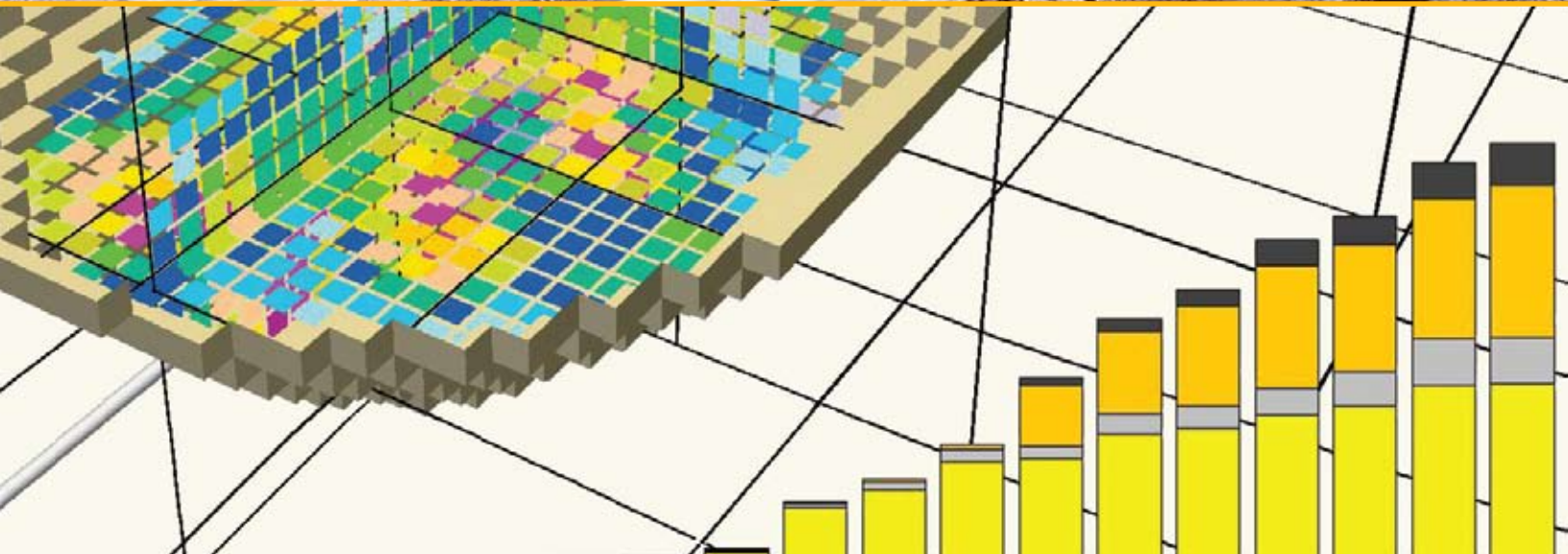


GEMCOM WHITTLE™

Strategic Mine Planning



Strategic Mine Planning Tools for Engineers, Geologists and Mine Planners

When mining companies seek to maximise NPV, balance schedules, and to optimise blends and stockpiles, they use Gemcom Whittle. With results that are trusted by the financial community, the software is also used in pre-feasibility and feasibility studies.

Whittle Benefits

- Determine and optimise the economics of mining projects.
- Enables mining companies to analyse pit designs in the context of all physical, economic and mining constraints, allowing significant value to be added to operations.
- With auditable, repeatable processes, Whittle delivers trusted results that sequence deposits as effectively as possible, optimising stockpiles, cut-offs and blends.
- With the ability to look at deposits in the context of multiple pits and changing market conditions, it helps to align strategic decisions to corporate policies.

Foundation

The Foundation module is the centrepiece of the Whittle product suite, providing easy access to essential planning tools for open pit mine planning. In addition, it provides a backbone upon which a growing range of advanced modules can be added, thus expanding the range of mine planning analysis possibilities.

Foundation enables users to rapidly and easily import, manipulate and visualise resource models, build pit slope, operational and economic models and optimise the pit shapes. Users can run multiple types of life-of-mine schedules, such as benchmark schedules, and graphically analyse the results.

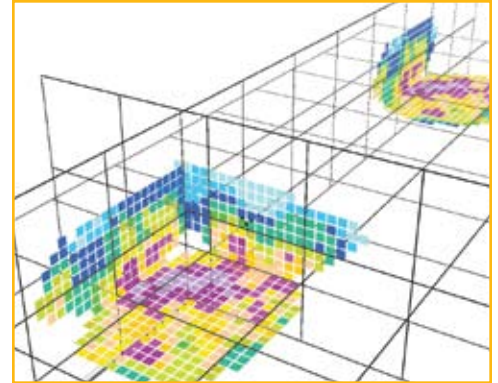
Within Foundation are two particularly important modules:

- **Buffer Stockpiles** – The use of Buffer Stockpiles can be evaluated, taking into account re-handling costs, stockpile degradation, etc. If the Milawa module is present, it is able to optimise the use of the stockpiles.
- **Discounted Pit Shells** – The Discounted Pit Shells module allows NPV value models to be generated for use in pit optimisation. You can use either discount-by-depth factors or discount-by-mining sequence to investigate alternative optimised pitshells.

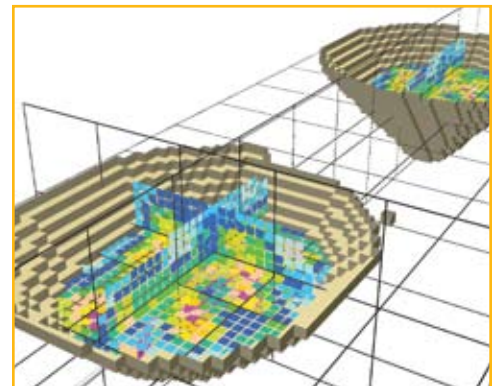
Whittle Modules

Whittle's modular architecture allows mining companies to choose the functions that are most important to them.

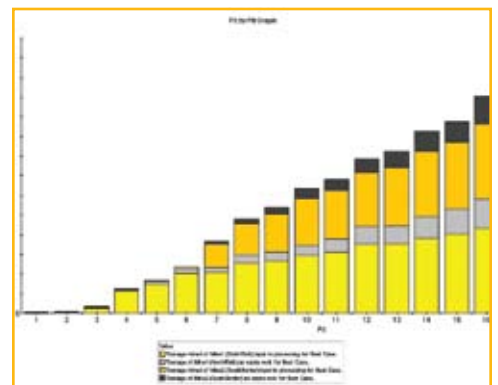
- **Multi-Element** – This extends the capabilities of Whittle to allow up to ten elements to be defined in the model. Individual elements are reported separately and the grades and quantities of each element are available for inclusion in user-defined expressions, graphs and reports.



Block model showing copper grades.

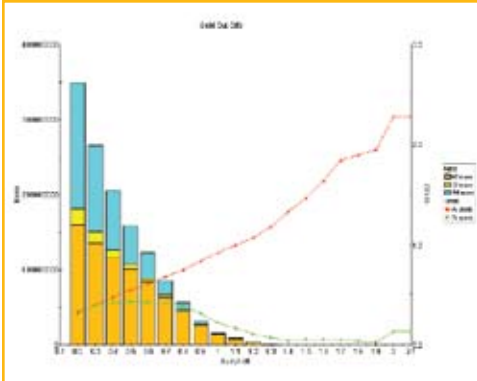


Multiple pit schedule visualisation showing copper grades.

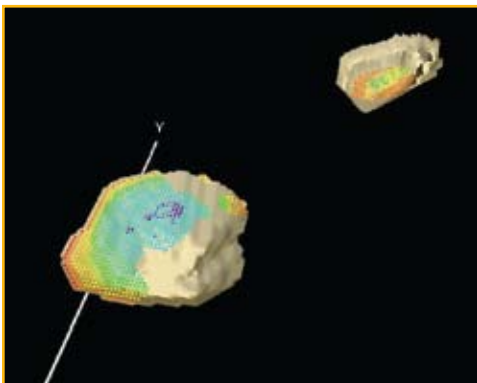


Ore and waste profiles from two mines with increasing sales value.

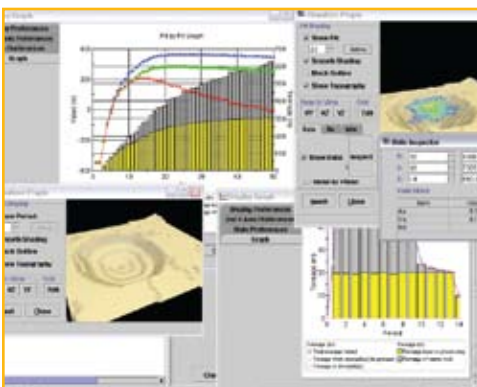
Whittle is the world's most trusted strategic mine planning software used to analyse and optimise open pit mines.



Grade tonnage graph.



Maximise NPV at multi-mine operations.



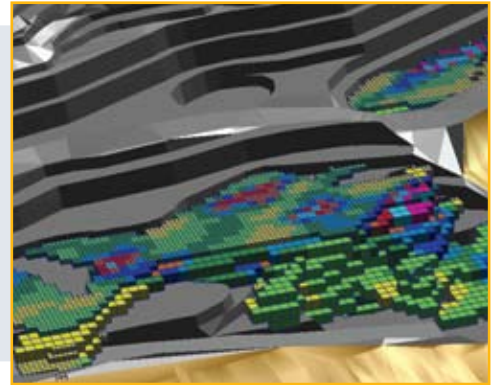
Better visualisation equals better understanding through multi-window views.

- ⇨ **Mining Width** – This adjusts pushbacks to allow for mining width constraints. The speed of the process, and its ability to be repeated, means that users can experiment with different mining widths to determine what economic impact they have.
- ⇨ **Milawa Algorithm®** – This module schedules pushbacks in order to maximise NPV or to balance the mining rate. It responds to all production constraints, price and cost models within Whittle and also provides additional controls over the schedule.
- ⇨ **Value Expressions** – This add-on option allows user-defined block value calculations. Using the expression builder, you can construct highly complex cost models. The ability to allow expressions that can refer to other expressions is powerful, yet allows the logic to be built step by step.
- ⇨ **Pushback 50** – Intended for use by large, long-life mines, this module extends the capabilities of the Milawa Algorithm to allow up to 50 pushbacks to be scheduled.
- ⇨ **Pushback Chooser** – This module provides greater flexibility in the choice of pushbacks. An “Auto-Expert” approach to push-back choice, this adds more certainty to the process, and achieves better results much faster than manual methods.
- ⇨ **Stockpile and Cut-offs** – Taking into account all the constraints and settings in Whittle, this module reschedules the mining sequence by optimising the stockpile utilisation and cut-off strategy.
- ⇨ **Blending** – This module allows blending constraints to be considered in the scheduling of the mine. This is especially useful for coal, iron ore, nickel laterite and any other mines for which ore blending is a requirement.
- ⇨ **Multi-Analysis** – This module significantly extends the capabilities of Whittle by allowing multiple imported models per project, and branching of the analysis trees thereafter. For example, you can attach several pit slope nodes to an imported model node, each representing a different set of assumptions. Whittle keeps track of all the data dependencies for you. You can build highly complex analysis models which can be viewed, accessed, and managed with ease.
- ⇨ **Multi-Mine** – Multi-Mine provides schedulers with the ability to choose material from multiple sources in pursuit of carrying out a crucial objective: maximising NPV. Companies that employ the Multi-Mine module will benefit from improved project values through more effective long-term scheduling of multi-mine operations.
- ⇨ **Advanced Analysis** – The Advanced Analysis module allows Whittle to perform very complex analyses. This is extremely useful to designers who are interested in extensively testing sensitivities and performing risk analysis. Features include the Whittle “Spider Diagram,” and the ability to generate hundreds of life-of-mine schedules by varying multiple input parameters in a single run.

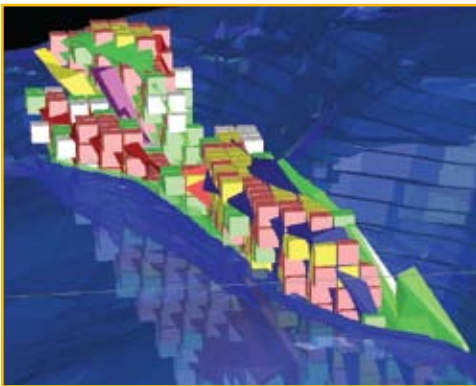
Extend Your Capabilities with these Gemcom Systems

Gemcom Surpac: Geology and Mine Planning

Surpac is an integrated geology and mine planning system that addresses all the software requirements of Geologists, Surveyors, and Mine Engineers in the resource sector. Surpac's powerful 3D graphics engine enables users to visualise, analyse, and model geological deposits quickly and efficiently.



Gemcom Surpac: Geology and Mine Planning.



Gemcom GEMS: Geology and Mine Planning.

Gemcom GEMS: Geology and Mine Planning

GEMS is the leader in collaborative geological and mine planning solutions. For over 20 years GEMS has been satisfying the needs of open pit and underground mining professionals in exploration, modelling, mine design, planning and production scheduling. GEMS' data management capabilities make it the premier choice for companies who value their mining data assets.

Gemcom InSite: Operational Performance

Gemcom InSite manages the processes that drive operational performance through the mining value chain. Improving productivity, reducing production losses, and controlling costs, InSite increases profitability.

InSite consolidates and validates information from operational systems in near real time, enabling you to make timely decisions in response to changing conditions.



Gemcom InSite: Operational Performance.

For more information email whittle@gemcomsoftware.com

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