



# Mine Engineering

## Capability Statement





Helping our clients succeed

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Cube Consulting's mining engineering team's experience allows us to offer practical solutions for a variety of mining activities spanning a wide range of commodities, mineralisation styles and geological environments. We combine our years of experience with the latest technologies to deliver innovative practical solutions that add value to our clients' businesses.



The mining engineering team works closely and collaboratively with our clients, who range from some of the world's largest mining companies through to small operations in need of expert technical advice. Our experienced mining engineers work on projects alongside their mining company clients with a view to mitigating risk, enhancing project value and enabling sound commercial decisions. We offer independent mine engineering and project management services.

We are able to draw on the expertise of our geologists to help enhance project value at the appropriate time.





## Our Services

- Evaluation Studies – Conceptual to definitive feasibility
- Mine Optimisation studies and sensitivity analyses
- Cut-off grade studies and strategies
- LOM and Strategic Scheduling
- Ore reserve reporting
- Detailed open pit and underground mine design
- Due diligence evaluations
- Project management
- Study management
- Independent reviews

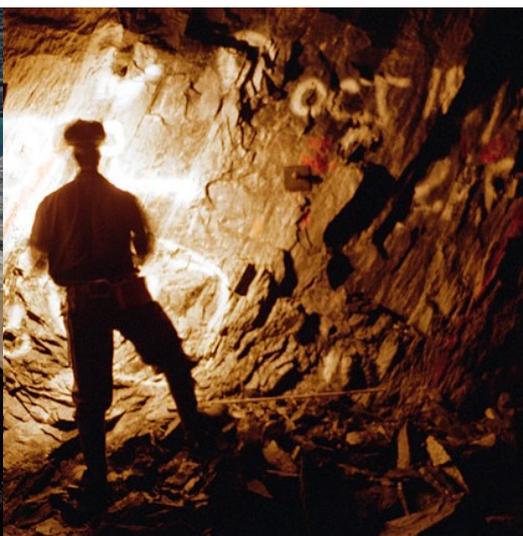
## Mine Studies

Whether you are conducting a preliminary assessment or have moved through to feasibility, Cube Consulting mining engineers possess the key experience and skills to deliver a quality mining study. With efficient and effective study management

*We draw on years of experience to ensure practical solutions and quality outcomes.*

skills garnered through many feasibility studies, a depth of knowledge of constructing and operating mining operations and many years operational experience, we will see that we take a strategic yet practical approach to your project.

Conducting any mining study is an iterative process with dynamic input parameters – we advise you when we think it necessary to revisit parameters which may have a significant impact on the study outcome. Our mining engineers manage parameters in a formalised manner so there is absolute clarity around the investigation and prevailing conditions.





We work closely and cooperatively with other mining professionals, both from within Cube Consulting and externally as required to ensure a study team achieves a professional result.

## Pit Optimisation

Generating an optimal pit with a favourable financial result for a given resource model can be a time consuming and repetitive process, particularly in times of changing commodity prices and volatile costs. Cube Consulting engineers are efficient at setting up and running open pit optimisations with a sufficient number of iterations to evaluate the appropriate final design and cutback selection.

At Cube, our engineers do not just push the buttons on software – the analysis of results is a vital stage and we work closely with your key decision makers to develop the appropriate strategy.



It may be that preliminary optimisations need to be carried out prior to the finalisation of all parameters – these parameters are almost certainly influenced by the preliminary mine schedules, which in turn provided valuable feedback on the project dynamics as part of the essential, iterative nature of mining studies.

## Mine Design

At Cube, we are experienced in both open pit and underground mine design.





Based on the results of the optimisation phase of the study, the Cube mining engineer will create the required pit designs taking into account known geotechnical factors, appropriate strip ratios and pit staging. This process is iterative in conjunction with the strategic scheduling of the project to ensure that staging is incorporated into practical pit designs. We will liaise with geotechnical experts for review and feedback prior to finalising the designs.

For underground mine design, we can produce conceptual designs through to final designs of development and stoping, working collaboratively to select the mining method best suited to the orebody.

In close consultation with our clients and other consultants, we will complete waste dump, stockpile and ROM pad designs together with haul roads showing access from the pit or portal exits to the various material destinations. This will include any other infrastructure location designs and becomes an important input to tactical scheduling.

### Life of Mine and Strategic Scheduling

*We support our clients when they most need help. We favour collaborative relationships.*

A critical part of any mining study is the strategic schedule – how many decisions have already been made or are “hard-coded”, how large is the impact of various constraints in the system and what targets do we need to achieve to ensure the success of the project. This is not an academic exercise – at Cube Consulting we always consider the practical constraints and work closely with your team to ensure quality decision making.





The Cube Mining Engineers have in depth knowledge and experience in the use of leading edge Strategic Mine Scheduling Software. This, together with their practical knowledge of mining operations, gives them the ability to generate the optimal Strategic Schedule for a mining operation. It also gives them the ability to rapidly generate multiple “what-if” scenarios, giving decision makers the best information possible in order to make decisions.

Automated schedule optimisation enables concurrent consideration of a number of variables, allowing the influence of these variables on the strategic schedule to be accurately represented. Incorrect decisions can have a substantial impact on the overall financial performance of a project.

*We are transparent, open and easy to work with. Our team of real world experienced engineers delivers positive results for our clients*

Our mining engineers use Minemax Scheduler as well as MineSight MSSO software to perform cut-off grade optimisation, investigate stockpiling strategies, evaluate timing of capital expenditure and consider practical development schedules when looking at a life of mine schedule. The ultimate goal is that the schedule will be able to provide evaluation of financial impacts of selected key constraints and targets to enable informed decision to be made relating to the development of the mine.

## Ore Reserve Reporting

A number of technical professionals need to work together to produce a publishable ore reserve statement. A trusted team is required to ensure the assessment made by the Competent Person as to the risk associated with each of the modifying factors is understood and articulated.





The Cube Mining Engineers have produced numerous ore reserve statements over many years and have the experience and skills necessary to produce a quality result. The team consider mining method, costs, revenue and work with specialist teams to ensure environmental and community issues are taken into consideration.

The ore reserve needs to be supported by a robust mine plan that is technically achievable and economically viable – our mine engineering team members work collaboratively to ensure the result is sensible.

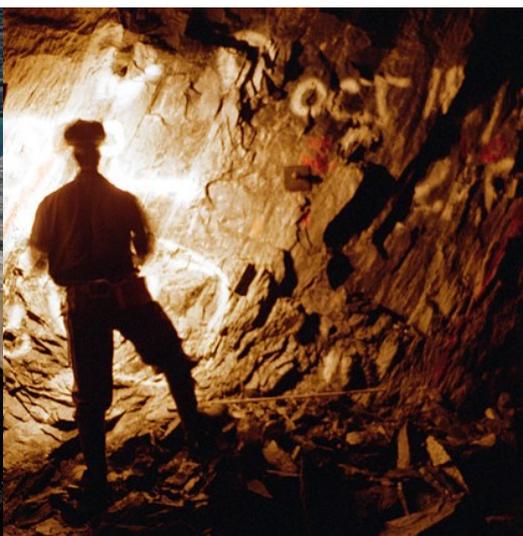
### Due diligence

Mining companies find themselves needing external and independent support when considering the purchase of a mining asset, entering into a joint venture or during mergers and acquisitions. Our Cube engineers are frequently called upon to conduct a range of activities from a fatal flaw desktop analysis through to full project due diligence.



This process involves reviewing all technical aspects of the mining engineering to date. For example, a reconciliation of reserves to resources may be required, or an evaluation of an existing mine schedule given the physical constraints.

Our team specialises in independent technical analysis and review of the practical application of the mine design and production schedule.

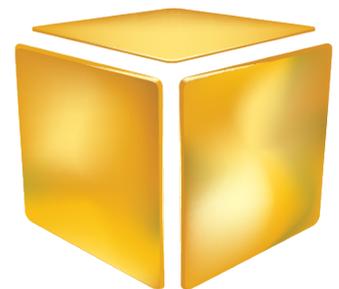


## About Cube

Cube Consulting provides specialist consulting services and software systems to the global mining industry. We are a quality team of geologists and mining engineers with a wide range of skills and experience, applicable from advanced exploration projects through to operational mines across multiple commodities.

Established in 2000 in Perth, Western Australia, Cube Consulting has grown to become a world class Mining Services Company, working with our customers to add value to their projects through considered and practical advice.

- Geological Services based on extensive operational and field based experience.
- Mine Engineering Consulting Services supporting sound commercial decisions.
- Technology solutions focused on Mine Grade Control and estimation.



### **For more information**

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