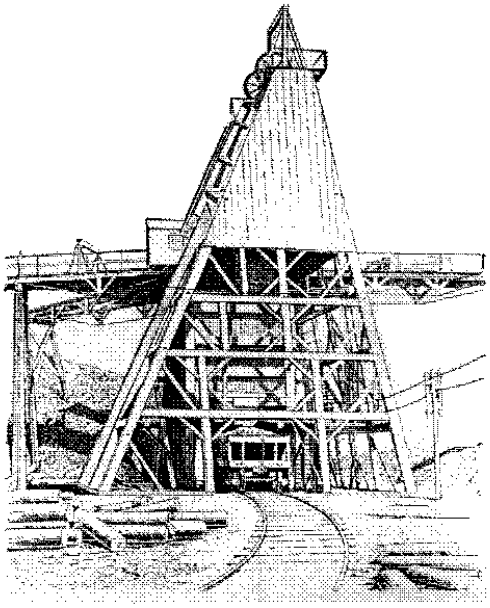
# DrillHoleMS



## MinServ

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# About DrillHoleMS

DrillHoleMS is a Windows program for drawing and plotting drill hole/mine cross sections, drill/well logs and plans. A wide variety of options allow the sections, logs and plans to be customized to your requirements. Designed for presenting and interpreting geological field data. DrillHoleMS consists of 5 integrated modules built into one application. These 5 modules are:

1. Spreadsheet Module for entering and editing data
2. Drill Hole Plotting Module for drawing and plotting plans
3. Cross Section Module for drawing and plotting cross sections
4. Drill Log Module for drawing and plotting drill/well logs
5. Map Drawing Module for drawing geological and other maps

### DrillHoleMS Features

- Plot Drill Hole Plans, Cross Sections and Drill/Well Logs
- Import Wizard for Tab, Comma, Space, Semi-colon Delimited and Fixed Width Files.
- Builtin Spreadsheet for Entering and Editing Data
- Save and Print Drill Logs, Sections and Plans
- Plot Wireline Logs, Import Log ASCII Standard (LAS) Files and Text Files
- Extract Depth Intervals and Individual Curves From Wireline Log Files
- Built-in Symbol Library for Plans, Sections and Drill Logs
- 60 Lithology Symbols, 36 Patterns, 24 Well/Drill Hole/Mine Symbols.
- Use Additional Windows Symbol Fonts
- Mapping Symbol Font Supplied
- Use Additional Windows Fonts
- North Arrows and Scale bar
- Five Drill Log Templates Built-in
- Three Log Header Templates Built-in, Core Log, Environmental Borehole Log and Oil Well Log
- Auto or Manual Scales
- Drawing and Text Tools, Including Line, Box, Filled Box, Text, Symbol Pen, Strike and Dip
- Choice of Colors, Labels, Symbols and Fonts
- Zoom Plot
- Printing and Clipboard Support
- Supports Paper Sizes from A5 to D Sheet
- Free FTP Internet Updates Built-in

## Getting Started

DrillHoleMS requires a minimum system configuration for effective results. The system requirements are:

Windows 2000, XP, Vista, Windows 7
Devices supported by Windows
Printer supported by Windows

For automatic installation, proceed as follows:

1. Start Windows and place CD into CD Drive
2. Go to the Run Option on the Start Menu Select the CD Drive

3. Open (CDROM)D:\DrillHoleMS\Disk1\Setup.exe to Setup DrillHoleMS
4. Setup will start. You should not have any problems, but if you do have problems, you may have to update with a service pack and Setup may not work correctly. Service packs are available from the Microsoft Windows Update Site.
5. After Setup has concluded, you will get a [App] Setup was Completed Successfully message.
6. To Start DrillHoleMS, go to the DrillHoleMS Menu and click on DrillHoleMS. Enter your registration details in the Registration Window.

Installation will now proceed. During installation, the user is prompted for a directory. If this is ignored, a new directory called DrillHoleMS will be created. If a directory path is entered, a new directory with this name will be created. The user will be notified when installation is complete. A new Start Menu Item containing the DrillHoleMS and DrillHoleMS HELP is created. Click on DrillHoleMS to start the program.

# How To Use DrillHoleMS

DrillHoleMS has a standard windows interface. Before starting the exercise, DrillHoleMS must be installed on the user's hard drive and opened ready to use. A sample data file called drillhole1.plt is provided for use with the tutorial exercise.

## Getting To Know DrillHoleMS

To load the drillhole1.plt data file, click the Open command button or select Open from the File Menu. The Open common dialog box will pop up. Select drillhole1.plt in the directory containing DrillHoleMS.exe. If the user during installation specified no directory, the default directory name is DrillHoleMS

**Hint:**
Use the toolbar as a short cut to access some options.

## Plotting Data

Pull down the Plot Menu and select Plot Drill Holes. The Options Window will pop up. Accept the default values and click the Plot button. A map will appear on a new form. Select Tables from the Options Menu. A grid showing all data on the plot is displayed in a new window. Click on a data point (row) in the grid to highlight the corresponding data point on the plot. Double click each data point (row) in the grid to join cross section lines. Click on Plot Cross Section in the Options Menu top plot the displayed cross section.

## Entering Data

Select New from the File menu to start a new data file. Data is entered in each cell by simply typing the value and pressing <enter>. Use the scroll bars, arrow, page up and page down keys to navigate through the spreadsheet. To edit a cell, press <enter> for the cell you want to edit and use the backspace/delete/insert keys to edit the text. When finished editing press <enter> the new value will appear in the spreadsheet. Whole rows can be inserted and deleted using the Insert Row and Delete Row command buttons. Blank lines are not permitted between data. **Column headings are used for reading column data. Be sure a column heading exists for each column of data in the spreadsheet, beginning with column 1 and ending with the last column of data.**

Enter the following data:

| ID# | X | Y | Top | Bottom (Depth) |
|---|---|---|---|---|
| A32 | 20 | 55 | 0 | 42 |
| C567 | 36 | 52 | 0 | 23 |
| F62 | 56 | 37 | 0 | 78 |
| B85 | 21 | 32 | 0 | 67 |

To edit a cell, go back to Row 2, Col 1 and press <enter>. Type A56 to replace A32 and press <enter>.

**Hint:**
Use the mouse to navigate through the spreadsheet. Click a cell to change the current cell or click on the scroll bars to display out of view data. To begin editing a cell, double click the mouse.

## Drawing a Map

Select Map Draw from the Plot Menu to enter the Map Options Window. Some details are required to

setup the map before starting. Select a paper size to draw the map on. A border can be added with tick marks. Also, titles can be added to the map. Keep in mind the final size of the map. Lines, shapes and symbols can be added with the drawing tools.. When finalized, the map can be printed and saved. When printing, select the correct paper size and orientation.

## Plotting a Plan

Open drillhole1.plt into the spreadsheet. Select Plot Drill Holes from the Plot Menu. Accept the default options in the Drill Hole Options Window and click on Plot. A new Plot Window showing a drill hole plan is displayed. Lines, shapes, labels and symbols can be added from the Edit Menu. If a z value has been entered into the spreadsheet, select Contour from the Options Menu to draw a contour map. Enter the contour options and plot the contour map. Select 3D Surface to display a 3D diagram of the gridded surface.

## File Formats

They may specify drill hole ID#, name, symbol, color, easting (x), northing (y), top depth, bottom depth (z), thickness, elevation, bearing, inclination and data values for all drill holes. Symbol and color values for each drill hole are entered under the corresponding headings.

The drill hole maps use Cartesian map coordinates, also known as UTM.

## Plotting a Section

Open drillhole1.plt into the spreadsheet. Select Plot Drill Holes from the Plot Menu. Accept the default options in the Drill Hole Options Window and click on Plot. A new Plot Window showing a drill hole plan is displayed. To select a section, double click on the drill hole in the data grid. The selected drill hole is highlighted. Continue selecting drill holes until the cross section is complete. Go to the Options Menu and select Plot Section. A new window showing the selected cross section is displayed. Lines, shapes, labels and symbols can be added with the drawing tools and the section can be saved. Change the viewpoint by selecting coordinates from the Plot Drill Hole Options Window, Easting displays an West/East view and Northing displays a South/North cross section view. To plot additional cross sections go back to the Plot Drill Holes Window and select a new cross section using the same procedure.

To start a cross section:
1. Plot the basic section in the Cross Section Window
2. Add lithology boundaries using the Line Tool
3. Add symbols using the Pen Tool
4. Additional strip log patterns can be added using the Patterns Tool
5. To undo a previous drawing action select Undo
6. To delete all and start a new section, select Delete All
7. To save a section, select Save Section As
8. Sample cross sections supplied with DrillHoleMS can be viewed by opening a section with the Open Section Command in the Cross Section Window.

Cross sections are projected onto West-East or South-North sections. To change the direction, select Coordinates from the Cross Section Options Window. Apparent dips for inclined/deviated drill holes are automatically calculated when the cross section is plotted.

## File Formats

File formats for cross sections may specify drill hole ID#, name, symbol, color, easting (x), northing (y),

top depth, bottom depth (z), thickness, elevation, bearing, inclination and data values for all drill holes. The orientation of the drill hole should be entered under the headings bearing, inclination and thickness. Color coded drill holes are plotted by specifying a color for each depth interval. Labels, such as assay values, are entered under the data column.

| ID# | Name | Symbol | Color | X (easting) | Y (northing) | Top | Bot | Bear | Inclination |
|---|---|---|---|---|---|---|---|---|---|
| A1 | Brenn | 1 | 2 | 112 | 135 | 0 | 45 | 0 | 90 |

The orientation values for deviated drill holes are as follows:

Bearing - the direction of the drill hole for inclined/deviated drill holes. Values between 0 and 360 are valid.
Inclination - the dip or plunge of the drill hole. Values between 90 digress and 0 degrees are valid.
Length - the length of the inclined drill section.

example: A drill hole is inclined at 67 degrees towards 123 degrees and the length of the drill stem is 45m.

Bearing: 123
Inclination: 67
Thickness (length): 45

If the drill hole has multiple changes in direction and/or inclination then these can also be entered, as long as they are entered sequentially.

example:

| ID# | Thickness | Bearing | Inclination |
|---|---|---|---|
| A23 | 10 | 123 | 56 |
| A23 | 25 | 154 | 67 |
| A23 | 35 | 125 | 76 |

## Plotting a Drill Log

To create a new drill log, select Drill Log from the Plot Menu. The Drill Log Options Window displays for setting the initial page layout. Enter the paper layout, top and bottom depths, units and header information. Click OK and a new window with a blank drill hole log template is displayed. Drill log information is entered using the drawing and text tools. The drill log can be saved and printed. The depth scale and paper layout should be set at the beginning of a new session.

To start a drill log:
1. Select a paper layout
2. Set the depth scale
3. Select a log header. Choose one of the pre-defined log headers or create your own using the blank header
4. Start adding patterns and descriptions to the log. Use the Pattern Command to add patterns. Click on the Drill Log and drag the mouse to the desired depth to draw the pattern. Use the Text Box Command to add text descriptions. Click on the blank area next to the drill log and drag the crosshairs to the desired depth to add a text box. Start typing in the text box to add text.
5. To undo a previous action select Undo.
6. To delete all and start a new log, select Delete All
7. To save the log select, Save Drill Log As
8. Sample drill logs supplied with DrillHoleMS can be viewed by opening a drill log with the Open Drill Log Command in the Drill Log Window.

# File Menu

The File Menu provides many standard file management options.

## New Command

Deletes data in the current spreadsheet to begin a new file

## Close Command

Closes the file displayed in the current window

## Open Command

Provides access to the Open common dialog box. Opens a new file. Select the directory and file and click OK. Clicking the Open command button can also open a file.

## Import Command

Imports a text file. Select the type of file to import:
Space Delimited
Comma Delimited
Tab Delimited
Semi Colon Delimited
Fixed Width
Specify the number of lines to skip at the beginning of the file to avoid importation of file headings into the spreadsheet

## Save Command

Saves a file to disk. The default filename is the current filename. The same result is obtained by clicking the Save command button.

## Save As Command

Saves a file to disk in a directory and filename specified by the user. A Save As dialog box pops up for the user to enter filename and directory path information.

## Print Spreadsheet Command

Prints the current spreadsheet. A Print dialog box pops up. Select Print to print the spreadsheet.

## Print Setup Command

Specifies printer settings available to the user. A Print Setup dialog box pops up with several options to control the printer.

## Exit Command

Quits the application.

# Edit Menu

The Edit Menu provides access to several standard commands for editing the spreadsheet.

## Copy Command

Copies selected text in the spreadsheet to the clipboard without deleting. Highlight the text to be copied by dragging the mouse or holding down the shift key and clicking cells. Select Copy to copy the selected text to the clipboard. Use Paste to paste text from the clipboard to the spreadsheet. Use Cut to remove highlighted text from the spreadsheet to the clipboard.

## Cut Command

Copies selected text from the spreadsheet to the clipboard and clears the highlighted area in the spreadsheet. Highlight text to be cut by dragging the mouse or holding down the shift key and clicking cells. Select Cut from the edit menu to transfer selected text to the clipboard. Use Paste to retrieve cut text from the clipboard. Use Copy when you want to copy text to the clipboard without deleting the highlighted text.

## Paste Command

Retrieves text from the clipboard and pastes it into selected cells. Highlight cells that are to receive the incoming text by dragging the mouse or holding down the shift key and clicking cells. Select Paste from the Edit menu to transfer text from the clipboard to the spreadsheet.. Any text that already exists in the highlighted cells will be replaced. If the number of selected cells are fewer than will hold the clipboard text, the rightmost text from the clipboard will be truncated to fit the selected cells. If the number of cells selected exceed the length of the clipboard text, the remaining cells will be cleared. Use Copy and Cut to send text to the clipboard.

## Insert Row Command

Inserts an entire row into the spreadsheet.

## Delete Row Command

Deletes an entire row from the spreadsheet.

## Delete All Command

Deletes all selected rows from the spreadsheet.

## Sort Menu

The Sort Menu allows the user to sort data in the spreadsheet according to any column #. A new window opens asking for a column to sort. Enter a column number and click on Sort to sort the data.

# Search Menu

The Search Menu allows the user to find and replace user specified text.

## Find Command

Finds a user specified search text in the spreadsheet. A pop up Find dialog box prompts the user for the search text. Enter the exact search text and click OK to proceed with the search.

## Find Next Command

Repeats a search using the previous specified search text.

## Replace Command

Finds a user specified search text and replaces it with a user specified replace text. A pop up dialog box prompts the user for search text (Find What) and replacement text (Replace With). The following options are available:

**Find-** find the first occurrence of specified text

**Replace-** replace the current text with the specified replace text

**Replace All -** replace all occurrences of the search text with the specified replace text.

# Core Menu

## Reports

Automatically loads a core report template for routine core descriptions. The reports can be used "as is" or customized to the users requirements. Reports can be saved or cut and pasted into spreadsheet applications for further formatting.

Report Templates Supplied:
Igneous Rocks
Pyroclastic Rocks
Metamorphic Rocks
Sedimentary Rocks
Limestones
Ore Minerals

# Options Menu

## Set Drill Hole Options Command

Accesses the Options Window to select the diagram settings prior to plotting.

## Drill Hole Headings Command

Selects a Drill Hole Plot and places the appropriate column headings into the spreadsheet.

## Colors Command

Provides access to the Colors dialog box for selecting the plotting colors and line styles. Select a number or click on the color or linestyle to place the corresponding code number in the spreadsheet.

## Symbols Command

The Symbol command opens the symbol box to view the available symbols and their codes. Select a number or click on the symbol to place the corresponding code number in the spreadsheet.

## Define Cols Command

Sets the columns containing XYZ coordinates, symbols, colors and drill hole ID# for plotting. If necessary, only columns containing the XYZ coordinates need to be entered. Leave the other boxes blank if your file does not contain symbols, colors etc. Default values will be used automatically. If your XYZ data is not contained in the default columns, define the appropriate columns and select the desired diagram type in the Options Window.

## Statistics Command

Calculates the maximum, minimum, median, mean and standard deviation of a group of samples. Enter the spreadsheet column number containing the data to be analyzed. Click on calculate to calculate statistics.

## Format Command

Automatically formats numeric data in the spreadsheet. Specify the number of decimal points and click on format to format data.

# Plot Menu

## Plot Plan Command

Plots the active spreadsheet data using the options set in the Options Window .

## Cross Section

Opens the Cross Section Window for creating new Cross Sections. Plots the active spreadsheet data.

## Drill Log

Opens the Drill Log Window for creating new drill logs or plotting drill log files.

## Plot LAS

Opens the Plot LAS Window for Importing and displaying LAS files.

# Drill Hole Options Window

The Drill Hole Options Window sets options to control the Drill Hole Plot.

Paper Size
Plot From File
Scale Type
Set Scale
Set Titles

## Paper Size

Sets the paper size for drawing maps and plans. Set the paper size before drawing the map.

**Important**

The following paper sizes are supported:
Paper Sizes - Letter, A5, A4, A3, A2, A1, C Sheet, D Sheet and E Sheet
VB does not have native support for A2 and A1 sizes. A2 and A1 will only print if your printer supports custom paper sizes
Custom paper sizes can also be entered if your printer supports custom paper sizes

## Scale Type

Select Auto Scale or Manual Scale.

## Set Scale

When manual scale is selected, enter the minimum and maximum values for the X and Y axes here.

## Set Titles

Enter diagram, X axis and Y axis titles here.

# Drill Hole Plot Window

The Drill Hole Plot Window displays the map on screen with several options and controls. The diagram can also be printed.


3D Surface View
Axes Font
Borders
Box Draw
Color
Contours
Copy Diagram
Data Grid
Diagram Size
Diagram Color
Ellipse
Filled Box
Fonts
Grid Stats
Insert Text
Load Bitmap
Line Draw
North Arrow
Open Plan
Page Setup
Pen
Plot Cross Section
Print Diagram
Save Bitmap As
Save Plan
Scale Bar
Strike and Dip Symbol
Symbol
Symbol Legend
Tick Marks
Undo


## 3D Surface View

Opens a 3D surface view of the contour map. A 3D surface plot is displayed with legend. The 3D view can be rotated and tilted with the mouse. The 3D surface plot can be saved as a bitmap.

## Axes Font

To change the font of axes labels select Axes Font. A font dialog box is displayed. Select a font from the list and click OK

## Borders

Selects a border style to plot around a plan, or section. The single left border is only available for sections.

## Box Draw

To draw a box, select box draw. The cursor will change to a cross hair. Position the cross hair where the box is to begin and drag the cursor by holding down the left mouse button. A dotted box is dragged with the mouse. Release the left mouse button when you have positioned the box correctly.

## Color

Opens a Color Dialog Window to select a drawing color. All graphics are drawn in the selected color.

## Contour

The Contouring Options Window sets options to setup gridding and contouring calculations and display. The gridding interpolation uses kriging. Kriging is a method for calculating a rectangular grid array from irregularly spaced data. Kriging recognizes geological structures are neither random or completely dependent on neighboring points. Kriging large data sets (>2000 points) is very slow. Use block kriging for these data sets.

### Gridding Method

Select either classic or block kriging. Block kriging is faster for large data sets.

### Variogram Model

Select a variogram model to use for the calculation. Three types are available, linear, spherical and exponential. Only linear variogram is available with classic kriging.

### Variogram Settings

Enter values for the nugget and sill. The default values are nugget = 1 and Sill = 3. If these values are used, a "best fit" variogram will be used.

### Contour Display

Grid Only - Only displays a grid

Grid and Values - Displays grid with calculated values

Contours only - Contour plot with isolines only

Grid and Contour - Grid display and isolines

### Contour Settings

Data Range – The valid range for minimum and maximum contour values

Auto Calc – Automatically calculates the contours using the data range

Minimum Contour Value – The minimum value contour to plot

Maximum Contour Value – The maximum value contour to plot

### Grid Size

Rows and Columns – Number of rows and columns to use in the grid calculation.

**Contour Color**

Select from black and white contours or one of the three color palettes, red, green or blue.

Solid Color Contours – Draws solid color contours

Solid Color Grid – Draws a color coded grid using the grid size specified above

**Contour Labels**

Contour Labels - Displays contour labels

Opaque Background - Displays labels with an opaque background

Decimal Points - The number of decimal points to display on the contour labels

**Smoothing Contours**

For smoother contours, enter a larger grid size. A 150x150 grid works well.

## Copy Diagram Command

Copies the current diagram to the clipboard for pasting into other applications.

## Data Grid

Displays a list of data values that appear on the diagram. The data point represented by the selected text in the grid is highlighted. Cross Sections can be selected using the Data Grid. Double click on each drill hole (row) to join cross section lines. When finished, go to the Options Menu and Plot Cross Section to plot the cross section.

## Diagram Size Command

Selects the size of the printed diagram. Choose from small, medium or large. Diagrams are printed relative to the current paper size selected in the printer. Large size will print the full paper width, medium size will print 3/4 width and small size will print 1/2 paper width

## Diagram Color

To change the diagram color select Diagram Color. A color dialog box is displayed. Select a color from the list and click OK.

## Ellipse

To draw an ellipse, select Ellipse. The cursor will change to a cross hair. Position the cursor where you would like the ellipse to begin and drag the ellipse by holding down the left mouse button and moving the mouse. Release the left mouse button when the ellipse is positioned correctly

## Filled Box

To draw a filled box, select Filled Box from the Edit Menu. The cursor will change to a cross hair. Position the cross hair where the box is to begin and drag the cursor by holding down the left mouse button. A dotted box is dragged with the mouse. Release the left mouse button when you have positioned the box correctly

## Fonts

To change the font for inserted text select Fonts. A Font dialog box is displayed with a list of available fonts. Select a font in the list.

## Grid Stats

Opens the Grid Statistics Window and calculates statistics for the current grid/contour plot. Calculates minimum, maximum, median, mean, standard deviation, summa and area. If x, y and z values are in the same units, the volume is also calculated. For the volume calculation, only grid nodes with a z value > 0 are calculated.

## Insert Text

To insert text select Insert Text. Position the cursor where you would like to insert text and click the left mouse button. Type the text to be inserted.

## Load Bitmap

Loads a bitmap into the current drawing. Bitmaps are not resizable once they are loaded. The bitmap should be at the correct size before it is loaded. If the bitmap is used as a base map for drawing a new map, the bitmap should be designed to fit the paper size the new map is drawn on.

## Line Draw

To draw a line select Line Draw. The cursor will change to a cross hair. Position the cursor where you would like the line to begin and drag the line by holding down the left mouse button and moving the mouse. Release the left mouse button when the line is positioned correctly.

## North Arrow

To insert a north arrow, click on North Arrow in the Edit Menu. A new Window shows a selection of north arrows. Select a north arrow and click on OK. Next, click on the map where the north arrow is to be inserted.

## Open Plan

Opens a Plan File that has previously been saved with DrillHoleMS Plot Window. Plan Files are files that have a *.plf extension. Plan and Map Files use a proprietary file format.

## Page Setup

The Page Setup Window sets options to control the Drill Hole Plot.

Paper Size
Plot From File
Scale Type
Set Scale
Set Titles

**Paper Size**

Sets the paper size for drawing maps and plans. Set the paper size before drawing the map.

**Important**

The following paper sizes are supported:
Paper Sizes - Letter, A5, A4, A3, A2, A1, C Sheet, D Sheet and E Sheet
VB does not have native support for A2 and A1 sizes . A2 and A1 will only print if your printer supports custom paper sizes
Custom paper sizes can also be entered if your printer supports custom paper sizes

**Scale Type**

Select Auto Scale or Manual Scale.

**Set Scale**

When manual scale is selected, enter the minimum and maximum values for the X and Y axes here.

**Set Titles**

Enter diagram, X axis and Y axis titles here.

## Pen

This option displays the Pen Window for drawing freehand or selecting symbols from the builtin symbol library. Select a symbol from the selection and select OK. To draw the symbol, click the mouse on the cross section.

## Plot Cross Section

Cross Sections can be selected using the Data Grid. Double click on each drill hole (row) to join cross section lines. When finished, go to the Options Menu and Plot Cross Section to plot the cross section. Cross sections plotted using this method initially use XYZ data. To change the display to use bearing/inclination data, select Dip/Strike from the Options Menu after the section is plotted.

## Print Diagram

Prints the current diagram. A pop up Print dialog box appears. Diagrams are printed relative to the current paper size selected in the printer. Large size will print the full paper width, medium size will print 3/4 width and small size will print 1/2 paper width. All drawing objects and labels are printed with the diagram. Be sure the correct paper size and orientation are selected when printing plans

**Important**

The following paper sizes are supported:
Paper Sizes - Letter, A5, A4, A3, A2, A1, C Sheet, D Sheet and E Sheet
VB does not have native support for A2 and A1 sizes . A2 and A1 will only print if your printer supports custom paper sizes
Custom paper sizes can also be entered if your printer supports custom paper sizes

## Save Bitmap As

This command saves the current diagram in a user-specified directory and filename. A pop up dialog box appears which prompts the user for directory path and filename information. The diagram is saved as a bitmap file.

## Save Plan

Saves a Plan that has been created with DrillHoleMS Plot Window. Plan Files are text files that have a *.pln extension.

## Scale Bar

To add a scale bar to the plan, click on Add Scale Bar in the Edit Menu. Click on the plan where the scale bar is to be inserted and drag the mouse until the scale bar is the correct size.

## Strike and Dip Symbol

To add a strike and dip symbol, or other structural symbol, click on Strike and Dip Symbol in the Edit Menu. A new Window allows selection of the size and rotation (strike or dip) of the symbol. Rotated strike and dip symbols will print with the map.

## Symbol, Add

To add a symbol from a symbol font family, select Symbol from the Edit Menu in the Plot Window. All symbol fonts currently on your PC are displayed in the fonts list. Select a symbol and click OK. Place the cross hairs where the symbol should be inserted and click the mouse to insert the symbol.

## Symbol Legend

Opens the Symbol Legend Window. To add symbol descriptions, type the description next to the desired symbol. Symbol descriptions can be printed selecting Print. The size of the symbol used on Drill Hole Plots can be changed by selecting a different symbol font size.

## Tick Marks

When Tick Marks is checked all tick marks are displayed and printed with the diagram.

## Undo

To use Undo, first select the drawing action to undo then click on the undo button or the undo menu

command.

# Map Draw Options Window

The Map Draw Options Window sets options to setup the Map Draw Window.

Border
Coordinate Display
Paper Size
Tickmarks
Title
X Axis
Y Axis

## Border

When selected, draws a border around the map. Specify the margin in centimeters

## Coordinate Display

Selects the units to display for tracking the onscreen map position.

## Paper Size

Sets the paper size for drawing maps and plans. Set the paper size before drawing the map.

#### Important

The following paper sizes are supported:
Paper Sizes - Letter, A5, A4, A3, A2, A1, C Sheet, D Sheet and E Sheet
VB does not have native support for A2 and A1 sizes . A2 and A1 will only print if your printer supports custom paper sizes
Custom paper sizes can also be entered if your printer supports custom paper sizes

## Tick Marks

When Tick Marks is checked all tick marks are displayed and printed with the diagram. Enter the tick mark spacing in centimeters.

## Title

Sets the title to appear on the map. Also specify titles for the X and Y axes if required

# Map Draw Window

The Map Window provides access to many tools for drawing geological and other maps.

Box Draw
Color
Copy Diagram
Diagram Size
Diagram Color
Ellipse
Filled Box
Fonts
Insert Text
Load Bitmap
Line Draw
North Arrow
Open Map
Page Setup
Pen
Print Diagram
Save Map
Save Bitmap As
Scale Bar
Strike and Dip
Symbol
Tick Marks
Undo
Zoom

## Box Draw

To draw a box, select box draw. The cursor will change to a cross hair. Position the cross hair where the box is to begin and drag the cursor by holding down the left mouse button. A dotted box is dragged with the mouse. Release the left mouse button when you have positioned the box correctly.

## Color

Opens a Color Dialog Window to select a drawing color. All graphics are drawn in the selected color.

## Copy Diagram Command

Copies the current diagram to the clipboard for pasting into other applications.

## Diagram Size Command

Selects the size of the printed diagram. Choose from small, medium or large. Diagrams are printed relative to the current paper size selected in the printer. Large size will print the full paper width, medium size will print 3/4 width and small size will print 1/2 paper width

## Diagram Color

To change the diagram color select Diagram Color. A color dialog box is displayed. Select a color from the list and click OK.

## Ellipse

To draw an ellipse, select Ellipse. The cursor will change to a cross hair. Position the cursor where you would like the ellipse to begin and drag the ellipse by holding down the left mouse button and moving the mouse. Release the left mouse button when the ellipse is positioned correctly

## Filled Box

To draw a filled box, select Filled Box from the Edit Menu. The cursor will change to a cross hair. Position the cross hair where the box is to begin and drag the cursor by holding down the left mouse button. A dotted box is dragged with the mouse. Release the left mouse button when you have positioned the box correctly.

## Fonts

To change the font for inserted text select Fonts. A Font dialog box is displayed with a list of available fonts. Select a font in the list.

## Insert Text

To insert text select Insert Text. Position the cursor where you would like to insert text and click the left mouse button. Type the text to be inserted.

## Load Bitmap

Loads a bitmap into the current drawing. Bitmaps are not resizable once they are loaded. The bitmap should be at the correct size before it is loaded. If the bitmap is used as a base map for drawing a new map, the bitmap should be designed to fit the paper size the new map is drawn on.

## Line Draw

To draw a line select Line Draw. The cursor will change to a cross hair. Position the cursor where you would like the line to begin and drag the line by holding down the left mouse button and moving the mouse. Release the left mouse button when the line is positioned correctly.

## North Arrow

To insert a north arrow, click on North Arrow in the Edit Menu. A new Window shows a selection of north arrows. Select a north arrow and click on OK. Next, click on the map where the north arrow is to be inserted

## Open Map

Opens a Map File that has previously been saved with DrillHoleMS Map Draw Window. Map Files are text files that have a *.map extension. Map Files use a proprietary file format.

## Page Setup

The Map Page Setup Window sets options to setup the Map.

Border
Coordinate Display
Paper Size
Tickmarks
Title
X Axis Title
Y Axis Title
.

**Border**

When selected, draws a border around the map. Specify the margin in centimeters

**Coordinate Display**

Selects the units to display for tracking the onscreen map position.

**Paper Size**

Sets the paper size for drawing maps and plans. Set the paper size before drawing the map.

**Important**

The following paper sizes are supported:
Paper Sizes - Letter, A5, A4, A3, A2, A1, C Sheet, D Sheet and E Sheet
VB does not have native support for A2 and A1 sizes . A2 and A1 will only print if your printer supports custom paper sizes
Custom paper sizes can also be entered if your printer supports custom paper sizes

**Tick Marks**

When Tick Marks is checked all tick marks are displayed and printed with the diagram. Enter the tick mark spacing in centimeters.

**Title**

Sets the title to appear on the map. Also specify titles for the X and Y axes if required

## Pen

This option displays the Pen Window for drawing freehand selecting symbols from the builtin symbol library. Select a symbol from the selection and select OK. To draw the symbol, click the mouse on the cross section.

## Print Diagram

Prints the current diagram. A pop up Print dialog box appears. Diagrams are printed relative to the current paper size selected in the printer. Large size will print the full paper width, medium size will print 3/4 width and small size will print 1/2 paper width. All drawing objects and labels are printed with the diagram. Be sure the correct paper size and orientation are selected when printing plans

**Important**

The following paper sizes are supported:
Paper Sizes - Letter, A5, A4, A3, A2, A1, C Sheet, D Sheet and E Sheet
VB does not have native support for A2 and A1 sizes . A2 and A1 will only print if your printer supports custom paper sizes
Custom paper sizes can also be entered if your printer supports custom paper sizes

## Save Map

Saves a Map that has been created with DrillHoleMS Map Draw Window. Map Files are text files that have a *.dmp extension.

## Save Bitmap As

This command saves the current diagram in a user-specified directory and filename. A pop up dialog box appears which prompts the user for directory path and filename information. The diagram is saved as a bitmap file.

## Scale Bar

To add a scale bar to the map, click on Add Scale Bar in the Edit Menu. Click on the map where the scale bar is to be inserted and drag the mouse until the scale bar is the correct size.

## Strike and Dip

To add a strike and dip symbol, or other structural symbol, click on Strike and Dip in the Edit Menu. A new Window allows selection of the size and rotation (strike or dip) of the symbol. Rotated strike and dip symbols will print with the map.

## Symbol, Add

To add a symbol from a symbol font family, select Symbol from the Edit Menu in the Plot Window. All symbol fonts currently on your PC are displayed in the fonts list. Select a symbol and click OK. Place the cross hairs where the symbol should be inserted and click the mouse to insert the symbol.

## Tick Marks

When Tick Marks is checked all tick marks are displayed and printed with the diagram.

## Undo

To use Undo, first select the drawing action to undo then click on the undo button or the undo menu command

# Section Options Window

The Section Options Window sets options to setup the layout of the Section..

Aspect Ratio
Calculate True Distance Between Drill Holes
Coordinates
Depth Scale
Orientation
Paper Size
Plot Elevations
Titles
Units

## Aspect Ratio

Select this option to specify the aspect ratio of the cross section. If 1:1 is selected, the cross section is plotted with equal x and y axes. Otherwise, the cross section is plotted to fit the page (elongated x-axis)

## Calculate True Distance Between Drill Holes

This option should be checked in most cases. When enabled, the drill holes are plotted using their true distance separating them on a map. When unchecked, the drill holes are plotted using their easting or northing coordinate (projected directly on a W-E or S-N plane).

## Coordinates

Selects the orientation of the cross section. If Use Easting is selected, the section is displayed along the X to X' axis. For oriented drill holes, this is the west to east axis. If Use Northing is selected the section is displayed along the Y-Y' axis. For oriented drill holes, this is the south to north axis

## Depth Scale

Input the top and bottom depths to plot on the cross section.

## Orientation

Select this option to specify the coordinate system to use for plotting cross sections. If Bearing/Inclination is selected, the orientation of drill holes are plotted using bearing and inclination values entered in the spreadsheet. If XYZ coordinates is selected, the orientation of drill holes are plotted using x, y and z values entered in the spreadsheet. When Bearing and Inclination are used, apparent dips are automatically calculated when the cross section is plotted. The cross section is projected in a W-E or S-N direction and the inclination or deviation of drill holes are projected onto these planes using apparent dips.

## Paper Size

Sets the paper size for drawing and plotting sections. Set the paper size before drawing the section.

**Important**

The following paper sizes are supported:
Paper Sizes - Letter, A5, A4, A3, A2, A1, C Sheet, D Sheet and E Sheet
VB does not have native support for A2 and A1 sizes . A2 and A1 will only print if your printer supports custom paper sizes
Custom paper sizes can also be entered if your printer supports custom paper sizes

## Plot Elevations

Plots a cross section with elevation correction. To plot correctly, additional data must be added into the spreadsheet. Enter the elevation for each well into the appropriate spreadsheet column. To determine which spreadsheet column to enter data, insert headings with the Insert Drill Hole Headings command in the Options Menu. The elevation is entered as a positive value, usually corresponding to the height of the well head above the local datum used for the survey. This may be mean sea level, in many cases, or an arbitrary datum determined by the location of the survey.

## Set Titles

Enter diagram, X axis and Y axis titles here.

## Units

Selects the units to display on the cross section.

## Other

If the drill holes extend beyond the cross section, go to the Page Setup Option in the Cross Section Window to setup the cross section display correctly. Enter values for Xmin, Xmax, Ymin and Ymax to adjust the scale and page display.

# Plot Section Window

The Plot Section Window plots cross sections created with the Drill Hole Plot Window. There are many drawing options to illustrate the section in detail.


Aspect Ratio
Borders
Box Draw
Change Units
Color
Copy Diagram
Diagram Color
Diagram Size
Dip/Strike
Drill Hole Width
Ellipse
Filled Box
Fonts
Insert Text
Legend
Line Draw
Open Section File
Page Setup
Pattern/Picture
Patterns
Pen
Print Diagram
Save Bitmap As
Save Section File
Strike and Dip Symbol
Symbol
Tick Marks
Undo


## Aspect Ratio

Select this option to specify the aspect ratio of the cross section. If 1:1 is selected, the cross section is plotted with equal x and y axes. If any other value is selected, the cross section is plotted with an elongated x-axis.

## Borders

Selects a border style to plot around a plan, or section. The single left border is only available for sections

## Box Draw

To draw a box, select box draw. The cursor will change to a cross hair. Position the cross hair where the box is to begin and drag the cursor by holding down the left mouse button. A dotted box is dragged with the mouse. Release the left mouse button when you have positioned the box correctly.

## Change Units

Select this option to change the depth scale units. The available units are kilometers (km), miles(mi), meters(m), centimeters(cm), feet(ft) and inches(in).

## Color

Opens a Color Dialog Window to select a drawing color. All graphics are drawn in the selected color.

## Copy Diagram Command

Copies the current diagram to the clipboard for pasting into other applications.

## Diagram Color

To change the diagram color select Diagram Color. A color dialog box is displayed. Select a color from the list and click OK.

## Diagram Size Command

Selects the size of the printed diagram. Choose from small, medium or large. Diagrams are printed relative to the current paper size selected in the printer. Large size will print the full paper width, medium size will print 3/4 width and small size will print 1/2 paper width.

## Dip and Strike

Changes the section display to use either bearing/inclination data or XYZ data for dip and strike of drill hole.

## Drill Hole Width

Select this option to change the width of drill hole traces on the cross section. Select from one of the pre-defined line widths and click OK.

## Ellipse

To draw an ellipse, select Ellipse. The cursor will change to a cross hair. Position the cursor where you would like the ellipse to begin and drag the ellipse by holding down the left mouse button and moving the mouse. Release the left mouse button when the ellipse is positioned correctly

## Filled Box

To draw a filled box, select Filled Box from the Edit Menu. The cursor will change to a cross hair. Position the cross hair where the box is to begin and drag the cursor by holding down the left mouse button. A dotted box is dragged with the mouse. Release the left mouse button when you have positioned the box correctly.

## Fonts

To change the font for inserted text select Fonts. A Font dialog box is displayed with a list of available fonts. Select a font in the list.

## Insert Text

To insert text select Insert Text. Position the cursor where you would like to insert text and click the left mouse button. Type the text to be inserted.

## Legend

Select this option to plot a Legend with the Cross Section. Click on Legend in the Options Menu to open the Legend Window. Choose symbols from the predefined lists of symbols and type a description next to each symbol. Select the number of Legend Items (symbols) to appear on the Legend. To remove an existing Legend , tick the No Legend Option. Click OK to accept the settings and plot a legend.

## Line Draw

To draw a line select Line Draw. The cursor will change to a cross hair. Position the cursor where you would like the line to begin and drag the line by holding down the left mouse button and moving the mouse. Release the left mouse button when the line is positioned correctly

## Open Section File

Opens a Section File that has previously been saved with DrillHoleMS Cross Section Window. Section Files are text files that have a *.stn extension. Section Files use a proprietary format.

## Page Setup

The Page Setup Window sets options to setup the layout of the Section. If the drill holes extend beyond the cross section, go to the Page Setup Option in the Cross Section Window to setup the cross section display correctly. Enter values for Xmin, Xmax, Ymin and Ymax to adjust the scale and page display.

Paper Size
Scale
Titles
Units

### Scale

Input the top and bottom depths to plot on the drill log or cross section. The Xmin and XMax can also be entered

### Paper Size

Sets the paper size for drawing and plotting maps, sections and plans. Set the paper size before drawing. To print, select the correct printer paper size and orientation to match the paper size setup at the beginning of the drawing session

### Important

The following paper sizes are supported:
Paper Sizes - Letter, A5, A4, A3, A2, A1, C Sheet, D Sheet and E Sheet

VB does not have native support for A2 and A1 sizes . A2 and A1 will only print if your printer supports custom paper sizes
Custom paper sizes can also be entered if your printer supports custom paper sizes

**Set Titles**

Enter diagram, X axis and Y axis titles here.

**Units**

Selects the units to display on the cross section.

## Pattern/Picture

This option displays the Open Dialog for selecting user specified lithology patterns and pictures to plot on the Section. Select a pattern or picture file and select Open. To draw the pattern or picture, click the mouse on the section and drag the Pattern Box to its desired size. User patterns and pictures must be stored in the drillholems/pats folder. Only bmp and jpeg images are supported. To edit a pattern, double click on a pattern to display the Patterns Window

## Patterns

This option displays the Patterns Window for selecting lithology patterns. Select a pattern from the selection and select OK. To draw the pattern, click the mouse on the cross section and drag the Pattern Box to its desired size. To edit a pattern, double click on a pattern to display the Patterns Window. Patterns must be stored in the drillholems\pats folder.

## Pen

This option displays the Pen Window for drawing freehand or selecting symbols from the builtin symbol library. Select a symbol from the selection and select OK. To draw the symbol, click the mouse on the cross section.

## Print Diagram

Prints the current diagram. A pop up Print dialog box appears. Diagrams are printed relative to the current paper size selected in the printer. Large size will print the full paper width, medium size will print 3/4 width and small size will print 1/2 paper width. All drawing objects and labels are printed with the diagram. Be sure the correct paper size and orientation are selected when printing maps.

**Important**

The following paper sizes are supported:
Paper Sizes - Letter, A5, A4, A3, A2, A1, C Sheet, D Sheet and E Sheet
VB does not have native support for A2 and A1 sizes . A2 and A1 will only print if your printer supports custom paper sizes
Custom paper sizes can also be entered if your printer supports custom paper sizes

## Save Bitmap As

This command saves the current diagram in a user-specified directory and filename. A pop up dialog box appears which prompts the user for directory path and filename information. The diagram is saved as a bitmap file.

## Save Section File

Saves a Cross Section that has been created with DrillHoleMS Cross Section Window. Section Files are text files that have a *.sec extension.

## Strike and Dip Symbol

To add a strike and dip symbol, or other structural symbol, click on Strike and Dip in the Edit Menu. A new Window allows selection of the size and rotation (strike or dip) of the symbol. Rotated strike and dip symbols will print with the map.

## Symbol, Add

To add a symbol from a symbol font family, select Symbol from the Edit Menu in the Plot Window. All symbol fonts currently on your PC are displayed in the fonts list. Select a symbol and click OK. Place the cross hairs where the symbol should be inserted and click the mouse to insert the symbol.

## Tick Marks

When Tick Marks is checked all tick marks are displayed and printed with the diagram.

## Undo

To use Undo, first select the drawing action to undo then click on the undo button or the undo menu command

## Vertical Exaggeration

Changes the topographical scale by the specified amount. Only available when drill hole elevations are plotted.

# Drill Log and Plot LAS Options Window

The Drill Log Options Window sets options to setup the page layout of the Drill Log..

Depth Scale
Header
Paper Layout
Units

## Depth Scale, Drill Log

Input the top and bottom depths to plot on the drill log.

## Header

Selects the type of header to display on the drill log. Choose one of the pre-defined header templates or start with a blank header to customize a new one.

## Paper Layout

Selects the initial paper layout for a drill log. Choose from a single page layout or continuous layout.

## Units

Selects the units to display on the drill log.

# Drill Log and Plot LAS Window

The Drill Log Window plots drill log or well logs. There are many drawing options to illustrate the log in detail.


Axes Font
Box Draw
Change Units
Color
Convert to Bitmap
Copy Diagram
Depth Scale
Diagram Color
Diagram Size
Ellipse
Filled Box
Fonts
Import LAS
Insert Text
Load Bitmap
Line Draw
Log Size
Pattern/Picture
Patterns
Pen
Print Diagram
Open Drill Log
Save Drill Log
Save Bitmap As
Symbol
Text Box
Template
Undo


## Axes Font

To change the font of axes labels select Axes Font. A font dialog box is displayed. Select a font from the list and click OK.

## Box Draw

To draw a box, select box draw. The cursor will change to a cross hair. Position the cross hair where the box is to begin and drag the cursor by holding down the left mouse button. A dotted box is dragged with the mouse. Release the left mouse button when you have positioned the box correctly.

## Change Units

Select this option to change the depth scale units. The available units are kilometers (km), miles(mi), meters(m), centimeters(cm), feet(ft) and inches(in).

## Color

Opens a Color Dialog Window to select a drawing color. All graphics are drawn in the selected color.

## Convert to Bitmap

Converts the current Drill Log to a Bitmap. All drawing objects are rasterized

## Copy Diagram Command

Copies the current diagram to the clipboard for pasting into other applications

## Depth Scale

Select this option to plot a depth scale with the drill log

## Diagram Color

To change the diagram color select Diagram Color. A color dialog box is displayed. Select a color from the list and click OK.

## Ellipse

To draw an ellipse, select Ellipse. The cursor will change to a cross hair. Position the cursor where you would like the ellipse to begin and drag the ellipse by holding down the left mouse button and moving the mouse. Release the left mouse button when the ellipse is positioned correctly

## Filled Box

To draw a filled box, select Filled Box from the Edit Menu. The cursor will change to a cross hair. Position the cross hair where the box is to begin and drag the cursor by holding down the left mouse button. A dotted box is dragged with the mouse. Release the left mouse button when you have positioned the box correctly.

## Fonts

To change the font for inserted text select Fonts. A Font dialog box is displayed with a list of available fonts. Select a font in the list.

## Import LAS

This options displays the LAS Window for importing wireline logs. Log ASCII Standard (LAS) and Tab Delimited ASCII wireline log files can be imported and displayed. To import a file, click on the Load Command Button and select a supported file from the Open File Box. LAS V1.2 and V2 files are currently supported. Click on OK, the selected file information is displayed. Select one of the curve types to import. Also required is the column number to import the file into and the title to be displayed on the Log. If no title is required, select No Title. Enter the depth range to be displayed, if required. Use the min and max depths to import the entire curve. When finished, click on OK to display the log. To overlay a new curve on an existing curve, simply match the column number and check the Display Overlay Option.
LAS files will be imported into the current plot displayed in the plot window. You may specify a depth range or accept the maximum and minimum depths to import the entire depth range. LAS files use the

depth scale of the current drill log, as specified in the Drill Log Options Window when a new drill log is started.

## Insert Text

To insert text select Insert Text. Position the cursor where you would like to insert text and click the left mouse button. Type the text to be inserted.

## Load Bitmap

Loads a drill log bitmap into the Drill Log Window for further editing and/or viewing. Primarily intended for drill log bitmaps created with DrillHoleMS.

## Line Draw

To draw a line select Line Draw. The cursor will change to a cross hair. Position the cursor where you would like the line to begin and drag the line by holding down the left mouse button and moving the mouse. Release the left mouse button when the line is positioned correctly.

## Log Size

Selects the size of the printed drill log/LAS. Enter the width and height of the drill log in percent. If 100% is entered, the drill log is printed the full paper width. If 50% is entered, the drill log is printed half the paper width. Also displays recommended printer settings.

## Pattern/Picture

This option displays the Open Dialog for selecting user specified lithology patterns and pictures to plot on the drill log. Select a pattern or picture file and select Open. To draw the pattern or picture, click the mouse on the drill log and drag the Pattern Box to its desired size. User patterns and pictures must be stored in the drillholems/pats folder. Only bmp and jpeg images are supported. To edit a pattern, double click on a pattern to display the Patterns Window.

## Patterns

This option displays the Patterns Window for selecting lithology patterns. Select a pattern from the selection and select OK. To draw the pattern, click the mouse on the drill log and drag the Pattern Box to its desired size. To edit a pattern, double click on a pattern to display the Patterns Window. Patterns must be stored in the drillholems\pats folder.

## Pen

This option displays the Pen Window for drawing freehand or selecting symbols from the builtin symbol library. Select a symbol from the selection and select OK. To draw the symbol, click the mouse on the cross section.

## Print Diagram

Prints the current diagram. A pop up Print dialog box appears. Diagrams are printed relative to the current paper size selected in the printer. Large size will print the full paper width, medium size will print

3/4 width and small size will print 1/2 paper width. All drawing objects and labels are printed with the diagram. Be sure the correct paper size and orientation are selected when printing maps.

**Important**

The following paper sizes are supported:
Paper Sizes - Letter, A5, A4, A3, A2, A1, C Sheet, D Sheet and E Sheet
VB does not have native support for A2 and A1 sizes . A2 and A1 will only print if your printer supports custom paper sizes
Custom paper sizes can also be entered if your printer supports custom paper sizes

Printing Drill Logs and LAS Plots

The drill log/LAS is printed on the current paper selected in the printer settings. To further modify the size of the printed drill log select Log Size in the Options Menu. Enter the drill log size in percent. If 100% is selected, the drill log will print the full paper width.. If 50% is selected, the drill log will print half the paper width. If your printer supports custom paper sizes, you can also enter the length and width of the paper to print the drill log on.

## Open Drill Log

Opens a Drill Log or Plot LAS File that has previously been saved with DrillHoleMS Drill Log/Plot LAS Window. DrillLog Files are text files that have a *.drl extension. DrillHoleMS Plot LAS Files have the *.wlg extension. DrillHoleMS Drill Log Files use a proprietary file format.

## Save Drill Log

Saves a Drill Log that has been created with DrillHoleMS Drill Log Window. Drill Log Files are text files that have a *.dlg extension. Log Files created in the Plot LAS Window have the *.wlg extension.

## Save Bitmap As

This command saves the current diagram in a user-specified directory and filename. A pop up dialog box appears which prompts the user for directory path and filename information. The diagram is saved as a bitmap file.

## Symbol, Add

To add a symbol from a symbol font family, select Symbol from the Edit Menu in the Plot Window. All symbol fonts currently on your PC are displayed in the fonts list. Select a symbol and click OK. Place the cross hairs where the symbol should be inserted and click the mouse to insert the symbol.

## Text Box

For logs, the cursor will change to a cross hair. Hold the left mouse button down and drag the mouse to draw a text box. Type directly into the text box to enter text. Use the font command to change fonts.

## Template

Selects a pre-defined drill log template

## Undo

To use Undo, first select the drawing action to undo then click on the undo button or the undo menu command.

# File Formats

The built in spreadsheet saves data files in tab delimited ASCII format. This format is used by Microsoft Excel and is compatible with most spreadsheets. To import a data file created with another application, save the file in tab delimited format (in Excel, these files have a .txt extension) , start DrillHoleMS and open the data file. DrillHoleMS will automatically load the file into the spreadsheet. To export a data file created with DrillHoleMS, use any of the following methods:

1. Select tab delimited ASCII format in the other application. These files usually have a .txt extension. Open the file.

2. In Excel, the file created with DrillHoleMS can simply be opened directly.

In many applications, the file can simply be opened directly.

The built in spreadsheet requires data to be in a specific format for plotting data. The first row in the spreadsheet is reserved for column headings. Any data placed in the first row will not be included in subsequent calculations. Imported data files will be displayed intact with all headings and data; however, to use DrillHoleMS's features it is necessary to correctly define which columns contain drill hole ID#, symbol, color, easting (x), northing (y) and depth values. Use Define Columns from the Options Menu to assign columns correctly. The drill hole ID# is required for all rows to plot drill holes correctly. Additional data can be entered via the keyboard or using the clipboard.

The drill hole maps and cross sections use Cartesian map coordinates, also known as UTM.

## Cross Sections

File formats for cross sections may specify drill hole ID#, name, symbol, color, easting (x), northing (y), top depth, bottom depth (z), thickness, elevation, bearing, inclination and data values for all drill holes. The orientation of the drill hole should be entered under the headings bearing, inclination and thickness. Color coded drill holes are plotted by specifying a color for each depth interval. Labels, such as assay values, are entered under the data column.

| ID# | Name | Symbol | Color | X (easting) | Y (northing) | Top | Bot | Bear | Inclination |
|---|---|---|---|---|---|---|---|---|---|
| A1 | Brenn | 1 | 2 | 112 | 135 | 0 | 45 | 0 | 90 |

The orientation values for deviated drill holes are as follows:

Bearing - the direction of the drill hole for inclined/deviated drill holes. Values between 0 and 360 are valid.
Inclination - the dip or plunge of the drill hole. Values between 90 digress and 0 degrees are valid.
Thickness (length) - the length of the inclined drill section.

example: A drill hole is inclined at 67 degrees towards 123 degrees and the length of the drill stem is 45m.

Bearing: 123
Inclination: 67
Thickness (length): 45

If the drill hole has multiple changes in direction and/or inclination then these can also be entered, as long as they are entered sequentially.

example:

| ID# | Thickness | Bearing | Inclination |
|---|---|---|---|
| A23 | 25 | 123 | 56 |
| A23 | 10 | 154 | 67 |
| A23 | 35 | 125 | 76 |

## Drill Hole Plots and Plans

They may specify drill hole ID#, name, symbol, color, easting (x), northing (y), top depth , bottom depth (z), thickness, elevation, bearing, inclination and data values for all drill holes. Symbol and color values for each drill hole are entered under the corresponding headings.

| ID# | Name | Symbol | Color | X (easting) | Y (northing) | Top | Bottom |
|---|---|---|---|---|---|---|---|
| A1 | Brenn | 1 | 2 | 112 | 135 | 0 | 45 |

Diagrams created with DrillHoleMS can be saved as bitmap files for exporting into paint programs, word processors and other applications. Diagrams can be saved in the following formats:

1. **bitmap (*.bmp)**

Select Save Bitmap As from the plot menu and enter the filename with the appropriate diagram extension.

# GeolBases

Geolbases is a set of geological databases to help retrieval of mineralogical and petrological data. Each database has its own unique graphical user interface so they can be used individually without having to change tables and report layouts. A database manager allows access to each database from Windows or the databases can be accessed from the database menu in DrillHoleMS.

## GeolBases Features

**Microsoft Access Jet Database Engine**

Each database uses the 32 bit Microsoft Jet Database Engine.

**Querying**

The databases use standard SQL query language to search records, however the SQL language is hidden behind a simplified Search interface so that no previous knowledge of SQL is required. The search engine keyword and substring searches are based on whatever text is input by the user.

**Printing and Clipboard Support**

Each database has printing and clipboard support. Search results can be printed in tables and information from the databases and be copied to the clipboard for use in other applications.

## Getting Started

Geolbases requires a minimum system configuration. The system requirements are:

1. Windows XP, Vista, 7
2. Net Framework 4.0
3. Access 2010 Runtime
4. 800x600 Display Resolution
5. Mouse
6. Printer supported by Windows

For automatic installation, proceed as follows:

1. Start Windows
2. Install Net Framework 4.0 or Higher
3. Install Access 2010 Runtime
4. Open (CDDrive)D:\Geolbases\Disk1\setup.exe to start Setup

## The WinRock Database

The WinRock Database for Windows is a petrographic database of igneous, metamorphic and sedimentary rocks. Each rocktype contains a petrographic summary consisting of Rock Name, Group, Family, Texture, Structure, Composition, Occurrence and Comments. The descriptions have been standardized using the usual petrographic terms. Searches can be carried out on individual or multiple fields using partial or complete key words. The composition field can be searched with up to three minerals simultaneously.

## Using The WinRock Database

Click on The WinRock Database menu item or icon to start the program. The WinRock Database Window is displayed with a scrollable list of rock names and their descriptions. Records can be printed or copied to the clipboard.

To start a query click on the Query command button. The Search Window is displayed with a list of searchable fields. Enter search terms in the appropriate fields. The database has been standardized using the usual petrographic terms. These terms are listed under the appropriate fields in the Search Window. It is recommended that searches are made using these terms; however, descriptions are not limited to these terms and any keyword can be used. Click on Search to start a search. A list of matches is displayed in The WinRock Database Window. Search results can be printed or copied to the clipboard. To list the entire database click on the Refresh command button.

The WinRock Database is editable. Enable editing by selecting Edit Database, then Enable. Once the edit mode is enabled, any changes made to the database will automatically be saved. Selecting Add New Record can enter a new record. A new record with empty fields is created.

**Important:** Blank and null entries are not allowed in the database. If no entry is desired under a specific property then enter "Empty" for that specific property. Default values for all properties are "Empty". This word is automatically added to new entries.

Bookmarks can be entered using the database ID property. Enable editing and enter a unique number/label into the ID field. This label is searchable with the Query/Search option. Useful for indexing samples or as simple reference bookmarks.

A set of sample images is included with the database. Further images can be added by placing the images in the images folder and editing the image file name in the database.

## List of Search Terms

### Group
Igneous
Metamorphic
Sedimentary

### Structure
Massive - No structure
Foliated - Planar alignment of platy minerals
Schistose - Discontinuous planar alignment of minerals
Flow - Changing alignment of minerals in a flow pattern
Banded - With bands of different composition or color
Bedded/Laminated - Divided into separate layers

### Texture
Crystalline - All crystalline textures, with a grain size > 0.2mm (e.g. Granite, Gneiss)
Microcrystalline - Crystalline textures with a grain size < 0.2mm and > 0.01mm (e.g. Hornfels)
Cryptocrystalline - Crystalline textures with a grain size < 0.01mm (e.g. Agate)
Amorphous - Non crystalline, glassy (e.g. Obsidian)
Porphyritic - Large crystals (phenocrysts) in a fine-grained ground mass (e.g. Basalt)
Recrystallized - Textures produced by partial recrystallization (e.g. Meta-Basalt)
Inequigranular - Fine to macro - sized grains (e.g. Kimberlite)
Fragmental - Composed of mineral and/or rock fragments (e.g. pyroclastics)
Biogenic- Textures produced by organisms (e.g. Limestone - Boundstone)

Organic-Textures produced by organic material (e.g. coal)
Clastic - Textures produced by mechanically accumulated grains cemented together (e.g. Sandstone)
Chemical - Textures produced by chemical precipitation (e.g. Anhydrite)

## Occurrence

Plutonic - A general term for any large scale intrusive rocks
Volcanic - Extrusive and associated intrusive rocks
Regional Metamorphic - Metamorphic rocks occurring over large areas
Contact Metamorphic - Adjacent to intrusions
Fault/Shear Zone - Planar zones of brittle and/or ductile deformation
Basin - Sedimentary rocks in a sedimentary basin.

## MinServ Mineral Database

The MinServ Mineral Database is a reference database of over 3700 minerals. Mineral Name, Formula and Crystal System index each mineral. Nearly all registered mineral names are listed but group terms such as feldspar and apatite are not listed. The database can be searched for key words and substrings and the results printed and copied to the clipboard.

## Using The Mineral Database

The Mineral Database has all entries listed in a table. Minerals can be scrolled up and down through the table. To find a specific property, it is a simple matter of entering a search term and selecting the field to be searched to find a specific mineral. The results can be printed or copied to the clipboard for use with other applications.

The Mineral Database is editable. Enable editing by selecting Edit Database, then Enable. Once the edit mode is enabled, any changes made to the database should be saved by using the Save Command or clicking on the Refresh Button. Selecting Add New Record can enter a new record. A new record with empty fields is created.

**Important:** Blank and null entries are not allowed in the database. If no entry is desired under a specific property then enter "Empty" for that specific property. Default values for all properties are "Empty". This word is automatically added to new entries.

Bookmarks can be entered using the database ID property. Enable editing and enter a unique number/label into the ID field. This label is searchable with the Query/Search option. Useful for indexing samples or as simple reference bookmarks.

There are three customizable project databases available for use. All functions work on these databases in the same way as for the Main Database. To select a project database, go to Active Database on the Edit Menu and select a database.

**Mineral Properties Included**

Mineral Name - The International Mineralogical Organization recognized mineral name

Formula - Enter part or whole formula i.e. Cu for formula containing copper

Crystal System - Enter crystal system
Isometric or cubic
Hexagonal or trigonal
Tetragonal
Orthorhombic
Monoclinic
Triclinic

## MinServ Rock Forming Minerals Database

The MinServ Rock Forming Minerals Database is a reference database of all rock forming and accessory minerals. The database is divided into two sections: 1. Physical properties, listing all physical properties and 2. Optical properties, listing all optical properties visible with a polarizing microscope.

## Using The Database

The Rock Forming Minerals Database is based around a standard mineral description report displayed as a form with a scrollable list of mineral names linked to each mineral property. Properties for each mineral are displayed as the names are selected from a scrollable list. Clicking on the Query button can search all properties. It is a simple matter of entering a search term and selecting the field to be searched to find a specific mineral. The results can be printed or copied to the clipboard for use with other applications.

The Rock Forming Minerals Database is editable. Enable editing by selecting Edit Optical Database, then Enable. Once the edit mode is enabled, any changes made to the database will automatically be saved. Selecting Add New Record can enter a new record. A new record with empty fields is created.

**Important:** Blank and null entries are not allowed in the database. If no entry is desired under a specific property then enter "Empty" for that specific property. Default values for all properties are "Empty". This word is automatically added to new entries.

Bookmarks can be entered using the database ID property. Enable editing and enter a unique number/label into the ID field. This label is searchable with the Query/Search option. Useful for indexing samples or as simple reference bookmarks.

A set of sample images is included with the database. Further images can be added by placing the images in the images folder and editing the image file name in the database.

**Recommended Search Terms:**

Formula - Enter part or whole formula i.e. Cu for formula containing copper

Crystal System - Enter crystal system
Isometric or cubic
Hexagonal or trigonal
Tetragonal
Orthorhombic
Monoclinic
Triclinic

Group - Enter mineral group name
Quartz
Pyroxene
Feldspar
Garnet
Serpentine
Clay
Mica
Brittle Mica
Bauxite
Oxide
Amphibole
Feldspathoid
Zeolite
Silliminite
Calcite
Barite
Humite
Tourmaline
Epidote
Chlorite

Specific Gravity - the relative weight of a mineral as compared to water

Hardness - hardness of a mineral according to Moh's Hardness Scale

1 - Soft, i.e. Talc
2 - Copper
3 - Calcite
4 - Fluorite
5 - Medium i.e. Apatite
6 - Feldspar
7 - Glass or Quartz
8 - Topaz
9 - Corundum
10 - Hardest natural occurring mineral, Diamond

Streak - Color of a minerals powder when crushed. Determined by rubbing a mineral on a porcelain plate.
White - most common, feldspar, calcite, garnet
Black  magnetite, uraninite
Green - hornblende, vesuvianite

Color - Natural color of a mineral
Black - Mica, Uraninite, Hematite

White - Plagioclase
Pink - Orthoclase
Green - Chlorite, Olivene

Opacity - The transparency of a mineral
Opaque - Does not transmit light
Translucent - Partially transmits light
Transparent - Fully transmits light

Luster - Appearance of a minerals surface
Pearly - Smooth, shiny, white surface, talc, calcite
Vitreous - Glass like, most transparent minerals are vitreous, quartz, garnet
Dull - Does not shine, talc, kaolinite
Adamantine - Brilliant shining surface, diamond
Soapy - Soapy feel, talc, chlorite
Greasy - Greasy feel, topaz, olivene
Silky - Like silk, antigorite, anthophyllite
Waxy - Wax like surface, quartz, serpentine,
Satin - Satin like surface, kaolinite
Submetallic - Shiny, opaque, metallic like surface, mica
Metallic - Shiny, metallic surface, pyrite
Splintery - In splinters, chlorite

Habit - A minerals external form
Cubic  In cubes, pyrite, halite garnet
Polyhedrons/Octohedrons - Garnet, fluorite
Rhombohedral - Rhomb shaped, calcite, chiastolite
Prismatic - Rectangular, square outlines, very common, hornblende, epidote, augite, zircon, sphene
Hexagonal - Hexagonal or triangular outlines, tourmaline, beryl, topaz
Tabular - Thick, flat prismatic outlines, feldspar, biotite, chlorite, epidote, olivene
Columnar - Thin columns, often in aggregates, tourmaline, actinolite/tremolite, hornblende, diopside
Flakes/Plates/Scales - Mostly the fine, microcrystalline varieties. Mica, clay minerals, chlorite, sericite
Fibrous - In fibers, actinolite/tremolite, talc, serpentine, nephrite
Acicular - Fine, needle like crystals, tourmaline, rutile, mimetite (apatite)
Radiating - Outwardly radiating from a center, zeolite, tourmaline, gypsum
Spherulitic - A radiating acicular mass of crystals forming a circular shaped pattern. Common pattern in devitrified volcanic glass
Short - Short
Long - Long

Occurrence - The mode of occurrence and/or formation of a mineral
Veins - hydrothermal veins, quartz, calcite veins
Pegmatites - V.coarse grained veins of granites, feldspars, tourmaline, micas
Vesicular/Amygdaloidal - Cavities in volcanic rocks
Evaporites - Within sedimentary evaporite basins
Metamorphic (Contact) - Along contact zones of recrystallized rocks, hornfels, skarn
Metamorphic (Regional) - Metamorphic rocks occurring over a large area, gneiss
Igneous - Generally some form of magmatic intrusion, granite, gabbro
Sedimentary - Derived from pre-existing rocks and often laid down in layers, sandstone, shale
Sedimentary Limestones - Deposited in ocean basins due reef building or accumulation of carbonate grains (detrital or precipitation), limestone

Optical Mineralogy Database
Most of these properties are only discernable with a polarizing microscope, as used by geologists.

Relief - The visibility of a mineral in plane polarized light. Usually compared to adjacent minerals or the

cementing material used in the slide, such as balsam.

Birefringence - The interference color observable under crossed polars. Refer to a birefringence table to determine values

2V - The angle of the optical axis in biaxial minerals. Measured in an oriented crystal with a Bertrand lens under crossed polars and high power.

Optical Sign - Most minerals are either uniaxial, with a single optic axis or biaxial, with two optic axes i.e. quartz, calcite, tourmaline are uniaxial, olivene, augite, hornblende, feldspar are biaxial.

Refractive Index - The degree to which a crystal bends light, as it passes through a crystal. The RI varies according to the optical axes. Uniaxial minerals have two directions of RI: 1. Along the ordinary ray; and 2. Along the extraordinary ray.. Biaxial minerals have three directions of RI: 1. Nalpha, 2. Nbeta and 3. Ngamma.

Pleochroism - The variation in color as a mineral is rotated under plane polarized light. I.e. hornblende, biotite are strongly pleochroic

Extinction Angle - The type of extinction when a mineral is rotated under crossed polarized light.
Parallel - Parallel to cleavage or crystal outlines
Oblique - At an angle to cleavage or crystal outlines
Symmetrical - Symmetrical to crystal shape or cleavage, i.e. hornblende, hypersthene, dolomite

Cleavage - Cleavage outlines in thin section are often distinctive of a mineral.
Amphibole Cleavage - Two at 56" and 124" in cross section
Pyroxene Cleavage - Two at 83" and 97" in cross section
Mica Cleavage - Perfect in one direction
Chlorite Cleavage - Perfect in one direction
Cubic Cleavage - Halite, galena
Cleavage/Foliation Masses/Aggregates - Aggregates of planar minerals, such as chlorite and mica in one direction, parallel to cleavage.

Twinning - Twinned crystals are often observed in thin section and are distinctive of certain minerals
Polysynthetic Twinning Albite Law - Plagioclase feldspars almost always exhibit this. Used to determine Albite/Anorthite content
Simple Twinning, Amphibole - Hornblende often is twinned with two crystals sharing a common twin plane
Simple Twinning, Carlsbad - Very common in K-feldspars
Penetration Twinning - Where two crystals penetrate each other through the center, andalusite, staurolite, cordierite

## MinServ Economic Database

The MinServ Commodity Database contains data on economic minerals and their uses. It has over 70 commodities and 200 economic minerals covering all major ore and industrial mineral commodities.

## Using The Commodity Database

The Commodity Database has all entries indexed by commodity and displayed report style. Each mineral is listed in a scrollable table and linked to their respective physical properties. As a mineral is selected in the list, all physical properties for that mineral are displayed on the report form. A separate query form allows querying of all fields by keyword or substring. To perform a query, click on query and enter the search terms under the field to be searched. Leave fields not searched blank. Click on Search to perform the Search. A list of matches is shown in the main window. Scroll through the minerals to see each record that matches the query.

The Commodities Database is editable. Enable editing by selecting Edit Database, then Enable. Once the edit mode is enabled, any changes made to the database will automatically be saved. A new record can be entered by selecting Add New Record. A new record with empty fields is created.

**Important:** Blank and null entries are not allowed in the database. If no entry is desired under a specific property then enter "Empty" for that specific property. Default values for all properties are "Empty". This word is automatically added to new entries.

Bookmarks can be entered using the database ID property. Enable editing and enter a unique number/label into the ID field. This label is searchable with the Query/Search option. Useful for indexing samples or as simple reference bookmarks.

A set of sample images is included with the database. Further images can be added by placing the images in the images folder and editing the image file name in the database.

**Recommended Search Terms:**

Commodity - Enter a commodity
Aluminum
Feldspar
Garnet
Lithium
Uranium
Copper
Lead
Zinc
Nickel
Iron
Phosphate
Gold
Silver
Etc.

Formula - Enter part or whole formula i.e. Cu for formula containing copper

Crystal System - Enter crystal system
Isometric or cubic
Hexagonal or trigonal

Tetragonal
Orthorhombic
Monoclinic
Triclinic

Group - Enter mineral group name
Quartz
Pyroxene
Feldspar
Garnet
Serpentine
Clay
Mica
Brittle Mica
Bauxite
Oxide
Amphibole
Feldspathoid
Zeolite
Silliminite
Calcite
Barite
Humite
Tourmaline
Epidote
Chlorite

Specific Gravity - the relative weight of a mineral as compared to water

Hardness - hardness of a mineral according to Moh's Hardness Scale

1 - Soft, i.e. Talc
2 - Copper
3 - Calcite
4 - Fluorite
5 - Medium i.e. Apatite
6 - Feldspar
7 - Glass or Quartz
8 - Topaz
9 - Corundum
10 - Hardest natural occurring mineral, Diamond

Streak - Color of a minerals powder when crushed. Determined by rubbing a mineral on a porcelain plate.
White - most common, feldspar, calcite, garnet
Black  magnetite, uraninite
Green - hornblende, vesuvianite

Color - Natural color of a mineral
Black - Mica, Uraninite, Hematite
White - Plagioclase
Pink - Orthoclase
Green - Chlorite, Olivene

Opacity - The transparency of a mineral
Opaque - Does not transmit light
Translucent - Partially transmits light

Transparent - Fully transmits light

Luster - Appearance of a minerals surface
Pearly - Smooth, shiny, white surface, talc, calcite
Vitreous - Glass like, most transparent minerals are vitreous, quartz, garnet
Dull - Does not shine, talc, kaolinite
Adamantine - Brilliant shining surface, diamond
Soapy - Soapy feel, talc, chlorite
Greasy - Greasy feel, topaz, olivene
Silky - Like silk, antigorite, anthophyllite
Waxy - Wax like surface, quartz, serpentine,
Satin - Satin like surface, kaolinite
Submetallic - Shiny, opaque, metallic like surface, mica
Metallic - Shiny, metallic surface, pyrite
Splintery - In splinters, chlorite

Habit - A minerals external form
Cubic  In cubes, pyrite, halite garnet
Polyhedrons/Octohedrons - Garnet, fluorite
Rhombohedral - Rhomb shaped, calcite, chiastolite
Prismatic - Rectangular, square outlines, very common, hornblende, epidote, augite, zircon, sphene
Hexagonal - Hexagonal or triangular outlines, tourmaline, beryl, topaz
Tabular - Thick, flat prismatic outlines, feldspar, biotite, chlorite, epidote, olivene
Columnar - Thin columns, often in aggregates, tourmaline, actinolite/tremolite, hornblende, diopside
Flakes/Plates/Scales - Mostly the fine, microcrystalline varieties. Mica, clay minerals, chlorite, sericite
Fibrous - In fibers, actinolite/tremolite, talc, serpentine, nephrite
Acicular - Fine, needle like crystals, tourmaline, rutile, mimetite (apatite)
Radiating - Outwardly radiating from a center, zeolite, tourmaline, gypsum
Spherulitic - A radiating acicular mass of crystals forming a circular shaped pattern. Common pattern in devitrified volcanic glass
Short - Short
Long - Long

Uses - The main uses for and applications for this commodity
Lithium - Greases, ceramics, production of aluminum
Garnet - Abrasives
Feldspar - Manufacture of porcelain
Lead - Pipes, batteries, radiation shielding
Copper - Alloyed for bronzes, brasses, electrical
Nickel - Steel making

Model - The mode of occurrence and/or formation of an economic mineral
Veins - hydrothermal veins, quartz, calcite veins
Pegmatites - V.coarse grained veins of granites, feldspars, tourmaline, micas
Vesicular/Amygdaloidal - Cavities in volcanic rocks
Evaporites - Within sedimentary evaporite basins
Metamorphic (Contact) - Along contact zones of recrystallized rocks, hornfels, skarn
Metamorphic (Regional) - Metamorphic rocks occurring over a large area, gneiss
Igneous - Generally some form of magmatic intrusion, granite, gabbro
Sedimentary - Derived from pre-existing rocks and often laid down in layers, sandstone, shale
Sedimentary Limestones - Deposited in ocean basins due reef building or accumulation of carbonate grains (detrital or precipitation), limestone
Replacement - Hydrothermal replacement deposits

## MinServ XRD Minerals Database

The MinServ XRD Minerals Database contains XRD data on all minerals. Over 3800 minerals with mineral name and three strongest d-spacings are listed.

## Using The XRD Database

The XRD Database has all entries indexed by mineral name and d-spacing and is displayed in tabular format. The table can be browsed using scroll bars. To perform a query, enter the search terms in the search option boxes. Mineral name and d-spacing can be searched and d-spacing search limits can be entered or selected.

**Important:** Search limits must be entered for d-spacing searches. In most cases, a narrow search pattern will give the most accurate results. If the XRD peaks are uncertain, perform a wider search, by specifying a wider d-spacing range.

Click on Search to perform the search. A list of matches is shown in the main window. Scroll through the minerals to see each record that matches the query. The results may be printed. The database can be sorted according to mineral name or d-spacing from the Edit Menu and all data can be printed.

**Important:** Blank and null entries are not allowed in the database. If no entry is desired under a specific property then enter "Empty" for that specific property. Default values for all properties are "Empty". This word is automatically added to new entries.

## Backing Up Databases

It is highly recommended, the databases are backed up periodically. The easiest way to do this is to copy the database files, *.mdb, to a backup folder of your choice using Windows Explorer or My Computer File Manager.

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# Software Support

Technical support for DrillHoleMS is provided through the printed manual and online help. Updates for DrillHoleMS can be obtained directly for free using the built-in ftp Internet connection. The updater requires Internet Explorer 6 SP1 and above. If an insurmountable problem occurs further technical support is available directly from Mineral Services; however, the software must be registered to receive support.

MinServ (Mineral Services)
email: support@geologynet.com
http://www.geologynet.com