ASX RELEASE
7 February 2020

Scoping Study Confirms Potential of HPA Production at TECH Project with Outstanding Economics

Highlights

- **Forecast production of 4,007tpa High Purity Alumina 99.99% (4N)**
- **Post-tax NPV of AUD849m and IRR of 80%**
- **Lower capex and opex compared with other HPA projects due to aluminium hydroxide feed source as opposed to aluminous clay or refined aluminium metal**
- **TECH Project demonstrates the potential to become a 'one stop shop' for key battery chemicals**

Pure Minerals Limited (ASX:PM1) ("**PM1**" or "the **Company**") is delighted to provide the results of a Scoping Study commissioned by its wholly owned subsidiary Queensland Pacific Metals Pty Ltd ("**QPM**") on the production of High Purity Alumina ("**HPA**") as a co-product at the Townsville Energy Chemicals Hub ("**TECH Project**").

The Scoping Study was undertaken by lead engineering company The Simulus Group ("**Simulus**") with support from Boyd Willis Hydromet Consulting ("**BWHC**"). Simulus is a leading engineering company in the HPA space, having undertaken numerous feasibility studies for various companies planning to produce HPA.

The December 2019 Pre-feasibility Study ("**PFS**") on the TECH Project (refer to ASX Announcement 9 December 2019) identified the production of HPA as a key value-add opportunity for the TECH Project. Using a conventional processing flowsheet, the aluminium hydroxide co-product is able to be upgraded to produce a high value 4N HPA.

Simulus has previously completed testwork for QPM demonstrating the production of 99.99% (4N) purity HPA at the TECH Project. This involved leaching the aluminium hydroxide in hydrochloric acid, then utilising four stages of aluminium chloride hexahydrate ("**ACH**") precipitation followed by calcination into HPA (refer to ASX Announcement 6 November 2019). Further work undertaken in the Scoping Study has determined that three stages of precipitation was sufficient.

The Scoping Study assessed the production of 4N HPA on a standalone basis, using the aluminium hydroxide as a feedstock. Per the December 2019 PFS, the TECH Project would produce 9,920tpa aluminium hydroxide. Key outcomes of the Scoping Study are provided in the tables below.

Cautionary Statement: The Scoping Study referred to in this announcement has been undertaken to assess the technical and financial viability of producing HPA at the TECH Project. Further evaluation work, including a Pre-Feasibility Study and Definitive Feasibility Study ("**DFS**") is required before PM1 will be in a position to provide any assurance of an economic development case. The Scoping Study is based on the material assumptions set out in Annexure A. These include assumptions about the availability of funding and the pricing received for the TECH Project's products. While PM1 and QPM consider 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 this Scoping Study will be achieved. To achieve the outcomes indicated in this Scoping Study, pre-production capital in the order of USD 427 million (assuming an exchange rate of 0.68), additional capital for further feasibility work and approvals and working capital is likely to be required. Pre-production capital of USD 421 million is derived from the December 2019 TECH Project PFS and this Scoping Study. Please also refer to the further cautionary statement on page 3 below.

Key Physical Metrics*

Area	Output
Plant design life	25 years
Input feed source	9,920 tpa aluminium hydroxide
Recovery of aluminium into HPA	77.4%
4N HPA final product	4,007 tpa

Key Financial Assumptions and Outputs*

Area	Input/Output
Study accuracy	±35%
4N HPA selling price	USD 25,000t/t
Exchange rate USD:AUD	0.68
Capex	USD 59.8m AUD 87.9m
Capex contingency (30%)	USD 17.9m AUD 26.4m
Unit Operating expenditure	USD 3,075/t AUD 4,522/t
Annual revenue	AUD 147.3m
Annual Operating expenditure	AUD 18.1m
Annual EBITDA	AUD 129.2m
Pre-Tax NPV (8% discount rate)	AUD 1,241m
Pre-Tax IRR	113%
Post-Tax NPV (8% discount rate)	AUD 849 m
Post-Tax IRR	80%

* *Refer to Cautionary Statement on page 4*

The key highlights of the Scoping Study are detailed below:

- Lower capex and opex compared with other HPA projects because the starting input is an intermediate aluminium product (aluminium hydroxide) rather than aluminous clay or refined aluminium metal;
- Confirms significant value-add opportunity for the TECH Project; and
- Increasing use of HPA in the production of ceramic-coated separators for separation of the anode and cathode in batteries.

PM1 Managing Director John Downie commented,

"The TECH Project is becoming a one-stop shop for battery manufacturers. Nickel sulphate, cobalt sulphate and HPA are key chemicals required by the battery industry and our potential ability to supply meaningful quantities of all these products will increase our appeal as a supplier to battery manufacturers.

"The HPA market is evolving and the TECH Project has two key advantages against other potential suppliers. Firstly, by starting with an advanced intermediate product in the form of aluminium hydroxide, our capital and operating costs are significantly lower. Secondly, the TECH Project will be

protected from any significant price volatility in the HPA market due to revenue derived from its primary product streams."

Simulus and BWHC are continuing with their work to upgrade the study to a Pre-Feasibility Study standard, improving accuracy to ±25%. These results will then be combined with the December 2019 TECH PFS to present the financial metrics of the overall project when producing HPA instead of aluminium hydroxide.

This announcement has been authorised for release by the Board.

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***Cautionary Statement:**

The Scoping Study referred to in this announcement is a study of the potential viability of producing HPA at the TECH project. It has been undertaken to understand the technical and economic viability this additional production unit for the TECH project.

The Company has concluded that it has a reasonable basis for providing the forward looking statements included in this announcement. The reasons for this conclusion are outlined throughout this announcement. However, the assumptions and results of the Scoping Study set out above and elsewhere in this announcement ("**Scoping Study Parameters**") have been developed through scoping study level work (+/- 35% accuracy) and the use of macroeconomic assumptions. **For the avoidance of doubt, investors are advised that the Scoping Study Parameters do not constitute a production forecast or target in relation to any mineral resources associated with any project owned by PM1 or QPM.** PM1 and QPM wish to expressly clarify that the Scoping Study Parameters are based on an expected grade of nickel-cobalt ore to be imported by QPM under an ore supply agreement with third party New Caledonian ore suppliers. The Scoping Study Parameters have been disclosed by PM1 and QPM in order to provide investors with an intended scale and nature of the Project.

The Scoping Study referred to in this announcement has been undertaken to assess the technical and financial viability of producing HPA at the TECH Project. Further evaluation work, including a Pre-Feasibility Study and Definitive Feasibility Study ("**DFS**") is required before PM1 will be in a position to provide any assurance of an economic development case. The Scoping Study is based on the material assumptions set out in Annexure A. These include assumptions about the availability of funding and the pricing received for the Project's products. While PM1 and QPM consider 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 this Scoping Study will be achieved. To achieve the outcomes indicated in this Scoping Study, pre-production capital in the order of USD 427 million (assuming an exchange rate of 0.68), additional capital for further feasibility work and approvals and working capital is likely to be required. Pre-production capital of USD 421 million is derived from the December 2019 TECH Project PFS and this Scoping Study.

Investors should note that there is no certainty that the Company will be able to raise this amount of funding required when needed. It is also possible that such funding may only be available via equity funding which may have a dilutive effect on the Company's share value. The Company may also pursue other strategies in order to realise the value of the Project, such as a sale, partial sale or joint venture of the Project. If this occurs, this could materially reduce the Company's proportionate ownership of the Project. Accordingly, given the uncertainties involved, investors should not make any investment decisions based solely on the results of the December 2019 PFS and the Scoping Study.

Competent Persons Statement

Information in this announcement relating to the processing and metallurgy (including the JORC table in Annexure C) is based on technical data compiled by Mr Boyd Willis, an Independent Consultant trading as Boyd Willis Hydromet Consulting (BWHC). Mr Willis is a Fellow and Chartered Professional of The Australasian Institute of Mining and Metallurgy (AusIMM). Mr Willis has sufficient experience which is relevant to metal recovery from the style of mineralisation and type of deposits in New Caledonia where the ore will be sourced (from third parties pursuant to an ore supply agreement) and to the activity which they are undertaking to qualify as a Competent Person under the 2012 Edition of the 'Australasian Code for reporting of Exploration Results, Mineral Resources and Ore Reserves'. This includes over 21 years of experience in metal recovery from Laterite ores. Mr Willis consents to the inclusion of the technical data in the form and context in which it appears.

Forward Looking Statement

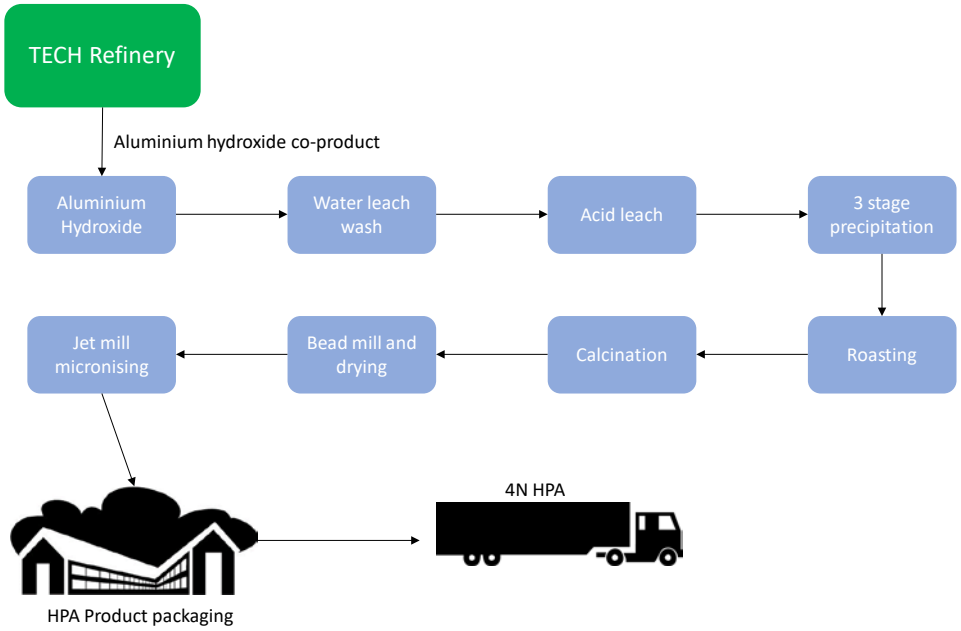
This Announcement contains certain forward-looking statements with respect to the financial condition, results of operations, and business of the Company, and certain plans and objects of the management of the Company. These forward-looking statements involved known and unknown risks, uncertainties and other factors which are subject to change without notice, and may involve significant elements of subjective judgement and assumptions as to future events which may or may not occur. Forward-looking statements are provided as a general guide only and there can be no assurance that actual outcomes will not differ materially from these statements. Neither the Company or its directors, QPM or its directors, nor any other person, gives any representation, warranty, assurance or guarantee that the occurrence of the events expressed or implied in any forward-looking statement will actually occur. In particular, those forward-looking statements are subject to uncertainties and contingencies, many of which are outside of the control of the Company. A number of important factors could cause actual results or performance to differ materially from the forward-looking statements. Accordingly, Investors should consider the forward-looking statements contained in this Announcement in light of these disclosures.

ANNEXURE A – SCOPING STUDY SUMMARY

Processing

To produce HPA, aluminium hydroxide produced from the TECH project is first washed to remove any nitrates. The resultant product is then re-leached in hydrochloric acid, followed by three stages of aluminium chloride hexahydrate ("**ACH**") precipitation and finally calcination into HPA.

A simplified flowsheet is detailed below:

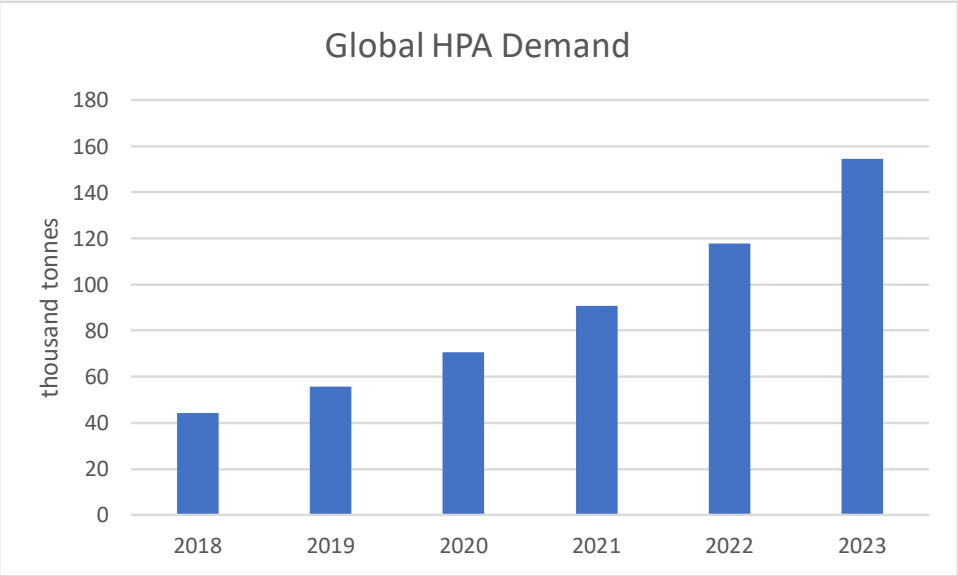


HPA Markets

HPA's main use is as a key component in the manufacture of light-emitting diode ("**LED**") lighting systems. The superior properties of HPA include corrosion and scratch resistance, high brightness and the ability to withstand extreme temperatures.

There is also increasing use of HPA in lithium ion batteries, where HPA is used in ceramic coated separators which separate the cathode and anode.

In 2018, the global sales volume market of HPA was 44kt. This is forecast to grow to 155kt by 2023 (*source: Technavio)*.



Source: Technavio 2019-2023 Global High Purity Alumina Market Report

Technavio also quotes the following prices for HPA.

Area	Input/Output
3N HPA 99.9%	USD 6,000/t
4N HPA 99.99%	USD 27,000/t
5N HPA 99.999%	USD 50,000/t

For the basis of the Scoping Study, a price of USD 25,000/t was assumed.

Capital Expenditure and Funding

The capital expenditure ("capex") estimates in the Scoping Study have been undertaken to an accuracy of +/- 35%.

Per the December 2019 PFS, total capex for the TECH Project was estimated at USD 300m plus a contingency of USD 49m (assuming an exchange rate of 0.68). The Scoping Study estimates that further capex of USD 59.8m plus a contingency of USD 17.9m is required to facilitate the production of HPA instead of aluminium hydroxide.

The breakdown of capex for the project is detailed below.

Area	Capex (USD m)	Capex (AUD m)
Direct Costs		
Plant	36.7	53.9
Painting and protective coatings	2.6	3.8
Spares	1.8	2.7
First fills	0.9	1.3
Site Buildings	3.7	5.4
Total Direct Costs	**45.7**	**67.1**
Indirect costs	14.1	20.8
Capex ex contingency	**59.8**	**87.9**
Contingency @ 20%	17.9	26.4
Grand Total	**77.7**	**114.3**

QPM will explore a number of funding options to fund the development of the TECH Project. This includes:

- Capital raised by parent company PM1
- Traditional debt finance with banks
- Bond issuance
- Australian funding initiatives such as North Australian Infrastructure Fund
- Offtake finance / prepayments with potential customers

QPM notes that at the current stage of the project, it is too early stage to have any definitive funding solutions, however these will be explored in parallel with further feasibility work.

Financials

Revenue

Total annual revenue derived from HPA production is AUD 147 m. This is based on the forecast production and macroeconomic assumptions detailed below.

Production	Output
4N HPA	4,007 tpa
HPA Price	USD 25,000/t
Exchange Rate USD:AUD	0.68
Annual revenue	AUD 147 m

Operating Expenditure

The operating expenditure ("opex") estimates in the Scoping Study have been undertaken to an accuracy of +/- 35%. Total annual costs are AUD 18.1 m per annum. Unit HPA costs are AUD 4,552/t or USD 3,074/t.

The breakdown of annual opex for the project is detailed below.

Area	AUD	USD
Labour	3.33	2.26
Power	0.85	0.58
Reagents	9.60	6.52
Maintenance	3.75	2.55
General and admin	0.30	0.20
Major shutdown costs	0.30	0.20
Total	**18.12**	**12.32**
Unit Cost	**4,522/t**	**3,074/t**

Financial Analysis

The financial analysis has been undertaken assuming a plant life of 25 years. This assumes that QPM will continue to be able to purchase ore from its ore supply partners beyond the term of the current ore supply agreement. QPM believes that this assumption is reasonable based on a number of factors including:

- QPM's ore supply partners' long term history of supplying projects around the world including the Queensland Nickel Refinery, at significantly higher tonnages; and
- The quantum of reserves held by QPM's ore supply partners and the nature of their mining licenses which are perpetual in nature.

Financial Results	Output
Average annual revenue	AUD 147.3m
Average annual opex	AUD 18.1m
Average annual EBITDA	AUD 129.2m
Pre-tax NPV (8% discount rate)	AUD 1,240.9m
Pre-tax IRR	113%
Post-tax NPV (8% discount rate)	AUD 848.8 m
Post-tax IRR	80%

ANNEXURE B – SUMMARY OF MODIFYING FACTORS

<table>
<tr><th>Aspect</th><th>Discussion</th></tr>
<tr><td>Study Scope and Status</td><td>QPM proposes to build a metals processing plant at Townsville in North Queensland. The Project will be built to supply into the emerging demand for Nickel and Cobalt chemical products whilst enabling further downstream processing of QPM's products within the North Queensland region.
The Company completed a PFS for the Project in December 2019. The PFS was undertaken to progress the Project definition to +/-25%.
The key components of the Project include the following:
Purchase and supply of 565,714 wtpa of lateritic ore from New Caledonia through the Port of Townsville (sourced from third parties pursuant to an ore supply agreement);
Transport of ore to site on road;
Construction and operation of a new hydrometallurgical metals processing facility and associated infrastructure at Townsville producing:
26,398 tpa of Nickel Sulphate hexahydrate;
3,097 tpa of Cobalt Sulphate heptahydrate
327,665 wtpa of Hematite fines
9,920 wtpa of Aluminium Hydroxide
20,079 wtpa Magnesia
Transport of products to the Port of Townsville by road for export.
The Scoping Study represents an addendum to the PFS, considering production of HPA instead of aluminium hydroxide. It has been undertaken to an accuracy of ±35%.</td></tr>
<tr><td>Risk Management</td><td>Risk Management processes have been established for the Project. Key risks identified include:
Security of Ore Supply and ability to extend ore supply agreement or source supplementary ore feed for the life of the plant
Quality Management
Environmental Permitting and Performance
Technology Performance
Capital and Operating Costs
An Enterprise Wide Risk Management Plan has been developed, including risk register. This will be enhanced during further feasibility work.</td></tr>
<tr><td>Ore Supply</td><td>Ore to be sourced directly from two third party New Caledonian suppliers. QPM does not assume material will be sourced directly from individual mining operations, it will be purchased from suppliers at an agreed specification. Suppliers' capacity to supply into a long term contract has been evaluated with Ore supply assumed to be at 565,714wtpa at the specified grades.
The PFS assumed the following ore grades to be supplied to the TECH Project:<table><tr><th>Ore Grade</th><th>%</th></tr><tr><td>Nickel</td><td>1.60</td></tr><tr><td>Cobalt</td><td>0.18</td></tr><tr><td>Iron</td><td>46.6</td></tr></table></td></tr>
</table>

Aspect	Discussion
	<table><tr><td>Aluminium</td><td>1.69</td></tr><tr><td>Magnesium</td><td>3.02</td></tr><tr><td>Moisture</td><td>30</td></tr></table> The assumed ore grades above resulted in the production of 9,920tpa aluminium hydroxide. This has been assumed as the annual input to derive the production of 4,007tpa HPA in the Scoping Study. The price of ore purchased is commercial in confidence, however it is linked to the nickel and cobalt spot price. QPM is confident that ore supply can be obtained for the full 30 year life of the plant based on the long term history and track record of its ore supply partners and their quantum of reserves on granted mining licenses. The current ore supply agreement is for a term of 10 years, with an option to extend for 5 years by mutual agreement. For the avoidance of doubt, the ore is not associated with any mineral project owned by QPM or PM1.
Metallurgical	Bench scale testwork has been undertaken by Simulus to confirm the potential of producing 4N HPA from a synthetic feed source representative of what would be produced at the TECH Project (refer to PM1 ASX announcement 6 November 2019.
Human Resources	Organisation structure and manning levels were determined from first principles and included in the Scoping Study.
Project Execution	Study work at Scoping Study level was completed by lead engineer Simulus with co-ordination and support from the QPM owners' team BWHC.
Operations Management	Management and Staff to be recruited from a readily available pool within Queensland and Townsville, with corporate management regionally focussed.
Information Management	"Off the shelf" IT and management systems to be used.
Social, legal and governmental	Environmental and infrastructure risk has been considered as part of the overall risk assessments. The final project location in Townsville was determined as Lansdown, however QPM have investigated a number of other suitable sites within the region. Environmental studies and application process for the TECH project have commenced. The use of the DNi Process™ has been considered an environmentally favourable approach compared with other processing methods as residue from ore processing is minimised and the final product is also benign, eliminating the requirement for tailings dam. The selection of the Lansdown precinct for location of the TECH Project will also assist in obtaining regulatory approvals for plant construction and operation as this has been designated to be an industrial area zoned for high impact industry. QPM's ability to move towards a decision to proceed for construction of the TECH Project is subject to obtaining an Environmental Authority, as required

<table>
<tr><th>Aspect</th><th>Discussion</th></tr>
<tr><td></td><td>under Queensland laws and regulations, and finalising land agreements with Townsville City Council on the Lansdown property.</td></tr>
<tr><td>Costs</td><td>The capital expenditure (“capex”) estimates in the Scoping Study have been undertaken to an accuracy of +/- 35%.
<table>
<tr><th>Area</th><th>Capex (USD m)</th><th>Capex (AUD m)</th></tr>
<tr><td>Direct Costs</td><td></td><td></td></tr>
<tr><td>Plant</td><td>36.7</td><td>53.9</td></tr>
<tr><td>Painting and protective coatings</td><td>2.6</td><td>3.8</td></tr>
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<tr><td>Site Buildings</td><td>3.7</td><td>5.4</td></tr>
<tr><td>Total Direct Costs</td><td>45.7</td><td>67.1</td></tr>
<tr><td>Indirect costs</td><td>14.1</td><td>20.8</td></tr>
<tr><td>Capex ex contingency</td><td>59.8</td><td>87.9</td></tr>
<tr><td>Contingency @ 20%</td><td>17.9</td><td>26.4</td></tr>
<tr><td>Grand Total</td><td>77.7</td><td>114.3</td></tr>
</table>

The opex estimates in the Scoping Study have been undertaken to an accuracy of ±35%.

The breakdown of annual opex for the project is detailed below.
<table>
<tr><th>Area</th><th>AUD</th><th>USD</th></tr>
<tr><td>Labour</td><td>3.33</td><td>2.26</td></tr>
<tr><td>Power</td><td>0.85</td><td>0.58</td></tr>
<tr><td>Reagents</td><td>9.60</td><td>6.52</td></tr>
<tr><td>Maintenance</td><td>3.75</td><td>2.55</td></tr>
<tr><td>General and admin</td><td>0.30</td><td>0.20</td></tr>
<tr><td>Major shutdown costs</td><td>0.30</td><td>0.20</td></tr>
<tr><td>Total</td><td>18.12</td><td>12.32</td></tr>
<tr><td>Unit Cost</td><td>4,522/t</td><td>3,074/t</td></tr>
</table></td></tr>
<tr><td>Environmental Factors</td><td>• Residue from the process plant will be washed, acid recovered and recycled. Residue is then dewatered using belt filters trucked to the Residue Storage Area and dry stacked.
• Residue storage area will be square and located in the east of the site, wall lengths will be approximately 500 m square and cover approximately 30 ha. Storage shall include a starter wall constructed of locally borrowed engineered fill followed by 2 m high upstream lifts using compacted residue to a maximum of 12 m height.
• A test pit programme has completed to establish ground conditions. These consist of very stiff to hard clays overlying weathered rock at approximately 2 m depth.</td></tr>
</table>

<table>
<tr><th>Aspect</th><th>Discussion</th></tr>
<tr><td></td><td>Process residue from the CSIRO process (Nickel and Co Sulphate production) will be disposed via registered waste contractors.

<table>
<tr><th>Parameter</th><th>Value</th></tr>
<tr><td>Residue discharge rate</td><td>125,000 wtpa</td></tr>
<tr><td>Residue discharge rate</td><td>88,000 dtpa</td></tr>
<tr><td>Insitu dry density</td><td>1.1 t/m3</td></tr>
<tr><td>Project Life</td><td>30 years</td></tr>
<tr><td>Discharge method</td><td>Dry Stacked</td></tr>
<tr><td>Residue volume capacity</td><td>2.8 Mm^3</td></tr>
<tr><td>Ultimate Height including 1m freeboard</td><td>12 m</td></tr>
<tr><td>Overall slope (H:V)</td><td>6:1</td></tr>
<tr><td>Area Required</td><td>30 ha</td></tr>
<tr><td>Area Available</td><td>75 ha</td></tr>
</table></td></tr>
<tr><td>Exclusions</td><td>Exclusions of this Scoping Study include:
• Working capital
• No allowance for utilities to the HPA site
• No allowance for residue storage
• No allowance for transfer pricing of aluminium hydroxide and magnesia

Ramp up of production has also not been considered as engineering at the Scoping Study level is not at a stage where predictions of ease of commission could be predicted with any reliability.</td></tr>
<tr><td>Investment Evaluation</td><td>The Project was evaluated using simple discounted cash flow methods. Net present value was calculated from estimated real, post-tax, unleveraged free cash flows. All sunk costs to date were excluded from the financial evaluation.

The discount rate used was 8.0%

A project life of 25 years was assessed, which is the design of the plant.
Cash flows were projected in Australian dollars, being translated from U.S. dollars of applicable.

The project evaluation model is unaudited. The following key assumptions were used in the investment evaluation.
<table>
<tr><th>Assumptions</th><th>Input/Output</th></tr>
<tr><td>HPA Price</td><td>USD 25,000/t</td></tr>
<tr><td>Exchange rate</td><td>0.68</td></tr>
</table></td></tr>
</table>

ANNEXURE C – JORC TABLES

1.1 Section 1 Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report.* • *In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	• The leach sample is a grab sample sourced from a shipping stockpile by laterite supplier SMT in New Caledonia. • The sample was packed into sealed plastic bags. • The sample grade was requested by QPM to be indicative of the specification required under the terms outlined an ore supply MoU between QPM, SMT and SMGM. It did not need to be representative of any specific location and is not considered to be an insitu sample.
Drilling techniques	• *Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	• No exploration drilling was undertaken
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.*	• No exploration drilling was undertaken

Criteria	JORC Code explanation	Commentary
	• *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.* • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	• No exploration drilling or logging was undertaken
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• No exploration drilling or logging was appropriate, required or undertaken. • The sample was supplied to Core on 19/06/18 and was classified as being type SMT by QPM. • It was received from the mine site as a moist, lumpy material ranging from extremely weathered rock to hard clay and silt consistency. • Prior to delivery to Core, the sample was irradiated in accordance with Australian Quarantine requirements. • The sample was dried and stage-crushed to -2 mm to enable homogenisation by a rotary splitter and a representative sub-sample was collected and pulverised for test work. • The sample size is considered appropriate for the test requirements.
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.*	• The method used to assay solid and leach liquor samples is included in Core's NATA certifications SS-4AD-MEICP and LA-MEICP. • No geophysical tools were used for assay purposes. • Quality control and assay procedures covered by Core's NATA accreditation.

Criteria	JORC Code explanation	Commentary
	• *Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.*	
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	• No exploration drilling or sampling was undertaken
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	• No exploration drilling was undertaken
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.* • *Whether sample compositing has been applied.*	• No exploration drilling was undertaken.
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	• No exploration drilling was undertaken.
Sample security	• *The measures taken to ensure sample security.*	• The laterite sample was collected, secured and sent in closed plastic bags via either a registered transport company, or were hand delivered directly to the laboratory.

Criteria	JORC Code explanation	Commentary
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• No external audits have been completed.

1.2 Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* • *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	• Not Applicable • Sample was sourced from third party supplier SMT in New Caledonia.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• Not Applicable
Geology	• *Deposit type, geological setting and style of mineralisation.*	• Not Applicable.
Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:* o *easting and northing of the drill hole collar* o *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar* o *dip and azimuth of the hole* o *down hole length and interception depth* o *hole length.* • *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*	• No exploration drilling or sampling was undertaken.

Criteria	JORC Code explanation	Commentary
Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.* • *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	• No exploration drilling or sampling was undertaken. • Metal equivalents were not used or reported.
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').*	• No exploration drilling was completed.
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	• No exploration drilling was completed.
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	• No exploration results have been reported sampling was carried out on insitu laterite.
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater,*	• Exploration drilling was not carried out.

Criteria	JORC Code explanation	Commentary
	geotechnical and rock characteristics; potential deleterious or contaminating substances.	
Further work	• *The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• No drilling or exploration work is planned.