ASX Announcement 4 March 2024

Underground Mining Study demonstrates potential to add value

Highlights:

- **Underground mining concept study targeting deeper high-grade mineralisation of the Sihayo Mineral Resource has now been completed by Mining One.**
- **Results demonstrate a standalone drift-and-fill operation is technically feasible and offers a potentially viable low CAPEX start-up option.**
- **A trade-off study is now required to determine the optimum combination of open pit and underground mining for the project.**
- **Mineralisation remains open and untested at depth and to the south of the known deposit.**

Sihayo Gold Limited (**ASX:SIH** – "**Sihayo**" or the "**Company**") is pleased to *report encouraging outcomes from a Concept Study of the potential for a viable* underground mining operation centred on the Sihayo gold deposit, located in the north block of the PT Sorikmas Mining Contract of Work ('CoW') in North Sumatra, Republic of Indonesia.

Sihayo's Executive Chairman, Colin Moorhead commented on this recent report:

"The Feasibility Study Update (FSU) completed during 2023 defined the open pit only bookend for Sihayo. This most recent underground mining study defines the standalone underground bookend showing that such an option could deliver a low CAPEX and lower risk start-up option with the potential to unlock the underlying potential of the larger Sihayo Mineral Resource. A trade-off study is now required to determine the optimum combination and scheduling of open pit and underground mining at Sihayo to take the project forward.

It is also clear that our exploration model, which is based on geologic analogues such as multi-million-ounce Cortez Hills deposit in Nevada, continues to be verified with the mineralisation remaining open and untested at depth and to the south. This continues to support the view that further drilling of the deeper mineralisation at Sihayo has real potential to grow the resource".

Background

The Company previously announced that it had engaged Melbourne consultant, Mining One, to evaluate the potential for an underground mining operation at Sihayo, either as a supplement to the proposed open pit operation described in the 2022 Updated Feasibility Study (Figure 1), or

as a stand-alone operation[1,2]. Mining One's initial assessment suggested that an underground drift-and-fill mining operation had potential to be technically and economically viable.

Two drilling programs were carried out at Sihayo from mid-2022 to early 2023, to identify additional high-grade mineralisation beneath the planned 2022 UFS open pit, and to collect geotechnical data to assist with design of an underground operation. The drilling successfully identified significant extensions to the 'below-pit' gold mineralisation and resulted in an updated Mineral Resource estimate (MRE) for the Sihayo gold deposit (Figures 2 and 3). The updated MRE showed an increase in higher-grade primary gold resource to some 4.48 Mt at 4.7 g/t gold (at a 3.0 g/t gold cut-off grade) comprising 677 koz of gold comprising 27 percent Measured, 52 percent Indicated and 21 percent Inferred Mineral Resource categories. This included an increase of 122 koz of gold or a 22 percent increase compared with the total 2022 MRE at a 3.0 g/t Au cut-off, and a 67 percent increase in the below-pit MRE compared with the total 2022 MRE at a 3.0 g/t Au cut-off (Refer to SIH:ASX announcement "Sihayo Mineral Resource Estimate Update results in increased grade and contained gold" dated 11 July 2023).

These results, combined with significant improvements in gold recoveries from primary sulphide mineralisation reported in previous metallurgical test work using high pH pre-leaching ('caustic leaching') [3,4], offer significant potential benefits for the project's scope and economic viability.

Concept Study

Following the release of the update MRE, the Company engaged Mining One to complete a Concept Study as the next step in evaluating the underground mining potential at Sihayo. This study is now complete and delivered encouraging results (*See* Appendix 1 for the Concept Study highlights). An alternative underground mining approach that involves a twin decline access and development design to selectively mine the higher-grade gold resource without an open pit development was evaluated (Figures 4 to 6).

The Concept Study proposes a smaller-scale underground mine based on a drift-and-fill mining method and focuses on extracting the resource from the bottom-up. The mining rate estimated in this study was approximately 500 kt per annum producing approximately 400-450 koz of gold over a mine life of eight years.

Mining One's financial modelling based on the Concept Study mine plan and cost estimates results in an encouraging economic case for the project. Estimated upfront costs to pursue this option would be in the order of US$11M for the Mine Development Capital Costs and circa US$30.5M for the processing plant capital costs. The Mining One financial model was updated with these capital costs, and other current variables for costs and recovery including the forecast long term gold price of ($/oz) US$1,700.

This strategy has the potential to deliver a more sustainable and manageable alternative to a conventional open pit mining method. This includes a reduced environmental footprint, geotechnical and operational benefits, and a significant reduction in the size of the Tailings Storage Facility (TSF). Sihayo is focussing on a risk-based technical and commercial optimisation which considers both open cut and/or underground miningoptions. The preferred option may be a combination of both a surface and underground mining option with a trade-off study planned to determine the optimum combination and scheduling of open pit and underground mining at Sihayo.

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[1] Refer to ASX announcement (SIH:ASX) titled "Ore Reserve and Economic Update for Sihayo Starter Project" dated 23 May 2023.

[2] Refer to ASX announcement (SIH:ASX) titled "Sihayo Mineral Resource Estimate Update results in increased grade and contained gold" dated 11 July 2023.

[3] Refer to ASX announcement (SIH:ASX) titled "Significant Results from High pH Leaching Test Work" dated 31 January 2022.

[4] Refer to ASX announcement (SIH:ASX) titled "Final Results Received from High pH Pre-leaching Test Work" dated 5 July 2022.

2024 Plans

Mining One also reviewed and concur that there is strong exploration upside potential to significantly expand the underground gold resource within extensions to currently defined mineralised lenses and on repetitions of these lenses.

A drilling program has been planned to upgrade the below-pit resource classification and to test for additional extensions to the high-grade mineralisation. The results from the Sihayo deeper targeted drilling programs in 2022-23 validate the Company's exploration model of increasing gold grades and mineralisation thickness toward potential feeder zones at depth. The deeper higher-grade gold zones are anomalous in arsenic, antimony, mercury, and thallium geochemistry. The breccias hosting high-grade gold mineralisation at Sihayo show physical features and alteration-mineralisation characteristics that appear similar to those reported in the literature from the multi-million-ounce Cortez Hills gold deposit in Nevada (*See* Appendix 2). This program is dependent upon sufficient funding being available to implement the program during 2024.

In addition to evaluating the underground mining option, exploration has continued with groundwork including mapping and soil geochemical sampling to advance exploration targets at Sihayo, Hutabargot Julu and Kotanopan[5].

Whilst Sihayo Gold is funded in the short term via a further shareholders loan, discussions are ongoing with key stakeholders to resolve future financing to progress the project and continue exploration on the Contract of Work.

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[5] Refer to ASX announcement (SIH:ASX) titled "Strong Exploration Targets Emerging at both Tambang Ubi and Hutabargot Julu" dated 24 October 2022.

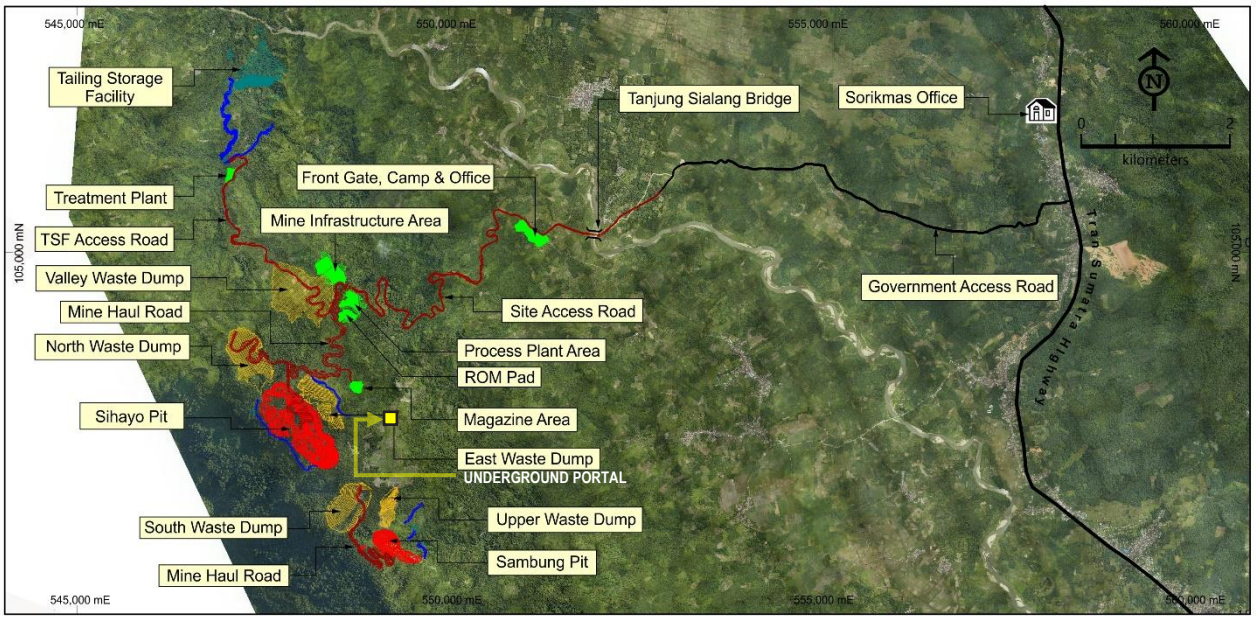


Figure 1: Sihayo 2022 FSU open-pit development layout plan

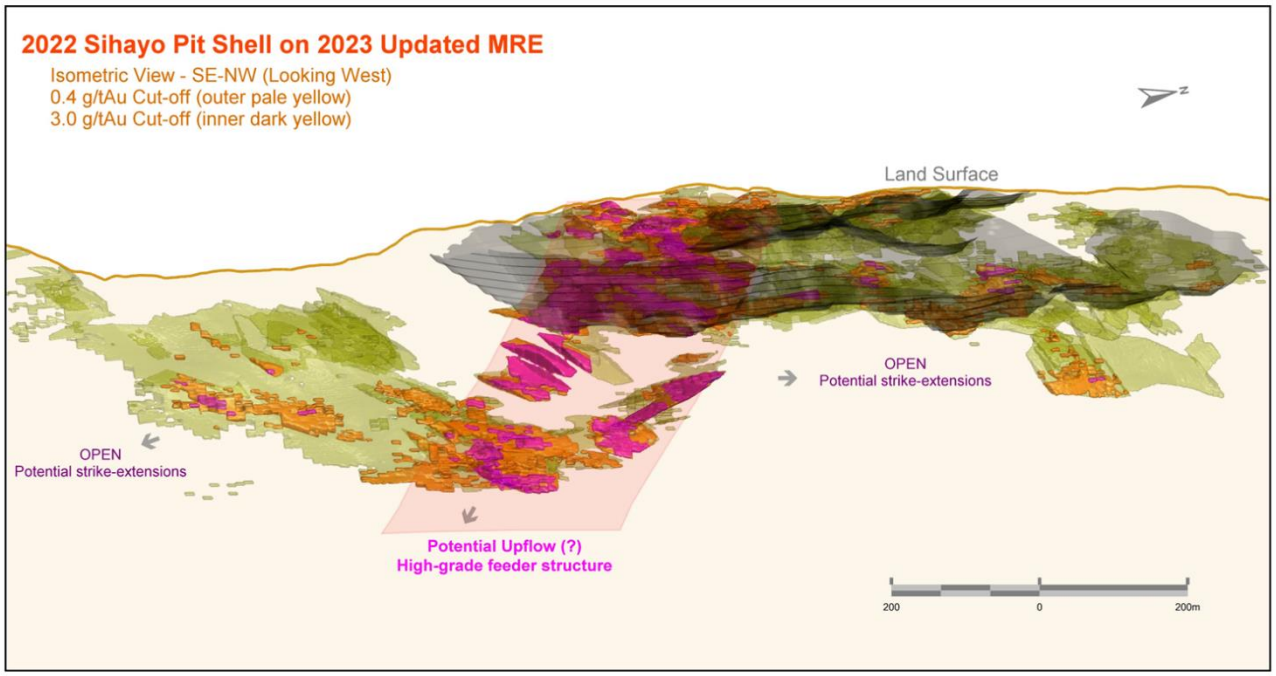


Figure 2: Sihayo 2022 Updated Feasibility Study pit shell on 2023 Update MRE

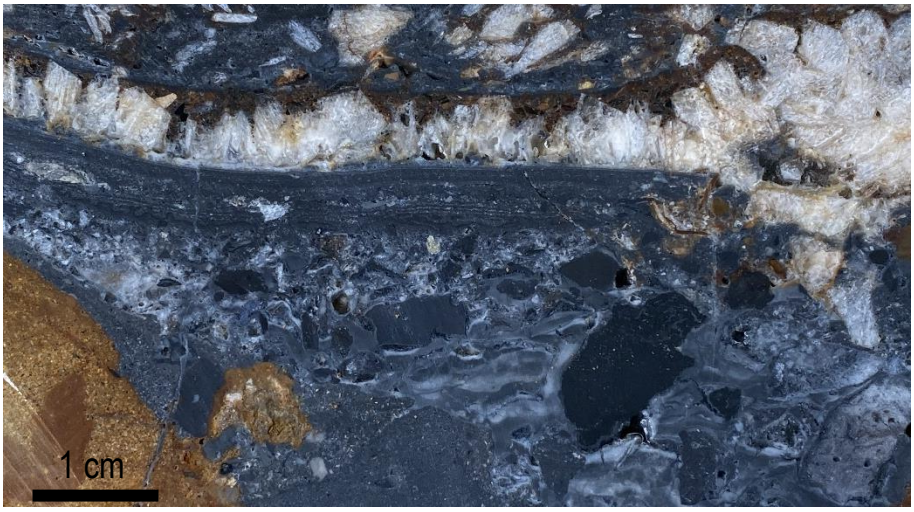


Figure 3: Example of mineralised jasperoid breccia from Sihayo

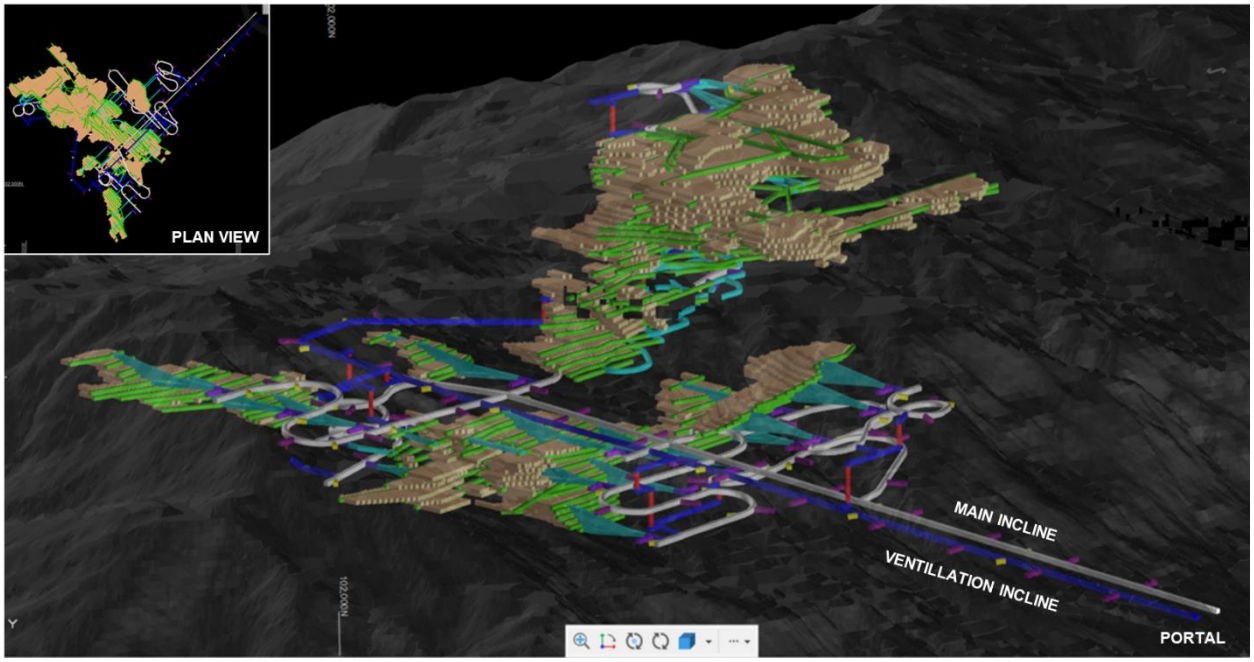


Figure 4: Sihayo Concept Study underground mine layout (Isometric view looking W) draped by LiDAR generated topography

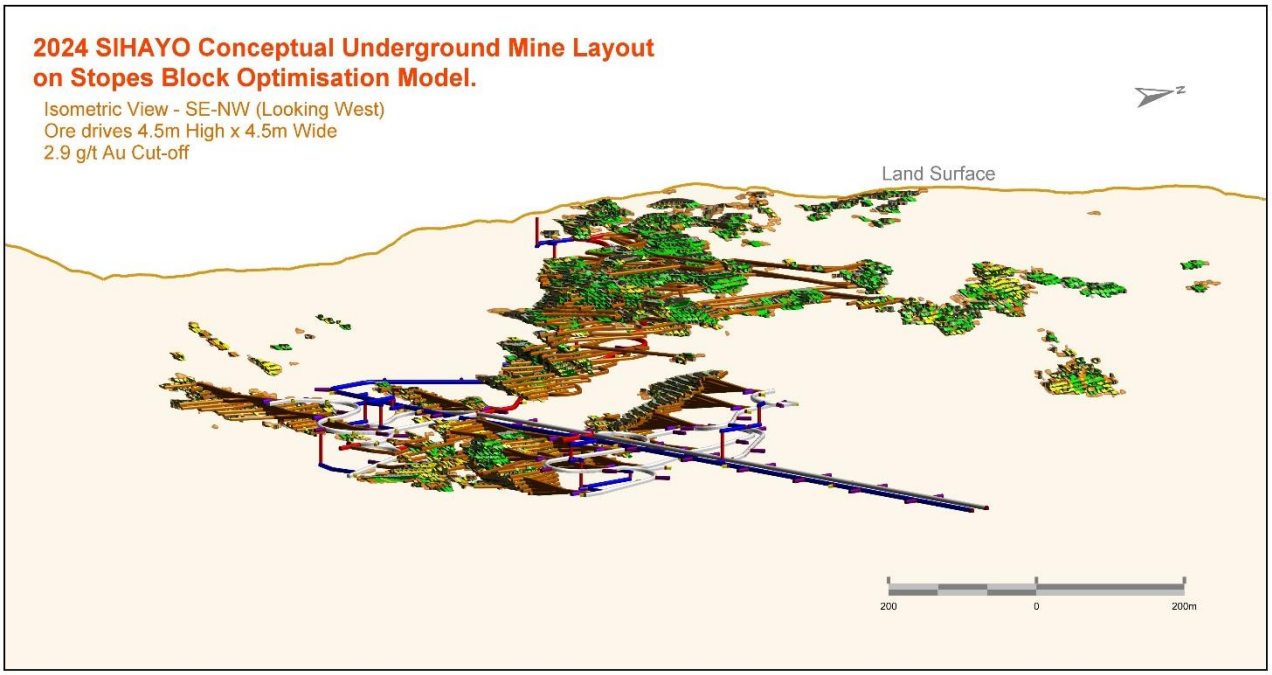


Figure 5: Sihayo Concept Study underground mine layout (Isometric view looking W) and Stope Block Optimisation Model at 2.9 g/t Au cut-off

Appendix 1: Underground Concept Study Highlights

Mine Layout

Stope optimization was performed with two scenarios using the resource block model (Table 1). The model was imported into Deswik CAD, depleted by topography and then a further 20-meters below the surface, the assumption that no mining will be possible within 20m of the surface. This estimated standoff distance from the surface will require further work in future studies. The other parameters were then applied, resulting in the table below:

Table 1: Mining Inventory Comparison of MSO Scenario

MSO Scenario	Stopes (ea.)	Tonnes (t)	Grade (g/t)	Ounces (oz)
YZ Scenario	3,107	3,516,661	4.57	516,485
ZX Scenario	3,927	4,002,303	4.49	577,955
Difference	**+820**	**+485,642**	**-0.08**	**+61,470**

The Mineable Stope Optimiser (MSO) results indicate that the XZ scenario yields a greater quantity of ore and contained ounces compared with the YZ scenario. However, it is important to note, the YZ scenario yields a higher gold grade.

The mine design is determined by consideration of the dimensions and distribution of the ore, as well as the limits of stope optimization. The detailed design parameters for this Sihayo Underground Mining Study are summarised in Table 2.

Table 2: Sihayo underground mine design parameters

Parameter	Description	Comment
Lateral Development		
Main Incline/Decline & Ventilation Incline/Declines (W x H)	5.5m x 5.5m, Radius 2.75m	Arched
Stockpile (W x H)	5m x 5m, Radius 2.5m	Arched
Level Access (W x H)	5m x 5m, Radius 2.5m	Arched, 20m from Decline
Level Access (W x H)	4.5m x 4.5m, Radius 1m	Semi arched
Return Air Drive (W x H)	5m x 5m, Radius 1.5m	Arched
Sump (W x H)	4.5m x 4.5m, Radius 1m	Semi arched
Vertical Development		
Return Air Rise (Diameter)	4.0 meter	Circular, Raisebore & Sinking
Production Profile		
Ore Drive & Sill Drive (W x H)	4.5m x 4.5m, Radius 1m	Semi arched
Max Decline Gradient	1: 7 (maximum)	

Access to the Sihayo Underground Mine would be via a portal located in the side of the hill (Figure 6). The primary focus of the mine development would involve developing an initial incline from the portal to reach the orebodies. Internal declines and inclines would then be required to reach level accesses. Once these internal declines/inclines reached the required elevation for the planned mining block, level access would be developed to allow the commencement of ore production on the level. Ventilation declines/inclines and ventilation shafts between levels in the mine would be developed to connect ventilation networks providing fresh air and return airways. The capital development and ventilation drives are planned on the foot wall side of the orebody.

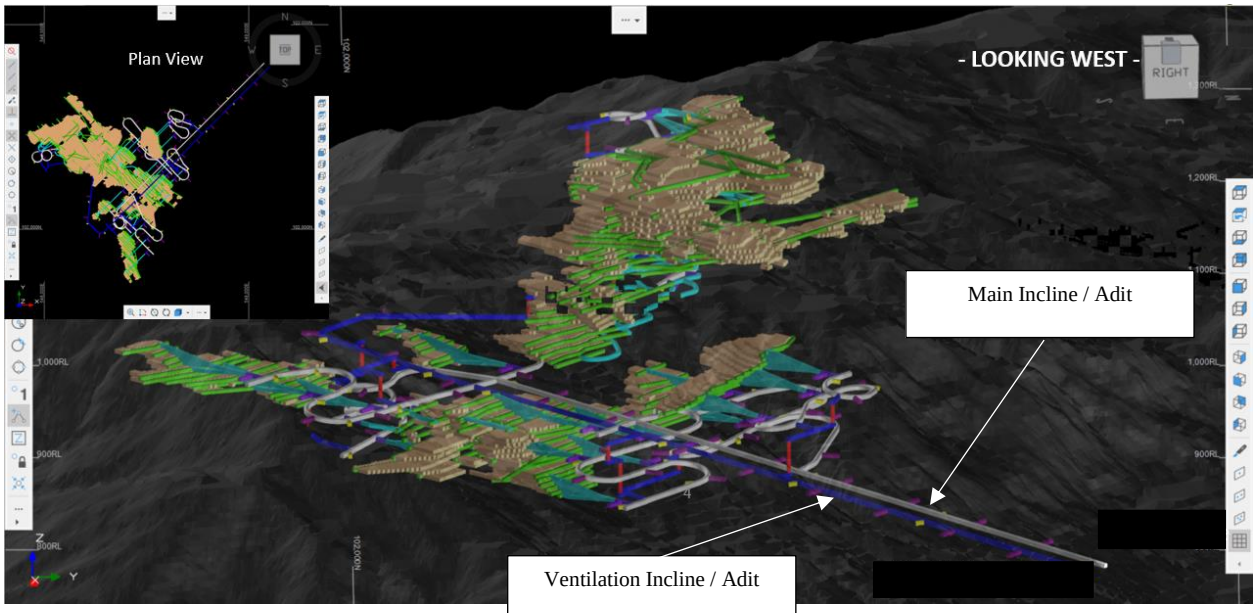


Figure 6: Looking west Sihayo underground mining layout.

The Sihayo underground mining operation is planned to use a twin incline concept, which offers several benefits. These include early access for production, providing locations from which to conduct diamond drilling to upgrade Inferred Mineral Resources and accessing underground exploration targets. This approach also allows primary ventilation to be progressively established as the incline advances.

Production Schedule

The mining method proposed in this design is overhand drift-and-fill. The orebody is planned to be extracted from the bottom up, with cut heights of 4.5 m and drift widths of 4.5 m. This method involves developing sill drive headings along the footwall from which the ore drives would be developed across the orebody.

The first ore drive is developed in the ore and is backfilled with consolidated fill. The second ore drive is driven adjacent to the first ore drive. This cycle continues until the ore zone is completely mined out to full width, once filled, the second lift commences, working immediately above the first lift. The mining process uses drilling, blasting, loading, and ore transportation. After an ore drive has been mined, backfilling is carried out, using waste from development activities mixed with dry tailings. The main equipment required for mining operational activities are jumbo drills, LHDs, and mining haul trucks. Ancillary equipment and activities include road maintenance, mine ventilation, lighting, pumping and drainage, power and communications.
The parameters used for mine scheduling are summarised in Table 3.

Table 3: Lateral and vertical development rates

Activity	Capital/Operating	Rate
Portal	Capital	1 month
Main Decline	Capital	80 – 150 m/month
Ventilation Decline	Capital	80 m/month
Stockpile	Capital	60 m/month
Sump	Capital	60 m/month
Return Air Drive	Capital	60 m/month
Level Access	Operating	80 – 135 m/month
Sill Drive	Operating	80 m/month
Ore Drive	Operating	300-570 m/month
Return Air Rise	Capital	1 m/day

During the first two years, mining activities will primarily focus on developing the main decline, the ventilation decline, and supporting infrastructure to gain access to orebodies. During this initial period ore production can begin at an elevation of 973 mRL, as the prosed development of twin declines would enable primary ventilation to be established (Figures 7 & 8).

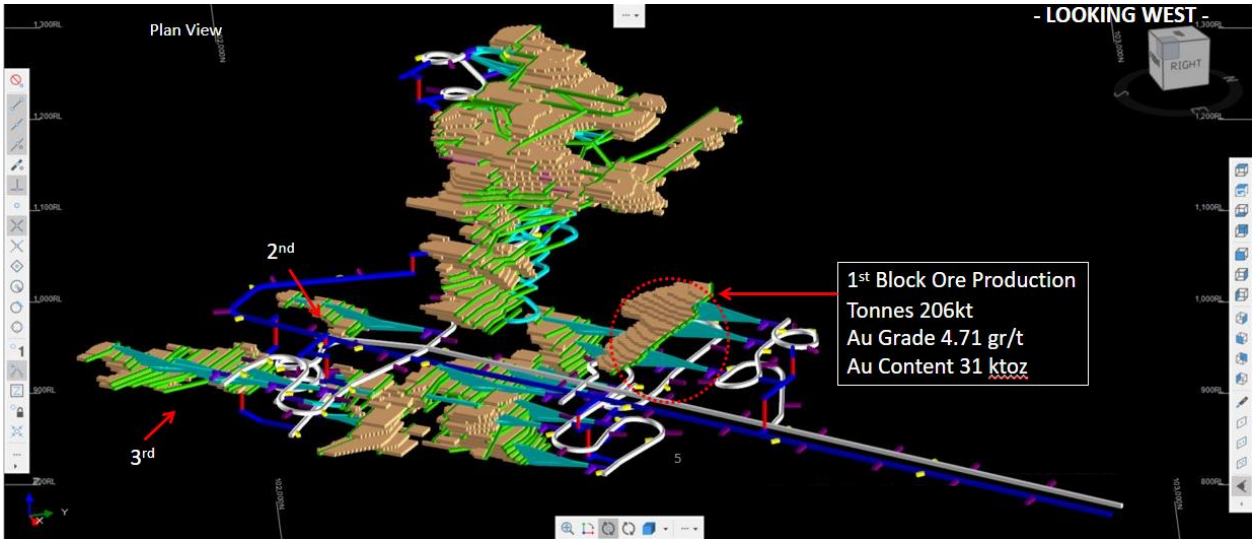


Figure 7: Looking west Sihayo underground mining 1st ore production.

As mine development progresses, production areas increase, peaking in the 3rd - 5th years, and begins to decline from year six. The Sihayo life-of-mine mine schedule is summarised in Table 4**.**

Table 4: Conceptual life-of-mine schedule
Standalone underground development

Name	Total	Y01	Y02	Y03	Y04	Y05	Y06	Y07	Y08
		Sub Total	Sub Total	Sub Total	Sub Total	Sub Total	Sub Total	Sub Total	Sub Total
--- Meter Summary ---									
Metres Total - Lateral	109,991	7,060	21,839	18,090	14,494	14,350	13,713	12,446	7,999
Metres Waste - Lateral	41,286	5,472	11,798	7,587	3,940	3,807	3,747	3,463	1,472
Metres Ore - Lateral	68,705	1,588	10,040	10,503	10,554	10,543	9,967	8,983	6,527
Metres Ore Sihayo Lower	29,317	1,588	8,349	7,709	5,805	4,742	1,124	-	-
Metres Ore Sihayo Upper	39,388		1,691	2,794	4,749	5,801	8,843	8,983	6,527
Metres Waste - Vertical	401	51	287	63	-	-	-	-	-
--- Tonnes Summary ---		-	-	-	-	-	-	-	-
Tonnes Total - Mined	5,934,684	484,916	1,266,645	953,337	746,327	736,463	702,529	635,968	408,499
Tonnes Waste - Total	2,456,503	404,520	758,347	421,627	212,046	202,737	197,971	181,208	78,048
Tonnes Ore - Total	3,478,180	80,396	508,299	531,711	534,281	533,726	504,557	454,761	330,450
--- Backfill ----									
Stope Backfill (tonnes)		80,396	508,299	531,711	534,281	533,726	504,557	454,761	330,450
Waste Surface Stockpile (tonnes)		324,123	574,171	464,088	141,852	344,589	197,971	181,208	78,048
Dry Tailing Backfill (tonnes)						189,136	306,586	273,553	252,402
---- Grade & Ounces ---		-	-	-	-	-	-	-	-
Ore Grade (gr/ton)	4.61	4.11	4.36	5.11	4.58	4.75	5.00	4.37	4.06
Ore Ounces (toz)	516,018	11,739	68,708	87,292	78,663	81,487	81,178	63,822	43,129
Gold Recovered (toz)									
--- Heading Avalaibility ----									
Heading Avalaibility		4	18	20	17	15	15	12	6

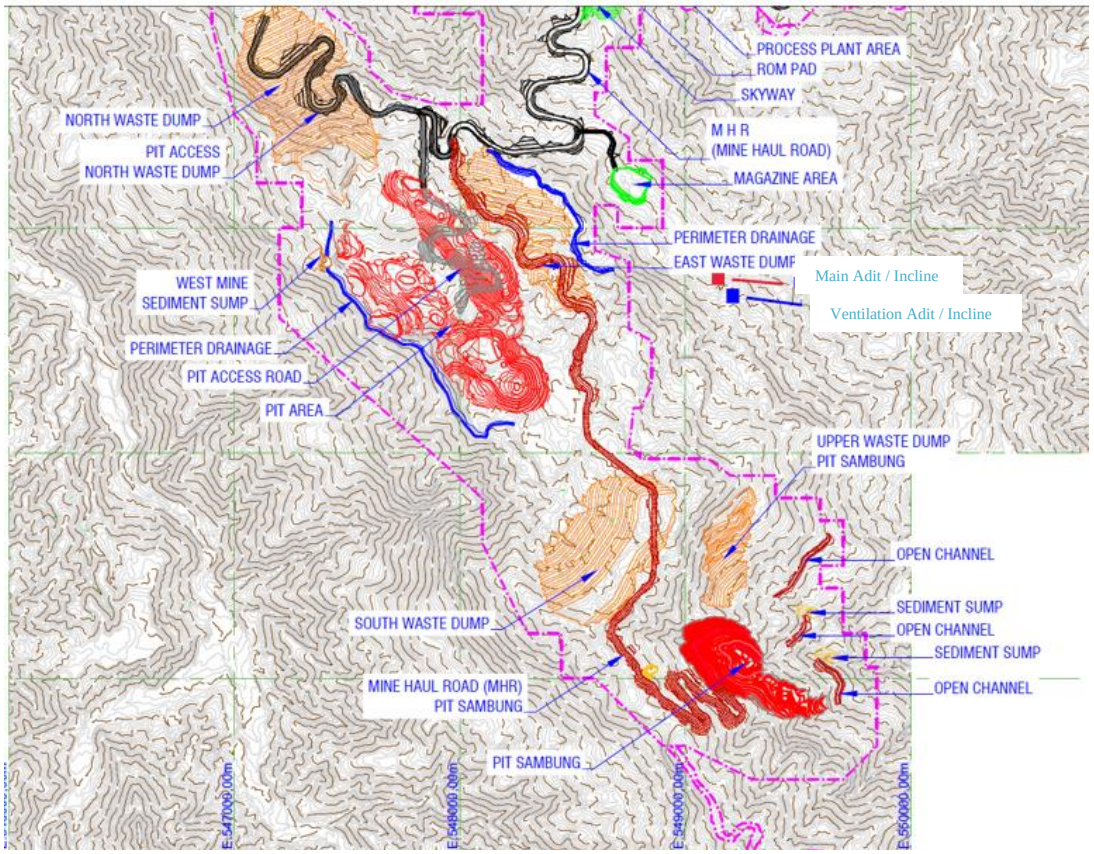


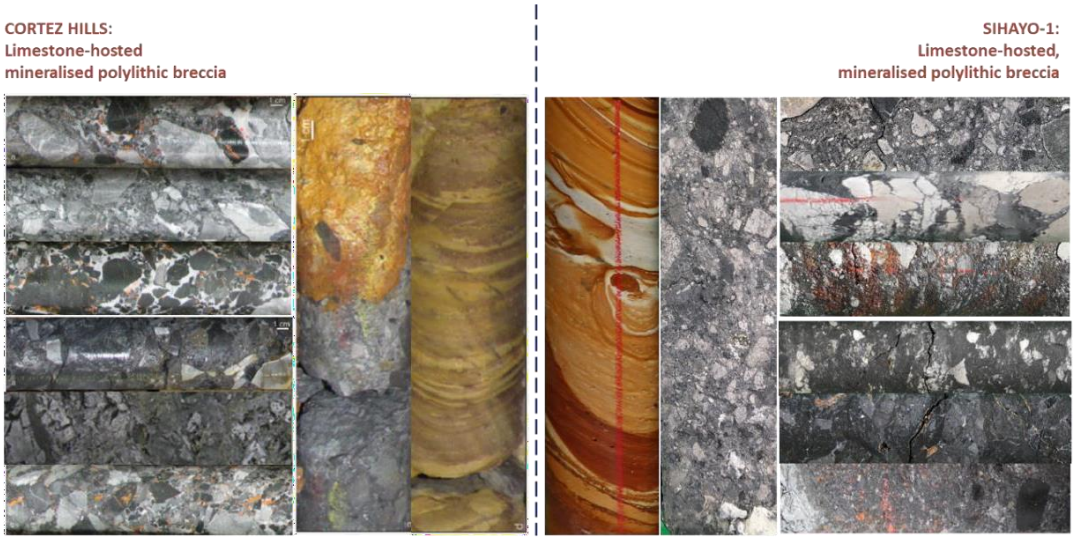
Figure 8: Surface Layout including location of Adits.

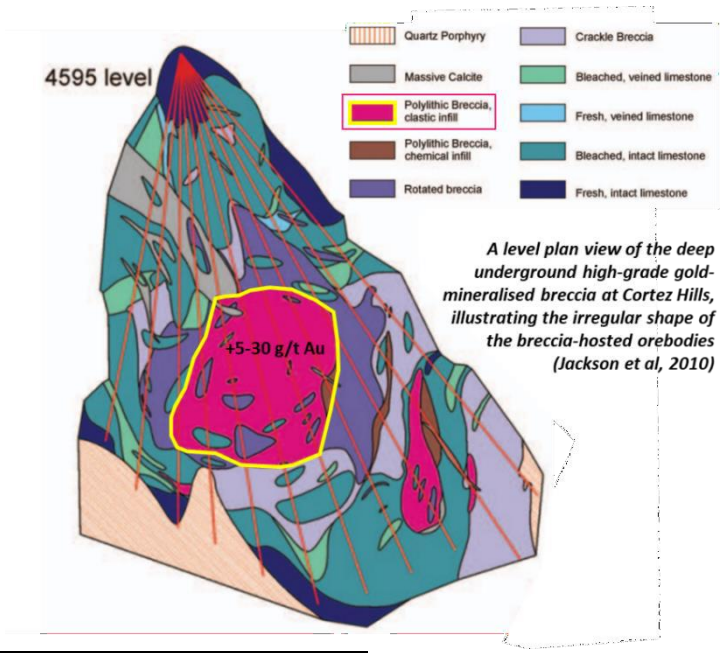
Appendix 2: Cortez Hills Analogue

A comparison is drawn between Sihayo and the high-grade and multi-million-ounce Cortez Hills breccia-hosted Carlin-type gold deposit in Nevada (the latter is described by Bradley et al, 2020[6], and Jackson et al, 2010[7]). Both gold deposits share a common set of geological characteristics including:

- Hosted in polylithic breccias within karstic carbonate rocks (limestone).
- Show strong structural controls and a spatial association with igneous intrusions.
- Sulphide-refractory gold mineralisation, where unoxidized, within varying proportions of hydrothermal clays, jasperoidal silica, and residual organic material.
- Submicron size gold occurring within the arsenic-rich rims of fine-grained pyrite.
- *See description of Sihayo pyrite composition by Prof Ross Large on the next page*.

A comparison of the breccia hosts in both deposits is shown below:





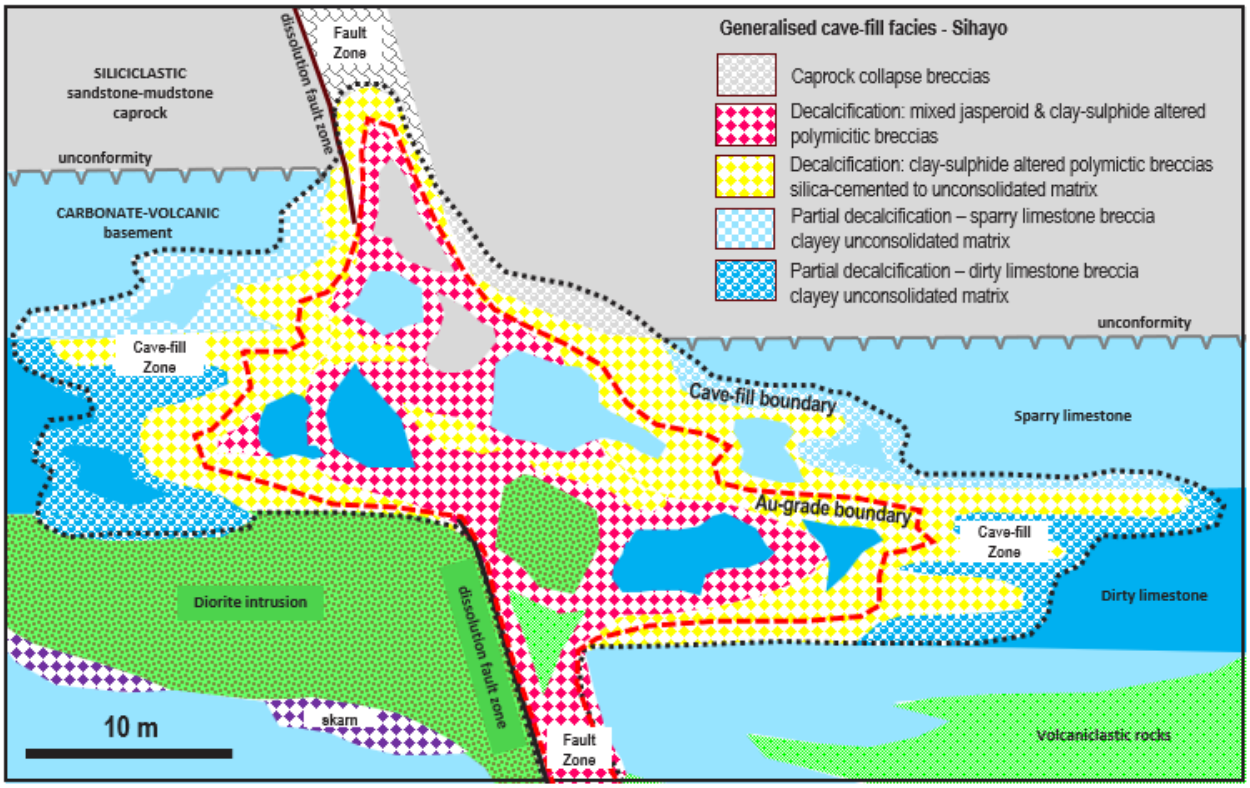
A level plan view of the deep underground high-grade gold-mineralised breccia at Cortez Hills, illustrating the irregular shape of the breccia-hosted orebodies (Jackson et al, 2010)

The basis for the comparison is that higher-grade gold mineralisation is associated with fluidised matrix-supported polylithic breccias that occur as irregular stratabound and discordant bodies (pipe-like) associated with hydrothermal karst developed in the limestone host along unconformities, major faults and/or igneous intrusion contacts.

There is an apparent trend of increasing gold grade with increasing depth; extremely high gold grades are predicted to occur in narrow root or upflow zones along individual breccia bodies.

[6] Bradley, M.A., Anderson, L.P., Eck, N., and Creel, K.D, 2020, Giant Carlin-type gold deposits of the Cortez district, Lander and Eureka Counties, Nevada, in Sillitoe, R.H., Goldfarb, R.J., Robert, F., and Simmons, S.F., eds., Geology of the World's Major Gold Deposits and Provinces: Society of Economic Geologists Special Publication 23, p. 335–353.

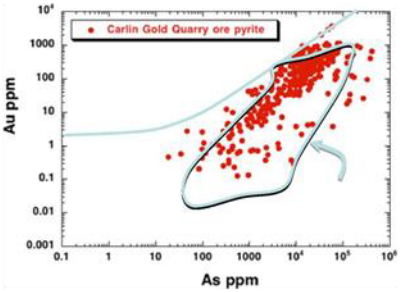
[7] Jackson, M., Arbonies, D., and Creel, K., 2011, Architecture of the Cortez Hills breccia body, in Steininger, R., and Pennell, B., eds., Great Basin evolution and metallogeny: Geological Society of Nevada Symposium, May 14–22, 2010, Proceedings, p. 97– 123.

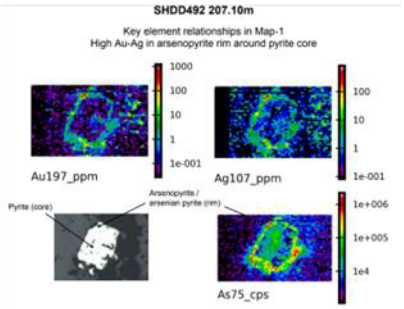


Generalised Schematic – Sihayo gold deposit
A fault-controlled cave-fill mineralisation zone

Summary of Internal Report to Sihayo Gold
Sihayo LA-ICPMS Pyrite Composition by Prof Ross Large (2011)

- The fine grained texture and composition of pyrite from the Sihayo samples is identical to the main ore stage pyrite from deposits on the north Carlin trend, previously studied in AMIRA project P923 (see also Large et al., 2009)
- Maximum As values up to 10 wt % dissolved in pyrite and invisible gold values up to 1000 ppm, measured by LA-ICPMS in the Sihayo samples, are similar to maximum values in Carlin pyrite
- Over 90% of the gold is invisible, locked in the structure of the arsenian pyrite, in both Carlin and the Sihayo samples
- A strong correlation between Au and As, Sb, Tl, Ag, Cu is recorded in both data sets
- Large, R. R., Danyushevsky, L. V., Hollit, C., Maslennikov, V., Meffre, S., Gilbert, S., Bull, S., Scott, R., Emsbo, P., Thomas, H., and Foster, J., 2009, Gold and Trace Element Zonation in Pyrite using a Laser Imaging Technique: Implications for the Timing of Gold in Orogenic and Carlin-Style Sediment-Hosted Deposits: ECONOMIC GEOLOGY, v. 104, p. 635-668.





Source: Large, R, and Hutchinson, D, 2011. Laser ablation ICP-MS study of Sihayo samples, 164pp. (Internal Report for PT Sorikmas Mining)

Competent Person's Statement

Exploration Results

The information in this report which relates to Exploration Results is based on, and fairly represents, information compiled by Mr Bradley Wake (BSc Hons. (Applied Geology)), who is a contract employee of the Company. Mr Wake does not hold any shares in the company, either directly or indirectly.

Mr Wake is a member of the Australian Institute of Geoscientists (AIG ID: 3339) and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves".

Mr Wake consents to the inclusion in the report of the matters based on this information in the form and context in which it appears.

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