2. Data Import

The following table displays the different types of input data required for Petrel along with their formats and types.

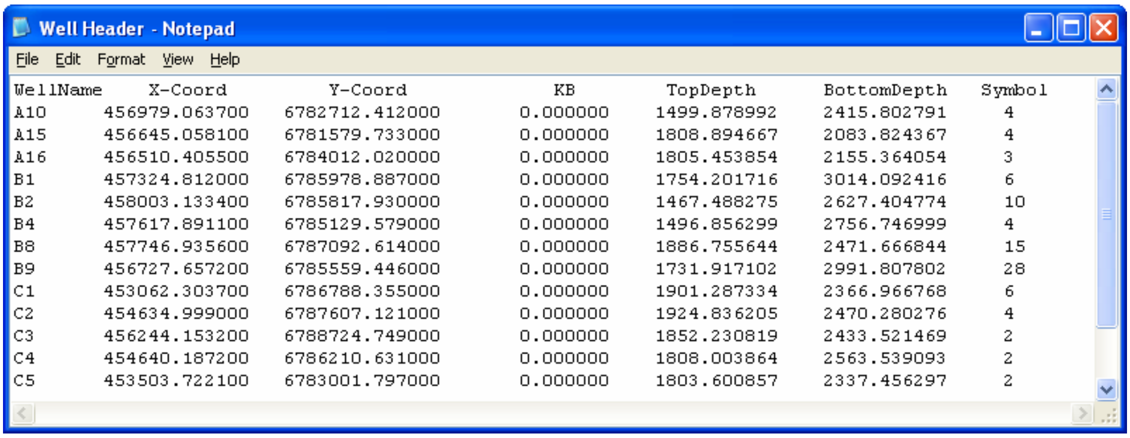
Data	Format	Type
1- Well Data		
A- Well Headers	Well heads (*.*)	Well
B- Well Deviations	Well Path deviation (ASCII) (*.*)	Well
C- Well Logs	Well Log (LAS 3.0) (*.las)	Well
2- Well Tops	ASCII (*.*)	Well Tops
3- 3D Seismic Data	Siseworks Horizon Pick (ASCII) (*.*)	Lines
4- Fault Data		
A- Fault Polygons	Zmap+ lines (ASCII) (*.*)	Lines
B- Fault Sticks	Zmap+ lines (ASCII) (*.*)	Lines
5- Isochore Data	Zmap+ grid (ASCII) (*.*)	Surface

2.1 Well Data

Well data includes three categories of data as will be discussed next.

2.1.1 Well Headers (Well Location Map)

Initially, well headers may be created using a text editor such as the Notepad, WordPad, or Word. The data includes Well Name, X-Coord, Y-Coord, Kelly Bushing (KB), Top Depth, Bottom Depth, and Symbol of each well as shown in Fig. 2.1. The Well Name column contains names of the wells as they should appear. X-Coord and Y-Coord are the well's x and y-coordinates respectively. The KB refers to the elevation of the Kelly Bushing at this well. The Top Depth and Bottom Depth refer to the depth of the top and bottom zones in the well. The Symbol refers to the type of well, which may initially be set to 1 and later changed from within Petrel to the appropriate well type. Once well headers are inserted into a project, they may be edited from within Petrel.



WellName	X-Coord	Y-Coord	KB	TopDepth	BottomDepth	Symbol
A10	456979.063700	6782712.412000	0.000000	1499.878992	2415.802791	4
A15	456645.058100	6781579.733000	0.000000	1808.894667	2083.824367	4
A16	456510.405500	6784012.020000	0.000000	1805.453854	2155.364054	3
B1	457324.812000	6785978.887000	0.000000	1754.201716	3014.092416	6
B2	458003.133400	6785817.930000	0.000000	1467.488275	2627.404774	10
B4	457617.891100	6785129.579000	0.000000	1496.856299	2756.746999	4
B8	457746.935600	6787092.614000	0.000000	1886.755644	2471.666844	15
B9	456727.657200	6785559.446000	0.000000	1731.917102	2991.807802	28
C1	453062.303700	6786788.355000	0.000000	1901.287334	2366.966768	6
C2	454634.999000	6787607.121000	0.000000	1924.836205	2470.280276	4
C3	456244.153200	6788724.749000	0.000000	1852.230819	2433.521469	2
C4	454640.187200	6786210.631000	0.000000	1808.003864	2563.539093	2
C5	453503.722100	6783001.797000	0.000000	1803.600857	2337.456297	2

Fig. 2.1: The well headers data file open in a Notepad window

To insert well headers to the project, click the **Insert** menu command and choose **New Well Folder.** A new **Wells** folder will be added, which will appear in the Project Explorer Window as a tree view item. Right-click on this item, then select Import (on Selection)…. The **Import File** form appears as shown in Fig. 2.2.

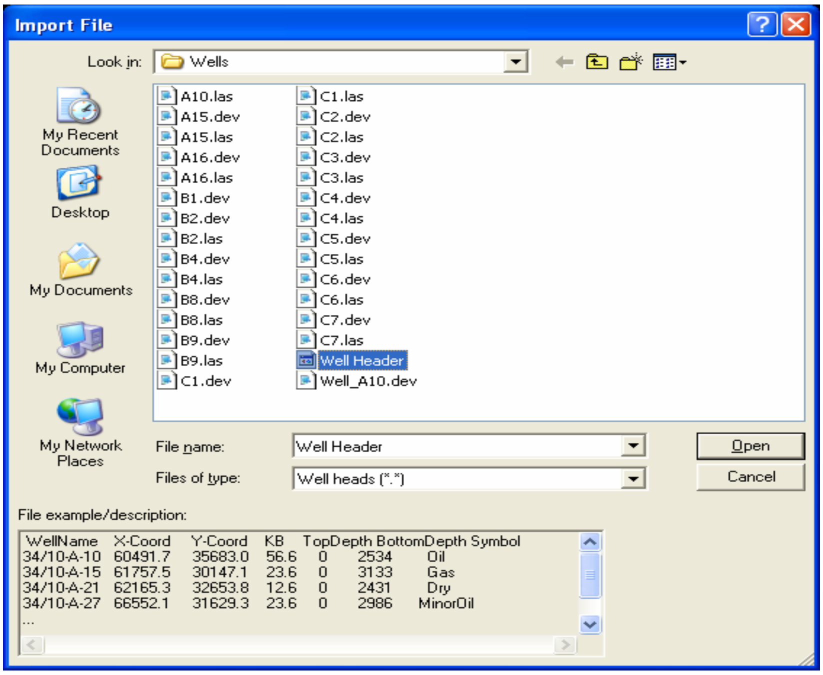


Fig. 2.2: The Import File form

Select **Well heads (*.*)** from the **Files of type** combo box, specify location and name of the well headers data file, and press the **Open** button. The **Import Well Heads** form appears as shown in Fig. 2.3. In this step, columns of the well headers file are identified. When you press **OK**, the wells are added to the **Wells** folder.

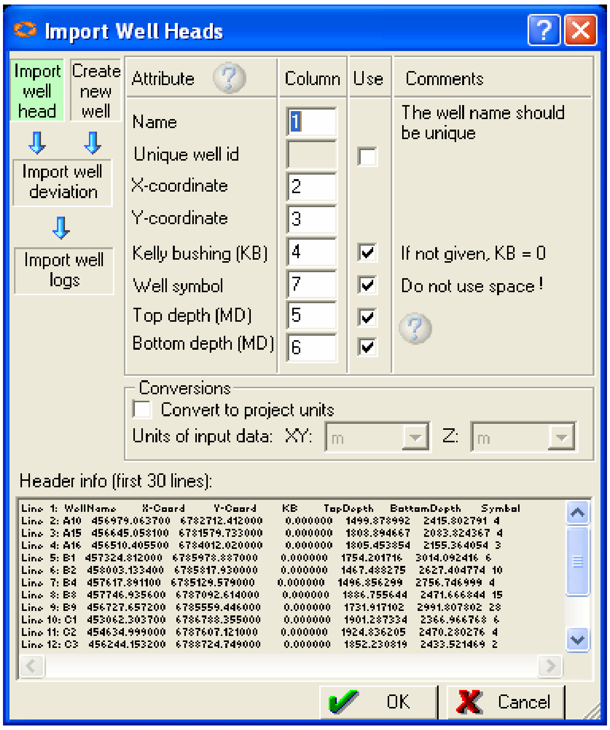


Fig. 2.3: The Import Well Heads form

To display the wells in a 3D window, make sure that a 3D window is active. The check to the left of the **Wells** folder toggles the display of the wells in the 3D window. Once you check the **Wells** folder, the wells will be displayed as vertical sticks in the 3D window as shown in Fig. 2.4. If the wells are not shown in the window, then click the **View All** icon from the **3D Buttons** toolbar.

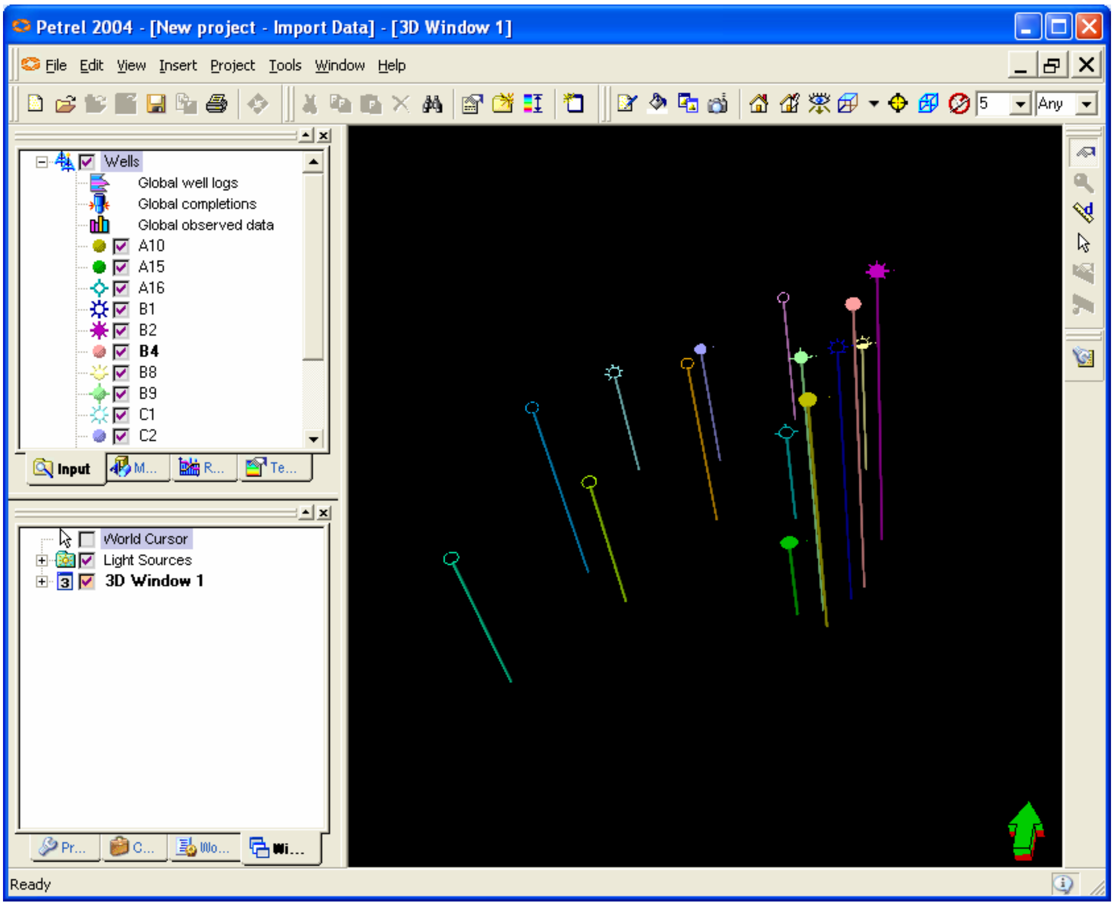


Fig. 2.4: The wells displayed in a 3D window

The settings of the wells may be changed by right-clicking on the **Wells** folder and selecting **Settings…** from the dropdown menu. The **Settings for Wells** form appears as shown in Fig. 2.5. Make sure that the **Style** tab is active. On the **Path** tab, change the **Pipe width** to a number different than the default number; say 50, and press **Apply**. Watch what happens, the wells pipe width changes. Now change it once to a higher number and another to a lower number. Every time you change the pipe width, press the **Apply** button for the changes to take effect. Now click the **Symbols** tab, change the **Font size** to a number different than the default number; say 200, and watch what happens, the well name size changes. Similarly, change the **Symbol size** to a number different than the default number; say 200, the well symbol size changes. Now play with it to get yourself familiar to using this functionality in Petrel.

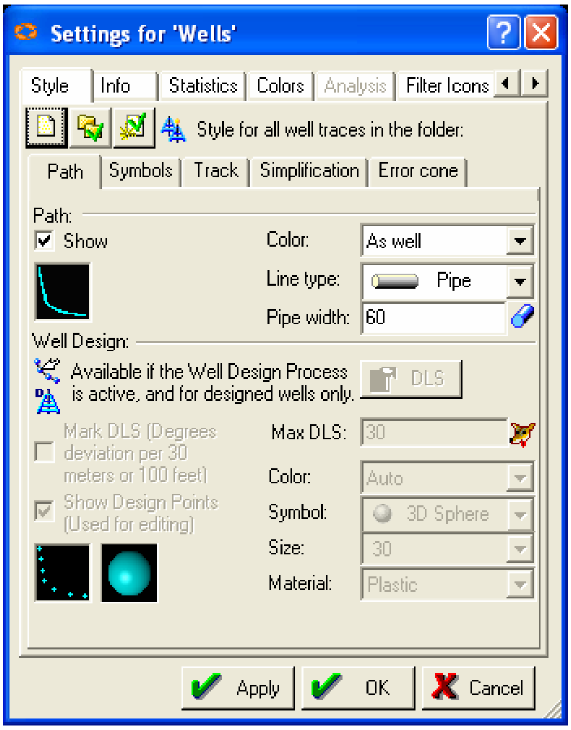


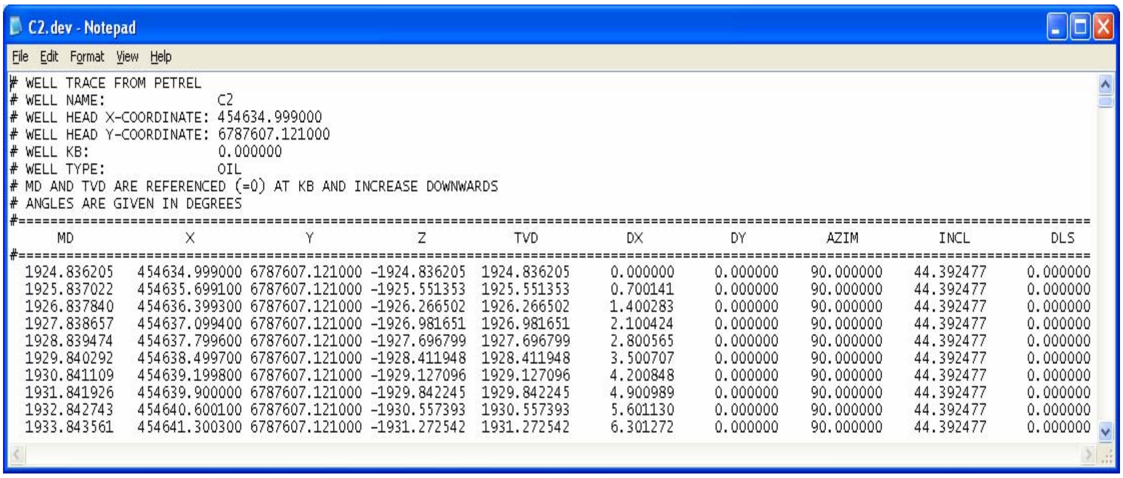
Fig. 2.5: The Settings for 'Wells' form

The well symbol may be independently changed for each well. This is done by expanding the **Wells** folder and right-clicking on the well whose symbol is to be changed. Select **Settings…** from the dropdown menu. On the **Info** tab, change the Well symbol as desired.

The view in the display window may be rotated, moved, or zoomed in and out. To rotate the view, move the mouse cursor on the 3D window while pressing the left mouse button. To move the view, move the mouse cursor on the 3D window while holding down the Ctrl key on the keyboard and pressing the left mouse button. To zoom the view in and out, move the mouse cursor on the 3D window while holding down the Ctrl+Shift keys on the keyboard and pressing the left mouse button. Pay special attention to the green and red arrows at the bottom right corner of the 3D window. The green arrow should be on top of the red one. Again, try to familiarize yourself to playing with those functionalities because things will get harder as you proceed.

2.1.2 Well Paths (Well Deviations)

The next piece of well data is well deviations. The well deviations are read into Petrel in a specific format as shown in Fig. 2.6. A deviated well is traced downward along its path. The well's path is sliced into a number of points more enough to represent its deviation. For each point, the following data is needed: MD, X, Y, Z, TVD, DX, DY, AZIM, INCL, and DLS. The MD refers to the positive value of the measured depth of each point. The X and Y values are the x and y-coordinates of each point respectively. The Z refers to the negative value of the depth of each point. TVD is the true vertical depth of each point. DX is the difference between the X value of the point and the well's x-coordinate. Similarly, DY is the difference between the Y value of the point and the well's y-coordinate.




```
# WELL TRACE FROM PETREL
# WELL NAME:              C2
# WELL HEAD X-COORDINATE: 454634.999000
# WELL HEAD Y-COORDINATE: 6787607.121000
# WELL KB:                0.000000
# WELL TYPE:              OIL
# MD AND TVD ARE REFERENCED (=0) AT KB AND INCREASE DOWNWARDS
# ANGLES ARE GIVEN IN DEGREES
#==========================================================================================================
      MD            X              Y             Z            TVD          DX          DY         AZIM        INCL        DLS
#==========================================================================================================
  1924.836205  454634.999000 6787607.121000 -1924.836205 1924.836205   0.000000    0.000000   90.000000   44.392477   0.000000
  1925.837022  454635.699100 6787607.121000 -1925.551353 1925.551353   0.700141    0.000000   90.000000   44.392477   0.000000
  1926.837840  454636.399300 6787607.121000 -1926.266502 1926.266502   1.400283    0.000000   90.000000   44.392477   0.000000
  1927.838657  454637.099400 6787607.121000 -1926.981651 1926.981651   2.100424    0.000000   90.000000   44.392477   0.000000
  1928.839474  454637.799600 6787607.121000 -1927.696799 1927.696799   2.800565    0.000000   90.000000   44.392477   0.000000
  1929.840292  454638.499700 6787607.121000 -1928.411948 1928.411948   3.500707    0.000000   90.000000   44.392477   0.000000
  1930.841109  454639.199800 6787607.121000 -1929.127096 1929.127096   4.200848    0.000000   90.000000   44.392477   0.000000
  1931.841926  454639.900000 6787607.121000 -1929.842245 1929.842245   4.900989    0.000000   90.000000   44.392477   0.000000
  1932.842743  454640.600100 6787607.121000 -1930.557393 1930.557393   5.601130    0.000000   90.000000   44.392477   0.000000
  1933.843561  454641.300300 6787607.121000 -1931.272542 1931.272542   6.301272    0.000000   90.000000   44.392477   0.000000
```

Fig. 2.6: The well deviations data file open in a Notepad window

To insert well deviations to the project, right-click on the **Wells** folder, then select Import (on Selection)…. The **Import File** form appears as shown in Fig. 2.2. Select **Well path/deviation (ASCII)(*.*)** from the **Files of type** combo box. In the **File name** combo box, type *.dev and press **Open** for the deviation wells to be listed. Select all files, and press **Open**. The **Match Filename and Well** window appears as shown in Fig. 2.7. Match **Filename** and **Well Trace** names together, if the match is wrong, select the correct well name in the well trace column from the drop down box and press **OK.** In this study, Well_A10 needs to be matched with the well A10. When the **Import Well Path/Deviation** window pops up, click the **Input data** tab. Check the TVD, X, Y radio button and specify column numbers of the MD, X, Y, and TVD as shown in Fig. 2.8. Once you press the "**Ok For All**", the wells with their deviations are displayed in the 3D Display Window as shown in Fig. 2.9.

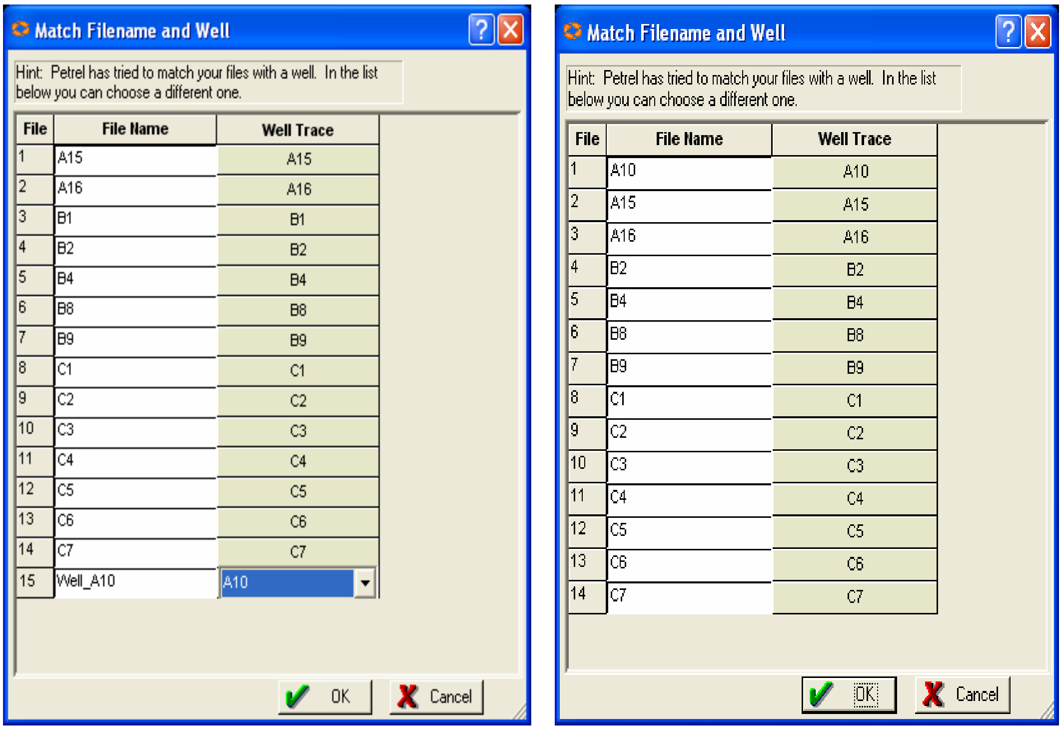


Fig. 2.7: The Match Filename and Well form

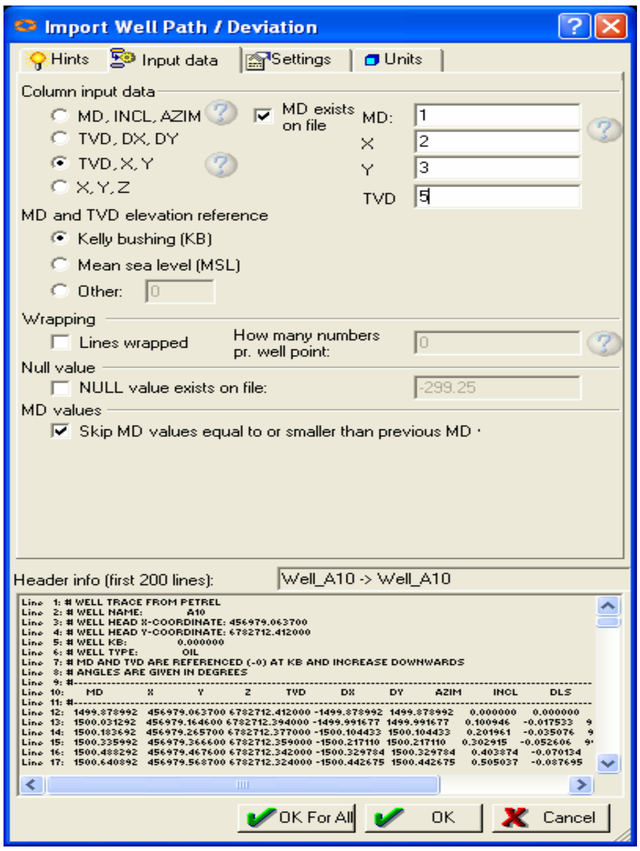


Fig. 2.8: The Import Well Path / Deviation form

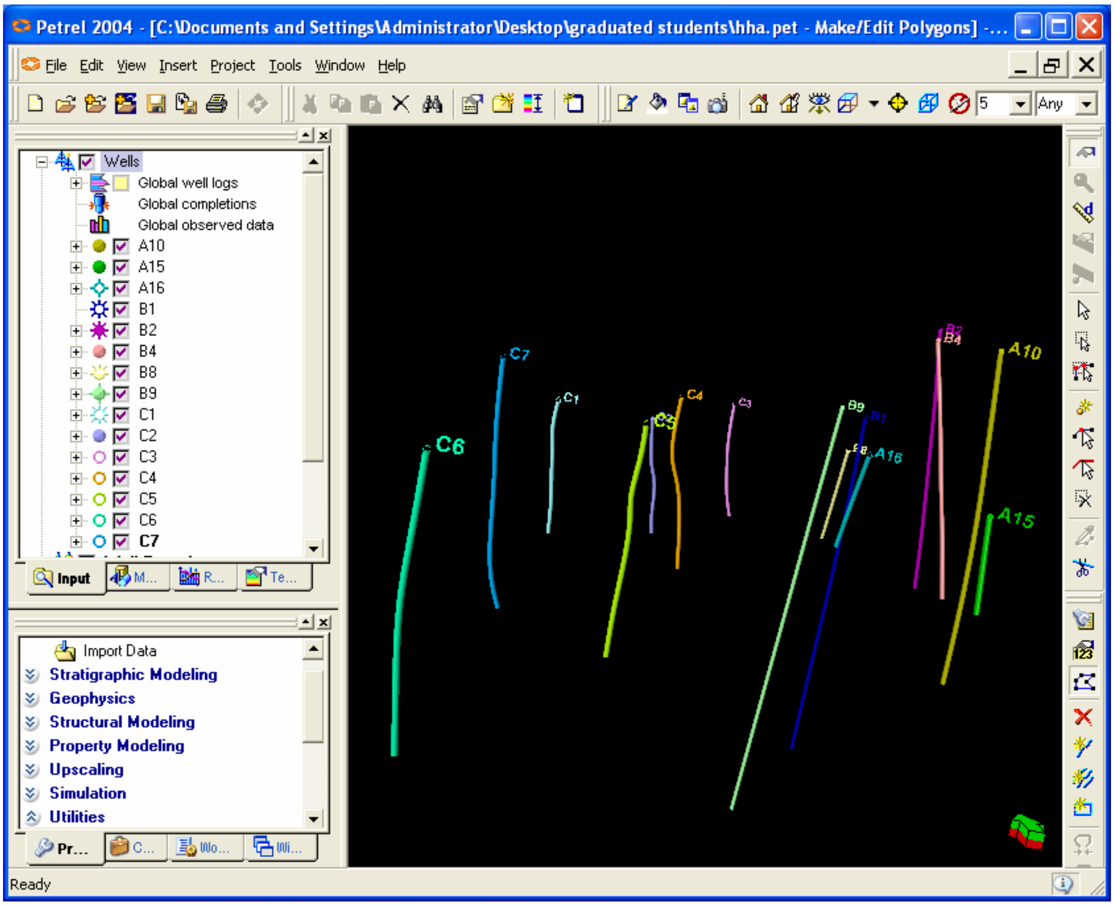
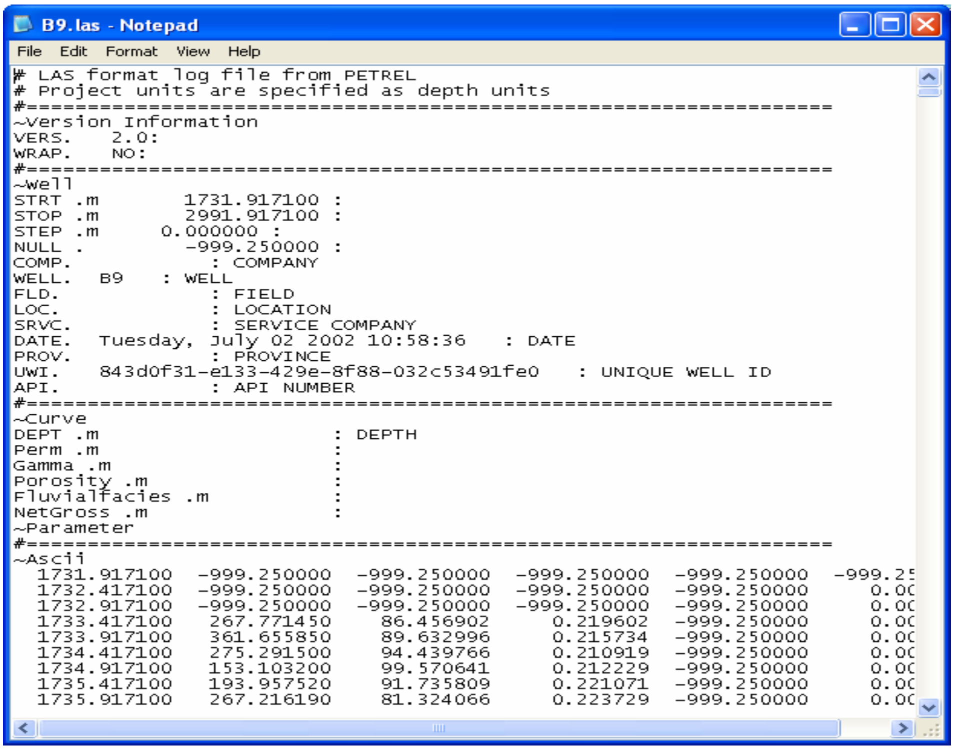


Fig. 2.9: The wells with their deviations displayed in a 3D window

2.1.3 Well Logs

The last piece of well data is well logs. Well logs are read into Petrel in a specific LAS format (both LAS 2.0/3.0 formats are currently supported) as shown in Fig. 2.10.


B9.las - Notepad

File Edit Format View Help

```
# LAS format log file from PETREL
# Project units are specified as depth units
#==================================================================
~Version Information
VERS.    2.0:
WRAP.    NO:
#==================================================================
~Well
STRT .m        1731.917100 :
STOP .m        2991.917100 :
STEP .m      0.000000 :
NULL .         -999.250000 :
COMP.              : COMPANY
WELL.   B9    : WELL
FLD.               : FIELD
LOC.               : LOCATION
SRVC.              : SERVICE COMPANY
DATE.   Tuesday, July 02 2002 10:58:36   : DATE
PROV.              : PROVINCE
UWI.    843d0f31-e133-429e-8f88-032c53491fe0   : UNIQUE WELL ID
API.               : API NUMBER
#==================================================================
~Curve
DEPT .m                        : DEPTH
Perm .m                        :
Gamma .m                       :
Porosity .m                    :
Fluvialfacies .m               :
NetGross .m                    :
~Parameter
#==================================================================
~Ascii
  1731.917100  -999.250000  -999.250000  -999.250000  -999.250000  -999.25
  1732.417100  -999.250000  -999.250000  -999.250000  -999.250000     0.00
  1732.917100  -999.250000  -999.250000  -999.250000  -999.250000     0.00
  1733.417100   267.771450    86.456902     0.219602  -999.250000     0.00
  1733.917100   361.655850    89.632996     0.215734  -999.250000     0.00
  1734.417100   275.291500    94.439766     0.210919  -999.250000     0.00
  1734.917100   153.103200    99.570641     0.212229  -999.250000     0.00
  1735.417100   193.957520    91.735809     0.221071  -999.250000     0.00
  1735.917100   267.216190    81.324066     0.223729  -999.250000     0.00
```

Fig. 2.10: The LAS format log file from Petrel displayed in a Notepad window

Well logs are first scanned using scanning software such as NeuraScan, which scans well logs and saves them in a graphics format; e.g. TIFF format. Next Neuralog is used to digitize well logs and convert them into a digital form. Log analysis software such as Interactive Petrophysics is used to interpret the digitized logs. Quantities such as formation tops, bottoms, thicknesses, shale volumes, lithologies, porosities, water saturations, etc. are calculated in this process. Logs are then saved in LAS format to be imported to Petrel.

To insert well logs to the project, right-click on the **Wells** folder, then select Import (on Selection)…. The **Import File** form appears as shown in Fig. 2.2. Select **Well logs (LAS 3.0) (*.las)** from the **Files of type** combo box. In the **File name** combo box, type *.las and press **Open** for the well logs to be listed. Select all files, and press **Open**. The **Match Filename and Well** window appears as shown in Fig. 2.7. Match **Filename** and **Well Trace** names together, if the match is wrong, select the correct well name in the well trace column from the drop down box and press **OK.** When the **Import well logs** window pops up, choose the **Property Template** of the log from the **Undefined Well Log** group box. In this case, choose the **Net/Gross** property template to be attached to the NetGross log as shown in Fig. 2.11. When you press **OK For All**, the logs associated with each well will be inserted under each wellbore as well as under the **Global well logs** folder.

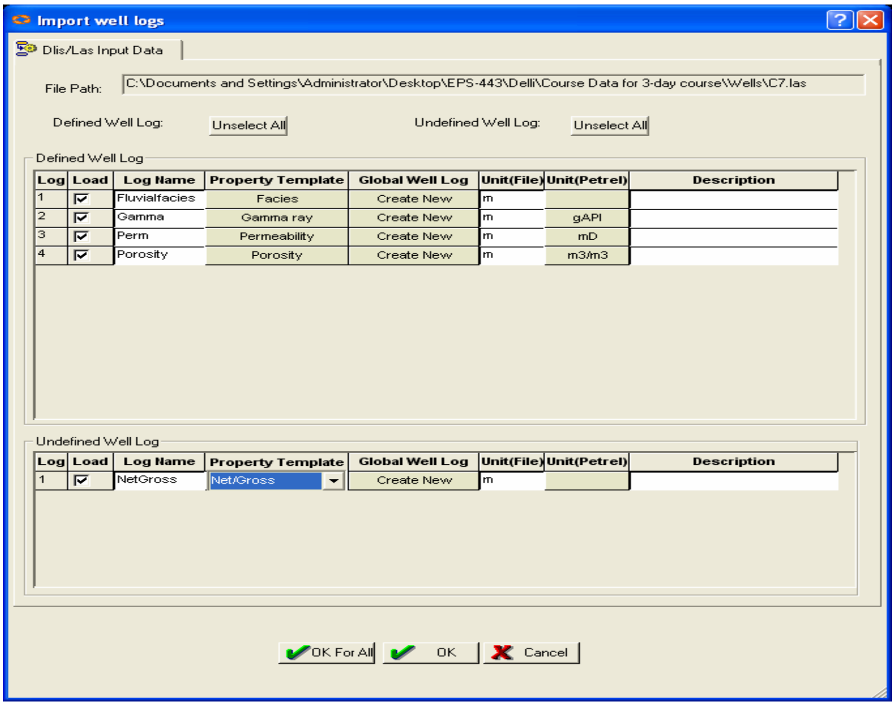


Fig. 2.11: The Import well logs form

Logs may be displayed for all wells or for a specific well. To display logs of all wells, expand the **Global well logs** item and select the logs to be displayed for all wells as shown in Fig. 2.12. To display logs of a certain well, expand the well's item, next expand its **Well logs** item, and finally select the logs to be displayed for that well. The logs will be attached to the existing well path in a manner similar to the attachment of the well path to the well header. Fig. 2.12 shows the Fluvialfacies and Perm logs displayed in a 3D window for all wells.

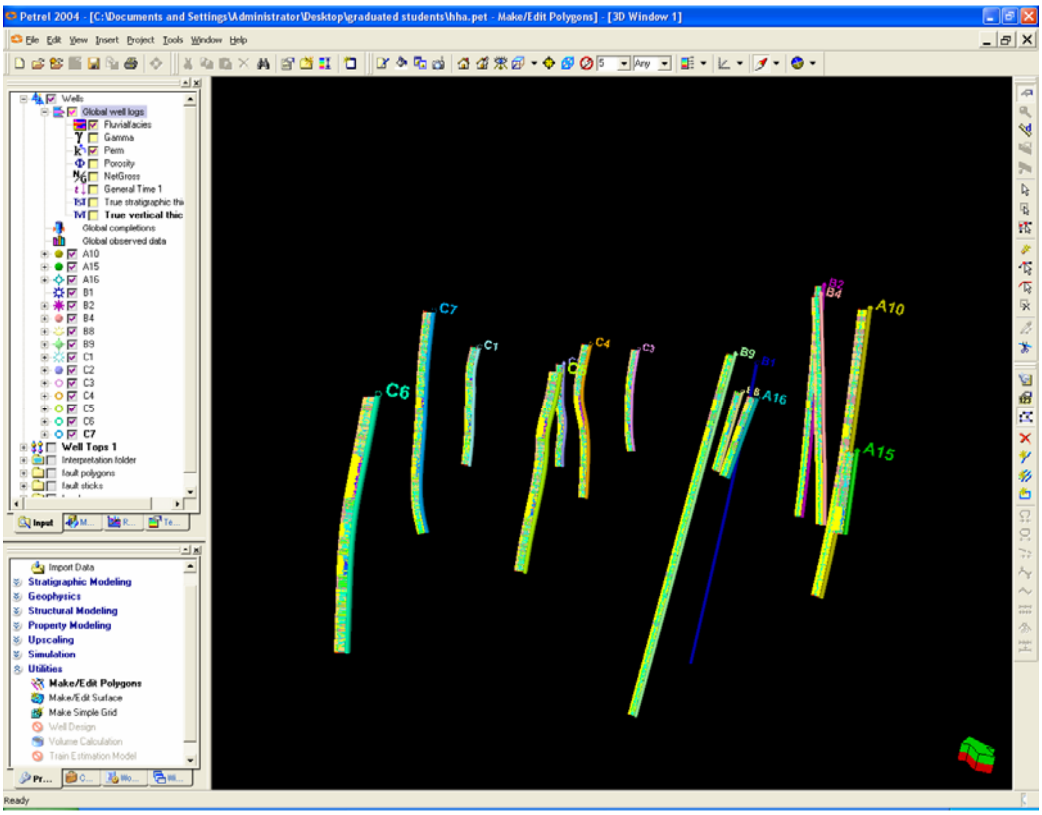
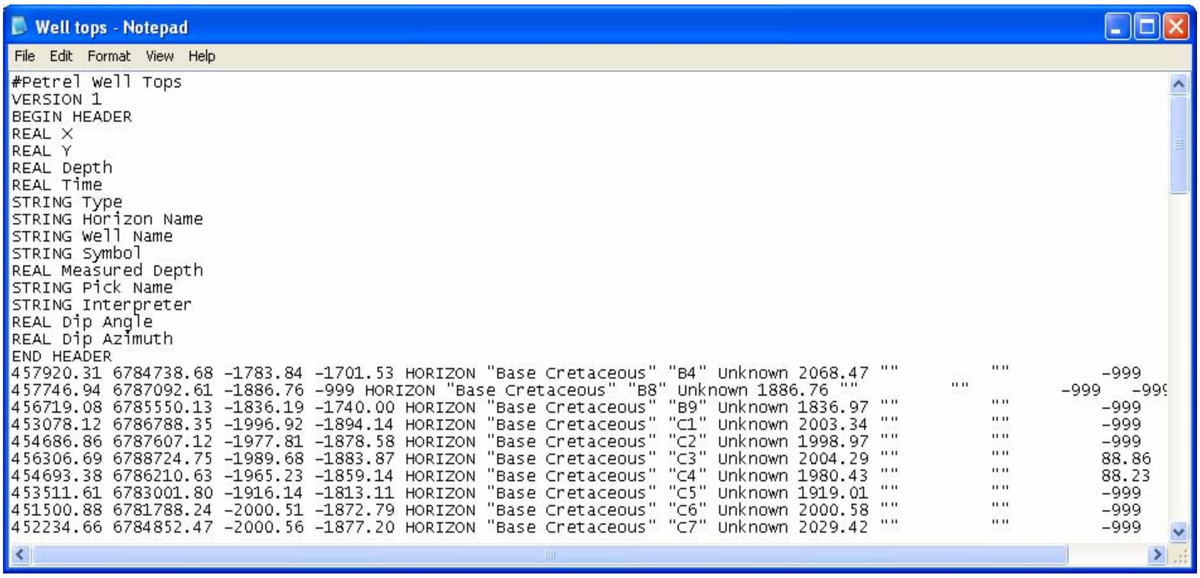


Fig. 2.12: Fluvialfacies and Perm logs displayed in a 3D window

2.2 Well Tops

Initially, well tops data file may be created using a text editor such as the Notepad, WordPad, or Word. The well tops data includes: X, Y, Depth, Time, Type, Horizon Name, Well Name, Symbol, Measured Depth, Pick Name, Interpreter, Dip Angle, and Dip Azimuth of each well as shown in Fig. 2.13.




```
#Petrel Well Tops
VERSION 1
BEGIN HEADER
REAL X
REAL Y
REAL Depth
REAL Time
STRING Type
STRING Horizon Name
STRING Well Name
STRING Symbol
REAL Measured Depth
STRING Pick Name
STRING Interpreter
REAL Dip Angle
REAL Dip Azimuth
END HEADER
457920.31 6784738.68 -1783.84 -1701.53 HORIZON "Base Cretaceous" "B4" Unknown 2068.47 ""       ""      -999
457746.94 6787092.61 -1886.76 -999 HORIZON "Base Cretaceous" "B8" Unknown 1886.76 ""       ""      -999   -999
456719.08 6785550.13 -1836.19 -1740.00 HORIZON "Base Cretaceous" "B9" Unknown 1836.97 ""       ""      -999
453078.12 6786788.35 -1996.92 -1894.14 HORIZON "Base Cretaceous" "C1" Unknown 2003.34 ""       ""      -999
454686.86 6787607.12 -1977.81 -1878.58 HORIZON "Base Cretaceous" "C2" Unknown 1998.97 ""       ""      -999
456306.69 6788724.75 -1989.68 -1883.87 HORIZON "Base Cretaceous" "C3" Unknown 2004.29 ""       ""      88.86
454693.38 6786210.63 -1965.23 -1859.14 HORIZON "Base Cretaceous" "C4" Unknown 1980.43 ""       ""      88.23
453511.61 6783001.80 -1916.14 -1813.11 HORIZON "Base Cretaceous" "C5" Unknown 1919.01 ""       ""      -999
451500.88 6781788.24 -2000.51 -1872.79 HORIZON "Base Cretaceous" "C6" Unknown 2000.58 ""       ""      -999
452234.66 6784852.47 -2000.56 -1877.20 HORIZON "Base Cretaceous" "C7" Unknown 2029.42 ""       ""      -999
```

Fig. 2.13: Well tops data file open in a Notepad window

The X and Y are the well's x and y-coordinates respectively. The Depth and Time refer to the horizon's depth and time. The Type refers to the type of the stratigraphic sequence (Horizon, Zone, and Layer). Horizon Name and Well Name refer to the horizon and well names respectively. The Symbol refers to the type of well, which may initially be set to 1 and later changed to the appropriate well type from within Petrel. Measured Depth refers to the measured depth of the horizon name.

To insert well tops to the project, click the **Insert** menu command and choose **New Well Tops.** A new **Well Tops** folder will be added, which will appear in the Project Explorer Window as a tree view item. Right-click on this item, then select Import (on Selection)…. The **Import File** form appears as shown in Fig. 2.2. Select **Petrel Well Tops (ASCII) (*.*)** from the **Files of type** combo box. Specify location and name of the well tops data file and press the **Open** button. The **Import Petrel Well Tops: Well Tops** appears as shown in Fig. 2.14. Press **Ok For All** and then press **OK** to close the information window.

Now, as an exercise, hide the well logs and display well tops. Well tops might not be shown clearly; you may need to change the settings of the well tops as you did before in the well headers. Again, try to familiarize yourself to playing with other factors because things will get harder as you proceed. If you set the settings for well tops correctly, you are supposed to get something like Fig. 2.15 for well tops.

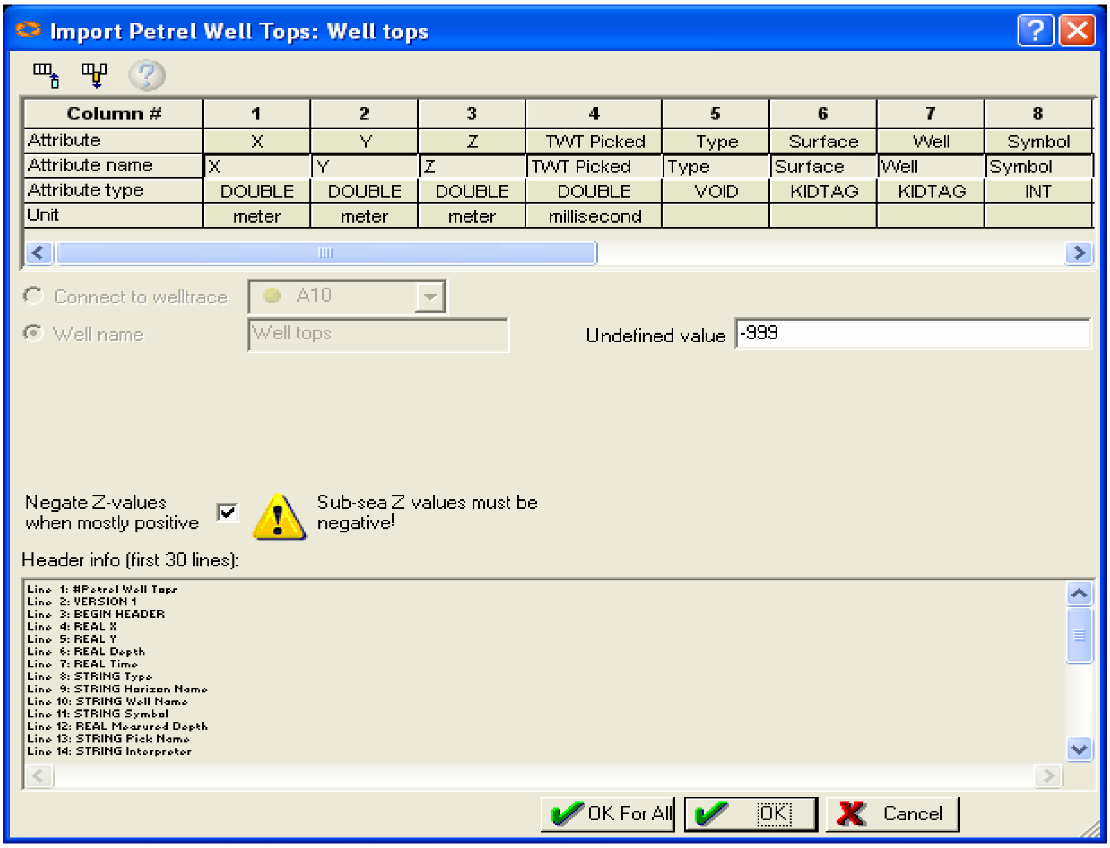


Fig. 2.14: The Import Petrel Well Tops: Well tops form

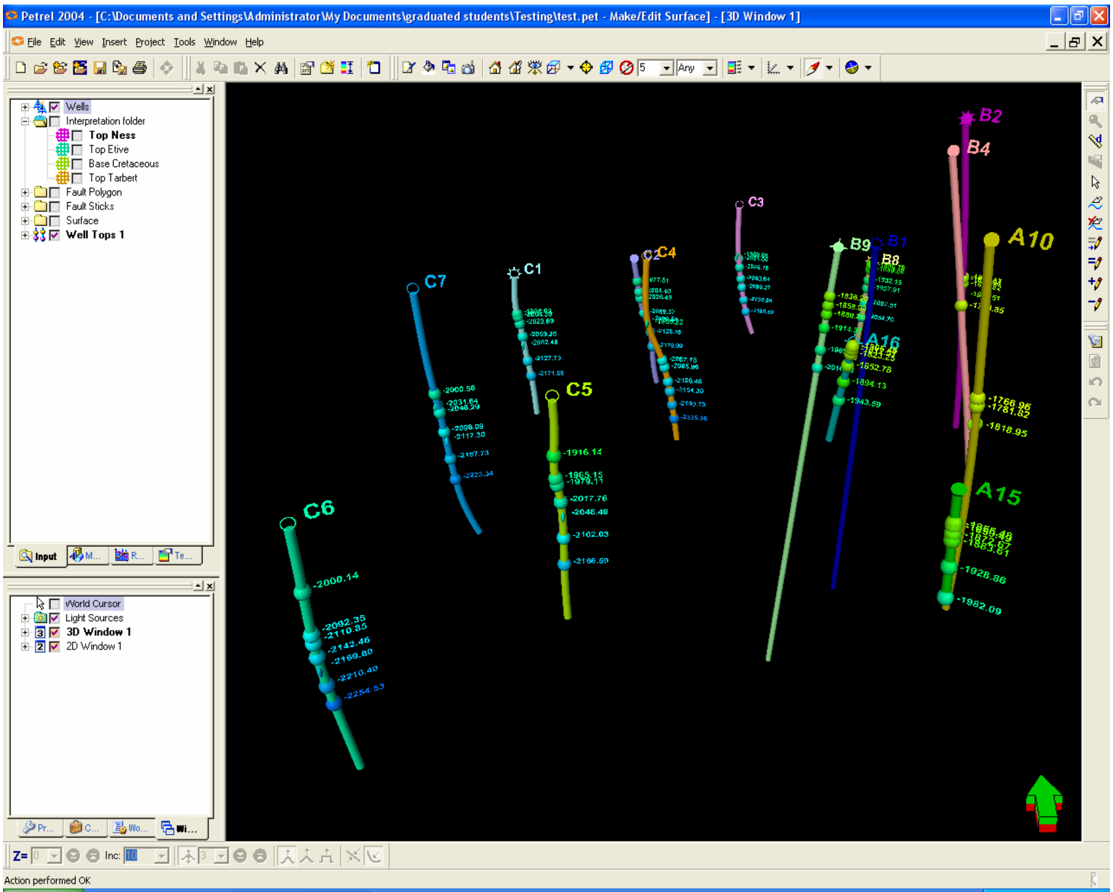
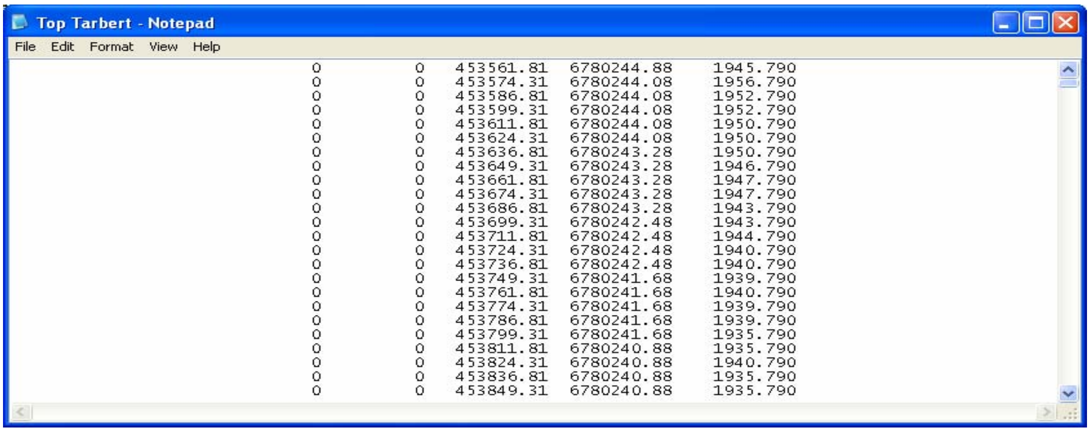


Fig. 2.15: Well tops displayed in a 3D window

2.3 3D Seismic Lines

The 3D seismic lines are read into Petrel in a specific **Seisworks horizon picks** format as shown in Fig. 2.16.



0	0	453561.81	6780244.88	1945.790
0	0	453574.31	6780244.08	1956.790
0	0	453586.81	6780244.08	1952.790
0	0	453599.31	6780244.08	1952.790
0	0	453611.81	6780244.08	1950.790
0	0	453624.31	6780244.08	1950.790
0	0	453636.81	6780243.28	1950.790
0	0	453649.31	6780243.28	1946.790
0	0	453661.81	6780243.28	1947.790
0	0	453674.31	6780243.28	1947.790
0	0	453686.81	6780243.28	1943.790
0	0	453699.31	6780242.48	1943.790
0	0	453711.81	6780242.48	1944.790
0	0	453724.31	6780242.48	1940.790
0	0	453736.81	6780242.48	1940.790
0	0	453749.31	6780241.68	1939.790
0	0	453761.81	6780241.68	1940.790
0	0	453774.31	6780241.68	1939.790
0	0	453786.81	6780241.68	1939.790
0	0	453799.31	6780241.68	1935.790
0	0	453811.81	6780240.88	1935.790
0	0	453824.31	6780240.88	1940.790
0	0	453836.81	6780240.88	1935.790
0	0	453849.31	6780240.88	1935.790

Fig. 2.16: The 3D seismic lines for Top Tarbert open in a Notepad window

The 3D seismic lines may be obtained via software like KingdomSuite package, which converts a surface into a digital form. Next surface analysis software is used to interpret the digitized seismic data. Surfaces are then saved in the **Seisworks horizon picks** format to be imported to Petrel.

To insert the seismic lines to the project, click the **Insert** menu command and choose **New Interpretation Folder**. A new interpretation folder will be added, which will appear in the Project Explorer Window as a tree view item. Right-click on this item, then select Import (on Selection)…. The **Import File** form appears as shown in Fig. 2.2. Select **Seisworks horizon picks (ASCII) (*.*)** format from the **Files of type** combo box. Specify location and name of the seismic data files to be inserted into the project. In this case, select the **Seismic Interpretation (time)** in the **Look in** combo box, then select all files and press the **Open** button. The **Input data dialog** form appears. Make sure that the correct domain is selected, in this case, the **Elevation Time** option should be selected from the **Domain** combo box, as shown in Fig. 2.17, and press the **Ok For All** button.

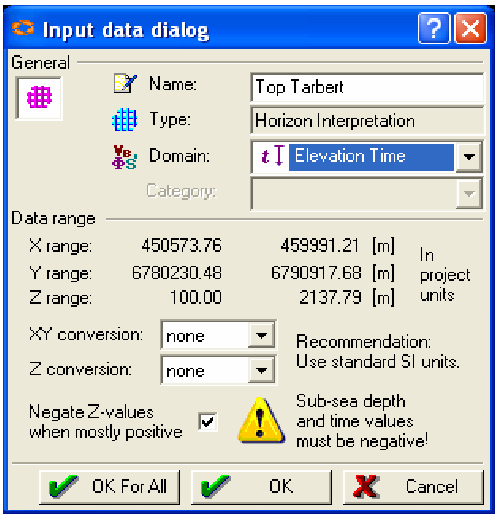


Fig. 2.17: The Input data dialog

To display the seismic surfaces, expand the interpretation folder by clicking the plus sign to its left, then select the surfaces to be displayed as shown in Fig. 2.18.

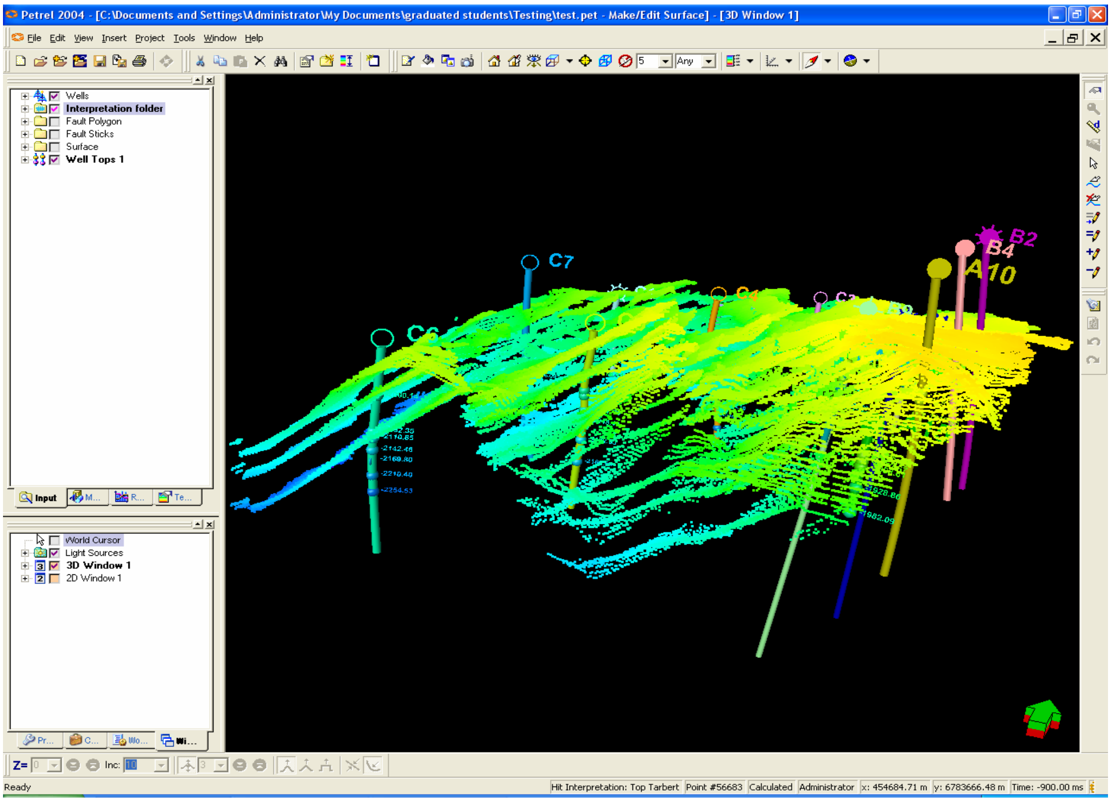


Fig. 2.18: Seismic data of Top Tarbert, Top Ness, and Top Etive, displayed in a 3D window

Now spend some time playing with the settings of each set of data. For example, deselect the wells, well tops, and seismic data, and only select the **Top Tarbert** seismic surface. Then display its settings dialog as shown in Fig. 2.19.

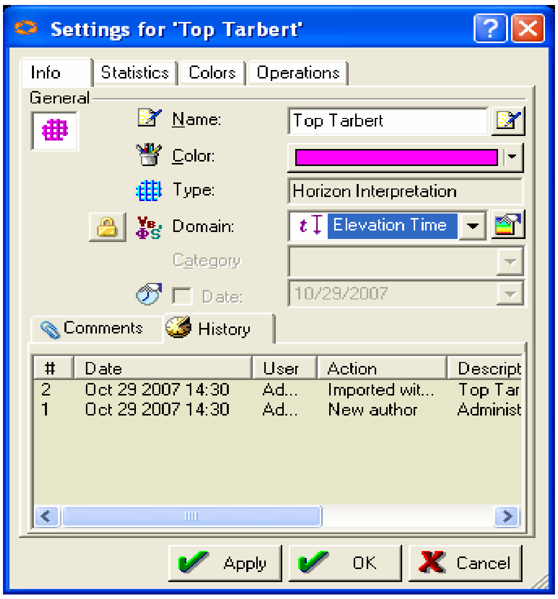


Fig. 2.19: Settings for 'Top Tarbert'

2.4 Fault Data

Fault data is entered to Petrel in one of two forms; either fault polygons or fault sticks as follows:

2.4.1 Fault Polygons

Fault polygons may be created from within Petrel. Their files can be edited with any text editor such as Notepad as shown in Fig. 2.20.

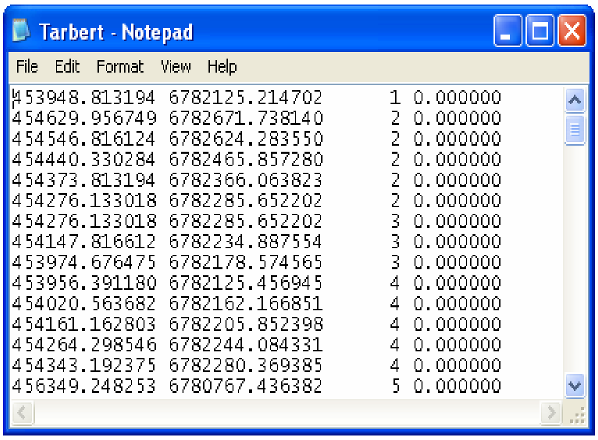


Fig. 2.20: The Tarbert fault polygons data file open in a Notepad window

To insert fault polygons to the project, click the **Insert** menu command and choose **New Folder.** A **New folder** will be added, which will appear in the Project Explorer Window as a tree view item. Rename the folder to **Fault Polygons** by right clicking on the folder and select **Settings…** from the dropdown menu. On the **Settings** dialog box, change the name and press **OK**. Now right-click on the **Fault Polygons** folder, then select Import (on Selection)…. The **Import File** form appears as shown in Fig. 2.2. Select **Zmap+ lines (ASCII) (*.*)** from the **Files of type** combo box. Specify location and name of the fault polygons data files and press the **Open** button. In this case, select the **Fault Polygons (time)** in the **Look in** combo box, then select all files and press the **Open** button. The **Input data dialog** form appears as shown in Fig. 2.21. Make sure that the correct domain and line type are selected; in this case, the **Elevation Time** option and the **Fault polygons** should be selected from the **Domain** and **Line Type** combo boxes. Press the **Ok For All** button.

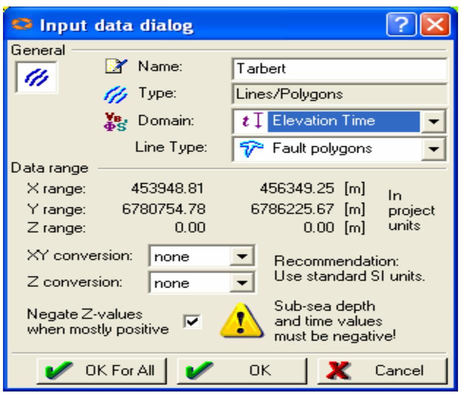


Fig. 2.21: The Input data dialog

To display the fault polygons, expand the **Fault Polygons** folder by clicking the plus sign to its left, then select the fault polygons to be displayed as shown in Fig. 2.22.

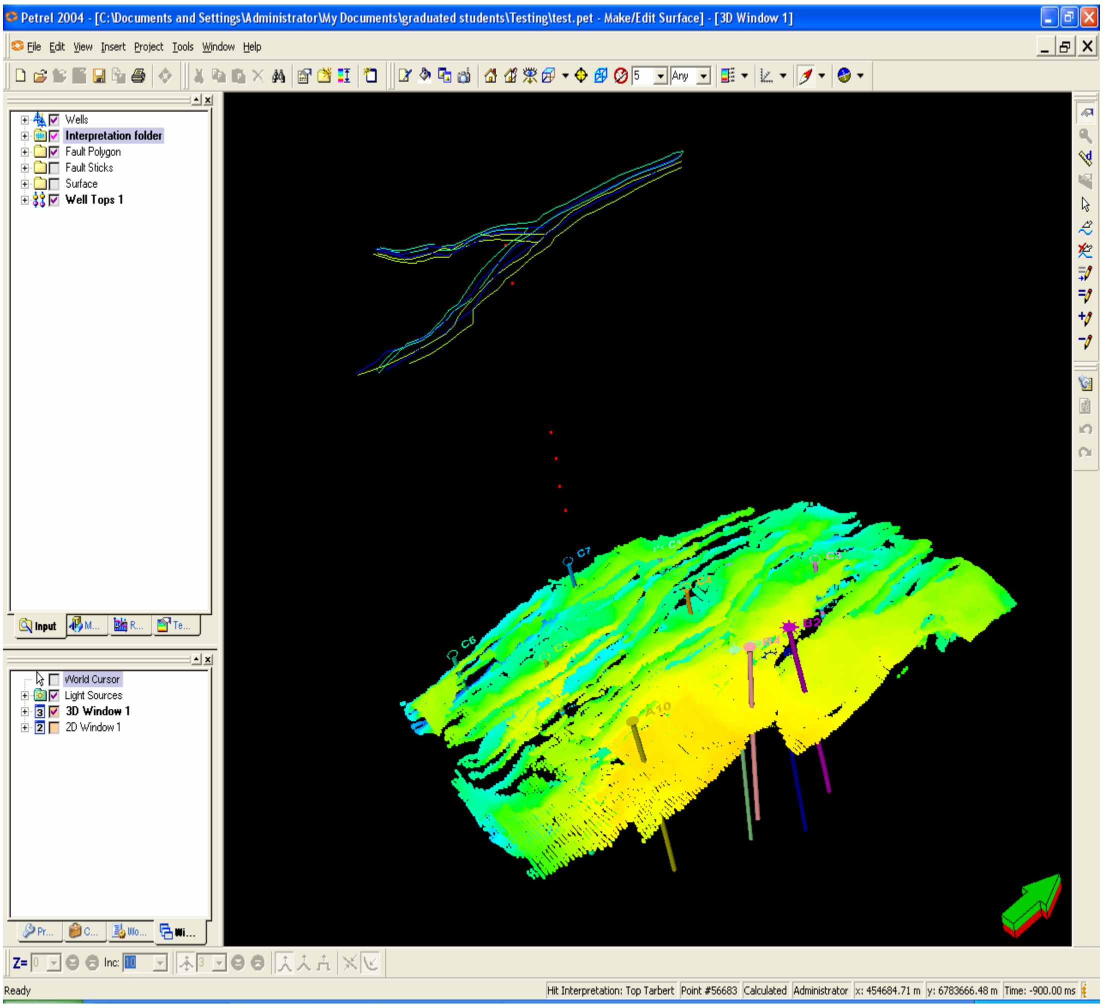


Fig. 2.22: The fault polygons of Tarbert, Ness, and Etive, displayed in a 3D window

At this stage, you should spend some time playing with different settings and options to familiarize your self to Petrel.

2.4.2 Fault Sticks

Fault sticks may be created from within Petrel. Their files can be edited with any text editor such as Notepad as shown in Fig. 2.23.

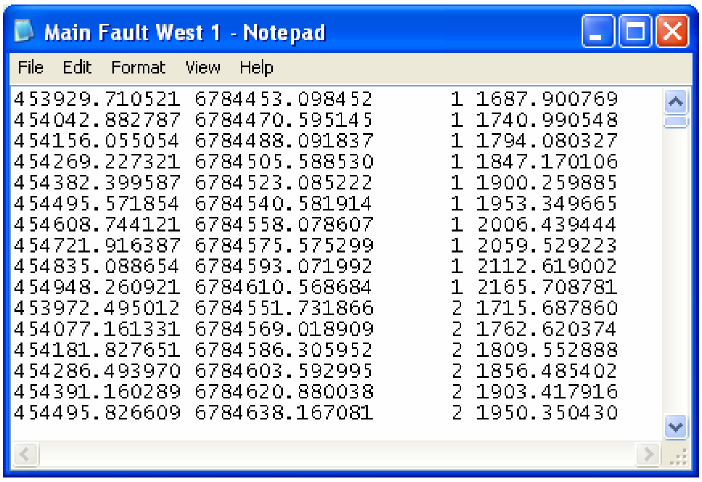


Fig. 2.23: The fault sticks data file open in a Notepad window

To insert fault sticks to the project, click the **Insert** menu command and choose **New Folder.** A **New folder** will be added, which will appear in the Project Explorer Window as a tree view item. Rename the folder to **Fault Sticks** by right-clicking on the folder and select **Settings…** from the dropdown menu. On the **Settings** dialog, change the name and press **OK**. Now right-click on the **Fault Sticks** folder, then select Import (on Selection)…. The **Import File** form appears as shown in Fig. 2.2. Select **Zmap+ lines (ASCII) (*.*)** from the **Files of type** combo box. Specify location and name of the fault polygons data files and press the **Open** button. In this case, select the **Fault Sticks (time)** in the **Look in** combo box, then select **For Create From FS** folder, then select all files and press the **Open** button. The **Input data dialog** form appears. Make sure that the correct domain and line type are selected; in this case, the **Elevation Time** option and the **Fault sticks** should be selected from the **Domain** and **Line Type** combo boxes, as shown in Fig. 2.24, and press the **Ok For All** button. Repeat the same process for other fault sticks folders to be inserted into the project.

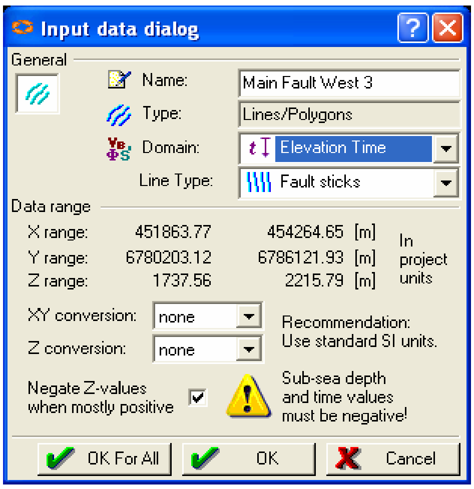


Fig. 2.24: The Input data dialog

To display the fault sticks, expand the **Fault Sticks** folder by clicking the plus sign to its left, then select the fault sticks to be displayed as shown in Fig. 2.25.

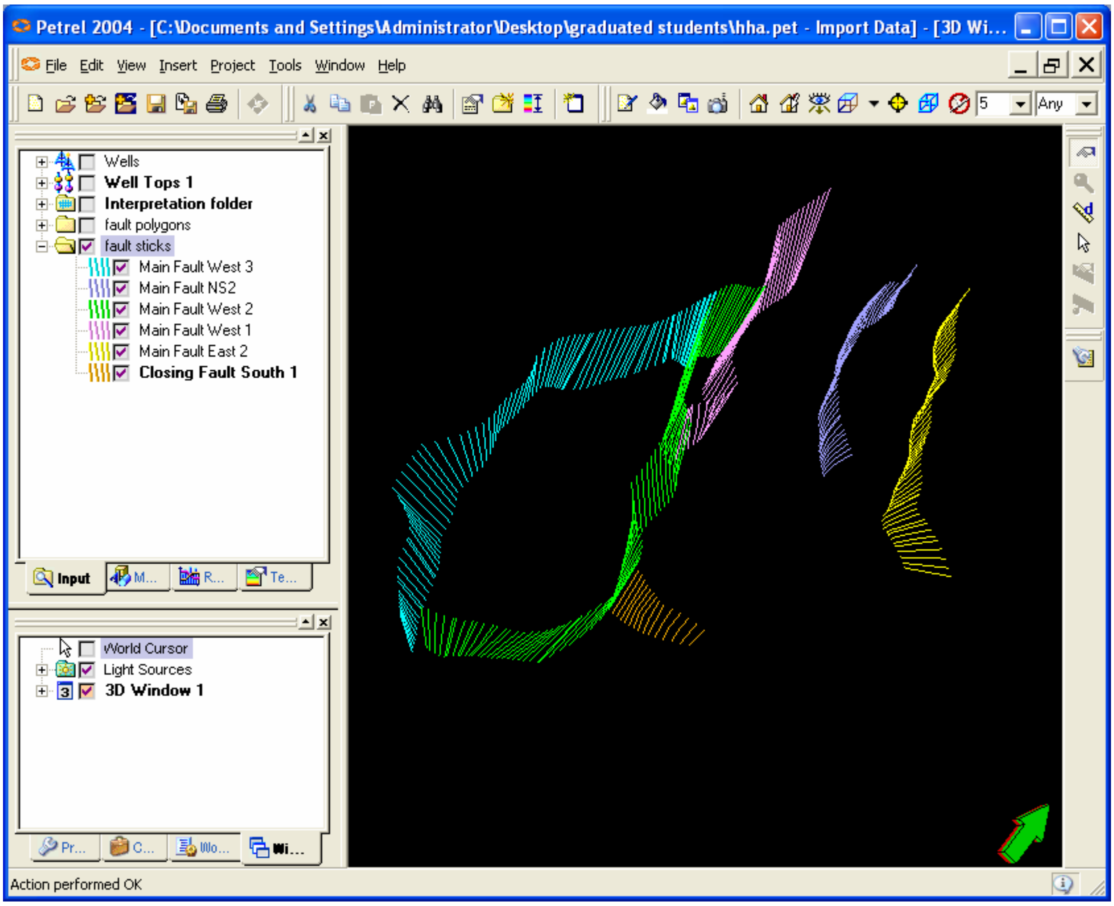
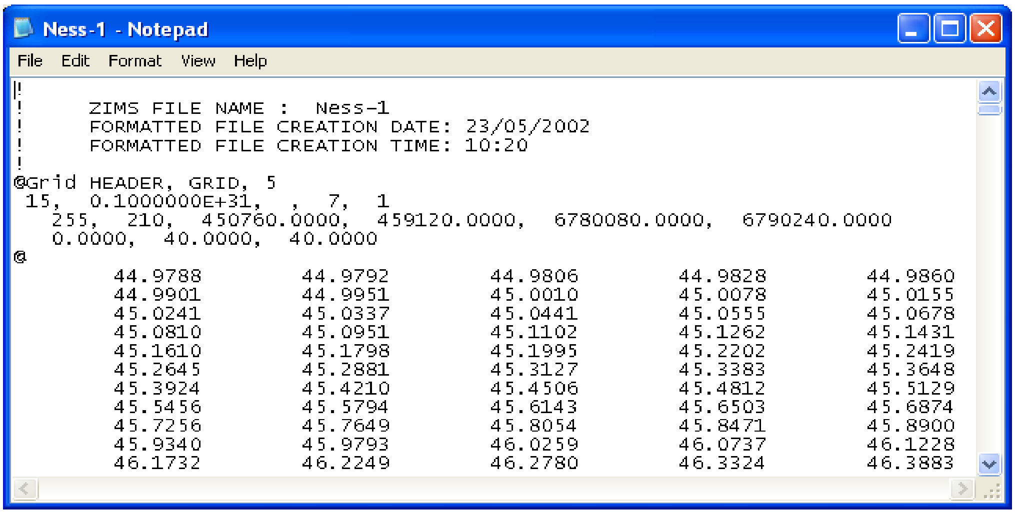


Fig. 2.25: The fault sticks displayed in a 3D window

2.5 Isochore Data

The isochore data is read into Petrel in a specific **Zmap+ grid** format as shown in Fig. 2.26.




```
!
!     ZIMS FILE NAME :  Ness-1
!     FORMATTED FILE CREATION DATE: 23/05/2002
!     FORMATTED FILE CREATION TIME: 10:20
!
@Grid HEADER, GRID, 5
 15,   0.1000000E+31,   ,   7,   1
   255,   210,   450760.0000,   459120.0000,   6780080.0000,   6790240.0000
   0.0000,   40.0000,   40.0000
@
        44.9788        44.9792        44.9806        44.9828        44.9860
        44.9901        44.9951        45.0010        45.0078        45.0155
        45.0241        45.0337        45.0441        45.0555        45.0678
        45.0810        45.0951        45.1102        45.1262        45.1431
        45.1610        45.1798        45.1995        45.2202        45.2419
        45.2645        45.2881        45.3127        45.3383        45.3648
        45.3924        45.4210        45.4506        45.4812        45.5129
        45.5456        45.5794        45.6143        45.6503        45.6874
        45.7256        45.7649        45.8054        45.8471        45.8900
        45.9340        45.9793        46.0259        46.0737        46.1228
        46.1732        46.2249        46.2780        46.3324        46.3883
```

Fig. 2.26: The isochore data file open in a Notepad window

To insert isochore data to the project, click the **Insert** menu command and choose **New Folder.** A **New folder** will be added which will appear in the Project Explorer Window as a tree view item. Rename the folder to **Isochores** by right-clicking on the folder and select **Settings…** from the dropdown menu. On the **Settings** dialog box, change the name and press **OK**. Now right-click on the **Isochores** folder, then select Import (on Selection)…. The **Import File** form appears as shown in Fig. 2.2. Select **Zmap+ grid (ASCII) (*.*)** from the **Files of type** combo box. Specify location and name of the isochore data files and press the **Open** button. In this case, select the **Isochores (depth)** in the **Look in** combo box, then select the **Ness** folder, then select all files and press the **Open** button. The **Input data dialog** form appears. Make sure that the correct template is selected, in this case, the **Thickness Depth** option should be selected from the **Template** combo box as shown in Fig. 2.27, and press the **Ok For All** button. Repeat the same process for the **Tarbert** folder to be inserted into the project. To display the isochore data, expand the **Isochores** folder by clicking the plus sign to its left, then select the isochores to be displayed as shown in Fig. 2.28.

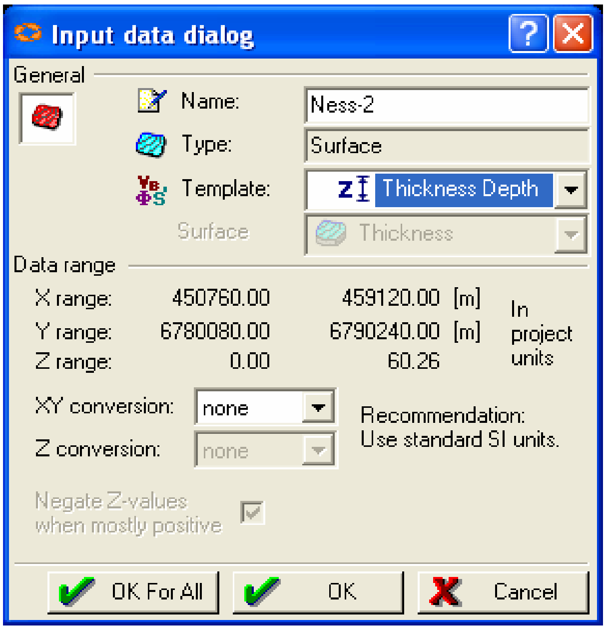


Fig. 2.27: The Input data dialog

With this step, most of the required data were input to Petrel. A chart of the input data with their formats, types, categories, and domains is shown in Fig. 2.29. Next, some editing of the input data is necessary before we start building the 3D geological model of the petroleum reservoir. Editing of the input data will be discussed in the next section.

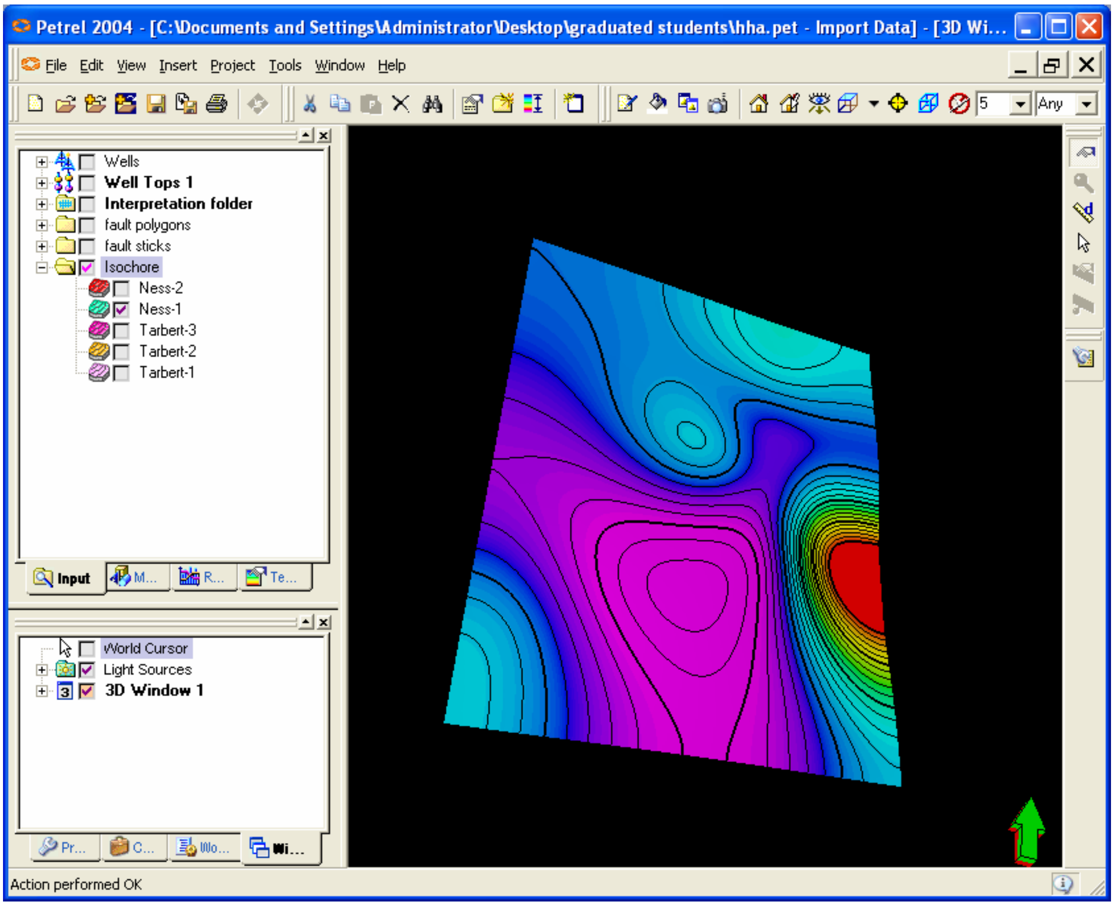


Fig. 2.28: The Ness 1 isochores displayed in a 3D window

Data	*Formats*	*Type*	*Category*	*Domain*
Wells	Wellhead-deviation-logs	Well		Depth
Well tops	Petrel Well Tops	Well tops		Depth
3D seismic lines	Seisworks Horizon Picks	Lines	Horizon	Time
Fault polygons	ZMAP+ lines (ASCII)	Lines	Fault polygons	Time
Fault sticks	ZMAP+ lines (ASCII)	Lines	Fault sticks	Time
Surfaces (Time)	Zmap+ grid	Surface	Elevation	Time
Isochores (Depth)	Zmap+ grid	Surface	Thickness	Depth
Properties	Zmap+ grid	Surface	Property	Respective Template
Velocity Data	Zmap+ grid	Surface	Property	Velocity Template
Extra data	*Formats*		*Category*	*Unit*
Seismic cube / 2D	SEG-Y	Seismic	Seismic	Template
Images	Bitmap (bmp, jpeg....)	No	No	No
Summary Files	Petrel summary data ASCII			
Eclipse grid				

Fig. 2.29: Petrel data types with their formats, categories, and domains

2.6 Import Data from Another Project

Any type of data can be copied between projects. This functionality allows for having a master project containing regional data. Parts of this data can then be copied over to a new project for detailed analysis of parts of the area. In this exercise you will import all the remaining data required for the following exercises by copying them from an existing project.

To import data from another project, follow the steps:

- Select File> Open Secondary Project.
- Select the **Input_Data.pet** file found under the Project folder. See Fig. 2.30.
- Drag and drop all the Input flies that you are missing into the Input tab of your project.

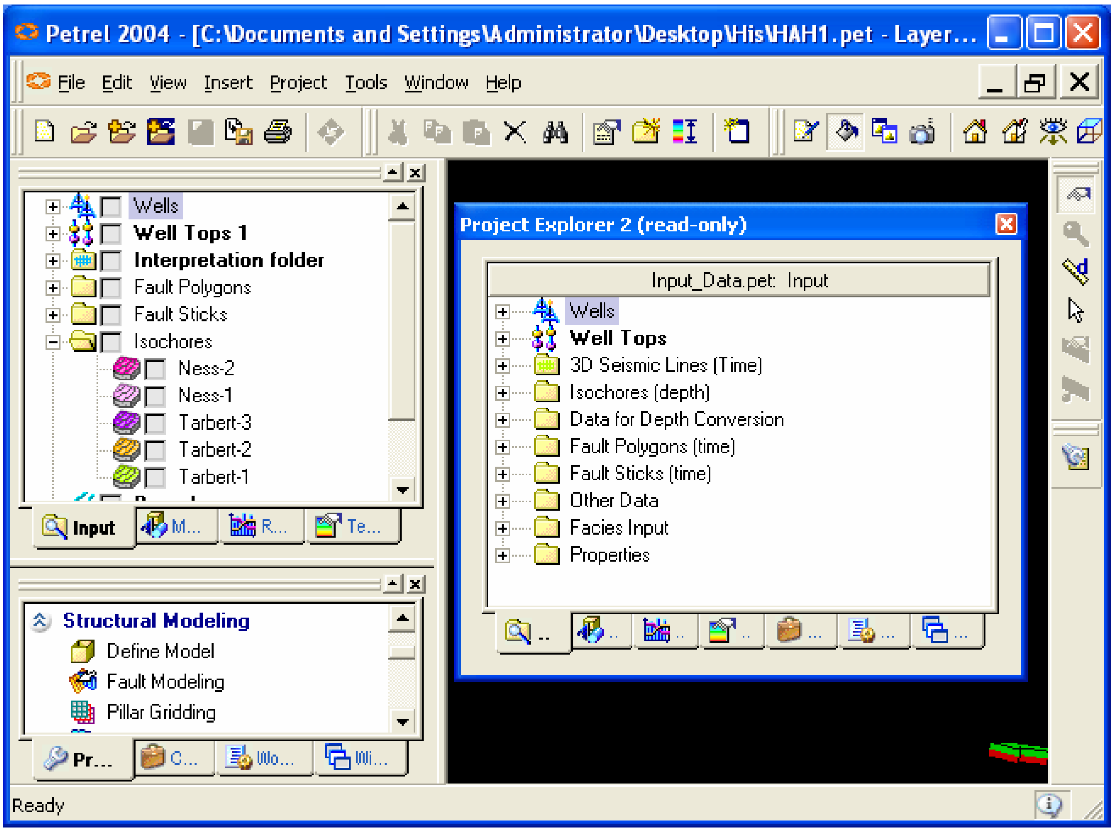


Fig. 2.30: The Input_Data.pet (read-only) displayed in a 3D window

2.7 Quality Check (QC) of Imported Data

After data has been imported into Petrel, you should always do a quality control and check if they look as you expected them to do. Typical ways of QC data are to display them and also to check the statistics. Using the general intersection to view the data in cross section and playing through the data set is a powerful tool as well. As an example, when you do the quality check of the fault polygons you have imported, you will see that they don't have any Z value. This we are going to fix in the next chapter with the editing of the input data.