



ESSENTIAL METALS

for a sustainable future

ASX Code: ESS

Corporate Profile

Shares on issue: 247,482,435
Listed options: 19,725,719
(\$0.15 exercise: 30/11/22 expiry)

Cash: \$10.5m (30 June 2022)
Debt: Nil

KEY PROJECTS

LITHIUM Pioneer Dome
GOLD Golden Ridge
GOLD Juglah Dome

Joint Ventures (ESS %)

2x nickel projects (20-25%)*
4x gold projects (25-30%)*
* Free carried to a decision to mine

Corporate Directory

Non-Executive Chairman
Craig McGown

Non-Executive Directors
Paul Payne
Warren Hallam

Managing Director
Timothy Spencer

CFO & Company Secretary
Carl Travaglini

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5 September 2022

Essential Metals targeting lithium production at the Pioneer Dome Lithium Project in 2025

Primero appointed to commence a Scoping Study with multiple upcoming catalysts including a Resource update in November and progressing discussions with potential off-take/project partners

HIGHLIGHTS

- Primero, a leading engineering firm with significant lithium project experience, has been engaged to oversee the preparation of an independent Scoping Study for the Pioneer Dome Lithium Project. Primero has been assisting Essential Metals with its metallurgical test work programmes and has extensive knowledge of the Project.
- The Mineral Resource Estimate (MRE) focused drill programme and metallurgical test work are both nearing completion, providing sufficient data to determine the likely scale of operation for inclusion in the Scoping Study.
- To enable the Study to commence, the basis for the Study will be an initial mining inventory of 7.5Mt @ 1.2% Li₂O (66% of the current MRE of 11.2Mt @ 1.21% Li₂O¹). The mining inventory will then be adjusted using the updated lithium MRE and pit modelling scheduled for November. Plant throughput is likely to be 1.2Mtpa.
- The updated MRE and scoping study will provide a platform for Essential to progress financing and offtake discussions with the various downstream companies that have already expressed an interest in joining Essential.
- The Scoping Study outcomes will then form a basis to finalise frameworks with the most suitable partner/partners to assist with advancing the Pioneer Dome Lithium Project into production.

Essential Metals Managing Director, Tim Spencer, said: "We are now entering a very important period for the Company as we determine the initial scale of the operation and progress selection of a partner/partners that are best suited to ensuring the Pioneer Dome Lithium Project is a long-term success for ESS shareholders."

¹ Refer to ASX announcement dated 29 September 2020 "Dome North Lithium Project – Resource Upgrade"



PIONEER DOME LITHIUM PROJECT

The 450km² Pioneer Dome Project (ESS: 100%) is located in the core of Western Australia's lithium corridor in the Eastern Goldfields, approximately 130km south of Kalgoorlie and 275km north of the Port of Esperance. A Mineral Resource² of 11.2Mt @ 1.21% Li₂O has been defined at 'Dome North' in the northern area of the Project.

The southern Yilgarn area is recognised as being well-endowed with spodumene deposits, including the Bald Hill Mine, the Mt Marion Mine and the Buldania Project, all of which are located within 80km of the Pioneer Dome Project. The world-class Greenbushes Deposit, the Mt Holland Mine and the Mt Cattlin Mine are located further west, south-west and south-south-west, respectively.

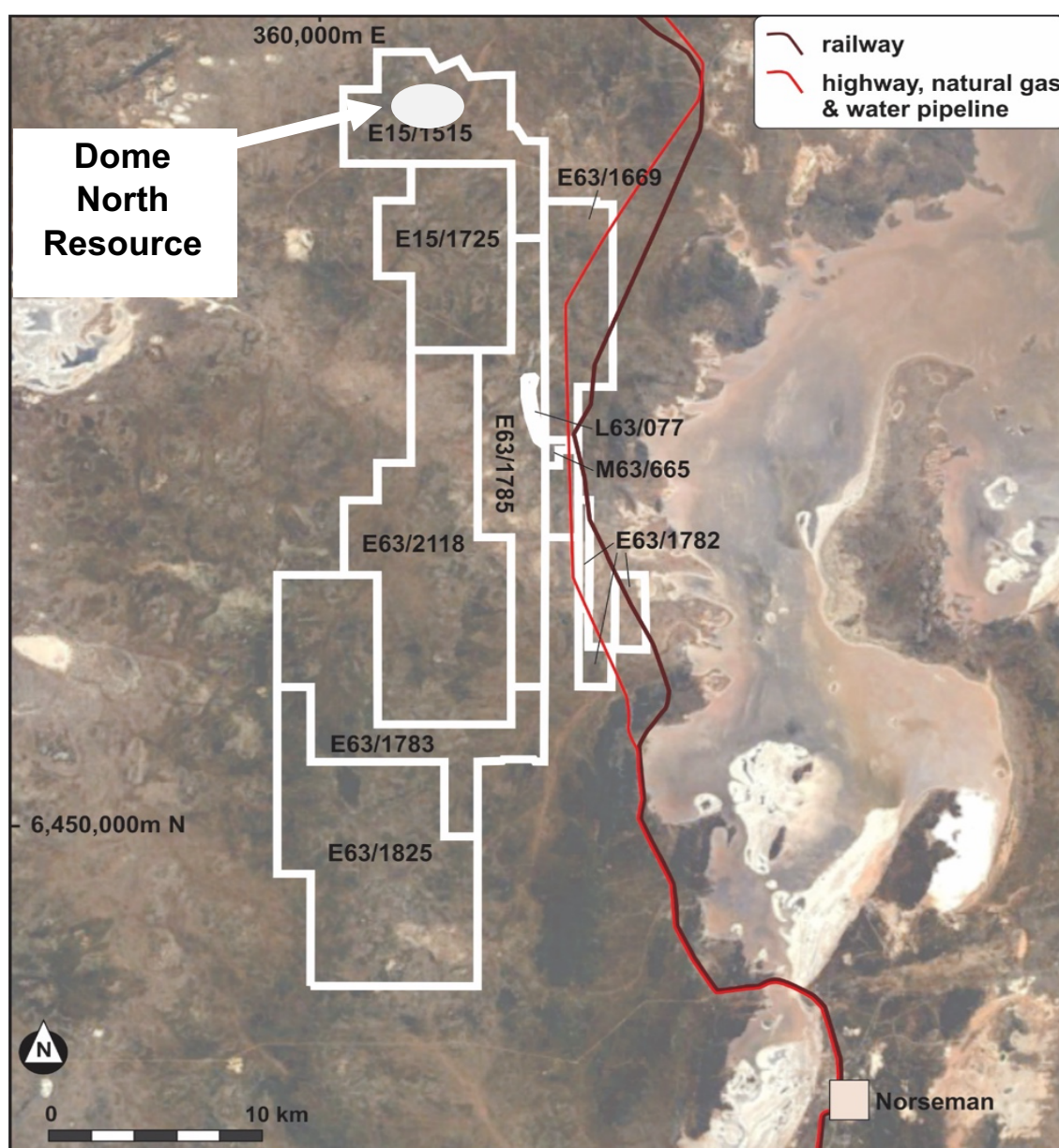


Figure 1 – The location of the tenements of the Pioneer Dome Lithium Project relative to major infrastructure.

² Refer to ASX announcement dated 29 September 2020 "Dome North Lithium Project – Resource Upgrade"



SCOPING STUDY

Leading engineering services firm Primero Group Limited (Primero) has been appointed to undertake a Scoping Study (Study). The aim of the Study is to provide capital and operating cost estimates for the proposed plant flowsheet and associated process and non-process infrastructure to an AACE Class-4 estimating standard (an accuracy of +/-25%) in order to evaluate the economic robustness of the Pioneer Dome Lithium Project prior to moving to more detailed feasibility studies in 2023.

Primero is a leading provider of diversified engineering services to the global resources industry, specialising in the design, construction, operation and maintenance of mineral processing facilities and their associated infrastructure. Primero has provided its services to multiple lithium companies, including Pilbara Minerals, Core Lithium and Covalent to name a few.

The Study will commence using a mining inventory of approximately 7.5Mt at an average grade of at 1.2% Li₂O and will be adjusted following completion of an update to the Dome North Lithium MRE, planned to be completed in November. The likely ROM feed rate and composition will be identified as part of the Study, however it is anticipated that the plant throughput will be approximately 1.2Mtpa, for an initial mine life of just over six years.

The process plant is likely to include:

- Two-stage crushing circuit and crushed ore storage
- Tertiary high pressure crushing Single-size fraction two-stage dense media separation (DMS) circuit
- Grinding circuit
- Flotation preparation circuit including separation and deslime plants
- Mica pre-flotation (single-stage open circuit)
- Spodumene flotation (3-stage open circuit)
- Concentrate thickening and filtration
- Tailings thickening
- DMS process water, flotation process water, raw and potable water services
- Reagents
- Air services

The non-process plant infrastructure is likely to include:

- Power mains supply
- Water supply/storage from bore fields
- Water treatment facility for potable and flotation water
- Tailings storage facility
- Workshops and Offices
- Warehousing / stores
- Fuel storage
- Laboratory building
- In-site access (between facilities) roads
- Telecommunications systems
- Fire suppression systems
- Accommodation camp (on-site and off-site locations will be considered)
- Roads Upgrade

An air strip is not required given the proximity of the Project to airfields in Kalgoorlie and Norseman.



Primero will deliver the Study engineered to an appropriate level of design to meet an AACE Class-4 estimate (+/- 25%) for the process facility. This includes:

- Developing the;
 - process design criteria
 - process flow diagrams
 - plant mass and water balance
 - major mechanical equipment lists
 - 2D general arrangements to support the estimating process
- Completing Scoping Study level engineering design and equipment selection for the proposed flowsheet
- Identifying long-lead equipment items
- Confirming necessary electrical power requirements for the facility and existing availability
- Completing the capital and cost estimation to the level expected in AACE Class-4 (+/- 25%), along with the relevant supporting engineering detail
- Developing a project implementation plan, project schedule and schedule basis document for the execution of the works

The Scoping Study is expected to be completed by end-December with its timing is dependent on the completion of the Dome North Lithium Mineral Resource Estimate update and the mining optimisation study based on the Resource update.

OFFTAKE – PROJECT PARTNERS

Multiple companies participating in the lithium 'downstream' value chain have approached Essential and expressed interest in participating in the Pioneer Dome Lithium Project, primarily to secure lithium concentrate off-take.

The MRE-focused drill programme and metallurgical test work programme are both nearing completion and have provided sufficient data to determine the likely scale of the operation for inclusion in the Scoping Study and therefore to determine an approximate guide on concentrate output and mine life for the purposes of discussing potential arrangements with the interested parties.

The Scoping Study outcomes will then form a basis to finalise frameworks and select the partner/partners best suited to advancing the Pioneer Dome Lithium Project towards production.

The Company's objective is to negotiate arrangements that provide a confident pathway to production. This includes:

- **Funding:** Achieving an outcome whereby loan/pre-payment funds are accessible to cover the majority of the Project capital requirement. Inclusion of a price floor or fixed price for part of the concentrate sold will greatly reduce the credit risk for any borrowings from the financier as well as underpin the Project during the price cycles that will inevitably occur.
- **Lower Risk Profile:** Aligning with a large, credible partner operating in the lithium downstream value chain.
- **Technical expertise:** Lithium processing across its value chain (concentrate, chemical, component) is very complex so an experienced partner that can assist in optimising the mine's product will be sought.



- **Flexibility with Processing:** The lithium value chain is in its infancy and fast-growing so partnering with an off-taker that has alternatives for processing lithium concentrate will help ensure that supply from the mine is always taken when available.

The Company cautions that it cannot give assurance that any or all of the above outcomes will be achieved or of the form in which they can be achieved.

Current market conditions and the future outlook for lithium are strongly in favour of lithium miners, particularly those who own spodumene deposits in low-risk jurisdictions that can or will supply lithium concentrate in compliance with ESG principles.

Essential's Pioneer Dome Lithium Project can meet these criteria and also has key fundamental attributes to underpin it being able to be developed into a robust operation. These attributes include:

- **High grade:** The current 11.2Mt MRE has an average grade of 1.21% Li₂O with the higher confidence Indicated Mineral Resource component of 5.4Mt @ 1.3% Li₂O.
- **High recoveries:** The initial test work undertaken on fresh rock (below ~50m from surface) from the Cade deposit achieved recoveries of 74-82%. Test work on composite samples representing the near surface (the first ~50m from surface) zones of the Cade and Davy deposits as well as the Davy fresh rock zone is expected to be completed in the second half of September.
- **Mineralogy:** The bulk of each spodumene zone within each deposit is relatively homogenous in terms of associated gangue minerals, which should result in more consistent processing and lithium recovery rates.
- **Deposit geometry:** The three deposits that comprise the MRE contain very high grades (>1% Li₂O) and broad widths (up to 30m) from surface and are tabular with consistent strike and dip, which makes them amenable to open pit mining with minimal pre-strip and very good dilution control.
- **Geography & Environment:** The Mineral Resource is located in flat lying topography that is lightly wooded. A baseline flora and fauna study completed earlier this year has provided evidence that there are no 'red flags' in terms of environmental sensitivities that could materially impinge the development of a mine.
- **Proximity to infrastructure:** An all-year unsealed access road passes within a few hundred metres of the Mineral Resource and traverses directly to the Coolgardie – Esperance highway, approximately 10km due east. A railway, gas pipeline and a mains water pipeline all run alongside the highway.
- **Proximity to operating mines:** The region surrounding the Pioneer Dome Lithium Project is an established mining jurisdiction. Multiple lithium, nickel and gold mines are currently operating within a 100km radius of the Project, including the Bald Hill Lithium Mine (in administration), 60km to the north-east, the Mt Marion Lithium Mine (Mineral Resources/Ganfeng) 75km to the north, the Cassini Nickel Mine (Mincor Resources), 17km to the north and the Norseman Gold Project (Pantoro Ltd), 55km to the south, is under development.
- **Ngadju Mining Agreement in place:** A mining agreement is already in place with the Ngadju Native Title Aboriginal Corporation, which represents the Ngadju People who hold native title over the land on which the Pioneer Dome Lithium Project is located. The mining agreement was executed as part of the Sinclair Caesium Mine operation that was successfully discovered, developed and operated by Essential Metals in 2018/19. Comprehensive consultation and dialogue will be required to ensure that the objectives, interests and concerns of NNTAC are taken into account as part of the lithium mine development planning.

**UPCOMING KEY EVENTS****September**

- Completion of MRE extension drill programme
- Results from metallurgical test work
- Submission of Mining Lease application

October

- Completion of an interpretation of the Pioneer Dome structural setting and controls of LCT pegmatite emplacement
- Receipt of assays from the Resource extension drill programme

November

- Completion of the Dome North Mineral Resource Estimates update

December

- Completion of the Pioneer Dome Lithium Project Scoping Study

Exploration activities will continue in parallel with the above key milestone activities, focused on discovering new spodumene-bearing pegmatites at the Pioneer Dome Lithium Project.

This ASX release has been approved by the Board of Directors.

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ABOUT ESSENTIAL METALS LIMITED

Essential Metals is a well-funded and active explorer focussed on the discovery of lithium and other key global demand-driven commodities, for the creation of shareholder wealth through exploration and project development. The Company operates **three strategically located lithium and gold projects** in Western Australia.

100% OWNED AND MANAGED PROJECTS:

- **LITHIUM:** The **Pioneer Dome Lithium Project** is highly prospective for lithium-caesium-tantalum (LCT) mineral systems and includes the **Dome North Lithium Mineral Resource** of 11.2 million tonnes @ 1.21% lithium (Li₂O).³
- **GOLD:** The **Juglah Dome Project** is located 60km east-south-east of Kalgoorlie and is considered to be highly prospective for gold and has potential for VHMS style polymetallic deposits.
- **GOLD:** The **Golden Ridge Project** is located ~20km south-east of Kalgoorlie, WA. Our activities are focussed on reappraising known prospects as well as identifying new areas within the large land tenure.

JOINT VENTURE INTERESTS:

- **GOLD:** The **Acra** Project is near Kalgoorlie. Northern Star Resources Limited (ASX:NST) has earned a 75% Project Interest and continues to fully fund exploration programmes until approval of a Mining Proposal by DMIRS is received with Essential Metals holding a 25% interest.
- **GOLD:** The **Kangan** Project is in the West Pilbara and part of a joint venture with Novo Resources Corp (TSXV:NVO), who will fund 100% of gold exploration programmes until a decision to mine is made, with Essential Metals holding a 30% interest.
- **GOLD:** The **Balagundi** Project is subject to a farmin & JV agreement where Black Cat Syndicate Limited (ASX:BC8) is earning a 75% interest in the Project located at Bulong, near Kalgoorlie. Black Cat will then fully fund gold exploration programmes until a decision to mine is made, with Essential Metals retaining a 25% interest.
- **GOLD:** The Company holds a 25% free-carried interest (20% for nickel rights) in the **Larkinville** Project near Kambalda, WA, with Maximus Resources Ltd (ASX:MXR).
- **NICKEL:** The nickel mineral rights on the **Blair-Golden Ridge** Project, which includes the suspended Blair Nickel Sulphide Mine, are subject to a Farmin/Joint Venture with Australian Nickel Company Ltd, a nickel exploration specialist which is earning up to a 75% interest. The Company will retain a 25% free-carried interest up to a decision to mine.
- **NICKEL:** The Company holds a 20% free-carried interest (nickel only) in the **Wattle Dam** project near Kambalda, WA, with Maximus Resources Ltd (ASX:MXR).

³ Refer to ASX announcement dated 29 September 2020 "Dome North Lithium Project – Resource Upgrade"

**Forward Looking Statement**

This announcement may contain forward-looking statements which involve a number of risks and uncertainties. These forward-looking statements are expressed in good faith and believed to have a reasonable basis. These statements reflect current expectations, intentions or strategies regarding the future and assumptions based on currently available information. Should one or more of the risks or uncertainties materialise, or should underlying assumptions prove incorrect, actual results may vary from the expectations, intentions and strategies described in this announcement. No obligation is assumed to update forward looking statements if these beliefs, opinions, and estimates should change or to reflect other future developments.

Reference to previous market announcements

The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcements continue to apply and have not materially changed. The company confirms that the form and context in which Exploration Results or Competent Person's findings are presented have not been materially modified from the original market announcements.

Competent Person Statement

The information in this Report that relates to Mineral Resources for the Dome North Lithium Project is based on and fairly represents information compiled by Competent Persons Mr Stuart Kerr and Mr Lauritz Barnes as extracted from the report entitled "Dome North Lithium Project – Resource upgrade" created on 29 September 2020 and is available to view on www.essmetals.com.au. The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and, in the case of Mineral Resources, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.