



Orion Minerals

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Early Production Assessment for Prieska Copper-Zinc Project to be Fast-Tracked

Investigations are under way into phasing the project development to bring forward first concentrate production and evaluate remnant pillar mining potential

- ▶ Investigations are now under way and due for completion by mid-2022 into an early-production scenario that re-schedules production from open pit mining to occur concurrent to the 33-month development phase of the Prieska Deeps Mine, rather than at the end of the Project life, as was planned in the 2020 Bankable Feasibility Study (BFS-20)¹.
- ▶ The focus of the investigations is on bringing forward production and phasing the implementation of the BFS-20 plan.
- ▶ An underground drilling campaign, to upgrade mineral resources categories supporting the BFS-20 open pit plan and to evaluate the potential to extract the pillars left unmined for structural support during previous mining operations, is currently mobilising, with results of the campaign expected by June 2022.
- ▶ Assessment of the option to phase the implementation of the BFS-20 full-scale mine dewatering plan, so that a reduced-scale first phase to be commissioned during CY2022, as part of pre-construction project preparation works, is underway and is expected to be completed for investment decision by June 2022.

Orion's Managing Director and CEO, Errol Smart, commented:

"With prevailing positive macro-economic factors and the continued long-term positive outlook for both copper and zinc prices, the Orion executive team is re-evaluating the Prieska Project development schedule to assess the potential to bring forward production, even on a reduced scale at our flagship Prieska Copper-Zinc Project, which could present a major breakthrough for the Project.

"Mining of our open pit was planned in the BFS-20 to be mined over 19 months at the end of the mine life. The studies now underway are assessing the potential to mine the open pit first, concurrent with the 33-month dewatering and mining development schedule for the 200,000 tonnes per month Prieska Deeps Mine. This alternative scenario is looking increasingly like the route we should go down. Importantly, this early production scenario relies on the material assumptions for the mine plan already incorporated in the 2020 Bankable Feasibility Study.

"The BFS-20 also flagged potential for eventual extraction of remnant pillars left by historic mining. These pillars, which are recorded in mine survey records, have not yet been drill tested by Orion, however, a 3,500m underground drilling program is planned to test them shortly. Subsequent estimation of the tonnage and grade of mineralisation within the remnant pillars will allow for their

¹ Refer ASX/JSE release 26 May 2020.

inclusion in our Mineral Resources, which would then allow their consideration in our mine planning and reserve estimation.

“These pillars, which were left for geotechnical reasons, were not excluded from historical mining on grade or quality basis, they were left in a grid pattern purely as ground support.

“The geotechnical support pillars were historically necessary as no backfilling of mined voids was employed at that time, leaving large open stopes only supported by the pillars. Our engineering studies are indicating that many of these pillars would not be required for continued geotechnical stability of excavations if our open pit mine tailings are placed in the historical voids using cemented tailings filling as planned in our BFS-20. This remains to be confirmed by the detailed studies now underway. Using cemented open pit mine tailings to back-fill the historic voids also provides the opportunity for us to rethink the size and the high upfront capital cost of the tailings storage facility planned in the BFS-20.

“Our negotiations with multiple banks and financing institutions for the funding of the Prieska Deeps Mine as per the BFS-20 continue as a priority and are not affected by the engineering studies and financial assessments of an early production value enhancement scenarios, that are currently underway.”

Orion Minerals Limited (**ASX/JSE: ORN**) (**Orion** or **Company**) is pleased to advise that it has commenced workstreams to assess the merits of phasing the development of its flagship Prieska Copper-Zinc Project in the Northern Cape Province of South Africa (**Prieska Project**), in a manner that brings forward the start of production and allows for dewatering of the underground workings to commence ahead of the final investment decision for the full-scale project construction as planned in the 2020 Bankable Feasibility Study (**BFS-20**) (refer ASX/JSE release 26 May 2020). The BFS-20 outlines the plan to re-establish the Prieska Copper Mine, which was previously operated as an underground mine between 1971 to 1991. During this time, mine records show, 46Mt were mined to produce 430kt of copper and 1.01Mt of zinc in concentrates².

While funding discussions for the Prieska Project, based on the BFS-20 plan, are in progress with banks and finance institutions, investigations into further enhancing the technical and commercial aspects of the Project are being advanced.

Our strategy is to capitalise on the positive near-term base metals market and focus on investigating opportunities that have the potential to bring forward the start of production and revenue generation, potentially reducing the upfront external peak funding requirements of the project.

On this basis, the Company's senior management team has focused on the following plan and opportunity assessment (**Early Production Scenario**), comprising:

- re-planning for upfront mining of the open pit (already included in the BFS-20 plan to occur at the end of the mine schedule);
- assessment of the remnant pillars remaining from historical mining operations for potential opportunistic early extraction; and
- preparation of a plan to commence the dewatering of the underground workings using a modular configuration, with the first modules being commissioned in CY2022, ahead of the scale up to the full-scale pumping rate proposed in the BFS-20 plan.

The scenario that is being investigated is based on and maintains the core elements and material assumptions of the Prieska Deeps BFS-20 plan. The work to fully evaluate and quantify this opportunity are expected to be completed by mid-2022.

² Historical production records for the Prieska Copper Mine are sourced from WILSON, M.G.C. and ANHAEUSSER, C.R. (eds), 1998. The Mineral Resources of South Africa: Handbook, Council of Geoscience, 16, 740pp.

A feasibility level study is underway to assess the merits of bringing forward the open pit mining.

Extraction of the shallow supergene sulphide ore by open pit mining is included in the BFS-20 plan³ (Figure 1). It is currently scheduled to be undertaken from Year 13 of the mine life, with tonnage milled stepping down from the 200,000 tonnes per month rate of the earlier underground mining to 100,000 tonnes per month, using only one of two installed mills for the open pit³ mining phase. The 1.12 Mt of supergene sulphide open pit ore, at an average grade of 1.9% Cu and 2.4% Zn, is planned to be mined and processed over a 2-year period in the BFS-20 (refer ASX/JSE release 26 May 2020).

The Early Production Scenario plan will assess the impact of re-scheduling mining of the open pit to the start of the Prieska Project mine plan to allow concentrate production with earlier commissioning of the first mill, while the second mill is being installed and other long-lead time capital projects for commencement of the Prieska Deeps Mine are completed.

In the BFS-20, the start of production is planned for month 33. Rescheduling of open pit mining to commence early aims to assess the impact of open pit production occurring concurrently to the long lead time elements of the Deeps Projects, such as mine dewatering, shaft refurbishment, underground infrastructure construction and stope preparation, which are all independent of open pit mining.

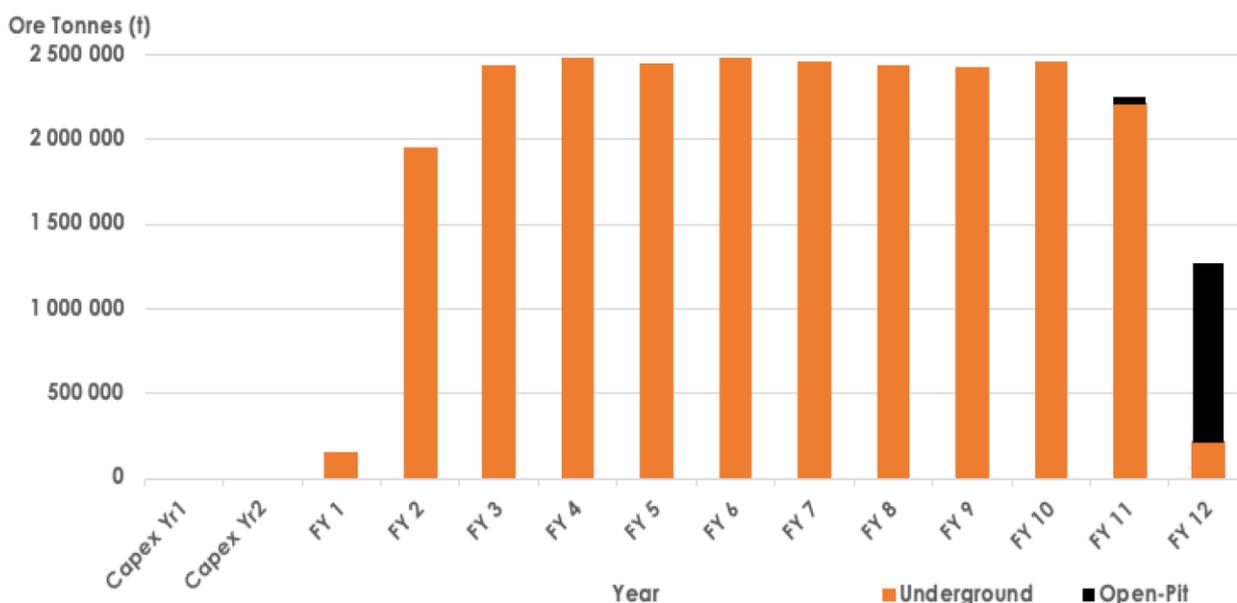


Figure 1: BFS-20 plan mine production profile, showing open pit ore contribution in the last 2 years and the initial 33-month construction period during which no production occurs. The re-scheduling of the open pit mining to commence with the start of the construction period is being assessed.

³ PCZM production targets were reported in ASX/JSE release of 26 May 2020. Orion confirms that all the material assumptions underpinning the production targets referred to in the initial public report continue to apply and have not materially changed.

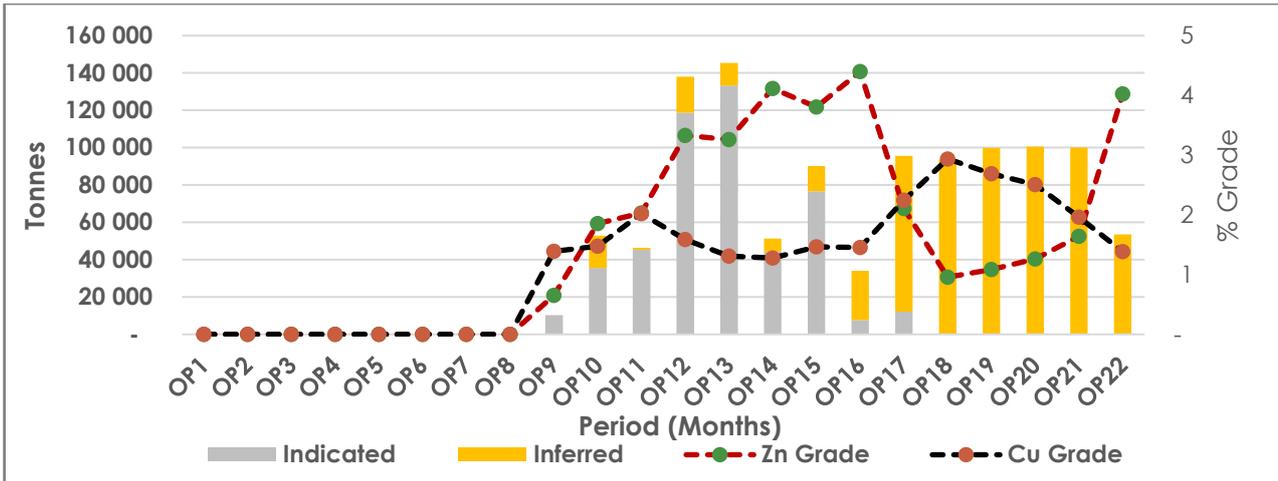


Figure 2: BFS-20 open pit mining extraction schedule for the +105 Mineral Resource, now being investigated for early extraction. The schedule shows it takes 19 months to build up enough run of mine feed stocks to commission ore processing at 100ktpm.

A small high-priority underground drilling program on the +105 open pit will commence shortly to provide sample density sufficient to upgrade the Mineral Resource classification in accordance with JORC Code (2012) reporting guidelines. This program, consisting of 770m of underground diamond drilling, will also supplement geotechnical information and confirm the survey plan location and widths of the voids. The program is scheduled to commence in February 2022 with completion anticipated by June 2022 and updated Mineral Resource and Ore Reserve estimates available shortly thereafter.

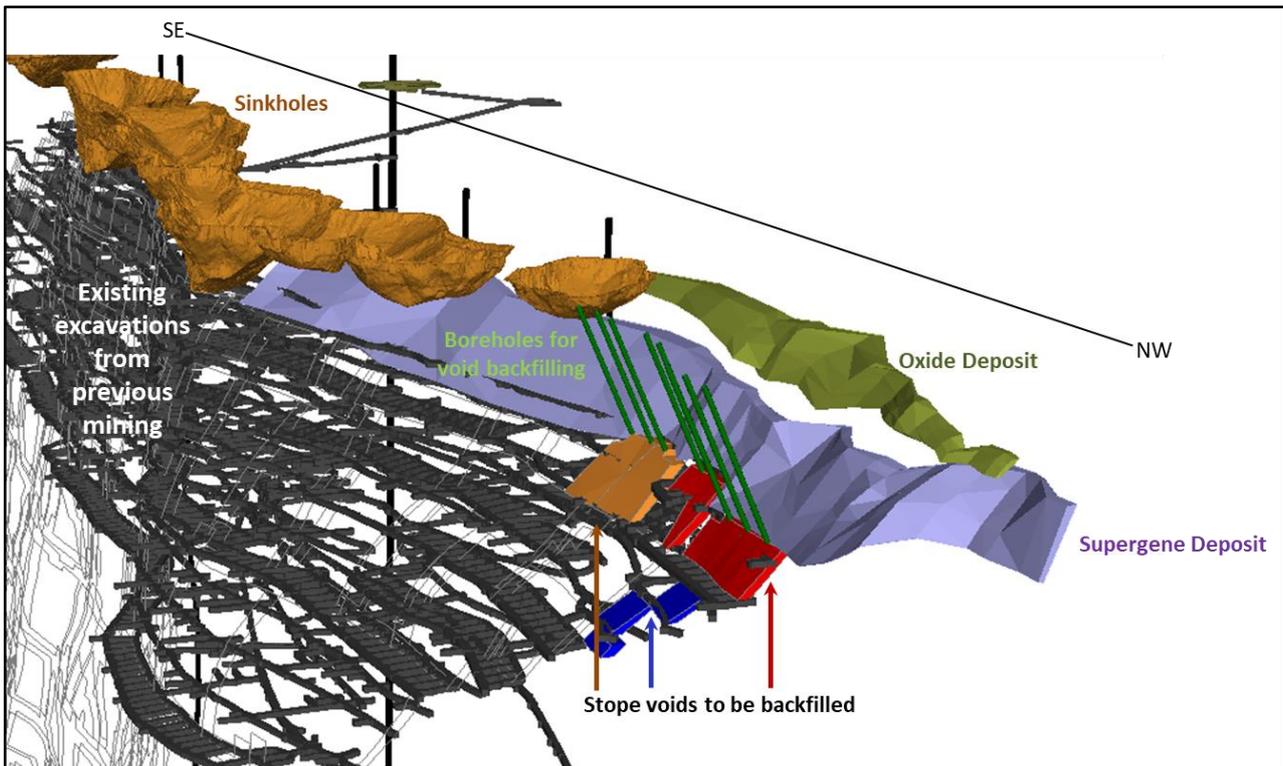


Figure 3: Oblique view showing the supergene sulphide deposit and the relative location of the voids created by previous mining that will need back-filling before open pit mining on the north-western strike extent of the Prieska Copper Zinc Mine (PCZM).

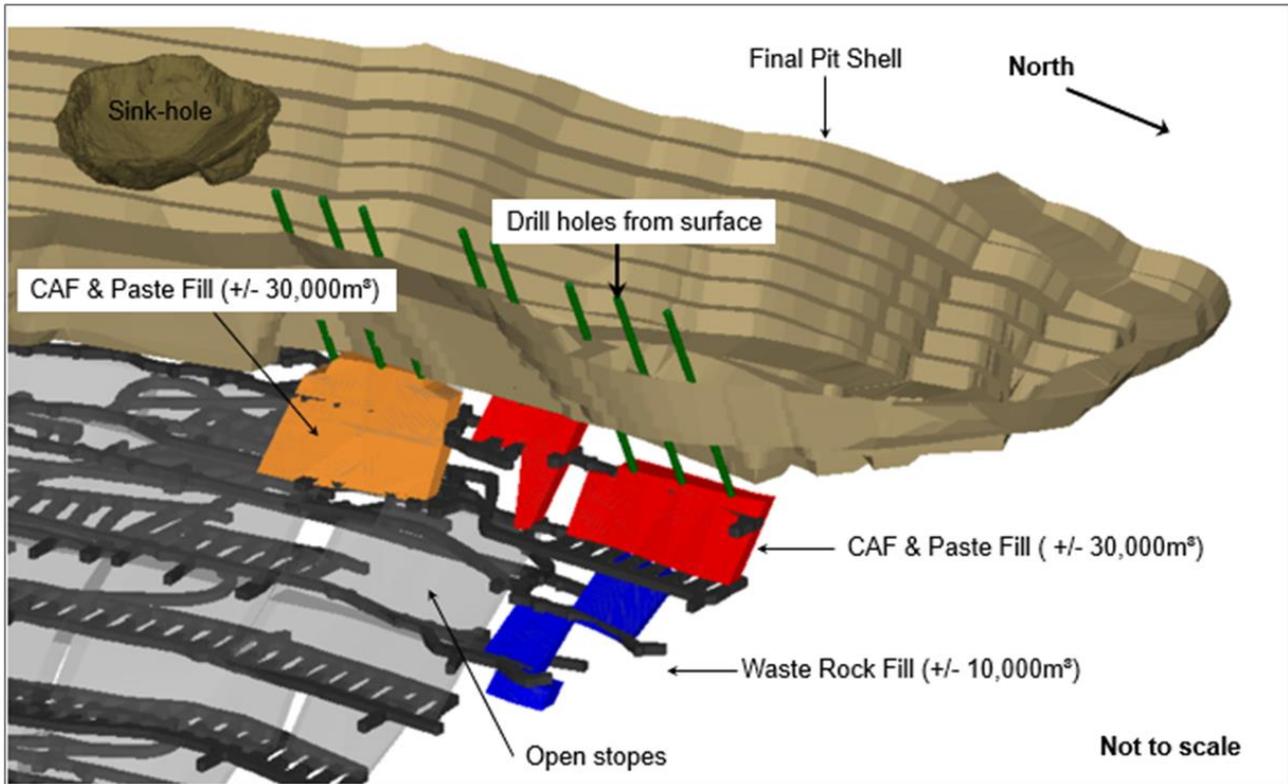


Figure 4: Oblique view of planned open pit relative to the mining voids planned for back-filling prior to open pit mining.



Figure 5: Long section of the mineralisation above the 105m Level that is targeted for extraction by open pit mining, showing the relative location of the Indicated and Inferred Mineral Resources, as well as the planned drill-hole intersections required in order to upgrade supergene sulphide Inferred Mineral Resources.

Table 1: Summary of shallow (down to 105m Level) Mineral Resources for the PCZM as per the BFS-20, of which the supergene sulphides are targeted for extraction by open pit mining methods.

+105 Mineral Resource for the PCZM Tenement (Effective Date: 11 January 2019)⁴						
Classification	Mineralised Zone	Tonnes	Cu (metal tonnes)	Cu (%)	Zn (metal tonnes)	Zn (%)
Indicated	Sulphide (supergene)	624,000	10,000	1.54	19,000	3.05
	Total	624,000	10,000	1.54	19,000	3.05
Inferred	Oxide	511,000	3,000	0.6	4,000	0.9
	Sulphide (supergene)	627,000	14,000	2.2	11,000	1.8
	Total	1,138,000	17,000	1.5	16,000	1.4
Total	+105 Mineral Resource	1,762,000	27,000	1.5	35,000	2.0

+105m Level Mineral Resource bottom cut-off = 0.3% Cu. Mineral Resources stated at zero % cut-off. Tonnes are rounded to thousands, which may result in rounding errors.

The Early Production Scenario plan is currently evaluating whether the sulphide ore processing plant can be commissioned by month 19, approximately 14 months ahead of the original BFS-20 schedule. As with the BFS-20, the processing plant would treat open pit material at a reduced throughput compared to steady-state operations for the Deeps, using one of the two mills that have already been secured in preparation for full-scale production from the Prieska Deeps. In this scenario, the second mill, together with additional flotation concentrators, would likely be installed later, as part of a phased expansion to accommodate feed from mining of the Deeps at the increased throughput rate.

The opportunity to place almost all tailings from the ore processing plant as back-fill in historic and planned mining voids, hence reducing the size of the required, lined, tailings storage facility and thereby further reducing upfront capital outlay and funding is also being assessed.

Remnant pillar evaluation

Mine records, plans and recent investigations by the Company confirm that previous underground mining was undertaken using long-hole open-stoping methods, without the use of any form of backfilling to stabilise the remaining voids. A grid of pillars was left in place to provide geotechnical mine stability. This resulted in inefficiently low ore extraction ratios at the time. Mineralisation and geology were reported to be continuous across the mined stopes and the remaining pillars.

Mine survey records document the outlines of the pillars and the width of the extracted voids surrounding each pillar, which has provided a basis for a preliminary geotechnical assessment of ground stability with or without the pillars in place. Based on positive preliminary assessments, Orion has commenced a detailed study to assess whether the insertion of cemented paste fill in the surrounding voids would allow for some of these remnant pillars to be extracted without negatively impacting the long term geotechnical stability.

A drilling program aimed at confirming the historical survey records and providing sufficient data for resource estimation will commence shortly. The first phase of the program is scheduled to be conducted concurrently with the 770m infill drilling being undertaken for the +105 open pit deposit.

⁴ Mineral Resource reported in ASX/JSE release of 15 January 2019: "Prieska Total Resource Exceeds 30Mt @ 3.7% Zn and 1.2% Cu Following Updated Open Pit Resource" available to the public on <http://www.orionminerals.com.au/investors/asx-jse-announcements/>. Competent Person: Orion's Mineral Resource: Mr. Sean Duggan. Orion confirms it is not aware of any new information or data that materially affects the information included above. The company confirms that all material assumptions and technical parameters underpinning the Mineral Resource estimates in the ASX/JSE release of 15 January 2019 continue to apply and have not materially changed. Orion confirms that the form and context in which the Competent Person's findings are presented here have not been materially modified.

The 3,500m underground diamond drilling program, targeting the pillars above the current water level (300m below surface), and subsequent resource estimation are expected to be completed by June 2022. Thereafter, the feasibility study assessments, currently underway to evaluate the extraction of some of these remnant pillars, possibly as part of early production, will be completed and reported.

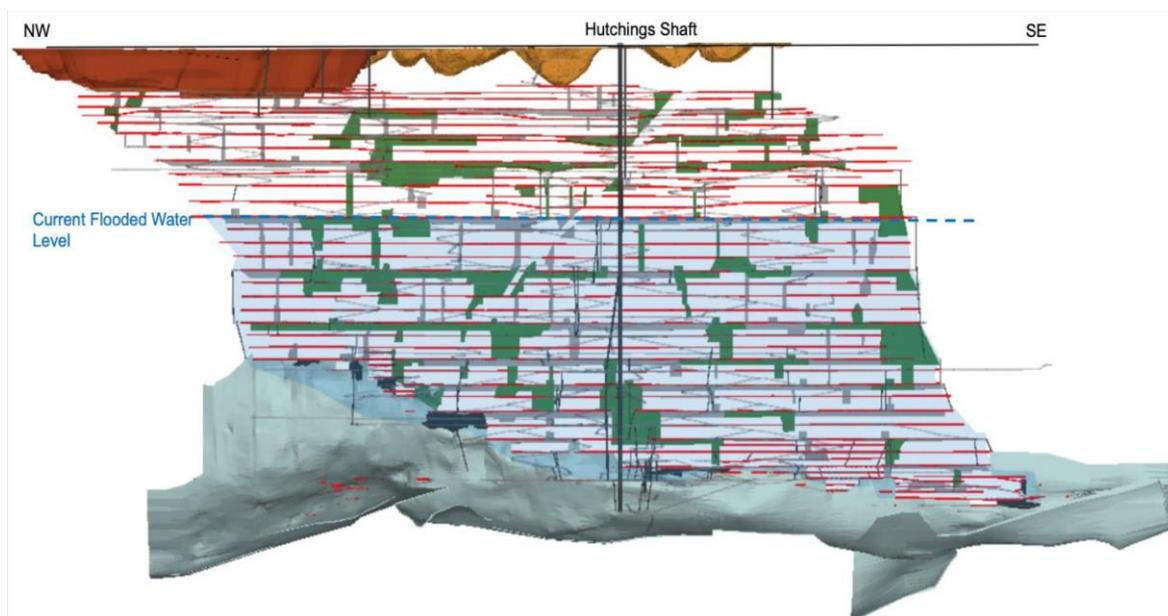


Figure 6: Isometric view showing the historically mined stopes and remaining pillars⁵.

It is anticipated that the core elements and material assumptions from the BFS-20 will be used as the basis to evaluate the remnant pillar mining opportunity. The remnant pillars are likely to have the same metallurgical characteristics as the ore historically mined from the surrounding stopes and therefore the metallurgical performance and costs in the BFS-20 plan are seen as realistic assumptions should the pillars be mined and treated. These assumptions are to be verified as part of the planned workstreams.

Existing declines provide access for truck haulage of material to surface, without requiring the use of the shaft and associated lead time and capital costs. The opportunity flagged in our BFS-20 studies will be further assessed in the current feasibility studies to confirm the financial viability of this haulage.

The BFS-20 provides cost profiles for various mining methods, cemented paste filling operations and both shaft hoisting and trucking for rock handling from underground. The all-in-sustaining costs over the Life of Mine for the Deeps mining with placement of cemented back filling have been estimated in BFS-20 at AUD88/RoM t (ZAR972/RoM t), with an operating break-even grade of 1.0% copper equivalent, for assumed metal prices of USD6,680/t copper and USD2,337/t zinc⁶.

This existing information highlights the pillars as a compelling opportunity to be fast tracked with exploration drilling, resource estimation and feasibility studies to be completed by mid-2022.

⁵ Refer ASX/JSE release 26 May 2020.

⁶ Forecast financial information derived from the PCZM production targets was reported in ASX/JSE release of 26 May 2020. Orion confirms that all the material assumptions underpinning the production targets and forecast financials referred to in the initial public report continue to apply and have not materially changed.

Early commencement of mine dewatering being assessed

An assessment of the potential to make an early start to the long-lead time mine dewatering project by implementing a modular approach is also being conducted.

The dewatering setup, including water treatment, can be established in a phased and scalable configuration. Studies underway will confirm the capital and operating costs of commissioning a first phase, capable of dewatering at a 1/3 of the full-scale capacity as contemplated in the BFS-20 plan, during CY 2022. This primary setup is to be designed in a manner that retains the option to scale-up to full capacity dewatering at the opportune time. Results of the assessment are expected by June 2022.

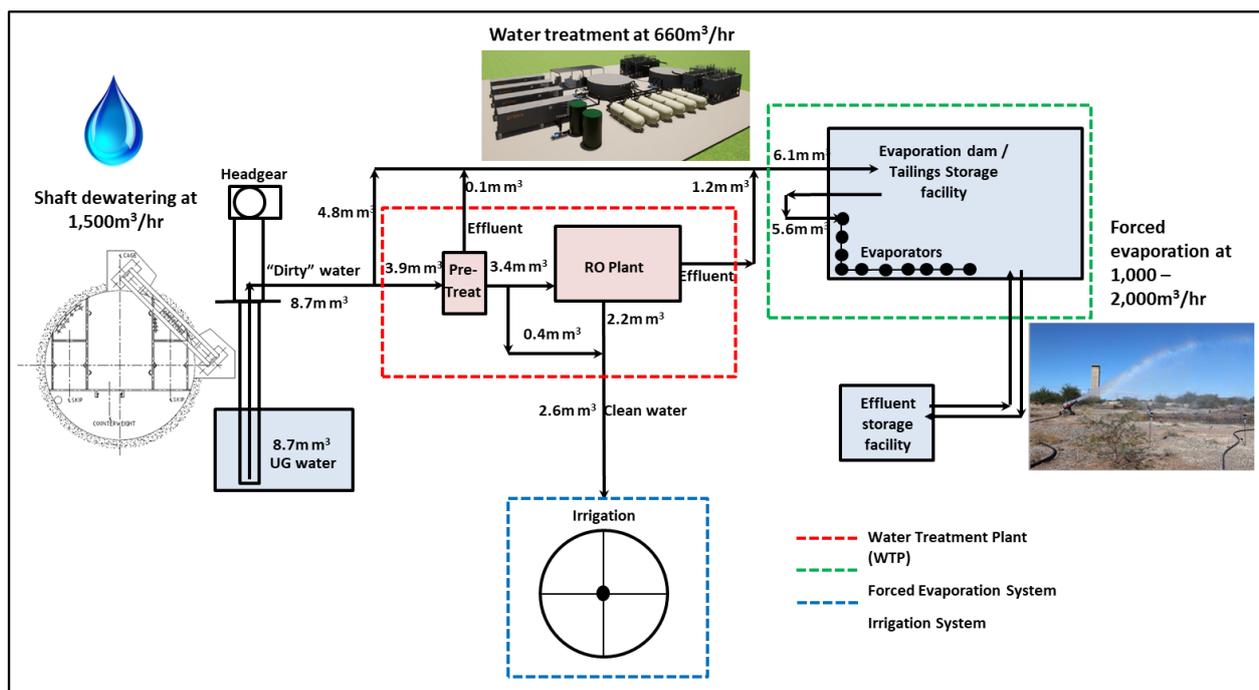


Figure 7: The mine dewatering configuration contemplated in the BFS-20 plan is shown. Approximately 9 million m³ of water would be pumped out of the mine over a 12-month period, at an average pumping rate of 1,500m³/hr. Some 45% of the water would be diverted for treatment to allow it to be used for agricultural purposes, while the remainder would be dispersed using forced evaporation⁷. Implications of phasing the establishment of this configuration by commencing with a reduced-scale module capable of future expansion are being assessed.

Forward Program

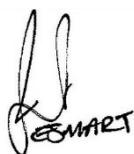
Orion has commenced a six-month program of intensive drilling and engineering studies to provide the required information to make an investment decision to proceed with the Early Production Scenario.

The engineering and feasibility studies will focus on the merit of proceeding with the early production workstreams with capital installations all forming elements of the final Prieska Deeps Mine, as outlined in the BFS-20.

Discussions with banks and financiers regarding the financing for the Prieska Deeps Project are continuing in parallel with the engineering assessment of the early works opportunities. In addition, discussions have been initiated with potential financiers who have expressed interest in funding the early dewatering and production plan.

⁷ Refer ASX/JSE release 26 May 2020.

For and on behalf of the Board.



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Reference to Previous Reports

Shallow PCZM Mineral Resources were reported in ASX/JSE Release of 15 January 2019: "Prieska Total Resource Exceeds 30Mt @ 3.7% Zn and 1.2% Cu Following Updated Open Pit Resource" available to the public on <http://www.orionminerals.com.au/investors/asx-jse-announcements/>. Competent Person Mineral Resource: Mr. Sean Duggan. Orion confirms it is not aware of any new information or data that materially affects the information included above. The company confirms that all material assumptions and technical parameters underpinning the Mineral Resource estimates in the ASX/JSE Release of 15 January 2019 continue to apply and have not materially changed. Orion confirms that the form and context in which the Competent Person's findings are presented here have not been materially modified.

PCZM production targets and forecast financial information derived from the production targets were reported in ASX/JSE release of 26 May 2020: "Updated Feasibility Study Delivers Substantial Increases in Production, Cash Flow and Mine Life for the Prieska Copper-Zinc Project Resource" available to the public on <http://www.orionminerals.com.au/investors/asx-jse-announcements/>. Orion confirms that all the material assumptions underpinning the production targets and forecast financial information referred to in the initial public report (26 May 2020) continue to apply and have not *materially* changed.