

GEMCOM CUSTOMER CASE STUDY



Rio Tinto fuels mine planning and pit optimisation globally with Gemcom Whittle™

RioTinto

Rio Tinto Group makes Whittle part of its standard strategic mine planning solution

Countries:

Australia, Brazil, Canada, India, Indonesia, Namibia, Peru, United States

Objective:

Designate a suite of strategic mine planning tools for a variety of open pit ore bodies across various company sites.

Approach:

Adopt Gemcom Whittle™ as part of the company's standard software solution for open pit optimisation.

IT Improvements:

- Software consistency across operations and commodities.
- Streamlined technology footprint, which reduces maintenance and support.
- Adoption of common operating processes across groups.

Business Benefits:

- Optimisation of ultimate pit shapes/shells to maximise long-term mine value.
- Trustworthy results to guide open pit analyses and detailed planning.
- Retention of personnel skills and knowledge during transfers or redeployments.
- Resource to facilitate improved staff collaboration and knowledge sharing.



Bingham Canyon Copper Mine, Utah.

Adopting an industry leader

Rio Tinto Group is an international mining organisation combining Rio Tinto plc, a London-listed public company (LONDON: RIO.L) headquartered in the United Kingdom, and Rio Tinto Limited, which is listed on the Australian Stock Exchange (AUS: RIO.AX) with executive offices in Melbourne, Australia.

A diversified company with refining and exploration divisions in nearly every continent, Rio Tinto (www.riotinto.com) is interested in large-scale, world-class ore deposits and invests in long-life, cost-competitive mines. This strategy has generated interests in many of the world's largest mineral deposits, in commodities such as copper, diamonds, borates, aluminum and iron ore. The company also mines and processes industrial minerals, including salt, talc and titanium dioxide.

With diverse operations in many areas, the company depends on its Technology and Innovation group to help guide its decisions on leading practices and technology use. The group stays abreast of the latest innovations that will give Rio Tinto a competitive advantage and drive performance improvements in mine design, scheduling, and geological modelling. The group assessed the status and benefits of the Gemcom Whittle software and endorsed it as one of the company's standard tools for economic evaluation of open pit mines.



Aerial view of Rio Tinto iron ore mine, Western Australia.

Beneficial for long-term planning

Even before adopting Whittle as one of its standard analysis tools, the company had used the software extensively across the organisation for about 10 years. It had proved beneficial for long-term planning and conducting feasibility studies for Rio Tinto's large, open pit mines. The staff leveraged the software to gain a wide angle view of the physical, economic and mining constraints regarding their pit designs. Over the years, Whittle has helped the staff advance Rio Tinto's strategy of converting ore bodies into long-life, efficient operations that can sustain the company through business cycles.

Whittle provides a baseline for the economic assessment around ore extraction from a large open pit, allowing users to look at mining scenarios and consider various processing and mining costs, geology, ore grades and other factors. The solutions contained in Whittle help engineers and planners understand the economic assumptions in a consistent way.



Red earth is typical of the Pilbara region of Western Australia, where the majority of Rio Tinto iron ore operations are based.

Supporting iron ore mine design

Rio Tinto is aiming for the best opportunities possible for all of its mines, including those in the Iron Ore product group. Rio Tinto Iron Ore (RTIO) — the world's second largest iron ore producer — operates in Australia, Canada and Brazil, with development projects in India and Guinea.

Rio Tinto has 11 mines operating in the Pilbara region covering various deposit styles. The geology of the Pilbara region is characterised by late Archaean and early Proterozoic rock formations known as the "Hamersley Group," which contain several large units of Banded Iron Formation. Most mines have their own crushing and processing facilities, where beneficiation or concentration occurs to enhance ore quality. Combined, the Pilbara mines can produce up to 220 million tonnes of iron ore annually. Additionally, the Pilbara operations consist of three shipping terminals and one of the largest



Stacking iron ore on to blending stockpile at Rio Tinto's Yandicoogina mine, Western Australia.

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Stacker reclaimer and stockpiles at dusk.



A reclaimer in action at Parker Point ship loading terminal, Rio Tinto, Dampier Port, Australia.



Haul truck transporting ore from Bingham Canyon mine to the Copperton concentrator.

privately owned railways in the world. Ongoing exploration is constantly turning up new iron ore mineralisation in the region.

Geometry is an issue in iron ore mining, which Whittle helps solve. The software allows the determination of the maximum pit shell shape and size to mine. Finding the maximum size of the pit can be done in a number of ways such as with pure economics and or using a limiting pit ratio.

Sound guidance for mine expansions

RTIO mining engineers use Whittle on feasibility studies for expansion projects and for new or updated geological models that are converted to mining models. They depend on Whittle to regularly reassess the economic parameters that define the optimum final pit shape, especially when considering a lengthy time horizon for the mines.

With changing market conditions and iron ore prices rising, it is important to reevaluate options constantly, particularly in respect to the blending of different quality materials for the market. The team makes the adjustments, redesigning the pit and its economics to improve the overall financial position of RTIO and increase the net present value (NPV) of the Pilbara mines.

Rationale for software standardisation

Rio Tinto has a global presence and personnel working at numerous sites. Adopting a more standardised strategic mine planning solution helps the company capture greater efficiencies. Not only does the practice streamline the company's overall technology footprint, but it also reduces the number of different technologies that personnel must learn, maintain and support. Designating Whittle as a part of the standard solution enhances collaboration among staff. They can offer guidance to each other, tailor procedures to their specific divisions, and share them across groups to help others improve proficiency.

The benefits of standardisation carry over to personnel training and development. When personnel know and use the same system, it can be easier and faster for redeployed staff to contribute in other parts of the company. It fosters training continuity, as well. Although Rio Tinto puts employees with no previous Whittle experience through Gemcom's two-day training course, a wide Whittle knowledge base is available that new users can tap into beyond their initial training.

By taking Whittle training, mine engineers learn what the software can do for pit optimisation and about cost adjustment and scheduling factors. This means that if they move into another division like the diamonds or the copper group, they already have the required knowledge.

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About Gemcom Whittle

Whittle is the world's most popular and effective pit optimisation and analysis solution for open pit mines. Mine planners depend on the system to help them maximise NPV, balance schedules, and to optimise blends and stockpiles. With results that are trusted by the financial community, Whittle 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.

Get your free Whittle demo CD and white papers at www.gemcomsoftware.com/whittle.



Parker Point loading facility, Rio Tinto, Australia.

Rio Tinto Group Solutions at a Glance

Primary Applications:

- Gemcom Whittle

Gemcom Services:

- Onsite training
- Technical support

For more information email info@gemcomsoftware.com or visit www.gemcomsoftware.com.

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