Mining Plus

DOCUMENT REVIEW & FINANCIAL UPDATE

EXECUTIVE SUMMARY

Both TWP/MP and GHD consider that block caving may be a suitable mining method to extract the Guinaoang deposit and both parties also agree that the available geological, hydrogeological and geotechnical data is insufficient to assess the cavability of the deposit. TWP/MP and GHD both recommend further investigation with the aim of deducing the cavability of the deposit as part of a multi-disciplinary Pre-Feasibility study.

The change in the mine design from a decline and shaft haulage configuration to a decline access plus a conveyor decline for the material haulage has a positive effect on the project economics by a reduction in total costs of US$307M. Additional changes to the project can also be made that will improve the project IRR and NPV. Table 0-1 below shows a summary of the suggested changes and the NPV and IRR results.

Table 0-1: Summary of Review Results

Design Change	**$NPV_{8\%}$ (US$M)**	**IRR %**
Base Case – Scoping Study	**199**	`10
Metal prices & Discount Rate Copper US$3/lb, Gold US$1,250/oz., Discount Rate 8%	299	12
Mine design + Schedule Change, Conveyor Haulage	331	14
Production Rate, 16Mtpa	525	17
Production Rate, 20Mtpa	739	21
Cave Column Height from 700m to 1000m	859	21
Reduction in total costs by 10%	915	22

Mining Plus re-sequenced and rescheduled the cave undercut approach from an advanced undercut to a pre-undercut strategy, which brought forward the full mine production by 3 years.

In prior study work, Mining Plus proposed the use of refrigerated mine air cooling systems on the basis that the virgin rock temperature expected in the mine is sufficient to cause un-workable conditions underground. GHD suggested changes to the ventilation system. The changes suggested by GHD are reasonable but are not backed up by detailed ventilation modelling and should therefore be considered as a guide for future work.

The cave footprint, the overall column height and the extraction level for lift 1 and lift 2 have not been optimised. Further work should be undertaken to determine the optimum cave geometry, cave height and extraction level positioning. This work should be undertaken in conjunction with scheduling and more detailed cost modelling in order to ascertain the optimum mine production rate.

The materials handling system for the mine requires further investigation. This review suggests that a change from a 12Mtpa shaft haulage system to a 20Mtpa underground conveying system has the potential to unlock value in the project. New technologies and innovation should also be considered with the aim of reducing the mine capital and operating costs.

The Guinaoang Copper Project is economically viable at a conceptual or scoping level. The project should be investigated in more detail as part of a multi-disciplinary Pre-Feasibility study.

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1 INTRODUCTION

The Guinaoang ore body is a copper-gold deposit (The Mankayan Project) located on the Philippine Island of Luzon 260km north of the capital, Manila. The Mankayan Project was acquired in 2007 with a 39 year history of resource definition by a multiple of companies. A definition drilling programme consisting of approximately 10,000 metres of diamond drilling over two years by Bezant Resources was conducted in parallel with an independent historic data compilation project.

In 2011 TWP Australia was commissioned by Bezant Resources PLC to undertake a Conceptual Study for the Mankayan Project in the Philippines. The Project was an undeveloped underground mine, for which a conceptual mining, extraction and processing method was to be determined. This study was conducted within the limits of accuracy of +35% to -30%.

TWP engaged the services of Mining Plus to provide mine planning expertise for this study. The scope of work for Mining Plus included but was not limited to:

- Geotechnical assessment of the ore body against the proposed mining method.
- Completion of a concept level mine design and an integrated mine schedule.
- Compilation of mine equipment and manning schedules.
- Capital and operating cost estimates.
- Financial evaluation of the project.

In 2014 GHD was commissioned to conduct a desktop review of the TWP report to update the capital and operating expenditure selected in the TWP report.

This work sees Mining Plus commissioned to assist Bezant Resources with a Document review and financial update related to its Mankayan Copper Project located in the Philippines.

1.1 Scope of Work

The scope of work is as outlined in email correspondence and subsequently discussed at a meeting on Wednesday 17th September 2014 at the Mining Plus offices. Scope of work is as follows;

1.1.1 GHD Document Review

Undertake a brief review and provide commentary into the recently completed GHD document titled “CMDC Guinaoang Copper Project, Review of TWP’s Conceptual Study Report, September 2014”.

In particular, the focus is understood to be as follows;

- Primary Materials Handling system changed from Vertical Shaft to Conveyor Decline
- Modifications to the ventilation network and motivating system
- Removal of a refrigerated mine air plant

Commentary is required into the degree of alignment of the changes with modern Block Cave practice, whether the attendant cost savings are reasonable, and whether Mining Plus can envisage any further or different avenues for reducing study Capital and Operating expenditure.

1.1.2 Financial Model Update

Provide an update of the previously completed Financial Model (Mining Plus model) incorporating current metal prices and reflecting any suggested changes to the Mine Design.

1.2 Deliverables

Deliverables are understood to be as follows;

- Brief report outlining review findings and any proposed changes that may arise
- Updated live financial model file

2 MINE DESIGN

2.1 Mining Method

Both TWP/MP and GHD consider that block caving may be a suitable mining method to extract the Guinaoang deposit and both parties also agree that the available geological, hydrogeological and geotechnical data is insufficient to assess the cavability of the deposit. TWP/MP and GHD both recommend that further investigation with the aim of deducing the cavability of the deposit is necessary for future studies.

2.2 Cut-off Grade

TWP/MP determined cut-off grades for the Guinaoang deposit on the basis of a block cave mine employing shaft haulage for ore. An initial cut-off grade including capital costs was calculated to determine the geometry of the block cave footprint. The initial cut-off grade ensures that the mineralisation contained within the footprint pays for the capital infrastructure required to access it. A marginal cut-off grade excluding capital costs was then calculated to determine the extent of the footprint. As all the capital infrastructure is paid for by the initial footprint, including the mineralisation on its periphery only incurs the cost of the development to reach it and the operating costs to extract it.

In their report TWP/MP state that higher than anticipated operating costs associated with shaft hoisting and materials handling have resulted in the marginal cut-off grade being higher than the initial cut-off grade. Usually the marginal cut-off grade is lower than the initial cut-off grade due to the removal of capital infrastructure costs from the calculation.

It is recommended that the initial and marginal cut-off grades be recalculated to reflect the changes in capital and operating costs associated with conveyor haulage rather than shaft haulage and alterations to the ventilation strategy. It is possible that this will result in more of the mineralisation falling within the block cave envelope.

2.3 Production Rate

A production rate of 12Mtpa was selected by TWP/MP on the premise of shaft haulage. TWP/MP benchmarked some of the largest block cave mines in the world and determined that 12Mtpa was the likely upper tonnage limit able to be hoisted through a single shaft.

The draw-down rate of the cave was also considered in the TWP/MP determination of production rate. The draw-down rate is calculated from the production rate, the area of the block cave footprint and the availability of the draw points. Using a production rate of 12Mtpa, the current block cave footprint and a draw point availability of 50% results in a calculated draw-down rate of 100mm a day. TWP/MP noted in their report that 100mm per day is well below the industry average of 143mm per day.

TWP/MP also found that if the industry average draw-down rate of 143mm were applied to the current block cave footprint a production rate of up to 16Mtpa could be achieved. An increased production rate of up to 16Mtpa would have a significant positive effect on the project financials. However either an additional shaft or an alternative haulage method would be required.

It is recommended that the project move forward with a production rate that reflects the industry average draw-down rate of 143mm per day. Given that it is also recommended that the initial and marginal cut-off grades be recalculated (and therefore that the footprint of the block cave may change) this new production rate is likely to be around 16Mtpa.

2.4 Material Movement

2.4.1 Shaft Haulage

TWP/MP selected shaft haulage (ore) in combination with trucks (waste) for material movement. As explained in the previous section, shaft haulage places limitations on the maximum production rate. In their report TWP/MP determined that the likely upper achievable production rate through a single shaft is 12Mtpa. To achieve production rates higher than 12Mtpa a second haulage shaft is required and therefore a step change in materials handling complexity, capital and operating expenditure and development time.

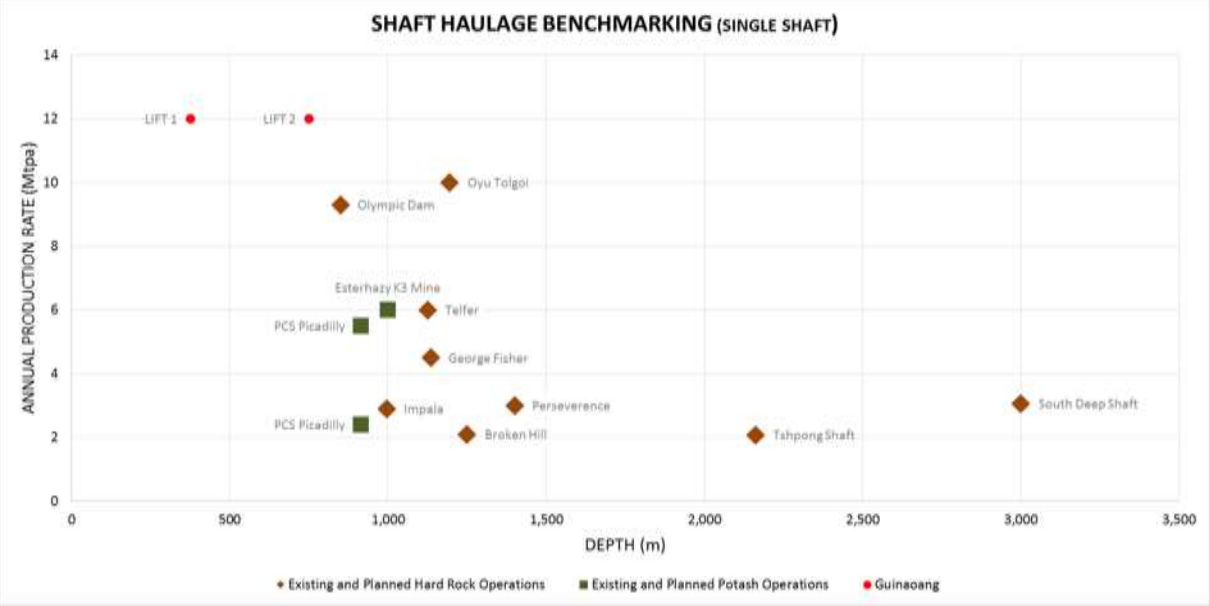

Figure 2-1 Shaft Haulage Benchmarking (Single Shaft)

Figure 2-1 details more recent benchmarking on single shaft production rates, including the TWP/MP proposed production rate for the Guinaoang block cave. It is clear that a production rate of 12Mtpa is an ambitious target. A production rate of between 8Mtpa and 10Mtpa is likely to be more achievable.

Moving the project forward with shaft haulage for material movement would require a drop in production rate (and therefore a draw-down rate well below the industry average) or the addition of a second haulage shaft. Both these scenarios would likely have a negative effect on the project financials.

2.4.2 Conveyor Haulage

GHD propose a conveyor to surface (ore) in combination with trucks (waste) for material movement. A conveyor to surface can accommodate varying production rates for the duration of mine life without the step change associated with shaft haulage. Conveyor haulage is a widely adopted haulage method and is utilised in some of the largest mines in the world to achieve high production rates. Despite being viewed as an application for shallow mines Figure 2-2 shows it is also a successful haulage method in deeper mines.

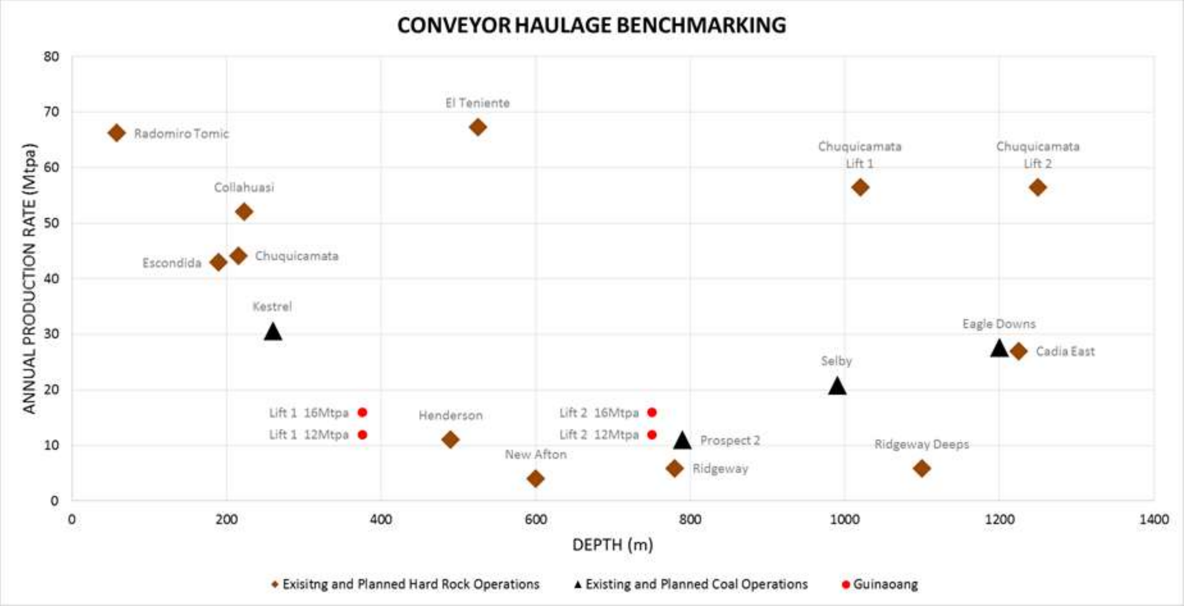

Figure 2-2 Conveyor Haulage Benchmarking

Figure 2-2 details recent benchmarking of conveyor haulage production rates and includes proposed approximate production rates for the Guinaoang block cave. It is clear that very high production rates can be achieved even from comparatively deep mines. Figure 2-2 suggests that any production rate between 12Mtpa and 16Mtpa should be readily achievable for the Guinaoang block cave.

Advantages

In this case, development and fit out of a conveyor drive is less expensive than the development of a shaft. When developed in parallel with a decline, the advance rate in the conveyor drive is significantly higher than if both were developed as separate single headings. This is because multiple headings are available to the development crew increasing the efficiency of the equipment and a ventilation circuit can be established to decrease the working temperatures and clear blast fumes faster.

The development of a conveyor decline also allows a second development entry into both the extraction and undercut levels. This second entry allows for an increase in the number of resources that can be used to develop both the extraction and undercut levels, which in turn allows the cave to be commenced sooner.

A conveyor to surface can be developed in parallel with the decline and it can be installed as the decline and conveyor drives progress. It would then be completed prior to the commencement of undercut level, extraction level, crusher and service infrastructure development. With the low additional expense of a tip-point, small jaw crusher and apron feeder it can then be used to transport rock from the development of the undercut level, extraction level, crusher and service infrastructure development to the surface. This would significantly increase the efficiency of this development by reducing the haul and therefore the number of trucks required.

Challenges

There is a maximum length of conveyor that can be run efficiently. The standard design length used by Mining Plus is 1.6km. The final design length is determined by the maximum load (both static and dynamic) on the belt and the belt designs available from the supplier. Each run of conveyor requires a transfer point where material from the lower conveyor run is loaded on. Generally these transfer points are placed where the conveyor must change direction. Dust is created at transfer points and sufficient ventilation must be provided to remove the dust from the ventilation circuit.

The conveyor can be either installed on concrete plinths set on the floor of the drive or suspended from rock anchors installed in the backs of the drive. The back mounted installation is generally preferred in order to assist with spillage clean up. In either option the conveyor machinery has very low tolerance for variations in the conveyor drive floor or backs meaning the profile of the conveyor drive must be extremely regular along its entire length. The tolerances required are well below those accepted in normal mining practice and non-specialised development crews can struggle to achieve the required tolerances. As a result it is likely that a specialised expatriate development crew would be required to develop the decline and conveyor drive in parallel. An in-country development crew would then take over once the undercut and extraction levels were reached.

In summary; a conveyor to surface would remove the limitations on maximum production rate, reduce capital expenditure and, by decreasing the development time of the block cave, bring forward ore production. The effect of increased production rate and reduced time to first ore will outweigh the cost savings lost by employing a specialised expatriate development crew rather than an in-country development crew for the development of the decline and conveyor drive. It is therefore recommended that the project move forward using conveyor haulage rather than shaft haulage for material movement.

2.5 Ventilation

In their report TWP/MP propose that primary ventilation is provided by a circuit consisting of three intakes; the decline, the haulage shaft (9.8mD) and a fresh air raise (6.0mD) and one exhaust; a return air raise (6.0mD). TWP/MP proposed that the decline is developed as a single heading accessing legs of the return air raise during development. The return air raise is raise-bored in sections and would have up to 5 dog-legs. The haulage shaft is blind sunk and the fresh air raise is raise bored from surface. TWP/MP identified heat as a result of the geothermal gradient as a significant issue in the proposed Guinaoang block cave. To mitigate this they propose a 10MW cooling plant situated on the fresh air raise.

GHD propose that primary ventilation is provided by a circuit consisting of four intakes; the decline, the conveyor drive and two fresh air raises (6.0mD) and one exhaust; a return air raise (9.0mD). GHD do not comment on how these are to be developed. GHD propose that the increase in the volume of air in the primary circuit would remove the requirement for a cooling plant.

Given the recommendations of this report, a revised primary ventilation model is required to accommodate:

- change to conveyor haulage from shaft haulage
- removal of dust from conveyor transfer points
- development of the decline and conveyor drive in parallel
- removal of heat from both production and development working areas
- dilution and removal of equipment exhaust contaminants

- removal of development, undercut trough and secondary blasting contaminants

It is now recommended that primary ventilation is provided by a circuit consisting of four intakes; the decline, the conveyor drive and two fresh air raises (6.0mD) and three exhausts; a main return air raise (8.0mD) and two smaller return air raises (2.0mD). It is proposed that the decline and conveyor drive would be developed in parallel. The smaller return air raises (2.0mD) would be located at the conveyor drive transfer points, at either end of the decline and conveyor drive development. These raises would be dog-legged down as the decline and conveyor drive advance down to Lift 2. Each of the fresh air raises (6.0mD) and also the return air raise (8.0mD) would be raise bored from the level of Lift 1 to surface and then dog-legged down to Lift 2.

The addition of the smaller return air raises (2.0mD) serves a number of purposes:

- Initially to speed the development of the decline and conveyor drive by reducing heat in the working areas (thereby reducing time to first ore),
- Later to remove dust from the conveyor transfer points,
- and finally to remove dog-legs from the main return air raise (8.0mD) thereby reducing the size of raise required

It is recommended that fresh air is delivered from the fresh air raises directly to the undercut and extraction levels thereby removing the fresh air drive and jump-up raises proposed by TWP/MP. This recommendation is in agreement with that of GHD. Also in agreement with the GHD review, it is expected that the increase in fresh air volume into the undercut and extraction levels in combination with the use of electric loaders and the comparatively mild temperatures of the Benguet Province may remove the requirement for a cooling plant. Mining Plus proposed the use of refrigerated mine air cooling systems on the basis that the virgin rock temperature expected in the mine is sufficient to cause un-workable conditions underground. The suggested changes in the ventilation system should be modelled to determine if working areas of the mine area still require cooling due to the high virgin rock temperatures.

2.6 Mine Layout

Mining Plus completed the following design changes as recommended by the conceptual study review report (GHD, 2014).

A. The haulage shaft was changed to a fresh air rise and its diameter reduced from 9.8m to 6.0m
B. A 1in 5.35 5.5mH x 5.0mW conveyor decline, with stockpiles and ventilation connections was added to the design.
C. Fresh air ventilation access drives moved to join into the extraction level
D. Lower fresh air ventilation drive removed
E. The transfer conveyor drive designs from the 4 crusher chambers were adjusted to link up with the conveyor decline.

The scoping study mine design is shown in Figure 2-3 and the adjusted design is shown in Figure 2-4 below.

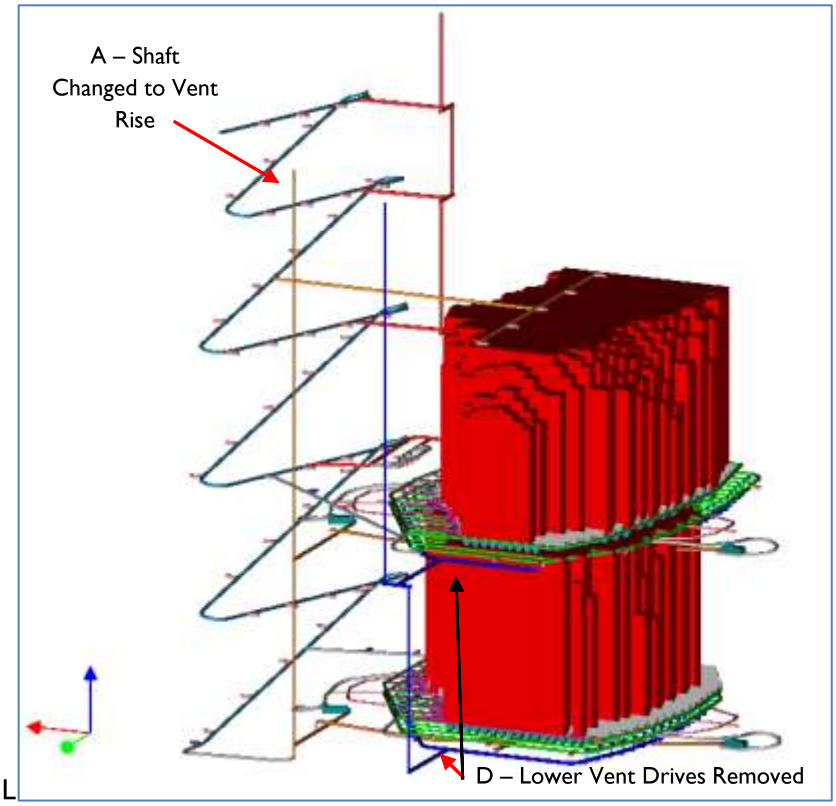

Figure 2-3: **Guinaoang Copper Project Scoping Study Mine Design**

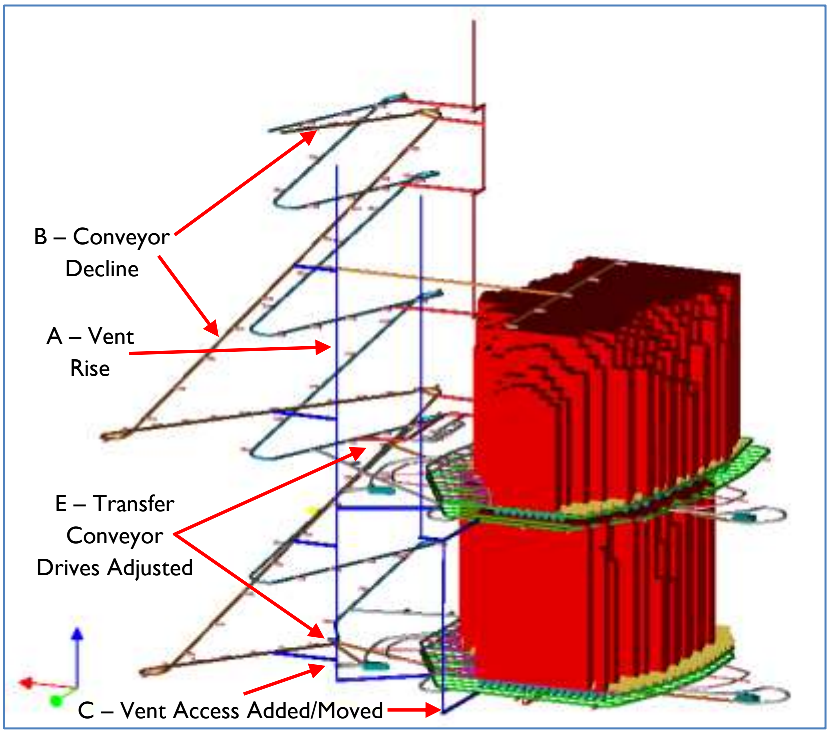

Figure 2-4: **Guinaoang Copper Project Scoping Study Revised Mine Design**

The design changes were completed using Mine24D, evaluated, sequenced and carried through to EPS to produce an updated mine schedule.

3 MINE SCHEDULE

During this review, the scoping study mine schedule, "*Mankayan Combine_PRL_400mt_12MTPA_100929.ews*" was smoothed to 12Mtpa in line with the shaft haulage limit. The schedule was limited by the development and installation of the shaft. The first ore is at the start of year 5, with full production in year 10.

The design changes outlined above were used to produce a revised EPS mine schedule. The development was re-sequenced and re-prioritized in order to bring the start of the cave forward. The revised development schedule has brought the first ore to year 4 and the full production to year 6.

The scoping study production schedule was based on a column draw rate of 100mm/d. The cave columns have an area of 17m x 20m = 540m². The ore has an estimated density of 2.57t/m3. The individual column production rate is therefore

Column Production Rate = $540m^2 \times 0.1m/d \times 2.57t/m^3 = 138.8t/d$, rounded to 140t/d

This production rate was used to produce the 12Mtpa revised mine schedules. The recommendation from TWP/MP and GHD was to increase the cave draw to 140mm/d in conjunction with an increase in the materials handling system capacity. The revised individual column production rate is therefore

Column Production Rate = $540m^2 \times 0.14m/d \times 2.57t/m^3 = 194t/d$

Two versions of the revised mine schedule were created using the higher column production rate which were smoothed to 16Mtpa and 20Mtpa. Figure 3-1 below shows the mine production schedule on an annual basis for the scoping study schedule and the revised versions.

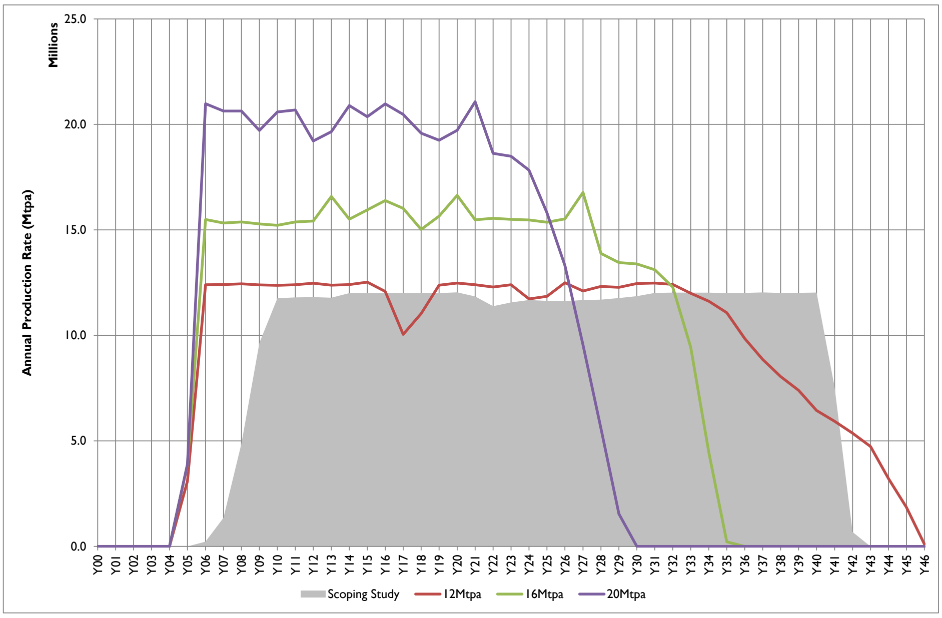

Figure 3-1: Mine Production Schedule, Scoping Study vs. Revised Design

Differential draw rates used for most feasibility studies are assumed. The general practice is to start with a low rate of 100mm/d during the early stage of the cave and ramp up as the cave matures to between 200 – 400mm per day. (Chitombo, 2010). This means that the revised draw rate of 140mm is also conservative and there is scope to increase the cave draw rate further in the latter stage of lift 1 and lift 2 within the mine schedule.

4 CAVE FOOTPRINT INVESTIGATION

Mining Plus conducted a review of the scoping study cave footprint to determine the impact of the design, schedule and cost changes on the optimum cave geometry. The review was focussed on three areas;

- the RL location of the lift 1 and lift 2 extraction levels cave footprint area,
- the overall cave column height and,
- cave footprint area.

The changes to the design, schedule and costs have resulted in a drop in the total cost per tonne for the project. Table 4-1 below shows the total cost per tonne for the project sourced from the scoping study cost models and the revised cost models produced as part of this review.

Table 4-1: Guinaoang Copper Project Total Cost Per Tonne Comparison

Schedule Case	Total Cost Per Tonne
12Mtpa – Scoping Study Case	$23.93
16Mtpa – Scoping Study Case	$26.59
12Mtpa – Revised Design & Schedule	$19.04
16Mtpa – Revised Design & Schedule	$18.12
20Mtpa – Revised Design & Schedule	$17.31

The effect of reducing the total cost per tonne for the project is an increase in both the caving footprint and the cave column height that are economic to mine. The increase in the footprint and the cave column height will give a higher ore tonnage mined. Using the 12Mtpa – revised design & schedule case as an example the increase in the cave footprint and column height correspond with an increase in the total caved tonnage from 425Mt in the current design to 510Mt.

The method used to examine the potential cave footprint involved re-blocking the block model into 15m East x 30m North by 10m RL blocks. The results from the re-blocking process were then transferred to Microsoft Excel, where the blocks were sorted into columns and a net smelter return value, (NSR), calculated for each block. The columns were analysed to determine the tonnes contained in each column above a set RL and above a NSR cut-off value. The RL value used to calculate the column tonnages was varied to produce the graph shown in Figure 4-1 below.

The scoping study block cave layout has 2 lifts with the extraction levels located at 811mRL and 445mRL. The two lifts have been designed with a cave column height of 350m. The cave footprint investigation using the $19.04 total cost as a NSR cut off value suggests that the lift 1 extraction level should be moved to 895mRL, the lift 2 extraction level should remain at 445mRL. The cave column height should be increased to 500m for lift 1 and 450m for lift 2.

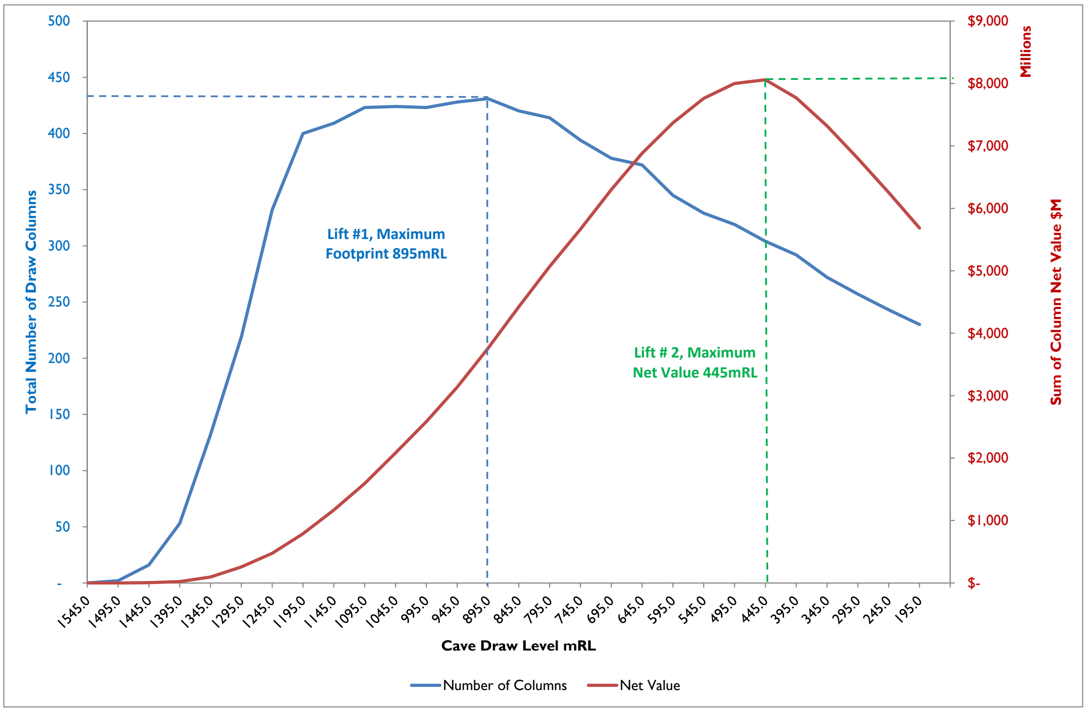

Figure 4-1: Cave Footprint Analysis Results at a Total cost per Tonne of $19.04/t

The proposed changes in the cave footprint for lift 1 are shown in Figure 4-2 below. The increase in the footprint is comprised of some minor expansion to the north-west and eastern sides as well as a substantial increase to the south. The presence of a blank area within the cave footprint to the south indicates that the option of panel caving should be explored in order to work the cave around the lower grade zone.

Panel caving involves setting up several smaller sized caving zones within the main footprint. Panel caving can have a number of advantages over the single cave method which are typically

- Less development intensity required to establish the cave. The development schedule is more even and can have fewer activities on the critical path.
- The materials handling systems used to transfer material out of the cave footprint is smaller and less capital intensive to install.
- Panel caving can allow targeting higher value material earlier in the mine schedule allowing for a faster overall pay back.
- Better control of mining induced stress effects through smaller caving zones.
- The panels effectively separate the mine into smaller discrete working areas, which can be easier to manage during operation.

The main disadvantage of panel caving is the potential loss of ore / dilution of ore around the margins of each panel.

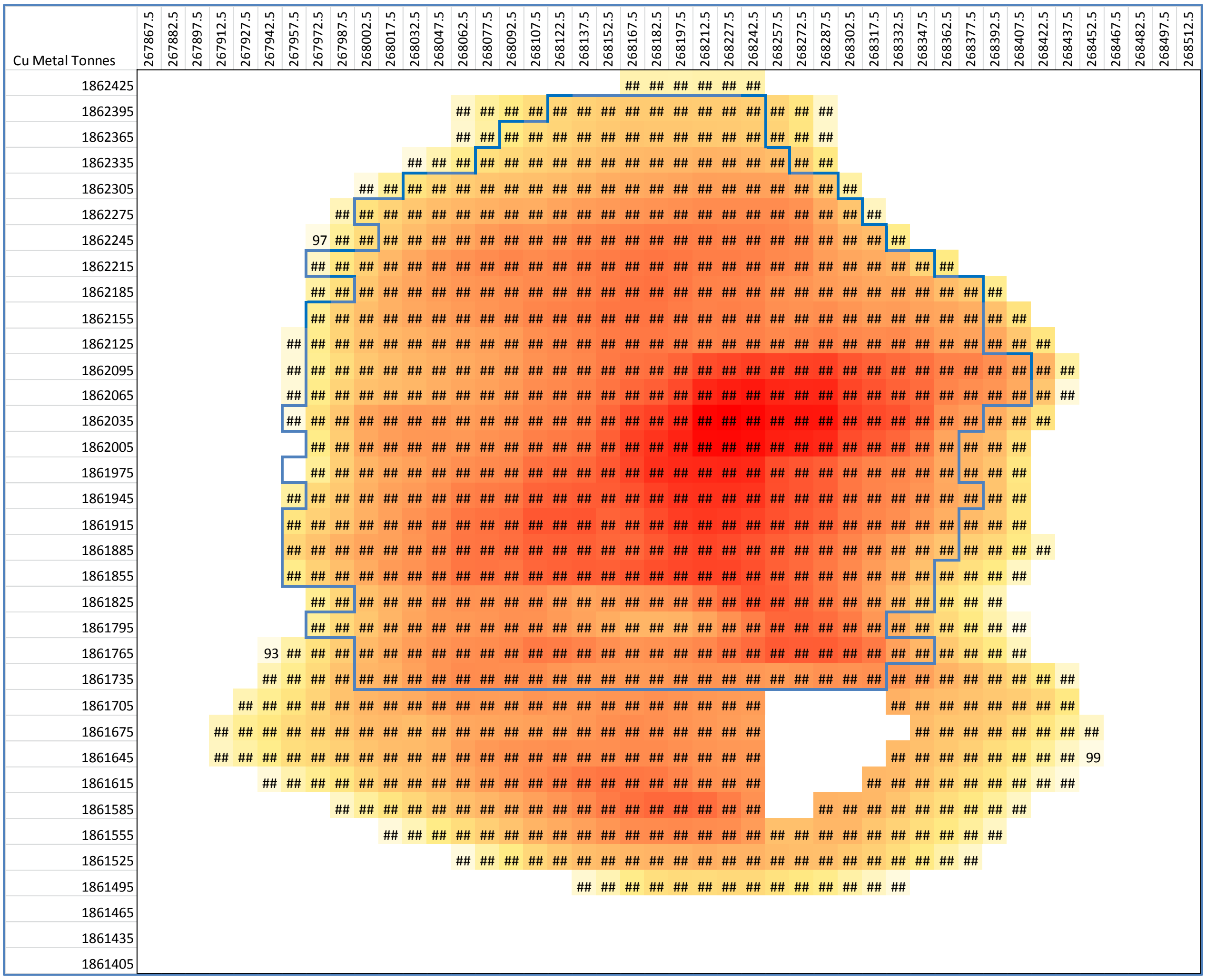

Figure 4-2: Revised Cave Footprint @ $19.04/t at 895mRL vs Scoping Study Footprint

The footprint of the revised lift 1 extraction level shows both an opportunity to increase the number of cave columns, and a potential grade hotspot, for the cave initiation point to start off with. The increased number of columns within the footprint should also allow for a larger production rate to be considered.

The northern part of the revised cave footprint for the second lift is a similar size to the scoping study design. The material in the southern section of the cave is potentially uneconomic and should be removed from the design. The revised footprint also shows a separate isolated cave zone to the south of the main zone, which may be mined concurrently to the main cave. This second zone could provide some top up production to the main cave and enable a similar production rate to the first lift to be maintained.

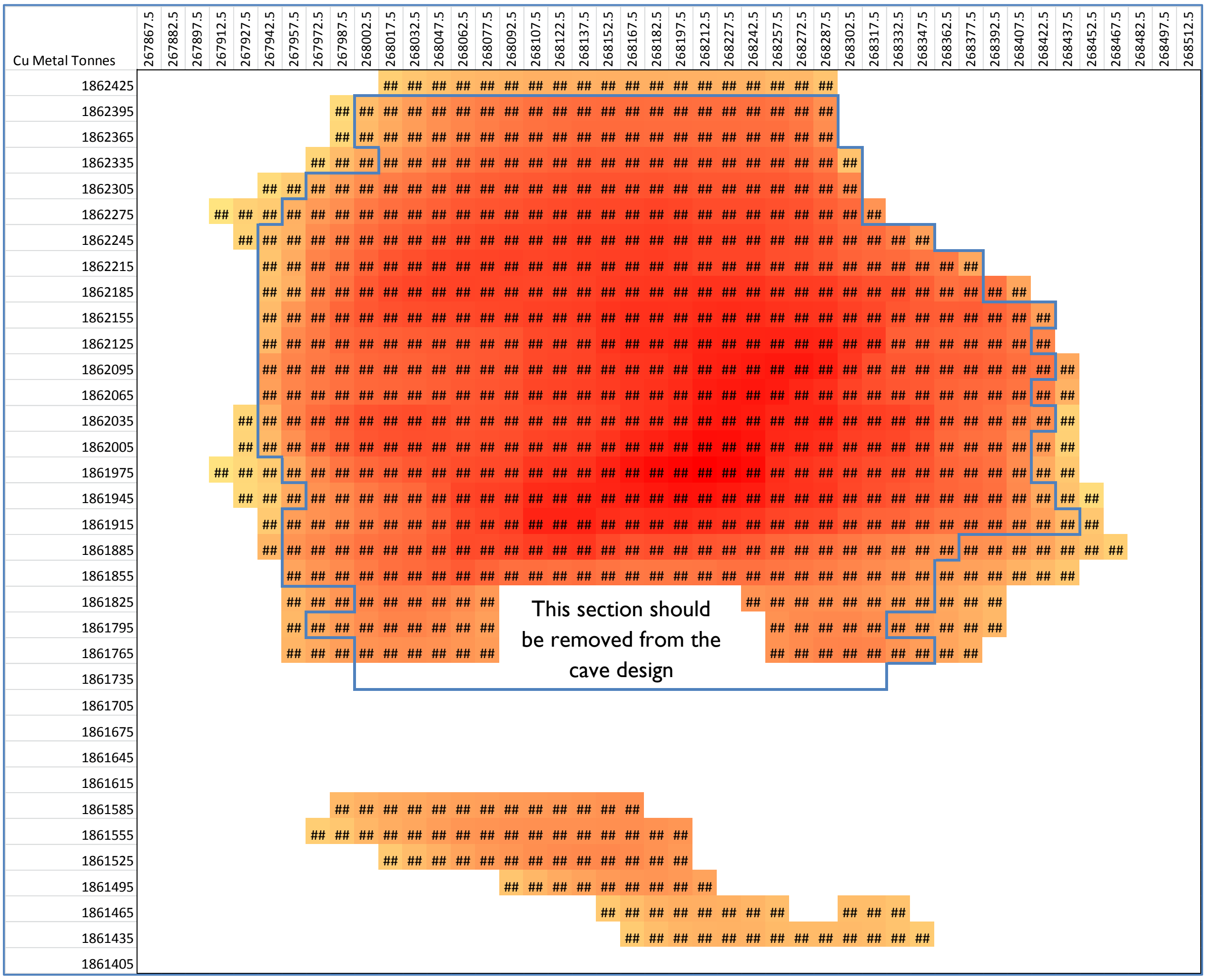

Figure 4-3: **Revised Cave Footprint @ $19.04/t at 445mRL vs Scoping Study Footprint**

The cave footprint investigation suggests that further work should be conducted in conjunction with the additional resource definition programs to ascertain the following key project parameters

- Optimum mine production rate.
- Optimum cave footprint
- Optimum cave height
- Optimum undercut blasting height
- Investigate potential panel cave layout
- Investigate the optimum cave undercut strategy, pre-undercut, post-undercut or advance undercut
- Geomechanical rock testing investigation to determine the cavability of the rock mass
- Optimise the material handling system and estimate of capital and operating costs
- PCBC modelling to determine the optimum cave design geometry
- Optimum mine development design and schedule

5 COST ESTIMATES

The TWP/MP scoping study cost model, "*Bezant Cost Model v.11_new TWP cost inputs.xlsx*" was used as the basis for the revised cost estimate. A number of changes were made to the cost model to reflect the capital and operating costs of the revised materials handling system, including;

- Removal of all capital costs associated with the shaft
- Input of the revised mine schedule physicals, for both the 12Mtpa and 16Mtpa cases, which included the additional development associated with the main conveyor decline
- Addition of capital costs for the purchase and installation of the main conveyor using an estimate of $7,000 per linear meter of conveyor drive and conveyor decline
- Removal of all operating costs associated with the shaft
- Addition of conveyor electrical operating cost per tonne of $0.52/t
- Change gold price from US$1,000 per ounce to US$1,250 per ounce

The revised project costs are shown in Table 5-1 below. The additional tonnes contained in the revised schedule have led to an increase in the total costs for processing and admin & tech services. The capital infrastructure and operating costs have both reduced as a result of the change in the mine design and materials handling system.

Table 5-1: Guinaoang Copper Project 12Mtpa Cost Summary

Costs	Scoping Total Cost (US$M)	Revised Total Cost (US$M)	Unit Cost (US$/t)	Unit Cost (US$/lb)
Total Ore Mined Mt	400	425		
Capital Mining Costs	200	217	0.51	0.07
Capital Infrastructure Costs	1,189	796	1.87	0.25
Equipment Ownership Costs	269	269	0.63	0.09
Operating Costs, Excluding Processing	3,687	3,567	8.39	1.14
Processing Cost	2,460	2,616	6.15	0.84
Admin & Tech Services	332	354	0.66	0.11
Royalties	269	281	0.83	0.09
Total Costs	**8,406**	**8,099**	**19.04**	**2.59**
Total Cost $/lb after gold credits				**1.70**

The revised annual project costs for the 12Mtpa schedule option are shown in Figure 5-1 below. There are two periods of elevated costs, between years 5 & 8 and between years 14 and 18, which are associated with the development of the extraction levels and installation of the materials handling systems for lift 1 and 2

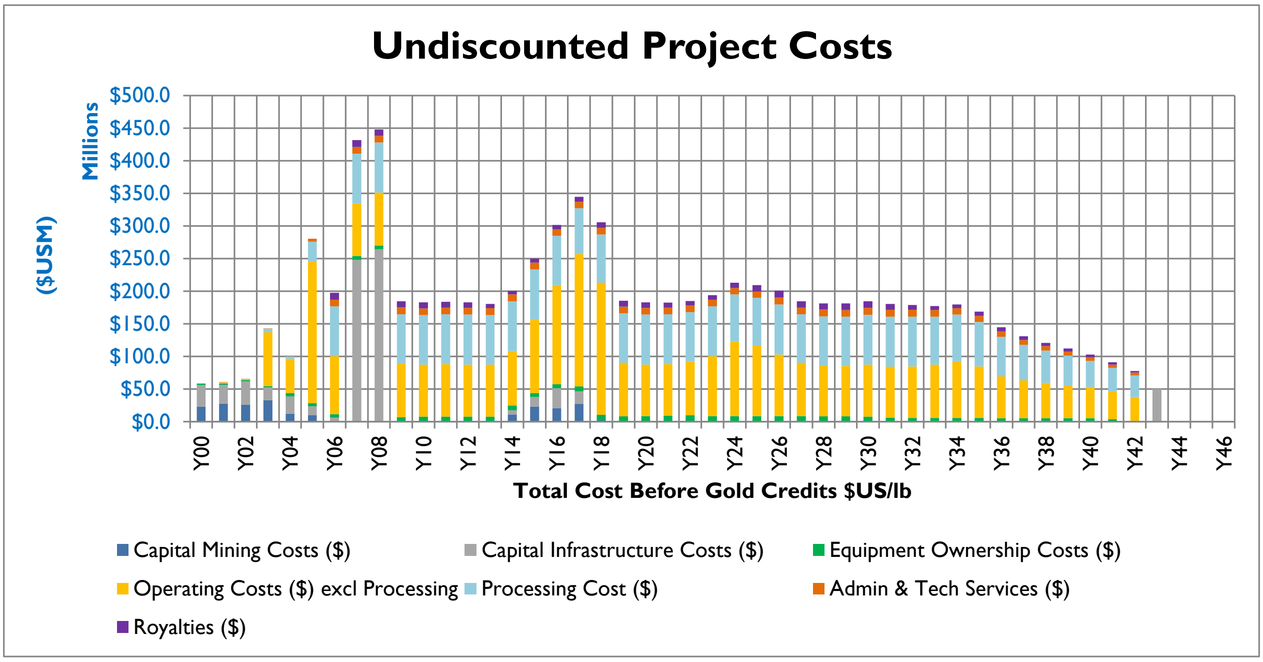

Figure 5-1: **Guinaoang Copper Project Revised 12Mtpa Costs by Year**

6 FINANCIAL ANALYSIS

The financial analysis conducted as part of this review was limited to compiling a number of updates to the cost model using the various versions of the revised mine schedule. The results of the analysis are shown in Table 6-1 below. The revised study 20Mtpa +80Mt case was produced by copying the physicals from year 21 to 29 of the 20Mtpa mining schedule and pasting it into years 25 to 33. The physicals from year 21 was copied and pasted into years 22 to 24. This process added another 80Mt of full production to the cost model and was conducted in order to show the impact of the recommended increase in the overall cave height. Table 6-1, Table 6-2 and Table 6-3 below show the financial analysis results using, spot metal prices, 5 year average prices and 10 year average prices.

Table 6-1: Revised Scoping Study Financial Results using Spot Prices

Revenue	Scoping Study (New Au Price)	Revised Study 12Mtpa	Revised Study 16Mtpa	Revised Study 20Mtpa	Revised Study 20Mtpa +80Mt
Recovered Cu. (kt)	1,433	1,417	1,426	1,423	1,692
US$ Copper Price ($/t)	6,614	6,614	6,614	6,614	6,614
Recovered Au. (koz)	4,015	3,948	3,972	3,964	4,700
US$ Gold Price ($/oz.)	1,250	1,250	1,250	1,250	1,250
Revenue US$M	**14,495**	**14,309**	**14,399**	**14,368**	**17,065**
Costs					
Capital Mining Costs US$M	200	217	221	221	221
Capital Infrastructure Costs US$M	1,189	796	1,008	1,008	1,008
Equipment Ownership Costs US$M	269	269	249	211	250
Operating Costs, excluding Processing US$M	3,687	3,567	3,036	2,699	3,129
Processing Cost US$M	2,460	2,616	2,648	2,633	3,151
Admin & Tech Services US$M	332	354	358	356	426
Royalties US$M	269	280	282	281	335
Total Costs US$M	**8,406**	**8,099**	**7,802**	**7,409**	**8,522**
Cash flow (before Tax) US$M	6,069	6,210	6,596	6,959	8,543
Tax US$M	1,987	2,684	2,917	3,292	3,767
Cash flow (after Tax) US$M	4,081	3,526	3,679	3,667	4,776
$NPV_{8\%}$ US$M	**300**	**333**	**525**	**739**	**859**
IRR	**12%**	**14%**	**17%**	**21%**	**21%**

The mine design, materials handling and schedule revisions have improved the overall project NPV from US$300M to US$333M for the 12Mtpa case at the current spot prices.

The increase in production rate from 12Mtpa to 20Mtpa increases the project NPV from US$333M to US$739M.

An increase in the overall cave column height could contribute an additional 4 years of full production life to the project at 20Mtpa, which will increase the project NPV from US$739M to US$859M.

Table 6-2: Revised Scoping Study Financial Results using 5 year Average Prices

Revenue	Scoping Study (New Au Price)	Revised Study 12Mtpa	Revised Study 16Mtpa	Revised Study 20Mtpa	Revised Study 20Mtpa +80Mt
Recovered Cu. (kt)	1,433	1,417	1,426	1,423	1,692
US$ Copper Price ($/t)	7,751	7,751	7,751	7,751	7,751
Recovered Au. (koz)	4,015	3,948	3,972	3,964	4,700
US$ Gold Price ($/oz.)	1,426	1,426	1,426	1,426	1,426
Revenue US$M	**16,831**	**16,617**	**16,720**	**16,685**	**19,817**
Costs					
Capital Mining Costs US$M	200	217	221	221	221
Capital Infrastructure Costs US$M	1,189	796	1,008	1,008	1,008
Equipment Ownership Costs US$M	269	269	249	211	250
Operating Costs, excluding Processing US$M	3,687	3,567	3,036	2,699	3,129
Processing Cost US$M	2,460	2,616	2,648	2,633	3,151
Admin & Tech Services US$M	333	354	358	356	426
Royalties US$M	336	326	327	327	389
Total Costs US$M	**8,473**	**8,144**	**7,848**	**7,454**	**8,576**
Cash flow (before Tax) US$M	8,358	8,472	8,872	9,230	11,241
Tax US$M	2,713	3,636	3,933	4,413	5,017
Cash flow (after Tax) US$M	5,645	4,836	4,939	4,816	6,224
NPV$_{8\%}$ US$M	**580**	**584**	**816**	**1,063**	**1,215**
IRR	**15%**	**17%**	**21%**	**26%**	**26%**

The 5 year metal prices represent an increase in revenue for the project compared to the spot price of 16%. The increase in revenue increases the project NPV of all cases by an average of 62%.

Table 6-3: Revised Scoping Study Financial Results using 10 year Average Prices

Revenue	Scoping Study (New Au Price)	Revised Study 12Mtpa	Revised Study 16Mtpa	Revised Study 20Mtpa	Revised Study 20Mtpa +80Mt
Recovered Cu. (kt)	1,433	1,417	1,426	1,423	1,692
US$ Copper Price ($/t)	6,810	6,810	6,810	6,810	6,810
Recovered Au. (koz)	4,015	3,948	3,972	3,964	4,700
US$ Gold Price ($/oz.)	1,058	1,058	1,058	1,058	1,058
Revenue US$M	**14,005**	**13,830**	**13,916**	**13,886**	**16,495**
Costs					
Capital Mining Costs US$M	200	217	221	221	221
Capital Infrastructure Costs US$M	1,189	796	1,008	1,008	1,008
Equipment Ownership Costs US$M	269	269	249	211	250
Operating Costs, excluding Processing US$M	3,687	3,567	3,036	2,699	3,129
Processing Cost US$M	2,460	2,616	2,648	2,633	3,151
Admin & Tech Services US$M	333	354	358	356	426
Royalties US$M	279	271	272	272	324
Total Costs US$M	**8,416**	**8,090**	**7,793**	**7,399**	**8,510**
Cash flow (before Tax) US$M	5,589	5,740	6,122	6,487	7,984
Tax US$M	1,848	2,492	2,712	3,065	3,514
Cash flow (after Tax) US$M	3,741	3,248	3,411	3,421	4,470
$NPV_{8\%}$ US$M	**239**	**280**	**464**	**670**	**783**
IRR	**11%**	**13%**	**16%**	**20%**	**20%**

The 10 year average prices are lower than both the spot prices and the 5 year average prices, which results in lower revenues and lower NPV's

6.1 Sensitivities

The project sensitivities were evaluated using the spot metal prices and the cost model created from the 12Mtpa revised schedule. Figure 6-1 below shows the project NPV sensitivity to the copper price. The break even NPV copper price was determined by goal seeking for a zero NPV result using the input copper price, while leaving the gold price constant. A drop in the copper price of 31% represents a 100% erosion of the NPV of the project.

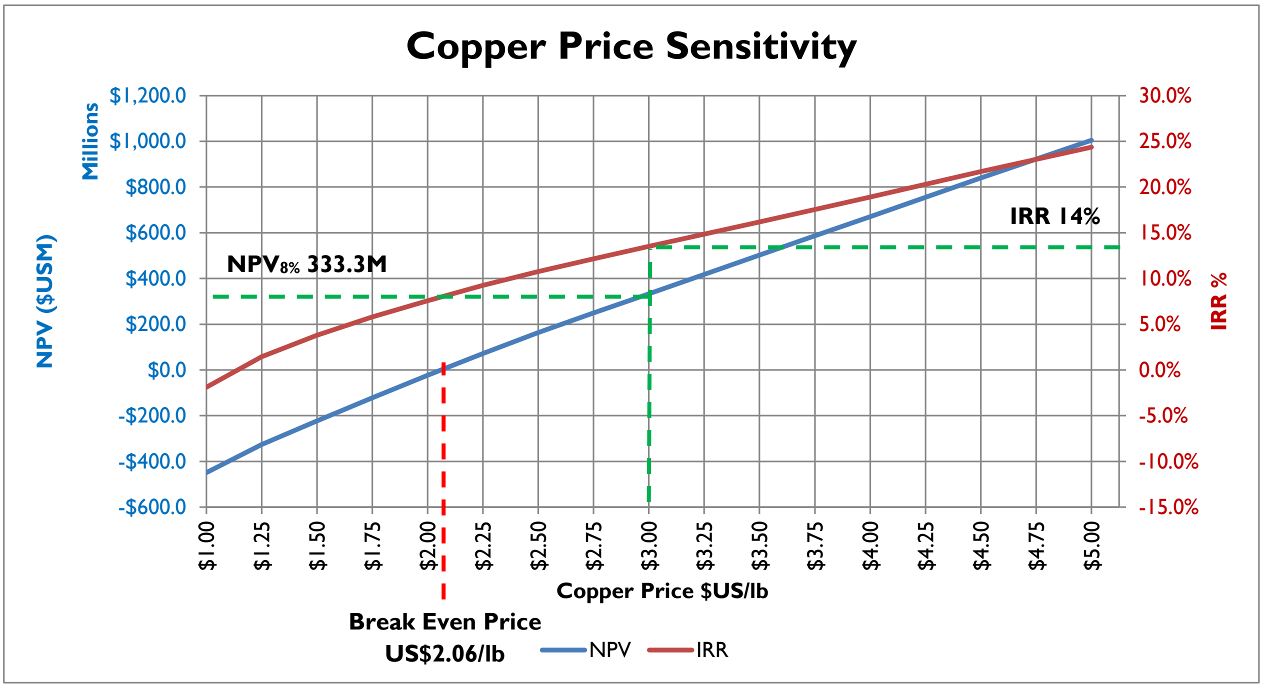

Figure 6-1: **Guinaoang Copper Project Revised 12Mtpa NPV vs. Copper Price**

The project EBITDA sensitivity to copper price is shown in Figure 6-2 below. The break even cash copper price was determined by goal seeking a zero EBITDA result using the input copper price.

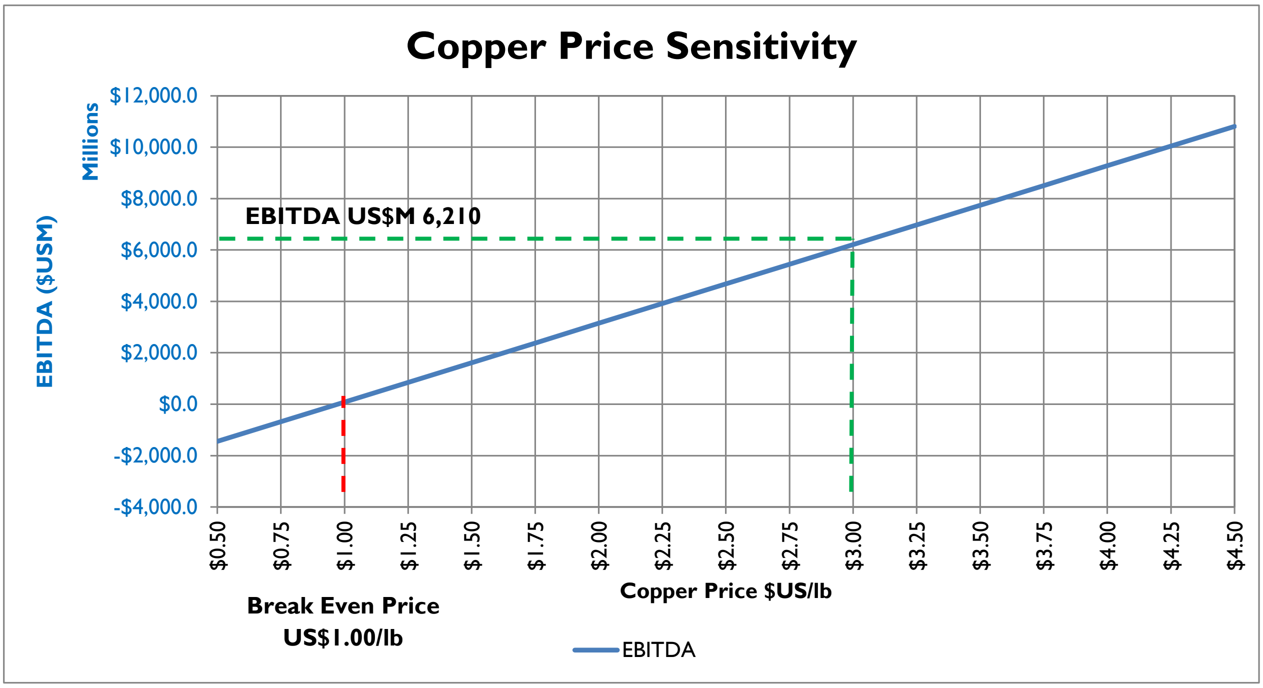

Figure 6-2: **Guinaoang Copper Project Revised 12Mtpa EBITDA vs. Copper Price**

The project is less sensitive to the gold price than the copper price. Figure 6-3 below shows the project NPV sensitivity to the gold price. A drop in gold price of 59% is required to erode the project NPV by 100%.

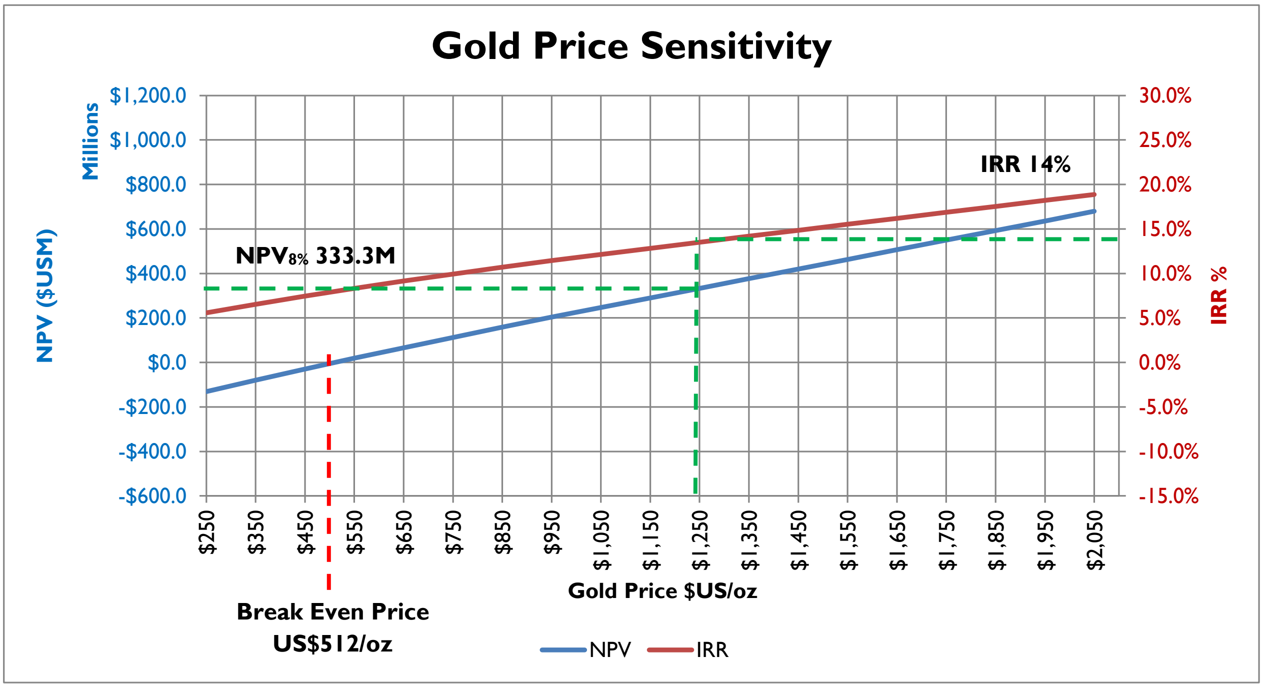

Figure 6-3: **Guinaoang Copper Project Revised 12Mtpa NPV vs. Gold Price**

A break even metal price analysis was conducted for each of the mine design and schedule configurations. The results are shown in Table 6-4 below.

Table 6-4: Summary of Break Even Metal Prices

Break Even Metal Price	Scoping Study 12Mtpa	Revised Study 12Mtpa	Revised Study 16Mtpa	Revised Study 20Mtpa	Revised Study 20Mtpa +80Mt
Break Even Copper Price (US$/lb), Gold Price US$1250/oz.	2.28	2.06	1.78	1.43	1.33
Break Even Gold Price (US$/oz.), Copper Price US$3/lb	669	512	2.89	21	-54

The block cave approach used in the scoping study is a bulk mining method and relies on the high production rate in order maximise on the economy of scale effects. This effect also means that the project is sensitive to costs. Figure 6-4 below shows the project NPV sensitivity to costs. The break even total cost per tonne for the project is US$25.64/t which is an increase of 35% from the spot price cost estimate.

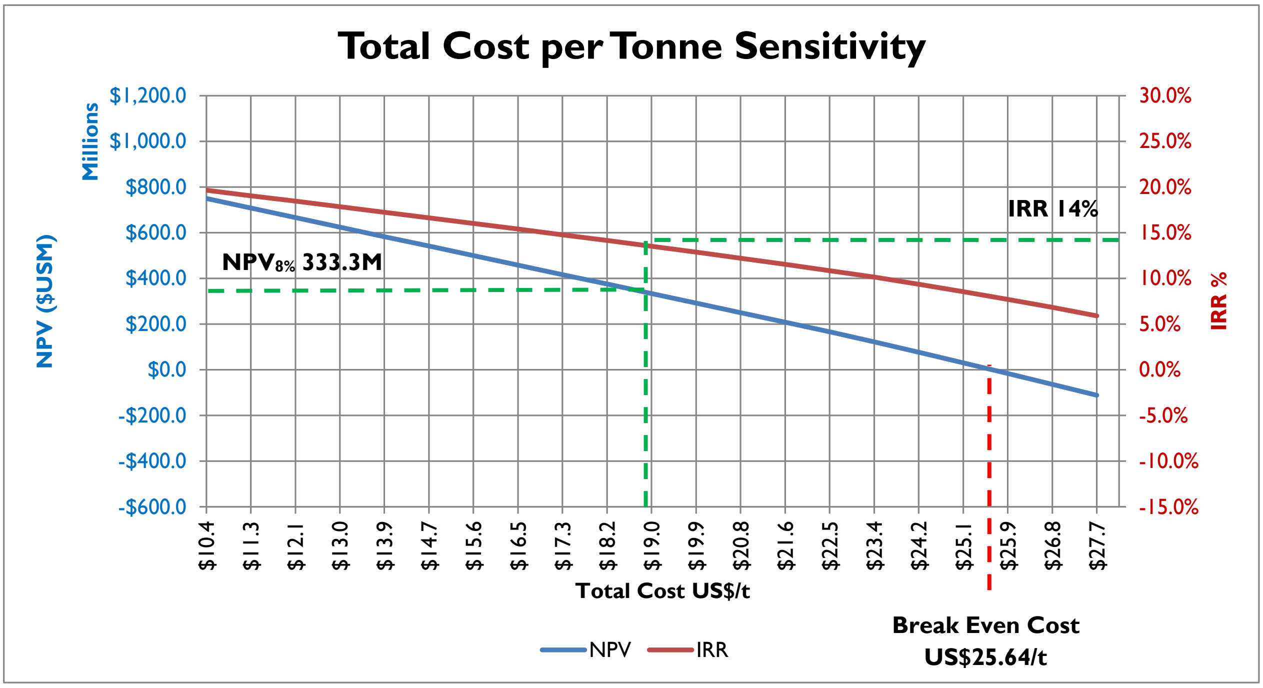

Figure 6-4: **Guinaoang Copper Project Revised 12Mtpa NPV vs. Total Cost per Tonne**

Figure 6-5 below shows the project NPV sensitivity to costs expressed in cost per lb. The break even total cost per lb before gold credits is $3.59.

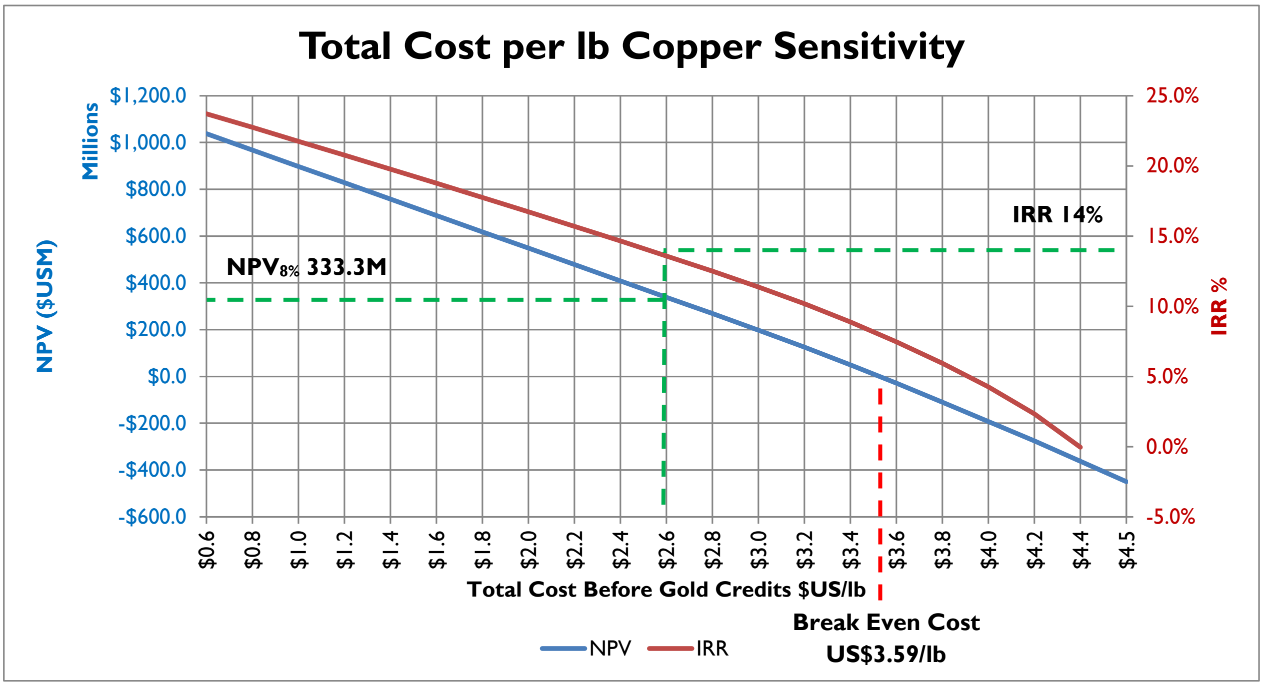

Figure 6-5: **Guinaoang Copper Project Revised 12Mtpa NPV vs. Total Cost per lb**

The application of new innovation in materials handling systems, the latest caving technology along with state of the art mine operating systems should be considered as part of the next stage of this project.

If the project total costs are able to be reduced by 30% from US$19.04/t to $13.32 the NPV of the project is improved from US$333.3M to US$609M which is an 82% increase. The same 30% reduction in costs when applied to the 20Mtpa case results in an improvement in the NPV from US$739 to $1,073M with a 25% IRR.

The key focus of the next stage of the mining study should be to examine, the project potential for

- Increasing the mine production rate
- higher mine grades, particularly in the early part of the mine life.
- The use of innovation and technology to reduce capital and operating costs

7 RECOMMENDATIONS

The caving mining method remains a suitable method for extraction of the Guinaoang Copper deposit. Variations of the standard block cave should also be investigated, which may include

- Pre-undercut, post undercut or advance undercut cave propagation strategies
- Panel caving, the establishment of smaller sub panels that can work independently.

The block cave design should be revised to incorporate potential changes to the caving footprint, cave column height and extraction level RL locations.

The mine production rate should be increased to 20Mtpa and further studies should investigate if the mine production rate can be increased beyond 20Mtpa.

The materials handling system for the mine requires further investigation. This review suggests that a change from a 12Mtpa shaft haulage system to a 20Mtpa underground conveying system has the potential to unlock value in the project. New technologies and innovation should also be considered with the aim of reducing the mine capital and operating costs. Some examples are;

- the use of sizors instead of large capacity gyratory crushers to crush the ore and place it onto the conveyor system
- The use of the Caterpillar Rockflow system
- Doppelmayr ropecon conveyors, with the plant located at a lower RL so the potential energy of the ore moving downhill can be used to generate electricity to run the plant.
- Underground mine automation systems

The suggested changes in the ventilation system should be modelled in detail to determine if it is feasible to remove the mine air cooling systems.

The Guinaoang Copper Project is economically viable at a conceptual or scoping level. The project should be investigated in more detail as part of a multi-disciplinary Pre-Feasibility study. This Pre-Feasibility study should include

- Resource definition and exploration drill programs
- Geological resource modelling
- Geotechnical/geomechanical investigation
- Hydrology/hydrogeology study
- Mining options study including cave modelling
- Materials handling options study
- Mine scheduling, ventilation and operation study
- Processing study including plant flowchart and recovery test work
- Site layout and infrastructure study
- Social & environmental & human resources study
- Project cost estimate
- Project financial evaluation
- Mine closure study
- Future works & recommendations

The recommendations suggested by GHD are relevant, best for project and should also be considered.

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Chitombo, G. (2010). Cave Mining - 16 years after Laubscer's 1994 paper 'Cave mining - state of the art'. *Caving 2010* (pp. 45 - 61). Perth, Australia: Australian Centre For Geomechanics.

GHD. (2014). *CMDC Guinaoang CopperProject Review of TWP's Conceptual Study Report.*

8 APPENDIX A – MINING PLUS CORPORATE EXPERIENCE

In this document the corporate experience and safety performance of Mining Plus will be outlined. This experience will be outlined in the sections below:

- Some examples of recent underground caving mining project experience.
- List of other underground mining project experience.
- Mining Plus values – including discussion of innovation.
- Safety in design.

8.1 Experience Introduction

Mining Plus has a proven experience across numerous projects across globe. These projects include:

- Mining studies.
- Open pit and underground mining engineering.
- Geosciences – geology, geotechnical
- Environmental approvals.

Mining Plus has this proven experience, through project successes across the globe. The critical components of this project experience are:

- Multi-discipline team – the Mining Plus team comprises professional from various professional backgrounds including Mining Engineering, Geology, Geotechnical Engineering, Environmental Management, Hydro-geology, Risk Management, Project Management, and Environmental Science.
- Mining Plus's "ONE TEAM" philosophy and culture – which facilitates a culture of knowledge sharing and mentoring to develop all team members and add value to the work we deliver to our clients, and also allows the best resource to be allocated for the completion of the specified task.
- Mining experience in both open pit & underground projects.
- Innovation - it's who we are (our values) and how we seek out and apply best practice.
- We are "locals!" (and we are here to stay) – Mining Plus has an established offices and resources across the globe, with significant underground project and operations experience across the globe and other projects.
- We are "global!" – The Mining Plus teams in each office are supported by global resources and experience.

Mining Plus also has previous and recent experience working with mining operations, both open pit and underground across the globe.

8.2 Mining Plus Safety Performance

Mining Plus Leadership team understands the importance of Safety in all aspects of our own operations, but clearly understands the criticality of the safety implications of the work we deliver. Mining Plus has a number of company safety, health and environmental policies and management plans in place to ensure the correct cultural is created within the organisation, and deliver an overall high standard of safety performance.

Data outlining the recent safety performance for the Mining Plus global team can be provided. We are pleased to confirm there have been no recent injuries or incidents.

To ensure the high quality of the consulting work Mining Plus deliver to our client, the process of “safety in design” is being implemented in our project work as outlined in Section 5 of this document.

9 APPENDIX B - UNDERGROUND CAVING PROJECTS

In this section underground caving mining projects with recent relevant project experience completed by Mining Plus will be outlined with brief project summaries. Mining Plus is also currently completing other relevant mining studies but as this work is currently being completed no detailed information can be shared.

9.1 Discovery Metals – Zeta Underground Definitive Feasibility Study

The primary objective of the Zeta Underground Definitive Feasibility Study (DFS) is to demonstrate an optimal case for technical and economic viability of the Zeta Underground Resource.

The Zeta Underground Definitive Feasibility Study (DFS) has evaluated all aspects of the development of an underground mining operation at Boseto producing an average of 1.5Mtpa copper–silver ore over 11 years. The ore is combined with that from the open pits and processed in the 3Mt Boseto concentrator currently nearing completion of construction.

Works carried out in the feasibility study include:

- Review of Work Previously Carried Out
- Develop a comprehensive geotechnical model for all underground openings. Review present geotechnical report and model and advice on further drilling program.
- Underground water management program inclusive anticipated inflows; pumping rates and dewatering system.
- Re–evaluate the potential underground mineable area based on the optimal cut–off grade identified from the PFS, including an assessment of any crown pillar to be left below the pit.
- Update underground mining model.
- Define underground mining method and layouts, design stope shapes and pillar locations.
    - Sub-level Stoping (without backfill)
    - Sub-level Stoping Sequential Retreat (with rock, cement fill, paste backfill)
    - Cut and Fill (Rock, Paste)
    - AVOCA (Standard and Modified)
    - Sub-level Cave (Longitudinal)
- Establish the location of decline(s) and portal(s), including a review of the potential lateral distance to be mined prior to developing more decline accesses.
- Recalculate open pit / underground transition level.
- Ventilation design.
- Produce a development and mining production schedule
- Develop a final analysis of schedule.
- Undertake a decline and sub–level capacity study to evaluate the maximum total and area production rates.
- Review stope recoveries and dilutions.
- Specify underground mining equipment.
- Calculate Mineral Reserves classify in accordance with The JORC Code.
- Team Based Risk assessment on mining

- Compile the projected total mine operating and capital costs.
- Carry out a benchmarking exercise and compare costs against available database and current mining costs of similar operations.
- Incorporate the underground mining operations within the Boseto Project infrastructure on surface.
- Addendum to the Boseto EIA study regarding the inclusion of the underground mining operations into the environmental impact assessment;
- Input into the overall site "Human Resources Management Plan" for Underground

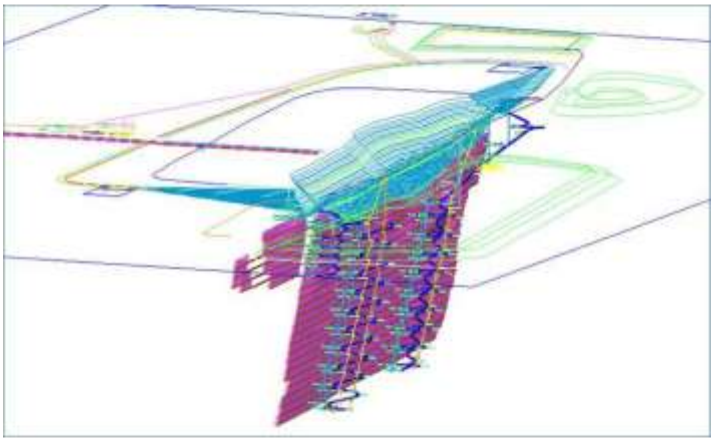

Figure 9-1: Surface and Underground design layout

9.2 Newcrest - Cadia East Material Handling Concept Study

Mining Plus was commissioned by Newcrest Mining Limited to undertake a Conceptual Study investigating various aspects of the block cave to improve efficiencies.

The study was conducted in 3 phases:

- Phase 1 – Investigate a range of suitable material handling alternatives and recommend an option that would be suitable for further investigation / implementation. Integrate the material handling system into ore body access to reduce the ramp up period of the mine. Review cave sequence to bring forward metal production.
  - Key areas of investigation were:
    - Access / Development and cave sequence
    - In-footprint ore pass cycle times and configurations vs perimeter ore passes
    - Material handling systems including:
      - Sizors / fixed and mobile
      - Conveyors
      - Armored Face Conveyor (AFC) from long wall Coal Mining Technology
      - Truck haulage
- Phase 2 – in conjunction with the operations staff on site refine the preferred alternative such that mine layouts can be modified for a staged implementation process.
- Phase 3 – Extend the investigation to include conceptual equipment that will assist block caves to move from an LHD batch process to a continuous process.
  - This included investigation into the use of:

- Extendable conveyors
- Draw point super loaders
- Integrated sizors/conveyor
- Perimeter drive conveyors, in floor conveyors
- Continuous miners (super loader/sizor combination)

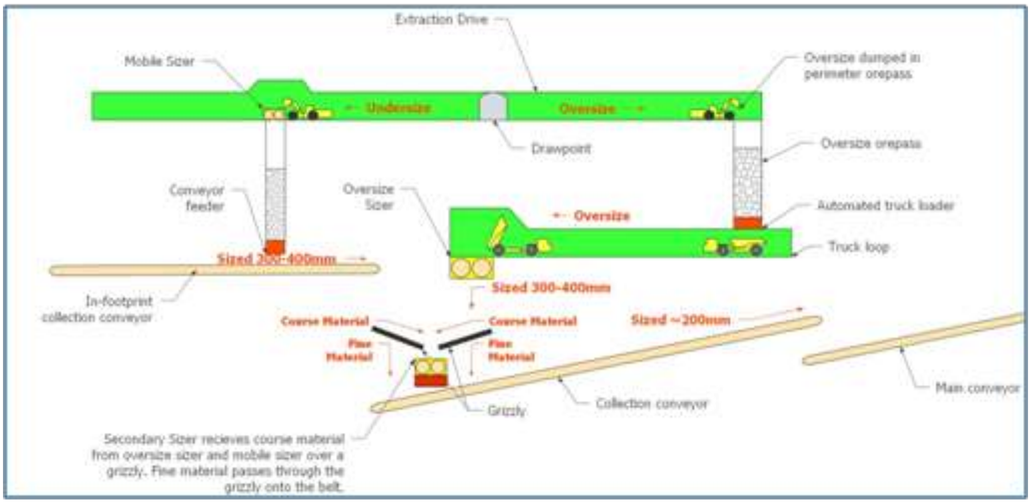

Figure 9-2: Proposed materials handling system layout

9.3 Wings Iron – Pea Ridge Iron Ore Mine (USA)

This mine had a total of 54Mt mined over a 30 year period prior to the mine's closure due to low iron ore prices. Recent increases in iron ore price indicate the project is potentially feasible once more, with an estimated resource of 200 million tonnes existing in an underground magnetite deposit. The operation has a capital cost estimate of $300 million over a 20 year mine life at approximately 5.5 million tonnes of ore per annum. Upon successful funding, the project will move into a feasibility phase.

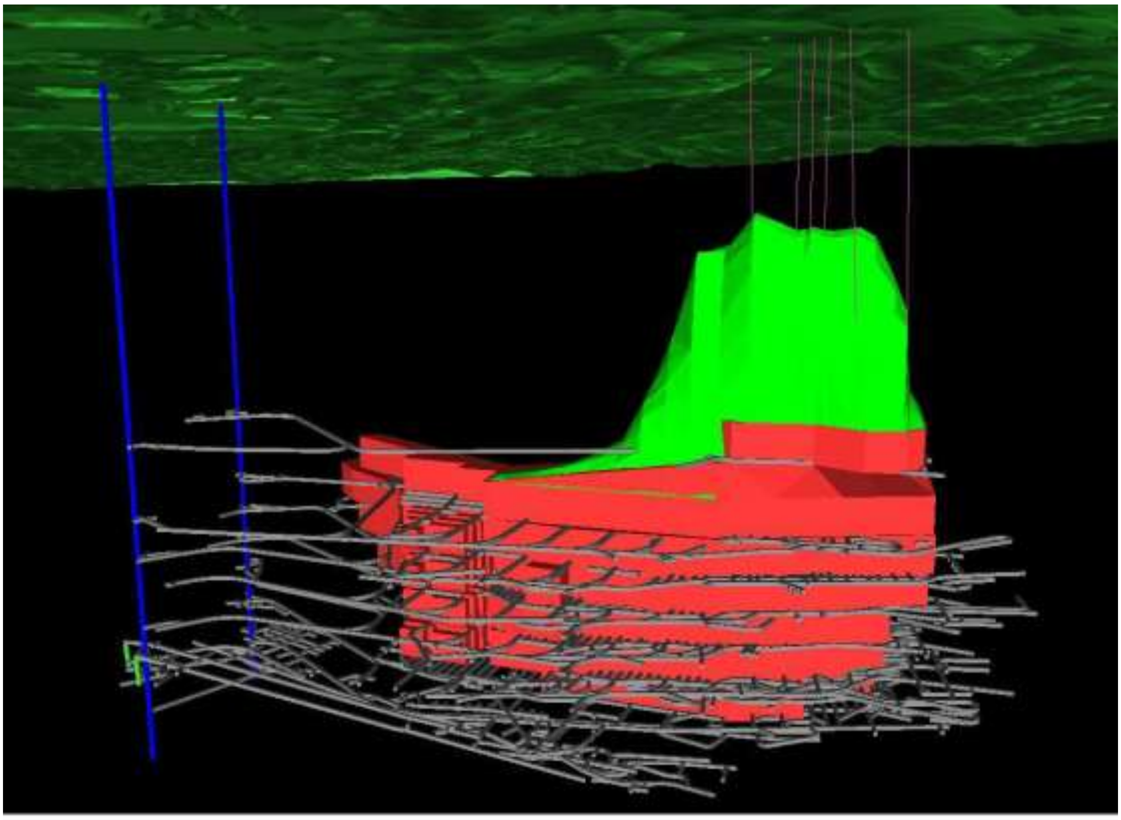

Figure 9-3: Oblique **long section view of Pea Ridge mine layout**

Mining Plus carried out a scoping study leading onto a pre-feasibility study on the Pea Ridge underground iron ore mine in Missouri, USA.

The scope of works included, but was not limited to:

- Scoping study for pre-feasibility preparation and mine re-opening
- Re-entry and remnant mine design
- Dewatering concepts and plan
- Geotechnical evaluation of the shafts, cave and other infrastructure
- Conversion of all historic data to electronic format
- Creation of an electronic block model
- Selection of mining method
- Design and schedule of sub level cave
- Design and selection of associated infrastructure
- Development of a cost model and financials
- Develop all mine plans
- Safety and risk analysis

9.4 Rex Minerals – Hillside Underground Conceptual Study

Mining Plus where engaged by Rex Minerals to complete a pre-feasibility study for the Hillside deposit, and as part of this work where to complete a conceptual study for an underground mining operation. The Hillside underground operation will be mined as two separate mines; the North and South Mines. This is due to the extensive strike length (2,600 m) of the ore body, independent capital infrastructure and haulage systems will be setup to service these areas for optimal production. The location of the underground mines around the proposed open out are shown below.

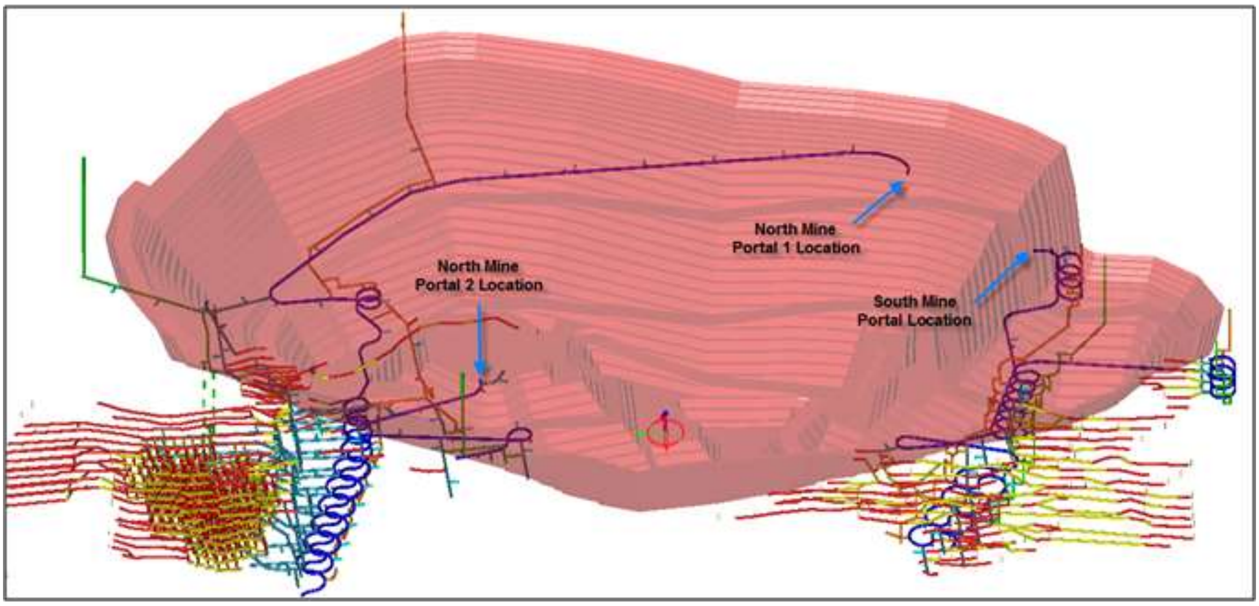

Figure 9-4: View of proposal open pit mine and underground working designs

The Hillside underground mine design report outlines in detail the following:

- Mineable resource model process
- Mine production rates
- Cost model
- Ore/waste determination
- Mining method based on sublevel caving method (SLC)
- Stope design

The overall aim of the work was to determine a target mine design production rate and a MSO cut-off grade to be used as the basis of the stope design. The work was broadly conducted in 5 main parts:-

- MSO evaluation runs
- Scenario generation and Mine 24d skeletal designs
- Cost modeling of each scenario

The sensitivity curves for all scenarios were combined to produce the "Hill of Value".

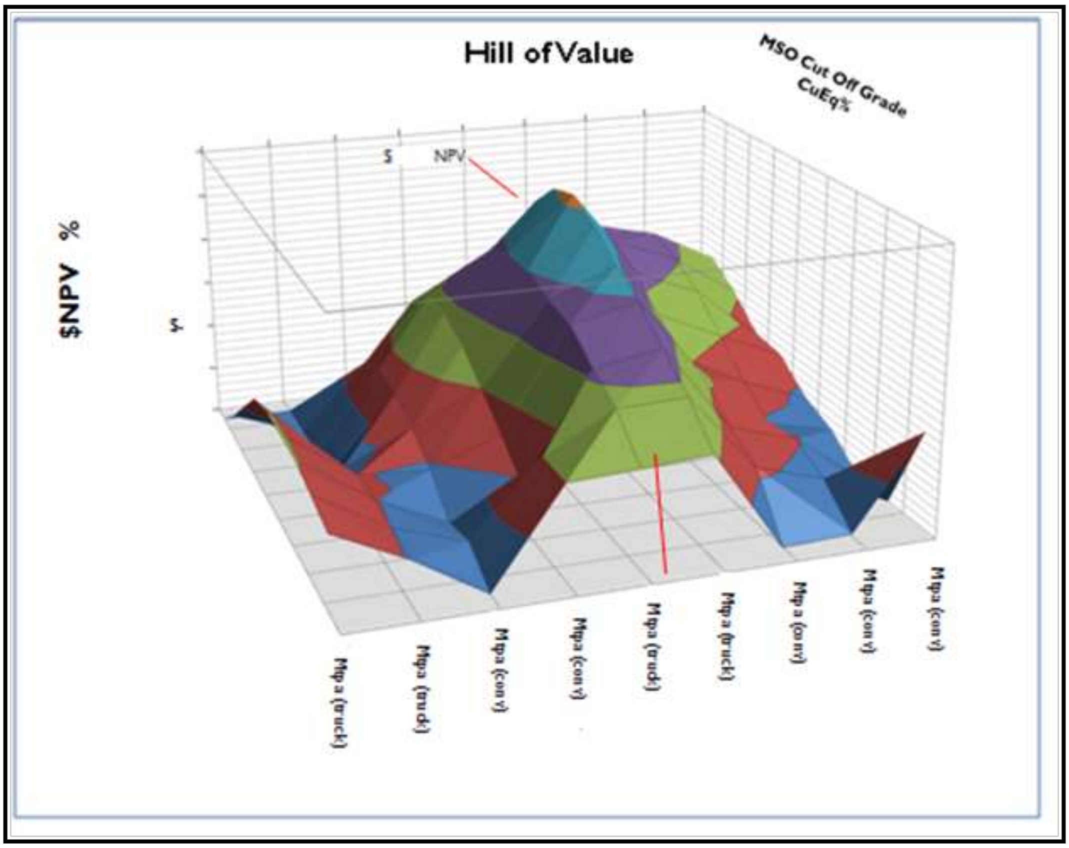

Figure 9-5: Hillside "Hill of Value" comparison

9.5 Kagara Ltd – Admiral Bay Project

Mining Plus completed mining method studies aimed at determining the most appropriate method to utilise for exploiting the Admiral Bay deposit. These studies determined that access via two shafts; a 10m diameter hoisting and intake shaft and a 6.7m exhaust shaft; and the application of a modified sub-level caving method would present the most appropriate option for use in the high level pre-feasibility study.

Application of a modified sub level cave mining method to the Admiral Bay deposit was guided by geotechnical design constraints and the Admiral Bay block model. This resulted in the design of 6 distinct mining panels with a maximum strike length of 300m separated by pillars with a minimum distance along strike of 100m. The main infrastructure drives had been placed in the expected mining induced de-stressed zones underneath the panels with the access, ventilation and emergency egress drives located in the pillars. Ore was to be delivered to the hoisting shaft via a conveyor after underground primary crushing.

The mining panels had been designed and sequenced to be mined from the panel centres retreating to the pillars. This has significant advantages in increasing production rates due to the doubling of available intra panel draw points and reducing anticipated rehabilitation costs by shortening the time the ore drives will be required to remain open. Broken ore will be loaded onto underground haul trucks via ore passes and transported to the underground primary crusher.

The current designed mine life was 10 years, 5 years of which has a steady state production rate of 5Mtpa. Utilising equivalent metres based on the high level pre-feasibility design, this initial designed LOM was extrapolated to include pillar recovery and extended to produce a 20 year mine life.

Mining Plus recommended that further design revisions and mine design/method studies be completed once a geotechnical review of this high level pre-feasibility design is complete, and further data is available. This includes further drilling to increase the confidence level of the resource, and further geotechnical analysis to establish the geotechnical parameters for the mine design and mining methodology.

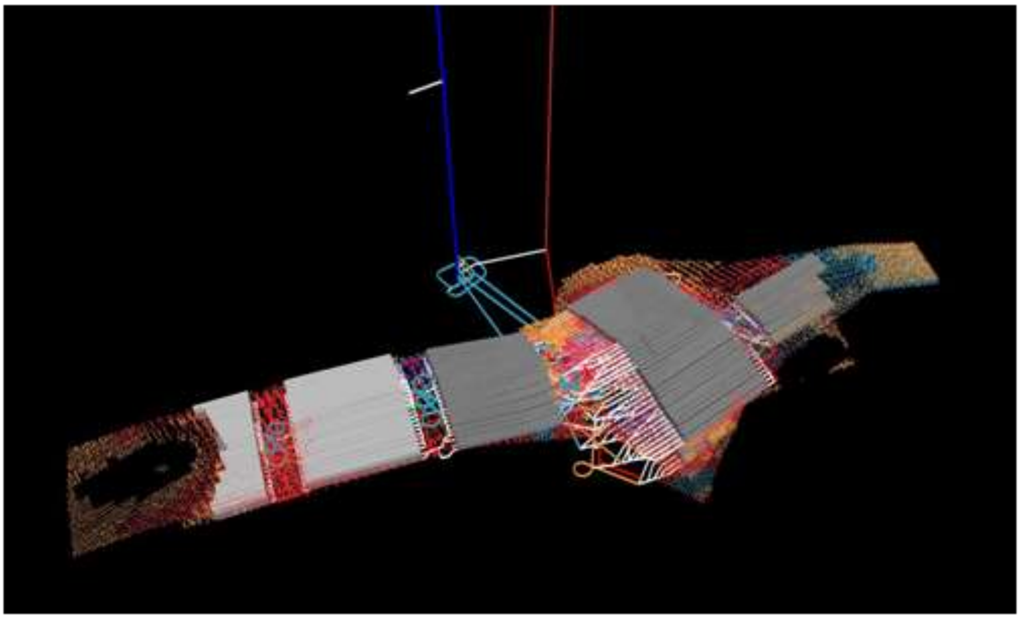

Figure 9-6: Admiral Bay mine design

9.6 Bezant Resources PLC - Mankayan Block Cave Concept Study

TWP Australia was commissioned by Bezant Resources PLC to undertake a Conceptual Study for the Mankayan Project (Guinaoang ore body) located on the Philippine Island of Luzon 260km north of Manila. The Project is an undeveloped underground mine, for which a conceptual mining, extraction and processing method was to be determined. The study was conducted within the limits of accuracy of +35% to -30%.

TWP engaged the services of Mining Plus to provide mine planning expertise for this study. The scope of work for Mining Plus included, but was not limited to, geotechnical assessment of the ore body, a concept level mine design and schedule including mine equipment and personnel schedules, capital and operating cost estimates, and a financial evaluation of the project.

The Guinaoang ore body contains a mineral resource is 221.6 million tonnes (Indicated) and 36.2 million tonnes (Inferred) at a 0.4% copper cut-off, grading at 0.49% copper and 0.52g/t. gold. Mining Plus completed a mine design which utilised a block caving mining method. An initial marginal cut-off grade of 0.20%CuEq was determined based on indicative operating costs. This marginal cut-off grade established the mining limits required to complete resultant mine design and cave footprint. The completed mine design was evaluated for approximately 400Mt of ore at an average grade of 0.38% copper and 0.42g/t gold. The mine comprises a haulage shaft for ore hoisting and as well as a decline for personnel waste haulage.

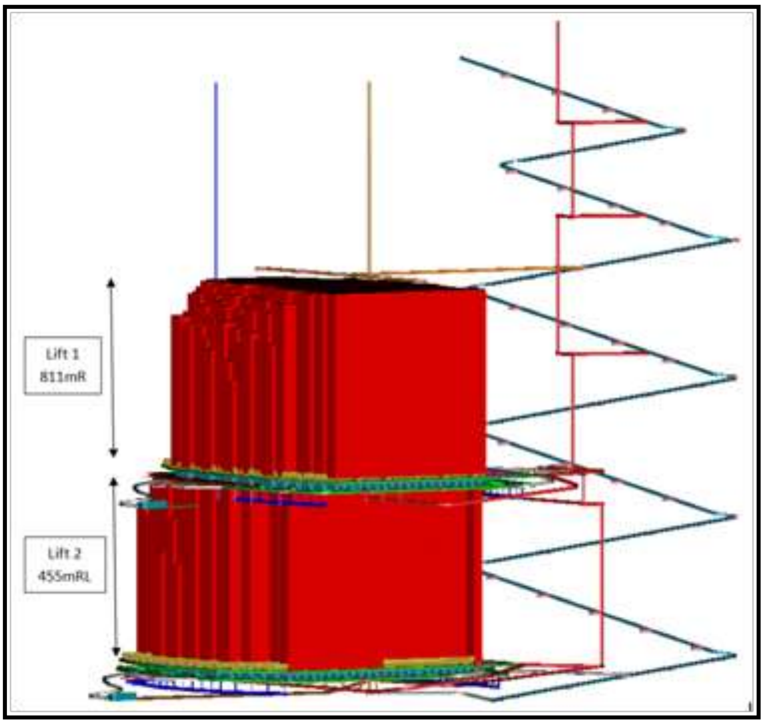

Figure 9-7: View of Guinaoang ore body and proposed mine development

An annual mine production rate of 12Mtpa was selected resulting in a mine life of 42 years. This production rate was seen to be well within the capabilities of the ore body and also reduced the requirement for a second hoisting shaft thus keeping capital infrastructure costs down.

Upon completion of the operating cost estimates, the marginal cut-off grade was recalculated. A higher cut-off grade was calculated for the project than that which was used initially to determine the cave footprint. This is due to some higher than anticipated operating costs associated with shaft hoisting and materials.

9.7 Olenegorsky/Kirovogorsky, Seversatal Resources, Russia

Mining Plus carried out three pre-feasibility studies on the Olenegorsky Stage1, Olenegorsky Stage 2 and Kirovogorsky underground iron ore mines in the Murmansk region, Russia.

Olenegorsky Stage 1 has a total of 16.4Mt mined over an 11 year period. The Olenegorsky Stage 1 operation was designed with a steady state production rate of 2Mtpa. Olenegorsky Stage 2 has a total of 343Mt mined over a 41 year period. The Olenegorsky Stage 2 operation was designed with a steady state production rate of 10Mtpa. Kirovogorsky underground mine has a total of 229Mt mined over 50 years. The Kirovogorsky underground mine was designed with a steady state production rate of 5Mtpa.

The scope of works for each stage included, but was not limited to:

- Block model analysis
- Detailed mine design and schedules
- Ventilation model
- Capital and operating cost estimation, modeling and financial analysis
- Key project metrics

- Study report
- Future works plan

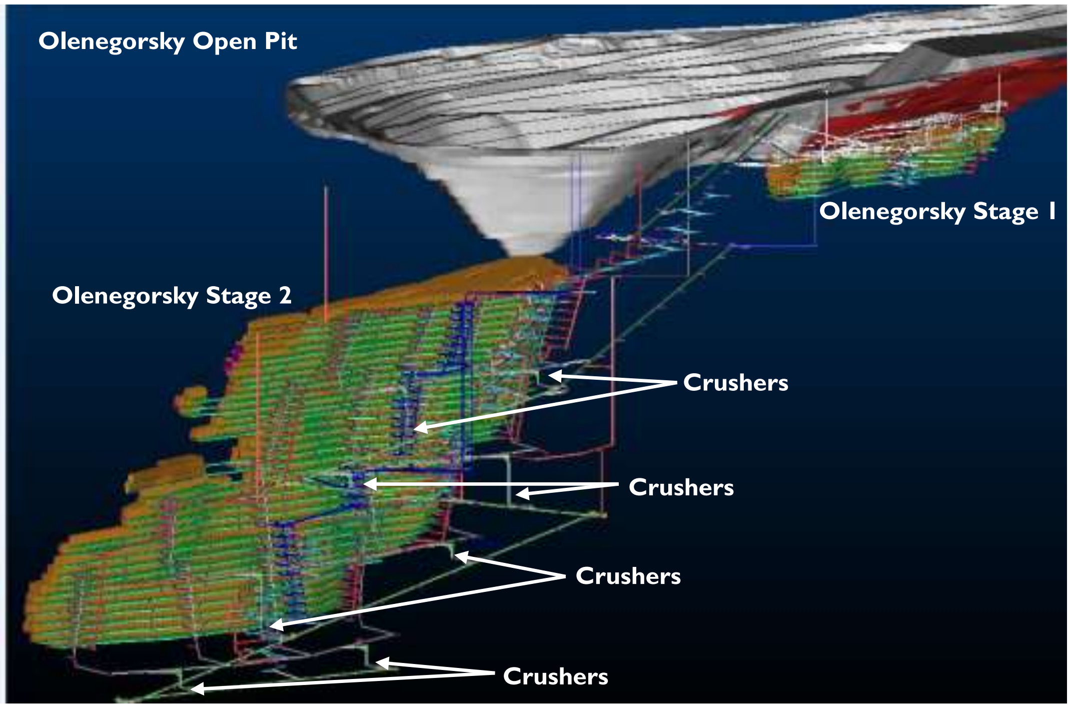

Figure 9-8: Olenegorsky stage 1 and 2 underground mine designs

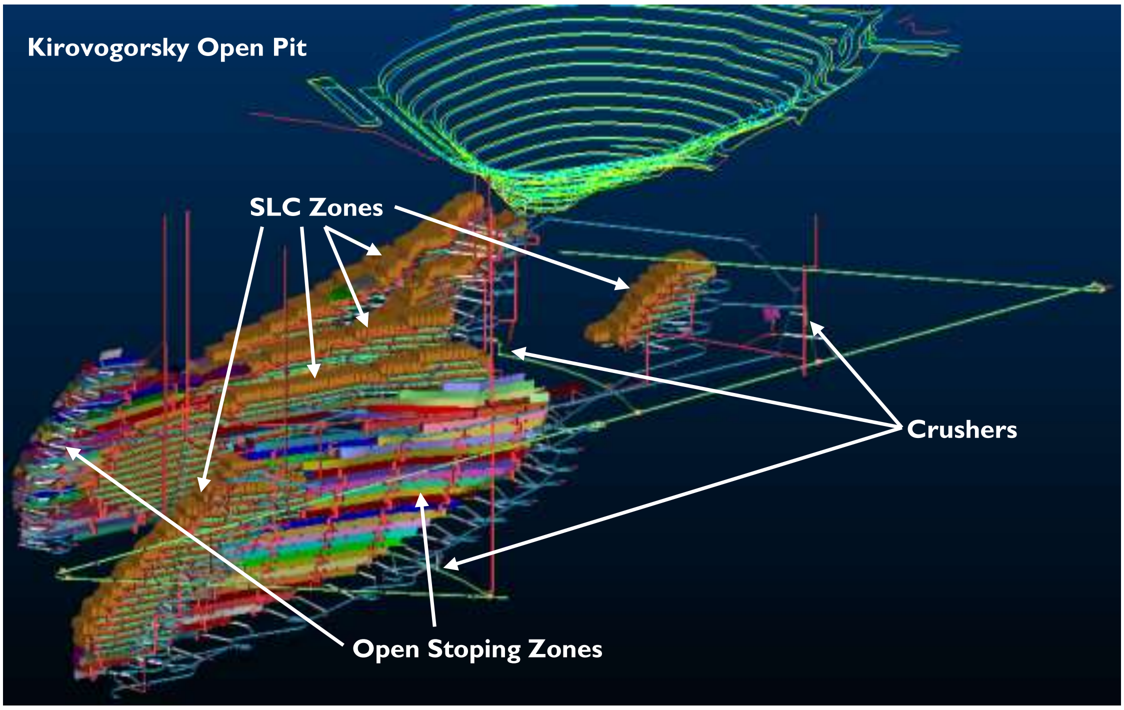

Figure 9-9: Kirovogorsky underground mine design

9.8 Abakan Project, Evraz Russia

Mining Plus was commissioned by Evraz (sub contract to Giproshakht) to select and redesign the Abakan Underground iron ore mine to nominally increased production from 2.0Mtpa to 6.0Mtpa.The scope of works included the design(including underground access and materials movement), sequencing and scheduling and ventilation.

Two overarching Sub-Level Cave (SLC) mine design options were developed for analysis:

- Option 1 – SLC With 25m Level Spacing
- Option 2 – SLC With 35m Level Spacing

The above options encompassed a longitudinal SLC for the thinner ore body and a transverse SLC for the wider areas of the ore body. Mine designs, sequences and schedules were developed for each option to establish key physicals.

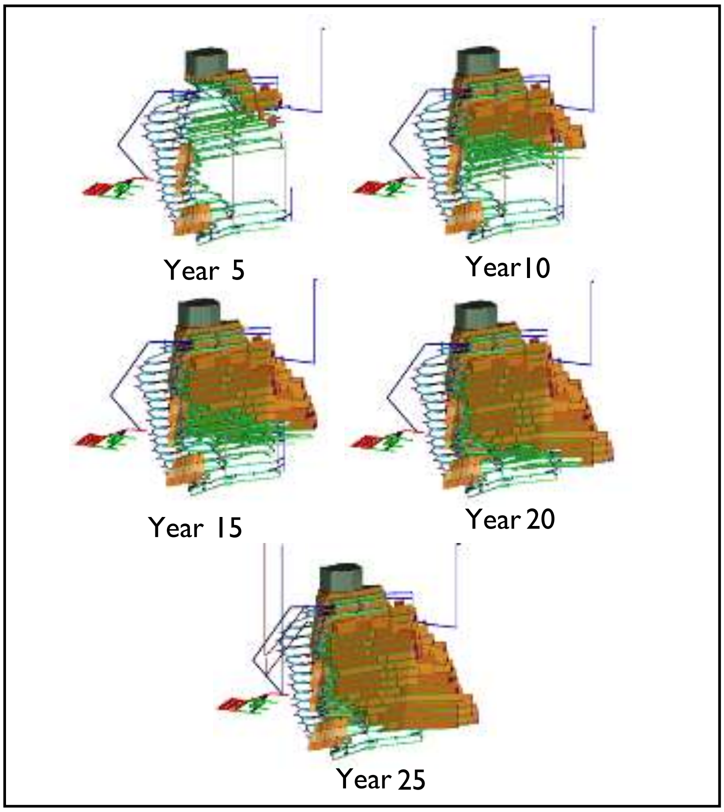

Figure 9-10: Development views of Abakan underground Iron Ore mine

Concurrent to the level spacing option analysis for the SLC, four mine access and haulage options were developed and integrated into the SLC mine design and sequence. These options were:

- Option A – Extension of the existing production shafts and a rail haulage system connecting to the main haulage level.
- Option B – A conveyor system from the main haulage level to the surface.
- Option C – A conveyor system from the main haulage level connecting to an existing production shaft.
- Option D – A truck haulage decline from the main haulage level to an existing production shaft.

It is was concluded that the SLC mining method was able to demonstrate an increase in production to 6.0Mtpa and that further trade-off studies to be conducted in order to finalise level spacing and material movements options.

9.9 Confidential – Block cave/SLC Western Australian

This mine undertakes a Block Cave / Sub-Level Cave combination, which the intent was to access the high grade portion of the resource early to create an early production opportunity to supplement production whilst the block cave is being established.

The block cave production physicals will target 6.0 Mtpa over a proposed 24 year mine life.

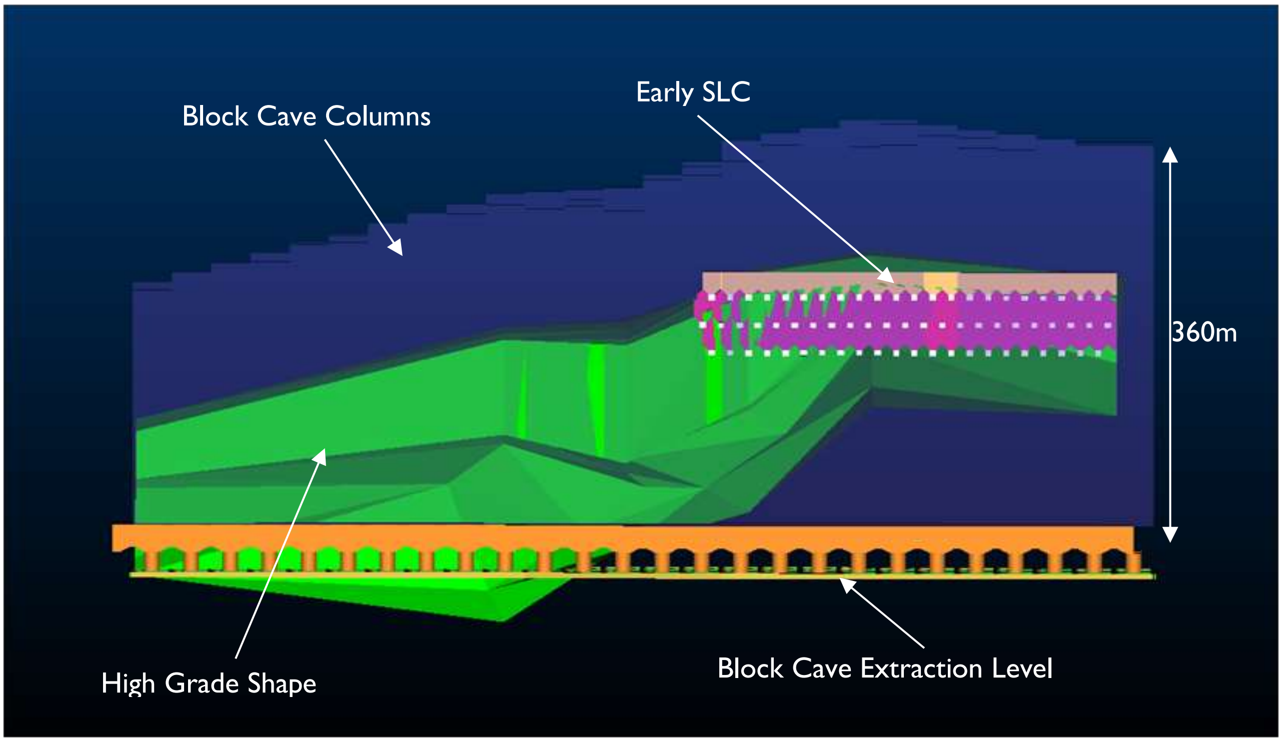

Figure 9-11: Section view of SLC production zone and planned block cave extraction

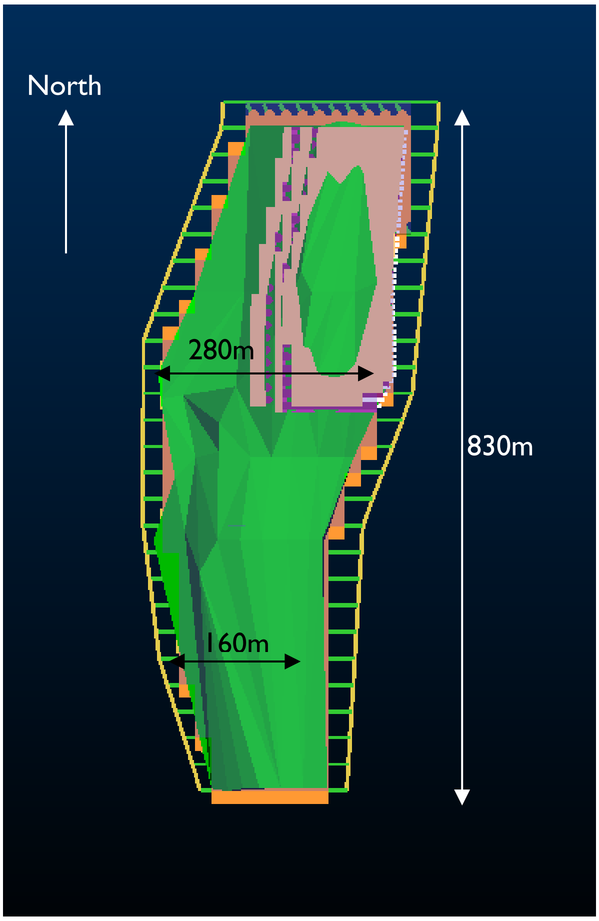

Figure 9-12: Block Cave Plan View

To date the following scopes of work has been completed

- Investigate caving options including mine design, schedules, capital and operating cost estimate for the Deeps Resource.
- Integration of block cave extraction sequence with existing SLC based on flat or angled cave backs at a scoping study level of accuracy.

9.10 Underground Tungsten Pre-Feasibility Study

Mining Plus was commissioned by a client to undertake a Pre-feasibility Study (PFS) for a tungsten ore body located within Australia. The project, an undeveloped (underground) mine, which a PFS mining and materials handling method was to be determined. The study was conducted within limits of accuracy of +/- 25%.

The scope of work for Mining Plus included, but was not limited to, geotechnical assessment of the ore body and capital development, a PFS level mine design and schedule, including mine equipment and personnel schedules, capital and operating cost estimates, and a financial evaluation of the project.

The mine design traded off various mining methods:

- Trough caving
- Sub-level caving
- Room and pillar
- Long hole open stoping with fill.

The materials handling study investigated:

- The conveying of ore with crushing under the footprint of the ore body
- Truck haulage, which investigated various model of underground trucks
- Shaft haulage

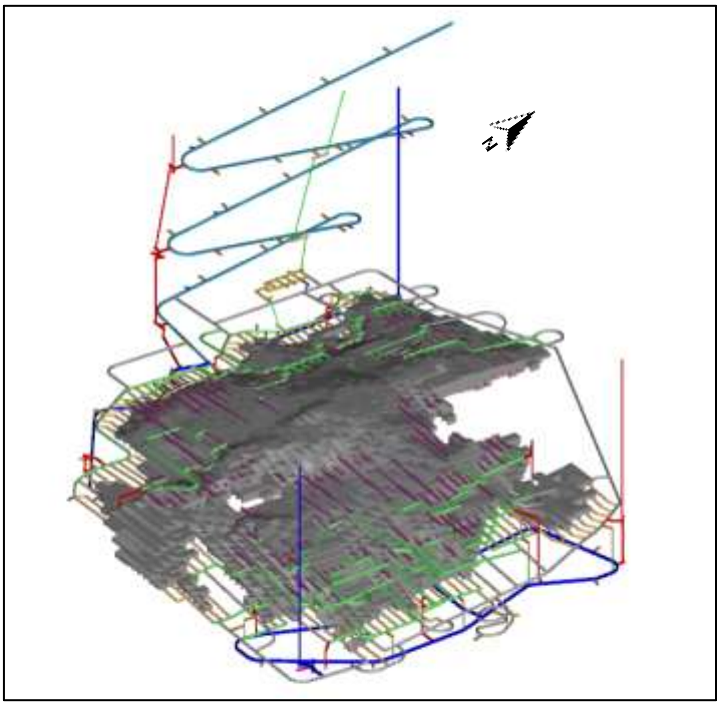

Figure 9-13: Complete Tungsten mine design layout

The tungsten deposit contains mineable resource of 67 million tonnes of ore at an average grade of 0.26% tungsten. Due to the polymetallic nature of the ore body, a Net Smelter Return (NSR) of $47.50 per tonne was calculated to determine the average cut-off value. The NSR cut-off value was derived from the indicative mining costs of each mining method and established the mining limits to complete the resultant mine design and footprint.

Production rates were selected based on the mining method and ranged between 3Mtpa to 4Mtpa resulting in mine life of between 16 and 23 years. The production rates were seen to be within capabilities of the ore body and a Hill of Value analysis was investigated to test this.

Upon completion of the cost analysis the total unit cost per tonne (inclusive of capital expenditure, royalties and processing) was determined from the overall cost estimate. This estimate did not include the capital cost of a processing plant.

9.11 Raglan, Kikialik Mine – Lens A

Mining Plus was commissioned to develop a layout of extraction drifts for a Sublevel Caving (SLC) operation with cascading rock fill for the mining of Lens A at the Kikialik mine. SLC with cascading rock fill had never been used at Raglan. The study was aimed at determining the best drift layout to achieve the best combination of ore recovery versus waste dilution and was measured against a base case of open stoping with cemented rock fill. Sublevel caving with cascading rock fill offered an alternative to the use of cemented rock fill or paste fill which are difficult to implement due to permafrost.

The scope of works included:

- Optimize mine design parameters for a SLC with cascading rock fill.
- Determine the backfill raises location with the additional development required.
- Design a long hole drilling pattern suitable for the method and geometry.
- Determine a mining sequence for Lens A.
- Provide estimate of expected recovery and dilution performance.

The Lens A ore body represented approximately half of the Kikialik ore at the time.

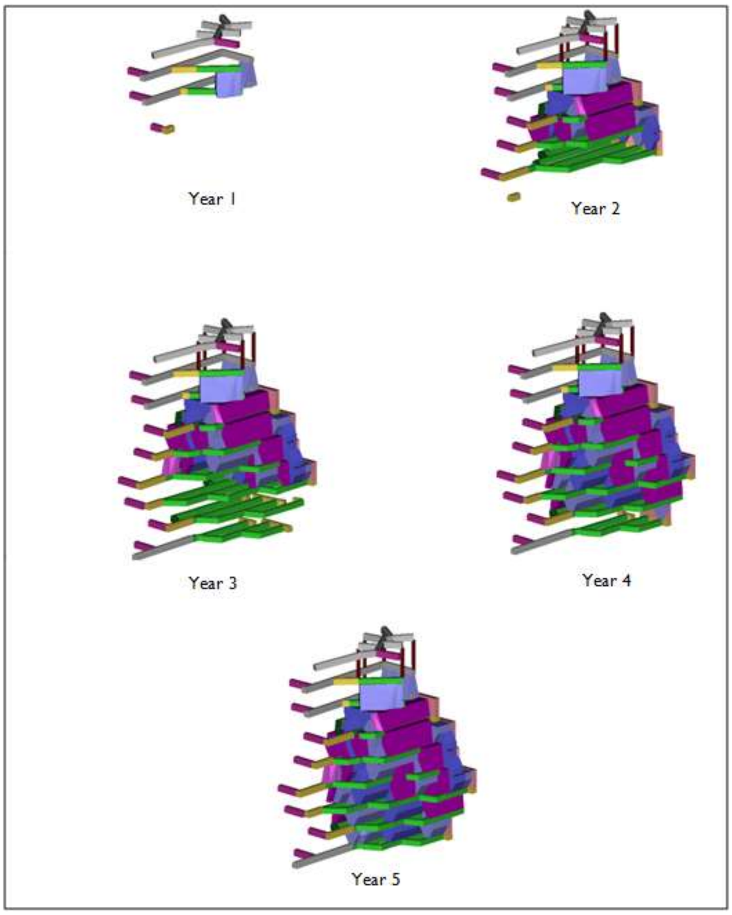

Figure 9-14: Kikialik Mine Lens A - Longitudinal Mine Sequence Development and Production

9.12 Confidential – Block Cave mine (Papua New Guinea)

Prefeasibility study proposing block caving mining method with initial production commencing from Lift 1 whilst ramp development continues down to Lift 2. Lift 1 has a planned extraction horizon located at 4850mRL3 (approximately 700m below surface) and a 250m column height. The extraction horizon for Lift 2 is located at 4100mRL (approximately 1.45km below surface) with a 750m column height. Production from Lift 1 is scheduled to ramp up to 15Mtpa over a four year period with production from Lift 2 would progressively ramp up to reach 22Mtpa within 10 years with a current mine life of 26 years.

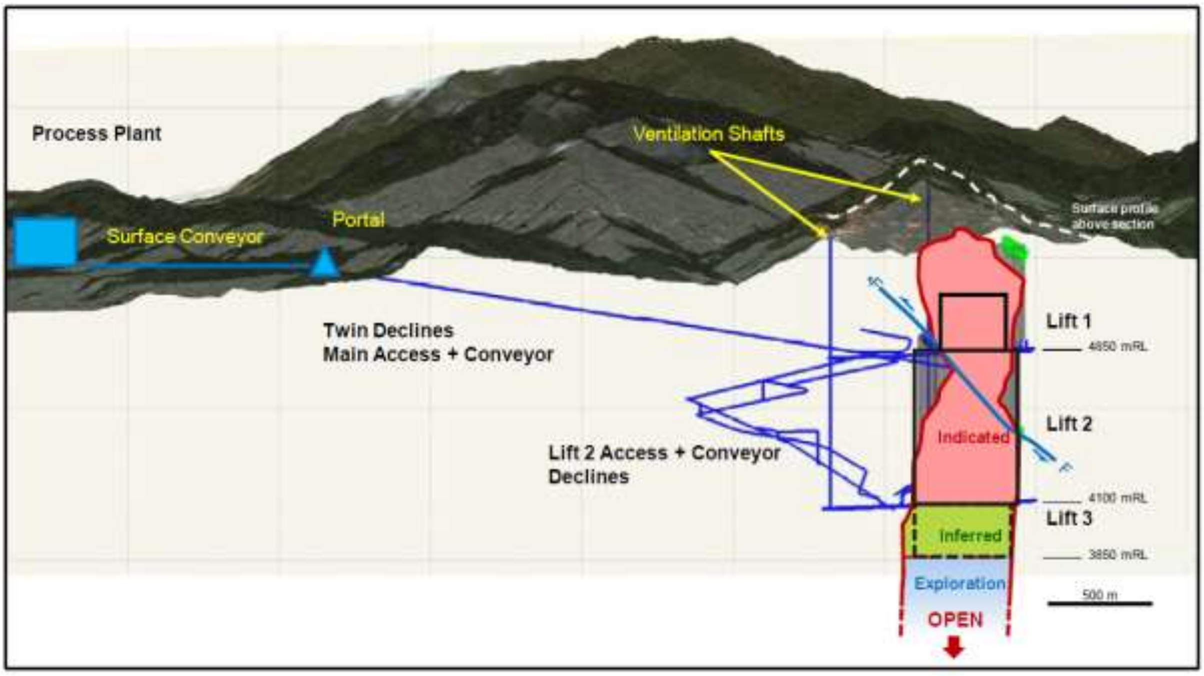

Figure 9-15: Project long section

Completed a pre-feasibility level mining schedule including:

- Review and conducting specific area design changes as deemed necessary
- Evaluation of mine design against provided block model.
- Undertake vertical mixing and recovery estimates.
- Complete mining sequence for the design.
- Construct an Enhanced Production Scheduler (EPS) template and complete production schedule.

9.13 BHP Billiton – Perseverance Deeps (Western Australia)

Mining Plus conducted an investigation into the establishment of a 2.2Mtpa operation below the 11 level (1.1km deep) block cave mine operation. As part of this scope included

- Involvement in Feasibility studies performing alternative mine designs such as Sub-Level Cave, Block Cave and Drop Down Cave.
- Mine design, scheduling and financials for the UG deposit above 11 Level
- Risk assessment workshops and documentation of study findings
- Implement LOM schedule and planning management.
- Mine 24D and MineCAD training.
- Implementation and training for Mine24D as an 'Integrated Planning Tool'.
- Implementation of Enhanced Production Scheduler (EPS) as long and short term scheduling tool.
- Create site wide operational financial driver tree
- Conceptual mine designs and financials for near mine ore bodies
- Operational mining engineering support

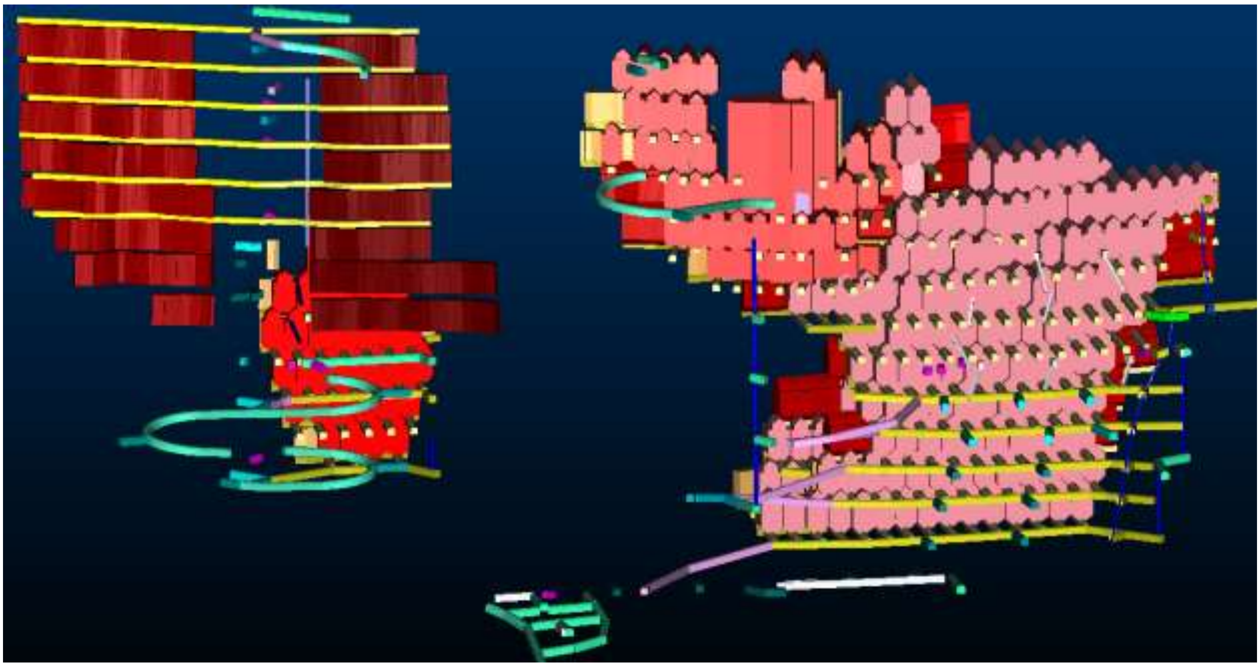

Figure 9-16: Sub-level cave designs

10 APPENDIX C - LIST OF OTHER UNDERGROUND PROJECTS

Other underground projects completed by Mining Plus include the following. Please note that the following Corporate Bios represents the work undertaken by Mining Plus Pty Ltd and does not include work undertaken by individual employees prior to joining Mining Plus.

AIM/Blackthorn Resources – Perkoa Underground

- Feasibility Study of underground longhole open-stope mine

AGD Operations - Costerfield Mine

- LOM Mine Planning
- Setup Mine Planning System for Remote Update of Quarterly Plan
- Drill and Blast Assistance

Apex Minerals

- LOM Mine Planning

Avoca Resources - Higginsville Gold Project

- Technical Assistance

Barrick- Kanowna Belle

- Concept Mine Designs for Near Mine and Current Mining Blocks
- Long Term Scheduling
- Reserve Calculations
- Daily Mine Planning Services
- Stope File Notes and Level Maintenance
- Mine 24D and MineCAD Training
- Drill and Blast Support and Auditing

Barrick - Raleigh Project

- Drill and Blast Assistance

Barrick - Lawlers Project

- Senior Scheduling Assistance
- Develop Quarterly Mine Schedule

Barrick - Trident Underground

- Training and Study Assistance

Bezant Resources PLC

- Mankayan Block Cave Concept Study

BHP Billiton – D Terrace

- Undertaking Mine Design, Scheduling and high level financials

Bluestone Tin

- Conceptual Mine Design, Schedule and Financials for Renison Tin
- Schedule Open Pit and Waste Dump Construction to Meet Environmental Acid Drainage Requirements
- Drill and Blast Support and Services for Collingwood Tin Mine
- Mine Backfill Study for Collingwood Tin Mine.
- Production Support for Renison Tin Mine

Byrnecut International – Burkina Faso (Perkoa Zinc)

- Feasibility Study
- Establish Drill and Blast Systems
- Life of Mine Design and Scheduling

Byrnecut Mining

- Conceptual Study - Orion Gold NL Walhalla
- Conceptual Study - Ivanhoe Merlin Molybdenum Project
- Conceptual Study and Project management Review - MMG Golden Grove
- Project Design Review - St Ives Goldfields Review
- Schedule options - Telfer M50
- Conceptual Study - Silver King

Central Norseman Gold - Norseman Gold

- Senior Planning Assistance
- Short and Long Term Scheduling

CopperChem – Great Australia

- Concept Study prior to Operations Study into the Commencement of the Great Australia Open Pit and Underground
- Pit and Underground Design and Trade-off

Cortona Resources

- Detailed Scoping Study
- Mine Feasibility Study (current project)

Crescent Gold Ltd - Laverton Mine

- Mine Closure Plans

Discovery Metals – Zeta Project

- Mining Study
- UG reserves
- Open Pit / Underground Transition Point

ETI Copper - Asikoy & Bakibaba Mines

- Site visit and review.
- Mine Planning Review

Evraz - Abakan Project, Russia

- Mining Method selection and redesign, and increase production 3 times.

Goldcorp Inc – Musselwhite, Canada

- Mine2-4D & EPS training and support

Goldfields Ballarat Pty Ltd - Lihir Gold

- Senior Planning Assistance and Training
- Life of Mine Scheduling

Gran Columbia Gold Corp – Marmato Project, Columbia

- Mining Pre-feasibility study

Ironbark Zinc Ltd – Citreon Project, Greenland

- Mining Study
- Open pit and underground trade-off

Jayden Resources Inc – Silvercoin Deposit

- NI 43-101 estimate and conceptual mine design

Kagara Ltd – Admiral Bay

- Mining Method Studies
- Prefeasibility study preparation work

Kimberley Metals Limited

- Mine Planning (use of UG tools such as EPS)

Klohn Crippen Berger Ltd – Aripuana Project, Peru

- Conceptual Mining Study

Norton Goldfields – Paddington Site

- Site Support

Mandalay Resources – Costerfield Project

- Desktop Study
- Operations Support

MMG – Avebury Nickel Project

- Mining Study including evaluation of production rates and development options

MMG – Izok Corridor Project

- Izok and Highlake Mining Study

MMG - Golden Grove Project

- Review of the current LOM EPS Schedule

MMG – Rosebery

- Implementation and Training for Mine24D as an Integrated Planning Tool
- Implementation of Enhanced Production Scheduler as the Long and Short Term Planning System
- Life of Mine Scheduling for New Project
- Life of Mine Planning, Scheduling and Software Implementation

MMG - Dugald River Project

- Scoping Study to confirm the next Stage of Study
- Ventilation Modelling

MMG – Silver King

- Concept Study
- Silver King Mining Study and Mining Method Trade-Off

Northgate Minerals - Fosterville Gold Mine

- Senior Planning Assistance
- Environmental Assistance
- Energy and Emission Assistance

Nyrstar – Myra Fall Operations

- Ventilation modeling

Newcrest Mining - Telfer Gold Mine

- Implementation and Training for Mine24D as an Integrated Planning Tool.
- Implementation of Enhanced Production Scheduler as the Long and Short Term Planning System
- Implementation and Training of Mine24D Rings as an Integrated Drill and Blast Tool with Live Level Plans Updates
- Establish and Setup Mine Cave Tracking System
- Drill and Blast Support and Services Onsite and Remote
- Mining Study – M50, M45, M30 and O'Callaghan's deposits
- Concept designs and schedules for SLC
- Pre-feasibility Study for O'Callaghan's

Newcrest Mining – Cadia East

- Assistance with Prefeasibility Study
- Mine Planning and Scheduling - Panel Cave
- LOM schedule updates
- Grade Engineering/Optimisations
- Materials Handling Options Analysis

Newcrest Mining - Marsden Open Pit

- Conceptual Dewatering Study

Newcrest Mining - Kencana Project

- Drill and Blast Training and Mentoring
- Production Engineer Mentoring
- Software setup

Newmont – Tanami

- Life of Mine Redesign
- Mentoring of the Drill and Blast Engineers
- Study for the Implementation of Mine 2-4D in Ring Design
- Refinement of the Mine Schedule

Norilsk Nickel – Black Swan Operation

- Mine Planning
- Survey Manager
- Open Pit Manager

OceanaGold – Blackwater

- Underground Mining Study

Onesteel – Whyalla

- Iron Knob Underground Concept Study

Orion Gold – Cohen's Line

- Study into the Dewatering, Treatment and Discharge of Water from the Historic Cohen's Line of Workings

Peak Gold – Peak Gold Mine

- Generation of Reserve Stope Shapes

Perilya - Broken Hill

- Short Term Mine Planning
- Operations Support

Perilya - Daisy Milano

- Mine Planning using Surpac
- Short Term Scheduling using MineWorks Planner

PT Dairi Prima Minerals

- Lae Jehe Mining Study
- Anjiing Hitam Mining Study, Northern Sumatra.

Priargunsky Mining & Chemical Works - No. 6 Mine Project, Russia

- Conceptual Study for the #6 Mine

Raglan - Kikialik Mine Lens A

- Mining study for Sub-Level cave mine

Rex Minerals – Hillside Project

- Underground evaluation
- Underground conceptual study

Seversatal Resources - Olenegorsky/Kirovogorsky Russia

- Mining Pre-Feasibility Studies - Olenegorsky Stage1 and Stage 2 underground iron ore mines
- Mining Pre-Feasibility Studies - Kirovogorsky underground iron ore mine

Sons of Gwalia – Greenbushes

- Scoping Study
- LOM planning

Straits Resources - Whim Creek

- Concept Mine Design and Scheduling
- High Level Financial Evaluation

Talison Minerals - Wodgina Operations

- Senior Metallurgy Assistance
- Senior Open Pit Planning Assistance

Terramin - Angus Mine Site

- LOM Mine Planning
- Short Term Schedule Setup

Terramin – Chaabet El Hamara Project

- Prefeasibility Study

Trevali Mining Corp – Santander Project

- Mine Scoping Study

Sons of Gwalia – Greensbushes

- Underground LOM Study

St Ives Gold Mining Company - Cave Rocks

- Drill and Blast Design
- Production Engineering

St Ives Gold Mining Company - Leviathan

- Drill and Blast Design

St Ives Gold Mining Company - Belleisle

- Drill and Blast Design
- LOM Mine Planning
- Mine24D, EPS and MineCAD systems implementation and training

St Ives Gold Mining Company - Argo

- Drill and Blast Design
- Medium Term Mining Planning

Votorantim Metals – Brazil

- Long range planning

Xstrata – Odysseus Mine

- Redesign and schedule

Xstrata – Kabanga Nickel

- Initial detailed mining study
- Full feasibility study
- Execution Phase Support

11 APPENDIX D - MINING PLUS VALUES - INNOVATION

There are numerous examples of innovation in Mining Plus's completed work, as shown by the brief project overviews outlined in this document.

Innovation is integral component of Mining Plus's working culture, as highlighted by Mining Plus's values as outlined below, where innovation is continually sought by our team members:

- **Professionalism** - We are committed to conduct all of our dealings to the highest level of integrity and ethical standards.
- **Respect** - We ensure respect for all employees, clients and environments with whom and where we interact.
- **Accountability** - We take ownership and responsibility for our decisions, actions, outcomes and the future.
- **Communication** - We communicate clearly and concisely, in a timely and engaging manner.
- **Teamwork** - Through our mentoring, knowledge sharing and supportive nature we are One Team.
- **Innovation** - We continually seek out and apply best practice while maintaining safety, practicality and sustainability.
- **Customer** - Our number one focus is the customer and we listen to ensure we realise their needs.
- **Action** - We are empowered to be decisive, efficient, proactive and driven to achieve results.
- **Leadership** - We are all leaders; our behaviors display a coaching style.

12 APPENDIX E - SAFETY IN DESIGN

There are numerous controls Mining Plus has in place for ensuring safety in all of our work, as outlined below.

- Safety, Health and Environmental considerations priority for all work completed.
- Mining options considered with multiple areas of assessment (risk based approach), considering the items below to ensure optimum value is able to be realised from the project's resources, with understanding of risks associated with selected option:
    - Safety.
    - Operability.
    - Economics.
    - Environment.
    - Community / Social.
- Environmental and Safety / Risk Management Professional resources available as internal MP resources to assist core team.
- Safety (HSEC – Health, Safety, Environment, and Community) in Design considered and incorporated in all parts of completed work.
- Safety statistics for the company measured – no incidents.

Some of the key components of the safety (HSEC) in Design process are outlined below. Overall the safety in design approach is expanded to include all significant risk areas such as Health, Safety, Environmental and Community:

- Safety in design is a process that focuses on minimising or eliminating hazards at the design phase that may pose a risk of injury throughout the life of the item being designed.
- It encompasses all design including facilities, hardware, systems, equipment, products, tooling, materials, energy controls, layout, and configuration.
- A safety in design approach begins in the conceptual and planning phase within a design's lifecycle, with an emphasis on making choices about design, methods of manufacture or construction and/or materials used which enhance its safety.

The concept of safety (HSEC) in design, is primarily regarding the ease and cost of implementation of control measures during the project phases as shown below in Figure 5-1. In summary earlier in a project that safety is considered in the design of a project, the easier it is to implement and cost is also less.

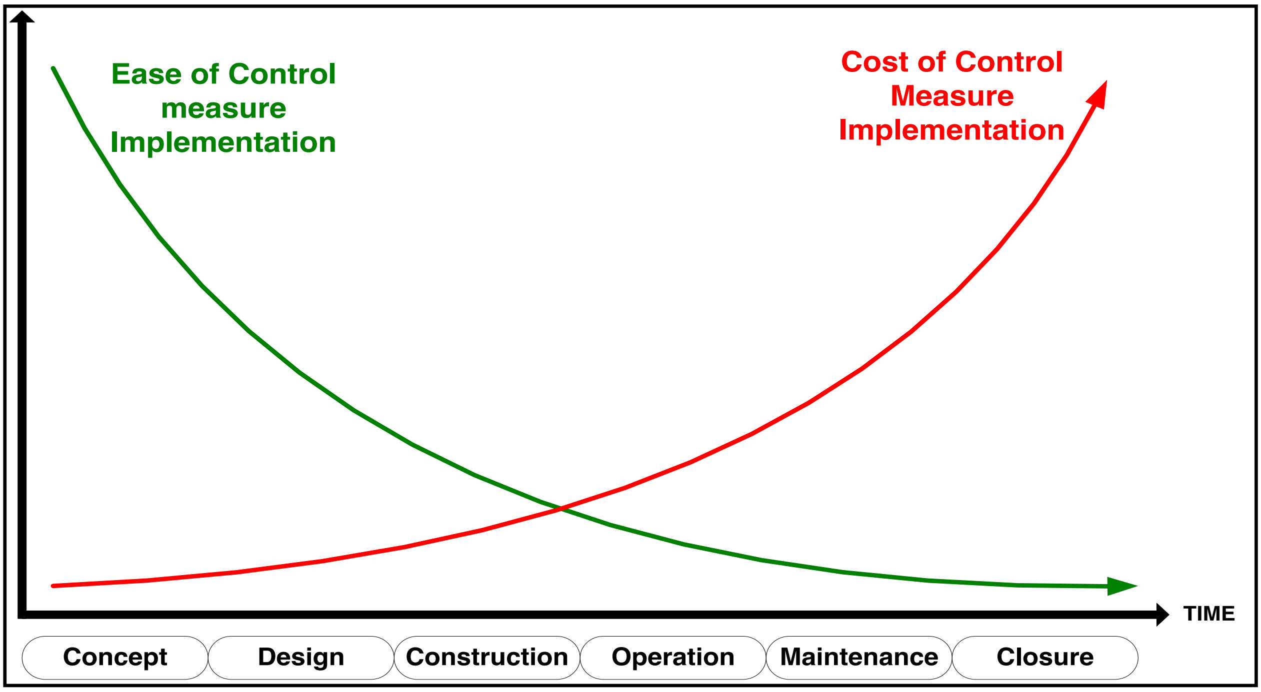

Figure 12-1: Ease and Cost of Control Measure Implementation during project phases.

What does the designer have to do, and what does Mining Plus strive to incorporate into all of our work is outlined below:

- Have a systematic hazard identification process in place.
- Ensure adequate stakeholder engagement.
- Assess the risk and minimize where possible.
- Manage the risk over which they have control.
- Adequately communicate residual risks.