sales and marketing of industrial minerals into high value sector markets including the nuclear, automotive, and advanced ceramics sectors. Prior to joining Arafura, he held several senior positions in account management, business development and marketing across a diverse range of commodities and chemicals including alumina, coal, industrial minerals, refractories, and ceramics.



PETER SHERRINGTON
CHIEF FINANCIAL OFFICER & COMPANY SECRETARY

He commenced employment with Arafura in 2008 as Commercial Manager and was appointed Chief Financial Officer in July 2013. He has more than 20 years' experience in professional and corporate roles in Perth. Prior to working with Arafura, he held senior finance and commercial positions with several ASX and public unlisted entities. He has also worked in public practice for 10 years in the areas of business services and corporate advisory.



BRIAN FOWLER
GENERAL MANAGER NT & SUSTAINABILITY

Brian has worked for over 40 years in private sector mineral companies developing a range of commodities, including rare earths, base metals, and gold. Brian is a member of the Northern Territory Mining Board, Management Board of the Northern Territory Minerals Council of Australia, and a member of Work Health & Safety Advisory Council of the Northern Territory.



STEWART WATKINS
PROJECT MANAGER – NOLANS PROJECT

Stewart Watkins has 25 years' experience in many facets of the mining industry including operations, engineering consulting, project development and management. Stewart is a Fellow of the AusIMM.