



# Advancing the Charley Creek Rare Earths Project

Corporate Presentation August 2022

**enova**  
mining | limited

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Critical metals for a sustainable future

# Our Company



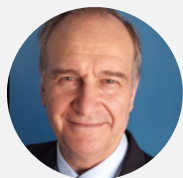
## Our team



**Dato' Sia Hok Kiang**

Non-executive Chairman

Mr Dato' Sia is Managing Director of the successful Malaysian private mining company, Malaco Mining Sdn. Bhd. He is a graduate of the University of Malaya in Applied Geology, an economic geologist with more than 30 years world-wide experience.



**Eric Vesel**

Executive Director / CEO

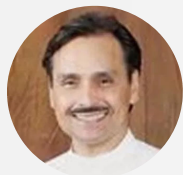
Mr Vesel is a qualified Mining Engineer with 35 years professional experience in the mining industry. He was formerly Chief Operating Officer for Avocet Mining PLC and has worked for both small and large mining companies in Australia, Namibia, Papua New Guinea, Indonesia, CIS and Malaysia.



**Stan Wassylo**

Non-executive Director

Stan has extensive experience in the resources sector and has 46 years' experience in businesses servicing the sector, in logistics, shipping, infrastructure, project construction, contract management and marketing.



**Harun Halim Rasip**

Non-executive Director

Mr Rasip is a Chartered Accountant who previously established Halim Rasip Holdings Sdn Bhd ("HRH") Group. During his time as Chairman and Managing Director, he planned, funded and developed the Lumut Port in the Straits of Malacca. He is currently the President Director of P.T. Tanah Laut Tbk., a Company listed on Bursa Efek Indonesia and based in Jakarta.

## Corporate Overview

|                  |                 |                       |
|------------------|-----------------|-----------------------|
| Share Price      | Shares On Issue | Market Capitalisation |
| <b>\$0.016</b>   | <b>367.2m</b>   | <b>5.9m</b>           |
| T20 Shareholding | Cash            | Debt                  |
| <b>90%</b>       | <b>10K</b>      | <b>Nil</b>            |

## Commodity Exposure

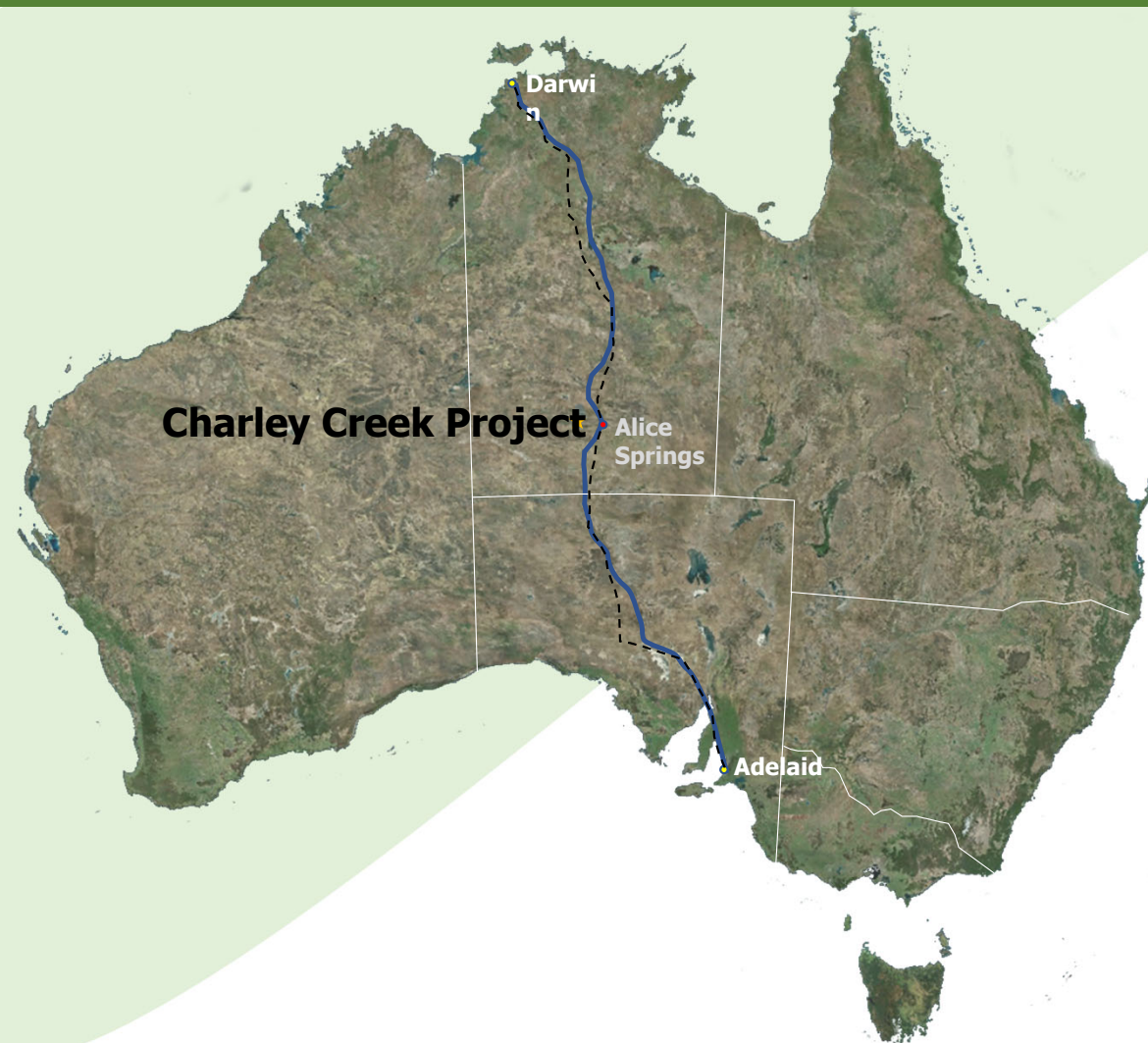
Rare Earth Minerals



Industrial Minerals

Ilmenite, rutile, zircon and aluminum

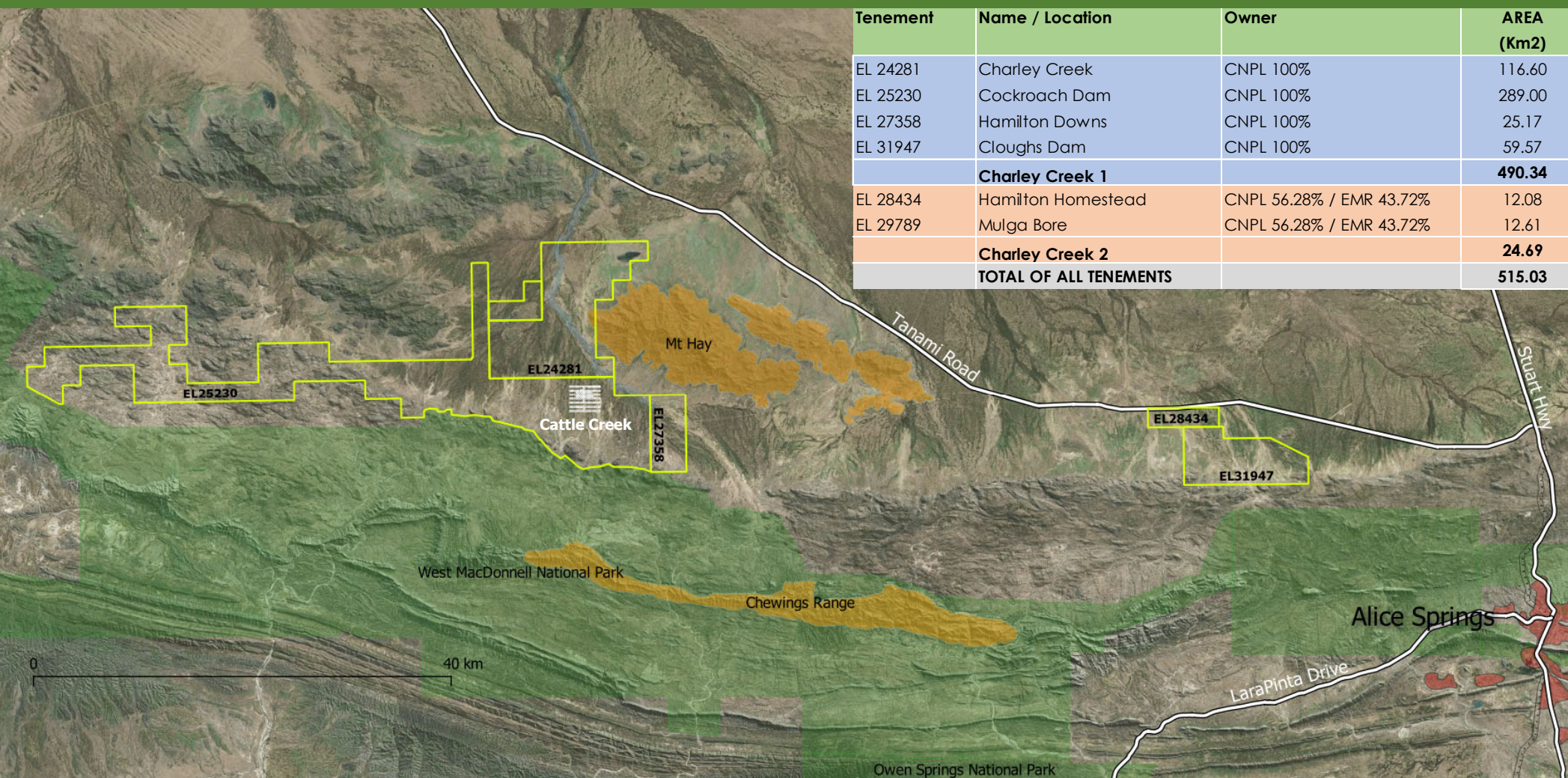
# Charley Creek Project Overview



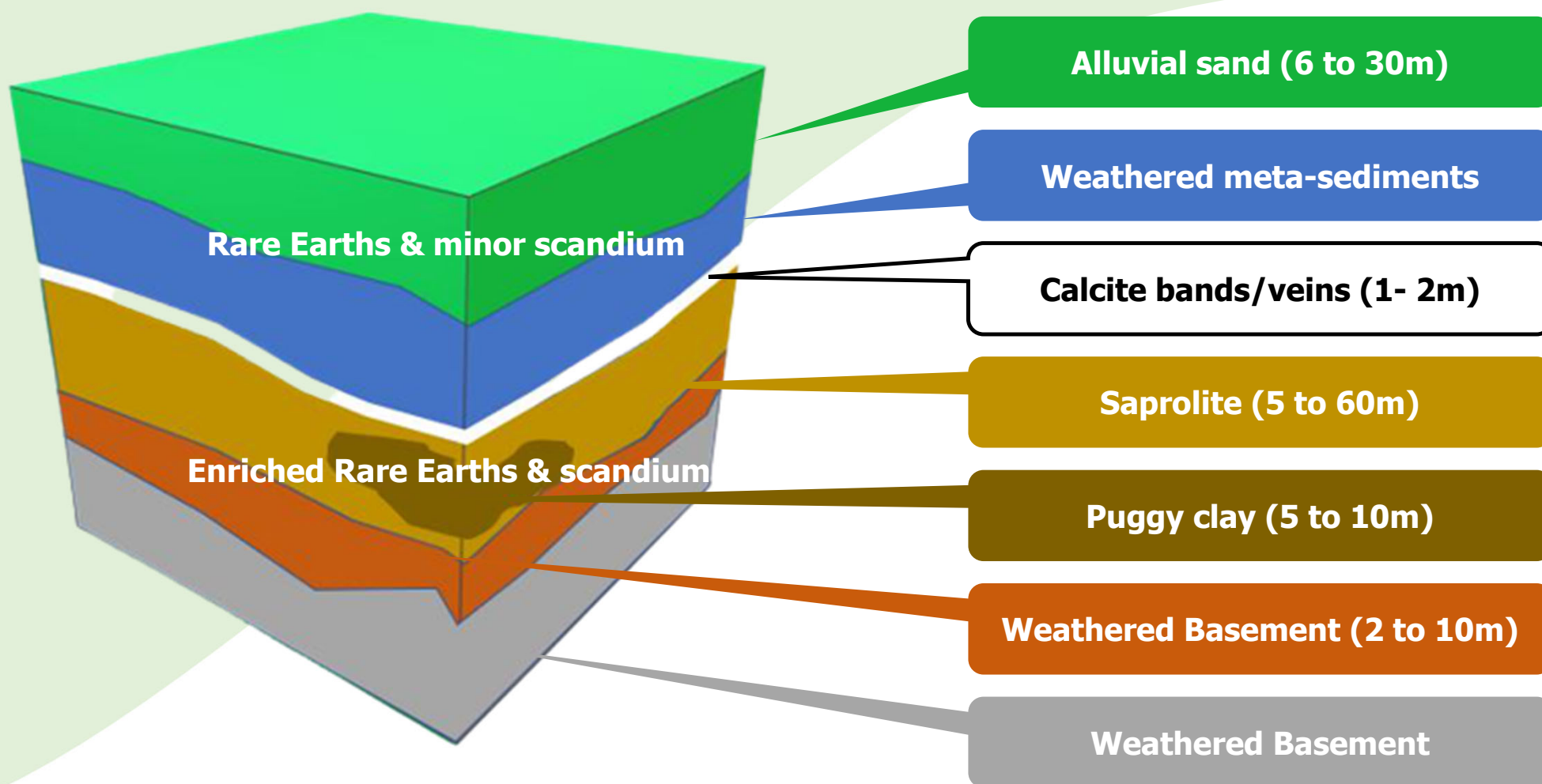
- ✓ Large rare earths and industrial mineral deposit within a 100% owned, 515km<sup>2</sup> tenement package
- ✓ Located in a tier-1, pro-mining jurisdiction
- ✓ In 2013 release of resource statement (2004 JORC)
- ✓ Near surface mineralisation, bulk tonnage mining potential
- ✓ Situated on open land nearby to rail and road transport network for export routing
- ✓ Extensive metallurgical testing and understanding
- ✓ Further exploration upside from under-explored areas, well understood regional prospects
- ✓ Growing demand for rare earth and mineral security by western governments

# Tenement Holdings

| Tenement                      | Name / Location        | Owner                    | AREA<br>(Km2) |
|-------------------------------|------------------------|--------------------------|---------------|
| EL 24281                      | Charley Creek          | CNPL 100%                | 116.60        |
| EL 25230                      | Cockroach Dam          | CNPL 100%                | 289.00        |
| EL 27358                      | Hamilton Downs         | CNPL 100%                | 25.17         |
| EL 31947                      | Cloughs Dam            | CNPL 100%                | 59.57         |
|                               | <b>Charley Creek 1</b> |                          | <b>490.34</b> |
| EL 28434                      | Hamilton Homestead     | CNPL 56.28% / EMR 43.72% | 12.08         |
| EL 29789                      | Mulga Bore             | CNPL 56.28% / EMR 43.72% | 12.61         |
|                               | <b>Charley Creek 2</b> |                          | <b>24.69</b>  |
| <b>TOTAL OF ALL TENEMENTS</b> |                        |                          | <b>515.03</b> |



# Charley Creek Geological Horizons (Simplified)



# Alluvial Resources\*

\* As announced on ASX 15<sup>th</sup> April 2013

| RESOURCE                                | Mass               | Weighted<br>Average<br>TREO | Contained<br>TREO  | Contained<br>Xenotime | Contained<br>Monazite | Contained<br>Zircon |
|-----------------------------------------|--------------------|-----------------------------|--------------------|-----------------------|-----------------------|---------------------|
|                                         | Tonnes             | ppm                         | kg                 | kg                    | kg                    | kg                  |
| Cattle Creek<br>Indicated Resource      | 249,900,000        | 280                         | 69,900,000         | 17,600,000            | 97,200,000            | 124,650,000         |
| Western Dam<br>Indicated Resource       | 136,960,000        | 323                         | 44,150,000         | 9,675,000             | 63,700,000            | 70,930,000          |
| <b>TOTAL INDICATED<br/>RESOURCES</b>    | <b>386,860,000</b> | <b>295</b>                  | <b>114,050,000</b> | <b>27,275,000</b>     | <b>160,900,000</b>    | <b>195,580,000</b>  |
| Cattle Creek Inferred<br>Resource       | 353,210,000        | 291                         | 102,750,000        | 26,450,000            | 141,075,000           | 183,750,000         |
| Western Dam<br>Inferred Resource        | 65,232,000         | 282                         | 18,350,000         | 4,240,000             | 26,160,000            | 36,230,000          |
| <b>TOTAL<br/>INFERRED<br/>RESOURCES</b> | <b>418,442,000</b> | <b>289</b>                  | <b>121,100,000</b> | <b>30,690,000</b>     | <b>167,235,000</b>    | <b>219,980,000</b>  |

*"This information was prepared and first disclosed under the JORC Code 2004. It has not been updated since to comply with the JORC Code 2012 on the basis that the information has not materially changed since it was last reported."*

# Rare Earths at Charley Creek

60  
Nd

59  
Pr

66  
Dy

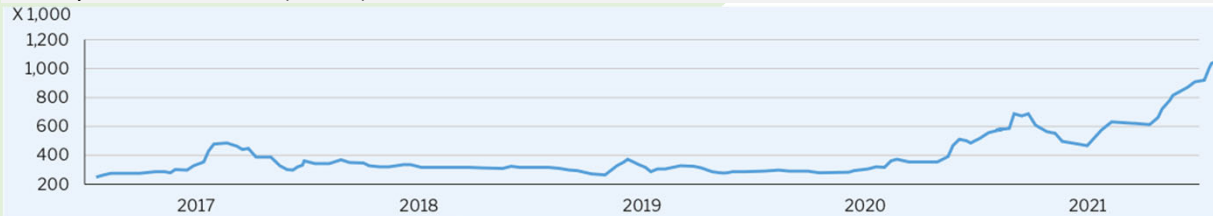
65  
Tb

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- Focus on drilling Cattle Creek prospect, with most of the tenement area unexplored but highly prospective for mineralisation. Western Dam prospect awaits re-drilling,
- Near surface and simple orebody to underpin potential open pit bulk mining
- Preliminary test work demonstrates that valuable rare earths may be extracted via cost-effective gravity separation of the upper alluvial sands, and leaching from the saprolite clays
- **Further drilling, gravity concentration testing and leach testing is planned for 2022**
- **Resource upgrade and Scoping Study planned for 2023**
- **Well placed to leveraged demand for rare earths minerals from tier-1 western jurisdictions**

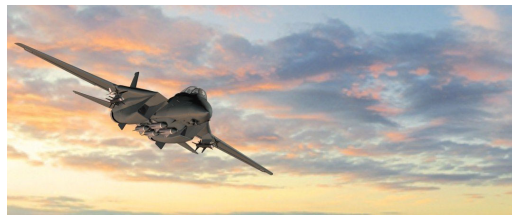
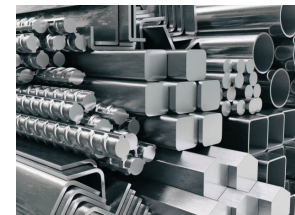
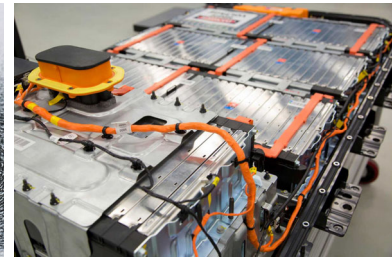
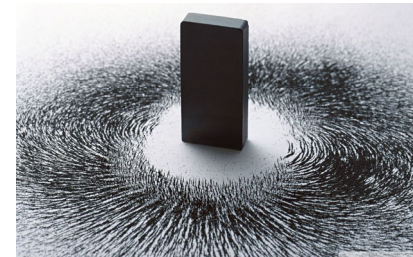
Neodymium Oxide Price (RMB/t)

Source: Refinitiv Datastream (Shanghai Metals Market)

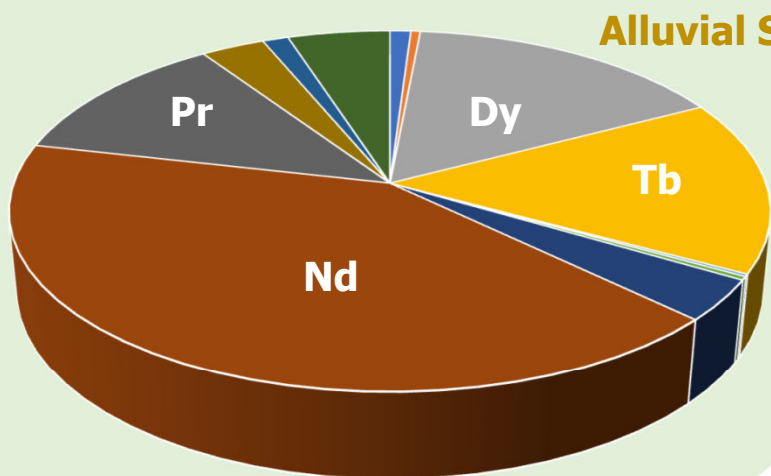


Praseodymium Neodymium Alloy Price (RMB/t)

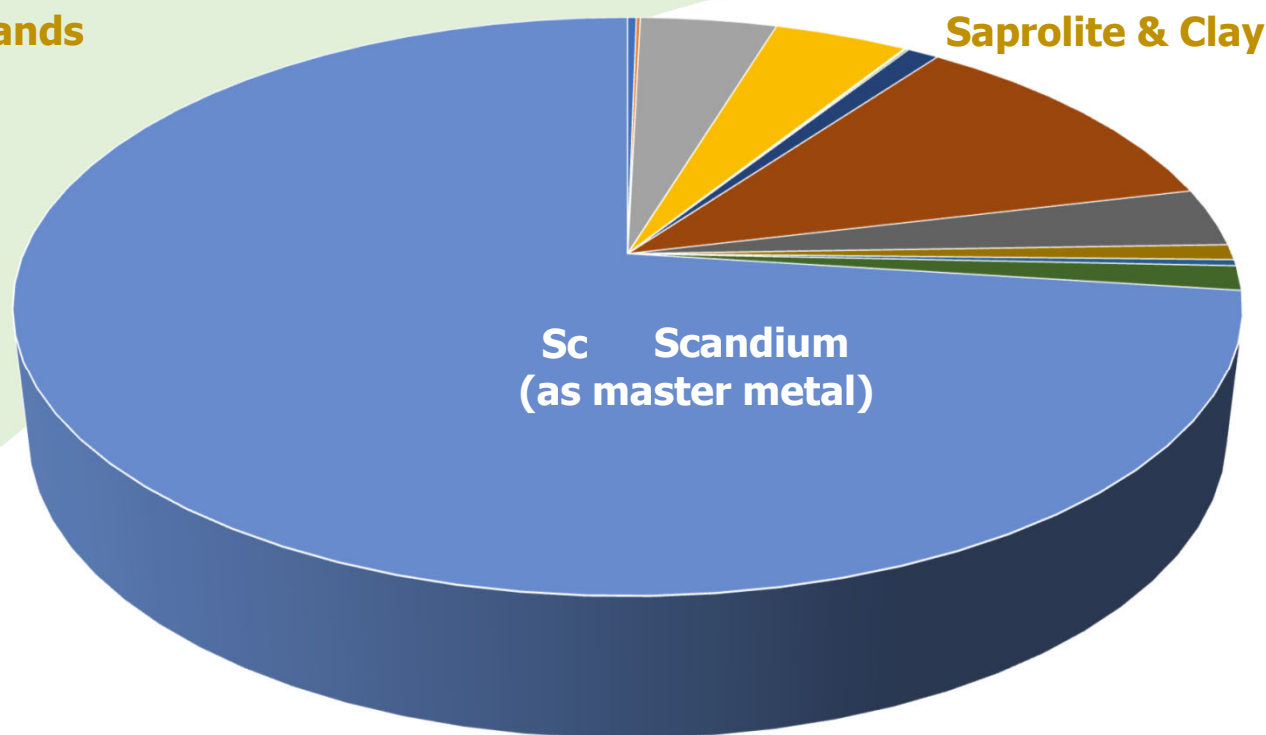
Source: Refinitiv Datastream (Shanghai Metals Market)



# Charley Creek Basket Price (% value from REO & Sc)



Alluvial Sands



Saprolite & Clay

■ Ce ■ La ■ Dy ■ Tb ■ Sm ■ Eu ■ Gd ■ Nd ■ Pr ■ Y ■ Er ■ Other ■ Sc

**Sc master metal alloy price typically US\$100\*/kg (@2% Sc)**

\* Discounted pricing based on scandium-alloy (US\$350/kg) taken from U.S. Geological Survey, Mineral Commodity Summaries, January 2022

# Scandium at Charley Creek



## Cost Effective and Scalable

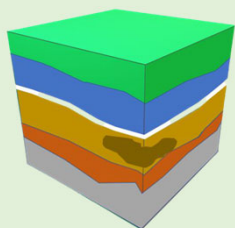
- ❑ Scandium is a low volume, high value product
- ❑ Potentially long mine-life due to depth of saprolite and extent of mineralisation
- ❑ Ideal conditions for low-cost mining, free-dig sands and silts
- ❑ Easily accessible to services from Alice Springs
- ❑ Opportunity to duplicate operation at adjacent prospects at Western Dam and Dad's Dam deposits

## Resource

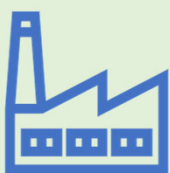
- ❑ Cattle Creek sufficient drill coverage to complete orebody, extensions are possible with more drilling
- ❑ Large zones of saprolite and clay with elevated Sc, REE and Al grades identified in model
- ❑ Cut-off/cut-over grades are expected to be low based on test work and current cost estimates

## Processing

- ❑ Natural concentration of scandium into fines (<100 microns),
- ❑ Plans for on-site acid production facility will be efficient providing acid, tank heating and power co-generation
- ❑ Tests to date indicate fast leaching and high recovery of Sc using heated acid leach, further validation tests are needed,
- ❑ Low environmental impact expected due to abundance of calcareous material to neutralise leach tail



## Enova Scandium Market Strategy



### Market scandium oxide as superior aluminium alloy, partnering with manufacturers:

- ☐ as a substitute for manufacturers currently using titanium products
- ☐ requiring low failure rates for intricate casting
- ☐ for 3D additive printing media to produce, intricate, high tech, high performance parts
- ☐ for products requiring high performance materials; aerospace and hydrogen generation
- ☐ with exotic products and components, seeking exclusivity and marketing edge... motor vehicles



### Market scandium oxide as superior aluminium alloy, partnering with material suppliers/custom smelter to:

- ☐ work with custom alloy producers to offer product to market
- ☐ create sample metals for key industry users and invite off-take participation
- ☐ exclusivity by partnering with off-take agreement



### Certainty of supply and market pricing will encourage new industry use by:

- ☐ providing researchers with government support, for new green products using scandium
- ☐ encouraging industry to conduct R&D into high technology uses
- ☐ encouraging government to incentivise industry to assess product substitution or new uses

# Cattle Creek Prospect – Next Steps

## Completion of Operation Concept & Resource Statement (update)



- ☐ Initial focus on the flag-ship Cattle Creek Prospect where the resource is best defined
- ☐ To date project is under-valued due to on-going test work which limited news releases
- ☐ Updated resource release will allow the market to reappraise the assets
- ☐ Expectation for Enova share price to adjust favourably

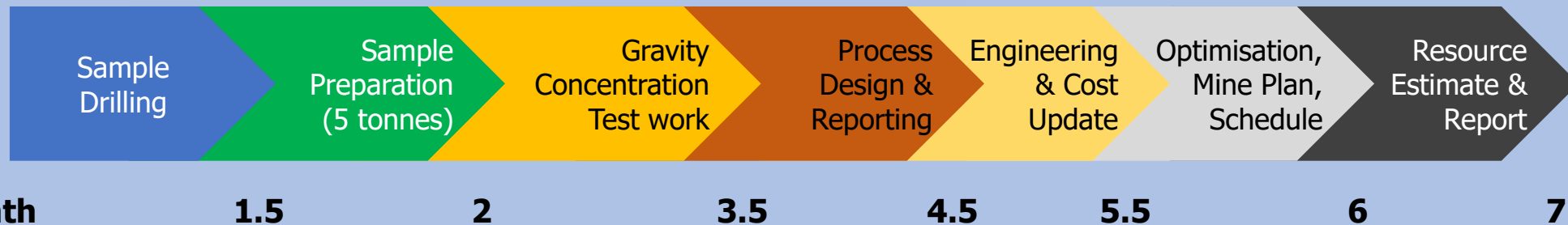
## Work Plan



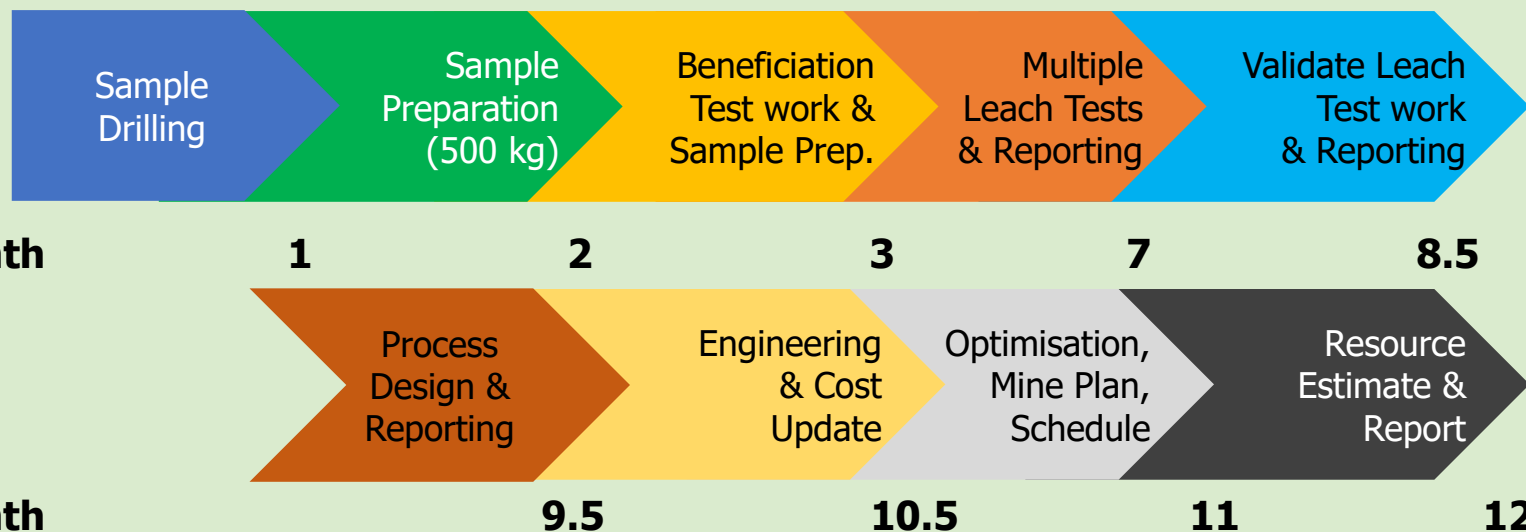
- ☐ Drilling for metallurgical samples for bulk sample process testing
- ☐ Alluvial Project : Bulk scale lab “Proof of Concept” test to :
  - ☐ validate method by demonstration; screening, sizing, grinding, gravity concentration
  - ☐ recover heavy concentrate for further analysis
- ☐ Cracking/leach concentrates, produce solutions for analysis and REE SX simulation
- ☐ Saprolite : Size beneficiation for leaching of ultra-fines, remove deleterious minerals and adsorption tests (SX and IX testing)
- ☐ hydrometallurgical leach testing and verification
- ☐ Pit optimisation and mine planning to ensure ore supply
- ☐ Process engineering to complete RPEEE and update/publish resource statement

# Cattle Creek Project Work Plan

## Alluvial Development Plan



## Weathered Rock (saprolite/clay) Development Plan



# Enova's Work Plan Budget



|                                                                                 | Budget AUD\$   | Months    |
|---------------------------------------------------------------------------------|----------------|-----------|
| Drilling/Sample preparation, freight and assaying                               | 110,000        | 2         |
| Gravity separation testing                                                      | 65,000         | 1.5       |
| Process concept engineering and costing review update                           | 65,000         | 2         |
| Resource model update, mine planning and reporting                              | 35,000         | 1.5       |
| <b>Alluvial Sands Project</b> Gravity Separation and Concentration Bulk Testing | <b>260,000</b> | <b>7</b>  |
| Sample preparation and freight                                                  | 10,000         | 2         |
| Hydrometallurgical assessment (KL)                                              | 70,000         | 5         |
| Hydrometallurgical test work verification (AUS)                                 | 40,000         | 1.5       |
| Engineering/Competent person review                                             | 85,000         | 2         |
| Mine planning and reporting                                                     | 35,000         | 1.5       |
| <b>Saprolite/Clay Project</b> Beneficiation and Leach Hydrometallurgy           | <b>240,000</b> | <b>12</b> |
| <b>Company Operations</b> Corporate governance, tenements, admin. charges       | <b>200,000</b> | <b>12</b> |
| <b>Budget Total</b>                                                             | <b>700,000</b> | <b>12</b> |

# Potential Operational Concept

## Mining

- ☐ Open-pit free-dig mining (sand, silt, clay -> low cost)
- ☐ Bulk mining operation with low strip ratio

## Two processes one operation

- ☐ **gravity plant** for alluvial sands  
screen → deslime → cyclone classification → spirals concentration
- ☐ **leach plant** for weathered rock (saprolite & clays)  
ultra-fines concentration → acid leaching

## Refining

- ☐ Cracking of monazite/xenotime with on-site solvent extraction
- ☐ Separation of mixed rare earth concentrate to rare earth oxide group products

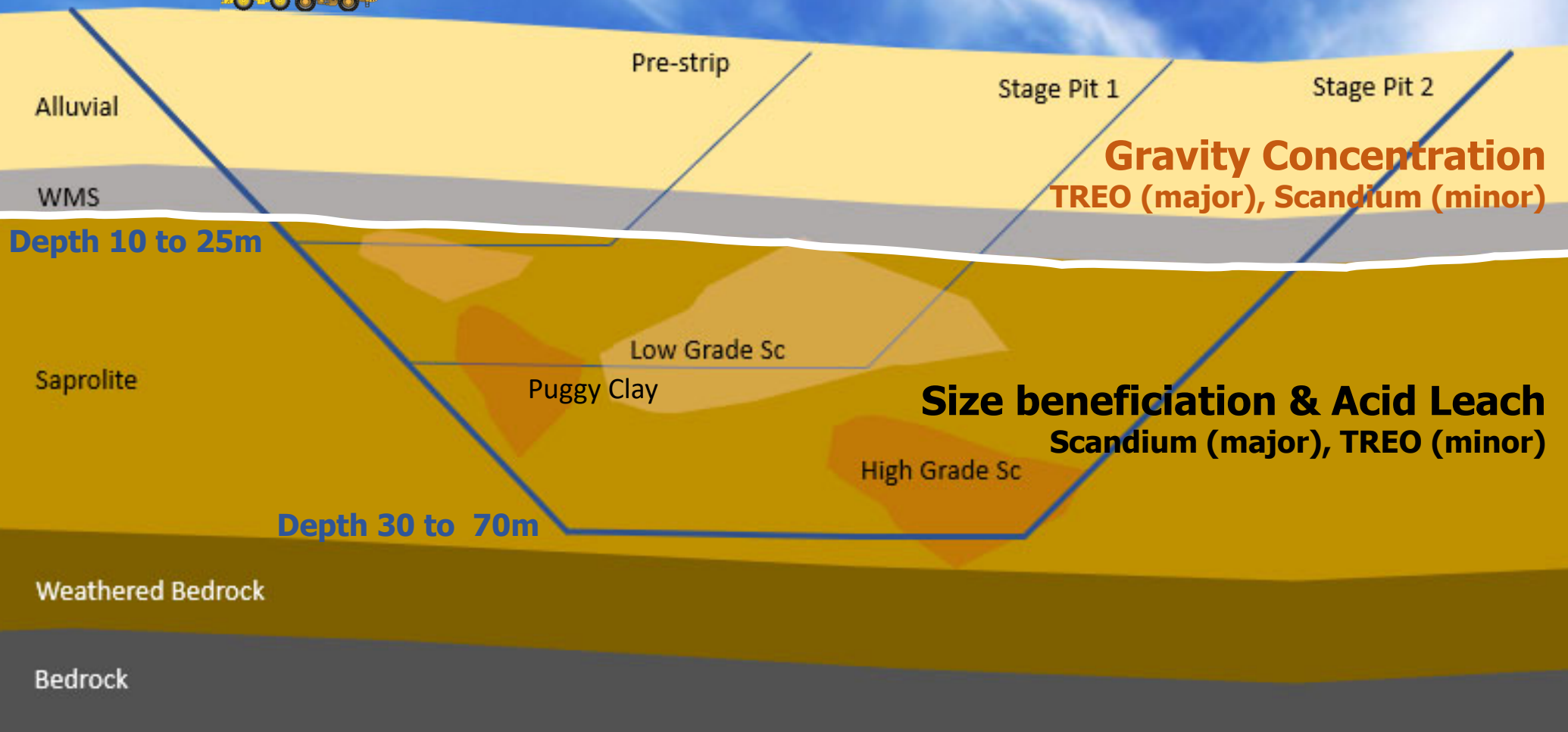
## Identified Potential Products

- ☐ Rare earth oxides :
- ☐ Scandium master metal :
- ☐ By-products (gravity concentration) :
- ☐ By-products (leaching circuit):

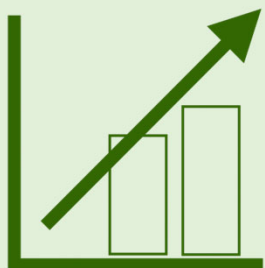
Light (Ce,La), Magnetics (Nd,Pr), SEG (Sm,Eu,Gd), Dy/Tb, Y Mix (Yb,Y,Lu,Ho,Er)  
2% Sc / 98% Al  
zircon, hafnium, rutile, ilmenite  
alumina/HPA alumina



# Mining & Process Concept



# Enova's Commercial Outlook



## Demand and lack of supply

- ❑ Ever increasing world-wide demand for rare earth metals (**REE**),
- ❑ Scandium (**Sc**) commercial usage is gaining momentum,
- ❑ Enova provides an opportunity to lead the world's Sc market,
- ❑ Scarcity of supply of critical metals and increasing demand,
- ❑ Lack of companies with minerals to execute responsible and sustainable production,

## Smart Metals



## Technology

## Availability = Development of new applications

- ❑ **REE** and **Sc** additives create materials with new high performance qualities for future technologies
- ❑ Electronics/electrical products need **REE** and **Sc** for efficiency and unique properties,
- ❑ **Sc** availability allows improved technology to be developed in green industries, such as hydrogen generation (SOFCs, RSOC and RFC)

## Contact us

**Eric Vesel**

Executive Director

For any questions, head to our [investor hub](#)

[contact@enovamining.com.au](mailto:contact@enovamining.com.au)

