

Chapter 9 - Sample Track, Histogram Track and the Tools and Views Menu

The sample and histogram tracks use a similar user interface for entering data. The tools menu offers a variety of options for improving your log, and making your log editing experience faster and easier.

Adding Samples Data to the Sample Track

The first step is to format the sample track using the Formatting->Sample Percentage Track menu item, as discussed in "Chapter 3 - The File and Formatting Menus". To enter sample percentage data, simply click on the "Sample Percentage" track as shown below.

A screenshot of the 'Add or Edit Sample Percentages' dialog box. The dialog has a title bar and a main area with several sections. At the top, 'Sample Depths' are defined by 'From: 3250' and 'To: 3260'. Below this is a 'Select Sample Components' section with a table of lithology types and their percentages. The table has columns for 'Lithology' and 'Percentage (%)'. The rows are: Sandstone (15%), Siltstone (0%), Shale (25%), Carbonaceous St (25%), Coal (15%), Limestone (0%), Claystone (0%), Bentonite (0%), Cement (0%), and Conglomerate (0%). Each row has a 'Clear' button to its left. To the right of the table are two buttons: 'Load Lithology Order' and 'Save Lithology Order'. At the bottom left, there is a 'No Sample' checkbox and a 'Preview Area' showing a small log segment. To the right of the preview area is a 'Percentage Left' field set to '20 %' and a 'Shift Key To Keep %' checkbox. On the far right, there are four buttons: '<< Prev', 'Next >>', 'Done', and 'Cancel'.

For example, if you are entering data from the sample 3250' - 3260' interval, click at between 3250' and 3255'. This will open the sample percentage editor with the correct sampling depth interval as shown below.

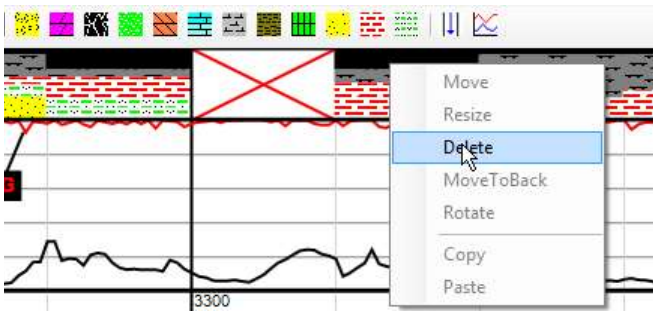
You can enter up to 10 different lithology components into each individual sample. Samples can be broken down into 5% component increments. However, it is suggested that for a "Sample Percentage" track height set at less than 1", avoid a 5% only component because it will barely be visible due to the finite resolution of most computer screens.

As components are added, the "Percentage Left" value decreases. Also, a preview area shows what the sample interval will look like on the log. Only when the "Percentage Left" is 0, will the user be able to click either "<<Prev", "Next>>" or "Done". The "<<Prev" and "Next>>" buttons will enter your selection and increment the sample interval up or down hole, respectively. The "Done" button will enter the selection and close the window.

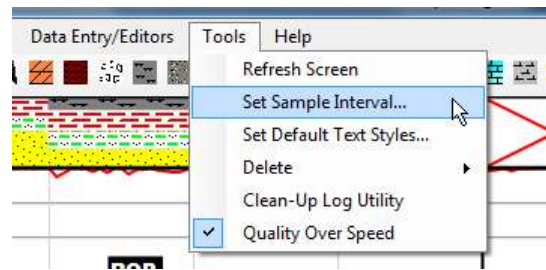
New Feature: Depress the shift key while clicking the "Next>>" button to advance to the next interval while retaining the same lithology % for each sample component.

Use the "Save Lithology Order" and "Load Lithology Order" buttons to save and load, respectively, the lithology components. Clicking on a sample interval that already has sample data, will open the "Add or Edit Sample Percentages" editor, preloaded with the appropriate data. To delete a sample interval, move the mouse over the sample interval to be deleted and right-click to open the pop-up menu, and then select "Delete" as shown below.

Delete sample



Set Sample Interval



If the "No Sample" check box is clicked, a red X will appear at the corresponding sample interval (see above).

When a Horizontal XSection session is started, the default sample interval is 10'. Use the menu item Tools->Set Sample Interval... to open the "Set Sample Interval" editor, and change the sample interval as desired. Note the default sample interval is used for both the "Sample Percentage" Track and the "Histogram" tracks.

Improved Histogram Track

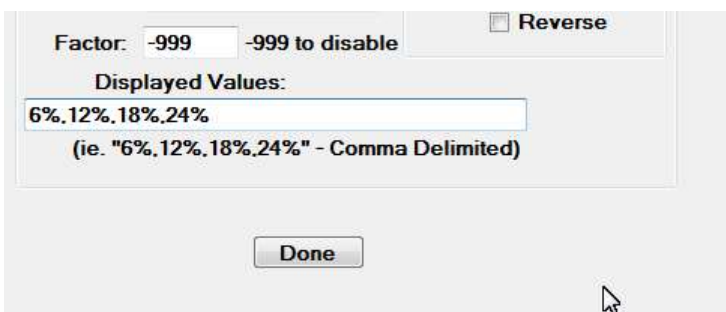
The histogram track has been rethought and improved to be both simple to use, and more versatile, than the original 1.0+ version. The histogram track can be configured into two modes: factor or values mode. A value "-999" in the "Factor:" box (i.e. below figure), enables values mode for the histogram. All other decimal values in the "Factor" box enables factor mode, and the "Displayed Values:" values are disabled (and ignored by the program).

Values mode

When the program is started, all three available histogram tracks are, by default, in values mode. The histogram values must be inputted by the geologist / user in the "Displayed Values" area. The values need to be separated by commas (comma delimited). For example, if the user enters the values "6%,12%,18%,24%" (there is no need to put in spaces between values), the histogram track will have five values: none, 6%, 12%, 18%, and 24% (i.e. vales for a porosity histogram). Another example would be to enter: "trace,fair,poor,good,v.good,excellent".

This would translate to a histogram with the values: none, trace, fair, poor, good, v.good, and excellent (i.e. oil show histogram). "None" does not need to be entered as a "Displayed Value", it is added to the histogram by default as a 0 value. When in values mode, the "Scale:" drop-down menu box will be ignored. In values mode the scale of the histogram is always set by the number of values separated by commas plus the "none" value. The "Visible Divisions:" drop-down menu box is still used in values mode for selecting the number of horizontal divisions for the particular histogram track.

The below figure shows a portion of a histogram formatting editor set for values mode, with the Factor box set to -999, and the values of the histogram being set to 6%, 12%, 18%, and 24%.

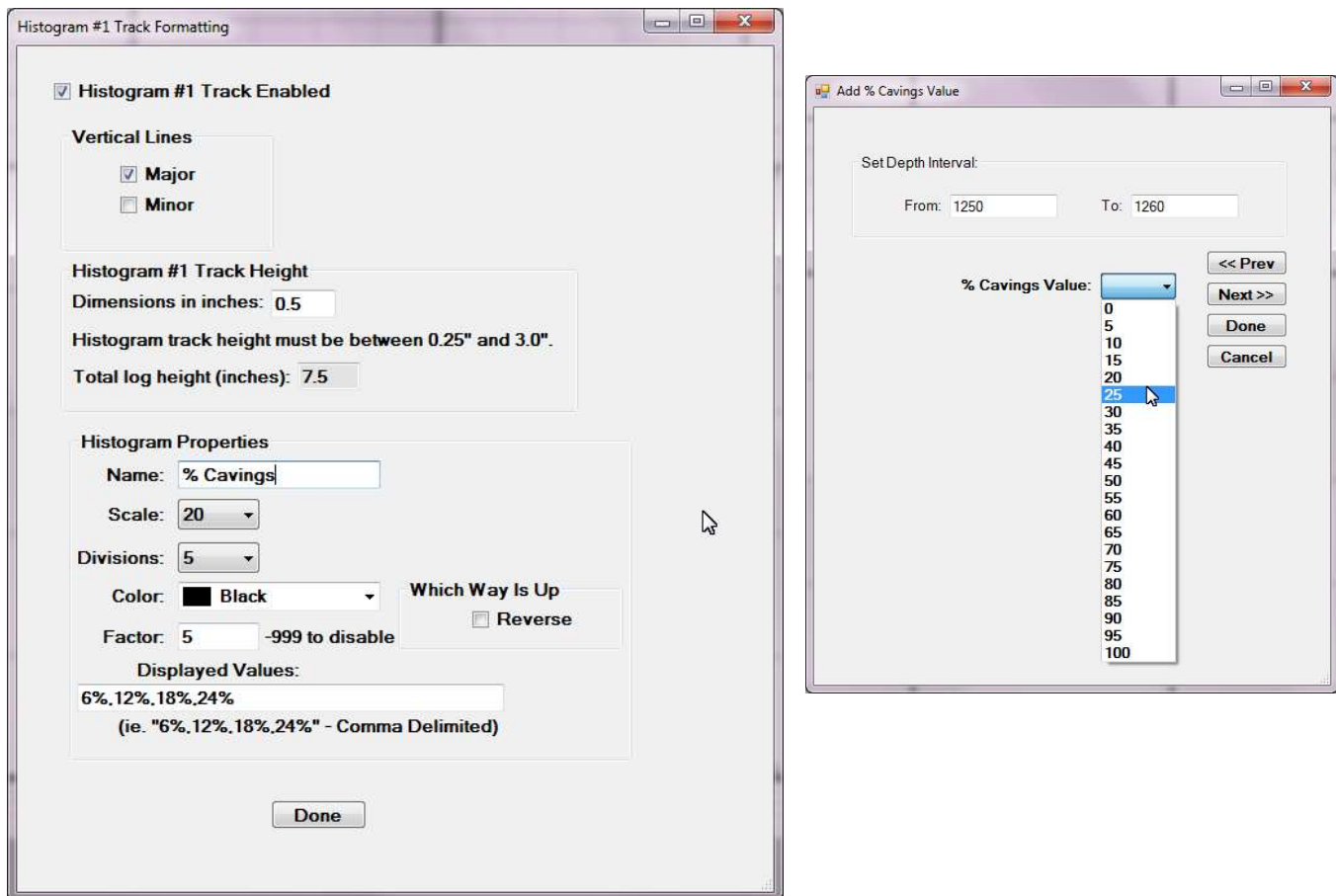


Factor mode

The histogram is in “Factor” mode when the “Factor” value is set to any decimal value other than ‘-999’. When in “Factor” mode, the “Displayed Values:”, used in “Values” mode are ignored by the program.

The basic procedure for using the histogram in factor mode is to pick a scale using the “Scale:” drop-down menu. Any scale from 2 through 20 can be selected (in the previous version, the histogram scale was immutable, set at 10). After a scale is selected, the user inputs a “Factor” value, which can be any decimal number. The program computes the histogram values to be selected by the user by multiplying each scale by the factor.

In the below example, the scale is set at 20, with a factor of 5. This means that the histogram values for the % Cavings Histogram will be: 0, 5, 10, 15....90, 95, 100. When the user clicks on the % Cavings histogram track, they will be presented with a drop-down menu with the above just mentioned values as shown below.



Adding Histogram Data to the Histogram Track

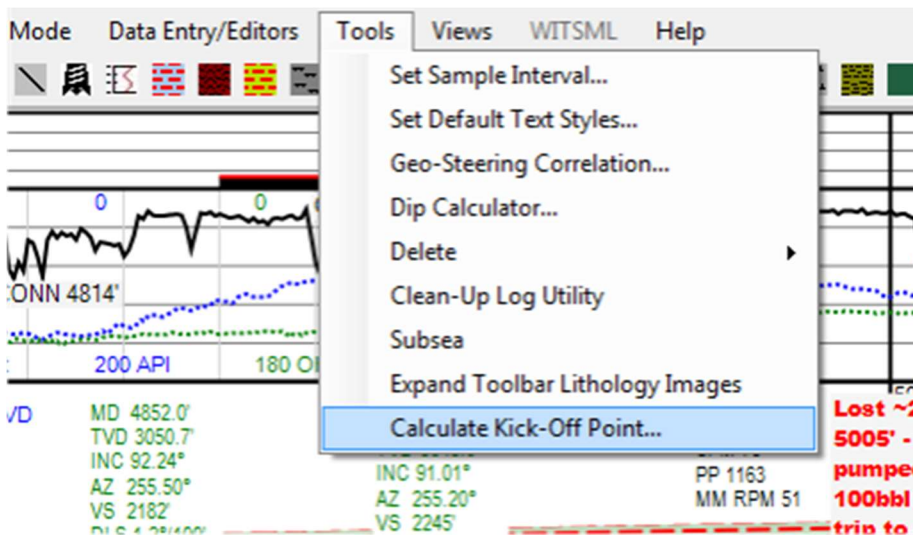
Similar to the sample track, to add data to the histogram track the user may simply click on the histogram track near where they want the data to go. This will open the histogram track editor allowing the user to edit the depth interval and the value of the histogram

Click and Drag

A new feature in Horizontal XSection version 3.0+ is the ability to draw the histogram value using the mouse. Simply, hold down the shift key and draw in the interval and value of the histogram. When the left mouse key is released, the histogram editor will open with the depth intervals and histogram values filled in based on the click and drag position.

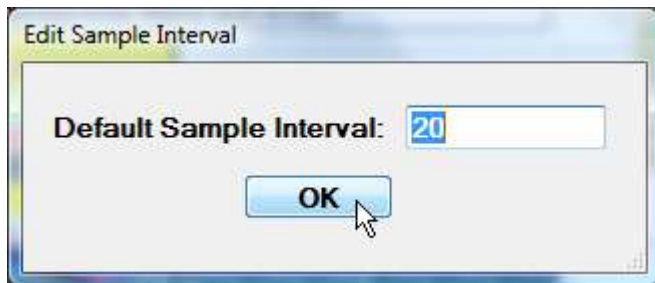
Tools Menu

The "Tools" menu as the name suggests contain an eclectic set of tools and is accessed from the main menu (see below). Each of these tools and their uses are described below.



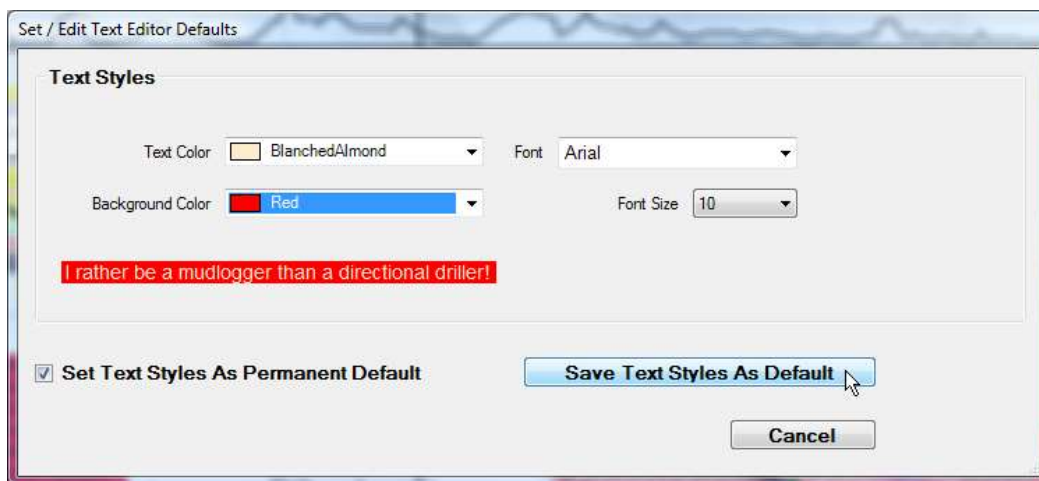
Set Sample Interval

Opens a window where the default sample interval for both the "Histogram" and "Samples" track can be set.



Set Default Text Styles

Opens a dialog window where the default text including font size, font color and background color, can be set for either this particular session, or for the program in general.



By checking the "Set Text Styles As Permanent Default", the selected Text Styles will be saved for future sessions of the Horizontal XSection program, otherwise any changes will only be saved for this particular session.

Delete

The delete feature allows the user to delete particular sections of the log. for example, all the Samples, or all Text Line or Lithology elements. Histogram tracks can quickly be cleared using the delete tool. Be careful though, there is no "Undo" feature for the delete tool!

Clean-Up Log Utility

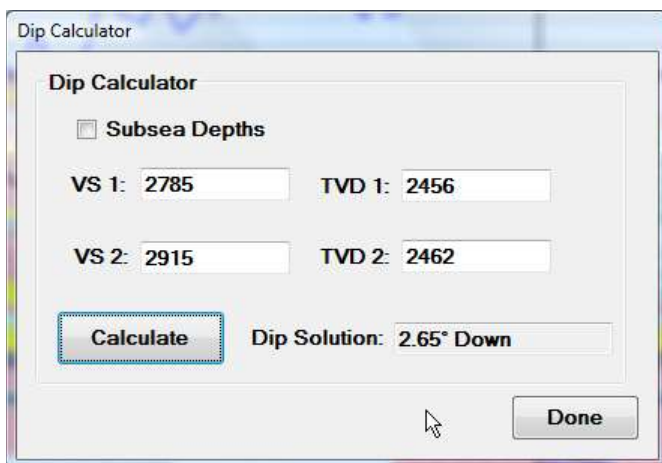
The feature will delete all elements of the log that are partially or wholly out of the viewing area. When a log is shortened, or a TVD scale changed, elements of the log may no longer be visible to the viewer, but still exist in computer memory. This utility will delete these elements, though there is no harm to their existence other than a larger file. Be careful with this utility, for there is no undo feature, and there maybe reasons to keep these elements.

Dip Calculator

There are two procedures for calculating the dip or apparent dip with the Horizontal XSection software. The first procedure is described in detail in "Chapter 2 - Getting Started", and involves drawing a line between two points and right-clicking the mouse.

The second procedure involves opening the "Dip Calculator" from the "Tools" menu. The dip calculator, as shown below is a simple calculator that takes two depths (VS1, and VS2) and two TVDs (TVD 1 and TVD 2), and calculates the angle defined by these values. The depths are labeled VS for vertical section, because using VS values obtained from the Horizontal XSection program, will result in the most accurate apparent dip values, assuming that the actual AZ is near the planned VS plane. Only use "Measured Depth" values if you are drilling with a near 90° Inclination, and only if VS values are not obtainable. Check the subsea checkbox to use subsea numbers instead of TVD numbers. The program will automatically detect the dip direction (i.e. "Up" or "Down").

Using TVD Values

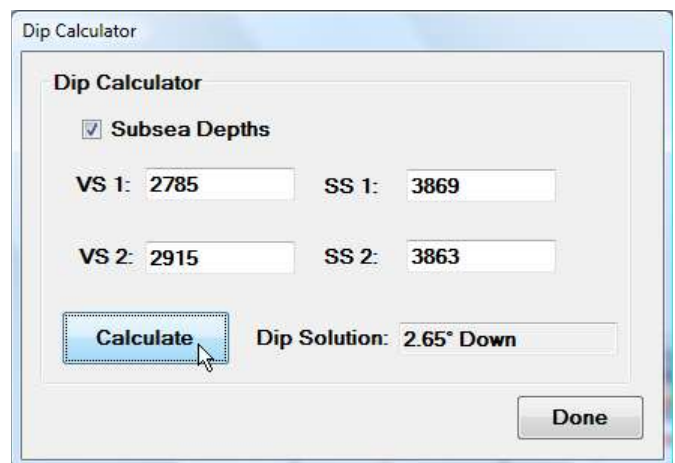


The screenshot shows the "Dip Calculator" window with the "Subsea Depths" checkbox unchecked. The input fields are as follows:

Field	Value
VS 1:	2785
TVD 1:	2456
VS 2:	2915
TVD 2:	2462

The "Calculate" button is highlighted with a red dashed border. The "Dip Solution" field displays "2.65° Down". A "Done" button is located at the bottom right.

Using Subsea Values



The screenshot shows the "Dip Calculator" window with the "Subsea Depths" checkbox checked. The input fields are as follows:

Field	Value
VS 1:	2785
SS 1:	3869
VS 2:	2915
SS 2:	3863

The "Calculate" button is highlighted with a red dashed border. The "Dip Solution" field displays "2.65° Down". A "Done" button is located at the bottom right.

The "Dip Calculator" can remain open while working on other aspects of your log, and is set to always be the top-most window.

Subsea

When the "Subsea" feature in the tool menu is enabled, the TVD scale on the cross-section will be replaced with Subsea values. Moreover, the TVD value in the status label at the bottom of the window that displays the survey data, will be replaced with subsea values (See red circles in below example). This feature can be toggled on and off, as desired, so that both TVD and Subsea values are easily accessible.

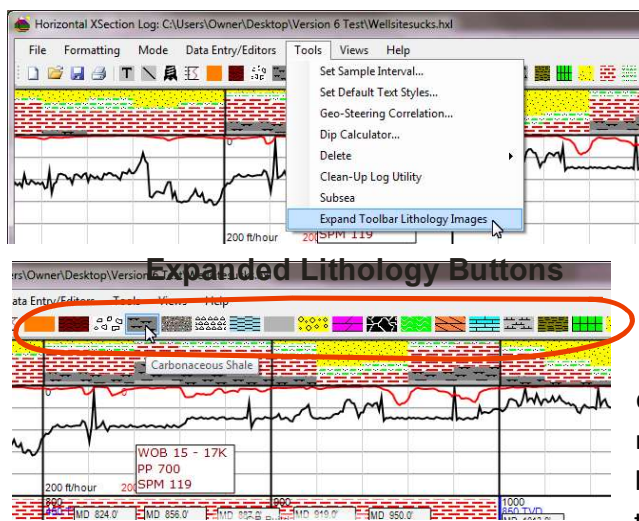


Geo-Steering Correlation Tool

This tool will open "Geo-Steering Correlation" instrument. See "Chapter 11 "(Geo-Steering Correlation Tool) for more information.

Expand Toolbar Lithology Images Menu Item

The expand toolbar lithology images menu item found in the "Tools" drop down menu (see below), expands the lithology buttons on the toolbar to exhibit the lithology patterns exactly as they will appear on the log. A wide monitor is helpful for this feature.



Calculate Kick-Off Point Calculator

The "Calculate Kick-Off Point..." menu item, as the name suggests, opens a build-in calculator that allows the user to determine the Measured Depth kick-off point (KOP). The calculator, based on the desired build dogleg, KOP inclination, landing point inclination and landing point TVD, will determine the KOP as a measured depth value, if the KOP is in a vertical borehole, or the KOP as a TVD, in an inclined or deviated borehole. Besides the MD Kick-off point, the calculator will determine the 'Build Length' as a measured depth value, the measured depth landing point and the vertical section at the landing point away from the KOP. If the KOP is in a deviated well, the calculator will not calculate the MD landing point, and the KOP will be a TVD value. It will still calculate the Build length, so if the MD at the TVD kick-off point is known, the MD landing point will be easy to calculate (MD Landing Point = MD KOP + Build Length).

Inputs

Dogleg / 100':

KOP Inclination:

Landing Pt. Inclination:

Landing Point TVD:

Output

Build Length (MD): 818.2

MD Kick-off Point: 2724.13

MD Landing Point*: 3542.31

*Only Applicable if KOP Inclination = 0!

VS at Landing Point: 520.9

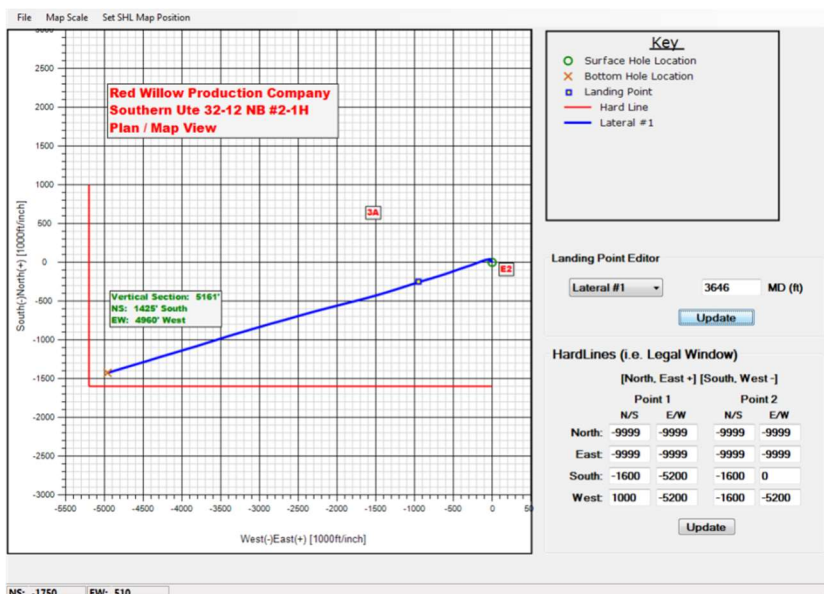
Views Menu

There are two sub menus under the “Views Menu”: “Plan Or Map View” and the “TVD vs. Vertical Section” menus.

Plan or Map View

Clicking the “Plan or Map” menu item will open a new window with a map view of all the laterals, including surface-hole location and bottom-hole

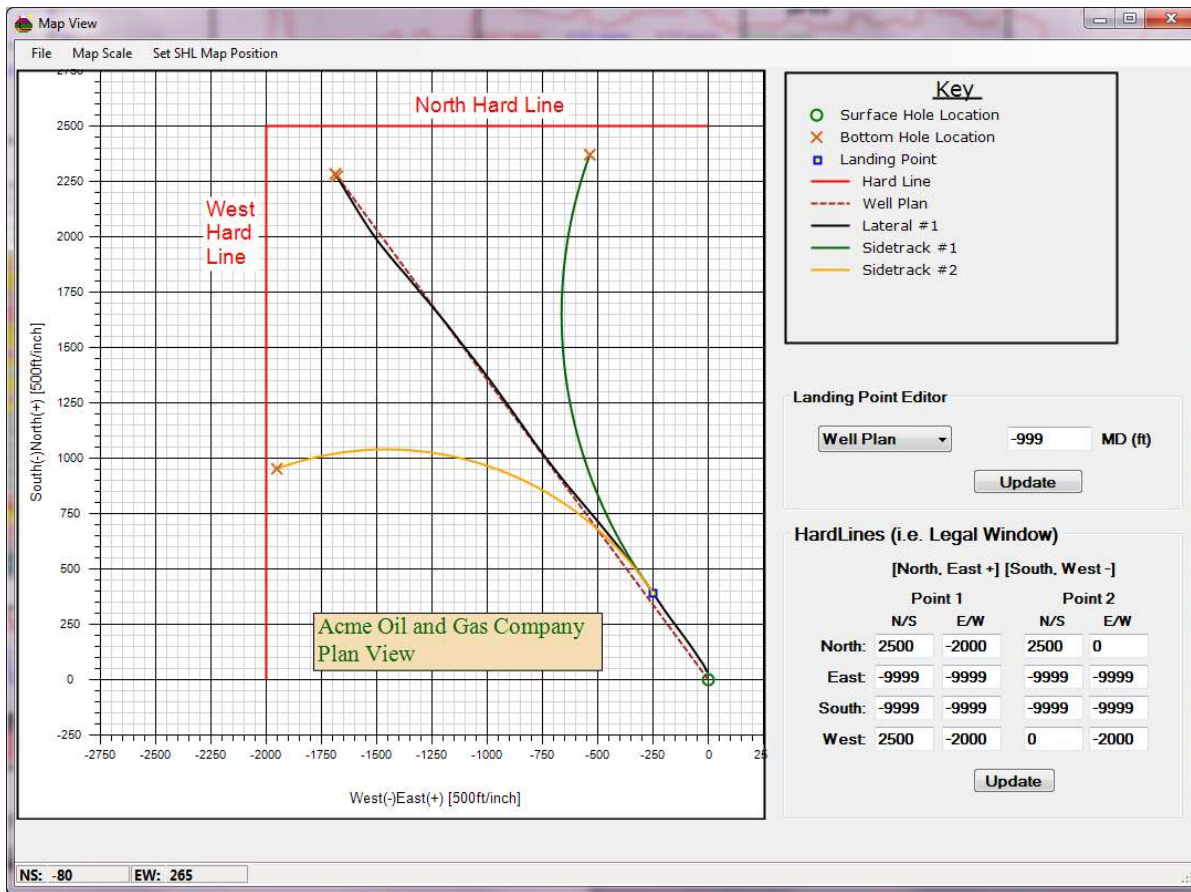
location. The user can then add landing points, hard lines, and text (screen shot example below).



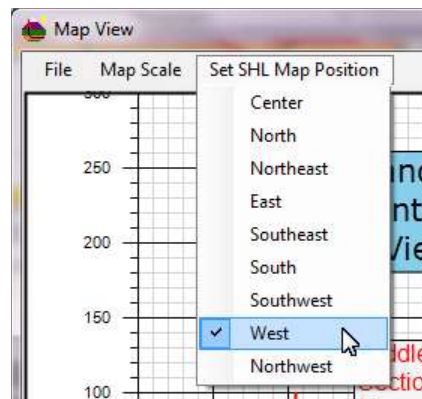
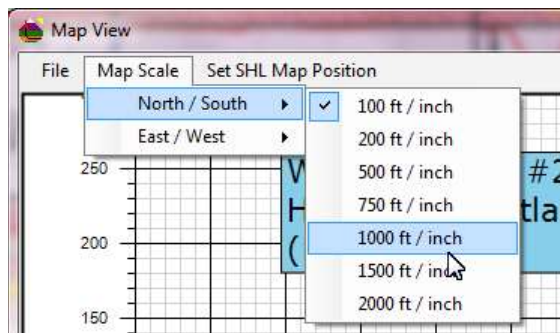
Up to four separate hard lines can be plotted corresponding to the four directions. Hard lines are drawn by the computer in red and are set according to the wells surface hole location. For example the “North” hard line is drawn below from a point 2500’ north and 2000’ west of the SHL to a point 2500’ north and 0’ west of the SHL. Enter -9999 for no hard line to be drawn.

Each lateral can have one landing point, which is usually the measured depth location where the build ends. To enter a landing point using the “Landing Point Editor”, select the lateral of

interest from the drop-down list, and enter the measured depth where the landing occurred. The program will then plot a blue and yellow rectangle at the appropriate map view location. Enter “-999” and the program will not plot a landing point symbol.



Map scales for both the north/south and east/west axis can be adjusted by using the “map Scale” drop down menu items:



Similarly, the SHL map position is automatically set by the computer based on the well plan or lateral #1 direction, but can also be manually set using the “Set SHL Map Position” drop-down menu.