

## Open Cut Coal Solutions



# INTEGRATED MINE PLANNING TOOLS FOR OPEN CUT COAL OPERATIONS

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

- Comprehensive core functionality for open cut coal operations at both long and short-term planning horizons:
  - 3D mining reserve solids with integrated Gantt scheduling
  - Complex grid manipulation
  - Superior Boolean processing for accurate 3D solids
  - Detailed process management via Deswik workflows.
- Deswik.AdvOCC, with advanced open cut coal tools for:
  - Detailed reserving using shells projection
  - Truck limited haulage
  - Margin ranking and pit shell optimization
  - Advanced scheduling functions including backwards pass resource leveling, objective targeting and resource path importing.
- Deswik.Agg to aggregate complex seam and ply grids or solids into run of mine reserves.
- Deswik.OPDB to develop comprehensive open pit production drill designs.
- Deswik.Blend to optimize complex blending and material flow from pit to product.

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.



# A complete solution

## Providing the best framework for open cut coal mine planning

### Unified design & information management in 3D environment

- Powerful design tools automate creation of designs. Best-in-class solids manipulation allows perfect 3D representation of each reserve block.
- Attributes for scheduling are created and manipulated during the design process and stored directly on designs, freeing the design process from cumbersome, disconnected spreadsheets and databases.

### Superior interoperability

- Spend time engineering, not transferring and manipulating data.
- Native support for many file types, and generic import tools that provide many options for seamless information transfer.
- Convert unused data into knowledge. Effortlessly extract data from other diverse databases on site, directly into the design or scheduling environment.
- Use powerful tools to clean, analyze and deliver understanding.

### Flexible data manipulation without opaque scripting

- Use Deswik's transparent Microsoft® Excel style formula builder without knowledge of arcane scripting languages.
- Using Deswik improves efficiency and self-sufficiency by removing thousands of lines of computer code that previously required specialist intervention to fix or change.
- Completing all calculations, from simplest to most complex, in an open format improves governance by making the entire plan readily auditable.

### Best-in-class reserving

- Fastest, most automated reserving tools for open cut coal.
- Reserve conventional, structurally complex, steep dip or partially underground mined deposits with speed and accuracy.
- Grid or solids-based aggregation, pit optimization on block models or solids, margin ranking and many other tools make this the ultimate reserving package.

### Geological data from any source

- Work interchangeably with grid models, block models, implicit models and hybrids.
- Import grids and models from all major geological packages.

### Integrated scheduling & blending

- Remove or minimize planning horizon interfaces by using a common platform for short, medium or long term scheduling.
- Convert design data directly into schedule tasks and easily update with design changes or survey updates.
- Gantt chart based scheduling is easy to work with and is more readily understood by all stakeholders.

### Landform and Haulage modeling

- Don't just calculate trucking, take it to the next level using the most flexible landform and haulage scenario analysis tools on the market.
- Rapidly test and refine haulage strategies and selective material placement scenarios including In-Pit Conveying and Crushing and other material transport options in a single model.
- Market leading integration with scheduling environment allows dynamic modeling of 'truck limited haulage'. Automatically account for changing from 'excavator limited' to 'truck limited' and back again, ensuring production estimates are not overstated.

### Superior reporting

- Simple and powerful reporting from both schedule and 3D environment improves communications and stakeholder buy-in.
- Save time communicating your plans with fast, professional plotting tools including full CAD-style annotation and presentation.

# Deswik.AdvOCC

Advanced functionality tailored to the specialized demands of open cut coal operations

## Advanced reserve projection

- CAD-based feature introduces advanced reserving processes and tools using the shells projection methods.
- Incorporate access ramps down each projected highwall for more detailed medium-term reserves.

## Automated road design tool

- Determine cut & fill requirements from road centerlines, with solids creation and surface updating.
- Design to gradient and bench and berm limitations with cut and fill balancing for dropcuts.

## Truck limited haulage (TLH)

- Specify truck fleet and the system dynamically models the mining and dump schedules based on trucks available.
- Use for modeling mixed-fleet haulage scenarios.

## New landform and haulage options

- Incorporate conveyor systems with fixed and mobile conveyor load points, modeling 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.

## Interactive spoil balance tool

- Block-by-block balancing of the pre-strip horizon against a defined dragline spoil design, with the ability to move material between blocks.
- Detailed reporting on individual and cumulative block spoil room.

## Bulk spoil balance tool

- Strip level calculation of spoil limited pre-strip horizons against a set of defined mining and dragline spoil solids.
- Automated across multiple strips, showing output labels for calculated dragline elevations.

## Reconciliation

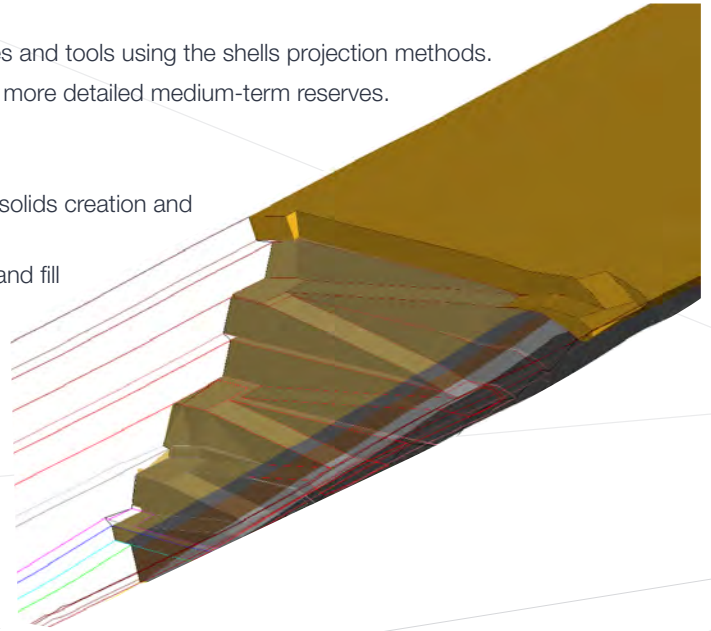
- Generate as-mined, as-designed and difference solids from initial, design and final surfaces.
- Detailed reporting of compliance to plan from a 3D perspective.

## 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.

## Pit shell optimizer

- Using reserve solids, grids or block models, vary the revenue to calculate the pit shell delivering the maximum undiscounted cash flow.
- Allows users to rapidly identify the economic limits of the deposit.



# Deswik.Agg

Simplifying complex aggregation processes to create fit for purpose Run-Of-Mine (ROM) reserves

- Work with grids or solids to create mineable working sections at the block or deposit level.
- Auditable, rule-based approach delivers the flexibility to tailor aggregation settings to any deposit.
- Set rules for thickness, material type or quality and apply different loss and dilution factors (roof, floor or edge).
- Ensure mined horizons satisfy constraints by incorporating pre and post requisite testing.
- Manage and run multiple rule sets simultaneously for rapid scenario generation and comparison.
- Assess effect of equipment selection by defining multiple equipment types with different loss and dilution parameters.
- Transparent pivot-style reporting interface highlights factors influencing aggregated ROM tonnages between scenarios.
- Graphical side-by-side comparison shows the physical impact of different aggregation constraints.
- Generates final mined working section grids or solids with all calculated aggregation values.
- Auditable outputs are suitable for downstream planning processes such as margin ranking and production or dump scheduling.

# Deswik.Blend

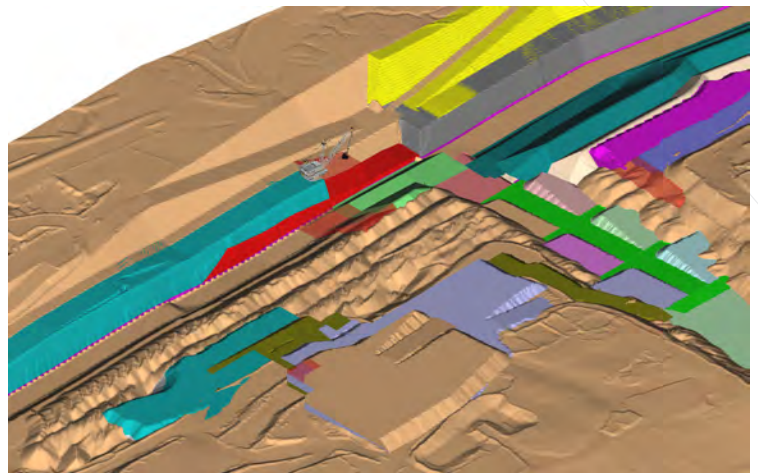
Optimize your product value with material flow modeling

- Material flow modeling and targeting that closes the planning gap between pit production and blended product.
- Blend production outputs from any mining complex, including both surface and underground feeds and multiple plants.
- Outputs are balanced across defined periods against the competing priorities of product quantity targets, product specifications and maximizing the value mix for multi-product scenarios.
- 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.

# 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 design software.
- Rapidly set up 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 for Open Cut Coal: Uncovering the factors that drive value in mine planning”

# An Integrated Platform

Dynamically link your mine designs and schedules



**Deswik.CAD**  
Design & Solids  
Modeling



**Deswik.IS**  
Interactive Scheduler



**Deswik.Sched**  
Gantt Chart Scheduling



**Deswik.LHS**  
Landform & Haulage

## Our industry-leading consulting solutions include

Mine Planning, Design and Scheduling

Equipment Selection and Optimization

Geological Services

Technical Due Diligence, Peer Reviews and Audits

Software Implementation

Scoping, Pre-Feasibility and Feasibility

Process Mapping and Improvement

Mergers and Acquisitions Support



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