



Open Pit Metals Solutions

Integrated planning
tools for open pit
metals operations

An integrated solution



Dynamically link your mine designs and schedules

Deswik uses best practice mine planning techniques embedded in next generation software enabling you to spend more time analyzing and planning scenarios rather than manipulating data. Built on our core software modules Deswik.CAD and Deswik.Sched, and linked via Deswik.IS, our integrated approach to mine planning helps our clients to deliver more with their mine planning expertise.

Our software incorporates design and scheduling features across the core platform and associated modules, including:

- » Comprehensive core functionality for open pit metals operations at both long and short-term planning horizons:
 - 3D mining reserve solids with integrated Gantt scheduling
 - Handle complex geological block models
 - Superior Boolean processing for accurate 3D solids
 - Detailed process management via Deswik workflows.
- » Deswik.AdvOPM provides advanced open pit metals tools such as:
 - Automated road design
 - Truck limited haulage
 - Margin ranking and pit shell optimization
 - Advanced scheduling functions including backwards pass resource leveling, objective targeting and resource path importing.
- » Deswik.OPDB to develop comprehensive open pit production drill designs.

Strong technical solutions tailored to specialized industry needs

Deswik has developed a fresh and innovative range of unique tools that span the value chain from receipt of a geological model through to reporting for costing. Our integrated planning tools give our software the proven capability and reputation of taking a project from the design stage to a schedule faster than ever before.

3D design environment

- » Easily generate accurate 3D solids from bench polygons, blast masters and geological control strings.
- » Variable ramps, graded switchbacks, automatic berms and tracing for cutback design.

Powerful design

- » Automated reprojections allow quick analysis of conceptual pits and haul roads prior to finalizing design.
- » Multiple pit design parameters based on block model fields, 2D polygons or 3D solids.
- » Create bulk Boolean rules to cut or merge thousands of solids in one operation without error, cutting against topography and pit designs.

Geological data

- » 3D visualization of block models.
- » Import and validate block models from various mine design software packages.
- » Interrogate solids against user defined block models with legends based on filters.

Data manipulation

- » Calculate medium-term and long-term drill and blast values, such as powder factor or holes by length, using intuitive formula builders.
- » Attribute graphics with user calculated property fields from Deswik.Sched to visualize mined grades in the graphics.

Interactive scheduler

- » Create derived tasks such as grade control drilling, production drilling or production blasting.
- » Superior control of dependency creation allowing the user to develop specific mining sequences combined with varying shaped mining blocks.

Powerful scheduling

- » Gantt Chart based scheduling is easy to update and readily understood by all stakeholders.
- » Schedule within the long-term horizon and still retain all the detail required for short-term scheduling and execution in the one model.

Landform and Haulage modeling

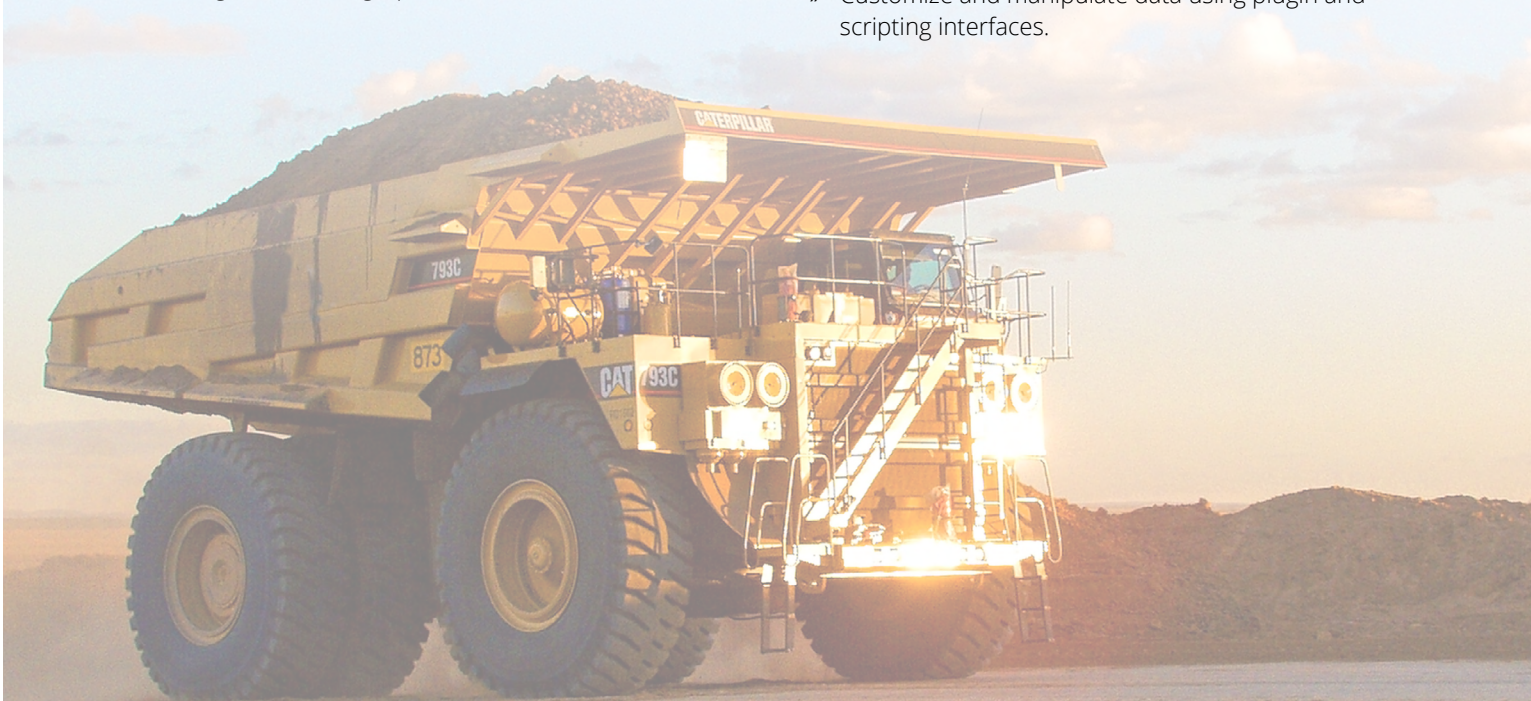
- » Multiple haulage strategies that can be varied over time, such as Minimize CycleTime, Minimize RL, Minimize Fuel Usage or Minimize Cost.
- » Multiple scenario manager and comparison tools including automated updating of Deswik.Sched with key haulage information for reporting.

Superior reporting

- » Use the comprehensive reporting functionality to easily export data to Microsoft Excel.
- » Use critical path and float analysis to help manage complex scheduling.

Inclusive platform

- » Import from and export to most mine design and CAD software packages.
- » Customize and manipulate data using plugin and scripting interfaces.

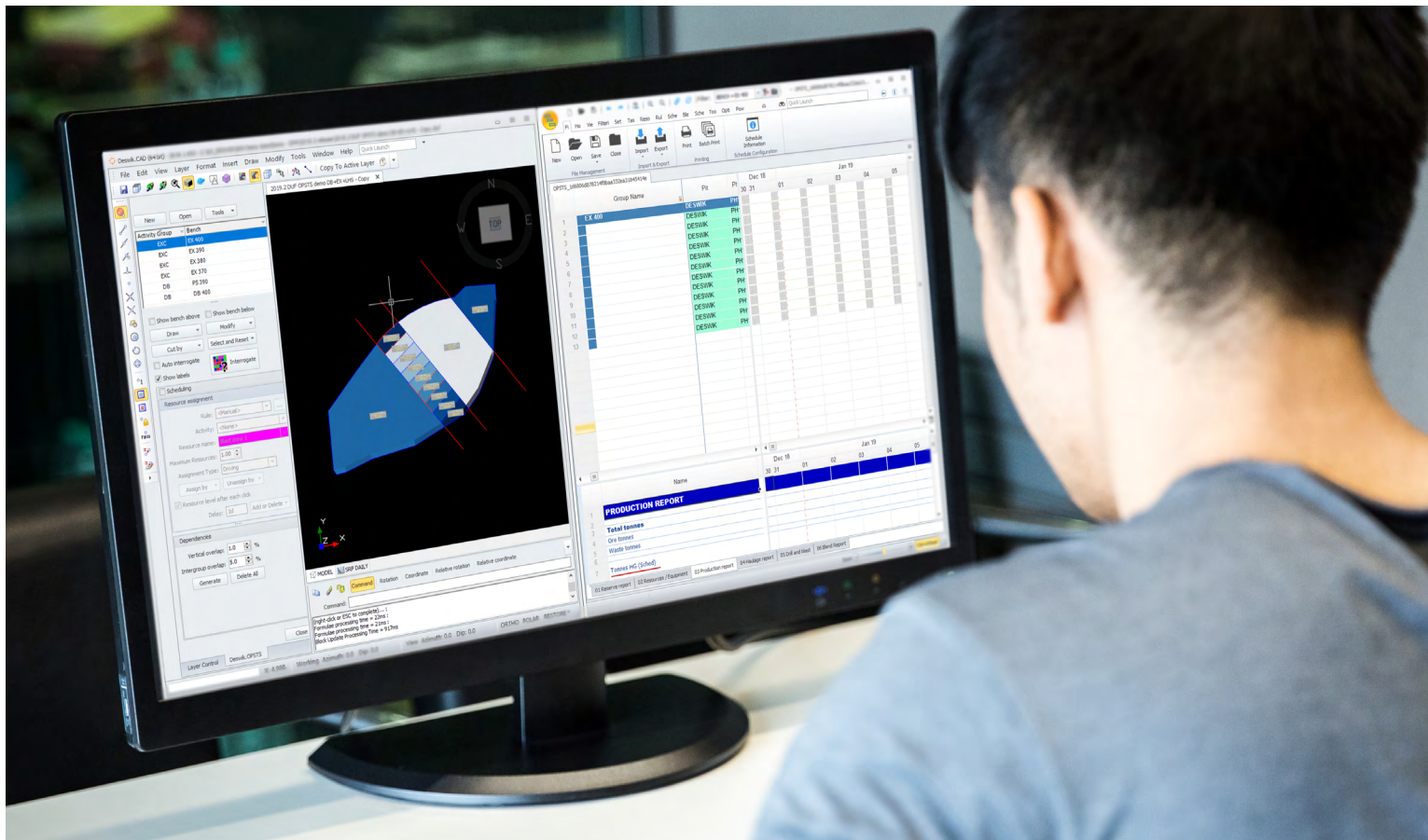




Deswik.AdvOPM

Advanced functionality tailored to the specialized demands of open pit metals operations

- » Pit shell optimizer
 - Using reserve solids, grids or block models, vary the revenue to calculate the pit shell delivering the maximum undiscounted cash flow.
- » Truck-limited haulage
 - Specify truck fleet and the system dynamically models the mining and dump schedules based on trucks available.
 - TLH is also appropriate for modelling mixed-fleet haulage scenarios.
- » New Landform and Haulage options
 - Incorporate conveyor systems with fixed and mobile conveyor load points, modelling interaction with normal truck haulage circuits.
 - Include trolley assist haulage options into landform scenarios.
- » Advanced resource leveling
 - Access to features such as backwards pass leveling, multi-field or sink rate targeting and time usage models.
 - Short term manual scheduling via interactive resource paths or import resource paths from other packages.
- » Reconciliation
 - Generate as-mined, as-designed and difference solids from initial, design and final surfaces.
 - Detailed reporting of compliance to plan from a 3D perspective.
- » Margin calculator
 - Wizard-based calculation of Net Present Value and incremental, cumulative and maximum cumulative margins from reserve solids.
 - Import, export and run multiple scenarios against defined costs and revenues as required.
- » Calculate Stereonets
 - Import strike azimuth and dip data to generate geotechnical Stereonets directly in the Deswik.CAD design space.
 - Support Schmidt, Wulff, Rose and observation diagrams.
- » Automated road design tool
 - Determine cut and fill requirements from road centrelines, with solids creation and surface updating.
 - Design to gradient and bench and berm limitations with cut and fill balancing for dropcuts.



Deswik.OPSTS

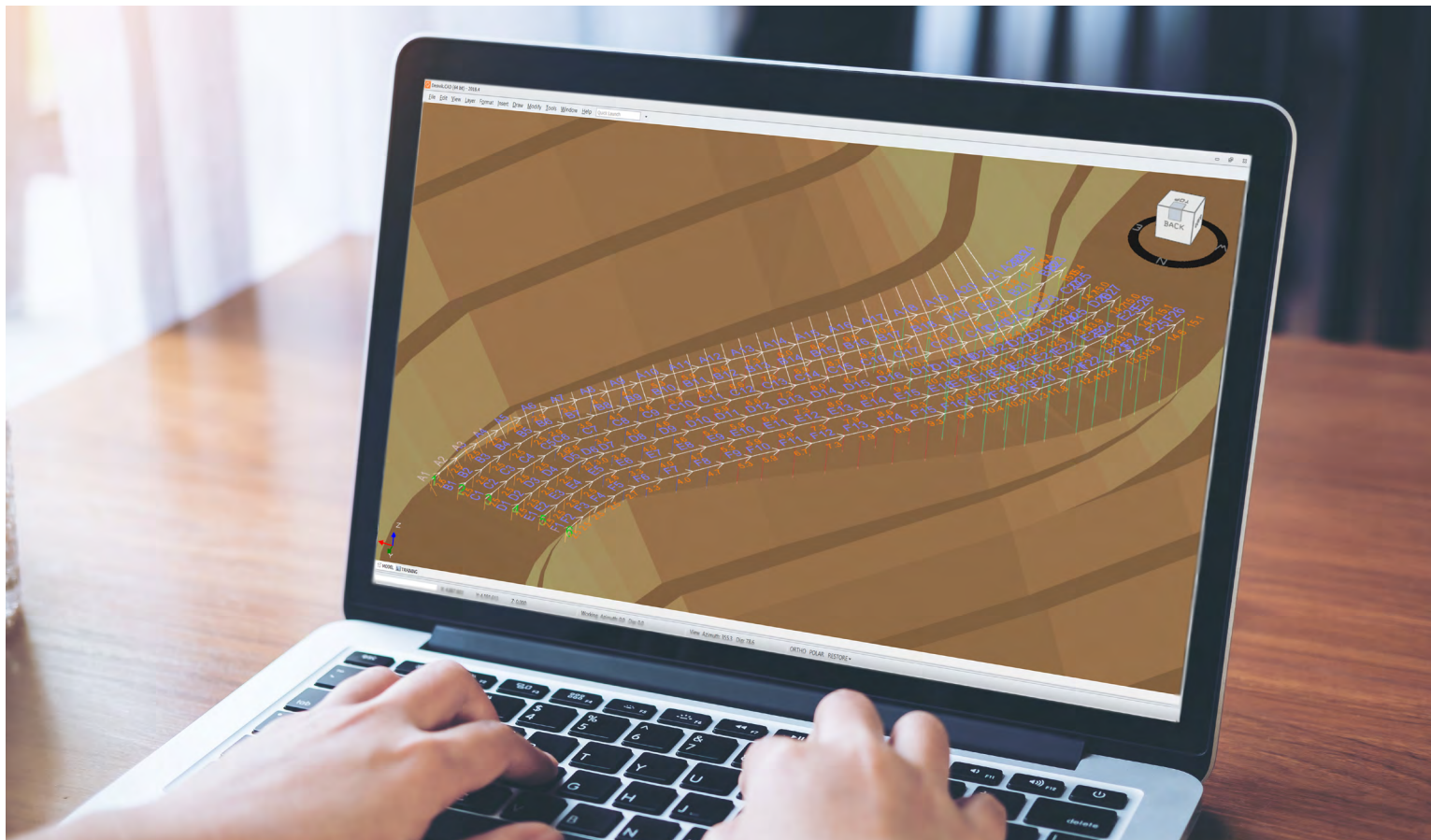
Short-range ore control modeling and design tool

- » Quickly build detailed, activity-based weekly and shift plans and manage the integration between longer-term schedules.
- » Query ore control shape data to override resource model grades.
- » Query drill & blast designs for updated physicals including automated calculation of drill and blast quantities.
- » 2D and 3D attribute transfer direct to the schedule.
- » Dynamically links Deswik.CAD to Deswik.Sched; as the cut line is moved, the associated block is altered and interrogated against the block model.
- » The embedded schedule is updated and automatically leveled, giving you immediate feedback on the impact of the change.
- » All data is contained within a single Deswik file, no need to export between the design and scheduling processes.
- » Import, export, print, report data ready for upstream and downstream stakeholders, including drill and blast engineers and long-term planners.
- » Integrates with Deswik.DO (Dig Optimizer) for grade control.

Deswik.GO

Maximize value by simultaneously optimizing decisions across the mining value chain

- » Generate optimized pit shells by individually scheduling each block in your block model while considering the time value of money.
- » Simultaneously optimize multiple block models to understand and analyze different pit interactions from the first pass in the strategic planning process.
- » Apply more realistic constraints to your schedule and ensure that the value of the deposit is being maximized.
- » Optimize the mine and processing schedule using the outputs of the pit optimization step or a block model coded with actual designs.
- » Use the Fixed Extraction Sequence option if you have a completed mine plan at hand to determine the best destination for each of the mined units in the plan.
- » Model complex flows, such as the movement of mined material through all the steps in the logistics process, from crushing to rail, stockpiling, and shipping.
- » Create business intelligence (BI) style reports using the integrated dashboard reporting to drill down into the details and results of the schedule. This gives you maximum visibility of the value drivers of the plan.



Deswik.OPDB

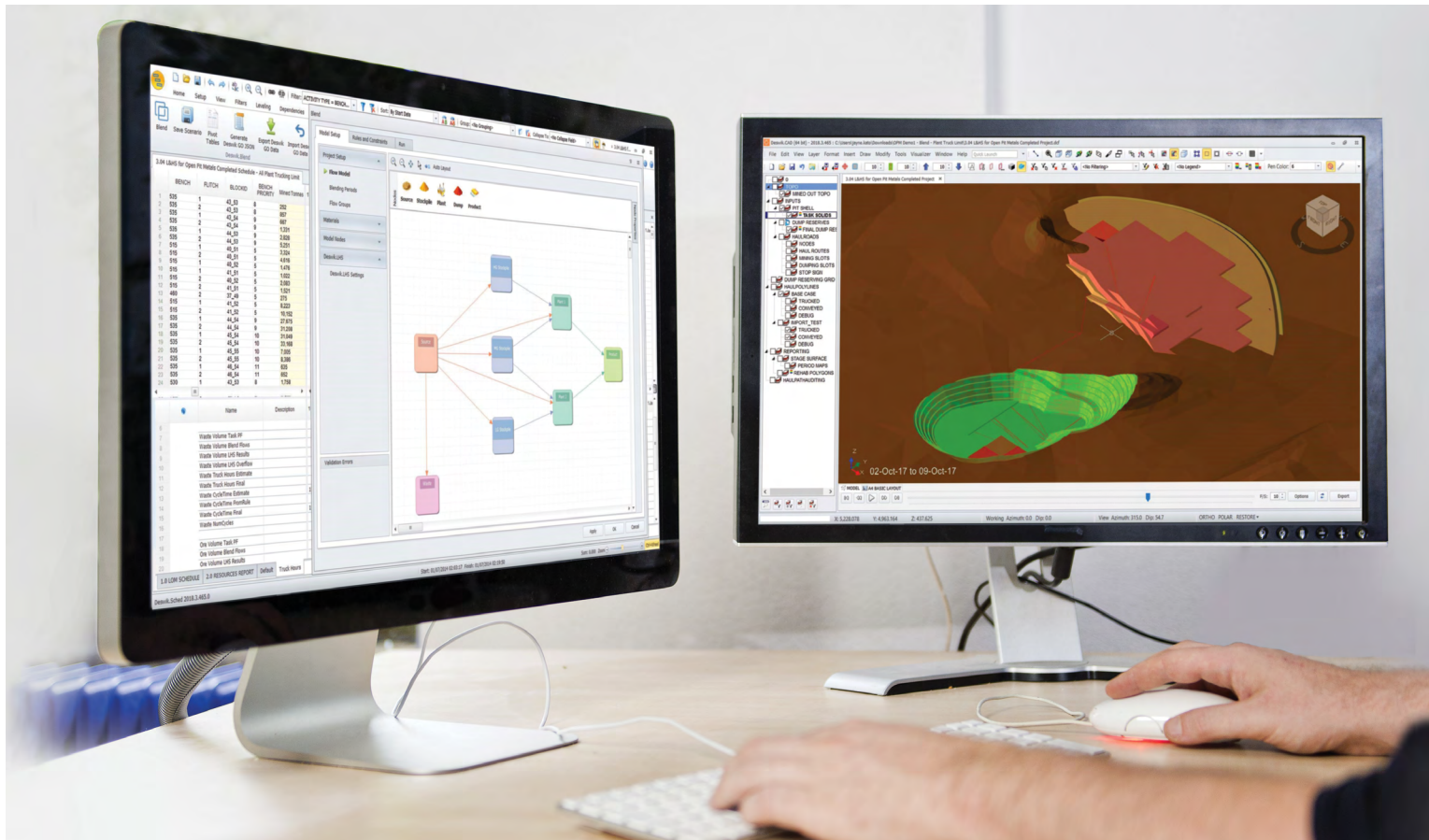
Fast, efficient drill and blast design for open pit mining methods

- » Construct hole templates with design parameters such as fixed/variable collar or toe spacing, angle changes and variable toe horizons.
- » Rapidly generate drill patterns using pre-defined hole templates then manually adjust as required to final design considering previous design and geological structures.
- » Audit drill patterns against blast hole distribution and location constraints.
- » Update hole layouts against survey and design changes, fast and intuitive hole numbering.
- » Export design data ready for direct import into BMI's BlastPlan Pro blast design software.
- » Rapidly setup plot templates with tables referencing key design information that updates for each plotted drill design.
- » Export to various data formats and upload the design directly to the drill rig.
- » Distribute drill designs and GPS guidance files to surveyors in either DXF or CSV formats.

Deswik.DO

Design of optimum dig lines for open pit grade control

- » Deswik.DO removes the manual and subjective grade control processes employed by the majority of open pit operations, and replaces them with an automated, transparent, and repeatable process.
- » The end result is a set of dig block polygons which maximize value and minimize losses from a blast.
- » As with the majority of Deswik products, Deswik.DO is integrated into the planning and scheduling processes.
- » The tool can also be applied in the short, medium, and long-term planning horizons.
- » Quickly understand the impact of mining direction on recovered material.
- » Use the polygons produced as a 'check' or as a guide for the person responsible for short-term grade control.
- » Polygons produced are directly fed into a dispatch system, or marked up in the field.
- » With just a few clicks, Deswik.DO produces results. It is also possible to rapidly assess changes in minimum mining width, mining direction, and other variables.



Deswik.Blend

Optimize your product value with material flow modeling

- » Build a network of sources, stockpiles, dumps and plants to model material flows and transformations to products and waste through an intuitive graphic interface.
- » Materials can be modeled on either a raw or product basis and incorporate unlimited variables.
- » In multi-period mode - make the optimal decision of where to send material once mined, develop product strategies considering capacity and blending constraints to maximize value across multiple periods.
- » In single period mode - make the optimal decision of when to mine and where to send material once mined, develop plans considering mining, capacity and blending constraints to achieve product targets on a period-basis.
- » Integrated seamlessly within Deswik.Sched eliminating any manual transfer of data.
- » Extend the results to Deswik.LHS for haulage scenario analysis including stockpile reclaim and reject placement trucking.

“Make the optimal decision of when to mine and where to send material once mined”

Our industry leading consulting solutions include



Mine planning, design and scheduling



Ongoing engineering and training support



Software implementation and reviews



Equipment selection and optimization



Mine rehabilitation, water analysis and closure



Technical due diligence, peer reviews and audits



Scoping, pre-feasibility and feasibility

