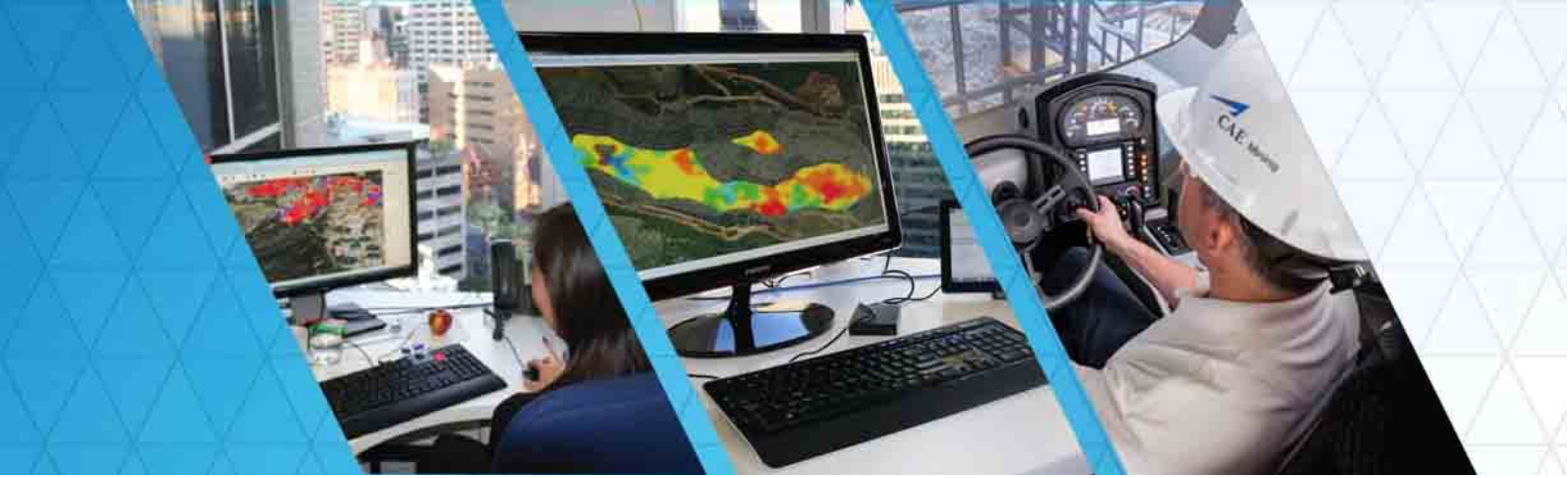


Studio 3

Data Presentation User Guide



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EXECUTIVE SUMMARY

This User Guide outlines the key processes and procedures that are associated with Data presentation including generating professional plots in the **Studio 3** application.

This document is suitable for standalone reference, or as a supplement to a **Studio 3** training course.

Studio 3 provides a wide range of tools for the presentation of exploration, geological modeling and mine planning data. These tools can be grouped into the following categories:

- Plots window: create plot sheets, insert plot items and print plots
- Logs window: create plot sheets, insert plot items and print log sheets
- Window images: save window views to graphics format files
- Datamine Processes: a large selection of plotting processes for generating and printing plots
- Design window plotting: generate and print plans and sections, superimpose plot files

Plots and Log Windows

The preferred environment for graphically creating plot and log sheets. Sheets can be enhanced by inserting and formatting of the following features and more:

- Scale bars
- Legend boxes
- Text boxes
- Arrows
- Images

The plot and log sheets are printed individually or in batches using standard windows printing tools.

All data displayed in the various sheets is automatically updated with any updated data files when a project is opened.

Window Images

Images of the Design, Plots, Logs, and VR window views can be saved to a graphics format file (.emf, .jpg, .tif, or .bmp). These images can then be used in the generation of documents and visual presentations.

Studio Processes

Studio's plotting Processes are primarily used to generate plots from Studio 3 macros and scripts. These processes provide the ability to create and print the following types of plots:

- Plot prototype file
- Scatter, lines, histogram, log, probability, pie chart, 'pp' and 'qq' plots
- Frames, Arrows, titles, text
- Symbols and scaled symbols,
- Contours, strings, annotated perimeters
- Drillholes
- Wireframes and wireframe slices
- Block model sections
- Exporting Plot Data in CAD format for Plotting

Contents

1	Overview	5
	Purpose of this document	5
	Prerequisites	5
	Acronyms and Abbreviations	5
	More information	5
2	Studio 3 Interface	6
	Windows	6
	Toolbars	6
	Control Bars	8
	Menu Bar	9
	Status Bar	9
	Popup Menus	10
3	Drillhole Types	11
	Static Drillholes	11
	Dynamic Drillholes	12
	Static vs. Dynamic Drillholes	12
4	The Plots Window – Overview	14
	The Sheets Control Bar	15
	The Holes Control Bar	16
	Using the Properties Control Bar	17
	Using the Compositor Tool	17
	Window Dependencies	18
5	Viewing Plot Data	19
	Sheets, Projections and Overlays	19
	Plot Sections	20
	The View Settings Dialog (Creating Custom Sections)	23
	Other Toolbars for Viewing Your Plot	26
6	Formatting Plots	30
	Formatting Plots	30
7	Formatting Downhole Columns	32
	Removing Existing Columns	32
	Adding a Lithology Bar	33
	Formatting a Downhole Column Legend	34
	Legends Overview	35
	Adding a Grade Histogram Column	36
	Adding a Second Grade, Text Block and a Line Graph Copy	37
	Other Downhole Column Formatting Options	38
8	Using Display Legends	40
	Legend Categories	40
	Legends Manger	41
	Edit a Legend	42
	Create a New Legend	44
9	Creating Sheets	45
10	Adding Plot Items and Features	49

	Plot Item Properties	49
	Feature Properties	52
	Formatting Objects	53
11	Formatting Log Sheets	54
	Log Sheets Overview	54
	Creating a New Log View	55
	The Log Toolbar	55
	Display Modes	55
	Setting Log View Properties	56
	Formatting the Header and Footer	58
	Formatting Log Columns	59
	Adding and Removing Columns	59
	Formatting Logs vs. Downhole Columns	60
	Adding and Formatting a Depth Axis Column	60
	Formatting Existing Text in Log Columns	61
	Formatting Structural Information Columns	62
	Formatting Existing Log Values As Graphs	63
	Comparing Related Deposit Values Using Histograms	63
	Appendix A: Hints, Common Questions & Issues	65

1 OVERVIEW

Purpose of this document

This document aims to provide an explanation of the key features within **Studio 3** used for presenting electronic data.

A wide range of tools is available for the presentation of exploration, geological modeling and mine planning data. These tools can be grouped into the following categories:

- **Plots** Window: create plot sheets, insert plot items and print plots.
- **Logs** Window: create plot sheets, insert plot items and print log sheets.
- **Visualizer** Replay Files: save normal, animated or dated **Visualizer** window replay views.

Instructions and work process examples are used throughout this user guide to highlight various procedures.

Prerequisites

Some experience of real-world mining techniques and processes would be an advantage, although this document focuses on the usage of the various window interfaces in order to represent real-world data and process results.

It is assumed that the reader has prior knowledge of **Studio 3** and has, at the very least, worked through the online Data Presentation tutorial that is available within the system.

Acronyms and Abbreviations

The following acronyms and abbreviations are used throughout this user guide.

Acronym	Description
DB	Database
DSD	Data Source Drivers
SQL	Structured Query Language
ODBC	Open Database Compliant

More information

For more information on using **Studio 3**, consult your online Help or contact your local CAE Mining representative.

2 STUDIO 3 INTERFACE

The **Studio 3** interface has several distinct areas, most of which can be hidden, moved or customized. The interface can be divided into the following areas:

- Windows
- Toolbars
- Control Bars
- Menu Bar
- Status Bar
- Popup Menus

Windows

Windows provide different views of loaded data as summarized below:

Window	Functions
Design	Design environment for the display and manipulation of data
Visualizer	3D rendered views of data
VR (Virtual Reality)	VR 'immersion' view of data including draping of aerial photos, simulations etc.
Plots	Provides the tools required to create high quality plots in plan, section and 3D views.
Logs	Drillhole log views.
Tables	Table view
Reports	Report view which includes drillhole summary and validation.

Toolbars

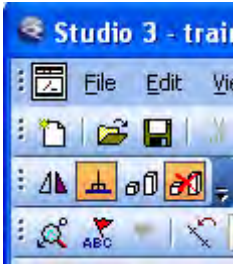
Studio 3 provides access to a wealth of commands via various toolbars, with each toolbar representing a group of commands of a given category. Some toolbars are likely to be used more often than others, and are referred to throughout this tutorial. For example the following toolbar contains buttons pertaining to project management (i.e. open, close, save etc).



Configuring Toolbars

You can configure the **Studio 3** interface in a variety of different ways, from the position and state of toolbars, to the commands each toolbar contains.

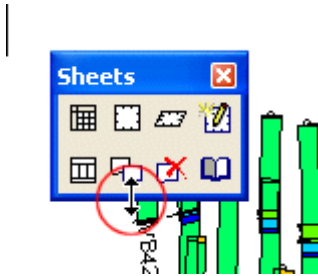
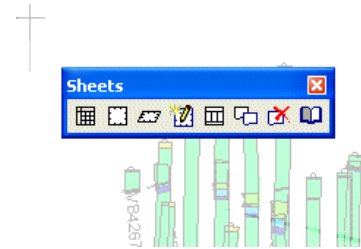
Toolbars can be locked in position around the edges of the interface, or can be dragged away from their 'docked' areas to become a 'floating' toolbar.



Docked toolbars, as shown on the left, can be rearranged within their current zone only, and are floated automatically if they are dragged away from any docking zone.

Docked toolbars will remain docked until floated. You can drag a toolbar by left-clicking and holding on the ridged tab area on the left side of the toolbar, and dragging it to a position away from any dockable area, then releasing the left mouse button.

When floated, toolbars will look similar to the image shown on the right. Floated toolbars, in contrast, can be moved to any position within the **Studio 3** interface (other than over a dockable area, whereby they will be automatically docked).



Floating toolbars show the title of the toolbar, and can also be resized by positioning your cursor over any edge (top, bottom, left or right). When the cursor changes to a resize icon, you can drag one of the toolbar edges to reorganize the contents of the toolbar, as shown in the image to the left.

Toolbars can be further customized by adding or removing icons, using the context menu for each toolbar. This menu is shown when you right-click any toolbar, regardless of whether it is docked or floated, and provides access not only to the configuration of the selected toolbar, but also allows you to make any other toolbar visible or invisible.

The image to the right shows an expanded context menu for the Sheets toolbar, although the same options are shown for any selected toolbar.

In addition, you can enable or disable entire zones (**Properties**, **Output** etc.) using this menu.

The top section of the context menu allows you to view or hide any of the available windows, toolbars and control bars.

You can access advanced toolbar editing functions using the **Customize** option at the bottom of the context menu. This option displays the **Customize** dialog. Note that you can also access this dialog from the drop-down menus by selecting **View | Toolbars | Customize**.

This dialog is used for editing toolbars, as well as editing device settings, look and feel options and other features.

With the **Customize** dialog, you can:

- Hide and display toolbars
- Toggle tooltips on or off and toggle inclusion of shortcut keys in tooltips
- Use large icons
- Change the toolbar button style
- Add and remove buttons from toolbars

- Design your own toolbars.

To create and name a new toolbar

1. In the **Customize** dialog, select the *Toolbars* tab.
2. Click **New**.
3. Type the name into the *Toolbar name* box and click **OK**.

To add and remove buttons from toolbars

If the toolbar you wish to edit is not currently displayed, select the *Toolbars* tab and turn on the toolbar.

1. In the **Customize** dialog, select the *Commands* tab.
2. If you are adding buttons to toolbars, select a *Category* to display the button required.
3. To add a button, click-and-drag a button from the *Commands* list to the toolbar.
4. To remove a button, click-and-drag a button from the toolbar to the *Commands* list.

Control Bars

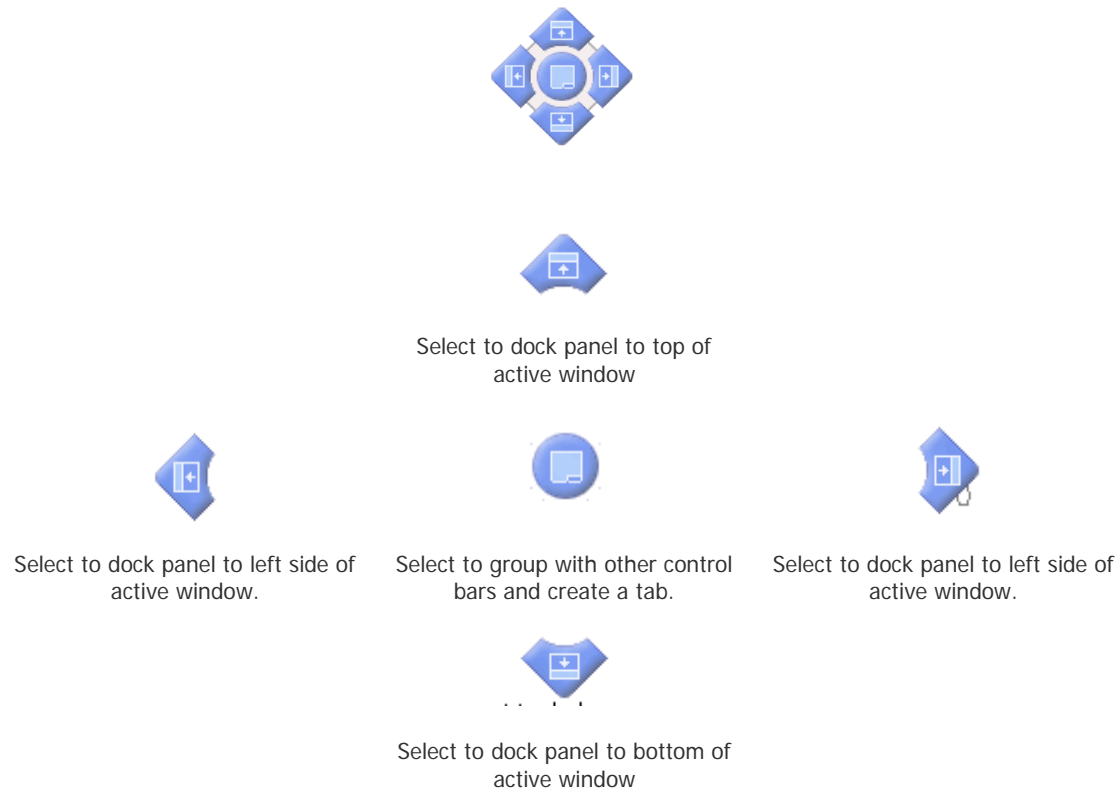
There are a number of control bars which contain application controls. They can be floated, docked, auto-hidden or hidden. The control bars include:

Control Bar	Application
Project Files Browser	This works in conjunction with the Project Explorer view and allows the user to see the files contained within the project. Files can be opened in the file editor or loaded from the Project Browser.
Sheets Browser	This shows the currently loaded plot objects.
Loaded Data Browser	This shows the currently loaded data.
Holes Browser	This shows the dynamic drillholes currently loaded
Customization Window	This is an Internet Explorer type window and hosts scripts or custom commands.
Data Properties	This shows the properties of currently selected items such as strings points and cells.
Properties Bar	This gives access to the view and file properties.

Customizing Control Bars



Studio 3 has several control bars which make use an elegant and intuitive tool, called *Smart Docking*, to enable users to customize their interface to suit their working behavior. Control bars can be positioned anywhere in the application window. They can be grouped, they can be docked and they can be made to hide and reveal themselves automatically.

Smart Docking uses drag-and-drop. When a control bar has been selected and dragged away from a docked position, the *Smart Docking* buttons appear.

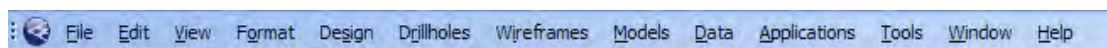


As the control bar is dragged over one of the buttons, the position where it would be dropped is highlighted. If no Docking location is selected the control bar will float.

Once docked, the automatic hiding and showing can be toggled on or off using the pin icons below.

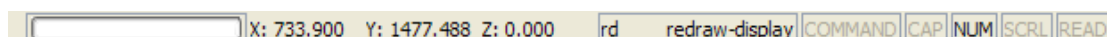
	Permanently displayed - Pinned in position.
	Hide and show automatically.

Menu Bar



The Menu Bar in **Studio 3** is the standard Windows drop-down text menu.

Status Bar



The Status Bar is situated at the bottom of the **Studio 3** window and is used for the following

- To display brief information relating to a specific icon or menu item.
- To show the progress of commands.
- To display or set the position of the mouse in XYZ space.
- To show if a command is currently running.
- To show the read status of the currently open file.
- To see or set numlock, scroll lock and caps lock statuses.

Popup Menus

These are context sensitive menus available within each window, activated with a right-click of the mouse button.

3 DRILLHOLE TYPES

It is important to understand that drillhole data represented on the screen is an emulation of the actual drillhole position, shape and direction. There are two methods of calculating coordinates down a hole:

- Straight-line method
- Desurveying

The simplest method of calculating the coordinates down a hole is the straight-line method. In this method, the hole direction at each survey point is projected to the depth of the next survey point. The advantage of this method is that it is very easy to compute.

Coordinates at each survey point are calculated directly by simple trigonometry from the position and orientation of the previous survey point. Unfortunately, this leads to errors which increase with depth due to this method ignoring the fact that a drillhole is in fact continuously curved, and does not bend abruptly and only at points where survey readings happen to have been taken.

In addition, there is a systematic bias in the interpreted coordinates, in that each surveyed direction is taken to apply for a length of hole below - but not above - the position of the measurement. A centered straight-line method avoids the bias problem, by assigning a given direction to a length of hole both above and below each measurement, half-way to the next higher or lower measurement. Unfortunately this method still does not account for the real curvature of the hole.

Desurveying a drillhole is the process of determining the actual XYZ coordinates down a drillhole given the collar location and survey data. It is customary to survey a hole to obtain known values of the azimuth and dip at regular downhole distances along its length. From the collar location and survey measurements the actual XYZ coordinates along the hole are then calculated. By default **Studio 3** uses the desurveying method to calculate downhole coordinates.

Studio recognizes two types of drillhole data namely:

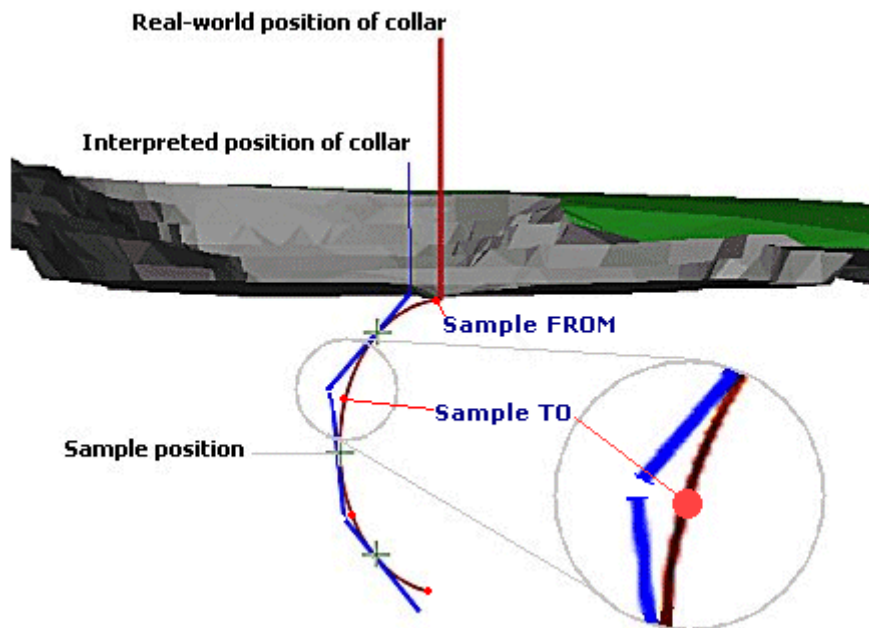
- Static Drillholes
- Dynamic Drillholes

Static Drillholes

A Static drillhole is a single **Studio 3** file which contains a set of XYZ sample center points, lengths and directions which represent the hole traces. The desurveyed file is generated using the command **Drillholes | Validate and Desurvey (HOLES3D)** which takes the imported raw drillhole data (i.e. collars, surveys and sample data) and desurveys them whilst maintaining the sample lengths and center points as specified in the raw drillhole data.

It is important to note that due to the way in which the coordinates are calculated, the length of the sample along the real-world curvature of the drillhole is maintained in the flat-line segment, thus a 'gap' is created to compensate. Preserving segment lengths for flat-line segments is essential to preserve ore grade locations along the segment, so this

issue is unavoidable. The following image shows a highly exaggerated example of the deviation of a screen-based drillhole line segment from a real-world drillhole location:



Note how the sample positions (shown as crosses) lie on the actual plane of the drillhole raw data, but the projected strings deviated both above and below this point. Also note the position of the interpreted collar position, offset from the real-world collar coordinates due to the projection of the first line segment above the initial sample point (a deviation of this magnitude in reality is, however, highly unlikely to exist). For more detailed information on how down hole sample positions are calculated refer to the online help.



The differences between real-world and interpreted screen data can be minimized by compositing by dividing samples into smaller segments before running the desurveying command **HOLES3D**

Dynamic Drillholes

Dynamic drillholes are calculated by desurveying raw data, which comprise collar coordinates, survey and sample information on the fly directly from a database. The resultant traces are used in conjunction with formatting options to create a holes overlay for display purposes.

This process differs from the way in which static drillholes are managed in that the in-memory coordinate data ensures that sample segments meet exactly at each end. In other words, down hole coordinates are calculated at the sample start and end points rather than the sample center point. It should be noted, however, that this is at the expense of retaining precise sample lengths, and the center points of each sample are not maintained as being on the calculated hole trace as calculated by static drillholes. As a result dynamic drillholes cannot be used for grade interpretation.

Static vs. Dynamic Drillholes

Whether you use static or dynamic drillholes depends on the type of function you wish to perform:

Function	Static Drillholes	Dynamic Drillholes
Grade Interpretation	Must be used	Cannot be used
Data Presentation	The displayed screen image will not match the raw drillhole coordinates along the full length of the hole if any curvature is present.	The displayed screen image will match the raw drillhole coordinates along the full length of the hole.
Updating data	The raw data files must be re-imported and then desurveyed to reflect any changes	Any changes made in the database will be reflected in the drillholes on reloading/refreshing.

The affects of differences between **Studio 3** data and real-world coordinates, although increasing in line with the curvature of a drillhole along its overall length, can be minimized by a combination of the following actions:

- Compositing prior to desurveying
- Dividing samples into smaller segments before desurveying
- Selecting the appropriate data type for the function you are going to perform (i.e. display or grade interpolation).

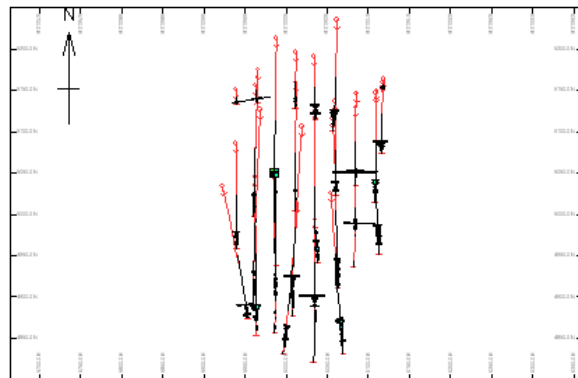
4 THE PLOTS WINDOW – OVERVIEW

Once geological and mine planning data have been loaded or created in **Studio 3**, they are available for presentation in the **Plots** and **Logs** windows. This section will explain the key features of the **Plots** window.

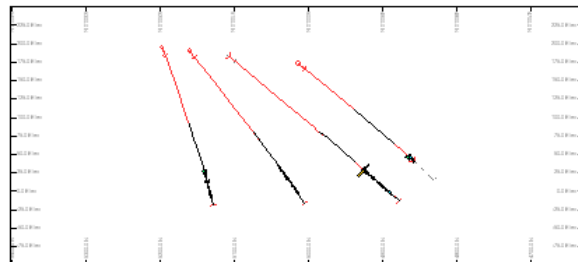
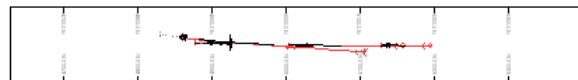
To view the **Plots** window click on the *Plots* tab. If the *Plots* tab is not displayed then you can enable it by selecting **View | Windows | Plots**.

When a new project is created or loaded four different views are automatically created in the **Plots** window. They include:

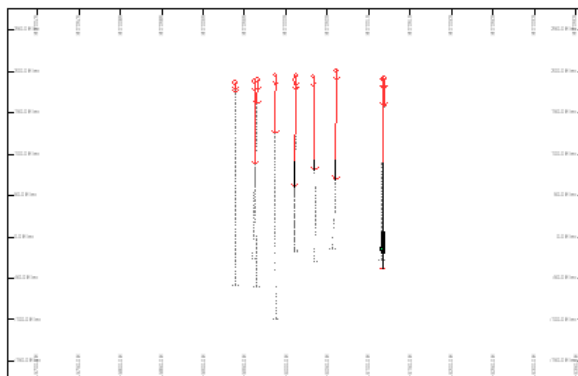
Plan View: plan map of all holes.



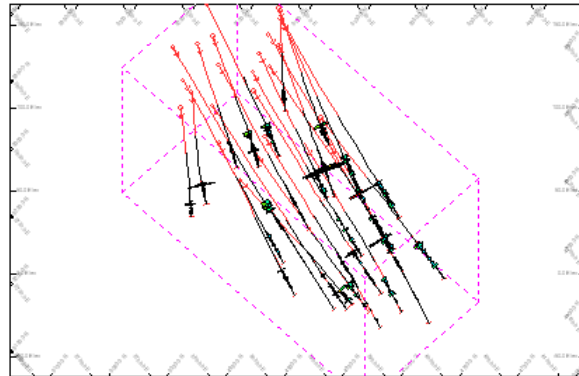
N-S Section nnnn.nn E: plot showing the section with the default active drill hole with a plan map above it.



Section nnnn.nn N: plot showing the section with the selected drill hole.



3D: plot showing a 3D view of the data. The default azimuth and dip is 45° and 60° respectively and can be changed.



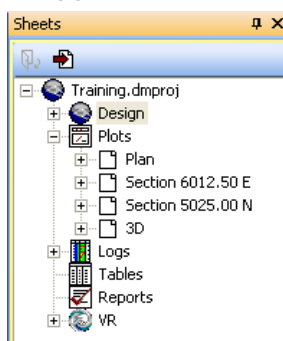
Each view can be edited by selecting the relevant tab along the bottom of the **Plots** window. Additional views can also be created and edited.

Some of the features available in the plots window are:

- Graphically interrogate the drillhole data in section or 3D view.
- Plot drillhole traces and sample data values in plan, section or any 3D view desired. A complete family of sections can be defined from a single section definition using a single dialog.
- Insert plot items such as text boxes, coordinate grids, scale bars, tables and title blocks which automatically adjust as you change the position, orientation and scale of plot sheets.
- Select different paper sheet sizes, orientations, margins and scales for each view.
- Use Page Layout mode to display and interactively edit page borders, sheet margins, plot frames, coordinate grids, plot items and parameter profiles.

The Sheets Control Bar

To access this control bar, click on the *Holes* tab at the bottom of the **Workspace** window.




The **Sheets** control bar can be used to view or modify the **Plot** window sheets and properties of the sheet. The image to the left shows the standard *Plots* sheets that are automatically generated for the online tutorial data.

Right-clicking on a *sheet* will give you a context sensitive menu.

Selecting either **3D Properties** or **Wizard**, provides you with a menu in which to modify the relevant settings.

Each Plot Sheet can be expanded to show the items displayed in the sheet. Right-clicking on the **Projection** and **Overlays** items will also initiate context sensitive menus.

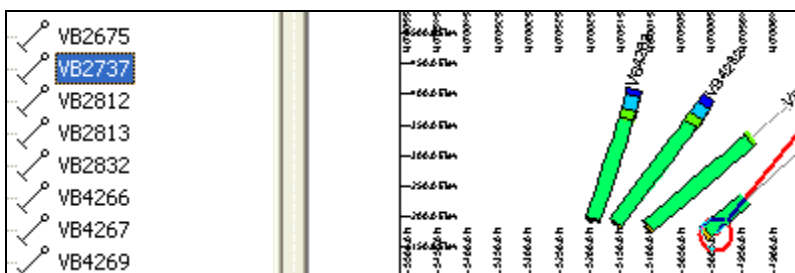
Items can be inserted, deleted or modified using the Menubar, Toolbar or "Right-click" context sensitive menus.

 A single data object can be added to a sheet multiple times as separate Overlays, each with its own display and formatting parameters.

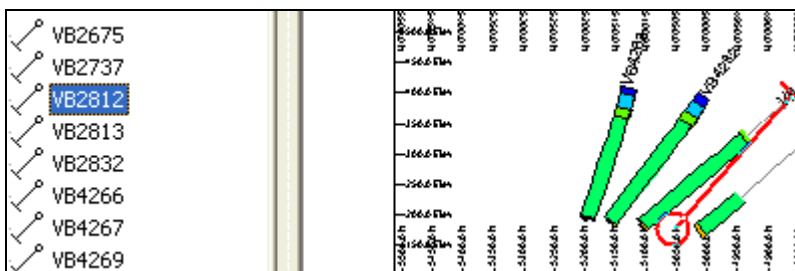
The Holes Control Bar

To access this control bar, click on the *Holes* tab at the bottom of the **Workspace** window.

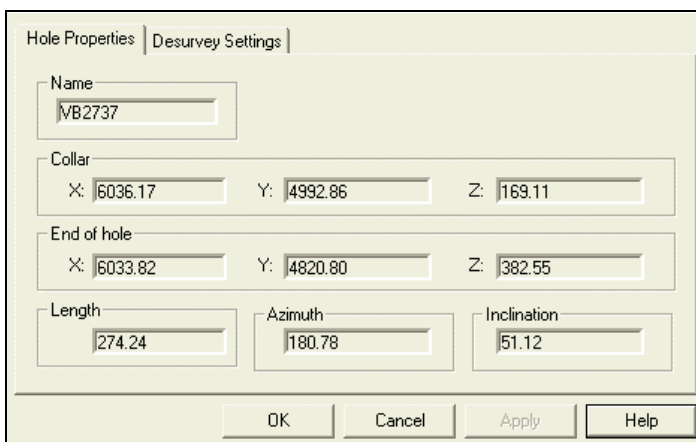
In the **Plot** view, the active hole is represented by a red symbol. Clicking a hole in the *All Holes* view will automatically update the position of the active hole symbol in the plot view, as shown in following example:



When another hole is selected, the **Plot** view is updated, e.g.:



The *Holes* tab is also used to access the **Hole properties** dialog, providing important information about a hole. Right-click a hole description and click the **Properties** option to see this dialog.



The screenshot shows the Hole Properties dialog box with the following fields and values:

Hole Properties		
Name	VB2737	
Collar	X: 6036.17	Y: 4992.86
	Z: 169.11	
End of hole	X: 6033.82	Y: 4820.80
	Z: 382.55	
Length	Azimuth	Inclination
274.24	180.78	51.12
OK Cancel Apply Help		

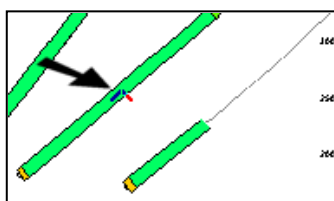
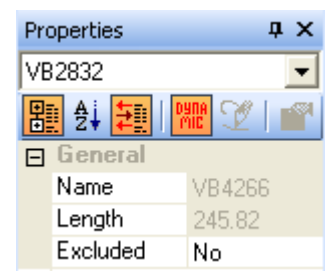
This dialog is explained in detail in your online Help, however as a brief introduction; there are two tabs;

- The first tab, *Hole Properties* shows the key information relating to the hole (Collar position, End-of-Hole position, Length and Name).
- The second tab, *Desurvey Settings* shows information relating to the method used to desurvey the hole.

Using the Properties Control Bar

The **Properties** control bar is context-sensitive, meaning that it is updated automatically according to what data has been selected in the **Plot** View or **Workspace** control bar.

For example, selecting a hole ID from the **Holes** control bar (see previous section for more information on this bar) updates the **Properties** control bar to show a single tab; named to match the ID of the hole. This tab shows brief summary information for the hole, describing its length and whether it has been excluded from the hole set or not.



In contrast, clicking a downhole position in the **Plot** view, as shown by the example on the left (arrow shown for demonstration purposes only), updates the **Properties** window to show a selection of tabs relevant to the selected hole position.

A tab will be displayed for accessing properties for the current Sheet and Projection, as well as viewing information about the associated overlays and summary information for the hole itself.

If the terms 'Projection', 'Section' and 'Overlay' confuse you, don't worry, these terms are explained in detail in the next section of this manual – 'Viewing Data'.

Each of the tabs displayed in the **Properties** window is used to view (and amend, if this is permitted) a particular category of data. Generally, editable properties are shown with a white background, and read-only properties displayed with a grey background.

Using the Compositor Tool

The **Compositor** is a powerful tool for investigating and navigating your way around project data. Use the compositor in conjunction with any section, 3D or log view.

By selecting intervals with the cursor, you can see the properties of the current hole selection in the Hole's *Name*, *From*, *To* and *Results* field boxes.

By editing the *From* and *To* fields in the **Compositor** window, you can update the current view using the **Synchronize** option (**Edit** | **Synchronize**).

Hole	VB4280	
AT	34.71810973	
ENDDATE	0	
AU	0	
CU	0	
LITH	Sandstone	
Zone	?	
X(Mid)	6011.991026	
Y(Mid)	4985.500572	
Z(Mid)	193.592063	
Azimuth	184.51	
Inclination	-39.32	
Declination	39.32	
Vertical Thick	0	
Horizontal Thi	0	
Exclude	<input type="checkbox"/>	

With the **Composer**, you can;

- Select intervals interactively and display composite results.
- Slide composite or composite limits up and down the hole and observe composite values.
- Select intervals by *Hole Name* and *From - To* depth and display composite results.
- Locate any interval on any hole on any section by synchronizing views from the composer.
- Composite samples over lithological domains.
- Composite drillholes over fixed downhole lengths.

Composite results may include:

- length weighted grades
- length @ grade
- length x grade
- dominant lithology
- specific gravity
- vertical and horizontal thickness
- from-to depths
- start, mid and end coordinates
- azimuth, inclination and declination

Compositing text values

The dominant text value in a composite is determined by calculating the total length of each text value e.g. lithology codes, and assigning the value with the maximum length to the composite.

Window Dependencies

The **Workspace** and **Properties** windows are linked. As you select different entries in the Workspace, the **Properties** window is updated. Similarly, making selections on the **Plot** view also updates the **Properties** window, which, in general terms, is a context-sensitive window for selected data.

By default, each view of data in the **Plot** window can be formatted independently of others to allow for a diverse collection of presentation screens. However, you can also choose to link views so that updates to multiple screens can be performed simultaneously. This view linking functionality is described later in this manual.

5 VIEWING PLOT DATA

This section describes the basic principles used when creating plots and logs.

Sheets, Projections and Overlays

Studio 3 provides many ways for viewing and interrogating mining and geological data. It does this through a variety of windows which each concentrate on a different aspect of the data.

This viewing hierarchy is closely related the way in **Studio 3** handles data and formats it for display. Data is loaded into memory as *objects* which, depending upon their nature, can be viewed through one or more of the windows in different formats.

In principle, each window contains at least one *sheet* and each sheet has an associated *projection*, which, in turn, is made up of *overlays*. Overlays are graphical representations, which can be formatted, of objects. Each object can have its own set of overlays, each representing a particular view of the underlying data.

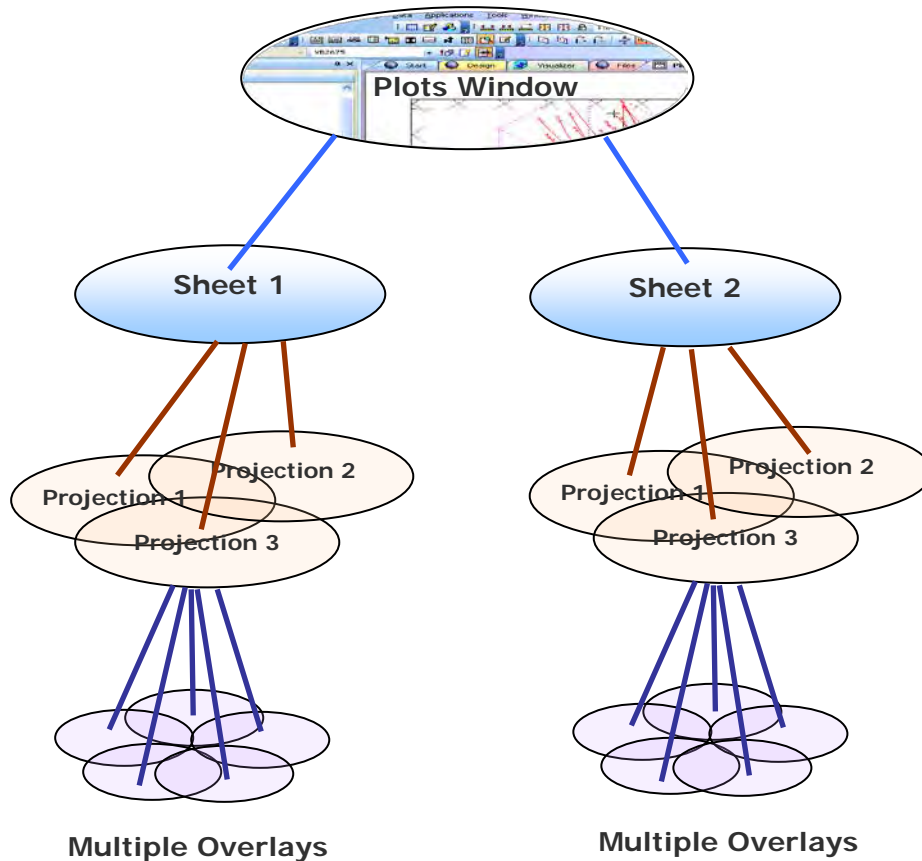
When viewing **Plots**, the view contains as many sheets as are required to represent the data appropriately, and each sheet may also contain more than one section. Data exists in memory as 3D objects and is displayed as overlays within a section. The **Plots** window, which is principally for producing printed output, requires the concept of the printable sheet, and for most kinds of work it requires many sheets. Furthermore, some sheets are often required to show more than one section or plan (projection) so the concept of multiple sections per sheet has been built in.

The **Logs** Window can contain many sheets, with multiple projections per sheet. However, due to the format of data displayed in this window, there is no facility to apply overlays.

In summary, there are three key components that together form the viewing hierarchy in **Studio 3**:

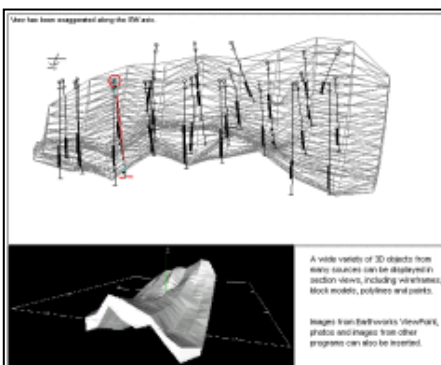
- **Sheet:** the means for showing more than one view of the data (3D objects) within the **Studio 3** application window. Many simultaneous sheets are supported in **Studio 3**.
- **Projection:** a discrete view of the data in memory. The **Plot** window allows multiple projections to be displayed on a single sheet.
- **Overlay:** a representation of a 3D object. An overlay has two main components: the object that it represents - shape, size and location in 3D space, and its formatting instructions. A single overlay can only represent a single object, but a single object may be represented by many overlays.

The concept of *Sheets*, *Projections* and *Overlays* is best described using an image, as seen below:



Plot Sections

The **Plot** view can contain as many views of sections through data as you need. However, it is important to remember that each section is capable of displaying a view from a single direction only. In other words, there can be only one section definition for each section. If you change the definition, all data within the associated section will be updated.



You will probably find it necessary to produce multiple section views of your plot in order to present your data most effectively. Several default section alignments are available, and you can also create your own custom sections.

For more information on creating and managing sections, see 'Creating Section Views', later in this section.

A complete family of sections is defined by a single section definition. For example; if the drilling data extends between northings 1000N and 2000N, by defining a single East-West section at 1000N (or 2000N or 1356N, for example) and a section width of 100 meters, the program will auto-range the extents of the data and create a total of 11 East-West sections. The entire family of sections is contained in a single section view.

Horizontal (benched), inclined and vertical sections can be quickly defined using the **Section Wizard** by selecting the section type, section azimuth, section width and the

center point coordinate of any one of the sections. The creation of plan and 3D views is a simple one step process. This key process is covered in more detail in subsequent sections.

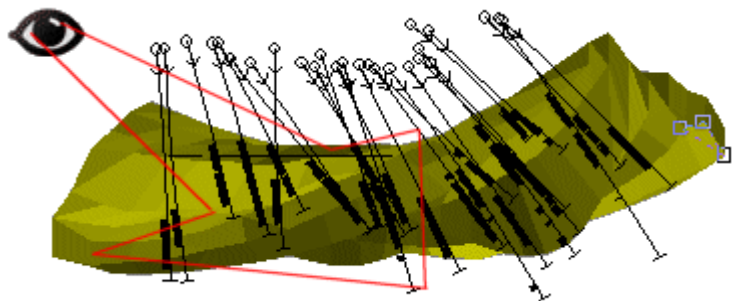
Having created the default section, plan or 3D view, the section definition, page size and view settings can then be modified as required. Changes made to the section definition can be displayed dynamically to give the user immediate feedback on the effect of changing one or more settings.

The section may also be redefined or repositioned interactively by picking the center point or end points of a new section in an existing view, or snapping to a particular hole collar or sample.

Views and Sections

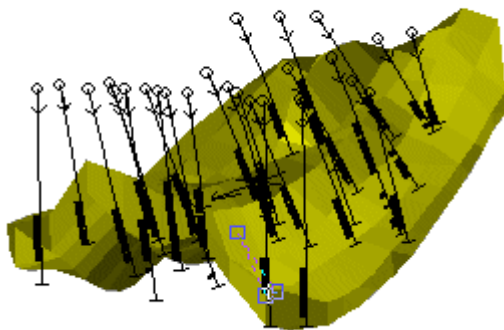
The concept of *view* and *section* is important in the **Plots** window, particularly with regards to *3D sections*.

3D data is *viewed* from potentially any angle, and is simply the angle at which the data is displayed to you, the viewer. A viewpoint is a purely aesthetic setting that will allow you to best display your data for whichever task you are undertaking.



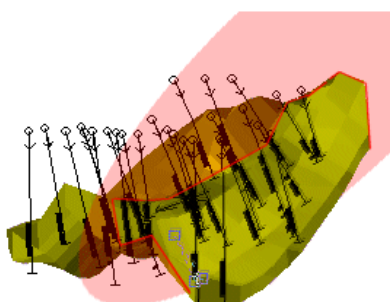
In the image above and to the right, a wireframe orebody is viewed in the direction indicated by the red arrow.

Once this view definition is set, this results in an image similar to the one below being shown in the 3D image on the left.



However, as this example is potentially misleading, it is important to highlight the fact that the *viewpoint* is simply the *view that is displayed to you*.

Instead, a *section* is a slice through the data, and this slice does *not* have to be the same as the viewpoint, in fact, in many cases, you may wish to view a section from a non-orthogonal angle. It is the separation of control between section and view that is fundamental to data management in the **Plots** window.



The orientation of a section of data determines how a particular body of data is 'cut' for the purpose of extracting data at a particular plane within it. So, in the following image, a section is represented by a transparent disc, which intersects the body of data at the position of the red boundary line:

The viewpoint and section are, at this stage, not aligned. This could be, for example, because the data is being *viewed* from an angle that suits the presentation

of the 3D data, but for useful 2D plot data to be drawn, a section needs to be applied through the area shown.

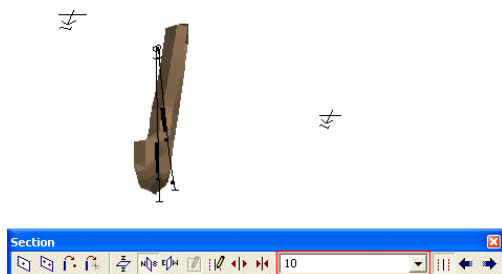
It is possible to align a view with a section by selecting the **Align View With Section** function on the **View** toolbar (more information on this function and toolbar follows, and your online Help also contains tutorials and supplementary information on how to create and align sections effectively).

If you are viewing a 3D section, by default, you will see the viewpoint of the current object, along with all the data that is currently set to be displayed. This data will either be the full object, or a section of the object. This section is displayed in alignment with the current section definition. In other words, your 'slice' of data can be controlled independently of the viewpoint. You can also specify how much data, either side of the section plane, is visible, by setting the *width* of the section.

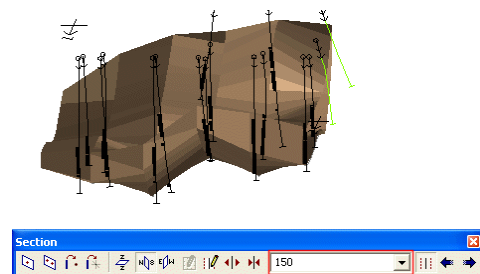
Section Widths (Clipping)

A section is, in effect, a 'snapshot' of the loaded data set at a particular angle and position, you can opt to include as much or as little as the data within your section as is required to demonstrate your results effectively. You can, for example, elect to have a section that only shows data that intersects with the exact position of a 2-dimensional plane. In this scenario, a cross-section will be shown without any neighboring data. However, by setting the thickness of a section (otherwise known as 'Setting Clipping Limits'), you can include more or less data before and after the section. You could, for example, show all data that lies 50 meters either side of the section plane in the current Plot view.

In the images below, the one on the left shows a section through a wireframe orebody (the same as shown in the images in the previous section), however, the section width has been reduced to 10 meters. In contrast, the image on the right shows the same view, with the section width set to be 150 meters:



10 meter section width



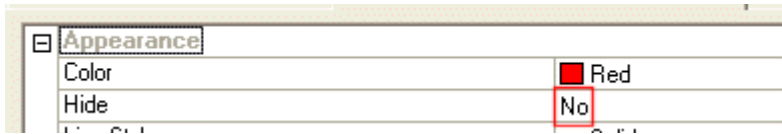
150 meter section width

The example images above also show another previously mentioned feature of sections and view – *they do not have to be aligned*. In both images (although more clearly seen in the right image) the section definition is set so that the section of data is shown at a non-orthogonal angle.

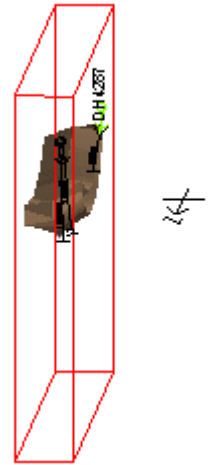
To see the alignment of the current section more clearly, use the Format Overlays dialog:

1. Select **Format | 3d Objects...**
2. Select the *Section Line Properties* tab.

3. Locate the *Hide* property, and if it is set to [Yes] (the default) click inside the box and select [No] from the drop-down list:



4. You can now see the boundary line of the section on the 3D plot view, as shown by the image on the right. You can use the same tab to set the color, linestyle and other properties of the section line.



Once the section line is in view, you can modify the location either using the **Section** toolbar (see the following section for more details) or the **View Settings** dialog (more information on this also follows). The important point to remember when managing sections is that any changes to the section definition in a particular view will be carried over to all other sections within the same view (the number of these sections will depend on the current section interval). There is also the possibility to control sections in other views using a section master, which is explained in more detail later in this user guide.

This **Section** toolbar is a useful tool for controlling how your section data is to be represented, and also how the section itself is defined in terms of position, alignment and width.

Each of the commands on the **Section** toolbar can be used to configure your section. A full description of each command can be found in your online Help, but as a brief summary;

- The first four icons are used to define the position of the section, either as a plane going through a single point, a plane defined by two points, by definition of a single point to include within the section or by manually setting the mid-point of the section.
- The following 3 icons represent the alignment of the section, which can be either horizontal, North-South or East-West.
- The next icon is used to define a custom section definition, using the **View Settings** dialog. This dialog is explained in more detail in the following section.
- The following set of icons allows you to control the section clipping. From left to right the commands are; **Set Section Width**, **Make Section Wider**, **Make Section Narrower**, **Select Section Width** and **Apply/Disable Clipping**.
- The final pair of icons allows you to step backwards and forwards through the family of sections relating to the current view. Data will be updated automatically as each new section position is set.

The View Settings Dialog (Creating Custom Sections)

When designing your presentation, you will find the **View Settings** dialog to be invaluable for quickly aligning and viewing data exactly as you want it to be displayed to your target audience. There are several ways to activate this dialog;

- Selecting **Section | Orientation | Custom...**
- Clicking the **Custom Section** icon on the **Section** toolbar.

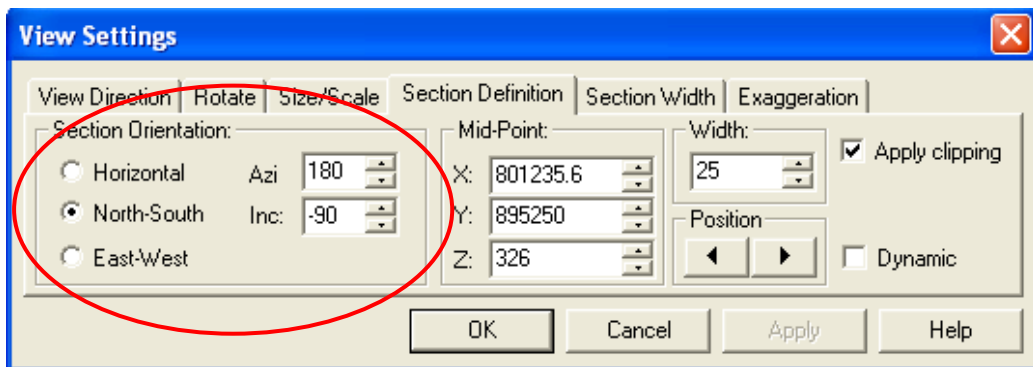
Firstly, it would be useful to outline a few basic principles about section views:

- The section line or plane is defined independently of the view direction. You can view a section from any angle, or you can fix your viewing direction and rotate the section, or you can lock the view direction so that it is always perpendicular to the section.
- There is only one section definition applied in each section view. It doesn't matter which section line you are currently viewing, when you change the section definition, the change is applied to all section lines in that view.
- The number of sections lines is dynamic and is recalculated by the program whenever the section width is changed so that the full extents of the data perpendicular to the section line are included.


Some of the more common tasks are listed below:

To change the section line orientation

1. Run the command **Section | Orientation | Custom**.
2. Position the dialog so that you can see the section view and check the *Dynamic* option.
3. The current section line orientation is displayed in the *Section Orientation* box on the *Section Definition* tab. For example:



4. Select a different standard orientation (*Horizontal*, *North-South* or *East-West*) or use the spin buttons to change the *Azi*(muth) and *Inc*(lination).

 When you type a value into an entry box, click **Apply** to accept the new value.

5. Use the *Position* buttons (forward and back) to review how these changes affect the other section lines in this view.



To change the section width

1. Run the command **Section | Orientation | Custom**.
2. Position the dialog so that you can see the section view and check the *Dynamic* option.
3. The current width is displayed in the *Width* box on the *Section Definition* tab.
4. Type a new value or use the dial buttons to increase or decrease the *Width*.



The *Section Width* tab has the same function and is displayed when the **Set Width** command is chosen from the **Section** menu.

The **Narrower** and **Wider** commands on the **Section** menu can also be used to decrease or increase the section width.

5. Use the *Position* buttons to review how these changes affect the other section lines in this view.

To change the section position

1. Run the command **Section | Orientation | Custom**.
2. Position the dialog so that you can see the section view and check the *Dynamic* option.
3. The current coordinates of the section mid-point are displayed in the *Mid-Point* box on the *Section Definition* tab.
4. Type a new value or use the dial buttons to increase or decrease the *X* (Easting), *Y* (Northing) and *Z* (Elevation) of the section mid-point.
5. Use the *Position* buttons to review how these changes affect the other section lines in this view.

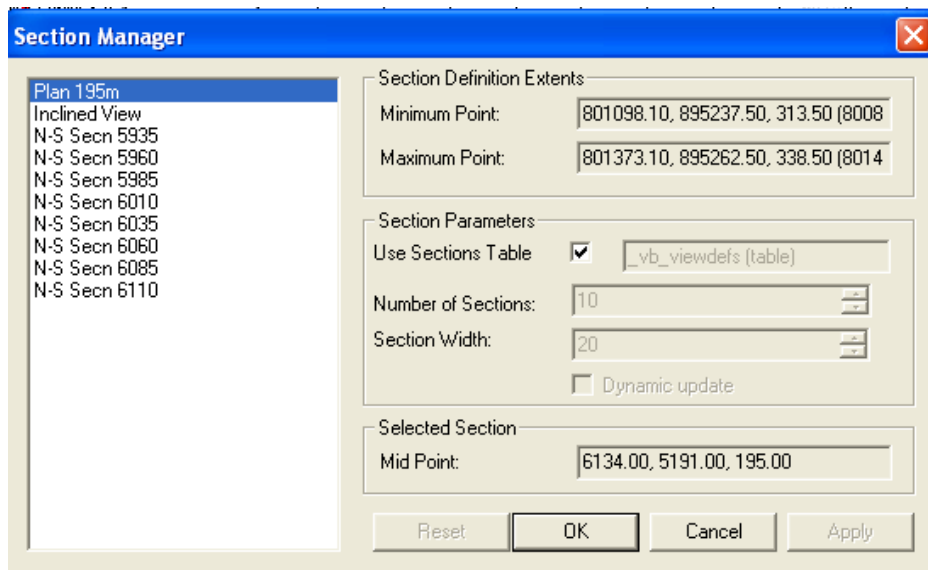
Using a section definition table

1. Run the command **Sections | Use Table**. If you have not already loaded a section definition table you will be asked if you wish to load one.



The sections table contains predefined section definitions. These might be in a predefined, non-parallel pattern such as a fan or they might not have any specific relationship one to the next. You can change the section displayed using the section navigation keys in the usual way.

2. After loading a section definition table you can view the predefined section definitions by running the command **Section | Section Manager**. The following dialog will appear listing the sections.



Other Toolbars for Viewing Your Plot

There are four toolbars used for navigating the **Plot** window; the **Pan** toolbar, the **Scale** toolbar, the **View** toolbar and the **Zoom** toolbar. These are shown below.

The Pan Toolbar



This toolbar is used to shift the current data display orthogonally.

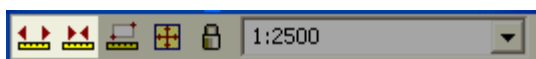
The four directional arrows on the **Pan** toolbar will shift the display incrementally in the indicated direction.

The final icon - **Pan Using Cursor** - shifts the display based on the start and end points you pick on the screen. The first point you pick is moved to match the second point you pick.

The Scale Toolbar

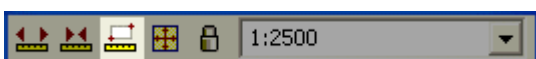
The buttons and tools on this toolbar change the scale of the plot, allowing more or less data to appear on the specified sheet size. All scale value changes are shown in the display window comprising the right half of this toolbar. You can also type scale values in this window or select a scale from the drop-down list.

From left to right, the icons are as follows.

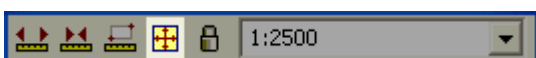


clicked.

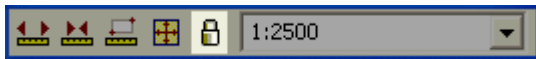
Increase Scale, Decrease Scale: changes the scale of the plot incrementally when



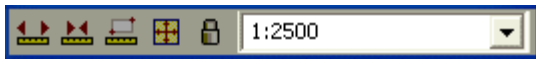
Scale Window: zooms to the box you draw in the **Plot** window.



Scale Fit: scales the data to best fit the page. This is used to show the full extent of the data.



Lock Scale: locks the scale at the current value and disables the **Scaling** toolbar.



Custom Scale: enter a ratio scale in the format *n:nnnn* to view a custom scale.

The View Toolbar

This toolbar is used to apply global changes to the current section view. There are four options available on this toolbar:



Flip View Direction: to understand how this function operates, it is important to understand how the view direction is established in a plot view. If you imagine your view of the current data is represented from your eyeball, to the screen, through the virtual data and out the other side (to the same virtual distance that you are currently viewing the data), this function simply swaps your viewpoint from one end of the 'line' to the other. It doesn't swap data around, or alter any of the coordinate points contained within the underlying data – it simply displays any 3D data as if viewed from the opposite direction. All other ('flat') data, such as text boxes, scale bars etc. remain unaffected.

This option is only available for 3D section views.

In the example on the left, a 3D section view has been appended with a 3D Visualizer® image and text.

Note that the 3D section data is shown in the top pane, and the 3D image has been added as a plot item to the bottom left pane (more details on inserting and editing plot items can be found later in this manual).

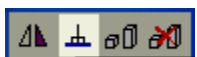
It is important to remember that the wireframe image represents the current *view* of the 3D data, and does not necessarily represent how the current *section* through the data is defined.

Selecting the **Flip View Direction** command shows the data as seen through a flipped viewpoint, as if the viewpoint is placed on the other end of the viewing 'line', and as such, should not be confused with a simple reversal of the original image (i.e. a mirror-image).

After flipping the viewpoint, the original view is then replaced with an image similar to that shown in the image above left.

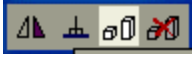
Selecting the **Flip** option again will revert the view to be the same as the top image again.

Note how the other items on the section are unaffected by view flipping, as only the *view* of 3D data can be amended with this command, the current section definition will not be changed as only the view is changing, not the data 'slice'.



Align View With Section: the concept of *View* and *Section* is important here, and this is explained in detail in 'Views and Sections' earlier in this Chapter – if you haven't read this yet, it is advisable to do so before continuing as it explains some key concepts relating to the display of data in **Studio 3**.

To align the view of the current 3D data with the currently defined section, select this icon. Note that once selected, the option becomes grayed-out, as it is only available for sections that are not currently orthogonal to the viewing plane.

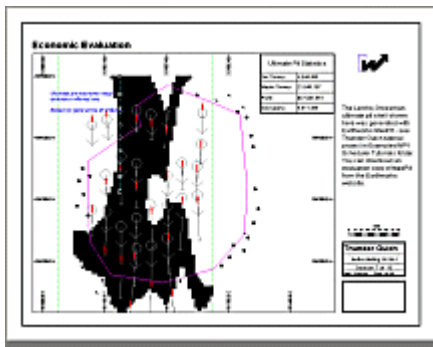


Set Exaggeration: 'exaggeration' is the stretching or shrinking of the current view of the data (but, and this is important, *not* the data itself).

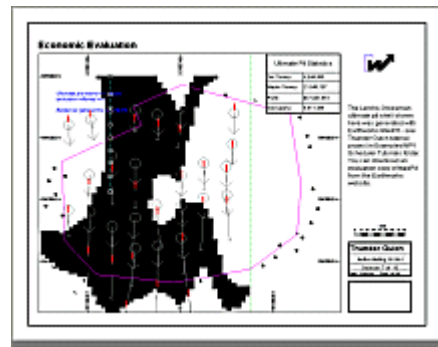
Data can be exaggerated in any of the 3D axes, using the **Exaggeration** dialog.

Exaggerating data effectively deviates the image from the current 1:1 view, and data can be exaggerated in both incremental and decremental directions. This function is particularly useful if a particular view does not incorporate all the elements you wish to display in your plot at the current scale, and a 1:1 view is unimportant, or where a particular direction needs to be extended in order to exaggerate the scale for demonstration purposes.

If exaggeration is applied along an axis that is perpendicular to the viewpoint, no change will be seen as the extension or retraction of data is along the line of view. Changes can still be applied, but will only be seen when the view direction is amended away from the perpendicular alignment. The following examples show two economic evaluations. The image on the left represents a 1:1 exaggeration, whereas in the right hand image, an exaggeration of 1.5 has been applied along the X axis:

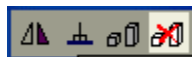


Exaggeration = 1:1



Exaggeration = 1:1.5 in X

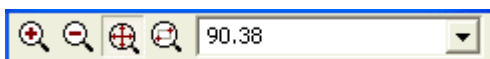
Note that it is only the *representation* of the 3D data (or the 2D representation of 3D data) that is amended. Exaggeration is not applied to plot items or other added 2D features.



No Exaggeration: you can remove any exaggeration settings from the current view with this option, and revert your view to a 1:1 display setting.

The Zoom Toolbar

Zoom in and out of your plot data using these commands:



The first two icons allow you to zoom in and out of the current data. Zooming in and out will double or halve the magnification of the current view. The third icon – **Zoom to Fit** – will increase or decrease the magnification required to show the entire body of displayed data on screen. Note that hidden parts of data can lie outside the viewable area, data is scaled to fit all visible data on screen.

The fourth icon is used to select a rectangle on the screen (make sure you drag a rectangle – click once, and create your area to magnify, then release the left mouse button).

The editable drop-down list on the right of the toolbar allows you to specify a scaling value manually, or to select a pre-defined scaling ratio from the list supplied.

There are many more functions available for viewing data, and construction sections. This manual includes some practical exercises to give you a greater understanding of the processes involved; 'Using a Section Master' and 'Creating Multiple Plots' are of particular relevance.

6 FORMATTING PLOTS

To create professional plots, presenting data clearly and attractively, you will at some stage need to configure the display of the current data to best achieve your aims.

Formatting can be applied at many levels, and the key to devising an effective plot is to utilize formatting functions in these key areas. This section covers the main formatting commands and functions. Note that due to the powerful and flexible nature of **Studio 3** there are many more functions and possible outcomes than are presented in this user guide, please refer to your online Help for more detail.

Formatting information has been divided into the following categories. This section focuses on the formatting of plots. Other areas are discussed in subsequent Chapters, in the following order:

- Formatting Plots: setting up the page and grid.
- Formatting Downhole Columns.
- Formatting Log Sheets.
- Formatting Downhole Lithology Columns.
- Formatting Structural Information Columns.
- Formatting Downhole Assay Columns.
- Formatting 3D Objects

Each section includes a general procedure for achieving the various formatting functions.

Formatting Plots

In this section, you will see how your plots can be configured to show geology and assays in a variety of different formats.

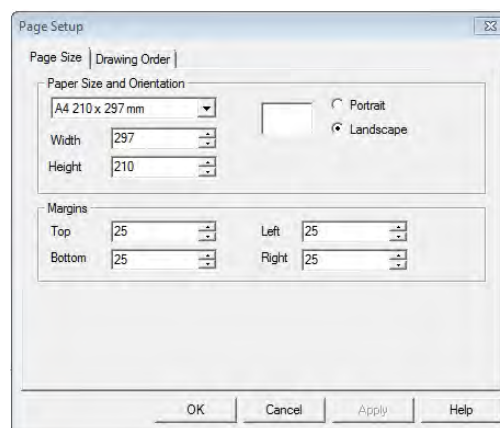
As with the setting of viewpoints and display settings in general, the formatting in the **Plots** window is applied on a plot-by-plot basis. For this reason, you must have the required plot sheet selected when changing plot settings as these are assigned to each plot type (section, plan, or 3D View) independently. For example, a project can have a series of plans at a 1:500 scale while the sections could be defined using a scale of 1:1000.

Page Setup

The page size, orientation and margins are defined in the **Page Setup** dialog, which is accessed using **File | Page Setup**.

The **Page Setup** dialog is a simple page configuration menu, as shown on the right, allowing you to select the *Paper Size* from the drop-down list, or enter a *Width* and *Height* manually, to set the margin dimensions, and the general orientation of the page (*Portrait* or *Landscape*).

After clicking **OK** in the **Page Setup** you will be given the choice of either applying the page



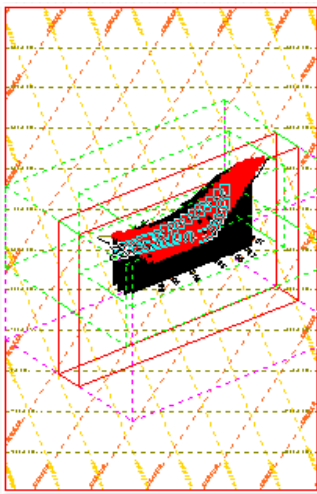
dimensions to the existing plot without scaling, or automatically scale all plot items (including 3D data representation) to the new dimensions.

Whichever settings you specify, you should always ensure that your printer/plotter is capable of supporting the dimensions specified.



Plotting in **Studio 3** has been designed with flexibility in mind, and this extends to the way media can be defined independently for each type of printable output. For example, you may wish to use an A2 sheet for a plan view print, A3 for E-W section views and A4 for log plots (more on these later). You are not restricted to a single sheet size for each output type.

Using the Grid



A 3-dimensional grid overlay can be applied in a variety of different ways. The level of information shown, the spacing, rotation, color, line style and interval used can be set independently for the X, Y and Z axes.

In addition, you can configure precisely how grid labels are displayed (if you decide to use them).

A grid is a useful tool for displaying the alignment of plot features and other items, although care should be taken not to 'overcrowd' your plot with grid lines that may be interpreted as confusing. The image on the left shows visible formatted grid lines for all three grid axes, each in a different color. As the view is isometric, all axes are visible; however, if the view is rotated so that one axis is orthogonal to the view, only two axes will be shown.

Grid formatting is achieved using one section of the **Format Display** dialog. This dialog is important as it provides access to a wide variety of display functions.

To display this dialog run the command **Format | Display**. To access the section that deals with the formatting of your grid select the *Grid* tab.

It is useful to regard a grid as a 3D object, and not a 2-dimensional overlay. If you scale your plot, or rotate the current view, or any other view manipulation command, the new settings will be applied to the grid as well as any other 3D data. This is important, as the grid represents the 3D space in which 3D data is positioned.

The *Grid* tab allows you to alter the border of the grid (and, effectively, the view of the data), as well as providing settings for the start position, interval, color and line style for each axis. In addition, you can specify what label you would like to apply for each axis, and for the interval markers, how many decimal points are to be displayed. If you are going to specify labels, these can be controlled using the *Labels* group, allowing you to set the position of each label in relation to its respective grid line, and how the label is positioned in relation to the border.

You can also change the Font for each label using the browse button at the bottom of the dialog. By default, labels are displayed in an Arial font, at 8 pt. You cannot set label settings independently for each axis, the settings made in the *Labels* and *Font* groups apply to all labels.

7 FORMATTING DOWNHOLE COLUMNS

Drillhole data can be formatted to allow your plot-viewing audience to get the most valuable information relating to the composition of the displayed data. **Studio 3**, again, allows you to perform a wide variety of formatting functions on drillhole representations.

Using the **Format Display** dialog, drillholes can be enhanced using the *Downhole Columns* section. The settings in this section are associated with each drillhole and allow you to present your data in easily understood formats.

This section of the user guide describes how to apply formatting to downhole data in a manner similar to the image shown on the left, using downhole columns, although the end result will probably vary significantly from the image shown, depending on the composition of the drillhole data you currently have loaded.

Before going into the details of how to format downhole columns, it is useful to know how to remove existing formatting.

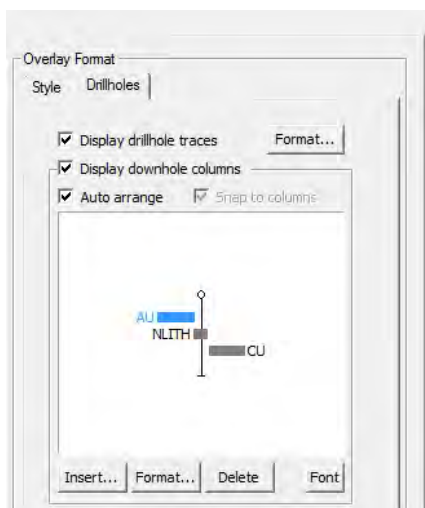
Removing Existing Columns

The procedure for removing existing downhole column data in either the **Design** or **Plots** windows is as follows:

1. Choose **Format | Display**.

If removing column data from Dynamic or Static Drillholes

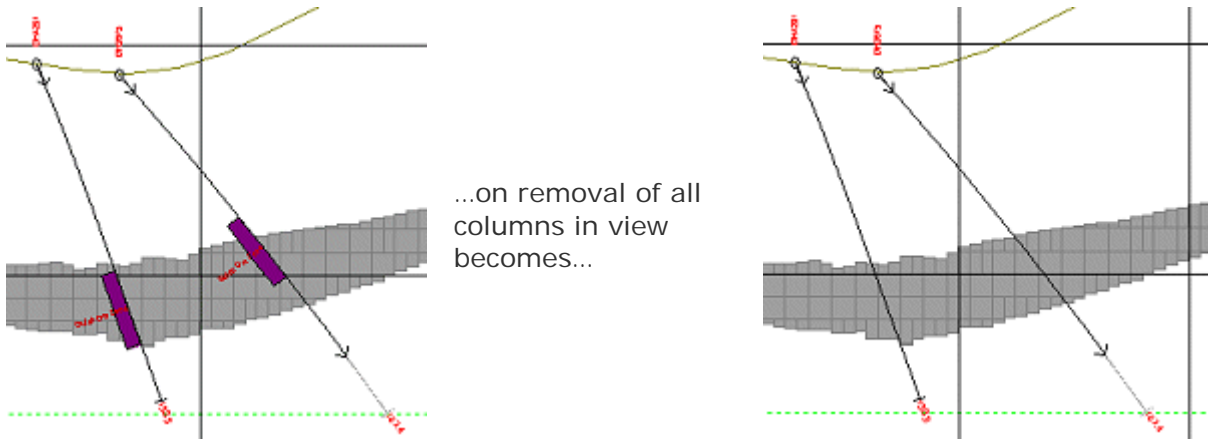
1. Ensure the relevant dynamic drillholes overlay is selected in the *Overlays* tab.
2. Select the Drillholes sub-tab, e.g.:



3. If it is not already ticked, click in the box next to 'Display downhole columns'.
4. Use the preview panel of the drillhole columns and click the column you wish to delete
5. Click the **Delete** button.

6. Repeat step 4-5 for each column you wish to remove.
7. Click on **Apply** to view these changes in the current plot view.

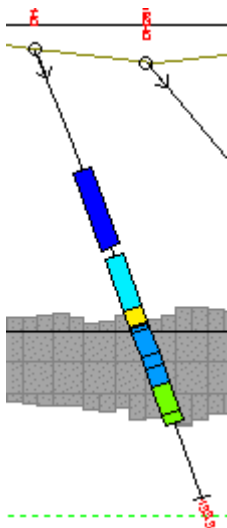
Removing all columns will result in your section displaying only the drillhole traces, e.g.:



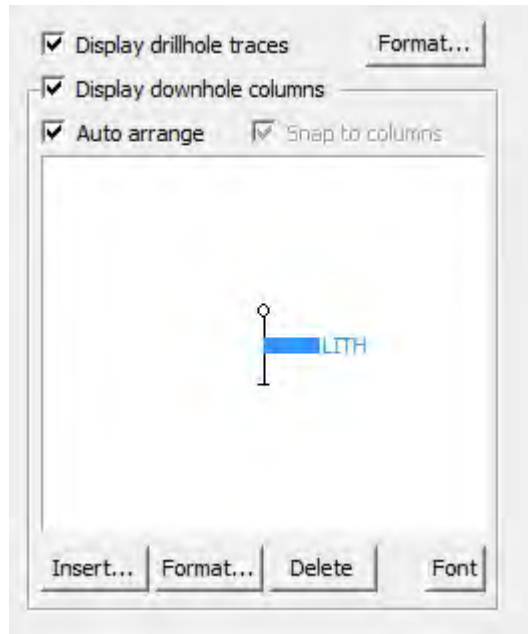
With the current downhole formatting removed, you can now add lithology as a constant width bar.

Adding a Lithology Bar

You can add a new fixed width lithology bar to the current dynamic drillhole display using the following procedure:



1. Open the **Format Display** dialog.
2. Select the static or dynamic drillhole overlay to which you wish to add a lithology bar (*Overlays* tab)
3. Select the *Drillholes* sub-tab.
4. Click the **Insert** button.
5. Select the *Data Column* option from the first page of the column wizard and the click **Next**.
6. Select a description relating to a Lithology log table from the list of *Tables*. Click **Next**.
7. Select the lithology code field name in the list of *Fields*. Click **Next**
8. Select [Bars] from the list of style templates to make the initial settings – you will be warned that the format will be reset so click **Yes**. Select **OK**.
9. A new tab will appear in the preview window, e.g.:

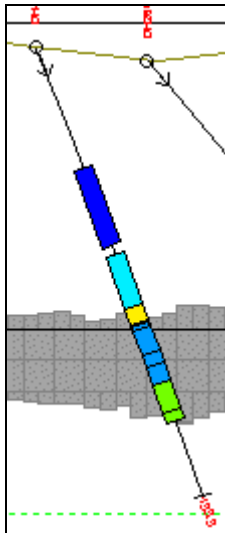


10. Double-click the new bar to open the formatting dialog.
11. Choose the *Width/Margins* tab and set the *Column Width* to the width of column required.
12. Click **Apply** and view the changes. As an example, the image on the preceding page shows a centrally-aligned downhole column, with a fixed width.

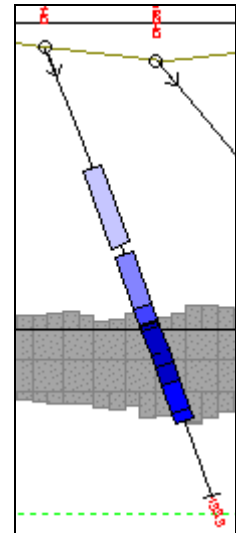
The lithology is displayed using a default legend. Legends are discussed in more detail in the next Chapter, however, the following procedure shows you how to apply different color settings to the lithology column.

Formatting a Downhole Column Legend

When the lithology data was imported, the data source driver created a default color legend for each of the fields in this file. The following procedure allows you to change this:



1. Make sure the **Format Display** dialog is open, at the *Overlays/Drillholes* tab.
2. Double-click the column you wish to edit and selected **Format...**
3. Choose the *Border/Color* tab.
4. Clear the *Fixed Color* check box, select the *Color* check box and choose an option from the color palette.
5. Select all four borders in the *Borders* box.
6. If not already selected, check the *Fill and Color using legend* options and choose a legend (if you do not have a current legend that is applicable to the selected data column, or if you are unsure which legend to select, it may be useful to refer to the following Chapter – ‘Legends’ – and return to this point after creating a legend for the lithology data column).

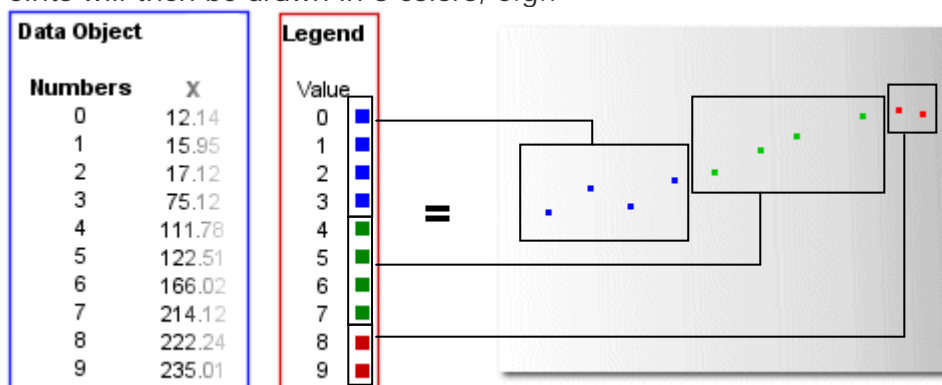


7. Click **OK** – click **Apply**

Legends Overview

Briefly, Legends (in this context) are a lookup table that associates certain values within a data object, with a display setting. For example, if you have a data object that has a column entitled ‘Numbers’, with 10 rows containing the numbers 0 to 9. Each row in the table also contains point data locations (X, Y and Z). A legend, in a simple form, can be set up so that points 0 to 3 are drawn in one color, 4 to 7 in another, with 8 and 9 being set to another color.

This legend is then associated with the data object following the instructions in this step. Points will then be drawn in 3 colors, e.g.:



Following this example, if you had a similar points object, but this time the integers in the ‘Numbers’ column ranged from 11 to 20, an attempt to apply your new legend to this object would result in all points being drawn in the default color, as none of the details in the legend match values found in the object.

As mentioned, legends are discussed in more detail in the following Chapter. The next procedure describes how to add a grade histogram to your downhole column.

Adding a Grade Histogram Column

To add histogram formatting to your downhole column for dynamic drillholes:

1. Make sure the **Format Display** dialog is open, at the *Overlays/Drillholes* tab.
2. Click the **Insert...** button.
3. Select the *Data Column* option and click **Next**.
4. Select an Assay Log table in the Table list and click **Next**.
5. Select a grade field name from the *Field* list and click **Next**.
6. Select *Filled Histogram* from the *Style template* list. Confirm and click **OK**.
7. In the column preview window, ensure the grade column is shown at the top. You can reposition the columns by left-clicking and dragging the columns up or down the top-bottom order, e.g.:

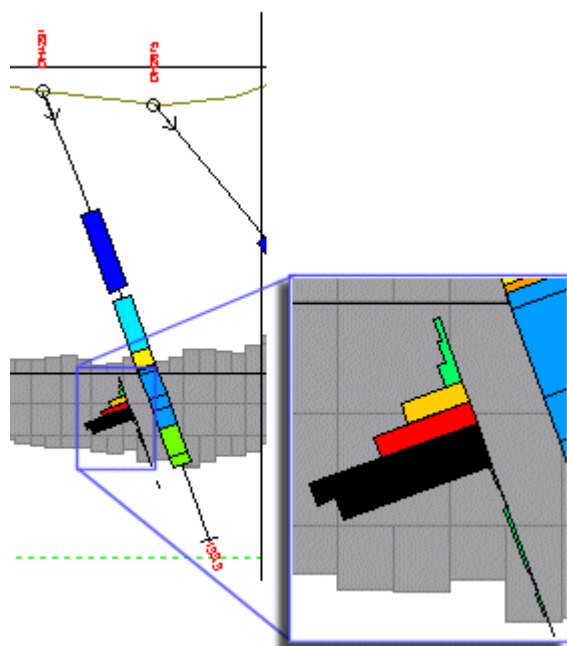


8. Double-click the grade column to reopen the formatting dialog.
9. Choose the *Graph/Color* tab.
10. Set your *Minimum* and *Maximum* values; these values will always be the minimum and maximum values found in the specified file (in this case, the assays log), however, you can restrict your histogram to report a narrower scope if you wish, by manually adjusting the values.
11. If not already selected, select the *Filled* and *Color using legend* check boxes and choose a legend to display the column (for more information on legends, and how to create them, see the following Chapter).
12. Choose the *Width/Margins* tab and set the *Column width* to the width of column you require. The value you enter in *Column width* controls the scale of the histogram. For example if the values range from 0 to 30 and you enter a value of 5 for *Column width* then a value of 30 will be represented by a bar 5mm long, a value of 15 will be represented by a bar 1.5mm long and a value of 10 will be represented by a bar 1.67mm long.
13. Choose **Apply** and view these changes.

A histogram has been placed alongside the drillhole trace.

The following image shows an example of a filled histogram, colored by legend, added as a new downhole column.

The image below shows the full drillhole trace on the left, a centrally-aligned fixed-width bar and a left-aligned histogram, with an expanded view on the right



Adding a Second Grade, Text Block and a Line Graph Copy

More formatting. This time, a text block and graph are being added to the dynamic drillholes. This can provide useful literal information to supplement any graphical columns that have already been added. To add grade text and a line graph:

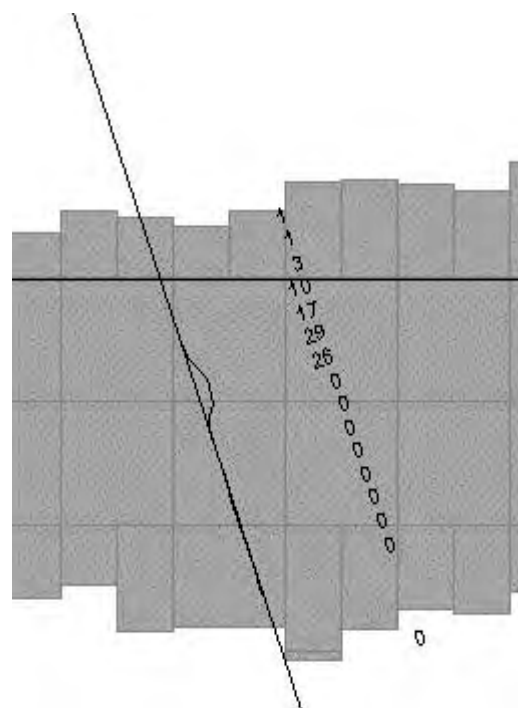
1. Make sure the **Format Display** dialog is open, at the *Overlays/Drillholes* tab.
2. Click the **Insert...** button.
3. Select the *Data Column* option.
4. Select your assays table in the *Table* box.
5. Select a grade field name in the *Field* box.
6. Select [Text] from the list of style templates. Click **Yes**, then **OK** to return to the **Format Display** dialog.
7. Repeat steps 2-6. You now have two new downhole columns in view. To format these:
8. Double-click the first of the two grade columns.
9. Choose the *Width/Margins* tab and set the *Column Width* to the width of the column required, or accept the defaults.
10. Choose the *Border/Color* tab and select *No Border*.

11. Choose the *Text* tab and in the *Number Format* box select [Integer]. Either accept the default settings or clear the *Use Defaults* check box and set the font size/type as required
12. Select the *Fixed Color* option in the *Color* box and choose a text color (e.g. black) by clicking the relevant colored button.
13. Choose the *Alignment* tab, and either accept the defaults or clear the option to *Use default alignment* and select your alignment options. Click **OK**.
14. Next, select the second grade column in the *Columns in View* box and choose the *Style Templates* tab.
15. Select the [Line Graph] template style.
16. Choose the *Graph/Color* tab and set your *Minimum* and *Maximum* values as explained in 'Adding a Grade Histogram' above. In the *Color* box select the *Fixed Color* option, and set a color for the line. The *Filled* check box should be cleared.
17. You may feel that your data will be represented more effectively if your Line Graph overlaps the Text column. If so, under the *Widths/Margins* tab, select the *Overlap previous column* option.

The image on the right shows an example of a drillhole trace formatted to show a Grade text column, and an associated line graph, in a magnified view.

The extent of line variation on the line graph (in i.e. the scale of the value axis) was set by the *Column Width* setting. However, when configuring the text column, the *Column Width* setting denoted the distance of the text from the column as, in the example shown on the left, a [right] horizontal alignment was selected, and the column itself was aligned to the right of the drillhole trace (the default setting).

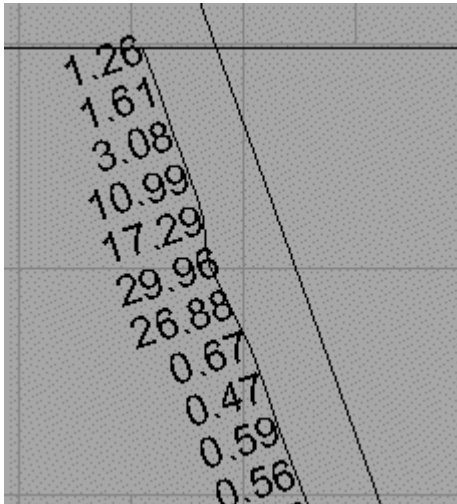
So, it is possible to achieve the same end result using a variety of methods; for example, the text column could have been positioned using a [Left] alignment, and offsetting the entire column a specified distance to the right of the drillhole trace.



The method used to format your columns is up to you, and in most cases, a balanced usage of settings is appropriate, to ensure that your plot is effectively presented.

Other Downhole Column Formatting Options

Depending on the style template chosen for your downhole column, some options in the **Format Display** (*Downhole Columns* tab) may be disabled by default. This will be the case if an option is not relevant to a particular type. For example, selecting a [Line Graph] style will force most of the options on the *Text* tab to be disabled. You can override this by selecting the *Show Text* check box.



The final procedure in this section described how to create two separate columns, one for a line graph, and one for a text column; however, you could also generate a single column that includes both a line graph and text.

The effect shown on the left was achieved by selecting a [Line Graph] style template and overriding the default text setting (i.e. disabled) by selecting the *Text* tab, and selecting the *Show Text* check box.

Once enabled, the font was reduced to 2 points, and the column width set to 5. The Potential problem with combined column formats such as this is that you cannot easily control each aspect of the column independently. In the example on the left, to increase the *Column Width* of the graph (i.e. to emphasize the value differences) may not position the text in the desired position.

Experiment with some different styles and see which suits your particular presentation.

8 USING DISPLAY LEGENDS

Hand-drawn graphs often incorporate some sort of key, to indicate what the various symbols, colors, line styles or other design aspects relate to. This allows people viewing the graph to see what each area represents and makes interpretation of information more consistent across a wide target audience by keeping the initial view as simple as possible, and more intuitive.

Display Legends act in a similar way, although instead of simply being used to interpret what values a particular type of data represents, they are used to *control* how the data is displayed. Display legends can be applied to any representation of data, and the same legend can be applied to more than one set of values.

A Display Legend is, in simple terms, a series of display instructions. The complexity of these instructions is completely up to you, and will depend on the type(s) of information you need to communicate. Legends do not just apply to the Plot view; they can be applied to Table and Log sheets as well, and can be displayed independently for each view; just because you wish to display your results in a particular way on a downhole strip log doesn't mean that format is appropriate for displaying a 3D view of the underlying data.

Legends can be constructed using:

- **Values:** A simple 'value look up' table. For example, you could define a legend so that all individual values in a range from 1 to 10 were displayed in a unique color, pattern or texture (1 = blue, 2 = red, 3 = green etc).
- **Ranges:** Ranges are defined by an upper and a lower limit, and a color, pattern or texture assigned to values that fall in that range. If a value falls on the upper limit on one range and the lower limit of the next, it will be displayed with the settings of the first range. For example, if ranges of 0-1, 1-5 and 5-10 were defined, a value of 5 would use the display settings for the 1-5 range.
- **Filters:** Filters are used to handle more complicated situations where simple values or ranges are not suitable. Filters are logical statements which defined the conditions under which a specific legend appearance applies. Complex filters can be developed to map the variation of more than one variable.

Legends can be used to control the display of:

- Text color
- Line color, style and weight
- Fill color, pattern or texture

When data is imported a default legend is created for each field. The default legends are stored in the document. You can also create your own legends and apply these to any object displayed. This chapter outlines the procedures for modifying existing legends and creating new legends.

Legend Categories

Studio 3 supports three legend categories:


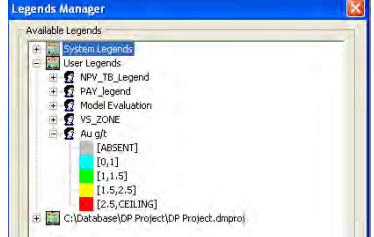


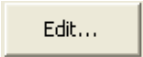
Category	Description
System	These legends are necessary for the software to operate and cannot be edited or deleted. They can, however, be copied to the other legend categories where the copies can be edited.
User	These are frequently used legends which are saved independently from the document. This category allows you to group legends for easier selection. They can be edited and deleted. If a document is sent to another user any user legends will not be available to the new user.
Project	These legends are saved as part of the project. If a project is sent to another user, its project legends are available to that user.


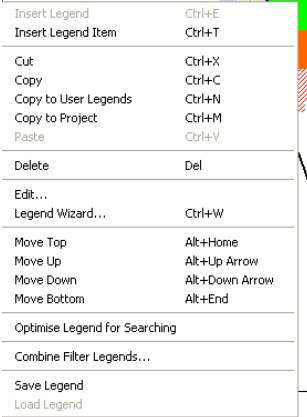
Legends Manger

The Legends Manager allows you to create, copy, edit and manage legends in **Studio 3**. You can display the **Legends Manager** dialog by running the command **Format |**

Legends or clicking on the **Edit Legends** button .


The following table is a summary of the items available from this dialog.

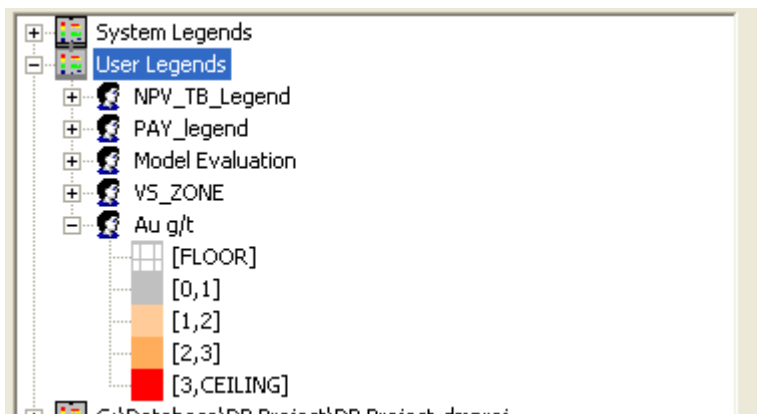
Item	Description
Available Legends	 <p>All three legend types are listed by default.</p>
Legend List	 <p>To view the legends stored in each category expand the tree by clicking on the  symbol.</p>
New Legend button	 <p>Allows you to create a new legend either manually or using a wizard which will guide you step by step through the procedure.</p>
Edit button	 <p>Allows access to the legend properties and legend items dialogs for editing purposes. You could also select the Show Details button to access the same information.</p>

<p>Show Details button</p>		<p>Displays the properties of a particular legend and allows you to edit the various legend items (e.g. value ranges, colors, legend name etc).</p>
<p>Context sensitive menus</p>		<p>Right-clicking on any item will open a menu that allows you to perform a variety of operations. Some options will be grayed out depending on what item you have clicked on.</p>

Edit a Legend

The following example uses a legend representing grade ranges to illustrate how to edit the item description and color.

1. Run the command **Format | Legends** or click on the **Edit Legends** button  to display the Legends Manager.
2. Select a legend from the legend list and expand the tree.



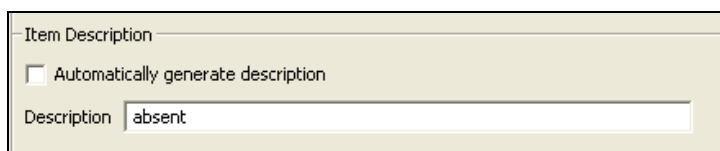
3. Select the first range (in this case FLOOR) and click on the **Show Details>>** button.
4. The details section of the dialog contains four sections. The *Legend Properties* section allows you to change the name of the legend as it appears in the legend list.

You can also change the data type from numeric to string. In this case the gold grades are stored as numbers and therefore the data type is numeric. In the case of lithology the value may be a name (e.g. basalt or sandstone) and the data type would therefore be a string.

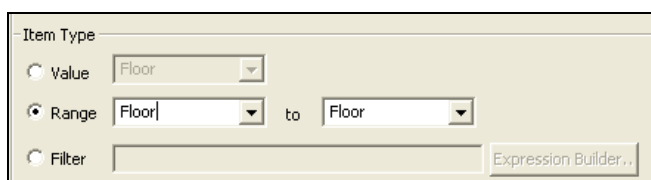
- The remaining three sections refer to each individual legend item and will change depending on which range is selected in the left hand side of the dialog.

The *Item Description* section allows you to define the description of the item or range. The description is what will appear in the legend box when added to a plot.

If the check box next to *Automatically generate description* is ticked the system will automatically generate the description. To enter your own description, untick the box and type your description, as shown below.



- The *Item Type* section allows you to define whether values, ranges or filters are used.



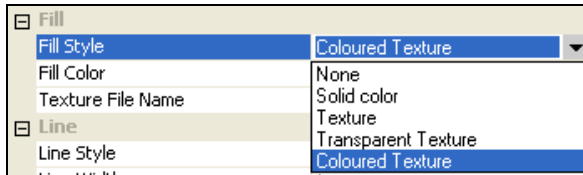
The drops down menu next to the value and range boxes contain the following options:

Option	Description
Floor	Refers to the lowest value.
Ceiling	Refers to the highest value.
Absent	If you have used a special value to signify when a sample is not assayed when importing data (e.g. -1) you should use this option.
Trace	If you have used a special value to signify when a sample has shown a trace when importing data (e.g. -9) you should use this option.
Below	If you have used a special value to signify when a sample is below the detection limit when importing data (e.g. -999) you should use this option.

- The fourth section labeled *Item Format* allows you to edit the color, line style and/or texture of each item.


When you select a description a drop down menu becomes available for each item. The options available for selection will depend on which item has been selected.

- For example; click on the *Coloured Texture* next to *Fill Style*. When you select the down arrow you will see the following menu:



Change the color and texture type by selecting from the drop down menus for *Fill Color* and *Texture File Name*.

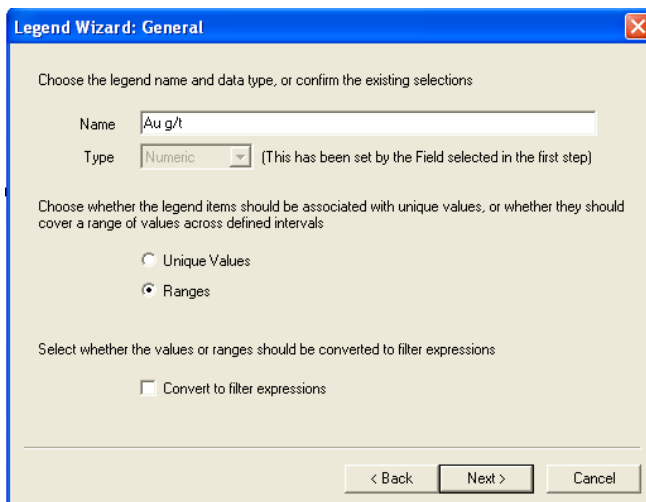
Create a New Legend

To create a new legend open the **Legends Manager** dialog (**Format | Legend** or ) and select the **New Legend** button to display the **Legend Wizard** dialog.

You have the option to use a field from one of the loaded files or to use explicit ranges. For the purposes of this example an *Object Field* will be defined.

Next select where the legend will be saved to, either the current project file or a user legend. If you select the user legend the legend will appear under the User Legends folder in the Legend Manager.

You then need to enter the name of the new legend and also whether you wish to use unique values or ranges.



Specify the number of ranges (referred to as items) in the legend followed by the type of distribution.


In the final dialog you are able to control the type of color range to use for the legend. You can preview the legend by clicking on the **Preview Legend** button.

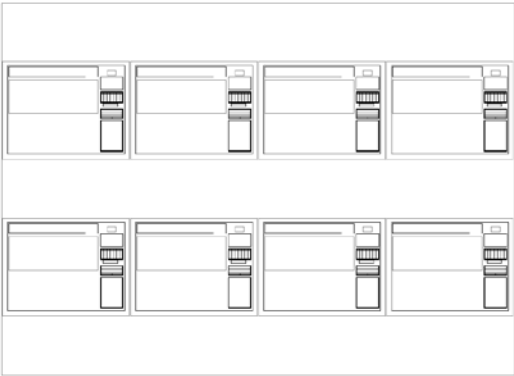
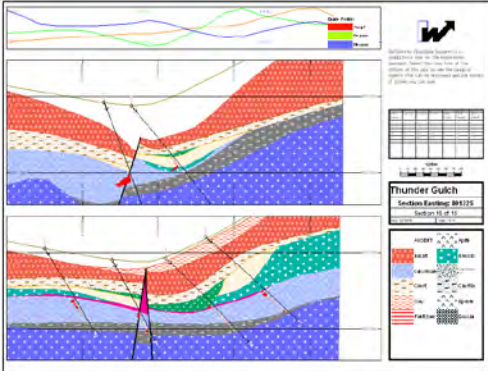
When you click **Done** you can view the new legend in the **Legends Manager** and edit the colors and texture using the Details section as described previously.

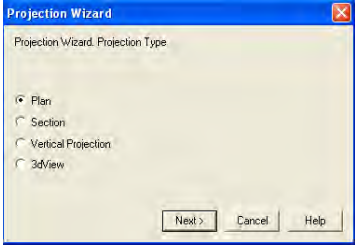
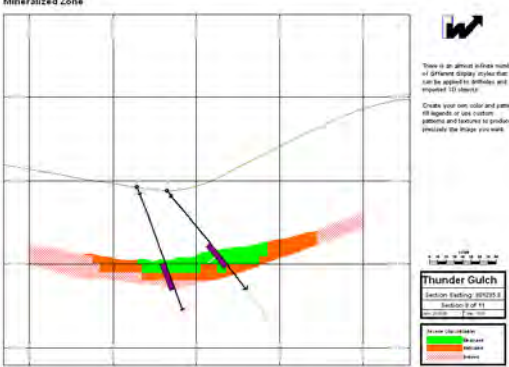
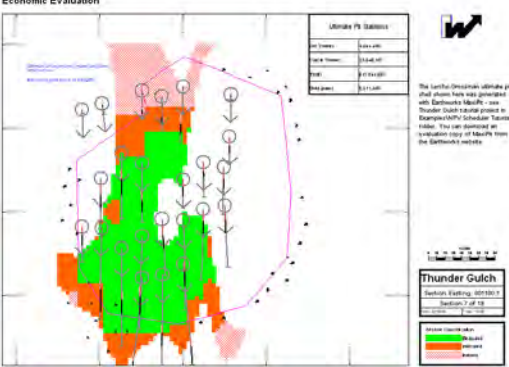
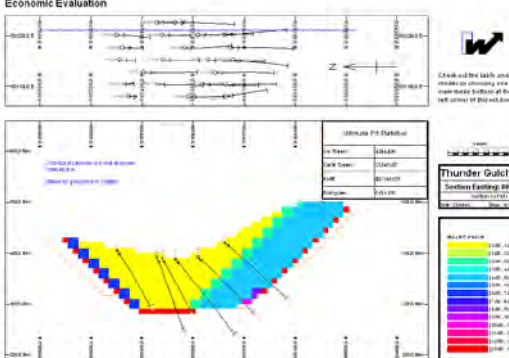
9 CREATING SHEETS

In the **Plots** window a complete family of sections is defined by a single section definition. Each page can contain either a single section or multiple sections. When you import data into **Studio 3** the program will automatically create a family of sections based on the extents of the data. For example, if drilling data extends between northing 1000N and 2000N, the program will auto-range the extents of the data and create 11 east-west sections using a section width of 100m. Each section is displayed on a separate page and all 11 pages are stored in a single sheet which can be accessed by clicking on the relevant tab.


When creating new sheets there are a number of standard sheet layouts which can be selected from the plot library. The resultant views are all created using the default page size and are positioned and scaled so that the full extents of the data are displayed. The views can then be edited and formatted as required.

You can access the **Plot Item Library** by running the command **Insert | Sheet | Plot | Custom** or click on the **Section Wizard** button . The sheet layouts that are available include:

Sheet Layout	Description	Edited Example
Linked Replica	Allows you to create a view containing a copy of selected items from other sheets. For example you can use this feature to display all pages from another sheet on a single page. Linked replica views are displayed as empty frames on screen but data may be viewed using File Print Preview . A linked replica view cannot be edited itself, but any changes made to the original view will be reflected in the replica.	
3 Parallel Sections	Creates a new sheet that contains 3 section views. Each view can be edited separately.	


<p>Projection Wizard</p>	<p>Guides you step by step through the procedures to create a plan, section or 3D view. The prompts will vary depending on what option you select.</p>	
<p>Vertical Section</p>	<p>A new section view sheet is created using the default page size, positioned and scaled so that the full extents of the data are visible.</p>	
<p>Plan Projection</p>	<p>A new plan view sheet is created using the default page size, positioned and scaled so that the full extents of the data are visible.</p>	
<p>Vertical Section & Plan</p>	<p>Creates a new sheet that contains both a section view and a plan view.</p>	

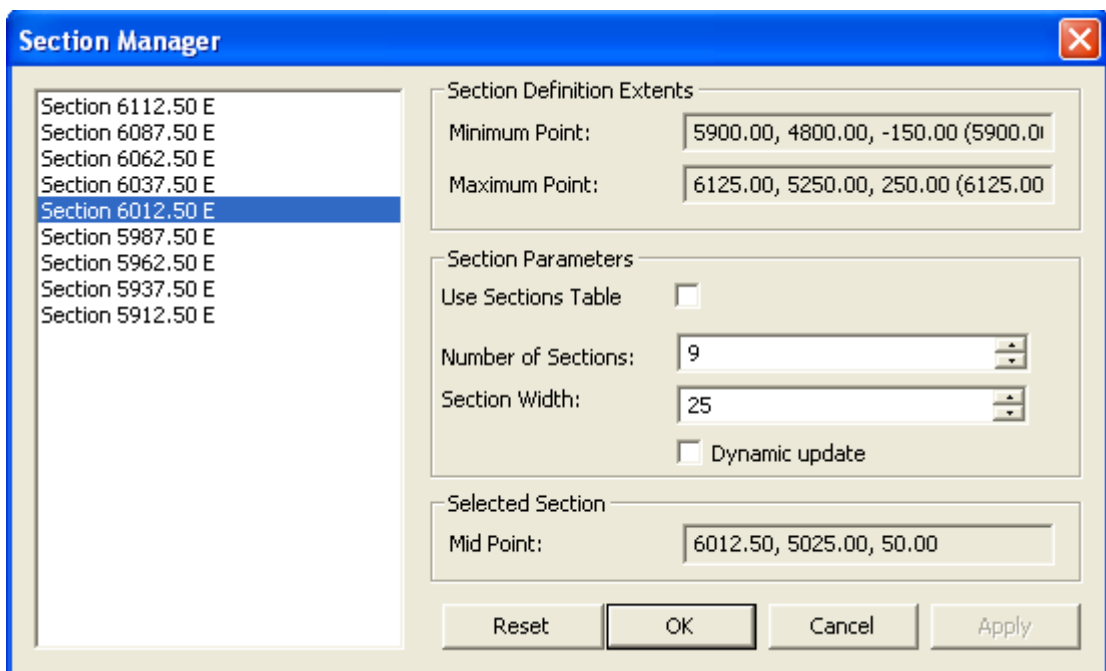
The following example uses the section wizard to create a new sheet which displays a family of North-South section views.

1. Run the command **Insert | Sheet | Plot | Custom** or click on the **Section Wizard** button .
2. Select *Projection Wizard* from the **Plot Item Library** dialog and click **OK**.
3. Select *Vertical Projection* and click **Next**.

4. In the next dialog select the *North-South* radio button and click **Next**.

A new sheet named North South View is created displaying all loaded data. The next step is to setup the section definition.

1. Click anywhere within the plot area (that is any point inside the plot frame). Click on the **View Settings** button  or select **View Settings** from the menu that appears when you click with the right hand mouse button in the plot area. This will display the **View Settings** dialog.
2. Select the *Section Definition* tab and click on the *Apply Clipping* box to access the other options in this dialog.
3. Edit the *Section Orientation*, *Mid-Point* and *Width* values as required and select **Apply**.
4. Run the command **Section | Section Manager** to display the **Section Manager** dialog. This dialog contains a summary of the section definition; you can edit the number of sections and section width to generate a family of sections. For example:



Another way in which a family of sections can be defined is by using a section table. A section table contains predefined section definitions. These might be in a predefined, non-parallel pattern such as a fan or they might not have any specific relationship one to the next. You can change the section displayed using the section navigation keys in the usual way.

The following is an example of a section table:

The screenshot shows the Datamine Table Editor window titled "_vb_viewdefs.dm - Datamine Table Editor". The window contains a table with the following data:

RECORD	XCENRE (N)	YCENTRE (N)	ZCENTRE (N)	SAZI (N)	SDIP (N)	HSIZE (N)	VSIZE (N)	DPLUS (N)	DMINUS (N)	SVALUE (A28)	TEXT (A60)
1	6134	5191	195	0	0	1548	1210	-	-	1	Plan 195m
2	6023	5017	22	345	-42	740	580	-	-	2	Inclined View
3	5935	5015	60	90	-90	450	350	10	10	3	N-5 Secn 5935
4	5960	5015	65	90	-90	450	350	10	10	4	N-5 Secn 5960
5	5985	5015	45	90	-90	450	350	10	10	5	N-5 Secn 5985
6	6010	5015	75	90	-90	450	350	10	10	6	N-5 Secn 6010
7	6035	5015	65	90	-90	450	350	10	10	7	N-5 Secn 6035
8	6060	5015	60	90	-90	450	350	10	10	8	N-5 Secn 6060
9	6085	5015	60	90	-90	450	350	10	10	9	N-5 Secn 6085
10	6110	5015	60	90	-90	450	350	10	10	10	N-5 Secn 6110

At the bottom of the window, there is a status bar with the text "Record 1/10 Column 1/11 SINGLE PRECISION LINKED READ CAP NUM SCRL".

To use a section table you need to click the box next to *Use Section Table* in the **Section Master** dialog.

10 ADDING PLOT ITEMS AND FEATURES

A variety of plot items such as tables, text boxes, title boxes, legends, bitmaps and scale bars can be inserted into any plot sheet. Many of the plot items have smart features which change as other plot and document settings change. For example, a scale bar will change automatically as the plot scale is changed.

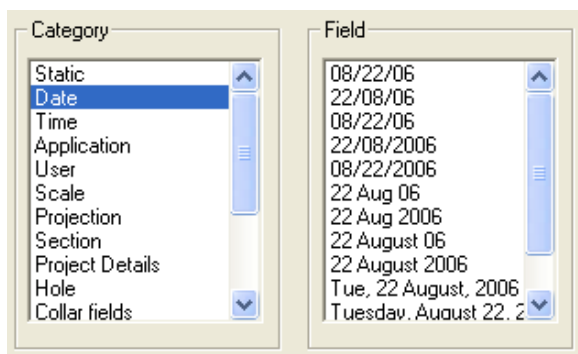
General lines and annotation features can also be inserted. These features can either be imported from other data sources or digitized and saved within the document. Once imported objects may be formatted and edited in the same way as an internal feature.

Plot Item Properties

Plot items can be positioned anywhere on the page. They can be any size and can be copied from one page to another. The following plot items can be inserted from the menu **Insert | Plot Items**.

- Title box
- Text box
- Legend
- Table
- Clip art
- Symbol
- North arrow
- Scale bar
- Columns list box
- Profile

Title and legend boxes can contain both user defined text or fields supplied by **Studio 3**. When editing the contents of a cell you can select a category and then choose from a number of field options. For example if you chose the *Date* category there are a number of different date formats from which you can choose.



The following categories and fields are available to define the contents of cells in title blocks, legend boxes and also log sheets.

Category	Field	Set By
----------	-------	--------

Static	Blank	User defined
Date	There are a number of different formats available.	System
Time	There are a number of different formats available.	System
License Details	Name	Program name
	User ID	Tools Options command
	User Name	Tools Options command
	Company	Tools Options command
Scale	Scale	View setting
View	Title	View setting
	Azimuth	View setting
	Dip	View setting
Section	Name	Section definition
	Width	Section definition
	Mid Point	Section definition
	Easting	Section definition
	Northing	Section definition
	Elevation	Section definition
	Azimuth	Section definition
	Inclination	Section definition
	Number	Whatever section is currently selected
	No. of Sections	Section definition
	Section ? of ?	Whatever section is currently selected (i.e. Section 5 of 25)
Project Details	Project Name	File Properties command
	Project Code	File Properties command
	Short Title	File Properties command
	Long Title	File Properties command
	Client	File Properties command
Hole	Hole Name	Whatever hole is currently selected
	Hole length	Traces table
	Hole azimuth	Traces table
	Hole Inclination	Traces table
Collar	X, Y, Z	Traces table
	X	Traces table
	Y	Traces table
	Z	Traces table
End of Hole	X, Y, Z	Traces table
	X	Traces table
	Y	Traces table

	Z	Traces table
Start	Same as EOH	Traces table
End	Same as EOH	Traces table

Inserting a plot item is a simple one step process running the command **Insert | Plot Item** and selecting which plot item to insert. In some cases you will want to edit the default settings and this is done by entering Page Layout mode (**View | Page Layout Mode**) and double clicking on the plot item to format. The dialogs and prompts will vary depending on which plot item you are formatting.

Title Box

Title boxes can be any size, with any number of rows and cells per row. They can contain user defined text or fields supplied by **Studio 3**. The section and hole fields in the title box will be automatically updated whenever you change the section definition.

Legend Box

A legend box is a special type of title block used to display the contents of a color or pattern fill legend. Like a title block, a legend box can be completely customized by changing its size, number and size or rows and columns, and the contents of each cell.



The size of text in each cell is automatically set by the program based on the maximum font size set on the *Properties* tab. For the best results, choose the font size that best suits the largest cell, typically the title in the first row, and the program will auto-size the text in the other, smaller cells.

Tables

Intelligent tables can be added to plots to enhance their usefulness. You can choose settings to make you table display only the data that is relevant to the drillholes and features in your present plot view. As you move through the sections the data will change accordingly.

When inserting a table you are prompted to select from a list of all tables currently loaded into the project. You can then use the **Table** dialog to edit and format the contents of the table.

- The options under the *Contents* tab allow you to select and format the data that is displayed in the table.
- The *Define Index* tab allows you to control the order in which data is displayed. For example you can choose to display drillhole data in descending order according to the Hole Name. Any of the columns can be selected as an index.
- The *Filters* tab allows you to define a filter which will display only the data that meets specified criteria.
- To display only the data relevant to the displayed section, select the *Section and Log Filters* tab and check the *Do not include records for hole off-section* box.

Columns List Box

This plot item displays a list of the data displayed downhole. The contents are automatically updated as you add, remove or modify your downhole columns.

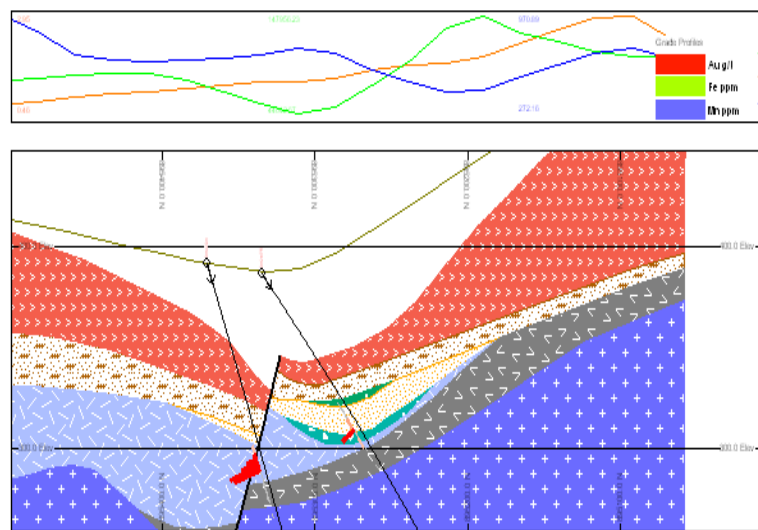
Downhole Columns		
Au	Histogram	1p , 3p , 5p , 7p ,
Lith Code	Bar	
ZONE	Bar	
Cu	Text	
Cu	Line Graph	2000 5000 8000



When resizing the width of cells, holding down the SHIFT key will ensure that all cells in that column will remain the same width.

Profiles

3D objects with Z coordinates which define parameters other than the elevation, for example a surface model derived from soil sampling or gravimetric surveys can be displayed inside a profile box. The Z coordinate of each parameter surface is scaled to fit the vertical axis of the profile box. Any number of 3D objects can be displayed in a single profile box and more than one profile box can be inserted on the same page. As will all the plot items profile boxes may be positioned anywhere on the page.



The horizontal position in the profile box is tied vertically to the corresponding horizontal position in the data area. The surface profile is automatically updated whenever:

- The profile box is moved or resized
- The data area is moved or resized
- The scale in the data area is changed
- The data area is panned horizontally
- The section is rotated or repositioned

Feature Properties

Annotation may be added to each view by digitizing with the mouse or importing from another source. The visibility of these features is controlled in the same way as the drillholes and 3D objects.

The main features that can be added are:

- Text Annotation
Use the command **Insert | Plot Feature | Text Annotation**.

- Dimension arrow

Use the command **Insert | Plot Feature | Dimension Arrow**. Use the mouse to draw the arrow onto the plot. A dimension arrow can comprise several lines as shown to the right. To end digitizing double click on the end point.



Formatting Objects

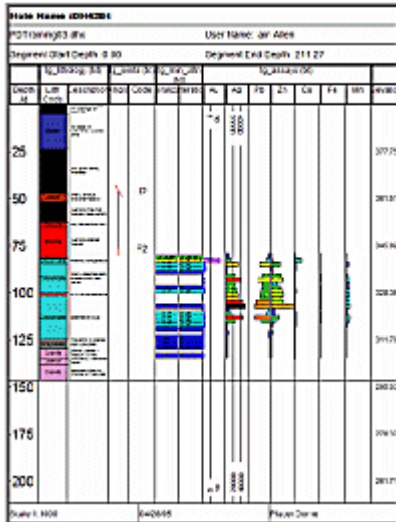
Objects can be hidden or displayed as points, lines, faces or section intersections. They can be displayed using a fixed color, a user defined color, pattern fill or texture legend.

To format the display of an object, run the command **Format | Display** to display the **Format Display** dialog.

Select an object in the display list to show the current format settings. The tabs and formatting options will change depending on what type of object you have selected. For a full list of formatting options and how to apply them refer to your online Help.

11 FORMATTING LOG SHEETS

Log Sheets Overview



Once a complete set of drillhole data has been loaded, the drillholes may be viewed as scaled hole log plots in the **Logs** window. Fields may be duplicated, displayed as text or graphs. Fields from more than one table source can be viewed in the same log view including system fields.

Log sheets consist of *header*, *column* and *footer* sections, the layout and contents of each are fully-customizable. The default layout created by the program when a new log view is created contains a useful selection of information about the project and the holes defined in the document.

Downhole data columns are scaled vertically by the downhole depth and may describe any interval log or depth log field or computed hole data field. The level of information a log sheet can contain extends to a variety of mineralogical scenarios, for example, the maximum drilling angle can be displayed, with respect to the axis of the drillhole, in the case of your core sample having evidence of a fault or joint, or a cumulative graph can be displayed in which the data values in two columns are added together and presented as a pair of superimposed histograms.

Log Sheets allow you to plot multiple downhole attributes, as well as lines representing angles for structural measurements. A single attribute can be plotted more than once, using different display methods to emphasize different features. Columns can be set to overlap, allowing some very useful displays to be created. Calculated values, including grade-thickness and other composited values can also be displayed.

You can modify the default log sheet, or, you can create your own log view.



When creating a new project a hole log view is created using the default display settings.

A wide range of formatting options are available for changing the layout and content of log sheet header, columns and footer. Log plots may be enhanced by the addition of *smart plot items* which have inbuilt intelligence and will adjust automatically to changes in the document. Plot items available include text boxes, legend boxes, tables and clip art images.

Almost any property of the plot sheet or view can be changed to produce plots which meet your precise requirements including sheet size and orientation, printer margins and plotting scale.

To view log sheets select the **Logs** window. If this window is not displayed run the command **View | Windows | Logs**.

All available Log Views are shown as a series of tabs along the bottom of the screen. Note that each tab represents a particular format for displaying logs. You can cycle through a view of the log reports for *all* available holes in each tab.

Select one of the named log view tabs to access a particular view, or you can create a new view entirely.

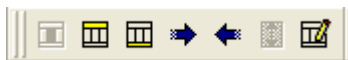
Creating a New Log View

To create a new log view click on the **Logs** window and run the command **Insert | Sheet | Log**.

A new Log view is created using the default page size, layout and format, and will be used to represent hole logs for each defined hole in memory. Choose the **Next** and **Previous** commands from the **Log** drop-down menu to quickly walk through and review all the holes defined in this document.

The Log Toolbar

Right-click the menu bar and choose **Customize** from the resulting menu. Click the *Toolbars* tab and select the **Log** toolbar. Click **Close**. The new toolbar, will appear at the top of the application interface.



All commands on this toolbar are also available from the **Log** drop-down menu.


Display Modes

There are two display modes available for Log sheets:

- **Normal Mode:** items can be selected, and modified using the context-sensitive dialogs, but the overall size, shape and position of plot items cannot be edited.
- **Page Layout Mode:** use Page Layout mode to display and edit interactively page borders, sheet margins, plot frames, coordinate grids, plot items and parameter profiles.

When you first enter the log, view, you are in **Normal** mode, and the cursor is a small cross, used to select intervals.

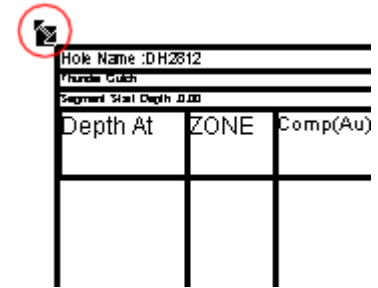
To switch to Page Layout Mode you can select **View | Page Layout Mode** (this command is also used to toggle back to **Normal** mode). Alternatively, you can click the

Page Layout Mode Icon  on the far right of the **Plot Items** toolbar to toggle each mode.

Using Page Layout Mode

After switching to Page Layout Mode (see above), you can select items within the plot view and edit or move them around on the current page. The first time you activate this mode, the entire log view is selected, and the mode can be recognized by the resize blocks around the edge of the log as shown in the image below right.

With the Log selected, you can use the mouse to re-size and/or move the boundaries of the log plot. This is another way of resizing the page boundaries on which the log will be printed, however, it is important that your manual adjustments do not create an output that conflicts with the settings for your printer, or unexpected results may occur.



Hole Name :DH2812		
Hole No		
Segment Start Depth 0.00		
Depth At	ZONE	Comp(Au)

Whilst in Page Layout mode, you can select any of the items comprising the log view, and resize bars will be shown around the selected item.

When the resize cursor is displayed (see image top right), you will be able to click-and-drag the edge of the selected component to create a new boundary shape. However, you will need to remember that if the item that has been selected is bounded by another component, the amount of movement possible may be restricted by the size of the bounding component. You may need to resize components from an 'outside-inwards' approach if this is the case.

Setting Log View Properties

The **Log View Properties** dialog is a powerful tool to give you comprehensive control over the appearance of your log plots. This dialog can be accessed by right-clicking any part of the currently viewed log sheet and selecting **Format Display**. Alternatively, you can access the log view for the currently active hole by selecting **Plot Item Properties**.



The **Format Display** command will display the same information as the **Plot Item Properties** command.

Note the seven tabs along the top of the dialog. Each represents a particular area of formatting functionality:

- **Hole:** this section is used to configure the hole that the current log view applies to. You can select an existing hole definition, and define its scale, data limits and how to handle data updates when new holes are selected.
- **Hole Set:** it is good practice to manage your hole data by categorizing it into sets. These sets can relate to whichever common criterion/criteria best suits the current project.
- **Header:** a log sheet is a special type of text block used to display scaled hole logs. Like any text block in the **Logs** or **Plots** windows, it can be completely customized by changing its size, number and size of rows and cells, and, the contents of each cell. The cells in both the header and footer may contain fields specific to the project, the sheet or the hole being viewed, and are automatically updated whenever these parameters change.
- **Column Titles:** turn on and off, and format the *Table Name* and *Column Name* header rows.
- **Columns:** define the data columns to be used to represent your log sheet, and the style in which they are displayed. This is an important part of Log formatting, and is discussed in more detail later in this section.
- **Footer:** used in a similar manner to the Header (see above) this section allows you to apply 'dynamic' content to your Log view.

- **Frame:** this tab controls the overall structure of the table used to display the log view data, such as the spacing between table cells, border style and overall size of the table.

Hole definition

Presuming that a set of drillholes are loaded, you can use the *Hole* tab to select the ID of a particular hole using the Name drop-down list. On selection of a hole ID, the length of the hole is shown immediately to the right of the selection field.

Click **Apply** to update the view of the current log sheet to reflect data from the selected hole. Remember that even though you are selecting an individual hole ID, this selection determines the hole that is viewed when **Apply** is clicked – all other holes will be displayed using the same log sheet format settings.

On the same tab you can set the *Extents* of data that will be displayed, the *Scale* of the log sheet and how to display the next or previous hole in sequence.

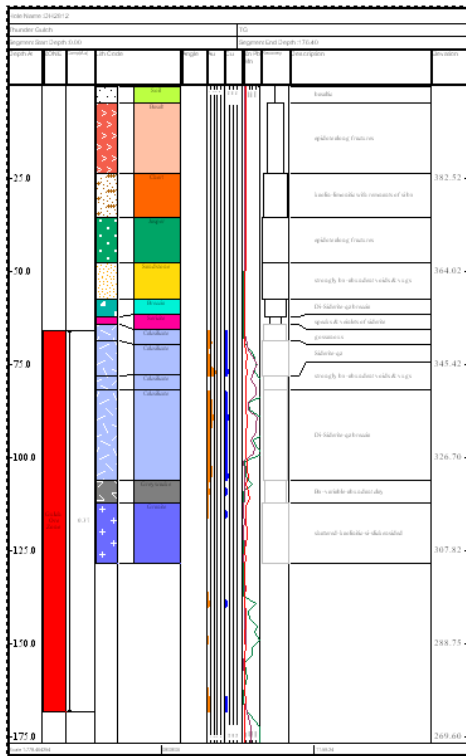
Your online Help gives you more information on these settings, but as an example, if you wished to view the log sheet for a specific hole, but only showing data relating to the first 100 meters of the downhole length, you would do the following:

1. Select the required hole from the *Current Hole* drop-down list (remember, this is the hole that will be viewed when you click the **Apply** button).
2. In the *Extents* section, select the *Custom* option and enter '0' into the *From* field, and '100' into the *To* field.
3. Leave all other settings and click **Apply**.

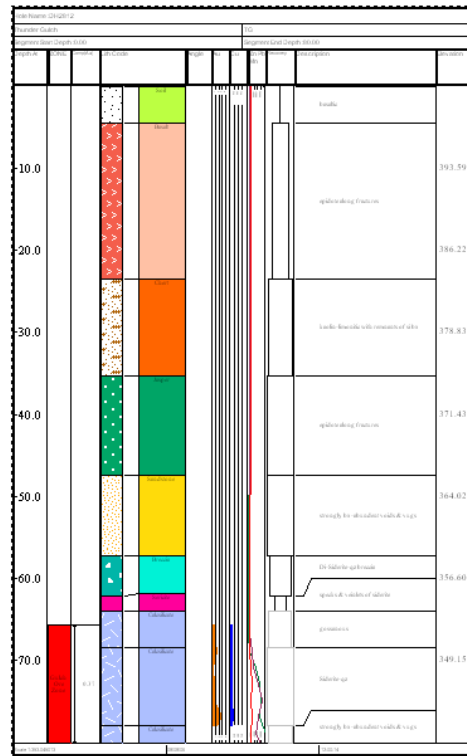


you can either set the extents of the hole to view, or the scale of the data axis on the log sheet, not both

The images below show the same hole represented by two similar, but different log sheet formats. The borehole in question is 176.4 meters in length. The first image (left) shows a log sheet representing the Entire Hole on screen, and the second shows a Custom extents setting of 0 to 80 meters, approximately half of the available lithological data:



Entire Hole Extents



First 80 Meters Only

Formatting the Header and Footer

The cells in the header and footer of your log split can contain fields specific to the project, the sheet, or the hole being viewed. These fields are automatically updated whenever these parameters change, or you switch to another hole.

Hole Name: VB4295	
Viking Bounty	
Segment Start Depth: 0.00	Segment End Depth: 228.81

In the example header shown above, there are three rows, with one cell in the first row and two cells in each of the second and third rows. The second cell in the second row is empty. In the following exercise, you will put your name in that cell, and change the font for all the cells:

1. If it is not already displayed, open the **Log View Properties** dialog (one method of doing this is to right-click anywhere on the current log sheet view and select the **Plot Item Properties...** option).
2. Click the *Header* tab. Using the *Row* and *Cell* sections of this tab, you can specify what information to place in each cell of the header. Specify '2' for both *Row* and *Cell*.
3. Click **Contents** on the right side of the tab. This opens another dialog listing all the *Categories* and associated *Fields* for each category. Choose [User] from the *Category* list and [User Name] from the *Field* list. Also, select *Include label* check

box. This will include the *Field* name as well as the value in the selected cell. Click **OK**.

4. Click **Format**. Clear the *Use default font* check box, click **Modify** and set the font to [Arial], [Regular], [12 point]. Click **OK**.
5. Make the same format change to cell 1 in row 2 and cells 1 and 2 in row 3.
6. Select Row 1 and Cell 1. Click **Format**. Set the font for this cell to [Arial Black], [Regular], [12 point]. Click **OK** three times to close all the dialog boxes. The Header should now look as shown below (with the exception of the description 'Your Name' being replaced with your current login name).

Hole Name: VB4295	
Viking Bounty	User Name: [Your Name]
Segment Start Depth: 0.00	Segment End Depth: 228.81

7. Open the **Log View Properties dialog** again. This time, click the *Footer* tab. Specify 1 row and 3 Cells. Click the **Contents** button. Choose [User>Company]. Make sure the *Include label* check box is clear. Click **OK**.
8. Use the **Format** button to change the text for all the Footer cells to 10 point. Close the **Log View Properties** dialog.

The **Log View Properties** dialog can also be used to insert and delete rows and cells from the Header and Footer. The **Header** and **Footer** buttons, on the **Log** toolbar (shown right) can be used to open the **Log View Properties** dialog with these tabs active.



Formatting Log Columns

The **Logs** window support a wide variety of formatting functions, and the following sections describe how to add and remove columns, define how downhole geology is to be displayed, format lithology and structural information columns, mineralization and alteration columns and downhole assay values.

You may notice as you progress through this section the similarities between formatting log sheet columns and downhole columns on plot views (as described in the previous Chapter). **Studio 3** has been designed in this way to maximize your familiarity with formatting commands, and as such, mastering the formatting of one particular view type will aid you considerably when exploring other data presentation formats.

The following procedures are generic, i.e. they describe the recommended process for following on common log-related tasks. For more specific information and tutorials, you should look at your online Help, and in particular, the 'Step by Step' procedures, or access the context help for the Log Formatting screens, accessed in the procedures that follow.

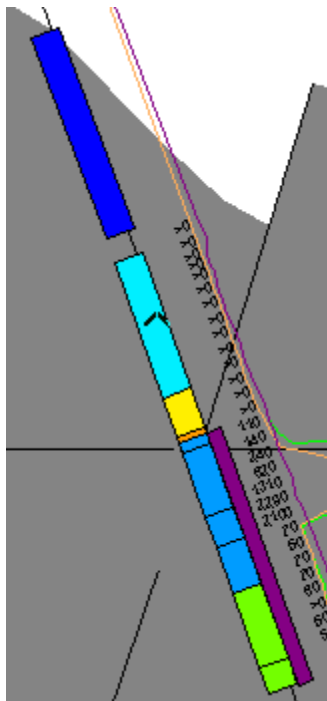
Adding and Removing Columns

The general procedure for adding or removing log sheet columns is as follows:

1. Ensure the **Log View Properties** dialog is open. If it is not, open it by selecting **Format | Display**.

2. Click the *Columns* tab. Select the *Description* column in the list. All new columns will be added immediately below this selected column.
3. Click the **Add** button beside the *Columns In View* list. Complete the **Column Wizard** using the instructions listed below:
 - On the first screen, select the *Data Column* option and click **Next**.
 - On the next screen, select the object or table that represents the data you wish to display in the new log sheet column and click **Next**
 - On the next screen, select the field(s) from the selected object that contains the values you wish to use as a basis for the log column. Click **Next**.
 - If you have selected more than one field on the previous column, the next screen gives you options on how to create a composite value based on your selections. Set your compositing options and click **Next**.
 - On the following screen, select the basic style to be used to display the specified data. Click **End**.
4. At this stage, the **Column Wizard** is closed and your new column is added to the *Columns in View* field in the **Log View Properties** dialog. The position of your new column in this list indicates where it will be displayed (from left to right) on the resulting log sheet. After you have added the new fields, click **Apply**. The new fields are added to the strip log.

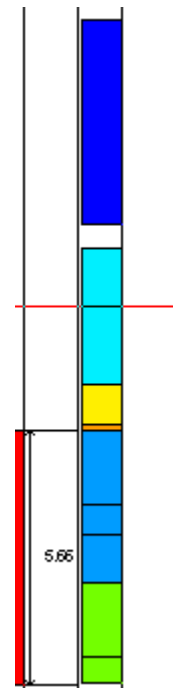
Formatting Logs vs. Downhole Columns



The procedure for editing a Log Sheet column is exactly the same as for a downhole column in the Plot View; the same tabs are available and they both have the same effect on the resulting data. The main difference between the two is that Log Sheet formatting is applied in a tabular arrangement and downhole column formatting is applied, generally, in relation to the position of a particular set of drillholes.

The image on the left shows a lithology bar added along the axis of a drillhole in the **Plot** view, and the image on the left right shows a representation of the same drillhole, colored using the same legend, in a *Log Sheet* column. The similarities are obvious, and the method and settings required to display them is identical; select **Format | Display** and select the *Columns* tab.

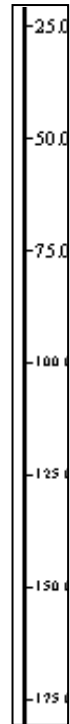
Note that the settings for each are independent.



Adding and Formatting a Depth Axis Column

It is often required to display your log sheet data alongside some form of downhole depth indicator. One way of adding a feature of this type to your sheet is as follows:

1. With a log sheet in view, make sure you are in a Page Layout format. Right-click the sheet and select **Plot Item Properties**.
2. Click **Add**.
3. On the first screen of the Add Column wizard, select [Axis Column] from the *Column Type* list. Click **Next**.
4. On the following screen, select [Depth At] in the *Field* box and choose **End**.
5. Choose the *Style Templates* tab and select [Ticks with annotation].
6. Choose the *Width/Margins* tab and set the *Column Width* to the width you would like for your axis bar, in millimeters. Set the *Left Margin Width* to increase or decrease the space before the vertical bar.
7. Choose the *Text* tab and set the number of *Decimal Places* you wish to display.
8. Choose the *Alignment* tab, and either select the defaults, or clear the *Use default alignment* check box, and apply your custom alignment settings.
9. Choose **Apply** and view the log sheet.
10. Click the *Style Templates* tab. A bar is selected. Click the *Graph/Color* sub-tab. You can now elect to display your bar using a solid color, or to Color it using a legend. For more information on legends, see the following Chapter – 'Legends'.
11. Click **Apply**, and then **Close** the **Log Properties** dialog.



Formatting Existing Text in Log Columns

The following procedures should be used if you wish to modify the way columns are formatted, make duplicates or overlap columns to create a more effective display.

1. Open the **Log View Properties** dialog and click the *Columns* tab. Select the column you wish to format from the *Columns in View* list on the left, and click the *Text* tab on the right.
2. On this tab, set the *Font Size* manually (i.e. override the default settings) by clearing the **Use Defaults** button and setting the *Font Size* manually, in points.
3. Click **Apply** to update the selected column. Text in other columns will be unaffected, allowing you to have a mixture of font sizes and styles in the same log sheet.
4. After adjusting your text size, if the current column dimensions need adjustment to ensure your text is now readable, click the *Width/Margins* tab and set the *Column Width* as your text requires. Click **Apply** to see your changes in the log view.

Formatting Structural Information Columns

If you have data columns representing structural angle information, and wish to display this information on your log sheet (see the image on the left for an example), you will need to add a log column to your sheet (if one does not already exist) using the Column Wizard.

Adding a New Angle Column

1. If it is not already in view, open the **Log View Properties** dialog.
2. Click the *Style Templates* tab and click **Add**.
3. Select *Data Column* from the options on the first screen and click **Next**.
4. On the following screen, select the table (i.e. the object) containing the structural information column and click **Next**.
5. On the following screen, select the data column containing the angle data you wish to represent in the new column and click **Next**.
6. On the Style Template screen, select the final entry in the list – [Angles] and click **End**.
7. Back in the Log View Properties dialog, you can now format your Angle column using the sub-tabs available. Many options are available for the control of your new column, but in the case of Angle data, you may wish to set up the *Alignment* and *Width/Margins* to see which values best display your structural data.
8. Click **Apply** to see your changes.

Easier Viewing of Angle Columns

It can be easier to see the relationship between the various angles if a vertical line is added to the plot that bisects the angle lines. The procedure below describes a quick way of doing this.

If you wished to add another angle column to your Log Sheet:

1. If it is not already in view, open the **Log View Properties** dialog.
2. Select the Angle field you wish to duplicate
3. Click **Copy**. A second Angle field is added to the plot, at the bottom of the list.
4. Select the new Angle field and use the **Up** button to move it to immediately below the first Angle field.
5. Click the *Style Templates* tab and select [Trace]. Click **Yes** to the Format Reset prompt.
6. Click the *Trace* tab, and select *Fixed color*, which defaults to black.
7. Click the *Width/Margins* tab and select the *Overlap previous column* check box. By choosing to overlap the previous column, the two Angle fields will



appear in the same space. This places the vertical trace line down the centre of the column, bisecting the angle lines.

8. Click **Apply**. You should now be able to see a vertical line extending down through the first angle column.

Formatting Existing Log Values As Graphs

Using the Filled Histogram Format

The graph formatting options provide a clear way of representing various mineralogical aspects of your downhole assets. One of the more likely uses of such a facility is the representation of mineral grade values for each downhole position.

Applying a graph format is very similar to applying any log sheet formatting option, although graph-specific options exist to compliment the current range of standard controls:

1. If it is not already in view, open the **Log View Properties** dialog.
2. Select the column you wish to portray in Graph format.
3. Click the *Style Templates* tab on the right hand side. If the selected column is not already using the [Filled Histogram] style, select it from the list of templates.
4. Click the *Graph/Color* tab. You can choose whether to have a fixed color graph, with values represented by bar heights only, or you can use the *Color using legend* option, which should be selected if you wish to color each bar of the graph according to legend values. Note that you will need to select a legend that is relevant to the data column in use (for more information on legends, see the following Chapter – “Using Legends”).
5. If mineral grade values for the drill holes in the current section are low you may need to modify the range of the data and widen the column to make the histograms more visible. To do this;
6. On the *Graph/Color* tab, try changing the settings in the *Maximum value* field and see how it affects the exaggeration of the histogram bars. The value selected will depend on the scale you require, and the values in the associated data column.
7. Click **Apply** to update the current view, and **Close** when you are happy with the view.



Comparing Related Deposit Values Using Histograms

Certain minerals, such as Lead and Zinc are frequently related in ore deposits. To more easily see the relationship between these two elements, you can use neighboring columns filled with histogram cells. In the following example, a histogram representing lead values is set up to be right-justified, while a histogram representing zinc values is set up to be left-justified.

1. Open the **Log View Properties** dialog. Click the *Columns* tab. Select the Zn field in the *Columns in View* list and use the **Up** or **Down** buttons to move the two mineral grade columns so they are next to each other in the list.

Appendix A: HINTS, COMMON QUESTIONS & ISSUES

I can't see any data in my section view...

Check that the scale is not locked. Uncheck the **View | Scale | Lock** command. Then use the **View | Scale | Fit All data** Command. Then check that no clipping is applied using the **Section | Apply Clipping** command.

Can I add my own textured bitmaps to log and section views?

Yes. Create a bitmap of the texture and add it into the Legends directory. By putting it into this directory it will appear in the list of textures shown in the Fill Patterns drop down box when using the **Format | Legends** command.

How can I increase the size of the color boxes in the legends? Every time I have to resize all the boxes individually and it is hard to make them the same size.

Hold the <SHIFT> key down when resizing a legend color box. All boxes will be sized.

What is the best way to line up legend boxes and title boxes etc.?

Make sure you are in Page Layout mode. **View | Page Layout Mode** command. Double click on the plot item to bring up the properties dialog for that plot item. Enter the required size in mm in the size entry box. Drag the plot item with the mouse to the required location. Use the arrow keys to line up the plot items exactly.

I have added a bitmap to my plot but when the bitmap changes the plot does not change...

To make it easy to pass documents around to other people in your company bitmap plot items are contained within the document. If you change the bitmap you will need to recreate your bitmap plot item.

The colors I want to use are not in the legend color palette...

You can make your own palette of colors by creating either solid color or colored pattern bitmaps and adding these to the Legends directory. The bitmaps need only be 16x16 pixel (or smaller) which can be created in any graphics program like Microsoft Paint. Use the color editing features in your graphics program to mix the precise color shades required. Use a common prefix e.g. a-magenta.bmp so that your bitmaps are all grouped together and easily located. When applying a color to the legend item, choose the Colored Texture option and select a custom color bitmap or pattern.

When formatting log columns, checking the offset position to prevent overlaps option on the *Alignment* tab has no effect.

Choose the Text tab, in the Style box select the Word wrap option and choose Apply.



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