



QUEENSLAND
PACIFIC METALS

Presentation

Dr Stephen Grocott
CEO

March 2021

ASX:QPM

www.qpmetals.com.au

***Re-energising Australia with
critical battery metals production***

121 Mining Investment APAC

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Company



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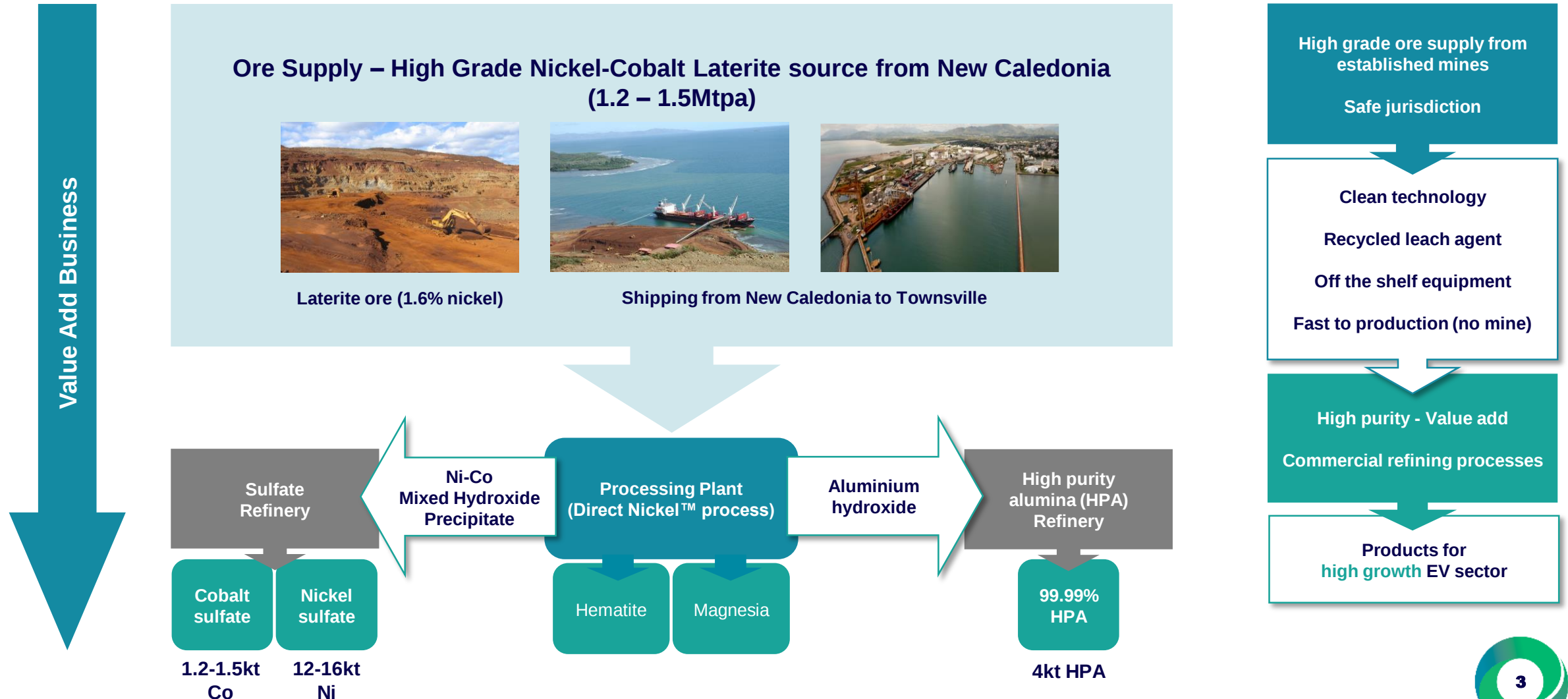


Stephen Grocott

Chief Executive Officer

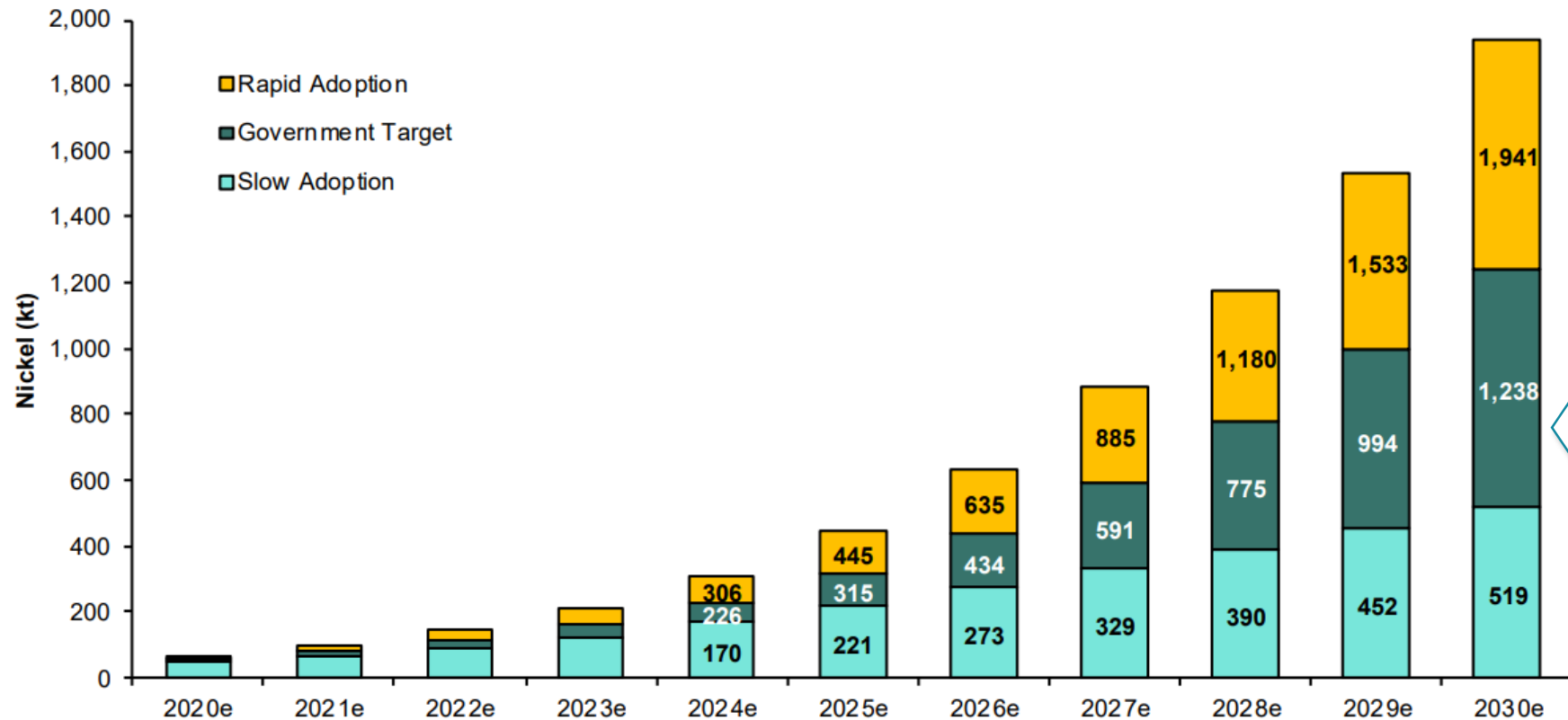
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Townsville Energy Chemicals Hub – “TECH Project”



Nickel Demand and the Project Pipeline

... in addition to current 2.3 Mtpa Ni for stainless steel, alloys, etc!



Source: Bernstein estimates and analysis

???

*...but where
will this extra
0.5 – 2M tpa nickel
come from?*

Tesla's estimate
(although ambitious)
for their own nickel demand
alone was 1.15Mt!

Sources of Nickel

Nickel Sulfides

- Reserves depleting (and only < 30% of world nickel reserves)
- Sulfide ore processed through to concentrate
- Next processing steps are big, complex and long lead-time
 - Concentrate typically smelted to nickel sulfide matte
 - Matte then refined to nickel metal or sulfate
- New exploration finds will be slow to market vs QPM TECH Project



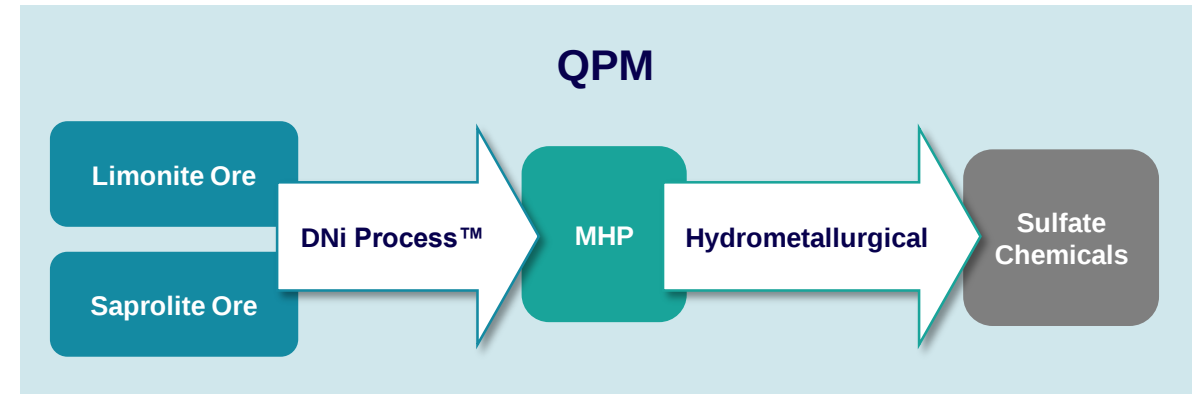
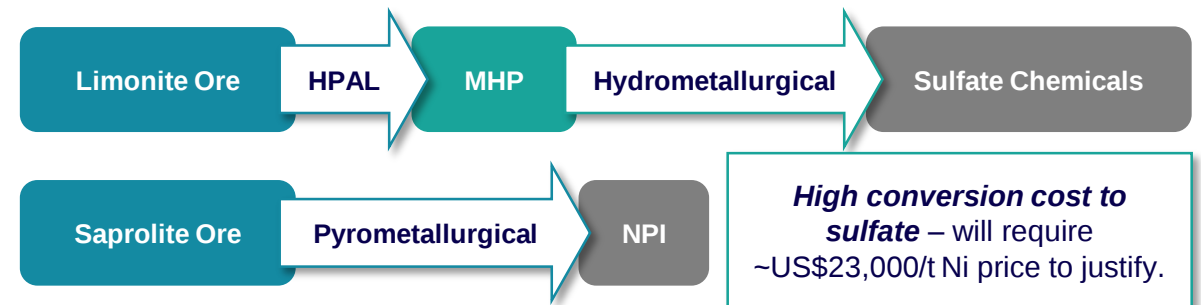
- Processes to convert concentrate straight to sulfate chemicals are in the early stages of development (high risk and expensive)

Nickel Laterites

- Limonite ore (high iron)
 - Typically processed through to MHP, which can then go straight to sulfate chemicals

- Saprolite ore (low iron, high magnesium)
 - Typically processed into nickel pig iron or ferronickel for stainless steel

Traditional



Where will the nickel come from – the cupboard is empty?

Nickel pig iron	• Conversion to nickel sulfate is chemically possible but not economically possible • Needs nickel >US\$23,000/t • Very “ugly” environmental footprint
Ferronickel	• Ditto
Nickel sulfides or MSP	• Sustainability – tailings, acid mine drainage, etc • Going from a sulfide concentrate to nickel sulfate is complex, difficult and expensive • Going directly from sulfide to nickel sulfate is mostly at lab/pilot scale or challenging • ... anyway, there’s not enough sulfide resource to meet global demand
Nickel metal	• Common practice and temporarily filling the gap (at a cost of ~US\$0.50 – 1.00/lb) • But the world still needs some Class I nickel metal for stainless steel and alloys – so this is only a stop-gap measure • Class I metal deficit by 2023 - 2025
High pressure acid Leach (HPAL)	• 10 – 11 of 12 existing HPAL operations have failed to meet objectives • Big sustainability challenges – effluent to ocean, 1.2 – 1.4t tailings/t ore, tailings disposal or filtration (e.g. Goro - very high capital) • Indonesia? Barriers include sustainability (tailings, effluent), coal electricity, destined for China and jurisdiction • High capital intensity US\$60 - \$120k/annual tonne nickel (including ESG capital and on Nickel-equivalent basis) • Low availability (averages << 80%) • Long ramp up (averages >5 years) • Very slow development (minimum 5 yrs, typically >10 yrs) • Complex technology (can be done but you have to be good to develop, build and operate)
MHP refinery	• But where will the MHP come from – HPAL (see above !) • Needs a MHP refinery • Brownfields refinery (with HPAL) is attractive but adds to capital intensity

MOUs for Offtake – LG Chem and Samsung



QPM and LG Chem agree to negotiate a binding offtake agreement for:

- 3-5 year term
- 10,000tpa contained nickel
- 1,000tpa contained cobalt
- Consideration of prepayment by LG Chem

Refer to ASX Announcement 15 October 2020



QPM and Samsung SDI agree to negotiate a binding offtake agreement for:

- 3-5 year term
- 6,000tpa contained nickel

Refer to ASX Announcement 26 November 2020

Re-Energising Nickel Production

What does this mean for the TECH Project?

- Attracting the attention of world class, bankable offtake partners
- QPM is being recognised as a potential supplier to address the growing concerns in the industry with respect to nickel supply
- Provides confidence that demand is there for larger scale TECH Project
- Competitive tension for offtake negotiations
- Vote of confidence from two world class battery manufacturers



Direct Nickel Process™ - Advantages

Nitric acid leaching: most efficient acid

- Low temperature, atmospheric pressure
- Treats entire orebody
- Simple alloys/construction
- 95% metal extraction
- Licensed from Direct Nickel (DNi Process™)

Recycle/re-use > 98% of the leaching agent

- Significantly reduce operating costs
- Greatly reduced environmental impact

Product options:

- Mixed Hydroxide Product MHP (>40% nickel) or refined, battery-grade products

Co-product revenues: Hematite, Magnesia, High-Purity Alumina

- Little or no residues

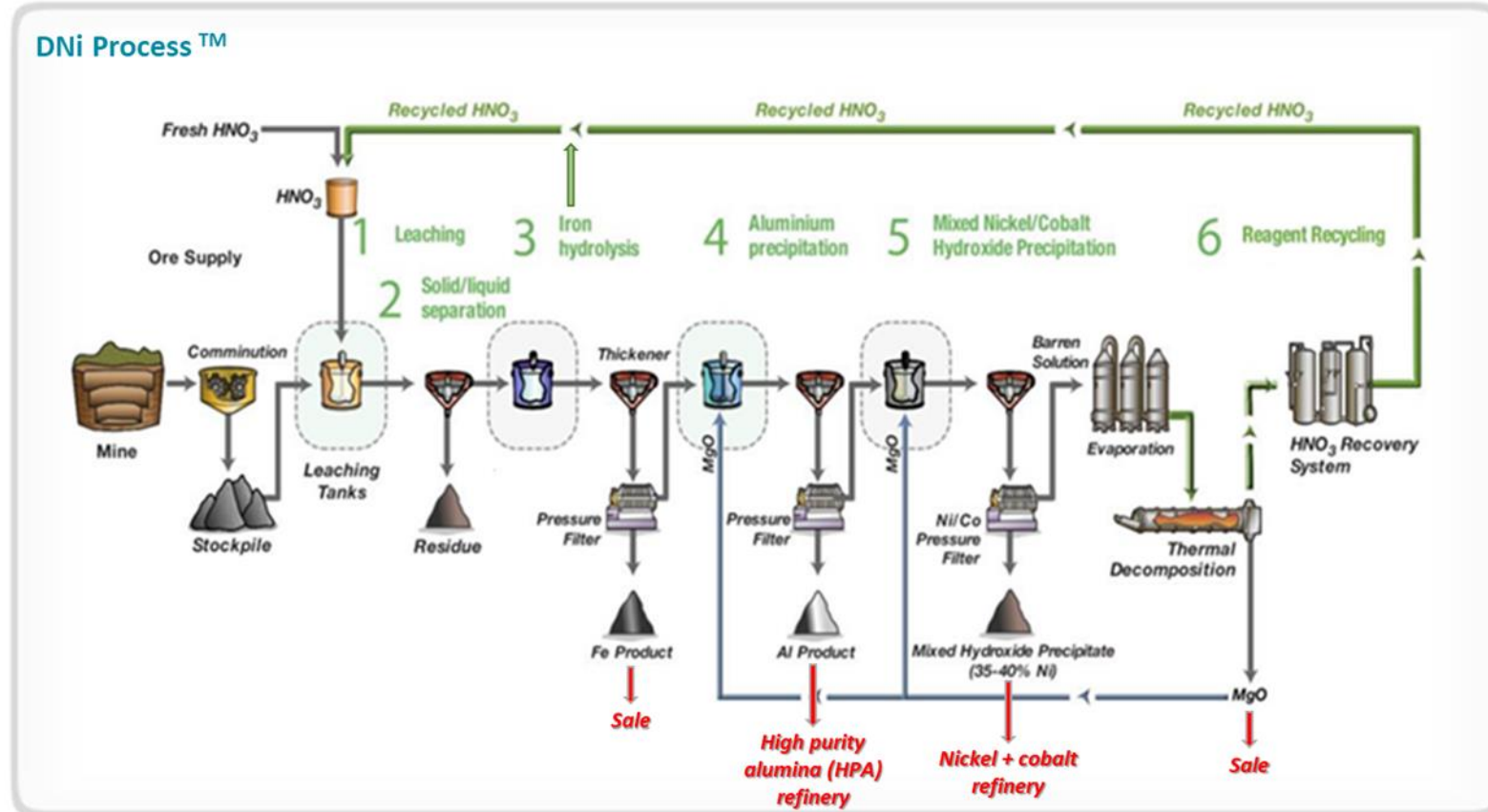
Scalable:

- Stirred tanks – just make them bigger

Speed to market:

- Approvals – no mine, no effluent, no tailings
- Construction – simple alloys and vessels

Re-Energising Nickel Production



Direct Nickel Process™ flowsheet

The Right Time for the Direct Nickel Process

First HPAL* 1960

* HPAL "High pressure acid leach"

2nd Generation HPAL

Bulong 1998-2003 (C&M)

Murrin Murrin 1999→ (operational, 75% design)

Cawse 1998-2009 (C&M)

3rd Generation HPAL

Ravensthorpe 2008-2009, 2011-2017 (C&M), 2020

Goro 2009→ (operational, 65% design)

Ramu 2012→ (operational, 5 year ramp-up)

Ambatovy 2012→ (operational, poor availability)

Taganito 2013→ (operational, poor availability)

Gordes 2014→ (operational, low throughput)

3rd Generation HPAL

Coral Bay 2005- (operational)

1st Gen Nickel Pig Iron

China plants – 8% Ni (low quality)

DNi Pilot Plant

Successful demonstration of technology - but the time (product market) wasn't right

2nd Gen Nickel Pig Iron (NPI)

14% Ni (high quality) squeezing out need for LME nickel metal for stainless steel.

Most viable process for stainless steel industry

EV Revolution

Class 1 nickel (after refining) for batteries – NPI not suitable for batteries.

Not enough sulfide resources to meet demand – laterites must be developed.

HPAL issues (capital, environment, failures) – Right time for DNi Process™



The Need for Green

The world is more socially, environmentally conscious.

- HPAL/NPI - sovereign risk, tailings

- NPI - very high GHG intensity

TECH Project – delivering Ni/Co from a safe jurisdiction with an attractive environmental footprint

Sustainable Nickel Production

Global leader in lowest CO₂ emissions for nickel sulfate production

- 3.4kg CO₂ per kg nickel sulfate
- Industry average per Nickel Institute is 5.4kg CO₂
- 36% lower than industry average
- Emissions can be further reduced by using vented/flared gas from existing coal mines (CO₂ credit received)
- Nickel matte, which is derived from nickel pig iron, is not a clean source of nickel for nickel sulfate
- Refining nickel matte is complex and capital intensive – it only takes place at a few places in the world

	1kg Class 1 Ni (>99.8% Ni)	1 kg Ni in FeNi (27% Ni in FeNi) Nickel Pig Iron / Pyrometallurgical	1kg Ni Sulfate (22.3% Ni in NiSO ₄)	1kg Ni metal in Ni Sulfate (4.48 kg Ni Sulfate)
CO ₂ eq emissions (kg)	13	45	5.4	24.2

No Tailings Dam

- All metals are leached into solution and nitric acid is recycled
- Residue is inert silicate
- MOU with James Cook University to investigate potential to utilise residue in commercial opportunities such as engineered landfill

Pilot Plant Activities

Pilot Plant

- Currently undertaking piloting activities at ALS Global
- Strong team including QPM Owner's team, Altilium Group, CSIRO, ALS Global and Hatch
- Commissioning run completed before end of 2020
- Continuous pilot runs being undertaken Q1 2021

Objectives

- Confirm flowsheet for TECH Project
- Produce samples of MHP for offtakers
 - MHP is key – offtakers view conversion of MHP to sulfate as low risk, since this is already common practice and MHP is a more liquid market
- Upgrade MHP to nickel sulfate and cobalt sulfate
- Produce aluminium hydroxide for conversion into HPA
- Produce iron product for conversion into saleable high grade haematite
- Produce residue for characterisation testing and evaluation as engineered landfill
- Provide data for DFS

Bankable Feasibility Study

- Appoint world class engineering group as study lead manager
- Build out owners team
- Commence towards end of Q1 2021 (post piloting)



John Downie (L) and Dr Stephen Grocott (R) with first MHP produced from pilot plant

Pilot Plant Activities



QPM Pilot Plant located at ALS Global Hydrometallurgy Centre of Excellence, Perth, Western Australia

Highly Experienced Technical Team



John Downie
Managing Director

- 40+ years experience
- Extensive nickel laterite experience
- Previous positions include:
 - Director of Mines at Goro
 - Director of Projects at Queensland Nickel
 - CEO of Gladstone Pacific Nickel



Dr Stephen Grocott
CEO

- 40 years experience
- Extensive nickel experience including laterites (HPAL, atmospheric, heap and bio leach) and sulfides
- Extensive alumina refining experience
- Previous positions include:
 - Chief Technical Development Officer at Clean TeQ
 - Chief Advisor Processing at Rio Tinto
 - Global Technology Manager at BHP



Dr Frank Houllis
Study Manager

- 25+ years experience
- Extensive process commercialisation experience
- Previous positions include:
 - CEO Magnis Energy Technologies
 - Director Imperium 3 Townsville
 - Project Leader ANSTO Minerals



Hermann Scriba
Technical Consultant

- 30+ years experience
- Metallurgical process consultant
- Extensive experience in piloting, feasibility, detailed design and commissioning
- Previous positions include:
 - Technical Development Anglo American
 - Engineering Consulting

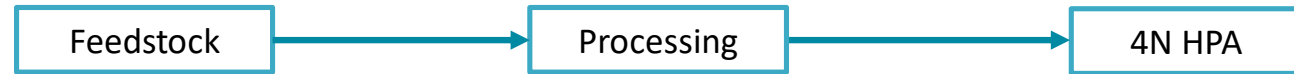


Boyd Willis
Technical Consultant

- 30+ years experience
- Nickel laterite specialist including HPAL, atmospheric and heap leach
- Worked on over 30 nickel laterite projects
- Previous positions include:
 - Kwinana Nickel Refinery
 - Queensland Nickel Refinery

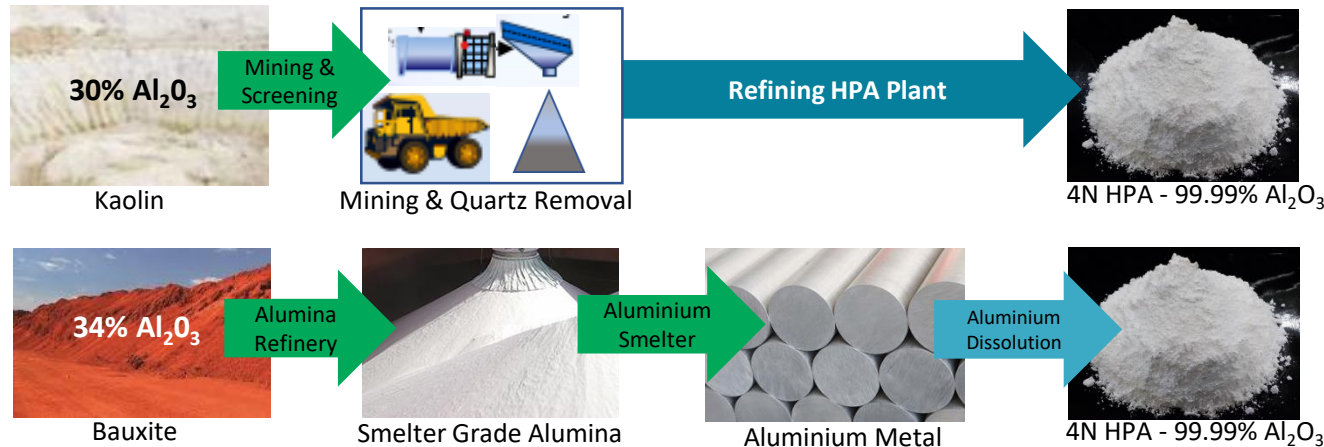
HPA – TECH Project Advantage

Project Economics Boosted with Aluminum hydroxide Co-Product Upgraded to produce High Purity Alumina HPA (4N) in lowest cost quartile

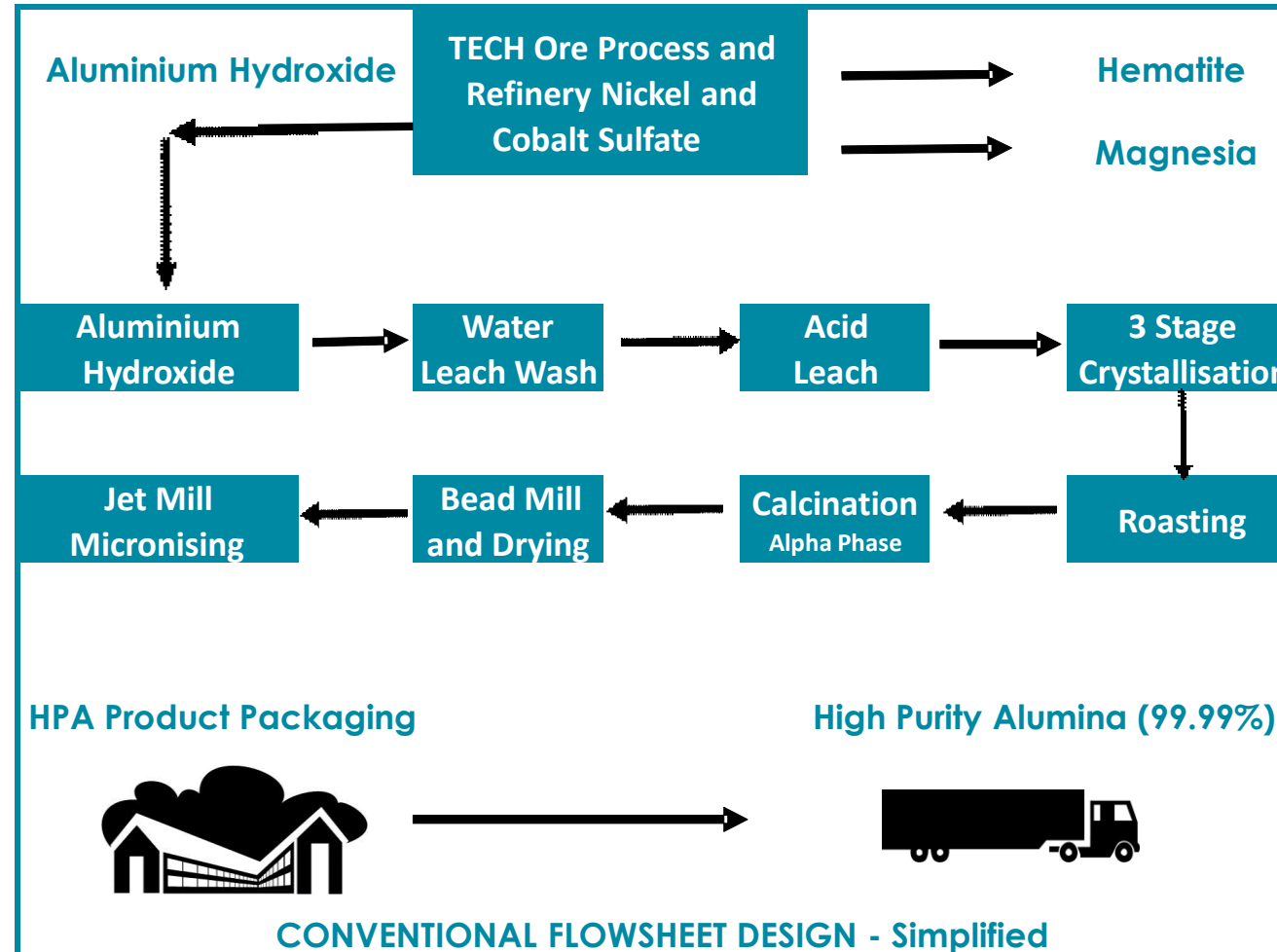


CRU forecast 272,000 tpa of HPA demand by 2028 (i.e. 30% CAGR demand growth by 2028)

- Future LED markets will require higher quality HPA
- LIB separators demand 187,000 tpa by 2028
- LED's demand forecast 85,000 tpa by 2028
- Significant supply deficit forecast

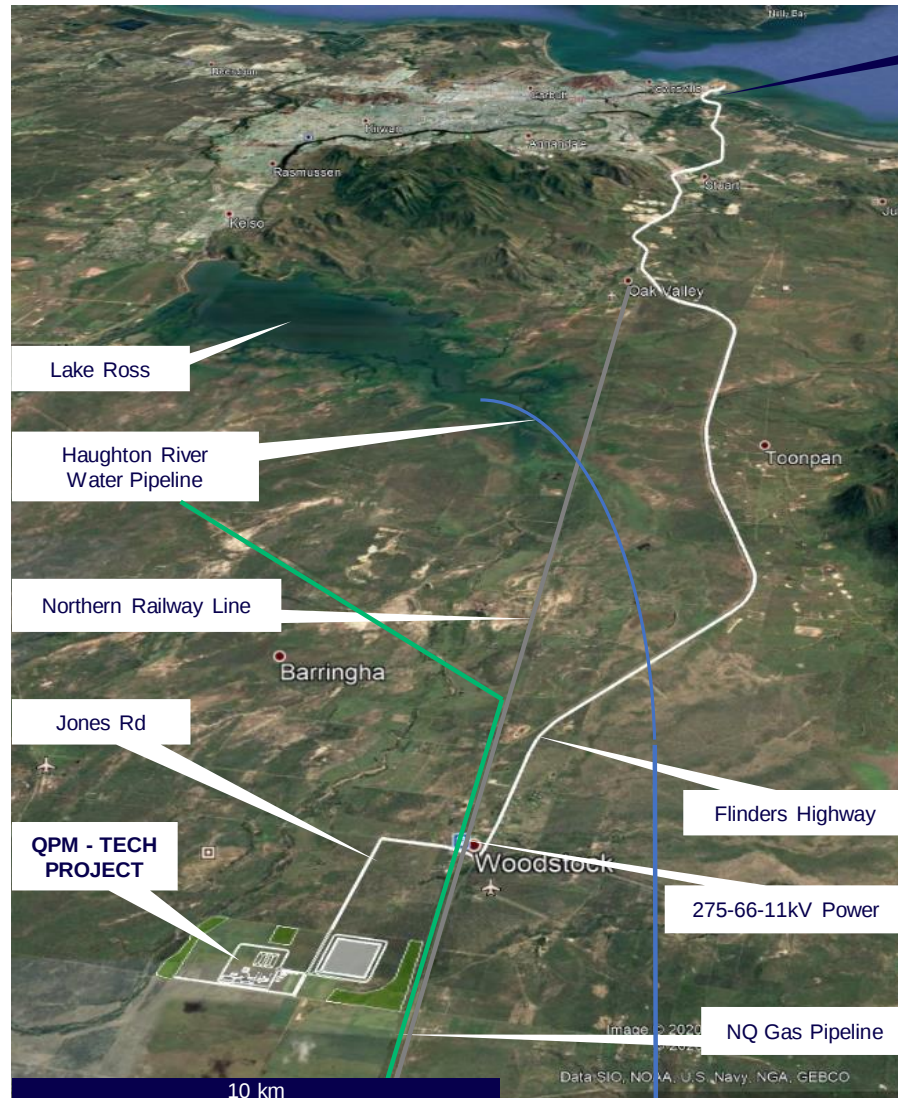


HPA Flowsheet



HPA process flowsheet

Project Location: Lansdown



Ideal site (290 Ha) allocated to QPM in the Lansdown Eco-Industrial Precinct

- Water pipeline
- Gas pipeline (35 PJ/y capacity – we need 10 PJ/y)
- Electric transmission lines (275kV, 66kV and 11kV)
- Fibre optic communications
- Existing Ross River (140 MW) and Edify (400MW) solar arrays
- Road train access to Townsville Port (Flinders Highway)
- Rail line
- Environment - gently undulating grazing land, sparsely wooded
- Zoned heavy industrial

Infrastructure, Logistics and Supporting Services

Port	• Advanced negotiations with Port of Townsville for berth access and development of warehouse for ore stockpile to unload cargoes
Road/Rail	• Optimisation study for road vs rail to transport ore and final products • A\$12M committed by Qld Labor government to upgrade road infrastructure to Lansdown
Gas	• Confirmed significant availability in gas pipeline owned by Palisade (current utilisation <15%) • MOU with Blue Energy • Ongoing discussions with other gas suppliers including green gas suppliers (coal mine flared or vented gas)
Power	• Solar power will reinforce green credentials of TECH Project • Existing Ross River solar array and planned 400MW Edify solar station • Significant power to come from co-gen (gas used to heat water) which massively improves energy and greenhouse efficiency
Water	• Existing Haughton River water pipeline • Sufficient water supply from Haughton River

Approvals

Approvals work has commenced

- Appointed EMM Consulting – highly experienced
- Lansdown Eco Industrial Precinct has been re-zoned heavy industrial – much of the heavy lifting has already been completed by Townsville City Council
- Working closely with Office of Co-Ordinator General in Queensland
- Confident that an EIS approval will not be required, therefore compressing approvals timeline
- Strong support to date from key Federal and State ministers
- Obtain approvals by Q4 2021

Project Schedule

	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	
Base Case																																					
Pilot plant activities																																					
Project approvals																																					
Definitive Feasibility Study																																					
FEED (detailed design)																																					
Funding																																					
Construction																																					
Production																																					

PFS Results

Key Physical Outputs

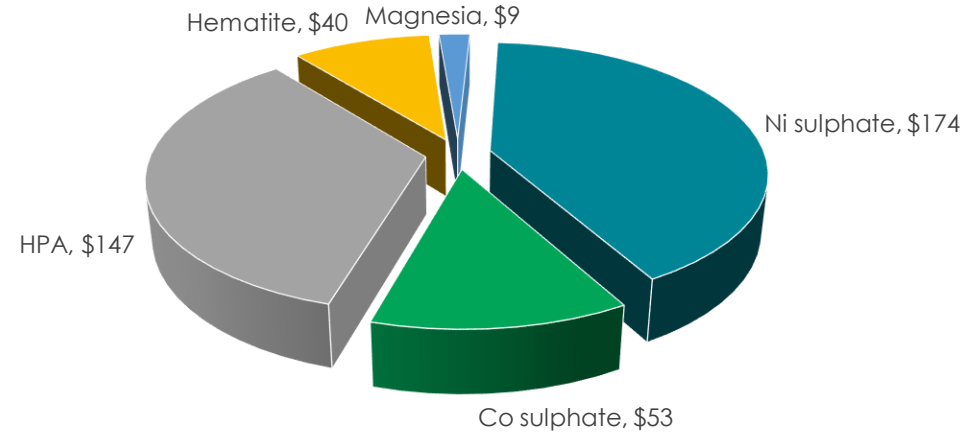
	Annual Production (t)
Nickel Sulphate	26,400 t
Cobalt Sulphate	3,100 t
High Purity Alumina (4N) HPA	4,000 t
Haematite	327,700 t
Magnesia	20,100 t

Capital and Operating Costs

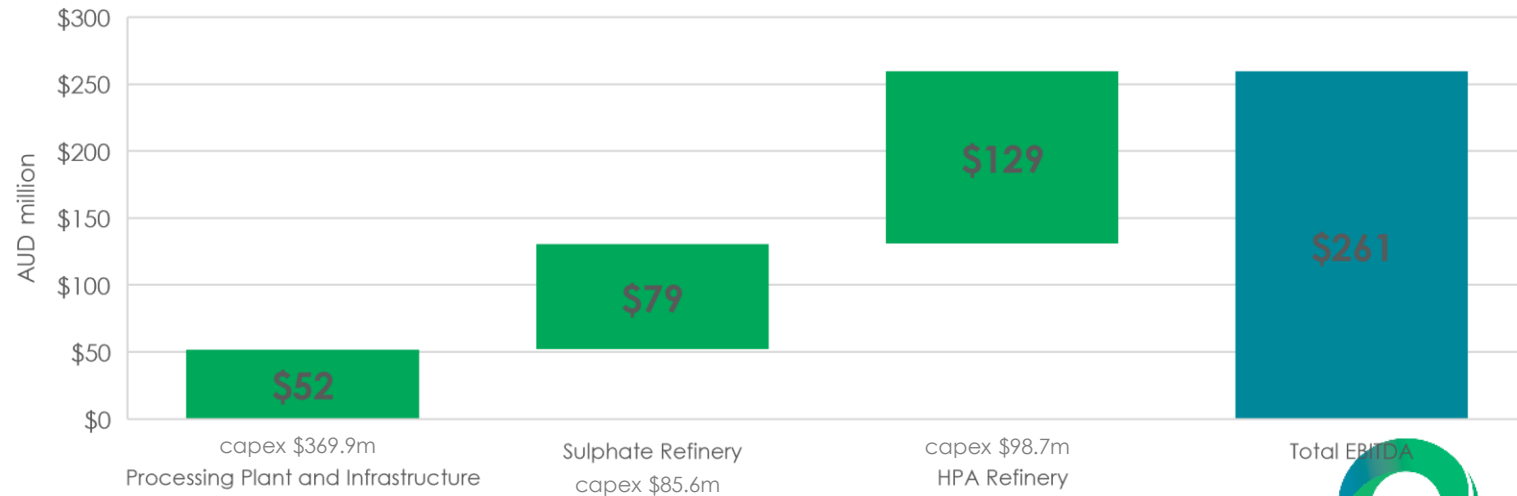
	Assumed 0.68 AUD:USD
Capex (excluding contingency)	AUD 554m
Contingency	AUD 96m
Operating Expenditure	AUD 163m/a

Key Metric	Units	Base Case	Spot Case
Nickel Price	US\$/lb	7.00	5.70
Nickel Sulphate Premium	US\$/lb	2.00	2.00
Cobalt Price	US\$/lb	25.00	14.15
HPA Price	US\$/t	25,000	20,000
EBITDA	AUD (m)	261	211
Post Tax NPV	AUD (m)	1,470	1,080
Post Tax IRR	%	30.7	24.9
Capital Payback	Years	3.5	4.25

Revenue Split in AUD million



Incremental Annual EBITDA



Funding Considerations

Project Feasibility Stage (current)

- Piloting
- Feasibility studies
- Regulatory approvals
- Secure project partners/offtake
- Front-end engineering design (FEED) and capital conformation

Funding Options

- Traditional equity investors
- Strategic investment by partner(s)/offtaker(s)
- Government grants including manufacturing grant
- R&D tax incentive

Project Construction – Funding Options

Achieving success in the project feasibility stage will increase the value of the company and open doors to funding opportunities for project construction.

Debt

- **Project Partners:** Strategic opportunity for a 'Big Brother' to be involved in a project that would be a game changer for the nickel industry
- **NAIF:** TECH Project meets NAIF criteria being in Northern Australia, is a centralised processing plant and will deliver many social benefits to Townsville and surrounding region
- **Export Finance Australia:** EFA is targeting assistance to critical minerals projects, which the TECH Project will produce
- **Offtake Finance:** Offtake is in high demand given the lack of nickel supply – end users understand the need for project participation or funding to secure offtake
- **International Export Credit Agencies:** Potential to obtain international ECA funding, particularly for plant and equipment being sourced from overseas

Equity

- **Project Partners/Offtakers:** Securing project or offtake participation by way of equity investment
- **Institutional Investors:** Traditional equity investors targeting critical minerals investment
- **Green Funds:** Many funds targeting green investments and the emerging EV sector

Corporate Overview

Capital Structure

Shares on issue	932.9M
Share Price	9.1c
Market cap	A\$84M
Top 20	43%

Board and Key Management

Eddie King	Non Exec Chair
John Downie	Managing Director
Cameron Mclean	Non Exec Director
Stephen Grocott	CEO

Share Price Performance



The QPM TECH Project

