

Ventilation and Production Optimization



VPO is developing the next generation of mine design tools with an emphasis on underground mine ventilation and schedule optimization. These two areas of research are key in maximizing the profitability of a mining operation.

It's What We Do...

Ventilation Optimization

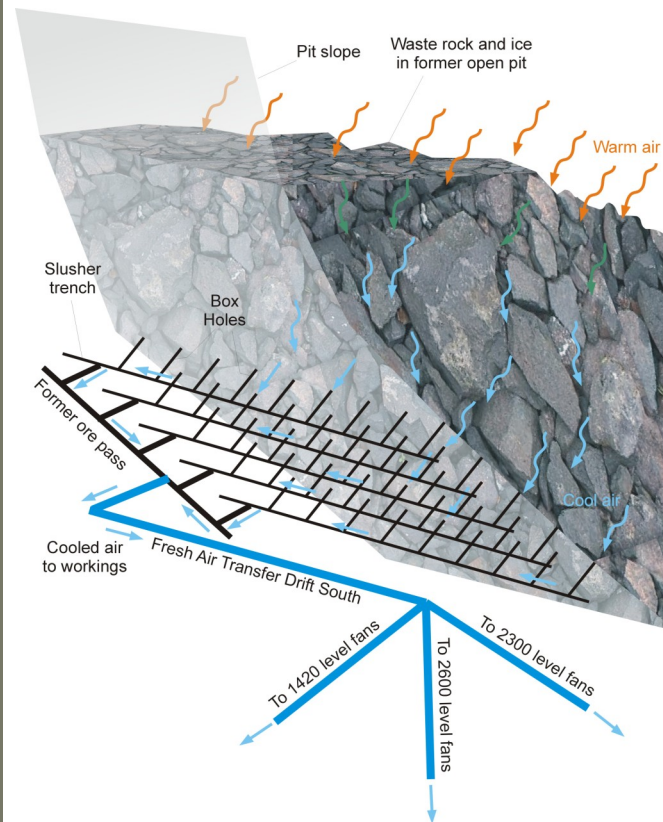
Proper use and planning of underground mine ventilation systems can:

- Minimize both capital and operation costs
- Ensure that underground workers are provided with a safe and healthy work environment

Production Optimization

The Schedule Optimization Tool (SOT):

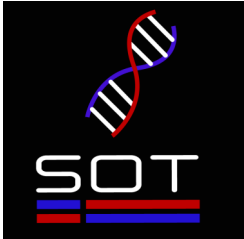
- Uses a genetic algorithm (artificial intelligence) to evolve near optimal schedules that increase a mine's Net Present Value
- Produces hundreds of possible schedules to allow for strategic decision making
- Generates schedules in a fraction of the time required by traditional methods



Current Projects...

MIRARCO's First Commercial Offering

MIRARCO's Schedule Optimization Tool, SOT, automates the scheduling of mine development and production activities, producing schedules optimized based on Net Present Value. SOT is commercially distributed by GijimaAst and Datamine. SOT and other software tools for the next generation of mine design and planning have been brought together through an international research consortium, and the recently completed PRIMO project. Follow-on projects will increase the scope of SOT capabilities to take into account a broader range of constraints important to the mine planner.



Extended Benefits of Natural Heat Exchange

MIRARCO is developing software to optimize the use of the existing natural heat exchange system at Vale's Creighton mine. This will allow Vale to avoid or postpone the significant capital and operating costs of mechanical refrigeration, while providing a comfortable work environment for miners as deeper levels of the mine come into operation.

Ensuring Good Air Quality Underground

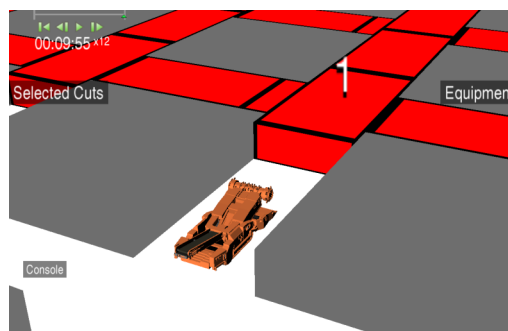
Working with BESTECH, the supplier of a ventilation on demand control system, MIRARCO is helping optimize the use of their system to ensure good quality air exists underground.

Linking Schedule Optimization and Simulation

Working with Labrecque Technologies, MIRARCO is exploring the integration of the Schedule Optimization Tool (SOT) with SimMine. Several potential benefits are anticipated through this linking. For example, by generating detailed short-term schedules, the simulator can aid the mine planner in choosing among SOT schedules reporting similar net present values those avoiding resource bottlenecks when deviations from the planned schedule occur.

Software Development for Mining Engineering and Training

MIRARCO is working with a mining company in the United States to optimize the coal cut selection process at their underground mine. A software tool is being developed that will be used both for engineering and for training purposes.



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