BLACKSTONE
MINERALS

ASX ANNOUNCEMENT
ASX: BSX
26 July 2021

Blackstone Delivers Exceptional Downstream PFS Results

Downstream Pre-feasibility Study (PFS) confirms technically and economically robust hydrometallurgical refining process to upgrade nickel sulfide concentrate to produce battery grade Nickel: Cobalt: Manganese (NCM) 811 Precursor for the Lithium-ion battery industry.

Valuation Outcomes

1. **Base Case**

   Post-tax NPV$_8$ of US$2.01bn and internal rate of return (IRR) of 67% (refer Table 4)

2. **Spot Case**

   Post-tax NPV$_8$ of US$3.51bn and internal rate of return (IRR) of 98% (refer Table 4)

Base Case Economics

- **Upfront Project Capital of US$491m paid back in 1.5 years from first production**
- **Life-of-Operations revenue of US$14.0bn and operating cash flow of US$4.5bn**
- **Average annual operating cash flow of US$451m**
- **Average annual post-tax cash flow of US$365m**
- **Life-of-operations All-in Cost of US$11,997/ t NCM811 as compared to study weighted average forecast price on sale of NCM811 of US$16,397/ t NCM811 and current Shanghai Metals Market (SMM) spot price of US$19,559/t NCM811**

Base Case Physicals

- **Refinery capacity of 400ktpa**
- **10-year life-of-Operations aligned with the Ban Phuc Disseminated orebody and availability of known third party concentrate feed (3PF)**
- **Average annual refined nickel output of 43.5ktpa**
- **Average annual NCM811 Precursor Production of 85.6ktpa**
- **First production currently targeted in 2024 and ramp up to steady state operations currently forecast to be achieved in CY 2026**
- **3.9Mt of concentrate feed with average Ni in concentrate grade of 11.5%, Co in concentrate grade of 0.3% and Cu in concentrate grade of 1.1%**
- **Average annual copper by-product of 4.1ktpa**

Suite 3, Level 3, 24 Outram Street, West Perth, WA, 6005 | PO BOX 1175, West Perth, WA 6872
T +61 8 9425 5217 | F +61 8 6500 9982 | E admin@blackstoneminerals.com.au
blackstoneminerals.com.au

Blackstone Minerals Limited ("Blackstone" or the "Company") is pleased to announce the completion of the PFS for the development of a Downstream Refinery in Northern Vietnam ("Ta Khoa Refinery Project", "TKR" or the "Project").

The PFS is a critical milestone for the Company and reiterates the competitive advantages of nickel sulfide projects and adding value via an integrated downstream processing strategy. The PFS demonstrates that a very low capital intensity is required for the TKR to produce Class I nickel at a scale that would make Blackstone a globally significant producer.

The PFS considers a refinery design to process up to 400ktpa (Base Case) of nickel concentrate, confirming a technically and economically robust flow sheet to upgrade nickel sulfide concentrate to produce battery grade NCM811 Precursor for the Lithium-ion battery industry.

Blackstone's development strategy is supported by using 3PF to supplement nickel concentrate supply from the Ta Khoa Nickel Project. Concentrate feed from Blackstone's Ban Phuc Disseminated Sulfide (DSS) orebody forms part of the overall concentrate blend. With ongoing drilling and further exploration success Blackstone believes the Base Case Refinery has the potential to be fed entirely by feedstock from the Ta Khoa Nickel Project.

The Company's decision to proceed with the development of the Ta Khoa Refinery is contingent upon a number of factors including but not limited to future exploration success at Blackstone's flagship Ta Khoa Mine, the ability to secure offtake for 3PF and consumer demand for battery grade NCM811 Precursor. Indicative quantum and concentrate specifications have been received from all 3PF concentrate Blackstone has included in this PFS for the Base Case TKR. Based on current and confidential discussions, BSX believes it can secure sufficient supply to meet the demand for the Base Case TKR.

The Company intends to develop and fund the construction of the TKR via a collaborative partnership-based model. Blackstone's intention is to retain a significant interest in the TKR and expects that its portion of funding will be met through a combination of debt, equity, and offtake financing.

Blackstone has commenced funding discussions with multiple potential partners, including NCM consumers and concentrate suppliers to jointly participate in the funding of the proposed refinery. Further, Blackstone has been approached by a number of financial advisors interested in supporting Blackstone's funding strategy.

The Company is immediately progressing approval to commence the next phase of Definitive Feasibility Studies and pilot plant testing (in Vietnam) and is currently targeting a Final Investment Decision (FID) in CY2022.

Management Comment

Blackstone Managing Director Scott Williamson said the Company's strategy to build a downstream refinery in Vietnam is amid a very supportive ESG, macroeconomic and fiscal backdrop. The electric vehicle revolution has accelerated demand for green nickel™ and the delivery of the PFS is an important milestone towards achieving Blackstone's vision to integrate lithium-ion battery supply chains and enable a green solution from mine to consumer.

"The Base Case PFS financial outcomes are compelling based on an NCM811 Precursor price forecast that is conservative compared to current observable market rates. The internal rate of return on capital invested is exceptional for the Base Case, owing to very low capital intensity, a significant premium available when upgrading nickel sulfide concentrates into battery grade NCM811 Precursor and the competitive operating advantages in Vietnam, which include access to low-cost renewable hydro power."

"Blackstone is very pleased by the level of collaboration with the Vietnamese Government to progress the Company's downstream refinery. As part of the PFS Blackstone completed a location study to identify preferred Refinery locations, with each of the shortlisted potential Refinery locations offering significant corporate tax incentives. The corporate tax incentives offered are a strong signal for the Vietnamese Government support for Foreign Direct Investment and Blackstone's downstream refinery strategy."

"The Base Case Refinery represents Management's view of the scale of operations that could over time, through exploration success, be supported by the Company's existing nickel sulfide mineralised landholdings. Economics have been presented assuming a ten-year life-of-operations, aligned with known and desired life-of-mine for 3PF concentrate sources that Blackstone aims to secure offtake. Management considers the more likely scenario is that the Refinery life will extend beyond ten years."

Key PFS Outcomes

Table 1 Life-of-Operations Physicals

Life-of-Operation Physicals	Unit	Base Case
Refinery Capacity	ktpa	400
Life of Refinery	years	10
Concentrate Feed	kt	3,894
Ni in Concentrate Grade	%	11.5%
Co in Concentrate Grade	%	0.3%
Cu in Concentrate Grade	%	1.1%
Metallurgical Recovery - Ni into NCM Precursor Product	%	96.8%
Metallurgical Recovery - Co into NCM Precursor Product	%	96.7%
Metallurgical Recovery - Cu into Copper Cathode	%	93.1%
NCM Precursor Production Breakdown:		
Nickel recovered in NCM Precursor Product	Kt	435
Cobalt recovered in NCM Precursor Product	Kt	11
Cobalt make-up Quantities	Kt	44
Manganese	Kt	51
Hydroxide	Kt	315
Total NCM Precursor Production	**kt**	**856**
Average Annual NCM Precursor Production	**ktpa**	**85.6**
Average Annual Refined Nickel Output	**ktpa**	**43.5**

Table 2 Project Capital

Project Capital (US$m)	Base Case
Process Plant	**245**
Site Infrastructure	**16**
Residue Storage	**8**
Owners Direct	**43**
Precommitment Costs	**-**
EPCM	**51**
Owners Costs	**47**
Contingency	**82**
Total Project Capital	**491**

Table 3 Base Case vs Spot Case Price Forecast

Price Forecast (US$/t), Life – of – operation weighted avg.	Base Case	Spot Case
NCM811 Precursor	16,397	19,559
Nickel Metal	18,230	19,613
Cobalt Metal	66,028	51,907
Cobalt Sulfate (21%)	12,842	11,119
Manganese Sulfate (32%)	1,035	1,168
Copper Cathode	6,985	9,458

Note

1. Refer to Section 1.6 of the detailed Ta Khoa Refinery PFS report included in this announcement for the derivation of NCM811 Precursor price applied in the Base Case valuation
2. The Base Case price assumptions for nickel metal, cobalt metal and cobalt sulfate have been referenced from Benchmark Mineral Intelligence (BMI)
3. The Base Case manganese sulfate price assumption has been referenced from Simulus Engineers
4. The Base Case copper price assumption has been referenced from Consensus Economics
5. All Spot Case Assumptions have been referenced from SMM on 19 July 2021

Table 4 Life-of-Operation Economics

Life-of-Operation Economics	Unit	Base Case	Spot Case
Revenue - Sale of NCM811 Precursor	US$m	14,032	16,739
NCM811 Precursor Price (avg realised)	US$/t NCM811	16,397	19,559
C1 Cash Costs	US$/t NCM811	11,125	11,209
All-in Sustaining Costs	US$/t NCM811	11,423	11,507
All-in Cost	US$/t NCM811	11,997	12,081
Avg Annual Operating Cash Flow	**US$mpa**	**451**	**715**
Operating Cash Flow	US$m	4,512	7,146
Net Cash Flow (Pre-tax)	US$m	3,766	6,400
Net Cash Flow (Post-tax)	US$m	3,646	6,199
Post-tax NPV (8% real)	**US$m**	**2,007**	**3,509**
IRR (Post-tax)	**%**	**67%**	**98%**
Capital Payback Period - from first production	**years**	**1.5**	**1.0**

Table 5 Life-of-Operation All-in Sustaining Costs

Life-of-Operation All – in Sustaining Costs (US$ /t NCM811)	Base Case	Spot Case
Purchase of Ni & Co Concentrate (Net of Penalties)	7,062	7,656
Refining	4,195	3,799
Logistics	138	138
G&A	32	32
Residue Storage	22	22
By-Product Credit (Copper)	(323)	(437)
By-Product Credit (PGEs)	0	0
Operating Costs (C1 Cash Costs)	**11,125**	**11,209**
Sustaining Capital	167	167
Closure	131	131
All - in Sustaining Cost	**11,423**	**11,507**

Next Steps

The next key steps to progress the Ta Khoa Refinery Project include:

- Pre-feasibility Study for the Upstream Business Unit
- Completion of the Ta Khoa Refinery Definitive Feasibility Study
- Phased construction of a pilot plant in Vietnam to produce NCM811 Precursor and ensure product meets consumer specification
- Continued aggressive drilling to increase mineral resources at the Company's flagship Ta Khoa Nickel Project
- Secure offtake for 3PF
- Final Investment Decision
- Detailed Engineering and Construction
- NCM811 Precursor production currently targeted in 2024.

Authorised by the Board of Blackstone Minerals Limited.

For more information, please contact

Scott Williamson
Managing Director
+61 8 9425 5217
scott@blackstoneminerals.com.au

Dhanu Anandarasa
Manager Corporate Development
+61 8 9425 5217
dhanu@blackstoneminerals.com.au

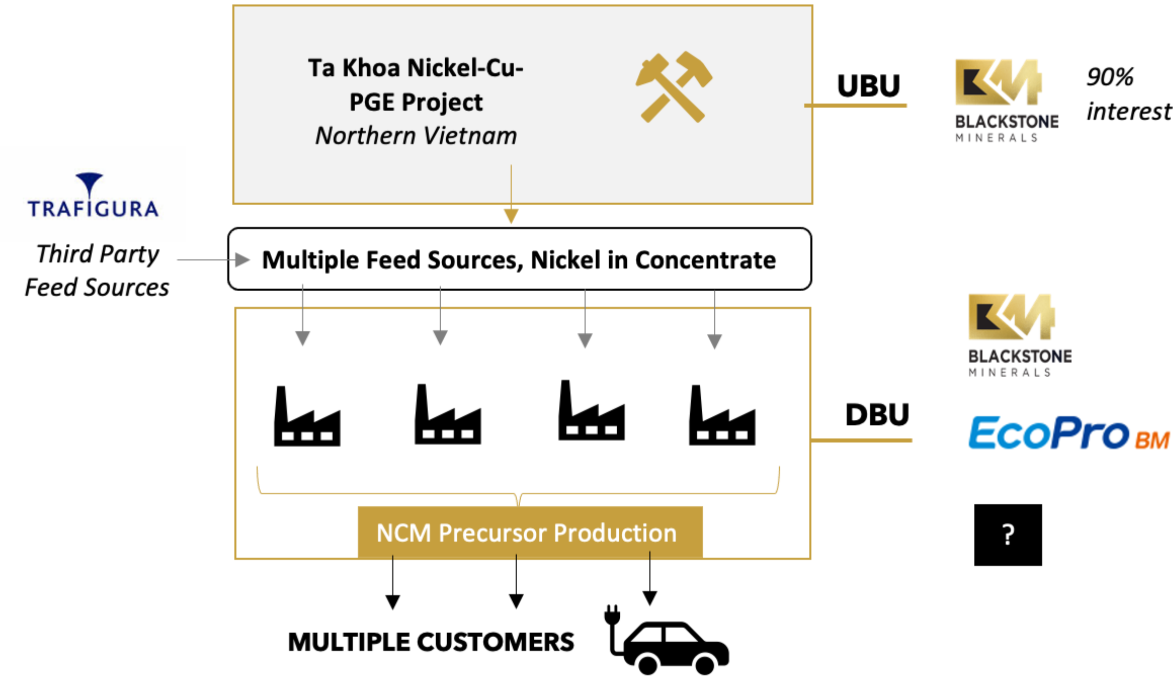
Patrick Chang
Head of Corporate Development
+61 8 9425 5217
patrick@blackstoneminerals.com.au

Andrew Strickland
Head of Project Development
+61 8 9425 5217
astrickland@blackstoneminerals.com.au

About Blackstone

Blackstone Minerals Ltd (ASX: BSX / OTCQX: BLSTF / FRA: B9S) is focused on building an integrated upstream and downstream processing business in Vietnam that produces Nickel: Cobalt: Manganese (NCM) Precursor products for Asia's growing Lithium-ion battery industry (refer Figure 1)

Figure 1 –Ta Khoa Project Snapshot



The Company owns a 90% interest in the Ta Khoa Nickel-Copper-PGE Project. The Ta Khoa Project is located 160km west of Hanoi in the Son La Province of Vietnam and includes an existing modern nickel mine built to Australian standards which is currently under care and maintenance (refer Figure 2). The Ban Phuc nickel mine successfully operated as a mechanised underground nickel mine from 2013 to 2016.

In October 2020, the Company completed a Scoping Study which investigated mining the Ban Phuc Disseminated nickel sulfide ore body (upstream) and the construction of one downstream refinery (refer to ASX announcement of 14 October 2020, including for the full details of the Company's Mineral Resource Estimate at Ban Phuc). Based on the outcomes of the Scoping Study, the Company has since completed a technically and economically robust Pre-feasibility Study for its Downstream Business Unit (DBU) which sees expanded downstream capacity. This is based on the Ta Khoa refinery being designed to process 400ktpa of nickel concentrate, supplied from the Ta Khoa Nickel – Cu – PGE mine as well as third party concentrate.

The Company is continuing to advance a PFS for the Upstream Business Unit (UBU). The UBU PFS will contemplate the option to mine several higher-grade massive sulfide vein (MSV) deposits, which has the potential to reduce initial upfront capital requirements for the UBU by enabling the Company to restart the existing Ban Phuc Concentrator (450ktpa).

By combining the Company's existing mineral inventory (Ban Phuc Disseminated Sulfide -DSS), exploration potential presented by high priority targets such as Ban Chang, King Snake and Ta Cuong the ability to source third party concentrate, Blackstone will be able to increase the scale of its downstream business to cater to the rising demand for downstream nickel products.

Figure 2. Ta Khoa Nickel-Cu-PGE Project Location

<u>Cautionary Statement</u>

The PFS referred to in this announcement is the study of the potential viability of the Ta Khoa Refinery Project. It has been undertaken to understand the technical and economic viability of the TKR.

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 PFS set out above and elsewhere in this announcement ("PFS Parameters") have been developed through feasibility work completed to the level of AACE/AusIMM Class 4 (+/-25% accuracy) and the use of macroeconomic assumptions. For the avoidance of doubt, investors are advised that the PFS Parameters do not constitute a production forecast or a target in relation any mineral resources associated with wit the Company. The Company wishes to expressly clarify that the PFS Parameters are based on the expected grade of nickel, cobalt and copper that is reliant upon 3PF for which there is currently no supply agreement. The PFS Parameters have been disclosed by Blackstone to provide investors with an intended scale and nature of the Project.

The PFS referred to in this announcement has been undertaken to assess the technical and financial viability of the Project. Further evaluation work, including a Definitive Feasibility Study ("DFS") is required before the Company will be in a position to provide any assurance of an economic development case. The PFS is based on material assumptions set out in Section 1.13 of the Executive Summary in this announcement. These include assumptions about the availability of funding and the pricing received for the Ta Khoa Refinery Project products. While the Company 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 PFS will be achieved. To achieve the outcomes in this PFS, the pre-production capital (including contingency) of US$491m, additional capital for pre-commitment activities such as a DFS , pilot plant development and working capital is likely to be required.

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 will 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 Ta Khoa Refinery Project, such as a sale, partial sale or joint venture of the Ta Khoa Refinery Project. If this occurs, this could materially reduce the Company's proportionate share of ownership of the Ta Khoa Refinery Project. Accordingly, given the uncertainties involved, investors should not make any investment decisions based solely on the results of the PFS.

Competent Person Statement

The information in this report that relates to Exploration Results and Exploration Targets is based on information compiled by Mr Andrew Radonjic, a Director and Technical Consultant of the company, who is a Member of The Australasian Institute of Mining and Metallurgy. Mr Andrew Radonjic has sufficient experience which is relevant to the style of mineralisation and type of deposits 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 Andrew Radonjic consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The information in this report that relates to Mineral Resource Estimation in respect of the Ta Khoa Nickel Project is based on information compiled by BM Geological Services (BMGS) under the supervision of Andrew Bewsher, a director of BMGS and Member of the Australian Institute of Geoscientists with over 21 years of experience in the mining and exploration industry in Australia and Vietnam in a multitude of commodities including nickel, copper and precious metals. Mr Bewsher 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 Bewsher consents to the inclusion of the Mineral Resource Estimate in this report on that information in the form and context in which it appears.

Information in this announcement relating to processing metallurgy is based on technical data compiled and reviewed by Tony Tang, a full-time employee of the company. Tony Tang is a Fellow of the Australasian Institute of Mining and Metallurgy (AusIMM) and has sufficient experience relevant to the metallurgical test-work discussed in this piece of news and the activity which he is 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. Tony Tang consents to the inclusion of the technical data in the form and context in which it appears.

The Company confirms that all material assumptions and parameters underpinning the Mineral Resource Estimates as reported within the Scoping Study in market announcement dated 14 October 2020 continue to apply and have not materially changed, and that it is not aware of any new information or data that materially affects the information that has been included in this announcement.

Forward Looking Statements

This report contains certain forward-looking statements. The words "expect", "forecast", "should", "projected", "could", "may", "predict", "plan", "will" and other similar expressions are intended to identify forward looking statements. Indications of, and guidance on, future earnings, cash flow costs and financial position and performance are also forward-looking statements. Forward looking statements, opinions and estimates included in this announcement are based on assumptions and contingencies which are subject to change without notice, as are statements about market and industry trends, which are based on interpretations of current market conditions. Forward looking statements are provided as a general guide only and should not be relied on as a guarantee of future performance. Forward looking statements may be affected by a range of variables that could cause actual results or trends to differ materially. These variations, if materially adverse, may affect the timing or the feasibility of the development of the Ta Khoa Nickel Project.

The project development schedule assumes the completion for the Downstream Business Unit of a Definitive Feasibility Study (DFS) by mid-2022. A PFS & DFS for the Upstream Business Unit is assumed to be completed in 2021 and 2022 respectively. Development approvals and investment permits will be sought from the relevant Vietnamese authorities concurrent to studies being completed. Delays in any one of these key activities could result in a delay to the commencement of construction (planned for early 2023). This could lead on to a delay to first production, currently planned for 2024. It is expected that the Company's stakeholder and community engagement programs will reduce the risk of project delays. Please note these dates are indicative only.

The JORC-compliant Mineral Resource estimate forms the basis for the Scoping Study in the market announcement dated 14 October 2020. Over the life of mine considered in the Scoping Study, 83% of the processed Mineral Resource originates from Indicated Mineral Resources and 17% from Inferred Mineral Resources; 76% of the processed Mineral Resource during the payback period will be from Indicated Mineral Resources. The viability of the development scenario envisaged in the Scoping Study therefore does not depend on Inferred Mineral Resources. There is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources or that the production target itself will be realised. The Inferred Mineral Resources are not the determining factors in project viability. Please refer to the Cautionary Statement in the Scoping Study market announcement dated 14 October 2020.

Looking forward. Mining green.

Ta Khoa Refinery Project

PRE-FEASIBILITY STUDY

Executive Summary
July 2021

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Contributor	Scope
ALS	Upstream metallurgical testwork and sample preparation
Ban Phuc Nickel Mines	Vietnamese salary expectations Local contractor pricing and consumables rates Project permitting planning
Blackstone Minerals	Strategic Planning Operational readiness and implementation planning
ERM	Environmental baseline study planning and recommendations
Fremantle Metallurgy	All dynamic thickening testwork for solid liquid separation
Optimize Group	Project infrastructure design, implementation planning
Simulus Engineers	Refinery process design and plant engineering, CAPEX and OPEX estimating, project dev elopement schedule, risk
Simulus Laboratories	Refinery metallurgy testwork
Trafigura	Provision of third party feed samples

Contents

EXECUTIVE SUMMARY 5

1.1 Introduction **5**

1.2 Development Strategy **6**
1.2.1 General 6
1.2.2 Financing Strategy 7
1.2.3 Concentrate Supply 8
1.2.4 Production Profile 9
1.2.5 Refinery Location Study 9
1.2.6 Environmental, Social and Governance (ESG) Strategy 12

1.3 Metallurgy & Flowsheet Development **13**
1.3.1 Testwork Overview 13
1.3.2 Metallurgical Testwork Results 15
1.3.3 POX Testwork 15
1.3.4 Leach Residue Thickening and Filtration 16
1.3.5 CuSX Testwork 18
1.3.6 Neutralisation Testwork 18
1.3.7 MHP 19
1.3.8 Neutralisation Thickening 20
1.3.9 MHP Thickening 21
1.3.10 Magnesium Crystallisation 22
1.3.11 Mixed Hydroxide Leach 22
1.3.12 CoMgSX 23
1.3.13 NCM Precipitation 23
1.3.14 Flowsheet Development 24
1.3.15 Project Piloting and Flowsheet Testing 25

1.4 Process Infrastructure Design **26**

1.5 Project Infrastructure **28**
1.5.1 Project buildings 28
1.5.2 Roads and Access 29
29
1.5.3 Residue Storage 30
1.5.4 Power Supply 31
1.5.5 Water Supply 31
1.5.6 Site Water Management 32
1.5.7 Accommodation Facilities 32

1.6 Marketing Study **33**
1.6.1 Market Overview 33
1.6.2 Nickel Concentrates 34
1.6.3 NCM Precursor 35
1.6.4 NCM811 Precursor Price Forecast 36

1.7 Capital Cost **38**
1.7.1 Summary 38
1.7.2 Estimate Accuracy 39

1.8 Operating Costs **42**

1.9 Project Economics 43
1.9.1 Base Case Sensitivity Analysis 47

1.10 Permitting and Environment 48
1.10.1 Project Permitting 48
1.10.2 Environmental and Social-Economic Studies and Permitting 50
1.10.3 Current Status, Impacts and Mitigation Methods 51

1.11 Project Implementation 52
1.11.1 Contracting Strategy 52
1.11.2 Project Schedule 53

1.12 Risk and Opportunity 53
1.12.1 Risks 53
1.12.2 Opportunities 57

1.13 Summary of Material Assumptions and Modifying Factors 60

2 APPENDIX A: BAN PHUC SCOPING STUDY SUMMARY 68

2.1 Project Background 68

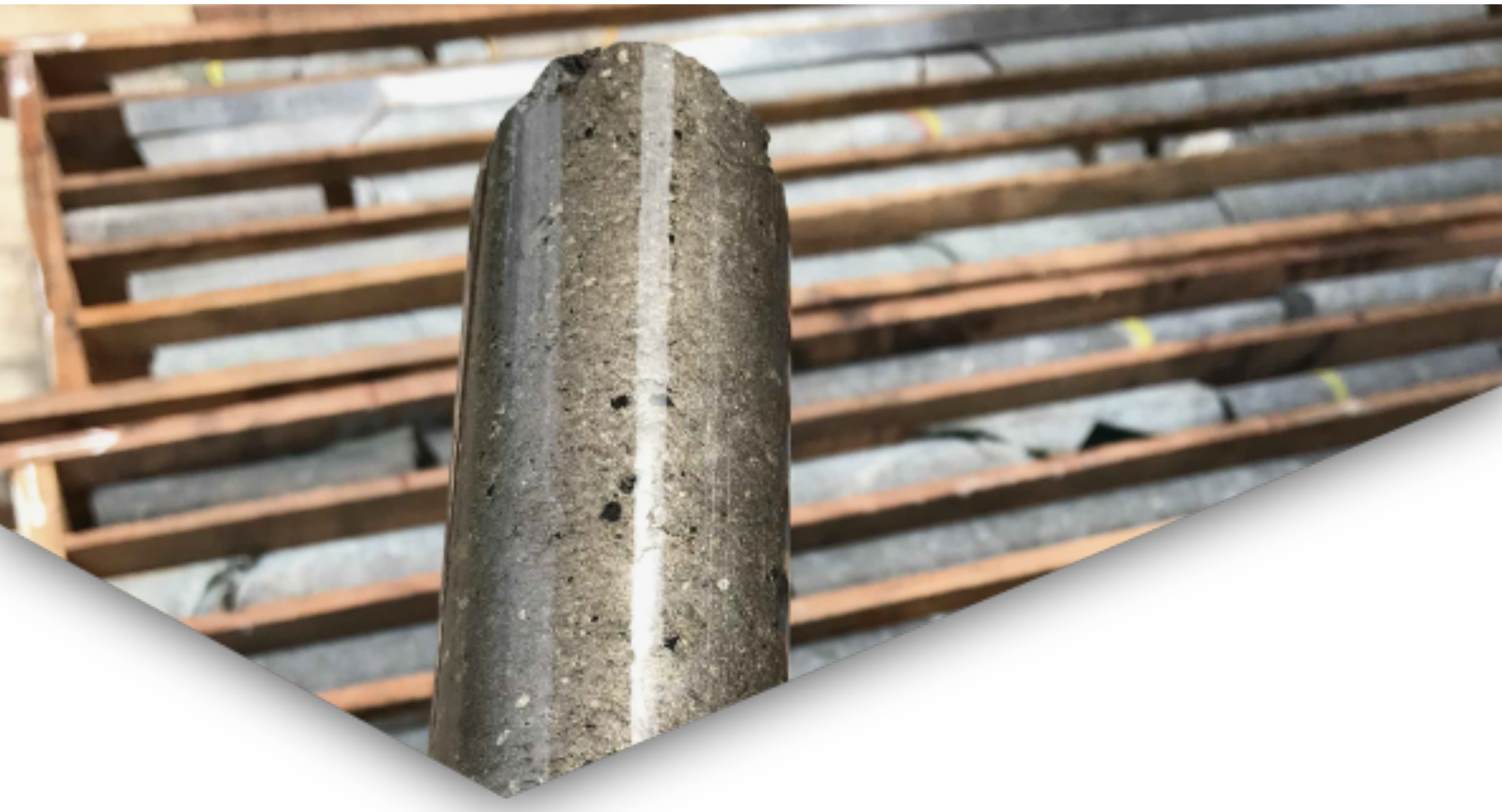
List of Figures

Figure 1. 1, TKR Process Schematic 5
Figure 1. 2, Development Strategy 7
Figure 1.3, Base Case Feed Profile (400ktpa, 10-year operational life) 9
Figure 1.4, Potential Refinery Locations 10
Figure 1.5, PGM chloride leach results 14
Figure 1.6, Batch POX autoclaves (2 L – left, 15 L – right) 16
Figure 1.7, Dynamic thickening setup 17
Figure 1.8, Pilot pressure filter press 17
Figure 1.9, CuSX batch test flowchart 18
Figure 1.10, Limestone dose response on CuSX raffinate (blended concentrate) 19
Figure 1.11, MHP 1 MgO dose response (blended concentrate) 20
Figure 1.12, Neutralisation dynamic thickening tests 20
Figure 1.13, MHP dynamic thickening tests 21
Figure 1.14, MHP leach stage 1 acid dose response (pH) 23
Figure 1.15, Process Flow Diagram for Downstream Processing 24
Figure 1.16, TKR Layout 27
Figure 1.17, RSF 1 Embankment Strategy 30
Figure 1.18, RSF Locations 31
Figure 1.19, Increasing Nickel Demand from Li-ion batteries 33
Figure 1.20, Simplified nickel-rich battery supply chain 34
Figure 1.21, Forecast nickel demand by NCM versus NCA adoption 35
Figure 1.22, Forecast nickel demand by NCM Chemistry 36

Figure 1.23, NCM811 precursor premium over metal prices 37
Figure 1.24, Base Case Total Capital Expenditure Profile 39
Figure 1.25, Base Case Total Operating Costs, By Aggregate (US$m) and Proportionate Expenditure (%)....42
Figure 1.26, Base Case Tornado Sensitivity Analysis 47
Figure 1.27, Project Milestones 53

List of Tables

Table 1.1, Base Case Feed Physicals 9
Table 1.2, Corporate Tax Schedule 11
Table 1.3, Concentrate blend POX test result summary 16
Table 1.4, POX leach residue filtration summary 18
Table 1.5, MHP dynamic thickening results summary 21
Table 1.6, Magnesium crystallisation operating conditions 22
Table 1.7, Magnesium crystallisation assay summary 22
Table 1.8, NCM811 Precursor Price Forecast 37
Table 1.9, Summary of Capital Costs 38
Table 1.10, AACE Class 4 Estimate Maturity Matrix 40
Table 1.11, Operating Cost Summary 42
Table 1.12, Base Case Operating Cost Breakdown 43
Table 1.13, Life of Operation Physicals 44
Table 1.14, Life of Operation Economics 45
Table 1.15, Annual Summary of Base Case Cash Flows 46
Table 1.16, Base Case Two-way Sensitivity Table, NCM811 vs Ni in Concentrate Payability 48
Table 1.17, Project Permitting Requirements 49



EXECUTIVE SUMMARY

1.1 Introduction

Blackstone Minerals Ltd (BSX) has completed a Pre-Feasibility Study (PFS) confirming a technically and economically robust strategy to process nickel sulfide concentrates to produce battery grade NCM811 Precursor for the Lithium-ion battery industry.

A simplified process flow schematic of the downstream processing is indicated in Figure 1.1.

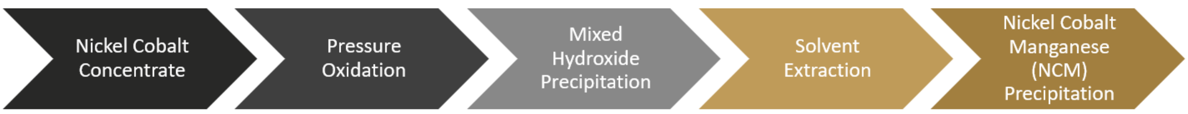


Figure 1. 1, TKR Process Schematic

This PFS report focuses on the Ta Khoa Refinery (TKR), which will be initially developed as part of a wholly owned Vietnamese subsidiary of BSX. The TKR will treat 400ktpa of nickel concentrate feed and produce an advanced battery precursor material called NCM811 Precursor, which is the technical name for a mixed hydroxide precipitate with nickel, cobalt and manganese hydroxides present in a ratio of 8:1:1.

BSX owns 90% of the Ta Khoa Nickel – Copper – PGE Project (Ta Khoa Nickel Project) via its interest in Ban Phuc Nickel Mines (BPNM). The Ta Khoa Nickel Project is located approximately 160 km west of Hanoi near Ban Phuc Village in Son La Province, in the north-west of Vietnam. The previous owners of the Ta Khoa Project mined the Ban Phuc Massive Sulfide Vein (MSV) underground deposit and treated approximately 1Mt over 3 years through the existing 450ktpa Ban Phuc Nickel Concentrator.

Since acquiring the Ta Khoa Nickel Project in 2019 BSX has completed extensive modern geophysical targeting and exploration drilling on multiple disseminated sulfide (DSS) and MSV targets. In October 2020 BSX announced a maiden resource at its first target being the Ban Phuc DSS orebody. The maiden Indicated Mineral Resource of 44.3Mt @ 0.52% Ni for 229kt nickel underpinned a Scoping Study also released in October 2020. The Indicated Mineral Resource and Production Target have been reported in accordance with the JORC Code by a Competent Person.

The Ta Khoa Scoping Study considered a basis of 4Mtpa mill feed rate from the Ban Phuc Disseminated Sulfide (DSS) deposit, producing approximately 200ktpa concentrate for feed to the downstream refinery. The Scoping Study Refinery produced a NCM811 product via a mixed hydroxide precipitate intermediate product. The TKR PFS considers an expanded downstream refining production strategy with no change to the upstream production.

The TKR treats 400ktpa (Base Case) nickel concentrate feed sourced from the Ban Phuc DSS deposit (~200ktpa as per the Scoping Study production profile) and Third Party Feed Sources (3PF) making up the 400ktpa. The PFS strategy is driven by strong indicative demand for the Company's downstream products underpinned by the burgeoning electric vehicle (EV) market.

The location of the TKR will be confirmed after completion of the PFS with further trade-off studies, but it will be situated in Northern Vietnam. The TKR will prioritise feed from the Ta Khoa Nickel Project, including any successful exploration targets and Upstream Joint Venture (JV) partners, with top-up from 3PF where excess TKR capacity is available.

1.2 Development Strategy

1.2.1 General

The BSX development strategy (refer Figure 1.2) is supported using 3PF to supplement nickel concentrate supply from the Ta Khoa Nickel Project, and to improve the overall operational flexibility of the TKR. BSX is in discussion with multiple 3PF suppliers and has obtained concentrate specifications from the respective suppliers. In addition, BSX has signed a Letter of Interest with Trafigura for the supply of nickel and cobalt sulfide concentrates. It should be noted that the TKR has been valued as a standalone business, and the purchase of concentrate, including from BSX's Ta Khoa Nickel Project, is assumed to occur at arm's length.

Trafigura is one of the largest physical commodities trading groups in the world and is one of the leading physical commodities traders involved in copper, zinc, lead, nickel and cobalt trading. The development of the TKR is reliant on final offtake agreements, with Trafigura and other 3PF suppliers, and will be the subject of ongoing negotiations that are commercial in confidence. Further, the ability for the TKR to process 3PF is contingent upon receipt of Vietnamese import approval.

The PFS has assumed the only Ta Khoa Nickel Project feed source for the TKR is the Ban Phuc open pit disseminated sulfide orebody. This material was the subject of the Ta Khoa Scoping Study announcement and as such is publicly available. This study has used the Scoping Study mine production / mill feed profile.

Even though the Refinery can operate in perpetuity, production modelling has been aligned with the availability of indicative feed sources. As a result, the feed modelling has been limited to 10 years. The start date (and valuation date) for the economic modelling of the TKR is 1 September 2022, first production is achieved in 2024 and steady state production from CY2026 onwards.

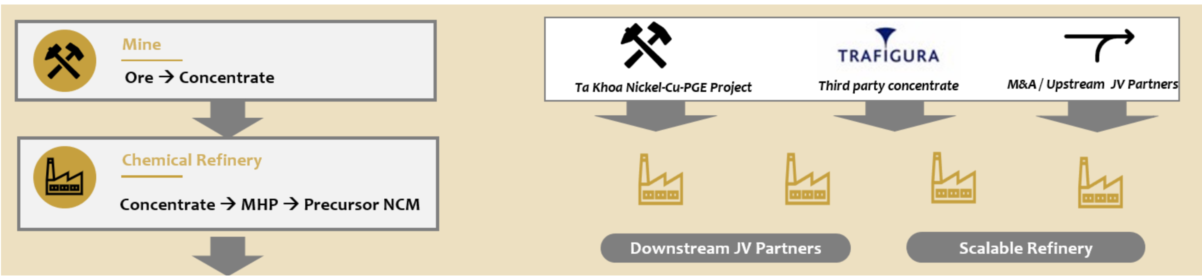


Figure 1. 2, Development Strategy

1.2.2 Financing Strategy

The Company intends to develop and fund the construction of the TKR via a collaborative partnership-based model. Blackstone's intention is to retain a significant interest in the TKR and expects that its portion of funding will be met through a combination of debt, equity, and offtake financing.

Blackstone has commenced funding discussions with multiple partners, including potential NCM consumers and concentrate suppliers to jointly participate in the funding of the proposed refinery. Further, Blackstone has been approached by a number of financial advisors interested in supporting Blackstone's funding strategy.

1.2.2.1 JV Partners

JV partner funding is expected to be a significant component of the overall funding volume and will be of strategic importance. JV partners could be end users of the products (e.g., electric vehicle, Li-ion battery or cathode manufacturer), traders or nickel concentrate suppliers (e.g., another mining company). Securing a JV partner will not only provide partial pre-production funding but also bring in technology and certainty of product offtake and/or feedstock, thereby enhancing the prospects of BSX of raising debt / equity financing for the project.

1.2.2.2 Investment Loan

BSX will consider conventional loan funding and is in discussion with investment loan advisors to determine criteria for lending. Early indications are for BSX to have potential to access low-cost loan products through conventional bank finance, development bank finance and export credit agencies. BSX has potential to access bonds with a particular focus on green bonds given the project's potential to meet the highest level of ESG compliance.

1.2.2.3 Equity

BSX is expected to undertake additional capital raisings to partially fund the TKR development. The amounts raised in future will depend on market condition and the market capitalisation of BSX at the time of the raise. Equity funding can come from three main parties, namely strategic investors, institutions, and retail investors. BSX maintains excellent relationship with Australian and international investment banks / stockbrokers. In addition, BSX undertakes frequent marketing campaigns directly to the institutions and strategic partners.

1.2.2.4 Offtake Prepayment

An offtake prepayment arrangement is essentially a loan, whereby the off taker provides funding in advance, typically to be utilised for upfront pre-production CAPEX. The loan provided by the off taker can be on a secured basis and is satisfied by the delivery of product as specified under the offtake agreement.

1.2.3 Concentrate Supply

1.2.3.1 Ta Khoa Nickel Project

The TKR PFS assumes that the only Ta Khoa concentrate feed is sourced from the Ban Phuc open pit disseminated ore. This material was the subject of the Ta Khoa Scoping Study announcement and as such is publicly available. This study has used the Scoping Study mine production / mill feed profile. A summary of the Ban Phuc Scoping Study is provided in Appendix A.

The PFS Ta Khoa concentrate blend excludes massive sulfide feed sources from the Ta Khoa Nickel Project. Once sufficient resource estimation work has been completed, BSX intends to incorporate these MSV targets into an updated feed profile, and the next phases of studies.

1.2.3.2 3PF

The Base Case is reliant on 3PF and Figure 1.3 illustrates the sequencing and quantities of 3PF assumed in the production profile.

Indicative quantities and concentrate specifications have been received from all 3PF concentrate suppliers / partners included in this PFS. Based on current and confidential discussions, BSX is confident it can secure sufficient supply to meet the feed concentrate requirements.

1.2.3.3 Hydrometallurgical flowsheet enables potential concentrate feed supply

The TKR has a higher tolerance of deleterious elements when compared to conventional pyrometallurgical operations. BSX considers there are several nickel sulfide mine opportunities with high MgO and arsenic content that will have enhanced economic prospects if treated via the TKR hydrometallurgical process. BSX is confident that the TKR technology has potential to expand the market for nickel sulfide concentrates and create appropriate incentives for some of these opportunities that are either under care and maintenance or still undeveloped to move forward.

1.2.4 Production Profile

The PFS feed profile treats 400ktpa of nickel concentrates through two Pressure Oxidation (POX) autoclaves (one POX autoclave hereafter referred to as one train). This scenario presented in Table 1.1 and Figure 1.3 is considered to be the most achievable by BSX, and likely the base-case development scenario. BSX also studied the potential of a 800ktpa feed scenario, and pending future partnerships may be pursued at a later date.

Table 1.1, Base Case Feed Physicals

	Life of Operation Average	Life of Operation Total Tonnes (T)
Concentrate Feed	400ktpa	3,893,882
Nickel	11.5%	449,447
Cobalt	0.3%	11,105
Copper	1.1%	44,041

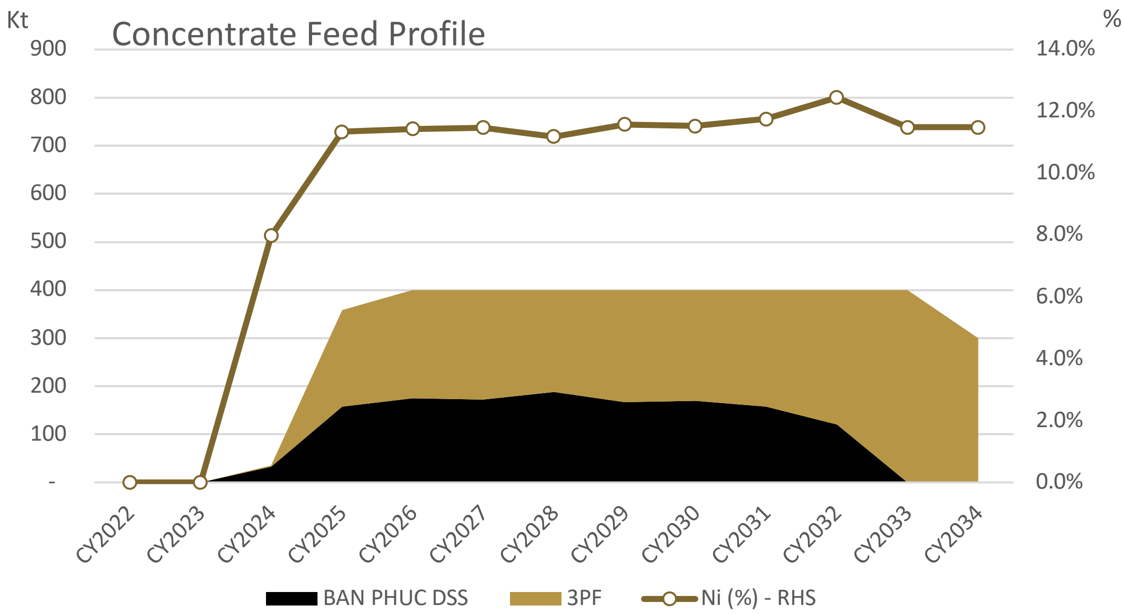


Figure 1.3, Base Case Feed Profile (400ktpa, 10-year operational life)

1.2.5 Refinery Location Study

BSX engaged a local Vietnamese based consulting firm specialising in Vietnamese logistics, infrastructure and local investment law, to conduct location and logistics study to help determine the optimum TKR location. A detailed location and infrastructure review and trade-off study was completed to identify the optimum refinery location, inclusive of an in-depth discovery phase with engagement with local governments and industry bodies. The location study considered five potential locations for the refinery which are illustrated in Figure 1.4:

- Tan Phu Industrial Cluster, Phu Tho Province
- Mai Son Industrial Park, Son La Province
- Son Thinh Industrial Park, Yen Bai Province
- Mong Hoa Industrial Park, Hoa Binh Province
- New Industrial Park, Nam Dinh Province

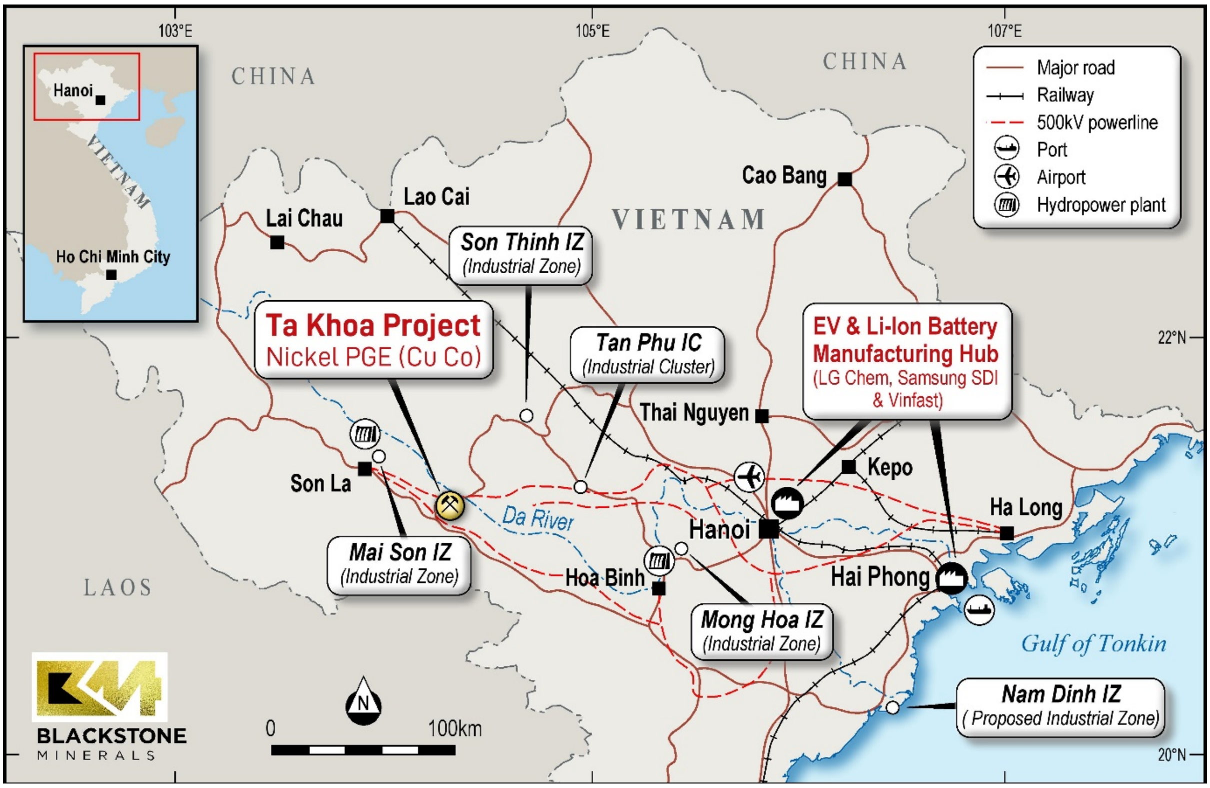


Figure 1.4, Potential Refinery Locations

The Study considered eight key factors in the assessment. Each of the proposed locations mentioned above were qualitatively judged against each of the key factors. BSX weighted each of the factors based on their relative importance for site selection criteria. The key factors assessed include:

- Provincial level support from the Government and the community
- Residue disposal options
- Tax incentives
- Logistics
- Availability of renewable power supply
- Power cost and connection complexity
- Availability of water
- Availability of labour

All analysis to date indicates that the TKR should be located either in Son La or Phu Tho provinces. Both of these provinces demonstrated great government support, ease of access to renewable power, suitable residue storage options and availability of suitable land.

The Location Study has confirmed there are also significant corporate tax incentives available to the Refinery. In particular, the prevailing law for investments in Industrial Zone / Industrial Cluster in especially difficult areas (including both Mai Son and Tan Phu) stipulate a corporate tax holiday of 4 years, followed by 9 years of 5% tax and 2 additional years of 10% tax. After 15 years, the corporate tax will be 20% (refer Table 1.2).

Table 1.2, Corporate Tax Schedule

Years of Operation	%	Corporate Tax Rate
0-4	%	0%
5-13	%	5%
14-15	%	10%
>15	%	20%

The PFS, and associated cost estimates and economic modelling, has been based on an assumption that the TKR would be located in Phu Tho. However, BSX is presently performing additional activities to confirm the location of the TKR including:

- Further engagement with the Vietnamese central government to increase centralised support, and for guidance on location selection.
- BSX will continue to meet and discuss potential locations with local authorities and industry bodies, particularly focusing on:
  - Land availability
  - RSF (Residue Storage Facility) location availability and storage volumes
  - Permitting pathway
  - Local level and Central government support

BSX will then complete a final trade-off study before finalising the TKR location for the DFS study.

1.2.6 Environmental, Social and Governance (ESG) Strategy

BSX is motivated to support the energy transition and battery-driven nickel demand through developing the TKR in accordance with best practice ESG standards. BSX aims to support this strategy, by producing green nickel™ through using existing renewable power infrastructure sourced from South-east Asia's biggest hydropower plants located close to BSX's operations. BSX is confident that intrinsic characteristics of the TKR will ensure that production of battery grade NCM811 Precursor will be delivered into battery supply chains meeting the highest standards of environmental compliance.

BSX is a member of the electric vehicle consortium in an effort to implement best practice electric mining operations shared through this network. In addition to electrifying our operations from renewable power sources, BSX is actively studying the commercial potential of green hydrogen to integrate hydrogen fuel cell vehicles into its mining fleet and to further offset the operating costs of the TKR refinery through the sale of Green Hydrogen.

As BSX develops its ESG strategy over the coming months, it is expected that downstream Environmental Impact Assessment (EIA) studies, alongside ongoing engagement with authorities from the preferred site, will support the prioritisation of managing the project's key ESG risks. Definition around these risks will also support the development of metrics to monitor and improve performance. Some key areas of ESG strategy and focus for the downstream plant are listed below.

1.2.6.1 Environment

BSX recognises that the project's impact upon land, water, air, and biodiversity need to be as minimal as possible in both establishing and maintaining the project. BSX has demonstrated its ability to manage environmental risks well at Ta Khoa, and from this experience, BSX is cognisant that ongoing monitoring and performance should be supported by well-resourced teams and robust environmental management plans. BSX's ultimate goal is to be a zero-carbon mining operation.

1.2.6.2 Social

BSX is committed to delivering to the highest social performance standards of the project. A key element of the project is delivering tangible social outcomes for individuals, businesses, and the broader communities in which it is operating. This includes employing local personnel wherever practicably possible for the project and providing development and employment pathways for these personnel. Complying with and demonstrating adherence to human rights expectations around safe working and fair labour conditions, as well as supporting suppliers in meeting expectations around human rights compliance will be a priority of BSX's ESG strategy.

1.2.6.3 Governance

Underpinning strong environmental and social protections and initiatives is BSX's approach to governance. A key step is understanding the ESG risks of the project and implementing appropriate mitigation methods to respond to these. BSX also understands that the implementation and management of a transparent grievance process will be critical in maintaining strong relationships and our social licence with the community and leadership of province.

1.3 Metallurgy & Flowsheet Development

The current TKR PFS is based on a blended concentrate feed consisting of Ta Khoa disseminated (DSS) nickel concentrate and various third-party concentrates. The PFS has considered development options at 400ktpa and 800ktpa concentrate feed rates.

1.3.1 Testwork Overview

Various testwork programs have been completed during the development of the TKR as follows:

1. TAKH-000-TBR-001 Rev B – Ta Khoa Project Nickel Refinery Testwork Report (April 2020)
2. TAKH-939-TBR-001 Rev A – Ta Khoa Project PGM Upgrading Testwork Report (June 2020)
3. TAKH-941-TBR-001 Rev B – Ta Khoa Project PFS POX Option (DSS) Testwork Report (April 2021)
4. TAKH-1008-TBR-002 Rev A – Ta Khoa Project MHP Generation Testwork Report (July 2021)
5. TAKH-1024-TBR-003 Rev A – Ta Khoa Project POX to NCM Testwork Report (July 2021)

All testwork listed above was conducted at Simulus Laboratory Welshpool facility from early 2020 to mid-2021. Additional flotation testwork was conducted at ALS metallurgy in Balcatta to optimise flotation conditions. The ALS flotation testwork was conducted concurrent to Simulus testwork programs three to five (refer above) to provide concentrate samples to Simulus and generate design data for the upstream processing plant. The upstream and flotation work is not the focus of this study and are not included in this report.

The first of the Simulus testwork reports (April 2020) was completed to support the initial scoping study and included testwork on three different flowsheet options. Each option included pressure oxidation leach (POX) on nickel flotation concentrate, produced from Ta Khoa disseminated ore. The flowsheets differed by production of either mixed hydroxide precipitate (MHP) or mixed sulfide precipitate (MSP) intermediate products or no intermediate in the case of the direct solvent extraction (DSX) option. Nickel sulfate solution was the final product due to sample availability constraints in this program.

The scoping study associated with this phase of work considered the following options:

- Option 1 – GlyLeach/$NiSO_4$ (4 Mtpa ore feed)
- Option 2a – POX/MSP/$NiSO_4$
- Option 2b – POX/MSP only
- Option 3a – POX/MHP/$NiSO_4$
- Option 3b – POX/MHP only
- Option 4 – POX/DSX/$NiSO_4$
- Option 5 – Albion Process to $NiSO_4$
- Option 6 – POX/DSX/NCM622 precursor
- Option 7 – POX/MHP/NCM811 precursor.

Separate testwork was completed for options 1, 2, 3 but will not be considered further as it is not relevant to the selected POX option. No testwork was completed on option 5 which did not progress beyond the scoping stage and will not be considered further.

The second testwork programs, Ta Khoa Project Platinum Group Metals (PGM) Upgrading Testwork Report (June 2020) included tests examining the potential for recovery of PGM content in POX leach residue samples generated in the first testwork program. Attempts to upgrade the

PGM were not successful, but chloride leaching on the whole of POX leach residue solids did demonstrate high PGM extractions (refer to Figure 1.5). Limited sample was available during this program and no further work was conducted at that time. Recovery of PGMs is not currently included in the process flowsheet but may be in future with further development.

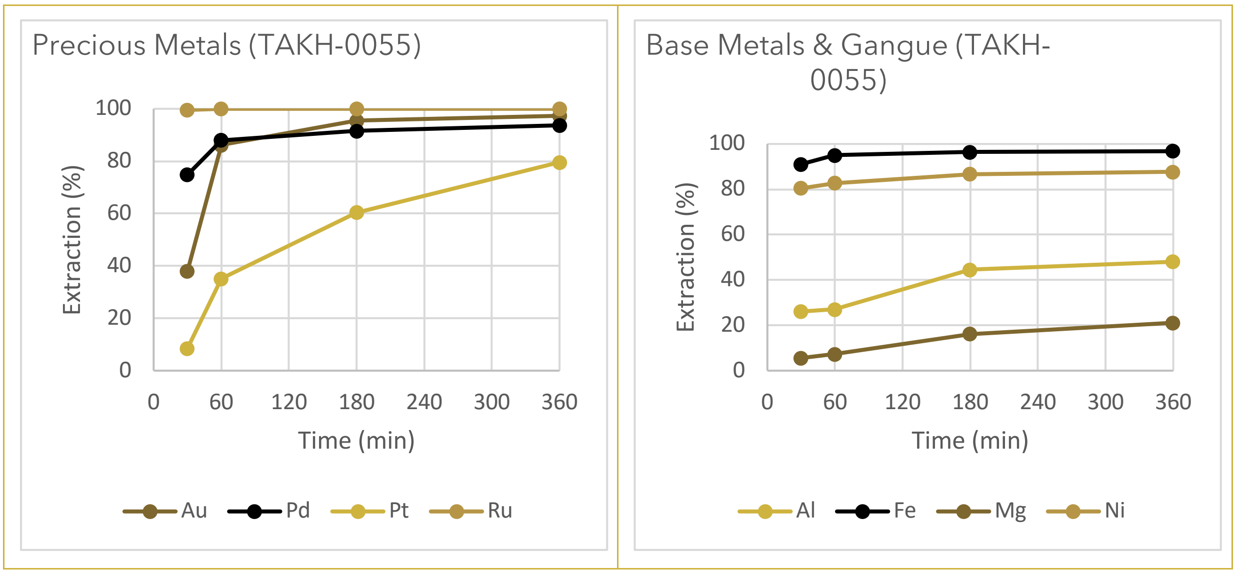


Figure 1.5, PGM chloride leach results

The third testwork program, Ta Khoa Project PFS POX Option (DSS) Testwork Report (April 2021) was completed in parallel to the original POX PFS study that considered a 200 ktpa of disseminated (DSS) concentrate feed to POX only. This test program was based on the preferred scoping study flowsheet, Option 7 – POX/MHP/NCM811 precursor. The key unit operations tested in this program included the following:

- POX
- Copper solvent extraction (CuSX)
- Neutralisation
- MHP
- Magnesium crystallisation
- MHP leach
- Recycle leach
- Cobalt and magnesium solvent extraction (CoMgSX).

The final product from this program was purified nickel sulfate solution. It stopped short of nickel cobalt manganese (NCM) ternary precursor. Results from this test program are applicable to the current 400 ktpa and 800 ktpa POX PFS options. The key difference being the concentrate feed which was DSS concentrate rather than a blend of DSS and third-party concentrates. The DSS data should be viewed as a variability sample that represents an extreme case but not expected in normal operation. Results from this program will be discussed in the relevant section below in comparison with the current blended concentrate testwork.

The fourth testwork program, Ta Khoa Project MHP Generation Testwork Report (July 2021) is designed to generate MHP marketing samples. As such, the program only includes the following unit operations:

- POX on four concentrate samples:
  - Low grade Ta Khoa DSS concentrate
  - High grade Ta Khoa DSS concentrate
  - Trafigura sample 1

- Trafigura sample 2

- Copper solvent extraction (CuSX) on combined POX liquor
- Neutralisation, and
- MHP.

The program has been structured to provide some POX leach variability data as different concentrate feeds have been processed separately through this unit operation. Results from this program will be discussed in the relevant section below in comparison with tests on various concentrate sources.

The fifth and most recent testwork program, Ta Khoa Project POX to NCM Testwork Report (July 2021) is the most recent and comprehensive program, consistent with the 400 ktpa and 800 ktpa POX PFS flowsheet. A blended concentrate feed to match the expected design case and a single high nickel and sulfur grade concentrate (an extra variability sample) were tested from POX through to MHP, and then a combined MHP was leached and processed through to NCM ternary precursor, as per the following flowsheet unit operations:

- Blended and high Ni and S concentrates tested:
    - POX
    - Copper solvent extraction (CuSX)
    - Neutralisation and
    - MHP.
- Single MHP composite sample tested:
    - MHP leach
    - CoMgSX and
    - NCM precipitation.

1.3.2 Metallurgical Testwork Results

The elemental feed composition of the concentrate blend for the 400 ktpa POX PFS is 11.5 % Ni, 0.3 % Co, 1.1 % Cu.

1.3.3 POX Testwork

POX tests were conducted at Simulus Laboratories Welshpool facility in either a 2 L or 15 L batch autoclave. Both autoclaves are made of titanium grade 2 and fitted with magnetic agitator drive assemblies, temperature controlled via external electric heating element, internal cooling water coils, oxygen injection sparge and various ancillary equipment such as sample bomb, instrumentation, valving, and tubing. Photos of the vessels are given in Figure 1.6 below.

Figure 1.6, Batch POX autoclaves (2 L – left, 15 L – right)

Three optimisation POX tests, each of two litres in volume were conducted prior to two 15 litre bulk tests on the blended concentrate as part of the fifth testwork program.

A summary of the test conditions and results are given in Table 1.3 for the blended concentrate. All tests were completed with 1,000 kPa(g) oxygen overpressure.

Table 1.3, Concentrate blend POX test result summary

Test ID	Vol.	Time	Solids	Temp	Oxygen	Metal Extraction (%)		
Units	L	Minutes	%w/w	°C	kPa	Ni	Co	Cu
TAKH-0142	2	120	15	180	1000	97	98	92
TAKH-0143	2	120	15	220	1000	96	98	98
TAKH-0144	2	120	15	230	1000	93	94	97
TAKH-0152	15	120	15	230	1000	90	94	93
TAKH-0153	15	120	15	230	1000	97	98	98

1.3.4 Leach Residue Thickening and Filtration

Flocculant screening and thickening testwork was completed by BASF on POX leach residue samples as part of the fifth testwork program.

Static cylinder tests were completed for flocculant screening and dose response with calculated solids flux for both samples at 6.3 %w/w feed solids. Magnafloc and Rheomax were the best performers for both samples.

A summary of results for the blended (blended concentrate) sample were as follows:

- Magnafloc at 15 m/h setting rate
    - Underflow solids content of 29 %w/w
- Rheomax at 15 m/h setting rate
    - Underflow solids content of 30 %w/w
- Solids flux calculated from the floc dose response tests was approximately 1.0 t/h/m².

Dynamic thickening testwork was completed by Fremantle Metallurgy at Simulus Laboratories on POX leach discharge samples from the blend (blended concentrate). The test rig setup is given in Figure 1.7.

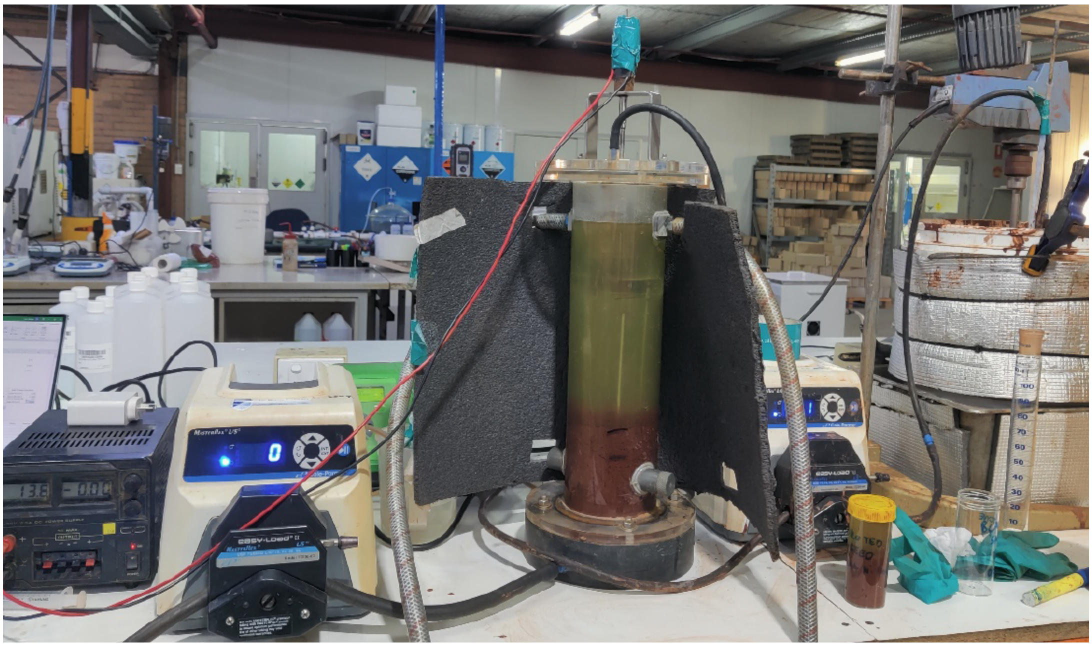


Figure 1.7, Dynamic thickening setup

Filtration testwork was completed on POX leach residue at Simulus laboratories in a pilot scale pressure filter (8 bar(g) maximum feed pressure) with 250 mm plates, 15 mm chamber thickness, cake washing, membrane squeeze (12 bar(g)) and cake blow capability (see Figure 1.8).

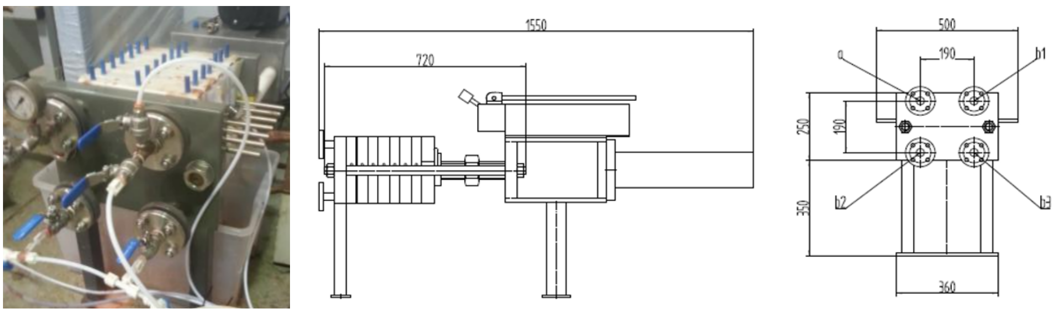


Figure 1.8, Pilot pressure filter press

Filtration results are given in Table 1.4 for partially neutralised POX leach residue as part of the fifth testwork program and wash recovery results using hot wash water.

Table 1.4, POX leach residue filtration summary

Test ID	Feed Pressure	Squeeze Pressure	Cake Moisture	Dry Cake Density	Dry Cake Solids	Cycle Time*	Filter Flux*
	bar(g)	bar(g)	%w/w	t/m³	kg	min	t/m².h
TAKH-0162	6.36	11.0	23.3	1.25	0.6	6.6	54.4

1.3.5 CuSX Testwork

Seven batch copper solvent extraction (CuSX) tests were completed to process a total of approximately 85 L of pregnant leach solution (PLS) generated.

Each set of CuSX tests included two extraction and two strip stages using a common organic and electrolyte that was recycled. Electrolyte was demineralised water with sulphuric acid added prior to each strip stage. Phases were mixed in an agitated, baffled glass reactor vessel at ambient temperature. An example test flowchart (applies to all sets) describing the stages for each set of tests is given in Figure 1.9.

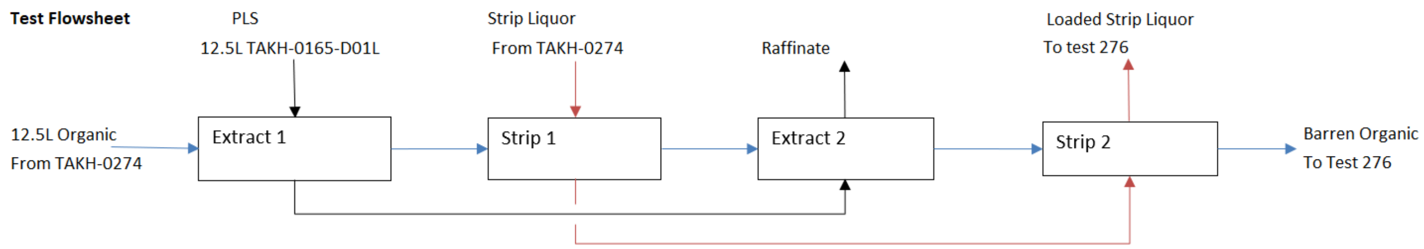


Figure 1.9, CuSX batch test flowchart

The CuSX batch tests achieved a copper recovery of 97.5 % on the blended concentrate PLS. Pilot operation with true counter-current flow is recommended in the next phase of work to confirm design data.

1.3.6 Neutralisation Testwork

Limestone neutralisation tests were completed on the CuSX raffinate. A total of approximately 85 L of CuSX raffinate was processed. The aim of the tests is to remove impurities prior to recovery of the mixed hydroxide precipitate (MHP) intermediate product.

An initial small-scale limestone dose response test was completed for both CuSX raffinate samples prior to doing a larger scale bulk test on each sample.

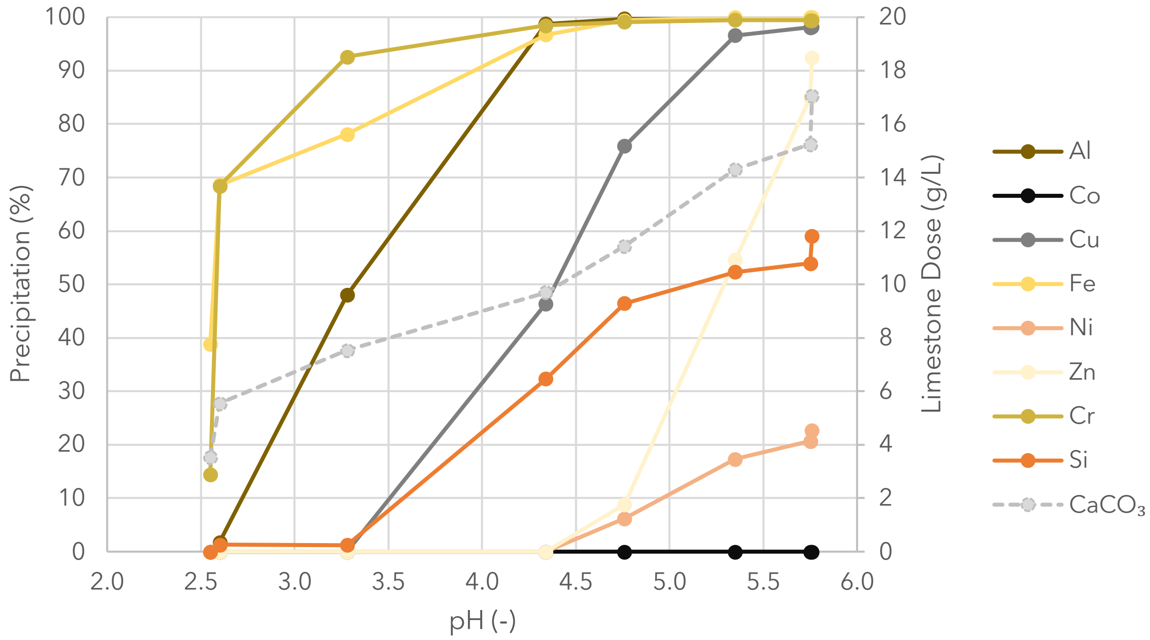


Figure 1.10, Limestone dose response on CuSX raffinate (blended concentrate)

1.3.7 MHP

Mixed hydroxide precipitation (MHP) stage 1 tests were completed on the neutralised liquor from both blended concentrates. A total of approximately 85 L of neutralised liquor was processed. The aim of the tests is to recover most of the nickel and cobalt to the mixed hydroxide precipitate (MHP) intermediate product whilst minimising impurities. Residual nickel and cobalt are recovered in subsequent MHP stage 2 using lime.

All MHP stage 1 tests were conducted at approximately 65 °C and two hours duration with kinetic samples taken for review. An initial small-scale magnesia dose response test was completed for both neutralised liquor samples prior to doing a larger scale bulk test on each sample. Results for the dose response tests are given in Figure 1.11.

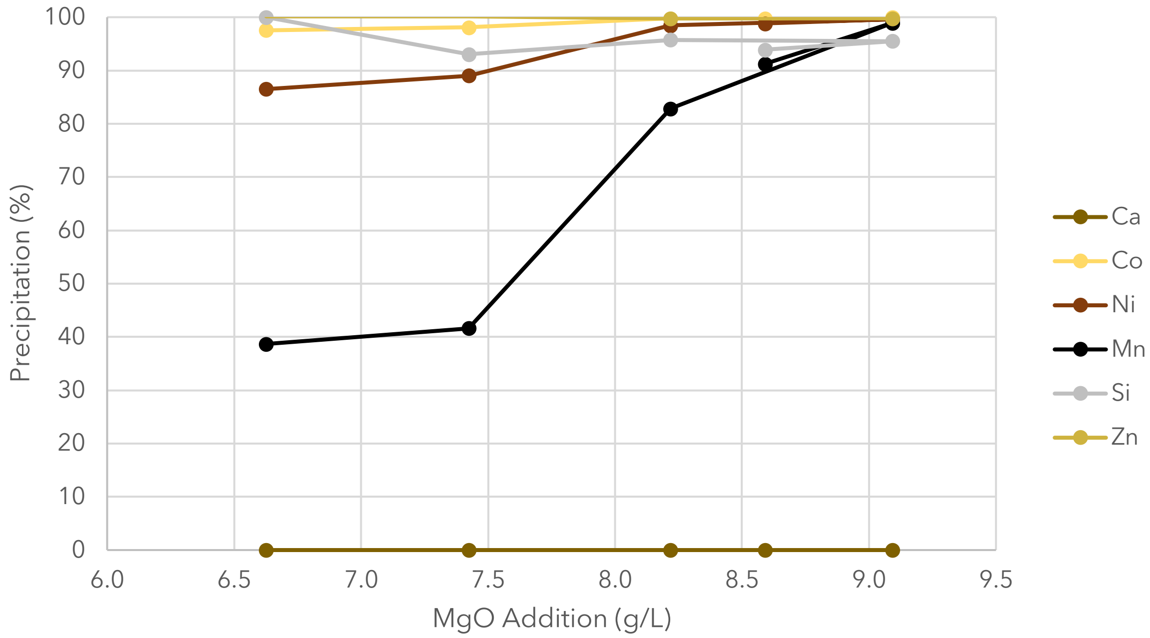


Figure 1.11, MHP 1 MgO dose response (blended concentrate)

1.3.8 Neutralisation Thickening

Dynamic thickening testwork was completed by Fremantle Metallurgy at Simulus Laboratories on neutralisation samples from the blend as part of the fifth testwork program. The test rig setup was similar to previous POX discharge work given in Figure 1.7. Photos of the neutralisation results are given in Figure 1.12.

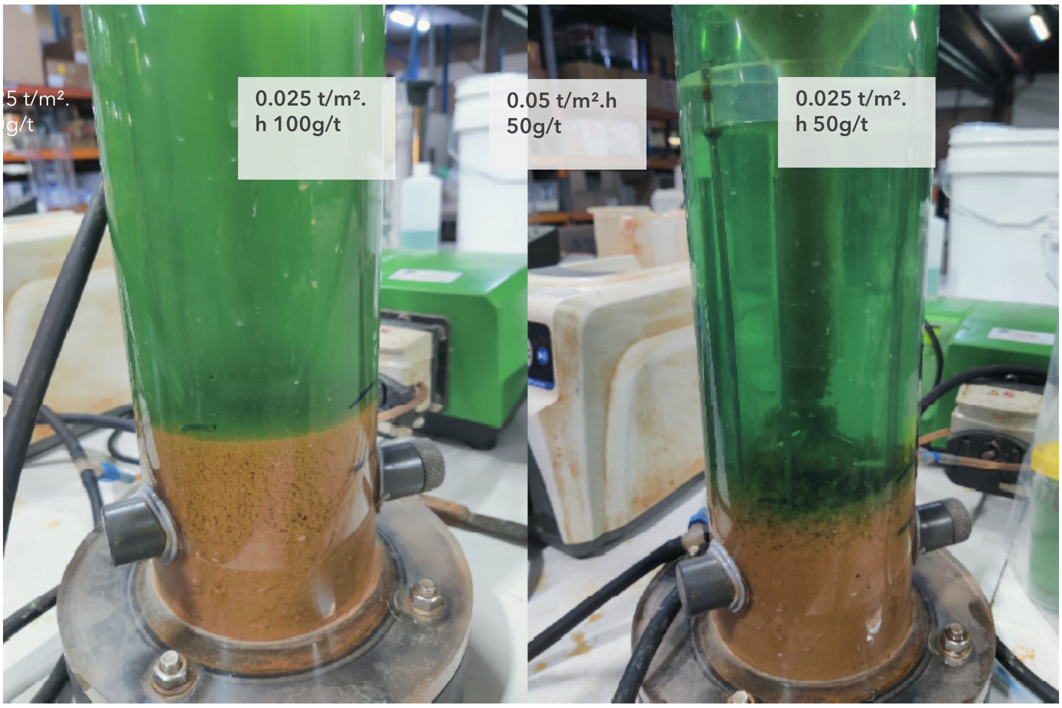


Figure 1.12, Neutralisation dynamic thickening tests

1.3.9 MHP Thickening

Flocculant screening and thickening testwork was completed by BASF on MHP samples generated as part of the fifth testwork program. Static cylinder tests were completed for flocculant screening and dose response with calculated solids flux due to insufficient sample availability for full flux curves to be generated. Magnafloc was the best flocculant identified and a summary of results is given as follows:

- Magnafloc at 20 m/h setting rate
- Solids flux of approximately 0.75 t/h/m² at 4 %w/w feed solids.

Dynamic thickening testwork was completed by Fremantle Metallurgy at Simulus Laboratories on MHP samples from both the blend as part of the fifth testwork program. The test rig setup was like previous POX discharge work given in Figure 1.7 . Photos of the MHP results are given in Figure 1.13 and summarised in Table 1.5.

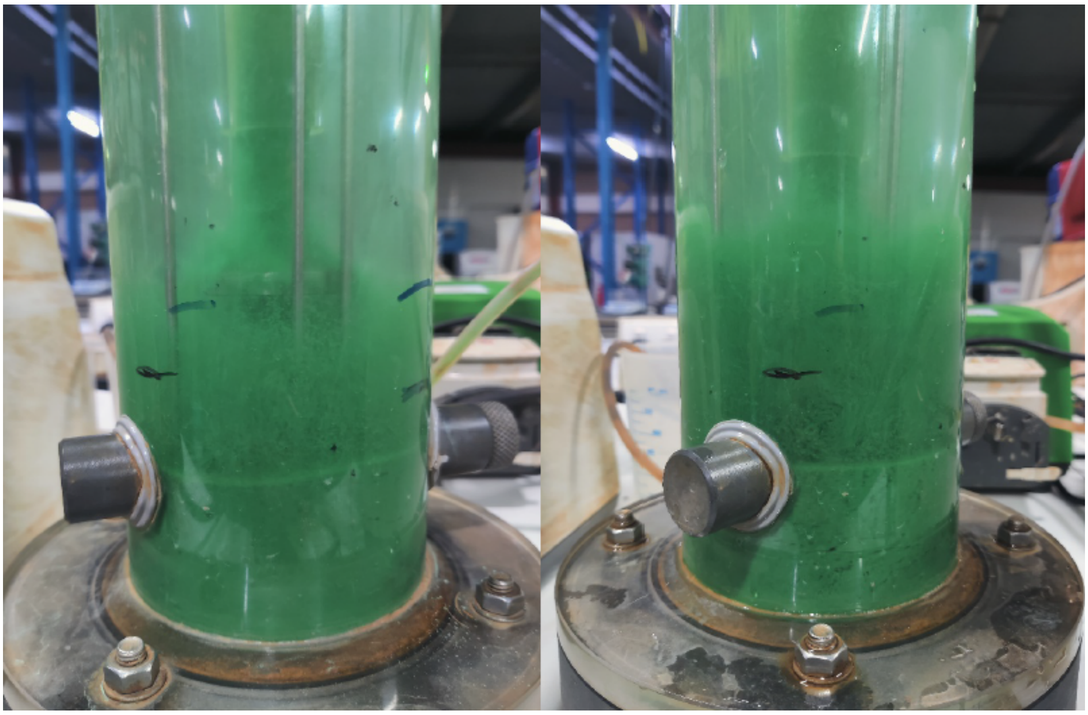


Figure 1.13, MHP dynamic thickening tests

Table 1.5, MHP dynamic thickening results summary

Sample	Flux Rate	Rise Rate	Fd Solids	Flocculant		U/F solids	Clarity
Type	t/m².h	m/h	%w/w	Type	Dose g/t	%w/w	mg/L
Blend	0.10	6.07	1.61	BASF Magnafloc	15	39.0	240
Blend	0.17	10.31	1.61		15	36.3	380

1.3.10 Magnesium Crystallisation

Magnesium crystallisation was completed on samples of barren liquor from MHP Stage 2 in the third testwork program. The crystals produced from the solvent displacement had 16 % Mg and 21 % S, consistent with Kieserite. The Magnesium crystallisation operating conditions and assay summary are presented in Table 1.6 and Table 1.7

Table 1.6, Magnesium crystallisation operating conditions

Test ID		TAKH-0113	TAKH-0124
Description	Units	Evaporative	Solvent Displacement
Temperature	°C	80	75
Pressure	kPa(g)	-50	Atmospheric
Starting Volume	mL	2,000	200

Table 1.7, Magnesium crystallisation assay summary

Test ID	-	TAKH-0109	-	TAKH-0113	TAKH-0124
Element	Units	Barren Liquor Feed	Units	Evaporative Crystals	Solvent Displacement Crystals
Mg	g/L	21.1	%	10.7	16.0
S	g/L	28.5	%	14.7	21.0

1.3.11 Mixed Hydroxide Leach

MHP produced from the blend was combined following characterisation and thickening testwork as the properties were very similar. An acid dose response test was completed prior to a bulk leach test (see Figure 1.14). Additional testwork is recommended on MHP leaching once larger sample mass is available during the next phase of work in pilot plant scale.

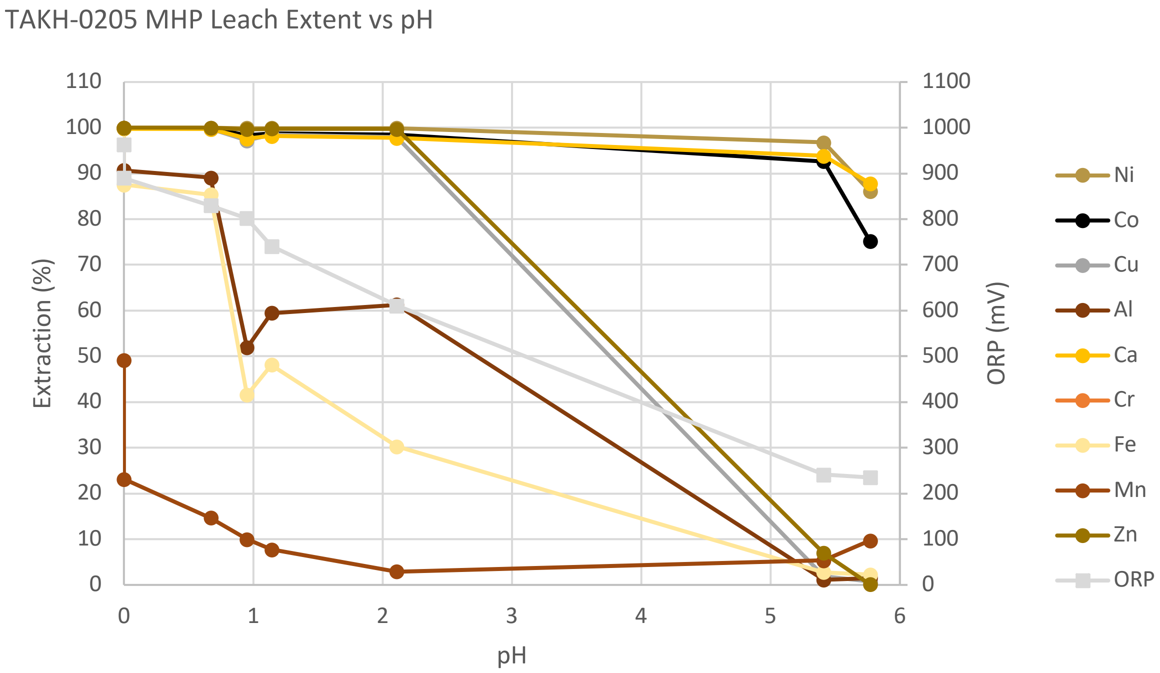


Figure 1.14, MHP leach stage 1 acid dose response (pH)

1.3.12 CoMgSX

Approximately 6.5 L of MHP stage 1 leach solution was contacted with pre-loaded barren organic in multiple stages at 50 °C to generate a raffinate stream, rich in nickel sulfate and very low trace in all other impurities.

The purpose of the fifth testwork program was to generate NCM ternary precursor product so CoMgSX testwork was limited to extraction to generate sample for downstream NCM precipitation.

1.3.13 NCM Precipitation

The heated nickel rich raffinate from CoMgSX is transferred to a clean container. This nickel sulfate solution is then accurately blended with the cobalt strip liquor and fresh manganese and cobalt sulfate reagents to make up NCM stock solution. The specifications required are:

- the Ni/Co/Mn ratios
- total metal concentration
- and suitable impurity levels

The alkali reagents dosed in a very controlled rate and correct amount to the NCM solution in a mixing tank, the precipitates quickly formed in the first tank and are then allowed to age in sequential agitated tanks to allow the precipitate to mature and is required to allow the solids to grow into larger particles to meet the particle size distribution (PSD), and particle morphology product specifications.

Filters are used to filter the NCM solid product with the final dewatering and washing in a filter.

Vacuum drying is used to dry the NCM wet cake to avoid excessive heat which will cause thermal decomposition of the hydroxides. The wet cake is fed through a chute into the dryer.

1.3.14 Flowsheet Development

Considerable testwork program has been completed on a range of concentrate samples for the Ta Khoa downstream refinery project to date. All the major unit operations from concentrate input through to purified nickel sulfate solution in line with the current 400 ktpa and 800 ktpa PFS study have been investigated. This includes:

- POX pre-leach
- POX
- Leach residue thickening and filtration
- CuSX
- Neutralisation (precipitation)
- Neutralisation thickening
- MHP (precipitation)
- MHP thickening
- Magnesium sulfate crystallisation
- MHP leach
- CoMgSX
- NCM precipitation

The testwork completed to date has demonstrated the selected process flowsheet is able to produce high purity nickel products from Ta Khoa disseminated concentrate and a range of other nickel concentrates including when blended with Ta Khoa material.

The downstream process is summarised in Figure 1.15.

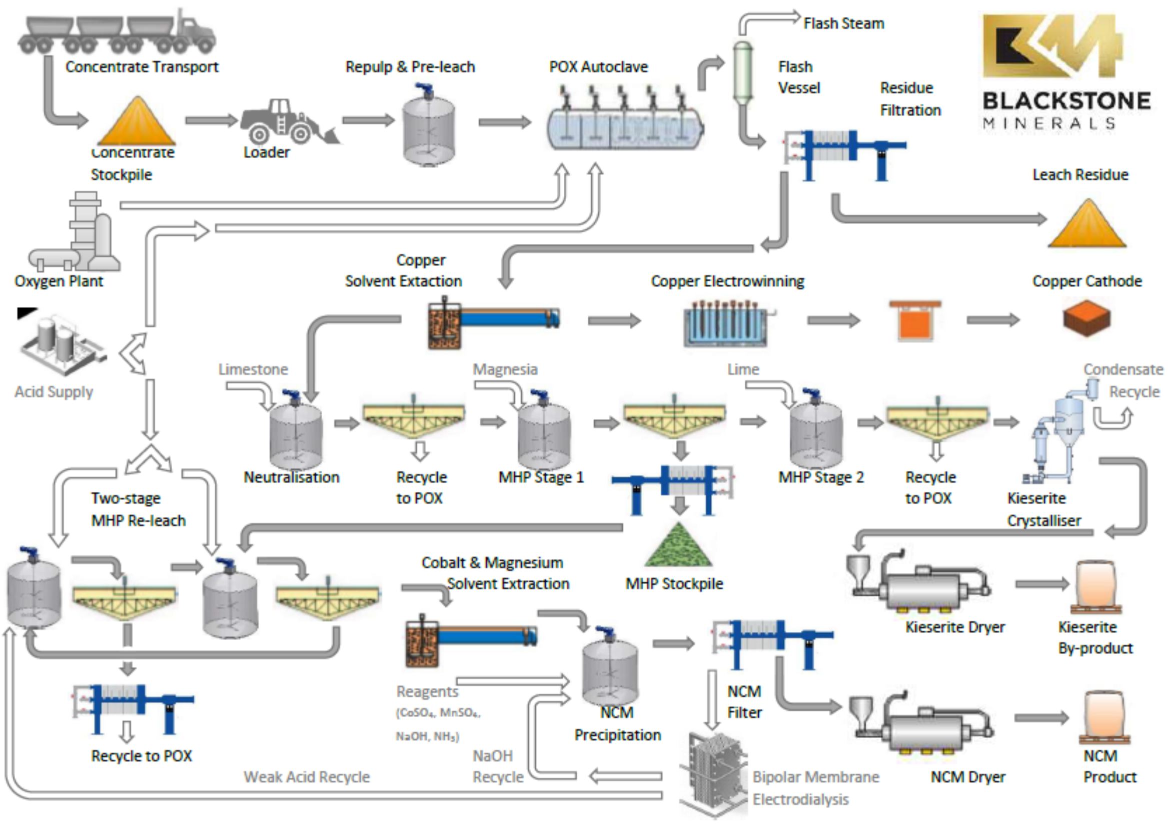


Figure 1.15, Process Flow Diagram for Downstream Processing

1.3.15 Project Piloting and Flowsheet Testing

BSX has planned two pilot plant phases fo completion prior to full commercial production.

- Phase 1 Pilot Plant (PP1) - 20kg/hr Ni Concentrate feed
- Phase 2 Pilot Plant (PP2) - 1,000kg/hr Ni Concentrate feed
- Provide samples further evaluation such as NCM, residues, vendors' testwork
- Laboratory analytical matrix development, procedures and build library calibration data
- Environmental survey data collection

1.3.15.1 Phase 1 Pilot Plant

BSX has commenced development of the Phase 1 Pilot Plant in support of the up-coming DFS study. PP1 design to process 20kg per hour of nickel concentrate feed and will produce approximately 1.75kg per hour of nickel in NCM products. The circuit will be designed to produce various grades of NCM. Including 811 and 622. PP1 will be located at the Ban Phuc nickel mine and will have access to the existing power, water and air services, as well as the maintenance and operations personnel.

PP1 will be the first stage of the BSX TKR training and education program. BSX will engage Vietnamese engineers, technicians, local suppliers, and fabricators to help build familiarity with the process.

PP1 Objectives:

- Confirm process design inputs for Definitive Feasibility Study
- Basic engineering design and all documents to be converted/translated into Vietnamese
- Procure off the shelves equipment
- Evaluation of local suppliers, fabricators, and construction
- Integrate with upstream concentrator pilot plant
- Training downstream team and local services

.

1.3.15.2 Phase 2 Pilot Plant

The Phase 2 Pilot Plant will support a detailed engineering design for a full commercial plant. PP2 will receive 1000kg per hour of nickel concentrates blend and will produce approximately 100kg per hour of nickel in NCM products. The circuit will be designed to produce various grades of NCM. PP2 will be located at the final selected location for the TKR.

PP2 will be providing the detailed engineering design 1:25 scale of a full single train of the commercial plant. BSX will engage international engineering firm and Vietnamese engineers, technicians, local suppliers, and fabricators to help build familiarity with the process.

PP2 Objectives: (In addition to PP1 objectives)

- Detailed engineering design
- Evaluating recycling streams
- Full team training and safe work procedures developed in Vietnamese
- Engineering data collection – process modelling, electrical loading, process control.
- Process Onstream Analysis instrument evaluations and calibrations
- Development of a fullscale laboratory – analytical library data collection and analytical methodology development

1.4 Process Infrastructure Design

The flotation concentrate is repulped in site process water and fed with sulfuric acid to an atmospheric pre-leach and pressure oxidation leach (POX) to recover the cobalt, copper, and nickel. Following solid and liquid separation, the combined leach and wash liquor would then be fed to a solvent extraction and electrowinning circuit (CuSX/EW) to recover copper as LME grade A copper cathode.

The raffinate from CuSX would be neutralised with limestone forming a precipitate containing impurities that are recycled back into the process. Magnesia has been added to the neutralised liquor to precipitate the bulk of the nickel and other base metals as MHP1, which has been thickened, filtered, and washed. The barren liquor from MHP1 still contains some nickel, which has then been recovered by raising the pH with hydrated lime. The precipitate, MHP2 has been recycled. Barren liquor from MHP2 still contains significant concentrations of magnesium. This liquor is fed to a crystallisation circuit, which produces kieserite, a marketable fertiliser product.

The MHP1 solids are releached in two counter-current stages with sulfuric acid to give a concentrated nickel sulfate liquor with low levels of soluble impurities. To remove the remaining impurities, the leach liquor has been fed to a solvent extraction circuit (CoMgSX) that produces an aqueous raffinate containing nickel and sodium. The scrub liquor has then been returned to the MHP1 unit, the cobalt strip liquor has then been fed to an ion exchange column to remove impurities and the zinc strip liquor is pumped to effluent treatment.

The CoMgSX raffinate containing the nickel in solution is combined with cobalt sulfate and manganese sulfate in a molar ratio of 8:1:1 (Ni:Co:Mn). This mixture has then been fed to the NCM precipitation circuit along with aqueous ammonia and sodium hydroxide to raise the liquor pH. The precipitate is then separated and dried as the NCM 811 ternary precursor product. The ammonia, sodium hydroxide and sulfuric acid has then been recovered from the barren liquor via BPED for reuse and as such has been recycled back to the process.

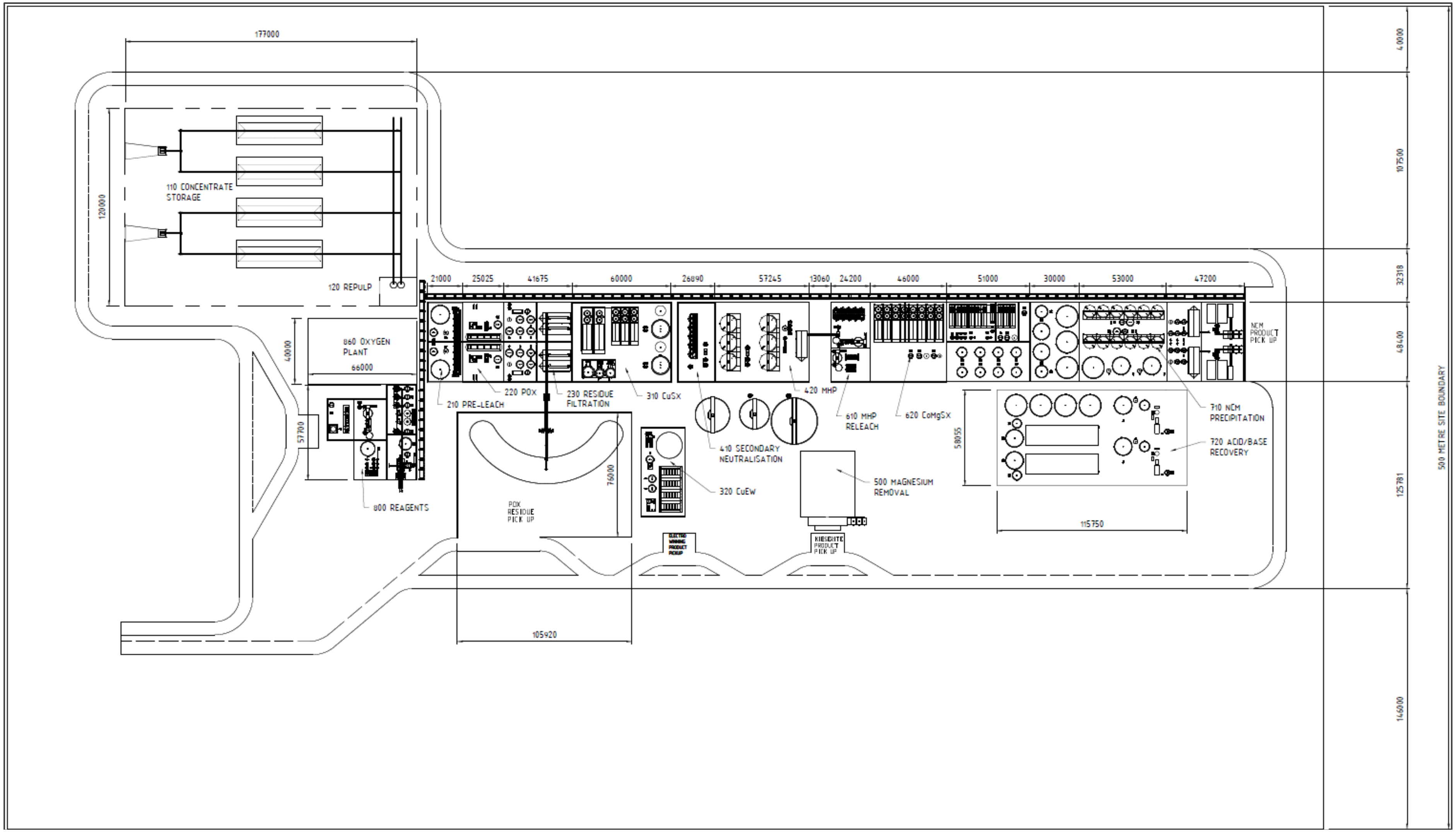


Figure 1.16, TKR Layout

1.5 Project Infrastructure

The project will require a significant amount of supporting infrastructure. The PFS includes design and costing for the following key infrastructure.

1.5.1 Project buildings

The TKR will require many administration and services buildings to support the main operations. These buildings will be constructed using locally or regionally sourced building methods including:

- Pre-Engineered steel frame cladded buildings
- Modular pre-fabricated sandwich panel buildings
- Container modular building as a building module or fabric covered covers

Each building will be equipped with an electrical panel and if required, fitted with a fire alarm system connected to the main process plant fire alarm system.

Key Buildings include:

- Plant Administration and Support Buildings
    - Main Administration Building
    - Kitchen and Mess Area
    - Change Room
    - Control Room
    - Workshop and Stores
    - Ablutions
    - Laboratory
    - Fuel Storage
- Production Buildings
    - Concentrate receival
    - Copper Electrowinning Shed
    - MHP Product Building (Provision)
    - NCM Production Area
    - Kieserite Storage
    - Sulfur Storage (Provision)
    - Product Storage
    - Residue Storage and Handling

1.5.2 Roads and Access

Several external roads will be required to be upgraded to ensure the safety of the community and TKR traffic. The following road works are planned for the project:

- Main Access Road
  - New sealed access road from highway to plant site
  - Specification: 6.0m seal with 1.0 m unsealed shoulders each side, 2.0 m wide gravel shoulders for 30 m each side of minor roads and property accesses to be sealed
- Minor Access Road
  - Upgraded existing access roads through industrial zone
  - Specification: 5.0m seal with 1.0 m unsealed shoulders each side, 3.0 m wide gravel shoulders for 30 m each side of minor roads and property accesses to be sealed.
- Residue Storage Facility Access
  - Combination of upgraded and new road
  - Specification: 5.0m seal with 1.0 m unsealed shoulders each side, 3.0 m wide gravel shoulders for 30 m each side of minor roads and property accesses to be sealed.

The main internal roads will be fully tar/rock chip sealed roads with side kerbing and water runoff/stormwater containment. Minor internal access roads will be unsealed with rock chipped Surfaces.

1.5.3 Residue Storage

BSX has commenced discussions with local brick makers for the potential use of the refinery residue as a brick making material. These discussions are at an early stage and BSX will continue to pursue this opportunity to help minimise residue storage requirements. The basis of the PFS is for storage of the refinery residues in near-by valleys using a dry-stack storage technique. BSX has had preliminary discussions with the provincial government with several near-by valleys marked as preferred locations for residue storage.

Preliminary designs included full HDPE lining and underdrainage, cut-off drains surrounding the facility and polishing pond including water treatment and handling facilities (see Figure 1.17). The total combined storage of these facilities is approximately 5Mm^3, or nearly 10Mt of residue, which is far more than is produced by the TKR in the 10-year life covered in this PFS.

BSX will continue to discuss options for further storage with local administrators for life extension purposes, but several other options have already been suggested within 10km.

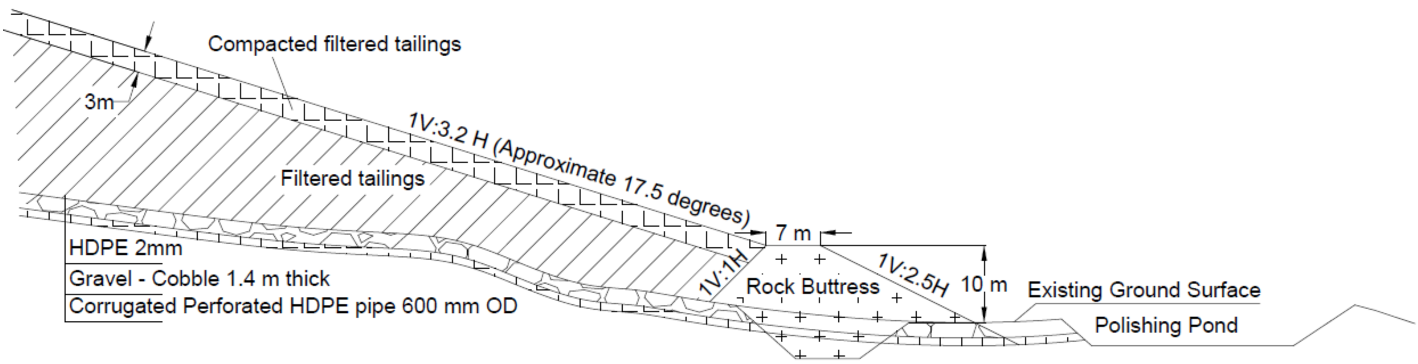


Figure 1.17, RSF 1 Embankment Strategy

Figure 1.18, RSF Locations

1.5.4 Power Supply

1.5.4.1 HV Power Supply

The TKR will be connected to both the Son La 220kV Hydroelectric Power Plant and the Hoa Binh Hydroelectric Power Plant via the Phu Tho substation. Three major hydro power plants – Lai Chau, Son La and Hoa Binh supply power to the substation. A new 20km long 110kV line will be required to connect the Phu Tho 220kV Substation to the Refinery at Tan Phu IC. If the Refinery Sub has its own dedicated double circuit 110kV line from Phu Tho 220kV Sub, the supply from the grid will be very reliable.

1.5.4.2 Refinery Power Supply

The battery limit for the power supply to the Project site would be the 110 kV terminal point of the HV switchyard. An 11 kV point of supply (stepped down to the required low voltage either 380V (lighting and small power), or 400V (plant operation) has been provided to the infrastructure areas.

1.5.5 Water Supply

1.5.5.1 Water Harvest

The raw water intake for the process will be obtained from the Red River. The river runs adjacent to the process plant. Due to the high level of water level fluctuations and high degree of floating debris in the wet season, the water intake will be constructed using a steel rolled plate structure with duty/standby submersible pumps. The intake of water from the river, will be fitted by cylindrical rolled screens prior to entry to the steel rolled plate structure to eliminate large particulates or debris. A walkway from the elevated riverbank to the top of the structure will allow maintenance and operation even while a high water level is present in the river system.

1.5.5.2 Water Storage

Due to the high level of solid during the wet season, the raw water extracted from the river will be flocculated and settled in a duty/standby settling pond prior to gravitate to the raw water settling pond. The raw water settling pond has a residence time of a minimum of 5 hours and will be installed with duty/standby submersible pumps.

The raw water settling pond will allow additional settling of fine solids prior to being pumped to the raw water tank. The raw water is then transferred to the raw water pond located near the process plant facility. The raw water pond is a HDPE lined pond which has a residence time of 24 hours.

Alongside the raw water pond, the process water pond allows for 15,000m^3 of storage capacity for the refinery process water needs. The process water pond is a HDPE lined pond which accepts overflow from the raw water pond, and its overflow is directed to the plant's emergency water pond.

1.5.5.3 Water Treatment

Higher quality of water is provided by:

- Treated water using multi-media filtration
- Potable water using multi-media filtration, chlorination and UV sterilisation
- Demineralisation Water – ion exchange vessel and conditioners

1.5.6 Site Water Management

All site drainage including roadways, process plant roads and excess water drainage are directed to the site water management system. For uncontaminated water such as roof gutter systems (excess to the rainwater capture tanks) is directed to the emergency water pond.

All run-off from the process plant will flow to the capture pond. If the water is contaminated, return pumps allows the recycle of water to the process water pumps for reuse in the process. The pond also allows turbulent water to be settled which allows solids to drop out of the flow and hydrocarbons to be captured prior to entering the emergency water pond. The catchment pond will be a HDPE lined pond with access ramps for mechanical remove of solids if required.

If further settlement of solids and storage for further testing/monitoring and treatment is required, the water will be directed to the emergency Water Pond. The pond allows the reuse of water into the raw water system displacing the river water intake requirements. If excess water is present, all water will be tested and treated prior to the release to the environment.

1.5.7 Accommodation Facilities

The accommodation facilities will be located on a property within the local community close to the refinery. The Camp, which will ultimately accommodate 500 people, will include sleeping quarters, laundry and ablution facilities, kitchen/dining complex, recreation facilities, camp management and maintenance facilities, a first aid facility and a retail outlet. It will be serviced by water and power supply facilities (initially diesel generators, being replaced by grid power as it becomes available, and being converted to emergency power units), a packaged sewerage system, wastewater irrigation area and a data and telephone system connected to the national fibre and wireless networks. The layout of the camp will be organised for

the design of gravity flow for surface water drainage and sewage transfer.
Catering will be provided by a dry mess facility incorporating a commercial kitchen for food preparation and dining areas for the consumption of sit-down meals.

1.6 Marketing Study

1.6.1 Market Overview

Nickel is a versatile metal with broad applications, including primarily in stainless steel making, but also in non-ferrous, plating, alloy, foundry and battery usages. The market for nickel is ~2.5Mtpa and primary sources of the metal are laterite and sulfide deposits, distributed across the globe. The refined products are generally classified into class I and Class II, with Class I products having better versatility and wider applications, whilst Class II products are almost exclusively used in making stainless steel. The TKR will be solely sourcing and producing Class I products.

Whilst the current nickel demand from lithium-ion battery usage is modest, this figure is expected to increase multi-fold due to the rapid evolution of the EV market. Benchmark Mineral Intelligence is forecasting an increase in demand from Li-ion batteries from ~125ktpa currently to ~1.4Mtpa by 2030 (refer Figure 1.19).

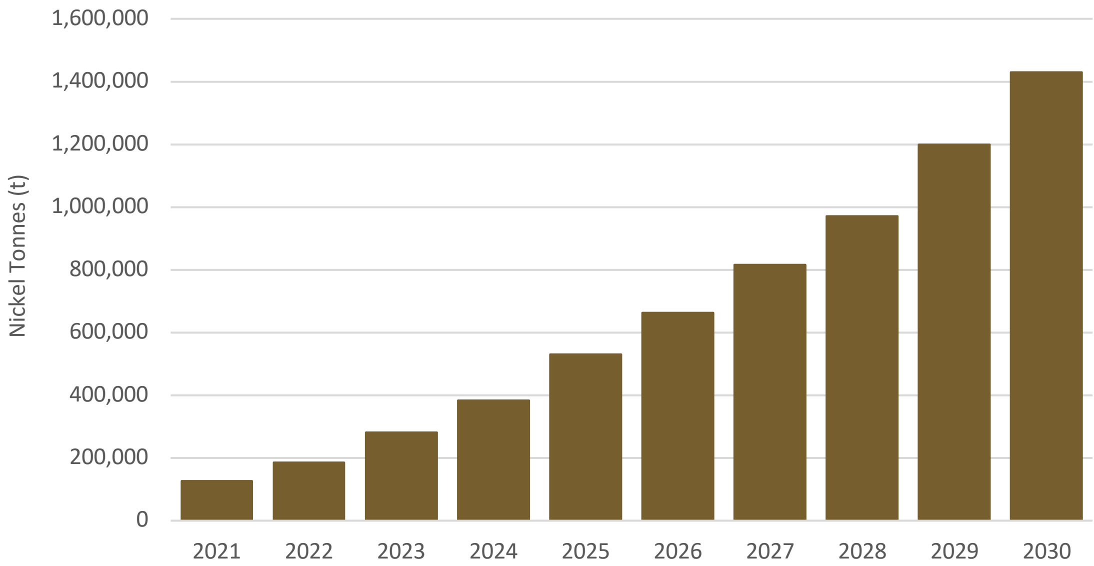


Figure 1.19, Increasing Nickel Demand from Li-ion batteries

BSX is planning to produce products exclusively catered to this emerging sector. Nickel-rich batteries (e.g., Nickel-Cobalt-Manganese batteries) have relatively complex supply chains (refer Figure 1.20). Nickel metal is concentrated in the cathode of the battery to enable high energy density. For the metal to be used in the cathode making processes, requires nickel in the form of chemicals (Nickel-Sulfate, Mixed-Hydroxide Precipitate or NCM Precursor), while nickel in other forms (i.e., briquette) generally need to be converted to chemical forms before becoming useful in the process.

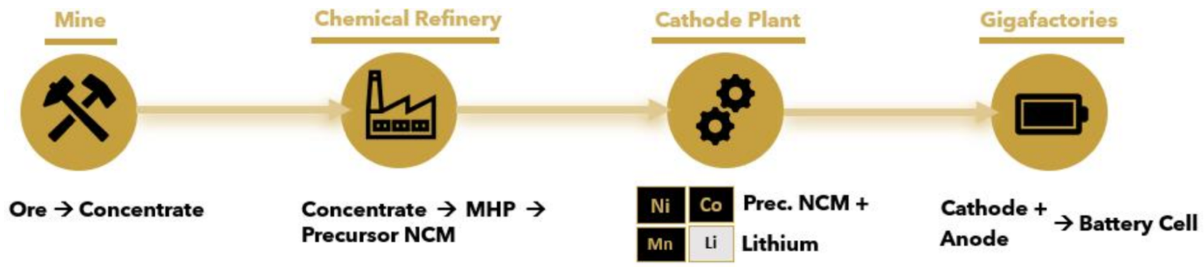


Figure 1.20, Simplified nickel-rich battery supply chain

BSX's NCM precursor products will be sold to cathode manufacturers, who have some flexibility to purchase various forms of chemical products (e.g. NCM precursor or nickel sulfate) in the process of making cathodes. Some battery manufacturers, including LG Chem and Samsung SDI, also have vertically integrated cathode businesses.

BSX maintains a list of global cathode producers and their respective dominant product chemistry. Cathode manufacturers with exposure (existing or planned capacity) to nickel-rich cathodes comprise BSX's primary customer targets. Secondary customer targets comprise international commodity traders who are moving into the NCM Precursor market. BSX is in discussion with both cathode manufacturer (e.g. EcoPro) as well as trading groups (e.g. Trafigura).

1.6.2 Nickel Concentrates

Nickel concentrates typically trade at a discount to the underlying metal price (currently ~65-80%), reflecting costs associated with further upgrading of the product. In general, this discount reduces with increasing concentrate grade and nickel price. Deleterious elements, such as elevated MgO and Arsenic content, also attract penalties. BSX has modelled each potential concentrate source based on the specific concentrate specification and logistics involved. The specific offtake terms are commercially sensitive.

An independent consultant has been employed by BSX to benchmark nickel concentrate pricing.

Payabilities for both nickel and by-product metals in nickel sulfide concentrates fluctuate due to fundamentals, driven by the concentrate supply-demand balance, and sentiment, driven by outright nickel price. However forward payabilities can reasonably be estimated based on historical norms and expected market conditions.

Other metals in a nickel concentrate, including copper, cobalt, gold and PGE metals could be payable in a nickel concentrate, subject to the respective elements meeting certain grade threshold. Both the threshold and payability of these metals are subject to negotiation and are considered commercially sensitive.

Primary competitors for BSX's Downstream Business Unit (DBU) are conventional nickel smelter and refinery businesses, as well as commodity traders. Despite this, BSX believes its proposed hydromet refinery in Vietnam has distinct advantages, including:

- Able to process concentrates considered difficult for conventional smelters
- Able to tolerate higher deleterious elements due to its process
- Cost advantage, having access to low-cost power and local labour
- Anticipated tax incentives associated with new investment
- Green credentials associated with processing route and renewable energy

Certain deleterious elements, including MgO, Arsenic and Lead, could result in lower operational efficiency of the planned refinery and in some cases, could result in the inability of the refinery to operate (e.g., too much toxic elements resulting in the inability to dispose of refinery waste).

The TKR has a higher tolerance of deleterious elements when compared to conventional pyrometallurgical operations. Additional metallurgical test and environmental studies are required to determine rejection thresholds. BSX believes the current concentrate specifications received to date, particularly on a blended basis, are well below the rejection threshold for the proposed refinery.

1.6.3 NCM Precursor

With respect to nickel-rich batteries, Nickel-Cobalt-Manganese (NCM) batteries are forecast to be preferred to Nickel-Cobalt-Aluminium (NCA) batteries. Figure 1.21 breaks down total nickel demand from lithium-ion batteries (as presented in Figure 1.19) between adoption of NCM versus NCA battery chemistry.

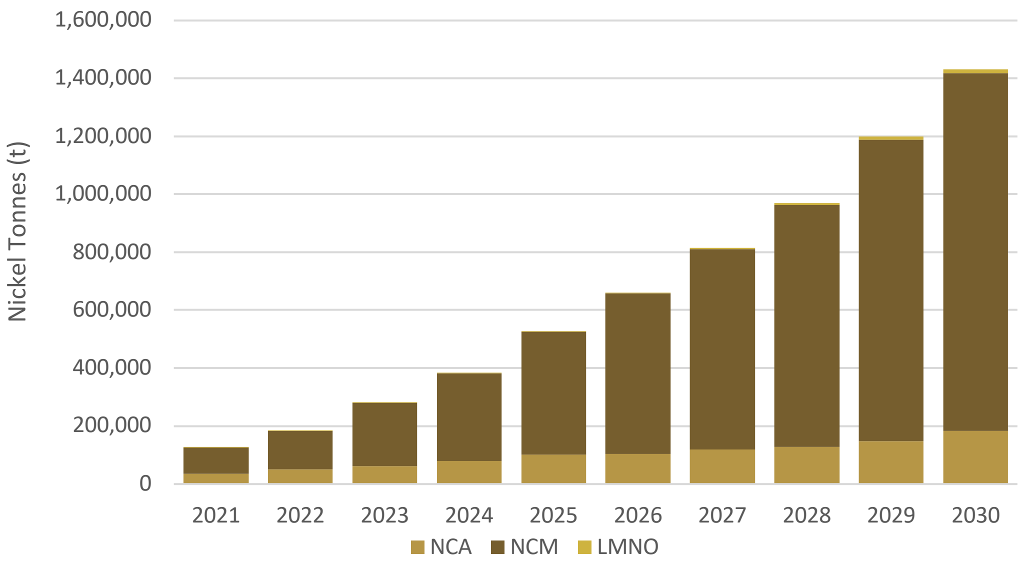


Figure 1.21, Forecast nickel demand by NCM versus NCA adoption

Within the NCM battery chemistry is a range of nickel-cobalt-manganese ratios. The ratio of nickel in the battery (NCM Precursor) as compared to cobalt and manganese is forecast to increase significantly in the coming years, with NCM811 forecast to become the highest demand NCM Precursor in 2024. Beyond 2024, the rate in adoption of NCM811 battery chemistry is estimated to be multi-fold (refer Figure 1.22).

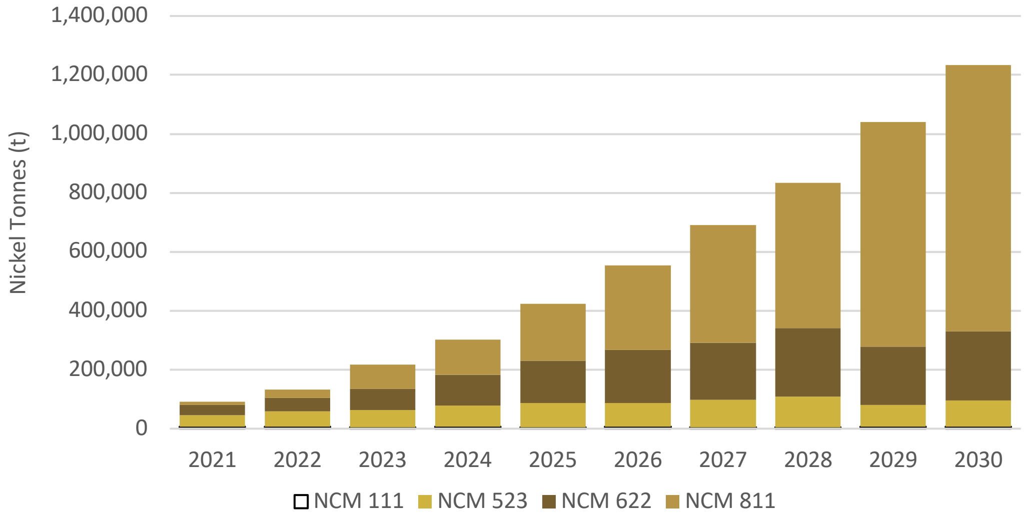


Figure 1.22, Forecast nickel demand by NCM Chemistry

1.6.4 NCM811 Precursor Price Forecast

The NCM811 Precursor price is tracked live on the Shanghai Metals Market (SMM) website, but there are limited independent providers of forecast information. BSX anticipates visibility of the product pricing to further improve given the expanding volume and increasing number of brands being actively traded. BSX performed an analysis of the NCM 811 Precursor price on the SMM website compared to the individual constituent metal prices being nickel, cobalt and manganese. The analysis indicates that NCM811 Precursor has typically traded at a premium of 20-40% to metal prices, reflecting additional costs, logistics and technology required to upgrade (refer Figure 1.23).

Figure 1.23, NCM811 precursor premium over metal prices

Table 1.8, NCM811 Precursor Price Forecast

Item	Nickel Metal Forecast (50.8%)	Cobalt Metal Forecast (6.4%)	Manganese Metal Forecast (6.0%)	NCM811 Precursor Price Based on Metal Inputs (a)	NCM811 Precursor Premium (b)	NCM811 Precursor Price Forecast	NCM811 Precursor Spot Price
Source:	BMI	BMI	SMM		BSX analysis of SMM	a*(1+b)	SMM
CY2024	16,000	58,387	2,696	12,020	20%	14,425	**19,559**
CY2025	16,400	67,145	2,696	12,783	20%	15,339	**19,559**
CY2026	17,300	72,011	2,696	13,551	20%	16,261	**19,559**
CY2027	17,800	75,904	2,696	14,053	20%	16,864	**19,559**
CY2028	18,300	77,850	2,696	14,432	20%	17,318	**19,559**
CY2029	18,500	75,033	2,696	14,354	20%	17,224	**19,559**
CY2030	18,800	61,227	2,696	13,625	20%	16,350	**19,559**
LT	**18,800**	**58,577**	**2,696**	**13,456**	**20%**	**16,147**	**19,559**

Notes: 1. Prices in the table above are all denominated in USD.
2. Benchmark Minerals Intelligence did not provide forecast information for nickel metal prices beyond CY2030, as such BSX has carried forward the CY2030 estimate as the Long Term (LT) price applied in the economic modelling.
3. Limited relevant forecast data is available for manganese metal, as such BSX has applied current observable market rates for the life-of-operations as evidenced from Shanghai Metals Market (SMM).

The forecast NCM 811 Precursor price applied in the TKR Study assumes a premium of 20% to metal forecast prices. The underlying metal price forecasts for nickel and cobalt were provided by Benchmark Mineral Intelligence. The basis for the forecast NCM 811 Precursor price applied in the economic modelling of the Refinery is summarised in Table 1.8.

1.7 Capital Cost

1.7.1 Summary

The TKR PFS capital cost estimate (Capex) has been completed to a AACE Class 4 (±25%) level of accuracy. A summary of the total Capital for the Base Case is presented in Table 1.9. Figure 1.24 illustrates the total capital expenditure profile over the life-of the operations including Project Capital, Sustaining Capital and Closure Costs.

Table 1.9, Summary of Capital Costs

Capital Cost Area (US$M)	Base Case
Process Plant	245
Site Infrastructure	16
Residue Storage	8
Owners Direct	43
Precommitment Costs	-
EPCM	51
Owners Costs	47
Contingency	82
Total Project Capital	**491**
Sustaining Capital	143
Closure	113
Total Capital	**746**

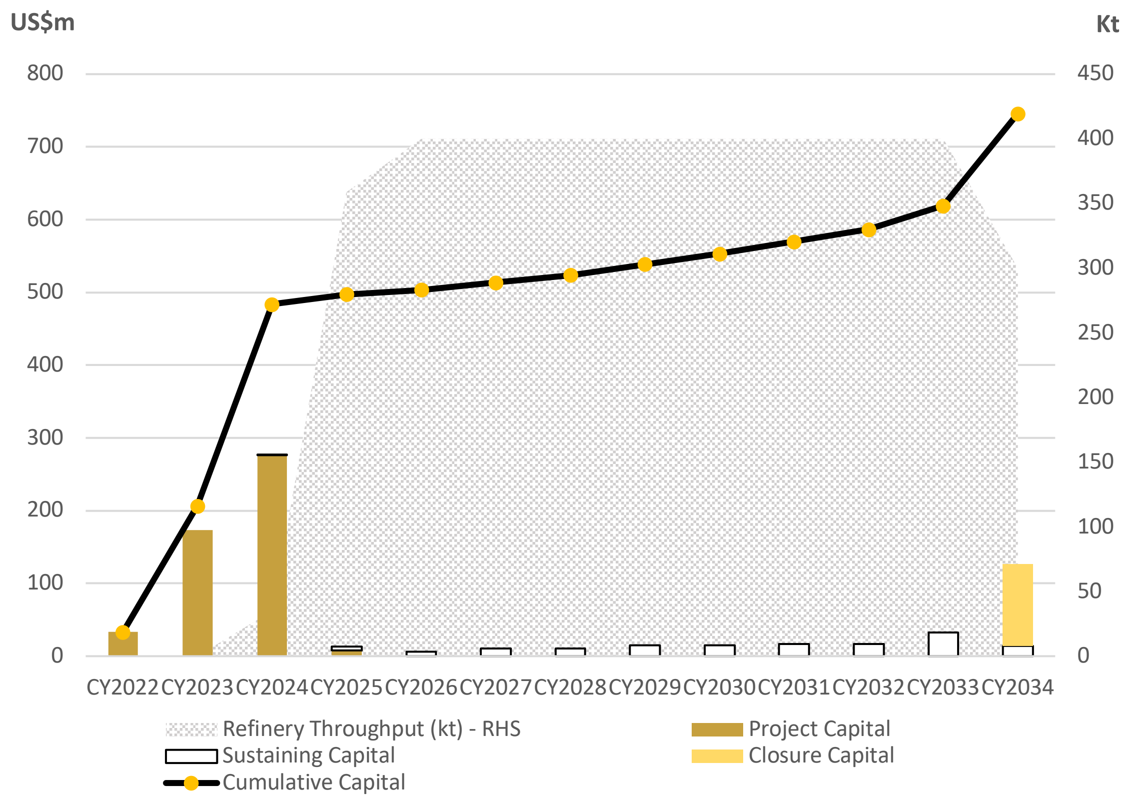


Figure 1.24, Base Case Total Capital Expenditure Profile

1.7.2 Estimate Accuracy

1.7.2.1 Estimating Method

The capital cost estimate for the TKR and associated infrastructure has been developed to a Class 4 (±25%) level, in alignment with the AACE Cost Estimate Classification System, as applied in the Mining and Mineral Processing Industries (47R-11) and the AusIMM Cost Estimation Handbook, 2nd Edition.

A minimum of 98 % of mechanical equipment costs are sourced from the Simulus equipment cost database, with at least 90 % of the costs, by value, having been received within six months of the capital estimate date following the process described above.

Mechanical installation costs are based on an estimated number of hours per item. The estimated hours are derived from a range of sources including estimation handbooks, industry standards and expert opinions. The installation rate is calculated based on the following inputs:

- Labour rates- both local and module assembly
- Labour efficiency factor (assessed based on location, plant type and plant scale).

Preliminary material take offs (MTO's) were completed for the civil, structural steel, and piping disciplines. These MTO's were based on the TKR plant layout and preliminary 3D model.

Electrical, instrumentation and controls costs were factored in line with the AusIMM Class 4 estimate guidelines.

Additional direct and indirect costs are assessed on a factored basis from the total mechanical equipment cost.

1.7.2.2 AACE Class 4 Estimate Maturity Matrix

Table 1.10 below summarises the requirements for a AACE Class 4 capital estimate, and the relevant detail achieved by BSX in the Study to support this estimate.

Table 1.10, AACE Class 4 Estimate Maturity Matrix

Deliverable	AACE Class 4	Achieved	Comment
General Project Data			
Project Scope Description	Preliminary	Preliminary	
Mine and Plant Production/Facility Capacity	Preliminary	Preliminary	Two options remain, 400ktpa and 800ktpa, but separate CAPEX developed for each
Plant Location	Approximate	Approximate	Plant location confirmed for purpose of the estimate. Final location may move, but will be within approximate area.
Soil & Hydrology	Preliminary	Preliminary	Preliminary review of historical data and assessment for plant location.
Resource Determination	Indicated	N/A	Not Relevant in this study
Reserve Determination	Probable	N/A	Not Relevant in this study
Geology	Preliminary	N/A	Not Relevant in this study
Geotechnical and Rock Mechanics	Preliminary	N/A	Not Relevant in this study
Metallurgical Testwork	Preliminary	Preliminary	Significant Testwork completed on various composites across all unit operations.
Integrated Project Plan	Preliminary	Preliminary	Integrated project plan preliminary documentation developed
Project Master Schedule	Preliminary	Preliminary	Project Level 3 master schedule developed
Life of Mine Plan / Schedule	Preliminary	Preliminary	Mine plan is not expected to change significantly
Initial Mine / Ore Access (Roads, tunnels, shafts, water management, waste management, etc.)	Preliminary	N/A	Not Relevant in this study
Operations Layout (UG Design, Waste Dumps, Roads, water	Preliminary	N/A	Not Relevant in this study

management, waste management etc.)			
Escalation Strategy	Preliminary	Preliminary	Escalation applied in financial modelling
Work Breakdown Structure	Preliminary	Preliminary	
Project Code of Accounts	Preliminary	S	
Contracting Strategy	Assumed	Assumed	
Mine (development & production equipment etc.)	Preliminary	N/A	Not Relevant in this study
Non-Process Facilities (Infrastructure, ports, pipelines, power transmission etc.)	Preliminary	Preliminary	
Engineering Deliverables			
Block Flow Diagrams	P/C	P	Preliminary – Issued for PFS
Plot Plans	S/P	P	Preliminary – Issued for PFS
Process Flow Diagrams	P	P	Preliminary – Issued for PFS
Utility Flow Diagrams	S/P	S	Included in PFD's
Piping & Instrumentation Diagrams	S/P	P	Preliminary – Issued for PFS
Heat & Mass Balances	S/P	P	Preliminary – Issued for PFS
Process Equipment List	S/P	P	Preliminary – Issued for PFS
Utility Equipment List	S/P	P	Included in Mechanical Equipment list
Electrical SLD's	S/P	S	In Progress – Preliminary versions to be issued for PFS
Specifications & Datasheets	S	S	Key project specifications complete
General Equipment Arrangement Drawings	S	S	Key arrangements for major equipment started, preliminary 3D model
Spare Parts Listings			
Mechanical Discipline Drawings			
Electrical Discipline Drawings			
Instrumentation/Control Drawings			
Civil/Structural Architectural Discipline drawings			

Notes: None (Blank): Development of Deliverables has not begun
Started (S): Work on deliverable has begun. Development is typically limited to sketches, rough outlines or similar levels of early completion
Preliminary (P): Work on the deliverable is advanced. Interim cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
Complete (C): The deliverable has been reviewed and approved as appropriate

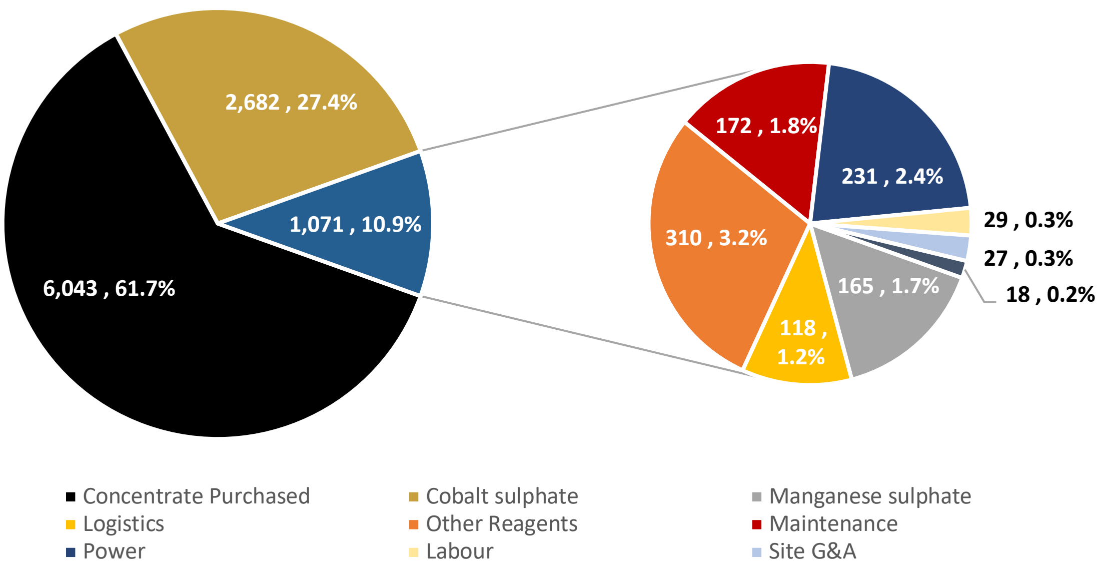
1.8 Operating Costs

A summary of the Operating Costs for the Base Case TKR is presented in Table 1.11.

Table 1.11, Operating Cost Summary

Life-of-Operation Operating Costs (US$/t NCM811)	Base Case
Purchase of Ni & Co Concentrate (Net of Penalties)	7,062
Refining	4,195
Logistics	138
G&A	32
Residue Storage	22
By-Product Credit (Copper)	(323)
By-Product Credit (PGEs)	-
Operating Costs (C1 Cash Costs)	**11,125**

Operating costs (C1 Cash Costs) include credits for by-products, which for the TKR includes the recovery of copper into copper cathode. A more detailed breakdown of Operating Costs for the Base Case is presented in Figure 1.25 and Table 1.12.



Note: Copper-by product not included in Figure 1.25

Figure 1.25, Base Case Total Operating Costs, By Aggregate (US$m) and Proportionate Expenditure (%)

Table 1.12, Base Case Operating Cost Breakdown

Base Case – Operating Costs	US$m Life of Operations	US$m average pa	US$/t NCM811 Precursor	US$/t Conc
Purchase of Ni & Co Concentrate (Net of Penalties)	6,043	604	7,062	1,552
Refining	3,590	359	4,195	922
Logistics	118	12	138	30
G&A	27	3	32	7
Residue Storage	18	2	22	5
By-Product Credit (Copper)	(276)	(28)	(323)	(71)
By-Product Credit (PGEs)	-	-	-	-
Operating Costs (C1 Cash Costs)	**9,521**	**952**	**11,125**	**2,445**

1.9 Project Economics

A financial model assessing real post-tax unleveraged free cash flows at the project / asset level has been prepared for evaluation of project economics. A monthly financial model has been deemed appropriate by BSX to evaluate the timing of upfront capital expenditure, to reflect an appropriate ramp up / commissioning of the Refinery as well as suitably capture variability in concentrate feed composition over the life-of the operations. A summary of the life-of operations physicals and economics is presented in Table 1.13 & Table 1.14 respectively.

Table 1.13, Life of Operation Physicals

Life-of-Operation Physicals	Unit	Base Case
Refinery Capacity	ktpa	400
Life of Refinery	years	10.0
Concentrate Feed	kt	3,894
Ni in Concentrate Grade	%	11.5%
Co in Concentrate Grade	%	0.3%
Cu in Concentrate Grade	%	1.1%
Metallurgical Recovery - Ni into NCM Precursor Product	%	96.8%
Metallurgical Recovery - Co into NCM Precursor Product	%	96.7%
Metallurgical Recovery - Cu into Copper Cathode	%	93.1%
NCM Precursor Production Breakdown:		
Nickel recovered in NCM Precursor Product	kt	435
Cobalt recovered in NCM Precursor Product	kt	11
Cobalt make-up Quantities	kt	44
Manganese	kt	51
Hydroxide	kt	315
Total NCM Precursor Production	**kt**	**856**
Average Annual NCM Precursor Production	ktpa	85.6
Average Annual Refined Nickel Output	ktpa	43.5

Table 1.14, Life of Operation Economics

Life-of-Operation Economics	Unit	Base Case
Revenue - Sale of NCM811 Precursor	US$m	14,032
NCM811 Precursor Price (avg realised)	US$/t NCM811	16,397
C1 Cash Costs	US$/t NCM811	11,125
All-in Sustaining Costs	US$/t NCM811	11,423
All-in Cost	US$/t NCM811	11,997
Avg Annual Operating Cash Flow	**US$mpa**	**451**
Operating Cash Flow	US$m	4,512
Net Cash Flow (Pre-tax)	US$m	3,766
Net Cash Flow (Post-tax)	US$m	3,646
Post-tax NPV (8% real)	**US$m**	**2,007**
IRR (Post-tax)	**%**	**67%**
Capital Payback Period - from first production	**years**	**1.5**

Note: C1 Cash Costs comprise the cost of purchasing nickel and cobalt in concentrate, refining, product logistics, site G&A including OHSE, residue storage less by-product credits (copper),.

The financial model assumes a start date and valuation date of 1 September 2022 and does not include pre-commitment costs that will be expended by BSX prior to a Final Investment Decision (FID). A summary of annual cash flows for the Base Case is presented in Table 1.15.

Table 1.15, Annual Summary of Base Case Cash Flows

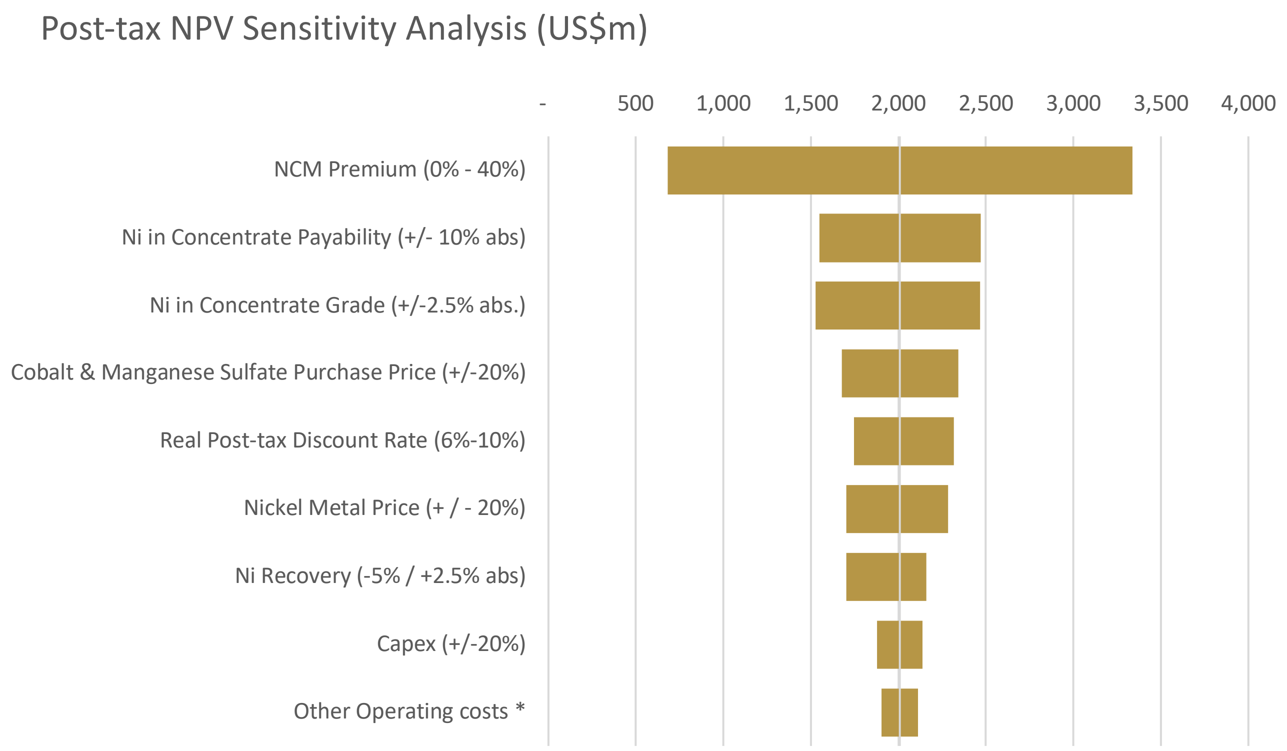
Cash Flow Item (US$M)	Total	CY 2022	CY 2023	CY 2024	CY 2025	CY 2026	CY 2027	CY 2028	CY 2029	CY 2030	CY 2031	CY 2032	CY 2033	CY 2034
NCM811 Revenue	14,032	-	-	77	1,188	1,416	1,474	1,476	1,519	1,435	1,445	1,531	1,412	1,059
Less:														
Purchase of Ni & Co Concentrate	6,043	-	-	28	474	565	602	600	634	640	656	704	651	488
Cobalt sulfate	2,682	-	-	16	266	306	324	325	322	260	235	248	217	163
Manganese sulfate	165	-	-	1	15	17	17	16	17	17	17	18	17	13
Reagents	310	-	-	4	31	31	31	31	31	31	31	31	31	24
Power	231	-	-	3	23	23	23	23	23	23	23	23	23	17
Maintenance	172	-	-	2	17	17	17	17	17	17	17	17	17	13
Labour	29	-	-	1	3	3	3	3	3	3	3	3	3	2
Logistics	118	-	-	0	10	11	11	11	11	11	12	13	16	12
G&A	27	-	-	1	3	3	3	3	3	3	3	3	3	2
Residue Storage	18	-	-	0	2	2	2	2	2	2	2	2	2	1
By Product Credits - Copper	(276)	-	-	(5)	(34)	(27)	(26)	(27)	(25)	(24)	(26)	(24)	(33)	(24)
Operating Cash Flows	**4,512**	**-**	**-**	**26**	**379**	**464**	**467**	**471**	**480**	**450**	**472**	**492**	**464**	**348**
Less:														
Sustaining Capital	143	-	-	1	6	6	10	10	15	15	17	17	32	14
Closure Capital	113	-	-	-	-	-	-	-	-	-	-	-	-	113
Project Capital	491	33	174	276	8	-	-	-	-	-	-	-	-	-
Tax	119	-	-	-	-	-	-	5	21	20	20	21	19	13
Post-tax Project Level Cash Flows	**3,646**	**(33)**	**(174)**	**(252)**	**365**	**458**	**456**	**455**	**444**	**416**	**435**	**454**	**412**	**208**

1.9.1 Base Case Sensitivity Analysis

The value of the Refinery is most sensitive to the NCM811 Precursor premium applied, nickel in concentrate payability and nickel in concentrate grade. The outcomes of the sensitivity analysis performed by BSX demonstrates the robust economics of the Refinery.

In general, movement in the spot nickel price affect revenue and costs for the Refinery in the same direction. For example, a higher nickel metal price will drive a higher NCM811 Precursor price as well as a higher nickel concentrate purchase price.

Figure 1.26 illustrates the range of valuation outcomes (post-tax NPV) based on sensitivity ranges applied to key inputs into the economic model. The valuation outcomes for each input (i.e., the NCM811 Precursor Premium) is assessed ceteris paribus. Table 1.16 describes the sensitivity of the TKR economics to changes in the NCM811 Precursor premium applied, as well as the cost of purchasing nickel in concentrate (driven by nickel concentrate payability).



Note: The Other Operating Cost sensitivity analysis applies a +/- 20% adjustment to reagents, power, labour, site G&A, residue storage, maintenance and logistic costs.
Note: abs = absolute

Figure 1.26, Base Case Tornado Sensitivity Analysis

Table 1.16, Base Case Two-way Sensitivity Table, NCM811 vs Ni Concentrate Payability

Post-tax NPV (US$m) Sensitivity Analysis		Realised NCM Precursor Price (US$/ t NCM 811)				
	Premium	0%	10%	20%	30%	40%
		13,664	15,030	16,397	17,763	19,129
Movement in Ni Concentrate Payability (Net of Penalties) %	-10%	1,141	1,804	2,468	3,131	3,795
	-5%	910	1,574	**2,237**	2,901	3,564
	0%	680	**1,343**	**2,007**	**2,670**	3,334
	+5%	449	1,113	**1,777**	2,440	3,104
	+10%	219	883	1,546	2,210	2,873

1.10 Permitting and Environment

As discussed in Section 1.2, BSX has not selected a final TKR location. Given this uncertainty, environmental and social studies were implemented in both potential locations:

- Tan Phu Industrial Cluster, Phu Tho Province
- Mai Son Industrial Park, Son La Province

BSX recognises that the TKR requires the trust and support of the community to access the natural resources within the area. Further to this, BSX understands that the benefits of the project must be shared with the community. This includes ensuring that opportunities for community members and local businesses are prioritized wherever practicable, and that community investment, resettlement and planning activities are conducted in consultation with community and local leadership.

1.10.1 Project Permitting

To successfully develop the TKR in Vietnam, BSX will need to submit the project proposal and socio-economic and environmental performance assessments to government authorities at all levels for review and approval. A summary of these permits and licences required is outlined below.

Table 1.17, Project Permitting Requirements

Permit / Licence	Issued/ Approved By	Description	Requirements	Duration
Inclusion of the TKR into Master Plan and Provincial Development Plan	Prime Minister	The TKR is not currently included in the National Master Plan and Provincial Development Plan. BSX needs to propose inclusion of the TKR into these plans.	A project proposal is required to be submitted for review.	5-6 months
Investment Guideline Approval	Province's People Committee	An Investment Guideline Approval is completed, which will result in an Investment Certificate being granted for the TKR.	A project proposal and preliminary Environmental Impact Assessment (EIA) report is to be submitted to the local Province.	1-2 months
Land Use Certificate	Province	Approval for the exchange of land from current owners and commencement of land compensation process.	Ongoing community engagement and management of stakeholders at provincial level.	6-12 months
Feasibility Study Approval	MOIT	This is a standard requirement in Vietnam for Project approval.	Provide all technical aspects of Blackstone's Pre-Feasibility Study and assessment of its alignment to national and local plans.	3 months
EIA Approval	MONRE	The EIA Approval is supported by an EIA process that is developed in accordance with Vietnamese laws.	The EIA includes the assessment of impacts of the TKR on the surrounding environmental, social and economic conditions.	3 months
Construction Detail Design Approval	MOIT	This step includes the submission of all design documents related to the TKR	Submission of all design documentation to MOIT	2 months
Firefighting System Approval	Provincial Police	To comply with provincial firefighting laws.	Submission of firefighting system design.	1 month
Construction Permit	Province	Needed if the TKR will be located outside of an Industrial Park.	Subject to the EIA, Construction Detail Design approval and Firefighting System approval.	1 month

Permits for operations.	Various	Water user and wastewater discharge permit; Export permit; Industrial and Hazardous Waste Management permit; Register Plan for Chemical Use; and Appraisal for Firefighting Plan.	BSX will make applications to the relevant approver, based on the type of permit, after construction has been completed.	

1.10.2 Environmental and Social-Economic Studies and Permitting

Preliminary studies show that both preferred locations for the TKR are in line with local socio-economic development plans and have the potential, if executed and managed well, to meet high ESG standards. BSX's goal is to build a processing plant utilising green technology and by using renewable energy from hydroelectric plants to reduce carbon emissions and provide economic opportunities for employees and local businesses. The two preferred locations face extremely difficult socio-economic conditions, and the Project intends to support the economic and social development of these communities.

The Project is classified by the Investment Law and Environmental Law into Group One category holding a high risk of adverse environmental impacts. According to the Vietnamese laws on environmental protection which will be effective from 1st January 2022, whereby the following environmental studies and permitting requirements are applicable for the project.

1.10.2.1 Preliminary Environmental Impact Assessment (PEIA)

The Preliminary Environmental Impact Assessment (PEIA) shall be conducted during the period of the Vietnamese Pre-feasibility Study on investment in construction, proposal for investment guidelines and request for approval of investment guidelines for investment projects. The PEIA will be reviewed and appraised at the Provincial level and the approval will come from the Provincial level.

1.10.2.2 Environmental Impact Assessment

The Environmental Impact Assessment (EIA) shall be conducted together with preparing the Vietnamese Feasibility Study report or equivalent document (technical design). The EIA will be approved at the central level by the Ministry of Natural Resource and Environment. The EIA is inclusive of social and economic studies.

1.10.2.3 Public Consultation

Public consultation shall be conducted during the time of implementation of EIA. This process will involve residential communities and individuals under direct impact of the investment project, and Agencies and organizations directly related to the investment project.

1.10.3 Current Status, Impacts and Mitigation Methods

1.10.3.1 Social-economic

One of BSX's commitments is to create employment opportunities and pathways for Vietnamese nationals and to increase the economic opportunities for the households and communities surrounding the TKR. Two proposed locations for the TKR are selected to be in what are classified as 'Especially Difficult' districts of Son La and Phu Tho Provinces. This classification is determined by the central government to describe districts experiencing economic and social disadvantage.

1.10.3.2 Flora, fauna and biodiversity

The predominant flora in the study area for the TKR are secondary plantations, with agricultural land including short-term trees and tea hills. The fauna in the study areas is cited as being reptiles and insects, as well as livestock raised by residents. According to reports on the environmental status of Phu Tho and Son La provinces in recent years, there are no rare animals found in the study areas.

1.10.3.3 Land Access

The TKR will be located in an Industrial Zone/ Industrial Cluster where the land has been zoned and developed for industrial purposes. Land use conversion, resettlement and compensation activities will be implemented by district government authorities.

The current land use in the proposed areas for the Residue Storage Facility (RSF) is secondary plantations located within limestone valleys. BSX will work with local authorities to register land use needs and change the use purpose in accordance with the appropriate laws. Compensation and site clearance will be carried out by local authorities at the district level.

1.11 Project Implementation

The following section outlines BSX's preferred project implementation strategy but given the early development stage this strategy may change before final project investment decision.

1.11.1 Contracting Strategy

At completion of the PFS, there is no clear preferred contracting strategy. This strongly depends on the outcomes of the DFS and the financing requirements. The following observations were made during the PFS:

- Lump Sum, Turn Key EPC (Engineering, Procurement and Construction)
  - While often preferred by debt providers, risk premium for construction in Vietnam will be high
  - Expatriate based construction teams will not be feasible
  - Potential contractors would need existing relationships with Vietnamese contractors or extended engagement times
  - Requirement to establish Vietnamese office could cause scheduling delays
  - Large project value limits the number of contractors who would be able to execute the Project
  - All project documentation is required in Vietnamese, so local engineering firm will likely be required
- Engineering, Procurement and Construction Management
  - Requires an increased owners management team
  - No risk premium, but BSX responsible for budget over-runs
  - Perceived higher risk of project budget over-runs and schedule delays
  - Reduced regulatory and business establishment requirements (compared to LSTK EPC)
  - Expatriate based construction teams will not be feasible
  - Potential contractors would need existing relationships with Vietnamese contractors or extended engagement times
  - All project documentation is required in Vietnamese, so local engineering firm will likely be required
- BSX Self Execution
  - BSX best placed to engage over extended period with Vietnamese contractors and fabricators
  - Very large owners teams requirements, with potential recruitment issues
  - All project documentation could be bilingual, with English and Vietnamese versions / annotations.
  - All risk on the owner

BSX's preferred strategy is to execute a hybrid contracting strategy. Engineering and procurement activities to be contracted on a lump sum, fixed prices basis, with construction management to be on a cost reimbursable basis. The construction contractor would be incentivised to meet budget and schedule targets through a reward / incentive scheme. This will enable BSX to commence the fabrication and construction contractor engagement and due-diligence process early and control interactions with the local community and stakeholders.

1.11.2 Project Schedule

A construction schedule was developed for the TKR Project based on BSX's preferred hybrid contracting strategy. The schedule indicates an overall duration of approximately 24 months from commencement of construction to the practical completion of the TKR Project prior to commissioning and ramp up. First production of NCM811 Precursor is currently anticipated in Q4 2024 with steady state production targeted for CY2026.

1.1.1.1 Milestones

The key project milestones are outlined in Figure 1.27.

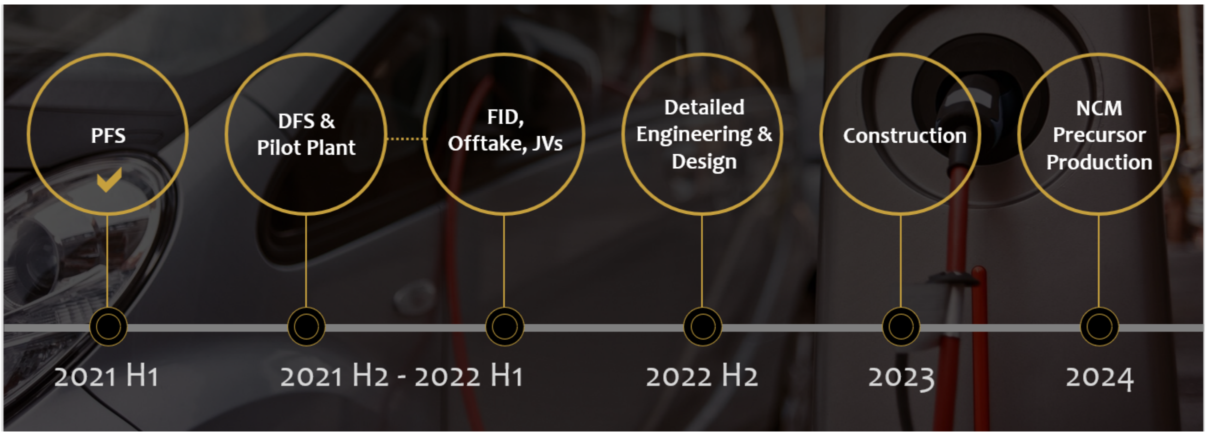


Figure 1.27, Project Milestones

1.12 Risk and Opportunity

1.12.1 Risks

1.12.1.1 Concentrate Supply Risk

BSX final investment decision and execution strategy, will be contingent upon the ability to secure 3PF as supported by definitive binding contracts.

The development of the TKR is reliant on final offtake agreements, with Trafigura and other 3PF suppliers, and will be the subject of ongoing negotiations that are commercial in confidence. Further, the ability for the TKR to process 3PF is contingent upon Vietnam import approval.

The TKR as outlined in the PFS has compelling operating advantages and BSX believes that its collaborative partnership-based model will be attractive to potential concentrate suppliers. In addition, BSX considers there are several potential suppliers of nickel sulfide concentrate, currently under care and maintenance or yet to be developed, that may be enabled via the TKR hydrometallurgical flow sheet (i.e., high MgO or arsenic nickel sulfide deposits).

Finally, Blackstone continues to aggressively explore the Ta Khoa Nickel project and is confident that over time the Ta Khoa Nickel

Project will contribute an increasing proportion of overall feed to the TKR.

1.12.1.2 Processing Risks

Although the flowsheet is based on established technology it is a relatively new concept to process nickel concentrate directly to produce battery grade NCM via a hydrometallurgical process. Blackstone believes that the growing demand for downstream nickel chemical products from the Lithium-ion battery industry will see the hydrometallurgical processing of nickel concentrate ores become more common place over the coming years. The Company believes the technical risks associated with the downstream processing can be managed by the next stages of test work, piloting and studies.

1.12.1.3 Reagent Supply Quality and Availability

BSX recognises the importance of ensuring the quality and availability of reagents supplied in the South East Asia region, and in particular within Vietnam. High purity of reagents are necessary to ensure NCM production meets strict specifications. BSX has appointed consultants to conduct a study and is encouraging local supplier engagement in the upcoming pilot plant development and campaigned operations.

1.12.1.4 Evolving Battery Chemistry

The Electric Vehicle and Lithium-ion battery industry is rapidly evolving. Independent market specialists are confident that EV adoption is set to increase, however, the underlying battery chemistries that will support this electrification movement is of considerably more debate. The market for nickel-based batteries, in particular high nickel content battery, is relatively immature. Although NCM811 is forecast to become the predominant battery chemistry, there is risk of substitution from both existing (for example LFP) and future potential technologies.

Globally, significant amounts of capital have been invested by cathode manufacturers to produce high nickel content products. This includes BSX major shareholder and cathode specialist EcoPro. Blackstone continues to stay abreast of changes in battery chemistry and to mitigate risk will ensure that flexibility in the design of the TKR will be maintained. For example, the proposed piloting phase will include a circuit that is designed to produce various grades of NCM, including 811 and 622.

Although concentrate feed from the Ta Khoa Nickel Project and 3PF included in TKR PFS include cobalt, it is not present in quantities sufficient to make up the prescribed NCM 8:1:1 ratio. As such, the ability to source cobalt is a risk to the TKR Project. The economic modelling by BSX in the TKR PFS assumes the purchase of battery grade cobalt sulfate. In recent history, the ratio of cobalt to nickel in batteries has dramatically decreased, due to difficulties in sourcing cobalt and its high cost. BSX is confident that it will be able to source make-up quantities of cobalt required to make NCM811 through existing cobalt sulfate supply chains but also considers that over time that the ratio of cobalt in battery chemistry may further decrease. BSX's flowsheet allows the Company flexibility to source cobalt via other products including concentrate, oxide and carbonate which typically trade at a discount to cobalt sulfate.

1.12.1.5 Feedstock and End-Product Pricing

The valuation of the TKR is most sensitive to the cost of purchasing nickel concentrate and the price realised on the sale of NCM811 Precursor. The underlying nickel metal price is a reference point for determining both inputs, with nickel concentrates typically trading at a discount to nickel metal, and NCM811 trading at a premium.

In general, movements in the nickel metal price affect the purchase of nickel in concentrate and revenue on the sale of NCM811 Precursor in the same direction. BSX considers the assumptions applied in the economic modelling of the TKR to be conservative. In particular, the premium applied to forecast the NCM811 Precursor price is at the lower end of historically traded ranges.

The TKR is a margin driven business, and therefore cash flow generation is impacted if the payability of nickel in concentrate (typically between 65-80%) increases and the premium associated with NCM811 Precursor diminishes. The sensitivity analysis in Section 1.9 demonstrates that the economics of the TKR is able to withstand adverse movements in both of these inputs. BSX's flowsheet allows the Company flexibility to source nickel via other products including MHP and nickel matte which typically trade at a small premium to nickel concentrate albeit still a discount to nickel metal.

1.12.1.6 Permitting Risks

Delays in the permitting and approvals process are a risk to the execution and timeline for the TKR. Vietnam has a structured permitting process involving provincial and national level approvals across several departments. Blackstone's in-country team has a long and successful history of permitting.

The TKR is expected to be a project of national significance and feature in the Vietnam National Master Plan. This national recognition, combined with the government's continued focus on attracting foreign direct investment and incentivising downstream processing, will be beneficial to the permitting process over the coming months.

1.12.1.7 Environmental and Community Relations

From an environmental and community relations perspective, there are several known risks in this project that have the potential for high sensitivity to the surrounding community and authorities. From demonstrated experience at Ta Khoa, BSX is keenly aware of the need to manage environmental impacts associated with this project and ensure the community is briefed on the risks and associated management, such as: waste impacts to land and water sources relied upon by the community and surrounding environment, and traffic and noise generated in both construction and operations phases. Further to this, there are multiple social and community risks requiring careful attention and management, such as human rights due diligence and compliance, impacts to local livelihoods, and communication across all stakeholders related to the Project.

To address these environmental and social risks, BSX will implement key mitigation approaches in line with community expectations, government guidance and international expectations. These include mitigations centre around good data collection, community outreach, and respectful and effective communication with stakeholders.

Firstly, Blackstone will develop a clear baseline of environmental and social data through studies and surveys engaging relevant stakeholders across the proposed areas, and resource BSX's environmental and community outreach teams to implement the associated environmental and community management plans. The environmental and community relations team will implement the management plans arising from these baseline studies. Importantly, the BSX outreach team will engage with community and government early in the Project's development to address concerns and set clear expectations about the Project. A community representative committee (comprising of community, employee and government leads) will be established to ensure community grievances and misunderstandings can be raised and addressed promptly and transparently; a key element of this early engagement will be education around BSX's grievance processes to set a culture of open communication amongst all stakeholders.

Further to these activities, BSXs outreach team, with the support of site management, Hanoi and Perth offices, will implement key elements of BSX's ESG strategy. This strategy will address the concerns most material to our stakeholders that have the potential to develop into project risks: human rights, climate change and environmental impacts, employee safety and health, disruptions to existing livelihoods and industries, and opportunities and pathways for employees and local suppliers to benefit from and develop alongside the project.

1.12.1.8 COVID 19

The global COVID 19 pandemic has increased business uncertainty. Overall Vietnam's response to COVID 19 has been positive and the country has continued to experience strong business investment and GDP growth. However, it is not possible for BSX to estimate the potential for disruption that may be caused by COVID 19, which includes but it is not limited to delays to the fabrication and supply of equipment and machinery for the TKR. BSX considers that any worsening to the current COVID 19 situation in Vietnam will likely result in delays to the construction of the TKR and overall project execution timelines.

1.12.1.9 Vehicle and Traffic Management

Construction and operation of the TKR will require detailed consideration of transportation routes and vehicle management. During construction there will be regular deliveries of very large and very heavy equipment and materials. This will need to travel through villages and on roads not intended for such heavy transportation. BSX will need to coordinate with local authorities and community groups to ensure that this is conducted safely, while minimising impact to the local community.

During operations, there will be dozens of trucks per day for inbound logistics, delivering the various inputs including internally sourced and internationally sourced Nickel concentrates, cobalt sulfate, lime, and other reagents and maintenance materials. There will also be dozens of trucks required for out-bound logistics, for handling and storing TKR residue, NCM production, Kieserite production, and the various other by-products.

The site vehicle management plant will need careful consideration to minimise the potential for interaction between trucks and employees. BSX has attempted to create a 1-way ring road around the facility to help control vehicle flow, and lower the risk. All deliveries will be made away from the key administration and accommodation areas.

The off-site vehicle management plan will also be a serious consideration for BSX. BSX will need to engage professional, respected transportation companies, or develop it's own fleet, to control the quality and safety of vehicles, and the training and operation of the drivers. BSX will also need to develop key relationships with various communities along key routes.

BSX has begun engaging with Bolloré Logistics, an internationally recognised logistics company, based in Hanoi, to complete various road surveys and infrastructure reviews to help identify potential concerns.

1.12.1.10 Funding

To achieve the outcomes in this PFS, the pre-production capital (including contingency) of US$491m, additional capital for pre-commitment activities such as a DFS, pilot plant development and working capital is likely to be required.

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 will 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 Ta Khoa Refinery Project, such as a sale, partial sale or joint venture of the Ta Khoa Refinery Project. If this occurs, this could materially reduce the Company's proportionate share of ownership of the Ta Khoa Refinery Project

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1.12.2 Opportunities

1.12.2.1 Ongoing Studies

BSX continues to progress two key areas of study that have potential to enhance the value of the TKR.

1. Platinum Group Element (PGE) By Product Credits

   Preliminary hydrometallurgical test work completed by Simulus Engineers on Pre-Feasibility Study (PFS) Pressure Oxidation (POX) residues has demonstrated excellent recoveries of Platinum Group Elements (PGEs) including palladium, platinum and rhodium using a conventional flowsheet. Specifically, concentrate residue samples have been tested and determined to be amenable to chlorination leaching (refer ASX announcement 27 May 2021). BSX will continue to perform test work to optimise initial results with the intention to include a circuit for the recovery of PGEs in the final TKR design.

2. Green Hydrogen Study

The TKR PFS design requires the use of oxygen in the downstream processing plant. Typically, the oxygen is produced by a conventional cryogenic oxygen plant with nitrogen as a by-product. However, the Company will investigate producing oxygen via the electrolysis of water, which will produce "green" hydrogen as a by-product through the utilising of abundant renewable hydro-electric power and water available at Ta Khoa (Green Hydrogen Study).

The Green Hydrogen Study will include:

- An investigation into emerging green hydrogen technologies and their potential application at Ta Khoa
- A trade-off assessment of the economic (capital cost and operating cost) and environmental benefits of each option
- Assessment of the potential for the downstream business to tap into renewable hydro-electric power and water sources.

The opportunity to produce a green hydrogen by-product at Ta Khoa strengthens BSX's aim to develop a zero-carbon mining operation and downstream processing facility at Ta Khoa. The following key points outline how the green hydrogen concept fits into the Company's strategy:

- Oxygen is required as an input into the POX process and the Company believes that water electrolysis with hydrogen as a by-product may be an economic and sustainable option.
- Green hydrogen for use in hydrogen fuel cells, is growing in favour as an alternate, complimentary technology to battery electric vehicles;
  - The Company intends to use this by-product hydrogen as a fuel for its own concentrate haulage road fleet
  - As new hydrogen fuel cell mining fleet becomes commercially proven, the Company will also look to integrate hydrogen fuel cell vehicles into their mining fleet.
- The Green Hydrogen Study will also assess the potential to offset the TKR operating cost base through the sale of Green Hydrogen.

Should this study yield positive economics, Blackstone will look to include Green Hydrogen into the TKR final design and consider options to commercialise production for sale to third parties given the abundance of hydroelectric power and clean water in the north of Vietnam.

1.12.2.2 Other By-products

BSX has planned to recover other by-products as part of reagents, steam and water regeneration. Through this process, a number of potential by products can be produced by selective removal processes via both chemically and physically separations. The concepts will be investigate during pilot plant trials with vendors involvement.

1.12.2.3 Engineering Centre of Excellence

BSX is building an in-house engineering centre of Excellence both in Australia and Vietnam. This is an important business segment to ensure we have a strong technical team to continuously develop and process improvement via in-house R&D, working collaboratively with high tech industries, universities, and STEM research centre globally. BSX is currently working with FBI-CRC, Curtin University, and Universities in Vietnam.

1.12.2.4 Commercialisation of Pilot Plant Products

BSX has planned two pilot plant phases for completion prior to full commercial production. The two pilot plant phases are in support of the upcoming DFS and will eventually treat up to 1 tonne of nickel concentrate feed per day.

The pilot plant will produce a range of NCM Precursor grades including NCM811 and NCM622. BSX is investigating the potential to sell quantities of NCM Precursor as part of the piloting phase. The revenue upon sale of NCM Precursor would effectively recover cost of constructing and operating the pilot plant. In a best-case scenario, BSX may not only generate revenue from the sale of NCM Precursor to cover costs, but potentially generate a return on the invested capital over the two pilot plant phases.

1.12.2.5 Scalable and Modular

The Ta Khoa Refinery design is scalable and modular. This means that following successful execution of the TKR, BSX can replicate the same technology and downstream refinery business model in other jurisdictions. BSX will only consider opportunities to scale its downstream business if the planned refinery had the potential to meet the highest ESG credentials.

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1.12.2.6 Upstream Acquisitions and Partnerships

The Base Case TKR is reliant on 3PF. BSX is interested in securing long – term feedstock for the TKR and has identified several stranded/ undeveloped assets suitable to provide feedstock for the TKR's hydrometallurgical process flow sheet. BSX's corporate development team maintains and monitors a list of nickel sulfide opportunities, that under the right market circumstances, could be potential targets for acquisition and/or partnerships.

1.12.2.7 Alternate Feed Materials

The TKR PFS has been prepared on the basis that nickel sulfide concentrate will be purchased (at arm's length) and upgraded into an NCM811 Precursor. However, BSX's development strategy and final refinery design will have flexibility in mind and the ability to accept alternate feedstock -- laterite ore, other metal rich sulfide concentrates, MHP, NPI, and nickel matte. The design and construction of the pilot plant will include the testing of alternate feedstock.

1.12.2.8 Battery Recycling

The modulation design of BSX hydrometallurgy plant is robust and flexible with provision to treat a wide range of feedstocks and chemical compounds. The refinery can be modularly upgraded to support additional processing capacity for any future lithium battery recycling for lithium, nickel, cobalt, manganese, copper, aluminium, and graphite products.

1.12.2.9 Repurposing of Residue

BSX has commenced discussions with local brick makers for the potential use of the refinery residue as a brick making material. These discussions are at an early stage and BSX will continue to pursue this opportunity to help minimise residue storage requirements. BSX also planned to conduct additional investigation during pilot plant trials in Vietnam to evaluate the POX residue for further use in land fill for plantation purpose.

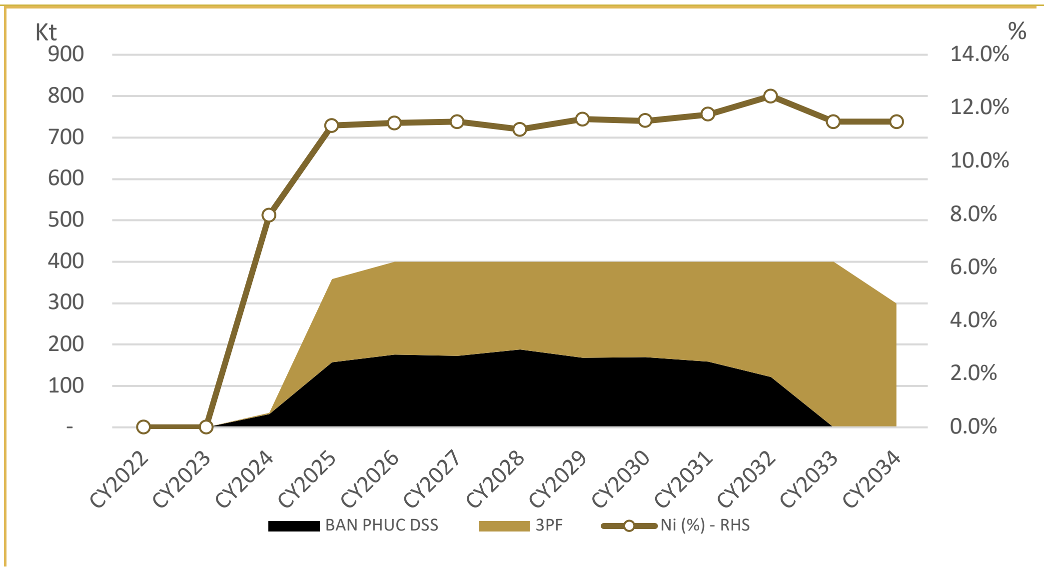
1.12.2.10 Further Vertical Integration of Lithium-ion Battery Supply Chains

The TKR PFS demonstrates the significant value generated by upgrading intermediate nickel products (i.e., nickel concentrates) into refined class I nickel products suitable for the Lithium-ion battery industry. The TKR is designed to produce a battergy grade NCM Precursor product, which is a major input in the manufacturing of cathodes for the Lithium-ion battery industry. In the future, BSX may investigate the potential to upgrade NCM Precursor to produce Precursor Cathode Active Material (P-CAM).

1.13 Summary of Material Assumptions and Modifying Factors

Material assumptions used in the PFS including consideration of the "modifying factors" under the JORC Code, are set out in the following table:

Assumption/ Factor	Commentary
Study Status	The TKR PFS, including capital estimates and processing costs, was completed to an AACE Class 4 Level, with an accuracy of +/-25% and was undertaken based on only open pit mining from the existing resources combined with third party concentrate feed (3PF). The proposed plant comprises a downstream Pressure Oxidation (POX) process with Mixed Hydroxide Precipitation (MHP) leaching and nickel refining via solvent extraction to produce battery grade NCM precursor. Two production throughputs were assessed by Simulus Engineers, namely 400ktpa and 800ktpa of nickel concentrate feed.
Concentrate Supply	A summary of the concentrate supply profile for the Base Case Ta Khoa Refinery is described below:

	 Blackstone considers there is a reasonable basis for securing concentrate supply for the Base Case Ta Khoa refinery, which assumes feed from the BSX's Ban Phuc DSS deposit as well as 3PF. Indicative quantities and concentrate specifications have been received from all 3PF concentrate suppliers / partners included in this PFS. Based on current and confidential discussions, BSX is confident it can secure sufficient supply to meet the feed concentrate requirements. Further, BSX is aggressively testing multiple DSS and MSV nickel targets within its 90% owned Ta Khoa Nickel Project. Although the level of resource confidence for several targets currently being assessed is not sufficient for inclusion in the TKR PFS, BSX considers there is potential for the TKR feed composition to eventually include a higher proportion of feed from the Ta Khoa Nickel Project.
NCM811 Precursor Price	BSX performed an analysis of the NCM811 Precursor price on the SMM website compared to the individual constituent metal prices being nickel, cobalt and manganese. The analysis indicates that NCM811 Precursor has typically traded at a premium of 20-40% to metal prices. Blackstone applied a premium of 20% to the individual constituent metal prices. The underlying nickel and cobalt metal prices to which a premium was applied was referenced from forecast data that was supplied by Benchmark Minerals Intelligence. There was limited forecast price data for manganese metal and as such current observable market prices were applied (as referenced from SMM) The average realised NCM Precursor Price assumed in the Base Case TKR valuation of US$16,397/t is significantly lower than current spot market prices (as referenced from SMM).

	
Metallurgical Methods and Parameters	The key metallurgical parameters assumed in the TKR PFS testwork and engineering study include:

	Units	Value
Basis of design data	000	
Site Operation		
Operating hours / year	hpa	7,448
Annual feed throughput	tpa	400,000
Design throughput	tph	53.7
Number of trains	number	2
Availability		
Hydromet plant availability	%	91.3
Reagents availability	%	95.0
Utilities availability	%	98.0
Overall availability	%	86.8
Utilisation (overall)	%	85.0
Feed		
Type of feed	text	Sulfide concentrates
Moisture	%	8.0
Bulk density	t/m3	2.2
Angle of repose	degrees	30.0
Concentrate grade (dry solids)		
Co	%	0.30
Cu	%	1.10
Mn	%	0.05
Ni	%	11.5

These metallurgical parameters have been supported by the following testwork:

WBS	Description
100	Concentrate Handling / Blending
200	Pressure Oxidation Leaching (POX)
300	Copper Solvent Extraction (CuSX)
400	Neutralisation / MHP production
500	Magnesium removal - Crystallisation
600	Ni-Co refining – Multiple stages of Solvent Extraction
700	NCM ternary precursor (NCM 811 precipitation)

<table>
<tr><td></td><td>
Metallurgical overall recovery reported from batch testwork and SysCAD process modelling:
<table>
<tr><td>Metallurgical Recovery – Ni into NCM Precursor Product</td><td>%</td><td>96.8</td></tr>
<tr><td>Metallurgical Recovery – Co into NCM Precursor Product</td><td>%</td><td>96.7</td></tr>
<tr><td>Metallurgical Recovery – Cu into Copper Cathode</td><td>%</td><td>93.1</td></tr>
</table>
It should be noted that there are common areas of the overall plant for the two trains such as the following:

Concentrate storage area
Concentrate repulping area
Kieserite storage and loading area
Copper electrowinning and loading area
Oxygen plant.

</td></tr>
<tr><td>Project Implementa-tion</td><td>BSX's preferred strategy is to execute a hybrid contracting strategy. Engineering and procurement activities to be contracted on a lump sum, fixed prices basis, with construction management to be on a cost reimbursable basis. The construction contractor would be incentivised to meet budget and schedule targets through a reward / incentive scheme.</td></tr>
<tr><td>Infrastructure</td><td>
BSX engaged a local Vietnamese based consulting firm specialising in Vietnamese logistics, infrastructure and local investment law, to conduct location and logistics study to help determine the optimum TKR location. A detailed location and infrastructure review and trade-off study was completed to identify the optimum refinery location, inclusive of an in depth discovery phase with engagement with local governments and industry bodies. All analysis to date indicates that the TKR should be located either in Son La or Phu Tho provinces. Both of these provinces demonstrated great government support, ease of access to renewable power, suitable residue storage options and availability of suitable land.
Project Infrastructure included in the PFS evaluation includes the following:

Plant Administration and Support Buildings
Accommodation facilities
Production Buildings
Access Roads
Residue Storage Facilities (RSF)
HV Power Supply
Water Supply
Waste Management

</td></tr>
<tr><td>Capital Costs</td><td>The capital cost estimate for the TKR and associated infrastructure has been developed to a Class 4 (±25%) level, in alignment with the AACE Cost Estimate</td></tr>
</table>

	Classification System, as applied in the Mining and Mineral Processing Industries (47R-11) and the AusIMM Cost Estimation Handbook, 2nd Edition. The estimate base date is Q3 2021. A minimum of 98 % of mechanical equipment costs are sourced from the Simulus equipment cost database, with at least 90 % of the costs, by value, having been received within six months of the capital estimate date following the process described above. The upfront project capital cost estimate of US$491m for the Base Case Ta Khoa Refinery capital does not include amounts for pre-commitment activities such as a DFS and pilot plant development. The process plant and infrastructure costs were estimated by Simulus Engineers, the Optimize Group and Blackstone Minerals. The costs for the RSF were provided by BSX. The capital costs include owner's project cost and contingency as calculated by Simulus Engineers.

Capital Cost Area (US$M)	Base Case
Process Plant	245
Site Infrastructure	16
Residue Storage	8
Owners Direct	43
Precommitment Costs	-
EPCM	51
Owners Costs	47
Contingency	82
Total Project Capital	**491**

Operating Cost	The estimate conforms to the requirements of an AACE /AusIMM Class 4 Estimate, and is deemed to have an accuracy of ± 25%. The largest operating costs for the Ta Khoa Refinery include the purchase of nickel and cobalt in concentrate. Nickel concentrates typically trade at a discount to the underlying metal price (currently ~65-80%). An independent consultant has been employed by BSX to benchmark nickel concentrate pricing. The major refining cost component relates to the purchase of cobalt and manganese make up quantities to produce NCM811 at the correct specification. The economic modelling for the TKR PFS assumes that cobalt sulfate and manganese sulfate is purchased to achieve this. A forecast for cobalt sulfate prices was referenced from Benchmark Mineral Intelligence and a forecast price for manganese sulfate was provided by Simulus Engineers. All other material operating cost assumptions, other than for logistics, were provided by Simulus Engineers with contributions from other parties including

<table>
<tr><td></td><td>BSX Owner's Team. These include reagents, power, maintenance, labour and G&A.

Logistic costs were determined as part of the location trade off study, for which BSX engaged a local Vietnamese based consulting firm specialising in Vietnamese logistics, infrastructure and local investment law.

<table>
<tr><th>Base Case – Operating Costs</th><th>US$m
Life of Operations</th></tr>
<tr><td>Purchase of Ni & Co in Concentrate (Net of Penalties)</td><td>6,043</td></tr>
<tr><td>Refining</td><td>3,590</td></tr>
<tr><td>Logistics</td><td>118</td></tr>
<tr><td>G&A</td><td>27</td></tr>
<tr><td>Residue Storage</td><td>18</td></tr>
</table>
</td></tr>
<tr><td>Environmental</td><td>BSX's goal is to build a processing plant utilising green technology and by using renewable energy from hydroelectric plants to reduce carbon emissions and provide economic opportunities for employees and local businesses. The Project is classified by the Investment Law and Environmental Law into a 'Group One' category - holding a high risk of adverse environmental impacts according to the Vietnamese laws on environmental protection which will be effective from 1st January 2022. This means, careful management of environmental risks determined through studies and baseline assessments, in addition to community engagement, will be priority a of the site-based and corporate teams.</td></tr>
<tr><td>Social</td><td>Preliminary studies show that both preferred locations for the TKR are in line with local socio-economic development plans of the provinces and have the potential, if executed and managed well, to meet high ESG standards. The project values the community in which it works and takes seriously its community and environmental obligations to ensure the community benefits from all stages of the project's activities. We have a history of operating responsibility and have the endorsement of the local community to operate. Our social and community values are demonstrated in the relationships we share with the local community, the economic and employment opportunities we provide, and engagement we have on environmental activities such as rehabilitation and waste management.</td></tr>
<tr><td>Risk Management</td><td>A risk register has been established for the project and risk management process have been established. Key risks identified to date include:

Permitting Risk
Feedstock and End-Product Pricing
Evolving Battery Chemistry
Reagent Supply Quality and Availability
Processing Risk
Concentrate Supply Risk
Environmental and Community Relations
</td></tr>
</table>

	• COVID 19 • Project and Operations Logistics • Funding
Exclusions	The PFS excludes the potential opportunity to incorporate chlorination leaching of the POX residues to recover Platinum Group Elements (PGEs) including palladium, platinum and rhodium using a conventional flowsheet. Specifically, concentrate residue samples have been tested and determined to be amenable to chlorination leaching (refer ASX announcement 27 May 2021). BSX will continue to perform test work to optimise initial results with the intention to include a circuit for the recovery of PGEs in the final TKR design. The PFS excludes all additions to the mining inventory at the Ta Khoa mine from the past 12 months of exploration which includes ~46,904m of diamond drilling. The total of ~46,904m includes ~17,372m of drilling at Ban Phuc since the completion of the BMGS resource model adopted in the BSX's Scoping Study (refer ASX announcement 18 October 2020).
Investment Evaluation	For evaluating the economics of the Refinery, a financial model assessing real post-tax unleveraged free cash flows at the project / asset level has been prepared. A monthly financial model has been deemed appropriate by BSX to evaluate the timing of upfront capital expenditure, to reflect an appropriate the ramp up/ commissioning of the Refinery as well as suitably capture variability in concentrate feed composition over the life-of the operations. The financial model assumes a start date and valuation date of 1 September 2022 and does not include pre-commitment costs that will be expended by BSX prior to a Final Investment Decision (FID). Given historically low global interest rates that persist at the time of compiling this report, BSX considers real project level post-tax discount rate of 8% applied to value the Refinery to be reasonable. A review of recent broker reports and several recent similar studies published on the ASX have also adopted a real project level post-tax discount rate of 8%. The financial model assesses real post-tax unleveraged free cash flows at a project / asset level. The economic modelling performed by BSX does not assume any real escalation to revenue or cost inputs into the model. The project evaluation model is unaudited, and the following key economic assumptions are applied in the valuation of the Base Case TRK:

Price Forecast (US$/t), Life - of - operation weighted avg.	Base Case
NCM811 Precursor	16,397

	Nickel Metal	18,230
	Cobalt Metal	66,028
	Cobalt Sulfate (21%)	12,842
	Manganese Sulfate (32%)	1,035
	Copper Cathode	6,985

2 APPENDIX A: BAN PHUC SCOPING STUDY SUMMARY

Project Background

The Ban Phuc nickel mine operated as a modern mechanised underground mine for 3.5 years between 2013 and 2016, producing 20.7kt Ni, 10.1kt Cu and 0.67kt Co, before closing when the defined mineable reserves were depleted. The high-grade Ban Phuc MSV deposit was mined adjacent to the Ban Phuc DSS deposit and remains underexplored at depths below the base of previous mining.
Many other MSV targets are within potential trucking distance of the existing 450ktpa Ban Phuc processing facility that was built to international standards, commissioned in 2013, and has been on care and maintenance since 2016.

Blackstone's Ta Khoa Nickel–Cu-PGE project has a combination of large, disseminated nickel sulfide targets and 25 other prospects, including multiple high grade MSV targets of the style that were mined from the Ban Phuc underground mine. Blackstone believes that the Ta Khoa project represents a true district scale Nickel-Cu-PGE sulfide opportunity of a calibre rarely controlled by a junior company. The project also has significant infrastructure advantages that include the existing processing facility, abundant low-cost hydroelectric power, a skilled low-cost labour force, and is located in a country that has become an Asian hub for electronics and battery manufacturing with a growing demand for downstream nickel products for the lithium-ion battery industry.

Location

The Ta Khoa Nickel-Cu-PGE Project is located approximately 160km west of Hanoi near the Ban Phuc village in Son La Province, north-west Vietnam. The nearest towns are Hat Lot, approximately 30km north-west and Bac Yen, approximately 25km east. The nearest major population centre is the provincial capital Son La, approximately 55km north-west. The site is approximately 3km from the Da River hydroelectric dam reservoir. The elevation across the site ranges from 100m to 500m above sea level. The site is approximately 350km from the port city of Hai Phong. Best access to site is by way of Son Tay, Thanh Son, Phu Yen, Bac Yen and the Ta Khoa Bridge with a travelling time of six hours from Hanoi on serviceable paved roads.

Geology

The Ta Khoa Project is a magmatic Ni-Cu-PGE sulfide district associated with the Song Da Rift, a major crustal suture zone, and the Emeishan Large Igneous Province that extends for over 1000 km from north Vietnam into south China and hosts several significant Ni-Cu-PGE sulfide deposits. Two main Ni-Cu-PGE sulfide deposit styles are recognised within the Ta Khoa district:

1. Massive Ni-Cu+PGE sulfide veins associated with narrow ultramafic dykes or locally within sedimentary wall rocks. Zones of disseminated semi massive and stringer sulfides are associated with many massive sulfide veins. The recently operating Ban Phuc nickel mine (2013-2016) exploited one of these massive sulfide veins adjacent to the Ban Phuc ultramafic body.
2. Disseminated sulfide deposits within larger ultramafic intrusions, of which the Ban Phuc ultramafic intrusion is the best known and hosts the Ban Phuc Disseminated Ni-Cu-PGE sulfide deposit subject of this report. The Ban Phuc ultramafic intrusion is approx. 940 m long by 420 m wide and >400 m deep with two main disseminated sulfides zones, an outer and more extensive inclined boat hull-shaped zone and a smaller bean-shaped central zone.

All of the Ta Khoa district ultramafic intrusions and associated Ni-Cu-PGE sulfide bodies have been affected by post-magmatic deformation and regional metamorphism.

Mineral Resources

The mineralisation model used for the Blackstone's maiden Mineral Resource estimate is based on an interpretation generated by BMGS in conjunction with geologists from Blackstone Minerals. A wireframe interpretation was created by combining sections into individual three-dimensional solids representing mineralised domains. Ordinary Kriging (OK) was used to interpolate Ni, Cu, Co, Pd and Pt grades to a block model constrained with the interpreted sulfide mineralisation wireframes and Indicated and Inferred Resources at a 0.3% Ni lower cut off are reported in Table 1 below.

More details on estimation methodology and resources at higher cut offs are included in the material assumptions section.

Category	Mt	Ni (%)	Cu (%)	Co (%)	Pd (g/t)	Pt (g/t)	S (%)	Ni (t)	Cu (t)	Co (t)	Pd (oz)	Pt (oz)
Indicated Resources	44	0.52	0.06	0.01	0.11	0.09	0.45	230,000	27,000	5,800	160,000	130,000
Inferred Resources	14	0.35	0.01	0.01	0.03	0.03	0.13	51,000	1,600	1,100	12,000	15,000

Table 1– Mineral Resource Estimate

Open Pit Mining

Conceptual Open Pit Mine

The Ban Phuc deposit is a large, near-surface disseminated nickel sulfide orebody amenable to bulk open pit mining with a pre-strip requirement of approximately 25Mt and life of mine (LOM) strip ratio of 6.1:1.

Processing rates of 2Mtpa, 4Mtpa and 6Mtpa were thoroughly examined and optimised rates of 4Mtpa (base case) and 6Mtpa were selected. Mining is modelled to be conventional drill, blast, load and haul and is assumed to be contractor operated with mining costs based on similar sized open pit mines within the region. Note the 2Mtpa processing rates were examined as part of this Scoping Study. However, the 2Mtpa case was considered to be sub-optimum in terms of being able to delivery sufficient product to secure superior offtake terms.

The open pit mine design has four stages with the first stage including initial drilling from the KCZ. The higher grade, near-surface mineralisation at KCZ will be mined during the first three years of open pit mining.

Pre-strip mining is modelled to commence approximately 18 months before processing to allow sufficient time to establish the initial stages of the open pit mine and the associated civil requirements for the processing facility and tailings storage facility.

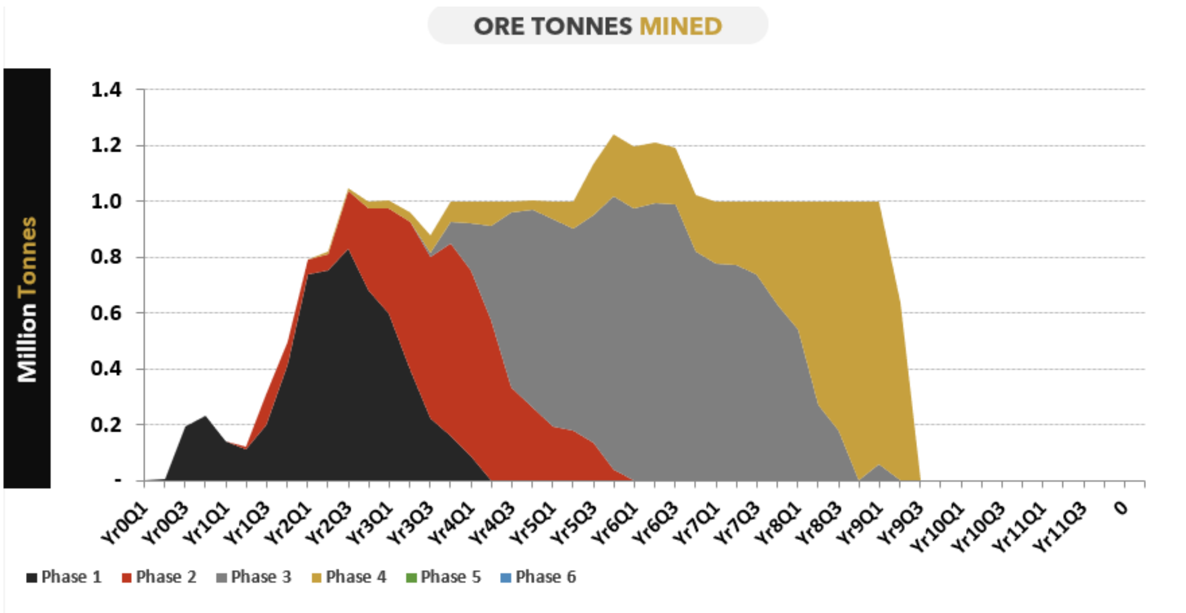


Figure 1 - Ore Tonnes mined - Stages 1 to 4

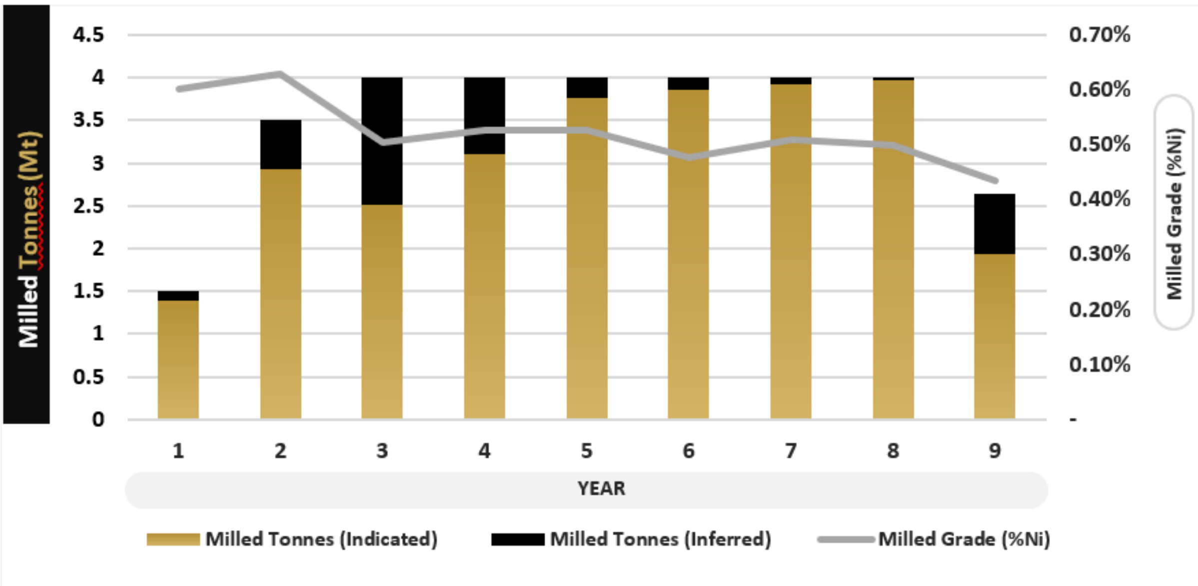


Figure 2 – Milled Tonnes & Grade

Upstream Processing

The Scoping Study considered a broad range of processing throughput options and product scenarios which include upgrades to the current processing facility and design and construction of an entirely new standalone plant.

The process design criteria have been derived from metallurgical test work from which process flowsheets and equipment lists have been prepared to develop the preliminary process plant design.

The process plant will produce a nickel concentrate targeting optimum metal recoveries at the concentrator whilst being suited to processing at the downstream process facility. The flotation circuit consists of a rougher/scavenger circuit followed by a cleaner flotation circuit.

The mineral concentrate is transported to a downstream processing facility via road transport to be converted to final product. An overall process flow diagram of the upstream processing is indicated below:

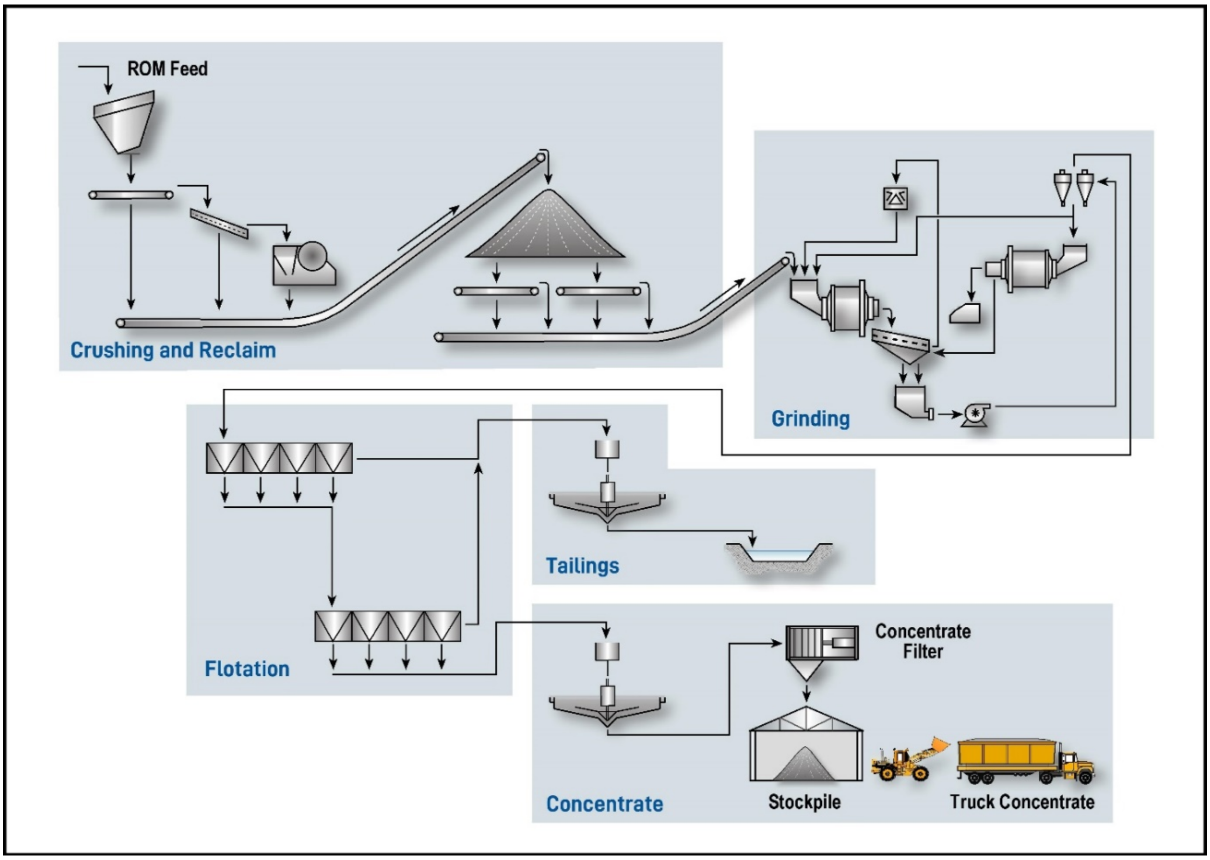


Figure 3 - Process Flow Diagram for Upstream Processing

Cautionary Statement

The Scoping Study at Ta Khoa was undertaken to determine the potential to restart the Ta Khoa Nickel-Cu-PGE project and develop downstream processing infrastructure in Vietnam to produce a downstream nickel and cobalt product to supply Asia's growing lithium-ion battery industry. The Scoping Study was a preliminary technical and economic study of the potential viability of those projects based on low level technical and economic assessments (+/- 40% accuracy) that are not sufficient to support the estimation of Ore Reserves. Mining and processing rates of 2Mtpa, 4Mtpa and 6Mtpa were examined within the Scoping Study. The 2Mtpa case was considered to be sub-optimum in terms of being able to delivery sufficient product to secure superior offtake terms. Further evaluation work and appropriate studies are required before Blackstone is in a position to estimate any Ore Reserves or to provide any assurance of an economic development case.

The JORC-compliant Mineral Resource estimate forms the basis for the Scoping Study. Over the life of mine considered in the Scoping Study, 83% of the processed Mineral Resource originates from Indicated Mineral Resources and 17% from Inferred Mineral Resources; 76% of the processed Mineral Resource during the payback period will be from Indicated Mineral Resources. The viability of the development scenario envisaged in the Scoping Study therefore did not depend on Inferred Mineral Resources. There is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources or that the production target itself will be realised. The Inferred Mineral Resources is not the determining factors in project viability.

Study Parameters and Material Assumptions

Material assumptions used in the estimation of the mineable material and associated financial information relating to the Ban Phuc Disseminated (DSS) feedstock discussed in this announcement and initially within the scoping study in October 2020, including consideration of the "modifying factors" under the JORC Code, are set out in the following table:

Material Assumptions	Commentary
Study Status	The Study, including capital estimates, mining and processing costs, was completed to an accuracy of +/-40% with a 90% level of confidence and was undertaken based on only open pit mining from the existing resources. The proposed plant comprises an initial single-stage crushing, milling (SAG + ball), flotation to concentrate and a downstream Pressure Oxidation (POX) process with Mixed Hydroxide Precipitation (MHP) leaching and nickel refining via solvent extraction to produce NCM precursor. Three production throughputs were assessed by Como Engineers, namely 2.0, 4.0 and 6.0 Mtpa. The metallurgical test work carried out to date indicates that nickel can be satisfactorily recovered from Ban Phuc DSS ore using conventional crushing, milling and flotation to concentrate. The test work is considered sufficient to determine that the Ban Phuc DSS Mineral Resource represents a deposit with potential economic extraction. The estimation of capital costs was prepared by Como Engineers and Simulus Engineers for the process plant, refinery, and associated infrastructure. Mining Plus provided open pit mine engineering services. The work comprised strategic planning by Whittle Consulting, open pit and enterprise optimization studies, pit designs and detailed mine schedules. A series of shells from the open pit and enterprise optimizations were selected and used to generate a Life of Mine (LOM) production schedule. Mining Plus provided an estimate of mining, including haulage, rehabilitation and administration costs. Como Engineers and Simulus Engineers provided processing cost estimates for upstream and downstream processing. The financial model was completed as a real model by ConnectivIQ. A LOM financial analysis was performed using the discounted cash flow (DCF) method and varying % real discount rates. The financial analysis was used to determine the potential economic return of the project over the LOM.
Global Mineral Resource	In summary, Ban Phuc DSS has been estimated as an Indicated Mineral Resource of 44Mt @ 0.52% Ni for **230kt Ni** and an Inferred Mineral Resource of 14Mt @ 0.35% Ni for **51kt Ni** at a 0.3% Ni cut off.

Lower cut off Ni%	Indicated Resources											
	Mt	Ni %	Cu %	Co %	Pd g/t	Pt g/t	S %	Ni t	Cu t	Co t	Pd oz	Pt oz

0.3	44	0.52	0.06	0.01	0.11	0.09	0.45	230,000	27,000	5,800	160,000	130,000
0.4	33	0.57	0.07	0.01	0.12	0.1	0.5	190,000	23,000	4,200	130,000	100,000
0.5	19	0.67	0.09	0.01	0.14	0.11	0.58	130,000	16,000	2,600	83,000	67,000
0.6	9.8	0.78	0.11	0.02	0.15	0.12	0.66	77,000	11,000	1,500	47,000	38,000
0.7	5.4	0.89	0.13	0.02	0.16	0.13	0.75	48,000	7,200	860	27,000	22,000
0.8	3.2	1	0.15	0.02	0.16	0.13	0.81	32,000	4,700	540	17,000	14,000
0.9	1.9	1.09	0.16	0.02	0.17	0.14	0.86	21,000	3,100	350	11,000	8,700
1	1.2	1.19	0.17	0.02	0.18	0.15	0.9	14,000	2,100	230	7,000	5,700
Lower cut off Ni%	**Inferred Resources**											
	Mt	Ni %	Cu %	Co %	Pd g/t	Pt g/t	S %	Ni t	Cu t	Co t	Pd oz	Pt oz
0.3	14	0.35	0.01	0.01	0.03	0.03	0.13	51,000	1,600	1,100	12,000	15,000
0.4	1.1	0.45	0.03	0.01	0.04	0.04	0.24	4,900	310	100	1,300	1,300
0.5	0	0.58	0.07	0.01	0.06	0.05	0.37	760	90	10	230	210
0.6	0	0.67	0.1	0.01	0.06	0.05	0.48	290	40	10	80	70
0.7	0	0.83	0.16	0.02	0.06	0.05	0.73	49	10	-	10	10
0.8	0	0.86	0.17	0.02	0.07	0.05	0.78	38	10	-	10	10
0.9	0	0	0	0	0	0	0	-	-	-	-	-

Ban Phuc Disseminated Ni-Cu-Co-PGE Mineral Resource Estimate by Ni % cut offs and classification

Estimation Methodology

BMGS created two disseminated Ni-Cu-PGE sulfide mineralization wireframes for the resource estimation: 1) An outer and more extensive slightly inclined boat hull-shaped zone with a strike of c. 900 m, beam of up to c. 400 m and a maximum depth extent of c. 400 m beneath surface. In cross section the outer sulfide zone is open bowl shaped at the western end to upturned horseshoe shaped at the eastern end, with interpreted mineralisation thickness ranging from c. 5 to 50 m. 2) a smaller bean-shaped core within the outer hull, also striking UTM NW with strike extent of c. 350 m, dip extent up to 300 m and thickness up to 100 m. The mineralisation interpretation was based on a nominal 0.3% nickel grade as a lower cut-off, with the presence of sulfides (nominally >0.1% S). A second wireframe set based on a 0.4% Ni cut-off was also created to test the effect concentration of mineralisation would have on the interpretation and the estimation. Both interpretations included material below the cut-off to improve continuity. Statistics were reviewed for all domains and assessed for multiple populations and bias from outlier grade populations, and Ordinary Kriging was used to estimate grade to a 10 x 10 x 5 m xyz block model with 2.5 x 2.5 x 2.5 m sub-blocks within the interpreted +0.3% Ni sulfide wireframes.

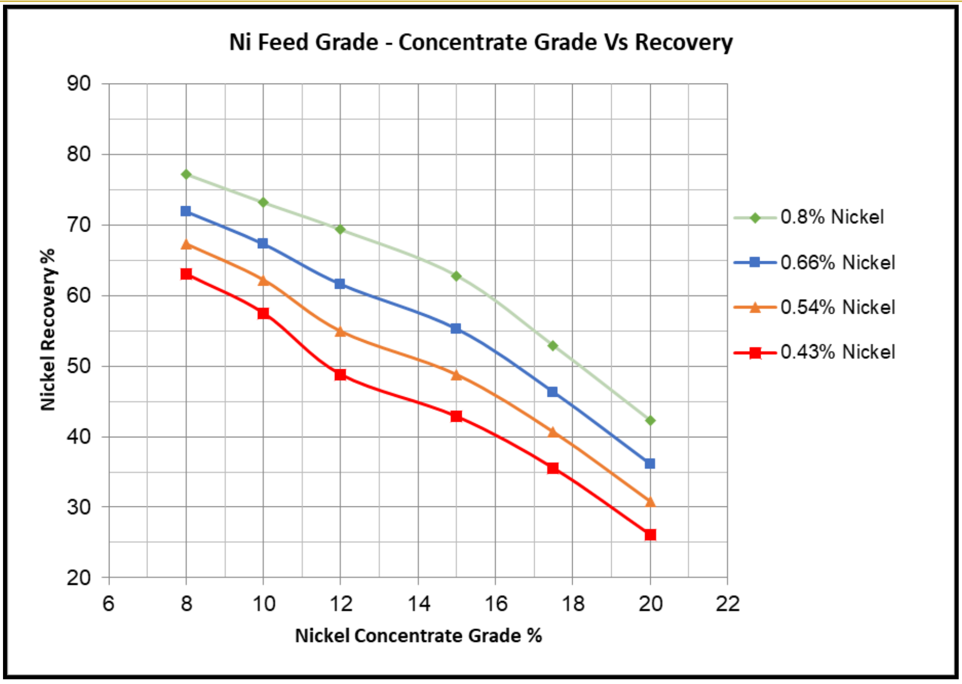
Classification

BMGS has assigned Indicated and Inferred status to the Ban Phuc DSS Mineral Resource in accordance with the 2012 Australasian Code for Reporting of Mineral Resources and Ore Reserves (JORC Code) and the CIM Definition Standards (CIM, 2014). A range of criteria were considered in determining this classification including geological and grade continuity, data quality and drill hole spacing. BMGS recognises that the outer hull zone is consistently drilled, shows consistent grade and geological continuity and is classified as predominantly Indicated. BMGS classifies the core zone as Inferred as it appears to have less geological continuity, the geological constraints are poorly

	understood and a higher density of drilling is required to improve geological and interpretational confidence. On a tonnage basis 76% of the MRE has been classified as Indicated. The production target is based on 83% Indicated Mineral Resources and 17% Inferred Mineral Resources. There is a lower level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources or that the production target will be realised.
Nickel Price	The mining study used a base-case nickel price of US$7.50/lb and a final product price of US$6.53/lb for NCM Precursor. Each pound of NCM precursor product contains approximately 51% Ni, 6% Co and 6% Mn. The NCM precursor product trades at a significant premium to the combined metal prices. The nickel price selected for the mining study was at a discount to the long-term average consensus price forecast. The price was also assessed as lower than what has been utilized across a number of studies presented by peers.
Mining and Metallurgical Methods and Parameters	Open pit optimisations were undertaken in Whittle while the project optimisations were completed in Prober at a US$7.50/lb Ni price to define the base of potentially economic material. Four stages were then selected and full mine designs applied. Mining of the Ban Phuc DSS project has been assumed to be medium-scale using conventional open pit mining equipment. The mining process will include drill and blast as well as conventional load and haul operations. There is expected to be a limited amount of free dig material with the majority of material assumed to require drilling and blasting. Mining will be carried out using staged cut-backs with four identified stages incorporated within the LOM final pit. Except for the initial plant commissioning, transitional ore will be stockpiled temporarily and blended into the process feed with the fresh ore. Waste rock will be stockpiled separately on the south-eastern side of the pit. The metallurgical work carried out to date indicates that nickel can be satisfactorily recovered from Ban Phuc DSS ore using crushing, milling and conventional flotation techniques. The work is considered sufficient to determine that the Ban Phuc DSS Mineral Resource represents a deposit with potential economic extraction.
Mining Factors	The in-situ deposit Mineral Resource Model is the basis for the mining model used for Life of Mine (LOM) planning and assessment reporting. The Mineral Resource Model provided as the basis of the LOM planning assessment is the OK resource model prepared by BMGS. The model has cell dimensions of 10m (east) by 10m (north) by 5m (elevation). Metal grades were supplied with the model as estimated proportional grades using the OK estimation technique. An estimated marginal cut-off grade was established at 0.3% Ni using an assumed long-term nickel price of US$7.50/lb and a final product price of US$6.53/lb for NCM Precursor Royalties were calculated to be 5.3% NSR (net smelter return). Mining costs used for the mine schedule were US$2.0/t mined, confirmed by in-country knowledge and experience. Process plant recoveries were estimated from grade recovery curves developed from bulk and variability flotation test work.

	For purposes of the baseline mining model, an input process cost for the 4.0Mtpa option was estimated at approximately US$11/t milled. Using the identified marginal Cut-off Grade, the proportion of ore per parcel and nickel grade above the Cut-off Grade were included within the mining model to allow export of the parcelled (ore + waste) blocks to the pit optimiser for open pit optimisation. Bulk mining (minimal selectivity) was assumed with 100t – 350t excavators feeding 50t - 140t rigid body haul trucks. A minimum mining width of 40m was assumed. Mining dilution and recovery were addressed in the mining block model through SMU analysis. Inferred Mineral Resources have been included for scoping study assessment within the LOM planning. No Ore Reserves are currently declared for the Ban Phuc DSS project. The proportion of Inferred Mineral Resource material accounts for 19% of potential mill feed. Mining Infrastructure requirements were assumed to be provided by the selected mining contractor with the mining performed on an outsourced basis. Grade control will be based on sampling from reverse circulation drilling spaced at approximately 15mE by 10mN with samples taken at 3.0 metre intervals downhole. All Grade Control sampling assays are assumed to be determined by fire assay on the mine site. Standard QAQC protocols will be applied which comprise of 1 in every 10 samples. Grade control drilling will precede ore identification and ore mark-out on a bench basis. Minimal infrastructure is required for the selected mining method.
Geotechnical Parameter	The pit slopes were assessed from an initial geotechnical assessment by PSM with the oxide (upper material) requiring an estimated overall slope angle of 37^0, whilst an overall slope angle of 56^0 was allowed for in the fresh rock except the southwest wall overall slope angle of 42^0.
Mine Scheduling	The mine scheduling programme includes revenue and cost information to maximise NPV. The scheduling software assesses the value generated by each block to determine whether the block is fed directly to the plant, stockpiled or treated as waste. Further financial analysis to determine more realistic absolute financial indicators and sensitivity analysis are performed separately using the tonnes and grades extracted from the schedule. The mine design of the Ban Phuc DSS Project consists of a series of nested conventional pit layouts with orebody access provided by a series of ramps. The orebody can be considered a layered sequence consisting of oxidised, transition and fresh mineralized zones. Mining will be of a conventional type back hoe and dump truck operation. High-level mine production schedules were evaluated for two scenarios considered (4Mtpa and 6Mtpa mill throughputs) using a starter pit with subsequent pushbacks to the target pit size. The schedules allowed an initial ramp up for the process plant in each case before full process plant production was assumed. In order to gain maximum value from the 6.0 Mtpa option, an estimated total peak rock movement of some 40Mtpa is required in year 1 of the schedule.
Mine Design Criteria	The mine design criteria were developed to allow for the development and assessment of designs to provide plant feed rates of 4Mtpa & 6Mtpa.

	For the conceptual pit design, three geotechnical domains namely Zone 1 – Completely Oxidised, Zone 2 – Partially Oxidised and Zone 3 - Fresh Weathering Domain, were used to define pit bench heights, berm widths and slope angles.
Mining Cost	The Scoping Study assumes the mining contractor will bear the total mining capital cost under an outsourced mining arrangement with the costs recovered by the mining contractor on a cost per tonne mined basis. Mining costs have been sourced from in-country knowledge and experience. The estimated base mining cost has applied an incremental cost with depth to account for increased haulage costs and the depth of mining increases in line with standard mining cost principles. All costs have been determined on a US dollar basis.
Metallurgy	Metallurgical factors and scoping level process flowsheets have been developed from metallurgical test work programs on master composite samples obtained during the 2019 & 2020 exploration drill programs. Test work included: *Upstream Processing* • Composite mineralogical examination; • ore and waste-ore transition comminution characteristics; • validation and optimisation of the flotation flowsheet identified by historical test programs; • production of sufficient concentrate via bulk flotation for hydrometallurgical evaluation; • rheology, thickening and filtration of both concentrate and tailings; • tailings deposition characterisation; • AMD and associated environmental testing; • production of sufficient concentrate via bulk flotation for hydrometallurgical evaluation. Comminution test work within the program is limited to ball mill, rod mill and abrasion indices testing due to limited core dimensions. Future dedicated metallurgical drill holes are scheduled to provide suitable samples for sag mill competency testing and ore flotation variability characterization. Based on the test work completed, the most suitable conditions for flotation of the disseminated sulfides were found to be: • Primary grind to P80 75µm; • Sodium silicate as the dispersant, added ahead of the rougher stage; • Rougher / scavenger flotation time of 30 minutes; • Three stages of cleaning, with flotation times of 15, 10 and 7 minutes; • Sodium ethyl xanthate as the collector, added to both the primary grind and regrind, and with staged additions throughout rougher flotation and to each cleaning stage. This processing route is conventional and well tested. Nickel flotation grade recovery curves were developed from initial flotation test work for the purposes of modelling economics of various concentrate products being supplied to the downstream refinery.



Processing Cost

Capital costs were provided by Como Engineers and Simulus Engineers who carried out a scoping level study for Blackstone Minerals on the Ban Phuc DSS Project. Capital and operating costs were estimated for three process plant throughputs, namely 2Mtpa, 4 Mtpa and 6Mtpa ore feed.

Capital Costs are tabulated below:

Unit	2.0Mtpa (Upstream)	4.0Mtpa (Upstream)	6.0Mtpa (Upstream)
USD (M)	64.1	89.3	131.4

Operating costs provided by Como Engineers were compiled from a variety of sources and compared against existing and planned operations elsewhere in Asia.

Pit optimisations

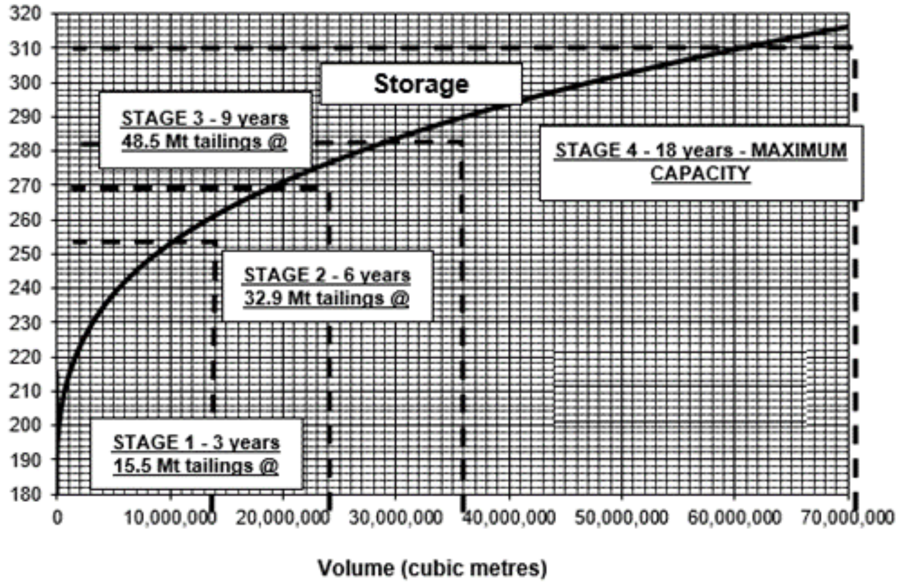
Pit optimisations were undertaken in Whittle and the project optimisations were completed using the Lerchs-Grossman (LG) algorithm in Prober© to calculate the optimal pit at specified input parameters that were determined prior to the study.

Infrastructure

The Son La Peoples Committee and Son La Industrial Zone Management Authority has proposed the Mai Son Industrial Park as a potential site for the Ta Khoa Project downstream processing facility. The 50-hectare lot is located 42km from the mine site and processing facility and 26km from the provincial capital of Son La. The site has necessary power and water supply infrastructure in place and is zoned for industrial application. Discussions have commenced with the province regarding investment incentives associated with the site which will be considered, along with alternate sites, in the next stage of study.

During historical operations a number of routes have been identified for road transport of goods to site with the size of the loads being the main determining factor as to which route is taken. Incoming freight will consist of equipment, spares, reagents, consumables and general merchandise. Some inbound goods will be in break bulk but others will be in 20 foot sea containers. Road transport of diesel fuel will be in conventional tanker trucks. Import equipment will be shipped via Hai Phong port. The road route passes Hanoi via the Hanoi-Hai

	Phong Expressway and then via Highway 6 from Hanoi to Son La and finally the intersection of Highway 6 with Highway 37 and then on Highway 37 to site.
Cut-Off Parameters	A marginal cut-off grade (COG) was estimated for nickel using: • a gross long-term nickel price of US$7.50/lb • processing costs of approximately $11/t A marginal Cut-off Grade has been estimated at 0.3% Nickel. The 0.3% Ni cut-off approximates an operational parameter that the Company believes to be applicable. This is in accordance with the guidelines of Reasonable Prospects for Eventual Economic Extraction ("RPEEE") per the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code 2012).
Capital Costs	The mining establishment cost was provided by in-country mining contractors. The process plant and infrastructure costs were estimated by Como and Simulus Engineers, the Optimize Group and Blackstone Minerals. The costs for the TSF were provided by Mr. Tony Sales. The capital costs include owner's project cost and contingency as calculated by Como Engineers and Simulus Engineers. The estimate base date is Q3 2020. The estimate is deemed to have an accuracy of ± 40%.
Operating Cost	The process plant operating costs were estimated and compiled by Como Engineers and Simulus Engineers with contributions from a number of sources including: • Reagent consumption based on test work by ALS Metallurgy and Blackstone; • Crushing and grinding modelling by Como Engineers; • Data from equipment vendors; • Como Engineers and Simulus Engineers databases.
Environmental	Baseline environmental studies in the area have been carried out since 2014 including an assessment of flora and vegetation, landforms, subterranean fauna, terrestrial environmental quality (including both mineralised and non-mineralised waste), terrestrial fauna, inland waters, air quality, heritage, archaeology, social surrounds and human health. Since the baseline studies a program of monitoring environment, vegetation, and implementation of minimizing environment impact has been maintained ongoingly and the project's Environmental Impact Assessment Report was approved by the Government of Vietnam. A preliminary assessment and construction cost estimate have been prepared by independent consultant Mr. Tony Sales (design and construction engineer for the current Ban Phuc TSF) for an additional TSF located approximately 3km west of the existing plant site. TSF embankment volumes have been made based on tailings production estimates and tailings deposition characteristics. An allowance was made in the initial capital cost and the sustaining capital cost estimates for the TSF.

	
Social	The project values the community in which it works and takes seriously its community and environmental obligations to ensure the community benefits from all stages of the project's activities. We have a history of operating responsibility and have the endorsement of the local community to operate. Our social and community values are demonstrated in the relationships we share with the local community, the economic and employment opportunities we provide, and engagement we have on environmental activities.
Audits or Reviews	The Scoping Study has been subject to a third-party review by Ian Mc Kenzie, Vice President Engineering at Optimize Group, an experienced project development firm with significant mineral processing experience in the South East Asia region.
Other	There are no known current impediments to the progression of the project or foreseen encumbrances to the granting of a licence to operate. Continued discussions with the regulatory authorities and submission of the mine plan and closure plan will be submitted to the Vietnam government authorities during the course of the pre-feasibility study.

BLACKSTONE MINERALS

Looking forward. Mining green.

CONTACT DETAILS

Address
Suite 3, Level 3, 24 Outram Street,
West Perth, WA, 6005

Postal Address
PO BOX 1175, West Perth, WA 6872

Email
admin@blackstoneminerals.com.au

Phone
+61 8 9425 5217

Fax
+61 8 6500 9982