micromine alastri

Introduction to Micromine Alastri **Spatial Conformetrics**

Training Booklet

Version 22.3, December 2022

For Software versions 22.3 and newer

Introduction

Spatial Conformetrics is a tool for consistent mine plan conformance calculations.

Mine planners and schedulers use Spatial Conformetrics to objectively analyse assumptions, methodologies, and implementation practices.

Practical Applications

Short Term & Production Scheduling	
Fast Mine Plan Conformance	Simply import surfaces, automatically generate conformance domains, and export your custom reports.
Automatic Solid Creation	Instantly convert overlapping surfaces into stacked solids. Most mining packages only support single Boolean operations on triangulations – Spatial Conformetrics automatically converts up to seven unique conformance domains into fully validated 3D solids in one step.
Increase Planning Efficiency	Reduce time validating solids and surfaces. Get live updates of reserves values based on your reporting regions. Feed conformance reports back into the planning process for faster, more accurate mine plans.

Mid- Long-Term Scheduling	
Stage Plan Generation Tools	Import a schedule, surfaces and blocks to create stage plans for any period in the schedule.
Performance Improvement	Use Spatial Conformetrics to objectively analyse mine planning assumptions, methodologies, and implementation practices.
Communicate Business Value	Conformance to plan affects pit development, blend ratios and haul profiles. Use hard numbers to demonstrate the real business cost of non-conformance to schedules.

Performance Management	
Key Performance Indicators	Consistent KPI calculations for mine plan conformance across crews, sites, and organisations.
Standardised Reporting	Make black-box reporting a thing of the past. Anyone can import surfaces into the Spatial Conformetrics and start generating maps, charts, and reports.
Increased Confidence	Use historical conformance calculations to increase confidence in budget estimations and production forecast.

Innovative Features

Reserving and Reporting	
Block Model Import	It is possible to import multiple block models using CSV, Vulcan, Bintab, MineSight, Surpac and Micromine files.
Real-Time Reserving	Geological reserves are automatically run, allowing you to immediately see the geological properties of conformance domains.
Simple Setup	Specify how geological information is aggregated with a simple interface which supports unlimited attributes and multiple material types within the same block.
Extensible with Formulas & Scripting	If your block model is missing vital information, you can easily add new calculated attributes with simple formulas. If you need to do more complex calculations, you have access to full C# scripting.
Conformance Shading	Shade conformance solids based on domains, making it easy to identify planned and unplanned movement for presentations.

Conformance Reports	Generate conformance and performance calculations across multiple pits, material types, and block model properties using a standard pivot table format.
Waterfall Charts	Use the power of visual communication to show the inter-locking components of plan conformance and performance.
Import/Export	Export conformance surfaces, solids and reserves to ".dxf", ".00t", ".csv", ".obj" and ".tridb".

Terminology

Mining Terms and User Interface	
Viewport	Any 3D visualisation area
Tab	Tabbed working area
Panel	Interactive frame within a tab
Dialog	A new window that opens to enter information
Dropdown	A dropdown box that lets you choose from a list
Icon / Button	A button that can be pressed
Checkbox	A box that can be ticked on or off
Block model	Reserves file
Parcel	Classification of materials in the reserves file
Conformance horizon	3D surface representing Schedule Start, Schedule End, Survey Start, or Survey End. Used for determining conformant volumes
Conformance domain	3D volume representing Mined Early, Mined Late, Mined in Plan, Mined Outside Plan, and Not Mined conformance types
Scheduling blocks	3D solids used for scheduling cut and fill in mining operations
Solid	3D closed triangulation
Stage Plan	The expected topography at a point in time in the schedule
Surface	3D triangulation without overlaps

CONTENTS

Prerequisites

To complete the workshops in this series you will require

1. A valid 20-digit license key.
2. A personal login to https://licensing.alastri.com.au/ .
3. Spatial Conformetrics (SC) installed on your computer.
    a. If SC is the first module in the Alastri Software Suite you start working with, you will first need to install Alastri Hub v2.0.84 (instructions can be found here).

Download Sample Data set

1. Download the Sample Data set for Spatial Conformetrics (click here).
2. Extract the archive to a working folder.
    a. You should have the following files: Block Models “pit1a”, “pit2a”, “pit3a”, Reserves Model in “.resmodelModel” format (optional), .blockmappings and .blockmodelfields files (optional), Production and Schedule Surfaces (start and end), Surveys, Conformance Blocks exported from ATS or APS project.
3. The following exercises refer to this as the “Sample Data folder”.

System Requirements

The following information outlines the recommended system requirements to run the Alastri suite of products. As the hardware required depends on the complexity of the mine and the amount of data, meaningful minimum requirements cannot always be listed. Ultimately the only way to know whether specific hardware will work for a specific mine site is to validate the software's performance during the free trial period.

- For large multi-pit mines with raw LIDAR surfaces and block models with 80M blocks the requirements will be at the extreme end.
- The minimum requirements will only support small mines with a small block model and surfaces with low triangle counts. Running Alastri Haul Infinity on minimum system requirements may slow the application response, depending on the size of the model. Use recommended requirements for optimal use.
- Please note that as our software develops over time, these requirements may change, and hardware upgrades may become necessary.

Component	Minimum	Standard	Extreme
Processor	Intel i5	Intel i7	Intel i9
Memory (RAM)	8 GB	64 GB	128 GB
Operating System	Windows 10 x64	Windows 10 x64	Windows 10 x64
Video Memory (GRAM)	2 GB	8 GB	12 GB
Monitor	1920 x 1080	Dual 1920 x 1080	Triple 1920 x 1080
Video Connection	HDMI, DisplayPort, DVI, VGA - USB not supported		
Video Driver	Driver no more than 6 months old (OpenGL 4.6+)		
Hard Drive	Solid State Drive with at least 50 GB Free		
Power Connection	AC Power - Battery power not supported (plug in the laptop)		
Network Connection	Consistent, reliable, high speed (>1 MB/s) connection to the Internet		
Software Prerequisites	.NET 4.7.2, Microsoft Excel		
Input Devices	Keyboard and Mouse with a left mouse button, right mouse button, and middle mouse button/scroll wheel		

Many IT departments block downloads of Microsoft prerequisites, so you may need to download them manually. The installation error "Element Not Found" indicates that you must download and install these manually.

- Microsoft .NET Framework 4.5.1.
- Microsoft VSTO Runtime for Office 2010.

First Principles

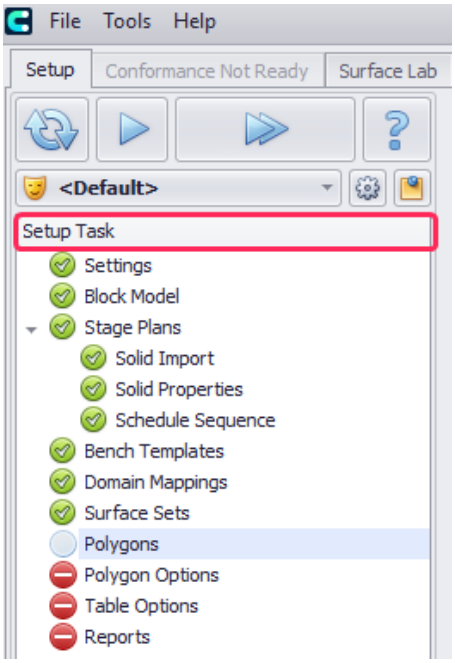
Spatial Conformetrics calculates the overlap between a plan volume and a survey volume. The resulting charts and tables provide visual communication and a simple scoring system for conversations around business improvement.

Spatial Conformetrics is organized into three tabs:

Setup tab	Contains a series of steps that must be completed to create a valid project. To proceed to the next steps and run your model you'll be prompted to complete every step of this tab.
Conformance tab	Presents a 3D reporting environment to assess results and export conformance data in various formats.
Surface Lab tab	Used to add operations for editing existing surfaces and solids.

On the left side of all Alastri's applications is the Setup Task panel, which represents a list of all the project setup steps that need to be completed before switching to the scheduling, network and reserves calculation tabs.

When setting up a project for the first time, all setup tasks need to be performed in the specified sequence. You cannot proceed to the red marked step without confirming the previous one. During the subsequent work with the configured project, you can return to any of the steps, but after making changes you will need to rerun all the tasks below in the list. This is because changes you make in a single step can affect settings in related tasks and need to be reviewed or adjusted.



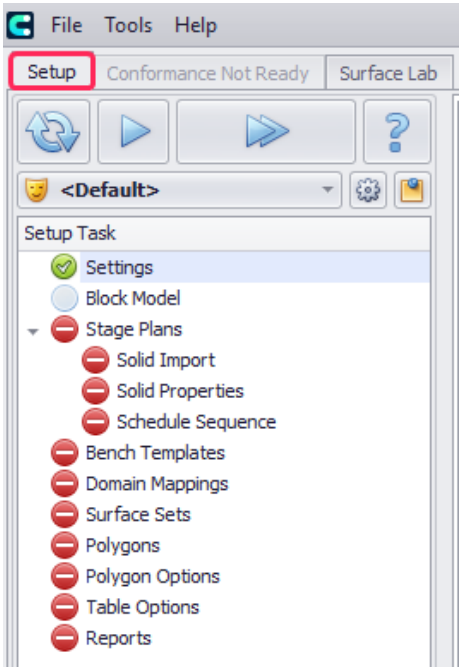
This document provides only a brief description of all the steps and tools for working with your conformance plan. For a full and detailed description, see Spatial Conformetrics Documentation section in the main documentation portal.

The exercises in this chapter are for familiarisation purposes and are deliberately light on detail. More in-depth discussion follows in the next section.

Unless otherwise noted, each exercise follows from the preceding exercise.

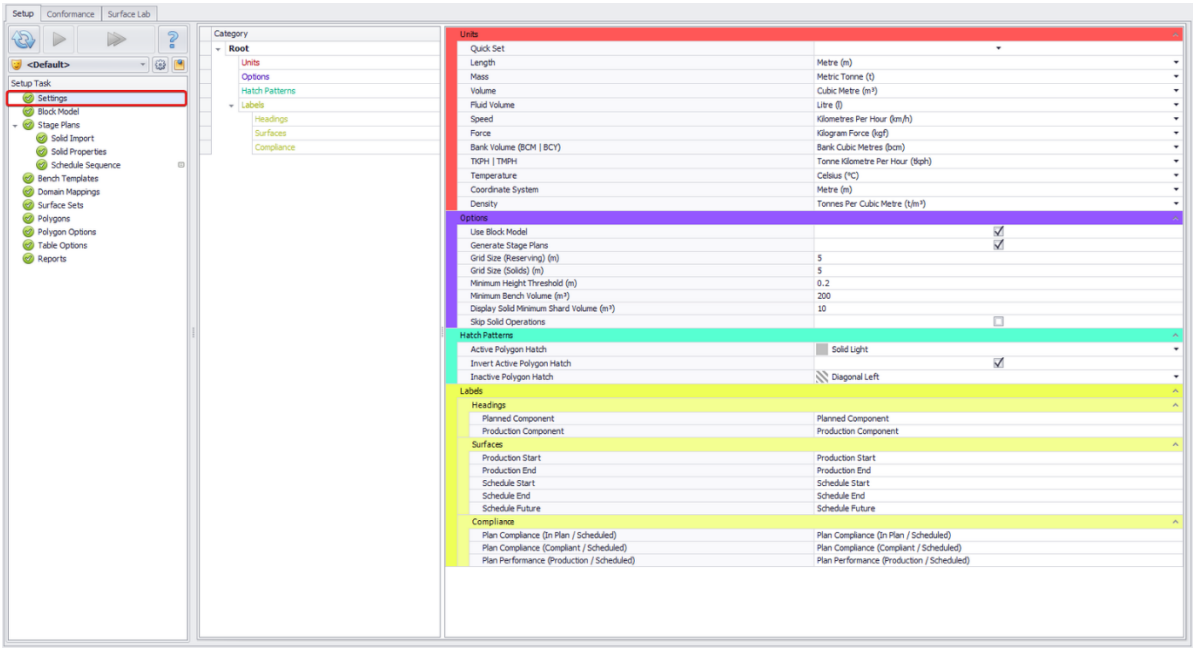
Setup tab

The Setup tab contains a series of steps that must be completed to create a valid project. To proceed to the next step and run your conformance analysis you'll be prompted to complete every step of this tab.



1. Settings step

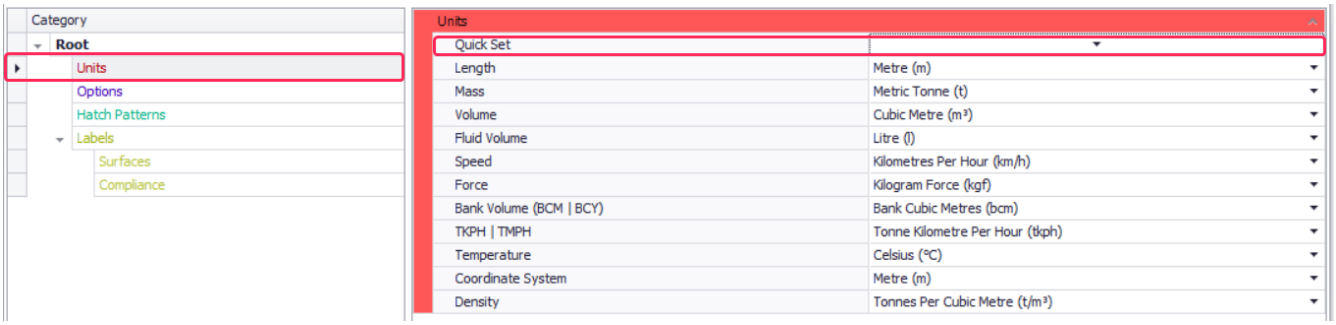
In the **Settings** section, you may set units of measurement, options, and thresholds to use in the project, as well as hatch patterns and labels.



Enter all global settings as described below to change the behaviour of the project.

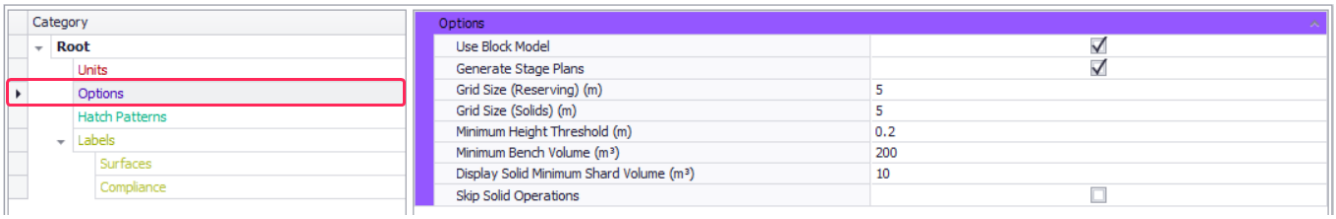
1.1.1. Units

Select the units of measurement which match your site coordinate system and local standards. Use the **Quick Set** dropdown to select Metric or Imperial units of measurement.



1.1.2. Options

Configure the parameters of your project. Description of each option see in the table below.

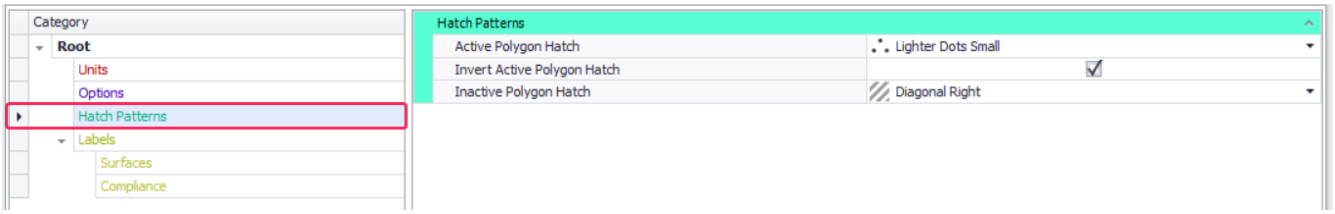


Option	Description
Use Block Model	If enabled, block model can be loaded into project for reporting purposes
Generate Stage Plans	Optional feature to generate stage plans from scheduling blocks
Grid Size (Reserving) (m)	Grid spacing to use in reserving calculations
Grid Size (Solids) (m)	Grid spacing to use in 3D solid visualization and export solids
Minimum Height Threshold (m)	Set this value to discard trivial solids from being displayed. Due to survey accuracy and uneven dig floors, users may find trivial conformance solids on walls and flat benches. Filter them out by raising the Minimum Height Threshold.
Minimum Bench Volume (m^3)	Set this value to discard trivial volumes from reporting
Display Solid Minimum Shard Volume (m^3)	Set this value to discard trivial shard solids from displaying in the viewport
Skip Solid Operations	If enabled, domain type solids won't be merged which can lead them to being invalid when imported into other applications. It is recommended to leave this unticked.

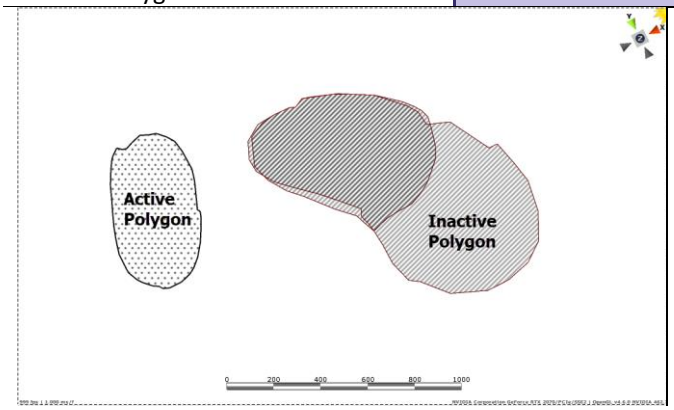
- Please take note when reducing the Grid Size for Solids and Reserves that there is a trade-off in the calculation time. That is, smaller the value the longer the calculations will take. There are negligible gains to be made from reducing the Grid Size from 1 to 0.1 however, the processing time will increase significantly. The recommendation is to start with values of 5 & 5 and inspect the resultant values. If desired, reduce the Grid Size values and quantify the change in values and the time taken. From this information, you should be able to identify if any significant gains are made and if they are worth the time trade-off.

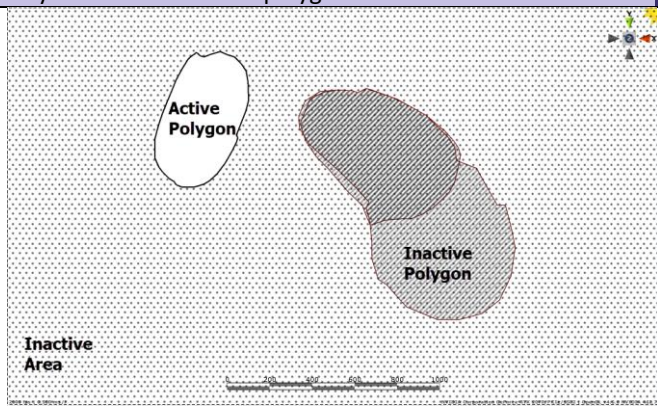
1.1.3. Hatch Patterns

Configure the visual component of bounding polygons in your model.



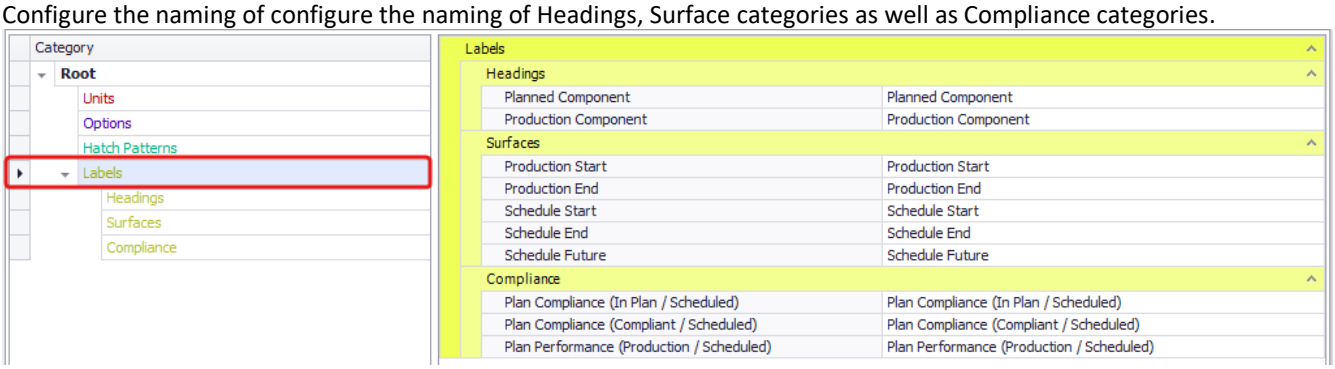
Hatch Patterns	Description
Active Polygon Hatch	Pattern used to visually define the active polygons
Invert Active Polygon Hatch	When enabled, the 'Active Polygon Hatch' pattern switches to the area outside of active polygons
Inactive Polygon Hatch	Pattern used to visually define the inactive polygons





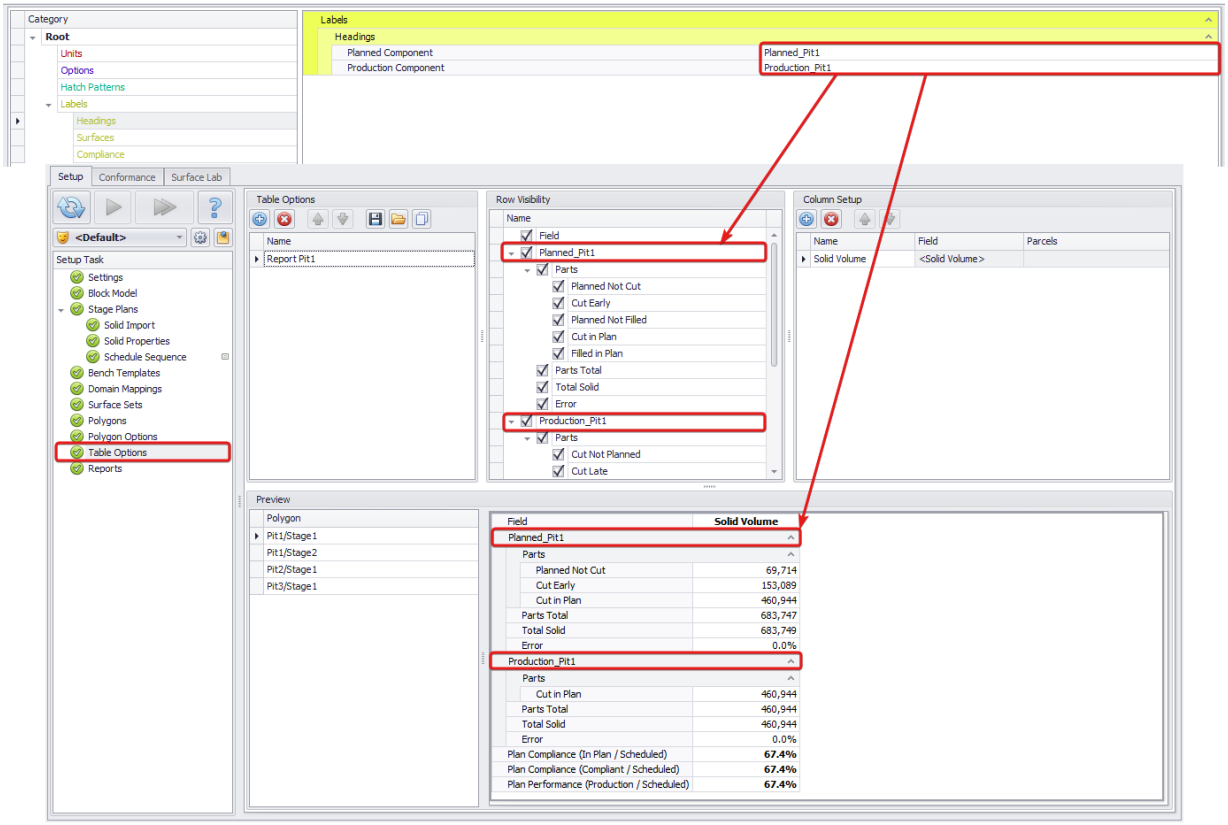
1.1.4. Labels

Configure the naming of configure the naming of Headings, Surface categories as well as Compliance categories.



1.1.4.1. Headings

The name of Planned and Production components can be changed from their default values to a user-defined value. The names of these components appear in several places in the application.

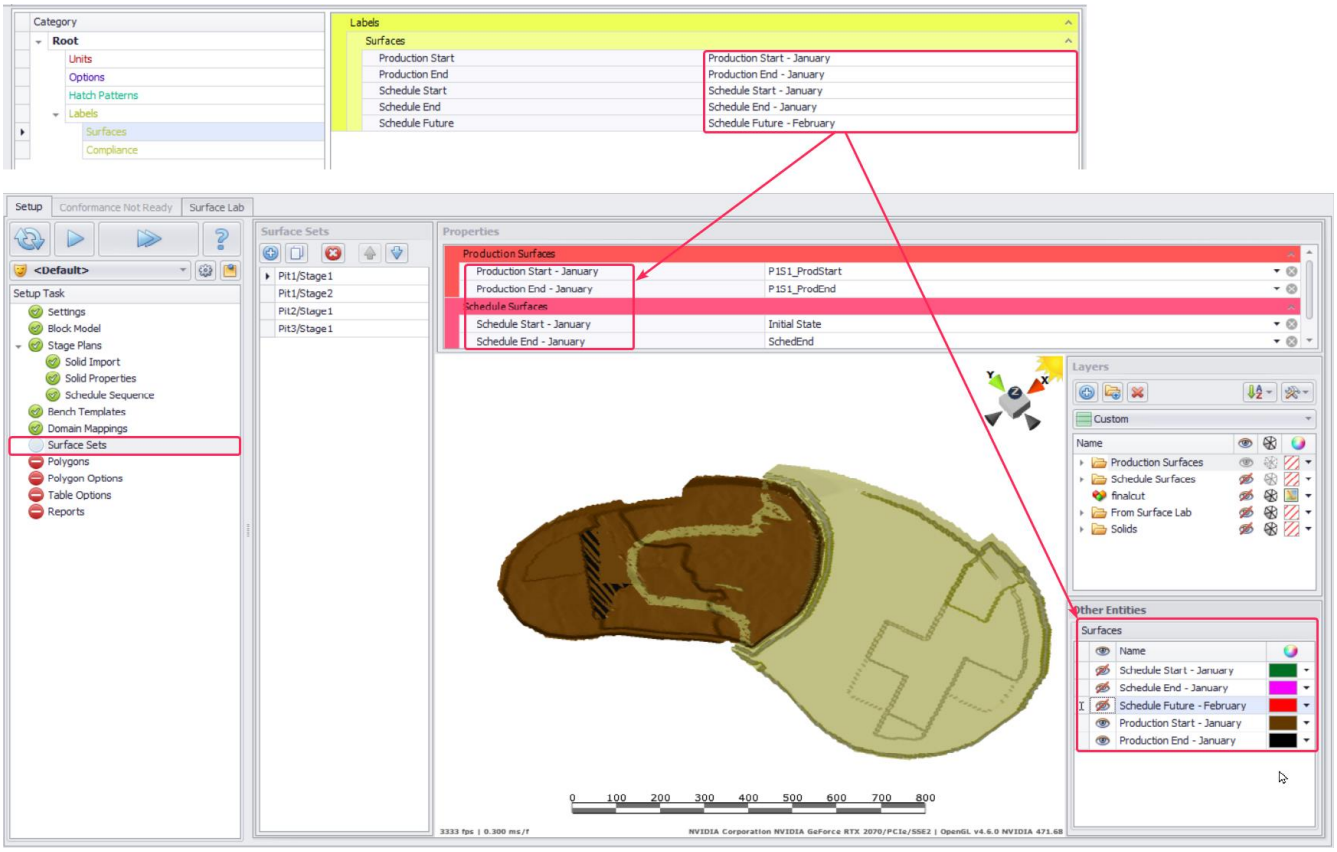


1.1.4.2. Surfaces

The name of the Production and Schedule surfaces can be changed from their default values to a user-defined value. The names of these surfaces appear in several places in the application.

Label	Reference
Production Start	The name of the surface which represents the production start surface.
Production End	The name of the surface which represents the production end surface.
Schedule Start	The name of the surface which represents the schedule start surface.
Schedule End	The name of the surface which represents the schedule end surface.

Production and Start Surfaces labels, specified in the Settings step shown in the Surfaces Sets step, illustrated below.

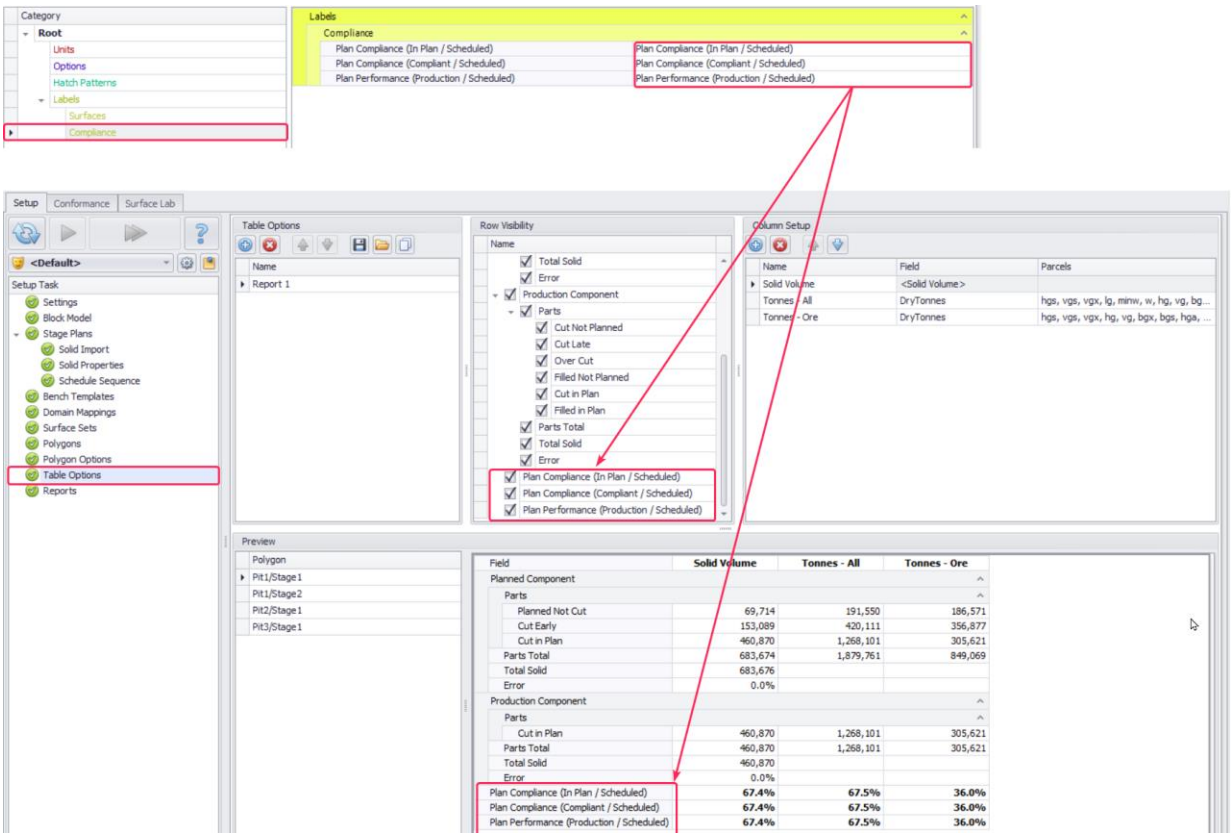


1.1.4.3. Compliance

The name of the “Compliance” report fields can be changed from their default values to a user-defined value. The names of these categories appear in the table reports.

Label	Reference
Plan Compliance (In Plan / Scheduled)	The name of the report field which reports in plan solids over scheduled solids.
Plan Compliance (Compliant / Scheduled)	The name of the report field which reports complaint solids over scheduled solids
Plan Performance (Production / Scheduled)	The name of the report field which reports production solids over scheduled solids.

Plan Compliance and Performance labels, specified in the Settings step shown in the Table Options step, illustrated below.

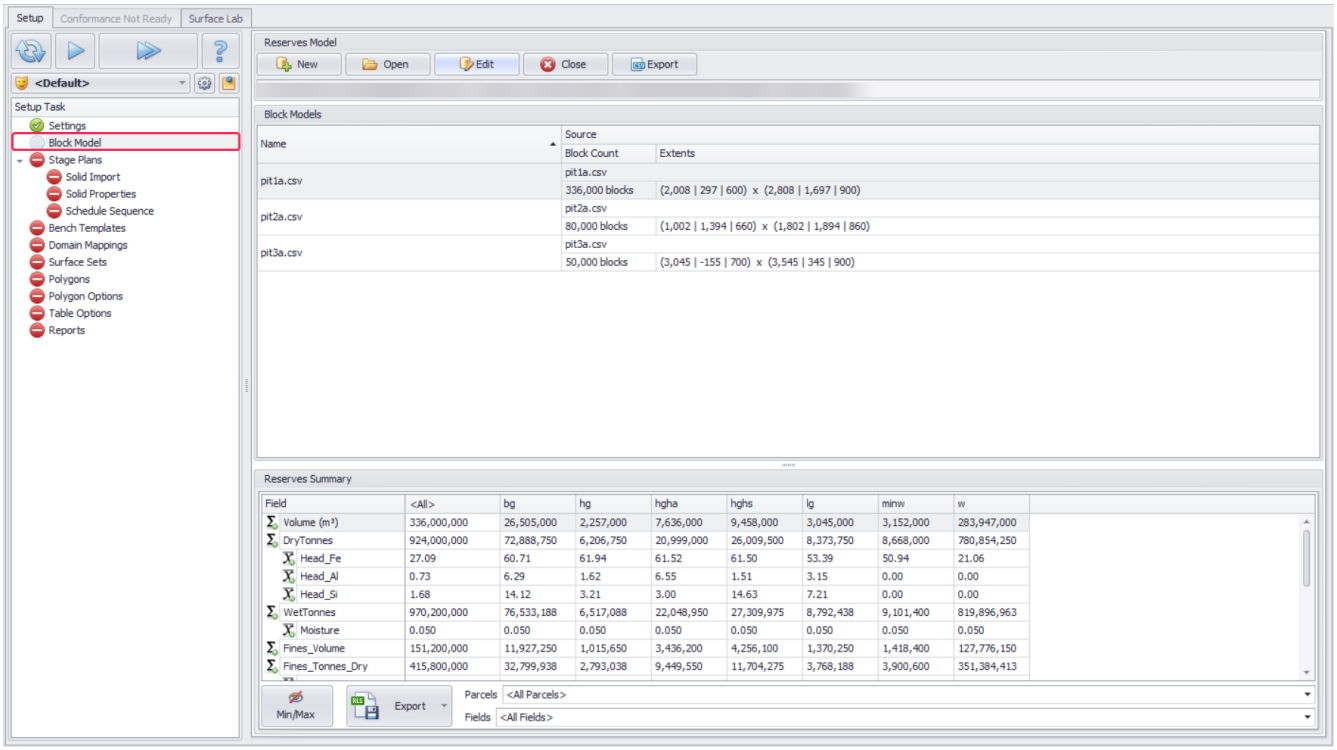


2. Block Model

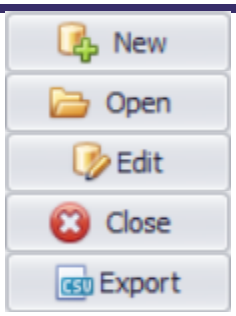
➢ The **Block Model** setup step is only visible if in the **Settings** step option **Use Block Model** is enabled.

The **Block Model** step allows users to load in block models which can then be used for reporting purposes.

This process is exactly the same as the **Block Model** step in Rapid Reserver.

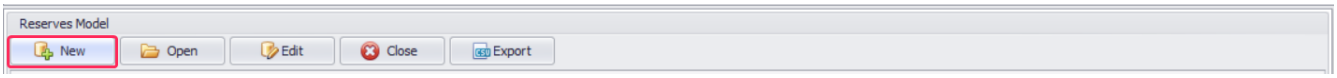


Top Toolbar buttons are explained in the table below.

Button	Description
	To create a new Reserves Model (.resmodel file)
	To open an existing Reserves Model
	To edit the currently loaded Reserve Model
	To remove the currently loaded Reserve Model
	To export the currently loaded Reserve Model to CSV

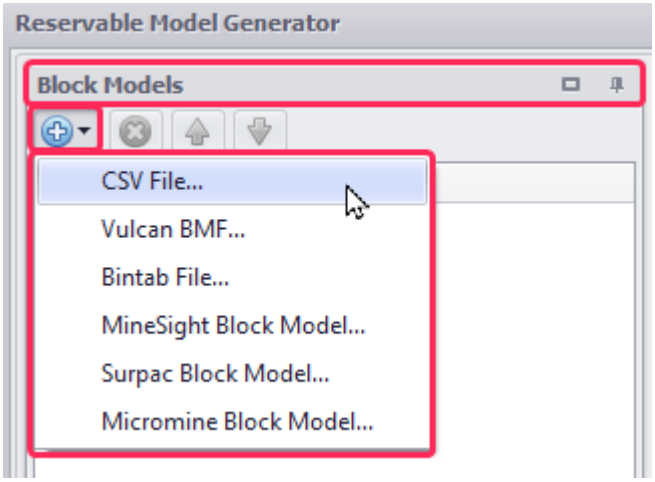
2.1.1. Creating Reserves Model

To create a new Reserve Model, press the **New** button, which will open the **Reserve Model Generator**.

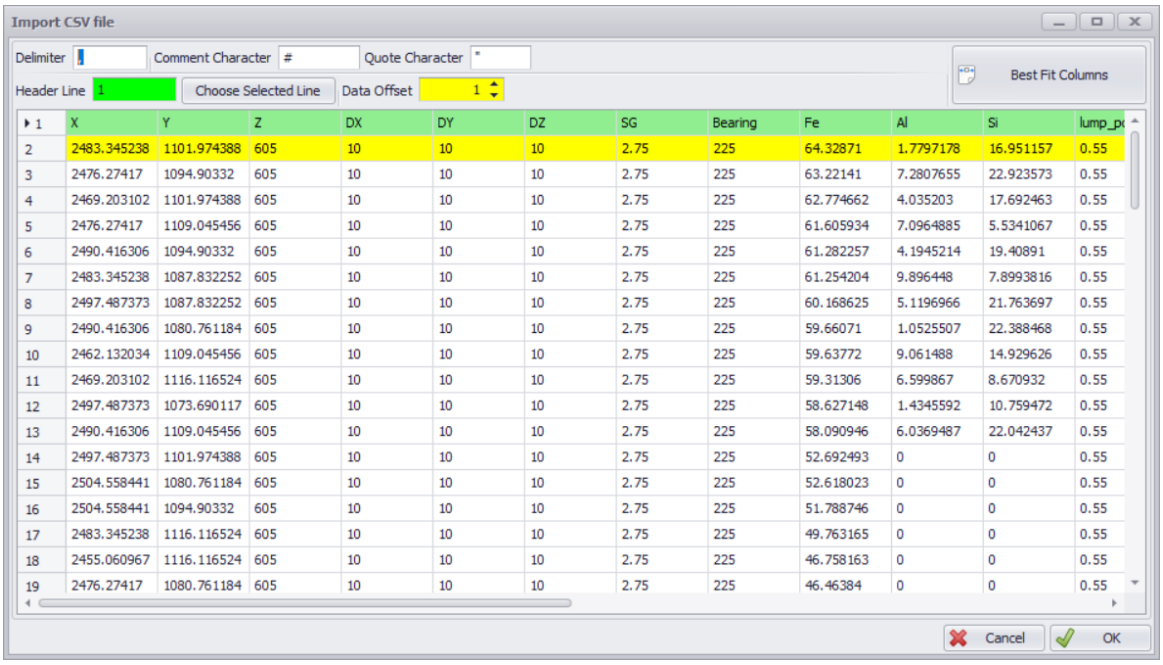


2.1.2. Loading Block Models

Located at the top left-hand side of the Reserve Generator is the "Block Model" panel. Here, block models can be introduced to the model and as well as removed. The process of loading in a block model as a CSV is outlined below.



1. Press the blue plus button  > select "CSV File" option > import "pit1a.csv" file from the Sample Data Folder.
2. In the Import CSV File window, set the green Header Line to match the header text.
3. Set the yellow Data Offset to match the first row of data.



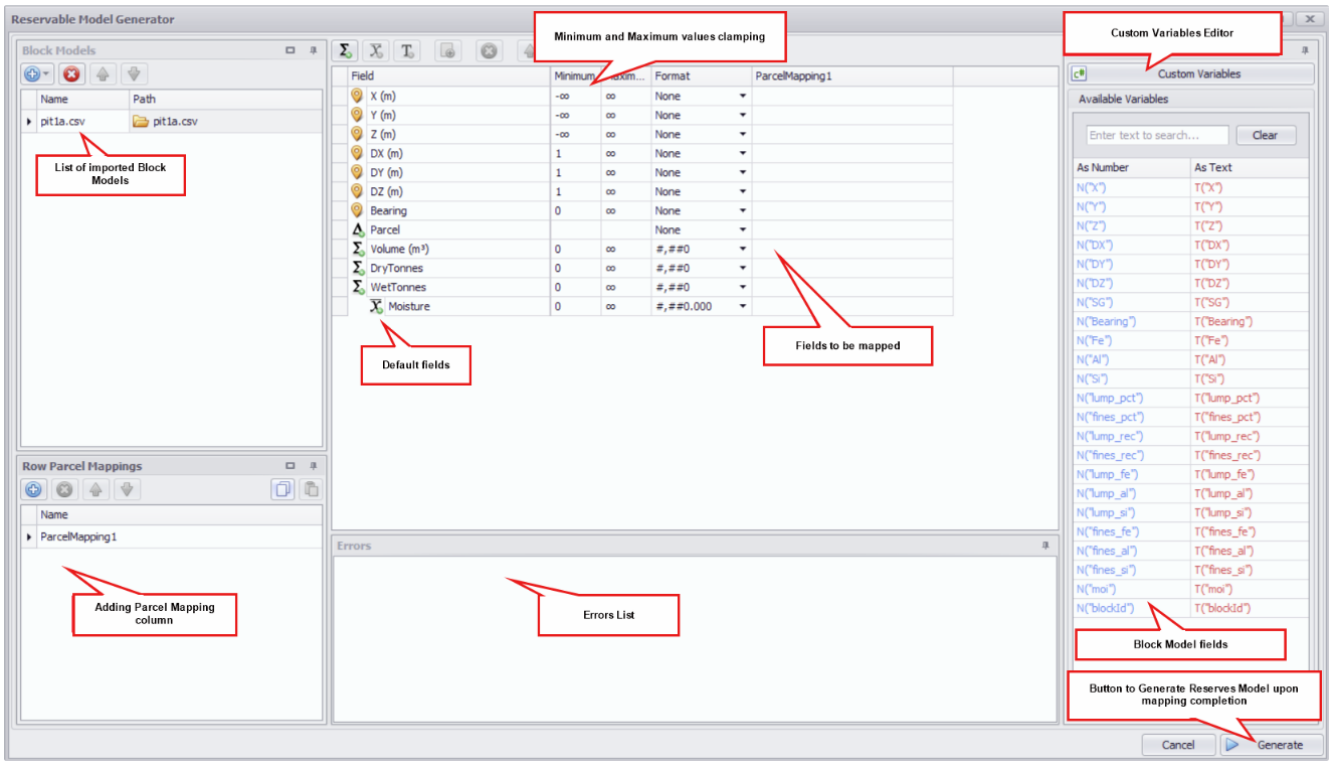
	X	Y	Z	DX	DY	DZ	SG	Bearing	Fe	Al	Si	lump_p
2	2483.345238	1101.974388	605	10	10	10	2.75	225	64.32871	1.7797178	16.951157	0.55
3	2476.27417	1094.90332	605	10	10	10	2.75	225	63.22141	7.2807655	22.923573	0.55
4	2469.203102	1101.974388	605	10	10	10	2.75	225	62.774662	4.035203	17.692463	0.55
5	2476.27417	1109.045456	605	10	10	10	2.75	225	61.605934	7.0964885	5.5341067	0.55
6	2490.416306	1094.90332	605	10	10	10	2.75	225	61.282257	4.1945214	19.40891	0.55
7	2483.345238	1087.832252	605	10	10	10	2.75	225	61.254204	9.896448	7.8993816	0.55
8	2497.487373	1087.832252	605	10	10	10	2.75	225	60.168625	5.1196966	21.763697	0.55
9	2490.416306	1080.761184	605	10	10	10	2.75	225	59.66071	1.0525507	22.388468	0.55
10	2462.132034	1109.045456	605	10	10	10	2.75	225	59.63772	9.061488	14.929626	0.55
11	2469.203102	1116.116524	605	10	10	10	2.75	225	59.31306	6.599867	8.670932	0.55
12	2497.487373	1073.690117	605	10	10	10	2.75	225	58.627148	1.4345592	10.759472	0.55
13	2490.416306	1109.045456	605	10	10	10	2.75	225	58.090946	6.0369487	22.042437	0.55
14	2497.487373	1101.974388	605	10	10	10	2.75	225	52.692493	0	0	0.55
15	2504.558441	1080.761184	605	10	10	10	2.75	225	52.618023	0	0	0.55
16	2504.558441	1094.90332	605	10	10	10	2.75	225	51.788746	0	0	0.55
17	2483.345238	1116.116524	605	10	10	10	2.75	225	49.763165	0	0	0.55
18	2455.060967	1116.116524	605	10	10	10	2.75	225	46.758163	0	0	0.55
19	2476.27417	1080.761184	605	10	10	10	2.75	225	46.46384	0	0	0.55

- When importing Block Model CSV, you'll see a preview of the first 100 rows of this CSV. It's a good time-saving feature, as your site Block models CSVs can be of a very large size and take a long time to open.

2.1.3. Reserve Model Generator Overview

Once you complete an import, in the Reservable Model Generator window you'll see:

- List of imported Block Models.
- All the fields contained in the imported Block Model listed on a right-hand side, as well as feature to create and choose Custom Variable, that can be missing, but required for mapping to one of the fields.
- Default fields that every single Reserves model needs to have.
- Minimum and Maximum columns to clamp numbers by block to be >= Minimum and <= Maximum.
- Format selection column.
- Mapping fields to be populated.
- List of errors without resolving which you will not be able to generate your Reserves model.
- Row Parcel Mappings template.
- Buttons to Generate Reserves Model or Cancel changes made.

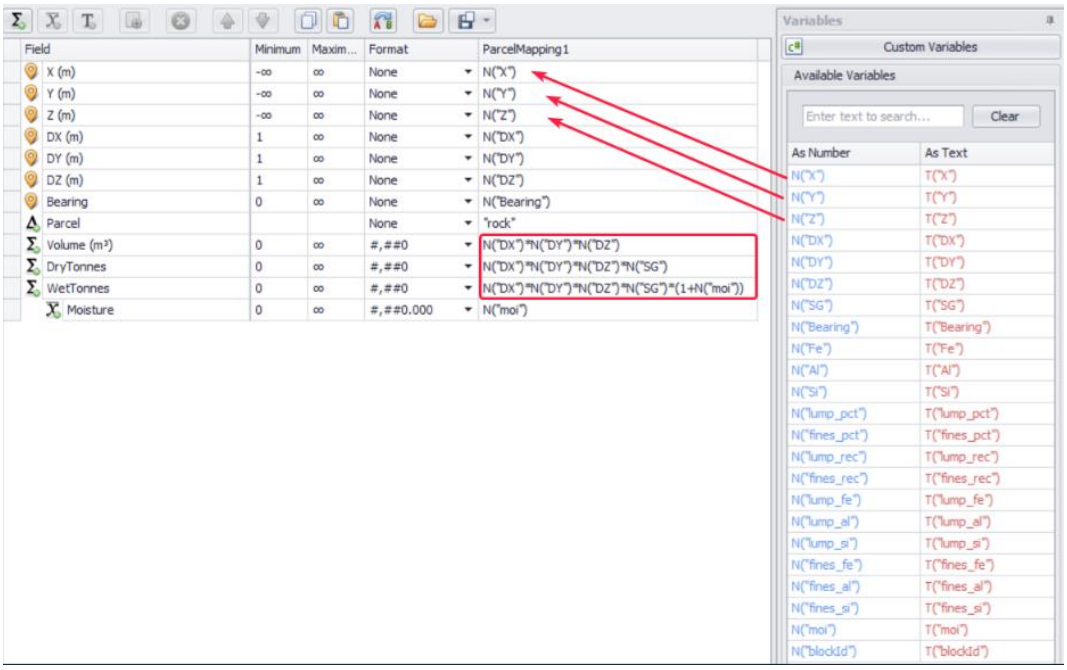


When the Block Model is loaded, its Header fields are listed in the Variables panel on the right-hand side.

- Drag and drop the variables to the appropriate field (or double click to map to the selected field).
- Numeric fields use the N("field") syntax, and text fields use the T("field") syntax.

2.1.4. Default Fields Mapping

- Once the block model has loaded, its header fields are listed in the Variables panel on the right.
- To map variables to the fields you can:
    - manually type it in,
    - drag and drop,
    - double click.
- X, Y and Z are blocks coordinates.
- DX, DY and DX are blocks dimensions.
- For the Volume field use the formula N("DX")*N("DY")*N("DZ").
    - For the DryTonnes field use the formula N("DX")*N("DY")*N("DZ")*N("SG").
    - For the WetTonnes field use the formula N("DX")*N("DY")*N("DZ")*N("SG")/0.95 or N("DX")*N("DY")*N("DZ")N("SG")(1+N("moi")).
- Numeric fields use the N("field") syntax, and text fields use the T("field") syntax.



2.1.5. Generating Reserves Model

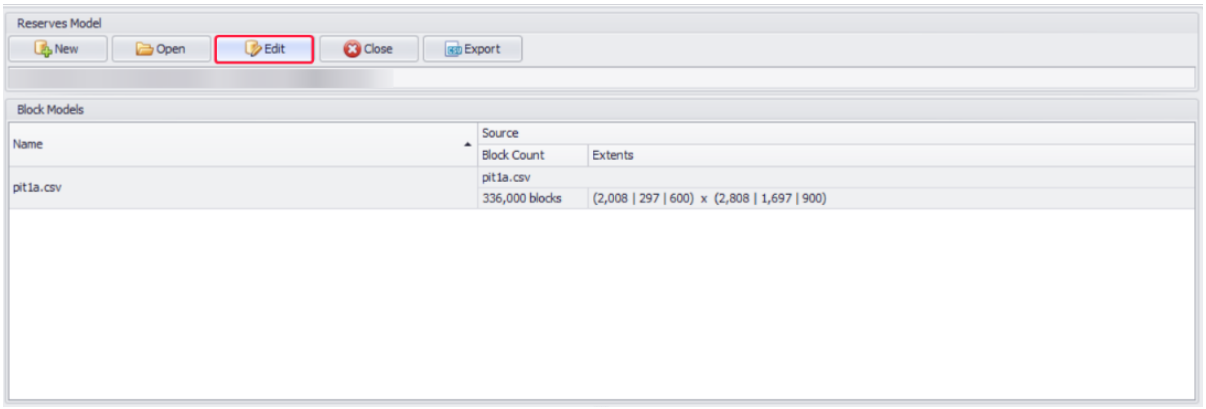
To check if the values are correct, generate a preliminary basic Reserves Model by hitting Generate button.

Upon completion Reservable Model Generator window will close and you'll be directed back to the main Block Model page, where you can see:

- Reserves model based on a single Block Model.
- Path to the folder where it is stored.
- Count of blocks and model extents.
- Summary with populated fields and materials grouped as "rock" (as specified Parcel).

2.1.6. Editing Reserves Model

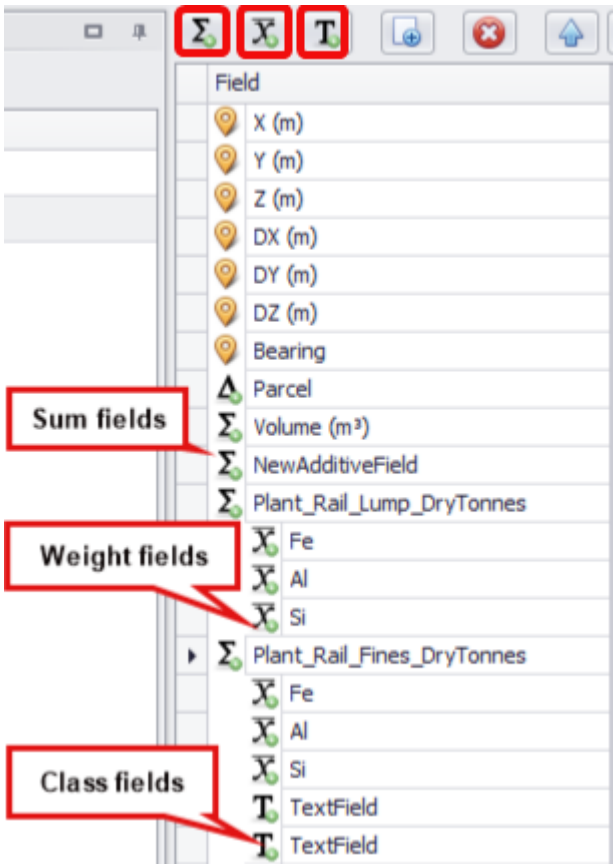
Press Edit button to come back to the Reservable Model Generator and input additional information.



2.1.7. Adding Grades

Reserve fields are the components that provide structure for the Reserve model. There are three types of fields that can be created by clicking the relevant icon in the toolbar: Sum Fields  , Weighted fields  , and Class Fields  .

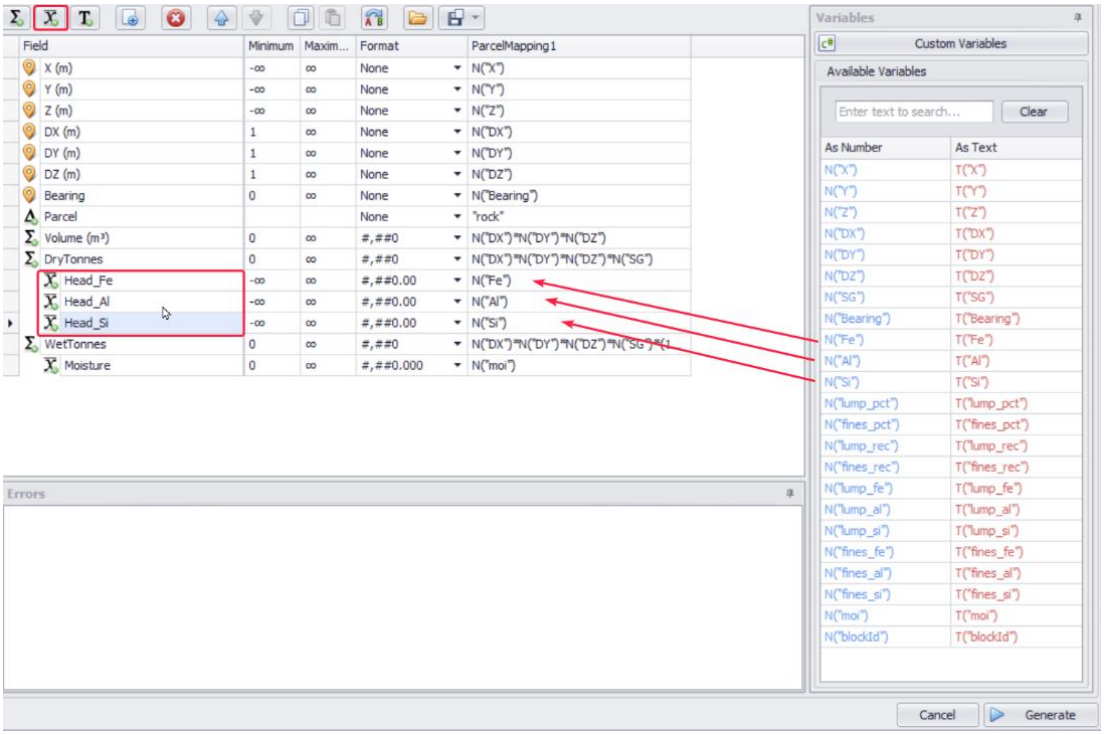
When a new field is created, it is expected that a block model variable will be mapped into it; however, it is possible to leave a field unmapped.



The table below provides a brief description of each field and how they behave when aggregated.

Button	Field Type	Description
Add Additive button	Sum fields	When aggregating multiple block model cells, the value of these fields will be summed together. Sum fields include quantity fields such as volume, tonnes and gold ounces.
Add Weight Averaged button	Weighted fields	When aggregating multiple block model cells, the value of these fields will be weight averaged by their parent Sum field. Weighted fields need to be nested under a Sum field.
Add Text button	Class fields	Creates subtotals of a sum field, such as Indicated / Inferred / Measured. When aggregating multiple block model cells, these fields behave like Sum fields.

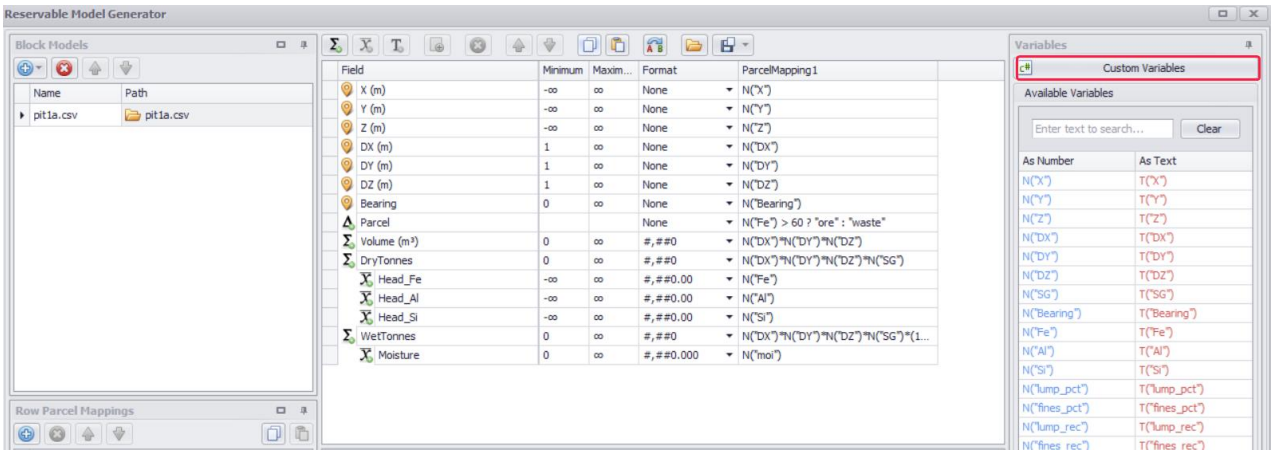
Since all grades are weight averaged by Dry tonnes, add three weight-averaged fields “Head_Fe”, “Head_Al” and “Head_Si” and map corresponding fields to them.



2.1.8. Creating Custom Variable

Advantage of creating Custom Variable via the **Script Editor** is that there it's possible to add more complicated variables.

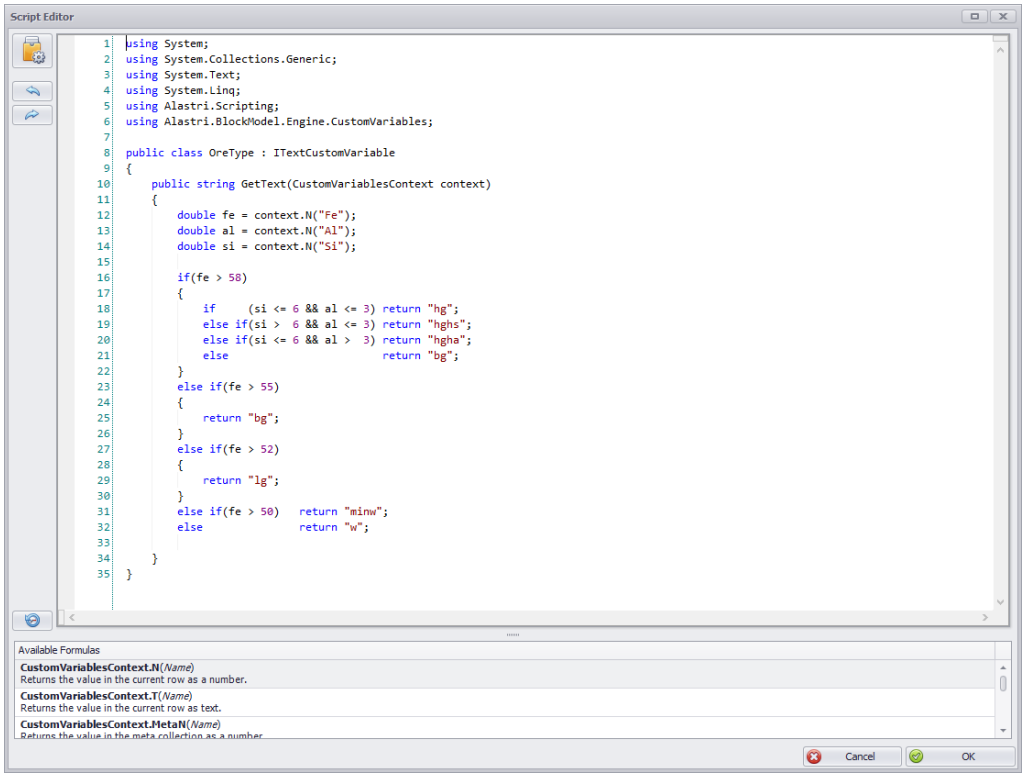
Press **Custom Variables** button at the top right corner to open **Script Editor** window.



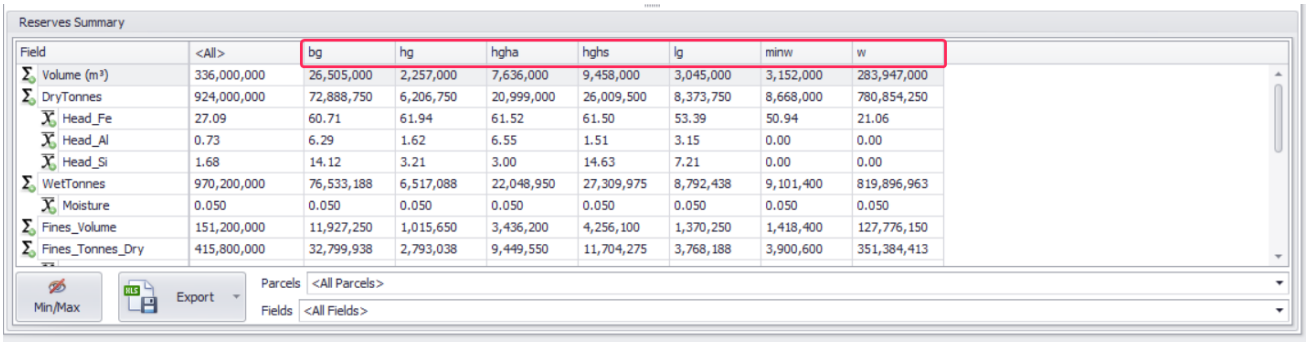
There are multiple different types of variables you can create; mains are Text and Double. In this example we will practice creating a Text Variable.

1. In the Script Editor window update the existing default variable by adding lines with a breakdown of parcels based on Si and Al content as shown below, or copy preconfigured formula from the SC. Block Model Custom Variables page in the main documentation portal.

- Additional script codes for custom formulas can be found in the **Attachment 1** at the end of this document.



2. Map this new custom variable to the Parcel field.
3. Generate Reserves Model.
4. Review grades in the Reserves Summary panel. Based on populated values, you should see “bg”, “hg”, “hgha”, “hghs”, “lg”, “minw” and “w” parcels added.



Field	<All>	bg	hg	hgha	hghs	lg	minw	w
Volume (m³)	336,000,000	26,505,000	2,257,000	7,636,000	9,458,000	3,045,000	3,152,000	283,947,000
DryTonnes	924,000,000	72,888,750	6,206,750	20,999,000	26,009,500	8,373,750	8,668,000	780,854,250
Head_Fe	27.09	60.71	61.94	61.52	61.50	53.39	50.94	21.06
Head_Al	0.73	6.29	1.62	6.55	1.51	3.15	0.00	0.00
Head_Si	1.68	14.12	3.21	3.00	14.63	7.21	0.00	0.00
WetTonnes	970,200,000	76,533,188	6,517,088	22,048,950	27,309,975	8,792,438	9,101,400	819,896,963
Moisture	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
Fines_Volume	151,200,000	11,927,250	1,015,650	3,436,200	4,256,100	1,370,250	1,418,400	127,776,150
Fines_Tonnes_Dry	415,800,000	32,799,938	2,793,038	9,449,550	11,704,275	3,768,188	3,900,600	351,384,413

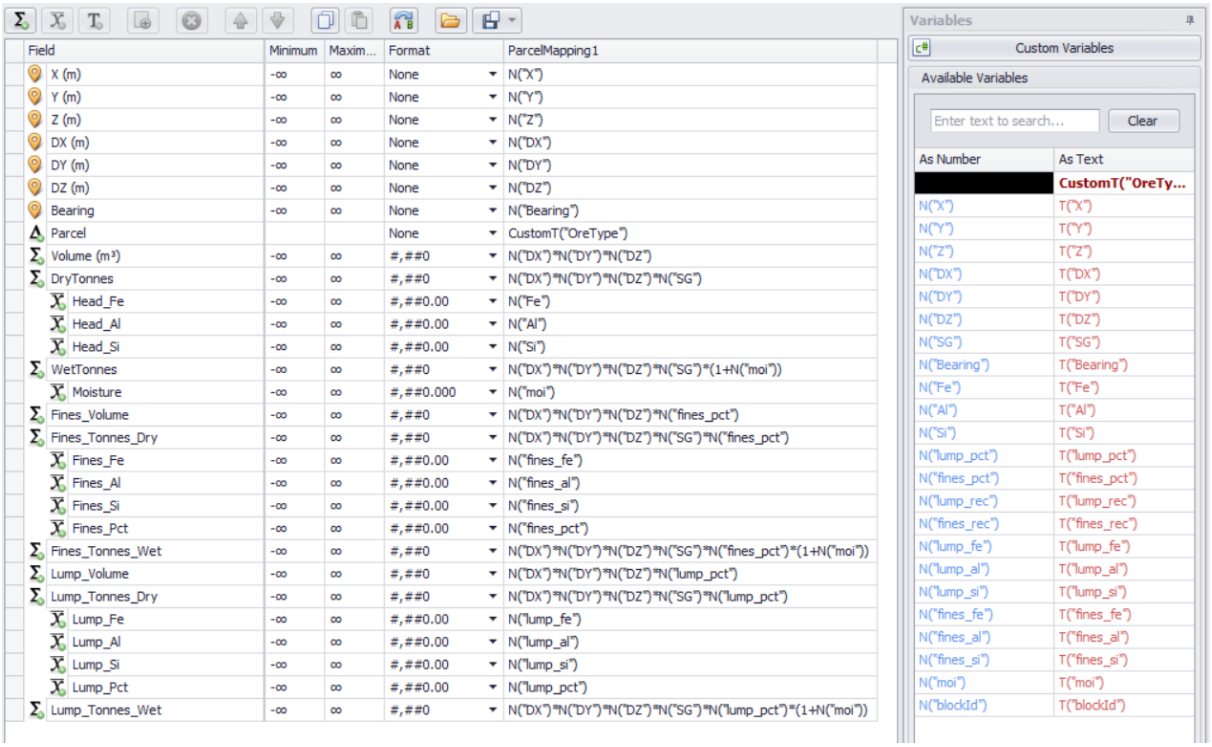
2.1.9. Adding Extra Fields

So far, we mapped only default block model fields and fields for Heads Fe, Al and Si. Now we can create and map additional fields for Lumps and Fines.

Add extra fields to map variables available from your Block Model.

1. Add a Sum (Add Additive icon) field - Fines_Volume - to calculate fines volume use inline formula N("DX")*N("DY")*N("DZ")*N("fines_pct").
2. Add a Sum (Add Additive icon) field - Fines_Tonnes_Dry - to calculate dry tonnes of fines use inline formula N("DX")*N("DY")*N("DZ")*N("SG")*N("fines_pct").
3. Add four Weight Averaged fields (Add Weight Averaged icon) - Fines_Fe, Fines_Al, Fines_Si, Fines_Pct - map corresponding numerical fields to them.

4. Add a Sum (Add Additive icon) field - Fines_Tonnes_Wet- to calculate wet tonnes of fines use inline formula N("DX")*N("DY")*N("DZ")*N("SG")N("fines_pct")(1+N("moi")).
5. Repeat for Lumps.
    a. You can use **Find and Replace** functionality.



Field	Minimum	Maxim...	Format	ParcelMapping1
X (m)	-∞	∞	None	N("X")
Y (m)	-∞	∞	None	N("Y")
Z (m)	-∞	∞	None	N("Z")
DX (m)	-∞	∞	None	N("DX")
DY (m)	-∞	∞	None	N("DY")
DZ (m)	-∞	∞	None	N("DZ")
Bearing	-∞	∞	None	N("Bearing")
Parcel			None	CustomT("OreType")
Volume (m³)	-∞	∞	#,##0	N("DX")*N("DY")*N("DZ")
DryTonnes	-∞	∞	#,##0	N("DX")*N("DY")*N("DZ")*N("SG")
Head_Fe	-∞	∞	#,##0.00	N("Fe")
Head_Al	-∞	∞	#,##0.00	N("Al")
Head_Si	-∞	∞	#,##0.00	N("Si")
WetTonnes	-∞	∞	#,##0	N("DX")*N("DY")*N("DZ")*N("SG")*(1+N("moi"))
Moisture	-∞	∞	#,##0.000	N("moi")
Fines_Volume	-∞	∞	#,##0	N("DX")*N("DY")*N("DZ")*N("fines_pct")
Fines_Tonnes_Dry	-∞	∞	#,##0	N("DX")*N("DY")*N("DZ")*N("SG")*N("fines_pct")
Fines_Fe	-∞	∞	#,##0.00	N("fines_fe")
Fines_Al	-∞	∞	#,##0.00	N("fines_al")
Fines_Si	-∞	∞	#,##0.00	N("fines_si")
Fines_Pct	-∞	∞	#,##0.00	N("fines_pct")
Fines_Tonnes_Wet	-∞	∞	#,##0	N("DX")*N("DY")*N("DZ")*N("SG")*N("fines_pct")*(1+N("moi"))
Lump_Volume	-∞	∞	#,##0	N("DX")*N("DY")*N("DZ")*N("lump_pct")
Lump_Tonnes_Dry	-∞	∞	#,##0	N("DX")*N("DY")*N("DZ")*N("SG")*N("lump_pct")
Lump_Fe	-∞	∞	#,##0.00	N("lump_fe")
Lump_Al	-∞	∞	#,##0.00	N("lump_al")
Lump_Si	-∞	∞	#,##0.00	N("lump_si")
Lump_Pct	-∞	∞	#,##0.00	N("lump_pct")
Lump_Tonnes_Wet	-∞	∞	#,##0	N("DX")*N("DY")*N("DZ")*N("SG")*N("lump_pct")*(1+N("moi"))

As Number	As Text
	CustomT("OreTy...
N("X")	T("X")
N("Y")	T("Y")
N("Z")	T("Z")
N("DX")	T("DX")
N("DY")	T("DY")
N("DZ")	T("DZ")
N("SG")	T("SG")
N("Bearing")	T("Bearing")
N("Fe")	T("Fe")
N("Al")	T("Al")
N("Si")	T("Si")
N("lump_pct")	T("lump_pct")
N("fines_pct")	T("fines_pct")
N("lump_rec")	T("lump_rec")
N("fines_rec")	T("fines_rec")
N("lump_fe")	T("lump_fe")
N("lump_al")	T("lump_al")
N("lump_si")	T("lump_si")
N("fines_fe")	T("fines_fe")
N("fines_al")	T("fines_al")
N("fines_si")	T("fines_si")
N("moi")	T("moi")
N("blockId")	T("blockId")

Use the **Import Template** button to populate preconfigured fields and mappings (available in your Sample Data folder).

- blockmodelfields.abmf - fields.
- blockmappings.abms - mappings.

2.1.10. Adding multiple Block Models

Press the blue plus icon to download additional Block Models you wish to combine within one Reserves Model.

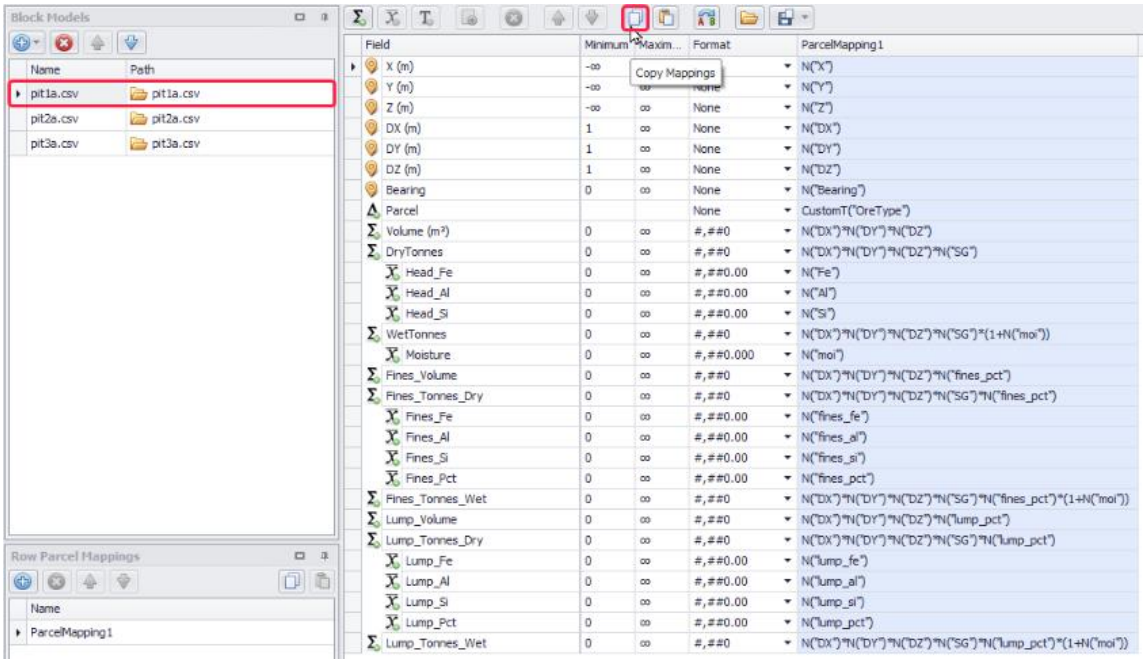
- Import CSV-files pit2a and pit3a from your Sample Data folder.

For each of the imported Block Models fields are the same. Within the Reserves Model for each of the Models you are importing in you have to have the same structure (number of fields and fields themselves). If in source model different variables or different names are uses, you can change fields mapping, but not the fields.

2.1.11. Copping Mappings

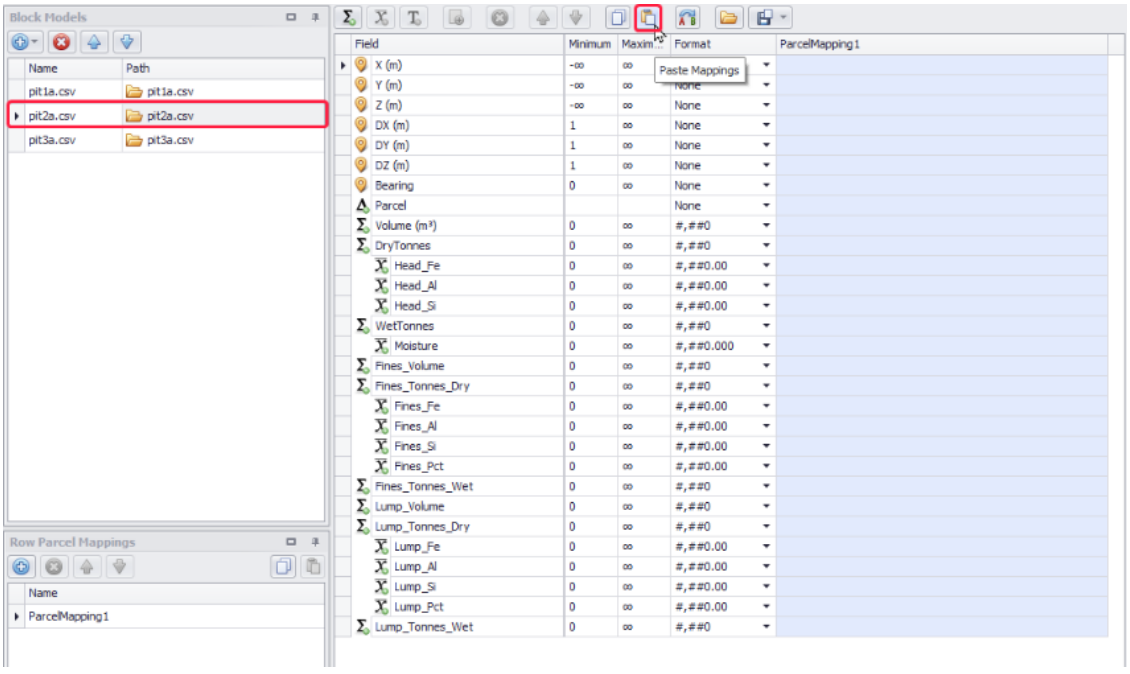
1. In “pit1a” Block Model table use <SHIFT> or <CTRL> buttons to select all or multiple fields.

2. Press the **Copy Mappings** icon at the top toolbar to copy selected mappings to the clipboard.



2.1.12. Pasting Mappings

1. Navigate to the imported “pit2a” Block Model and multi select all the empty fields to be mapped with custom variables.
2. Press **Paste Mappings** icon at the top toolbar to populate selected fields with the mapping imported.



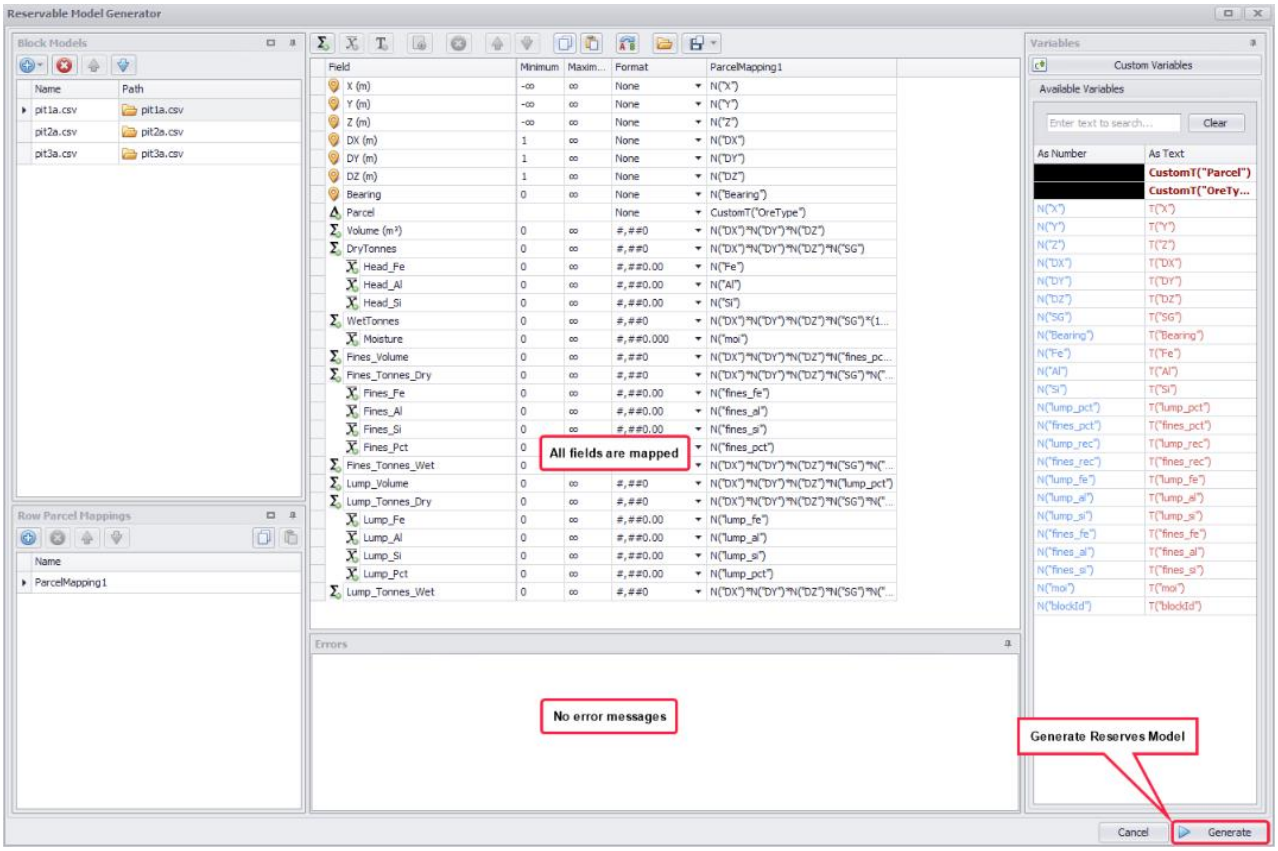
3. Repeat for “pit3a” Block Model.

To copy and paste fields mappings between multiple Block Models you can also use <CTRL+C> and <CTRL + V> hotkeys.

2.1.13. Combined Reserves Model

Once you are satisfied with added fields and mapping for each Block Model, generate one common Reserves Model, which will combine all of the above.

Before generating Reserves Model make sure that no issues listed in the Errors panel. You cannot generate reserves until all the errors are resolved, if any, refer to the bottom error panel for more details.



Review the Reserves Summary, it will update depending on which one you click on.

2.1.14. Block Model Formulas and Logical Operators

There are a number of expressions available to use in the Reserve Model Generator.

Formula	Meaning
A+B	Add A and B
A-B	Subtract B from A
A*B	Multiply A and B
A/B	Divide A by B
A.ToLower()	Convert all upper case text (HG, Hg) into lower case (hg)
Math.Min(A,B)	Return the minimum of A and B
Math.Max(A,B)	Return the maximum of A and B
N("density") <= 0 ? 0 : N("volume")	If density is less than or equal to zero, return zero volume, else return the volume field
A.Substring(0,Math.Min(3,A.Length))	Return the first three letters of A
(RowT("material")=="waste1" || RowT("material")=="waste2") ? "waste" : RowT("material")	If material is waste1 or waste2, then return "waste", else return the "material"

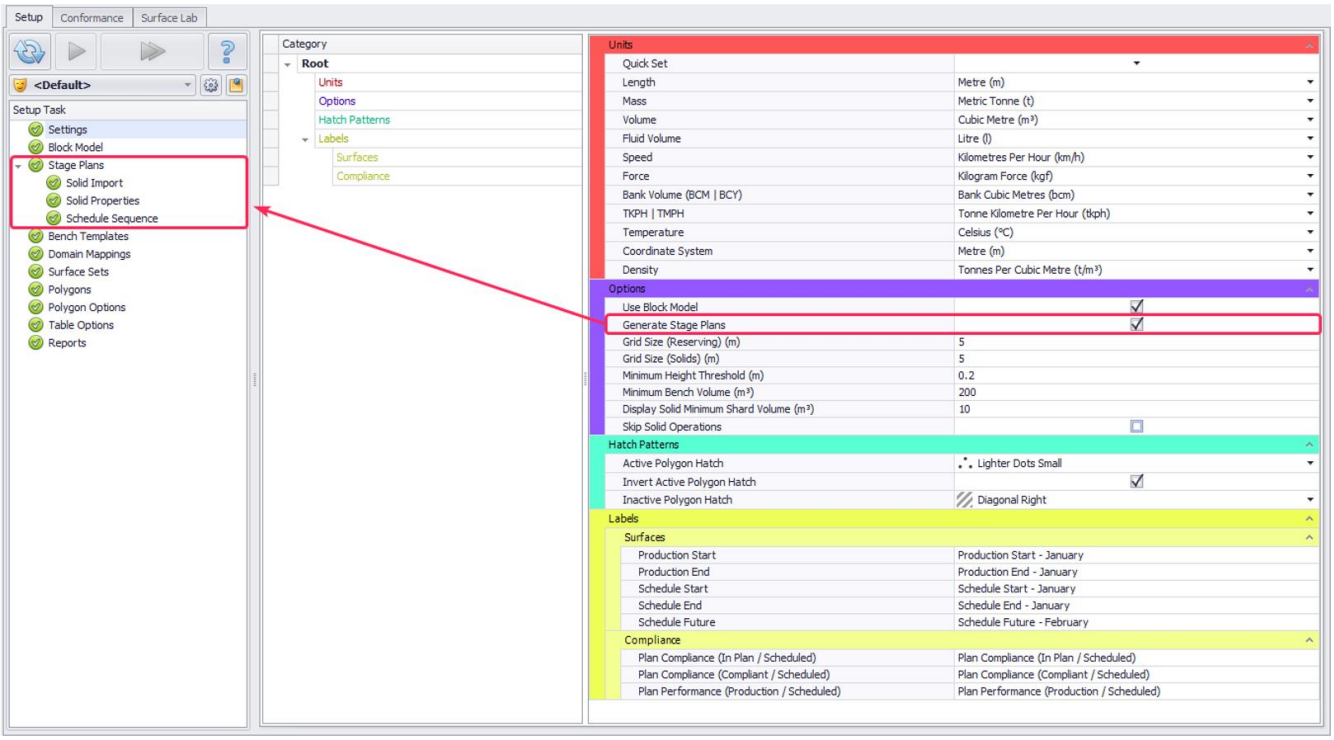
Logical Operator	Symbols	Meaning
And	&&	If A is "true" and B is "true" and C is "true", then return "true", else return "false"
Or	||	If A is "true" or B is "true" or C is "true", then return "true", else return "false"
Equal to	==	If A is equal to B, return "true", else return "false"
Not equal to	!=	If A is not equal to B, return "true", else return "false"
Greater than	>	If A is greater than B, return "true", else return "false"
Greater than or equal to	>=	If A is greater than or equal to B, return "true", else return "false"
Less than	<	If A is less than B, return "true", else return "false"
Less than or equal to	<=	If A is less than or equal to B, return "true", else return "false"

3. Stage Plans

To determine conformance, Start and End schedule surfaces are required.

These surfaces can come from external software or be generated directly through the **Stage Plans** steps in Alastri Spatial Conformetrics. One benefit of using Stage Plans is that you can account for actual mining direction when generating schedule surfaces. This means that if a block is 50% scheduled and 50% mined, it can achieve 100% conformance regardless of the originally scheduled mining direction.

- Stage Plans steps are only visible if **Generate Stage Plans** option is flagged in the **Settings** step.



The **Stage Plans** Setup Task consists of three steps, explained in the sections below:

1. Solid Import
2. Solid Properties
3. Schedule Sequence

3.1. Solid Import

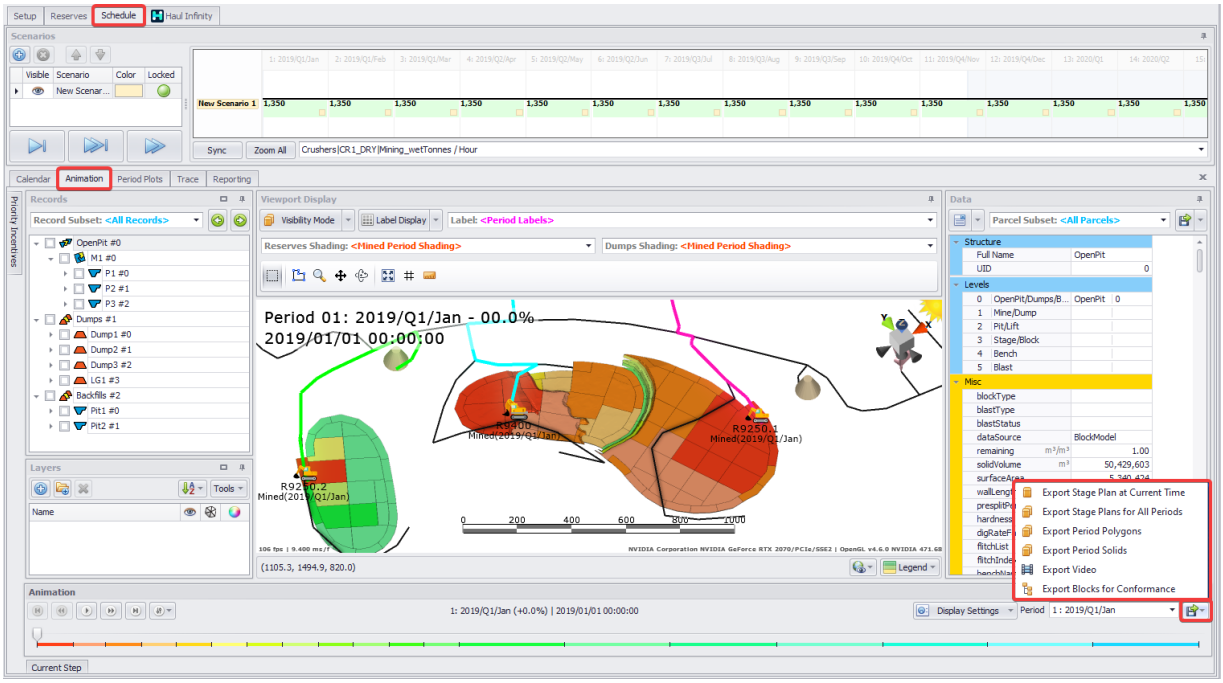
In the **Solid Import** step, scheduling blocks from Tactical Scheduler or Production Scheduler can be imported. The state of these blocks at a defined point of time will be used to generate the stage plan.

- For users of third-party scheduling applications, blocks can be imported directly from a folder or .zip file. Any underscores in the file name will be treated as level name delimiters in the block tree.

3.1.1. Exporting from Tactical Scheduler

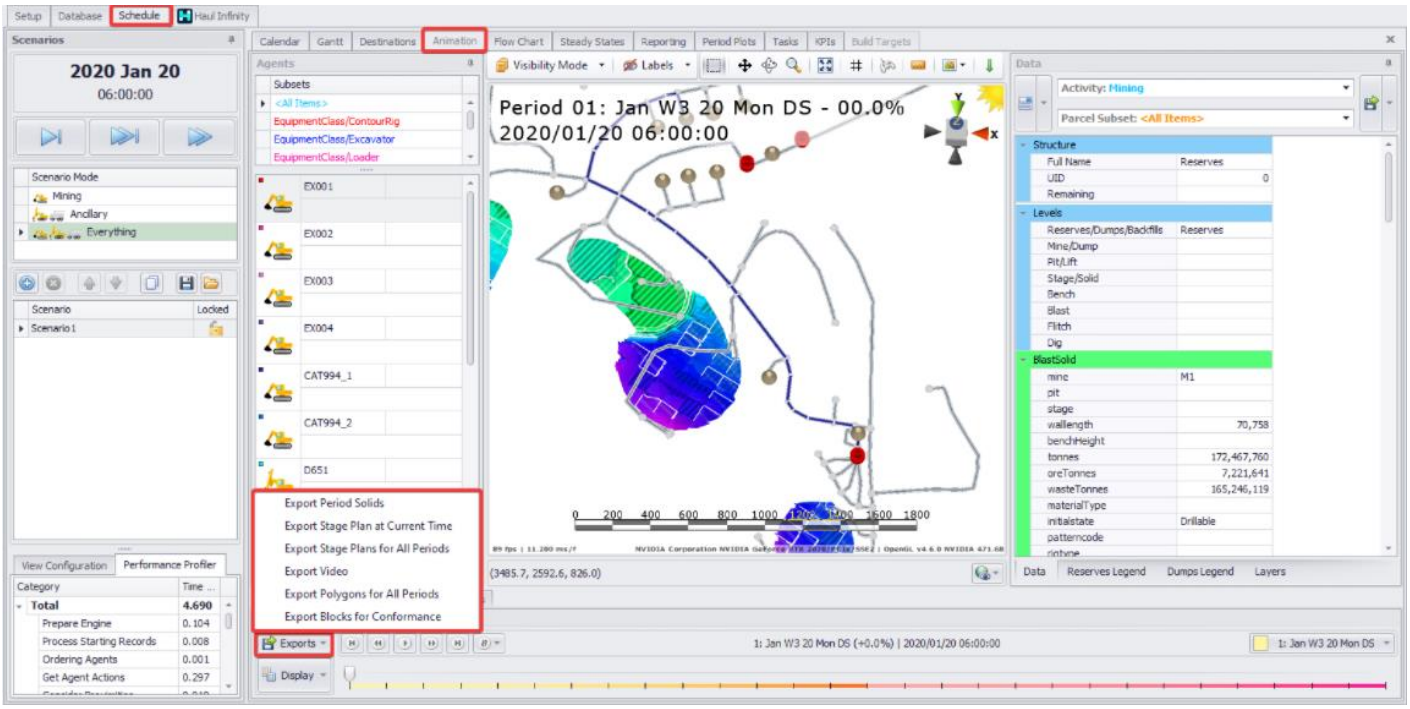
1. Open the relevant Tactical Scheduler project.
2. Go to **Schedule** tab > **Animation** tab.

3. Press the **Export** button, located down on the bottom right and select the “Export Blocks for Conformance” option.
4. Specify a directory for saving and a file name. The exported file will be saved in “.atsconformance” format.



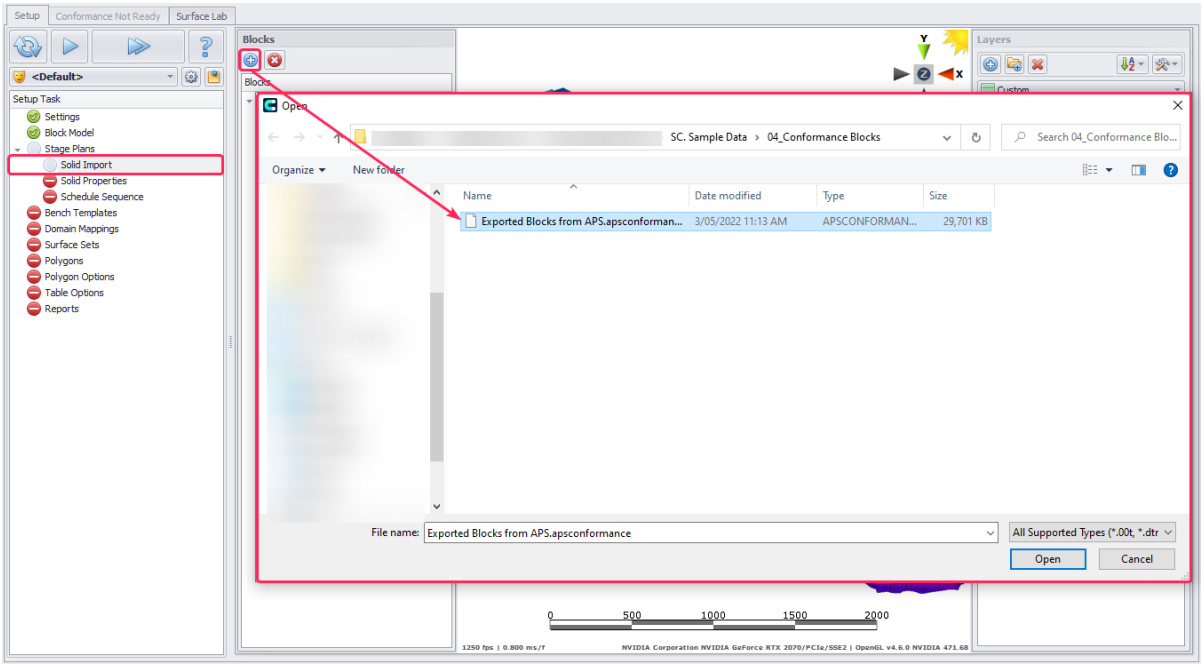
3.1.2. Exporting from Production Scheduler

1. Open the relevant Production Scheduler project.
2. Go to **Schedule** tab > **Animation** tab.
3. Press the **Export** button, located down on the bottom left and select the “Export Blocks for Conformance” option.
4. Specify a directory for saving and a file name. The exported file will be saved in “.apsconformance” format.



3.1.3. Importing Solids into Spatial Conformetrics

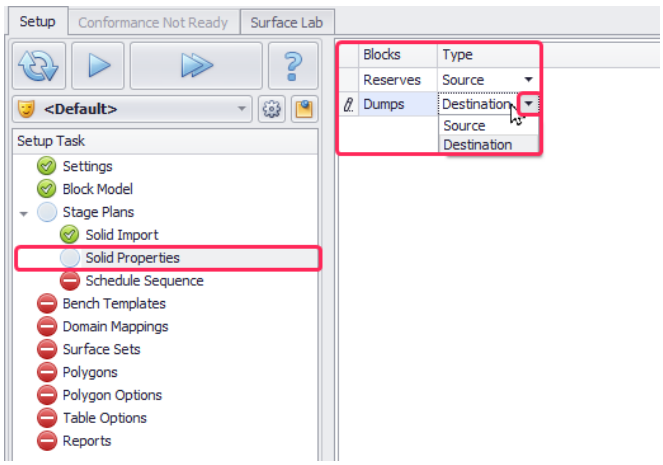
1. In the **Blocks** panel, press the blue plus icon.
2. Select the relevant conformance file.



3. Once loaded, solids will appear in the viewport and listed in the Blocks panel. Use the dropdown triangle to expand to the desired level and inspect exported blocks.

3.2. Solid Properties

In the **Solid Properties** step the imported blocks need to be assigned a type. A collection of blocks can either be assigned "Source" or "Destination".



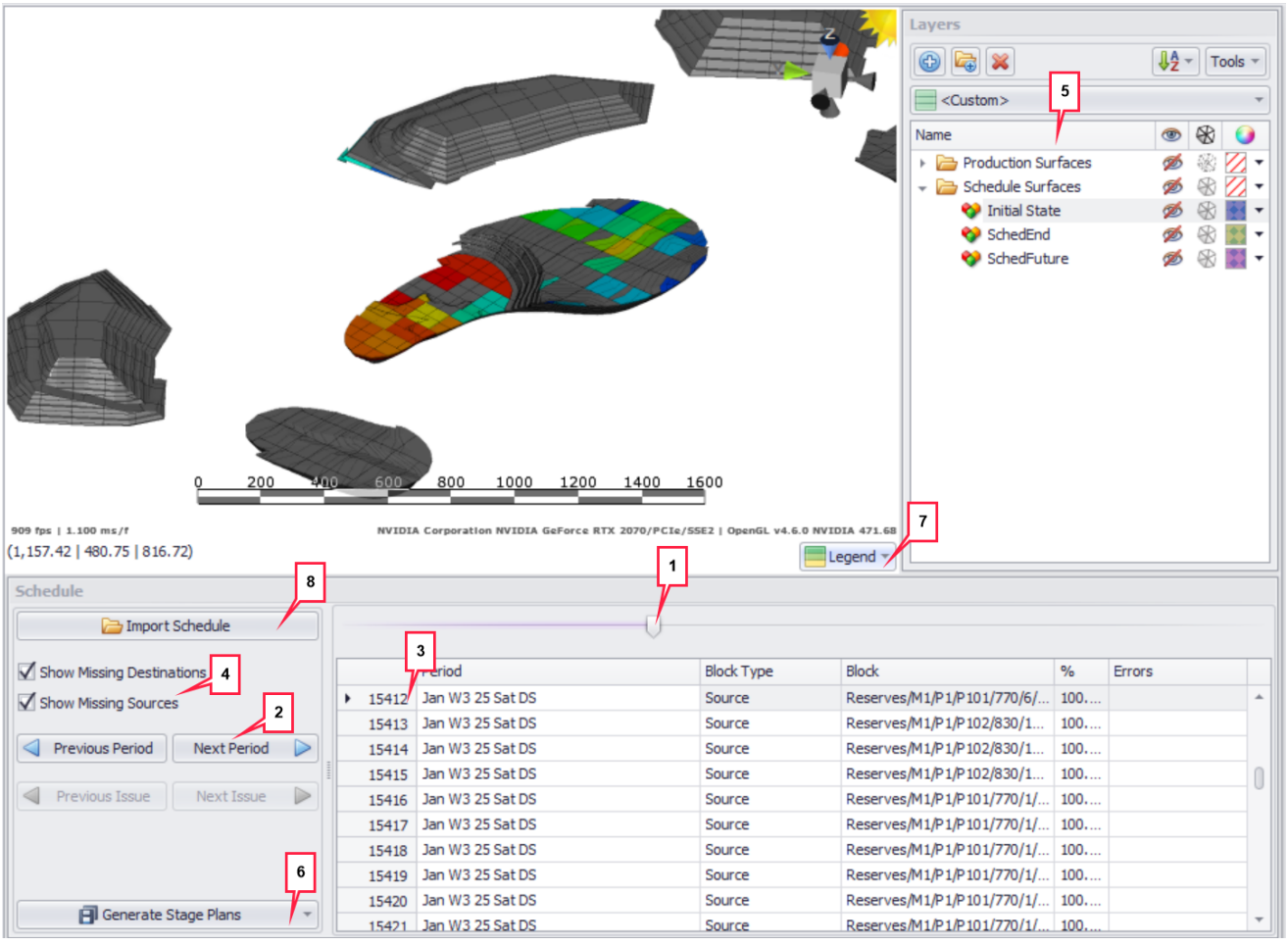
Use the dropdown triangle to assign “Source” type to Reserves and “Destination” type to Dumps.

3.3. Schedule Sequence

In the **Schedule Sequence** step, review the mining schedule, so that the stage plan can be generated for the correct point in time.

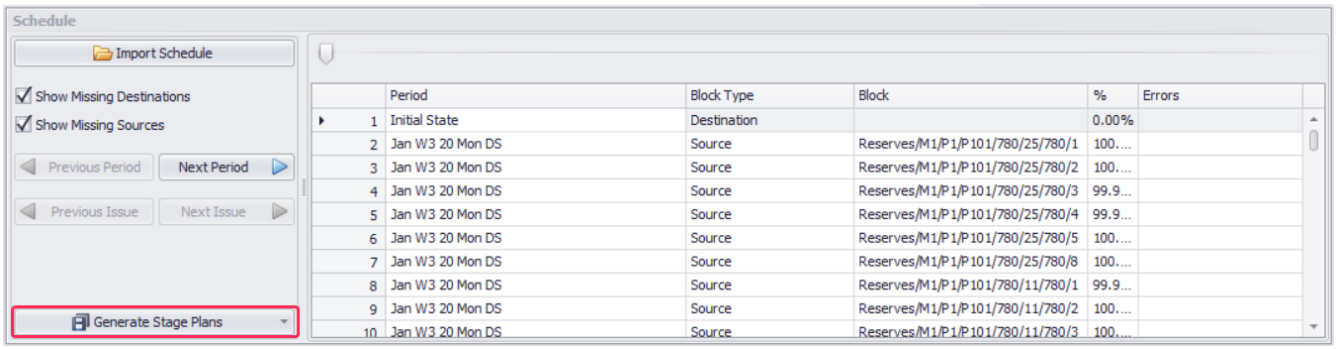
3.3.1. Navigation

1. Drag the horizontal slider to move forward and backward through the transactions.
2. Use **Previous Period** and **Next Period** buttons to jump between time periods.
3. Click a row in the table to view a specific transaction by number, Period, Block Type, Block Name, percentage remaining, and possible errors.
4. Flag **Show Missing Destinations** and Show Missing Sources if you wish to display in the viewport dumps or sources outside of the imported solids.
5. Use the **Layers** panel to import and toggle different designs and surfaces. For more details about this panel, functionality see in the Layers panel section.
6. Use **Generate Stage Plan** button to create a Zip, File or Layer of a specified state or period. More details see in the section below.
7. Use the **Legend** to see blocks color-coding.
8. For users of third-party scheduling applications, press the **Import Schedule** button to import from CSV.



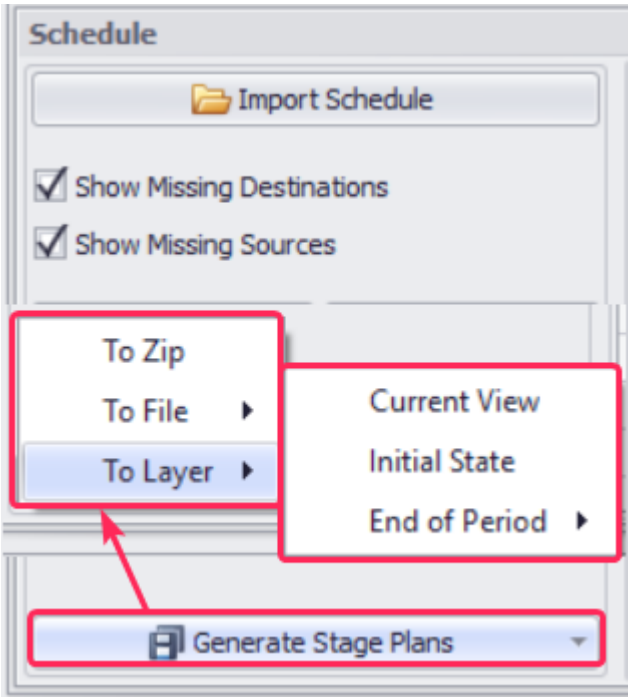
3.3.2. Generating Stage Plans

Press the **Generate Stage Plans** button and select the relevant export option.



3.3.2.1. Exporting options

Exporting options, available via **Generate Stage Plans** button are shown and explained below.



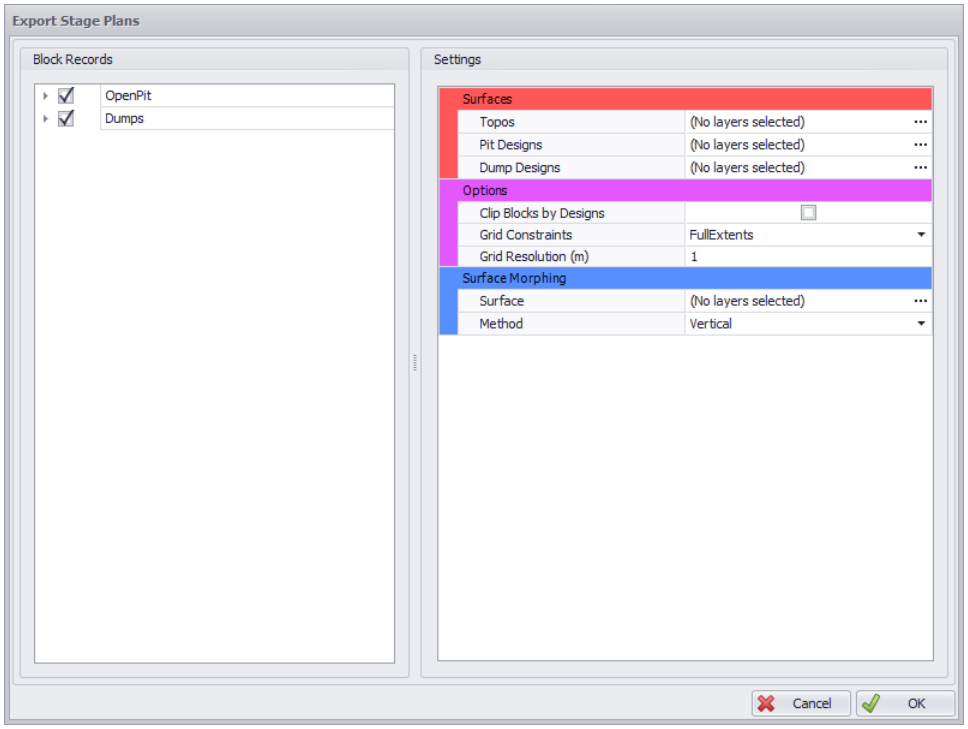
Option	Description
To Zip	A zip file containing a stage plan for each or selected periods.
To File	A single stage plan exported to file.
To Layer	A single stage plan exported to the Layers panel.

If “To File” or “To Layer” was chosen, additional export options will appear.

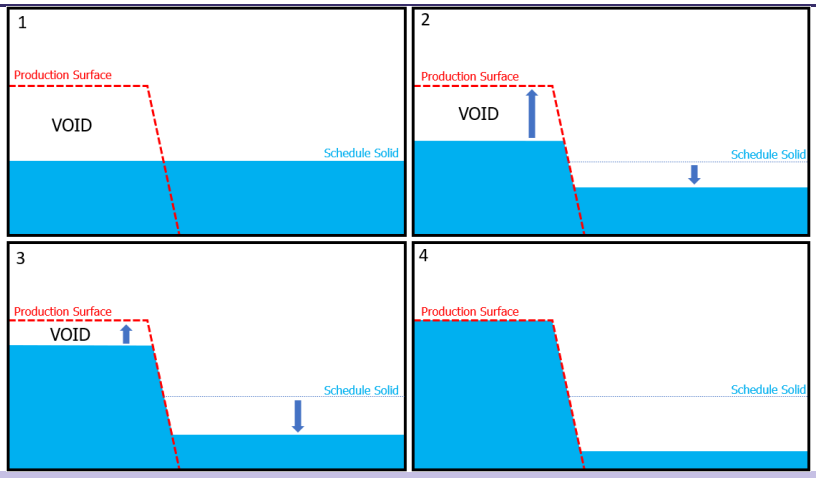
Option	Description
Current View	A stage plan will be generated for the period currently selected in the record transaction table.
Initial State	A stage plan will be generated based on the initial state of the imported solids.
End of Period	A stage plan will be generated based on the state of the solids at the end of defined period.

3.3.2.2. Stage Plan Settings

Exporting Stage Plans to Layers options are shown and explained below.

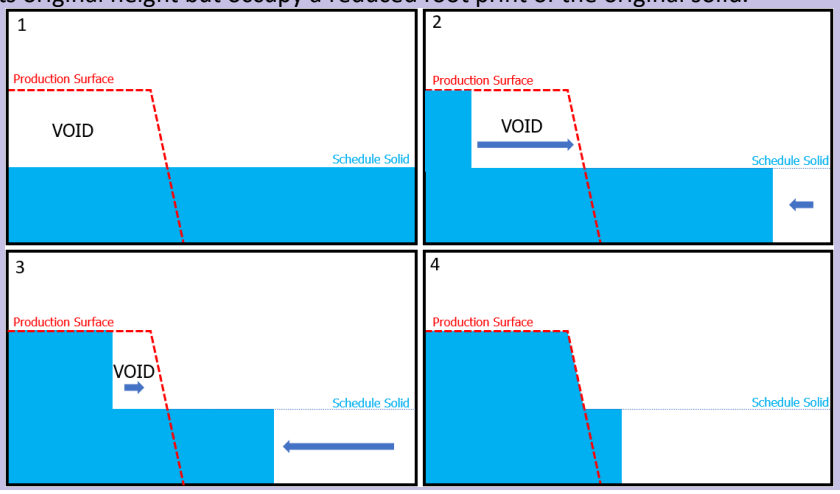


Settings	Description
Surfaces	
Topo	Specified Topo surface will be stitched into the stage plan.
Pit Designs	Specified Pit Design surface will be stitched into the stage plan.
Dump Designs	Specified Dump Design surface will be stitched into the stage plan.
Options	
Clip Blocks by Design	Clips any blocks that extend below the pit design or above the dump design.
Grid Constraints	"Full Extents" includes all data in the stage plan. "Blocks" limits the data in the stage plan to only selected Blocks.
Grid Resolution	Grid size of the resulting stage plan. Smaller grid size will give a more detailed surface at the price of processing time and file size.
Surface Morphing	
Surface	Survey surface which contains the current face positions.
Method	Select a desired method of Surface morphing:
Vertical	Material from the Schedule Solid will be depleted **vertically** and repositioned in the void that exists between the Production Surface and Schedule Solid. This method honors the volume of the void and the volume filling it. Once the void has been filled, any excess material will occupy the foot print of the original solid but at a reduced height.



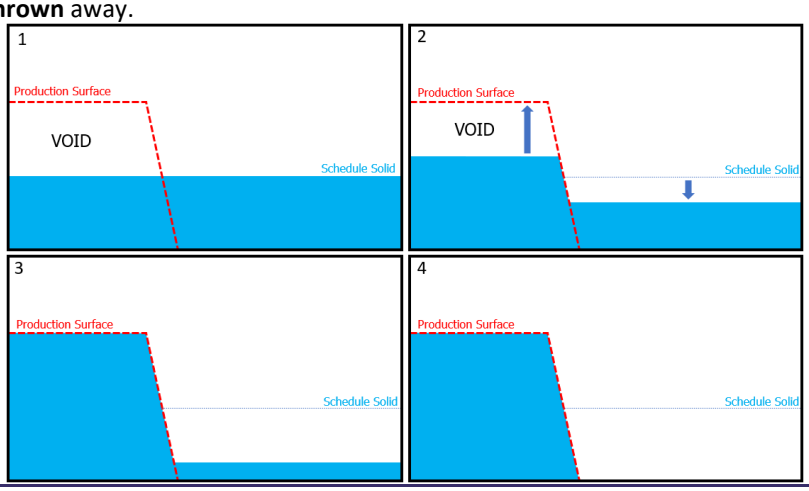
Material from the Schedule Solid will be depleted **horizontally** and repositioned in the void that exists between the Production Surface and Schedule Solid. Material will fill the void in the opposite direction as the solid is being depleted. This method honors the volume of the void and the volume filling into it. Once the void has been filled, any excess material will be left at its original height but occupy a reduced foot print of the original solid.

Horizontal



Material from the Schedule Solid will be repositioned in the void that exists between the Production Surface and Schedule Solid. This method **does not** honor the volume of the void and the volume of material going into it. Once the void has been filled, any excess material will be **thrown** away.

Forced



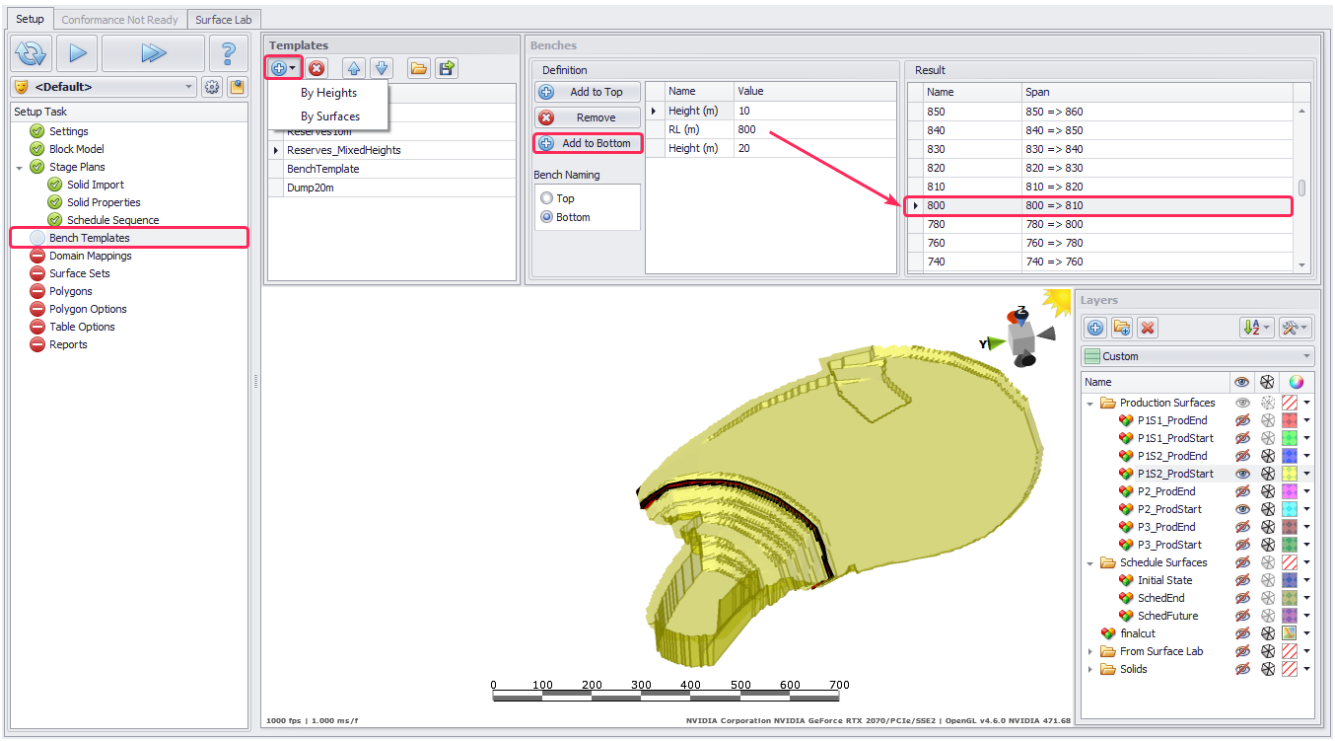
4. Bench Templates

The **Bench Templates** step stores incremental heights, which are then used to divide regions into horizontal layers. The conformance per layer (bench) can then be reported against. Multiple templates can be created, with templates being able to be applied to different regions in the **Polygon Options** step. The steps to creating a standard and mixed height Bench Template are outlined below.

➢ If conformance by bench is not required, the items in this step can be left blank.

4.1.1. Creating a Template

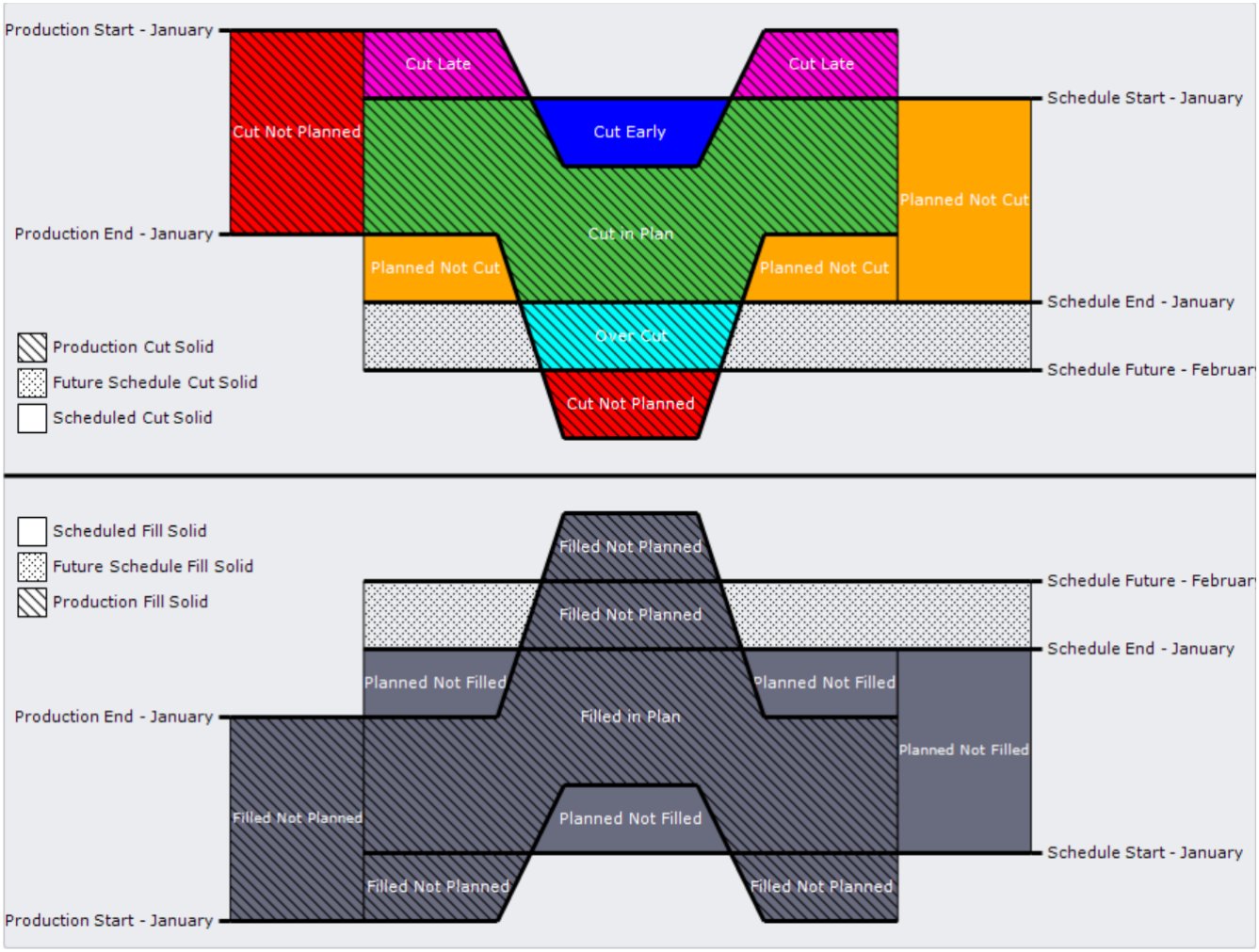
1. Press the blue plus icon to add a new bench template.
    a. Select “By Height” to set a template based on increment height.
    b. Select “By Surfaces” to specify a layer to be applied for the template creation.
2. Rename the bench template to something meaningful, i.e. “10m”.
3. In the **Benches** panel, change the height value to the desired height.
    a. If the template doesn’t apply correctly, you can create a template with different heights. This transition in height occurs at a defined RL.
        i. In the **Benches** panel, press **Add to Bottom**.
        ii. Set the transition RL for the heights change, i.e. “800".
        iii. Set the heights below and above the transition RL, i.e. 10 and 20.
4. In the **Result** panel, the height increments will be shown.
5. Turn on relevant surfaces from the Layers panel.
6. When iterating through the height increments, the region that falls within the currently selected increment will be highlighted. Edit if required.



5. Domain Mapping

Spatial Conformetrics looks at the intersection of a Production Solid and a Schedule Solid generated from a set of Start and End surfaces. The resultant solids are then divided up into various domain solids (also referred to as "conformance domains") based on how they interact with one another.

The cross-sectional diagram visually depicts the conformance domains based on the two solids intersecting.

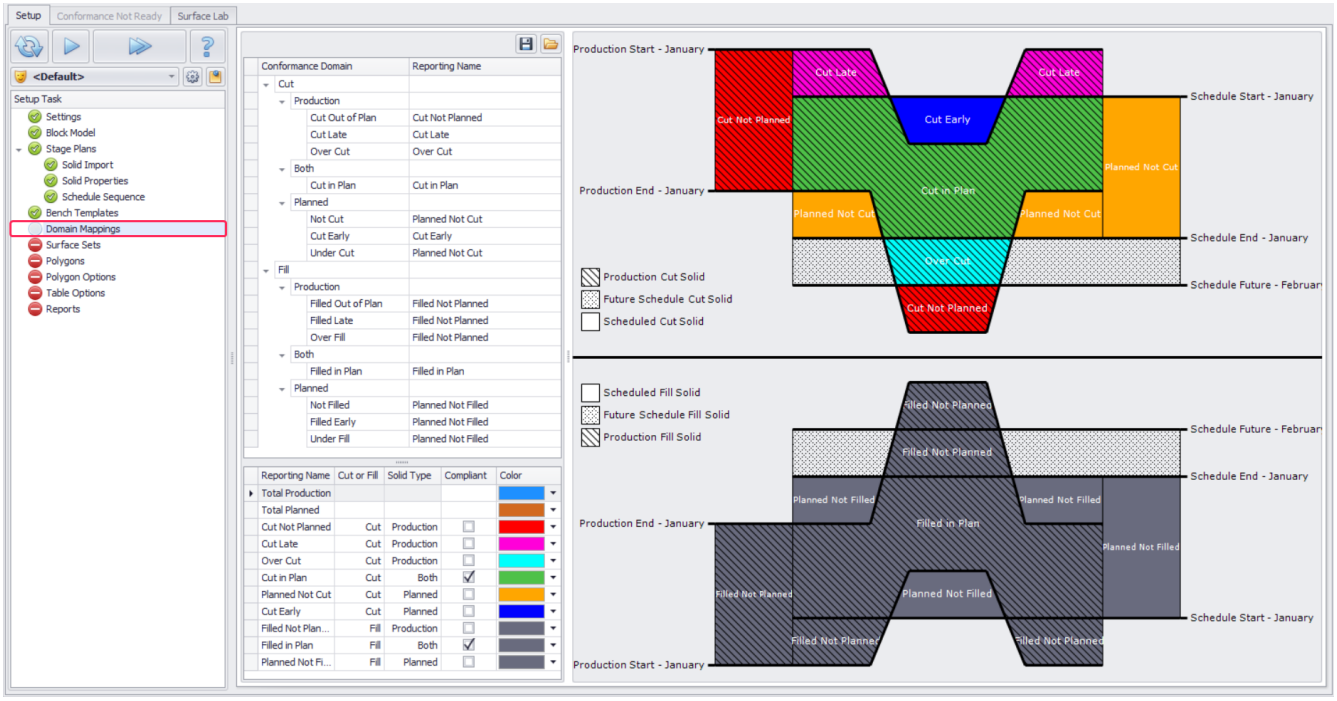


5.1.1. Domains explanation

Explanation of each conformance block (domain) see in the table below.

Domain Name	Solid Type	Description
Cut Out of Plan	Production	Represents mined material that was not scheduled to be mined. The production solid does not overlap with the scheduled solid.
Cut Late	Production	Represents mined material that was sitting above planned material. The production solid does not overlap with the scheduled solid.
Over Cut	Production	Represents mined material that is below planned material. The production solid does not overlap with the scheduled solid.
Not Cut	Scheduled	Represents planned material that was not mined. The scheduled solid does not overlap with the production solid.
Cut Early	Scheduled	Represents planned material that was mined prior to the start date. The scheduled solid does not overlap with the production solid.

Under Cut	Scheduled	Represents planned material that was not fully mined. The scheduled solid does not overlap with the production solid.
Cut in Plan	Both	Represents planned material that was mined. The scheduled solid does overlap with the production solid.



In the example above:

- Any intersecting volume is "**Cut in Plan**".
- Any production volume outside the schedule boundary is "**Cut Out of Plan**".
- Any schedule volume outside the production boundary is " **Not Cut**".
- Any production volume above or below a schedule solid is "**Cut Late**" or "**Over Cut**".
- Any schedule volume above or below a production solid is "**Cut Early**" or "**Under Cut**".

5.1.2. Domain Configuration

Different organizations may choose to report these domains with different names or combine them. This can be achieved by editing the domains Reporting Name. Other domain settings are explained in the table below.

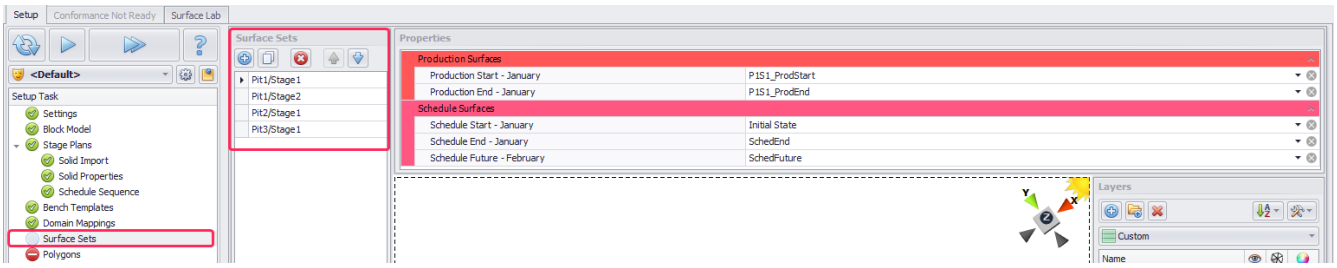
Column	Description
Reporting Name	The name which will be used for reporting purposes.
Cut or Fill	Is the domain a cut solid (mining) or a fill solid (dumping).
Solid Type	The parent solid of the domain, i.e. Scheduled, Production, Both.
Compliant	Whether or not the domain is 'compliant'. Will be used for the Plan Compliance (Compliant / Scheduled) reporting result.
Color	Color which will visually represent the domain solid.

6. Surface sets

As outlined in the previous section (**Domain Mappings**), Spatial Conformetrics looks at the intersection of a Production Solid and a Schedule Solid.

To generate these solids, a set of Start and End surfaces needs to be defined for each solid type.

These surfaces can be specified inside a surface set. Multiple surface sets can be created, which is useful when different pits have different production surfaces.

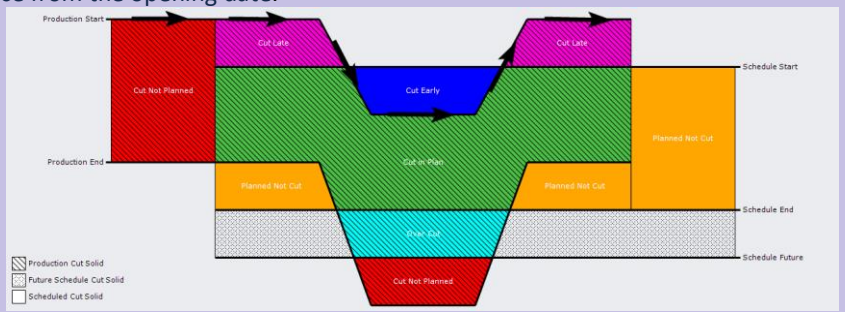
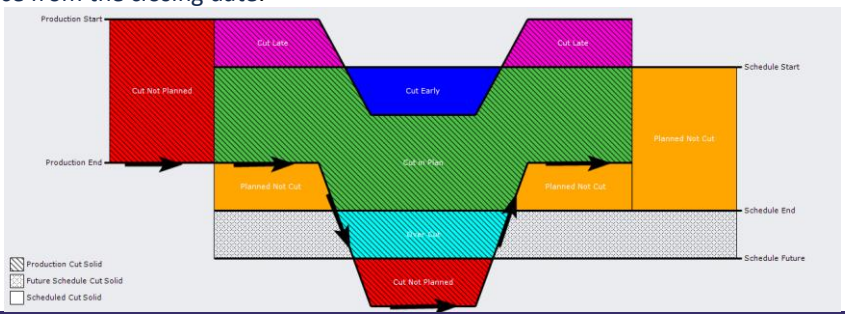


6.1.1. Creating a Surface Set

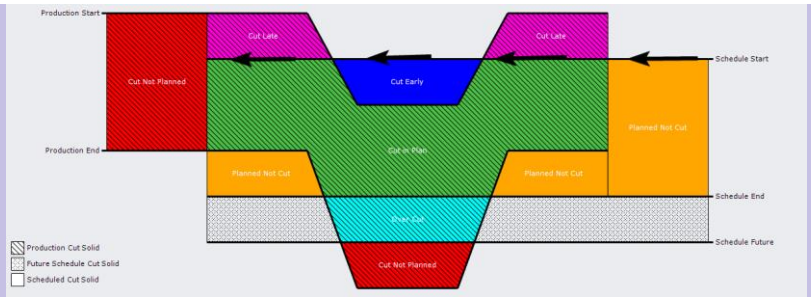
1. Press the blue plus button located in the toolbar of the **Surface Sets** panel.
2. Give the surface set a meaningful name, i.e., "Pit1/Stage1".
3. Provide the relevant surfaces by dragging the surface from the Layers panel or loading it in via file by clicking on the black downwards pointing arrow at the end of the cell.

6.1.2. Surfaces description (Properties panel)

A description of the surfaces that can be loaded is shown in the table below.

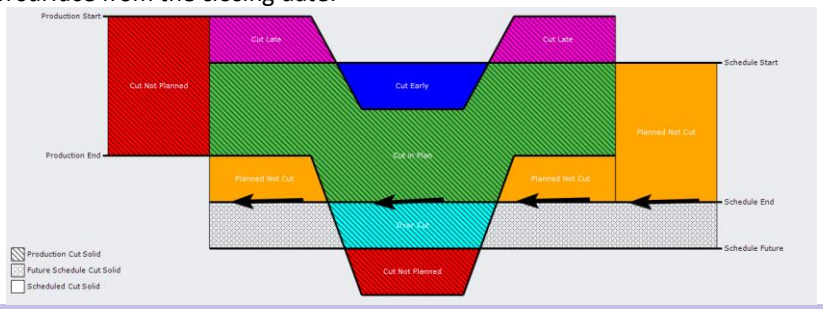
Production Surfaces	
Production Start	Survey surface from the opening date. 
Production End	Survey surface from the closing date. 

Schedule Surfaces	
Schedule Start	Plan depletion surface from the opening date.



Schedule End

Plan depletion surface from the closing date.



Schedule Future

(Optional) Plan depletion surface for the next period.

- The Schedule Future surface may be used to differentiate between "Over Dig" and "Out of Plan" material.

Shared Surfaces

Sometimes it is assumed that the Schedule Start and the Production Start are the same surface.

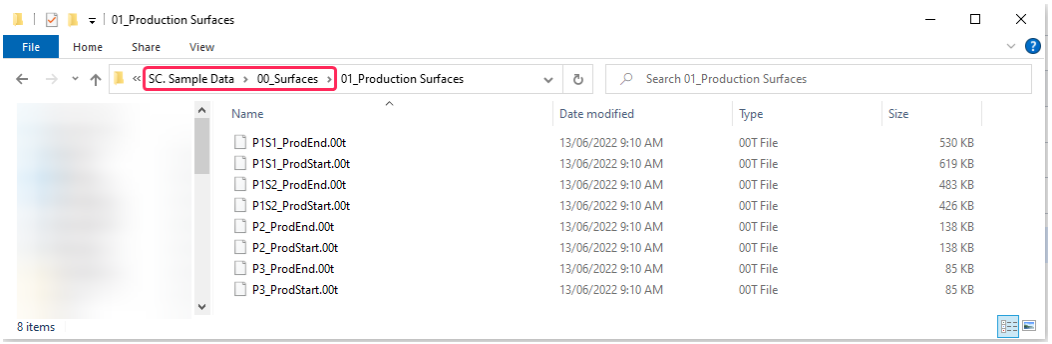
If this is the case, leaving the schedule start as blank will automatically set Schedule Start = Production Start.

6.1.3. Working with surfaces in the Layers panel

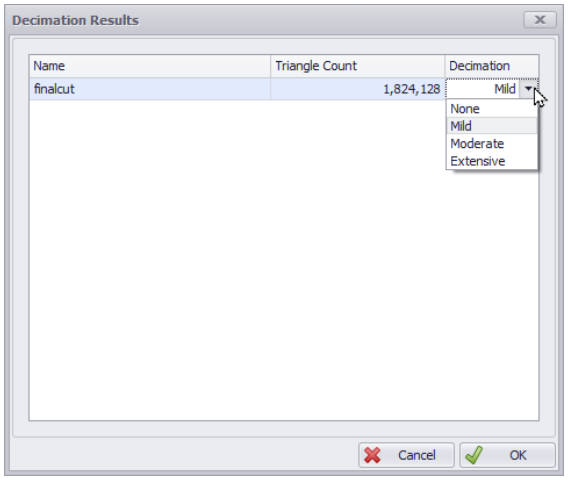
6.1.3.1. Importing surfaces

Surfaces are imported through the **Layers** panel.

1. Find the **Layers** panel in the right of the screen.
2. Press the blue plus icon to import surfaces.
3. Navigate to the Sample Data folder and import:
    a. Production Surfaces: P1S1_ProdEnd.00t, P1S1_ProdStart.00t, P1S2_ProdEnd.00t, P1S2_ProdStart.00t, P2_ProdEnd.00t, P2_ProdStart.00t, P3_ProdEnd.00t, P3_ProdStart.00t.
    b. Schedule Surfaces: Initial State.00t, SchedEnd.00t, SchedFuture.00t.
    c. Surveys: finalcut.00t.

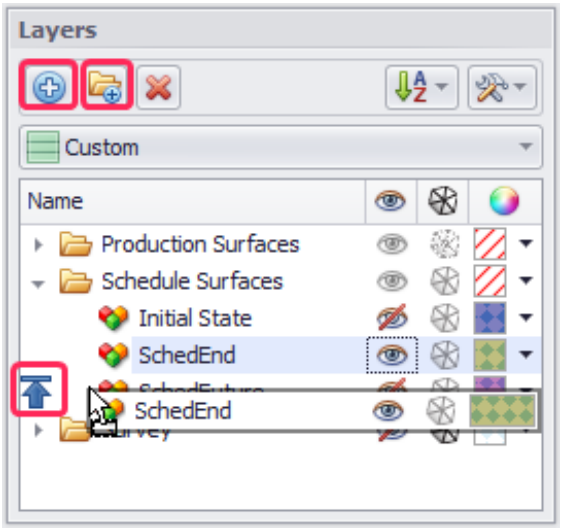


When importing survey surfaces the Decimation Results dialog will appear, where you can see the triangle count and specify the decimation required (in this demo project, decimation is not required, but for other projects when importing large files, you may need to reduce the image size by excluding every tenth one).



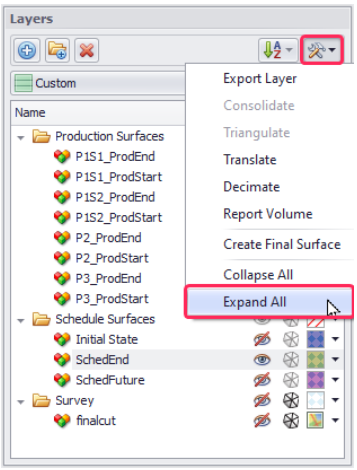
Decimation is a reduction of image size by decimal subsampling, which is used to minimize the image quality and loading time. When the triangle count is low, the default setting is zero decimation (<None>). When loading larger layers with more triangles, you may need to select another option of low ("Mild"), medium ("Moderate") or strong ("Extensive") decimation to reduce the uploading and scheduling time. Depending on the choice of the decimation level, the time of importing layers may increase.

- When working with multiple surfaces and surveys, group them into folders to make it easier to browse and find the surface required.
  - You can change the order in which folders and their items are displayed by dragging and dropping them. The place of insertion is pointed by blue arrows.



6.1.3.2. Changing surfaces colours

1. Expand out the folders in the **Layers** panel (manually or using Tools button > “Expand” option).

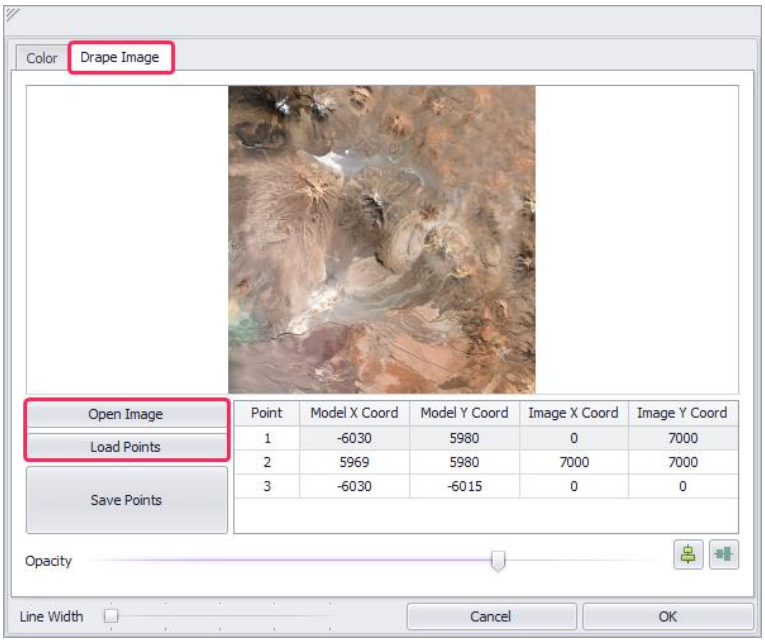


2. Open the dropdown in the far-right column.
3. Select a new colour.
4. Press OK.

Drape image

➢ If you have a 3D image of your site survey, upload it using Drape Image function.

1. Select “finalcut” surface in the Layers panel.
2. Click on the color selection dropdown to the right of the layer name.
3. Switch to the **Drape Image** tab.
4. Select Open Image and import the image file (topo.jpg).
5. Select Load Points and import the georeference file. (drape.alsdrp).
6. Sometimes when importing images from third-party software, the coordinates of the points may get displaced or not match. If there is a misalignment, to adjust the surface/image overlay, use the Mirror Image X or Mirror Image Y buttons.

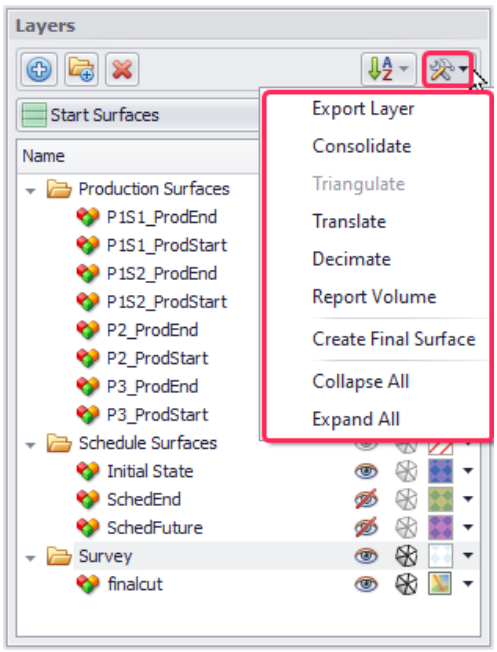


6.1.4. Surfaces display settings

- ✓ Toggle the eyeball icon to display or hide selected surfaces or folders  .
- ✓ Use the edges icon  to toggle visibility of the surfaces edges.
- ✓ Use the color icon  to change surface color, brightness, opacity, and saturation.
- ✓ Configure and save your preferred layers display settings using the Custom button.

6.1.5. Layers panel Tools

Use the Tools button  located in the top right corner of the Layers panel to perform various actions with the imported layers.



The options, available from its dropdown are described in the table below.

Tool	Functions
Export Layer	- Export Single Layer. Select one layer you wish to export and in Save As window specify its name and saving path. - Export Multiple Layers. Use <CTRL> and <SHIFT> keys to select multiple layers you wish to export. When exporting multiple, the program allows you to place them into zip file (folder sign on the right). Specify format for Construction Line, Solid and Text files what you may have loaded as well. Available formats include ".arch_d", ".str", ".dxt", ".obj", ".shp", "00t", ".dat".
Consolidate	Allows to consolidate multiple layers into one. Choose layers required and select "Consolidate". Selected files will be merged into one newly generated layer, which contains these consolidated items.
Triangulate	Triangulation function is used to triangulate lines. Available only when polylines file is imported, otherwise greyed out.
Translate	Translation function is used to shift information in X, Y and Z-directions if you need a slight change or if you wish to change grids. Translated files will be automatically added to the same folder where original layer is stored. Translated file is automatically named after original one and followed by "[Translated]".

Decimate	The Decimation function automatically runs when a triangulated file is imported into the software. If you didn't decimate a larger surface when importing it, you still can decimate it using "Decimate" dropdown option. Select a file, choose the level of decimation required (including <None>) and this function will retriangulate the given layer at a lower resolution. On completion the results will be displayed, and the user has the option whether to use the original data or the decimated.
Report Volume	Report Volume is an option to display total volumes of closed solids from layers in the Layers panel. Since only closed solids can have volume, this tool is also useful for distinguishing surfaces from closed frame models, where it is hard to identify.
Create Final Surface	This tool allows users to extract the lowest surface from any combination of solids and surfaces. The result is colored according to which solid or surface each part of the lowest surface comes from.
Collapse All and Expand All	The last two dropdown options are used to collapse and to extend all folders. It is particularly useful when working with larger projects with multiple layers, organised in many folders and subfolders.

7. Polygons

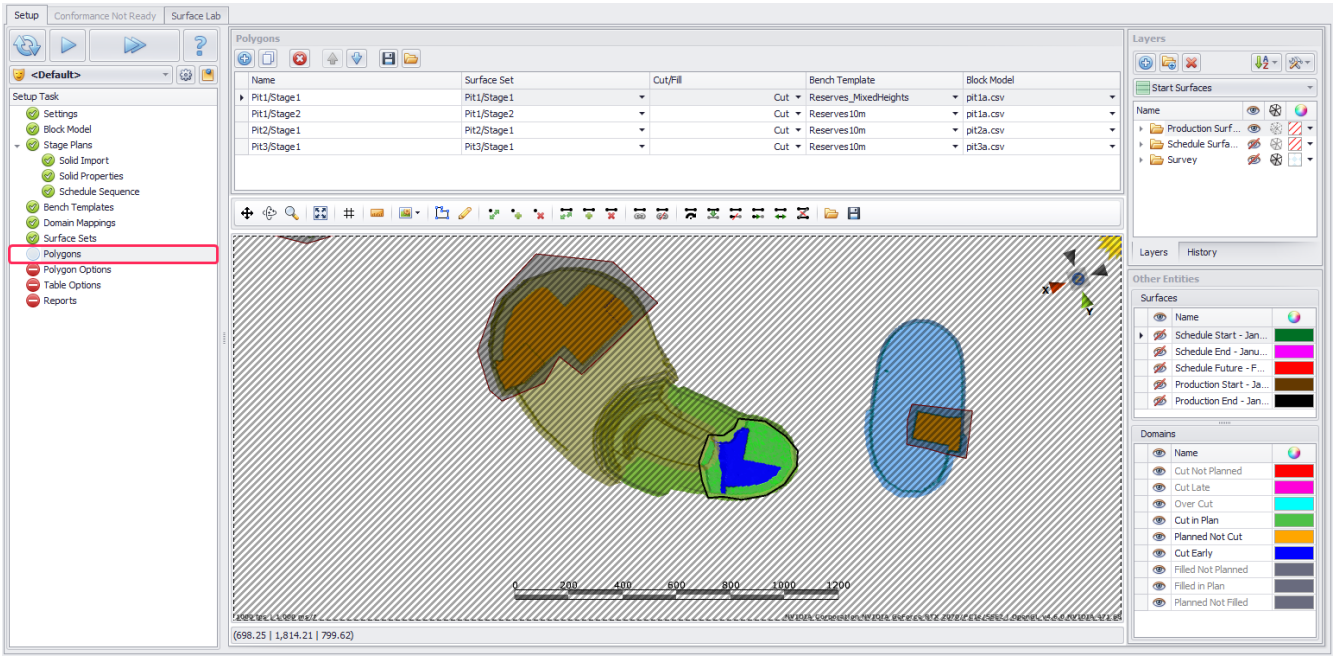
The regions/polygons we are calculating conformance in need to be explicitly defined.

In the Polygons step, you can draw the polygonal extents for each reporting region.

7.1.1. Creating polygons

1. Click the blue plus button located in the Polygons toolbar.
2. Draw a closed polygon using the CAD tools found in the toolbar above the viewport (explained below).
3. Set the properties of each polygon, as per table below.

Property	Description
Name	The name of the region. Polygons can be organized in a tree using delimiters for levels, such as "Alastri/Pit1".
Surface Set	The solids which will be used to calculate the conformance
Cut/Fill	Does the defined region encompass a pit (Cut) or a dump (Fill)
Bench Template	Optional - Bench Template to use within the defined region
Block Model	Optional - Block model to use within the defined region



Use the **Other Entities** and **Domains** panels to show or hide previously defined Production and Schedule surfaces and Conformance Domains.

7.1.2. Design tools

See below a description of the main navigation and design elements. Use these tools to draw polygons and see and interact with the 3D design area.

Mouse Controls		
Pan		Middle click and drag
Rotate		Right click and drag
Zoom		Scroll wheel
Zoom to All		Left click to Zoom to all
Vertical Exaggeration	-	<CTRL> + Scroll wheel

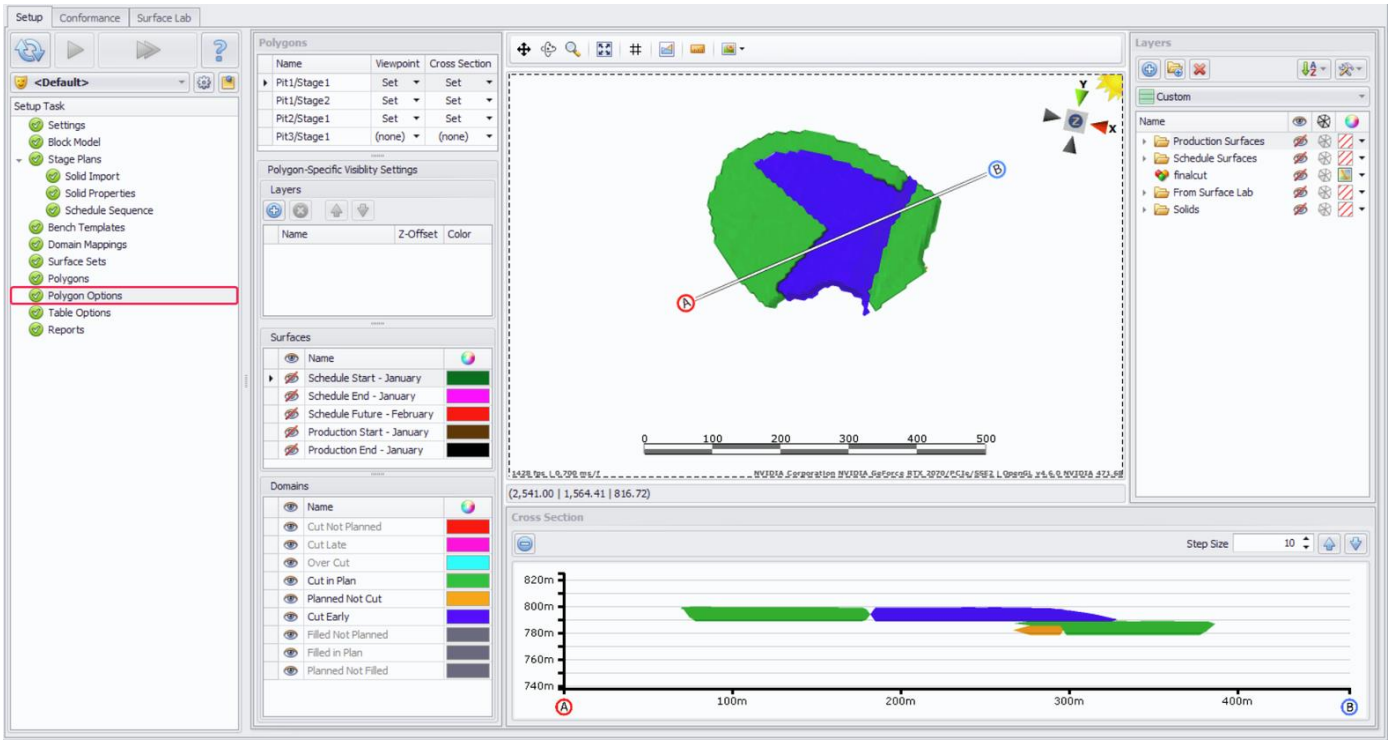
Measurement		
Grid		Display a grid in the viewport. ➢ Note that the grid is only displayed in the top view. If the grid is not displayed, then you are working in a different plane. Press the "Z" icon on the compass to return to the top view.
Ruler		Draw a measurable distance in the viewport

Design tools		
Create Polygon		<P> - Create Polygon
Create Construction Line		<D> - Create Construction Line
Move Points		<F> - Move Points
Add Points		<A> - Add Points
Delete Points		<S> - Delete Points
Move Segment		<M> - Move Segment
Copy Segment		<C> - Copy Segment
Delete Segment		<N> - Delete Segment
Join		<J> - Join Segment
Break Segment		<B> - Break Segment
Rotate Segment		<R> - Rotate Segment
Offset Segment		<O> - Offset Segment
Trim		<T> - Trim
Intersect		<I> - Intersect
Quick Extend		<Q> - Quick Extend
Clear Path		-
Import Construction Lines		Import from .arch_d, .str, .dxf, .obj, .shp, .dat formats
Export Construction Lines		Export to.arch_d, .str, .dxf, .obj, .shp, .dat formats

8. Polygon Options

Preconfigured views can be generated for the defined conformance regions inside the **Polygon Options** step. The preconfigured views will then be used in the automated report process.

Two views can be used specified which are Viewpoint and Cross-Section.

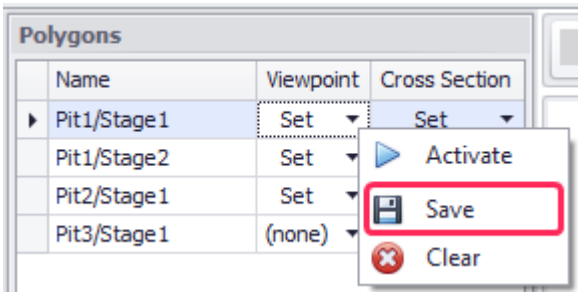


8.1.1. Viewpoint

The Viewpoint image can either be a 2D image (top-down) or a 3D image (rotated) of the selected Polygon.

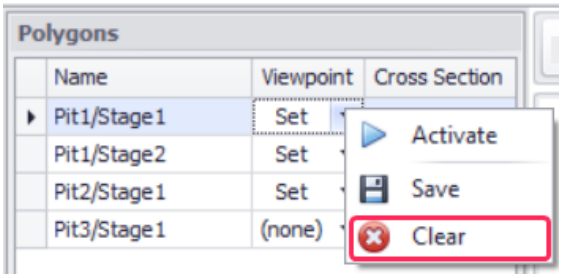
8.1.1.1. Setting the Viewpoint

1. Selected the relevant Polygon from listed in the Polygons panel.
2. Inside the top viewport, orientate the viewport to the desired position.
3. Select the black downwards pointing arrowhead located in the Viewpoint column.
4. Select the “Save” option.
5. The view set in the **Viewport** will be saved for later use.



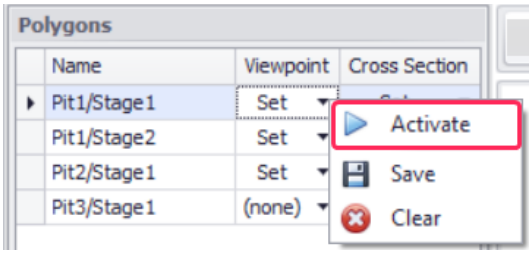
Clearing the Viewpoint

1. Selected the relevant Polygon from listed in the **Polygons** panel.
2. Select the black downwards pointing arrowhead located in the **Viewpoint** column.
3. Select the “Clear” option.
4. Specified saved view will be deleted.



8.1.1.2. Activating the Viewpoint

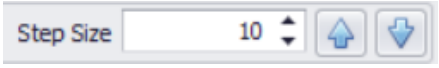
1. Selected the relevant Polygon from listed in the **Polygons** panel.
2. Select the black downwards pointing arrowhead located in the **Viewpoint** column.
3. Select the “ Active ” option.
4. The viewport will orientate itself to the saved position.



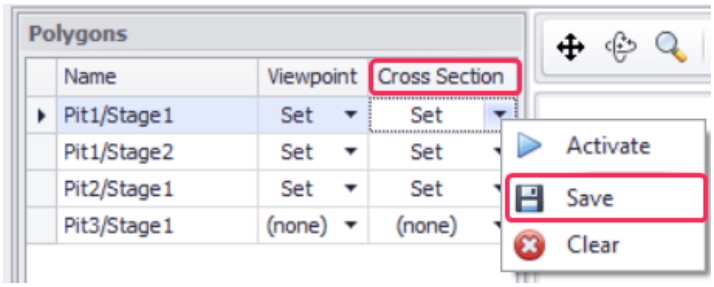
8.1.2. Cross-Section

The cross-section image is a 2D cross-sectional image of the selected Polygons.

8.1.2.1. Setting the Cross-Section

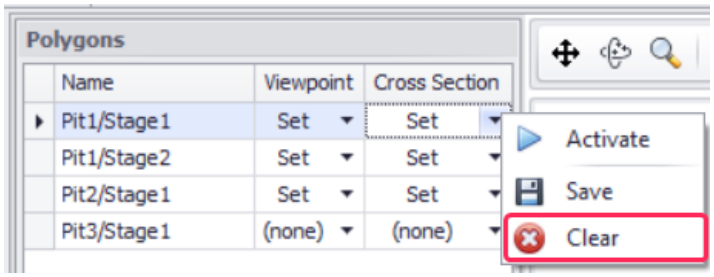
1. Selected the relevant Polygon from listed in the **Polygons** panel.
2. In the toolbar located above the top viewport, select the cross-section button  .
3. Click and hold the left mouse button inside the top viewport and move the cross-section arrow across the selected polygon.
4. The cross-section will then be displayed in the bottom viewport.
5. Use the **Step Size** box and blue up and down arrows to change the step size of the cross-section arrow and move it across the polygon 

.
6. To reset the cross-section line, simply click in the desired location and start stretching the A<-->B line, or click the minus icon  in the upper left corner of the bottom panel.
7. Once the desired view has been established, select the black downwards pointing arrowhead located in the Cross-Section column.
8. Select the “Save” option.
9. The cross-section set in the **Viewport** will be saved for later use.



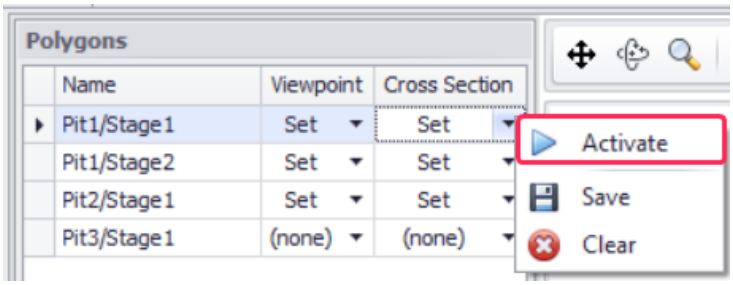
8.1.2.2. Clearing the Cross-Section

1. Selected the relevant Polygon from listed in the **Polygons** panel.
2. Select the black downwards pointing arrowhead located in the **Cross-Section** column.
3. Select the "Clear" option.
4. Specified saved cross-section will be deleted.



8.1.2.3. Activating the Cross-Section

1. Selected the relevant Polygon from listed in the **Polygons** panel.
2. Select the black downwards pointing arrowhead located in the **Cross-Section** column.
3. Select the "Active" option.
4. The viewport will orientate itself to the saved position.



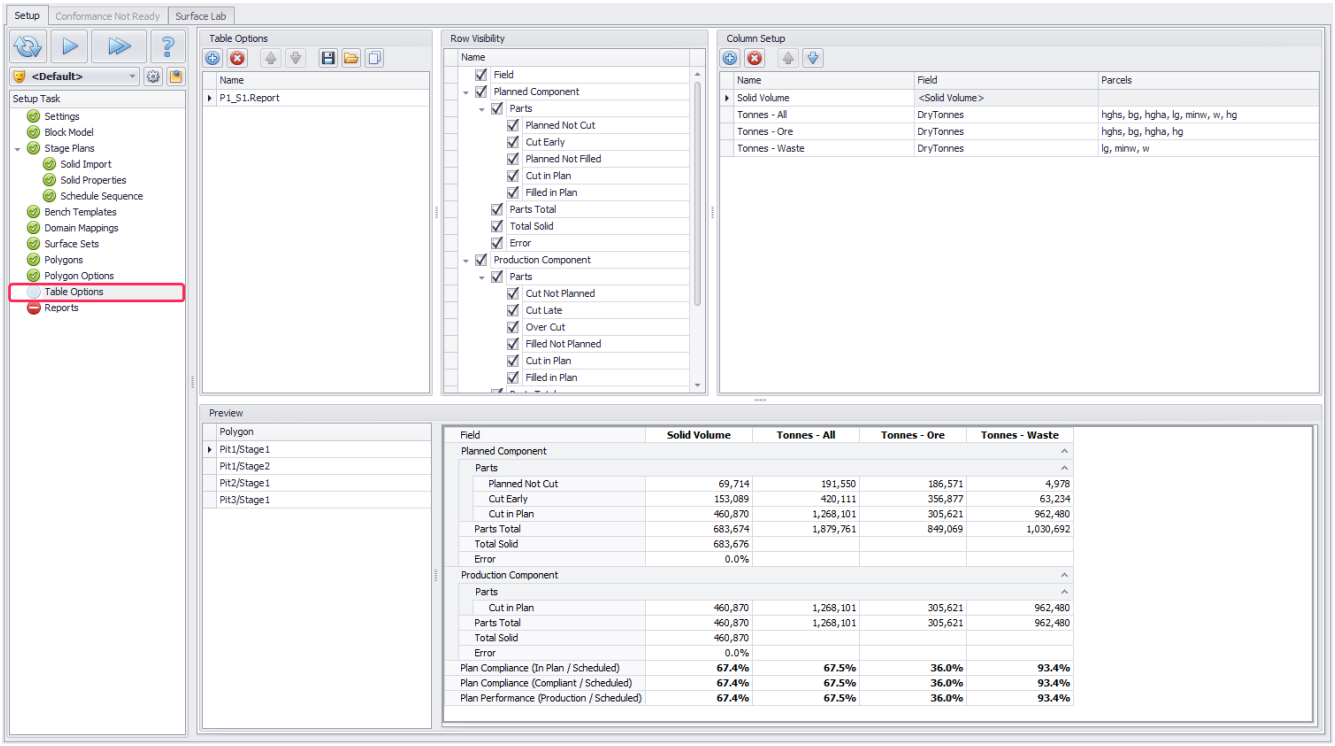
8.1.3. Polygon-Specific Visibility Settings

Several additional items can be displayed or hidden to help digest the conformance result. The items specified are specific to the selected Polygon.

Setting	Description
Layers	Layers loaded here will be part of the Viewpoint image. An elevation offset can be specified to raise or lower the layer.
Surfaces	The surface set layers are used for the selected polygon. The surface will be part of both the Viewpoint and Cross-Section images if enabled.
Domains	The individual domain solids generated from the intersection of the production and schedule solids. If enabled, solid will be part of both the Viewpoint and Cross-Section images.

9. Table Options

Conformance results displayed in a Table Report are configurable in the **Table Options** step. The configuration options are detailed below.



9.1.1. Row Visibility

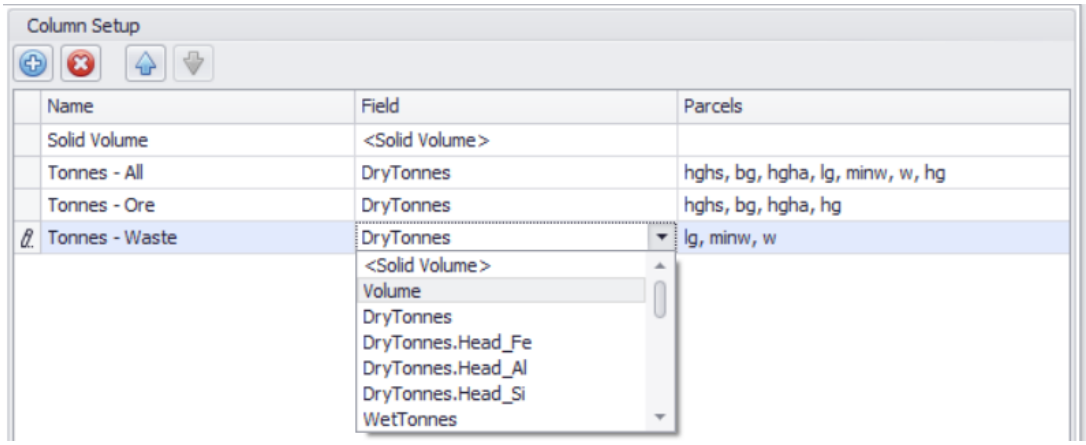
In the Row Visibility panel all reportable fields are listed, which can be toggled on or off. If the field is toggled off, it will not appear as a report row. Descriptions of the fields reporting conformance values are outlined below.

Value Field	Description
Planned Component / Production Component > Parts > Domain Category	The column value (Volume, Tonnes) that is associated with the domain solid.
Parts Total	The sum of the individual domain solids for the specified column (Volume, Tonnes)
Total Solid	The volume of the **initial** solid generated from the start and end surfaces. The initial solid is before any error, or simplification processes are performed.
Error	The difference in solid volume between the Total Solid and Parts Total → *Error = 1 - (Parts Total / Total Solid)*
Plan Compliance (In Plan / Scheduled)	Cut in Plan Solid Volume / Planned Parts Total Solid Volume
Plan Compliance (Compliant / Scheduled)	Solid Volume of domains marked as “Conformant” / Planned Parts Total Solid Volume
Plan Performance (Production / Scheduled)	Production > Parts Total Solid Volume / Planned Parts Total Solid Volume

- Please note the name of the three compliance fields may differ if they have been renamed in the Settings step.

9.1.2. Column Setup

The default report column for a report is the Solid Volume; however, if block models have been set up within the model, it is possible to report against these fields. In addition, a parcel filter can also be applied to the report column.

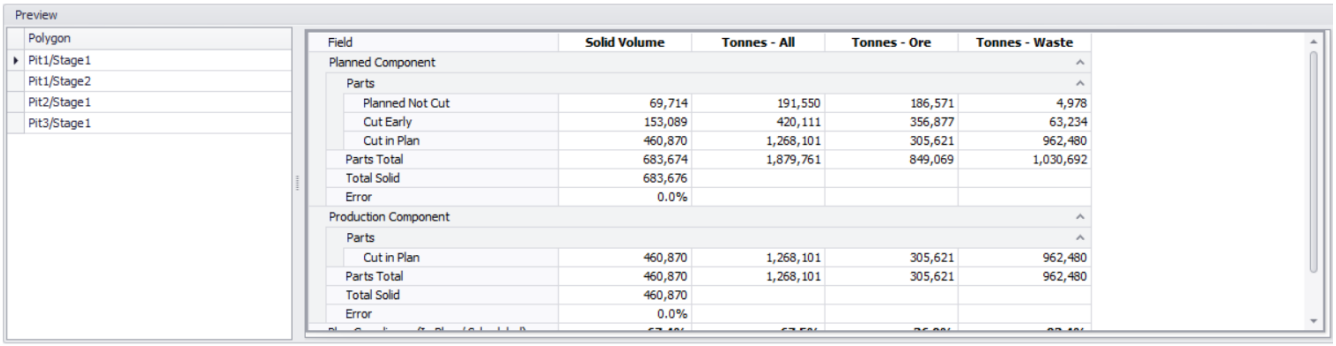


Creating a Report Column

1. Select the blue plus button in the **Column Setup** toolbar.
2. Give the report column a name.
3. Select the field to report against.
4. Select applicable parcels.

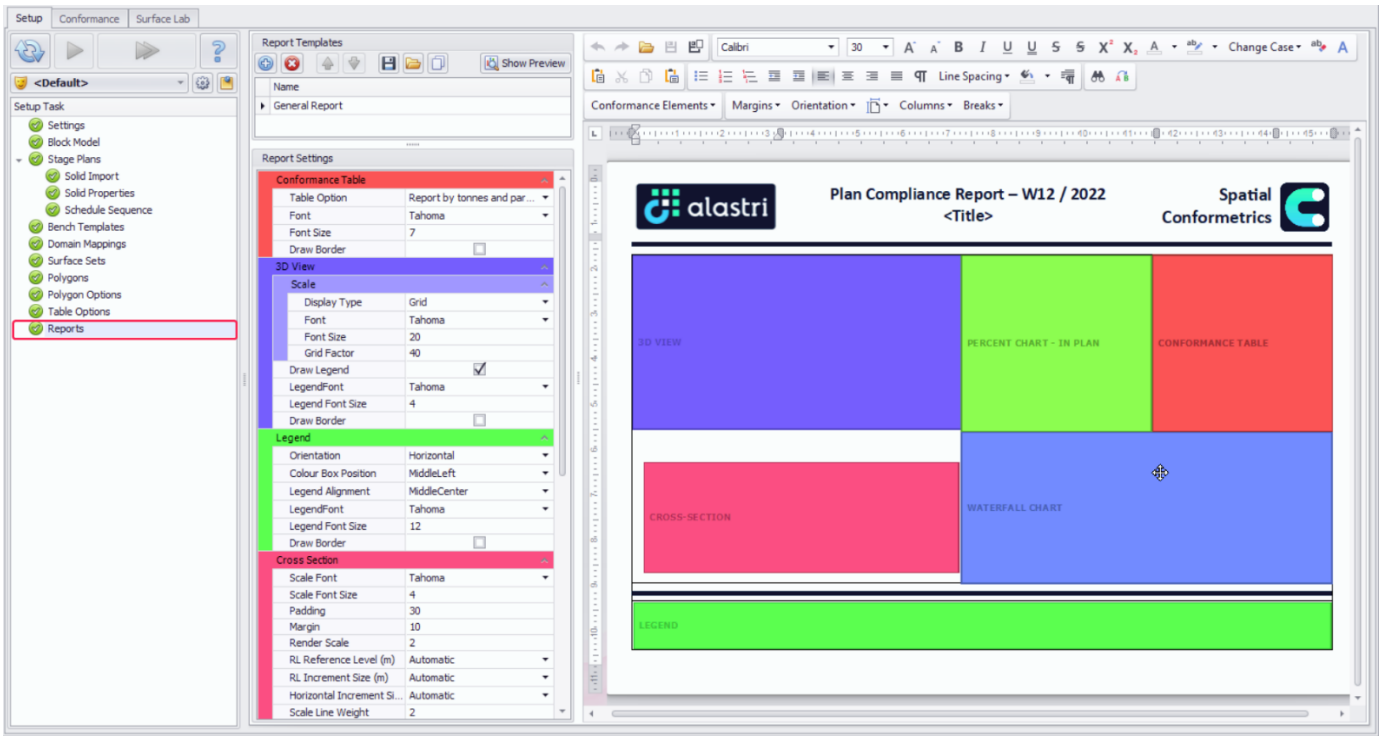
9.1.3. Preview

In the **Preview** panel, a preliminary version of the report for the select polygon can be viewed.



10. Reports

In Spatial Conformetrics, it's possible to export a report containing visual and numeric conformance data. The layout of these reports can be configured in the **Reports** step.

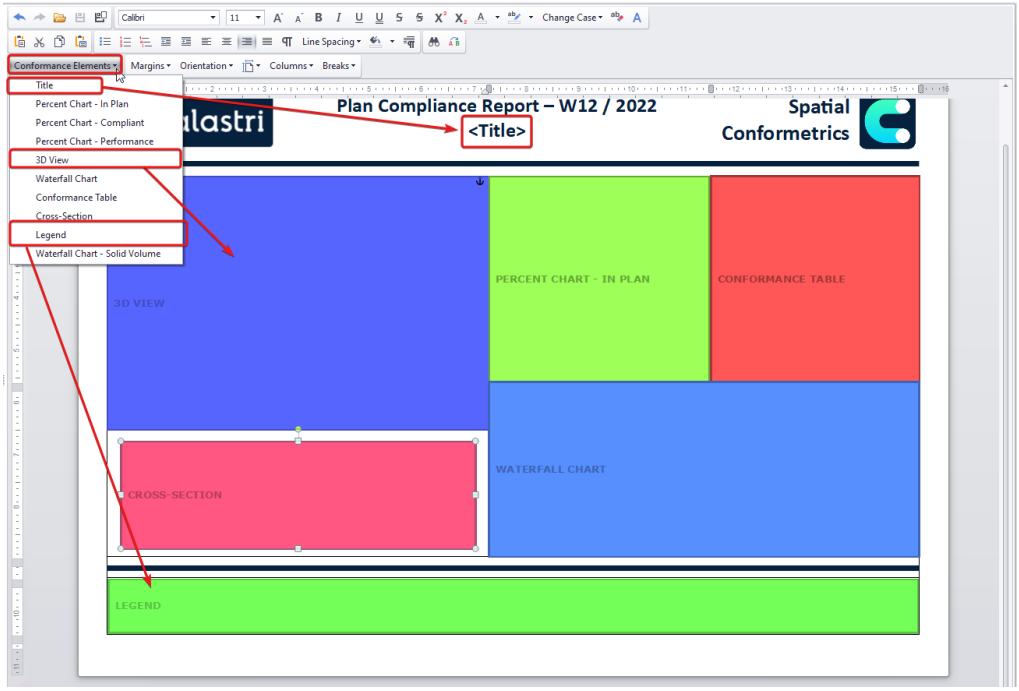


10.1.1. Conformance Elements

The layout of the report can be configured in the document editor on the right-hand side of the UI.

The footprint of each item that will be displayed on the report page is displayed and is editable.

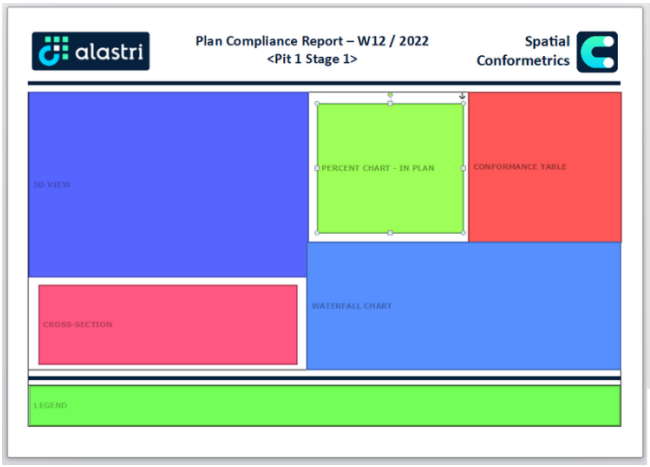
Report items can be added through the **Conformance Elements** drop-down menu located in the toolbar.

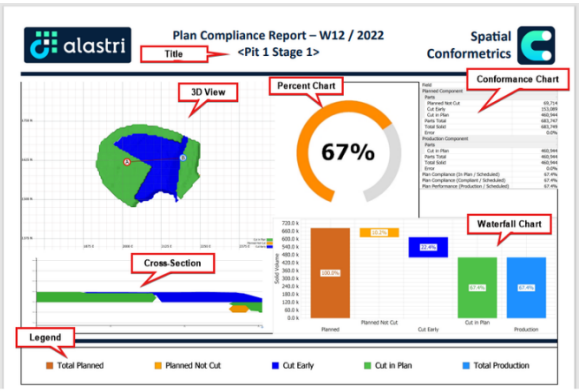


A description of the elements which can be added can be found below.

Element	Description
Title	The name of the Conformance Polygon, i.e., Alastri/Pit1.
Percent Chart - In Plan	The "In Plan" conformance score is shown as a percent chart.
Percent Chart - Compliant	The "Compliant" conformance score is shown as a percent chart.
Percent Chart - Performance	The "Performance" conformance score is shown as a percent chart.
3D View	The saved Viewpoint for the conformance Polygon.
Waterfall Chart	The solid volume associated with each conformance domain is shown as a waterfall graph.
Conformance Table	A table report configured in the Table Options step.
Cross-Section	The saved Cross-Section view for the conformance Polygon.
Legend	A legend displaying the conformance domain names and their associated color.

- Drag and resize the elements to configure the report as desired.
- Type in your report <Title>.
- Optionally, make any other settings, such as font, its colour and size, indents, margins, orientation etc, similar to any standard text editor.





10.1.2. Report Settings

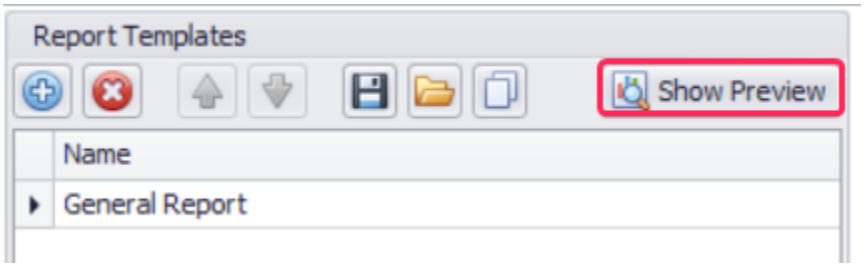
Several Report Settings are available to be configured to help configure the report. These settings are outlined below.

Item	Description
Conformance Table	
Table Option	Which table report to display in the report.
Font	The font of the text that will appear in the report.
Font Size	The size of the text that will appear in the report.
Draw Border	Enable to display a border around the table report.
Show Unused Items	Enable to display in the report items that are present in the project but are not used.
3D View	
Display Type	Grid → A grid will be displayed behind the image. Scale → A scale will be displayed showing the ratio of the distance on the image to the corresponding distance on the solid. None → Only the image will appear in the report.
Font	Font of any text displayed as part of the image.
Font Size	The size of the text that will appear in the image.
Grid Factor	A factor to adjust the Grid Size if the Display Type has been set to Grid.
Draw Legend	Enable to display the conformance domain names and their associated color.
Legend Font	Font of the text displayed in the legend.
Legend Font Size	The size of the text displayed in the legend.
Draw Border	Enable to display a border around the image.
Legend	
Orientation	The orientation of the text displayed in the legend.
Colour Box Position	The position of the color box relative to the legend text.
Legend Alignment	The relative position of the legend within the footprint of the legend box defined the report layout.
Legend Font	Font of the text displayed in the legend.
Legend Font Size	The size of the text displayed in the legend.
Draw Border	Enable to display a border around the legend.
Cross-Section	
Scale Font	Font of the text displayed on the scale.
Scale Font Size	The size of the text displayed on the scale.
Padding	Spacing between elements in the cross-section image.
Margin	Spacing between elements and the edge of the cross-section image.
Render Scale	Relative size of rendered elements in the cross-section image
RL Reference Level (m)	The elevation at which the vertical scale of the cross-section starts.
RL Increment Size (m)	The distance between marked increments on the vertical scale of the cross section.
Horizontal Increment Size (m)	The distance between marked increments on the horizontal scale of the cross section.
Scale Line Weight	Thickness of the drawn scale.
Pit Line Weight	Thickness of the pit surface's drawn cross-section.
Level Line Weight	Thickness of the level lines drawn at RL increments.
Level Line Opacity (%)	
Draw Border	Enable to display a border around the legend.
Waterfall	
X-Axis Font	The font of the text displayed on the X-Axis.
X-Axis Font Size	The size of the font displayed on the X-Axis.
Y-Axis Font	The font of the text displayed on the Y-Axis.
Y-Axis Font Size	The size of the font displayed on the Y-Axis.
Bar Label Font	The font of the text displayed inside the graph bar.
Bar Label Font Size	The size of the font displayed inside the graph bar.
Show Title	Enable to display the title on the X-Axis

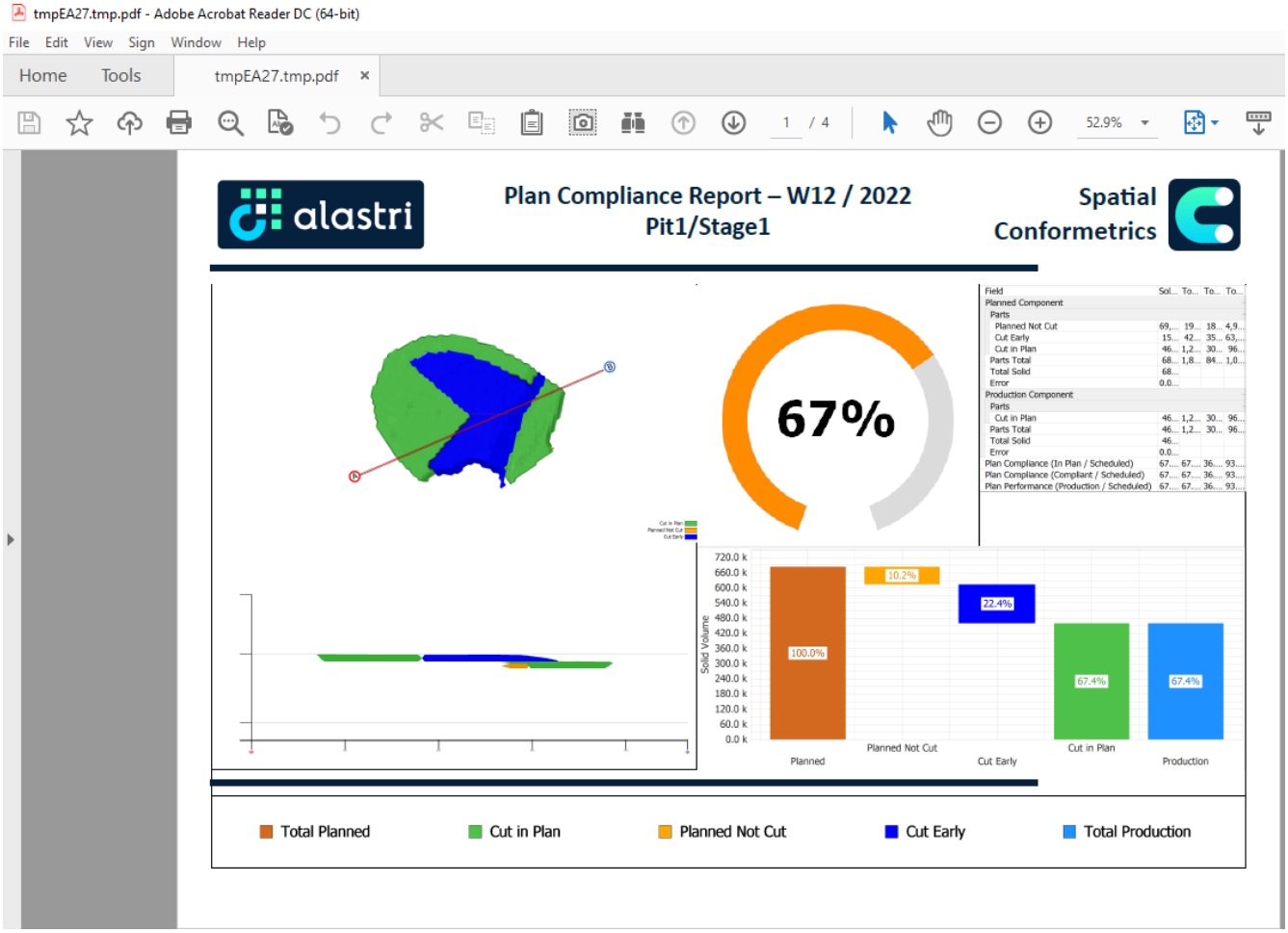
Draw Series Label	Enable to display “Data Labels” and make the chart easier to understand.
Show X Labels	Enable to display labels along the X-Axis.
Show X Grid Lines	Enable to show gridlines along the X-Axis.
Show Y Labels	Enable to display labels along the Y-Axis.
Show Y Grid Lines	Enable to show gridlines along the Y-Axis.
Draw Border	Enable to display a border around the waterfall graph.
Percent Chart	
Low Color	The color of the chart if the conformance score is considered Low.
Low Threshold	If the conformance score is less than this value, the Conformance score is considered Low, and the Low color will be used.
Medium Color	The color of the chart if the Conformance score is considered Medium. The Conformance will be classified as Medium if the score is between the High and Low threshold holds.
High Threshold	If the conformance score is greater than this value, the Conformance score is considered High, and the High color will be used.
High Color	The color of the chart if the conformance score is considered High.
Draw Border	Enable to display a border around the chart.

10.1.3. Report Preview

Once the report has been configured, it is possible to review it visually before moving on. This can be achieved by selecting the **Show Preview** button located in the **Reports Template** panel.



After generating the configured report will show up as PDF document, that you can save or print as desired, using standard Adobe Acrobat Reader tools.

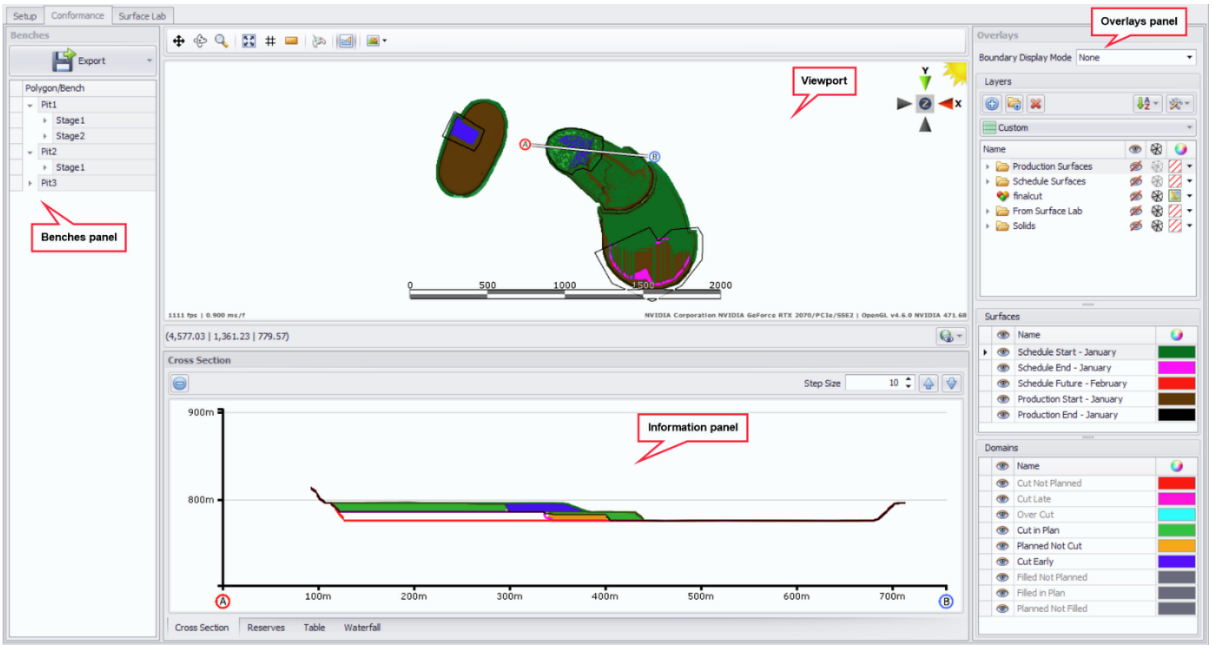

tmpEA27.tmp.pdf - Adobe Acrobat Reader DC (64-bit)
File Edit View Sign Window Help
Home Tools
tmpEA27.tmp.pdf
1 / 4
52.9%
alastri
Plan Compliance Report – W12 / 2022
Pit1/Stage1
Spatial
Conformetrics
67%
Solid Volume
720.0 k
660.0 k
600.0 k
540.0 k
480.0 k
420.0 k
360.0 k
300.0 k
240.0 k
180.0 k
120.0 k
60.0 k
0.0 k
100.0%
10.2%
22.4%
67.4%
67.4%
Planned
Planned Not Cut
Cut Early
Cut in Plan
Production
Total Planned
Cut in Plan
Planned Not Cut
Cut Early
Total Production

Conformance tab

Once you finish your conformance project setup, populating all the data required and running all the steps, the **Conformance** tab becomes available.

In this tab, you can review site conformance, display pit benches and dump lifts of interest, view and configure custom reports, export conformance data in various formats.

The **Conformance** tab consists of four main parts, some of which include additional tabs and panels. For a detailed description of each, see below.



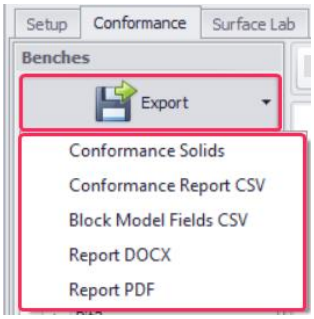
10.1.4. Benches and Export panel

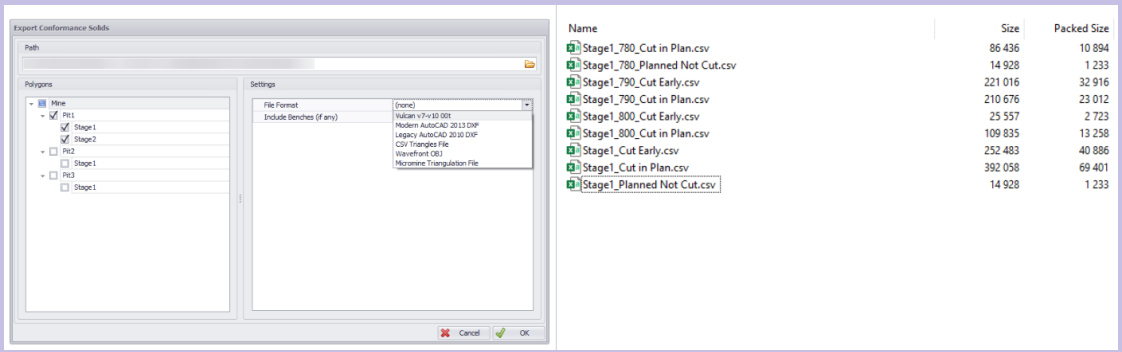
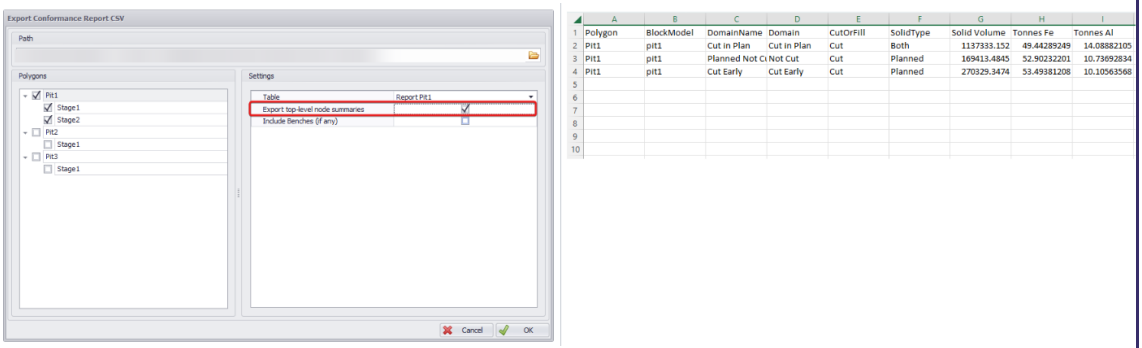
The Benches panel contains a tree structure listing all polygons/benches in a certain order, i.e. Pit - Stage - Bench.

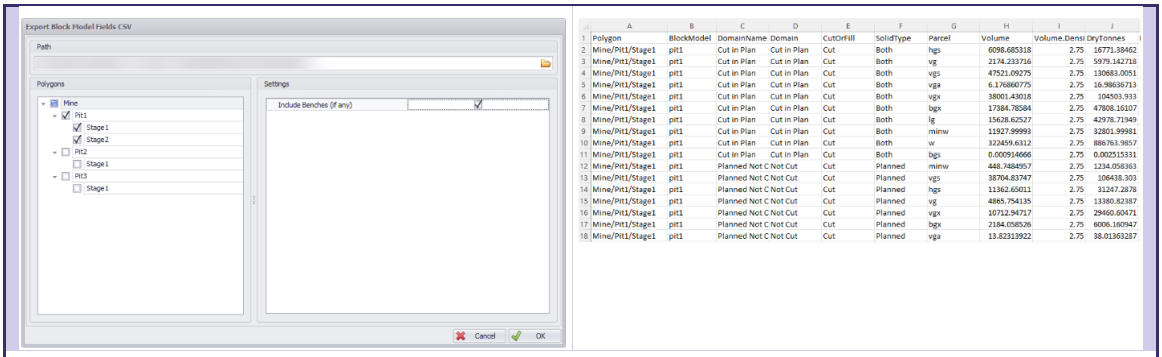
- By selecting a record, its polygons will display in the **Viewport**.
- You may select the whole pit or stage by clicking on it.
- Use <CTRL> and <SHIFT> hotkeys to select multiple benches.
- Double click on the tree level to zoom to its polygon in the **Viewport**.

10.1.4.1. Export Options

Different Export options are available by selecting the **Export** button located in the **Benches** panel.

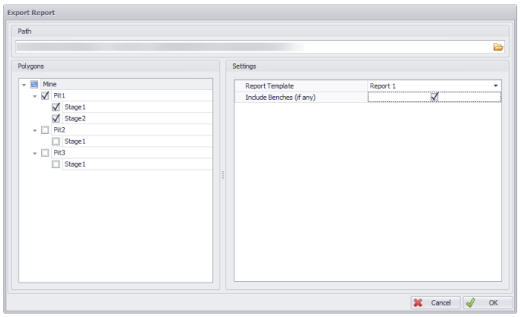


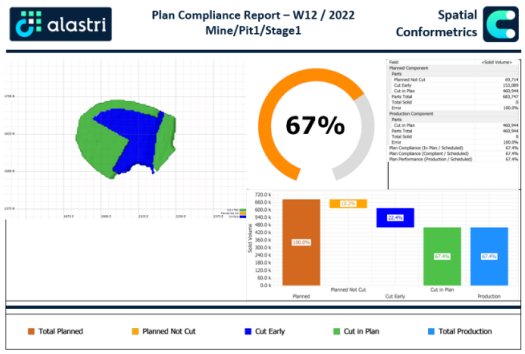
Export Option	Example and Result
Conformance Solids	1. Specify the output path and file name. 2. Flag the Stages to be included in the export. 3. Select the required file format. 4. Flag **Include benches (if any)** to include separate report for each bench of the stage *. 1. If **Include Benches** is unticked, the pdf generated will have one report for the whole Stage. 5. Open the generated file and review the results. 
Conformance Report CSV	1. Specify the output path and file name. 2. Flag the Stages to be included in the export. 3. Select the relevant Table. 1. The exported report will contain all the rows and fields as specified for the selected Table Option. 4. Flag **Include benches (if any)** to include separate report for each bench of the stage *. 1. If **Include Benches** is unticked, the pdf generated will have one report for the whole stage. 5. You can also export the conformance data for combined polygons. Conformance data from individual polygons will be aggregated based on the top-level name. In the screenshot below, the top-level names are ‘Pit1’ and ‘Dump’. To export the data using this logic, ‘Export top-level node summaries’ must be enabled in the Export Conformance Report CSV dialog. 6. Open the generated file and review the results. 
Block Model Fields CSV	1. Specify the output path and file name. 2. Flag the Stages to be included in the export. 3. Flag **Include benches (if any)** to include separate report for each bench of the stage *. 1. If **Include Benches** is unticked, the pdf generated will have one report for the whole stage. 4. Open the generated file and review the results.



Report DOCX/PDF

1. Specify the output path and file name.
2. Flag the Stages to be included in the export.
3. Select the relevant Report Template.
    1. The exported report will contain all the settings as specified for the selected Report Template (more details see here).
4. Flag **Include benches (if any)** to include separate report for each bench of the stage *.
    1. If **Include Benches** is unticked, the pdf generated will have one report for the whole stage.
5. Open the generated file and review the results.





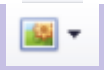
10.1.5. Viewport

The **Viewport** provides a graphical representation of all the 3D conformance solids of Reserves and Dumps on your mine site. The user can select the levels to be displayed (pit/stage/bench), switch to the display of dumps or open pits, display or hide schedule and production surfaces, zoom in to one or multiple solids, etc.

Toolbar

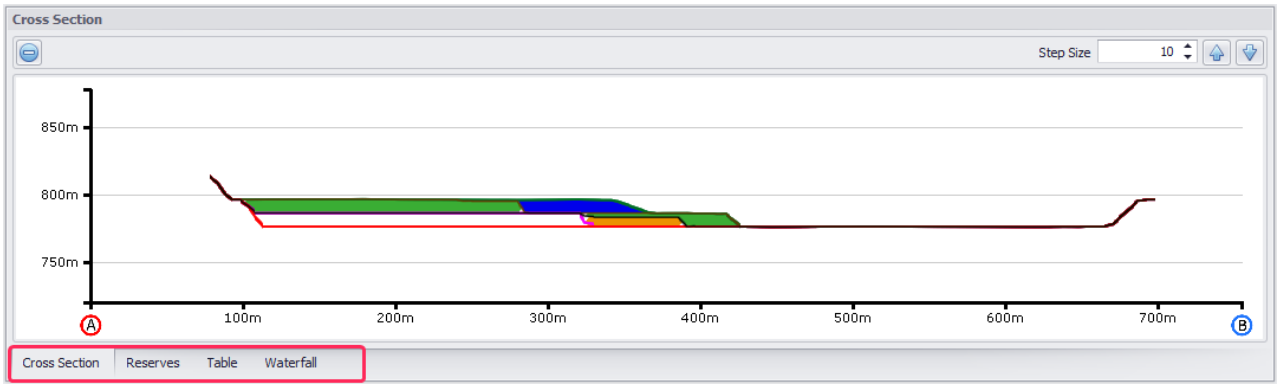
The toolbar is provided on top of the **Viewport**. Use these tools to see and interact with the 3D design area.

Icon	Description
Pan	Middle click and drag
Rotate	Right click and drag
Zoom	Scroll wheel

Zoom to All		Left click to Zoom to all
Grid		Display a grid in the viewport. ➢ Note that the grid is only displayed in the top view. If the grid is not displayed, then you are working in a different plane. Press the "Z" icon on the compass to return to the top view.
Ruler		Draw a measurable distance in the viewport
Place Drone		Places a drone into the Viewport which can be flown around. <Q>, <E> keys rotate drone; <A>, <W>, <S>, <D> keys move drone; <CTRL> key: lowers drone. Space bar: raises drone.
Cross-Section		Drag and rotate in the viewport to define the breadth and bearing of the section plane.
Capture Screenshot		Save the viewport capture in a suitable resolution for later reference in reports or presentations.

10.1.6. Information panel

The Information panel is the main area to review Polygons and Reserve information, interact with Cross-section tool, review charts, and configure and export Reports.

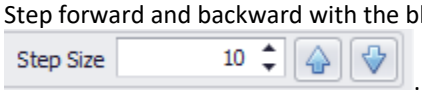


11.1.3.1 Cross-Section tab

Click in the Cross-Section panel tab to view cutaways of the conformance solids.

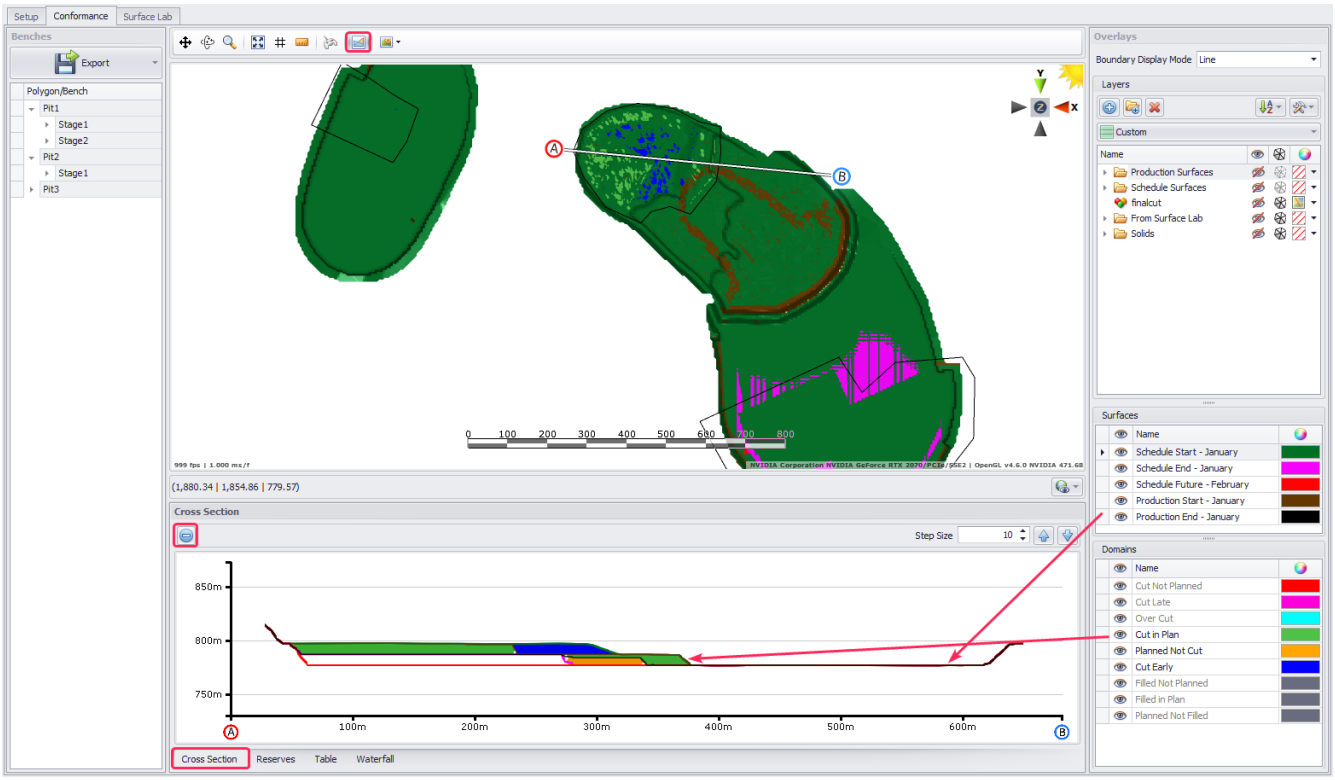
1. Press the cross-section icon from the top toolbar to begin  .
2. Click and hold the left mouse button inside the top viewport and move the cross-section arrow across the selected polygon.
    a. middle click to pan,
    b. scroll wheel to zoom,
    c. <CTRL> + scroll to vertically exaggerate.
3. To reset the cross-section line, simply click in the desired location and start stretching the A<-->B line, or click the minus icon  in the upper left corner of the bottom panel.
4. Zoom, pan and vertically exaggerate the view inside the **Cross-Section** panel.

5. Step forward and backward with the blue up/down arrow icons in the Cross-Section panel



.

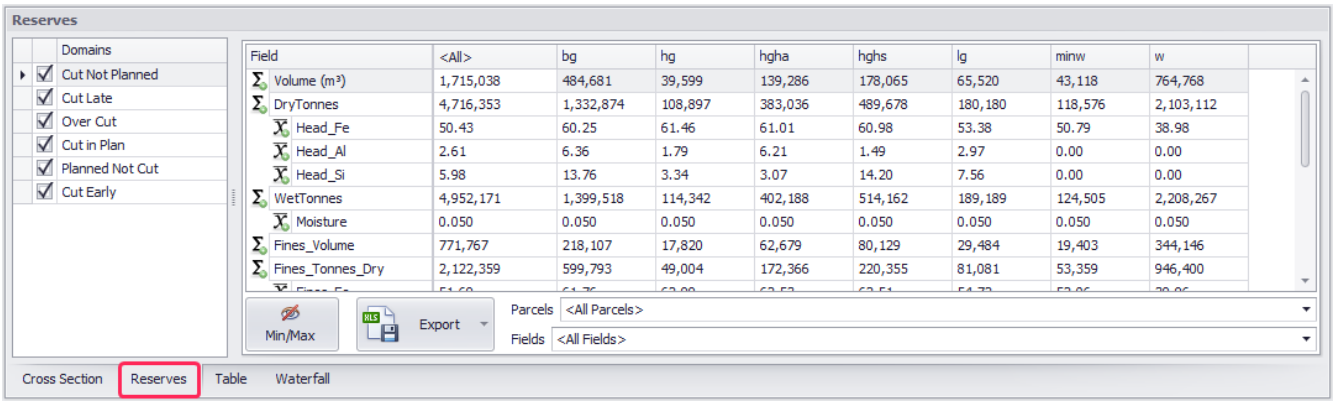
6. Toggle layers in the **Surfaces** and **Domains** panels to display different Production or Schedule surfaces or Domains.



11.1.3.2 Reserves tab

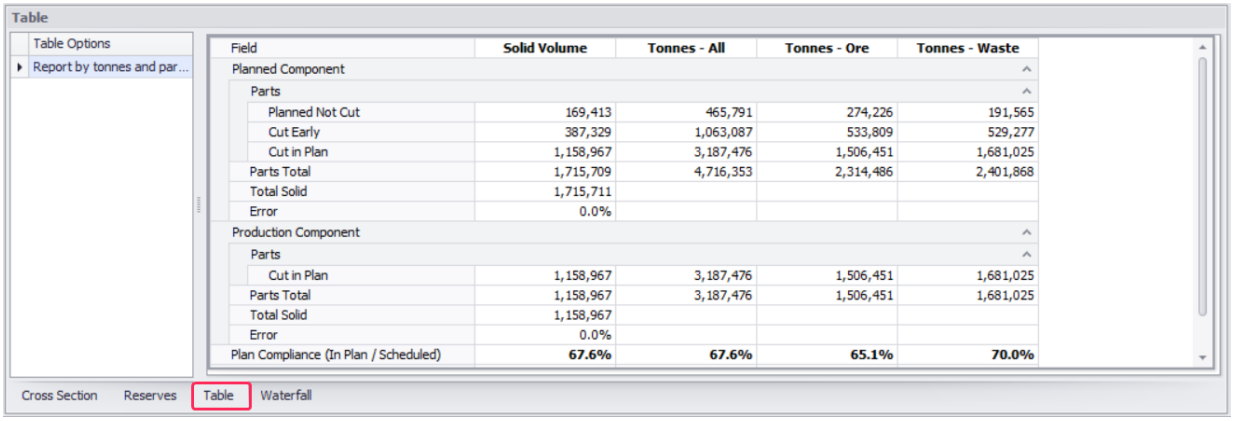
Open the Reserves panel to compare the actual and scheduled reserves.

1. In the **Domain** list, use the checkboxes to show and hide different reserves groups.
2. In the **Parcels** dropdown, toggle parcels you wish to display in the top row.
3. In the **Fields** dropdown, toggle fields you wish to display in the left list.
4. Use the **Min/Max** toggle to inspect the data for missing or rubbish values.
5. Use the **Export** button to export Reserves data to Excel, Text or CSV format.



11.1.3.3 Table tab

The Table tab is where you can review the reports configured in the Table Options step. Configured reports will appear in the Table panel.

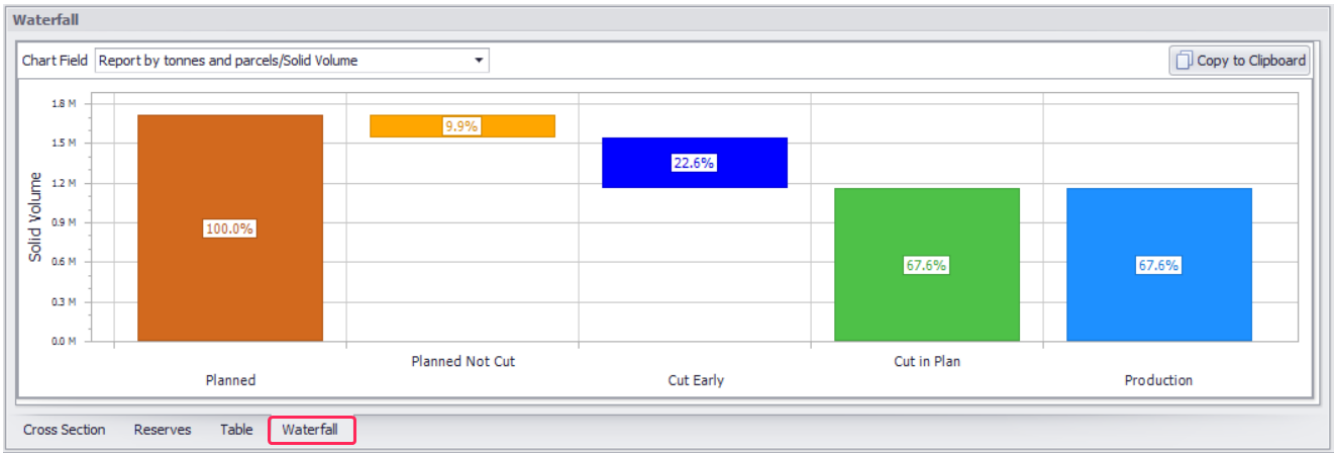


Field	Solid Volume	Tonnes - All	Tonnes - Ore	Tonnes - Waste
Planned Component				
Parts				
Planned Not Cut	169,413	465,791	274,226	191,565
Cut Early	387,329	1,063,087	533,809	529,277
Cut in Plan	1,158,967	3,187,476	1,506,451	1,681,025
Parts Total	1,715,709	4,716,353	2,314,486	2,401,868
Total Solid	1,715,711			
Error	0.0%			
Production Component				
Parts				
Cut in Plan	1,158,967	3,187,476	1,506,451	1,681,025
Parts Total	1,158,967	3,187,476	1,506,451	1,681,025
Total Solid	1,158,967			
Error	0.0%			
Plan Compliance (In Plan / Scheduled)	**67.6%**	**67.6%**	**65.1%**	**70.0%**

- The settings in **Setup** > **Settings** > **Options** may cause greater or lesser degrees of accuracy in the solid calculations.
- Each scheduled component in the Report table contains an Error row — the greater the error, the lower the accuracy of the result.
- Aim to keep Error-values lower than 1%. This can be achieved with tighter reserving grid sizes and lower minimum height thresholds.

11.1.3.4 Waterfall tab

Open the **Waterfall** tab to see the Conformance chart for the selected report and mine level.

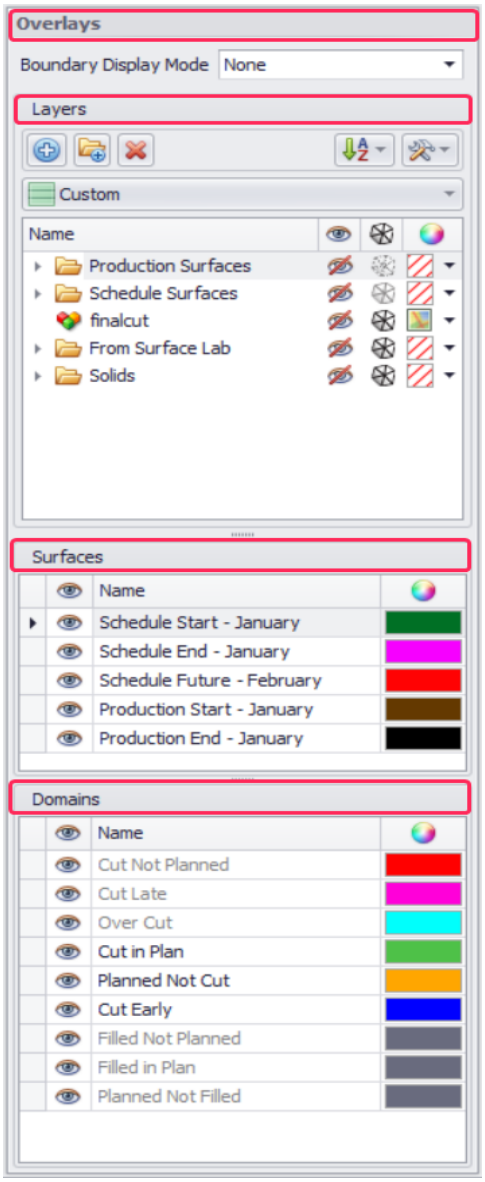


1. Select polygon/bench from **Benches** panel to display a chart for it. You can select single RL or multiple using <CTRL> and <SHIFT> keys.
2. Use the **Chart Field** dropdown to select data to display (will be shown on the left).
3. Hover the mouse cursor over bars to see detailed information.
4. Press **Copy** to Clipboard button to save the current chart view.

- The left "Planned" component is always 100%: it consists of “Cut in Plan” + “Cut Early” + “Planned not Cut”.
- The right "Production" component is the ratio of (Cut / Scheduled). It consists of “Cut Late” + “Cut Not planned” + “Cut Later”.
- The subtotals of each "Plannede" and "Production" component are shown in the waterfall from left to right.

10.1.7. Overlays panel

The Overlays panel is used to work with layers, surfaces, and domains.



Layers section

The top **Layers** panel is common for all Alastri apps and is used to add and toggle various layers. Full description of its functions, see in the section 6.1.3 Working with surfaces in the **Layers** panel and the following.

Surfaces section

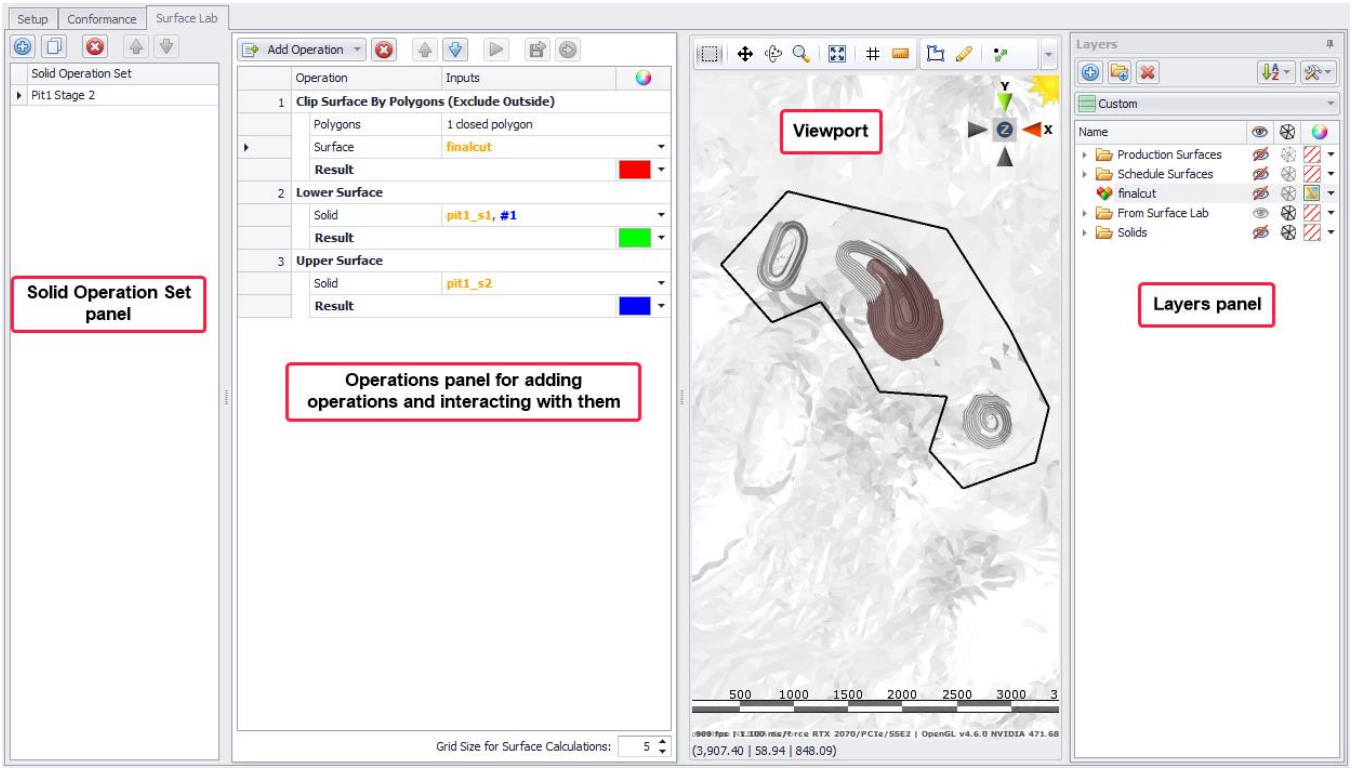
The Surfaces panel is used to toggle surfaces to display in the viewport. These surfaces and their colours are configured in the Surface Sets setup step.

Domains section

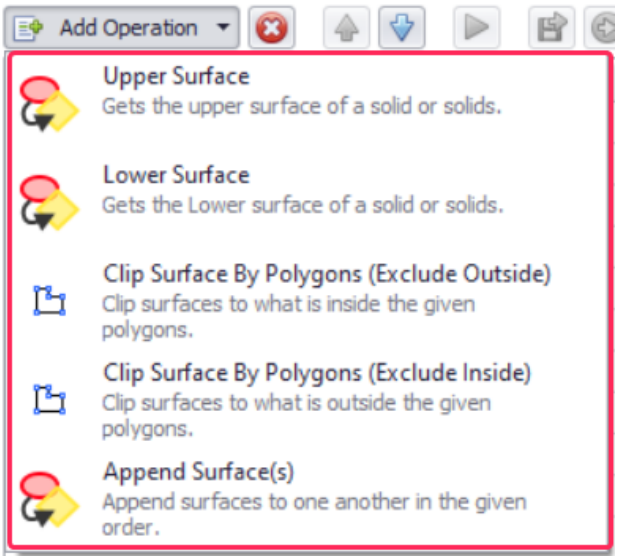
The **Domains** panel is used to toggle domains to display in the viewport. These domains and their colours are configured in the **Domain Mapping** setup step.

Surface Lab tab

Surface Lab tab in Spatial Conformetrics software is used to add operations for working with your mine plan. It is similar to the **Solids Lab** tab in Rapid Reserver, but has much less Operation options, that can be added.



1. In the **Solid Operation Set** panel on the left, create a new operation set with a descriptive name indicating what this set is expected to create.
2. In the **Operations** panel a series of Boolean operations is added to create a final outcome. Organising the creation of the final files in sets displays a high degree of transparency in what files were used to create the final solid allowing ease of error trapping.
    a. Click the **Add Operation** button to display a list of the available operations. Each operation performs a single boolean step and a number of these steps are used in concert to create the final result.



Operations from **Add Operation** dropdown are described in table below.

Operation	Description
Upper Surface	Gets the upper surface of solid(s). An open surface is created of the upper part of the input solid(s).
Lower Surface	Gets the lower surface of solid(s). An open surface is created of the lower part of the input solid(s).
Clip Surface by Polygon (Exclude Outside)	Intersect a surface with a polygon(s). Clips surfaces to what is inside the given polygons. This can be digitised in graphics or imported. Exclude the outside.
Clip Surface by Polygon (Exclude Inside)	Outersect a surface with a polygon(s). Clips surfaces to what is outside the given polygons. This can be digitised in graphics or imported. Exclude the inside.
Append Surfaces	Append surfaces to one another in the given order.

Besides **Add Operations** button **Operations** panel also contains icons to delete operations, move up/down, run and save results to the file or Layers panel.

See the detailed description of these icons in the table below.

Icons	Symbol	Description
Red X		Remove highlighted Operation
Up / Down arrows		Reorder operations by moving highlighted set up/down the list
Blue triangle (Play sign)		Run selected operations
Save Disc		Save the result of the selected operation to a file
Green Arrow		Save the result of the selected operation to the **Layers** panel

Attachments.

Attachment 1 – Block Model Custom Variables

Sometimes we want to map a block model field that isn't coded in the original block model. Custom variables allow us to write complex logic in a readable and reusable way, which can then be mixed with other inline formulas in the block model mappings.

Dry Tonnes

```
using System;
using System.Collections.Generic;
using System.Text;
using System.Linq;
using Alastri.Scripting;
using Alastri.BlockModel.Engine.CustomVariables;

public class DryTonnes : IDoubleCustomVariable
{
   public double GetNumber(CustomVariablesContext context)
   {
      double density = context.N("DENSITY");

      double volume =
context.N("XINC")*context.N("YINC")*context.N("ZINC");

      return (density > 0 ? density * volume : 0);
   }
}
```

Grade Bins

```
using System;
using System.Collections.Generic;
using System.Text;
using System.Linq;
using Alastri.Scripting;
using Alastri.BlockModel.Engine.CustomVariables;

public class Parcel : ITextCustomVariable
{
   public string GetText(CustomVariablesContext context)
   {
      double fe = context.N("fe");

      if(fe > 60)       return "hg";
      else if(fe > 58)   return "mg";
      else if(fe > 57.5) return "lg1";
      else if(fe > 56)   return "lg2";
      else if(fe > 50)   return "minw";
      else               return "w";
   }
}
```

Multiple Grade Bins

```
using System;
using System.Collections.Generic;
using System.Text;
using System.Linq;
using Alastri.Scripting;
using Alastri.BlockModel.Engine.CustomVariables;

public class Parcel : ITextCustomVariable
{
   public string GetText(CustomVariablesContext context)
   {
      double fe = context.N("fe");
      double al = context.N("al");
      string geology = context.T("geology");

      string fe_bin;

      if(fe > 60)
      {
          fe_bin = "60";
      }
      else if(fe > 55)
      {
         fe = Math.Floor(fe);
         fe_bin = fe.ToString("#,##0");
      }
      else
      {
        fe_bin = "50";
      }

      string al_bin;

      if(al < 3)
```

Ore Ratio

Spatial Conformetrics block model fields cannot report Stripping Ratio, because Stripping Ratio is not a sum or weight average type field. Instead, we can report ore ratio, which is the weight average of ore tonnes over total tonnes.

To do this we can set up a weight-averaged field called OreRatio as a child of "dryTonnes" or "wetTonnes" (whichever you want to report). This field will report a "1" for ore and a "0" for waste. The weight average of the 1s and 0s across a blast becomes the ore ratio.

```
using System;
using System.Collections.Generic;
using System.Text;
using System.Linq;
using Alastri.Scripting;
using Alastri.BlockModel.Engine.CustomVariables;

public class OreRatio : IDoubleCustomVariable
{
   List<string> ores = new List<string>(){ "hg", "mg", "lg" }; //all lower
case

   public double GetNumber(CustomVariablesContext context)
   {
      string matType = context.T("mattype").ToLower(); //material type
field from original block model

      bool isOre = ores.Any(ore => matType.StartsWith(ore));
```

```
      {
        al_bin = "3";
      }
      else if(al < 6)
      {
        al = Math.Ceil(al);
        al_bin = al.ToString("#,##0");
      }
      else
      {
       al_bin = "9";
      }

      string geoClass = "1";
      if(geology.Equals("detrital", StringComparison.OrdinalIgnoreCase))
      {
        geoClass = "2";
      }

      return fe_bin + "_" + al_bin + "_" + geoClass;
    }
}
```

```
      if(isOre) return 1;
      else return 0;
    }
}
```

Multiple Custom Variables

To create multiple custom variables, a class implementing the IDoubleCustomVariable or ITextCustomVariable interface needs to be created for each variable. These classes need to be listed under one another in the Custom Variables Script Editor, as shown in the examples below

.

```
using System;
using System.Collections.Generic;
using System.Text;
using System.Linq;
using Alastri.Scripting;
using Alastri.BlockModel.Engine.CustomVariables;

public class Parcel : ITextCustomVariable
{
   public string GetText(CustomVariablesContext context)
   {
      double fe = context.N("fe");

      if(fe > 60)       return "hg";
      else if(fe > 58)  return "mg";
      else if(fe > 57.5) return "lg1";
      else if(fe > 56)  return "lg2";
      else if(fe > 50)  return "minw";
      else              return "w";
   }
}

public class DryTonnes : IDoubleCustomVariable
{
   public double GetNumber(CustomVariablesContext context)
   {
      double density = context.N("DENSITY");

      double volume =
context.N("XINC")*context.N("YINC")*context.N("ZINC");

      return (density > 0 ? density * volume : 0);

   }
}
```

Multiple variables with shared logic

```
using System;
using System.Collections.Generic;
using System.Text;
using System.Linq;
using Alastri.Scripting;
using Alastri.BlockModel.Engine.CustomVariables;

//block model 1 has a "parcel1" variable
public class Parcel1 : ITextCustomVariable
{
   public string GetText(CustomVariablesContext context)
   {
      string parcel = context.T("mtype"); //block model 1 field
      return ParcelResolver.Parcel(parcel);
   }
}

//block model 2 has a "parcel2" variable
public class Parcel2 : ITextCustomVariable
{
   public string GetText(CustomVariablesContext context)
   {
      string parcel = context.T("ioretype"); // block model 2 field
      return ParcelResolver.Parcel(parcel);
   }
}

//parcel logic is wrapped up in the static ParcelResolver class
public static class ParcelResolver
{
   private static List<string> _oreList = new List<string>
   {
      "hg", "hg1", "bl1", "mg", "lg", "lg1", "lg2", "mw"
   };

   public static string Parcel(string parcel)
   {
      if(_oreList.Contains(parcel.ToLower())) return "ore";
      else return "waste";
   }
}
```

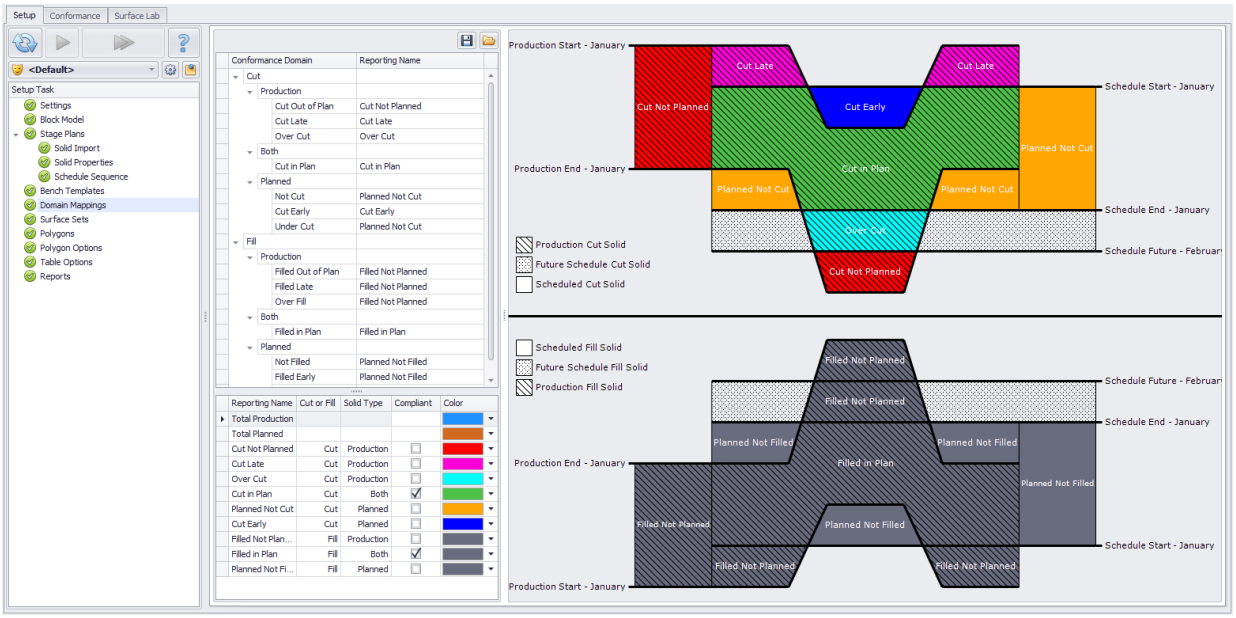
Attachment 2 – Validate Conformance Reserves

To generate conformance solids, the software calculates the intersection of a Production solid and a Schedule solid, then cookie-cuts the results by the boundary polygon of each solid. The resulting volumes are referred to as "conformance domains".

- ✓ Any intersecting volume is "cut in plan".
- ✓ Any production volume outside the schedule boundary is "cut not planned".
- ✓ Any schedule volume outside the production boundary is "planned not cut".
- ✓ Any production volume above or below a schedule solid is "cut late" or "over cut".
- ✓ Any schedule volume above or below a production solid is "cut early" or "under cut".

Different organisations may choose to report these volumes in different buckets, or with different names. The Domain Mappings step allows any conformance domain to be given a reporting name and colour to match company standards.

- ➢ If material is neither mined or scheduled to be mined in the current (or future) period it will not be reported



Conformance Surfaces

Start surfaces and End surfaces are input by the user per polygon in Setup tab > Surface sets step > Properties panel.

Surface	Description
Production Surfaces	A production volume is defined by a Start surface and an End surface. ➢ If the start surface is higher than the end surface, it is a cut volume. ➢ If the end surface is higher than the start surface, it is a fill volume. ➢ If neither surface is higher or lower (because they are equal, or because one is missing), then there is no production volume at this location.
Schedule Surfaces	A scheduled volume is defined by a start surface and an end surface. ➢ If the start surface is higher than the end surface, it is a cut volume. ➢ If the end surface is higher than the start surface, it is a fill volume. ➢ If neither surface is higher or lower (because they are equal, or because one is missing), then there is no scheduled volume at this location.

Schedule Future Surface	A fifth in a list Schedule Future surface may be used to distinguish between over-dig and out of plan movement. This is used to generate two schedule solids: a "planned now" and a "planned later" solid. ➢ Production volumes inside the "planned now" solid are classified as cut in plan. ➢ Production volumes inside the "planned later" solid are classified as over dig. ➢ Production volumes outside both solids are classified as out of plan.
Shared Surfaces	Sometimes it is assumed that the schedule start and the production start are the same surface. If this is the case, leaving the schedule start as blank will automatically set schedule start = production start.

Software Support

Our aim is to give great aftercare and support to all Alastri customers. If you have a problem, try searching by keyword in the online help documentation, asking a question in the user forums, learning from our video tutorials or by contacting an Alastri customer support representative.

Documentation	Extensive online documentation is accessible through the **Help** menu.
Website	Software updates are available at www.alastri.com.au
Video Tutorials	Search for Alastri on www.youtube.com
Contact	Send your support requests to alastrisupport@micromine.com

Sometimes we may link advanced users to preview releases on the Alastri website. It is possible that these unstable versions may crash, and if they do, we ask that you copy down the error message and send it to alastrisupport@micromine.com.