

# AUSTRALIAN NICKEL CONFERENCE

*Odysseus Mine – “Greek Mythology to Nickel Reality”*

DAN LOUGHER | 15 October 2019

WESTERN AREAS LTD



# AGENDA

## CORPORATE



## GROWTH



## NICKEL MARKET



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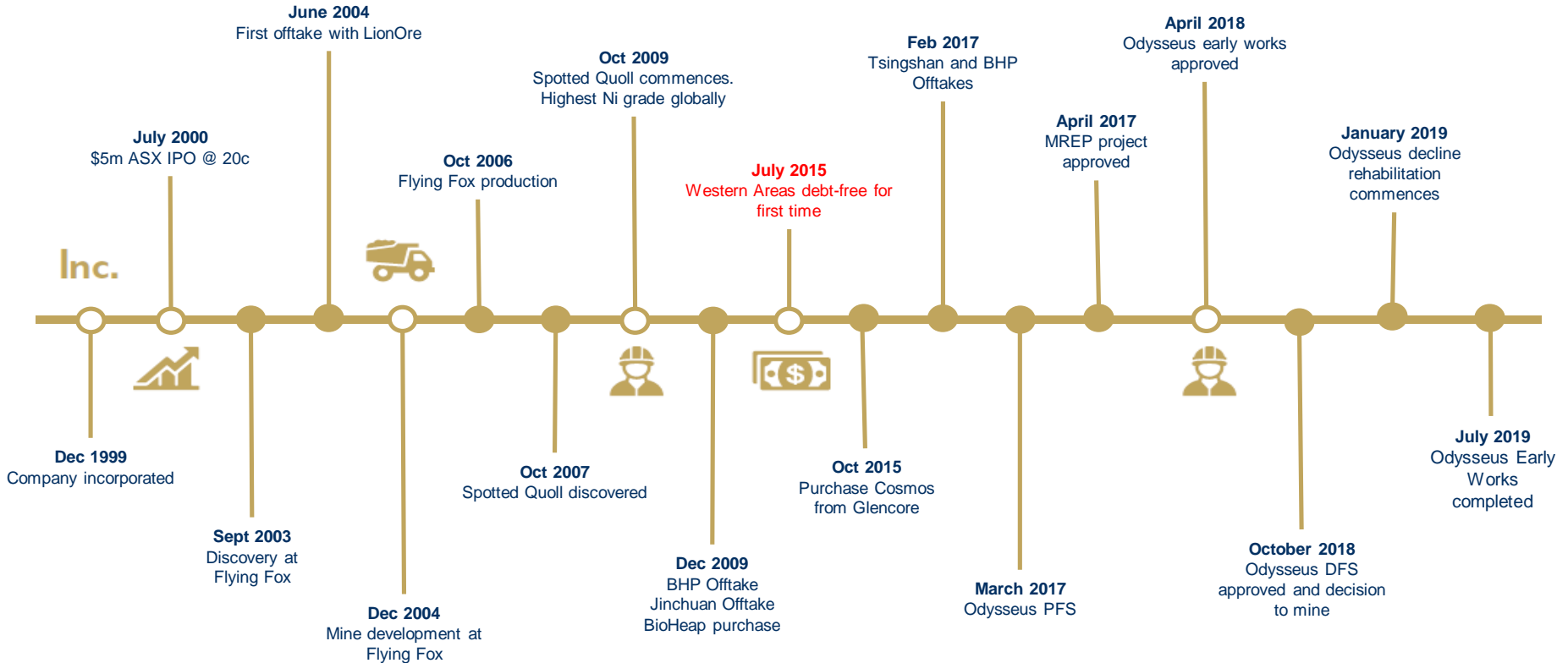
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# CORPORATE



# Western Areas success timeline



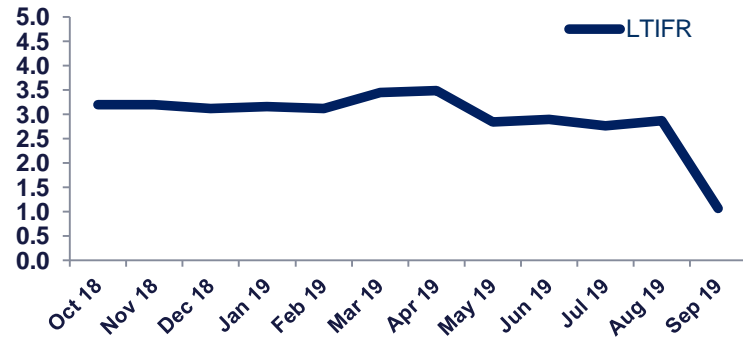
# Western Areas are safe areas



## Days LTI free

Spotted Quoll	3,093	Aug-11
Cosmos	1,460	Oct-15 (no injuries)
Cosmic Boy Concentrator	388	May-18
Exploration	374	Sep-18
Flying Fox	192	Mar-19

## 12 month LTIFR moving average



# Corporate overview



<b>ASX code</b>	<b>WSA</b>
<b>Share price</b>	<b>3.13</b>
<b>Shares outstanding (m)</b>	<b>273.5</b>
<b>Market Cap (A\$m) <sup>1</sup></b>	<b>856</b>
<b>Cash (A\$m)<sup>2</sup></b>	<b>144.3</b>

## COSMOS

### Odysseus

165kt Ni Ore Reserves  
199kt Ni Mineral Resource  
Early works complete

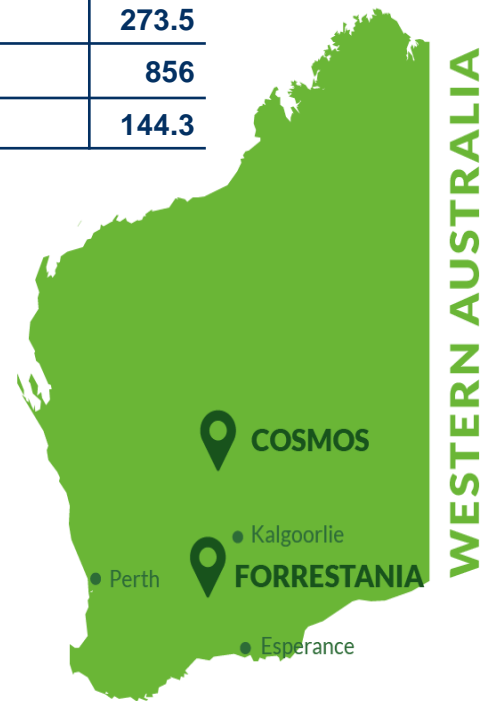
## FORRESTANIA

### Flying Fox

9.8kt Ni mined FY19  
21.1kt Ni Ore Reserves  
79.3kt Ni Mineral Resource

### Spotted Quoll

13.3kt Ni mined FY19  
64.2kt Ni Ore Reserves  
78.9kt Ni Mineral Resource



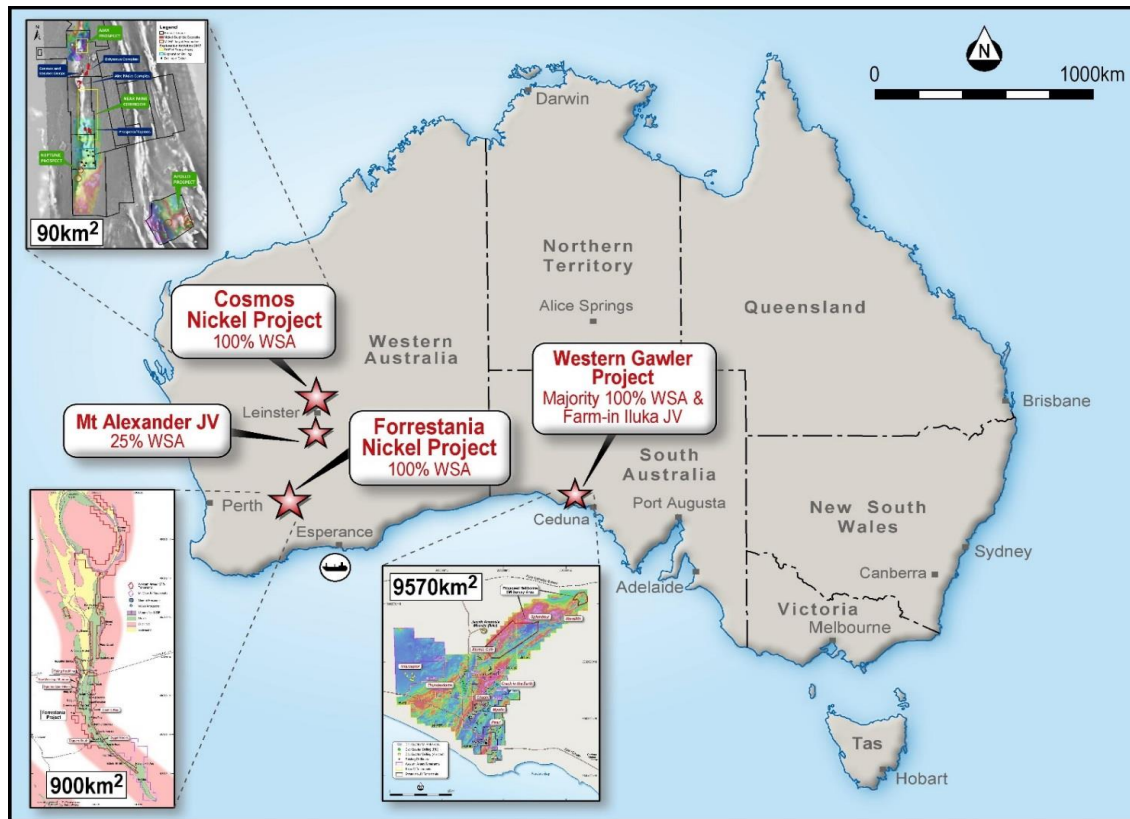


# GROWTH

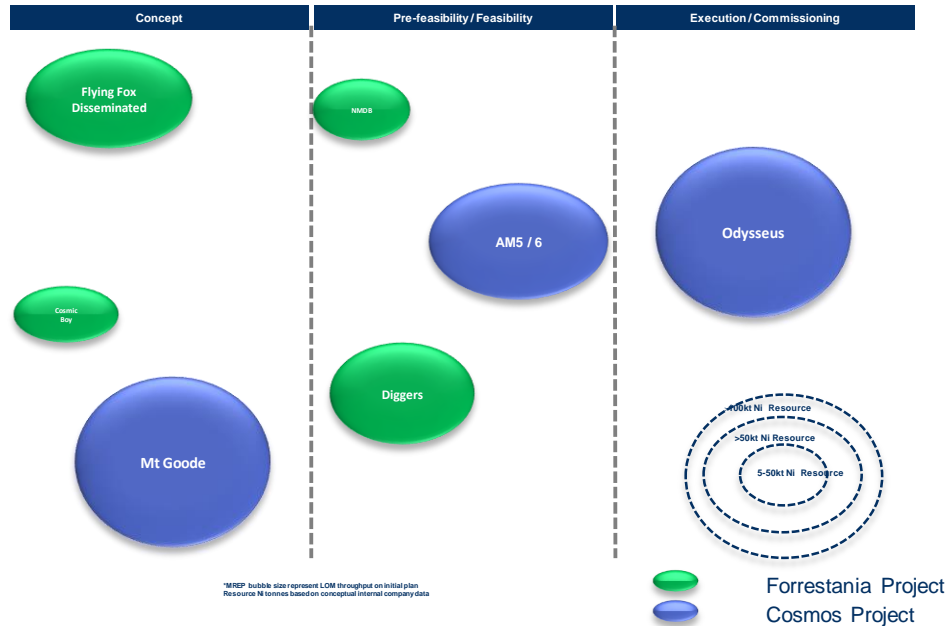




# Key tenement holdings



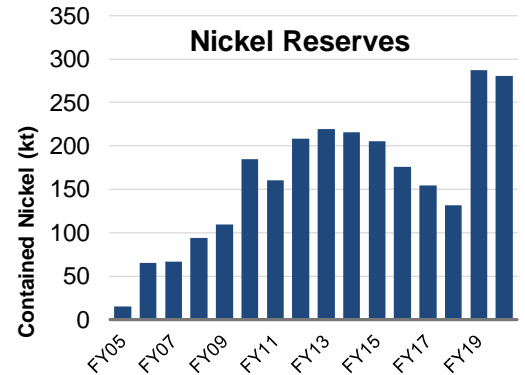
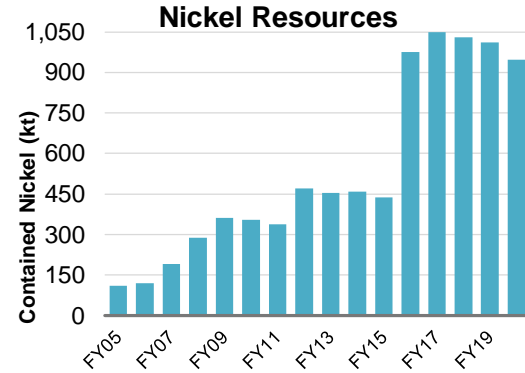
# Nickel growth pipeline



\*MRP bubble size represent LOM throughput on initial plan  
Resource Ni tonnes based on conceptual internal company data

- Many projects in the pipeline to drive nickel production well into the future
- Ore Reserves have substantially increased in FY19 with Odysseus

## Ore Reserves & Mineral Resources



# Mill recovery enhancement project (MREP)

***Produces additional new higher-grade product (45%-50% Ni)***

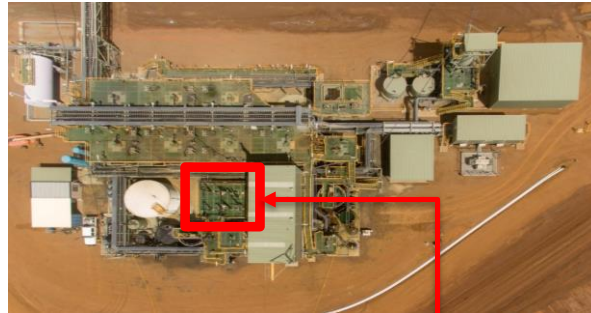
***Generating value from As rich waste tailings***

***New customers - EV battery market***

- Product specification achieved
- Filtration and bagging facilities to sell a new high grade nickel sulphide product complete
- Premium payables versus flotation concentrate
- Back-end of plant capable of up to 4,000t of nickel pa – Mill Scats, New Morning, Flying Fox LG to provide future feed options

## Front End – BioHeap Leach

- 1400 tpa capacity
- Tailings stream from Cosmic Boy - applies BioHeap Leach, then passes to precipitation

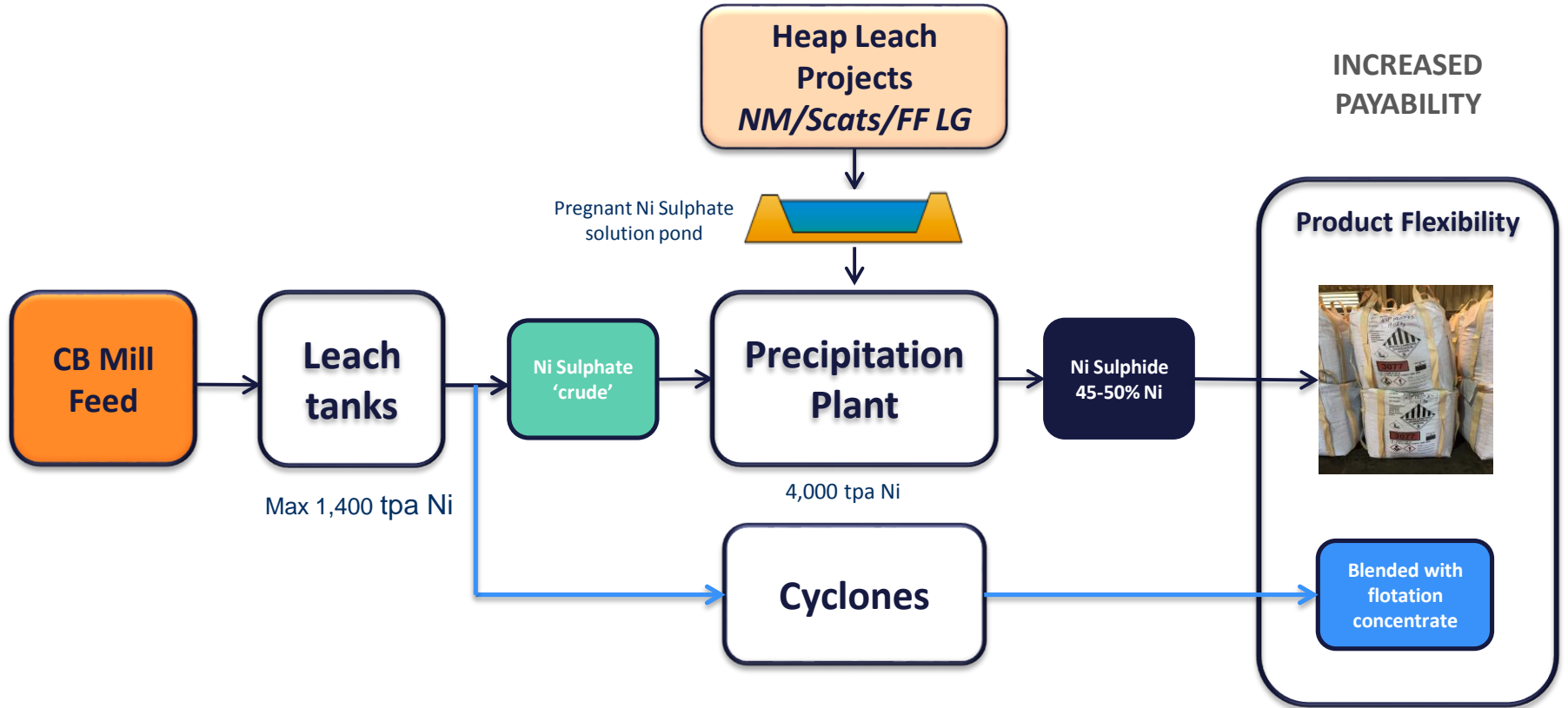


## Back End – Precipitation

- 4000 tpa capacity
- 1400 tpa - leached material from BioHeap front end
- 2600tpa - other sources of nickel in solution eg. heap leach elsewhere in Forrestania, or scats treatment



# MREP Flowsheet



# Cosmos – the new hub!

## WESTERN AREAS' SECOND OPERATIONAL HUB

### Outstanding Nickel Address:

- Within prolific Leinster – Wiluna Nickel camp
- Jubilee Mines sold in 2007 to Xstrata for A\$3.1B!
- WSA purchase from Glencore, Oct 2015 for \$24M
- WSA DFS completed in Oct 2018; and
- Mining commenced in January 2019.





# Odysseus – early works complete

## ***Early Works Activities:***

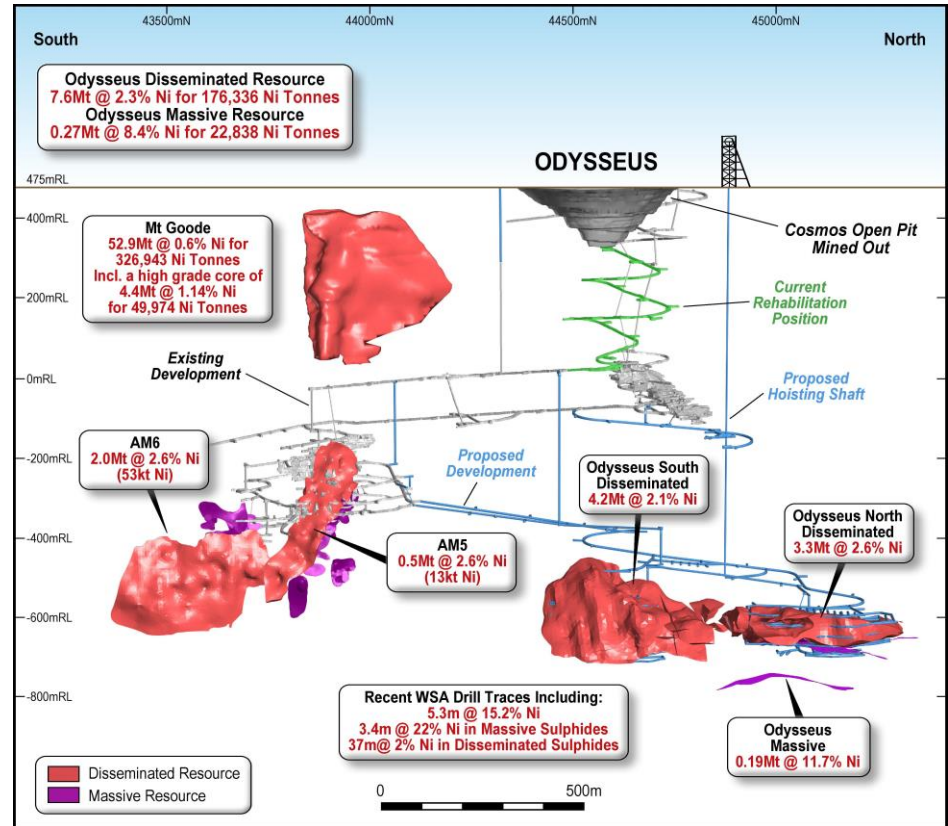
- Decline rehabilitation to 500m below surface and Underground pump station construction commenced
- Water Management Ponds all constructed and operational
- Camp commissioned with over 250 rooms available out of 520



# Odysseus – now a long life mine > 10yrs

## Western Areas' Second Operation:

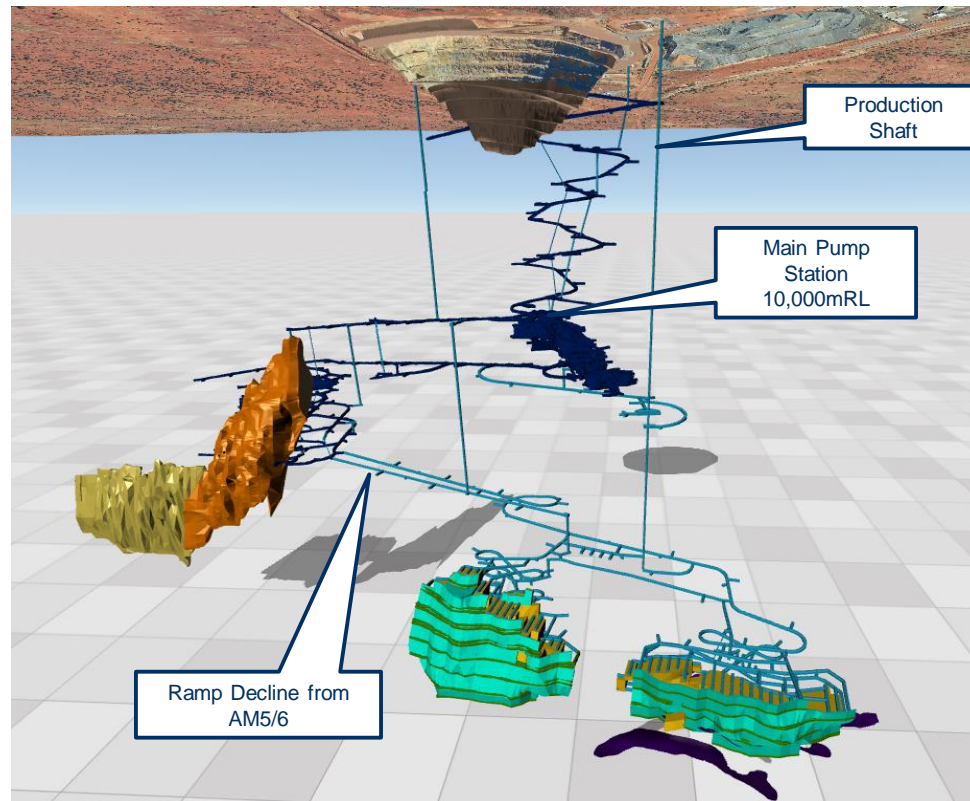
- **Long life, low cost project:**
  - ✓ Ore Reserve 8.1mt @ 2.0% for 164kt nickel
  - ✓ Mine life > 10 years
  - ✓ AISC A\$3.50/lb
  - ✓ Average nickel in concentrate production >13.0ktpa (14.6ktpa from FY24-FY31)
- **Significant upside:**
  - ✓ AM5 & AM6 deposits contain an Indicated Mineral Resource of 57.6kt of nickel (not included in DFS) – currently completing reserve estimation
  - ✓ Record massive sulphide intersections



# Odysseus

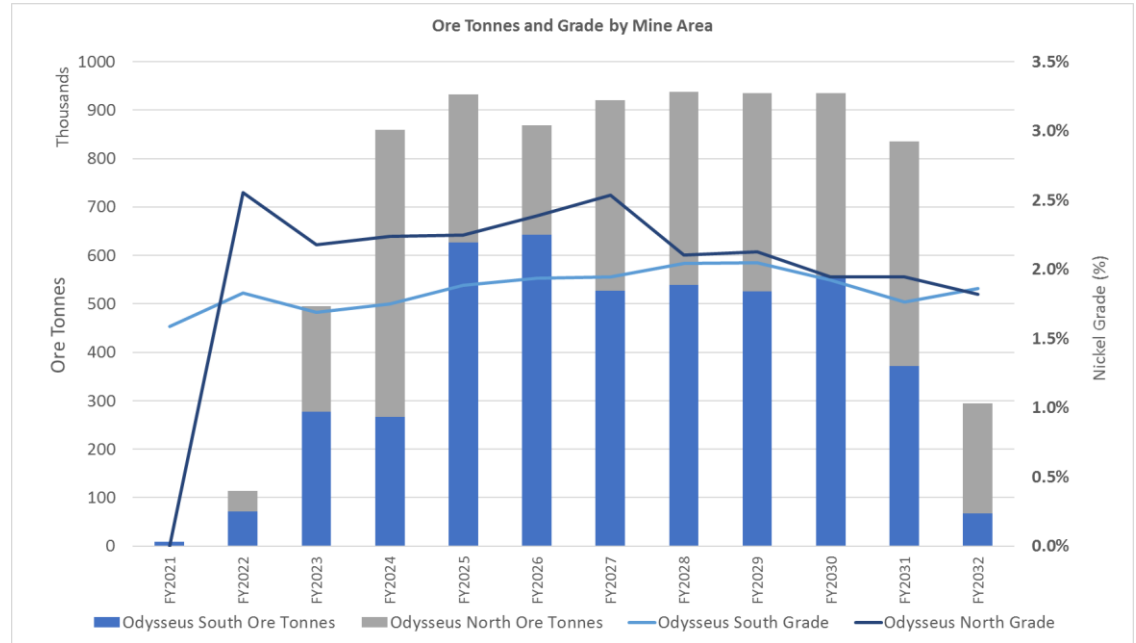
- **Pre-production capex A\$299m includes:**

- ✓ Shaft hoisting
- ✓ Larger mill (900ktpa immediately)
- ✓ WSA is well funded with cash and no debt
- ✓ Updated development expenditure profile is now FY20 – A\$80m, FY21 – A\$66m, FY22/23 – A\$143m
- ✓ Already receiving funding interest from offtake providers and third parties, including banks



# Production ~900K tpa ore

- Minimum 10 year mine life on reserves
- Annual ore production of 900kt
- First Ni concentrate late CY 2022
- Consistent annual nickel production





# Shaft infrastructure

- WSA has purchased a high quality, second hand head gear and winder
- Shaft infrastructure dismantling completed for refurbishment in South Africa prior to shipment to Perth in March/April 2020
- Significant economical benefit versus trucking.

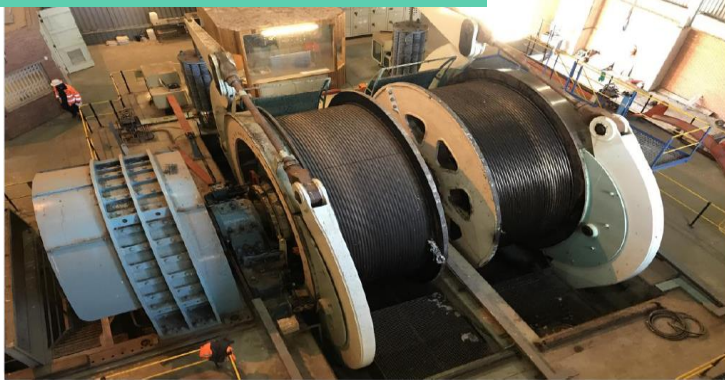
## Key Metrics:

- ✓ *5.5m diam. raise bore;*
- ✓ *4 guide ropes per conveyance;*
- ✓ *1.27Mtpa (ore and waste);*
- ✓ *12 t skips;*
- ✓ *1 truck required to feed shaft;*
- ✓ *4.5 MW peak power.*





# Winder



# Head frame-going going gone!



# Why shaft hoisting?

## Electrical power vs diesel

- Future proofing the operation
- Combined with renewable power = energy efficient site, 85% reduction in CO<sub>2</sub>
- Low consistent opex and proven technology
- Fully automated winder and materials handling system direct to mill
- Cycle time: ~3 mins

## Equivalent truck fleet ~ 8 trucks

- Save 1.5 ML diesel burnt pa (DPM)
- Remove 5 MW of heat generated from diesel engines
- Remove minimum 200m<sup>3</sup>/s of additional ventilation requirement (another vent shaft)
- Removes issue of decline constraints





# NICKEL MARKET



# Offtake contracts best in class

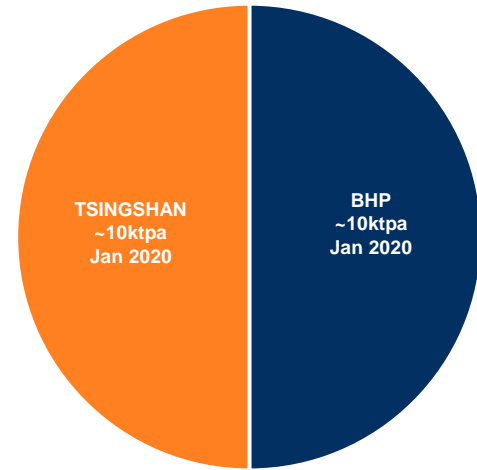
*Existing offtake agreement 4 months to expiry.  
Currently in market with tenders – strong response*

*Premium blending concentrate - superior commercial terms*

*Significant increase in inbound off-take enquiries for Nickel Sulphide concentrate post current contract period, primarily linked to the Electric Vehicle battery pre-cursor sector*

## Our Partners:

- **BHP:** 50%
  - **Tsingshan:** 50%
- ✓ China's largest stainless steel producer
  - ✓ Consumes ~25% of China's nickel demand



## Roasting

- Creates a high grade nickel oxide that can be blended with laterite ore
- By-product of sulphuric acid for 'pickling' stainless steel
- Most concentrates do not suit roasting
- Proven process - opening up opportunities with Tsingshan





# What we are seeing

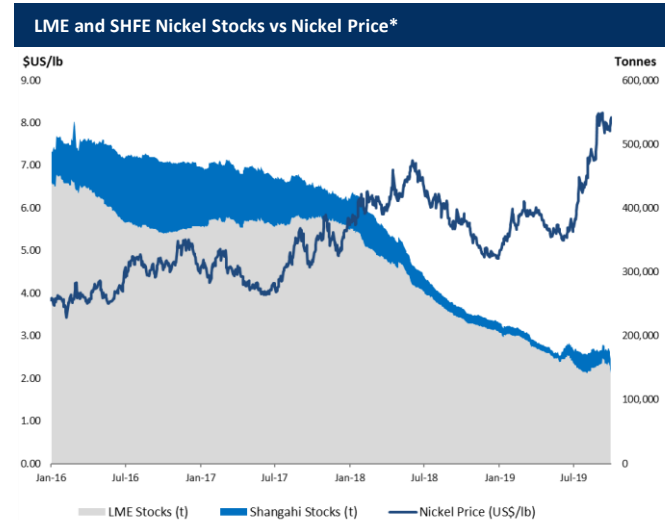
## ▪ Recently visited:

- ✓ Tsingshan (largest stainless steel producer in the world) - has strong growth plans, and buying refined nickel on the LME
  - ✓ Jinchuan (largest nickel cathode producer in China)
  - ✓ CATL (One of China's largest EV pre-cursor producer)
- **Recent Indonesian decision** to bring forward ore export ban to 1st Jan 2020 from Jan 2022 – currently accounts for ~10% of supply
- **LME and other stockpiles shrinking** on the back of current stainless demand and EV growth



Estimated electrification impact per vehicle (avg NMC battery)

40-50kg <b>Ni</b>	50-75kg <b>Cu</b>
5-15kg <b>Co</b>	+ Cu for charging point + Cu for grid access

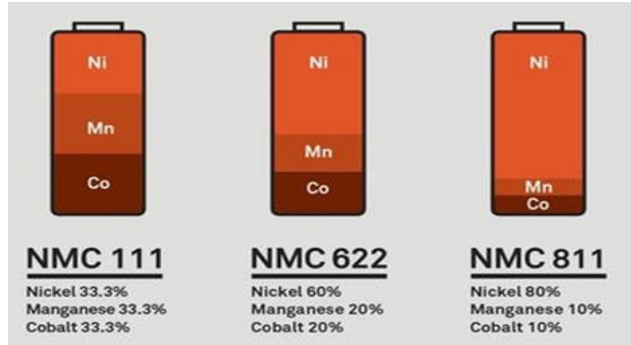


Source: Global Mining Research, Bloomberg



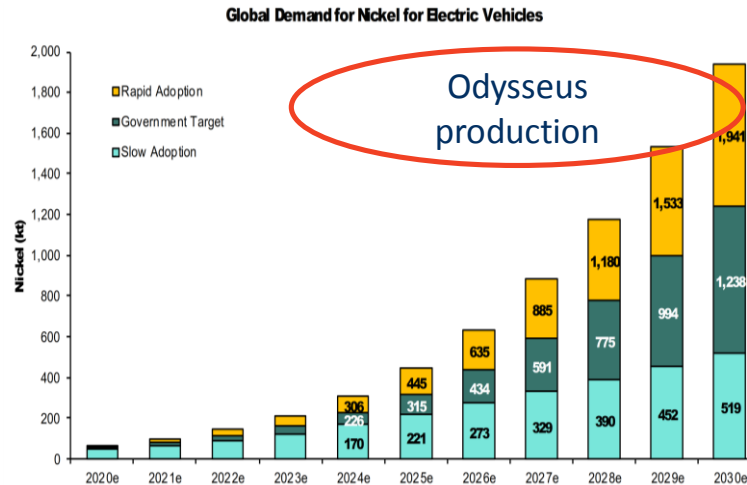
# The present – driven by stainless steel

- **Technology change to NCM 811** which requires even more nickel
- **Current nickel price too low** to incentivise new project development. New mine development can take 3 years – the nickel “pie” is not expanding
- **May see divergent market in nickel supply** emerging between stainless steel and EV

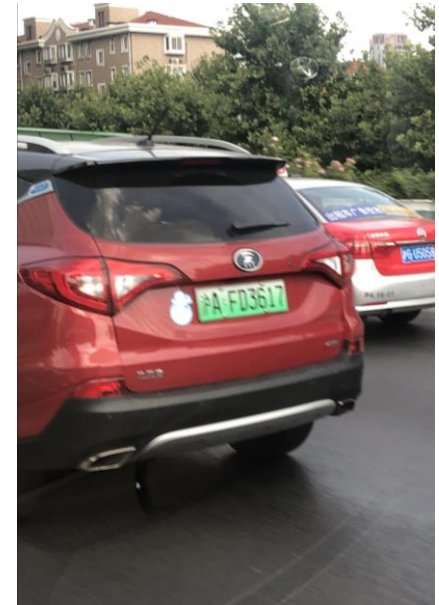


# The future - EV demand for nickel

- Potentially very significant incremental demand versus a current nickel market size of c.2,200kt
- Research indicates NCM 811 will be the fastest growing battery combination by 2025!



Source: Bernstein - June 2018



# Nickel deficits NOW a reality!

Long term trends supporting Ni consumption growth:



Vehicle Electrification



Increasing mobility



Growth in Renewables



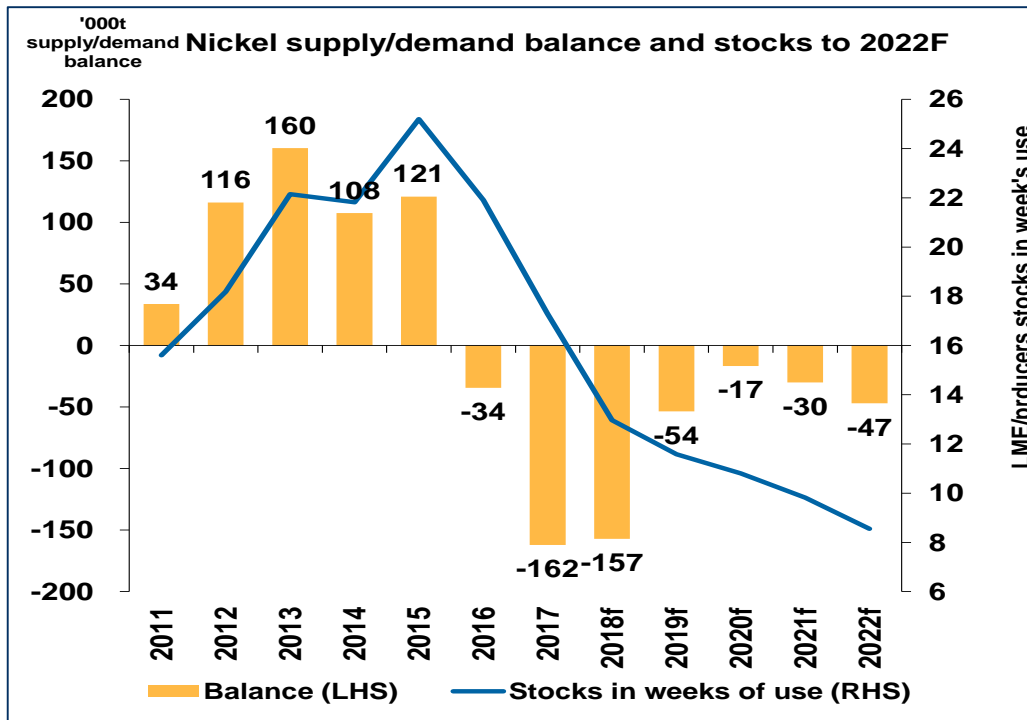
Population growth



Growing disposable incomes



Urbanization



Source: INSG, CRU, LME, Macquarie Strategy, Feb 2019

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[www.westernareas.com.au](http://www.westernareas.com.au)

**ASX:WSA**

**PO Box 1891 West Perth 6872  
+61 8 9334 7777**