



# **SOUTH HARZ POTASH** LTD.

## Ohmgebirge Development Scoping Study

ASX: SHP

August 2022





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## Forward looking and Competent Person's statements

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Mrs Elizabeth de Klerk M.Sc., Pr.Sci.Nat., SAImm., Managing Director and Senior Geologist of Micon International Company Limited (UK) has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which she 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". Mrs De Klerk consents to the inclusion in this document of the matters based on this information in the form and context in which it appears.

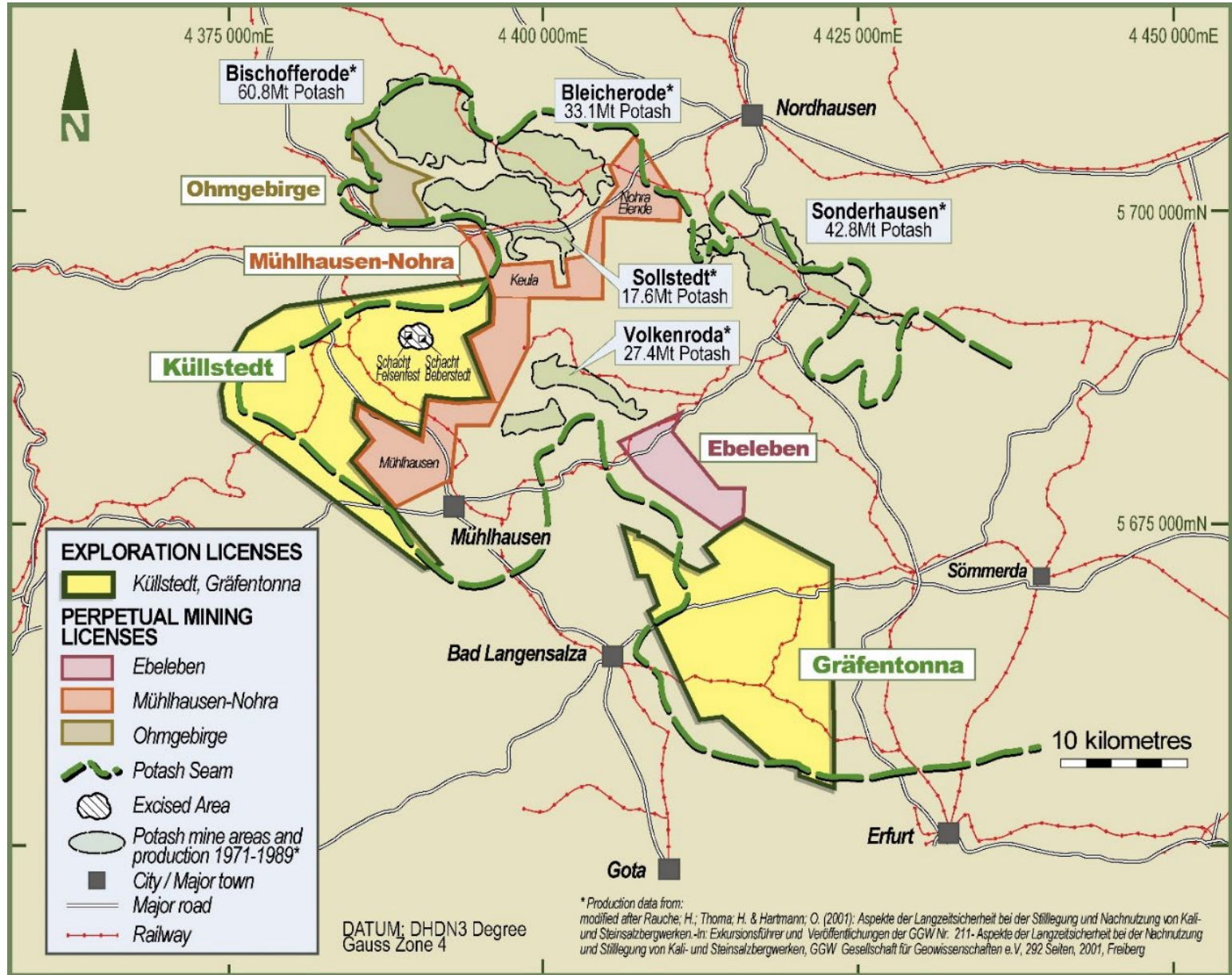
The information in this announcement which relates to the Mineral Resource Estimates for the Ebeleben, Mühlhausen-Keula, Mühlhausen-Nohra Elende, Küllstedt and Ohmgebirge Mining Licence areas, as set out in the Appendix to this document, were compiled and generated by Mrs De Klerk under commission by SHP. Mrs De Klerk holds no shares in SHP.

# South Harz Potash LTD.



Growing a responsible potash business in the heart of Europe

Ohmgebirge Scoping Study demonstrates the technical and financial robustness of a vertical shaft access, underground mining operation with a conventional cold water leach - hot crystallization process producing approximately 1 Mtpa of premium Muriate of Potash



# A Tier 1 Potash Project

Scoping Study evidences world-class development in every sense

## OUTSTANDING LOCATION



- First world jurisdiction
- Established local infrastructure
- Rich potash mining history

## LOW COST DELIVERY



- Operating costs expected in bottom half of global cost curve
- Below average capital intensity for equivalent scale project

## EXCELLENT MINERALISATION



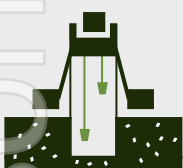
- Relatively shallow, thick deposit
- Simple, well-established minerology

## HIGH SCALABILITY

**5.3**  
billion  
tonnes

- Already Tier 1 scale
- Broader resources provide available inventory for multiple developments

## SIMPLE EXTRACTION



- Long established process
- Extensively regionally proven mining and processing mechanics

## LOW-IMPACT COMMITMENT



- Zero permanent waste piles on surface
- Zero industrial water discharges
- Low delivered carbon footprint

## KEY OHMGEBIRGE PARAMETERS (+/- 30%)<sup>1</sup>

Ore throughput	Mtpa ROM	4.5
<b>Initial life-of-mine</b>	<b>Years</b>	<b>21</b>
K <sub>2</sub> O head grade	%	13.5%
<b>MOP output and sales (+60% K<sub>2</sub>O)</b>	<b>Mtpa MOP</b>	<b>1.0</b>
Industrial salt sale (+99% NaCl)	Mtpa NaCl	1.0
<b>Pre-production capital expenditure</b>	<b>US\$M</b>	<b>620</b>
Cash operating cost (AISC, delivered NW Europe) – pre salt credits	US\$/t MOP	172
Industrial salt price (delivered NW Europe)	US\$/t	79
<b>Cash operating cost (AISC, delivered NW Europe) – post salt credits</b>	<b>US\$/t MOP</b>	<b>93</b>
Weighted average FOB Hamburg equivalent potash price	US\$/t MOP	385
<b>NPV<sub>8%</sub> (post-tax, real basis, ungeared)</b>	<b>US\$M</b>	<b>1,279</b>
<b>IRR (post-tax, real basis, ungeared)</b>	<b>%</b>	<b>26.6%</b>
<b>Annual free cash flow post ramp-up</b>	<b>US\$M pa</b>	<b>229</b>
<b>Payback following commissioning</b>	<b>Years</b>	<b>3.6</b>
Project net cashflow (post-tax)	US\$M	3,928

<sup>1</sup> For full Ohmgebirge Development Scoping Study details, refer South Harz ASX release dated 8 August 2022, Ohmgebirge Scoping Study Evidences World-Class Potash Development at South Harz Project. South Harz confirms that it is not aware of any new information or data that materially affects the information included in that release. All material assumptions and technical parameters underpinning that release continue to apply and have not materially changed.



# Corporate snapshot

ASX | SHP



## CAPITAL STRUCTURE

Share price (01 August 2022)	A\$0.10
Shares on issue	532M
Options and performance rights	101M
Market capitalisation (undiluted)	A\$53.2M
Cash (30 June 2022)	A\$6.7M
Debt (30 June 2022)	A\$0.0M

## BOARD OF DIRECTORS

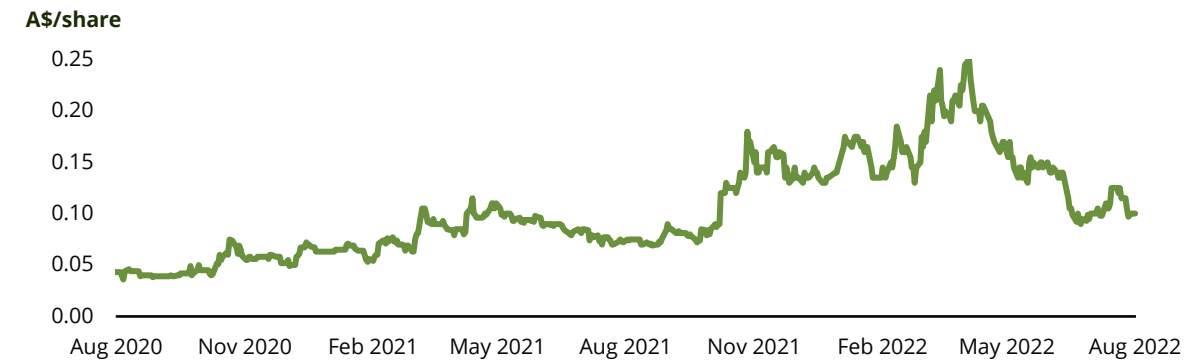
Executive Chairman	Ian Farmer
Non-Executive Director	Dr Reinout Koopmans
Non-Executive Director	Rory Luff
Non-Executive Director	Hansjorg Plaggermars
Non-Executive Director	Len Jubber

1. Register details as at 5 May 2022

## MAJOR SHAREHOLDERS<sup>1</sup>



## SHARE PRICE HISTORY



# 01 | KEY OUTCOMES



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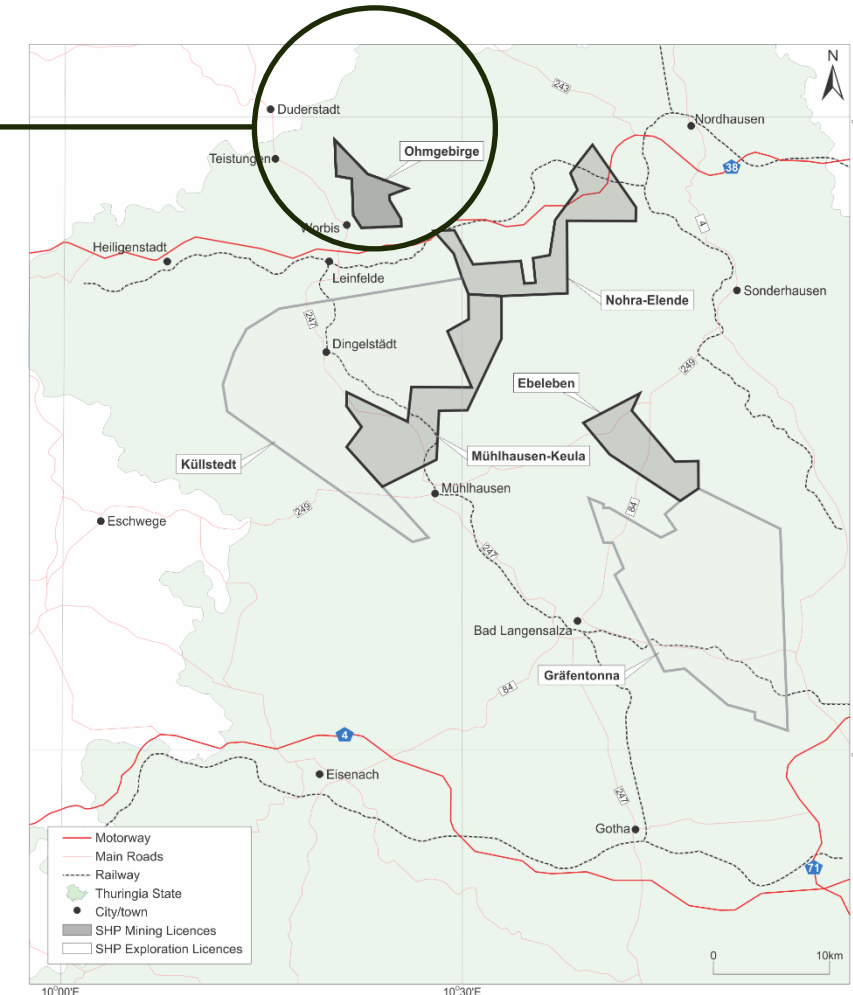
# Historic potash mining district

Within the central German state of Thuringia, 100 years of mining history

## Ohmgebirge Development



- Assets historically part of the East German state
- Purchased via tender from the German Government in 2017
- Licences granted in perpetuity and unencumbered by royalties or rents
- Total of five 100%-owned project areas within central Europe
- Three perpetual potash mining licences and two potash exploration licences
- Total area of approximately 659km<sup>2</sup>
- Ohmgebirge Development located in the north of Thuringia covering an area of approximately 25 km<sup>2</sup>



# Advancing under South Harz

## Recent Ohmgebirge confirmatory drilling and Mineral Resource update

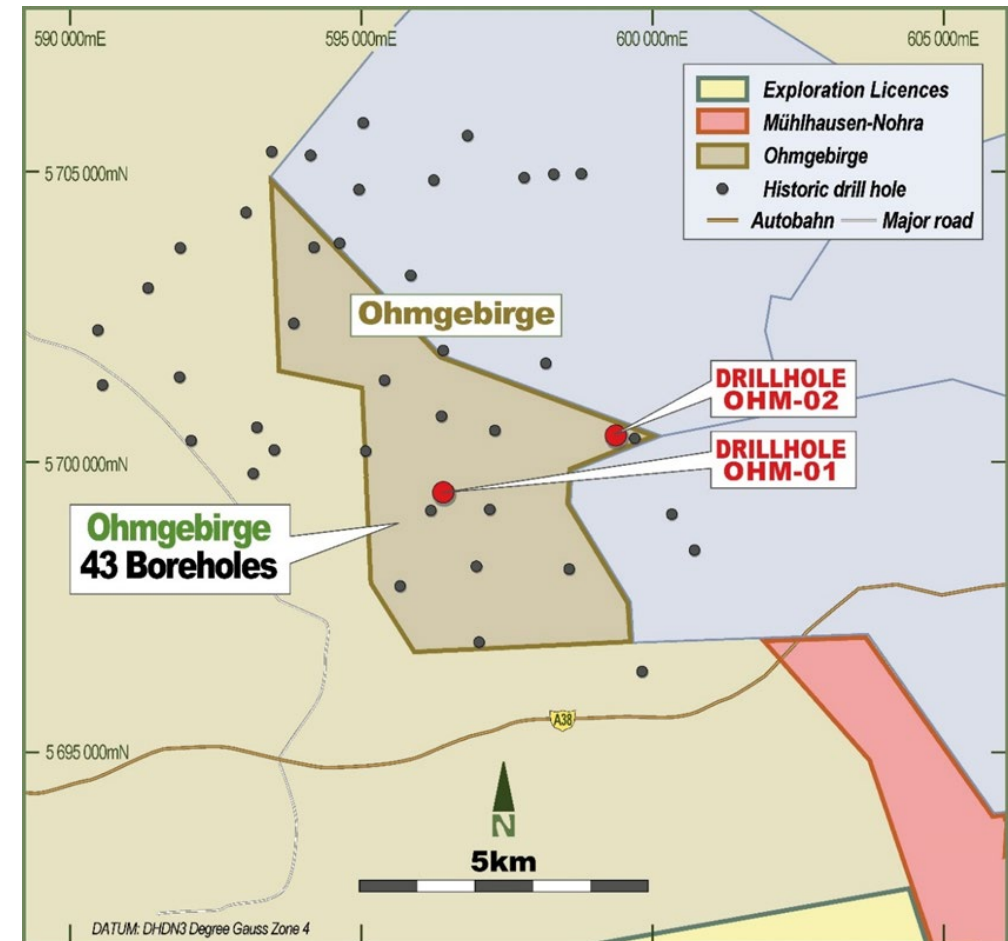
- Two confirmatory drill holes (OHM-01 and OHM-02) completed in H1 2022 to complement extensive historical exploration
- Database of 43 diamond drill cores (15 within the Ohmgebirge licence boundary), 29 with chemical and mineralogical assay data
- Updated Ohmgebirge Mineral Resource estimate with extensive categorisation upgrade announced July 2022<sup>1</sup>
- Approximately 89% of the Sylvinite seam resource now residing in the Indicated classification

Mineralised seam <sup>1</sup>	Categorisation	Resource (Mt)	K <sub>2</sub> O (%)	K <sub>2</sub> O (Mt)
Sylvinite	Indicated	258	13.54	35
Sylvinite	Inferred	32	12.84	4
<b>Sylvinite<sup>2</sup> total</b>		<b>290</b>	<b>13.47</b>	<b>39</b>
Carnallitite	Inferred	48	9.81	5
<b>Carnallitite<sup>3</sup> total</b>		<b>48</b>	<b>9.81</b>	<b>5</b>
<b>Total Ohmgebirge Mineral Resources</b>		<b>338</b>	<b>12.91</b>	<b>44</b>

1. For full Mineral Resource estimate details, refer Appendix and South Harz ASX release dated 12 July 2022, Landmark Resource Upgrade at Ohmgebirge. South Harz confirms that it is not aware of any new information or data that materially affects the Mineral Resource estimate information included in that release. All material assumptions and technical parameters underpinning the Mineral Resource estimate in that release continue to apply and have not materially changed.

2. Sylvinite is the mineral name for potassium chloride (KCl), the most common form of potash.

3. Carnallitite is made up of potassium chloride, magnesium and water and can be extracted using solution mining





# Scoping Study rationale and team

Premium geological and mining industry experts

## RATIONALE

- To evaluate the technical and financial robustness of a modern, low-impact mining development of the Ohmgebirge deposit to produce premium MOP
- This study is the first time potash mining opportunities in the South Harz district have been evaluated based on modern, internationally recognized standards and procedures

## STUDY LED AND MANAGED BY MICON INTERNATIONAL

- **Micon International:** Geology, Mineral Resource, Environment and Social
- **K-UTEC:** Process Flowsheet and Plant Design, Mine Design and Scheduling, Site Layout, Operating and Capital Cost Estimates
- **Crystal Strategy:** Potash Market Outlook and Pricing, Product Marketing Strategy
- **Ukwazi:** Financial Analysis
- **ERM:** Permitting



*"We have had excellent support from a formidable team of premium global geological and mining industry consultants in undertaking the Ohmgebirge Scoping Study – some of whom have a long history with, and deep expertise in, the South Harz district as the cradle of potash mining globally."*

**- South Harz Executive Chairman, Ian Farmer**

# A Tier 1 Potash Project



Scoping Study evidences world-class development in every sense

**POSITIONED TO  
BECOME  
EUROPE'S  
MOP  
SUPPLIER  
OF CHOICE**



## OHMGEIRGE DEVELOPMENT HIGHLIGHTS

- Outstanding, first world jurisdiction
- Region rich with infrastructure and potash mining history
- Relatively shallow, thick deposit with simple, well understood mineralogy
- Mining and processing mechanics extensively proven in the district
- Low-impact development – zero permanent waste piles and industrial water discharges
- German grid power approximately 50% renewable
- Operating costs projected in the bottom half of the global unit cost curve
- Forecast capital intensity to be comfortably below average
- Proximity to European markets offers huge transport cost advantages and lower relative carbon footprint versus other suppliers
- Clear strategic opportunity for South Harz to become a new supplier of choice for potash in Europe
- Tier 1 scale with broader South Harz Project resources delivering potential for multiple developments
- Range of potential funding pathways available given scale, projected economics and strategic location



# Responsible and sustainable

Building a strong social license to operate

## TARGETING

# SECTOR-LOW EMISSIONS



## FOOTPRINT FOR DELIVERED PRODUCT

- Underground operation results in **minimal surface disturbance and lower carbon emissions**
- Unwavering commitment to **low impact mining practises**
  - Zero permanent waste piles on surface
  - Zero industrial water discharges
- Proximity to market access delivers **low freight-related carbon emissions** versus competitors in Canada and eastern Europe
- Dedicated to making a **positive social impact** in Thüringia
  - Significant investment to directly benefit regional population
  - Delivering hundreds of new, highly skilled local jobs



*"At South Harz, we have a deep commitment to developing Ohmgebirge in a responsible and sustainable fashion. We seek to advance our projects in a way that never loses sight of this fundamental truth. Our local community engagement is already strong and our focus on environmental stewardship is unwavering."*

**- South Harz Executive Chairman, Ian Farmer**

# Physical outcomes

Robust operational base

**4.5 Mtpa**

Nameplate ROM  
capacity

**13.5%**  
K<sub>2</sub>O head grade

**1.0 Mtpa**

Nameplate MOP  
production and sales

**21 years**  
Initial mine life

**2.0 Mtpa**

NaCl by-product  
production

**1.0 Mtpa**  
NaCl by-product  
sales

## KEY PHYSICAL PARAMETERS

KCl product	Mtpa MOP	1.00
NaCl by-product production	Mtpa NaCl	2.00
Ore throughput	Mtpa ROM	4.50
Total adjusted exploitable ore	Mt	134.1
Initial life-of-mine	Years	21
K <sub>2</sub> O head grade	%	13.5%
<b>Standard MOP output and sales (+60% K<sub>2</sub>O, SMOP K60)</b>	<b>Mtpa MOP</b>	<b>0.40</b>
<b>Granular MOP output and sales (+60% K<sub>2</sub>O, GMOP K60)</b>	<b>Mtpa MOP</b>	<b>0.35</b>
<b>Granular MOP output and sales (+60% K<sub>2</sub>O, GMOP K60 Brazil)</b>	<b>Mtpa MOP</b>	<b>0.25</b>
Industrial salt sale (+99% NaCl)	Mtpa NaCl	1.00

*Of the Mineral Resources scheduled for extraction in the Scoping Study production plan approximately 89% are classified as Indicated and 11% as Inferred. 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 plan itself will be realised. The mine production plan does not incorporate mining of Inferred Mineral Resources during the first three years of operation and it is unlikely that Inferred Mineral Resources will contribute meaningfully to scheduled production until after Year 16 of the mine schedule. South Harz confirms that the financial viability of the Ohmgebirge Development is not dependent on the inclusion of Inferred Resources in the production schedule.*



# Financial outcomes

Highly attractive projected economic returns

**US\$385/t**

Weighted average MOP  
FOB price

**US\$1,279**

Post-tax NPV<sub>8%</sub>  
(real basis, ungeared)

**US\$93/t**

Cash operating costs  
(AISC, delivered NW Europe)

**3.6 years**

Post-tax  
payback period

**US\$620M**

Pre-production capital  
expenditure

**26.6%**

Post-tax IRR  
(real basis, ungeared)

## KEY FINANCIAL OUTCOMES

### Price inputs (LOM average)

Weighted average FOB Hamburg equivalent potash price	US\$/t MOP	385
Industrial salt price (delivered NW Europe)	US\$/t	79
EUR/USD exchange rate	US\$/€	1.02

### Key metrics

NPV <sub>8%</sub> (pre-tax, real basis, ungeared)	US\$M	1,919
IRR (pre-tax, real basis, ungeared)	%	32.8
<b>NPV<sub>8%</sub> (post-tax, real basis, ungeared)</b>	<b>US\$M</b>	<b>1,279</b>
<b>IRR (post-tax, real basis, ungeared)</b>	<b>%</b>	<b>26.6</b>
Payback period (post-tax, from first production)	Years	3.6
Pre-Production Capital Expenditure	US\$M	(620)
<b>Project Pre-tax Cashflow</b>	<b>US\$M</b>	<b>5,572</b>
Tax Paid (at 29.65%)	US\$M	(1,644)
<b>Project Free Cashflow</b>	<b>US\$M</b>	<b>3,928</b>

### Unit cash operating costs

Gross operating cost	US\$/t MOP	171.6
Salt by-product credit	US\$/t MOP	(79.0)
<b>Net operating cost</b>	<b>US\$/t MOP</b>	<b>92.6</b>

# Sale price upside

## Conservative average MOP price forecast

- Ohmgebirge Development Scoping Study utilises a weighted average FOB Hamburg equivalent **MOP price of US\$385/t**
- Internal view based on a combination of the Argus price deck and consensus forecast estimates:
  - Standard MOP, delivered NW Europe: US\$370/t
  - Granular MOP, delivered NW Europe: US\$395/t
  - Granular MOP, CFR Brazil: US\$445/t
- Clear potential upside for significantly greater revenue realisation should future contract prices reflect **current reported spot of >US\$900/t**

Forecast persistent  
European MOP market  
**DEFICIT**

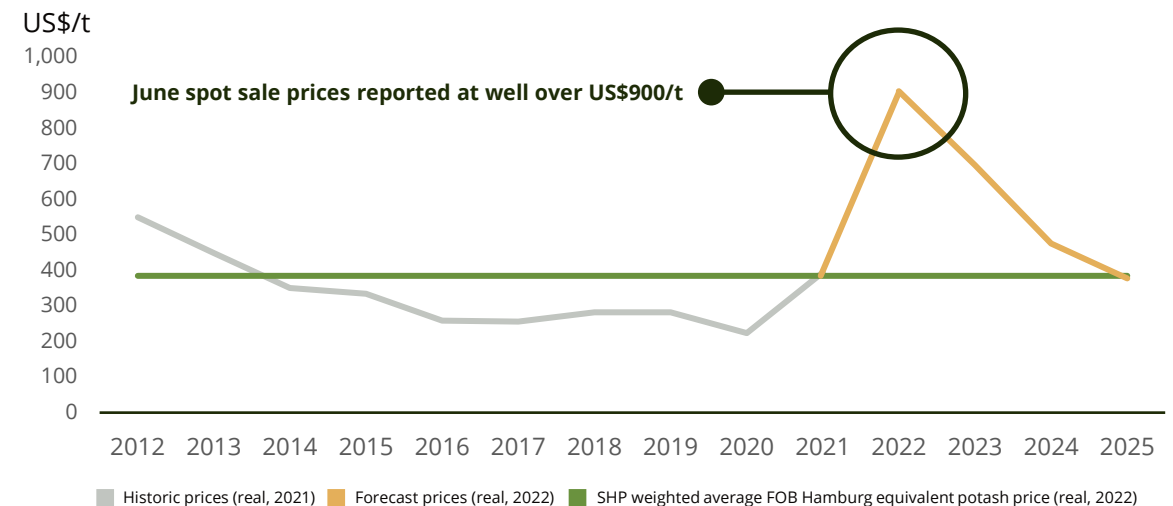
Spot MOP price<sup>1</sup> input  
yields a post-tax NPV<sub>8%</sub>  
**US\$4,246M**

1. At US\$900/t average across SMOP fob NW Europe, GMOP fob NW Europe and GMOP cfr Brazil

MOP price data (US\$/t), real	2022	2023	2024	2025
FOB Vancouver (Standard)	882	682	462	369
CFR Brazil (Granular)	1,093	820	507	414
FOB NW Europe (Standard)	904	696	476	378

Source: Argus 2022

### MOP FOB NW Europe (Standard, bulk)



Source: Argus 2022 and South Harz Potash internal forecast

# Excellent future scalability

Long-term, multiple operation development opportunity

## AN ENDOWMENT OF SIGNIFICANT QUALITY AND SCALE

**5.3**  **AT 10.8%**  
**Bt K<sub>2</sub>O**

## JORC MINERAL RESOURCE ESTIMATE<sup>1</sup>

- Five 100%-owned project areas
- Already a large, high grade resource base
- Scope for future resource growth
- Perpetual mining licenses - key differentiating feature of our asset profile
- Facilitates optionality ensuring capital efficiency
- Growth timed to match market demand
- Ensures relevance, corporate appeal and maximisation of long term cost competitiveness

1. For full Mineral Resource estimate details, refer Appendix and South Harz ASX release dated 12 July 2022, Landmark Resource Upgrade at Ohmgebirge. South Harz confirms that it is not aware of any new information or data that materially affects the Mineral Resource estimate information included in that release. All material assumptions and technical parameters underpinning the Mineral Resource estimate in that release continue to apply and have not materially changed.



# Delivery pathway

## Parallel advancement of detailed studies and EIA

- Board approved progression to PFS to address remaining open scope questions
- Detailed environmental impact assessment (EIA) to be compiled concurrently with the development of a Definitive Feasibility Study (DFS)
- Targeting commencement of construction activities during mid CY2025

Target schedule	FY23				FY24				FY25				FY26				FY27			
Quarter	SEP	DEC	MAR	JUN	SEP	DEC	MAR	JUN	SEP	DEC	MAR	JUN	SEP	DEC	MAR	JUN	SEP	DEC	MAR	JUN
Site selection	■	■																		
Pre-Feasibility Study	■	■	■	■	■	■														
Environmental Study (EIA)	■	■	■	■	■	■														
Definitive Feasibility Study	■	■	■	■	■	■	■	■	■	■										
Project permitting			■	■	■	■	■	■	■	■	■	■	■	■						
Project construction												■	■	■	■	■	■	■	■	■

**Legend:**  
 ■ Target  
 ■ Contingency

*Target development schedule includes forecast internal and external / third-party timeframes and includes contingency allowances. Schedule is subject to change in response to changes in market and regulatory environments.*

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## 02 | MINING AND PROCESSING



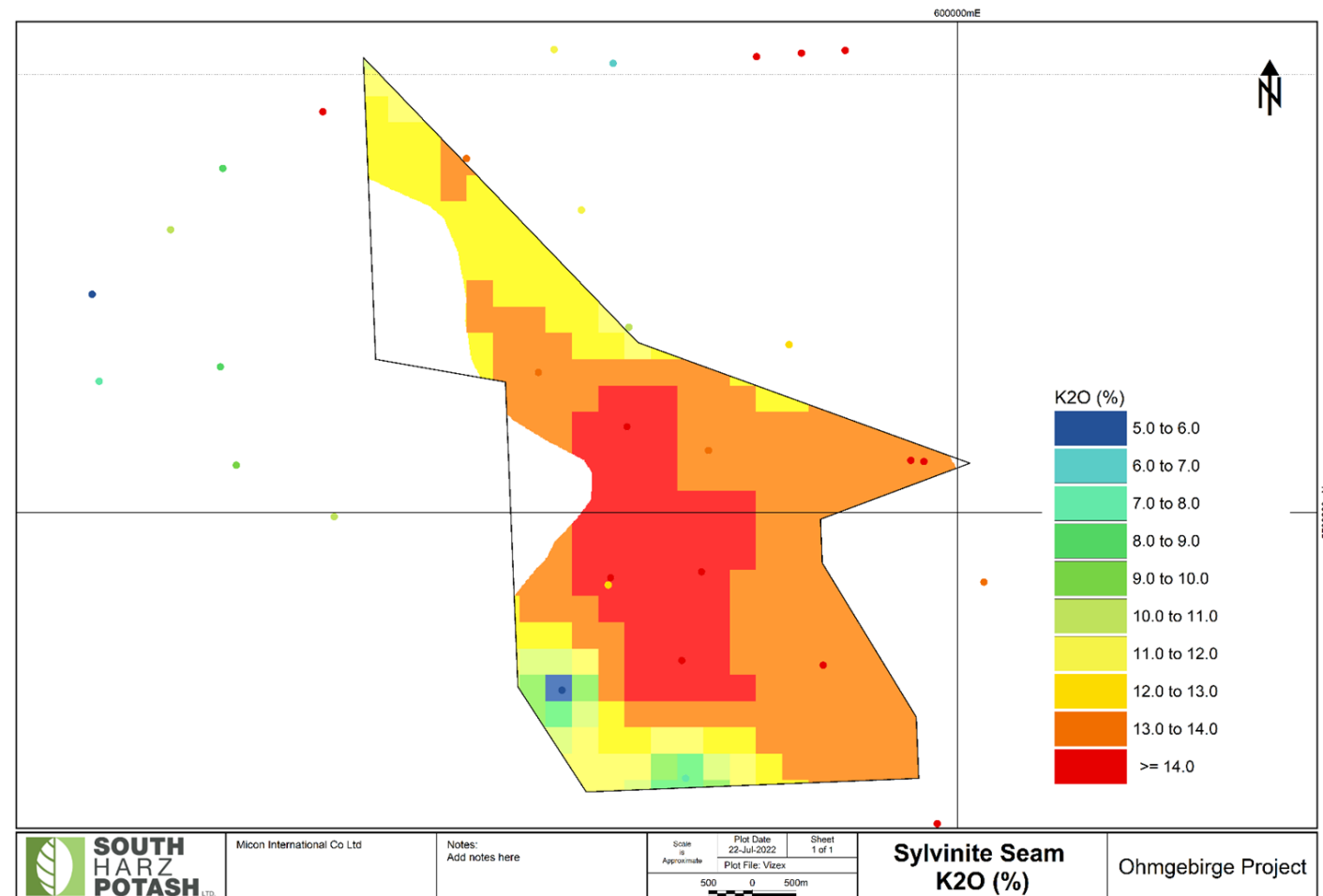
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HARZ  
POTASH** LTD.

# High-grade Sylvinite seam

Ohmgebirge Mineral Resources total 338 Mt at 12.91%  $K_2O$ <sup>1</sup>

- Indicated Sylvinite Mineral Resource of 258 Mt at 13.5%  $K_2O$ <sup>1</sup>
- Sylvinite is the mineral name for potassium chloride (KCl) and the most common form of potash
- The Sylvinite seam is comprised of KCl, NaCl and sulphates (anhydrite, kieserite and polyhalite)
- The rich potash seam at Ohmgebirge can be classified, according to the local terminology, as Hartsalz
- Focus is on the development, mining, processing and sale of potash extracted from the high grade Sylvinite resource

<sup>1</sup> For full Mineral Resource estimate details, refer Appendix and South Harz ASX release dated 12 July 2022, Landmark Resource Upgrade at Ohmgebirge. South Harz confirms that it is not aware of any new information or data that materially affects the Mineral Resource estimate information included in that release. All material assumptions and technical parameters underpinning the Mineral Resource estimate in that release continue to apply and have not materially changed.





# Mine design and parameters

## Typical underground room and pillar potash mining

### MINE ACCESS AND VENTILATION

- Mine access and ore haulage via new vertical hoisting shaft with assumed 7m diameter
- Shaft depth dependent on the chosen location - estimated to be between 750m and 780m
- Final shaft design will be capable of handling annual throughput of 4.5 Mtpa plus development waste
- Sufficient mine ventilation is expected to be available via utilisation of existing historical shaft infrastructure in the immediate area

### MINE METHOD AND DESIGN

- Conventional room and pillar mining in long chambers (up to 500m)
- Backfilling of the mined-out voids to take place shortly after mining using waste NaCl and insolubles (hydraulically transported as slurry)
- Pillar re-mining to be employed after backfilling and consolidation
- ROM ore extracted using continuous miners and transported via shuttle cars to panel belt conveyors with feeder-breakers

### KEY PHYSICAL AND MINING PARAMETERS

Parameter	Value	Volume
KCl Product (MOP)	1,000,000 t/a	-
Raw Salt Extraction	4,500,000 t/a	2,040,000 m <sup>3</sup> /a
Average Raw Salt Density	2.2 t/m <sup>3</sup>	-
Mined Volume Available for Backfilling	80%	-
Volume Available for Backfilling	-	1,636,000 m <sup>3</sup> /a
Residue for Backfilling (Halite-Anhydrite-Clay)	1,650,000 t/a	970,000 m <sup>3</sup> /a
NaCl (Salt) By-Product:	2,000,000 t/a	-
Product NaCl (minimum)	1,000,000 t/a	-
NaCl for Backfilling (maximum)	1,000,000 t/a	666,000 m <sup>3</sup> /a
Density Backfilled Halite-Anhydrite	1.7 t/m <sup>3</sup>	-
Density Backfilled NaCl	1.5 t/m <sup>3</sup>	-

# Flowsheet selection and design

## Conventional cold leaching and evaporation-hot crystallization

### KEY PROCESS ATTRIBUTES

- Ore quality not limited to a maximum  $\text{MgSO}_4$  content, selective mining is not necessary
- All components of ore can be extracted and sold as products
  - Not necessary for permanent waste to be deposited on the surface, no tailings facility is required
- No brine waste produced
- Simple process route requires a lower number of employees
- Lower demand for steam for heating processes
- Lower consumption of energy and other auxiliary materials
- Assumed overall recoveries of 90%



*"We believe conventional cold leaching and evaporation-hot crystallisation provides the optimal process route for our deposit. It provides a strong, low-risk mineral recovery without so many of the disadvantages associated with hot leaching and floatation."*

**- Chief Operating Officer, Jason Wilkinson**

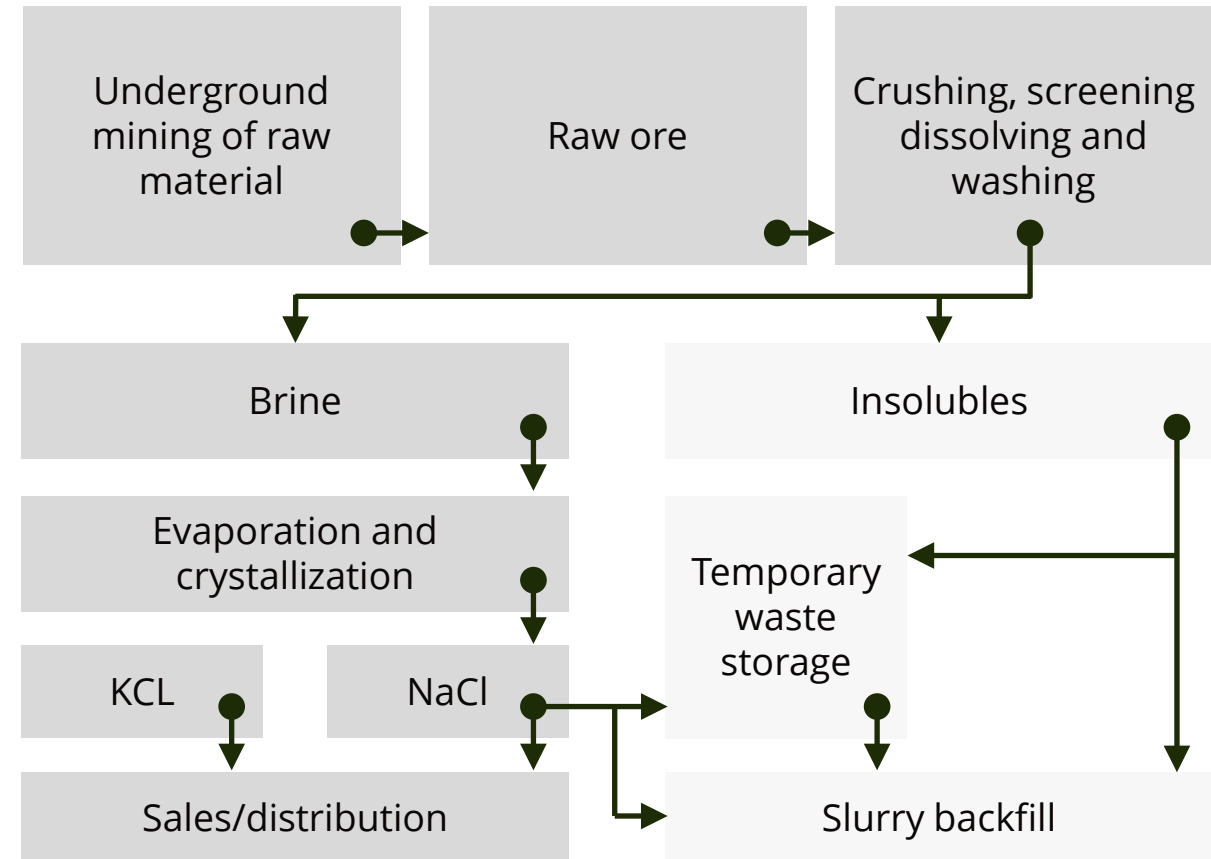
# Process flowsheet and route

## Conventional cold leaching and evaporation-hot crystallization

### KEY PROCESS FLOWSHEET STEPS

- Cold leaching of soluble chloride minerals, KCl and NaCl, at approximately 20°C with water
- Separation of undissolved sulphate minerals and undissolved NaCl and usage as backfilling material
- Clarification of leaching liquor and separation of fines (clay, anhydrite)
- Mixing of clarified potash liquor with recycled mother liquor and heating this mixed brine to boiling temperature
- Evaporation of water with mechanical vapour compression at approximately 110°C
- Separation of crystallised NaCl
- Cooling of hot KCl-NaCl liquor in multi-step vacuum crystallisation plant
- Separation of obtained KCl-crystalline crop from the mother liquor and preparation of Muriate of Potash (MOP) with a K<sub>2</sub>O content of 60% to 62%
- Recycling of cold KCl-NaCl-mother liquor back to the evaporation process

### BLOCK FLOW DIAGRAM OF PROCESS ROUTE



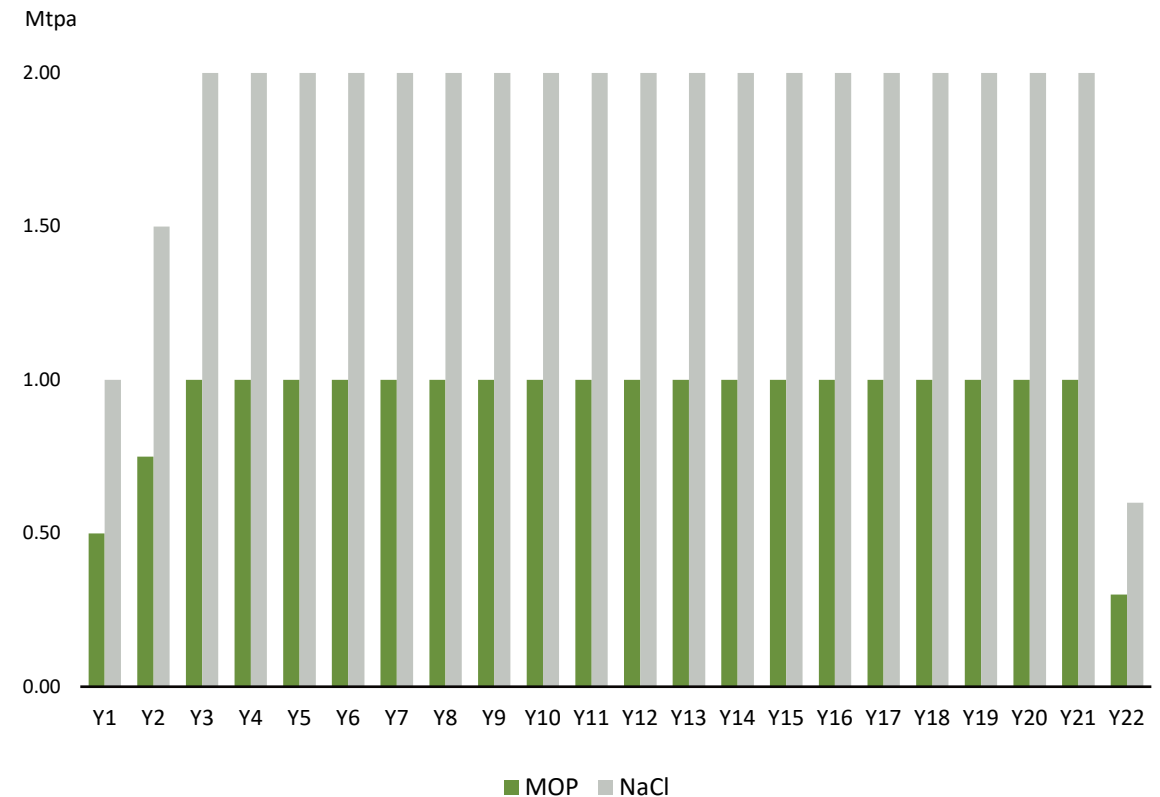


# Production output

Steady state 1Mtpa MOP and 2Mtpa NaCl

- Two year ramp up period
- Nameplate MOP output of 1.0 Mtpa expected to be comprised of the following product split:
  - Standard MOP 60% K<sub>2</sub>O (SMOP K60): 400 ktpa
  - Granular MOP 60% K<sub>2</sub>O (GMOP K60): 350 ktpa
  - Granular MOP 60% K<sub>2</sub>O Brazil (GMOP K60 Brazil): 250 ktpa
- Nameplate 2.0 Mtpa salt (+99% NaCl) production:
  - 1.0 Mtpa for sale to European industrial grade salt markets
  - 1.0 Mtpa backfilled into underground mining voids

## OUTPUT SCHEDULE







## 03 | UTILITIES AND LOGISTICS

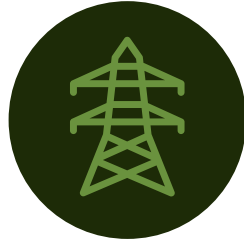


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# Energy and water

## Readily available solutions



### ENERGY

- Electrical power for the process plant and the mine provided by on-site, natural gas-fired co- (or tri-) multi-engined generation plant
- Process cooling requirements met using absorption chillers (utilising surplus heat from natural gas plant)
- Cogeneration plant backed up by a high voltage substation connected to the grid via conventional overhead lines – German grid, +50% renewable power
- Further energy studies to be completed during next stage of the project – including a review of the use of renewables, and other sources, to supplement the primary energy choice



### WATER

- Self-imposed commitment to zero quantities of industrial water discharges into surface water
- Water consumption on site planned to be strictly controlled and monitored
- Significant recirculation, recovery and reuse of water in leaching circuits, evaporation circuits and the crystallization plant is planned minimising freshwater makeup
- Make up water provided from treated rainwater run-off, boreholes and municipal supplies
- Rainwater run-off preferentially collected and diverted to storage for re-use



# Product transport and residue

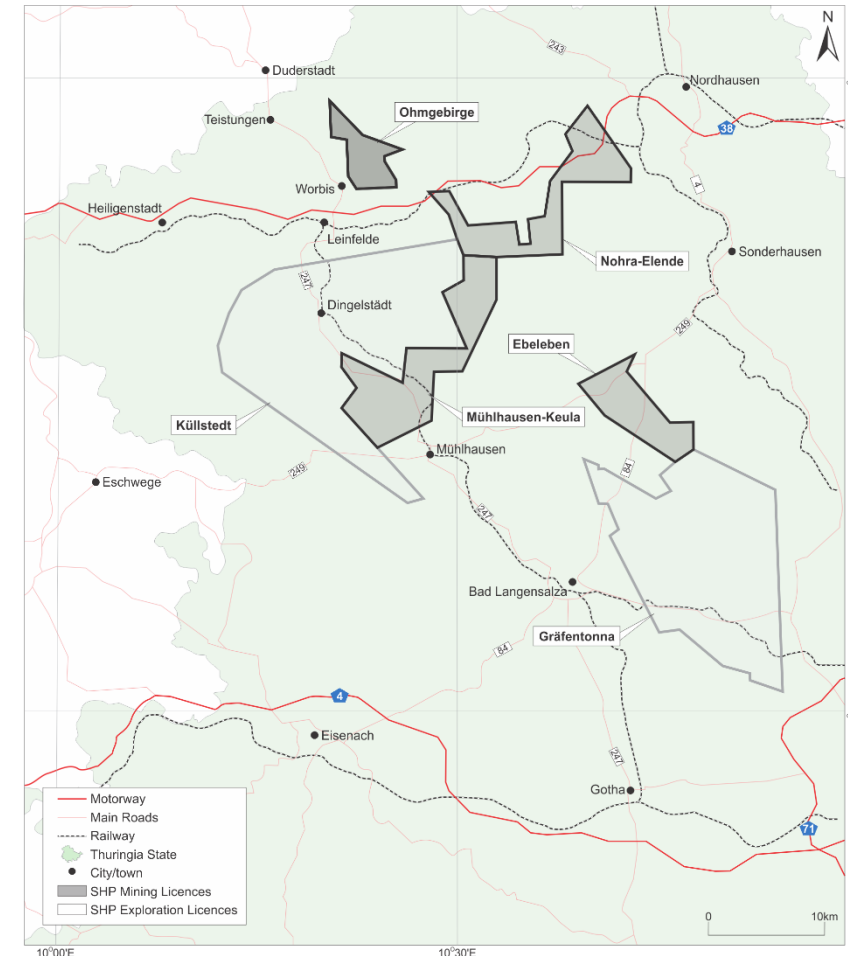
## Modern, efficient regional transport network

### ATTRACTIVE PRODUCT TRANSPORT LOGISTICS

- Modern freight rail network with an existing line proximate to the Ohmgebirge site serves the South Harz region
- Product to be transported via this network which services the major hubs of Northwest Europe and the Hamburg and Rotterdam ports
- Central and Eastern European sales delivered by combinations of rail, truck and river barge - depending on customer location
- Transportation costs estimated to be US\$30/t for NW and Central European customers
- Granular MOP sales to Brazil (during the European off season) sold CFR with assumed additional shipping and handling cost of US\$50/t – Brazilian landed MOP commands a premium price offsetting additional transportation costs

### RESIDUE BALANCE – ZERO SURFACE WASTE

- No surplus residue material expected during steady state operation of mine or plant – all residues planned to be utilised as mining backfill
- Expected that ~1 Mtpa of the 2 Mtpa salt (NaCl) production will also be backfilled to mining voids
- Excavated material from sinking of initial underground infrastructure and the first years of mine operation to be appropriately, temporarily stockpiled (ie before excavation voids are available for backfilling)
- No permanent waste stockpiles to remain on site



## 04 | LICENCE TO OPERATE



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# Environmental focus

## Unwavering commitment to low impact mining practices

- Environmental Impact Assessment (EIA) underway – identification and evaluation of environmental risks and impacts
- Ohmgebirge Environmental Standards and Monitoring System (ESMS) to be developed – focus on key elements of EIA process and associated conditions attached to the Environmental Licence
- Unwavering, self-imposed commitment to low impact mining practises
  - Zero permanent waste piles on surface
  - Zero industrial water discharges
  - No major protected areas impacted
  - 50% renewable grid power preferenced



# Social commitments

## Reinvigorating a multi-generational mining community

- Region with a century-long history in potash mining and a positive view of future operations
- Taking an early and proactive approach to local stakeholder engagement
- Progressing with awareness and respect for the traditions of the long local mining history
- Committed to making a positive social impact to the broader Thüringen community
- Significant future investment will directly benefit the regional population
- Anticipate the Ohmgebirge Development alone will deliver hundreds of new, highly skilled local jobs



*"I am personally delighted to be part of the next generation of mining activities in the South Harz region. I look forward my continued work with our local stakeholders as we progress the Ohmgebirge Development in an environmentally sensitive way."*

**- Regional Director Thüringia, Germany, Dr Babette Winter**



# Permitting overview

## Four step process within the jurisdiction of the Thuringia State

Phase	Detail and authority
<b>Step 1:</b> Regional and Spatial Planning Procedure	<ul style="list-style-type: none"><li>▪ Determines whether project can be implemented in a spatially, socially and environmentally compatible manner at the planned location</li><li>▪ Applies for projects with significant impact on development of a state or region measured by its effect on environment, supply of public goods, traffic, plus economic and social goals of state development plan</li><li>▪ Assesses and determines the feasibility of the project in a broader scope at an early planning stage</li><li>▪ <b>A formal EIA is required</b></li><li>▪ Approval authority is <b>Thüringer Landesverwaltungsamt (TLVwA)</b></li></ul>
<b>Step 2:</b> Planning Approval Procedure	<ul style="list-style-type: none"><li>▪ Covers all mandatory regulatory processes and permits for General Operating Plan</li><li>▪ Includes all approvals and permits by the competent authorities to construct a mine and related facilities, except for very certain water law permits</li><li>▪ A typical operator regards a Step 2 approval which has become final as a sufficient basis for a project FID</li><li>▪ <b>Requires an EIA to be submitted as part of a General Operating Plan</b></li><li>▪ Plan submitted for the purpose of carrying out a public consultation procedure with authorities other than the TLUBN, municipalities, the public and environmental organisations</li><li>▪ Approval authority is the <b>Thüringer Landesamt für Umwelt, Bergbau und Naturschutz (TLUBN)</b></li><li>▪ Approval leads to a <b>Planning Approval Decision</b></li></ul>
<b>Step 3:</b> Approval of Main Operating Plan	<ul style="list-style-type: none"><li>▪ Mandatory to operate plants and facilities in the mining area</li><li>▪ Mining authority has no discretion regarding approval of initial and subsequent Main Operating Plans (and Special Operating Plans); if fulfilling the statutory requirements and <b>in-line with the Step 2 approval, then the Step 3 approval must be granted</b></li><li>▪ Includes <b>submission of Main Operating Plan</b>, renewable every two years</li><li>▪ Based on same information as submitted under Step 2 above and includes technical concept, detailed safety measures and hazard prevention for operation of mines and facilities</li><li>▪ Approval authority is <b>TLUBN</b></li><li>▪ Approval leads to an <b>Operating Plan Permit</b></li></ul>
<b>Step 4:</b> Approval of Special Operating Plan	<ul style="list-style-type: none"><li>▪ Special Operating Plans provide the operator greater flexibility in separating certain installations and activities from the Main Operation Plan. Such plans do not have to be renewed every two years</li><li>▪ Approval process includes submission of a Special Operating Plan for specific installations or activities</li><li>▪ Based on same information as submitted under Steps 2/3 above, with more detailed technical specification</li><li>▪ Approval authority is <b>TLUBN</b></li><li>▪ Approval leads to a <b>Special Operating Plan Permit</b></li></ul>

# Permitting timeline

Phases are interdependent, process timing can overlap

## SUMMARY

- Well understood requisite environmental impact assessment requirements
- Thüringian state project permitting process clearly articulated
- Phased approach allows for process overlap
- Sensible target schedule with reasonable contingencies built in
- Permitting activities to parallel the next phases of technical feasibility work
- Targeting progression of the Ohmgebirge Development as sensitively and expeditiously as possible
- Anticipated 2.5 year permitting schedule with 1 year contingency allowance

Target schedule	FY23				FY24				FY25				FY26			
Quarter	SEP	DEC	MAR	JUN	SEP	DEC	MAR	JUN	SEP	DEC	MAR	JUN	SEP	DEC	MAR	JUN
Step 1: Regional and Spatial			■	■	■	■	■	■								
Step 2: Planning Approval			■	■	■	■	■	■	■	■	■	■	■	■	■	■
Step 3: Main Operating Plan									■	■	■	■	■	■	■	■
Step 4: Special Operating Plan									■	■	■	■	■	■	■	■

**Legend:**

- SHP internal
- Regulatory review
- Contingency

*Target development schedule includes forecast internal and external / third-party timeframes and includes contingency allowances. Schedule is subject to change in response to changes in market and regulatory environments.*

## 05 | COST ASSUMPTIONS



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# Operating costs

## Robust construction of forecast operating expenditure

- Projected **LOM net operating cost of US\$92.6/t** (inclusive of US\$79/t salt by-product credit)
- Operational expenditure for mining includes;
  - estimated costs for personnel,
  - mining excavation,
  - auxiliary facilities, and
  - transport of raw material and backfill
- Process operating costs are based on consumption figures estimated on the basis of process units for similar projects
- Cost of energy (electricity and gas) benchmarked from other projects in central Germany
- Annual US\$13M sustaining capital included (representing 2.1% of total pre-production capex)

### STEADY STATE ANNUAL OPERATING COST ESTIMATES

Mining	US\$/t MOP	37.2
Processing	US\$/t MOP	96.9
General	US\$/t MOP	2.5
Product packaging and transport	US\$/t MOP	35.0
<b>Gross operating cost (delivered)</b>	<b>US\$/t MOP</b>	<b>171.6</b>
Salt by-product credit	US\$/t MOP	(79.0)
<b>Net operating cost (delivered)</b>	<b>US\$/t MOP</b>	<b>92.6</b>



# Capital costs

## Highly attractive pre-production capital intensity

- Forecast **US\$620M capital expenditure**
  - Includes US\$95M total contingency allowance (representing 20% mining contingency and 18% processing contingency)
  - Pre-production capital intensity at approximately US\$620/t of average annual production capacity
  - Industry norm for a 1 Mtpa MOP mine understood as being in US\$800 - 1,000/t range
  - Ohmgebirge benefits from its proximity to existing infrastructure and relatively shallow deposit depth

### PRE-PRODUCTION CAPITAL EXPENDITURE ESTIMATE

Mining	US\$M	171.7
Process Plant	US\$M	341.9
Infrastructure and G&A	US\$M	10.7
Contingency	US\$M	95.4
<b>Total pre-production capital expenditure</b>	<b>US\$M</b>	<b>619.7</b>



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## 06 | FINANCIAL PROJECTIONS



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# Attractive opportunity

Long life, high cash generation potential

**US\$385/t**

Weighted average MOP  
FOB price

**US\$1,279**

Post-tax NPV<sub>8%</sub>  
(real basis, ungeared)

**US\$93/t**

Cash operating costs  
(AISC, delivered NW Europe)

**3.6 years**

Post-tax  
payback period

**US\$620M**

Pre-production capital  
expenditure

**26.6%**

Post-tax IRR  
(real basis, ungeared)



*"This Scoping Study confirms that we have an extremely attractive commercial opportunity with the Ohmgebirge Development. Utilising conservative modelling assumptions, we are able to demonstrate the potential for a long life, highly cash generative business."*

**- Chief Financial Officer, Andrew Robertson**

# Key financial projections

## Compelling return profile

### ASSUMPTIONS

- 8% real discount rate, cashflows are ungeared and post-tax
- Costs quoted in real US\$ dollar 2022 terms; key exchange rate used for translation purposes is Euro/US\$ dollar 1.02.
  - Annual calendar year cash flow periods – LOM 21 years
- Costs have forecast on an owner operated basis
- Steady state sales volumes assumed achieved by Year 3 after production commences - provision made for marketing expenses
- Tax calculated based on a combination of applicable State (13.8%) and Federal (15.38%) tax rates
- Tax amortisation of capex based on 6 -20 year asset lives
- Tax losses in Germany do not time expire, however in any one year only 60% of taxable profits can be offset against carried-forward losses, and the remaining losses carried forward for offset against future profits.
- No royalties are payable

### KEY FINANCIAL OUTCOMES

#### Valuation Returns and Key Ratios

NPV 8% (pre-tax, real basis, ungeared)	US\$M	1,919
IRR (pre-tax, real basis, ungeared)	%	32.8
<b>NPV 8% (post-tax, real basis, ungeared)</b>	<b>US\$M</b>	<b>1,279</b>
<b>IRR (post-tax, real basis, ungeared)</b>	<b>%</b>	<b>26.6</b>
Payback period (post-tax, from first production)	Years	3.6
Capital intensity	US\$/t/a	620
<b>Annual free cash flow post ramp-up</b>	<b>US\$M pa</b>	<b>229</b>

#### LOM Cashflow Summary

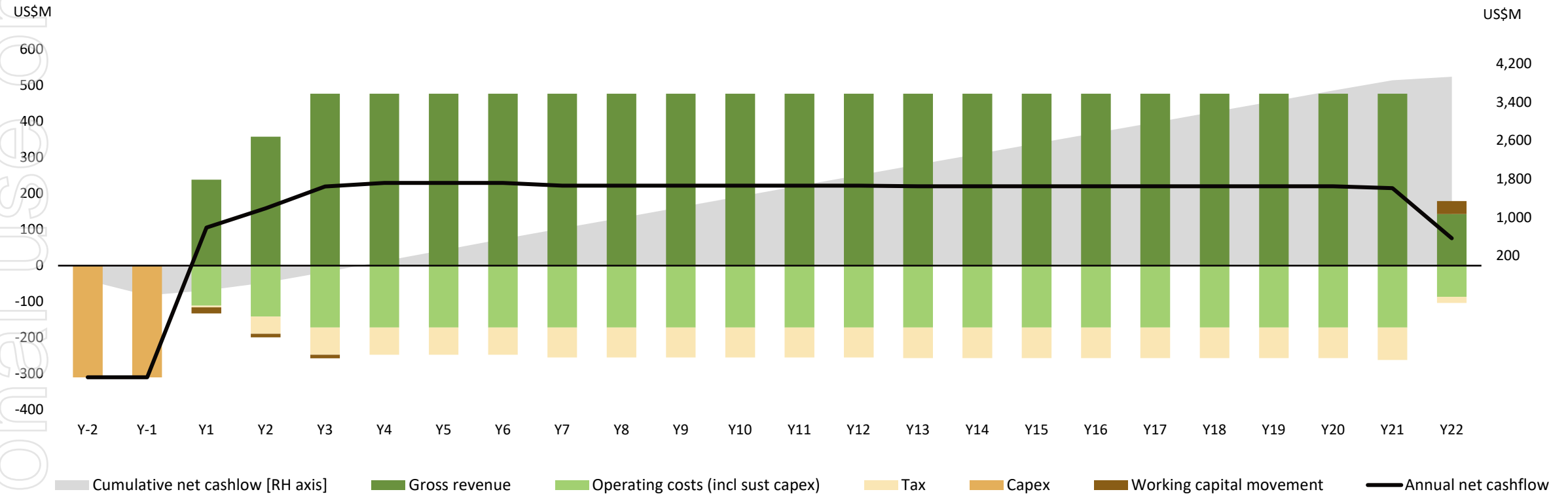
MOP Sales Revenue	US\$M	8,169
NaCl Sales Revenue	US\$M	1,623
<b>Total Sales Revenue</b>	<b>US\$M</b>	<b>9,792</b>
Mining Opex	US\$M	(803)
Processing Opex	US\$M	(2,024)
G&A Opex	US\$M	(54)
Product Packaging and Transport	US\$M	(719)
<b>Project Operating Cash Flow</b>	<b>US\$M</b>	<b>6,192</b>
Pre-Production Capital Expenditure	US\$M	(620)
<b>Project Pre-tax Cashflow</b>	<b>US\$M</b>	<b>5,572</b>
Tax Paid	US\$M	(1,644)
<b>Project Free Cashflow</b>	<b>US\$M</b>	<b>3,928</b>



# Forecast cashflow profile

Strong steady state generation profile

## LIFE OF MINE PROJECTED CASHFLOW PROFILE



# Valuation sensitivities

Positively leveraged to current elevated potash prices

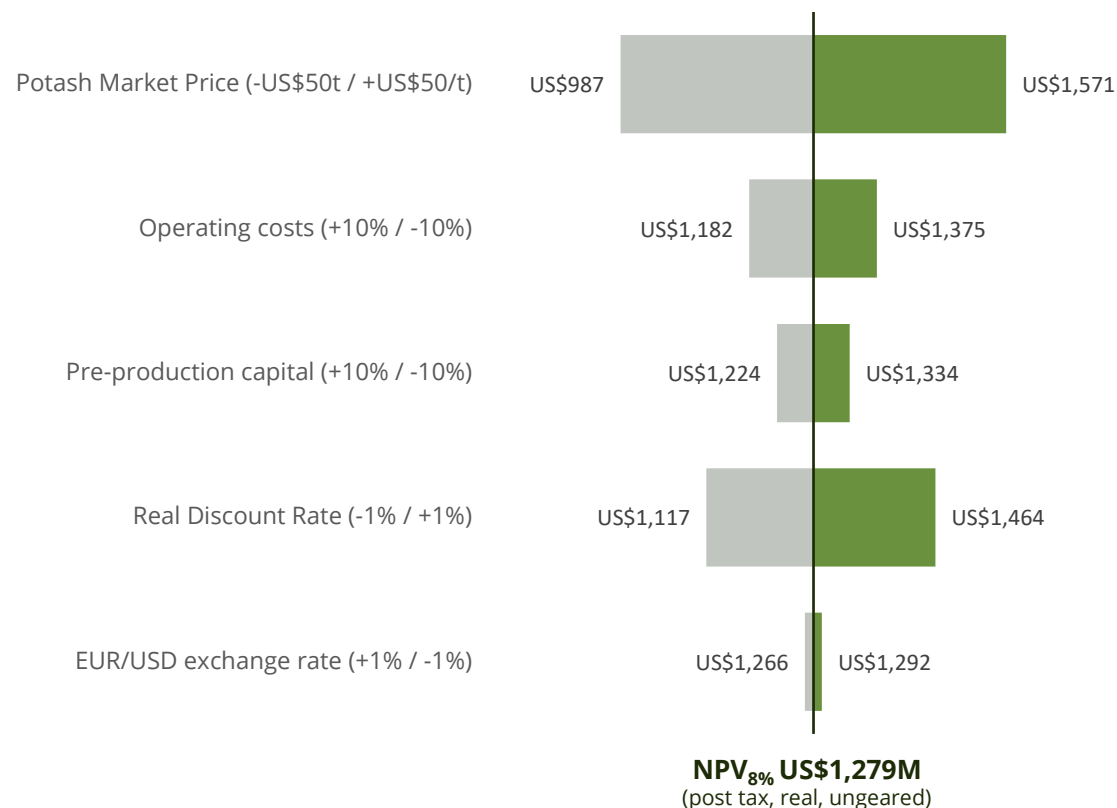


## MOP PRICE LEVERAGE

Independently varying the Potash Market Price parameter to approximate spot levels (~US\$900/t standard MOP product) yields a +US\$2,967 uplift to post-tax NPV<sub>8%</sub>

# US\$4,246M

## NPV<sub>8%</sub> SENSITIVITIES | 1 MTPA MOP



# Key risks

## Considered planning to ensure mitigation of development risk

Key Risk	Description	Potential Controls
<b>Permitting Timeline</b>	Completion of the permitting Step 1 and Step 2 submissions, with the correct supporting detail on time, drives the project's delivery timeline.	Work has commenced with input from key technical and permitting advisory team. Diligent submission content preparation together with close collaboration with advisors is essential, as is relationship management with all regulatory and other stakeholders.
<b>Hydrogeological Barrier</b>	The barrier at Ohmgebirge is relatively thin.	Underground development drilling for mine planning, utilising some of the hanging wall as a barrier, alteration to mining style.
<b>Energy Solution</b>	Study assumes use of electricity and gas from the German grid. Energy costs are volatile.	The PFS stage will include a study to identify optimal energy and greenhouse gas friendly solution.
<b>NaCl Sales</b>	The project benefits from profitable sales of some NaCl	Market outlook and entry potential appears robust. Conservative NaCl sale price utilised.
<b>Team Building</b>	Building on the existing team, South Harz needs to create an owner's team with the necessary bandwidth to ensure delivery on schedule.	This has commenced; however, it is a key early area of emphasis. Sound advisory relationships are already in place in a supporting capacity.
<b>Exchange Rate</b>	The CFM is based on a 1.02 conversion from Euros to US\$ and selling in US\$.	Mitigate capital cost execution risk by entering into fixed currency rate contracts against the US\$.
<b>Funding</b>	Prevailing market circumstance can impact future financing success.	Selling price is conservative to spot. Robust marketing and strong jurisdiction.
<b>Environmental Impacts</b>	Impacts on water, waste management and application of IFC standards will determine the environmental risk.	South Harz are already addressing the possible risks to the environment and aim to have no permanent waste storage on surface.
<b>Production Levels</b>	The ramp up rate to full production levels could be slower than anticipated.	Prudently, additional contingency has been built into the model to allow for a slower build up than advised by South Harz's technical advisory team.
<b>Dissolving Salt</b>	If processing is slow or interrupted, raw salt and some sulphates will be dissolved as well as KCl.	Continuous, uninterrupted processing.
<b>Marketing</b>	Ability of market to absorb anticipated sales volumes.	The prudent ramp up profile referred to above, together with the growing European deficit of product leads us to believe that this risk is low. South Harz's close proximity to Hamburg permits cost competitive exports to Brazil during the off season.



# Alternative development cases

## Robust scaling options

- Economics were evaluated using two development scenarios:
  - Scenario 1: Single phase development to 1 Mtpa, which is the Base Case
  - Scenario 2: Two-phase development to 1 Mtpa, being sequential phases of 500 ktpa + 500 ktpa
- Scenario 2 envisages an initial 500 ktpa development with a further 500 ktpa capacity being added in later years
- Scenario 2 has an overall higher capital expenditure requirement of US\$668 million, but a significantly lower peak finance requirement of US\$443 million
- Scenario 1 is ultimately preferred as it presents a significantly higher NPV and IRR, with a shorter payback period and greater capital efficiency



## 07 | NEXT STEPS



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# PFS set to commence

## Approved progression to next phase

- Advancing to Pre-Feasibility Study (PFS) on the Ohmgebirge Development
- Scheduled for completion in Q4 CY2023
- PFS to focus on base Scoping Study scale of 1 Mtpa MOP
- A two-phase alternative (500 + 500 ktpa) with a lower peak financing requirement is also planned to be progressed alongside
- Requisite environmental and social impact assessment and permitting requirements are well understood and set to parallel the next phases of technical feasibility work to progress the Ohmgebirge Development as expeditiously as possible





# Ohmgebirge Development



South Harz: The new potash supplier of choice to Europe and beyond

## OUTSTANDING LOCATION



- First world jurisdiction
- Established local infrastructure
- Rich potash mining history

## LOW COST DELIVERY



- Operating costs expected in bottom half of cost curve
- Below average capital intensity compared to an equivalent scale project

## EXCELLENT MINERALISATION



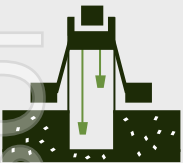
- Relatively shallow, thick deposit
- Simple, well-established minerology

## HIGH SCALABILITY

**5.3**  
billion  
tonnes

- Already Tier 1 scale
- Broader resources provide available inventory for multiple developments

## SIMPLE EXTRACTION



- Long established process
- Extensively regionally proven mining and processing mechanics

## LOW-IMPACT COMMITMENT



- Zero permanent waste piles on surface
- Zero industrial water discharges
- Low delivered carbon footprint

# APPENDIX



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# Mineral Resources estimates

## South Harz Project

Licence Area	Categorisation	Resource (Mt)	K <sub>2</sub> O (%)	K <sub>2</sub> O (Mt)
Ohmgebirge	Indicated	258	13.5	35
<b>Total Indicated</b>		<b>258</b>	<b>13.5</b>	<b>35</b>
Ebeleben	Inferred	577	12.1	69
Mühlhausen-Nohra-Elende	Inferred	1,698	9.7	165
Mühlhausen-Keula	Inferred	1,130	11.1	125
Küllstedt	Inferred	1,538	10.7	165
Ohmgebirge	Inferred	80	13.1	9
<b>Total Inferred</b>		<b>5,023</b>	<b>10.6</b>	<b>533</b>
<b>Total South Harz Project JORC Mineral Resource estimate<sup>1</sup></b>		<b>5,281</b>	<b>10.8</b>	<b>568</b>

Ohmgebirge Mineralised Seam	Categorisation	Resource (Mt)	K <sub>2</sub> O (%)	K <sub>2</sub> O (Mt)
Sylvinite	Indicated	258	13.54	35
Sylvinite	Inferred	32	12.84	4
<b>Sylvinite<sup>2</sup> total</b>		<b>290</b>	<b>13.47</b>	<b>39</b>
Carnallite	Inferred	48	9.81	5
<b>Carnallite<sup>3</sup> total</b>		<b>48</b>	<b>9.81</b>	<b>5</b>
<b>Total Ohmgebirge Mineral Resources</b>		<b>338</b>	<b>12.91</b>	<b>44</b>

1. For full Mineral Resource estimate details, refer to South Harz ASX release dated 12 July 2022, Landmark Resource Upgrade at Ohmgebirge. South Harz confirms that it is not aware of any new information or data that materially affects the Mineral Resource estimate information included in that release. All material assumptions and technical parameters underpinning the Mineral Resource estimate in that release continue to apply and have not materially changed.

2. Sylvinite is the mineral name for potassium chloride (KCl), the most common form of potash.

3. Carnallite is made up of potassium chloride, magnesium and water and can be extracted using solution mining



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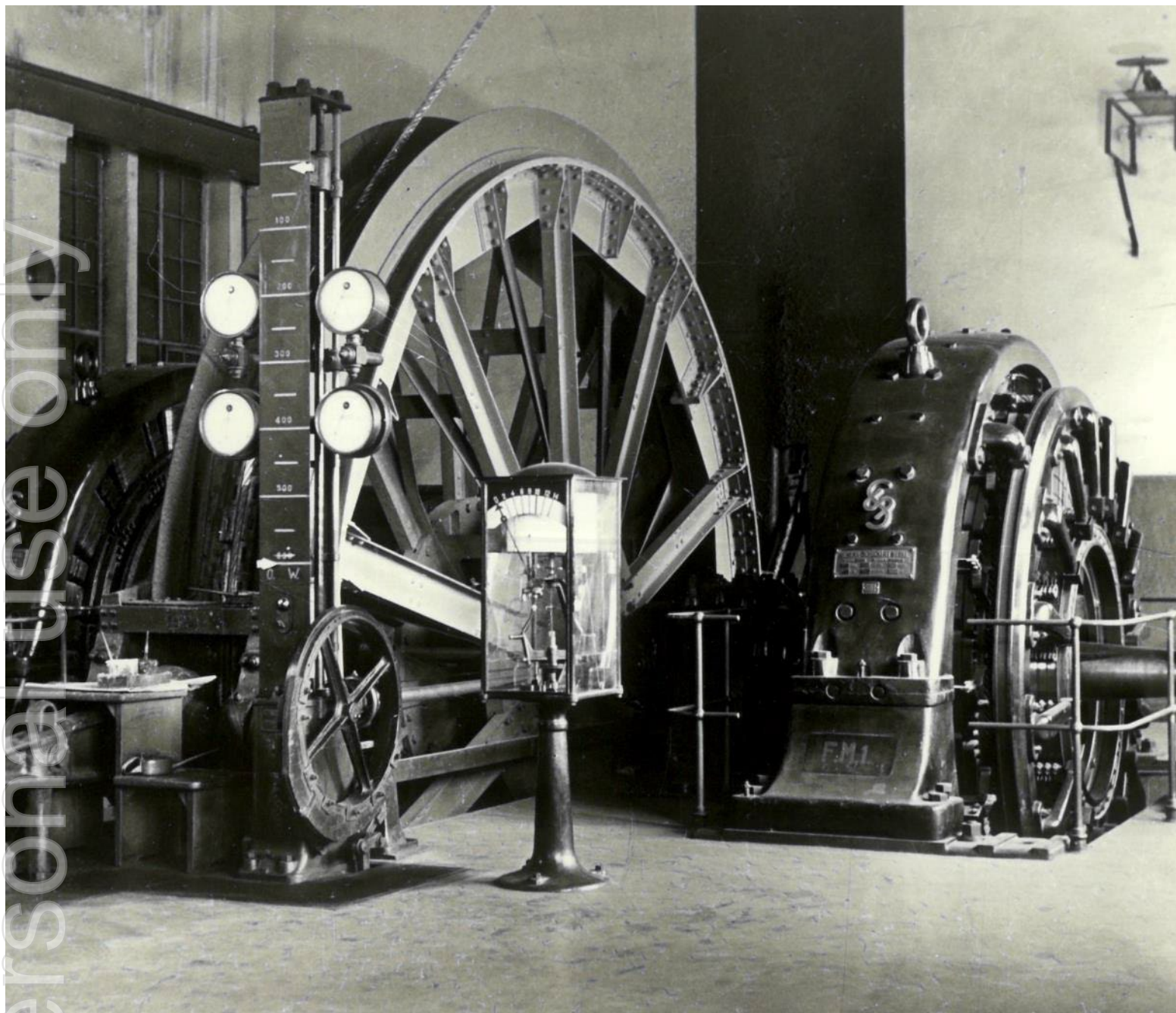


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