



HASTINGS
Technology Metals Limited

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ASX Code: Shares - HAS

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**YANGIBANA PRE FEASIBILITY STUDY
PRE-TAX NPV OF \$700-750M AT 8% DISCOUNT
RATE AND IRR OF 40%**

HIGHLIGHTS

- **Tetra Tech Proteus, independent global engineering consultant, has reported the financial analysis for the Pre-Feasibility Study (PFS) for the Yangibana Project.**
- **Pre-Tax Net Present Value (NPV) of \$700-750 million at an 8% discount rate.**
- **Internal Rate of Return (IRR) of 40% with a payback on capital of 2.5 years.**
- **PFS is based on a 7-year operation extracting only current JORC Indicated Resources.**
- **Beneficiated concentrate of 20% TREO and 5.05% mass pull (since increased to 30% and 3.1%) was used in the PFS financial analysis.**
- **Toll treatment model - Hydrometallurgical concentrate produced on site will be shipped overseas for further separation and refining into individual rare earths oxides.**
- **Off-take contracts – prospects for supply of rare earths hydromet concentrate to overseas customers are promising in view of on-going negotiations.**
- **Non Disclosure Agreements signed with potential end customers of separated rare earths oxides and metals.**
- **Final PFS documentation compilation is nearing completion with the full report to be presented in the next four weeks. This documentation will not affect the findings presented in this release.**

All dollars reported in this document are Australian dollars (A\$) unless otherwise stated



SUMMARY

The Board of Hastings Technology Metals Limited (ASX:HAS) (Hastings or the Company) is pleased to announce the results of the Financial Analysis for the Pre-Feasibility Study (PFS) of the Yangibana Project by its independent global engineering consultant Tetra Tech Proteus (TTP).

Based on a 1.0 million tonne per annum operation commencing in 2019, extracting approximately 7.0 million tonnes of mill feed from the Bald Hill South, Fraser's, Yangibana West (Hastings 100%) and Yangibana North (Hastings 70%) deposits, the project has a Pre-Tax NPV of \$700-750m at an 8% discount rate using forecast rare earths prices. The 7.0 million tonnes of mill feed is based solely on current JORC Indicated Resources as estimated by Simon Coxhell of CoxsRocks Pty Limited. Mr. Coxhell qualifies as a Competent Person to undertake this estimation, as defined in the 2012 edition of the 'Australasian Code for Reporting of exploration Results, Mineral Resources and Ore Reserves (JORC Code)'.

On site beneficiation and partial hydrometallurgical ("hydromet") processing will produce a concentrate that is shipped overseas for separation and refining into the individual rare earths oxides under a contract toll treatment arrangement. This will enable Hastings to fast track its production of separated rare earths oxides and metals for sale to end users, utilising the sub-contractor's manufacturing and engineering knowledge, saving the Company the time and expense to develop this critical capability locally.

Final documentation of the PFS is being compiled by TTP and is expected within the next four weeks. This future document will provide the detailed information regarding project tenements, geology, exploration, resources, mine optimisation, design and scheduling, metallurgical test work, plant design, engineering design, infrastructure, environmental and market analysis of the project that are required to establish project viability and to obtain the necessary approvals to allow the operation to be developed. Nothing in this future document will amend any of the findings of this financial evaluation.

YANGIBANA PROJECT PRE-FEASIBILITY FINANCIAL EVALUATION

TTP commenced work on the PFS for the Yangibana Project in January 2015 and has now completed its financial evaluation on time and on budget. The evaluation confirms the financial viability of the project as indicated in the Scoping Study Update as announced on 10 November 2015. The PFS is a comprehensive cost build up based on a significantly higher level of information particularly regarding engineering design and costings.

Costing information relating to the project capital and operating costs was established by:-

- Snowden Mining Industry Consultants (Snowden) – mining and mining operating costs
- ATC Williams – tailings storage facility and infrastructure
- Ksypymet – beneficiation flotation



- The Core Group – hydrometallurgical flow sheet
- Tetra Tech Proteus – engineering design and costing

BASIS FOR THE EVALUATION

Table 1 provides the material assumptions and calculated figures on which the Financial Evaluation of the Yangibana Rare Earths Project is based.

Commencement date		2019
Mining/Processing Rate	Million tonnes per annum	1.0
Mine/Processing Life	Years	7.0
Exchange Rate	A\$:US\$	0.72
Total Mined	Mt	73.36
Total Diluted Mineralisation Mined	Mt	7.0
Average Stripping Ratio		9.4:1
Average Diluted Mineralisation Grade	%TREO	1.15
Total Separated Oxides Produced	T	60,500
Commodity Prices	US\$/kg – see Appendix 1	
Total REO Sales	A\$bn	3.00-3.50
Total Capital Costs (detail below)	A\$m	390 - 420
Total Operating Costs (detail below)	A\$bn	1.50-1.60
State Royalty	%	2.5
Discount Rate	%	8
Net Present Value (NPV)	A\$m	700-750
Internal Rate of Return (IRR)	%	40
Payback on Capital Costs	Years	2.5

Table 1 – Yangibana PFS – Material Assumptions

Based only on the current Indicated Resources at Bald Hill South, Fraser's, Yangibana West and Yangibana North deposits, a proposed 1.0 million tonnes per annum operation commencing in 2019 is calculated to return a Pre-Tax NPV at an 8% discount rate (NPV₈) of A\$700-750 million over a mine life of 7 years, with an Internal Rate of Return (IRR) of 40% and a payback on capital costs of 2.5 years.



The Company is confident that the mine life will exceed the period incorporated in this evaluation. The PFS is based on the production of a mixed rare earths double sulphate on site with overseas treatment to produce separated oxides of the rare earths neodymium (Nd), praseodymium (Pr), dysprosium (Dy), europium (Eu), samarium (Sm) and gadolinium (Gd) through a Toll Treatment agreement with a third party. Additional rare earths would be considered for processing at a later date to meet future market requirements.

THE YANGIBANA TOLL TREATMENT MODEL

The concept of the Toll Treatment model is to allow Hastings to take advantage of existing downstream processing technology and production facilities that currently exist overseas. The advantage of this model is that Hastings does not need to develop, design and construct its own separation and refining plant in Australia. This will enable the Company to commence on-site development and fast track to production of the hydromet concentrate earlier than previously envisaged (at the time of the Scoping Study). By incorporating toll treatment overseas, it has the added benefits of significantly lowering budgeted costs for capital equipment and associated operating expenses of owning and operating those processes on site. The toll treatment model and its advantages became apparent in February this year when the PFS was practically completed.

The proposed exploitation of the Yangibana Project incorporated in the PFS is based on:-

1. Mining and processing to produce a rare earths hydromet concentrate of double sulphate on site at Yangibana; and
2. The separation and refining of the rare earths concentrate to produce separated rare earths oxides and metals to be undertaken overseas.

This route is represented in Figure 1.

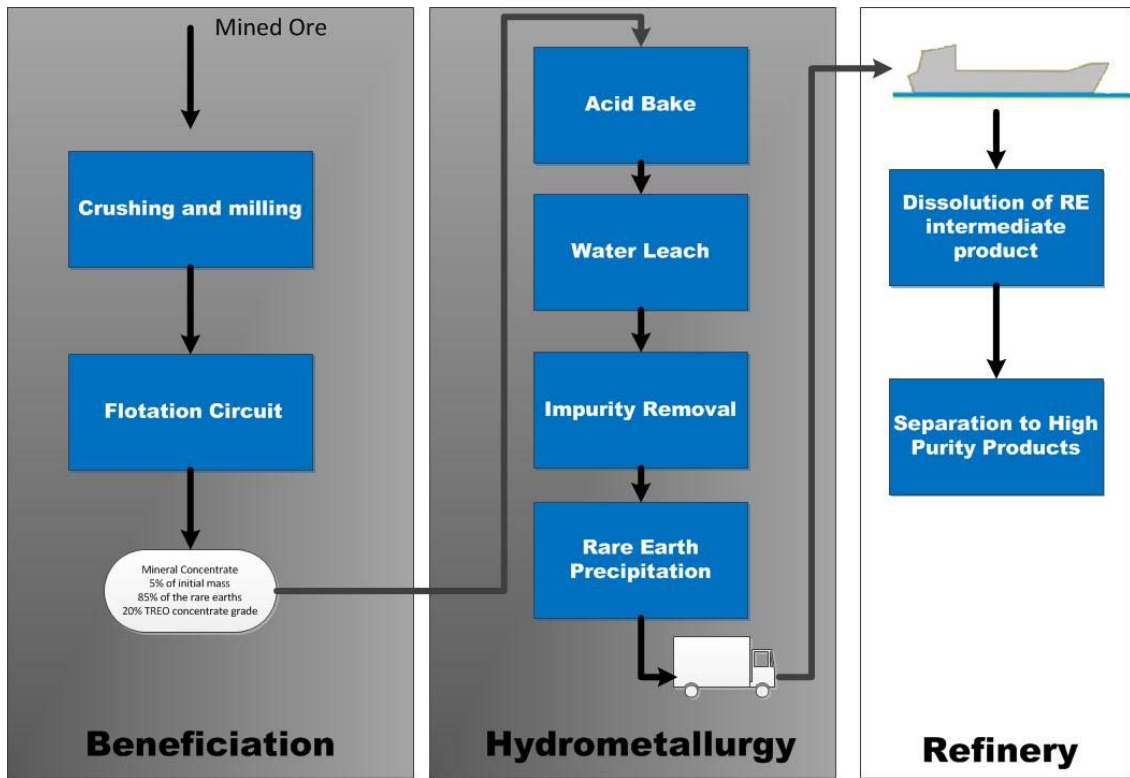


Figure 1 – Yangibana Project – Proposed Toll Treatment Route

CAPITAL COST ESTIMATE

TTP has established baseline capital costs for the project based on detailed engineering design and costings utilising entirely new equipment and 100% local sourcing content. A total capital cost of A\$390-420 million over the operating period, including a 22% contingency, has been established with a breakdown as shown in Table 2.

Capital Cost Centre	Total A\$m
Mining	30-35
Processing	130-140
Infrastructure	30-35
Management, Services, EPCM	60-65
Other*	70-75
Contingency	70-75
TOTAL CAPEX	390-420

Table 2 - Yangibana PFS, Calculated Total Capital Costs

(Other* incorporates project services, accommodation, temporary services, and pre-production costs)

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OPERATING COST ESTIMATE

The baseline operating costs are predicated on contract mining and 90% processing plant availability. The Study is based on the sale of separate (or combined if required by the customer) rare earths oxides following separation of these oxides from a mixed rare earths concentrate at an overseas plant. In addition, the estimates are based on a beneficiated concentrate of 20% TREO and mass pull of 5.05%. Operating costs over the full 7-year period total approximately A\$1.5-1.6bn and Table 3 provides a breakdown of the calculated operating costs.

Category	Total Operating Cost A\$m
Contract Mining	340-350
Labour	175-190
Power/Fuel	65-75
Product Transport	45-55
Toll Treatment	240-250
Reagents	575-600
Other*	90-110
TOTAL OPEX	1,500-1,600

Table 3 - Yangibana PFS, Calculated Total Operating Costs over mine life

(Possible minor rounding discrepancy)

(Other* incorporates maintenance, consumables, equipment hire, contract general expenses and royalties)

Since the practical completion of the PFS, on-going metallurgical test work at Kyspymet has achieved a breakthrough resulting in a much improved beneficiated concentrate of 30% TREO with a mass pull of 3.1%. This has the appreciable benefits of significantly lowering capital cost for the processing plant and will also help to reduce labour, reagents and transport costs by approximately 30%.

FORECAST COMMODITY PRICES

The revenue is based on the commodity prices forecast by Adamas Intelligence in its 30th June 2015 report entitled "Rare Earth Market Outlook Update: Supply, Demand, and Prices from 2014 Through 2020" using the average figure for 2019 for the six target rare earths with no projected metal price escalation in the ensuing years.

The commodity prices used in the Study are as shown in Appendix 1.

ROYALTY/EXCHANGE RATE

A state royalty based on the export of rare earths double sulphate concentrate was incorporated in the financial evaluation, and a 0.72 US\$/A\$ exchange rate was used.

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RESOURCES

As announced to the ASX release on 6th October 2015, the JORC resources at the Yangibana Project are as shown in Table 4. The resources were estimated by Simon Coxhell of CocksRocks Pty Limited. Mr Coxhell is a consultant to the Company and a member of the Australasian Institute of Mining and Metallurgy. He has sufficient experience relevant to the styles of mineralisation and type of deposits that are covered in this announcement and to the activity which he has 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' (JORC Code).

Resource Classification	Tonnes	%TREO	ppm Nd ₂ O ₃	ppm Pr ₂ O ₃	ppm Dy ₂ O ₃	ppm Eu ₂ O ₃
Indicated	8,126,000	1.11	2865	738	50	79
Inferred	4,236,000	1.09	2531	703	43	67
TOTAL	12,362,000	1.10	2750	726	48	75

Table 4 – Yangibana Project, October 2015 JORC Resources

A detailed breakdown of the resources was provided in the previous release.

MINING

Mining of Bald Hill South, Fraser's, and Yangibana West and Yangibana North (referred to below as Yangibana) is proposed using standard drill and blast, and truck and shovel methods as outlined in the previous release. Dilution is accounted for in the resource estimate.

Snowden has completed pit optimisations, mine designs, and life-of-mine material movement schedules for the Yangibana Project using metallurgical recoveries and process costs that are different from those used in this announcement. The mining study is currently being updated to reflect the revised recoveries and costs. Snowden does not expect that the final pit designs and material quantities will be materially different to those reported in Table 5. All resources included in the proposed mine plan are from within the current Indicated Resources.

	Bald Hill South	Fraser's	Yangibana	Total
Pit Size (kt)	21,903	39,357	12,102	73,362
Strip ratio (w:o)	6.3	10.2	20.3	9.4
Mining inventory (kt)	2,997	3,507	569	7,074
Waste (kt)	18,906	35,849	11,533	66,289
TREO (%)	0.86	1.43	0.97	1.15
Nd ₂ O ₃ (ppm)	3,018	3,061	3,556	3,083
Pr ₂ O ₃ (ppm)	663	893	869	794
Dy ₂ O ₃ (ppm)	62	46	59	54
Eu ₂ O ₃ (ppm)	76	95	67	85

Table 5 – Yangibana PFS, Mining Inventory

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The three optimised and modelled pits (Yangibana West and Yangibana North form one continuous pit with the distinction being based on Mining Lease boundaries) provide over 7.0 million tonnes of mining inventory at an average grade of 1.15% TREO to the processing plant. The pits extract a total of 73.4 million tonnes of material with an average stripping ratio of 9.4:1.

Using the predicted commodity prices and calculated capital and operating costs each of the pits can be expanded by further drill coverage. They each remain open at depth, and along strike in at least one direction.

Mining will be undertaken by contractors at standard contract mining rates.

PROCESSING

All processes including crushing, milling, flotation, and the first phase of hydrometallurgy are standard processes used within the rare earths industry, optimised for the Yangibana Project mineralogy.

The mined ore will be crushed and milled to reduce the feed to the required sizing for the flotation process.

Hastings has completed beneficiation test work that indicates that, at a plant throughput rate of 1.0 million tonnes per annum, a flotation plant can achieve a 95% mass reduction to 49,000t per annum of concentrate from Bald Hill South and Fraser's feed, and a 93% mass reduction to 70,000t per annum of concentrate from Yangibana feed with recoveries of 85% of the contained rare earths (i.e. loss of only 15% of contained rare earths).

The subsequent on-site hydrometallurgical plant further processes the flotation concentrate, containing 85% of the initial rare earths in 4.9-7.0% of the original mass, to extract the target rare earths into a mixed rare earths double sulphate. This double sulphate concentrate will then be shipped offshore under a contract arrangement that will provide the Company with separated rare earths oxides products for sale. The proposed contract refiner is an established operation that produces and markets rare earths products.

The predicted recovery rates incorporated in the Study are as shown in Table 6.

	Overall Recovery to Separated Oxides (%)
Nd ₂ O ₃ recovery	71
Pr ₂ O ₃ recovery	71
Dy ₂ O ₃ recovery	40
Eu ₂ O ₃ recovery	58
Gd ₂ O ₃ recovery	54
Sm ₂ O ₃ recovery	60

Table 6 – Yangibana PFS, predicted processing recovery rates

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PROJECT ENGINEERING

Based on test work results achieved at Kyspymet Metallurgy and at The Core Group, TTP has developed engineering designs for all components of the proposed on-site processing facility with the key components shown in Figures 2-4 below.

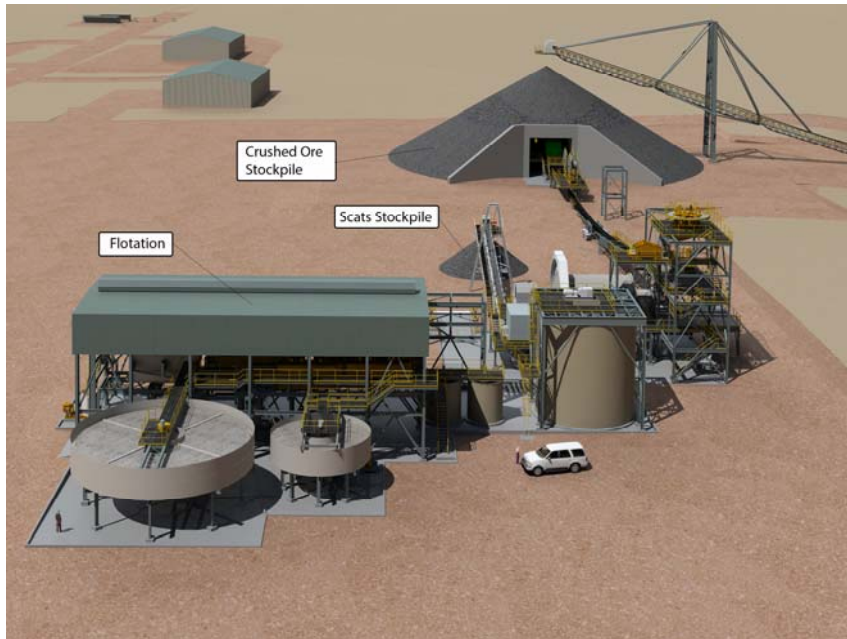


Figure 2 – Yangibana Processing Plant – Crushed Ore Stockpile through to Flotation

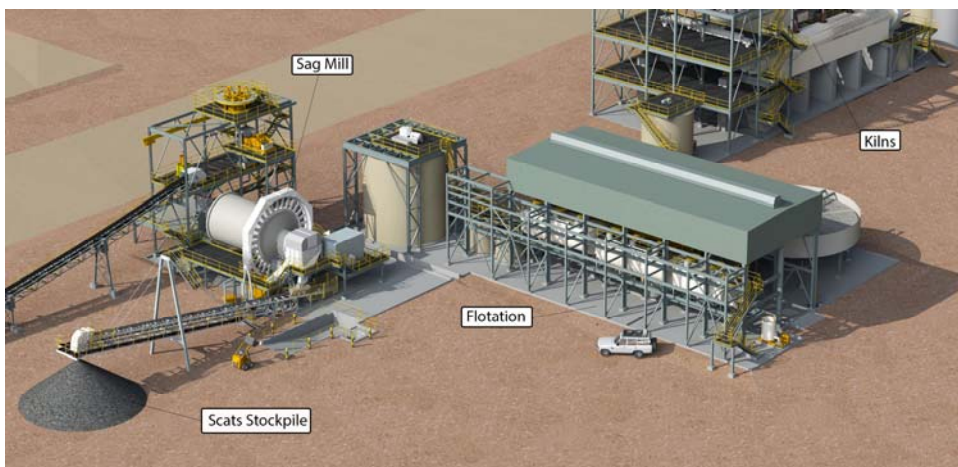


Figure 3 – Yangibana Processing Plant – Sag Mill through to Kilns

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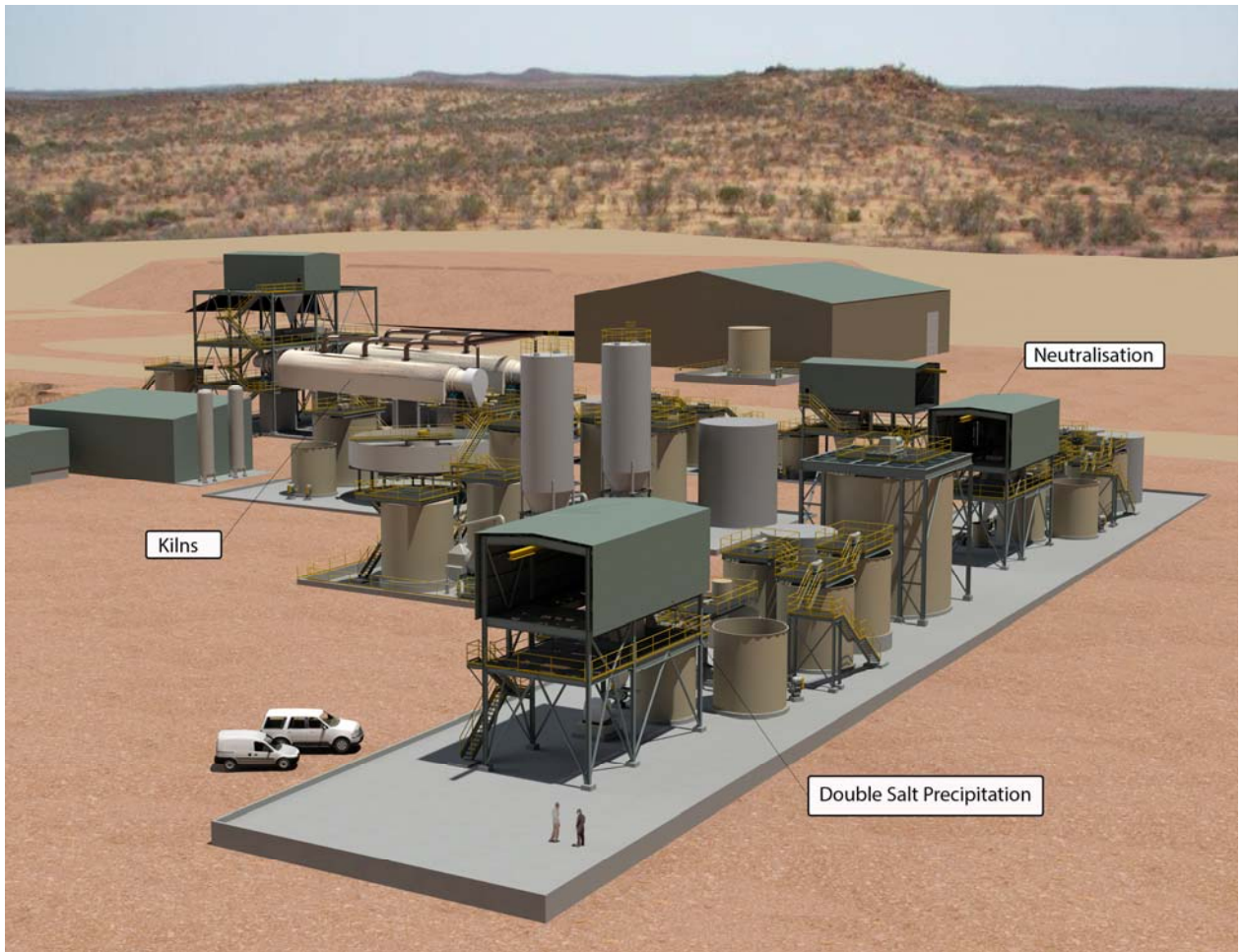


Figure 4 – Yangibana Processing Plant – Kilns through to Double Sulphate Precipitation

Detailed design of all equipment requirements to the first phase of hydrometallurgical treatment has been completed and equipment has been costed. This design meets the requirements of the on-site portion of the project, which currently aims to produce a double sulphate product that will be sent overseas for toll treatment to produce the separated oxides that the Company will sell.

Power supply will be predominantly based on diesel trucked to site but includes a significant renewable solar component.



PROJECT INFRASTRUCTURE

As well as the processing plant design and costings, TTP has sized and costed the various infrastructure components for the project.

Locations have been selected for all items of major infrastructure including:-

- Plant Site and associated infrastructure
- Tailings Storage Facility (currently for 10 years) and associated infrastructure
- Roads
- Accommodation Camp
- Fresh Water Storage Dams
- Temporary Concentrate Dams
- Water supply
- Air strips

All ground required to host these infrastructure components is held under already granted Mining Leases, General Purpose Leases or Miscellaneous Licences as warranted.

The project is well located to make use of existing air strips to allow ready access to site. Local roads provide access from the proposed site to Carnarvon which is 450km away.

ENVIRONMENTAL AND SOCIAL CONSIDERATIONS

Ecoscape has completed flora and fauna assessments of the project area with no areas of potential concern identified. With Ecoscape's and Austwide's (tenement management) assistance the Company is progressing through the approvals process, again with no areas of concern identified. A Mining Proposal, incorporating a Mine Closure Plan, is nearing completion and will be submitted in the near future.

The Yangibana Project lies within an area outside of any Native Title claims and as such all tenements have been granted free of Native Title claims.



FUTURE PLANS AND OFF-TAKE CONTRACTS

Particular areas in which additional work might further improve the project economics include but are not limited to:-

- Achieving contracts for products would allow development to be expedited;
- Increased exploration success could allow increased production rate if warranted;
- Improved beneficiation success, as identified in the ASX announcement of 31st March 2016, would reduce the size of the downstream processing equipment and reduce any capital components for the downstream the processing route;
- Variation of the target finished product exported from site instead of a double sulphate to an alternative could significantly reduce transport cost;
- Ongoing hydrometallurgical test work is aimed at improving REO recoveries and/or project economics;
- The equipment costs incorporated in the PFS Financial Evaluation are based on local sourcing and new equipment. Assessment of alternatives could provide superior alternatives, reducing capital expenditure requirements; and
- Off-take contracts, currently in negotiations, for both the hydromet concentrate and individually separated oxides and metals will further reduce the commercial risk of the project. Such discussions are underway with potential customers in Vietnam, China, Japan and Europe.

To further advance the project the Company will undertake the above, and will meet all requirements to achieve the various approvals and documentation as required by the various regulatory bodies.

TERMINOLOGY USED IN THIS REPORT

TREO is the sum of the oxides of the heavy rare earths elements (HREO) and the light rare earths elements (LREO).

HREO is the sum of the oxides of the heavy rare earths elements europium (Eu), gadolinium (Gd), terbium (Tb), dysprosium (Dy), holmium (Ho), erbium (Er), thulium (Tm), ytterbium (Yb), lutetium (Lu), and yttrium (Y).

CREO is the sum of the oxides of neodymium (Nd), europium (Eu), terbium (Tb), dysprosium (Dy), and yttrium (Y) that were classified by the US Department of Energy in 2011 to be in critical short supply in the foreseeable future.

LREO is the sum of the oxides of the light rare earth elements lanthanum (La), cerium (Ce), praseodymium (Pr), neodymium (Nd), and samarium (Sm).

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About Hastings Technology Metals

- Hastings Technology Metals is a leading Australian rare earths company, with two rare earths projects hosting JORC-compliant resources in Western Australia.
- The Yangibana Project hosts JORC Indicated and Inferred Resources totalling 12.36 million tonnes at 1.10% TREO, including 0.44% Nd₂O₃-Eq (comprising 8.13 million tonnes at 1.11% TREO Indicated Resources and 4.24 million tonnes at 1.09% TREO in Inferred Resources).
- The Brockman deposit contains JORC Indicated and Inferred Resources totalling 41.4 million tonnes (comprising 32.3mt Indicated Resources and 9.1mt Inferred Resources) at 0.21% TREO, including 0.18% HREO, plus 0.36% Nb₂O₅ and 0.90% ZrO₂.
- Rare earths are critical to a wide variety of current and new technologies, including smart phones, electric hybrid and electric cars, wind turbines and energy efficient light bulbs.
- The Company aims to capitalise on the strong demand for critical rare earths created by expanding new technologies. In November 2015 Snowden completed an updated Scoping Study of the Yangibana Project that confirmed the economic viability of the Project and Hastings is advancing work on a Pre-Feasibility Study.

Competent Persons' Statement

The information in this announcement that relates to Resources is based on information compiled by Simon Coxhell. Simon Coxhell is a consultant to the Company and a member of the Australasian Institute of Mining and Metallurgy. The information in this announcement that relates to Exploration Results is based on information compiled by Andy Border, an employee of the Company and a member of the Australasian Institute of Mining and Metallurgy.

Each has sufficient experience relevant to the styles of mineralisation and types of deposits which are covered in this announcement and to the activity which they are 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' ("JORC Code"). Each consents to the inclusion in this announcement of the matters based on his information in the form and context in which it appears.

The Pre-Feasibility Study Financial Evaluation has been compiled under the supervision of Tetra Tech Proteus under the management of Mr Greg Short. Mr Short is a full time employee of Tetra Tech Proteus and a Fellow of the Australasian Institute of Mining and Metallurgy and a Fellow of the Institution of Engineers Australia.

The mining section of the report has been undertaken by Snowden Mining Industry Consultants under the supervision of Mr Frank Blanchfield. Mr Blanchfield is a member of the Australasian Institute of Mining and Metallurgy and has sufficient experience relevant to the type of deposit and mining technique which are covered in this announcement 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' ("JORC Code"). Mr Blanchfield consents to the inclusion in this announcement of the matters based on his information in the form and context in which it appears.

Cautionary statement

This document contains certain forward-looking statements with respect to the financial condition, results of operations and business of Hastings. The words "intend", "aim", "project", "anticipate", "estimate", "plan", "believes", "expects", "may", "should", "will", or similar expressions, commonly identify such forward-looking statements.

Examples of forward-looking statements in this document include those regarding mineral resources, anticipated production or construction dates, costs, outputs and productive lives of assets or similar factors. Forward-looking statements involve known and unknown risks, uncertainties, assumptions and other factors set forth in this document that are beyond the Hastings' control. For example, future ore reserves will be based in part on market prices that may vary significantly from current levels. These may materially affect the timing and feasibility of particular developments. Other factors include the ability to produce and transport products profitably, demand for our products, the effect of foreign currency exchange rates on market prices and operating costs, and activities by governmental authorities, such as changes in taxation or regulation, and political uncertainty.

In light of these risks, uncertainties and assumptions, actual results could be materially different from projected future results expressed or implied by these forward-looking statements which speak only as to the date of this report. Except as required by applicable regulations or by law, Hastings does not undertake any obligation to publicly update or revise any forward-looking statements, whether as a result of new information or future events. Hastings cannot guarantee that its forward-looking statements will not differ materially from actual results.

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APPENDIX 1 - Commodity Prices for Target Oxides

Oxide	US\$/kg
Neodymium Oxide	103.69
Praseodymium Oxide	92.55
Dysprosium Oxide	480.97
Europium Oxide	420.49
Gadolinium Oxide	49.57
Samarium Oxide	3.85

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