

POWER CURVE

2018 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:

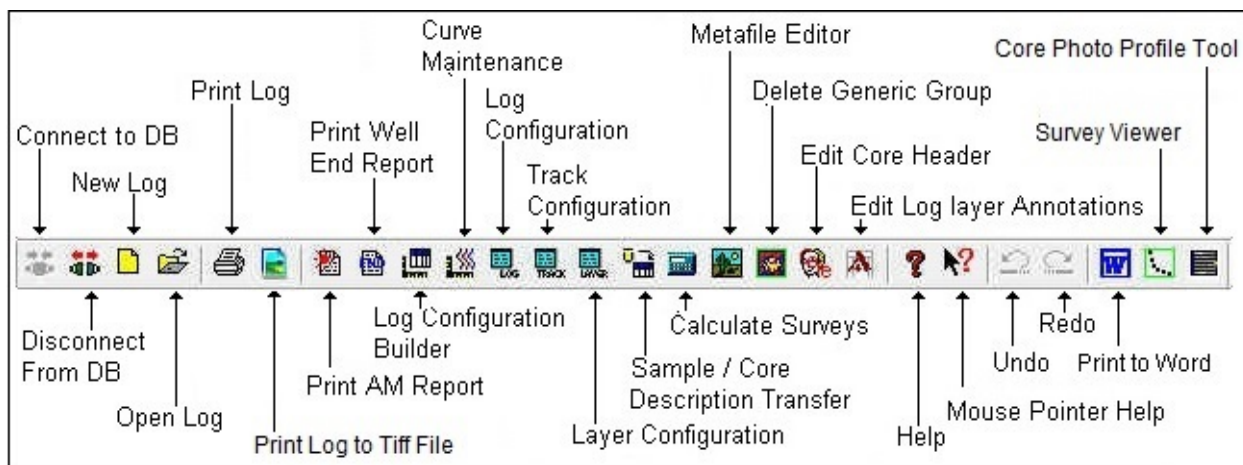
When you are entering information into data forms, you may move between boxes/fields by **pressing the Tab key** to go forward and **Shift +Tab keys** to move backwards. To exit forms that do not have an **Exit**, **OK**, or **Cancel** button, **press the Esc key** on the keyboard.

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

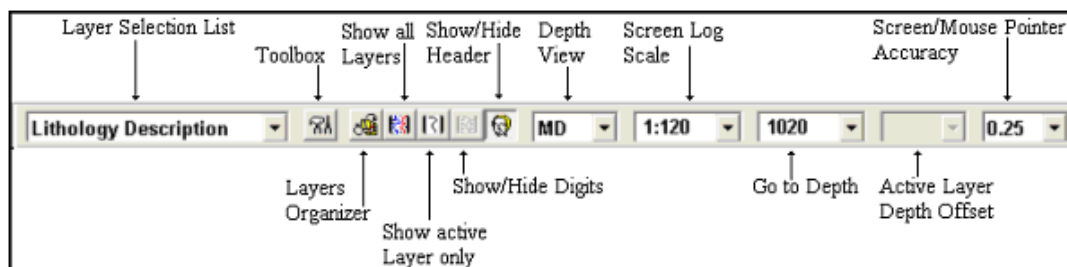
You can make use of the context sensitive help by **pressing the F1 key** when you are in a dialogue box. A pertinent help file will appear, opened to the topic relevant to the dialogue box you are in.

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

The Toolbar



The Selection Bar...



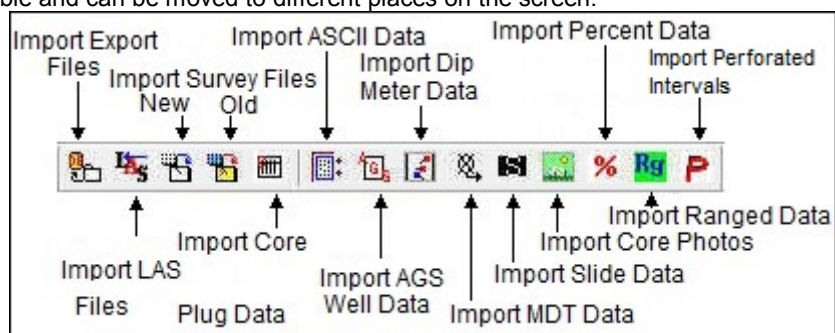
The Status Bar...

For Help, press F1 poeology UPDATE KB: 567.6

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**.

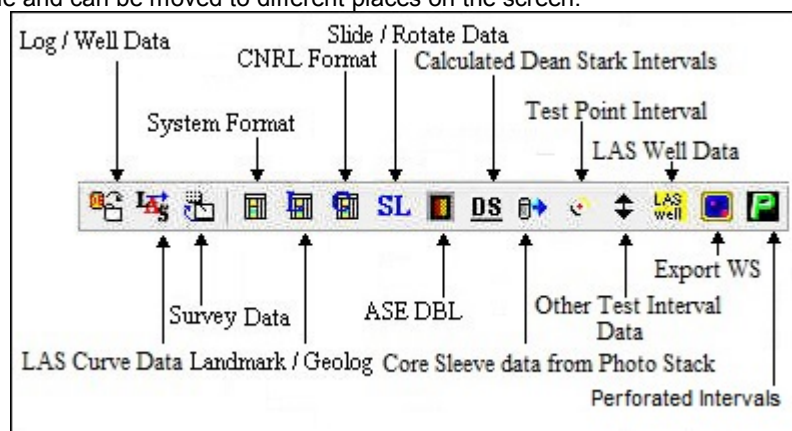
Import Toolbar

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



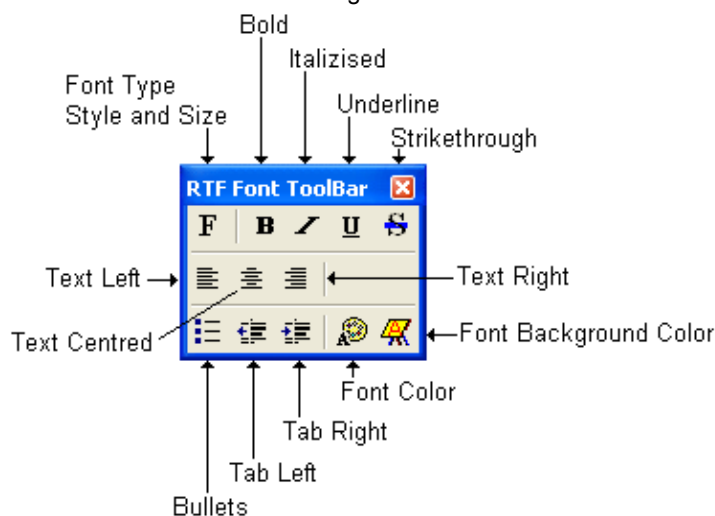
Export Toolbar

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



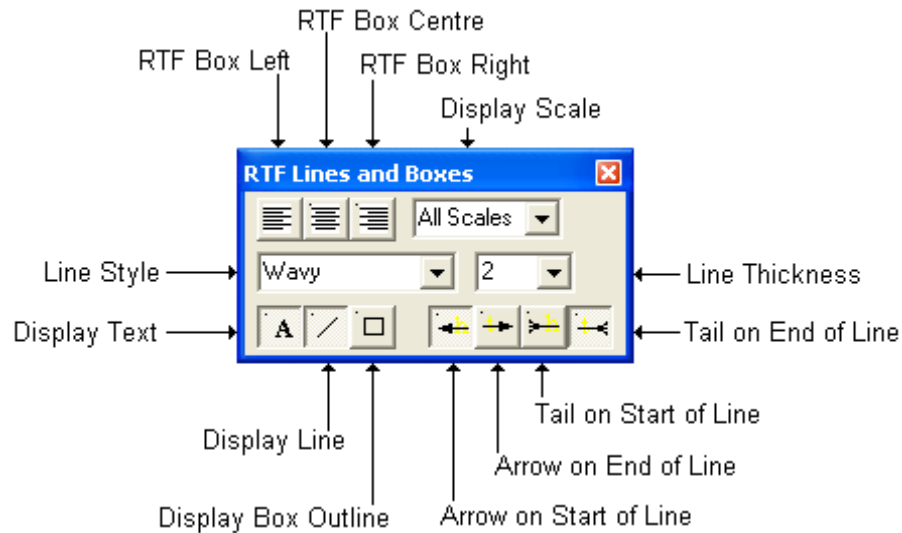
RTF Font Toolbar

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



<u>Radio Buttons</u>	
<input checked="" type="radio"/> Activated	<input type="radio"/> De-Activated
<u>Check Boxes</u>	<u>Drop Box</u>
<input checked="" type="checkbox"/> Activated	Click Arrow ▼
<input type="checkbox"/> De-Activated	

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.

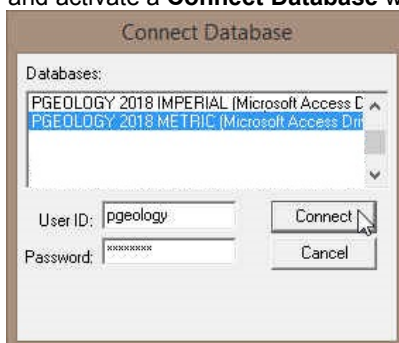
Quick Reference Guide - The portion of the **On-line Help System**, that quickly refers you to some of the more commonly performed tasks.

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 2018** icon. Acknowledge the Security Information window by **clicking** on the **OK** button. This will initiate the program and activate a **Connect Database** window.




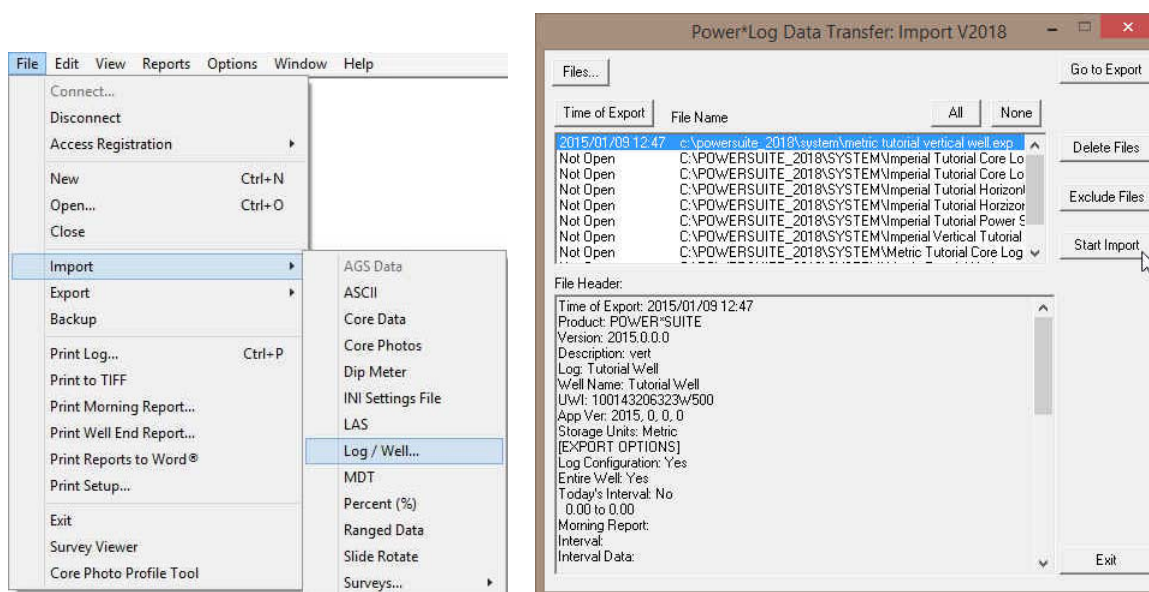
- 2.) Highlight the **PGEOLGY 2018 METRIC (Microsoft Access Driver[*.mdb])** database by **clicking** on it once.
- 3.) Move your mouse pointer to the **User ID** field and **click**. This will activate a flashing cursor in the **User ID** field. **Type "pgeology"** in the **User ID** field. **Press** the **Tab** key on the keyboard to move to the **Password** field.
- 4.) **Type "pgeology"** in the **Password** field and then **click** on the **Connect** 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_2018\system folder. The export file name is Vertical Tutorial Well.exp. If you have completed the Vertical tutorial then proceed to page 8.

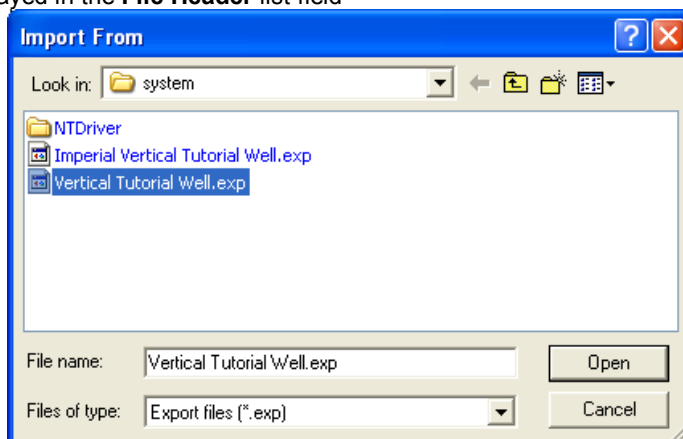
Importing the Vertical Tutorial Well.

1. Select **Import** under the **File** menu selection, and then select **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_2018\System 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



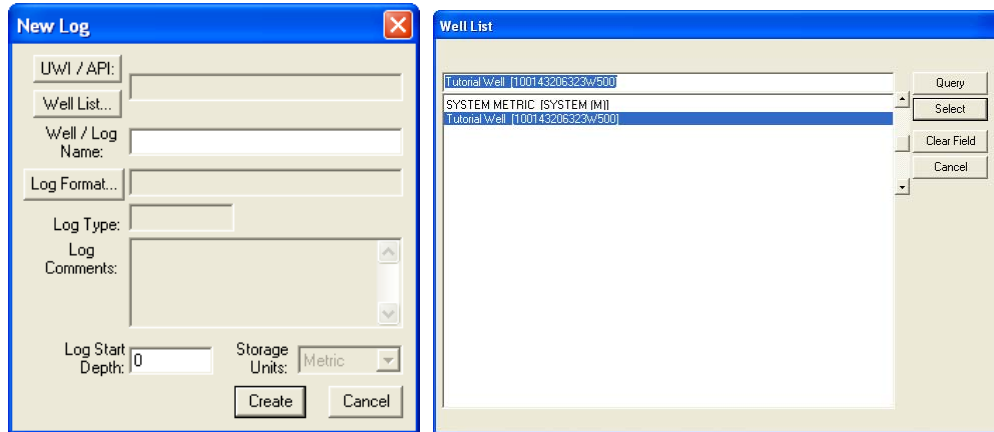
2. Click on the **Start Import** button to activate the following system message, "**Do you really want to IMPORT the highlighted files?**"
3. Click on the **Yes** button to proceed with the import.



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.

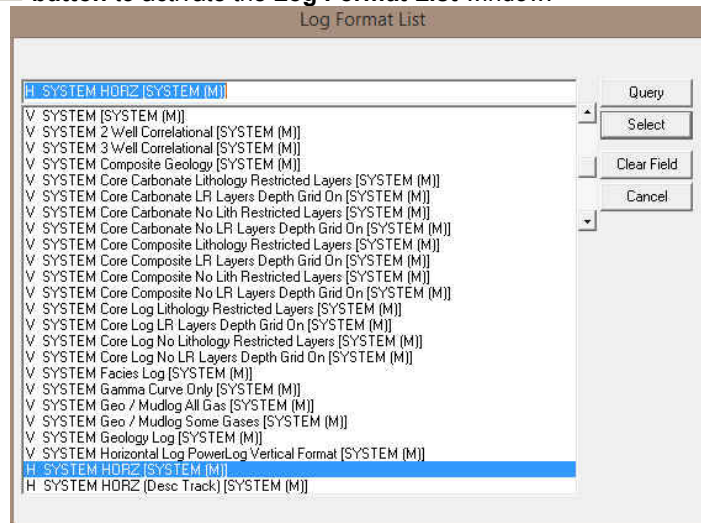
- 1.) The first step in creating a new log is to **click** on the  **New Log button** on the **Toolbar** or to **select New** under **File** on the **Selection Bar**. This will open the **New Log** window shown below.




- 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  **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.

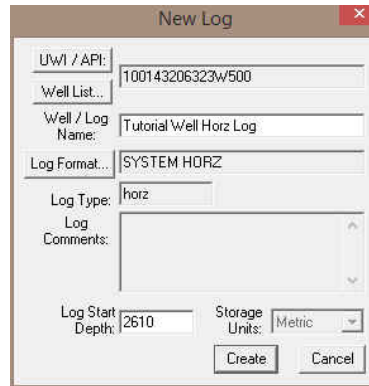
- 5.) **Click** on the  **Log Format...** **button** to activate the **Log Format List** window.



- 6.) **Click** on **"H SYSTEM HORZ [SYSTEM (M)]"** to highlight it and then **click** on the  **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

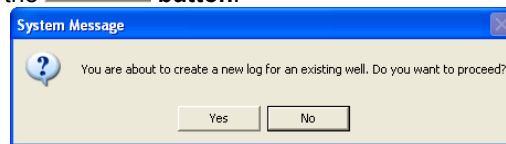
- 7.) Once you have been returned to the **New Log** window, **double click** in the **Log Start Depth** field. This will highlight the zero (0) and activate a flashing cursor. Type **2610** in the **Log Start Depth** field.



The 'New Log' dialog box contains the following fields and controls:

- UWI / API: 100143206323w500
- Well List... (button)
- Well / Log Name: Tutorial Well Horz Log
- Log Format...: SYSTEM HORZ
- Log Type: horz
- Log Comments: (empty text area)
- Log Start Depth: 2610
- Storage Units: Metric (dropdown)
- Create (button)
- Cancel (button)

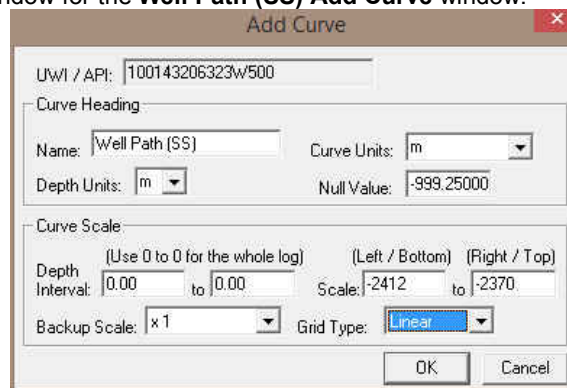
- 8.) Once the information is entered, **click on the Create button.**
- 9.) This will initiate a **New Log**. Because you have created a second log for an existing well you will be reminded with a System message. **Click on the Yes button.**



The 'System Message' dialog box displays the following:

- Icon: Question mark
- Text: You are about to create a new log for an existing well. Do you want to proceed?
- Yes (button)
- No (button)

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



The 'Add Curve' dialog box contains the following fields and controls:

- UWI / API: 100143206323w500
- Curve Heading:
 - Name: Well Path (SS)
 - Curve Units: m (dropdown)
 - Depth Units: m (dropdown)
 - Null Value: -999.25000
- Curve Scale:
 - Depth Interval: (Use 0 to 0 for the whole log) 0.00 to 0.00
 - Scale: (Left / Bottom) -2412 to -2370 (Right / Top)
 - Backup Scale: x1 (dropdown)
 - Grid Type: Linear (dropdown)
- OK (button)
- Cancel (button)

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.

- 11.) **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. From the **Backup Scale drop box select x1**. Finally, select **"Linear"** in the **Grid Type** field and then **click on the OK button**. This will activate the next Add curve window for the **Well Path (TVD)** window will then be displayed.

The 'Add Curve' dialog box is shown with the following settings:

- UWI / API: 100143206323w/500
- Curve Heading:
 - Name: Well Path (TVD)
 - Curve Units: m
 - Depth Units: m
 - Null Value: -999.25000
- Curve Scale:
 - Depth Interval: (Use 0 to 0 for the whole log) 0.00 to 0.00
 - Scale: (Left / Bottom) 2436.9 to 2394.9
 - Backup Scale: x 1
 - Grid Type: Linear

Buttons: OK, Cancel

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

- 12.) **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. From the Backup Scale drop box select x1. Finally,**

select "Linear" in the Grid Type field and then click on the OK 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.

The 'Add Curve' dialog box is shown with the following settings:

- UWI / API: 100143206323w/500
- Curve Heading:
 - Name: Proposed Well Path (TVD)
 - Curve Units: m
 - Depth Units: m
 - Null Value: -999.25000
- Curve Scale:
 - Depth Interval: (Use 0 to 0 for the whole log) 0.00 to 0.00
 - Scale: (Left / Bottom) 2436.9 to 2394.9
 - Backup Scale: x 1
 - Grid Type: Linear

Buttons: OK, Cancel

- 13.) **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. From the Backup Scale drop box select x1. Finally, select "Linear" in the Grid Type field and then click on the OK button. The Detailed Lithology Scale [DETLITH1] window will then be displayed**

The 'Detailed Lithology Scale [DETLITH1]' window is shown with the following settings:

- Buttons: Save, Undo, New, Del, First, Prev, ?, Next, Last
- Interval: (0 to 0 for entire log) 0 to 0
- Scale: Top -2370, Bottom -2412
- Backup Scale: straight shift

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.

- 14.) **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.**

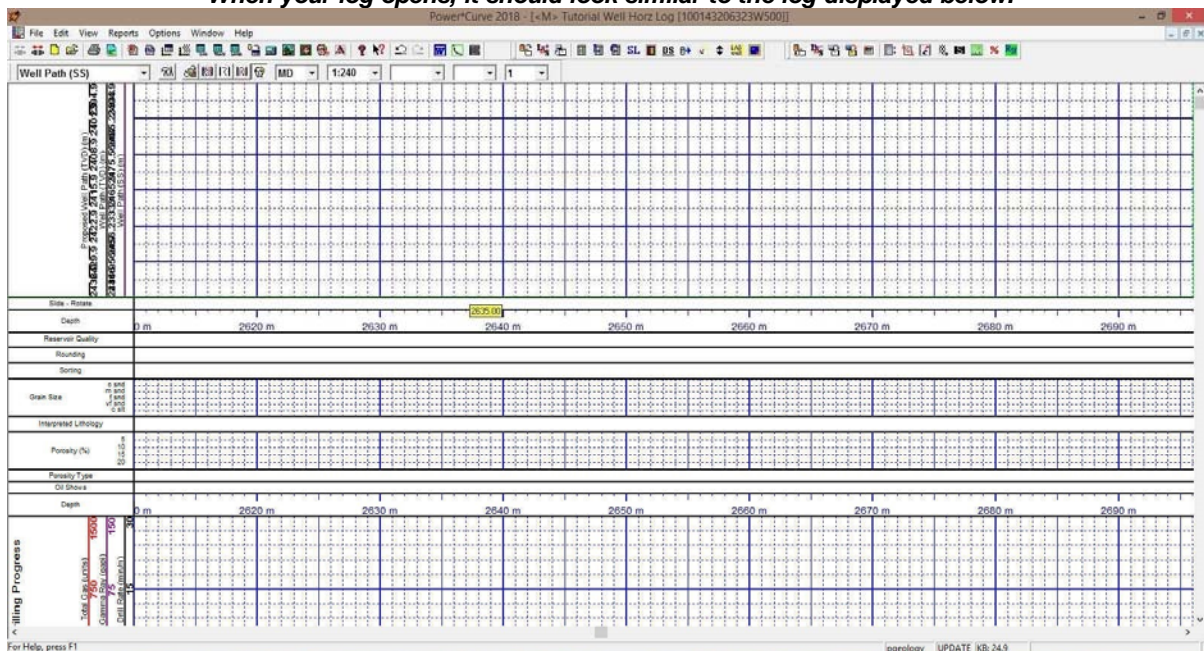
- 15.) Click on the **Save** button, and exit from the ensuing **Shortcut Options** window by clicking once on the **Exit** button.
- 16.) You will now be prompted with an Add Generic Category layer window named Reservoir Quality. **Type Reservoir Quality** into the field as shown in the proceeding window.

- 17.) Click on the **OK** button. This will initiate another Add Curve Window for Gamma Ray.

- 18.) The Curve Units, top an bottom scales should be fine. Click on **OK** button.

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. ****



- 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.

The screenshot shows the 'Well' window with the following data entered:

- UWI: 100143206323W500
- Well Name: Tutorial Well
- Operator: ABC Oil and Gas
- Drilling Contractor: Drill Em Up
- Province/State: Alberta
- Country: Canada
- Surf. Location: 14-32-63-23 W5M
- Btm. Location: 8-32-63-23 W5M
- Licensee: ABC Oil and Gas
- License #: 124634
- Pool: Big
- Field: Bigger
- Rig #: 23
- Reference: Survey Pe
- KB: 24.9
- Ground / Collar: 21.1
- Casing Flange: 21
- Surface Coordinates:
 - Latitude: 53.612323
 - Longitude: 112.908911
 - N/S: 1400.5 meters North of the South Boundary of Sec. 32-63-23 W5M
 - E/W: 550.2 meters East of the West Boundary of Sec. 32-63-23 W5M
- Intermediate Casing Point Coordinates:
 - Latitude: 53.612401
 - Longitude: 112.909023
 - N/S: 1399.2 meters North of the South Boundary of Sec. 32-63-23 W5M
 - E/W: 550 meters East of the West Boundary of Sec. 32-63-23 W5M
- Bottom hole Coordinates:
 - Latitude: 53.615377
 - Longitude: 113.103213
 - N/S: 603.5 meters North of the South Boundary of Sec. 32-63-23 W5M
 - E/W: 1213.5 meters East of the West Boundary of Sec. 32-63-23 W5M
- UTM Surface Coordinates:
 - Northing: 373718.96
 - Easting: 5942083.68
- Hole Direction: Horizontal
- Faulted: ☐
- Deviated: ☒
- Hole ID: 100-302
- Depths:

Drillers T.D. (Tally) MD	Drillers T.D. (Tally) TVD	Drillers T.D. (Strap) MD	Drillers T.D. (Strap) TVD	Loggers T.D. MD	Loggers T.D. TVD
3241	2426.96	3240	2426.96	3243	2426.96
- KB to Ground: 5.3
- Cut: 1.5
- Fill:
- Plugback:
- Sidetrack:
- Water Depth Reference:
- Water Depth:
- Work Schedule:

Date	Time	Work Schedule
Jan 3, 2015	12:30	Curves
Jan 22, 2015	23:00	Mud Types
Jan 31, 2015	08:00	Dir. Surveys
		Det. Lith.
		Abstract

- 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.

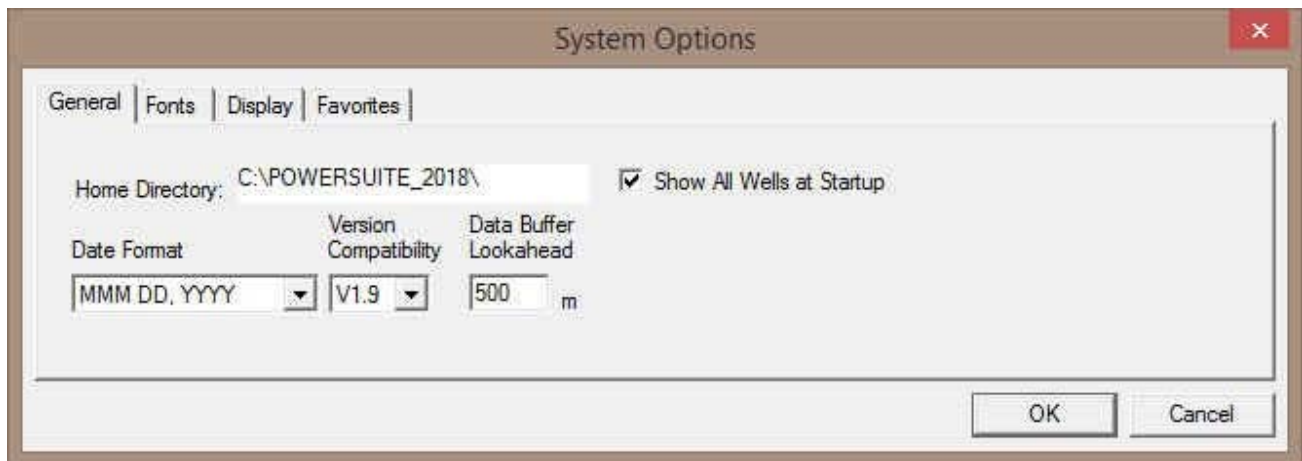
- If the record has been successfully saved, **click** on the **Exit** button, when prompted with the **Shortcut Options** system window shown below:

The 'Shortcut Options' window contains the following text and buttons:

- Record saved successfully. Choose one of the following shortcuts.
- Buttons: Start New Record, Move to Next Record, Exit, Cancel

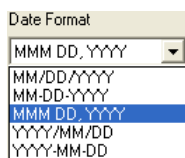
To activate the System Options window **click** on **System Options** under the **Options** menu selection.

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.



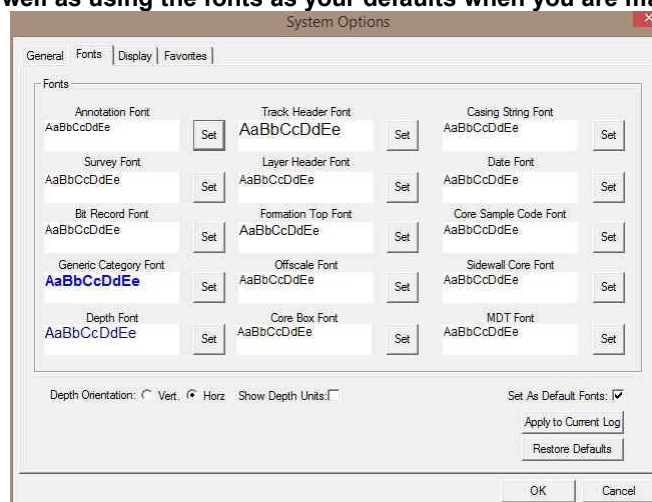
Date Format - From this drop box, you can select the date format. This selection determines how every date in **Power*Log / Core & Curve** will be entered and displayed. If you import a log with different date formats, **Power*Log / Core & Curve** will change the dates to comply with the format you've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

System Options

General | Fonts | Display | Favorites

Symbology

☒ Arrowed Subintervals Frequency @ 1,240: 1 symbol every 2 m

☒ Transparent Lithology Profile ☐

☒ Use Global Symbols Use Ratio Scales ☒

☐ Interbed Line Display Type

☒ Curve Backup Fill

Grain Size

Scale: Canstrat Verbal Display: ☒ (mm) Display: ☐ Hard Edges ☒ Soft Edges

Fill Pattern: Pattern Color: [Color Picker]

Carbonate Textures

Fill Pattern: Pattern Color: [Color Picker]

☒ Hard Edges ☒ Soft Edges

Interpreted Lithology Layer

Show Bedding Contacts: ☒ Show Accessories: ☒

Monitor

Height: 8.5 inches Width: 16 inches

Other

Directional Survey display: Azimuth

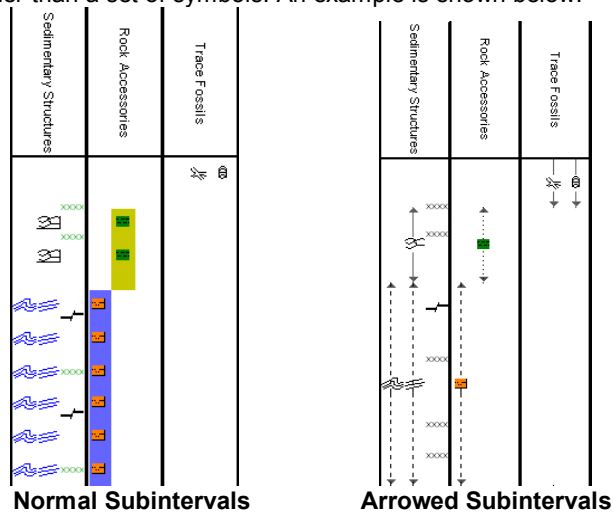
☒ Display TVD

☒ Display SSL

☒ Sidewall Core Run and Core No.

OK Cancel

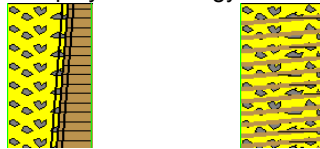
Arrowed Subintervals - This check box ☒ when activated will indicate the top and bottom of your subintervals (portion of an interval) with an arrow rather than a set of symbols. An example is shown below.



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.

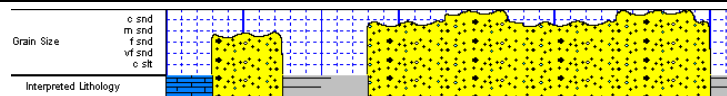


Curve Backup fill - This check box ☒ when activated will show a sideways hatching fill pattern when a curve goes off scale or in the backup mode. If unchecked there will be no hatching pattern when the curve goes off scale.

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.

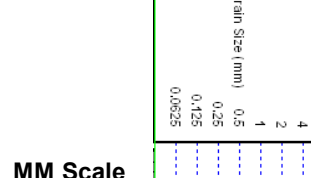
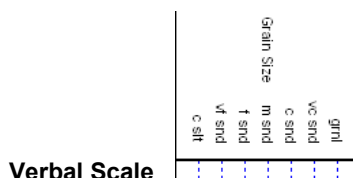
Note: The user may wish to turn off the track borders when this option is selected. You will see an example of this shown below.



Grain Size Scale:

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.

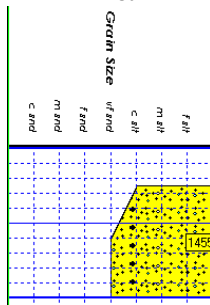
Verbal Display: ☒ This ☐ radio button will display the **Grain Size Track header** with the equivalent verbal grain sizes such as C silt, VF snd, F snd, M snd, C snd etc.



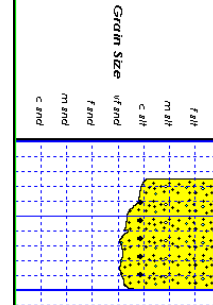
(mm) Display: ☐ This ☒ radio button will display the **Grain Size Track header** with the equivalent numeric grain sizes (in mm) such as .0625, .125, .25, .5, 1, 2 etc. as shown above.

☐ 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.

Hard Edges



Soft Edges

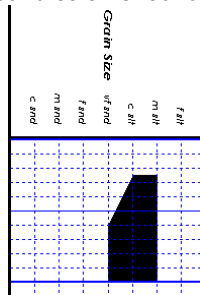


☒ Soft Edges This ☒ radio button will display the grain size with curved edges and rounded angles between the grain sizes.

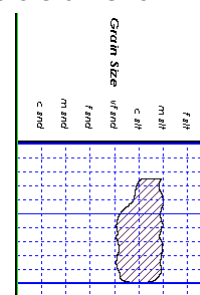
Grain Size Fill Pattern Upward hatch (left to right) at 45 degrees This drop box allows the user to select a hatching pattern when using the Grain Size Layer with the Lithology Profile not activate.

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.

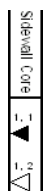
Monitor Width - This option allows you to scale your monitor for Power*Curve so you may correlate on-screen wells with hard copy logs that you may have. It is recommended that you take an opportunity to measure the horizontal viewing area of your monitor in inches and then insert that value in the **Monitor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

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

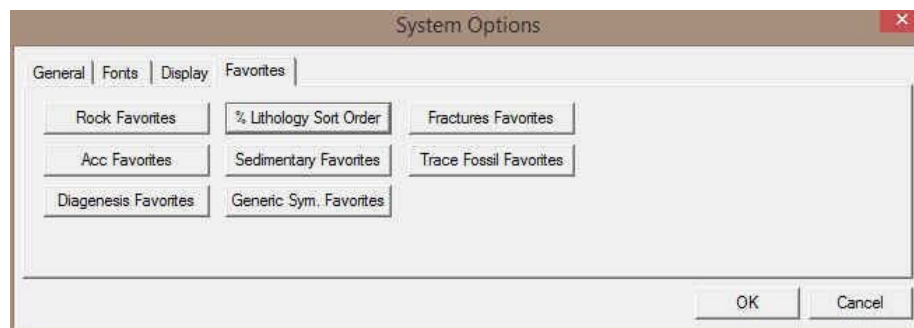
Display SSL check box ☒ when activated will display the survey with SSL values




☒ 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]

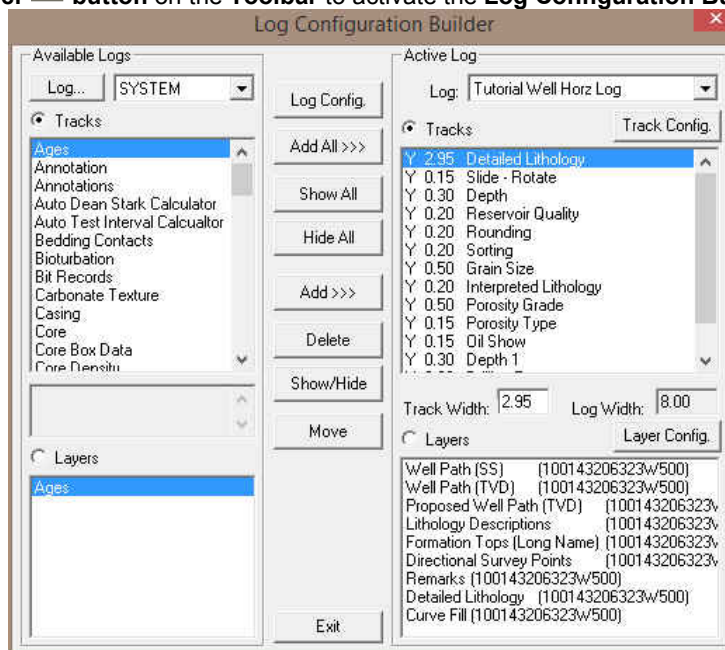
Cement

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.


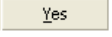
The right side of the Log Configuration Builder window: Active Log

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 working with), 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 Horz Log." 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 top of the log, while the track on the bottom of the list is drawn on the bottom 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.

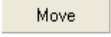

Working with the Log Configuration Builder window:**Deleting the Date track from the Horizontal Tutorial Log...**

- 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.

Turning off a track...



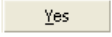
- 1.) Click on the **Porosity Type** track to highlight it on the right side of the Log Configuration Builder window.
- 2.) Click on the  button to turn the "Y"(yes), to the left of the track name, to "N"(no), indicating that the track will not be shown on the log, until it is reactivated.
- 3.) Alternatively,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

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 (2.95") and **type** in the value of **3.3**. Now, 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.

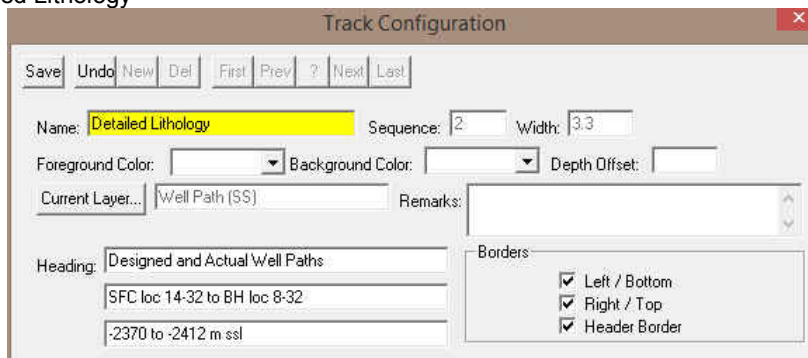
Note: For paper 8.5" wide, 8.00" is the widest that you want your log to be, especially if you are printing out the log in the **Landscape** paper orientation.




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  **Layers** 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...

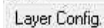
- 1.) Click on the **Detailed Lithology** track to highlight it.
- 2.) Click on the  button (to the right of Tracks portion of the window), to activate the **Track Configuration** window for Detailed Lithology

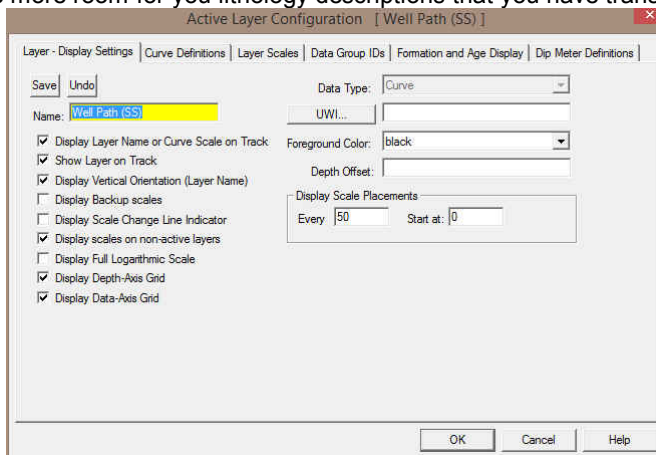



- 3.) The Track name is **Detailed Lithology**. To modify the Track Heading name type in “**Designed and Actual Well Paths**” in the first **Heading** field. In the second heading field, type in “**SFC loc 14-32 to BH loc 8-32.**” and in the third heading field type in “**-2370 to -2412 m ssl**”. These modifications are shown in Figure above.
- 3.) 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.

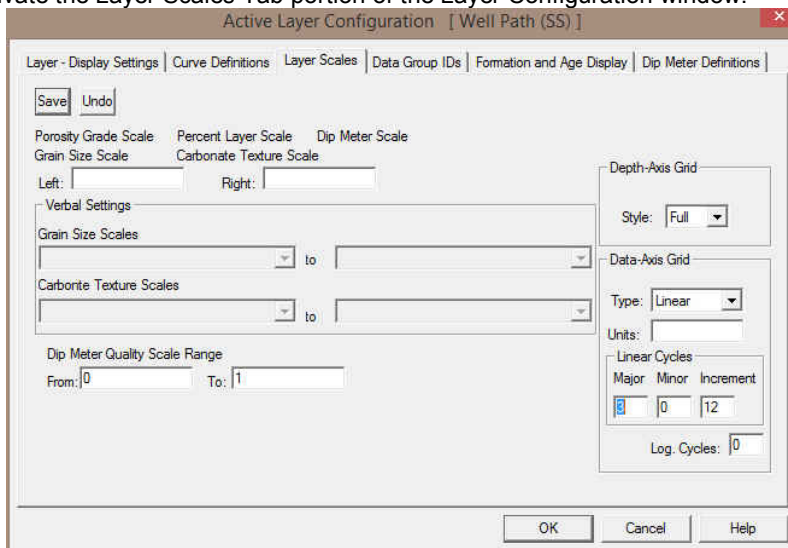
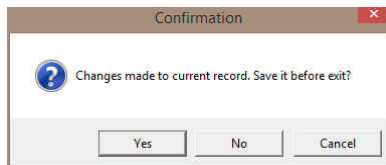
Configuring the Well Path SS / TVD and Proposed Curve Layers...


We will be doing this as the grid pattern is a little tight to show the curve scales on the header without being all meshed together.

- 1.) Click on the **Detailed Lithology** track to highlight it.
- 2.) Click on the **Well Path (SS)** layer to highlight it.
- 3.) Click on the  **Layer Config.** button (just above and to the right of Layers portion of the window), to activate the **Layer Configuration** window for Well Path (SS).
- 4.) 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.

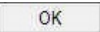



- 5.) Click on the **Layer Scales Tab**. It may activate a Confirmation Message asking you to Save? Click on the  **Yes** button. This will then activate the Layer Scales Tab portion of the Layer Configuration window.




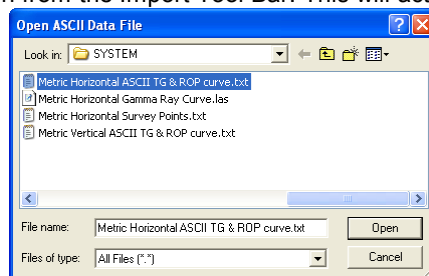
- 6.) In the lower right corner of the window is the grid pattern displayed by this curve. Change the **Linear Cycle Major** divisions from **6** to **3**.
- 7.) Click on the  **button**. This will activate a Database Message.




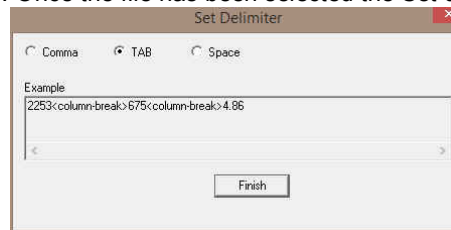
- 8.) Click on the  **button**.
- 9.) Click on the  **button** in the Layer Configuration window Layer Scales Tab. This will close the Window.
- 10.) Repeat Steps 2-8 for the Well Path (TVD) and Proposed Well Path (TVD) Layers


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

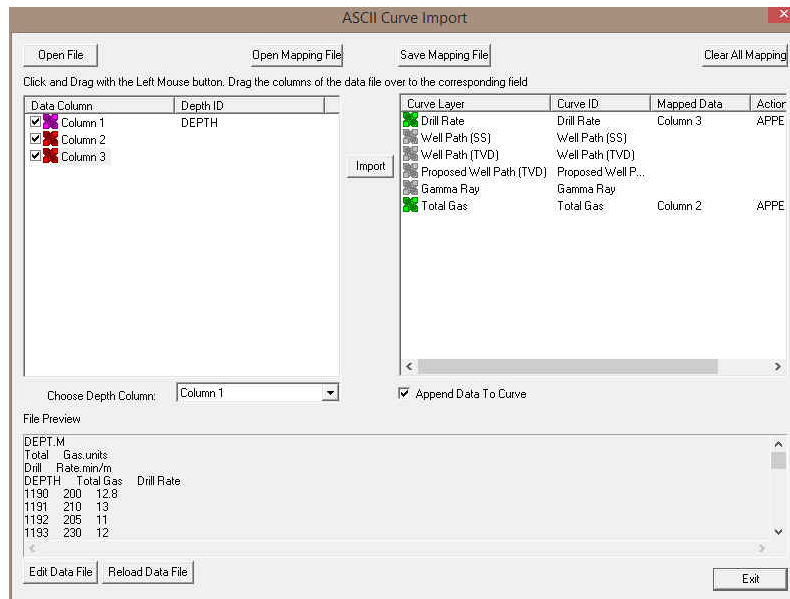
- 1.) Click on the **File** pull down menu, **select Import / Export** and then **select ASCII Import** from the pop out menu.
- OR the user can **select** the  Icon from the Import Tool Bar. This will activate an Open ASCII Data File window.



- 2.) Navigate to the **C:\Powersuite_2018\System** folder and **select the Metric Horizontal ASCII TG & ROP curve.txt** file. Click on the  **button**. Once the file has been selected the Set delimiter window will be activated.



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



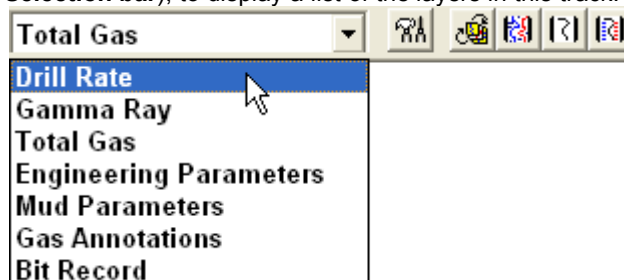
- 4.) If you saved a mapping file for the GAS and ROP import in the Power*Log tutorial then you can **click** on the **Open Mapping File** button and then select your mapping file. This will map the curves to the layers. Skip to step 8.
- 5.) The default on the Depth column is Column 1 which is indicated by the purple X. **In our case the depth is the first column so we do not have to change the depth column indicator.**
- 6.) **Click** on the **Column 2** on the left side and **drag it to the Total 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.
- 7.) **Click** on the **Column 3** on the left side and **drag it to the Drill Rate 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.
- 8.) **Click** on the **Import** Button. This will import the curve data and prompt you with a database message saying Imported successfully.



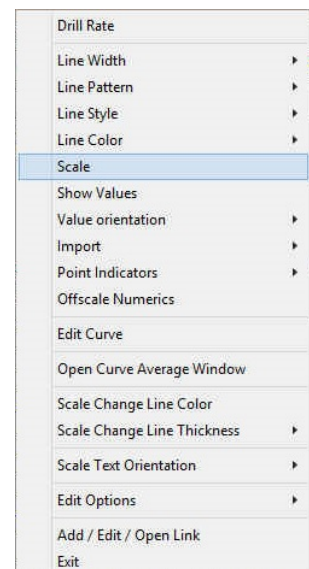
- 9.) **Click** on the **OK** button to close the window.
- 10.) **Click** on the **Exit** button to close the ASCII Import window.
- 10.) **Click** on the **Exit** button or Press the **Esc** key on the keyboard to exit from the Curve Editor.

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.

The 'Curve Scale' dialog box has a title bar with a close button. It contains a menu bar with 'Save', 'Undo', 'New', 'Del', 'First', 'Prev', '?', 'Next', and 'Last'. Below the menu bar, there are fields for 'from' (0), 'to' (1212), 'Left / Bottom' (0), and 'Right / Top' (30). The 'Depth Interval...' field is set to 0. The 'Backup Scale' dropdown is set to 'straight shift'.

- 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.

Two 'Curve Scale' dialog boxes are shown side-by-side. The left box shows the 'from' field set to 1212 and the 'to' field set to 10000. The right box shows the 'from' field set to 1212 and the 'to' field set to 1260. Both boxes have the 'Left / Bottom' field set to 0 and the 'Right / Top' field set to 60. The 'Depth Interval...' field is set to 1212 in both. The 'Backup Scale' dropdown is set to 'straight shift' in both.

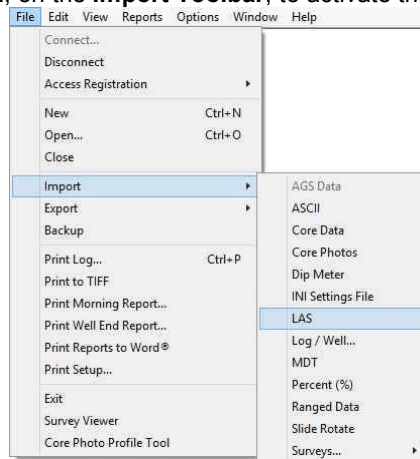
- 7.) Click on the **Start New Record** button. This will clear the window and add a 3rd scale to the drill arte curve.

The 'Curve Scale' dialog box shows the third scale configuration. The 'from' field is set to 1260 and the 'to' field is set to 10000. The 'Left / Bottom' field is set to 0 and the 'Right / Top' field is set to 30. The 'Depth Interval...' field is set to 1260. The 'Backup Scale' dropdown is set to 'straight shift'.

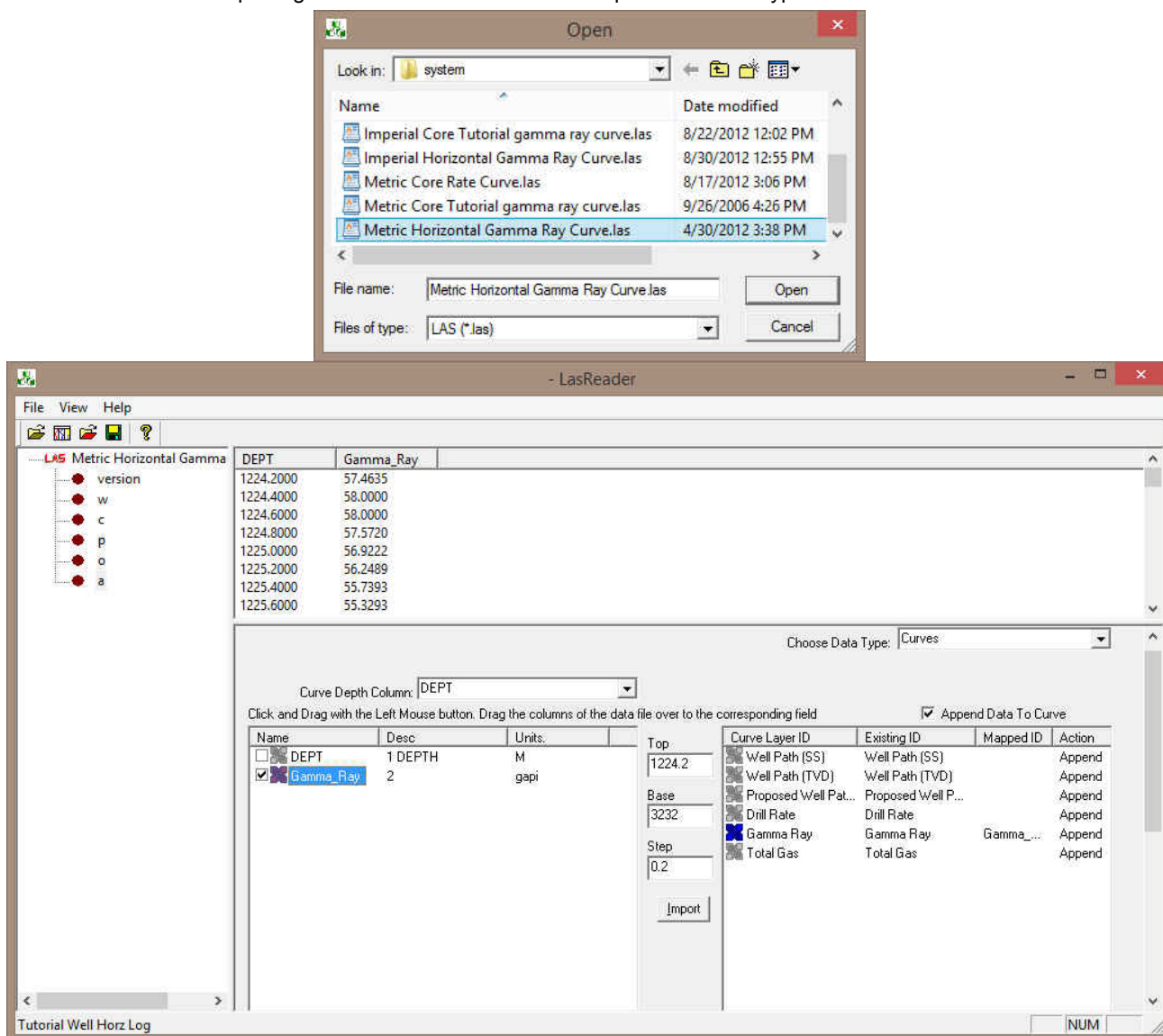
- 8.) Type in 1260 in the **from depth** interval field, tab, type 10000 in the **to depth** interval field, tab, type in 0 in the **left / bottom scale** field, type in 30 in the **right / top scale** field, select **strait shift** from the **Backup Scale** drop box.
- 9.) Click on the **Save** button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

Importing an LAS Gamma Ray Curve Data

1. Click on the **File** pull down menu selection and click on **Import** and then click on **LAS** from the pop out-menu or simply click on the **LAS** button, on the **Import Toolbar**, to activate the **LAS Reader** window.



2. This will then activate the Open window which allows the user to select the LAS file you wish to import the data from. You can find the file in the PowerSuite_2018\System\Metric Horizontal Gamma Ray Curve.las and highlight the file by **clicking** on it **once** and then **click** on the **Open** button. You will see the window shown on the next page. We default to the importing of Curve data. The user can Import other data types as well.



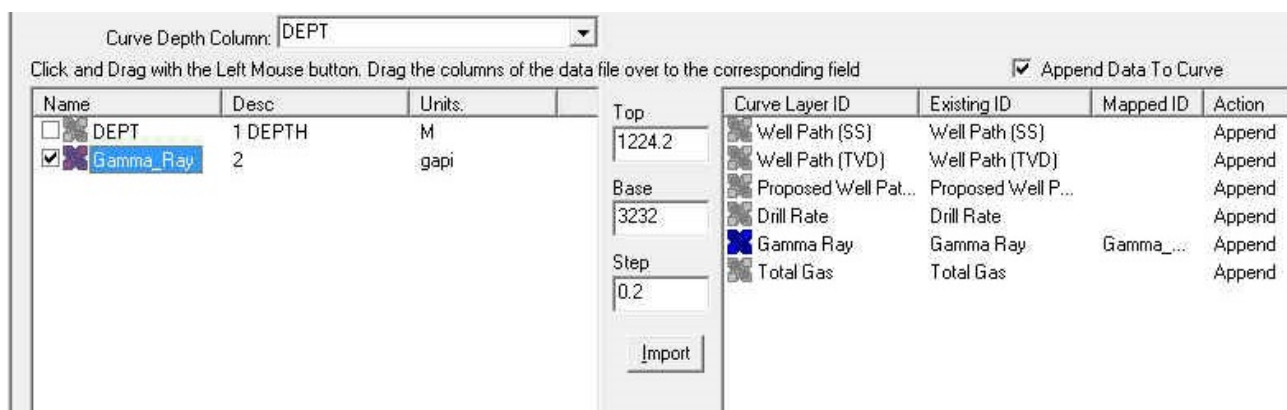
Overview of window

The **left hand side** of the **LAS Reader window** (shown on the right) allows the user to see the tree view of the data file format including the different data, parameter and definition blocks. The tree enables the user to select different sets of data or definitions. We have the choice to import these data types into the predefined data sets such as curves, Inclinometry, Tests, Tops and Core Data within the Power*Suite application. We default the window to select the log data or curve data if it is available.

The **upper right hand side** of the **LAS Reader window** (shown to the right) allows the user to see the data associated with the different data and parameters and definition blocks.

The **bottom left hand side** of the **LAS Reader window** (Shown below left) displays the curve data sets that available to be imported. These can then be dragged to the import side of the LAS reader.

DEPT	Gamma_Ray
1224.2000	57.4635
1224.4000	58.0000
1224.6000	58.0000
1224.8000	57.5720
1225.0000	56.9222
1225.2000	56.2489
1225.4000	55.7393
1225.6000	55.3293



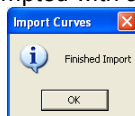
The **bottom right hand side** of the LAS Reader window (shown above right) shows the Import side displaying the Curve Layers and Curve names associated with the log that is open and active at the time the LAS Reader window was invoked.

Importing LAS Curve Data files

1. On the lower left side of the window **Click and drag** the **Gamma Ray curve** to the **Gamma Ray layer** on the lower right side and release it when the layer name becomes highlighted.

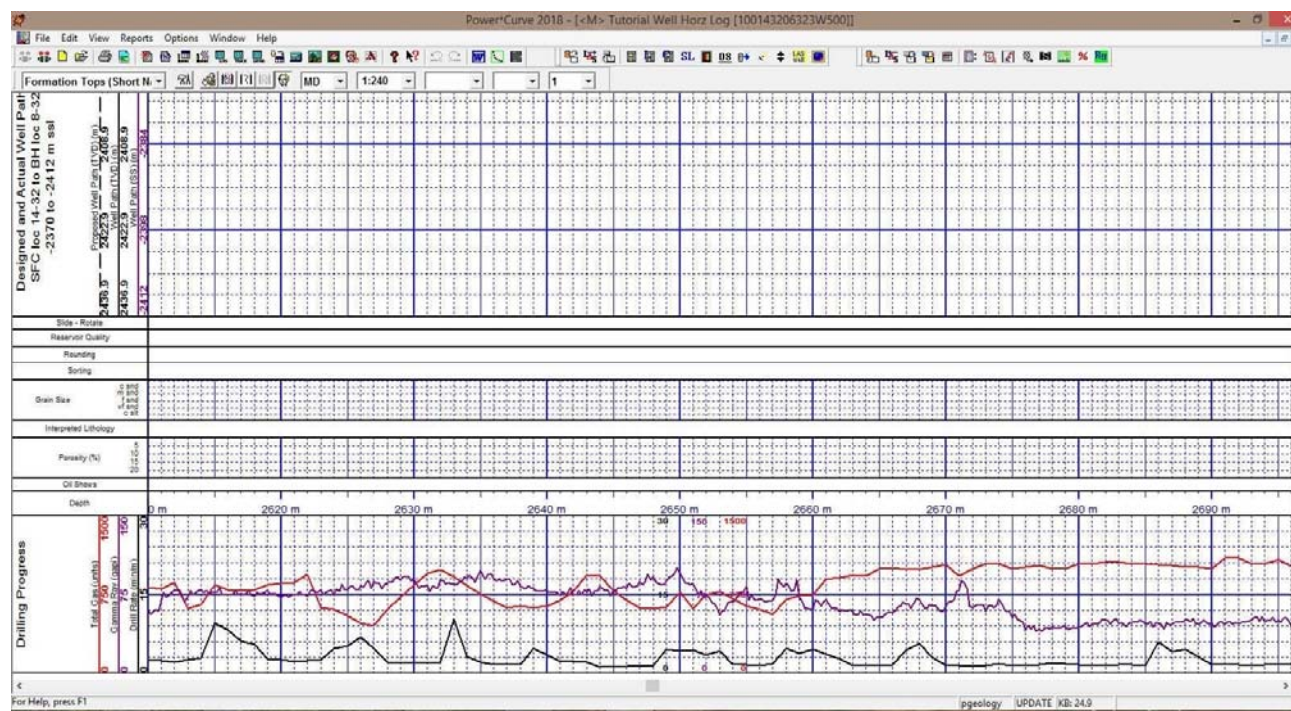
N.B. The user can **Right click** on the **Curve Layer ID** to remove the mapping or switch the action from append to replace. The Symbol color will either be purple for replace or blue for append.

2. **Click** on the **Import** button. You will then be prompted with a system message after the import has finished.



3. **Acknowledge** the Finished Import message. **Click** on the **OK** button and then **click** on the **X** button to exit or **click** on the **File** menu and **select the Exit** option to close the LAS Reader Window.

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




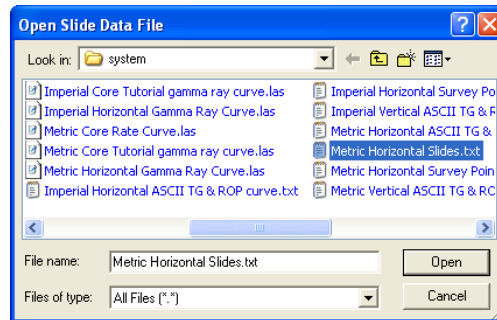
The Slide/Rotate Layer:


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

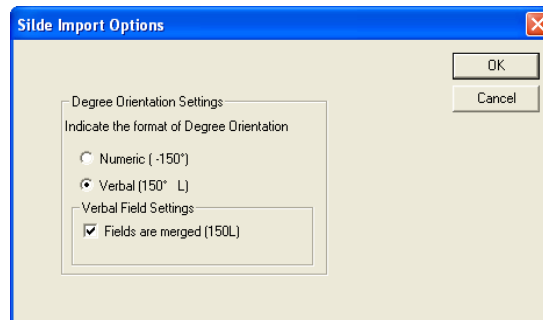
The **Rotate** function of the window is shown as disabled, because rotation is represented as a blank space on the layer. The only thing you can physically draw on this layer is a **Slide** or Orientation of the Drill string as done when you are directionally drilling, which is shown as a black bar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


Importing ASCII File Data into the Slide Rotate layer:

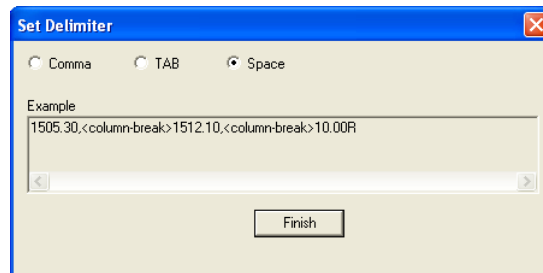
- 1.) Click on the **File** pull down menu, **select Import / Export** and then **select Import Slide Rotate** from the pop out menu. OR the user can **select** the  Icon from the Import Tool Bar. This will activate an Open Slide Data File window.




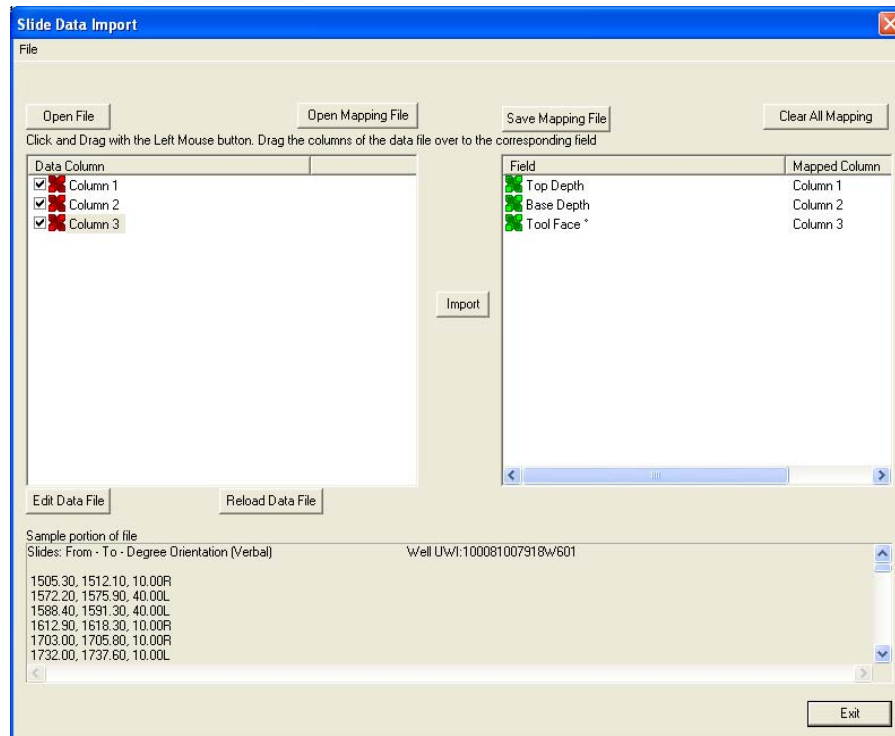
- 2.) Navigate to the **C:\Powersuite_2018\System** folder and **select** the **Metric Horizontal Slides.txt** file. Click on the  **Open** button. This will activate the Slide Import Options window.



- 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.



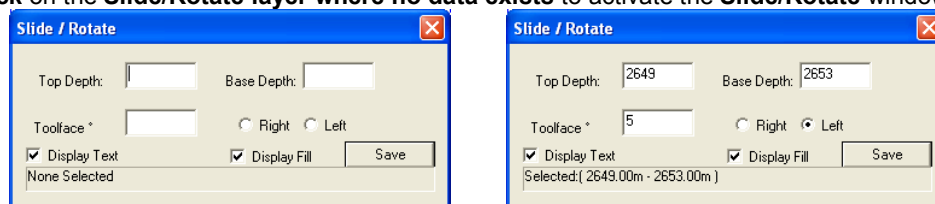
- 5.) Click on the **Column 1** on the left side and **drag it to the Top Depth** on the right side of the window. You will see Column 1 in the mapped Data field.
- 6.) Click on the **Column 2** on the left side and **drag it to the Base Depth** on the right side of the window. You will see Column 2 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.

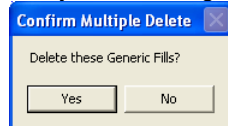



- 2.) On the **Slide/Rotate** track, position your mouse pointer at **2649m**, because this is where the **Slide** will begin.
- 3.) Hold down your **left** mouse button and drag the mouse pointer to **2653m** because this is the position where you want the **Slide** to end.
- 4.) Release the mouse button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

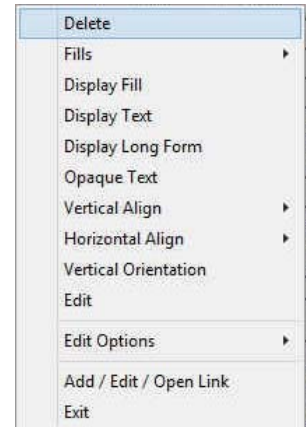
- 1.) **Right click** your mouse button on an existing **Slide**. This will activate the pop-out menu.
- 2.) **Click** on the **Delete** Selection and your slide will be deleted.
- 3.) If you would like to delete multiple slides **hold the SHIFT key down on your keypad** and **click and drag and area 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.

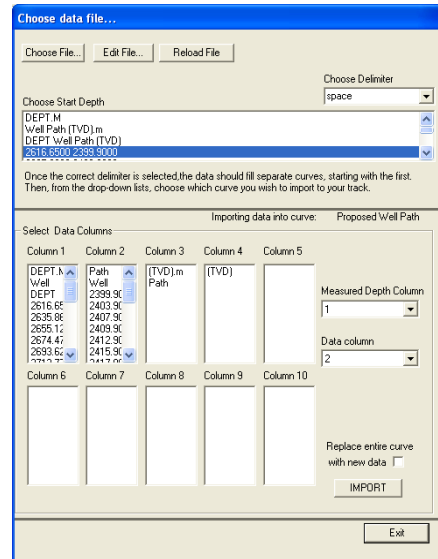
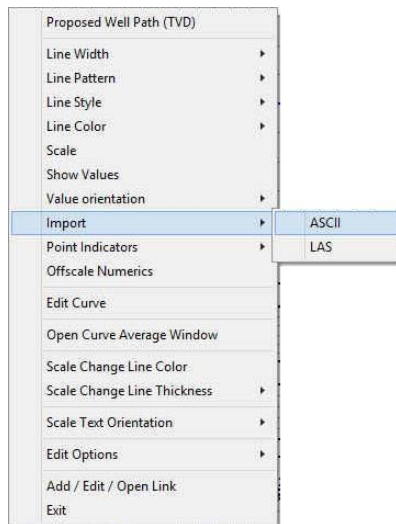


Import ASCII data to the Proposed Well Path Curve (right click method)

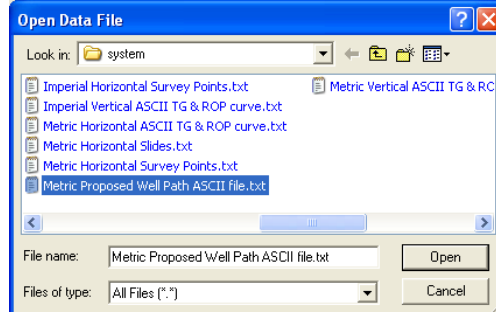
There are two ways to import ASCII data. The right click method was the first method that was developed for importing curve data. It has a couple of limitations. The first limitation is that it can only import one curve at a time and the other is that if the ASCII file has more than ten columns we are not able to import columns 11 and higher.

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. I.e. 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 the Pop out menu and then **select Import**. This will activate another pop out and then **select ASCII**. This will activate a Choose ASCII data file import window.



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



11.) Navigate to the **C:\Powersuite_2018\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**.

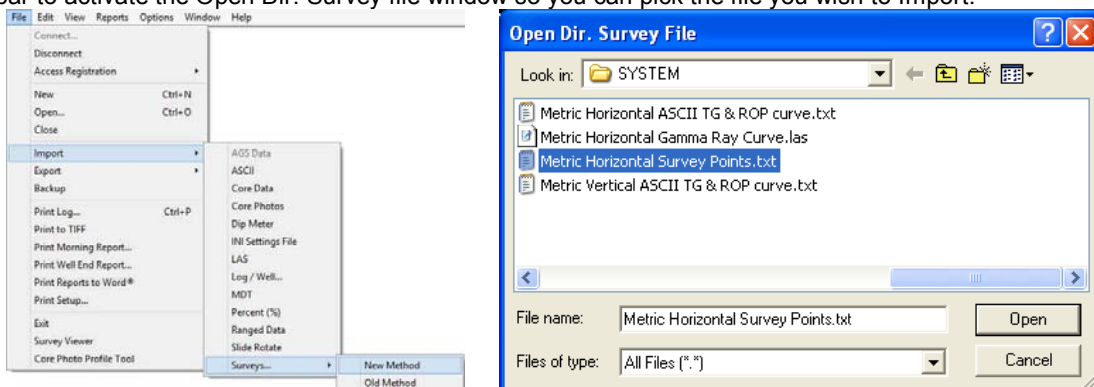
15.) Click on the **Import** Button. This will import the curve data for the Proposed Well path.

Directional Survey Report

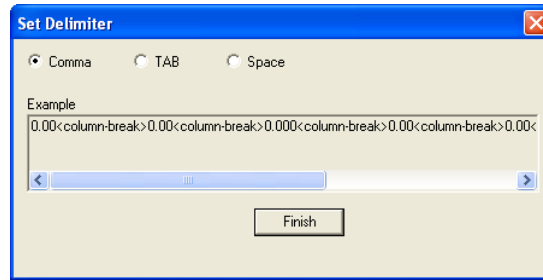
This report must have the information required for our minimum curvature calculations be prepared to accept and correctly calculate the survey data to be imported. The two bits of data that are required is the **Target Azimuth** of the well and either the **Tie In** or **Kick Off** point information.

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.

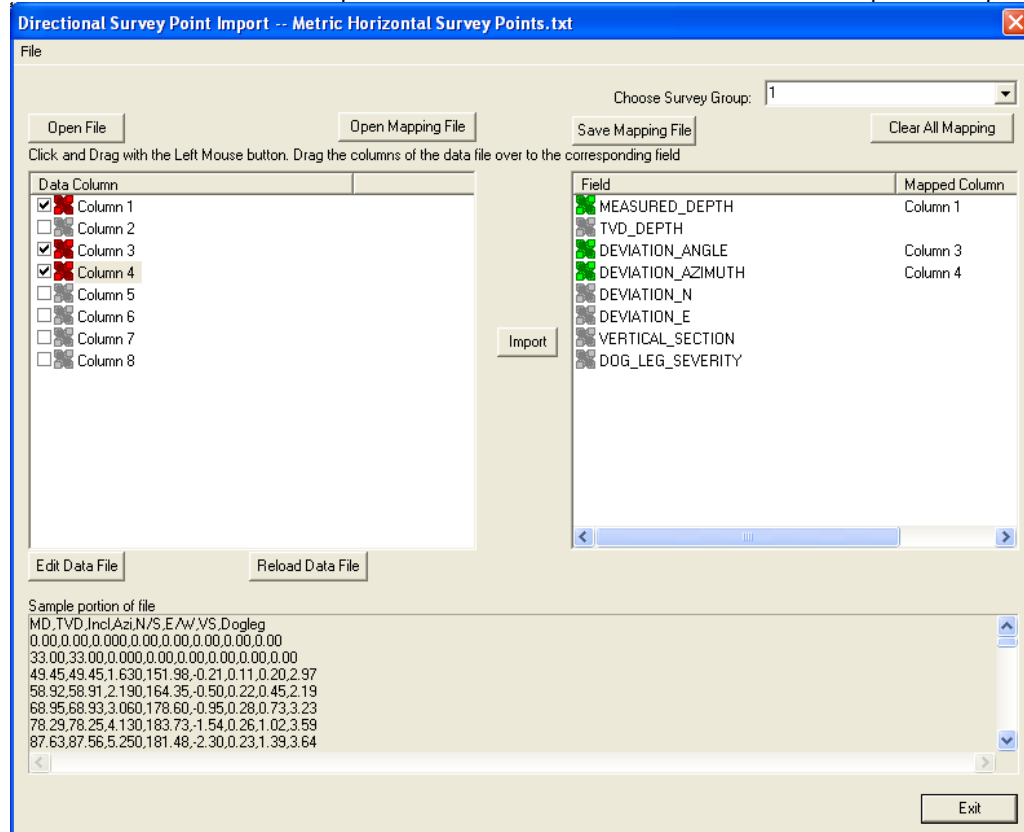
- 2.) **Select 30 from the Dog Leg Severity Characteristic Drop Box.**
- 3.) **Type in 110 in the Target Azimuth Field**
- 4.) **Type in 0 into all 8 Tie in Fields.**
- 5.) In the user defined portion of the window **place a check in the box beside the calculate field, select minimum curvature** from 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** to activate the pop-out menu and **Select 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_2018\System folder.** If chosen correctly it will look like the Open Dir. Survey File Window. **Click on the Open button.** This will activate the Set Delimiter window.



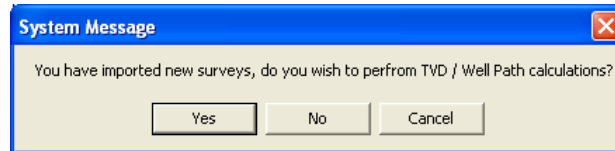
- 9.) This file is a Comma delimited file so the user must **activate the radio button beside Comma delimited**. You will see <column break> between the data points. **Click on the Finish button**. This will open the Import window.



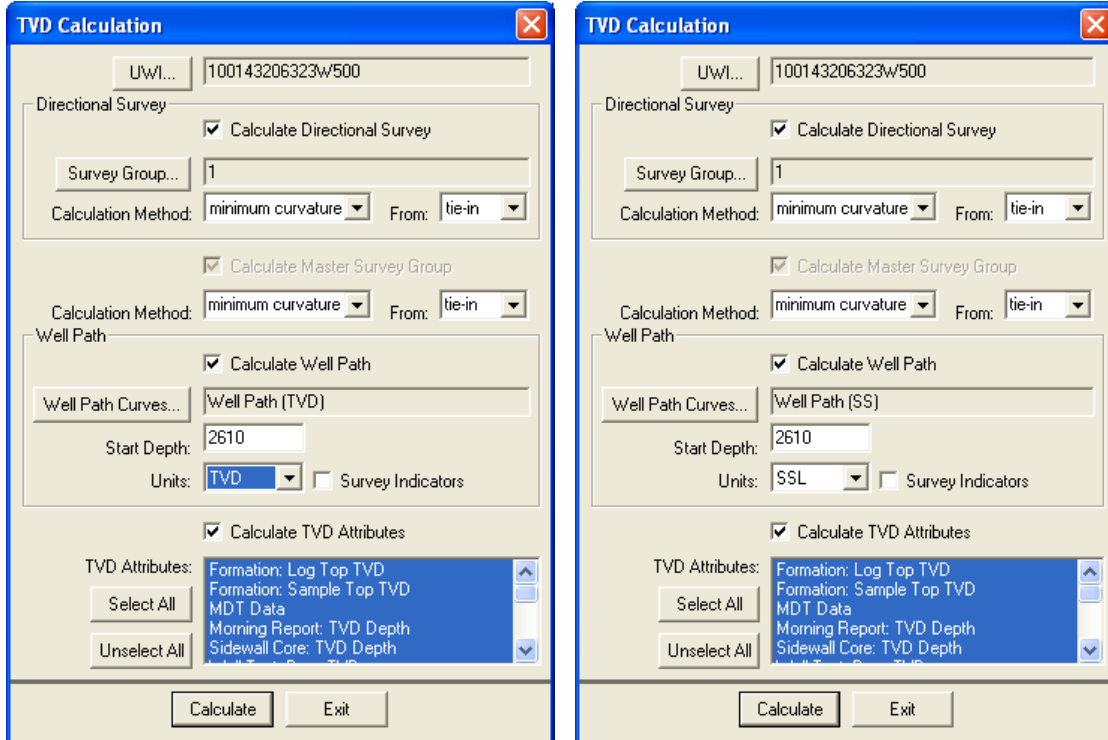
- 10.) **Click on the Column 1** on the left side and **drag it to the Measured Depth** on the right side of the window. You will see Column 1 in the mapped Data field and an APPEND in the action field.
- 11.) **Click on the Column 3** on the left side and **drag it to the Deviation_Angle** on the right side of the window. You will see Column 2 in the mapped Data field and an APPEND in the action field.
- 12.) **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.
- 13.) **Click on the Import Button**. This will import the curve data and prompt you with a database message saying Imported successfully.



- 14.) **Click on the OK button** to close the window.
- 15.) **Click on the Exit button** to close the ASCII Import window.
- 16.) This will activate a System Message will be activated asking the user "Do you wish to perform TVD / Well path Calculations?".



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



Calculate Well Path (TVD) Curve

Calculate Well Path (SS) Curve

- 18.) 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
- 19.) In the Master Survey Group select the **Minimum Curvature** in the Calculation Method drop box and **tie in** is selected from drop box
- 20.) 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.
- 21.) **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**.

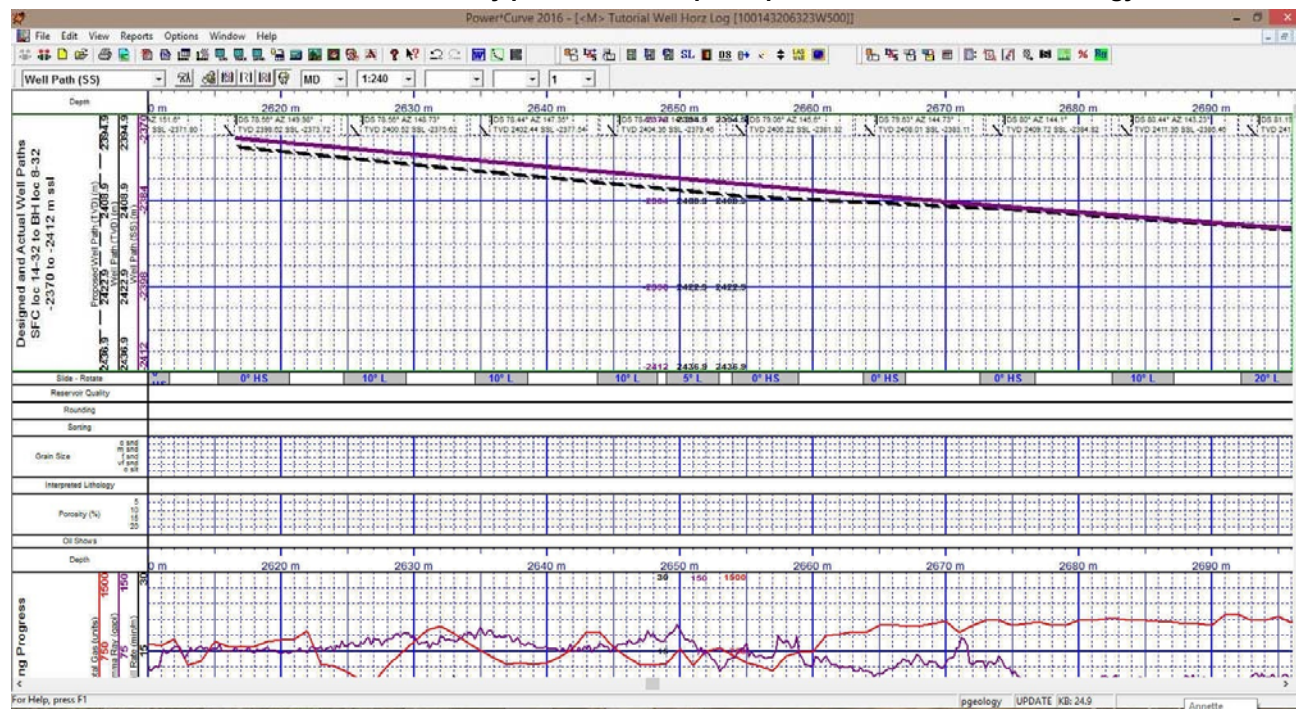
Note: The reason why we will **start this curve at 2610** is because of the TVD / SS scales we have picked for the horizontal display. This is the depth where the curves are on scale and will not wrap before getting on scale. Wrapping can cause lots of display issues with our curve fills. Once you have a number in this field it will stay for the duration of the well.

- 22.) 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.
- 23.) 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.
- 24.) 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.

25.) **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**.

26.) **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.



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.

Note: 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, rexlid 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 **Save** button and then click on the **Start New Record** button from the ensuing **Shortcut Options** window.
- 6.) Click on the **Auto Next** 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:

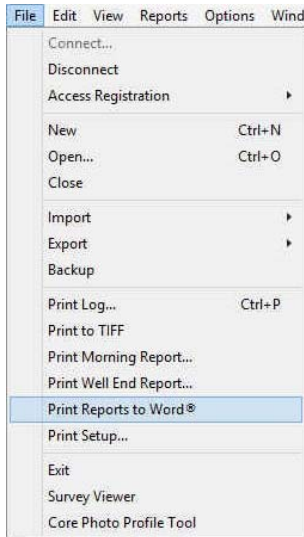
wh, lt gy, m - c gred, modly w srt, sbang - sbrdd, qtz, tr wthrd fld grs, tr dk cht pbls, sils cmt, g - ex intgran por (20-22%), abnt even brn o stng, flor aa.

- 10.) Click on the **Save** button and then click on the **Exit** button from the ensuing **Shortcut Options** window.

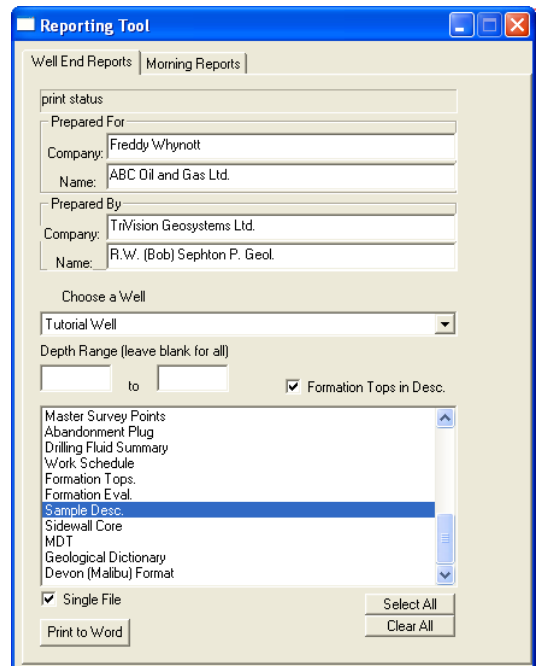
You will now view all your sample descriptions on the upper third of the Lithology Description Layer in your Detailed Lithology Track. We will move these descriptions around to fit so that the reader can see all the descriptions on the log at a later time. This will be done when we are finished with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

Printing out Sample Descriptions to MSWord.

- 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 **Reporting Tool** window.



- 2.) The **Reporting Tool** print window will automatically default to the active **Well/Log Name**. You will see **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 **Print to Word** button in the **Well End Report** window to print out the **Sample Descriptions**. This will activate your word program and you will get the Sample descriptions and Formation tops that were




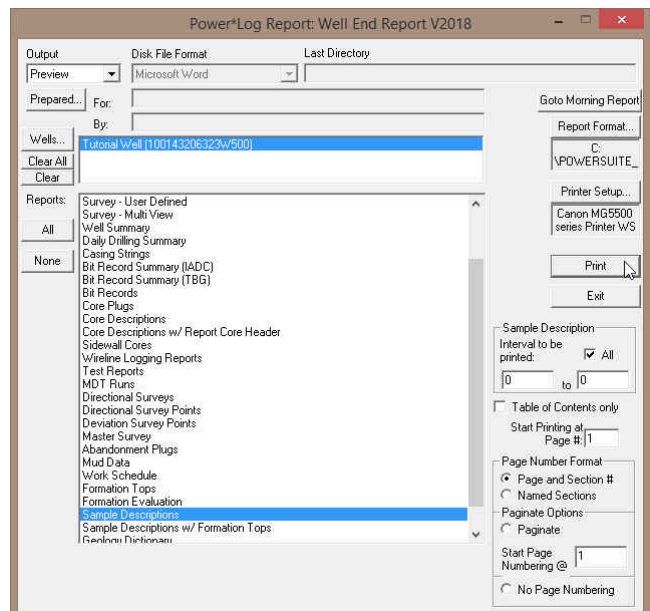
input through the Reports window.

- 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 **Yes** button and the window selections you have just made will be remembered for the next time. Clicking on the **No** button will remember the default selections that were set for this window.

Printing out Sample Descriptions (Crystal Format)

- 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.




- Click on the **Printer Setup...** 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.

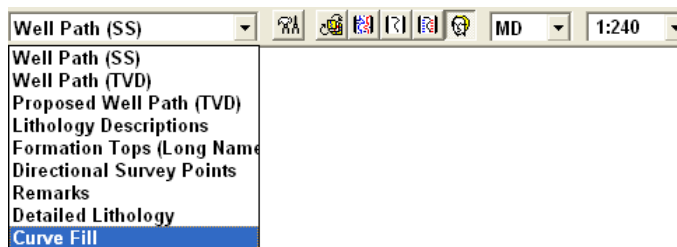
Note: Power*Log™ automatically defaults to a **Paper Orientation** of **Portrait** and a **Paper Size** of **8 5 x 11**, as specified in the **Orientation** and **Paper** sections, respectively, of the **Print Setup** window. Please do **NOT** change these default settings.

- Make sure that the **All** check box ☒, in the **Sample Description** section at the lower right of the **Well End Report** window, is activated.
- Click on the **Print** button in the **Well End Report** window to printout the **Sample Descriptions**.
- 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 **Yes** 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.

- 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.
- Click on the **down arrow** in the **Layers Selector** on the Selection Toolbar and **select the Curve Fill** layer.
- Double click on the **Detailed Lithology** track or click on the  button. This will activate the Curve Fill options window.



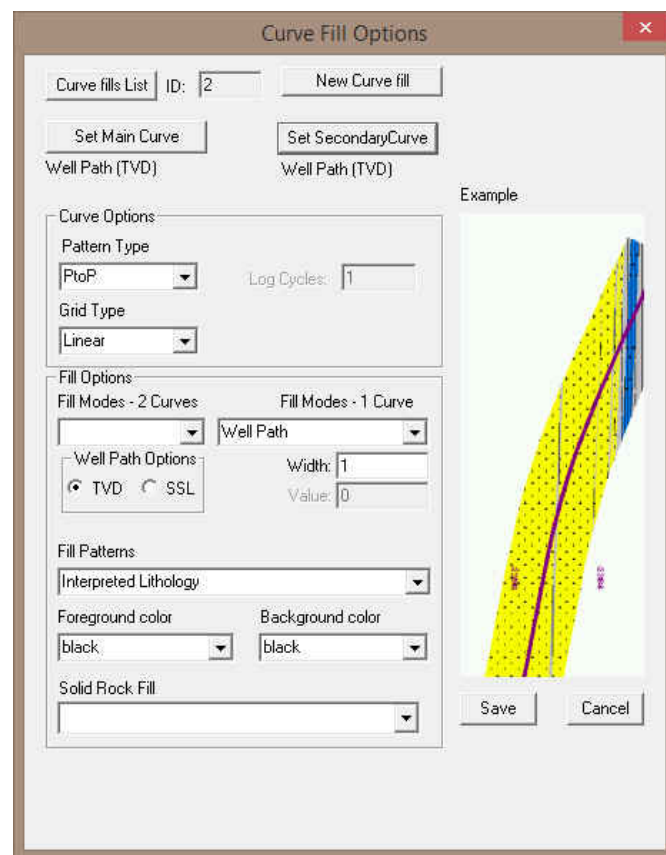
- Click on the **Set Main Curve** button. This will activate a list of curves associated with this well.
- Click on the **Well Path (TVD)** so that it gets listed in the upper portion of the window and then click on the **Select** button or double click on the **Well Path (TVD)**. You will now view the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

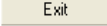

Curve Options Portion of the Window. This information is pertaining to the Main Curve and its Curve attributes.

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

Fill Options Portion of the Window (One Curve)

- Click on the **Fill Modes – 1 Curve** down arrow and select **Well Path**.
- Type **1** in the **Width** field. Example If (1) one is typed into the width field then the fill will be 1/2" either side of the Well Path Curve.
- Select the radio button beside the **SSL** because we will be using the SS scales.
- Click on the **Fill Patterns** down arrow and select the **Interpretive Lithology**.



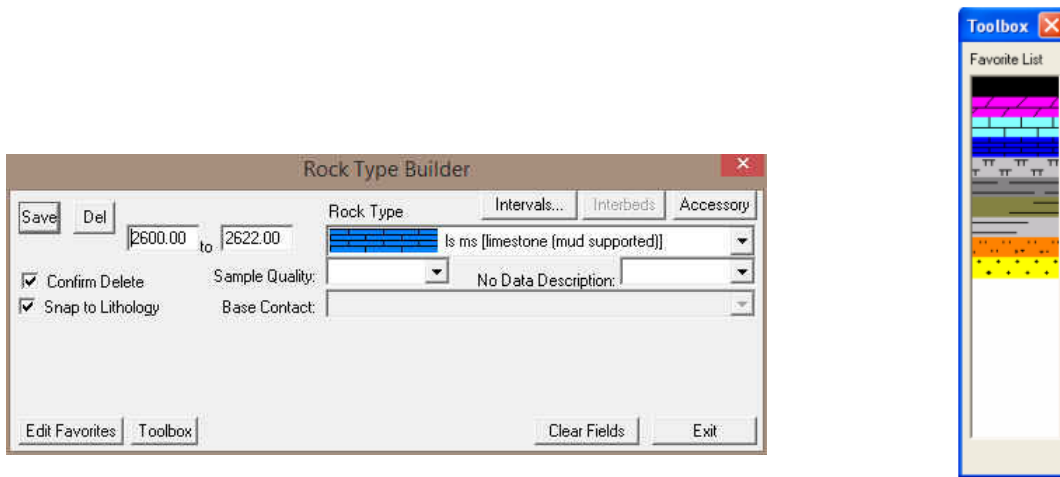
- 12.) Click on the  button to close this window.
- 13.) Click on the  button to exit the Curve fill options window.

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.

Note: If you happen to do something wrong remember you have an **UNDO** under the **Edit Menu** selection. Also there is an  button on the **Toolbar**.

- **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...

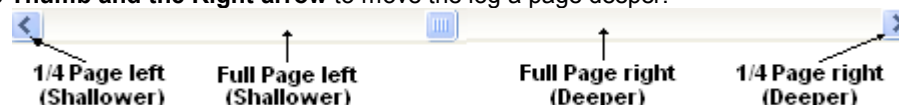
- 1.) **Select** the Rock Type for **Ls ms (limestone (mud supported))** from the Toolbox and it will automatically be displayed in the **Rock Type** field within the **Rock Type Builder** window **or** the user can **click** on the **existing Limestone** that was drawn on the left to select that rock 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 **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 lithology's 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 **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 **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.

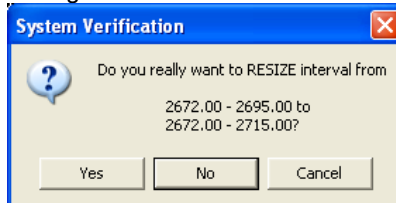
Inserting Rock Type within an interval...

- 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 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  button to resize the **Sandstone** bed.

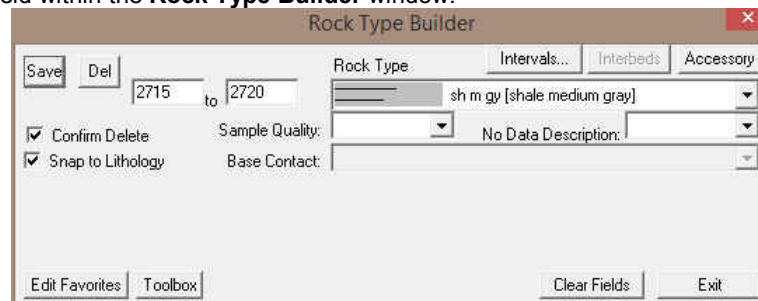
Changing the Log Scale, Mouse Pointer Accuracy and changing the depth.



- 1.) **Click** on the **Screen Log Scales** drop box and **select 1:480**. This will make your screen or monitor log scale represent your log at a 1:480 depth scale. The user can type any scale in here between 1:1 and 1:5000.
- 2.) **Click** on the **Screen/Mouse Pointer Accuracy** drop box and **select 0.5**. This will make your mouse pointer accurate down to the ½ meter.
- 3.) **Click** in the **Go to Depth** field and **type** in **2710** and then **press** the **Tab Key** on your keyboard to place 2710 at the top of your Screen. The user can scroll up or down by using your mouse roller button or use the Scroll bars on the left side of the log. Arrow goes ¼ page, area between thumb and arrow full page. Thumb will not work.

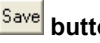
Drawing a Rock Type from the builder...

- 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.



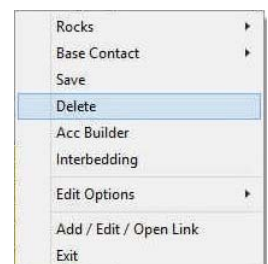
- 2.) **Type 2715** in the **from** field, **depress the tab key**, and then **type 2720** in the **to** field.
- 3.) **Click** on the  button.
- 4.) **Click** on the  button

Drawing a Rock Type from the builder...

- 1.) **Select** the Rock Type for **ss (Sandstone)** from the Toolbox and it will automatically be displayed in the **Rock Type** field within the **Rock Type Builder** window
- 2.) **Type 2720** in the **from** field, **depress the tab key**, and then **type 2820** in the **to** field.
- 3.) **Click** on the  button and then press the **Esc** key on the keyboard to exit from the **Rock Type Builder** window.
1. Press the **Esc** key on the keyboard to exit from the **Rock Type Builder** window.

Deleting a Single Rock Type or Bed

1. **Double click** on the **Interpreted Lithology** track to activate the **Rock Type Builder** window.



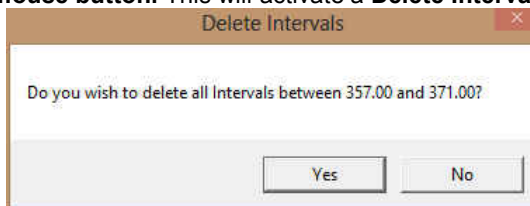
2. **Right click** anywhere within the **Interpreted Lithology** track to activate the pop-up menu.
3. **Click on Delete** and the following system message will be activated, "**Do you really want to DELETE _ to _ ?**"
Click on the **Yes** button to confirm the deletion.

Note: When you delete a **Rock Type**, you will also delete its associated bed restricted rock description information, i.e. **Grain Size, Porosity Grade, Type, Oil Show** and all other bed restricted data.

4. Press the **Esc** key on the keyboard to exit from the **Rock Type Builder** window.

Deleting Multiple Rock Types or Beds

1. **Double click** on the **Interpreted Lithology** track to activate the **Rock Type Builder** window.
2. **Hold the SHIFT Key down** and then **click and drag** anywhere within the **Interpreted Lithology** track and then let go of the Shift Key and left mouse button. This will activate a **Delete Intervals** message box.



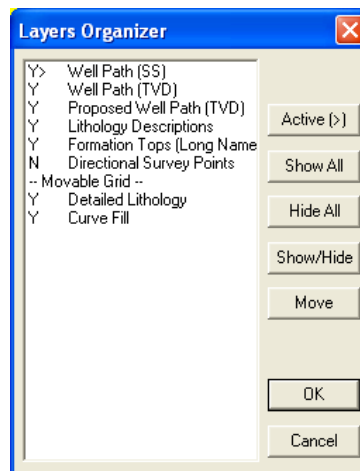
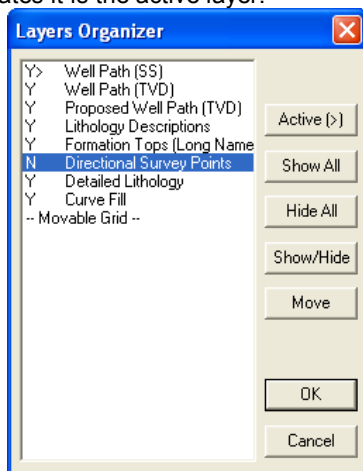
3. **Click on** **Yes** button and the Intervals dragged over will be deleted.

Note: When you delete a **Rock Type**, you will also delete its associated bed restricted rock description information, i.e. **Grain Size, Porosity Grade, Type, Oil Show** and all other bed restricted data.


4. Press the **Esc** key on the keyboard to exit from the **Rock Type Builder** window.

Layers Organizer 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 **Show/Hide** 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 **Active [>]** 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 be 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 **Move** button. It will change to **Move Start** 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.

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 45 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 44 for our suggestions.

Resizing Sample Descriptions

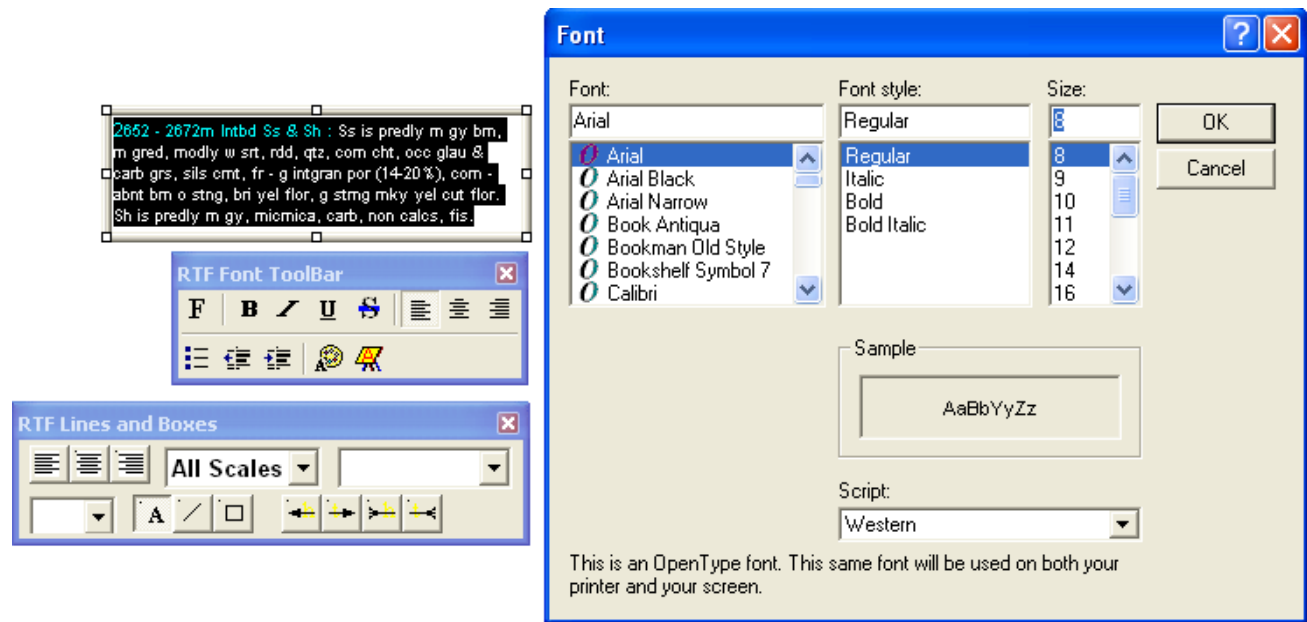
- 1.) Click anywhere within an **Annotation** to activate the RTF Toolbars for the Lithology Descriptions Layer and it will highlight that description and an outline will appear around the **Sample Description**.

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

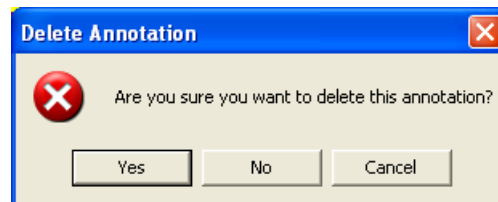
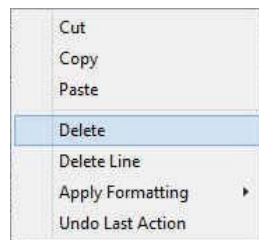
- 1.) Click on the **Intbd Ss & Sh description from 2652 to 2272 m** to activate the RTF Toolbars for the Lithology Descriptions Layer and it will highlight that description
- 2.) Highlight the entire description by clicking and dragging the mouse pointer.
- 3.) Click on the **F** selection in the RTF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



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

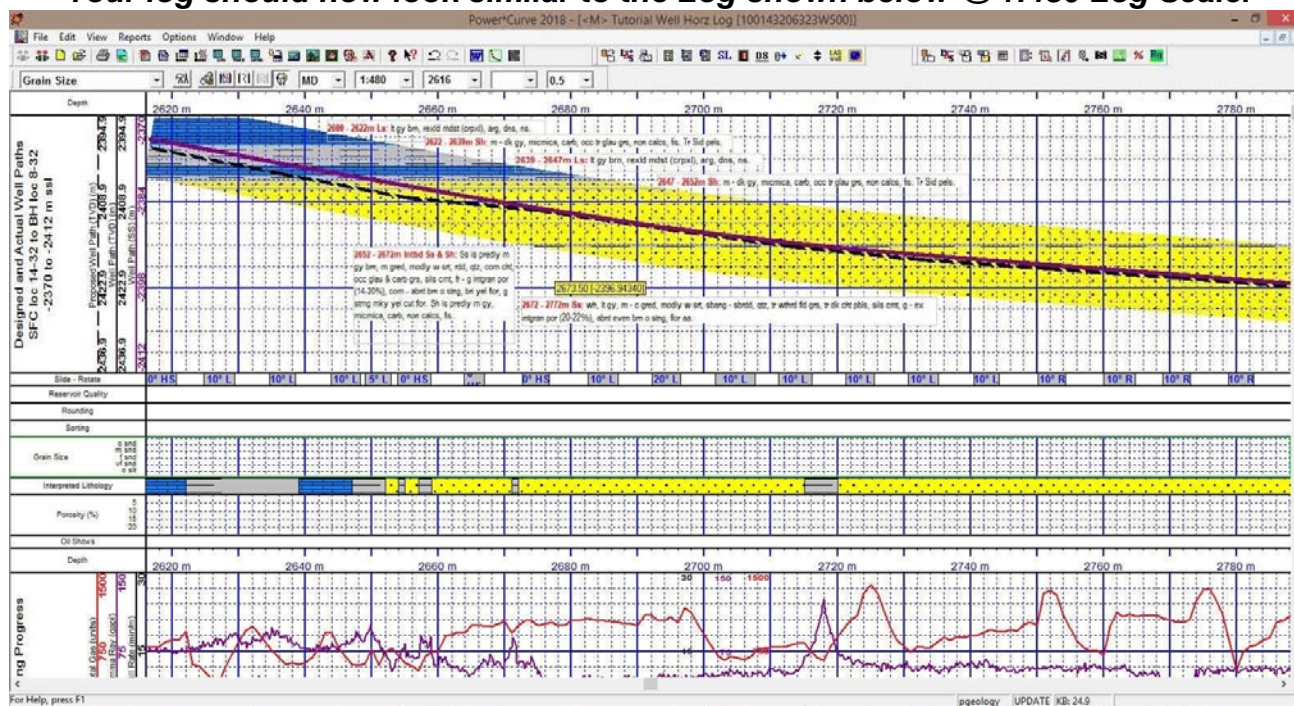
Deleting a Sample Description

- 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



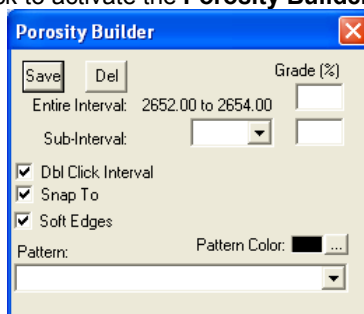
- 3.) Click on the **Yes** button. Your annotation will be deleted.

**** Your log should now look similar to the Log shown below @ 1:480 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 Sandstone 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**.

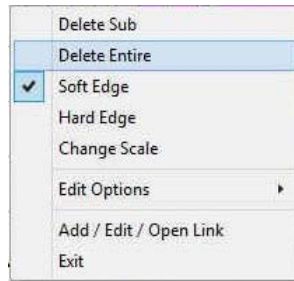
Drawing Porosity Grade sub-intervals...

To draw **Porosity (%)** sub-intervals, as illustrated on **Page 50**, 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.

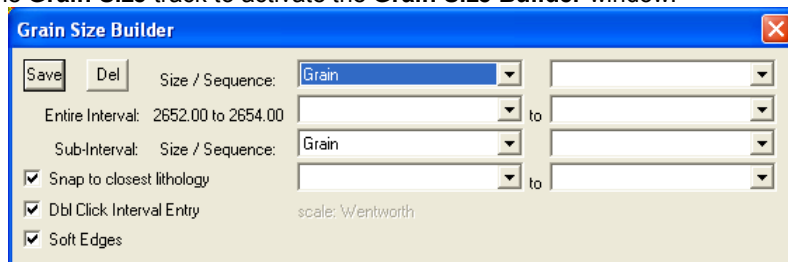
Note: If you happen to do something wrong remember you have an **UNDO** under the **Edit Menu** selection. Also there is an  button on the Toolbar.

- **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

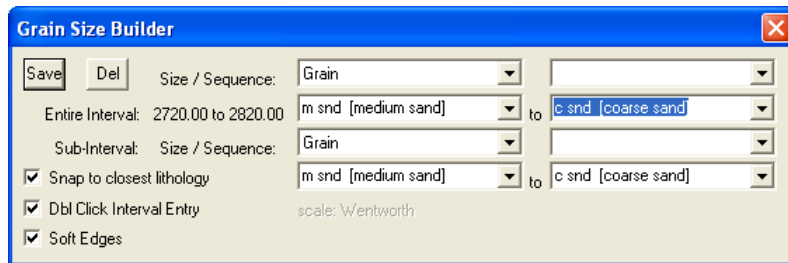
- 1.) **Click and drag** the mouse pointer from **2673 [m snd]** to **2715 [c snd]** **2673.00 [m snd]** **2715.00 [c snd]** on the **Grain Size** track.


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.

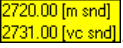
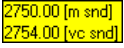
- 3.) The other method for drawing larger intervals of Grain Size is to click the mouse pointer within the interval. In our case **click the mouse** in the grain **size track between 2720 and 2820m**. You will notice the builder will show the entire interval for the bed.




- 4.) Click on the top Grain size **from** field drop box arrow and select **m snd [medium sand]** from the resulting choice list.
- 5.) Click on the top Grain size **to** field drop box arrow and select **c snd [coarse sand]** from the resulting choice list.
- 6.) Click on the  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**.

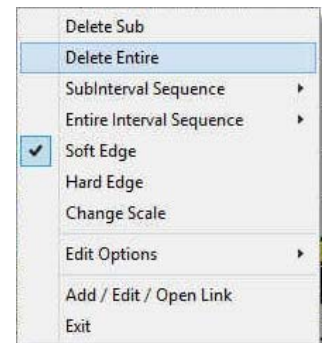
• Drawing Grain Size sub-intervals...

- 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]** .
- 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]** .
- 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.

Note: If you happen to do something wrong remember you have an **UNDO** under the **Edit Menu** selection. Also there is an  button on the Toolbar.

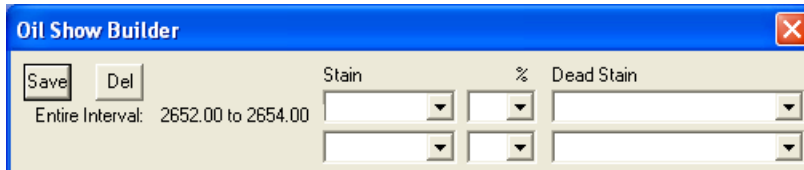
• Deleting entire Grain Size intervals and sub-intervals...

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.

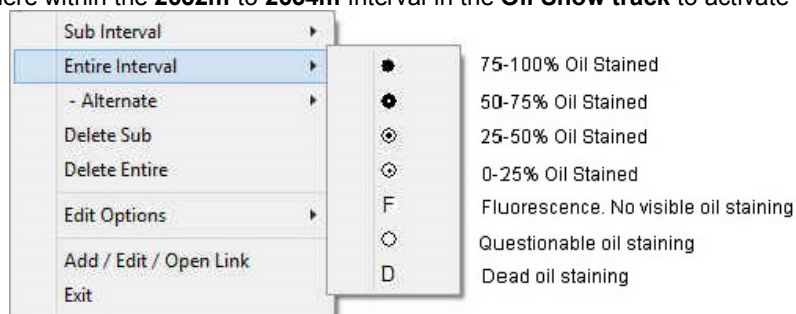


Drawing Oil Shows


- 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.

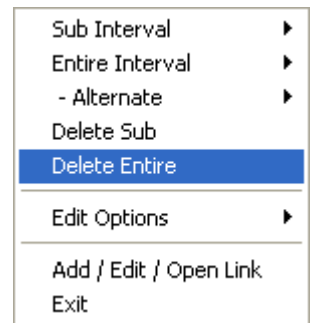
• Drawing Oil Show sub-intervals...

Note: 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**.

- 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**  , **2730-2740m**  , and **2811-2814m**   and three sub-intervals (in red) will be populated with the **50-75%** oil staining symbol .

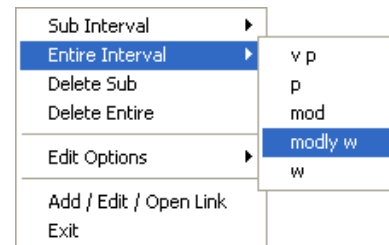
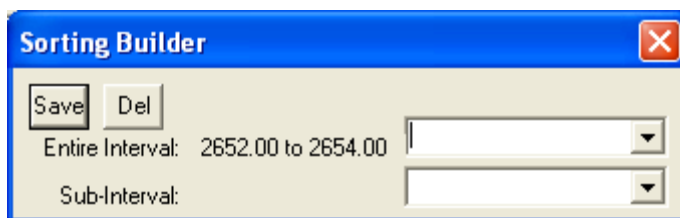
• Deleting entire Oil Show intervals and sub-intervals...

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.

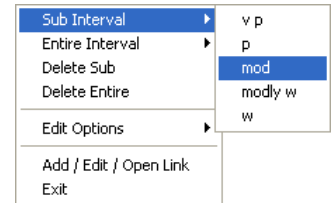


- 2.) **Right click** once anywhere within the **2652 - 2654m** interval the **Sorting Track** to activate the pop-up menu.
- 3.) Select **modly w** for the **Entire Interval** from the pop-up menu and the entire bed will be populated with the "**mW**" symbol.
- 4.) **Right click** once anywhere within 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.

Note: 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...

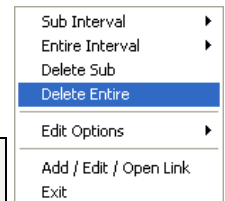
- 1.) **Right click** anywhere on the **Sorting** track to activate the pop-up menu.
- 2.) **Select mod** from the Sub Interval pop-up menu.
- 3.) **Click and drag** from **2720 - 2731m** and the specified sub-interval will be populated with the "M" symbol.
- 4.) **Repeat steps 2-3** where you previously put in subintervals for grain size.



Deleting entire Sorting intervals and sub-intervals...

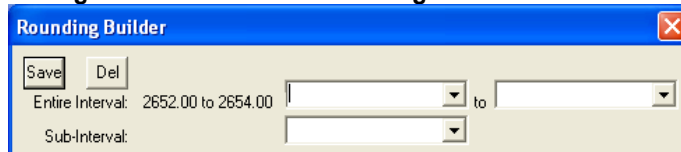
To delete an entire **Sorting** interval or sub-interval, while the **Sorting Builder** window is open, **right click** within the interval or sub-interval slated for deletion to activate the pop-up menu and then right click once on the appropriate selection.

Note: If you happen to do something wrong remember you have an **UNDO** under the **Edit Menu** selection. Also there is an  button on the Toolbar.

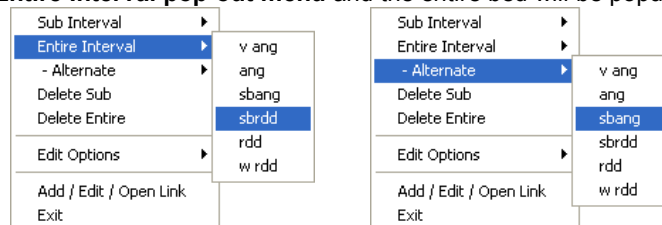
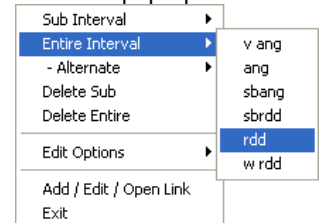


Drawing Rounding

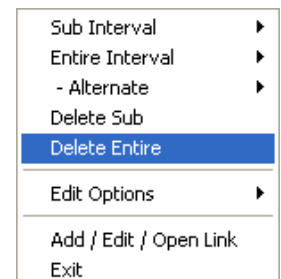
- 1.) **Double click** on the **Rounding** track to activate the **Rounding Builder** window



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



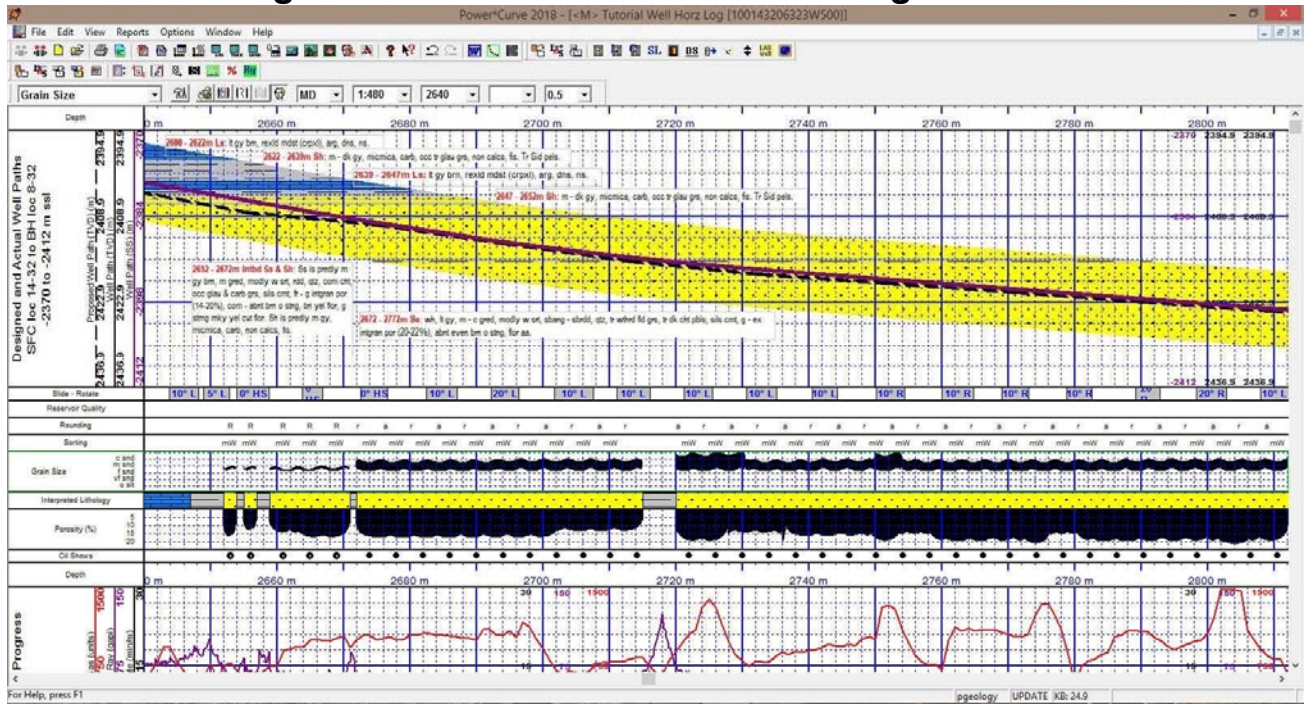
- 12.) **Right click** anywhere within the **2672m to 2715m** interval in the **Rounding** Track to activate the pop-up menu.
- 13.) **Select sbang** from the **- Alternate** pop-out menu and you will view alternating "a" and "r" symbols in this track.
- 14.) **Repeat steps 10-13** within the **2720m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

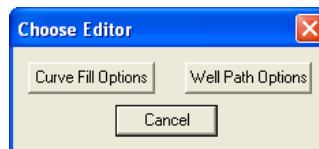
If you wish to delete an entire **Rounding** interval or sub-interval, while the **Rounding Builder** window is open, **right click** within the interval or sub-interval slated for deletion to activate the pop-up menu and then right click once on the appropriate Delete selection.

**** 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. 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 300 meters before the bed was encountered and 300 meters after the bed ended. If the interpretive lithology was drawn between 1000m and 1050m we would draw it on the curve fill from 700m and 1350m 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.

Bedding Contact Angles

Rock Type	Rock Mo...	Bed Angle	Encounter...	Departure...	Encounter...	Departure...	Covered Range
sh	m gy	0	2657	2659	-300	300	2357.00 - 2959.00
ss		0	2659	2671	-300	300	2359.00 - 2971.00
sh	m gy	0	2671	2672	-300	300	2371.00 - 2972.00
ss		0	2672	2715	-300	300	2372.00 - 3015.00
sh	m gy	0	2715	2720	-300	300	2415.00 - 3020.00
ss		0	2720	2820	-300	320	2420.00 - 3140.00

Angle:

Encounter Extent: Departure Extent:

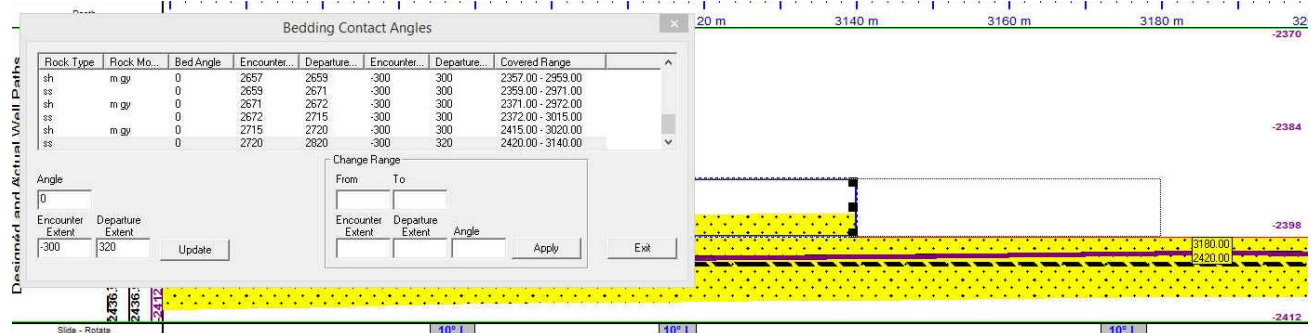
Change Range

From: To:

Encounter Extent: Departure Extent: Angle:

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 methods in this tutorial. In our case this would not be necessary as all the coverage is what is expected.

- 4.) Click on the **ss** bed drawn from 2720 to 2820 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 300 to 320** and then click on the button. This will extend the bed further filling in the 1" area surrounding the Well Path TVD curve
- 5.) Click on the **SS Bed drawn from 2720 to 2820m 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.
- 6.) Hold the **CTRL Key down** and move mouse over the right edge of the bed (departure extent) and click and drag the departure extent out to 3180m 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 SS bed going to the end of the area.



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.

Bedding Contact Angles

Rock Type	Rock Mo...	Bed Angle	Encounter...	Departure...	Encounter...	Departure...	Covered Range
ls ms		0	2600	2622	-300	300	2300.00 - 2922.00
sh	m gy	0	2622	2639	-300	300	2322.00 - 2939.00
ls ms		0	2639	2647	-300	300	2339.00 - 2947.00
sh	m gy	0	2647	2652	-300	300	2347.00 - 2952.00
ss		0	2652	2654	-300	300	2352.00 - 2954.00
sh	m gy	0	2654	2655	-300	300	2354.00 - 2955.00

Angle:

Encounter Extent: Departure Extent:

Change Range

From: To:

Encounter Extent: Departure Extent: Angle:

- 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 3000** in the **to field**. This modification will change all the existing beds drawn to date. **Tab** to the Encounter Extent field.
- 3.) **Type -200** in the **Encounter Extent** field. **Tab** to the Departure Extent field Change the Encounter extend
- 4.) **Type 200** 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 200 meters before and after with a bedding angle of -1 degree.

Bedding Contact Angles

Rock Type	Rock Mo...	Bed Angle	Encounter...	Departure...	Encounter...	Departure...	Covered Range
anhy prim		-1	1190	1199	-200	200	990.00 - 1399.00
ss		-1	1199	1209	-200	200	999.00 - 1409.00
sh	m gy	-1	1209	1213	-200	200	1009.00 - 1413.00
sh	m gy	-1	1213	1218.4	-200	200	1013.00 - 1418.40
ss		-1	1218.4	1219.4	-200	200	1018.40 - 1419.40
sh	m gy	-1	1219.4	1221.4	-200	200	1019.40 - 1421.40

Angle:

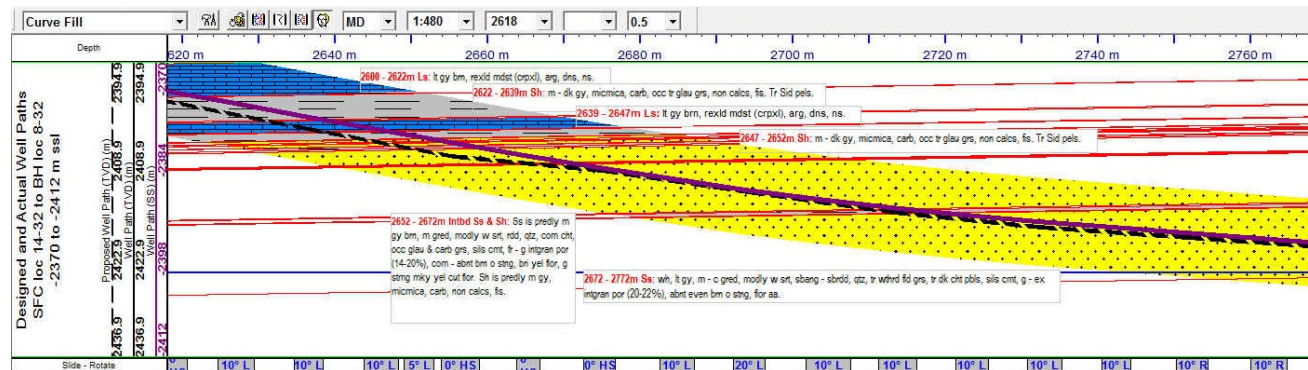
Encounter Extent: Departure Extent:

Change Range

From: To:

Encounter Extent: Departure Extent: Angle:

Note: Once this has been done the default will still remain -300 and 300 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.

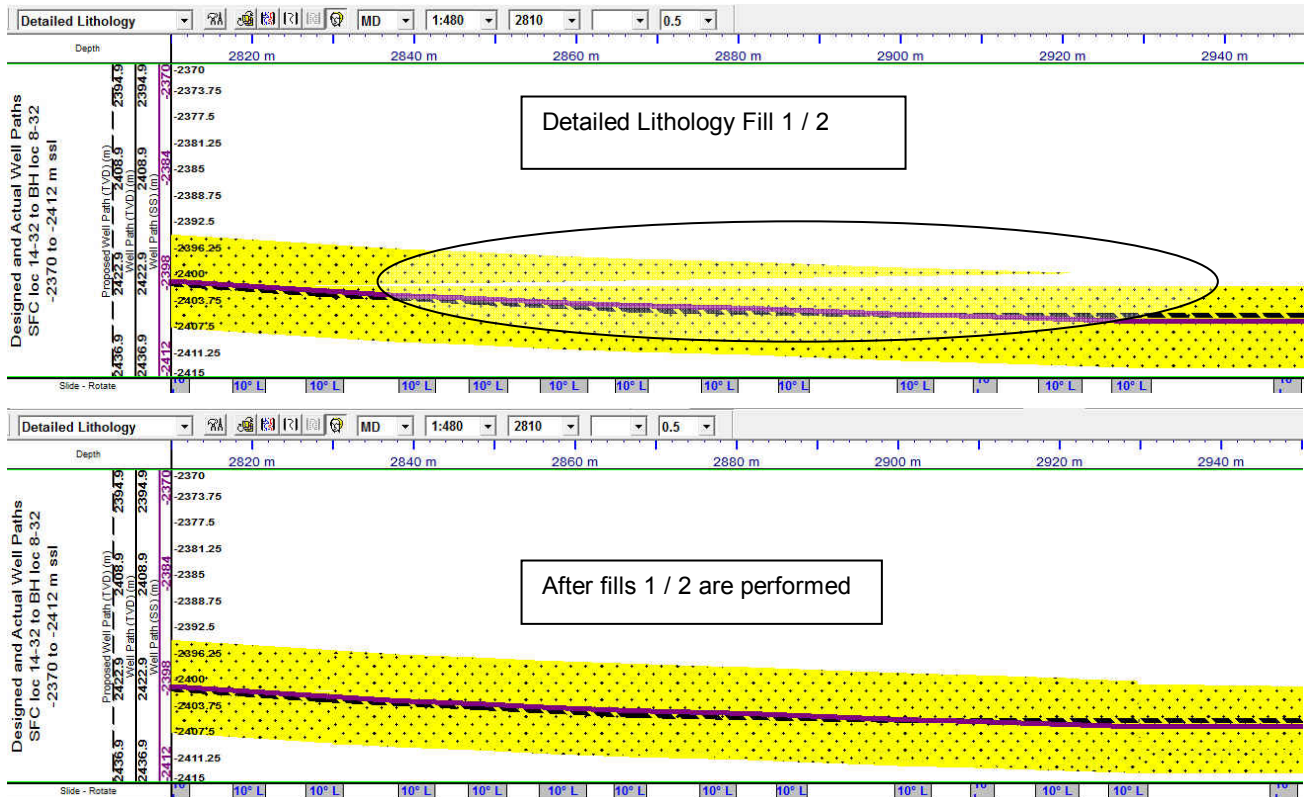


- 7.) **Click** on the **Exit** button to close this window.

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 or entered any Interpretive lithology past 2820m.

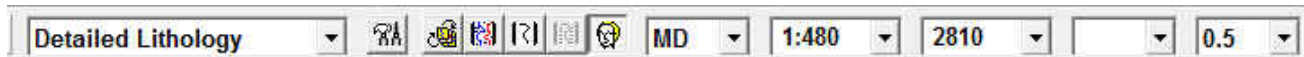


This is an illustration of the log after we have drawn in some lithology with detailed lithology layer.

- 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 **2810** meters so we can view the drawing on the screen with a **screen scale** of **1:480** meters as shown below.

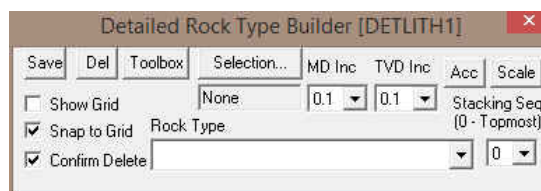


- 2.) Make the **Detailed Lithology** layer active within the **Detailed Lithology** track by clicking on the Track and then selecting the **Detailed Lithology** layer from the **Layer Selection List** field.

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.

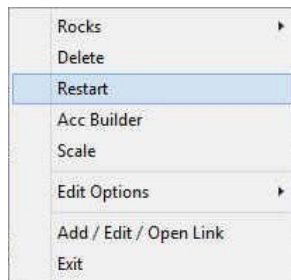
- 5.) Also turn off the ☐ **Show Grid** check box as shown in the builder above. With the grid off the detailed lithology layer is not as busy as the MD and TVD Inc are quite close together.

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 check box** is a **troggle** 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 / 2 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 **2830.00 [-2396]**. To define the top **left click and drag** your mouse on the Detailed Lithology layer until you see **2930.00 [-2400.3]** **2830.00 [-2396]** **2930.00 [-2400.3]** 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 **2830.00 [-2409.1]**. To define the bottom of the Sandstone bed **left click and drag** your mouse on the Detailed Lithology layer until you see **2930 [-2413.3]** **2830.00 [-2409.1]** **2930.00 [-2413.3]** 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.

Note: You can only draw on the Detailed Lithology beds that extend from 1 to 100 meters. That is why we will have to fill in with a second Sandstone fill.

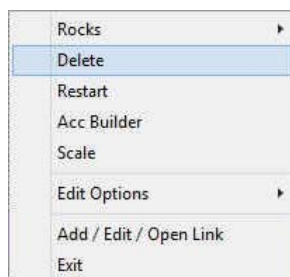
- 4.) Repeat Steps 2-3 with the following first drag **2929.50 [-2400.6]** **3029.50 [-2402.3]** and second drag **2930.00 [-2410.3]** **3028.50 [-2409.5]** and the SS will fill in the remaining gap.

Deleting a Detailed Lithology

1. **Double click** anywhere within the Detailed Lithology Layer to activate the **Detailed Rock Type Builder** window.

Note: If the lithology you wish to delete is part of a stack, you must **click** the **left** mouse button on the stack, until the lithology you wish to delete is displayed in the **Detailed Rock Type Builder** window.

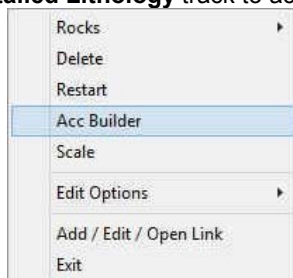
2. **Right click** anywhere within the **Rock Type** you wish to delete to activate the pop-up menu shown below:



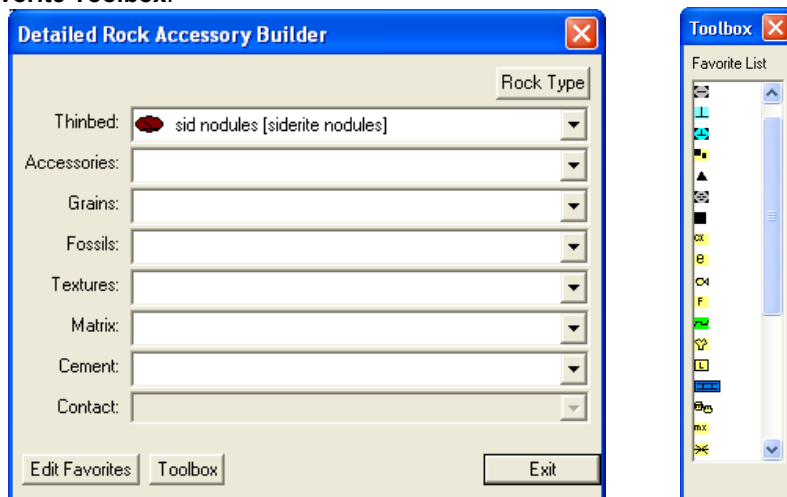
3. Select **Delete** from the pop-up menu and you will receive the following system message, "*Do you really want to DELETE _ []?*"
4. Click on **Yes** button to confirm the deletion and the selected **Lithology** will be deleted accordingly.
5. Press the **Esc** key on the keyboard to exit from the **Detailed Rock Type Builder [DETLITH]** window.

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...**

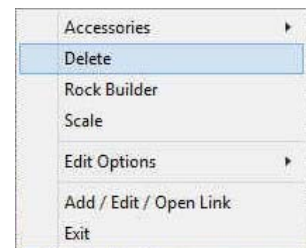
- 1.) **Right Click** on the **Detailed lithology layer** to activate the pop out menu.
- 2.) **Click** on the **Accessories** selection to activate the favorites list.
- 3.) **Click** on the symbol for **Micromicaceous** from the pop-out menu and the component field in the Detailed Rock Accessory Builder 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

Moving a Thinbed, Components, Internal Contact, Matrix, or Cement

1. With the **Rock Accessory Builder** window activated **click and drag** the **Accessory symbol** you wish to move and drag the red box to the new location.
2. **Release the mouse button** and the accessory will be redrawn at the position.

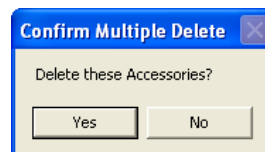
Deleting a single Accessory

1. With the **Rock Accessory Builder** window activated **right click** (in the upper right corner) of the **Accessory** symbol you wish to delete and the pop-out menu will be activated.
2. **Click** on the **Delete** selection from the pop-out menu and the selected **Accessory** symbol will be deleted.
3. Press the **Esc** key on the keyboard to exit from the **Rock Accessory Builder** window.



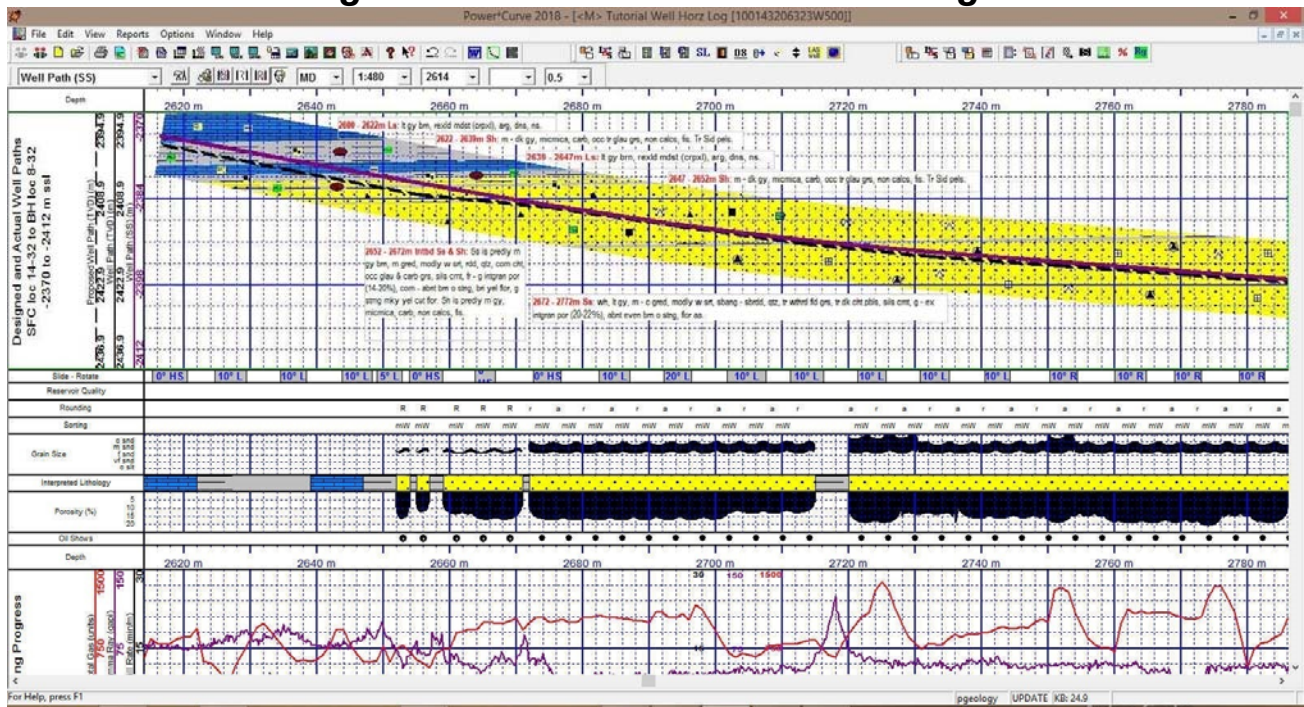
Deleting Multiple Accessories

1. With the **Rock Accessory Builder** window activated **Press and Hold the SHIFT Key** and then **click and drag an area** where the symbols are that you want to delete.
2. **Release the mouse button** and this will activate a message.



3. **Click** on the  button. The accessories that were covered by your drag will be deleted.

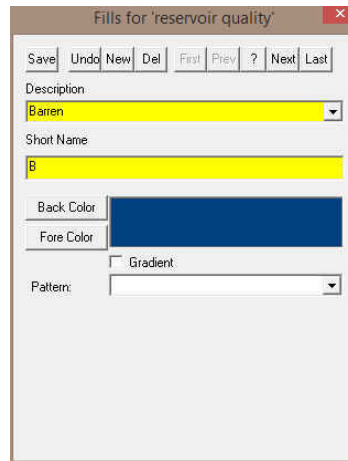
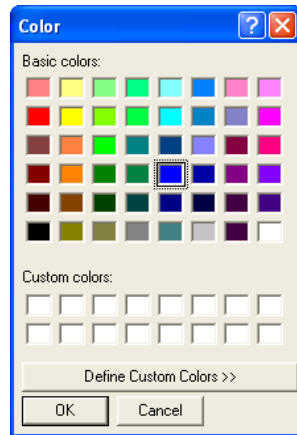
**** Your log should now look similar to the Log Below ****



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 **Back Color** button and select a blue color from the palette and then click on the **OK** button.



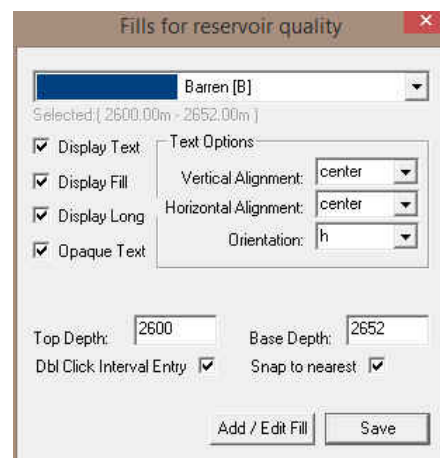
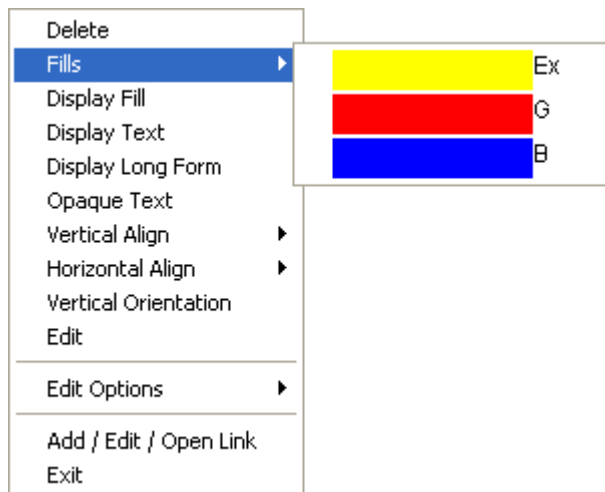
- 5.) Click on the **Save** button and then **select** **Start New Record** from the ensuing **Shortcut Options** window. This will clear the window and allow the user to enter a new record.

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 **Back Color** button and **select an orange color** from the palette and then click on the **OK** button.
- 4.) Click on the **Save** button and then **select** **Start New Record** 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 **Back Color** button and **select a yellow color** from the palette and then click on the **OK** button.
- 8.) Click on the **Save** button and then **select** **Exit** 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.

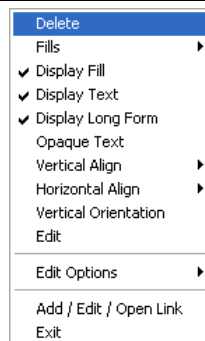
- 4.) **Right Click** on the **fill just drawn** and **select** or **click on** the **Opaque Text** selection to turn off the background around the text.
- 5.) **Right Click** on the **fill just drawn** and **select** or **click on** the **Vertical Orientation** selection turn the orientation of the 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**


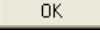


- 14.) **Click on the**  **close button** in the upper right hand corner of the builder. This will close down the Reservoir Quality builder window.


[illegible]

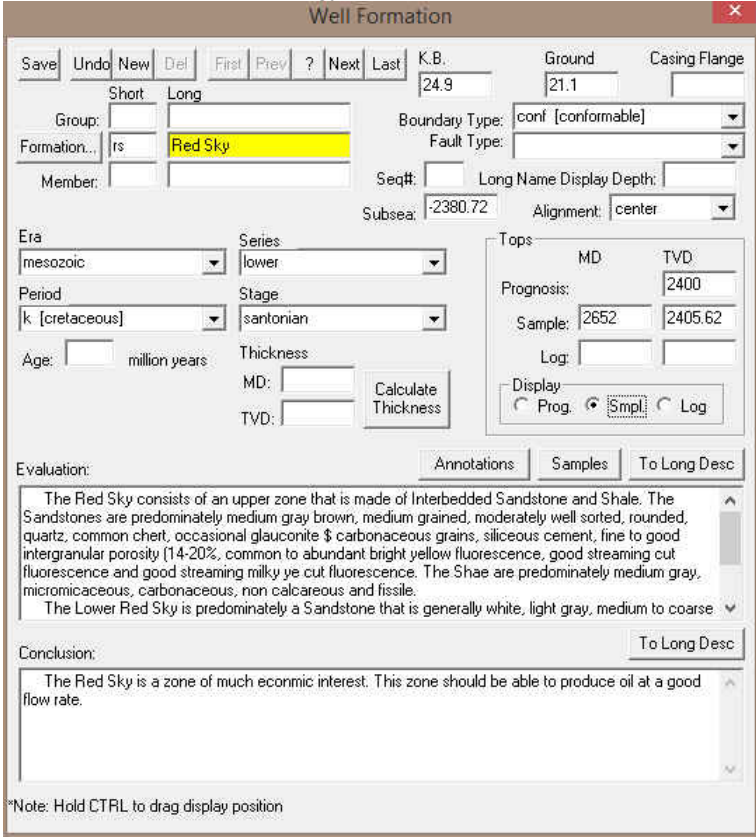
There are a number of annotations layers associated with this track. These are represented with Engineering Parameters, Mud Parameters and Gas Annotations. You could one annotation layer for all three types of annotations. We will deal with making an annotation in the Engineering Parameters layer.

-
- The screenshot displays the RTF Editor software interface. On the left is a 'Color' palette with 'Basic colors' and 'Custom colors' sections. The main workspace shows a technical drawing of a mechanical part with various colored regions (yellow, blue, black) and dimensions. Two floating toolbars are visible: 'RTF Font ToolBar' with text formatting options (Bold, Italic, Underline, etc.) and 'RTF Lines and Boxes' with line and box drawing tools. A data box on the right contains the following information:
- | |
|---------------|
| FOB: 10-12000 |
| RPM: 50-70 |
| SPP: 12000 |
| VOL: 1.4 |

- 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 **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.



Well Formation

Save Undo New Del First Prev ? Next Last K.B. Ground Casing Flange

Short Long

Group: Formation... rs Red Sky

Member: Seq#: Long Name Display Depth: Subsea: -2380.72 Alignment: center

Era: mesozoic Series: lower

Period: k [cretaceous] Stage: santonian

Age: million years Thickness: MD: TVD: Calculate Thickness

Tops: MD: 2400 TVD: 2405.62

Prognosis: Sample: 2652 Log: Display: Prog. ☒ Smpl ☐ Log

Evaluation: Annotations Samples To Long Desc

The Red Sky consists of an upper zone that is made of Interbedded Sandstone and Shale. The Sandstones are predominately medium gray brown, medium grained, moderately well sorted, rounded, quartz, common chert, occasional glauconite & carbonaceous grains, siliceous cement, fine to good intergranular porosity (14-20%, common to abundant bright yellow fluorescence, good streaming cut fluorescence and good streaming milky ye cut fluorescence. The Shale are predominately medium gray, micromicaceous, carbonaceous, non calcareous and fissile.

The Lower Red Sky is predominately a Sandstone that is generally white, light gray, medium to coarse

Conclusion: To Long Desc

The Red Sky is a zone of much economic interest. This zone should be able to produce oil at a good flow rate.


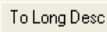


*Note: Hold CTRL to drag display position

- 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**.

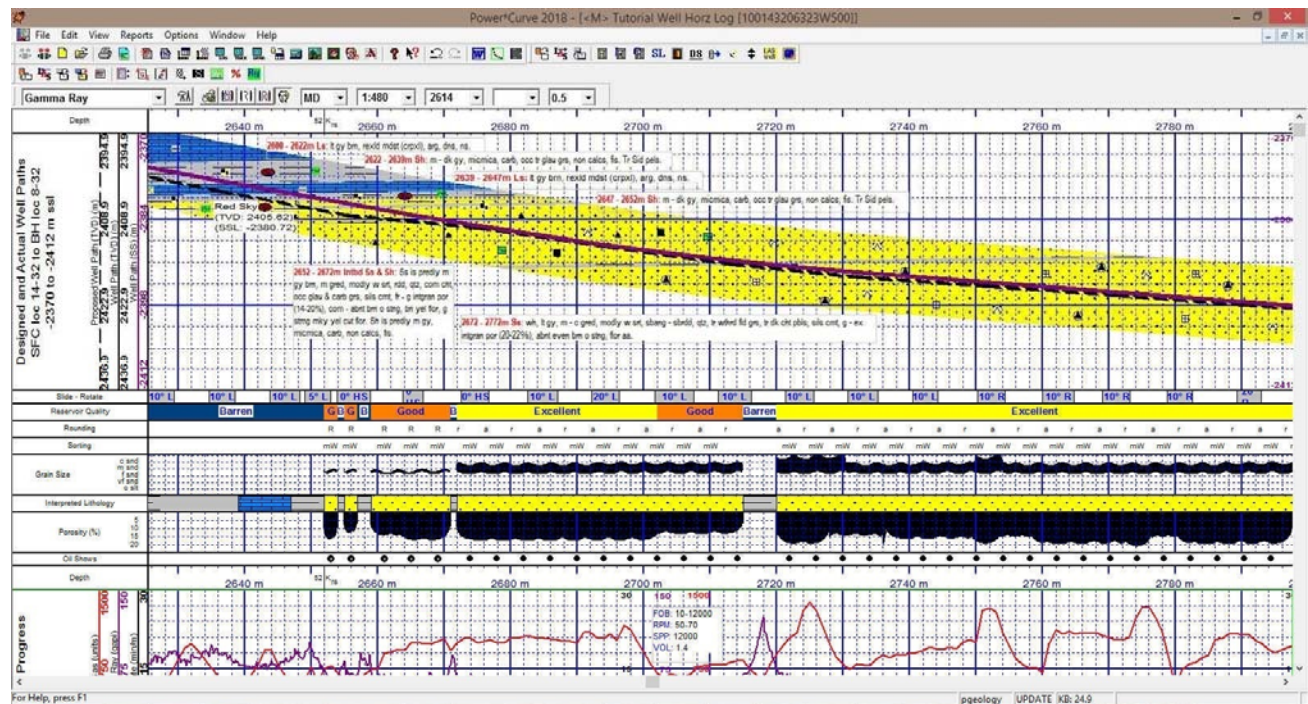
- 11.) **Select**  from the Display portion of the Window.
- 12.) **Type 2652** into the **Sample Top MD** field. You will notice that the TVD Sample top field will be calculated for you. Then depress the tab key four times. This will place the flashing caret in the Evaluation field.
- 13.) The user 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  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  button to expand the description.
- 15.) **Click** on the  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 below.
- 5.) The user would probably want a Grid Pattern on this Track for printing purposes. Select a Curve layer (Well Path (SS), Well Path (TVD) or Proposed Well path) from the layer selection list on the Selection Bar.

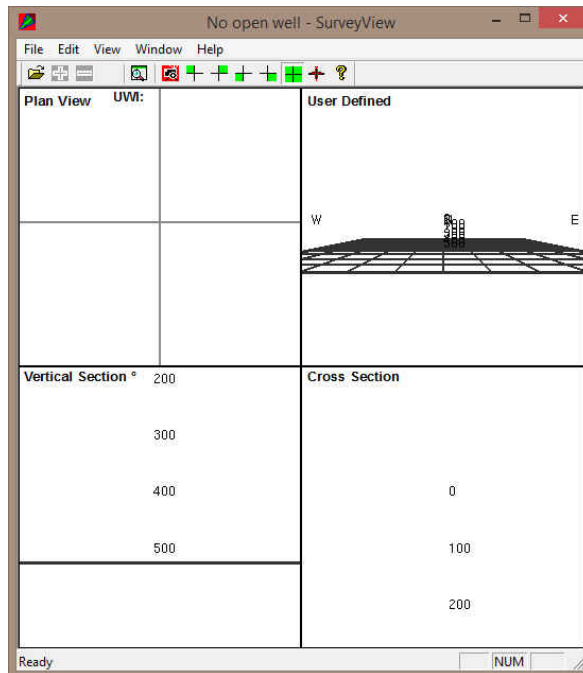
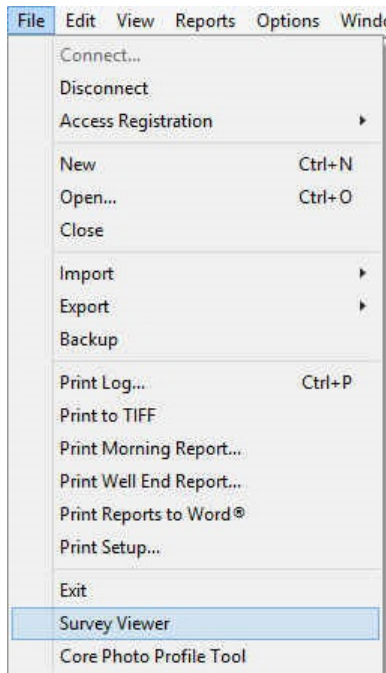
**** Your log should now look similar to log shown below. ****



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.

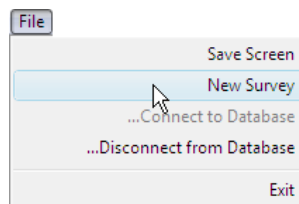
1. Click on the **Survey View**  Icon on the Toolbar OR go under the **File Menu** and select the **Survey Viewer**. This will activate the Survey View Module.



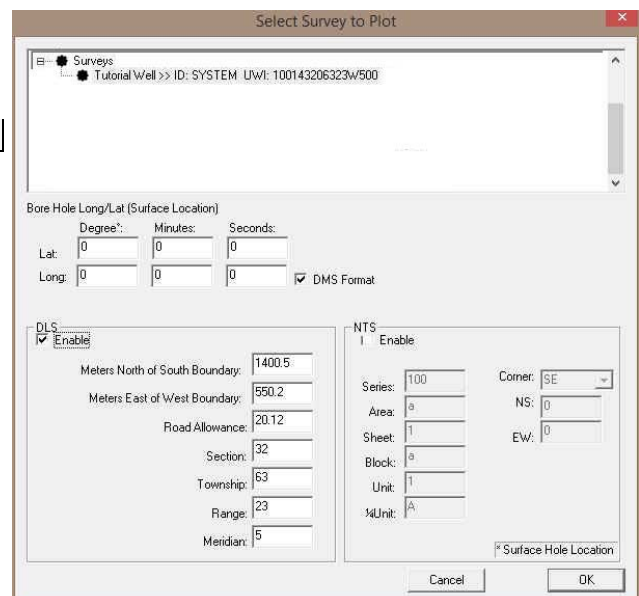
Note: It is important to know some of the well location information before you proceed with step 2. If you are in the DLS land survey system you should know your metes and bounds surface hole coordinate values and if you are in the NTS survey system you should know your surface hole location identification.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



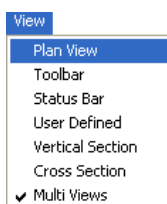
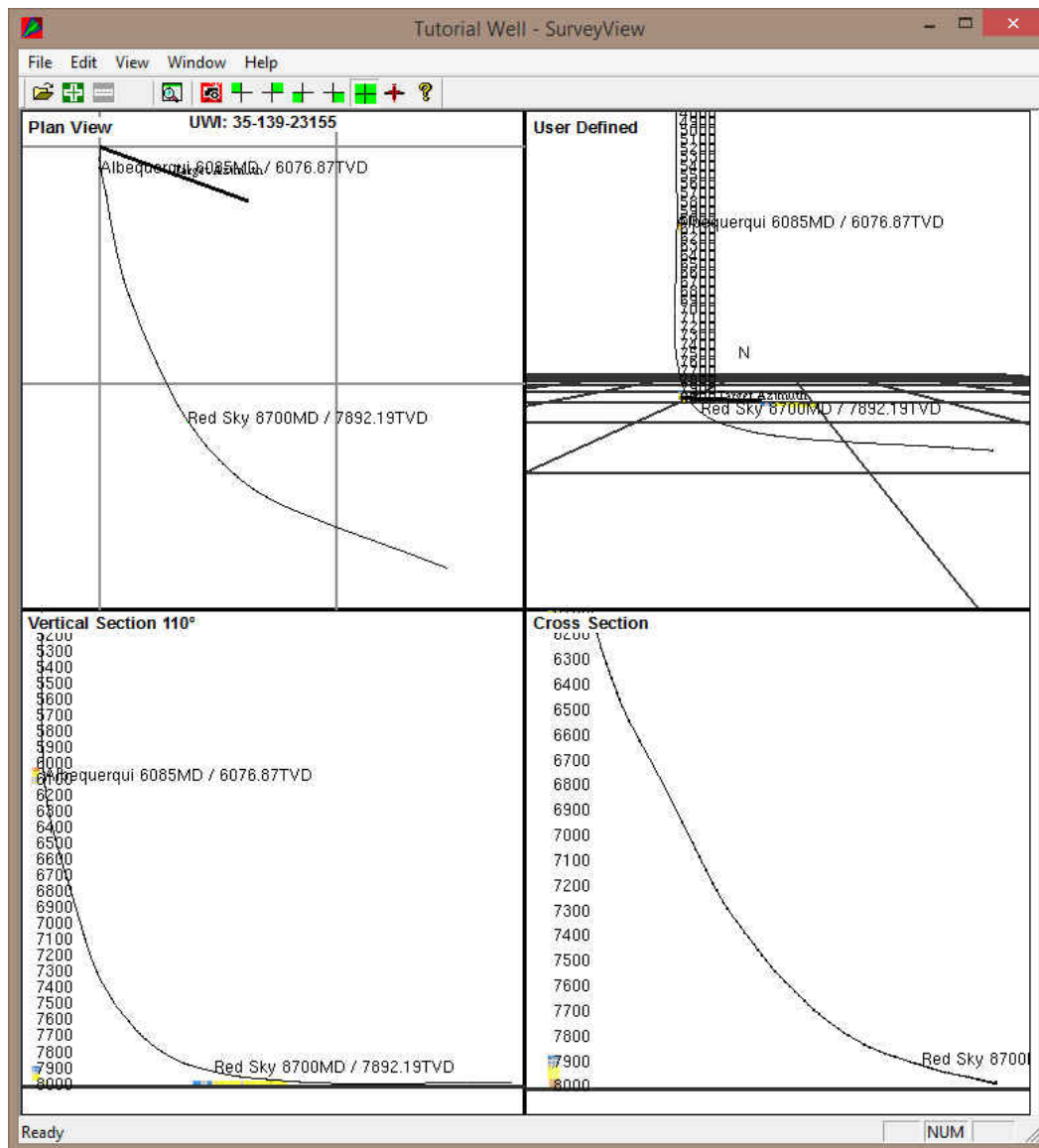
information is also located on the Survey plat for the Well.



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 32** in the **Section** field. **Tab** to the Township field.
7. **Type 63** in the **Township** field. **Tab** to the Section field.
8. **Type 23** in the **Range** Field. **Tab** to the Meridian Field.
9. **Type 5** in the **Meridian** Field.
10. **Click** on the **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 **toolbar**. 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.

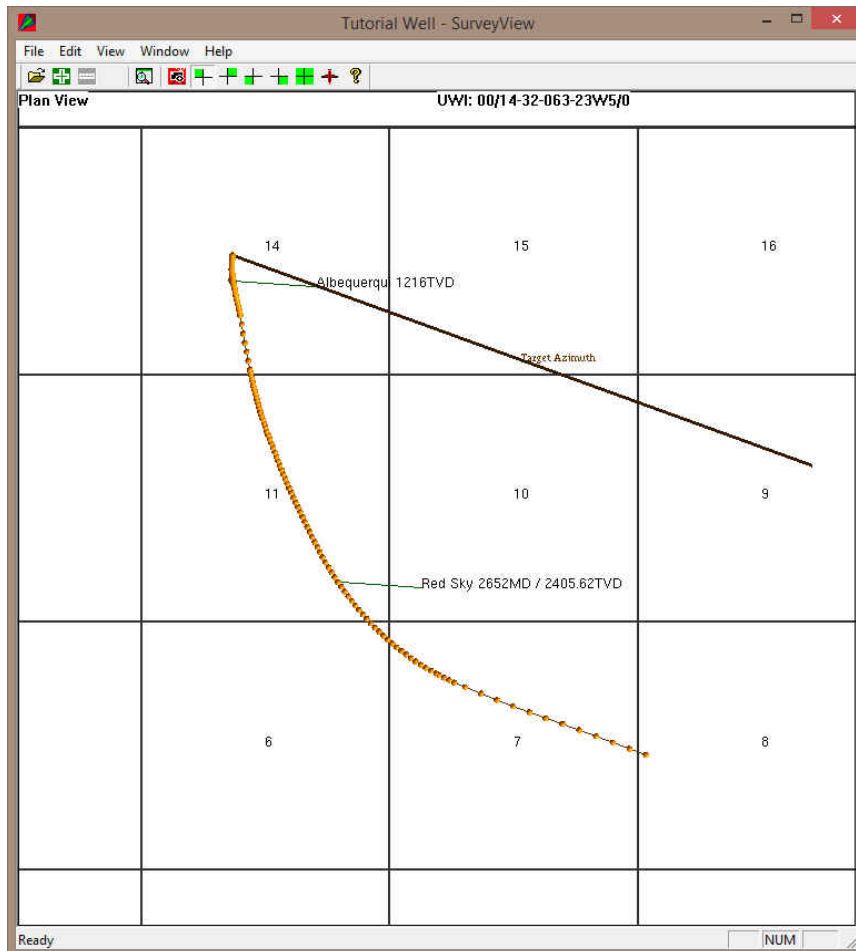
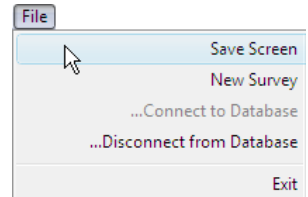
If you were to go into the properties of the Survey view application you can change numerous displays. F1 key when the properties window is open will get you an overview of this window. An important note is that if you change something on the plan view it will change on all the views.

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

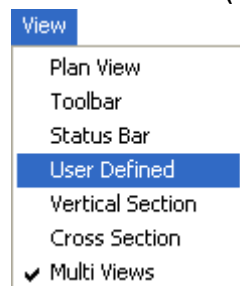


Icon on the tool bar or the Save Screen

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. The following Edit properties window is shown on the next page.

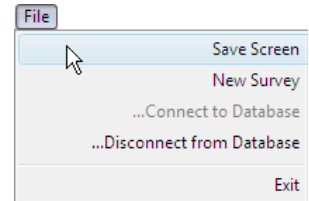
- 4.) Once the view is set up the way you want you can save this by **Clicking** on the

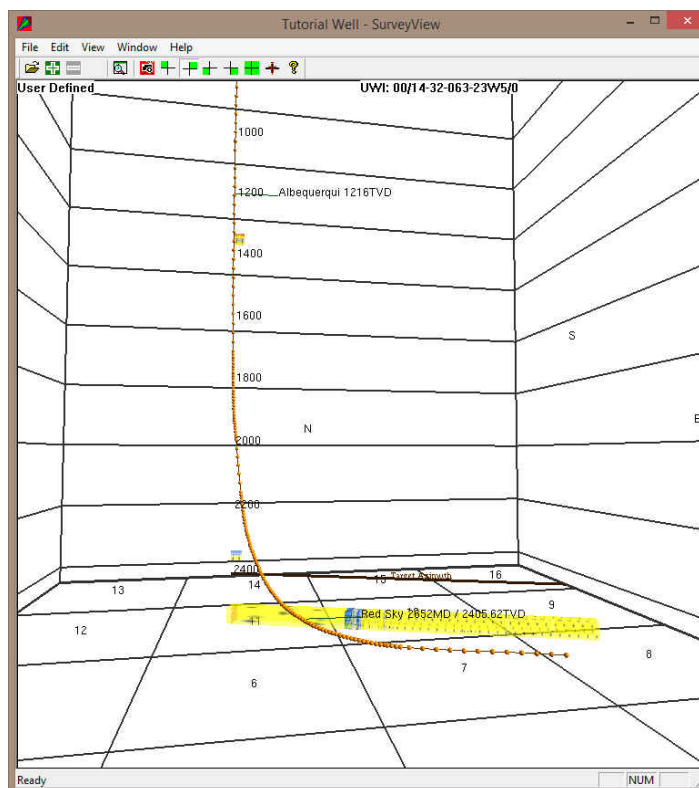


Icon on the tool bar or the Save Screen

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.







Print the Log to a printer driver.

Before you start printing the Log it must look the way you want it to print. If it looks the way you want continue on.

- 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 1:480** 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 **2600 to 2825** 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.

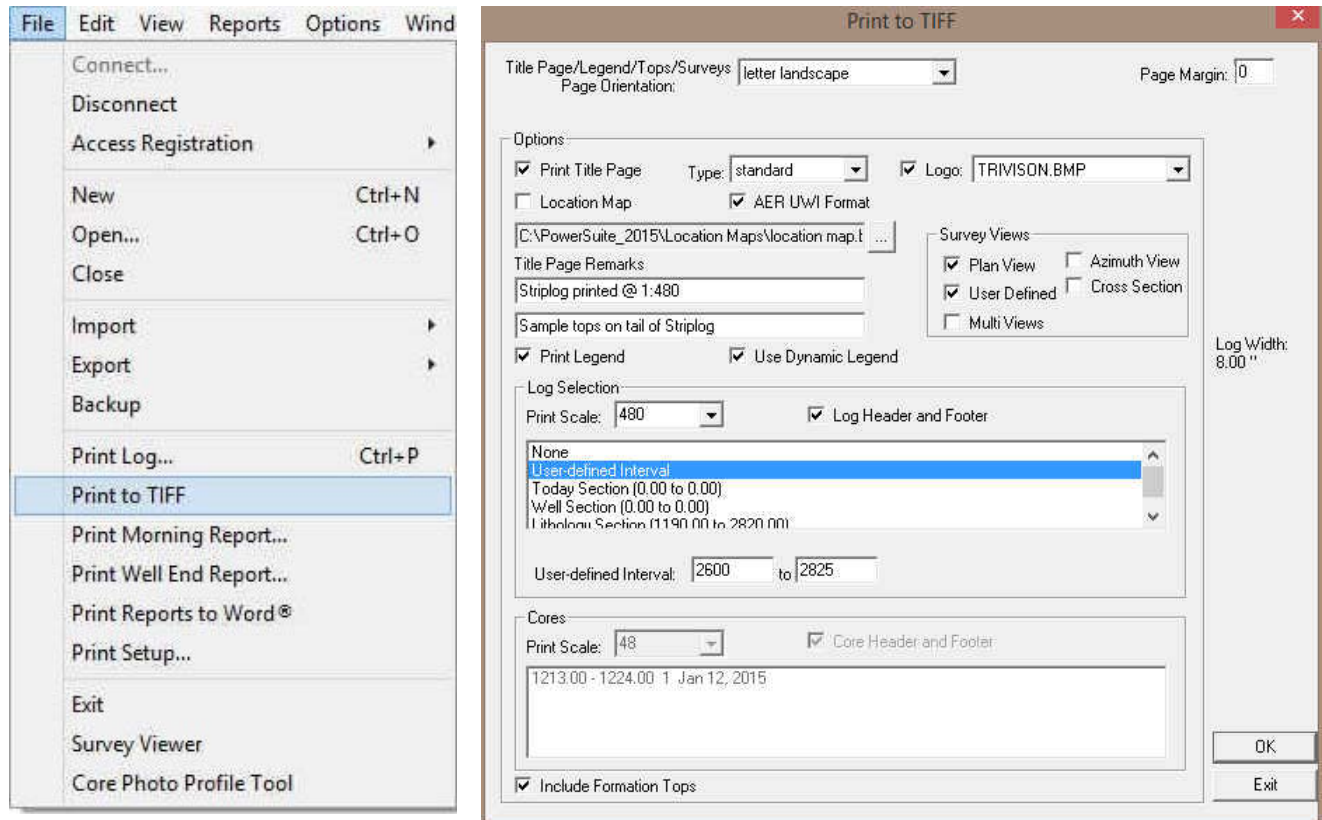
Note: If you do exit from the **Print Log** window, you will be asked if you wish to save the print settings. If you **click** on **Yes**, the program will remember every setting that you made to the **Print Log** window and then will default to those settings the next time you enter the **Print Log**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

How to Print the Log to a TIFF (file format)

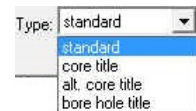
Prints all or part of your log/well along with the Title page, location map, legends, survey views, Cores will not be printed in the Horizontal Log, and formation tops on a continuous basis in a tiff file format.

1. Under the **File** menu selection, **click** on **Print to TIFF** or **click** on the  **Print to TIFF** button on the Toolbar to activate the **Print to TIFF** window shown below:

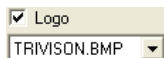
Note: The depth views associated with the Print TIFF window are defaulted to the Depth View that Power*Log / Curve / Core is in at the time of the activation of the Print to TIFF window.



2. **Select letter landscape** from the drop box field for the **Title Page, Legend, Tops, Survey Views** and they will automatically conform to the selected orientation. There are four (6) types of paper orientation to choose from. But your log is 8" wide so letter portrait is the page orientation.
3. ☒ **Print Title Page** **Select** this check box ☒, to printout a Title Page.
4. The Type (Title Page) drop box displayed on the right allow you to pick the appropriate title page format to print. **Select standard** to prints out our full blown title page with most of the Wells data.
5. ☒ **AER UWI Format** Select the AER UWI format for the Title page as the well is in Alberta.





N.B. This format changes our UWI printout from 100121605812W500 to 00/12-16-058-12W5/0 only on the Striplog Title page. All other UWI formats (DLS and NAME) remain the same.



6. Activate this check box ☒, if you wish to printout a logo, and then select a logo from the **Logo** drop box field.

Note: The logo file format must be a bitmap image file (*.bmp) if you want a logo printed out on the title page. Also, it is recommended that the bitmap image should be a square image, because **Power*Suite** will shrink or expand the image to fit the logo space on the **Title Page**. This bitmap must be placed in the **Powersuite_2018\LOGO** directory for the application to find it.

7. Type any pertinent comments into the **Title Page Remarks** field and they will be displayed accordingly on the **Strip Log Title Page only**.
8. **Deselect** the ☒ **Location Map**  **C:\POWERSUITE_2018\LOGO\location map.bmp** check box. In our Case we do not have a location map so **deactivate** this check box ☒. If you wish to printout a location map following the title page, and then the user select a location map from your computers drives by clicking on the  and finding the file you want to print out as a location map.

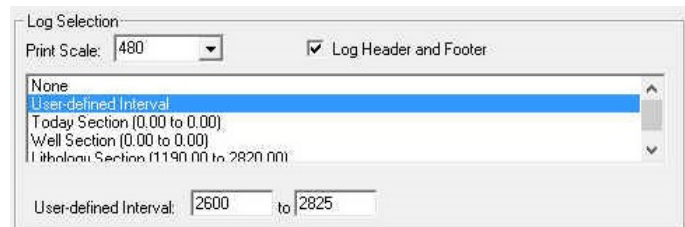
Note: The location map file format must be a bitmap image file (*.bmp) if you want a location map to be printed out. Also, the bitmap image must be a square image, because **Power*Suite** will shrink or expand the image to fit the

location map space following the **Title Page**. This bitmap can be placed anywhere as the file location is saved within the Power*Suite ini file.

9. **Select** the Survey views ☒ **Plan View** check box.
10. **Select** the Survey views ☒ **User Defined** check box.
11. **Deselect** the Survey views ☒ **Azimuth View** check box.
12. **Deselect** the Survey views ☒ **Cross Section** check box.
13. **Deselect** the Survey ☒ **Multi Views** check box.
14. **Select** the ☐ **Legend** to activate this check box ☒.
15. **Select** the ☐ **Use Dynamic Legend** to activate this **check box** ☒, because we want 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.

In the Log portion of the Print Log window

16. Print Scale: **Select 1:480** or type in the **Scale** for the main log to be printed out at, in the **Scale** drop box field.
17. **Select** ☒ **Log Header and Footer** to activate this check box ☒ to have the track headers /footers printed out with the main log.
18. **Select** ☐ **Core Accessories** to activate this check box ☒ to have the core accessories printed out on the main log.
19. **Select** the **defined interval**. **Type** in **2600** and **2825** in the **from** and to **fields**.



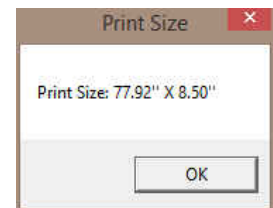
Note: The log itself must be displayed in whatever depth view you wish to print before you activate the print log window. To change the log to the desired format, refer to depth view under the view pull down menu.

Note: A separate **Header Information Box** is automatically printed out with every **Core** and includes the **Core Scale**, **Core Date**, **Core Number**, **Cored Interval**, **Amount Cut**, **Amount Recovered**, and **Percentage**.

20. ☐ **Formation Tops** **Activate** the **Formation Tops** check box ☒ if you wish to printout **Formation Tops** and the **Formation Tops** will be included on a separate page at the end of the log printout.

Page Margin: The page margin field is available, primarily, when you are printing to Adobe Acrobat writer. **This is not necessary for printing to tiff file format**

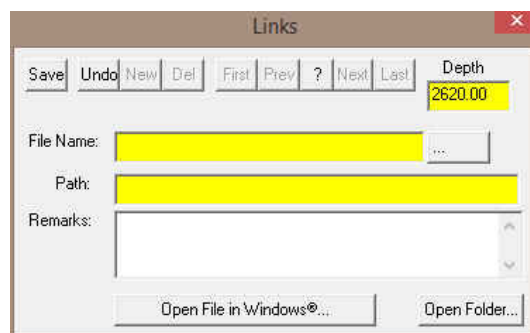
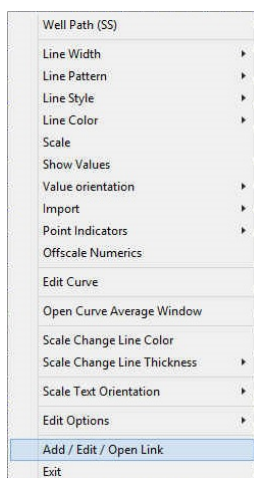
21. When you are ready to print your log, **click** on the **button**.
22. This will activate a message box indicating the size of your printout. Click on the **button**.
23. This will activate a file name window to be filled in with a file name and location to where you can locate it for further reference.





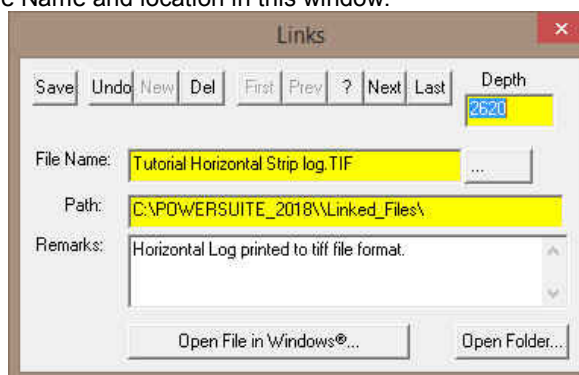
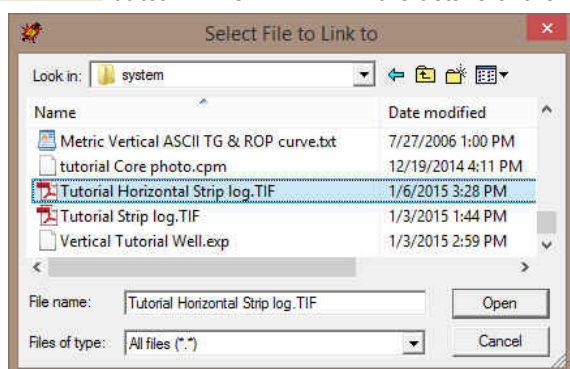
Note: If you do **exit** from the **Print to TIFF** window, you will be asked **if you wish to save the print settings**. If you **click on Yes**, the program will remember every setting that you made to the **Print to TIFF** window and then will default to those settings the next time you enter the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


Adding a Link (Attachment) to your Log

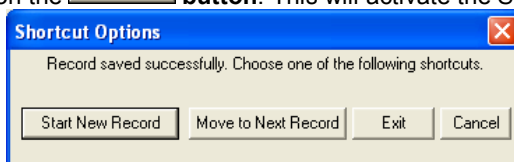
- 1.) In our case **Right Click** on the **Well Path SS** layer at 2620 m to activate the pop out menu.





- 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 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.