

POWER CURVE

Version 12 Metric Tutorial



The Intelligent Geological Software Solution

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Introduction

Power*Curve™(Petrographical Office Wellsite Evaluation and Reporting) is a chip and core logging management program that utilizes single-entry data capturing to produce geological striplogs. The geological data is entered into the system through the use of intuitive data entry forms to ensure standardization of data. This data is stored in an RDBMS(Relational Database Management System) to allow data manipulation using SQL access tools.

Power*Curve™ software consists of four (4) main parts:

- 1.) A horizontal log editor module that allows you to change the striplogs to suit your needs and preferences.
- 2.) A data transfer module.
- 3.) Report printing modules.
- 4.) An on-line help system that is designed to familiarize you with the commands and functions available in **Power*Curve™** and lead you through many of the processes involved in creating welllogs.

A note about navigating through Power*Curve™ Reports:

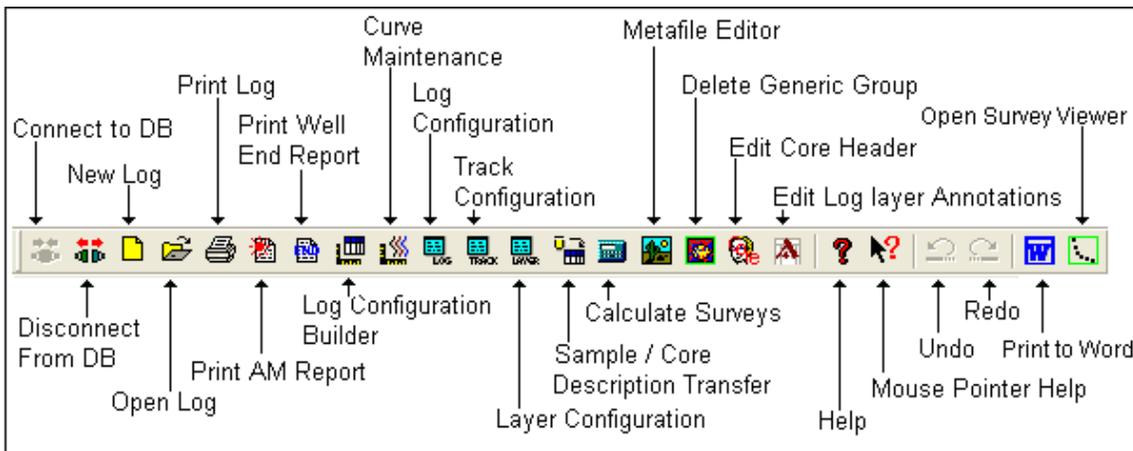
When you are entering information into data forms, you may move between boxes/fields by **pressing** the **Tab** key to go forward and **Shift +Tab** keys to move backwards. To exit forms that do not have an **Exit, OK, or Cancel** button, **press** the **Esc** key on the keyboard.

To access the On-line Help System in Power*Curve™:

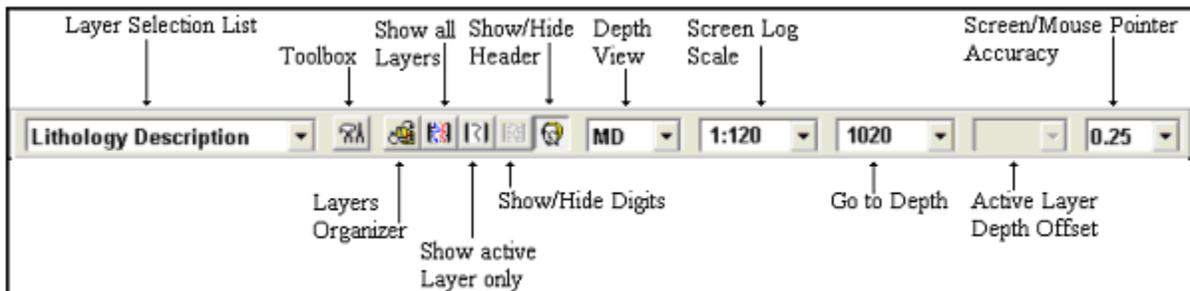
You can make use of the context sensitive help by **pressing** the **F1** key when you are in a dialogue box. A pertinent help file will appear, opened to the topic relevant to the dialogue box you are in.

Below are some examples of common features within Power*Curve™:

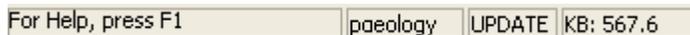
The Toolbar



The Selection Bar...



The Status Bar...

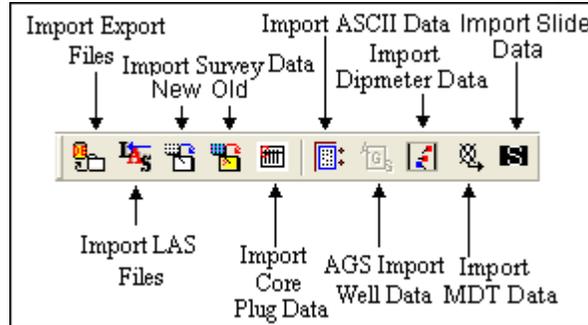


The **Status Bar** displays system status messages and any error message (associated with a field entry), in the far left corner. The KB elevation is displayed in the lower right corner of the **Status Bar**.

Import Toolbar

This toolbar is dock able and can be moved to different places on the screen.

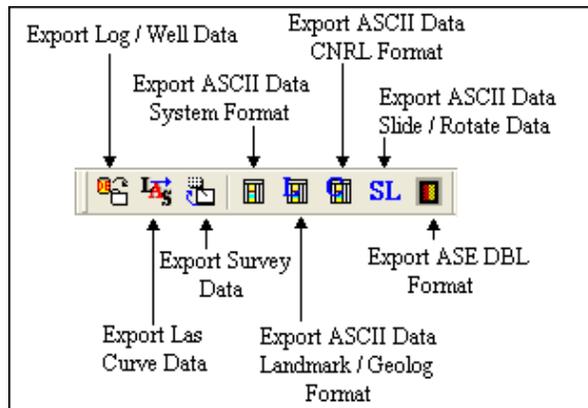
The Power*Log / Core & Curve™ Import Toolbar...



Export Toolbar

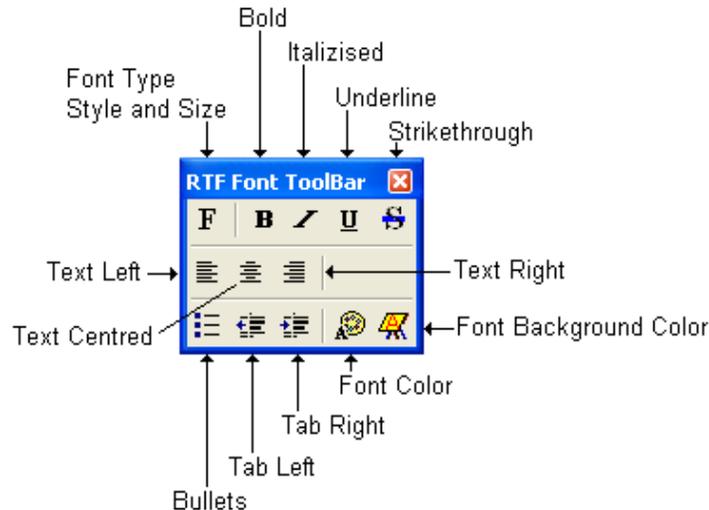
This toolbar is dock able and can be moved to different places on the screen.

The Power*Log / Core & Curve™ Export Toolbar...



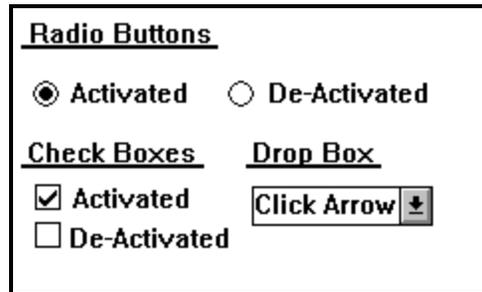
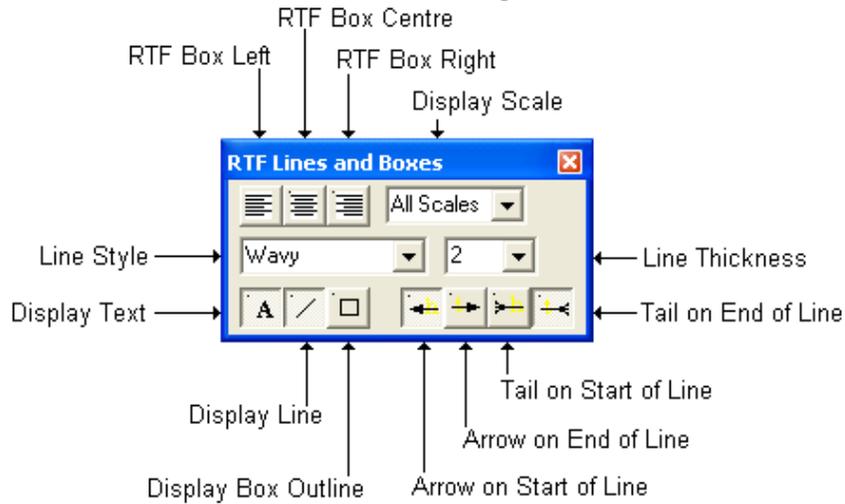
RTF Font Toolbar

Turns the RTF Font Toolbar on and off. This toolbar is dock able and can be moved to different places on the screen. This is used with the New RTF Annotations used on the Log.



RTF Line and Boxes Toolbar

Turns the RTF Line and Boxes Toolbar on and off. This toolbar is dock able and can be moved to different places on the screen. This is used with the New RTF Annotations used on the Log.



The On-line Help is divided into four(4) main categories:

Commands - Descriptions of each menu command within **Power*Log™**.

Toolbar - Shortcuts to common commands are explained.

Database Table Operations - Commands/functions related to the Database Table are described.

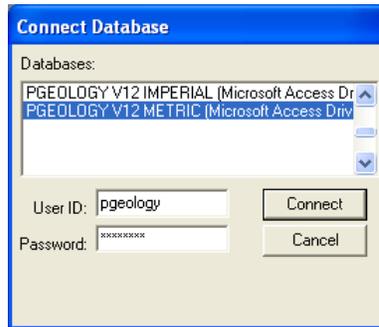
Quick Reference Guide - The portion of the **On-line Help System**, that quickly refers you to some of the more commonly performed tasks.

This tutorial will guide you through the process of creating and editing a new horizontal striplog (hereafter referred to simply as a log), with curves and interpreted lithology.

Connecting to the Database



- 1.) **Double click** on the PowerCurve V12 **Icon**. Acknowledge the Security Information window by **clicking** on the  **button**. This will initiate the program and activate a **Connect Database** window.



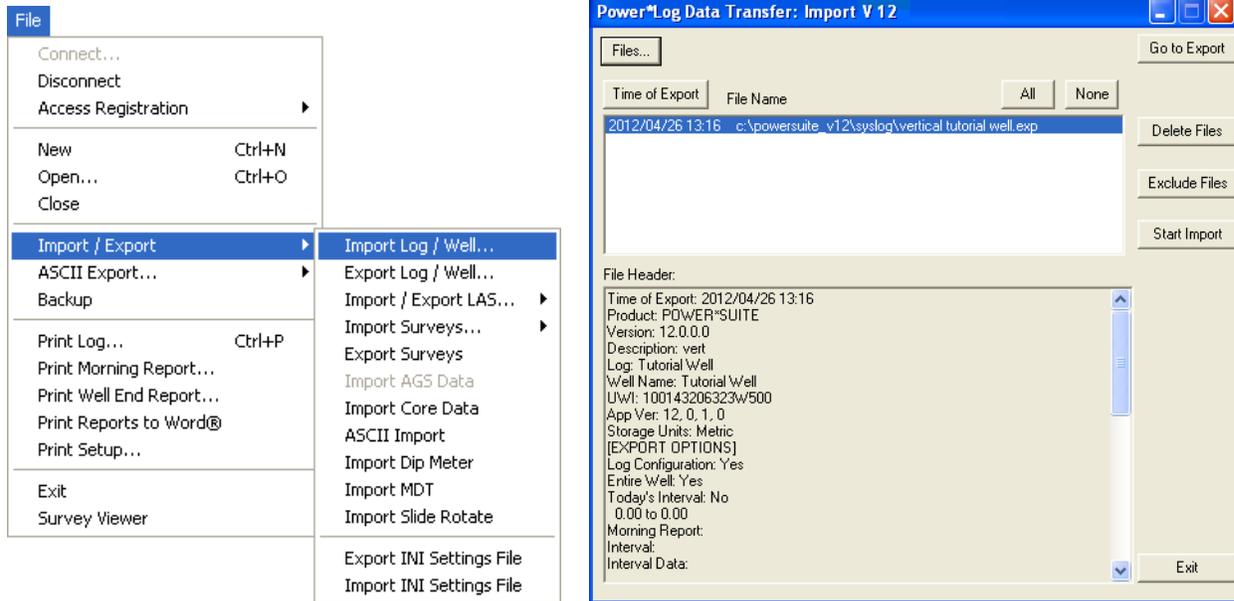
- 2.) Highlight the **PGEOLGY V12 METRIC (Microsoft Access Driver[* .mbd])** database by **clicking** on it once.
- 3.) Move your mouse pointer to the **User ID** field and **click**. This will activate a flashing cursor in the **User ID** field. **Type "pgeology"** in the **User ID** field. **Press** the **Tab** key on the keyboard to move to the **Password** field.
- 4.) **Type "pgeology"** in the **Password** field and then **click** on the  **button**. The program will now load various dictionaries and then activate an **Open Log** window.

Creating a new Log for an Existing Well.

The idea behind this tutorial is that you have already completed the Vertical Tutorial and that well exists in your database. The information that has been entered in the Vertical Tutorial will be shared and displayed on this horizontal tutorial. If you have not completed the Vertical Tutorial you can now import that log / well from the C:\PowerSuite_V12\syslog folder. The export file name is Vertical Tutorial Well.exp. If you have completed the Vertical tutorial then proceed to page 8.

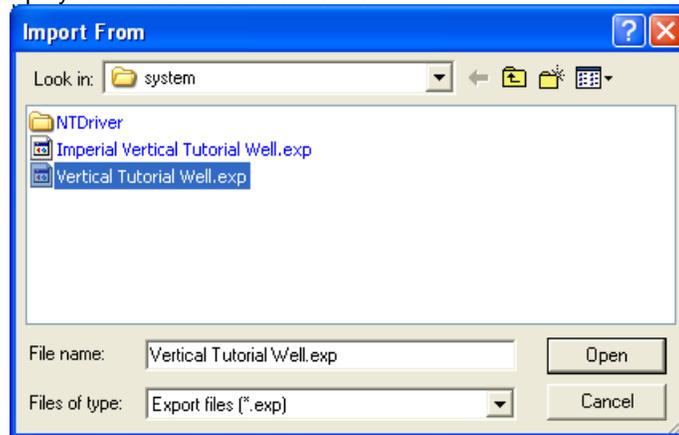
Importing the Vertical Tutorial Well.

1. Select **Import/Export**, under the **File** menu selection, and then select **Import Log/Well** from the sub-menu. Or, you can use the  **Import** button on the **Import Toolbar**. This will activate the **Import** window.



Importing the Tutorial Vertical Log/Well...

1. Click on the **Files...** button. This will activate the Import From Window and browse to the C:\PowerSuite_V12\syslog folder. Please make sure that the **Vertical Tutorial Well.exp** is highlighted (selected) and then click on the **Open** button. This will fill in the Data Transfer Window with the file name highlighted and the file's contents displayed in the **File Header** list field



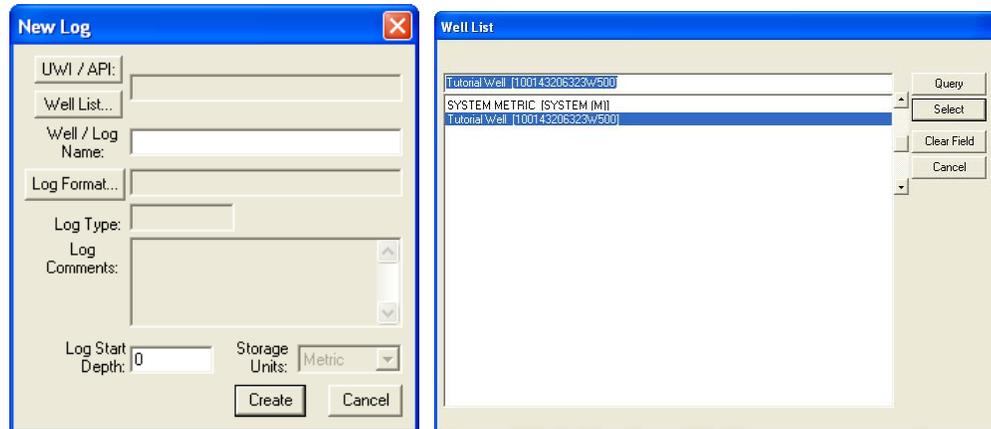
2. Click on the **Start Import** button to activate the following system message, "**Do you really want to IMPORT the highlighted files?**"
3. Click on the **Yes** button to proceed with the import.

Note: If you click on the "Yes" button, and the file you are importing contains the information from an **Entire Well**, the following system message will be activated, "**About to IMPORT ENTIRE WELL data. All information associated with this well in the database will be OVERWRITTEN. Continue?**"

4. Click on the **Yes** button and then click on the **Yes** button again.
5. Upon completion of the import, the following system message will then be activated, "**Data has been imported successfully.**"
6. Click on the **OK** button to confirm the successful import of the data.
7. Click on the **Exit** button to close the Window down.

Creating a new Log for an Existing Well.

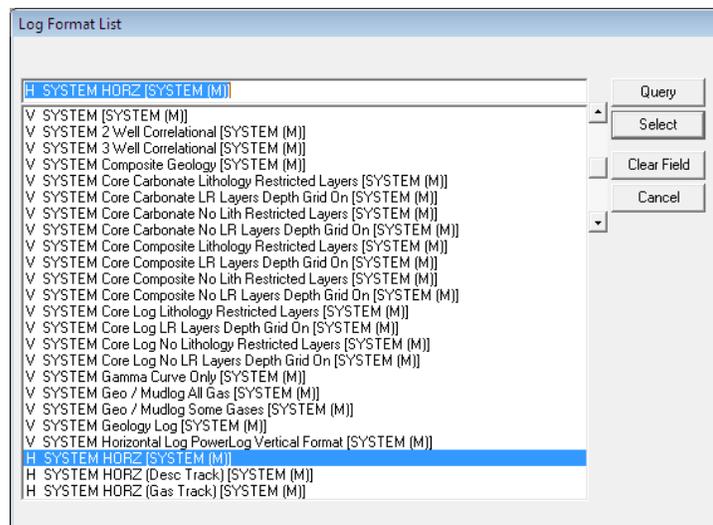
- 1.) The first step in creating a new log is to **click** on the  **New Log** button on the **Toolbar** or to **select New** under **File** on the **Selection Bar**. This will open the **New Log** window shown below.



- 2.) **Click** on the  **Well List...** **Button**. This will activate a Well List window with a list of wells associated with your database
- 3.) **Select** the **Tutorial Well** by either **double clicking** the name in the list or **clicking on the name once** and **clicking** on the  **Select** **button**. This will fill in the **Well/Log Name** and the **UWI** fields.
- 4.) The user must now modify the Well/Log Name as you cannot have 2 logs with the same name. In our case we will **click the mouse button at the End of the Well/Log name field and type in HZ log** after the Tutorial Well.

Note: Because the Well / Log Name field is associated with the original UWI / API you are only changing the Log name. The well name that was created in the Vertical Tutorial remains as it was first entered.

- 3.) **Click** on the  **Log Format...** **button** to activate the **Log Format List** window.



- 4.) **Click** on **"H SYSTEM HORZ [SYSTEM (M)]"** to highlight it and then **click** on the  **Select** **button**. You may also **double click** on **"H SYSTEM HORZ [SYSTEM(M)]"**.

Note: The H before the Log name represents a Horizontal Log Format and the V before the Log name represents a Vertical Log Format

- 5.) Once you have been returned to the **New Log** window, **double click** in the **Log Start Depth** field. This will highlight the zero (0) and activate a flashing cursor. Type **2610** in the **Log Start Depth** field.

- 6.) Once the information is entered, **click** on the **Create** button.
- 7.) This will initiate a **New Log**. Because you have created a second log for an existing well you will be reminded with a System message. **Click** on the **Yes** button.

- 8.) During this process, the curves associated with the selected log format will be added. You will now be prompted with the **Well Path (SS) Add Curve** window.

The **Well Path (SS) Curve** allows the user to draw the actual well path that the well takes when being drilled. These depths should correspond to the last few meters of the build section and the proposed window for the horizontal or lateral section of the well bore. In our tutorial the KB is 24.9 m. This curve will be updated with SS values.

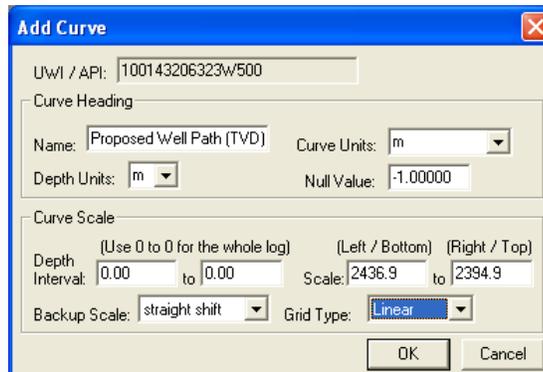
Note: The **Left / Bottom Scale** maps to the bottom on a horizontal curve and the **Right / Top Scale** maps to the top on a horizontal curve.

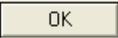
- 9.) **Select "m"** for meters in the **Curve Units** field. Then, enter a value of **"-2412"** into the **Left/Bottom Scale** field and a value of **"-2370"** into the **Right/Top Scale** field. Finally, select **"Linear"** in the **Grid Type** field and then **click** on the **OK** button. Then the next Add curve window **Well Path (TVD)** window will then be displayed.

The **Well Path (TVD)** allows the user to draw the same well path as the SS but this time the curve will be displayed in TVD depth units

- 10.) Select "m" for meters in the **Curve Units** field. Then, enter a value of "2436.9" into the **Left/Bottom Scale** field and a value of "2394.9" into the **Right/Top Scale** field. Finally, select "Linear" in the **Grid Type** field and then click on the  button. The Proposed Well Path (TVD) add curve window will then be displayed

The **Proposed Well Path (TVD)** allows the user to draw the proposed well path as first drawn by the directional drilling company. Typically, you would only show the horizontal portion of the well path and/or the last few meters of the build section. The **Proposed Well Path Add Curve** window should have the exact same scale values as the Well Path (TVD) window.

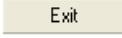


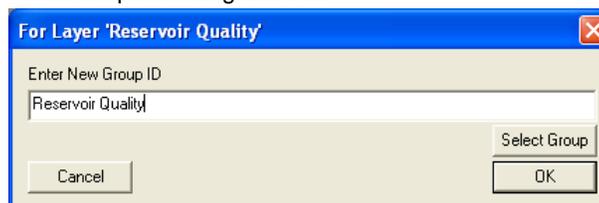
- 11.) Select "m" for meters in the **Curve Units** field. Then, enter a value of "2436.9" into the **Left/Bottom Scale** field and a value of "2394.9" into the **Right/Top Scale** field. Finally, select "Linear" in the **Grid Type** field and then click on the  button.. The **Detailed Lithology Scale [DETLITH1]** window will then be displayed



The **Detailed Lithology Scale [DETLITH]** window allows the user to draw **Lithology** in the **Detailed Lithology** track with respect to a scale. This enables the user to change the scale to match the SS curve if there happens to be a scale change the represented lithology can also change so that the user will not have to redraw everything to fit the scale change on the curve. We will draw this layer with respect to the subsea units that were added with the Well Path subsea curve

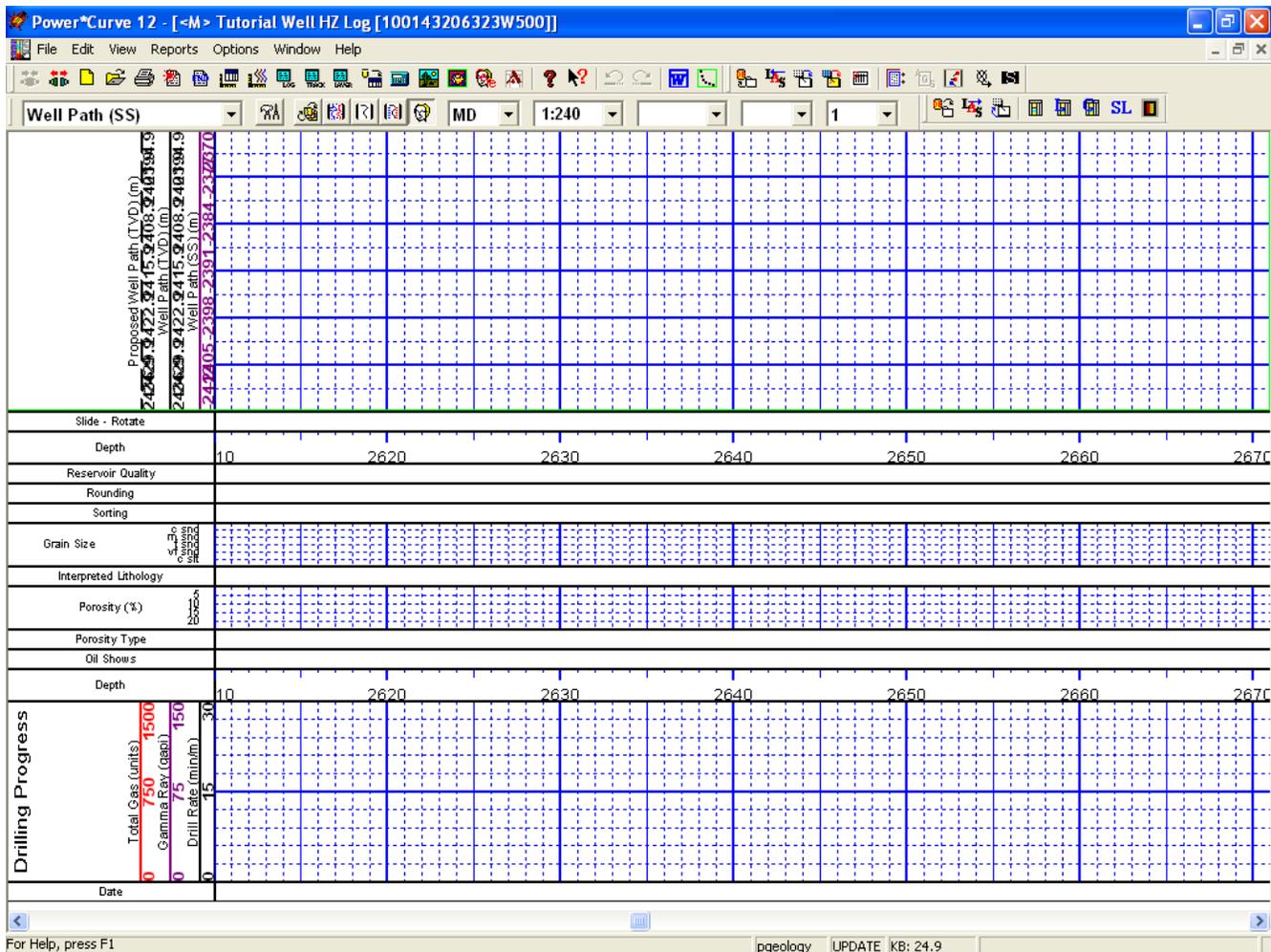
Note: The **Display Depths** associated with the **Detailed Lithology** layer in the **Detailed Lithology** track are determined by the values entered into either the **Major** or the **Minor** field in the **Layer Configuration** window for the **Detailed Lithology** layer.

- 12.) Enter a value of "-2370" into the **Top Scale** field and a value of "-2412" into the **Bottom Scale** field. Finally, select **Straight Shift** in the **Backup Scale** field.
- 13.) Click on the  button, and exit from the ensuing **Shortcut Options** window by clicking once on the  button.
- 14.) You will now be prompted with an Add Generic Category layer window named Reservoir Quality. **Type Reservoir Quality** into the field as shown in the proceeding window.



You have just added four curves to the database, that will be displayed as layers in the Drilling Progress track and the Detailed Lithology track on your new horizontal log along with the Drill Rate and Total Gas Curves that were associated earlier with the Vertical Tutorial.

**** When your log opens, it should look similar to the log displayed below. ****



The tracks on this log have been shrunk to fit the screen resolution. Your tracks will appear wider and will not all fit on your screen. This will depend on the screen resolution at the time.

1. You can now fill in your pertinent well information by selecting **Well** under **Edit** pull down menu on the **Selection Bar** to activate the **Well** window.

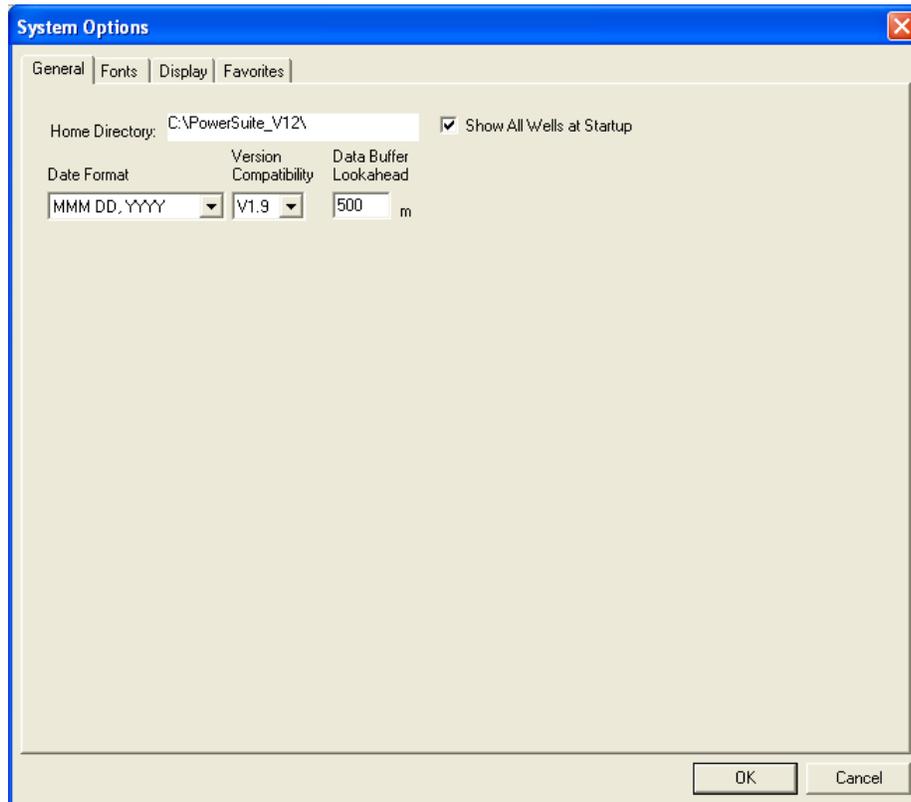
2. Fill in the information you feel is necessary (the Figure above, has been filled in to give you an idea of how to complete the fields. Please **type in** the **KB elevation field** with **"24.9"**. This is done so that when we need to calculate the Well path SS curve and add a formation top that a sub sea level (ssl) field will be filled in. Then **click** on the **Save** **button** to save any changes you have made to the well record.

Note: Some of the fields in the **Well** window have character restrictions or mandatory requirements. Consequently, if any of these restrictions have been violated or if any requirements have not been met, the offending field will be highlighted, the nature of the problem will be displayed on the **Status Bar** (lower left hand corner of the screen). Then you will be prompted with a system error message window. Remember to save your work, after the problem has been fixed.

3. If the record has been successfully saved, **click** on the **Exit** **button**, when prompted with the **Shortcut Options** system window shown below:

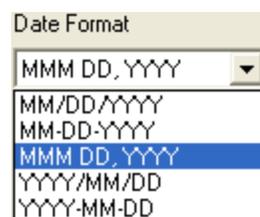
To activate the System Options window **click** on **System Options** under the **Options** menu selection.

General Tab



Home Directory - This is the directory on your hard drive where **Power*Log, Power*Core and Power*Curve** is being executed. The user will not see any symbols on their log or print out any of our reports if you have the wrong home directory.

Show All Wells at Startup This check box when activated will populate the Open Log window with all the wells in the database. If it is unchecked it may help our corporate users and the time it take to retrieve thousands of wells from the database and to populate the Open Log window with that information. If this check box is deactivated and you wish to see all your wells then simply **click** on the **Clear Query** button in the Open Log window to see all their wells if this option is deactivated.



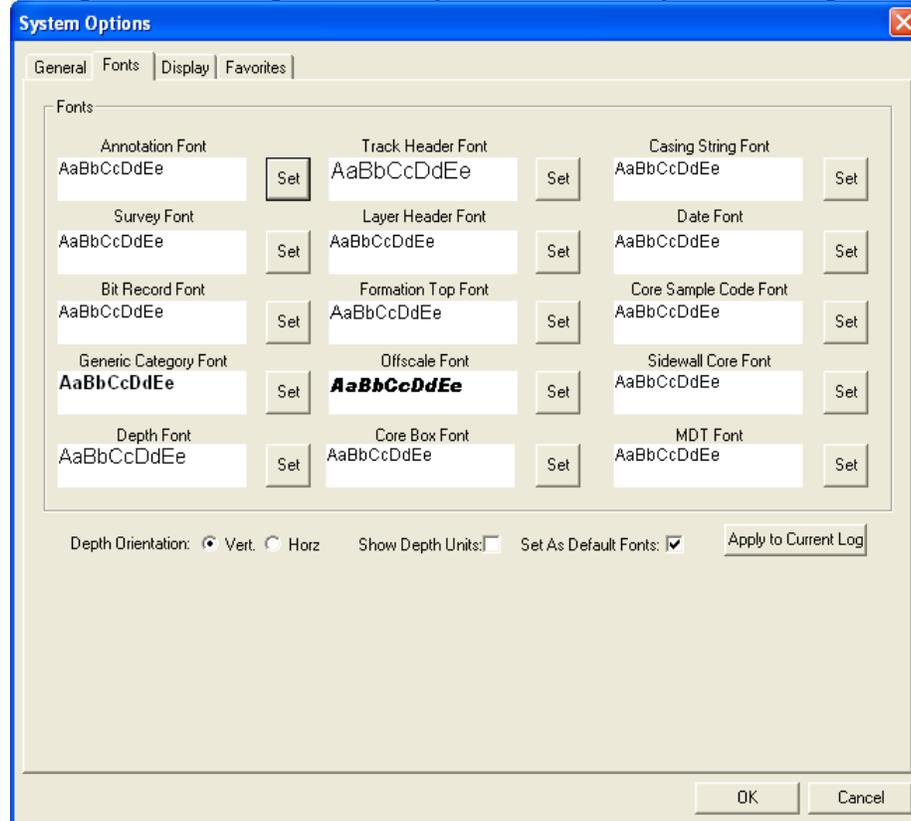
Date Format - From this drop box, you can select the date format. This selection determines how every date in **Power*Log / Core & Curve** will be entered and displayed. If you import a log with different date formats, **Power*Log / Core & Curve** will change the dates to comply with the format you've chosen here. The user can change this at any time and all the Date formats will be changed in the database.

Version Compatibility - Enables the user to achieve compatibility for Annotations in the older Versions of Power*Suite (V1.81 and before) and the Annotations in the newer Versions of Power*Suite (V1.9 and later).

Data Buffer Lookahead - The number placed in this field determines how far ahead and behind the current top depth will be stored in the computers buffer. The larger the look ahead number, the longer it takes for Power*Log / Core & Curve to refresh the screen when you exceed the look ahead value. However, until you meet or exceed the look ahead value, scrolling will be much faster, because the database is not yet being accessed.

Fonts Tab

This tab allows the user to set up most of the fonts used in Power*Log, Core and Curve. You can set it up to be used on the current log as well as using the fonts as your defaults when you are making new logs.



Annotation Font - Allows you to determine the default font style, type, color and size of your annotations on your log, Also this is the default when you use any of the Sample Description Transfer options.

Survey Font - Allows you to determine the font style, type, color and size of your survey data associated with the Survey Layer on your log.

Bit Record Font - Allows you to determine the font style, type, color and size of your bit record data associated with the Bit Record Layer on your log.

Generic Category Font - Allows you to determine the font style, type, color and size of your Long or Short Name display option in all the Generic Category Layers displayed on your log.

Depth Font - This allows you to determine the font style, type, color and size of the depth markers in the **Depth** track of the log.

Depth Orientation: Vert. Horiz - These radio buttons allows the user to change the orientation of the Depth Font on the Layer. Beware you may have to change the Track Width to accommodate the Font size and orientation. Refer to the Log Configuration Builder to do this.

Show Depth Units This check box when activated will display the depth units with the depth on the Depth Layer. ie. 1000 ft or 1000 m vs. 1000

Track Header Font - Allows you to determine the font style, type, color and size of your Track Headers on your log. All track headers use the same font across the entire log.

Layer Header Font - Allows you to determine the font style, type, color and size of your Layer Headers on your log. All Layer headers use the same font across the entire log.

Formation Tops Font - Allows you to determine the font style, type, color and size of your Formation Tops data associated with the Formation Tops Long and Expanded Layers on your log.

Offscale Font - Allows you to determine the font style, type, color and size of your curve values displayed when the curve pegs off scale.

Core Box Font - Allows you to determine the font style, type, color and size of your Core Box data entered in the Core Box layer.

Casing String Font - Allows you to determine the font style, type, color and size of your Casing string data displayed on the Casing String layer. This data is entered through the Casing String Report.

Date Font - Allows you to determine the font style, type, color and size of your Date data entered in the Date layer.

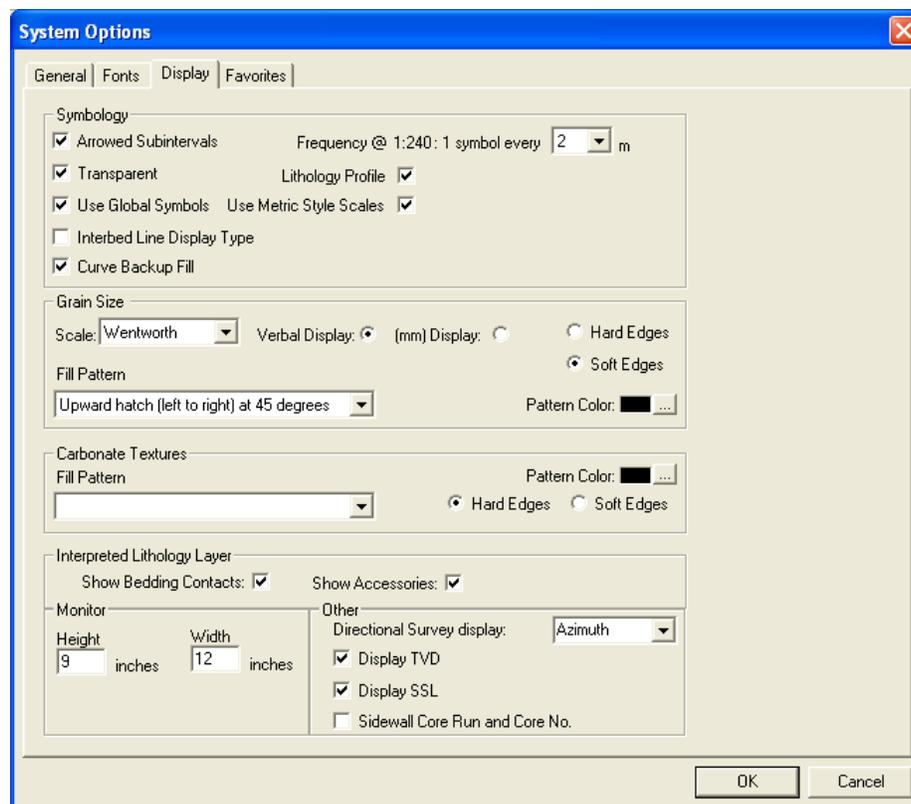
Core Sample Code Font - Allows you to determine the font style, type, color and size of your Core Plug data entered through the Core Plug Report. This font is displayed on the Core Sample Code layer.

Sidewall Core Font - Allows you to determine the font style, type, color and size of your Sidewall Run and Sample Number data entered through the Sidewall Core Report. This font is displayed on the Sidewall Core layer.

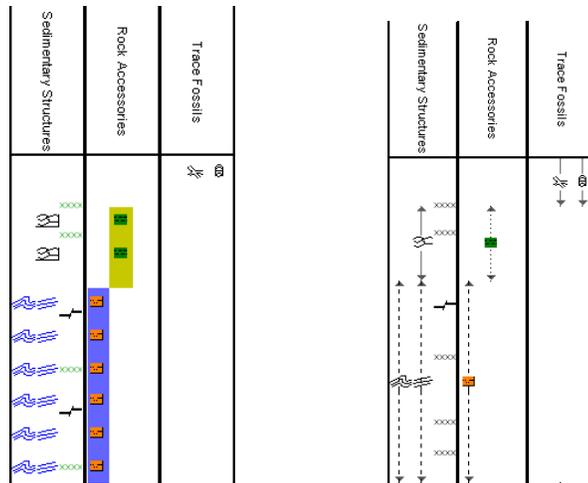
MDT Font - Allows you to determine the font style, type, color and size of your MDT Run and Test Number data entered through the MDT Report. This font is displayed on the MDT layer.

Set As Default Fonts This check box when activated will make the font setting in this window your defaults for any new log created regardless on the Fonts stored in the template.

Display Tab



Arrowed Subintervals - This check box when activated will indicate the top and bottom of your subintervals (portion of an interval) with an arrow rather than a set of symbols. An example is shown below.



Normal Subintervals

Arrowed Subintervals

Transparent - This check box when activated, this function makes the background of the accessory symbols transparent, so that the bed in the background shows through. If deactivated, a white background surrounds the accessory symbols in order to separate them more from the beds.

Use Global Symbols - With the ability to edit existing metafiles the user may have imported a well that has used metafiles or symbols that have been modified to look differently than the one existing within your system symbols. If you wish to use your symbol set instead of the revised imported ones you can select this check box to make that change.

Interbed Line Display Type - This check box when activated will display the interbed data with a line display splitting the two lithology types or when unchecked will display the lithology in an interbed fashion as displayed below.

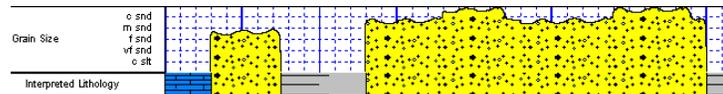


Curve Backup fill - This check box when activated will show a sideways hatching fill pattern when a curve goes off scale or in the backup mode. If unchecked there will be no hatching pattern when the curve goes off scale.

Frequency @ 1:240 - This drop box determines how often symbols are drawn on a **Lithology Layer**, with the scale of 1:240. For example: 1 symbol every 1 meter at 1:240, 2 symbols every 1 meter at 1:120, 1 symbol every 2 meters at 1:480, and so on. These frequencies are only in effect if you utilize the entire interval in **Oil Shows, Rounding, Sorting, Framework**, or designated an interval in **Sedimentary Structures, Traces Fossils** and Rock Accessories.

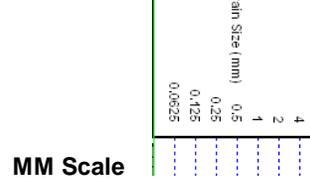
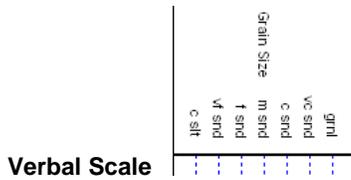
Lithology Profile - This check box when activated will fill in the Carbonate Texture and Grain Size layers with the interpretive lithology. It will draw the lithology to the maximum size filled in over the interval.

Note: The user may wish to turn off the track borders when this option is selected. You will see an example of this shown below.



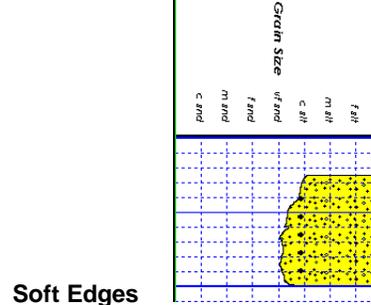
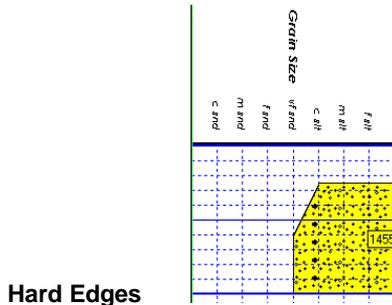
Grain Size Scale List box - You may choose between **Wentworth, Canstrat** or **Amstrat** scales, when using the **Grain Size Builder**. The Wentworth Grain size only allows full grain size while Canstrat / Amstrat allow half grain sizes when drafting in the Grain size and matrix layers.

Verbal Display: This radio button will display the **Grain Size Track header** with the equivalent verbal grain sizes such as such as C silt, VF snd, F snd, M snd, C snd etc.



(mm) Display: This radio button will display the **Grain Size Track header** with the equivalent numeric grain sizes (in mm) such as .0625, .125, .25, .5, 1, 2 etc. as shown above.

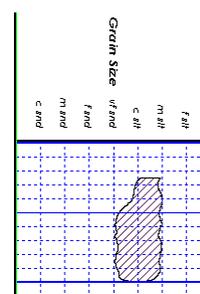
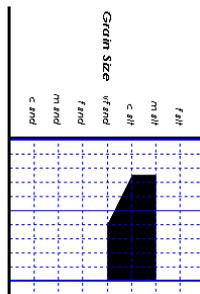
Hard Edges This radio button will display the grain size with strait edges and right angles between the grain sizes. The illustration below is shown with Lithology Profile activated.



Soft Edges This radio button will display the grain size with curved edges and rounded angles between the grain sizes.

Grain Size Fill Pattern Upward hatch (left to right) at 45 degrees This drop box allows the user to select a hatching pattern when using the Grain Size Layer with the Lithology Profile not activate.

Grain Size Pattern Color: This color selector allows the user to pick the line color (foreground) when the fill pattern option is used. The background color is found in the Layer configuration for the Grain Size.



Grain Size No Pattern Hard edges

Grain Size Pattern Soft edges

Carbonate Texture Fill Pattern Upward hatch (left to right) at 45 degrees This drop box allows the user to select a hatching pattern when using the Carbonate Texture Layer with the Lithology Profile not activate.

Carbonate Texture Pattern Color: This color selector allows the user to pick the line color (foreground) when the fill pattern option is used. The background color is found in the Layer configuration for the Carbonate Texture Layer.

Carbonate Textures Hard Edges This radio button will display the grain size with strait edges and right angles between the Carbonate Textures. The illustration below is shown with Lithology Profile activated.

Carbonate Textures Soft Edges This radio button will display the grain size with curved edges and rounded angles between the Carbonate Textures.

Interpreted Lithology Layer - Show Bedding Contacts: -When this check box is activated the bedding contacts (lines) between the drawn lithology types in the Interpretive Lithology Layer will be shown.

Interpreted Lithology Layer - Show Accessories: When this check box is activated it will turn on the accessories in the Interpretive Lithology Layer.

Monitor Height - This option allows you to scale your monitor for Power*Log / Core so you may correlate on-screen wells with hard copy logs that you may have. It is recommended that you take an opportunity to measure the vertical viewing area of your monitor in inches and then insert that value in the **Monitor Height** field. Be aware, however, that if you adjust the screen height knob on your monitor, this will affect the monitor height setting.

Monitor Width - This option allows you to scale your monitor for Power*Curve so you may correlate on-screen wells with hard copy logs that you may have. It is recommended that you take an opportunity to measure the horizontal viewing area of your monitor in inches and then insert that value in the **Monitor Width** field. Be aware, however, that if you adjust the screen width knob on your monitor, this will affect the monitor width setting.

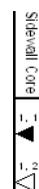
Note: You must restart **Power*Log / Core & Curve** for the **Monitor Width / Height** changes to take effect.

Directional Survey display: Azimuth This drop box option will display your directional surveys on your log in either Quadrant format (N 62 ° W) or Azimuth format (AZ 298 °)

Display TVD check box when activated will display the survey with TVD values

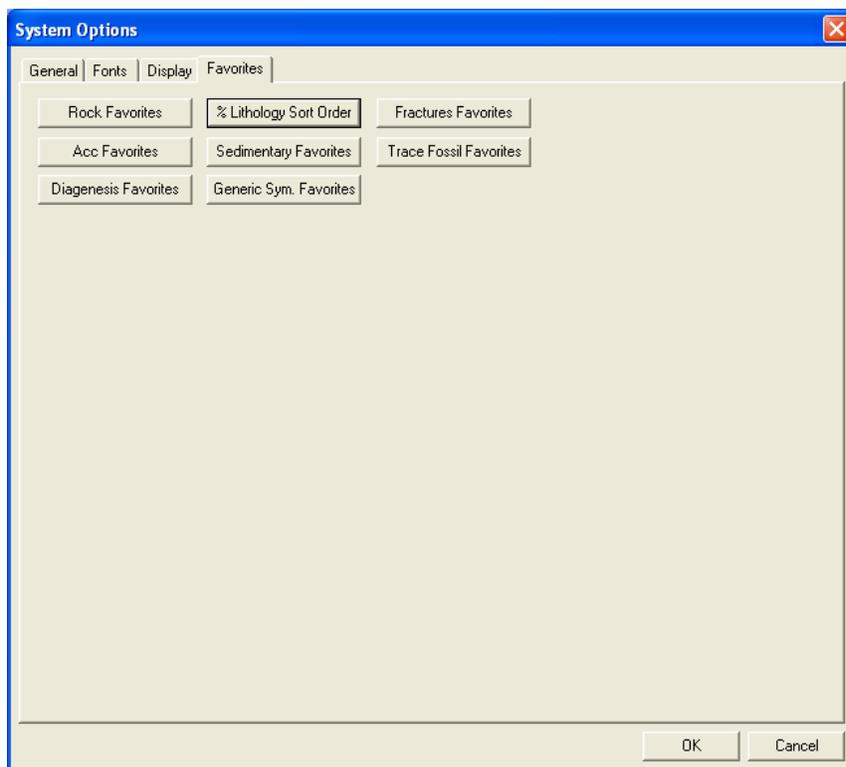
Display SSL check box when activated will display the survey with SSL values

Sidewall Core Run and Core No. This check box when activated will display the Sidewall Core Run & Core numbers above the core triangle indicator on the Sidewall Core layer.



Favorites Tab

This tab allows the user to define their System favorites for all the data categories that support these choices. This tab dialogue also allows the user to access the % Lithology Sort order for the % Lithology Track.



- 1.) Click on the  button in the **System Options** window.
- 2.) Click on the  button in the Rock Type Favorites list window to prepare it for the selection of your Rock Favorites.
- 3.) Select the following **Rock Types** from the **Rock Type Favorites** list window:
 - Ls ms [Limestone (mud supported)]**
 - Sh m gy [Shale medium gray]**
 - Ss [Sandstone]**
 - Dol [Dolomite]**
 - Plus any other rock types you would use a lot.**
- 4.) Click on the  button to return to the **System Options** window.

Accessory Favorites - Allows the user to determine their favorite **Accessories** and then displays them in a pop-up menu generated by the activation of the **Accessory Builder** window in the **Interpretive Lithology** track.

- 1.) Click on the  button in the System Options window.
- 2.) Click on the  button in the **Accessory Favorites** list window to prepare it for the selection of your **Accessory Favorites**.
- 3.) Select the following **Accessories** from the **Thinbed**, **Components**, and **Cement** headings in the **Accessory Favorites** list window:

Note: You can navigate around these selections by typing in the first two characters of the accessory to get a lot closer to your selection.

Thinbed

cht dk pebbles [chert dark pebbles]
 sh gy stringers [shale gray stringers]
 sid nodules [siderite nodule]

Component

aren [arenaceous]
 calcs [calcareous]
 carb [carbonaceous]
 coal (carb) grs [coal (carbonaceous) grains]
 cht dk grs [chert (dark) grains]
 fld grs [feldspar grains]
 glau grs [glauconite grains]
 micmica [micromicaceous]
 pyric [pyritic]
 slty [silty]

Cement

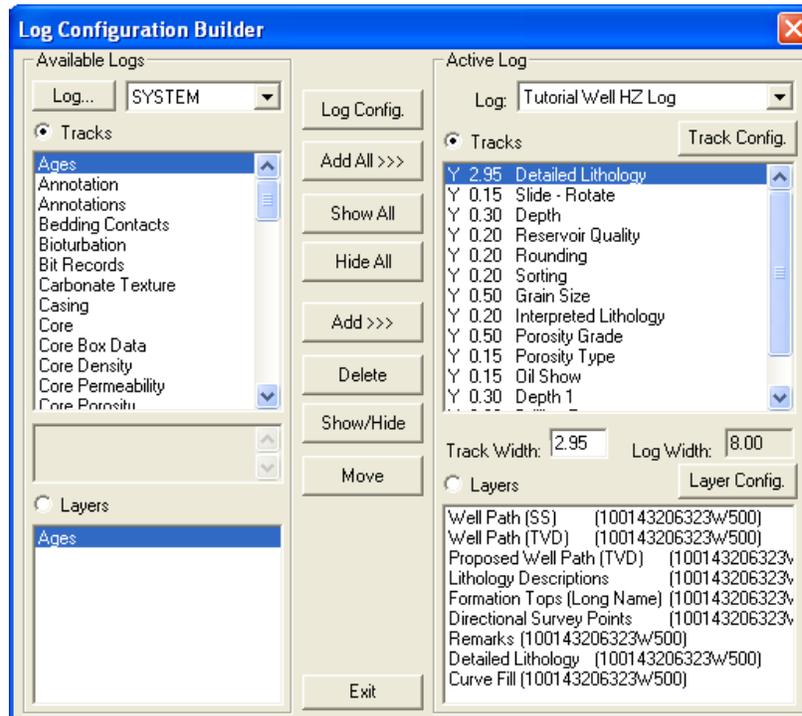
sid [siderite]
 sils [siliceous]
 Plus 15 other components that you would use a lot.

- 4.) Click on the  button to return to the System Options window.

The Log Configuration Builder Window

- This is the heart of the Log/Track/Layer configurations and controls the way your well's information is displayed on the log.
- The well may have a lot of information stored in the database, but that information cannot be shown graphically on the log, until the necessary layers have been created to illustrate that information.

- 1.) Click on **Log Configuration Builder** under the **Options** menu on the **Selection Bar** or click on the **Log Configuration Builder**  button on the **Toolbar** to activate the **Log Configuration Builder** window.



Fundamentals of the Log Configuration Builder window

The left side of the Log Configuration Builder window: Available Logs

The **Available Logs** section or **left** side of the **Log Configuration Builder** window allows you to take any track or layer from **Available Logs** and add it to the log you are currently creating/building. On the **left** side of the window, below the **Tracks** radio button, is a list of the tracks available for adding to the **Active Log**.

The **Available Logs** section or left side of the window contains the track and layer configuration of the **SYSTEM [SYSTEM]** log, when the window first opens. You have the option of using any of the existing **Tracks** and their associated layers or any of the existing **Layers** that are associated with any of the system logs in the log database. The user can click on the **Log** button on the left side of the screen to activate a selection list of all log formats that are in your database. The list is comprised of two (2) names with the first name in the list being the system **Log Name** and the second name (in brackets), being the **UWI** of its primary well. **Double click** on the log format you wish to copy from.

Below the **Layers** radio button, on the **left** side of the window, is a list of the layers available in the track highlighted above. They will be added all at once, if you add their parent track. However, they can also be added on an individual basis, if you only want to add one(1) layer to an existing **Active Log** track.

The right side of the Log Configuration Builder window: Active Log

The **Active Log** section or **right** side of the window displays the track and layer configuration of the **Active Log** (the log you are currently creating), in the main **Power*Curve™** window. The name of the log is viewed in the **Log** field. In this case, it will be "Tutorial Well." Below the **Tracks** radio button, on the **right** side of the window, is a list of the tracks that are currently found within the **Active Log**. The track at the top of this list is drawn on the left side of the log, while the track on the bottom of the list is drawn on the far right of the log with all of the other tracks drawn in between, respectively. Below the **Layers** radio button, on the **right** side of the window, is a list of the layers that are associated with the track highlighted above.

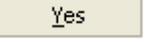
The middle of the Log Configuration Builder window: Selection Buttons

The **selection** buttons, found in the middle column of the window, are for adding layers or tracks from the **Available Logs** to the **Active Log**, activating/deactivating the **Active Log's** tracks, deleting active log tracks or layers, and moving tracks or layers within the **Active Log** itself. Step-by-step instructions for accomplishing these tasks are provided on the following pages.

Working with the Log Configuration Builder window:

Deleting the Date track from the Horizontal Tutorial Log...

- 1.) On the right side of the Log Configuration Builder Window scroll down in the Tracks list and **highlight** or **click** on the **Date** track.

- 2.) Click on the  button in the middle of the builder. This action will prompt you with a system message, "**Do you want to delete the selected track in your log?**" Click on the  button. The **Date** track has now been removed from the log.

Moving the Depth track...

- 1.) Click on the **Depth** track to highlight it on the right side of the Log Configuration Builder window.

Note: Make sure you have clicked on the **Depth** track and NOT the **Depth 1** track.

- 2.) Click on the  button and it will change to  button." Then, click on the **Detailed Lithology** track. The **Depth** track will then be placed above the **Detailed Lithology** track.

Resizing a track...

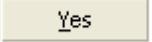
- 1.) On the right side of the Log Configuration Builder window and **highlight** or **click** on the **Detailed Lithology** track.
- 2.) **Double click** in the **Track Width** field and **type** in the value of **3.3** Then, press the **Tab** key and the Detailed Lithology Track with will change as well as the total width of the log itself will change to reflect the increase in the width of the **Detailed Lithology** track.

Note: For paper 8.5" wide, 8.00" is the widest that you want your log to be, especially if you are printing out the log in the **Landscape** paper orientation.

Turning off a track...

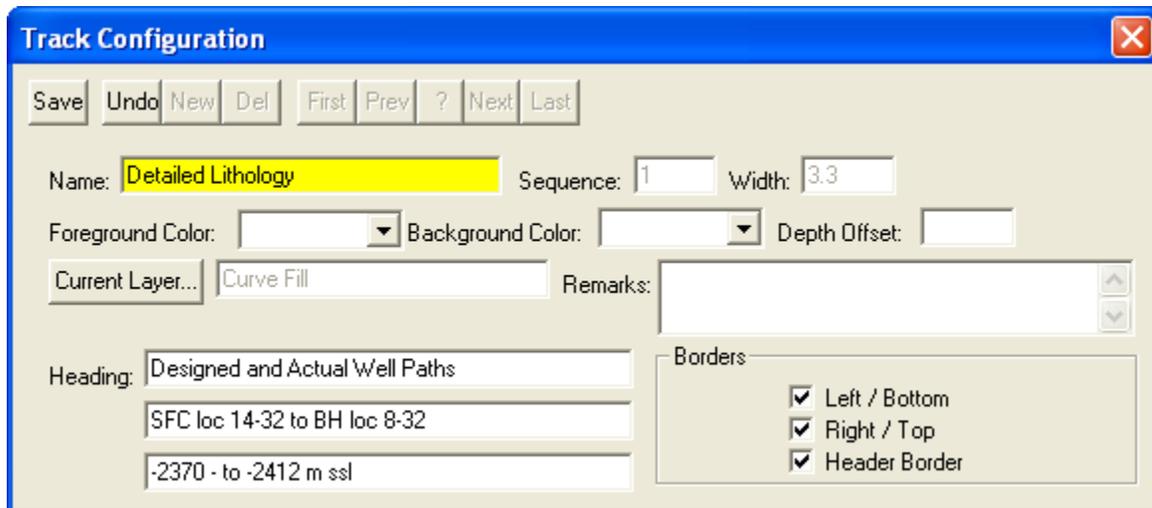
- 1.) Click on the **Porosity Type** track to highlight it on the right side of the Log Configuration Builder window.
- 2.) Click on the  button to turn the "Y"(yes), to the left of the track name, to "N"(no), indicating that the track will not be shown on the log, until it is reactivated.
- 3.) Alternatively, you can simply **double click** on the **Porosity Type** track to turn the "Y"(yes) to "N"(no).

Deleting the Remarks layer from the Detailed Lithology track...

- 1.) Click on the **Detailed Lithology** track to highlight it on the right side of the Log Configuration Builder window. Notice that the layers associated with this track are displayed below, in the Layers list box in the lower right portion of the window.
- 2.) Click on the **Remarks** layer to highlight it in the layers list box. Notice that the  radio button is automatically activated by highlighting a given layer.
- 3.) Click on the  button. This action will prompt you with a system message, "**Do you want to DELETE the selected [layer] in your log?**" Click on the  button. The **Remarks** layer has now been removed from the log.

Configuring the Detailed Lithology track...

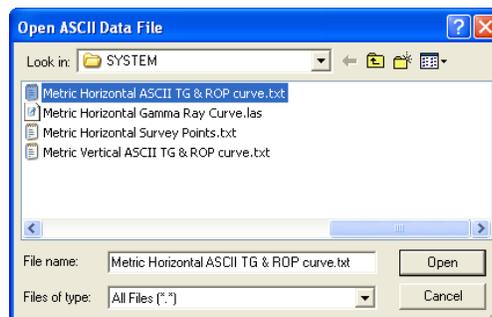
- 1.) Click on the **Detailed Lithology** track to highlight it.
- 2.) Click on the **Track Config.** button (to the right of Tracks portion of the window), to activate the **Track Configuration** window for Detailed Lithology



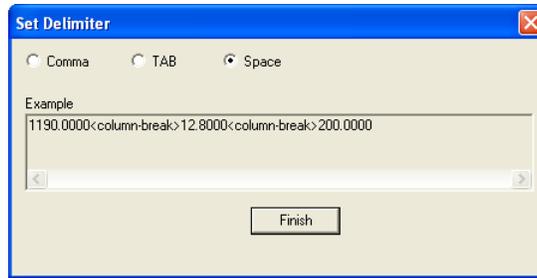
- 3.) The Track name is **Detailed Lithology**. To modify the Track Heading name type in "**Designed and Actual Well Paths**" in the first **Heading** field. In the second heading field, type in "SFC loc 14-32 to BH loc 8-32." and in the third heading field type in "**-2370 - to -2412 m ssl**". These modifications are shown in Figure above.
- 4.) Click on the **Save** button to save the changes.
- 5.) A system message will appear asking the User. "Record saved successfully. Do you wish to exit?" Click on the **Yes** button. This action will return you to the **Log Configuration Builder** window. When you exit from the **Log Configuration Builder** window, you will notice that the track headings have conformed to your changes.
- 6.) Click on the **Exit** button or depress the **Esc** key on the keyboard to exit from the **Log Configuration Builder** window and you will be returned to the main log window, where you will see the changes you have made to the new log.

Importing ASCII File Data into the Drill Rate & Total Gas curve layers:

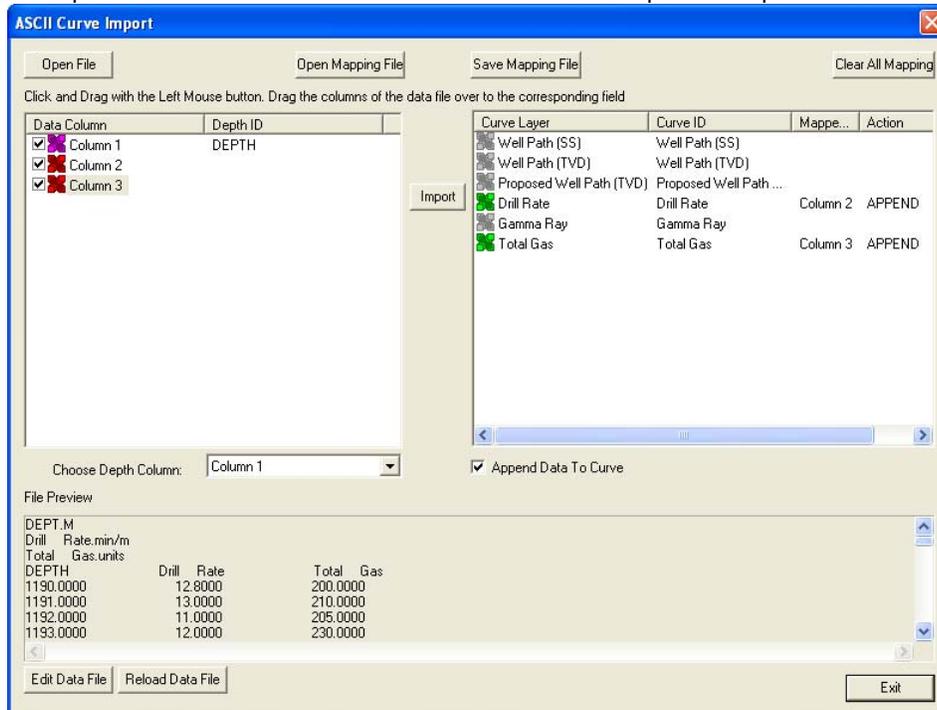
- 1.) Click on the **File** pull down menu, **select Import / Export** and then **select ASCII Import** from the pop out menu.
OR the user can **select** the  Icon from the Import Tool Bar. This will activate an Open ASCII Data File window.



- 2.) Navigate to the **C:\Powersuite_V12\System** folder and **select** the **Metric Horizontal ASCII TG & ROP curve.txt** file. Click on the **Open** button. Once the file has been selected the Set delimiter window will be activated.



- 3.) This file is a Space delimited file and the default on this window is space delimited. You will see <column break> between the data points. **Click** on the  **button**. This will open the Import window.



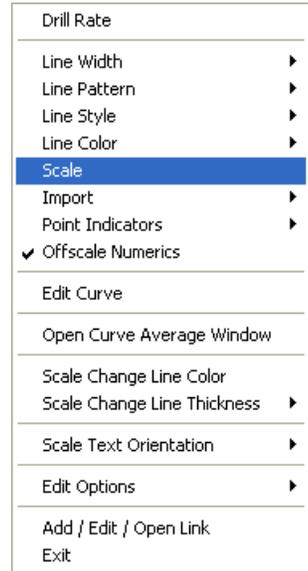
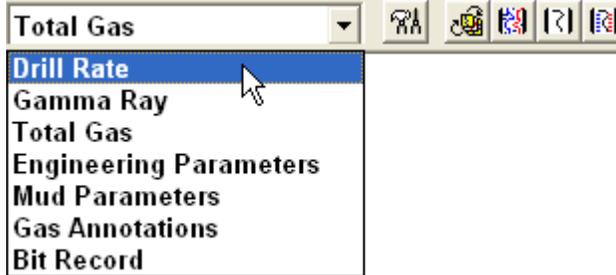
- 4.) The default on the Depth column is Column 1 which is indicated by the purple X. **In our case the depth is the first column so we do not have to change the depth column indicator.**
- 5.) **Click** on the **Column 2** on the left side and **drag it to the Drill Rate Curve layer** on the right side of the window. You will see Column 2 in the mapped Data field and an APPEND in the action field.
- 6.) **Click** on the **Column 3** on the left side and **drag it to the Total Gas Curve layer** on the right side of the window. You will see Column 3 in the mapped Data field and an APPEND in the action field.
- 7.) **Click** on the  **button**. This will import the curve data and prompt you with a database message saying Imported successfully.



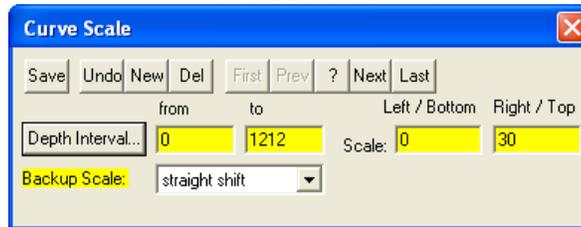
- 8.) **Click** on the  **button** to close the window.
- 9.) **Click** on the  **button** to close the ASCII Import window.
- 9.) **Click** on the  **button** or Press the **Esc** key on the keyboard to exit from the Curve Editor.

Changing Curve Scales from Drill Rate Layer Pop Up Menu

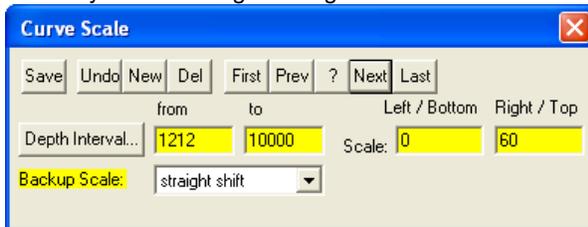
- 1.) Click anywhere in the **Drilling Rate** track. Depending on your screen resolution you may have to scroll down to see the Drilling Rate track
- 2.) Use the drop down arrow in the **Layer Selection List** field (located at the upper left side of the **Selection bar**), to display a list of the layers in this track.



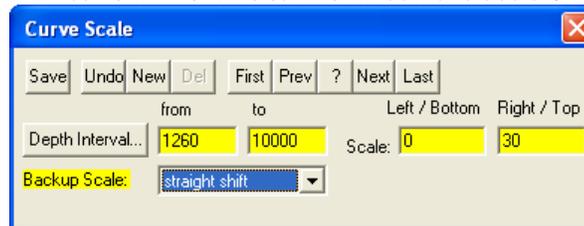
- 3.) Click on **Drill Rate** to make it the active layer and the **Layer Selection List** will close automatically after you have made your selection.
- 4.) **Right click** on the **Drill Rate** layer. This will activate a Drill Rate Pop-up menu.
- 5.) Our last scale change on this curve was when we were in the vertical tutorial and we changed scales because of the coring time that we input into the drill rate data. We are again going to change scales. **Select Scale** from the menu. This will activate the Scale Window shown below with the first scale for the drill rate curve.



- 6.) Click on the **Next** button to move to the second scale. We will be changing this scale in our case at **1260m**. Type in a different from Depth Interval changing the 10000 to **1260** and then click on the **Save** button. This will activate a System message stating Record Saved Successfully.



- 7.) Click on the **Start New Record** button. This will clear the window and add a 3rd scale to the drill arte curve.

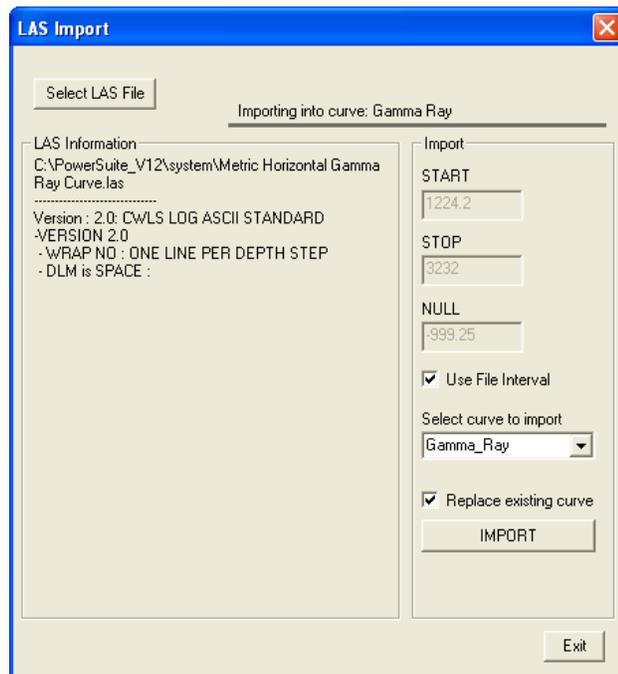
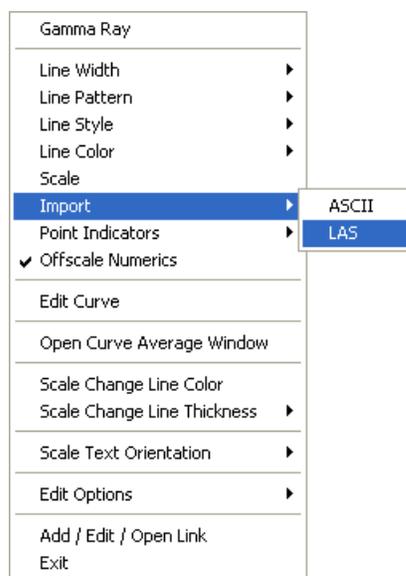


- 8.) Type in **1260** in the **from depth** interval field, **tab**, type **10000** in the **to depth** interval field, **tab**, type in **0** in the **left / bottom scale** field, type in **30** in the **right / top scale** field, **select** **strait shift** from the **Backup Scale** drop box.
- 9.) Click on the **Save** button and then click on the **Exit** button from the ensuing Record Saved Successfully message box.

Importing an LAS Gamma Ray Curve data file...

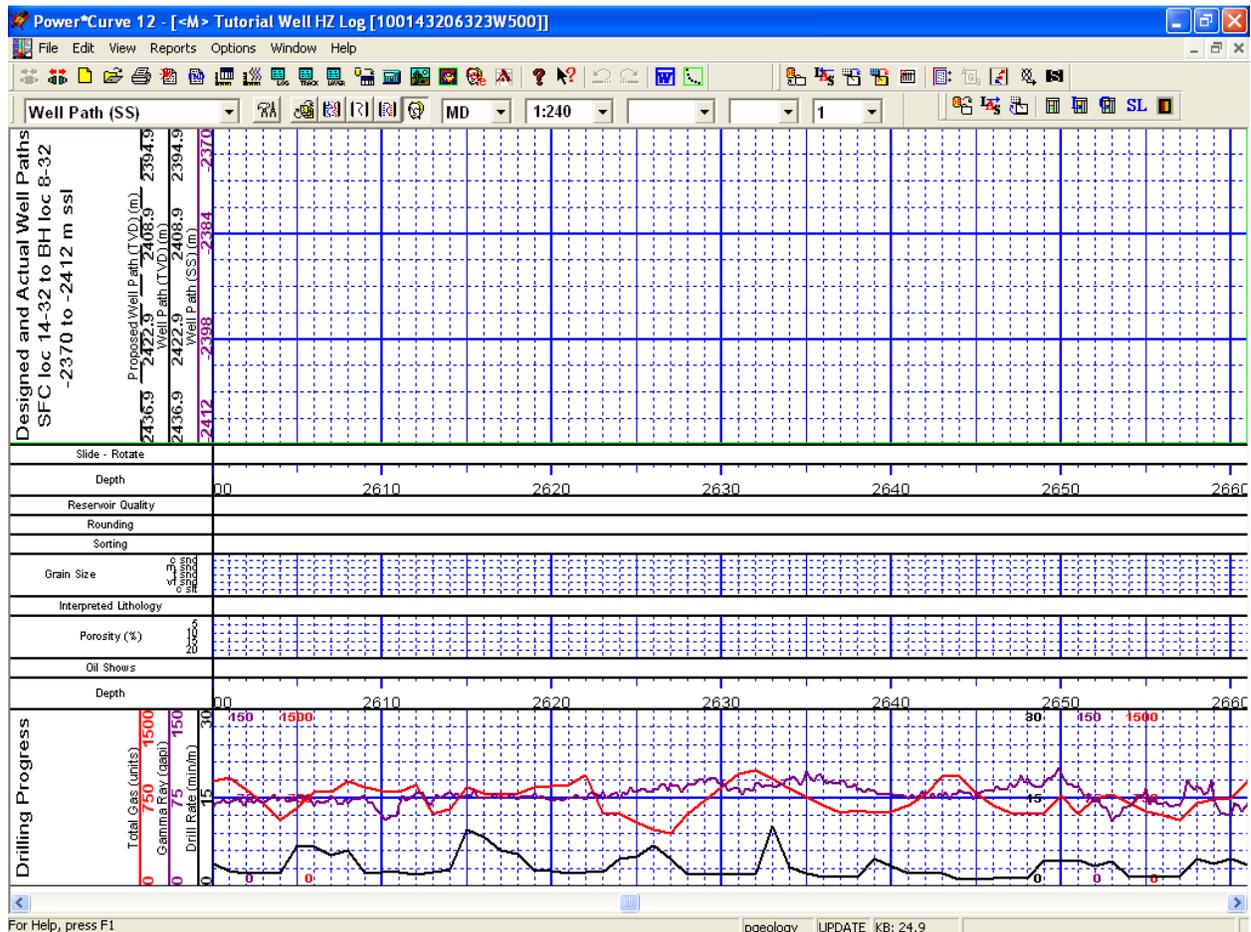
There are two ways to import LAS Files. If you are importing only one curve it is easier to use the method described below. If you are importing more than one curve it would be best to utilize the LAS Import method found on the Import toolbar or under the File menu.

- 1.) **Click** on the **Drill Progress track** to make it active. You will notice a green trace around the outside of the track if done correctly.
- 2.) Use the drop down arrow in the **Layer Selection List** field (located on the left side of the **Selection bar**), to display the **Drilling Progress** track layer list.
- 3.) **Select** the **Gamma Ray** layer to make it the active layer and the **Layer Selection List** will close automatically after you have made your selection.
- 4.) **Right click** on the **Gamma Ray layer** to activate a popup menu.
- 5.) **Select Import** from the pop-up menu to activate a pop out menu and **select LAS**. This will activate the Las Import Window.



- 6.) **Click** on the **Select LAS File** button. This will activate the Open LAS File window and locate the **“Metric Horizontal Gamma Ray Curve.las”** in the **Powersuite_V12 / System directory**.
- 7.) After locating the Drive and Directory where the **Metric Horizontal Gamma Ray Curve.las** file is the user must select the file by **double clicking on the file name** or **clicking on it once** and clicking on the **Open** button. This will bring the file header into the LAS Import window.
- 8.) **Click** on the **Select Curve to Import drop box** and select the **GR** curve.
- 9.) **Click** on the **IMPORT** button. The curve will import and the window will disappear leaving the core rate curve on the layer.

**** Your log should now look similar to the log shown below. ****



The tracks on this log have been shrunk to fit the screen resolution. Your tracks will appear wider and will not all fit on your screen. This will depend on the screen resolution at the time.

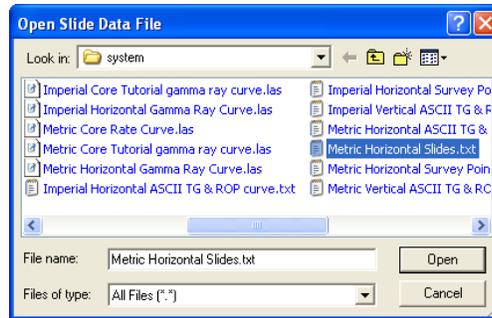
The Slide/Rotate Layer:

The **Slide/Rotate** layer provides a visual representation of the **Drill String Rotation** and **Orientation** throughout the progress of the well.

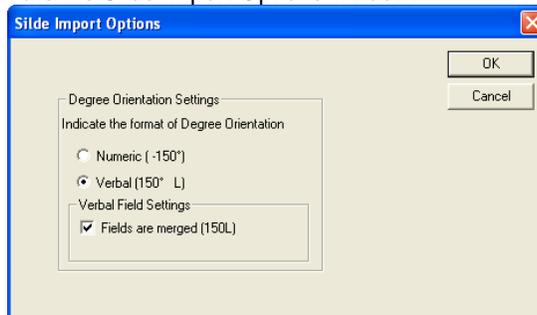
The **Rotate** function of the window is shown as disabled, because rotation is represented as a blank space on the layer. The only thing you can physically draw on this layer is a **Slide** or Orientation of the Drill string as done when you are directionally drilling, which is shown as a black bar with an S covering the distance of the slide or orientation of the drill string.

Importing ASCII File Data into the Slide Rotate layer:

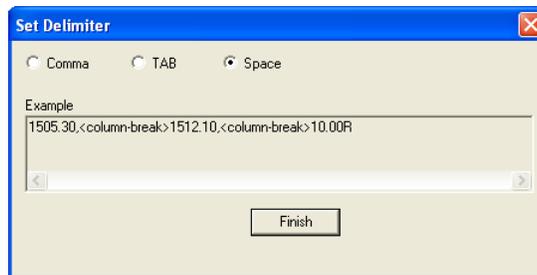
- 1.) Click on the **File** pull down menu, **select Import / Export** and then **select Import Slide Rotate** from the pop out menu. OR the user can **select**  icon from the Import Tool Bar. This will activate an Open Slide Data File window.



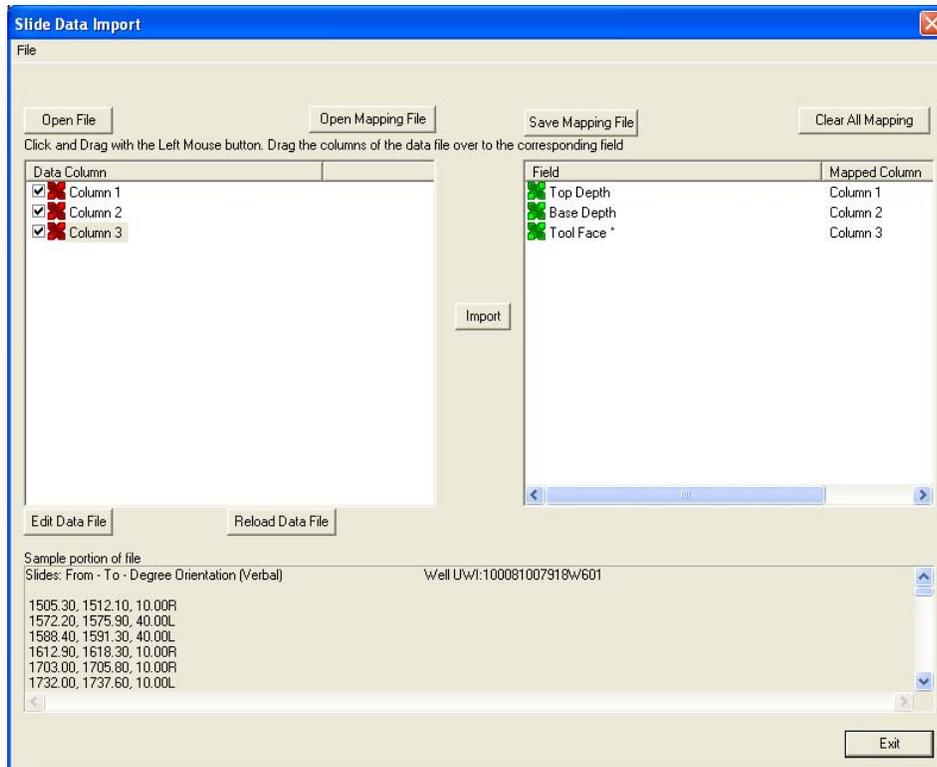
- 2.) Navigate to the **C:\Powersuite_V12\System** folder and **select** the **Metric Horizontal Slides.txt** file. Click on the **Open** button. This will activate the Slide Import Options window.



- 3.) The user must know how the toolface orientation fields are set up in the ASCII file. If the field for orientation have a +/- or a L/R and if they have a L/R then are the fields merged or not. **Select the correct radio and check boxes** and then **click** on the **OK** button. Follow the example above for this file. This will activate the Set Delimiter window.



- 4.) This file is a Space delimited file and the default on this window is space delimited. You will see <column break> between the data points. **Click** on the **Finish** button. This will open the Import window.



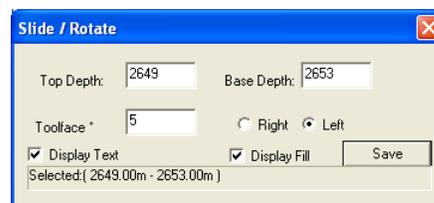
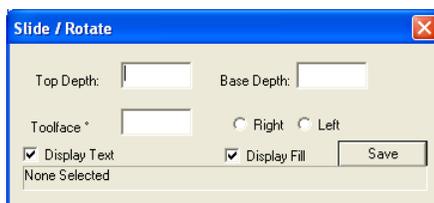
- 5.) Click on the **Column 1** on the left side and **drag it to the Top Depth** on the right side of the window. You will see Column 1 in the mapped Data field.
- 6.) Click on the **Column 2** on the left side and **drag it to the Base Depth** on the right side of the window. You will see Column 2 in the mapped Data field.
- 7.) Click on the **Column 3** on the left side and **drag it to the ToolFace** on the right side of the window. You will see Column 3 in the mapped Data field.
- 8.) Click on the **Import** Button. This will import the curve data and prompt you with a database message saying Imported successfully.



- 9.) Click on the **OK** button to close the window.
- 10.) Click on the **Exit** button to close the Slide Import window.

• **Drawing a Slide...**

- 1.) Double click on the **Slide/Rotate** layer where no data exists to activate the **Slide/Rotate** window.

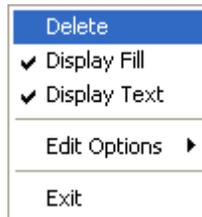


- 2.) On the **Slide/Rotate** track, position your mouse pointer at **2649m**, because this is where the **Slide** will begin.
- 3.) Hold down your **left** mouse button and drag the mouse pointer to **2653m** because this is the position where you want the **Slide** to end.

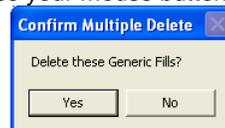
- 4.) Release the mouse button and the **Slide** will be drawn from **2649m** to **2653m**. It will have an **S** to indicate a random slide.
- 5.) Now **click** on the **slide you just drew** so that it refreshed the window. **Type** in **5** in the **ToolFace** field and **select** the **left radio button**.
- 6.) **Click** on the  **Button**. This will redraw the slide with 5 L.

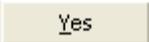
- **Deleting a Slide...**

- 1.) **Right click** your mouse button on an existing **Slide**. This will activate the pop-out menu.



- 2.) **Click** on the **Delete** Selection and your slide will be deleted.
- 3.) If you would like to delete multiple slides **hold the SHIFT key down on your keypad** and **click and drag and area within the Slide / Rotate track**. Then release your mouse button. This will activate a System Message.



- 4.) **Click** on the  **button** to delete multiple slides

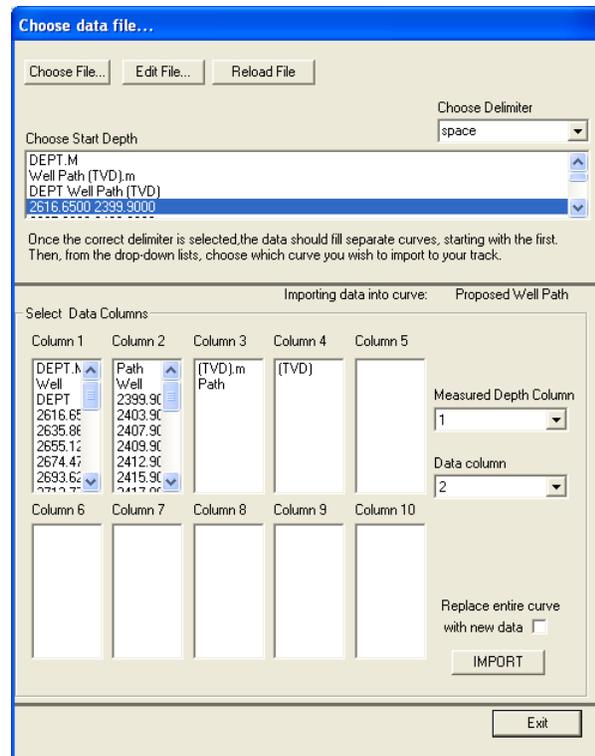
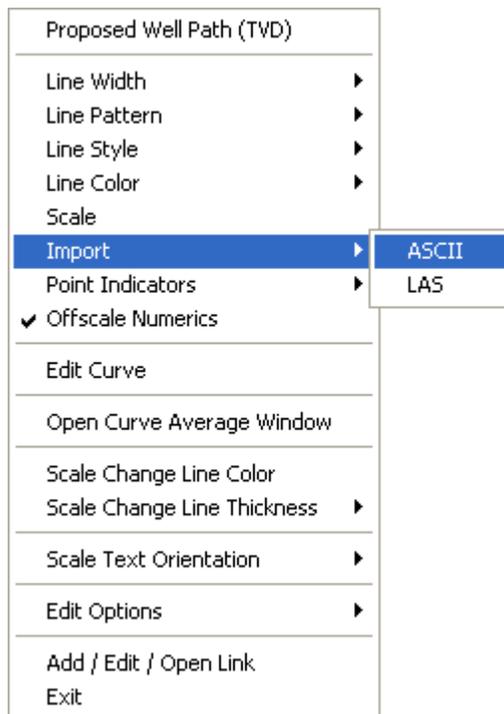
- **Resizing a Slide...**

- 1.) Hold down the **Ctrl** key on the **keyboard** and **position** the mouse pointer to the edge of the **Slide** you wish to resize. The mouse pointer will turn into a resize  cursor.
- 2.) While continuing to hold down the **Ctrl** key and the mouse button, **drag the mouse pointer** to the left / right to resize the **Slide**. Notice that the yellow increment box displays the two depth limits of the **Slide**, as you move the mouse pointer.
- 3.) **Release** the **left mouse button** (before the Ctrl key) and the new **Slide** interval will be drawn.
- 4.) **Press** the **Esc** key on the **keyboard** or **click** on the  in the builder to exit from the **Slide/Rotate** window.

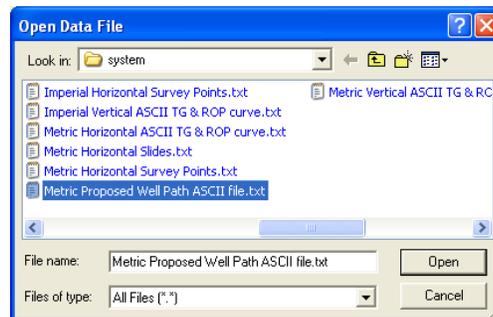
Adding values to the Proposed Well Path Curve

The following steps will show you how to add values to the **Proposed Well Path** curve layer. In an actual Wellsite situation the User could import the Proposed well path curve if the ASCII file for the drilling program is available from the directional drillers. We will make up proposed well path in this case. Ie where the well was designed to be drilled.

- 1.) **Click** anywhere in the **Detailed Lithology** track. Notice that a **green** border highlights or surrounds the track. This is used to indicate that the track is ACTIVE.
- 2.) **Click** on the **down arrow on the right hand side of the Layer Selection List** to activate the list.
- 3.) **Click** on the **Proposed Well Path** from the Layer Selection List. This will make the Proposed Well Path curve layer the active.
- 4.) **Right click** within the active **Detailed Lithology** track to activate thePop out menu and then **select. Import**. This will activate another pop out and then **select ASCII**. This will activate a Choose ASCII file import window.



5.) Click on the **Choose File...** Button. This will activate the Open Data file window



11.) Navigate to the **C:\Powersuite_V12\System** folder and **select** the **Metric Proposed Well Path ASCII file.txt** file.

Click on the **Open** button. This will fill in the ASCII Import window as shown above.

12.) Click on the **first line of data** in the Choose Start depth portion of the window.

13.) **Select column 1** from the **Measured Depth Column Drop box**.

14.) **Select column 2** from the **Data Column Drop box**.

15.) Click on the **Import** Button. This will import the curve data for the Proposed Well path.

Importing Directional Surveys, Running Minimum Curvature Calculations and Updating the Well Path SS and TVD Curves.

Before we can successfully import surveys, run the minimum survey calculations and update the well path curve at one time we have to fill in some necessary information in the Survey Report.

Getting the Directional Survey Window prepared to accept and correctly calculate the survey data to be imported.

1.) Click on the **Report** selection on the Menu bar and **select** the **Directional Survey** selection from the pull down menu. This will activate the Direction Survey Window. The steps below will fill in the necessary fields to run minimum curvature calculations, you can fill in the rest if you so desire.

Directional Survey

Save Undo New Del First Prev ? Next Last Survey Points Master Survey Group Calculate TVD

Survey Group... 1

Service Company: _____

Directional Driller: _____

MWD Hands: _____

Survey

Date: Apr 23, 2012 Type: _____ Mode: _____

Calculation Method: minimum curvature Dog Leg Severity Characteristic: 30 Target Azimuth: 110

User-defined TVD Calculation

Calculate Calculation Method: minimum curvature Calculate From: tie-in

Remarks:

Indicates fields that are required for Minimum Curvature and TVD calculations

Prognosis

Kick-off

*MD	*Inclination °	*Azimuth °	*TVD
_____	_____	_____	_____
*N/S	*E/W	*Dog Leg	*Section
_____	_____	_____	_____

Latitude: _____

Longitude: _____

Surface Coordinates relative to boundary

N/S: _____

E/W: _____

Tie-in

*MD	*Inclination °	*Azimuth °	*TVD
0	0	0	0
*N/S	*E/W	*Dog Leg	*Section
0	0	0	0

Latitude: _____

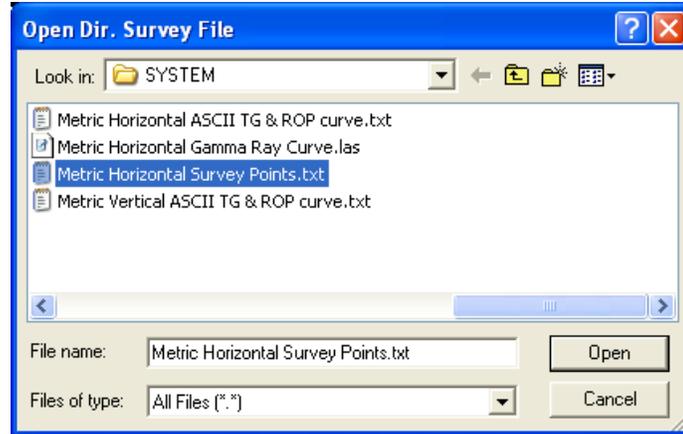
Longitude: _____

Surface Coordinates relative to boundary

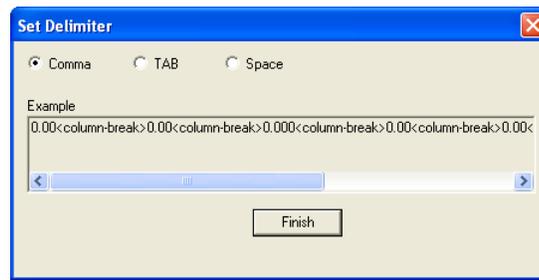
N/S: _____

E/W: _____

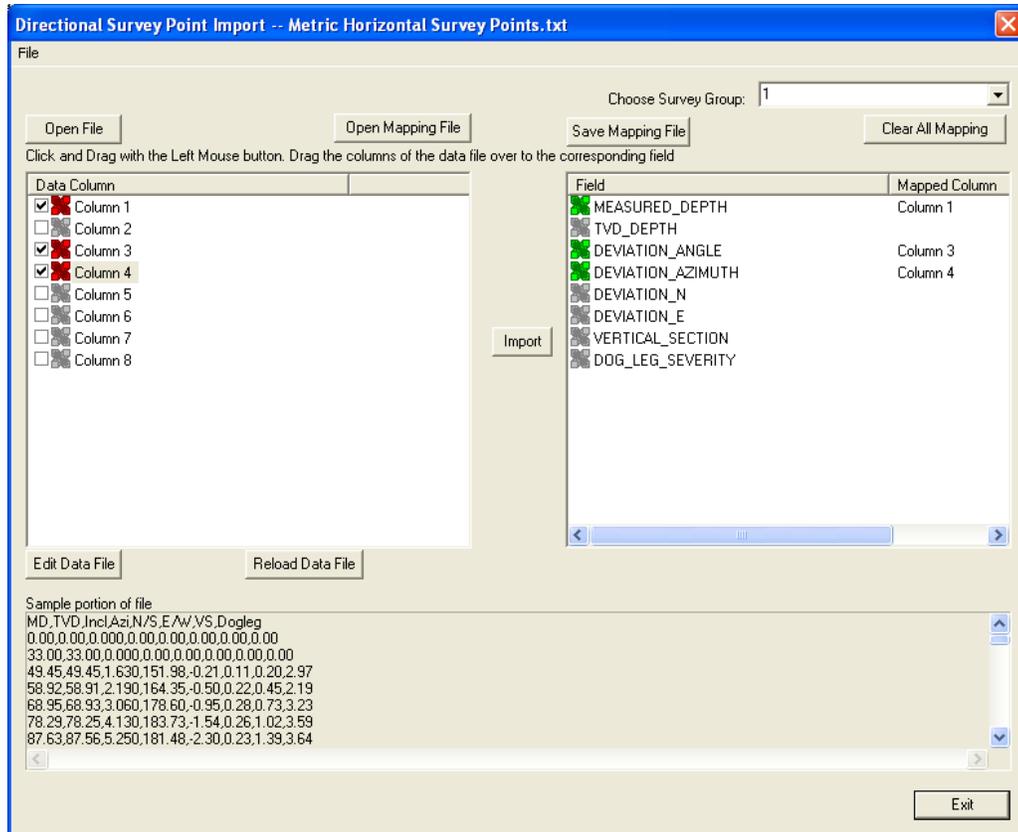
- 2.) **Select 30** from the **Dog Leg Severity Characteristic** Drop Box.
- 3.) **Type in 120** in the **Target Azimuth Field**
- 4.) **Type in 0** into all 8 **Tie in Fields**.
- 5.) In the user defined portion of the window **place a check in the box beside the calculate field, select minimum curvature** from the calculation method drop box and **select tie in** from the Calculate from drop box. Doing this will automate the calculation in survey points window.
- 6.) **Click** on the **Save** button and then **click** on the **Exit** button from the ensuing Record Saved Successfully System Message. This will put you back into the main Power*Curve window.
- 7.) **Click** on the **File** selection to activate the pull down menu and **select Import / Export** to activate the pop-out menu and **Select Import Surveys...** Then **Select New Method** or you can **click** on the  **Import Surveys** button on the Import toolbar to activate the Open Dir. Survey file window so you can pick the file you wish to Import.



- 8.) Select the “**Metric Horizontal Survey Points.txt**” located in the **Powersuite_V12 / System** directory. If chosen correctly it will look like the Open Dir. Survey File Window. Click on the  button. This will activate the Set Delimiter window.



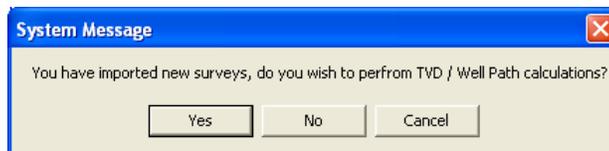
- 16.) This file is a Comma delimited file so the user must **activate the radio button beside Comma delimited**. You will see <column break> between the data points. Click on the  button. This will open the Import window.

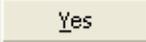


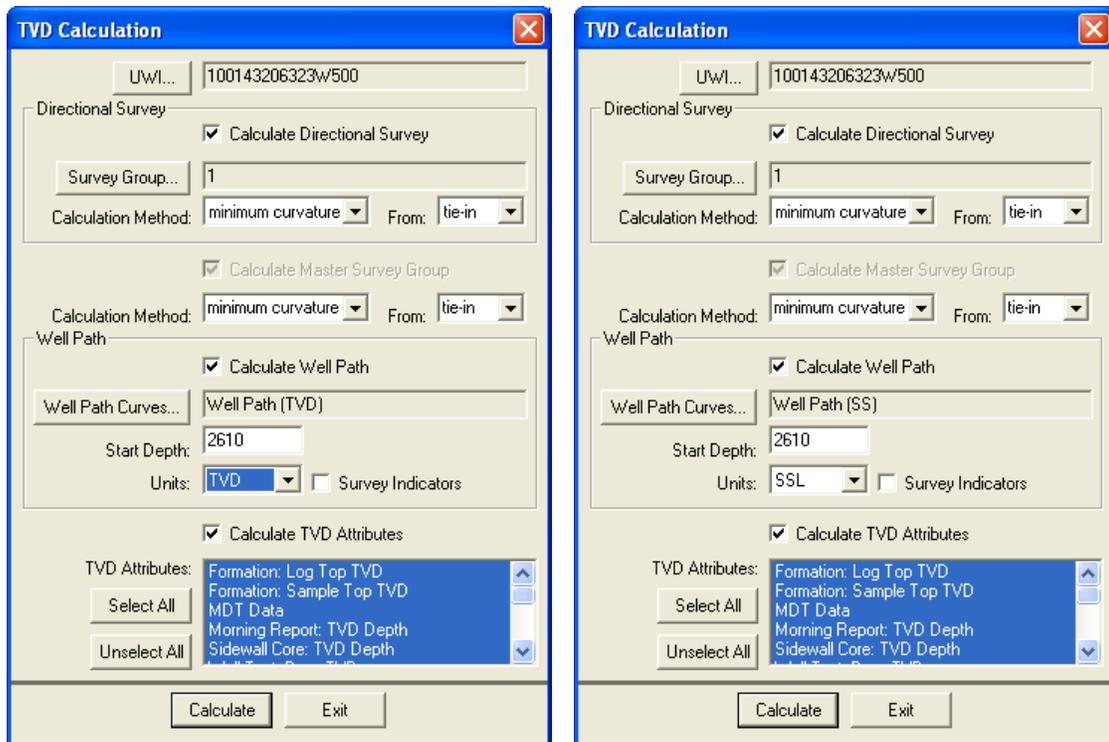
- 17.) Click on the **Column 1** on the left side and **drag it to the Measured Depth** on the right side of the window. You will see Column 1 in the mapped Data field and an APPEND in the action field.
- 18.) Click on the **Column 3** on the left side and **drag it to the Deviation_Angle** on the right side of the window. You will see Column 2 in the mapped Data field and an APPEND in the action field.
- 19.) Click on the **Column 4** on the left side and **drag it to the Deviation_Azimuth** on the right side of the window. You will see Column 3 in the mapped Data field and an APPEND in the action field.
- 20.) Click on the  **Import** Button. This will import the curve data and prompt you with a database message saying Imported successfully.



- 21.) Click on the  **OK** button to close the window.
- 22.) Click on the  **Exit** button to close the ASCII Import window.
- 23.) This will activate a System Message will be activated asking the user *“Do you wish to perform TVD / Well path Calculations?”*.



- 24.) Click on the  **Yes** button. This will activate the TVD Calculations window.

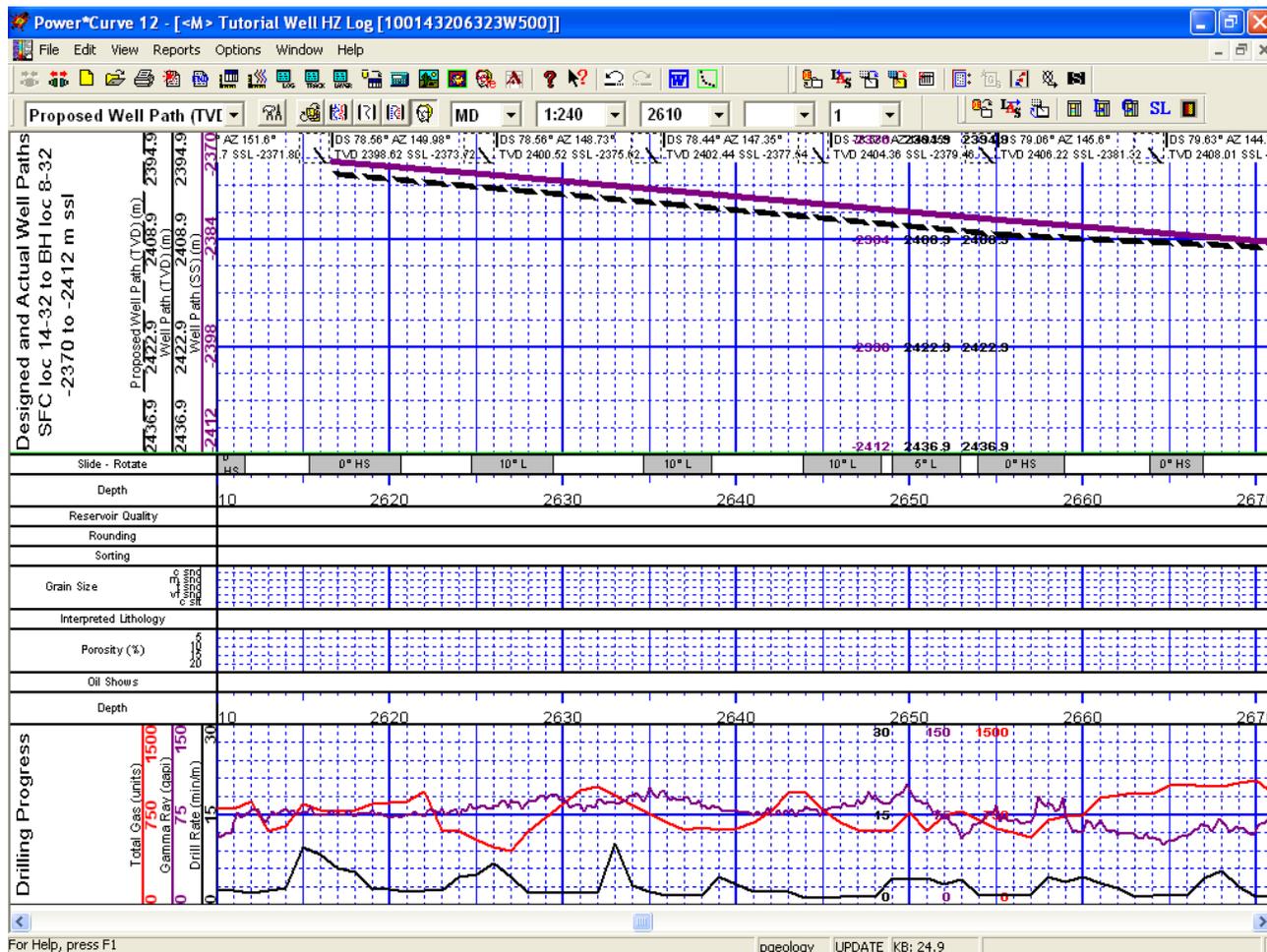


Calculate TVD Curve

Calculate SS Curve

- 25.) In the **Directional Survey** portion of this window the defaults should be set by the Directional survey report we filled in earlier. Make sure that the **Calculate Directional Survey** check box is checked, **Survey Group One (1)** is viewed, **Minimum Curvature** is selected in the Calculation Method drop box and **tie in** is selected from drop box
- 26.) In the Master Survey Group **select the Minimum Curvature** in the Calculation Method drop box and **tie in** is selected from drop box
- 27.) In the Well Path portion of the window **select the Calculate Well path** check box. **Click** on the **Well Path Curves...** button. This will activate a Curve List window.
- 28.) **Double Click** on the **Well Path (TVD)** curve or **Click once** on the **Well Path (TVD)** curve and **click** on the **Select** button. This will put you back into the TVD Calculations window and place the Well Path (TVD) curve name. **Type** in a Start Depth of **2610** in the Start Depth field and **select** the **Units** for the curve as **TVD**.
- 29.) In the **Calculate TVD Attributes** portion of the window deselect the **check box**. We do not have any of these fields to be updated at this point in time.
- 30.) **Click** on the **Calculate Button**. This will activate a Progress Window followed by a System message "**Exit TVD Calculation Window?**". **Click** on the **No** button. We will now update the Well Path SS curve with the new data from the survey points as well.
- 31.) In the Well Path portion of the window **select the Calculate Well path** check box. **Click** on the **Well Path Curves...** button. This will activate a Curve List window.
- 32.) **Double Click** on the **Well Path (SS)** curve or **Click once** on the **Well Path (SS)** curve and **click** on the **Select** button. This will put you back into the TVD Calculations window and place the Well Path (SS) curve name. **Select** the **Units** for the curve as **SSL**.
- 33.) **Click** on the **Calculate Button**. This will activate a Progress Window followed by a System message "**Exit TVD Calculation Window?**". **Click** on the **Yes** button.

You should now see the directional survey points and well paths plotted in the Detailed Lithology Track.



The tracks on this log have been shrunk to fit the screen resolution. Your tracks will appear wider and will not all fit on your screen. This will depend on the screen resolution at the time.

Adding Sample Descriptions

- 1.) Click on the **Reports** selection on the **Power*Curve™ Menu Bar** to activate the pull down menu and then **Click on Sample Description** to open the **Sample Description** window. The last description will appear in this window that was entered in the Vertical Tutorial. That is if you have imported the Vertical Tutorial or you have done the Vertical tutorial already.
- 2.) The very first thing that has to be done is to **click** on the **New** button to clear the Sample Description window of previous data and get it ready to have new data entered into this window.

N.B. The way the data entry windows work is that we will always open the data entry window with the deepest record entered for that record set. If you want to change that record then you can modify it and then click on the **Save** button. But, if you want a new record remember to always **click** on the **New** button. If you do forget to click on the **New** button and change the record and you have not saved yet you can **click on the Undo** button. Then **click** on the **New** button and proceed with entering the new data record for that data entry window.

- 2.) Type **2600** into the **Interval** (From) field and then depress the tab key.
- 3.) Type **2622** into the **Interval** (To) field and then depress the tab key.
- 4.) Type **LS** into the **Rock Type** field and then depress the **tab key 4 times**. This will move the cursor to the Short description field.

Note: The rock types can be entered in a percentage format. This would generate a % description report as well as a % track or layer. For this exercise we will describe the samples interpretively.

- 5.) Type the following description into the **Short Description** field, exactly as it appears below:

lt gy brn, rexl d mdst (crpxl), arg, dns, ns.

Note: The Long or **Short Descriptions** can be automatically transferred to the **Lithology Description** layer in the **Power*Curve™** window and the **Long Description** will be printed out in the **Sample Description Reports** from the **Print Well End Report** window.

- 6.) In the transfer options portion of the window **check mark** the **Automatic Description transfer**, **check mark** the **Transfer Depth Range**, and **check mark** the **Transfer Short Form** and **select** the **lithtext2** group from the Transfer to Annotation Group drop box. The reason for lithtext2 is that this is the second log for the Tutorial Well and we have added a second lithtext group to the Lithology Description layer.
- 7.) **Click** on the **Save** button and then **click** on the **Start New Record** button from the ensuing **Shortcut Options** window.

Note: This will automatically transfer your samples descriptions to the Horizontal Striplog on the Lithology Description layer. This layer is displaying **Lithtext2** Annotation group.

- **Adding another Sample Description...**

- 1.) Click on the **Auto Next** button to advance the description interval from depth to **2622m** and places the caret or highlight in the Interval to field.
- 2.) Type **2639** into the **Interval (To)** field and then depress the tab key
- 3.) Type **Sh** into the **Rock Type** field and then depress the **tab key 4 times**. This will move the cursor to the Short description field.
- 4.) Type the following description into the **Short Description** field, exactly as it appears below:

m – dk gy, micmica, carb, occ tr glau grs, non calcs, fis. Tr Sid pels.

- 5.) Click on the **Save** button and then click on the **Start New Record** button from the ensuing **Shortcut Options** window.

Note: If you have made any typing errors the user can click on the Cancel button, then you can make any necessary corrections and then **Save** the record once again to replace the old record with the new one.

- **Adding another Sample Description**

- 1.) Click on the **Auto Next** button to advance the description interval from depth to **2639m** and places the caret or highlight in the Interval to field.
- 2.) Type **2647** into the **Interval (To)** field and then depress the tab key
- 3.) Type **Ls** into the **Rock Type** field and then depress the **tab key 4 times**. This will move the cursor to the Short description field.
- 4.) Type the following description into the **Short Description** field.

lt gy brn, rexld mdst (crpxl), arg, dns, ns.

- 5.) Click on the **Save** button and then click on the **Start New Record** button from the ensuing **Shortcut Options** window.

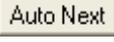
- **Copying a Sample Description...**

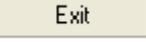
- 1.) While still in the **Sample Description** window, click on the **Interval...** button to bring up a list of the descriptions you have already entered.
- 2.) **Double click** on **2622 - 2639 Sh** and you will now see this description displayed in the **Sample Description** window.
- 3.) Highlight the text in the **Short Description** field by **clicking and dragging the mouse pointer over the text**.
- 4.) Once the text is highlighted, **hold down** the **Ctrl** key on the keyboard, press the letter **“C”** key on the keyboard, and then release the **Ctrl** key or the users can simply **right click** anywhere and then select the **Copy** function from the ensuing pop-up menu.
- 5.) Click on the **New** button to clear the **Sample Description** window.
- 6.) Type in a new from **depth of 2647m** and **press** the **tab key** to place the caret or highlight in the Interval to field.
- 7.) Type **2652** into the **Interval (To)** field and then depress the tab key
- 8.) Type **Sh** into the **Rock Type** field and then depress the **tab key 4 times**. This will move the cursor to the Short description field.
- 9.) In the **Short Description** field **hold down** the **Ctrl** key on the keyboard, press the letter **“V”** key on the keyboard, and then release the **Ctrl** key or the users can simply **right click** anywhere and then select the **Paste** function from the ensuing pop-up menu.
- 10.) Click on the **Save** button and then click on the **Start New Record** button from the ensuing **Shortcut Options** window.

- **Adding more Sample Descriptions...**

- 1.) Click on the **Auto Next** button to advance the description interval from depth to **2652m** and places the caret or highlight in the Interval to field.
- 2.) Type **2672** into the **Interval (To)** field and then depress the tab key
- 3.) Type **Intbd Ss & Sh** into the **Rock Type** field and then depress the **tab key 4 times**. This will move the cursor to the Short description field.
- 4.) Type the following description into the **Short Description** field, exactly as it appears below:

Ss is predly m gy brn, m gred, modly w srt, rdd, qtz, com cht, occ glau & carb grs, sils cmt, fr - g intgran por (14-20%), com - abnt brn o stng, bri yel flor, g stmg mky yel cut flor. Sh is predly m gy, micmica, carb, non calcs, fis.

- 5.) Click on the  button and then click on the  button from the ensuing **Shortcut Options** window.
- 6.) Click on the  button to advance the description interval from depth to **2672m** and places the caret or highlight in the Interval to field.
- 7.) Type **2772** into the **Interval (To)** field and then depress the tab key
- 8.) Type **Ss** into the **Rock Type** field and then depress the **tab key 4 times**. This will move the cursor to the Short description field.
- 9.) Type the following description into the **Short Description** field, exactly as it appears below:

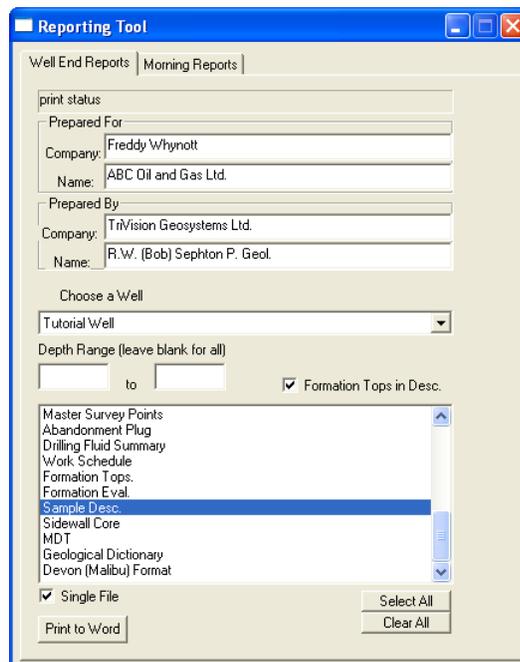
wh, lt gy, m - c gred, modly w srt, sbang - sbrdd, qtz, tr wthrd fld grs, tr dk cht pbls, sils cmt, g - ex intgran por (20-22%), abnt even brn o stng, flor aa.
- 10.) Click on the  button and then click on the  button from the ensuing **Shortcut Options** window.

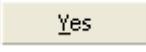
You will now view all your sample descriptions on the upper third of the Lithology Description Layer in your Detailed Lithology Track. We will move these descriptions around to fit so that the reader can see all the descriptions on the log at a later time. This will be done when we are finished with the Detailed Lithology Layer.

Printing out Sample Descriptions to Word. (Only if you have Word for Windows)



- 1.) Click on the  **Print Reports to Word** button on the **Toolbar** or select **Print Reports to Word Selection**, under the **File** menu, on the **Selection Bar** to activate the **Power*Log Report: Well End Report** window.
- 2.) The **Reporting Tool** print window will automatically default to the active **Well/Log Name.:** You will see **Horizontal Tutorial Well** in the **Choose a Well** field If it is not the defaulted well then go to the Well list drop box and select it from the List.
- 3.) Highlight **Sample Desc** in the **Reports** field by clicking on it once.
- 4.) Leave the **Depth Range** field blank to print all the descriptions.
- 5.) Click on the **Formation Tops in Desc.** check box



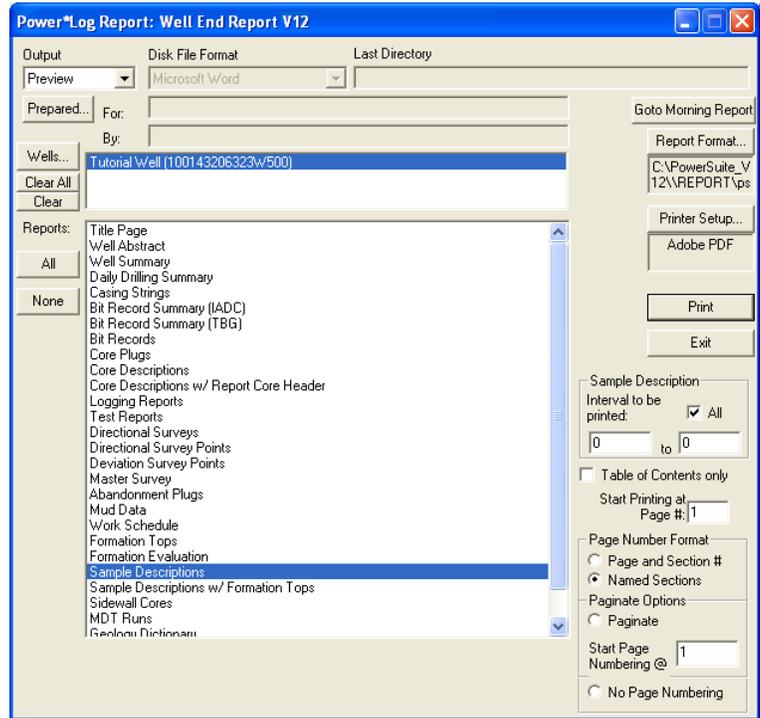
- 6.) Click on the  button in the **Well End Report** window to printout the **Sample Descriptions**. This will activate you word program and you will get the Sample descriptions and Formation tops that were input through the Reports window.
- 7.) When you are finished, **press** the **Esc** key on the keyboard to exit from the **Well End Report** window and to activate the following system message, "**Do you want to save the setup**" Clicking on the  button and the window selections you have just made will be remembered for the next time. Clicking on the  button will remember the default selections that were set for this window.

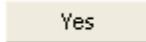
Printing out Sample Descriptions (If you do not have Word for Windows)

- 1.) Click on the  **Print Well End Report** button on the **Toolbar** or select **Print Well End Report**, under **File**, on the **Selection Bar** to activate the **Power*Log Report: Well End Report** window.
- 2.) The **Well End Report** print window will automatically default to the active **Well/Log Name** and its associated **UWI**: you will see **Tutorial Well (100143206323W500)** in the **Well List** field and it should be highlighted. If it is not highlighted, move the mouse pointer to the **Well List** field and click on the desired **Well / Log Name** to highlight the **Well** you wish to print information from.

- 3.) Highlight **Sample Descriptions** in the **Reports** field by clicking on it once.
- 4.) **Select Printer** from the **Output** drop box field list.
- 5.) Click on the  button, in the upper right corner of the **Well End Report** window, to activate the **Print Setup** window. Notice that the currently selected printer is listed beneath the **Default printer** radio button (), at the top left of the **Print Setup** window. Use the **Printer** section of the **Print Setup** window to specify the use of a printer other than the default printer.

Note: Power*Log™ automatically defaults to a **Paper Orientation** of **Portrait** and a **Paper Size** of **8 5 x 11**, as specified in the **Orientation** and **Paper** sections, respectively, of the **Print Setup** window. Please do **NOT** change these default settings.

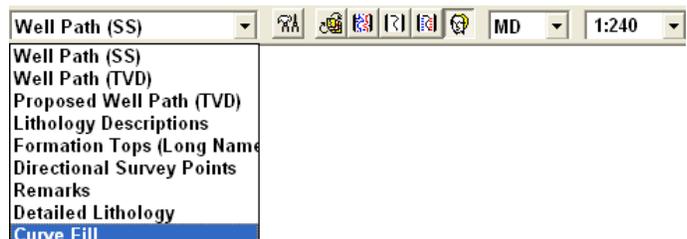


- 6.) Make sure that the **All** check box (), in the **Sample Description** section at the lower right of the **Well End Report** window, is activated.
- 8.) Click on the  button in the **Well End Report** window to printout the **Sample Descriptions**.
- 9.) When you are finished, **press** the **Esc** key on the keyboard to exit from the **Well End Report** window and to activate the following system message, "**Do you want to save the setup configuration?**" Click on the  button and all of the printer selection/settings information utilized in the **Well End Report** window will be saved to the database for any future **Well End Report** print jobs.

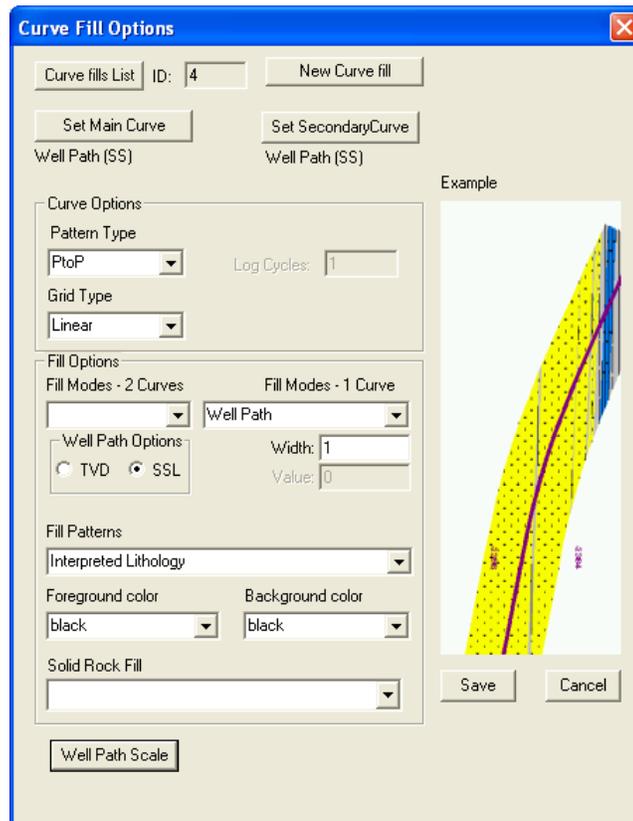
Curve Fill Layer automated Lithology in the Detailed Lithology Track

Before we start drawing the Interpreted Lithology that we described in the Sample Descriptions we will set up the Curve fill layer in the detailed lithology track to replicate the Lithology in a two dimensional view entered into the interpretive lithology layer. This will then be filled in automatically when the interpretive lithology is entered.

- 1.) Click anywhere within the **Detailed Lithology** track to highlight the track with a green border and to get the layers in the layer selection list for this track.
- 2.) Click on the **down arrow** in the **Layers Selector** on the Selection Toolbar and **select the Curve Fill** layer.



- 3.) **Double click** on the **Detailed Lithology track** or **click** on the  **button**. This will activate the Curve Fill options window.

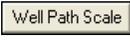


- 4.) **Click** on the  **button**. This will activate a list of curves associated with this well.
- 5.) **Click** on the **Well Path (SS)** so that it gets listed in the upper portion of the window and then **click** on the  **button** or **double click** on the **Well Path (SS)**. You will now view the curve name below the Set Main Curve button.

Curve Options Portion of the Window. This information is pertaining to the Main Curve and its Curve attributes.

- 6.) **Click** on the **Pattern Type** down arrow and **select** PtoP (Point to Point).
- 7.) **Click** on the **Grid Type** down arrow and **select** the **Linear**.

Fill Options Portion of the Window (One Curve)

- 8.) **Click** on the **Fill Modes – 1 Curve** down arrow and **select** **Well Path**.
- 9.) **Type 1** in the **Width** field. Example If (1) one is type into the width field then the fill will be ½” either side of the Well Path Curve.
- 10.) **Select the radio button** beside the **SSL** because we will be using the SS scales.
- 11.) **Click** on the **Fill Patterns** down arrow and **select** the **Interpretive Lithology**.
- 12.) **Click** on the  **button**. This will activate the Well Path Scales window shown below.

Type 0 both the **from** and **to** Depth interval fields.

- 13.) **Type in -2412** in the **Left / Bottom** and **-2370** to the **Right / Top** fields.
- 14.) **Select Straight Shift** from the **Backup Scale** drop box.
- 15.) **Click** on the  **button** to add the Well Path Scales to the Curve fill layer in the Detailed Lithology Track. This will activate the Shortcut Options menu.
- 16.) **Click** on the  **button** to close this window.
- 17.) **Click** on the  **button** to exit the Curve fill options window.

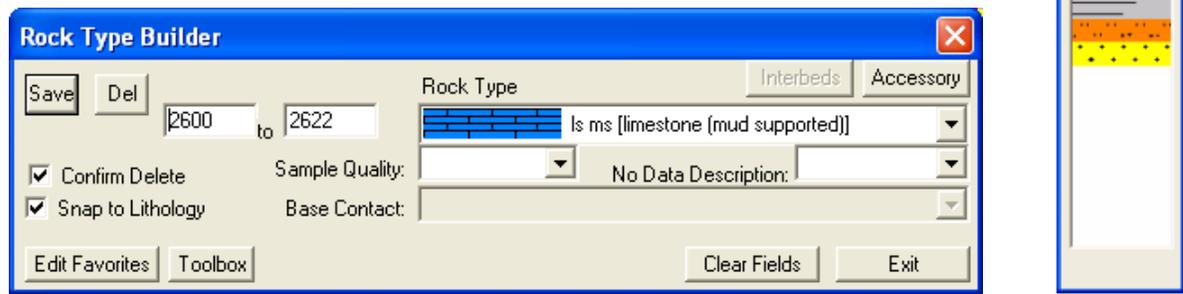


Drawing Interpreted Lithology

Note: To work on any layer in any track, simply **double click** on the track in which you wish to work to activate the “builder” window for that particular layer. Once the “builder” window for a given layer is active, you are then able to access the right click **pop-up** menu(s) associated with that “builder” window and may proceed to enter any necessary intervals and graphical descriptions for the given layer.

- **Drawing Rock Types...**

- 1.) **Double click** anywhere within the **Interpreted Lithology** track to activate the **Rock Type Builder** window and its **Toolbox**.



Note: The **Rock Types** are selected by the user in the **System Options** window (See **System Options** earlier in this tutorial).

- 2.) **Select** the Rock Type for **Ls ms (limestone (mud supported))** from the Toolbox and it will automatically be displayed in the **Rock Type** field within the **Rock Type Builder** window.
- 3.) You may need to scroll to the left a bit by **clicking on the bottom left arrow** (scrolls ¼ page left).



- 4.) **Define** the left side of the interval by **clicking and holding** the left mouse button at **2600m** on the **Interpreted Lithology** track.

- 5.) **Define** the right side of the interval by **dragging** the mouse pointer to **2622m**.
- 6.) Finally, **release the mouse button** and the interval will be drawn accordingly.

- **Drawing another Rock Type...**

- 1.) **Select** the Rock Type for **Sh m gy (Shale (medium gray))** from the Toolbox and it will automatically be displayed in the **Rock Type** field within the **Rock Type Builder** window.
- 2.) Define the left side of the interval by **clicking and holding** the left mouse button at **2622m** on the **Interpreted Lithology** track.
- 3.) Define the right side of the interval by **dragging** the mouse pointer to **2639m**.
- 4.) Finally, release the mouse button and the interval will be drawn accordingly.

Drawing another Rock Type...

- 1.) **Select** the Rock Type for for **Ls ms (limestone (mud supported))** from the Toolbox and it will automatically be displayed in the **Rock Type** field within the **Rock Type Builder** window **or** the user can **click** on the **existing Limestone** that was drawn on the left to select that rock type.
- 2.) **Define** the left side of the interval by **clicking and holding** the **left** mouse button at **2639m** on the **Interpreted Lithology** track.
- 3.) **Define** the right side of the interval by **dragging** the mouse pointer to **2647m**.
- 4.) Finally, **release the mouse button** and the interval will be drawn accordingly.

Drawing another Rock Type...

- 1.) **Select** the Rock Type for for **Sh m gy (Shale (medium gray))** from the Toolbox and it will automatically be displayed in the **Rock Type** field within the **Rock Type Builder** window **or** the user can **click** on the **existing Shale** that was drawn on the left to select that rock type.
- 2.) **Define** the left side of the interval by **clicking and holding** the **left** mouse button at **2647m** on the **Interpreted Lithology** track.
- 3.) **Define** the right side of the interval by **dragging** the mouse pointer to **2652m**.
- 4.) Finally, **release the mouse button** and the interval will be drawn accordingly.

Drawing another Rock Type multiple times...

- 1.) Before we draw the next set of lithologies we will have to move the log to the right or deeper. **Click** on the **space between the Thumb and the Right arrow** to move the log a page deeper.



- 2.) **Select** the Rock Type for for **ss (Sandstone)** from the Toolbox and it will automatically be displayed in the **Rock Type** field within the **Rock Type Builder** window.
- 3.) **Define** the left side of the interval by **clicking and holding** the **left** mouse button at **2652m** on the **Interpreted Lithology** track.
- 4.) **Define** the right side of the interval by **dragging** the mouse pointer to **2654m**.
- 5.) Finally, **release the mouse button** and the interval will be drawn accordingly.
- 6.) Define the left and right of another sandstone bed by **clicking and holding** the **left** mouse button and **dragging** from **2655m** and then to **2657m** and finally release the mouse button and a sand will be drawn.
- 7.) Define the left and right of another sandstone bed by **clicking and holding** the **left** mouse button and **dragging** from **2659m** and then to **2695m** and finally release the mouse button and a sand will be drawn.

Inserting Rock Type between 2 existing Lithology Intervals...

- 1.) **Select** the Rock Type for for **Sh m gy (Shale (medium gray))** from the Toolbox and it will automatically be displayed in the **Rock Type** field within the **Rock Type Builder** window **or** the user can **click** on the **existing Shale** that was drawn on the left to select that rock type.
- 2.) **Double click** the **left** mouse button between **2654m** and **2655m** on the **Interpreted Lithology** track and a shale will be drawn.
- 3.) **Double click** the **left** mouse button between **2657m** and **2659m** on the **Interpreted Lithology** track and a shale will be drawn.
- 4.)

Inserting Rock Type within an interval...

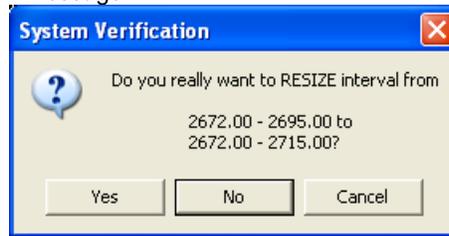
- 1.) **Select** the Rock Type for **Shale (medium gray)** from the Toolbox and it will automatically be displayed in the **Rock Type** field within the **Rock Type Builder** window.
- 2.) **Define** the left side of the interval by **clicking and holding** the **left** mouse button at **2671m** on the **Interpreted Lithology** track.

- 3.) Define the right side of the interval by **dragging** the mouse pointer to **2672m**.
- 4.) **Release the mouse button** and the user will be prompted with a system message **“Do you want to ADD an interbedded interval?”**
- 5.) **Click** on the **Yes** button and the Shale bed will be inserted within the Sandstone Interval. If you had any accessories, grain size, sorting, rounding etc. Within this interval they would have been deleted.

Resizing an interval...

Note: The user can only resize either the top or the bottom of a particular bed at any one time. Accordingly, if you wish to resize both, you will have to repeat the steps.

- 1.) **Press and hold** the **Ctrl** key on the keyboard **down**, while hovering over the right border of the Sandstone bed drawn earlier @ **2695m** so that the mouse pointer turns into a resize cursor.
- 2.) **Click and dragging** the **left** mouse button from **2695m** to **2715m** on the **Interpreted Lithology** track.
- 3.) **Release the mouse button** at **2715m**, followed by the release of the **Ctrl** key on the keyboard, and you will be prompted with the following system message.



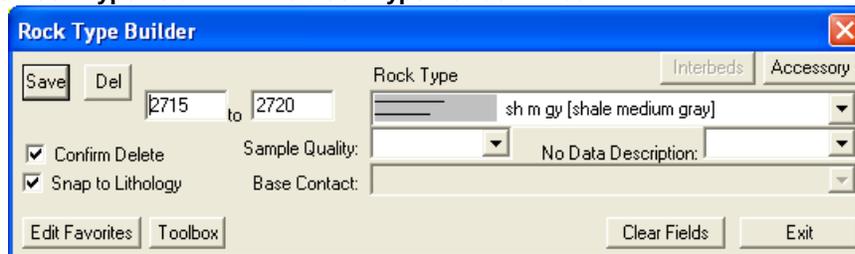
- 4.) **Click** on the **Yes** button to resize the **Sandstone** bed.

Drawing a Rock Type from the builder...

- 1.) Before we draw the next set of lithologies we will have to move the log to the right or deeper. **Click** on the **space between the Thumb and the Right arrow** to move the log a page deeper.



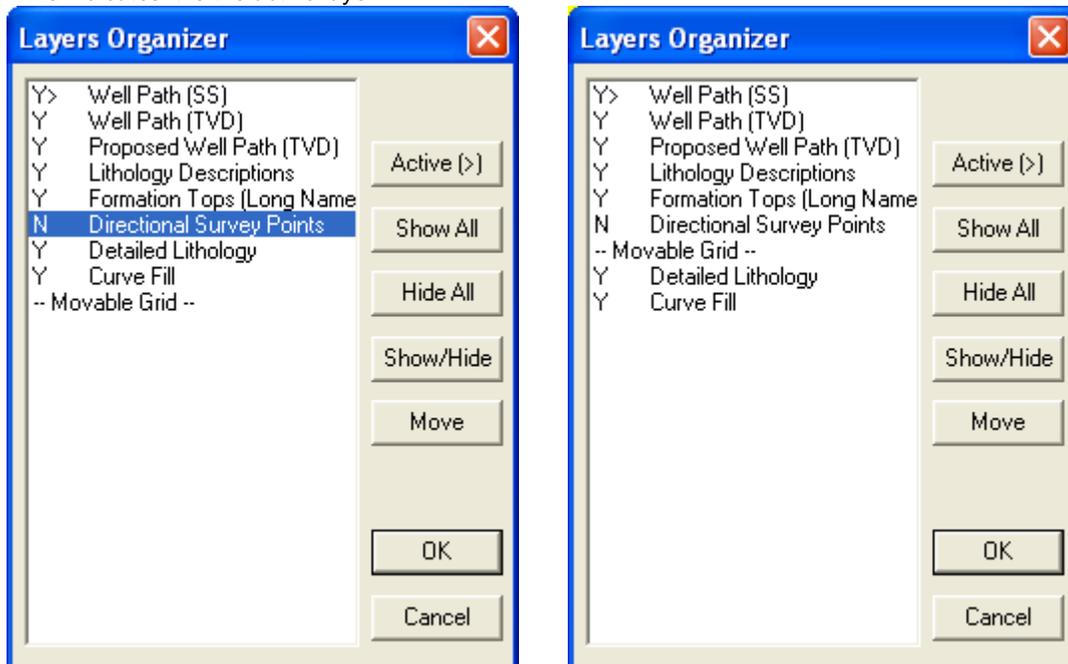
- 2.) **Select** the Rock Type for for **sh m gy (Shale (medium gray))** from the Toolbox and it will automatically be displayed in the **Rock Type** field within the **Rock Type Builder** window.

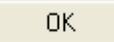


- 3.) **Type 2715** in the from field, **depress the tab key**, and then **type 2720** in the to field.
- 4.) **Click** on the **Save** button.
- 5.) **Click** on the **Clear Fields** button
- 6.) **Select** the Rock Type for for **ss (Sandstone)** from the Toolbox and it will automatically be displayed in the **Rock Type** field within the **Rock Type Builder** window
- 7.) **Type 2720** in the from field, **depress the tab key**, and then **type 2820** in the to field.
- 8.) **Click** on the **Save** button and then press the **Esc** key on the keyboard to exit from the **Rock Type Builder** window.

Layers Organiser for the Detailed Lithology track

- 1.) Click on the **Detailed Lithology** track to make it active (highlighted in green).
- 2.) Click on the **View pull down menu** and **select Layers Organizer**. You can also select the  button on the selection bar. This will activate the Layers Organizer window for the detailed Lithology Track.
- 3.) Click on the **Directional Survey Points Layer** so that it is highlighted.
- 4.) Click on the  button. This will turn off the directional survey layer. You will notice and N beside the layer name.
- 5.) Click on the **Well Path (SS) Layer** and then click on the  button. This will put a > symbol beside this layer. This indicates it is the active layer.

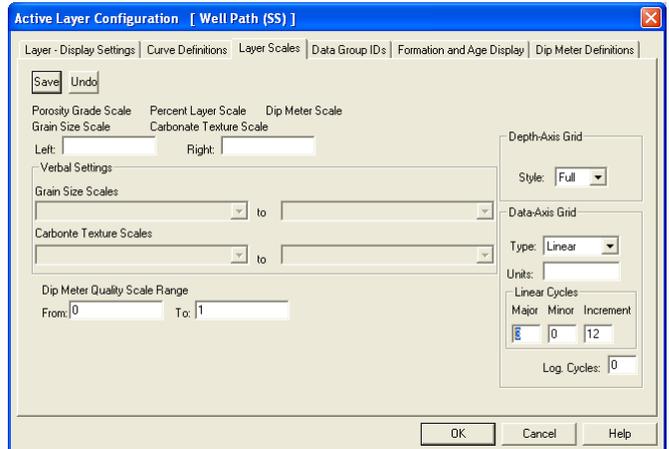
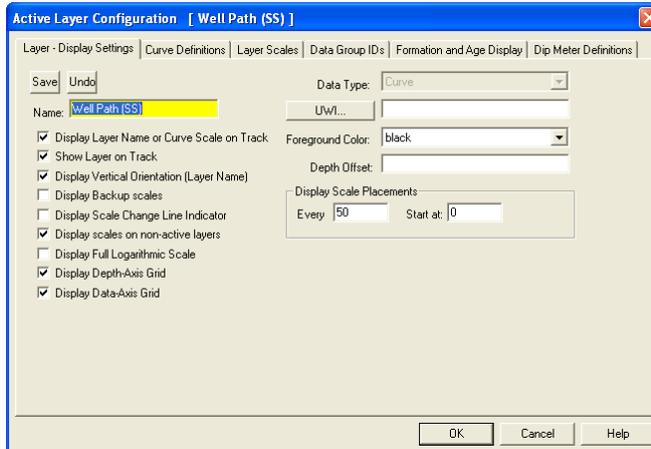


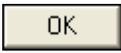
- 6.) Because the Well Path SS layer is active it has a Movable grid associated with it which is defaulted to the bottom of the display. Every Curve has this option. In our case we will the moving the grid so that it overlays the Curve Fill and Detailed Lithology Layers. To do so **Highlight the Movable Grid** in the layers organizer.
- 7.) Click on the  button. It will change to  button.
- 8.) Click on the layer you want it to go above in our case the **Detailed lithology** layer and the moveable grid will go above it. As illustrated in the layers organizer above right.
- 9.) Click on the  button. This will close the window and turn off the Directional Survey Points layers and make the Well Path (SS) layer active on the detailed lithology track.

Edit the Curve Layers to change the grid pattern.

Because we made the Well Path (SS) layer active we can now go stait to the layer configuration for this layer. Every layer has its own configuration. We will repeat these steps for the proposed well path and the Well Path (TVD) layers.

- 1.) Click on the  button on the toolbar or click on the **Edit pull down menu** and **select layer configuration**. This will activate the Layer configuration window for the Well Path (SS) layer. The display tab is the default for any layer. Here you have the controls to change any of the display options. The defaults are fine but you may want to change the **scale placements from every 50 meters to every 100 meters** so that you have more room for you lithology descriptions that you have transferred over.

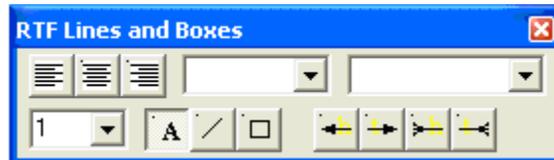
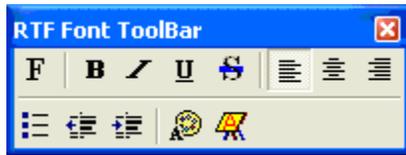


- 2.) Click on the **Layer Scales** tab. If you get a Confirmation message click on the  button.
- 3.) Double Click on the **Majorfield** of the Linerar cycles and change the **6 to a 3**.
- 4.) Click  button. This will activate a Confirmation message click on the  button.
- 5.) Click anywhere within the **Detailed Lithology** track to highlight the track with a green border and to get the layers in the layer selection list for this track.
- 6.) Click on the **down arrow** in the **Layers Selector** on the Selection Toolbar and **select the Well Path (TVD)** layer.
- 7.) Click on the  button on the toolbar or click on the **Edit pull down menu** and **select layer configuration**. This will activate the Layer configuration window for the Well Path (TVD) layer. The display tab is the default and defaults are fine but you may want to change the **scale placements from every 50 meters to every 100 meters** so that you have more room for you lithology descriptions that you have transferred over.
- 8.) Click on the **Layer Scales** tab. If you get a Confirmation message click on the  button.
- 9.) Double Click in the **Major field** of the Linerar cycles and change the **6 to a 3**.
- 10.) Click  button. This will activate a Confirmation message click on the  button.
- 11.) Click anywhere within the **Detailed Lithology** track to highlight the track with a green border and to get the layers in the layer selection list for this track.
- 12.) Click on the **down arrow** in the **Layers Selector** on the Selection Toolbar and **select the Proposed Well Path (TVD)** layer.
- 13.) Click on the  button on the toolbar or click on the **Edit pull down menu** and **select layer configuration**. This will activate the Layer configuration window for the Proposed Well Path (TVD) layer. The display tab is the default and defaults are fine but you may want to change the **scale placements from every 50 meters to every 100 meters** so that you have more room for you lithology descriptions that you have transferred over.
- 14.) Click on the **Layer Scales** tab. If you get a Confirmation message click on the  button.
- 15.) Double Click in the **Major field** of the Linerar cycles and change the **6 to a 3**.
- 16.) Click  button. This will activate a Confirmation message click on the  button.

Moving the Lithology Descriptions

The Descriptions when saved through the Sample description window with the automatic transfer option checked will place the description at the top of the designated layer at the top depth of the described interval. You may want to move these around to make the other information on the track more readable. We will describe how to move and resize the annotations and the user should look at the log on page 49 to make yours look similar.

- 1.) Make the **Lithology Descriptions** layer active within the **Detailed Lithology** track by clicking on the Track and then selecting the **Lithology Descriptions** layer from the **Layer Selection List** field.
- 2.) **Click** anywhere within an **Annotation** to activate the RTF Toolbars for the Lithology Descriptions Layer and it will highlight that description.



- 3.) Place the mouse pointer on the outline surrounding the selected **Sample Description** on the **Lithology Descriptions** layer and the mouse pointer will turn into a cross-hairs  cursor.
- 4.) **Click and drag** the mouse pointer to the Sample Description's new position and then release the mouse button, and the **Sample Description** will be redrawn at its new location.
- 5.) **Click** anywhere **outside** the description to **save** and close the RTF builders.
- 6.) **Repeat steps 2-5** to move all of the descriptions to where they best fit.

Refer to the Log Example on Page 49 for our suggestions.

• Resizing Sample Descriptions

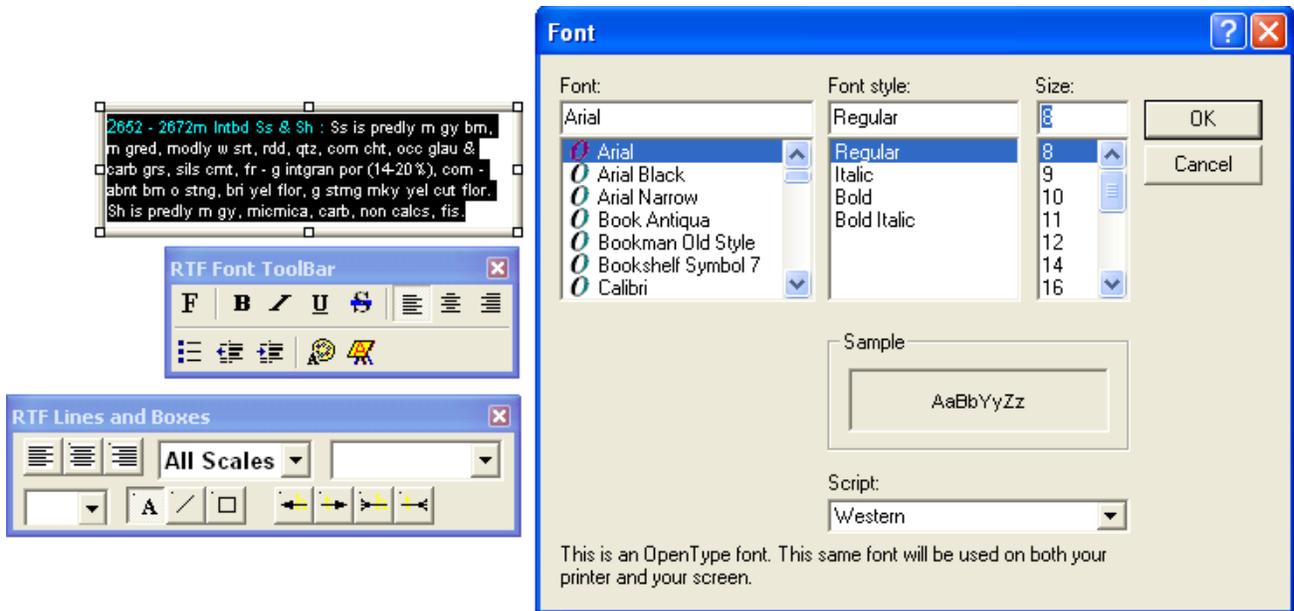
- 1.) **Click** anywhere within an **Annotation** to activate the RTF Toolbars for the Lithology Descriptions Layer and it will highlight that description and an outline will appear around the **Sample Description**.

Note: You may only be able to activate the red dot associated with the uppermost **Sample Description**, because the **Sample Descriptions** created by you in the **Sample Description** window may overlap one another within the **Lithology Descriptions** layer.

- 2.) Place the mouse pointer overtop of the square boxes in the outline around the selected **Sample Description** on the **Lithology Descriptions** layer and the mouse pointer will turn into a resize  cursor.
- 3.) **Click and drag** the mouse pointer to the Sample Description's new size and then **release** the **mouse button**, and the **Sample Description** will be redrawn at its new size.
- 4.) Repeats steps 2-3 to change any of the sizes of the Sample Descriptions on your Log.
- 5.) **Click** anywhere **outside** the annotation to **save** and close the RTF builders.

• Resizing the font in a Sample Descriptions

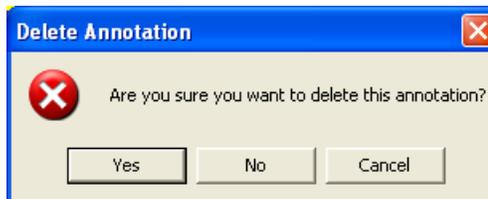
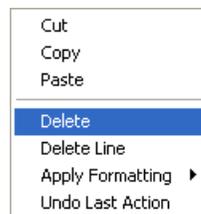
- 1.) **Click** on the **Intdb Ss & Sh description from 2652 to 2272 m** to activate the RTF Toolbars for the Lithology Descriptions Layer and it will highlight that description
- 2.) **Highlight the entire description by clicking and dragging the mouse pointer.**
- 3.) **Click** on the **F** selection in the RTF Font builder. This will activate the Font builder.
- 4.) **Drop** the **Size** menu and **select 8** point font.

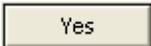


- 5.) Click on the  button in the **Font builder**, when you are finished.
- 6.) Click anywhere **outside** the description to **save** and close the RTF builders

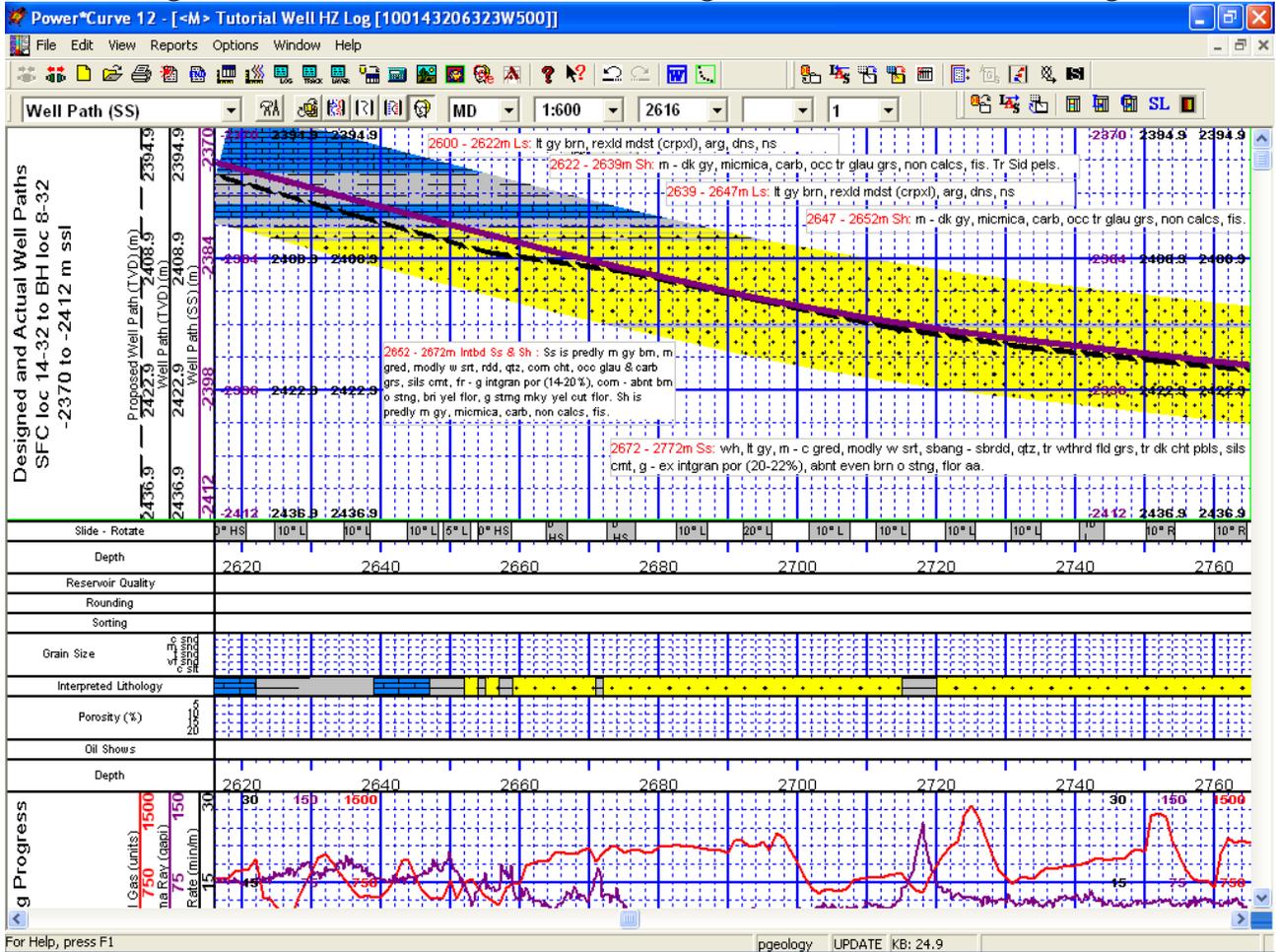
Deleting a Sample Description

- 1.) Click anywhere within an **Annotation** to activate the RTF Toolbars for the Lithology Descriptions Layer and it will highlight that description and an outline will appear around the **Sample Description**.
- 2.) **Right click** inside the annotation to activate the pop-up menu and then **click** on the **Delete selection**. This will activate a System message



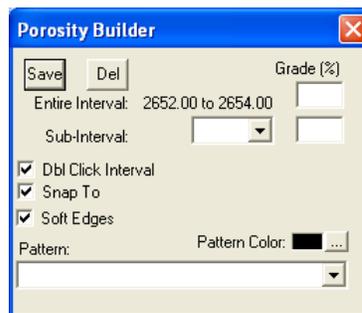
- 3.) Click on the  button. Your annotation will be deleted

**** Your log should now look similar to the Log shown below @ 1:600 Log Scale. ****



Drawing Porosity (%)

- 1.) Double click on the **Porosity (%)** track to activate the **Porosity Builder** window.



- 2.) Set the overall **Porosity** of the entire interval (**Ss** from **2652.0m** to **2654m**), by moving the mouse pointer to the left or right within the **Porosity (%)** track, until the mouse pointer displays a depth somewhere between the above interval **and a porosity reading of 18%** **2653.00 [18%]** which will be displayed in the yellow display box adjacent to the mouse pointer.
- 3.) Double click the mouse pointer and the desired **Porosity Grade** will be drawn accordingly.
- 4.) Set the overall **Porosity** of the entire interval (**Ss** from **2655m** to **2657m**), by moving the mouse pointer to the left or right within the **Porosity (%)** track, until the mouse pointer displays a depth somewhere between the above

interval and a porosity reading of 14% **2656.00 [14%]** which will be displayed in the yellow display box adjacent to the mouse pointer.

- 5.) Double click the mouse pointer and the desired **Porosity Grade** will be drawn accordingly.
- 6.) Set the overall **Porosity** of the entire interval (**Ss** from **2659m to 2671m**), by moving the mouse pointer to the left or right within the **Porosity (%)** track, until the mouse pointer displays a depth somewhere between the above interval and a porosity reading of 18% **2662.00 [18%]** which will be displayed in the yellow display box adjacent to the mouse pointer.
- 7.) **Double click** the mouse pointer and the desired **Porosity Grade** will be drawn accordingly.
- 8.) Repeat the procedure for the rest of the Sanstone intervals that were drawn.

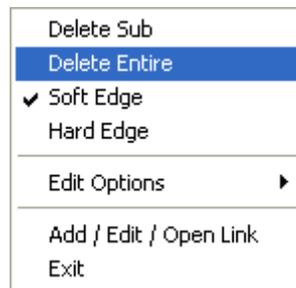
N.B. The **entire intervals** when entered will be displayed in a **purple color**. On the next section we will define the **subintervals** and when they are entered they will be displayed in a **green color**.

Drawing Porosity Grade sub-intervals...

To draw **Porosity (%)** sub-intervals, as illustrated on **Page 49**, simply **click and drag** the mouse pointer from a desired **Depth** and **Porosity (%)** to another **Depth** on the **Porosity Grade** track and the sub-interval will be drawn in green accordingly.

- **Deleting entire Porosity (%) intervals and sub-intervals...**

If you wish to delete an entire **Porosity (%)** interval or sub-interval, while the **Porosity Builder** window is open, **right click** within the interval or sub-interval slated for deletion to activate a pop-up menu, and then right click once on the appropriate selection.



Drawing Grain Sizes

- 1.) **Double click** on the **Grain Size** track to activate the **Grain Size Builder** window.



- 2.) Set the overall **Grain Size** of the entire interval (**Ss** from **2652m to 2654m**), by moving the mouse pointer to the left or right within the **Grain Size** track, until the mouse pointer displays a depth somewhere between the above interval and a **grain size of [m snd]** **2653.00 [m snd]** which will be displayed in the yellow display box adjacent to the mouse pointer.
- 3.) Double click the mouse pointer and the desired **Grain Size** will be drawn in purple to represent an entire interval.
- 4.) Repeat steps 2-3 for the (**Ss** **2655m to 2657m**) **2656.00 [m snd]** and (**Ss** **2659m to 2671m**) **2664.00 [m snd]**

To define another entire interval with a grain size range the user has two methods described below.

You must be able to see the entire interval to do this first method. Use the horizontal scroll bar to position the interval on the screen

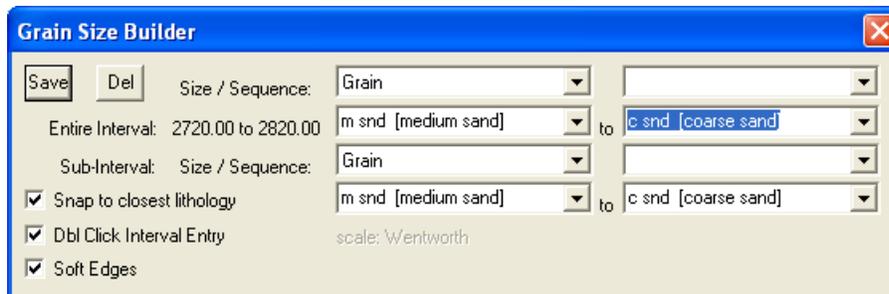
- 1.) Click and drag the mouse pointer from 2673 [m snd] to 2715 [c snd] 2673.00 [m snd] 2715.00 [c snd] on the **Grain Size** track.

Note: Measured Depths and Grain Sizes, like 2673 [m snd], can be viewed within the mouse pointer display box, situated just to the right of the mouse pointer.

- 2.) Release the mouse button and the entire **Grain Size** interval will be drawn in purple to represent an entire interval.

The other method when the entire interval is larger than your screen view.

- 3.) The other method for drawing larger intervals of Grain Size is to click the mouse pointer within the interval. In our case click the mouse in the grain size track between 2720 and 2820m. You will notice the builder will show the entire interval for the bed.



- 5.) Click on the top Grain size from field drop box arrow and select m snd [medium sand] from the resulting choice list.
- 6.) Click on the top Grain size to field drop box arrow and select c snd [coarse sand] from the resulting choice list.
- 7.) Click on the **Save** button and the entire interval will be drawn.

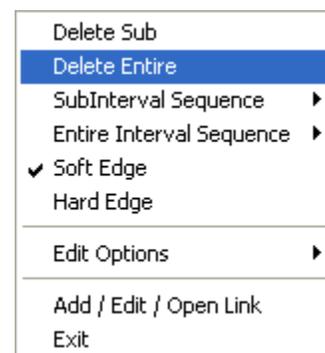
N.B. The entire intervals when entered will be displayed in a purple color. On the next section we will define the subintervals and when they are entered they will be displayed in green color.

- Drawing Grain Size sub-intervals...

- 1.) To draw subinterval without snapping to the top of the bed (depending on the mouse pointer accuracy) the user must first **deselect** the Snap to closest lithology in the **Grain Size Builder**.
- 2.) Using the left mouse button, click and drag the mouse pointer from 2720 [m snd] to 2731 [vc snd] 2720.00 [m snd] 2731.00 [vc snd]
- 3.) Release the mouse button and the sub-interval will be drawn in green to represent a subinterval versus an entire interval which is drawn in purple.
- 4.) Repeat Steps 2 and 3 for 2750 [m snd] to 2754 [vc snd] 2750.00 [m snd] 2754.00 [vc snd]
- 5.) Repeat these steps where you see fit.
- 6.) To exit from the **Grain Size Builder** window press the **Esc** key on the keyboard once.

- Deleting entire Grain Size intervals and sub-intervals...

If you wish to delete an entire **Grain Size** interval or sub-interval, while the **Grain Size Builder** window is open. Simply right click within the interval or sub-interval slated for deletion to activate a pop-up menu, and then right click once on the appropriate selection.

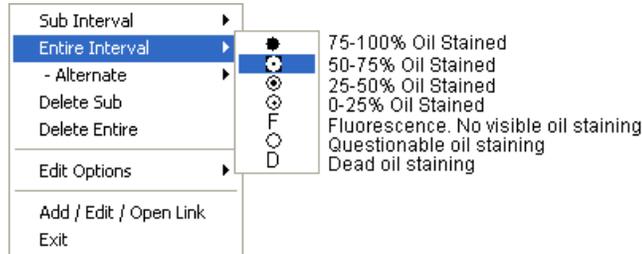


Drawing Oil Shows

- 1.) Double click on the **Oil Show** track to activate the **Oil Show Builder** window.



- 2.) Right click anywhere within the **2652m to 2654m** interval in the **Oil Show** track to activate the pop-up menu.



Note: The symbols utilized in the pop-up menu, represent a specific percentage (%) or amount of oil staining, as illustrated in the above diagram.

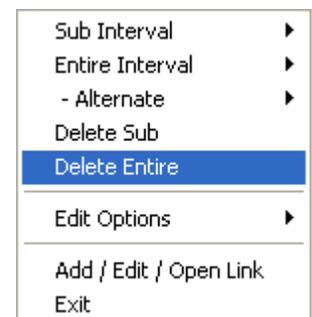
- 3.) Select **50-75%** oil staining from the **Entire Interval** pop out menu and the entire bed will be populated with the **Oil Show** symbol (●).indicating **50-75%** oil staining.
- 4.) Right click anywhere within the **2655m to 2657m** interval in the **Oil Show** track to activate the pop-up menu.
- 5.) Select **75-100%** oil staining from the **Entire Interval** pop out menu and the entire bed will be populated with the **Oil Show** symbol indicating **50-75%** oil staining.
- 6.) Right click anywhere within the **2659m to 2671m** interval in the **Oil Show** track to activate the pop-up menu.
- 7.) Select **75-100%** oil staining from the **Entire Interval** pop out menu and the entire bed will be populated with the **Oil Show** symbol indicating **50-75%** oil staining.
- 8.) Right click anywhere within the **2672m to 2715m** interval in the **Oil Show** track to activate the pop-up menu.
- 9.) Select **75-100%** oil staining from the **Entire Interval** pop out menu and the entire bed will be populated with the **Oil Show** symbol indicating **75-100%** oil staining.
- 10.) Continue on with the same process

Note: The Symbol frequency or the number of symbols on a 1:240 scale is determined in the System Options / Display Tab located under the Option pull down men on the Power*Curve Menu Bar.

- Drawing Oil Show sub-intervals...

N.B. The **entire intervals** when entered will be displayed **coloreess**. On the next section we will define the **subintervals** and when they are entered they will be displayed in a **red color**.

- 1.) Right click anywhere **Oil Show** Track to activate the pop-up menu.
- 2.) Select **50-75%** oil staining from the **Sub Interval** pop-up menu.
- 3.) Click and drag from **2701-2715m** 2701.00 2715.00, **2730-2740m** 2730.00 2740.00, and **2811-2814m** 2811.00 2814.00 and three sub-intervals (in red) will be populated with the **50-75%** oil staining symbol .

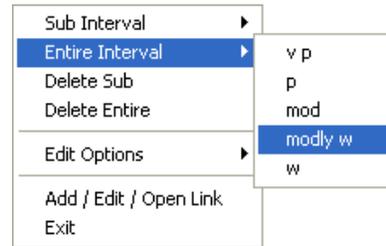
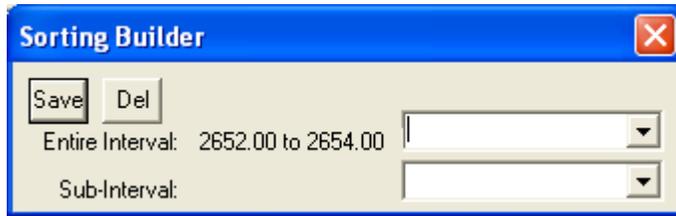


- Deleting entire Oil Show intervals and sub-intervals...

To delete an entire **Oil Show** interval or sub-interval, while the **Oil Show Builder** window is open, **right click** within the interval or sub-interval slated for deletion to activate the pop-up menu and then right click on the appropriate selection.

Drawing Sorting

1.) **Double click** on the **Sorting** track to activate the **Sorting Builder** window.

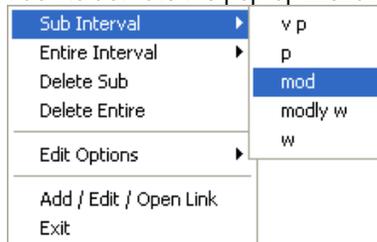


- 2.) **Right click** once anywhere within the **2652 - 2654m** interval the **Sorting Track** to activate the pop-up menu.
- 3.) Select **modly w** for the **Entire Interval** from the pop-up menu and the entire bed will be populated with the “mW” symbol.
- 4.) **Right click** once anywhere within the **2655 - 2657m** interval the **Sorting Track** to activate the pop-up menu.
- 5.) Select **modly w** for the **Entire Interval** from the pop-up menu and the entire bed will be populated with the “mW” symbol.
- 6.) **Right click** once anywhere within the **2659 - 2671m** interval the **Sorting Track** to activate the pop-up menu.
- 7.) Select **modly w** for the **Entire Interval** from the pop-up menu and the entire bed will be populated with the “mW” symbol.
- 8.) **Right click** once anywhere within the **2672 - 2715m** interval the **Sorting Track** to activate the pop-up menu.
- 9.) Select **modly w** for the **Entire Interval** from the pop-up menu and the entire bed will be populated with the “M” symbol.
- 10.) Etc. Etc. Etc.

N.B. The **entire intervals** when entered will be displayed **colorless**. On the next section we will define the **subintervals** and when they are entered they will be displayed in a **red color**.

Drawing a Sorting sub-interval...

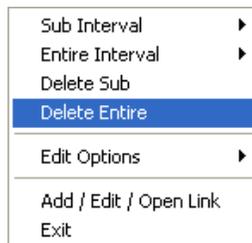
1.) **Right click** anywhere on the **Sorting** track to activate the pop-up menu.



- 2.) **Select mod** from the Sub Interval pop-up menu.
- 3.) **Click and drag** from **2720 - 2731m** and the specified sub-interval will be populated with the “M” symbol.
- 4.) **Repeat steps 2-3** where you previously put in subintervals for grain size.

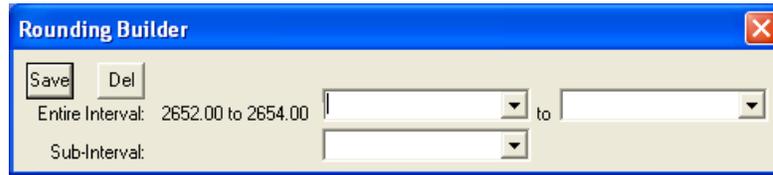
- **Deleting entire Sorting intervals and sub-intervals...**

To delete an entire **Sorting** interval or sub-interval, while the **Sorting Builder** window is open, **right click** within the interval or sub-interval slated for deletion to activate the pop-up menu and then right click once on the appropriate selection.

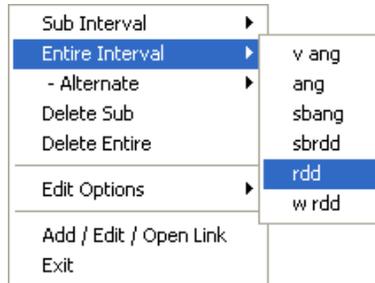


Drawing Rounding

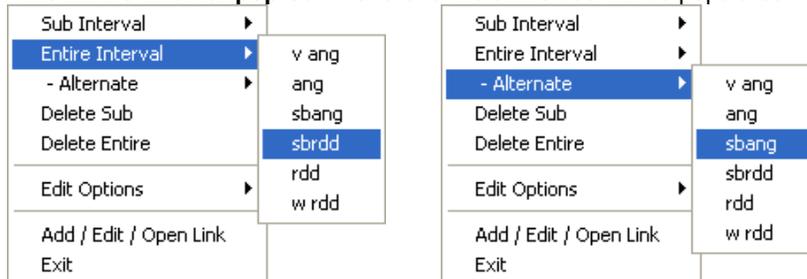
- 1.) Double click on the **Rounding** track to activate the **Rounding Builder** window



- 2.) Right click anywhere within the **2652m to 2654m** interval in the **Rounding** Track to activate the pop-up menu shown below



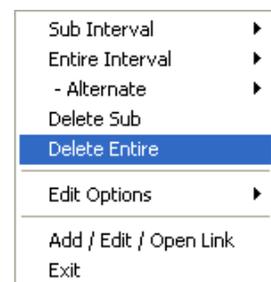
- 3.) Select **rdd** for the **Entire Interval** from the pop-up menu and the entire bed will be populated with the “R” symbol.
- 4.) Right click anywhere within the **2655m to 2657m** interval in the **Rounding** Track to activate the pop-up menu shown below.
- 5.) Select **rdd** for the **Entire Interval** from the pop-up menu and the entire bed will be populated with the “R” symbol.
- 6.) Right click anywhere within the **2659m to 2671m** interval in the **Rounding** Track to activate the pop-up menu shown below.
- 7.) Select **sbrdd** for the **Entire Interval** from the pop-up menu and the entire bed will be populated with the “r” symbol.
- 8.) Right click anywhere within the **2655m to 2657m** interval in the **Rounding** Track to activate the pop-up menu shown below.
- 9.) Select **sbrdd** for the **Entire Interval** from the pop-up menu and the entire bed will be populated with the “r” symbol.
- 10.) Right click anywhere within the **2672m to 2715m** interval in the **Rounding** Track to activate the pop-up menu.
- 11.) Select **sbrdd** from the **Entire Interval** pop-out menu and the entire bed will be populated with the “r” symbol.



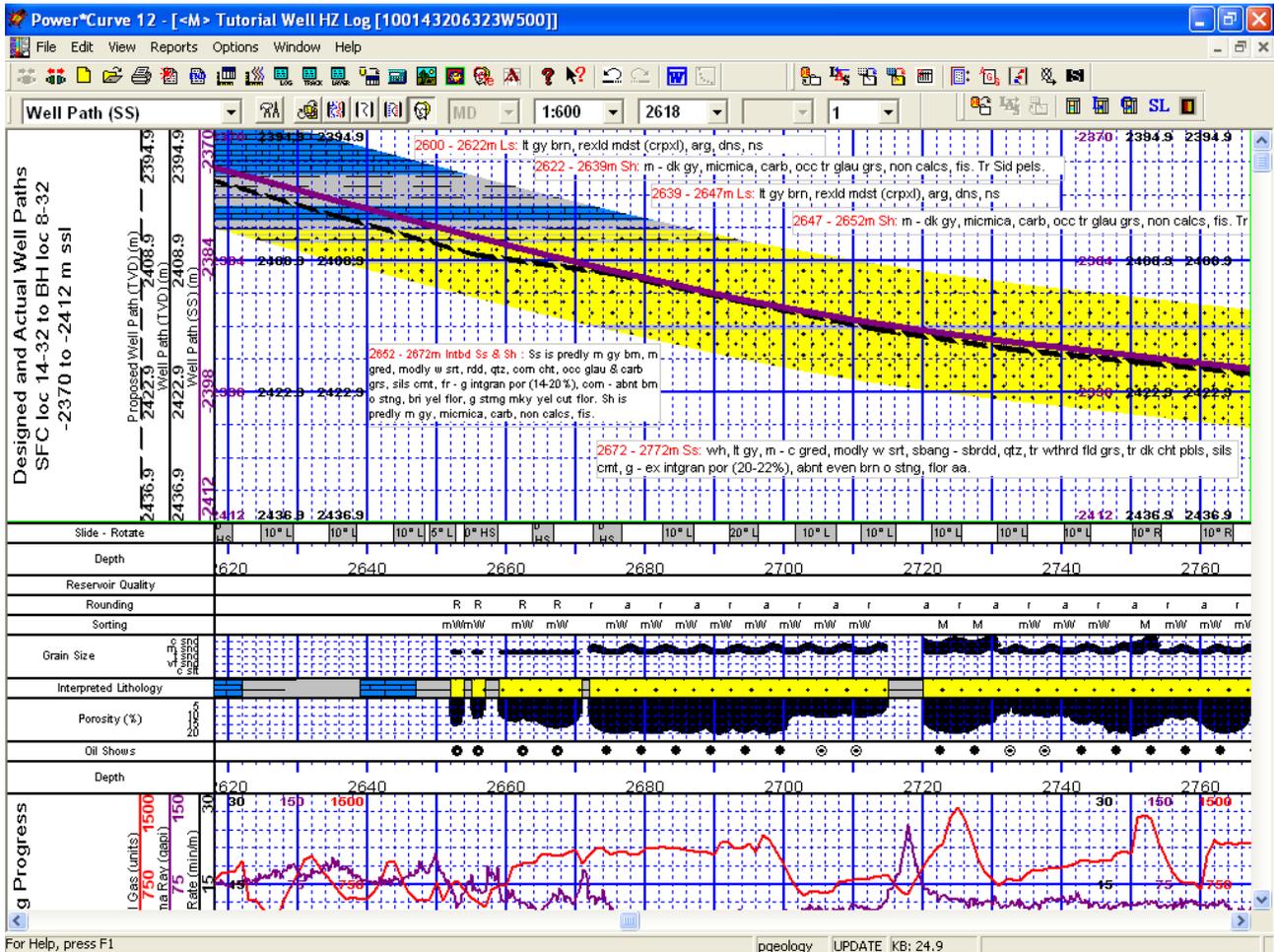
- 12.) Right click anywhere within the **2672m to 2715m** interval in the **Rounding** Track to activate the pop-up menu.
- 13.) Select **sbang** from the **- Alternate** pop-out menu and you will view alternating “a” and “r” symbols in this track.
- 14.) Repeat steps 10-13 within the **2720m to 2820m** interval in the **Rounding** Track and you will view alternating “a” and “r” symbols in this track.

- **Deleting entire Rounding intervals and sub-intervals...**

If you wish to delete an entire **Rounding** interval or sub-interval, while the **Rounding Builder** window is open, right click within the interval or sub-interval slated for deletion to activate the pop-up menu and then right click once on the appropriate Delete selection.

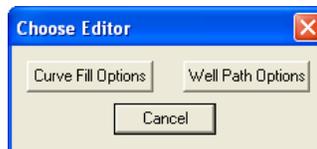


**** Your log should now look similar to the Log shown below. ****



The Well Path Curve Fill Layer

- 1.) Make the Curve Fill layer active within the Detailed Lithology track by **clicking on the Detailed Lithology Track** and then selecting the **Curve Fill layer** from the **Layer Selection List** field.
- 2.) **Double click** anywhere within the Curve Fill Layer in the Detailed Lithology track to activate the Choose Editor window shown below.



- 3.) **Click** on the **Well Path Options** button to activate the **Bedding Contact Angles** window shown on the next page.

The Well Path Curve fill only works if the correct curve is identified and the scales for that curve are correct. We complete that task in the **Curve Fill Options** selection. Also there is a width field that comes into play that defines the area surrounding the Curve and where the curve fill area is defined. The **Well Path Options** portion of the window defines the extents and dipping angles of the lithology drawn in the interpretive lithology. We default the extents to be 50 meters before the bed was encountered and 50 meters after the bed ended. If the interpretive lithology was drawn between 1000m and 1050m we would draw it on the curve fill from 950m and 1100m as long as it fell within the width of the curve fill. The user can change an individual beds extents and bedding angles or multiple beds through the builder.

Rock Type	Rock Mo...	Bed Angle	Encounter...	Departure...	Encounter...	Departure...	Covered Range
sh	m gy	0	2657	2659	-50	50	2607.00 - 2709.00
ss		0	2659	2671	-50	50	2609.00 - 2721.00
sh	m gy	0	2671	2672	-50	50	2621.00 - 2722.00
ss		0	2672	2715	-50	50	2622.00 - 2765.00
sh	m gy	0	2715	2720	-50	50	2665.00 - 2770.00
ss		0	2720	2820	-50	50	2670.00 - 2870.00

Change Range

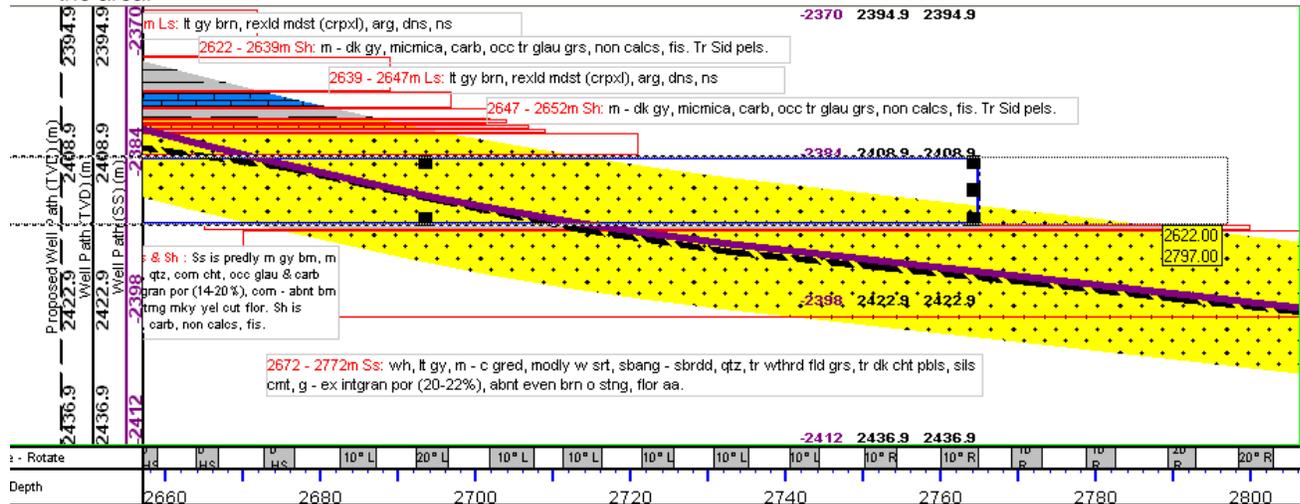
From: To:

Encounter Extent: Departure Extent: Angle:

Buttons: Update, Apply, Exit

We will now modify the extents of an individual bed. To do so you can utilize the Mouse pointer or the keypad method of data entry. We will demonstrate both in this tutorial.

- Click on the **sh mgy bed** drawn from 2715 to 2720 m in the Bedding Contacts Angles builder and it will appear in the lower left hand portion of the window. Change the departure extent from 50 to 80 and then click on the **Update** button. This will extend the bed further filling in the 1" area surrounding the Well Path SS curve
- Click on the **SS Bed** drawn from 2672 to 2715m on the curve fill layer to activate the blue highlight box around it. This will also activate it in the Bedding Contacts Angles window as well.
- Hold the **CTRL Key** down and move mouse over the right edge of the bed (departure extent) and click and drag the departure extend out to 2797m as shown in the illustration below and let the mouse button go. This will revise the bed in the Bedding Contact Angles window and refresh on the screen with the LS Ms going to the end of the area.



Rock Type	Rock Mo...	Bed Angle	Encounter...	Departure...	Encounter...	Departure...	Covered Range
sh	m gy	0	2654	2655	-50	50	2604.00 - 2705.00
ss		0	2655	2657	-50	50	2605.00 - 2707.00
sh	m gy	0	2657	2659	-50	50	2607.00 - 2709.00
ss		0	2659	2671	-50	50	2609.00 - 2721.00
sh	m gy	0	2671	2672	-50	50	2621.00 - 2722.00
ss		0	2672	2715	-50	82	2622.00 - 2797.00

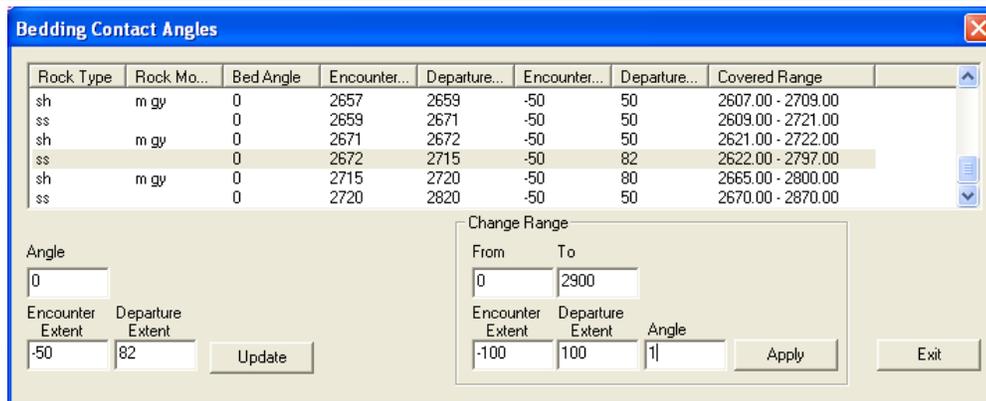
Change Range

From: To:

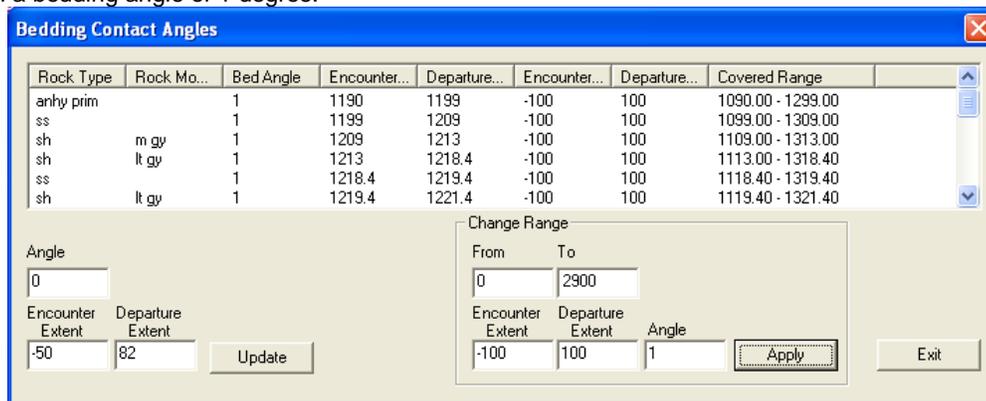
Encounter Extent: Departure Extent: Angle:

Buttons: Update, Apply, Exit

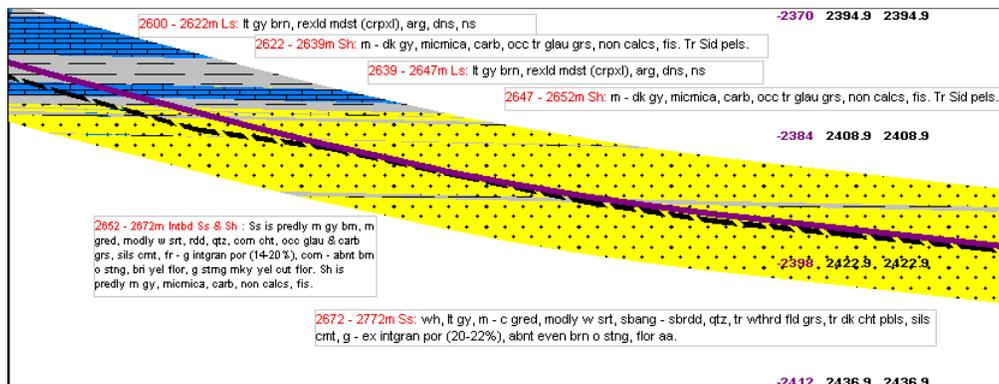
We will now demonstrate how to modify multiple beds at once. It is not necessary in our case but it is just to demonstrate how it is done.



- 1.) Click in the **from** field in Change Range portion of the window and **type 0** in the from field. **Tab** to the To Field.
- 2.) **Type 2900** in the **to** field. This modification will change all the existing beds drawn to date. **Tab** to the Encounter Extent field.
- 3.) **Type -100** in the **Encounter Extent** field. **Tab** to the Departure Extent field Change the Encounter extend
- 4.) **Type 100** in the **Departure Extent** field. **Tab** to the Angle field.
- 5.) **Type 1** in the Angle Field.
- 6.) Click on the **Apply** button. This will change all the beds extents and departures to 100 meters before and after with a bedding angle of 1 degree.



N.B. Once this has been done the default will still remain -50 and 50 for the extents and departures with an angle of 0 degrees. The above procedure will have to be done periodically to maintain a steady 1 degree bedding angle.

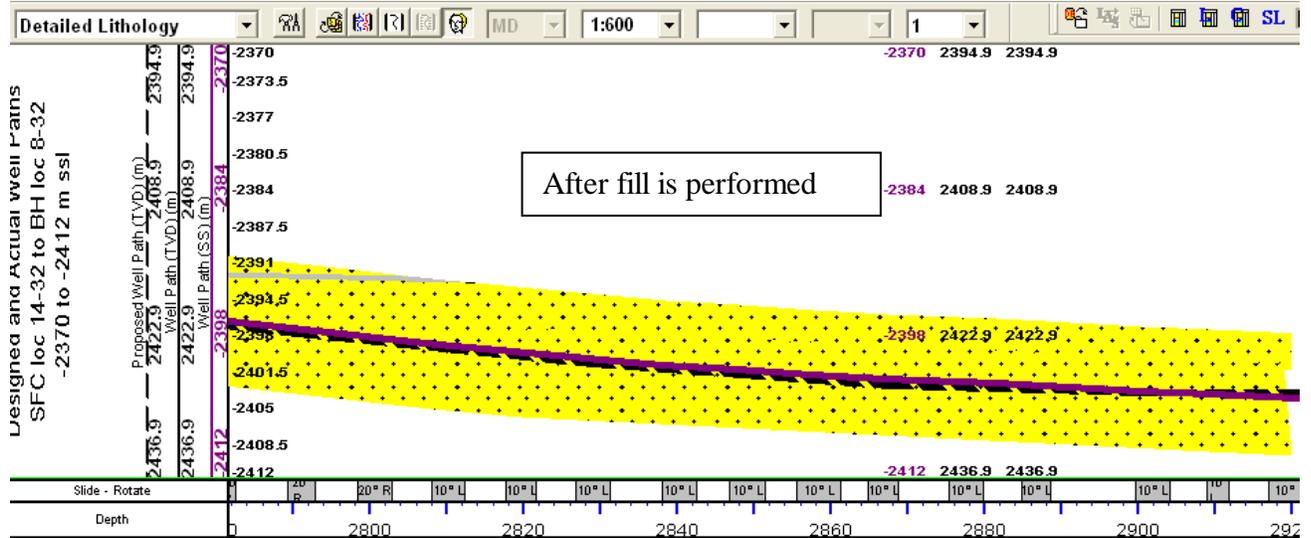
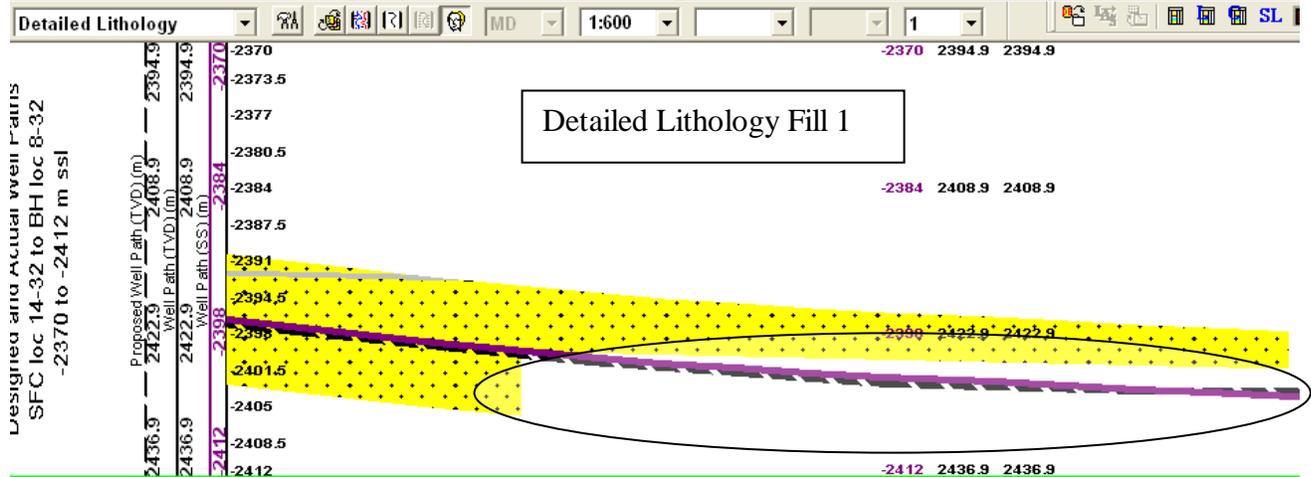


- 7.) Click on the **Exit** button to close this window.

The Detailed Lithology Layer

In Power*Curve™, this layer allows you to create a visual representation of the **Interpreted Lithology** associated with your horizontal well path and gives you the ability to show **Lithology** above and below the well path curves or fill in areas where the Curve fill layer leaves a bit to be desired.

This is an illustration of the log before we fill in the erroneous lithology drawn by the curve fill layer. This is done with the detailed lithology layer. At the end of our log we have not described any lithology past 2820m



This is an illustration of the log after we have drawn in some lithology with detailed lithology layer.

- **Drawing Detailed Lithology Fill...**

Before we start this let us go to the area of the log we want to draw.

- 1.) Click in the **Go to depth** field and type in **2800** meters so we can view the drawing on the screen with a **screen scale of 1:600** meters as shown below.

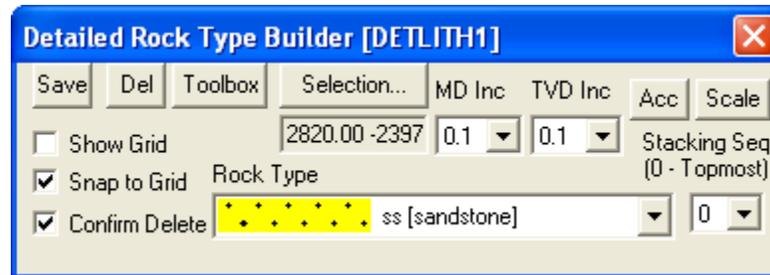


- 2.) Make the **Detailed Lithology** layer active within the **Detailed Lithology** track by clicking on the Track and then selecting the **Detailed Lithology** layer from the **Layer Selection List** field.

Note: When this layer was first added to your log, you were prompted with a **Measured Depth** interval and a **Scale** for the top and bottom of the layer. This scale defines the upper and lower limits of your **Detailed Lithology** and should correspond to the top/right and bottom/left scales of your well path curves. The scale can be changed at any time and new scales may be added within the Detailed Lithology builder window.

When **Detailed Lithology** is your active or working layer, you will have the **True Vertical Depth (TVD)** increments visible on the left side of the layer. These are predetermined by the major/minor linear cycle settings set in the **Layer Configuration** window for this layer.

- 3.) **Double click** on the track to activate the **Detailed Rock Type Builder** window, the Toolbox, and a grid pattern (both the MD and TVD are defaulted to **1m** increments), in the **Detailed Lithology** layer.



- 4.) In our case we will need a little more accuracy in the TVD grid pattern and MD grid pattern. To change the grid pattern in the detailed lithology layer **click on the MD Inc drop box arrow** and **select 0.1** and then **click on the TVD Inc drop box arrow** and **select 0.1** from the subsequent list. This grid change will now be the default when you open this builder window the next time.
- 5.) Also turn off the **Show Grid** check box as shown in the builder above. With the grid off the detailed lithology layer is not as busy as the MD and TVD Inc are quite close together.

The Grid pattern is determined by the MD Inc and the TVD Inc drop boxes. This grid pattern is extremely helpful when the **snap to grid option** is activated. This makes the drawing of lithology a lot simpler when the user is attempting to join similar rock types together. The Show Grid option is a toggle for lack of better terms. It places the grid in front of the rock type, in back of the rock type and then it also turns the grid off entirely. As you click on this option you will notice the 3 different types of grid options.

Drawing Fill 1 in the Detailed Lithology layer...

- 1.) **Click** once on the **ss [sandstone]** selection in the Rock Type Favorite toolbox to highlight it. This will fill in the rock type field in the builder.
- 2.) To define the top of the Sandstone bed move the mouse pointer to the detailed lithology layer so that you see in the yellow field that follows the mouse **2820.00 [-2397.3]**. To define the top **left click and drag** your mouse on the Detailed Lithology layer until you see **2919.00 [-2400.7]** in the lower portion of the yellow field that follows the mouse pointer and then **release the left mouse button**. This will draw a line indicating the top of the Sandstone bed.

Note: If you do not like the position of the line the user can right click on the layer and you can select Restart from the resulting pop-out menu and the line will disappear so that you can proceed with step 2 again.



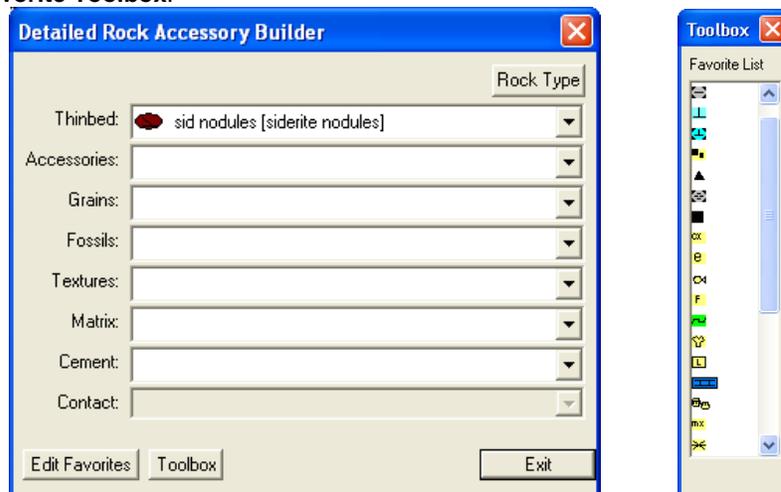
- 3.) Move the mouse pointer to the detailed lithology layer so that you see in the yellow field that follows the mouse **2820.00 [-2405.9]**. To define the bottom of the Shale bed **left click and drag** your mouse on the Detailed Lithology layer until you see **2920.00 [-2409.6]** in the lower portion of the yellow field that follows the mouse pointer and then **release the left mouse button**. This will fill in the area between the two lines with Sandstone.

Drawing Accessories:

- 1.) Make the **Detailed Lithology** layer active within the **Detailed Lithology** track by clicking on the Track and then selecting the **Detailed Lithology** layer from the **Layer Selection List** field. If your Detailed lithology builder is open move on to step 3.
- 2.) **Double click** anywhere within the **Detailed Lithology** track to activate the **Detailed Rock Type Builder** window and it favorites toolbox.
- 3.) **Right click** once anywhere within the **Detailed Lithology** track to activate the pop-up menu.



- 4.) **Select Acc Builder** from the pop-up menu to activate the **Detailed Rock Accessory Builder** window along with the **Accessory Favorite Toolbox**.



Note: The graphical images utilized in the Favorites Toolbox shown above represents the specific **Accessories** selected by the user in the **System Options** window (See **System Options** earlier in this tutorial).

...Adding a Thinbed...

- 1.) **Click** on the symbol for **Siderite Nodules** from the Toolbox and the Thinbed field in the Detailed Rock Accessory Builder window will be filled in with sid nodules [siderite nodules].
- 2.) **Click anywhere** within the existing Detailed Lithology layer to insert the desired symbol.
- 3.) Repeat Steps 1 to 2 for **dark chert pebbles**

Note: To delete an **Accessory symbol**, activate the **Detailed Rock Accessory Builder** window, **right click** on the upper left corner of the **Accessory** symbol you wish to delete, and then select **Delete** from the pop-up menu.

- **Adding a Cement...**

- 1.) **Click** on the symbol for **Siliceous Cement** from the Toolbox and the **Cement** field in the Detailed Rock Accessory Builder window will be filled in with sils [siliceous].
- 2.) **Click** anywhere within the existing Detailed Lithology layer to insert the desired Symbol.

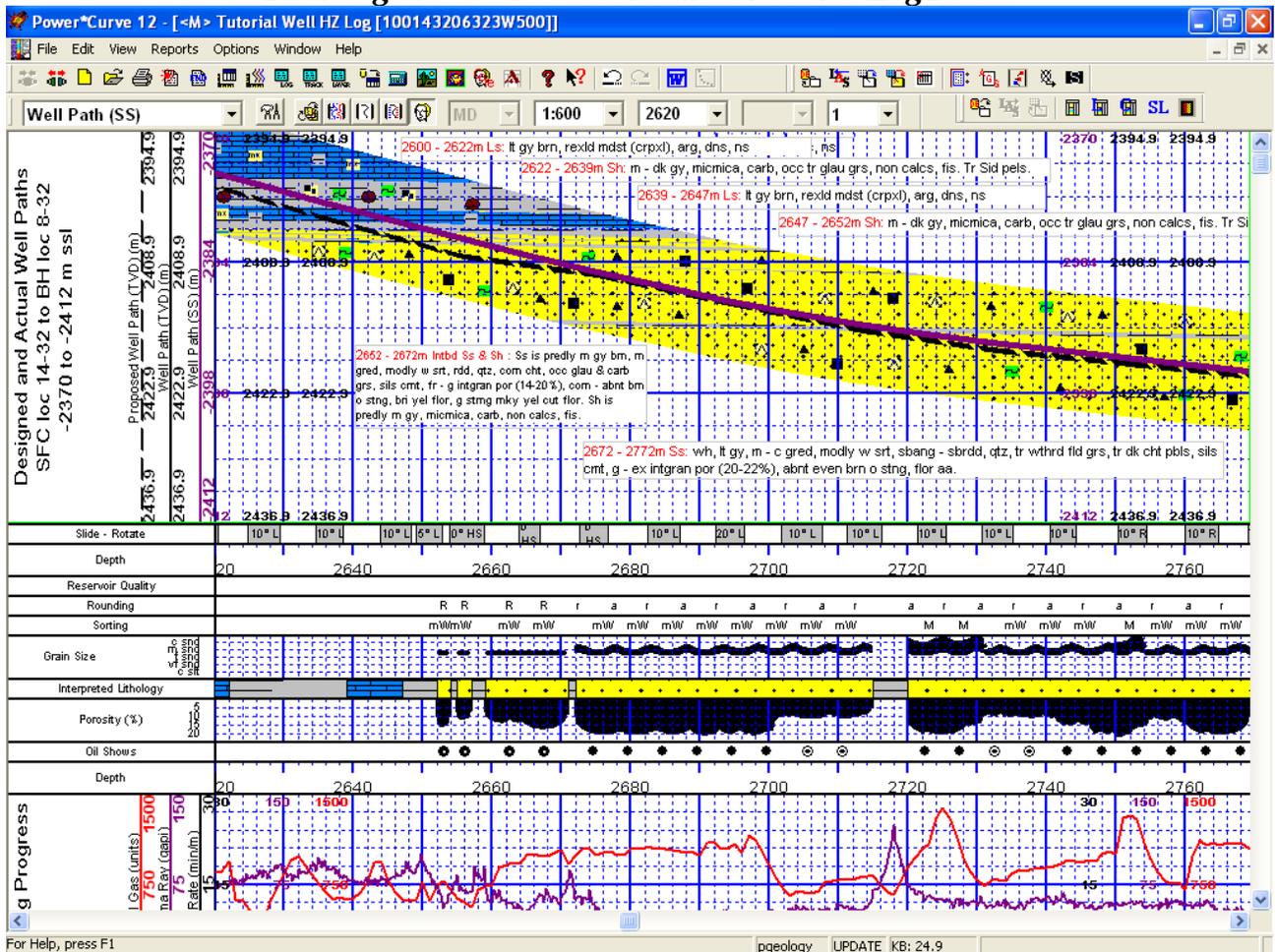
- **Adding an Accessory...**

- 1.) **Click** on the symbol for **Carbonaceous** from the Toolbox and the **Accessories** field in the **Detailed Rock Accessory Builder** window will be filled in with **carb [carbonaceous]**.
- 2.) **Click** anywhere within the existing Detailed Lithology layer to insert the desired Symbol.

Note: When placing **Accessories** on the log, you may wish to increase the mouse accuracy from the default of 1 to **0.1**. This selection is located to the far left on the **Selection Toolbar**.

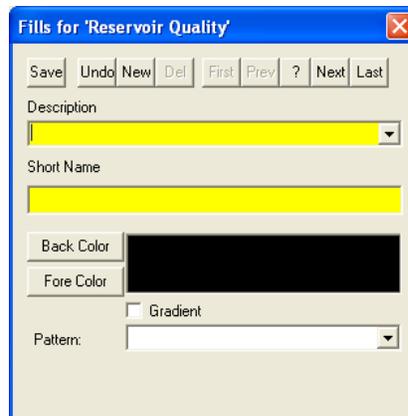
- **Adding more Accessories, Grains and Textures...**
- 1.) **Right Click** on the **Detailed lithology layer** to activate the pop out menu.
 - 2.) **Click** on the **Accessories** selection to activate the favorites list.
 - 3.) **Click** on the symbol for **Micromicaceous** from the pop-out menu and the component field in the Detailed Rock Accessory Builder window will be filled in with micmica [micromicaceous].
 - 4.) **Click** anywhere within the existing Detailed Lithology layer to insert the desired Symbol.
 - 5.) Repeat **Steps 1** and **4** for the following grains and textures:
 - argillaceous
 - chert grains
 - feldspar grains
 - cryptocrystalline
 - glauconite grains

**** Your log should now look similar to the LogBelow ****

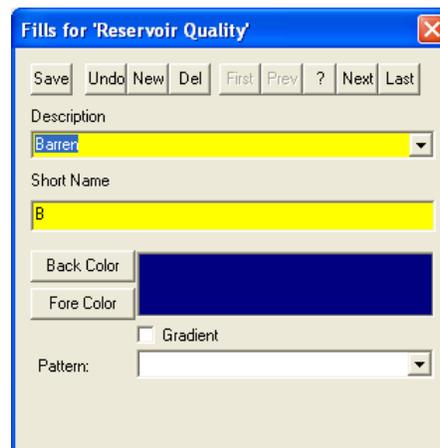


Adding Reservoir Qualities to the Reservoir Quality Track

- 1.) **Double click** anywhere within the Reservoir Quality track to activate the **Fills for Reservoir Quality** window.

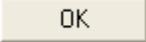


- 2.) **Type Barren** into the Description field.
- 3.) **Type B** into the Short name field.
- 4.) **Click on the  button and select a blue color from the palette and then click on the  button.**



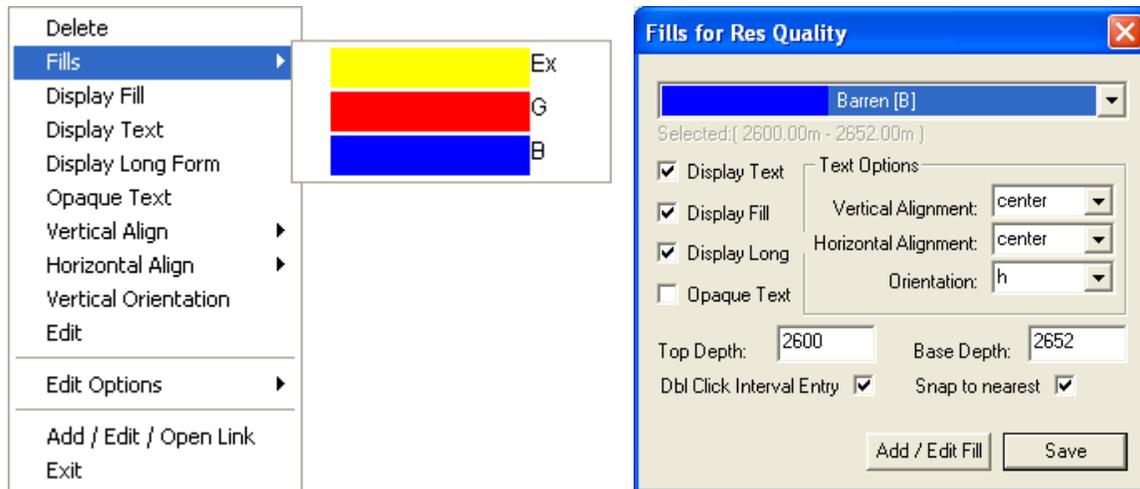
- 5.) **Click on the  button and then select  from the ensuing **Shortcut Options** window. This will clear the window and allow the user to enter a new record.**

Adding more environments to the Environment fill category...

- 1.) **Type Good** into the Description field.
- 2.) **Type G** into the Short name field.
- 3.) **Click on the  button and select an orange color from the palette and then click on the  button.**
- 4.) **Click on the  button and then select  from the ensuing **Shortcut Options** window. This will clear the window and allow the user to enter a new record.**
- 5.) **Type Excellent** into the Description field.
- 6.) **Type Ex** into the Short name field.
- 7.) **Click on the  button and select a yellow color from the palette and then click on the  button.**
- 8.) **Click on the  button and then select  from the ensuing **Shortcut Options** window. This will close the window.**

Drawing Reservoir Quality onto the Reservoir Quality Track...

- 1.) **Double click** on the **Reservoir Quality** to activate the Fills window.
- 2.) **Right click** in the **Reservoir Quality** track to activate the pop out window, **select fills** and **click** on the **B selection**. Or **click** on the **builder drop box** and **select Barren [B]**.



- 3.) Define the interval by **clicking and dragging** within the **Reservoir Quality** track from **2600 to 2562m** 2600.00 2652.00 . The Barren Reservoir Quality will be displayed in that interval.
- 4.) **Right Click** on the **fill just drawn** and **select** or **click** on the **Opaque Text** selection to turn off the background around the text.
- 5.) **Right Click** on the **fill just drawn** and **select** or **click** on the **Vertical Orientation** selection turn the orientation of the text.

Note: Once you have done this once this will be the default for this layer until you change something.

- 6.) Define an entire interval by **double clicking** within the Reservoir Quality track **between the depths of 2654 and 2755m**. The Barren Reservoir Quality will be displayed in that interval. This is capturing the rock interval data entry and utilizing it to draw an entire interval
- 7.) We will **double click** the next 3 barren intervals **between 2657 and 2659m**, then **between 2671 and 2672m**, then **between 2715 and 2720m**
- 8.) **Right click** in the **Reservoir Quality** track to activate the pop out window, **select fills** and **click** on the **G selection**. Or **click** on the **builder drop box** and **select Good [G]**.
- 9.) We will **double click** the next 3 good intervals **between 2652 and 2654m**, then **between 2655 and 2657m**, then **between 2659 and 2671m**.
- 10.) **Right click** in the **Reservoir Quality** track to activate the pop out window, **select fills** and **click** on the **Ex selection**. Or **click** on the **builder drop box** and **select Excellent [Ex]**.
- 11.) We will **double click** the next 2 Excellent intervals **between 2672 and 2715m**, then **between 2720 and 2820m**.
- 12.) We will now define a subinterval with the Good reservoir quality **Right click** in the **Reservoir Quality** track to activate the pop out window, **select fills** and **click** on the **G selection**. Or **click** on the **builder drop box** and **select Good [G]**.
- 13.) **Click and drag** within the **Reservoir Quality** track from **2702 to 2715m** 2702.00 2715.00 . The Good Reservoir Quality will be displayed in that interval.

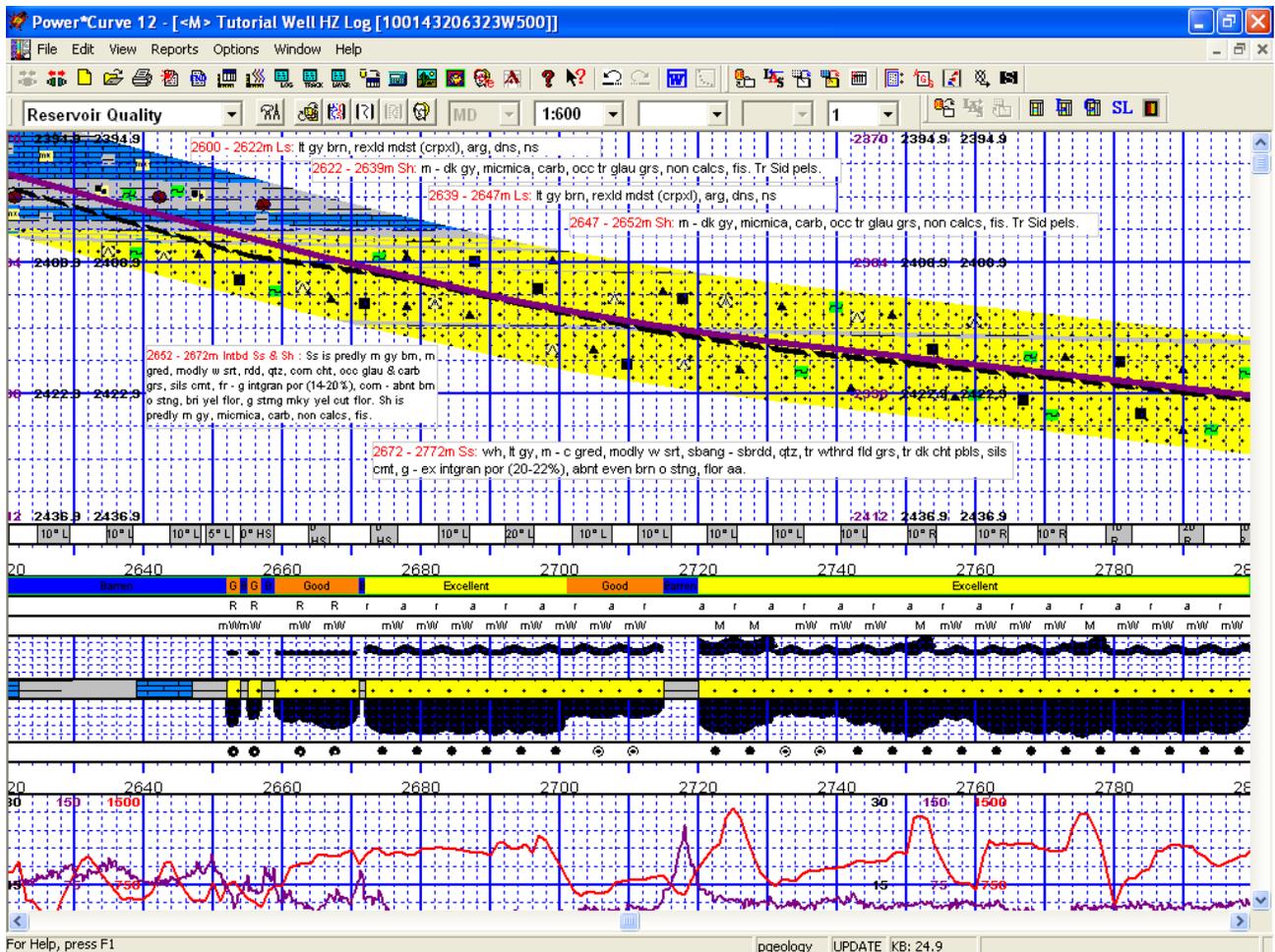
To **resize** an existing fill **hold your Ctrl Key down** on your keypad and **move mouse pointer over the end part of the interval until it turns into a resize cursor**  and then **click and drag** to a new depth. Remember you cannot overwrite existing intervals.

To **delete** an exiting interval **right click on the interval** and **select delete** from the pop out menu. The User can also delete multiple Reservoir Qualities by **holding down the Shift Key** and **dragging an area within the Reservoir quality track**



14.) Click on the  close button in the upper right hand corner of the builder. This will close down the Environment builder window.

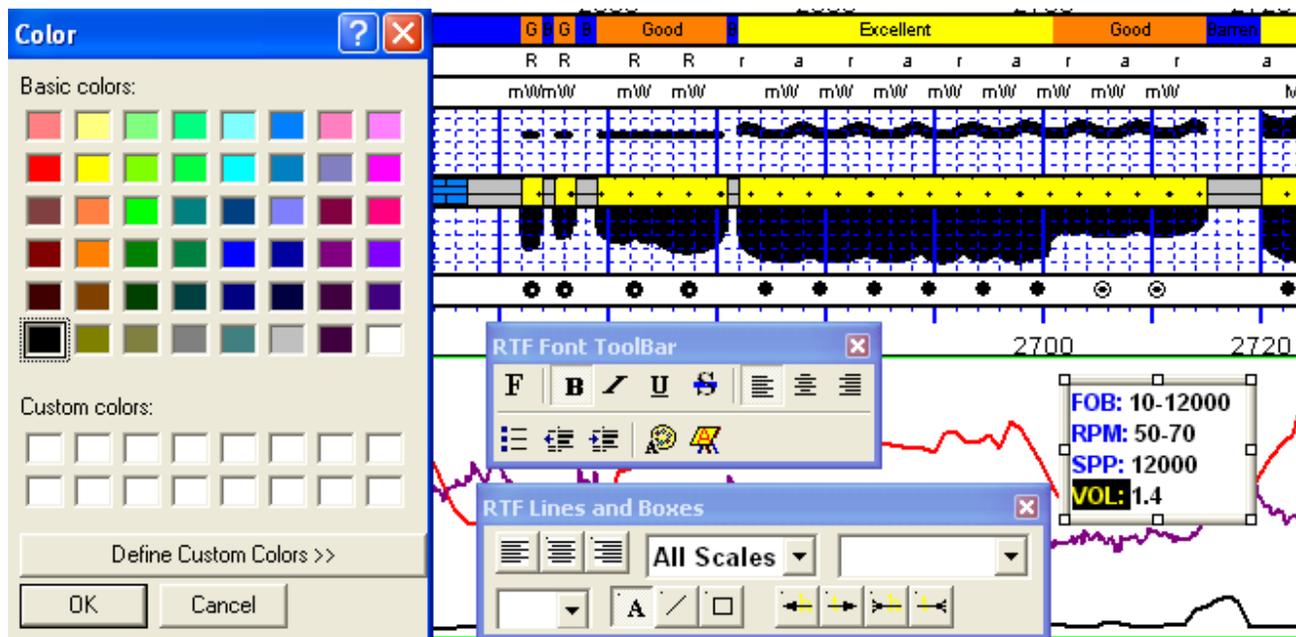
**** Your log should now look similar to the log shown below. ****



Adding an Annotation to the Drilling Progress Track

There are a number of annotations layers associated with this track. These are represented with Engineering Parameters, Mud Parameters and Gas Annotations. You could one annotation layer for all three types of annotations. We will deal with making an annotation in the Engineering Parameters layer.

- 1.) Click on the **Drilling Progress** track to make it active (highlighted in **green**).
- 2.) **Select Engineering Parameters**, as your active layer, from the **Layer Selection List** field.
- 3.) Define the area on the layer where the **Annotation** will appear by:
 - a) placing the mouse pointer at the desired depth;
 - b) **clicking and dragging** the **left** mouse button from the upper left corner to the lower right corner of the desired area to form a rectangular shape
 - c) releasing the **left** mouse button. This will activate the RTF Toolbars.

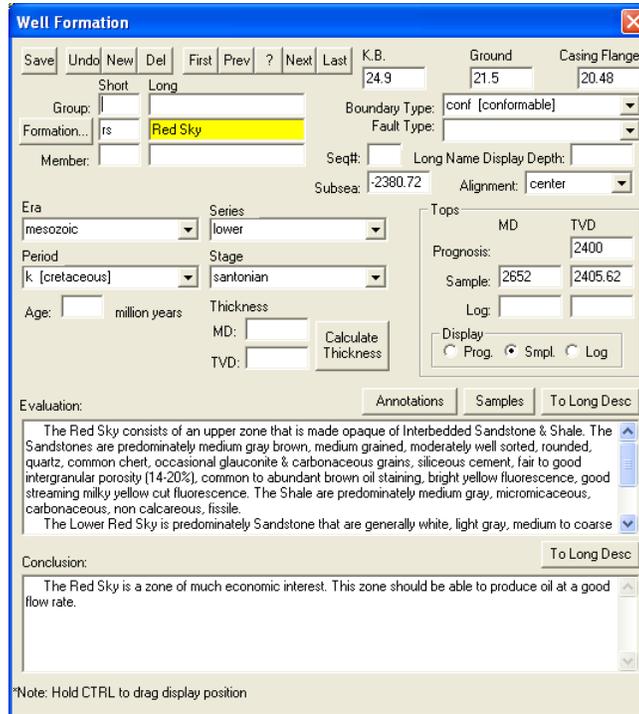


- 4.) **Type** the following into the text field in the annotation layer:
 - FOB: 10-12000**
 - RPM: 50-70**
 - SPP: 12000**
 - VOL: 1.4**
- 5.) To change the Font Color **Highlight the Text you want to change by dragging the Mouse over the text** to highlight the letters.
- 6.) Click on the  button in the RFT Font toolbar. This will activate the color palette.
- 7.) Click on the **new color** and then click on the  button. This will close the Color Palette and make your changes.
- 8.) Click anywhere outside the text box to save your annotation and close the Toolbars.
- 9.) The user would probably want a Grid Pattern on this Track for printing purposes. Select a Curve layer (Gamma Ray, Drill Rate or Total Gas) from the layer selection list on the Selection Bar.

Adding a Formation Top

- 1.) Click on the **Reports** selection on the **Power*Curve™ Menu Bar** to activate the pull down menu and then **Click** on **Formation** to open the **Formation** window shown on the next page. This will open up with the Alberquerque Top.
- 2.) Click on the  button to clear the window and get the window ready to accept another record.

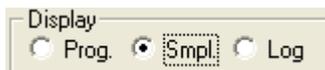
- 3.) **Click** in the **Formation Short Name** field to activate a flashing caret and **type** in **rs**. Press the Tab Key. This will advance the user to the Formation Long Name field. The rs will be drawn in the Formation Tops (Short Name) layer which is associated with the Measured Depth Tracks.
- 4.) **Type** in the **Red Sky** in the Formation Long name field. Red Sky will be drawn in the Formation Tops (Long Name) layer which is associated with the Detailed Lithology Track.



- 5.) **Select Mesozoic** from the **Era** drop down box.
- 6.) **Select Lower** from the **Series** drop down box.
- 7.) **Select K (Cretaceous)** from the **Period** drop down box. The K will be drawn in the Formation Tops (Short Name) layer which is associated with the Measured Depth Tracks.
- 8.) **Select Santorian** from the **Stage** drop down box.
- 9.) **Select Center** from the **Alignment** drop down box. Red Sky will be drawn in the center of the Formation Tops (Long Name) layer which is associated with the Detailed Lithology Track along with its Subsea and TVD values

Note: The subsea values are calculated from the K.B. elevations entered into the Well window which can be edited. The Well window can be found by clicking on Edit on the Power*Curve men bar and select Well from the resulting pull down menu.

- 10.) **Select Conformable** from the **Boundary Type** drop down box.



- 11.) **Select** from the Display portion of the Window.
- 12.) **Type 2652** into the **Sample Top MD** field. You will notice that the TVD Sample top field will be calculated for you. Then depress the tab key four times. This will place the flashing caret in the Evaluation field.
- 13.) The user can then **type** in the Evaluation short form or the user can go to the **Annotations** or **Samples** button and search the samples to copy and paste the relevant description. Once done **click** on the **To Long Desc** button to expand the description. Then depress the tab key. This will advance the flashing caret to the Conclusion field.

- 14.) **Type the Conclusion** into the Conclusion field. **Click** on the **To Long Desc** button to expand the description.

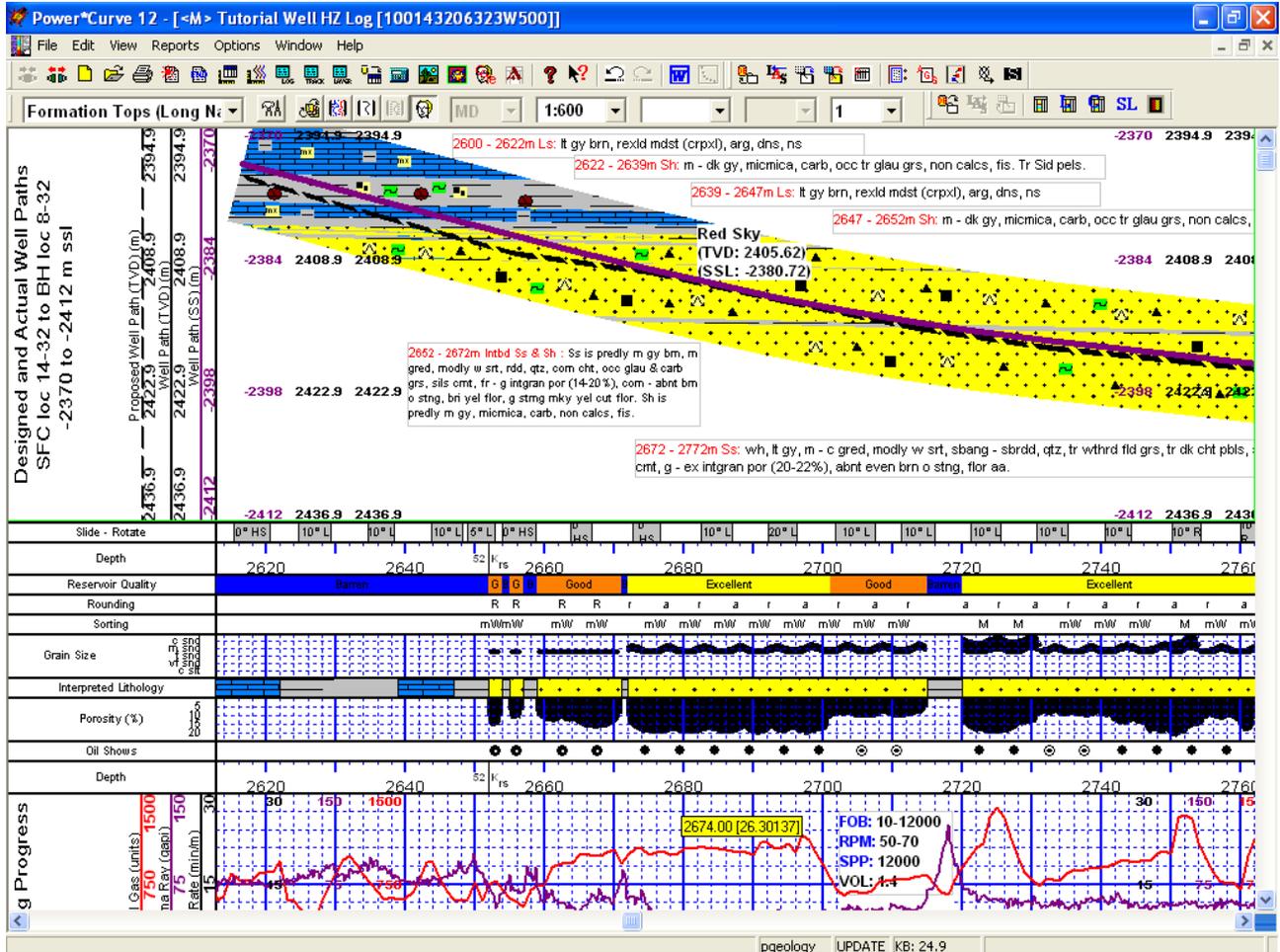
- 14.) **Click** on the **Save** button and then select **Exit** from the ensuing **Shortcut Options** window. You will notice the both the Short Name and Long Name formation tops layers filled in with the appropriate Red Sky tops information.

Move the Formation Top

If the centre is not the best display, then you may want to move the Formation name around to another spot on the Layer. You can also follow these procedures for 3 other types of Data. You can also move Survey points, Bit Record Data and Casing Data with this method.

- 1.) Click on the **Detailed Lithology** track to make it active (highlighted in green).
- 2.) Select the **Formation Tops (Long Name)** layer, as your active layer, from the **Layer Selection List** field.
- 3.) Double click on the **track / layer**. This will activate the formation Tops data Entry window.
- 4.) Hold the **CTRL Key down** and clicking and dragging the Red Sky to a neutral position on the log and releasing the mouse button. The long name should snap to the new position as shown on the log on the this page

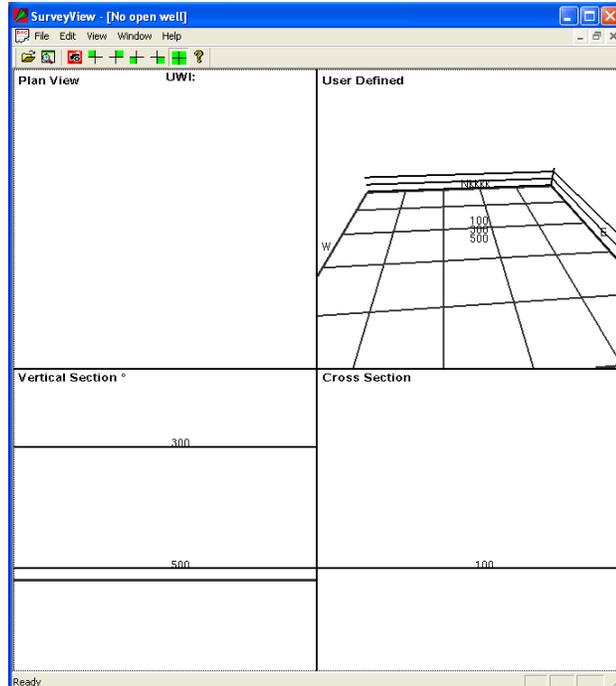
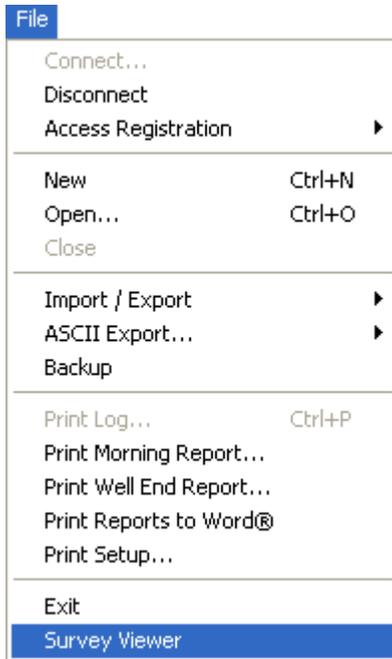
**** Your log should now look similar to log shown below. ****



Setting up the Survey Views

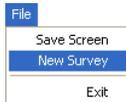
The Survey View module allows the user to view a well in multi view angles. We give the user the ability to zoom in or out as well as up or down and view the well path in four (4) separate views. The views are **Plan view** (from the top), **Vertical Section view** (parallel to the target azimuth), **Cross Section view** (right angles to the target azimuth) and a **User Defined view** where the user can spin the view to any angle they wish. Each view can be captured separately or the capture can be taken of all four views at once. The screenshots taken in this module can then be printed with the striplog.

1. Click on the **Survey View**  Icon on the Toolbar OR go under the **File Menu** and select the **Survey Viewer**. This will activate the Survey View Module.

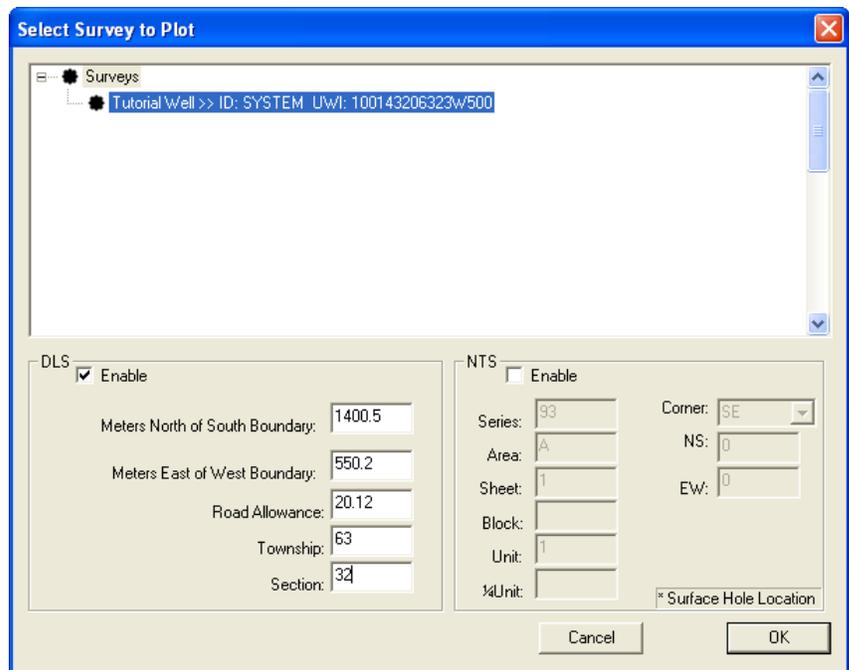


Note: It is important to know some of the well location information before you proceed with step 2. If you are in the DLS land survey system you should know your metes and bounds surface hole coordinate values and if you are in the NTS survey system you should know your surface hole location identification. This information would have been entered into the Well Record at the beginning of the Tutorial. This information is also located on the Survey plat for the Well.

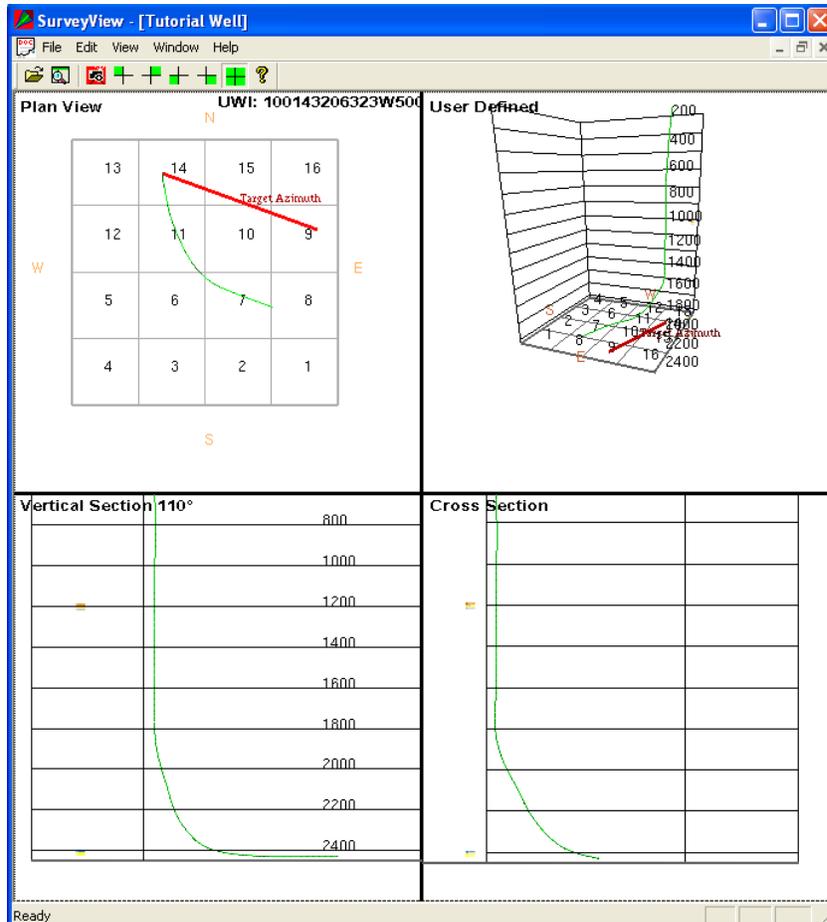
1. Click on the  **New Survey** button on the toolbar or click on **New Survey** from the **File** menu selection to activate the Open survey window.



2. Click on the **+** beside the **Surveys** to expand the list of surveys that are in the database and then **select the Tutorial Well** by highlighting it with the mouse pointer.
3. **Enable the check box** for the DLS System.
4. **Type 1400.5** in the **Meters North of the South Boundary** field. Tab to the Meters East of the West boundary field.
5. **Type 550.2** in the **Meters East of the West Boundary** field. Tab **twice** to the Township field.
6. **Type 63** in the **Township** field. Tab to the Section field.
7. **Type 32** in the **Section** field. Tab.

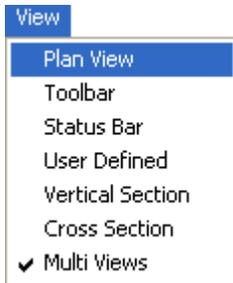


8. Click on the  **OK** button to activate the survey view window with your surveys from this well.



Isolating the individual Survey Views

Plan view (isolated)



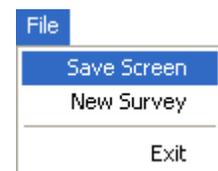
1. Click on the **Plan View** selection under the **View** pull down menu or click on the  icon on the **tool bar**. This will Isolate the plan view and make it bigger.
2. The user can then use the **scroll button** on the mouse to **zoom in or out** of the image (up scroll to zoom out and down scroll to zoom in). The user can also use the **up / down arrows** on the keypad to move the **image up or down** or the **left / right arrows** on the keypad to move the **image left or right**.
3. Click on the **properties** selection under the **Edit** pull down menu or **right click** on the **image** and **select properties** this would activate the properties window where the user can change what is shown on the view but will be applicable to all views.

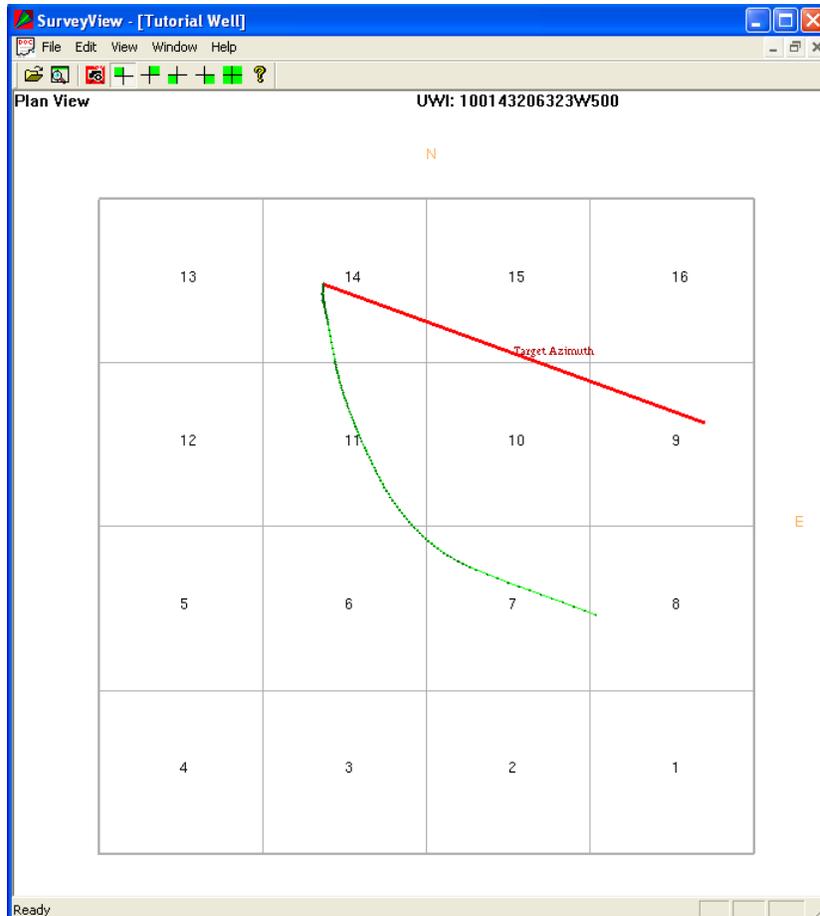
If you were to go into the properties of the Survey view application you can change numerous displays. F1 key when the properties window is open will get you an overview of this window. An important note is that if you change something on the plan view it will change on all the views.

4. Once the view is set up the way you want you can save this by **Clicking** on the

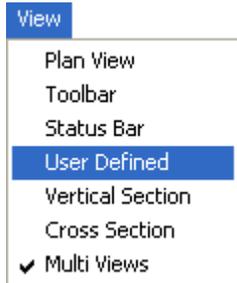


Icon on the **tool bar** or the **Save Screen** Selection under the **File** pull down menu. This will save the screen capture and give you the ability to print it out on your striplog in all of our applications.





User defined view (isolated)



1. Click on the **User Defined** View selection under the **View** pull down menu or click



on the **icon** on the **tool bar**. This will Isolate the User Defined view and make it bigger.

2. The user can then use the **scroll button** on the mouse to **zoom in or out** of the image (up scroll to zoom out and down scroll to zoom in). The user can also use the **up / down arrows** on the keypad to move the **image up or down**. The user can use their mouse to rotate the view by **clicking and dragging within the view** to rotate the view.
3. Click on the **properties** selection under the **Edit pull down menu** or **right click on the image** and **select properties** this would activate the properties window where the

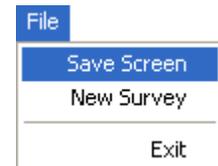
user can change what is shown on the view but will be applicable to all views.

4. Once the view is set up the way you want you can save this by **Clicking** on the

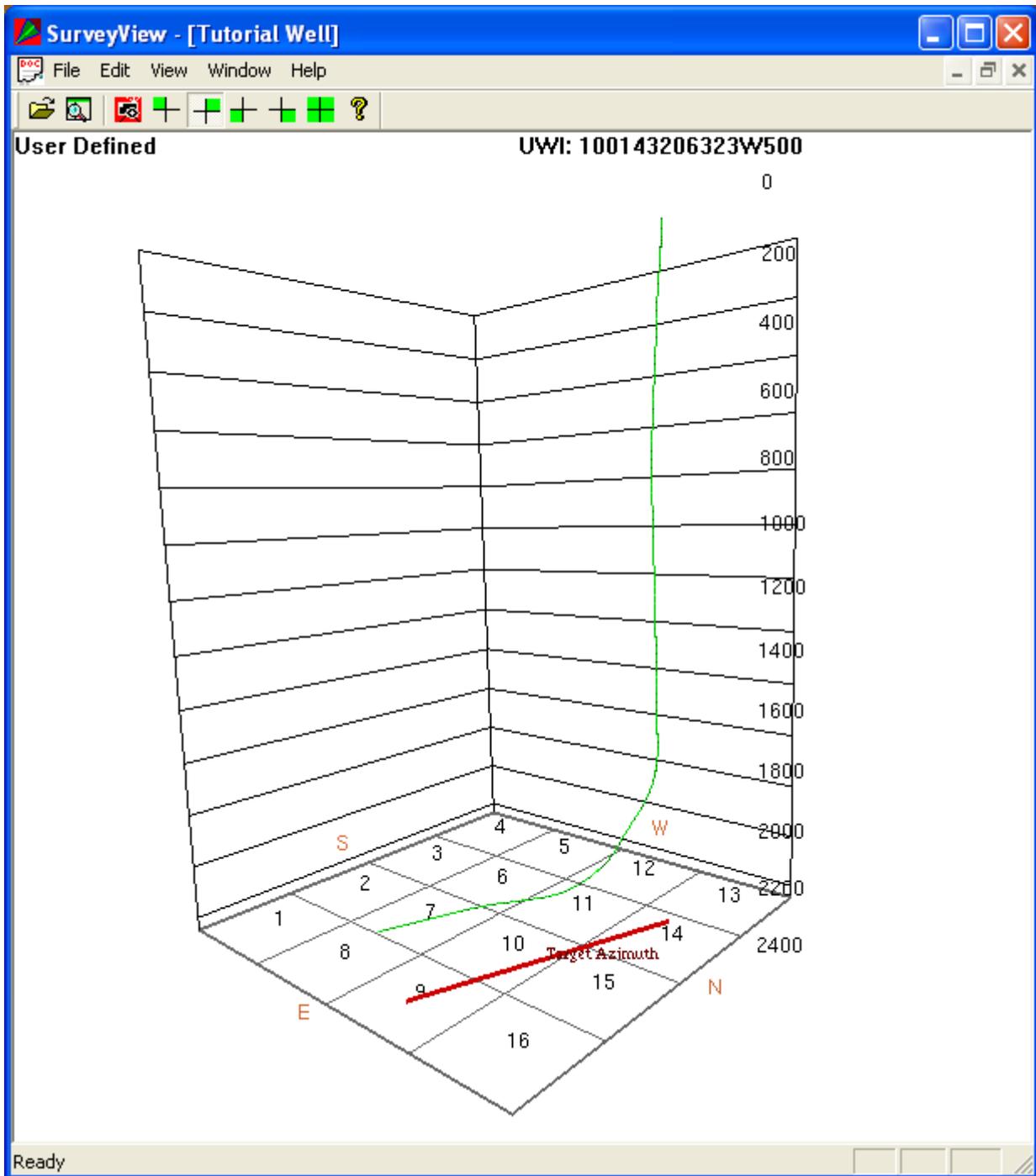


Icon on the **tool bar** or the **Save Screen**

Selection under the **File pull down menu**. This will save the screen capture and give you the ability to print it out on your striplog in all of our applications.



These Screen captures will then be printed in the Striplog. The user has the ability to take a screen capture every view available as well as the compilation of all 4. The can also print these in the Print Log portion of the application



How to Print the Log

Before you start printing the Log it must look the way you want it to print. The Log example on page 67 would print with no grid pattern in the Detailed Lithology Track. If it looks the way you want follow the steps below. In the above case you would go to the layer selection list and select one of the curves to be active (Well Path Ss, Well Path TVD or Proposed Well Path)

- 1.) Under the **File** menu, click on **Print Log** or click on the  **Print button** on the **Toolbar** to activate the **Print Log** window.

Note: The Title bar and all depths associated with the Print Log window are defaulted to the Depth View that Power*Curve are in at the time of the activation of the Print Log window.

- 2.) Select the **letter landscape** paper orientation from the **Page Orientation drop box** field and the **Title Page, Legend, and Formation Tops** will automatically conform to the selected orientation.
- 3.) Activate the **Plan View and the User Defined View** check boxes () , These were the screen captures we did in the Survey View Module.

Note: The letter or legal landscape or portrait settings selected from within the **Print Log** window will NOT override the paper orientation settings selected in the printer's **Properties** window. Therefore, you must also modify the paper orientation settings in your printer's **Properties** window to letter or legal landscape.

- 4.) Activate the **Use Dynamic Legend** check box () , if you wish to have the legend reflect only the symbols printed on the log or core portions of the printed intervals defined in the log and core portions of the print log window. Leave the Dynamic Legend unchecked if you wish to print out the entire list of symbols.

In the Log portion of the Print Log window

- 5.) Select **1:240** from the scale drop box for the log to be printed out at.
- 6.) Click to activate the **Header and Footer** check boxes () to print the track headers on the log.
- 7.) Click on **User Defined Section** and **type** in **2610 to 2920** in the appropriate fields to highlight it in the printing options selection box.

Note: The log itself must be displayed in whatever depth view you wish to print before you activate the print log window. To change the log to the desired format refer to depth view under the view pull down menu.

Page Margin The page margin field is available, primarily, when you are printing to Adobe Acrobat writer. When a numerical value in inches is typed into this field it will initiate a top and left margin for the templates (Title Page, Legend and Formation Tops) as well as a left margin for the main log.

Page Overlap Activate the **Page Overlap** check box() if you are printing on single sheets. This will force the printer to include an additional 1/4 inch of the log at the top and bottom of each page, so that you can cut-and-paste pages manually, if you so desire.

Print Methods...

Default Activating the **Default** radio button () forces Power*Log / Curve / Core to use a **raster or bitmap graphic printing method**. This printing method is generally used with Laser printers but not exclusively so.

Meta File Activating the **Meta File** radio button () forces Power*Log / Curve / Core to use the **meta file technology printing method**. This printing method was developed for the newer models of printers on the market today as well as using the Adobe Acrobat Distiller or pdf printing technology.

Color Options...

Auto Activating the Auto radio button () forces Power*Log / Curve / Core to use the settings from the printer driver to printout the log.

Color Activating the Color radio button () forces Power*Log / Curve / Core to override the printer driver settings and consequently Power*Log / Curve / Core assumes that you are using a color printer.

Mono Activating the Mono radio button () forces Power*Log / Curve / Core to override the printer driver settings and consequently Power*Log / Curve / Core assumes that you are using a monochrome (black and white) printer.

Interval per page field indicates how many meters of log will fit on a page of selected paper size and orientation selected in the setup as well as what log scale you are printing at. This will help indicate to the user how many pages will be required by the print job.

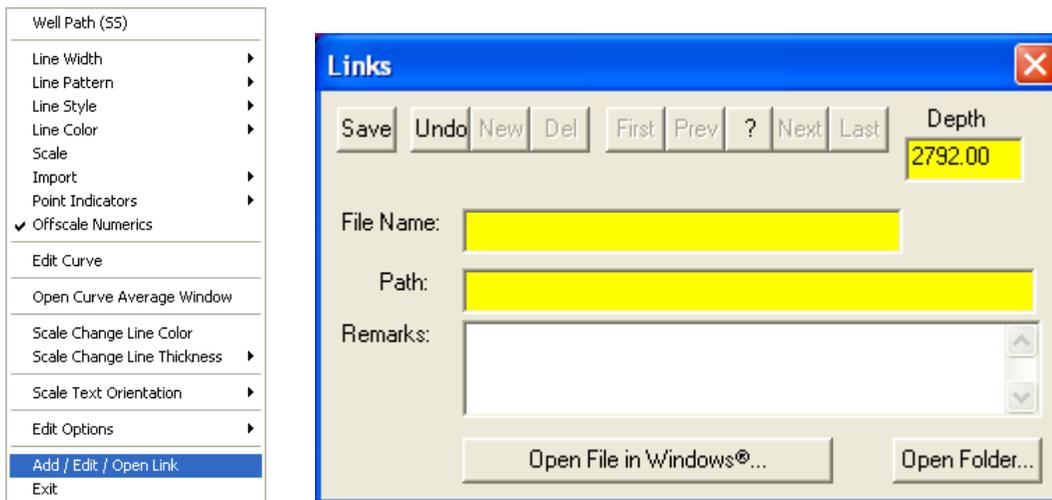
8.) Click on the  button to activate the **Print Setup** window and confirm that the correct printer settings are in effect.

9.) When you are ready to print your log, click on the  button.

Note: If you do exit from the **Print Log** window, you will be asked if you wish to save the print settings. If you **click** on **Yes**, the program will remember every setting that you made to the **Print Log** window and then will default to those settings the next time you enter the **Print Log** window.

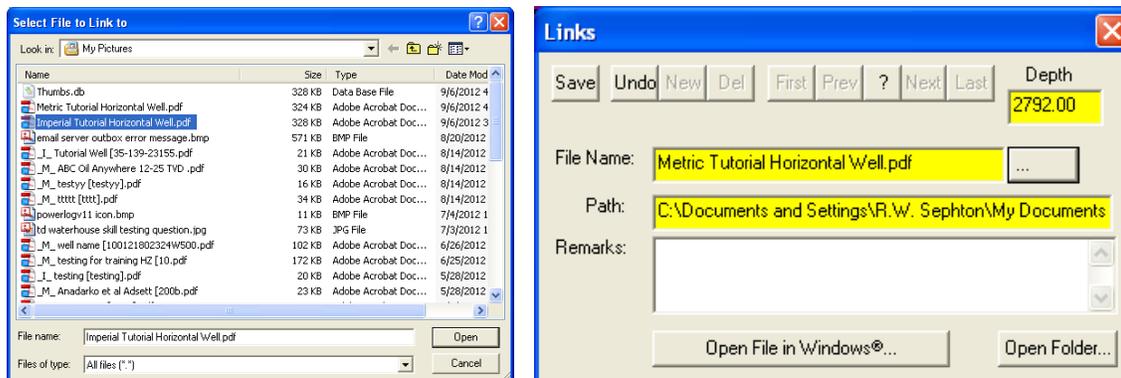
Adding a Link (Attachment) to your Log

1.) In our case **Right Click** on the **Well Path SS** layer at 2792m to activate the pop out menu.



2.) **Select Add / Edit / Open Link** from the pop out menu. This will activate a blank Links window with the depth you right clicked at.

3.) **Click** on the  **button** in the Links window and you can now pick any windows compatible file. In our case I am linking the printed well file from the next section of the tutorial printed to my backup folder and then **click** on the  **button**. This will fill in in the details of the File Name and location in this window.



4.) Now the user can **Type** in some **remarks** to tell the viewer what the file is (if the user wishes to identify the file they have attached) and then **click** on the  **button**. This will activate the Shortcut Options Window.



5.) **Click** on the  **button**. This will insert the paperclip symbol  where you originally right clicked and link the file to the log.

This concludes the Power*Curve™ Tutorial. If you need help with specific functions or operations, please use the Table of Contents in the Power*Suite™ User Manual to find the desired topic or use the Search function built into the Power*Curve™ On-line Help System.