



GEOVIA WHITTLE GEOVIA BLEND OPTIMIZER Blend Your Way to a Higher NPV

් Navigation Tree ජ අ	S Extractive	Blend Scenario		
 Marvin Copper Marvin block model Basic Slope Set S Operational scenario S Operational scenario Pit by Pit Graph P Vshback: 11 12 14 16 20 25 31 P Vshback chooser -> 8 9 11 13 16 21 & 31 NPV Practical Push backs: 7 8 9 11 15 20 31 S Millawa balance mode S Millawa balance mode S Multer stockpile example S Mew Extractive Blend Scenario V Compressed revenue factors V Revised economics 	Description Mining Processing Selling Stockpiles Blend Bins Expressions User Element Time Costs Limits	Blend Definitions: Add Rename Co MINC Blend Details (MINC) Description: Method: Blending Cost (tonne Source Material: Rock-types: Stockpiles:	Minimize soluble copper MILL ~ (): 0.1 12 MX, OX, PM MX, OX, PM	Edi
	Pressayes	Constraints (input to Element Au (gram) Cu (%m)	process): MinGrade 0.	MaxGrade 0

The Blend Optimizer helps to make GEOVIA Whittle[™] accessible to a whole range of strategic planners who, up until now, have had to manage with less than satisfactory tools. Coal, iron ore and industrial minerals miners often have to blend ore to meet product specifications. Metals miners need to blend ore before feeding it into the extraction process. The Blend Optimizer not only allows such blending to take place, it actually optimizes the blend. Moreover, when combined with the functionality of Whittle's Milawa Algorithm[®], it can also optimize stockpile usage. The overall objective of this is to maximize the Net Present Value (NPV) of the whole operation.

This functionality allows a blending optimization of a mining sequence produced in GEOVIA Whittle[™], or one imported into the software. The engineer, who has tremendous control over the assumptions, models and constraints underlying the optimization process, guides the whole process.



WHAT IT CAN DO

The Blend Optimizer plugs into Whittle's well-established simulation and analysis functionality and utilizes all the power and flexibility that has made Whittle world famous.

- Bulk blending: user can specify multiple products, each with different specifications (constraints), prices, blending costs and blending limits.
- Extractive blending: user can specify blend-criteria for each method, which includes blending costs and constraints.
- The standard process recovery, prices and selling costs and limits are applied to the extractive process.
- When used in conjunction with Whittle's Multi Element component, Whittle allows multiple grade constraint criteria to be used. For example, a coal specification can be given as a minimum BTU, maximum ash and sulphur.
- Multiple stockpiles can be specified, each with minimum cut-offs, time dependent recoveries, and, if applicable, initial size and grades.
- When used in conjunction with Whittle's Stockpile and Cutoff component (SPCO) it can assist in determining the best use of grade stockpiles and optimised cut-off grade strategy that maximises NPV.

The Blend Optimizer is fully integrated into Whittle's scheduling system so multiple pushbacks can be scheduled using one of Whittle's standard scheduling methods. If the Milawa Algorithm is selected for of scheduling the pushbacks,



Element and blend characteristics.

then the blending and stockpile usage is also optimized. The user has control over minimum and maximum leads and bench separations for each push back and like many other variables in Whittle, these can be changed over time.

HOW IT WORKS

GEOVIA has integrated an industry-standard Linear Programming (LP) engine into Whittle, where it is used to optimize the blend and the stockpile utilization. Whittle reduces the problem to an LP formulation and passes it to the Lindo optimization engine. The solution then calculates and feeds the results back to the Element and Blend Characteristics of Whittle, which completes the calculations and formats the results for the user.

When used in conjunction with the Milawa Algorithm[®] functionality, blend optimizations occur within each Milawa iterative loop, so blend considerations influence the schedule optimization. Combining both the algorithms of the Milawa and Blending components leads to an unprecedented ability to handle tremendous complexity. The result is a schedule that meets all your technical requirements, and maximizes project NPV.



Bulk blend schematic.

For more information visit 3ds.com/GEOVIA/Whittle or email GEOVIA.Whittle@3ds.com.

Our **3D**EXPERIENCE® platform powers our brand applications, serving 11 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the **3DEXPERIENCE**® Company, is a catalyst for human progress. We provide business and people with collaborative virtual environments to imagine sustainable innovations. By creating 'virtual experience twins' of the real world with our **3DEXPERIENCE** platform and applications, our customers push the boundaries of innovation, learning and production. °Dassault Systèmes' 20,000 employees are bringing value to more than 270,000 customers of all sizes, in all industries, in more than 140 countries. For more information, visit **www.3ds.com**





Americas Dassault Systèmes 175 Wyman Street Waltham, Massachusetts 02451-1223 USA Europe/Middle East/Africa Dassault Systèmes 10, rue Marcel Dassault CS 40501 78946 Vélizy-Villacoublay Cedex France

Asia-Pacific Dassault Systèmes K.K. ThinkPark Tower 2-1-1 Osaki, Shinagawa-ku, Tokyo 141-6020 Japan