

Please note: This announcement must be read in the context of the Cautionary Statement on Page 3, the footnotes that accompany this announcement, and the attached Scoping Study Summary Report.

ASX ANNOUNCEMENT 18 JANUARY 2022

## Study Highlights a Low Operating Cost, Long-Life High Purity Manganese Sulphate Project with Compelling Economics

Element 25 Ltd (Element 25, Company or E25) - ASX:E25, is pleased to announce that a Scoping Study (Study) into the construction and operation of a High Purity Manganese Sulphate Monohydrate (HPMSM) plant has returned a robust set of financial metrics over a 20 year project life. The project is strongly leveraged to the emerging Electric Vehicle (EV) industry. EV's typically use lithium-ion batteries for energy storage and battery cathode materials contain HPMSM<sup>1</sup>.

The Company is moving directly into a definitive Feasibility Study (FS) for the development of a High Purity Manganese Sulphate project and expects that study to be finalised in the second half of 2022.



### Highlights

- The Study returned a robust Net Present Value (NPV) with a healthy base case Internal Rate of Return (IRR).
- The Study used a life of project average High Purity Manganese Sulphate (HPMSM) price of US \$1,950 (A \$2,600) per tonne FOB and Fertiliser Grade Manganese Sulphate (FGMSM) price of US \$900 (A \$1,200) per tonne FOB.
- The Study investigates three stages of development modelled on a southeast Asian site. The second and third stages are scheduled for construction after completion of the previous stage.

<sup>1</sup>[https://www.moorestephens.com.au/MediaLibsAndFiles/media/australia.moorestephens.com/Images/Profile%20Photos%20\(Contact%20boxes\)%20110w%20x%20110h%20px/Western%20Australia/Manganese-Moore-Stephens-Report.pdf](https://www.moorestephens.com.au/MediaLibsAndFiles/media/australia.moorestephens.com/Images/Profile%20Photos%20(Contact%20boxes)%20110w%20x%20110h%20px/Western%20Australia/Manganese-Moore-Stephens-Report.pdf)

### COMPANY SNAPSHOT

#### Market Summary

ASX code: E25  
 Shares on issue: 153M  
 Share price: \$1.415

#### Board of Directors:

Seamus Cornelius Chairman  
 Justin Brown MD  
 John Ribbons NED


Element 25 Limited is developing the world class Butcherbird Manganese Project in Western Australia to produce high quality manganese concentrate and high purity manganese products for traditional and new energy markets.

- Modest startup capital cost of approximately US \$150M (**A \$200M**) (including US \$14M (**A \$19.0**) contingency and US \$24M (**A \$32M**) working capital), employing a proprietary leaching and sulphate purification solution developed in-house.
- Test work indicates an overall manganese recoveries of at least 85% which is the base-case assumption for the Study.
- Life of project operating costs are projected to be approximately US \$552/t HPMSM (**A \$736**) or approximately 28% of assumed revenue per tonne HPMSM. Planned process optimisation test work will be conducted during the FS aimed at confirming metallurgical assumptions, improving metal recoveries and reducing energy usage.
- The Study is based on manganese ore supplied from the Company's existing Butcherbird Manganese Project, (**Project**) which is based on a JORC (2012) Proved and Probable Reserve at Butcherbird of 55Mt @ 10.8% Manganese<sup>2</sup>. Refer the Table of Materials Assumptions.
- The results of the Study confirm the Company's view that a HPMSM Project represents a long life, low operating cost opportunity to expand into the down-stream processing of ore from the Project to produce HPMSM, requiring modest capital in a stable jurisdiction with simple logistics and in a growing market.
- The HPMSM Project is underpinned by the Company's 100% owned Project having a large upside potential due to the large resource base defined to date, which will support potential future expansions to larger scale operations.
- Production cost reduction opportunities, including use of hybrid energy systems and use of alternative export ports, will be further investigated during more detailed studies.
- E25 has sufficient funding, supported by forecast revenues from its existing production operations to progress through to a HPMSM Feasibility Study and subject to the outcomes of the studies, finance and develop the project as soon as possible.
- The Company envisages a traditional debt-equity funding solution to be completed in 2023 post offtake finalisation. Equity will be sourced via cash reserves, future revenues from operation and/or the issue of new shares to raise further equity.
- The plant will be designed with a focus on ESG principles including carbon minimisation, social engagement good corporate stewardship. Energy will be sourced from renewable where available in-line with the Company's' net-zero carbon strategy.

**Mn<sup>25</sup>**  
**95-98% Recovery**  
 Repeatable high recoveries and fast kinetics in leach tests



**Waste Volumes**  
 Reduction (~50%) in waste production simplifies plant, lowers costs.



**Reagent Usage**  
 Significant reduction in reagent consumption reduces operating costs.



**Leach Selectivity**  
 Fe & Si selectivity improves repurposing options and environmental outcomes.

<sup>2</sup> Reference: Company ASX release dated 31 September 2021.

## Cautionary Statements

The Scoping Study referred to in this announcement has been undertaken to evaluate the opportunity to expand the E25 manganese business vertically into the HPMSM market. It is a preliminary technical and economic study of the potential viability of the HPMSM Project. It is based on low level technical and economic assessments that are not sufficient to support the estimation of ore reserves. Further evaluation work and appropriate studies are required before E25 will be in a position to provide any assurance of an economic development case.

The production target referred to in this announcement is based on the purchase of manganese ores sourced from the Company's Butcherbird Manganese Project. The Project has a 40-year project life and is capable of supplying sufficient manganese ore for the HPMSM project over a 20 year<sup>2</sup> HPMSM project life.

The Scoping Study is based on the material assumptions outlined below. These include assumptions about the availability of funding. While E25 considers all of the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by the Scoping Study will be achieved. To achieve the range of outcomes indicated in the Scoping Study, funding of in the order of A\$200 million will likely be required. Investors should note that there is no certainty that E25 will be able to raise that amount of funding when needed. It is also possible that such funding may only be available on terms that may be dilutive to or otherwise affect the value of E25's existing shares. It is also possible that E25 could pursue other 'value realisation' strategies such as a sale, partial sale or joint venture of the project. If it does, this could materially reduce E25's proportionate ownership of the project. Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the Scoping Study.

## Forward Looking Statements

Some of the statements contained in this report are forward looking statements. Forward looking statements include, but are not limited to, statements concerning estimates of tonnages, expected costs, statements relating to the continued advancement of Element 25 Limited's projects and other statements that are not historical facts. When used in this report, and on other published information of Element 25 Limited, the words such as 'aim', 'could', 'estimate', 'expect', 'intend', 'may', 'potential', 'should' and similar expressions are forward looking statements.

Although Element 25 Limited believes that the expectations reflected in the forward-looking statements are reasonable, such statements involve risks and uncertainties and no assurance can be given that the actual results will be consistent with these forward-looking statements. Various factors could cause actual results to differ from these forward-looking statements including the potential that Element 25 Limited's Project may experience technical, geological, metallurgical, mechanical problems, changes in manganese price and other risks not anticipated by Element 25 Limited.

Element 25 Limited reports this summary of the study in a fair and balanced way and believes that it has a reasonable basis for making the forward-looking statements in this announcement, including with respect to any mining of material, modifying factors, production targets and operating cost estimates. This announcement has been compiled by Element 25 Limited from the information provided by the various contributors to the announcement.

## Scoping Study Summary

Element 25 Limited is pleased to announce that a Scoping Study (**Study**) into the construction and operation of a High Purity Manganese Sulphate Monohydrate (**HPMSM**) Plant (**HPMSM Project**) has returned a robust set of financial metrics over a 20 year project-life. The Project is strongly leveraged to the emerging Electric Vehicle/Battery industry. The Company is moving directly into a definitive Feasibility Study (**FS**) to further explore the commercial potential of this opportunity. The Study assumes that the Project will be built in an industrial park located in southeast Asia, leveraging local low cost of power and the local supply of process reagents. A final site has not yet been determined and this will be further considered in the FS.

The HPMSM Project includes the construction of a HPMSM conversion plant as well as supporting administrative, packaging and laboratory facilities. The site will most likely be located on an industrial park, near a deep sea, bulk cargo port and will most likely have established water, power and communications facilities.

E25 is investigating several such locations in southeast Asia and a final decision on the location has yet to be reached.

The Project is 100% owned and E25 will likely establish a local company in the destination country to manage local ownership. Manganese ore will be sourced from the Project.

The Study examines the macro-economic inputs, operational and capital cost parameters and contemplates the progressive expansion of production at the Project. These inputs include:

- Staging of HPMSM production in 3 x 50,000tpa HPMSM increments;
- Manganese recovery of 85%;
- Exchange rate 0.75 A \$/US\$;
- Startup Capital expenditure of US \$150M
- Local workforce; and
- Operational costs based on local supply of personnel, power, reagents and consumables.

The results confirm that the project exhibits robust economics for a base case 50,000 tpa HPMSM and that the economics are improved by expanding production beyond the base case. Economies of scale result in better equipment and overhead utilisation and minor operating efficiencies which improve project economics.

Table 1: HPMSM Project Financial Summary

Key Economic Metrics	Unit	50 ktpa HPMSM	100 ktpa HPMSM	150 ktpa HPMSM
Ore Purchased	ktpa	78.4	156.8	235.3
Operating Manganese Sulphate Trains	Units	1	2	3
HPMSM Produced	ktpa	50.0	100.0	150.0
FGMSM Produced	ktpa	16.6	33.2	49.9
HPMSM Price Received	US\$/t MnSO <sub>4</sub>	1,950	1,950	1,950
FGMSM Price Received	US\$/t MnSO <sub>4</sub>	900	900	900
Undiscounted Cashflow	US\$M pa	73	141	205
Project Life	Years	20	20	20
<b>NPV<sub>8 Real</sub> (Pre Tax)</b>	<b>US\$M</b>	<b>439</b>	<b>890</b>	<b>1,275</b>
NPV <sub>8 Real</sub> (Post tax)	US\$M	395	801	1,142
<b>IRR (Pre-tax)</b>	<b>%</b>	<b>40</b>	<b>45</b>	<b>47</b>
Simple Payback	Months	26	24	19
Operating Cost	US\$/t MnSO <sub>4</sub>	573	558	552
Capital Cost ( <i>incremental capital cost</i> )	US\$ M	150	+86	+86

## Key Outcomes of Base Case

This Study includes estimated production schedules and metallurgical testing relevant to the processing of HPMSM processing and recovery. Capital costs were based on preliminary engineering designs and industry sourced quotations provided by technical experts within E25 and by external consultants. Operating costs were derived from first principals with labour costs sourced from published data for factories in southeast Asia ore haulage and camp facilities, other operational costs were sourced from industry quotations and database costs and are considered to be at a ±30-40% level of estimation. Ore supply is based on the internal sale at cost of manganese ores from the Project.

The study base case for the Study comprises:

- Development of a staged High Purity Manganese Sulphate Monohydrate processing circuit in southeast Asia. Each circuit producing 66,650t MnSO<sub>4</sub> per annum (75% HPMSM and 25% FGMSM)
- Manganese lump concentrate purchased from the Project and transported to a Port in southeast Asia, at an average grade of 32% Mn per annum.

- An initial project life of 20 years utilising only 50% of the proposed Butcherbird stage 1 production capacity
- Operating expenses over the life of the project are currently estimated at US \$552/t (AUD736/t) HPMSM.
- Startup capital costs of US\$150M (AUD200M) including working capital and contingency.

Using a base case HPMSM (32.5% Mn grade) price sourced from industry of US\$1,950/t, NPV<sub>8</sub> pre-tax is US \$1,280M (A \$1,707M), post-tax US \$1,146M (AUD 1,528M), with an IRR of 47%.

The base case NPV<sub>8</sub> highlights that the Project is robust and offers returns even at conservative pricing assumptions. The Project breaks even at a HPMSM price of US \$960/t for the life of the Project.

### Expansion Studies

The Study included assumptions for two expansions where the HPMSM plant is replicated in 2 stages to produce a steady state production volume of 150,000 tonnes per annum of HPMSM.

The assumptions for the expansion cases are listed below and detailed within the remainder of the study. These assumptions comprise the following:

- Commencement of construction in 2023.
- The startup site layout and infrastructure has been designed to allow expansion options
- Environmental and other studies required to allow statutory approvals for expansion to be obtained.
- ESG principles will be incorporated into the design and supply of reagents, consumables and power
- Submit the relevant expansion approval applications.
- Commence expansion construction activities of Train 2 in Q1 2025 and Train 3 in Q3 2026.

## Development Timeline

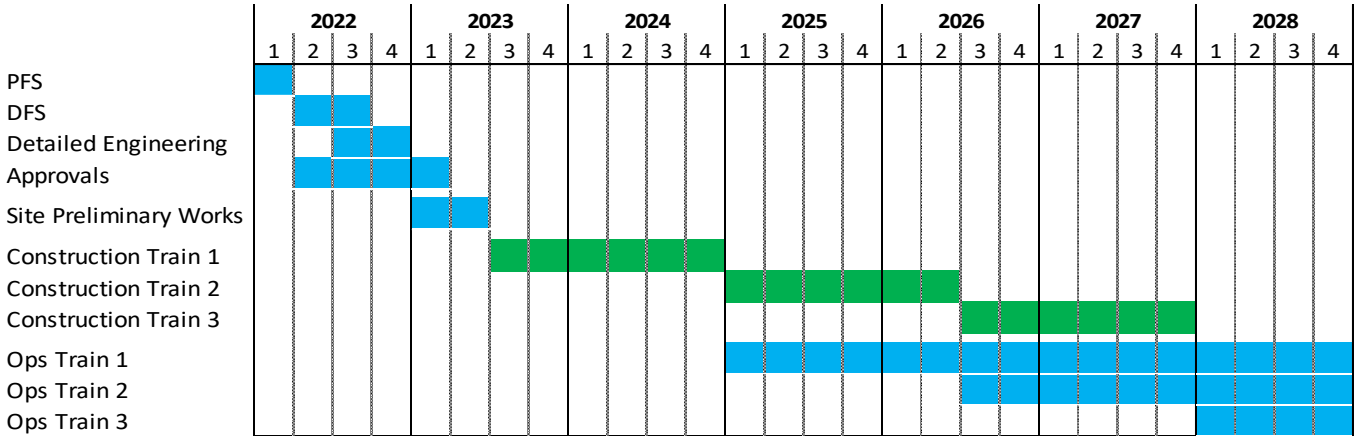


Figure 1. Project Development Timeline

## Project Description

The Company intends to move into the down-stream processing of its large resources of manganese ores available at the Project and this study examines the potential of developing a HPMSM facility within southeast Asia.

The facility will consist of up to three processing trains each capable of producing a total of 66,650 tpa of manganese sulphate with 75% or 50,000tpa at a battery grade (HPMSM) and 25% or 16,650 tpa at a fertiliser grade (FGMSM).

### Location

The Company is considering a number of locations for a facility including the Butcherbird mine site, coastal and other areas within Western Australia, as well as a number of industrial parks within southeast Asia, Europe and the United States of America.

These preliminary studies indicates that a site where all the key reagents, people and port access are accessible with a low cost of power will be the best location to build such a plant subject to geo-political stability and environmental acceptance. The current Study has focused on a potential site located in an industrial park within Southeast Asia, however further work as part of the FS will aim to finalise the location.

The Company is monitoring the battery industry and will continue to review options to locate some level of production to facilities near future battery plants should the option arise.

### Ore Supply

The Company intends to source the manganese ores for the project from the Company’s Butcherbird Manganese Project. The Project was commissioned in April 2021 and has been operational since then delivering 3 shipments of manganese lump concentrate to customers up to December 2021.

At full production, the HPMSM project will consume concentrate volumes equivalent to 60% of the current Butcherbird manganese concentrate production. It is anticipated that the feed for the HPMSM project will, however, be sourced from expanded concentrate production from the Project as detailed in the Pre-Feasibility Study announced 3 December 2020. The feed requirement for the conversion facility are not expected to be sourced from existing production, however if this is required, then it is anticipated that the current offtake agreement(s) will be renegotiated.

The Company has derived an ore purchase price based on operating costs, port charges and sea freight to derive a purchase price for the supply of the ore. This is detailed in the Material Assumptions section.

### Processing

The processing circuit proposed is based around taking E25 manganese ores and converting them to HPMSM and FGMSM via a hydrometallurgical process outlined in the flow diagram below

The comminution circuit will take ROM Manganese ores from Butcherbird and reduce them to P90 < 2mm. This circuit will consist of a small cone crusher and rolls crusher and small drum plant capable of processing approximately 10 tph.

Following reduction to less than 2mm, the manganese ore will be leached in a multi-stage tank leach circuit.

Reducing and leach reagents will be added and the tanks heated to 85°C using steam to produce a Pregnant Leach Solution (PLS).

The details of the reductant and leach agents are confidential as patent applications are underway.

Once leached the PLS will be purified by addition of various reagents wherein the base metal contaminants within the PLS will drop out of suspension and will be filtered from the polished leach solution. The polished leach solution will be crystallised in a multi-stage crystallisation process to produce HPMSM and FGMSM.

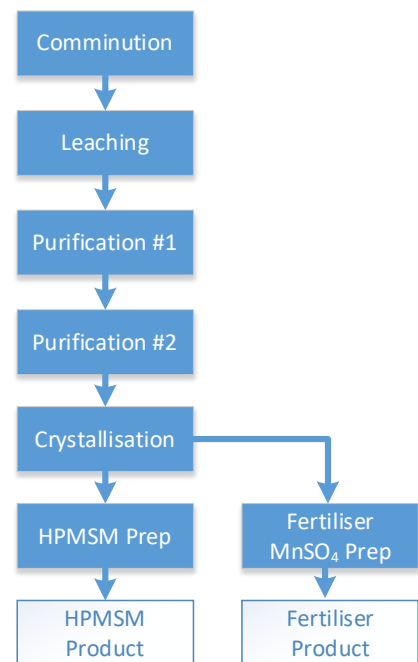


Figure 2. HPMSM Process Flowchart



Process residues will be either re-purposed in nearby industrial applications or disposed of in an appropriate facility. Liquids will be neutralised by addition of limestone and disposed into approved waste-water systems.

## Operating costs

Operating costs have been derived from first principals. Labor costs were sourced from a schedule of manning required to run then plant and a table of wages applicable to the location. Reagents and consumables costs have been derived from consumption figures derived from laboratory test-work and reagent costs derived from suppliers.

Table 2. Operating Cost Breakdown

Cost Area	Operating Cost (US \$/t HPMSM)			Source
	50,000 tpa	100,000 tpa	150,000 tpa	
Ore Purchase	\$159	\$159	\$159	E25 budget cost
HPMSM Production	\$297	\$297	\$297	E25 estimates of usage and supplier quotes for reagent supply
Production & Maintenance	\$48	\$43	\$41	Industry websites for SE Asian labour
Overheads	\$30	\$20	\$17	E25 Estimate
Logistics	\$38	\$38	\$38	E25 estimates based on local knowledge
<b>Total Operating Cost</b>	<b>\$573</b>	<b>\$558</b>	<b>\$552</b>	

Capital costs for the plant were derived for both the Site Preparation and then the construction costs for a Manganese sulphate train.

Table 3. Capital Cost Breakdown

Capital Area	Capital Cost (US \$M)	Source
Design and Engineering	13.7	Comparative Works and Database Estimates
Site Preparation and pre-works	21.7	Comparative Works and Database Estimates
Manganese Sulphate Train 1	76.5	Comparative Works and Database Estimates
Working Capital	23.8	12 Months Operating Cost
Contingency Capital	14.2	10% of startup capital
<b>Total Start Up Capital</b>	<b>149.9</b>	
Manganese Sulphate Train 2	+85.6	
Manganese Sulphate Train 3	+85.6	

## Logistics

Manganese ores from Butcherbird are transported by road train from the Butcherbird Project to Utah Point at Port Hedland where they are loaded onto bulk ships for dispatch to customers ports.

On arrival at the destination port they are unloaded and transported by road to the HPMSM site.

Table 4. Freight Summary

Freight Component	Cost	Note
Shipping Utah Point to SE Asia	US \$18/t	Bulk shipping to SE Asia Included in Mn ore purchase price
Road Freight to Site	US \$20/t	Included in Mn ore purchase price

Product will be sold to final customers in sea containers on a Free on Board (FOB) basis.

### Mn Sulphate Market

Manganese ore originates globally as a carbonate, semi-carbonate, or oxide ore. 80-90% of mined supply ore is used in steel and specialty alloys sectors. The global manganese market is circa 20mt per annum of contained manganese. In 2020, the battery grade market represented 0.5% of the total contained manganese consumption but is the strongest growth sector of the Manganese market.

High purity manganese, is produced by a handful of producers globally, with only three companies outside of China, which are all are long established. China supplies over 90% of the High Purity Manganese market.

High Purity Manganese, also known as battery grade manganese, is purchased by cathode and battery manufacturers in either a metal or sulphate form. More specifically, High Purity Electrolytic Manganese Metal (HPEMM) or High Purity Manganese Sulphate Monohydrate (HPMSM).

HPEMM is a 99.99% of contained manganese, low impurity metal and HPMSM is a pale pink inorganic compound with typically 32% contained manganese. The chemical symbol of this low impurity salt is  $MnSO_4 \cdot H_2O$ . High Purity Manganese is used in lithium ion battery cathodes, specialty steels, aluminium, and chemicals.

The forecast demand for high purity manganese is heavily skewed towards HPMSM, with new capacity coming online demanding HPMSM, not HPEMM.

It is possible to make HPMSM directly from ore (carbonate, semi-carbonate or oxide) as is done in China. Alternatively, HPMSM can be dissolved from EMM. The economic viability of each operation is influenced by a number of factors such as; cost and access to electricity, cost of acid, access to infrastructure, soluble manganese grade, ore impurities and metallurgy.

Traditionally precursor and cathode manufacturers purchased HPEMM and dissolved it in acid to produce HPMSM. This was done to maintain purity levels, however this comes at a significant cost. It is therefore more economical to manufacture HPMSM directly from ore if metallurgically feasible and this is the pathway E25 is embarking.

CPM Group’s forecast for manganese use in lithium-ion batteries also includes other battery applications like Energy Storage Systems (ESS, grid-electricity storage, or renewable sources electricity storage) and consumer electronics. However, demand

from batteries for EVs will account for about 84% of all manganese demand from the battery sector in 2037.

CPM Group and many battery experts like Cairn ERA expect the demand for manganese from the battery sector to grow over 80 times by 2037 (when compared to its use in 2017).

As indicated above, this demand can be satisfied by either HPEMM or HPMSM, or, most likely, by a mix of the two products.

The Project enjoys a number of advantages over competitors including a low-cost ore supply base, high quality, proximity to market and the Company believes that a new manganese producer in a stable well-regulated jurisdiction like SE Asia producing cost competitive HPMSM will be welcomed by existing consumers looking for ex-China input sources.

The development will be staged with the first stage producing an estimated 50Ktpa HPMSM and 16Ktpa FGMSM. Subsequent stages of the same size will be built following the completion of the first stage.

The Company has had preliminary discussions with a number of potential offtake partners and believes that the assumptions for potential sales volumes and values are reasonable.

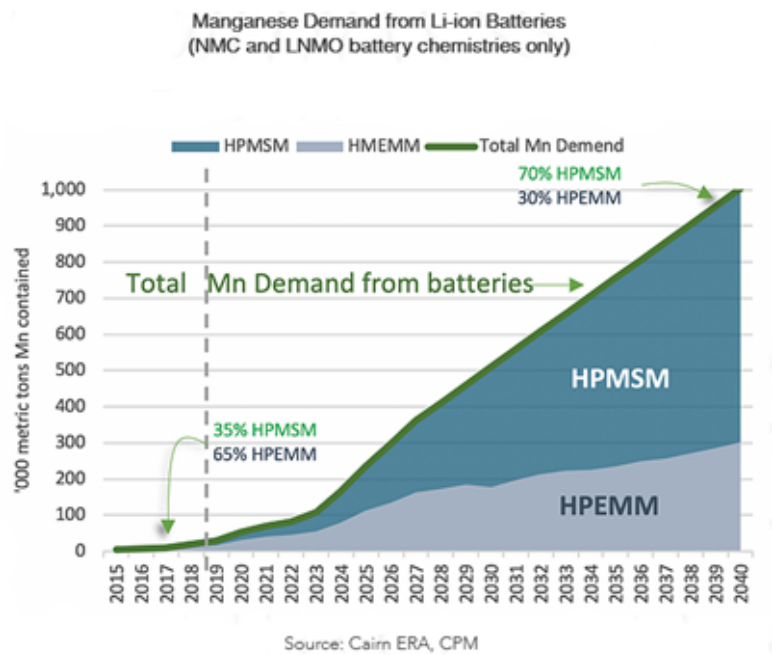


Figure 3. HPMSM Forecast Demand

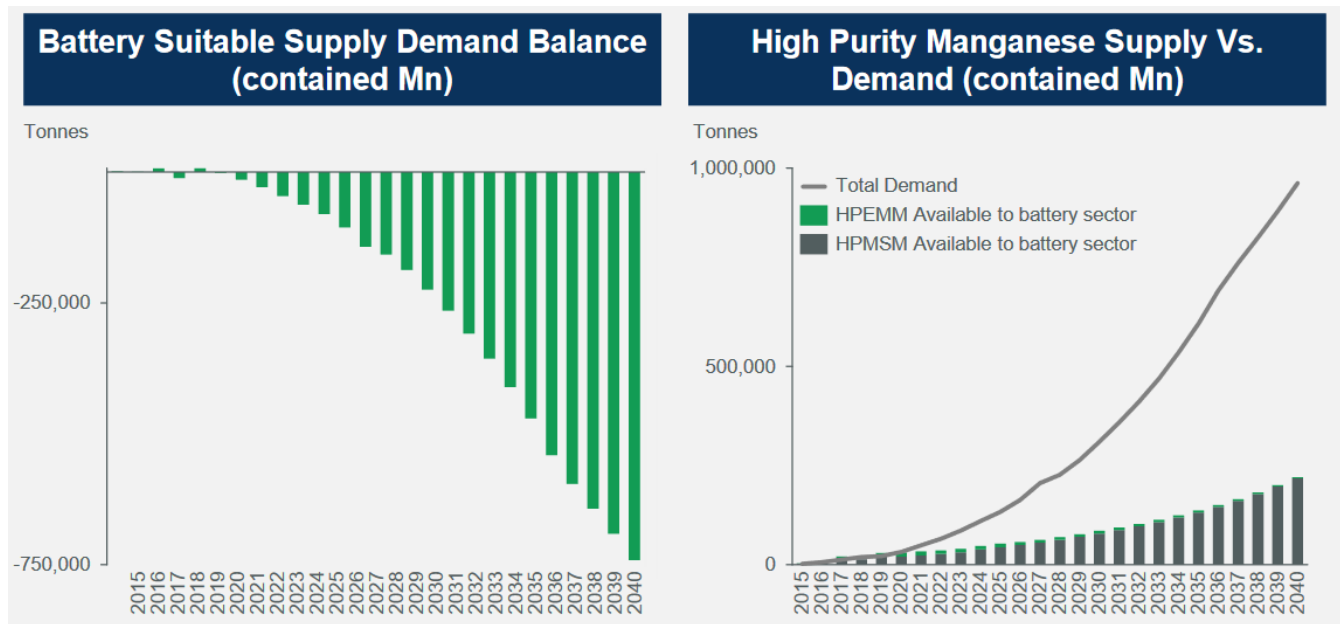


Figure 4. HPMSM Supply Demand Forecast. Reference Cairn ERA/CPM

## Economic Analysis

### Project Assumptions

The following assumptions have been made in the construction of the financial model for the Project and are relevant to the base and the two expansion options:

- 20 Year project life, but could be expanded.
- AUD/US Exchange rate of 0.75 for the life of the project.
- 10 Year straight line depreciation for capex.
- Discount Factor 8%.
- Project startup capital costs totaling US\$150M (A \$200M), which includes contingency of US\$14.3M (A \$19.0M) and working capital of US \$23.8M (A \$31.7M).
- Manganese price forecasts sourced from comparative industry source.
- Expansion funding to be sourced from cash flow, equity and loans.

## HPMSM Price

The HPMSM prices assumed for the project were sourced from comparative industry source. The pricing assumptions are supported by the preliminary offtake discussions and a pricing structure will be built into any offtake agreements.

## Key Financial Outcomes

The key financial outcomes of the Study are detailed below.

Table 5. Key financial outcomes

Key Economic Metrics	Unit	50 ktpa HPMSM	100 ktpa HPMSM	150 ktpa HPMSM
Ore Purchased	ktpa	78.4	156.8	235.3
Operating Manganese Sulphate Trains	Units	1	2	3
HPMSM Produced	ktpa	50.0	100.0	150.0
FGMSM Produced	ktpa	16.6	33.2	49.9
HPMSM Price Received	US \$/t MnSO <sub>4</sub>	1,950	1,950	1,950
FGMSM Price Received	US \$/t MnSO <sub>4</sub>	900	900	900
Undiscounted Cashflow	US \$M pa	73	141	205
Project Life	Years	20	20	20
<b>NPV<sub>8</sub> Real (Pre Tax)</b>	<b>US\$M</b>	<b>439</b>	<b>890</b>	<b>1,275</b>
<b>NPV<sub>8</sub> Real (Post tax)</b>	<b>US\$M</b>	<b>395</b>	<b>801</b>	<b>1,142</b>
IRR (Pre-tax)	%	40	46	47
Simple Payback	Months	26	24	19
Operating Cost	US \$/t MnSO <sub>4</sub>	573	558	552
Capital Cost ( <i>incremental capital cost</i> )	US \$M	149.9	+85.6	+85.6

## Operating Costs Summary

Operating costs were developed from supplier sources together with consumption rates sourced from laboratory test-work conducted by E25 at ALS laboratories in Perth, Western Australia.

Sea freight and logistics charges were sourced from suppliers.

Due to the use of fixed costs in certain areas efficiencies of scale impacts were seen resulting in lower overall unit costs for the expansion cases.

Unit operating costs for the two expansion options are shown below:

Table 6. Life of Project Operating Costs Summary for Expansion Options

Operational Area	50ktpa	100ktpa	150 ktpa
Ore Purchase	159	159	159
Site Operating Cost	376	361	355
Product Logistics	38	38	38
<b>Total Operating Cost (US \$/t HPMSM)</b>	<b>573</b>	<b>558</b>	<b>552</b>

An operational staff schedule was developed based on an expected operating scenario based on the flow chart developed during the study. Salaries and wages were sourced from published salaries for personnel in similar positions in southeast Asia.

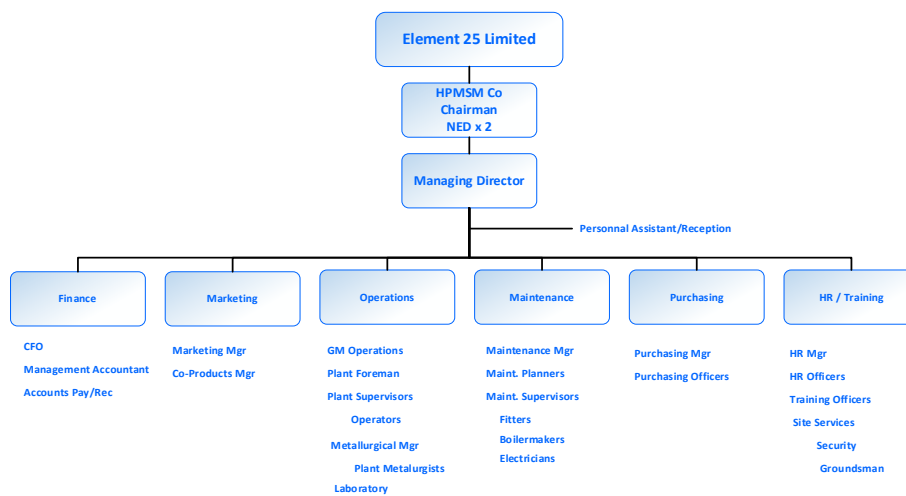


Figure 5. Proposed organisational chart for a HPMSM production operation.

### Project Sensitivity

These sensitivities are shown graphically below for the Base Case:

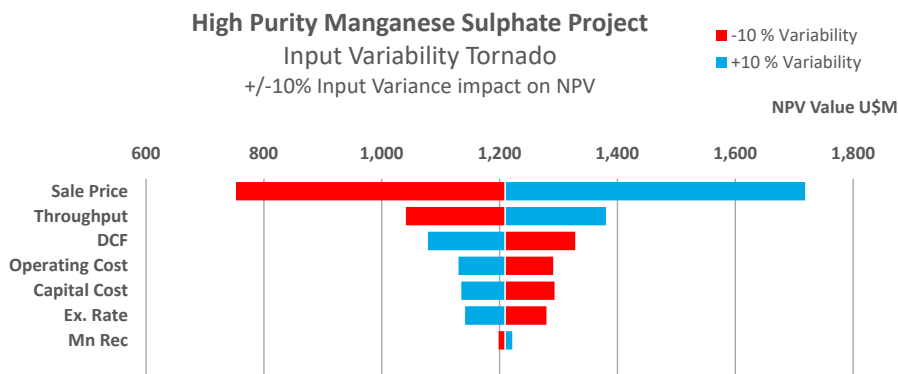


Figure 6. HPMSM Project - NPV Sensitivity Tornado Chart (note Mn Recovery variability is ±5%).

## ESG Principles

E25 are constantly working to improve energy efficiency and reduce carbon emissions. We are setting targets to reduce our net emissions in line with our aspiration to achieve net zero over time. We believe that the transition to a renewable energy powered world is an important legacy to which we want to make a contribution.

Technology and innovation are key building blocks in our journey towards long-term sustainability. Our people are a key ingredient to our success and we want to attract, develop and retain a diverse, high-performing workforce.

We understand that establishing and maintaining constructive long-term relationships with Traditional Owners and other communities are fundamental to maintaining our social licence to operate and we continue to seek to build relationships with stakeholders who are influenced by our activities.

## Business Plan Risks

### Operating Costs

The top three cost areas are HPMSM selling price, throughput and operating/capital costs.

HPMSM selling price is mitigated by appropriate strategies with regards offtake partners, forward sales arrangements, and speed to market.

Throughput is mitigated by design and assessment diligence to ensure that the plant is appropriately sized with some overhead capacity built in.

Operating and capital cost are mitigated by due diligence in the feasibility and design phases of the project by sourcing costs for as many areas as possible and then an operating strategy that ensures cost variances are analysed, explained and mitigations put in place to offset negative variances.

### Revenue

The Company believes that being an early entrant into the rapidly expanding manganese sulphate market will allow Element 25 to establish long term relationships with potential offtake partners, traders and end users of manganese sulphate wherein the properties of the Projects manganese sulphate including impurity levels can be used as a marketing tool.

### Social License

The decision to base the Project in one of southeast Asia's business parks, ensures that the concerns of local

communities are considered and met and that all agreements are complied with.

The Company intends to staff the Project with local sourced skilled operators and ensure in as much as is possible that local suppliers are used for as much as possible throughout both construction and operations.

### Project Finance

The Company reported cash at bank and of approximately \$29M before creditor payments at the end of the September 2021 quarter. The Company also held ASX listed investments valued at approximately \$3.3M. Based internal budgets there is sufficient capital available to fund the development of the feasibility study for the development of the conversion plant.

Cashflows from the HPMSM production are expected to be sufficient to fund the incremental capital required for the expansion case.

Stockpile finance has been sourced which allows payment of production on delivery of manganese product to the port. This brings forward revenue and has reduced working capital requirements from those included in the May 2020 PFS. The details of the stockpile finance arrangement are commercial in confidence.

### Consultants and Contributors

The internal E25 team has unique expertise in process design, start-up and operation of manganese operations throughout the world. E25 has partnered with a similar team of outstanding professionals across multiple disciplines to assure that the Study is of the highest quality. The external team includes input and services from:

Table 7. Butcherbird PFS Major Consultants and Contributors

Group	Abbreviation	Function
ALS Laboratories	ALS	Metallurgical test-work
HPS (WA) Pty Ltd	HPS	Mn Marketing, Offtake and Logistics support
Mining Solutions Pty Ltd	MinSol	Project management, Financial Modelling
NG Consult	NGC	Metallurgical assessment and Process Engineering
ProjX	Projx	Process flowsheet development and Engineering design



## Competent Persons Statement

### Disclaimer

The Company confirms that in the case of estimates of Mineral Resource or Ore Reserves, all material assumptions and technical parameters underpinning the estimates in the market announcements dated 17 April 2019 and 19 May 2020 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 has not been materially modified from the original market announcements.

### Competent Person Statement - Resources and Reserves

The Company confirms that in the case of estimates of Mineral Resource or Ore Reserves, all material assumptions and technical parameters underpinning the estimates in the market announcements dated 17 April 2019 and 19 May 2020 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 has not been materially modified from the original market announcements.

The information in this report that relates to Exploration Results and Exploration Targets is based on information compiled by Mr Justin Brown who is a member of the Australasian Institute of Mining and Metallurgy. At the time that the Exploration Results and Exploration Targets were compiled, Mr Brown was an employee of Element 25 Limited. Mr Brown is a geologist and 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'. Mr Brown consents to the inclusion of this information in the form and context in which it appears in this report.

### Competent Person Statement - Metallurgical Results and Financial Analysis Results

The information in this statement that relates to Mining, Metallurgical and Financial Modelling is based on information compiled by independent consulting mining engineer Ian Huitson (B.Eng Mining Eng, Fellow AusIMM, CP Min). Mr Huitson is a Fellow of The Australasian Institute of Mining and Metallurgy. Ian Huitson is employed by Mining Solutions Pty Ltd. Mr Huitson is a shareholder of Element 25 Limited. Mr Huitson has not visited the SE Asia sites, but other Element 25 staff and management have visited the potential development sites on a number of occasions as part of the ongoing studies and prior working lives. Mr Huitson has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which is undertaken, 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'.

Mr Huitson consents to the inclusion in the report of the matters based on the information made available to him, in the form and context in which it appears.

This announcement is authorised for market release by Element 25 Limited's Board of Directors.

## Material Assumptions

The proposed base case operation at a southeast Asia HPMSM plant has been designed with future expansion in mind during the design and layout stages for all areas of the operation. E25 is currently approaching the feasibility, design and build phase of the Project with expansion included in all aspects of the Project from design, approvals and financing. E25 has a good understanding of the expected operational and capital costs for the Project. These costs have been used to review the base and expansion case financials.

The following table details the Material Assumptions taken within the analysis of the Project and expansion cases.

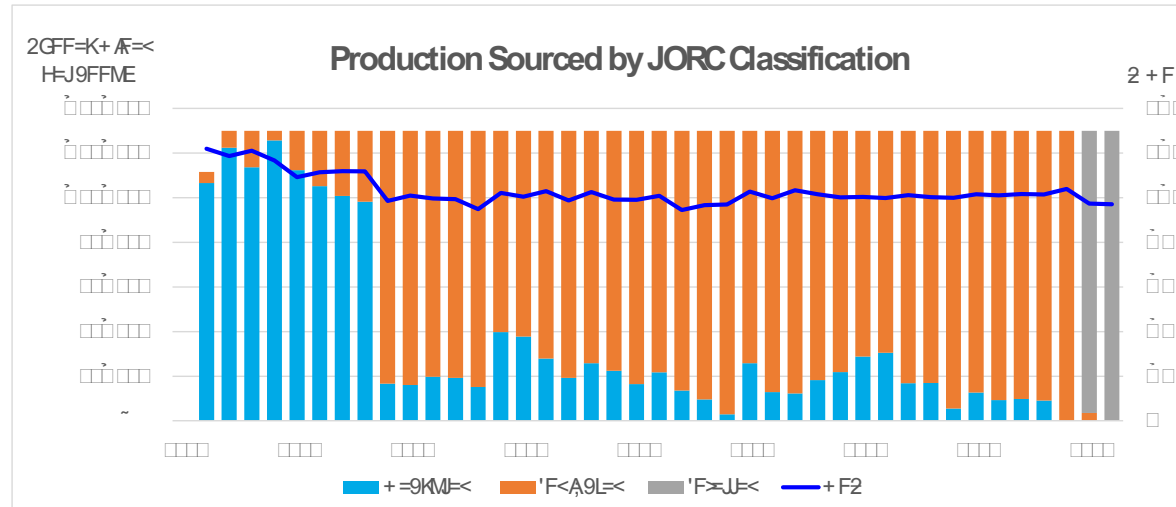
Table 8. Material Assumptions

Area	Description
<b>Mineral Resource Estimate</b>	<p>Manganese ore at 32% will be sourced from the Company's 100% owned Butcherbird Manganese Project.</p> <p>The most recent Mineral Resource estimate was declared and announced to the ASX on May 17, 2019. The estimate was prepared by a Competent Person in accordance with the JORC Code 2012.</p> <p>The Measured, Indicated and Inferred Mineral Resource estimate for the Butcherbird area is 263Mt at 10.0% Mn which includes 16Mt at 11.6% Mn in the Measured Resource category, 41.0Mt at 10.0% Mn in the Indicated Resource Category and 206Mt at 9.8% Mn in the Inferred Mineral Resource Category.</p> <p>The Yanneri Ridge total Measured, Indicated and Inferred Mineral Resource is 105 Mt at 10.1% Mn which includes a Measured and Indicated Mineral Resource of 57Mt at 10.45% Mn.</p> <p>The Butcherbird mine plan comprises 95% of current global Measured resources, 96% of current global Indicated resources.</p>
<b>Ore Supply</b>	<p>Manganese ore at 32% will be sourced from the Company's currently producing, 100% owned Butcherbird Manganese Project which produces a concentrate suitable as feedstock for conversion to HPMSM.</p> <p>Ore for the HPMSM plant will be sourced for 20 years from the Yanneri Ridge Mining Reserve and will be used in preference to selling to other customers during this period. The manganese ore demand is approximately 60% of existing Butcherbird base case production of 390ktpa.</p>

**Area** Description

The Yanneri Ridge Mineral Resource supports a Mining Reserve of 55 Mt at 10.8% Mn which supports a 40 Year mining operation at Butcherbird.

The chart below shows the use of Measured and Indicate mineralisation within the Butcherbird Ore Reserve.



Inferred Resources have not been used for either the optimisation of the project or scheduled as part of the mine plan. Inferred mineralization encountered during mining will be evaluated by grade control techniques at the time of mining to determine its suitability as a plant feed.

The manganese concentrate produced will be purchased at cost delivered to a port in southeast Asia:

Area	Unit	Cost	Source
Mine Gate	A \$/t	\$ 70.00	E25 May 20 PFS
Haulage	A \$/t	\$ 49.00	E25 May 20 PFS
Port Costs	A \$/t	\$ 12.00	E25 May 20 PFS
Shipping	US \$/t	\$ 16.90	E25 Nov 21 Update
Shipping	A \$/t	\$ 22.53	
Royalties	A \$/t	\$ 13.00	E25 May 20 PFS
Cost CIF S.E. Asia	A \$/t	\$ 166.53	
	US \$/t	\$ 124.90	
Port Charges and Delivery to Site	US \$/t	\$ 10.00	E25 May 20 PFS
<b>Total at Site S.E Asia</b>	<b>US \$/t</b>	<b>\$ 134.90</b>	

The maximum volume of ore required for the project will only require 50% of the Stage 1 Butcherbird production capacity per annum.

Area	Description
<b>Mining Assumptions and Factors</b>	<p>Mining assumptions are not relevant to the construction of the HPMSM Project.</p> <p>Mining factors and assumptions as related to the Butcherbird Mining Reserve were published in 30 September, 2021.</p>
<b>Cut-off Grades</b>	<p>Cut-off Grade assumptions are not relevant to the construction of the HPMSM Project Cut-off grades have been calculated as 7% Mn based on work completed during the scoping and PFS studies. Low grade domains, basal shales and inferred mineralisation are not considered for processing as ore in the base case. It is considered that the cut-off grades used for all cases are suitable as the optimisation selects the majority approximately 98% of all mineralisation within the base case. Lower cut-off grades for higher throughputs will only marginally increase mineralisation conversion. Mining factors and assumptions as related to the Butcherbird Mining Reserve were published in 30 September, 2021.</p>
<b>Open Pit Optimisation</b>	<p>Open pit optimisation assumptions are not relevant to the construction of the HPMSM Project. Mining factors and assumptions as related to the Butcherbird Mining Reserve were published in 30 September, 2021.</p>
<b>Mine Design</b>	<p>Mine design assumptions are not relevant to the construction of the HPMSM Project. Mining factors and assumptions as related to the Butcherbird Mining Reserve were published in 30 September, 2021.</p>
<b>Mine Schedule</b>	<p>Mine scheduling assumptions are not relevant to the construction of the HPMSM Project. The HPMSM project will only purchase between 7% and 25% of planned annual manganese ore production.</p>
<b>Mining Costs</b>	<p>Mining cost assumptions are not relevant to the construction of the HPMSM Project. Mining factors and assumptions as related to the Butcherbird Mining Reserve were published in 30 September, 2021.</p>
<b>Process Design Criteria</b>	<p>The processing circuit has been designed to produce manganese sulphate as described in the body text above. The designs are based on metallurgical test-work conducted at ALS and benchmark information where required. Conceptual process design has been undertaken by ProjX overseen by Element 25 personnel.</p> <p>The following major equipment is to be sourced and ordered to meet the 50ktpa throughput. Trains 2 &amp; 3 will utilise the same equipment. As such</p>

Area	Description													
	economies of operation can be achieved in both a capital and operating sense. These have been incorporated into the project as appropriate.													
<b>Major Mechanical Equipment</b>	<p>Major mechanical equipment including a cone crusher, Rolls crusher, leach and precipitation tanks, thickening, filter presses and crystallisers will be sourced from reputable suppliers to suit the requirements of the designed processing circuit and throughput.</p> <p>Prices for the Scoping study were sourced from supplier quotes, previous company studies and database costs and are thought to be in the +/-25-30% range</p>													
<b>Metallurgical Factors</b>	<p>A comminution and beneficiation process using a combination of conventional techniques including crushing, screening and milling has been proposed to produce a manganese concentrate for feed to the Hydrometallurgical process. The Hydrometallurgical process consists of leaching and subsequent purification of the pregnant leach solutions using conventional leach and purification processes.</p> <p>Metallurgical test-work supports these processes which are well proven and in operation across the mining industry. The metallurgical recoveries adopted for the base case of 85% metallurgical recovery were based on test-work on multiple manganese ore samples sourced from the measured resource area and representing the first 10 years of mining.</p> <p>Metallurgical characterisation test-work was carried out by ALS Metallurgy. Mineral processing data was supplied as raw data to E25.</p>													
<b>Operating Costs</b>	<p>Operating costs have been derived from first principals. Labor costs were sourced from a schedule of manning required to run the plant and a table of wages applicable to the location. Reagents and consumables costs have been derived from consumption figures derived from laboratory test-work and reagent costs derived from suppliers.</p> <p><a href="#">Table 9. Operating Cost Breakdown</a></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #0070C0; color: white;"> <th rowspan="2">Cost Area</th> <th colspan="3">Operating Cost (US \$/t HPMSM)</th> <th rowspan="2">Source</th> </tr> <tr style="background-color: #0070C0; color: white;"> <th>50,000 tpa</th> <th>100,000 tpa</th> <th>150,000 tpa</th> </tr> </thead> <tbody> <tr> <td>Ore Purchase</td> <td>\$159</td> <td>\$159</td> <td>\$159</td> <td>E25 budget cost</td> </tr> </tbody> </table>	Cost Area	Operating Cost (US \$/t HPMSM)			Source	50,000 tpa	100,000 tpa	150,000 tpa	Ore Purchase	\$159	\$159	\$159	E25 budget cost
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Area	Description																																																						
	HPMSM Production	\$297	\$297	\$297	E25 estimates of usage and supplier quotes for reagent supply																																																		
	Production & Maintenance	\$48	\$43	\$41	Industry websites for SE Asian labour																																																		
	Overheads	\$30	\$20	\$17	E25 Estimate																																																		
	Logistics	\$38	\$38	\$38	E25 estimates based on local knowledge																																																		
	<b>Total Operating Cost</b>	<b>\$573</b>	<b>\$558</b>	<b>\$552</b>																																																			
<b>Capital Costs</b>	<p>Capital Costs are based on process design criteria, material balances, electrical load schedule and a selected equipment list. The main equipment pricing is sourced from vendor quotes. Quotes and estimates were utilised for infrastructure and mine support facilities. All costs are estimated in Australian dollars as at Q4 2021 and are calculated to have an overall project accuracy of +/-25-30%.</p> <p>The capital costs summary is tabulated below:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #00AEEF; color: white;"></th> <th style="background-color: #00AEEF; color: white;">Site Prep</th> <th style="background-color: #00AEEF; color: white;">50ktpa HPMSM Train</th> <th style="background-color: #00AEEF; color: white;">Each subsequent 50ktpa HPMSM Train</th> <th style="background-color: #00AEEF; color: white;"></th> </tr> <tr> <th style="background-color: #D3D3D3;">Project Section</th> <th style="background-color: #D3D3D3;">US \$M</th> <th style="background-color: #D3D3D3;">US \$M</th> <th style="background-color: #D3D3D3;">US \$M</th> <th style="background-color: #D3D3D3;">Source</th> </tr> </thead> <tbody> <tr> <td>Site Prep and Common works</td> <td>21.7</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Major plant and equipment</td> <td></td> <td>76.5</td> <td>76.5</td> <td>Engineering design and industry quotations</td> </tr> <tr> <td>Project Management, Engineering &amp; Consultants</td> <td>13.7</td> <td></td> <td>9.2</td> <td>sourced from the base case actual costs</td> </tr> <tr> <td><b>Subtotal</b></td> <td><b>35.4</b></td> <td><b>76.5</b></td> <td><b>85.7</b></td> <td></td> </tr> <tr> <td>Contingency</td> <td></td> <td>14.2</td> <td>8.5</td> <td>Weighted allowance</td> </tr> <tr> <td><b>Total Plant &amp; Contingency Capital</b></td> <td><b>35.4</b></td> <td><b>90.7</b></td> <td><b>94.2</b></td> <td></td> </tr> <tr> <td>Working capital allowance</td> <td></td> <td>23.8</td> <td></td> <td>First 12 months operating costs at start of Yr 1 only</td> </tr> <tr> <td><b>Total Capital (inc. base)</b></td> <td></td> <td><b>149.9</b></td> <td><b>94.2</b></td> <td></td> </tr> </tbody> </table>						Site Prep	50ktpa HPMSM Train	Each subsequent 50ktpa HPMSM Train		Project Section	US \$M	US \$M	US \$M	Source	Site Prep and Common works	21.7				Major plant and equipment		76.5	76.5	Engineering design and industry quotations	Project Management, Engineering & Consultants	13.7		9.2	sourced from the base case actual costs	<b>Subtotal</b>	<b>35.4</b>	<b>76.5</b>	<b>85.7</b>		Contingency		14.2	8.5	Weighted allowance	<b>Total Plant &amp; Contingency Capital</b>	<b>35.4</b>	<b>90.7</b>	<b>94.2</b>		Working capital allowance		23.8		First 12 months operating costs at start of Yr 1 only	<b>Total Capital (inc. base)</b>		<b>149.9</b>	<b>94.2</b>	
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<b>Waste Disposal</b>	<p>Waste storage costs derived from water balance requirements designed for the operating scenario. Pumping and power designed for this scenario and costs sourced from Supplier quotes based on detailed designs.</p> <p>Tails storage facility wall lifts included in the Mining Contractors Scope of work. Pricing included in the Mining Tender completed in Sept 2020. Costs are</p>																																																						

Area	Description
	commercial in confidence.
Power Supply	Power will be derived from local grid power supplied to all users in the industrial park.
Water Supply	Water will be supplied from local grid water supplied to all users in the industrial park.
Administration	<p>Site administration staffing numbers as per an Organisation chart developed for this scenario. Site administration miscellaneous costs have been derived from Published Factory costs and in line with similar operations of this scale.</p> <pre> graph TD     E25[Element 25 Limited] --&gt; HPMSM[HPMSM Co Chairman NED x 2]     HPMSM --&gt; MD[Managing Director]     MD --- PA[Personal Assistant/Reception]     MD --&gt; Finance     MD --&gt; Marketing     MD --&gt; Operations     MD --&gt; Maintenance     MD --&gt; Purchasing     MD --&gt; HR_Training[HR / Training]          Finance --- CFO[CFO]     Finance --- MA[Management Accountant]     Finance --- AP[Accounts Pay/Rec]          Marketing --- MM[Marketing Mgr]     Marketing --- CPM[Co-Products Mgr]          Operations --- GO[GM Operations]     Operations --- PF[Plant Foreman]     Operations --- PS[Plant Supervisors]     Operations --- OP[Operators]     Operations --- MMet[Metallurgical Mgr]     Operations --- PM[Plant Metalurgists]     Operations --- Lab[Laboratory]          Maintenance --- MMaint[Maintenance Mgr]     Maintenance --- MP[Maint. Planners]     Maintenance --- MS[Maint. Supervisors]     Maintenance --- F[Filters]     Maintenance --- BM[Boilermakers]     Maintenance --- E[Electricians]          Purchasing --- PMgr[Purchasing Mgr]     Purchasing --- PO[Purchasing Officers]          HR_Training --- HRM[HR Mgr]     HR_Training --- HRO[HR Officers]     HR_Training --- TO[Training Officers]     HR_Training --- SS[Site Services]     HR_Training --- Sec[Security]     HR_Training --- GS[Groundsman]     </pre>

Area	Description
Ore Haulage	Ore haulage costs from port to the process plant and freight of final HPMSM product to the port have been derived from local supplier costs.
Country Office	SE Asia Country office charges have been built up from a zero base based around the organisation structure proposed for the processing and support requirements. Directors fees and staff salaries have been sourced from published labour rates and Industry Salary Surveys.
Royalties	State royalties will be paid as applicable.
Environmental	Environmental approvals are not expected to be an issue within these existing industrial parks. Base case environmental surveys will be completed during the FS and all approvals will lodged during the feasibility stage of the project.
Social	E25 will source an industrial park in an area close to a major international shipping port in southeast Asia. Such a park will include access agreements  Site personnel will be predominantly E25 employees.
Market Assessment	Element 25 have assessed the Manganese metal market utilising data and research provided by published. Based on this data, the outlook for HPMSM, driven by battery demand remains strong.  The price of HPMSM at the time of writing is approximately US \$1,950/t and FGMSM is US \$900.00/t. These values have been used for the study.
Economics	A discount rate of 8% has been used for financial modelling.  This number was selected as a generic cost of capital and considered a prudent and suitable discount rate for project funding and economic forecasts in Australia. The model has been run as a 20 year model and includes sustaining capital costs.  The Study outcome was tested for key financial inputs including: Capital and Operating Costs. All these inputs were tested for variations of +/-10%.
Finance	To achieve the range of outcomes indicated in the Scoping Study, funding in the order of US \$176.7Million (AUD 2335.6 M) for the project could be sourced through a number of sources including, end user offtake agreements, capital placements to existing and new shareholders or debt (domestic or offshore)



Area	Description
	<p>or a combination of all these sources.</p> <p>Element 25 may need to raise additional capital to fund further pre-feasibility/feasibility studies. Given the strong interest in the Project to date, it is the opinion of Element 25 that end users/Element 25 may contribute capital to further studies or capital costs required to develop the project.</p> <ul style="list-style-type: none"> <li>(a) The Metals X Board and Management have a broad experience in the resources industry. They have played leading roles in the exploration, development, production and funding of resource projects.</li> <li>(b) E25 has a proven track record of being able to attract new capital.</li> <li>(c) E25 has engaged in discussions with potential funders and considers that there is a reasonable expectation that a project of this scale will be able to be funded with a combination of debt and equity. It is possible that such funding may only be available on terms that may be dilutive to or otherwise affect the value of Element 25 shares.</li> </ul> <p>Existing Reserves are sufficient to underpin the proposed project life and give supply surety in relation to the availability of manganese concentrate feedstock.</p> <p>The Study outcome excludes optimisation of capital and operating costs which will be completed in the feasibility phase of the project and are likely to improve overall economics.</p>