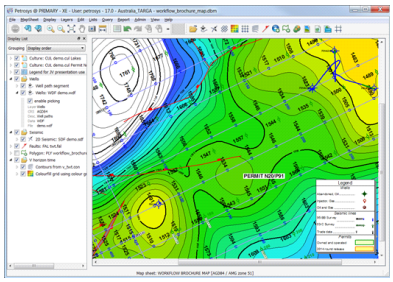
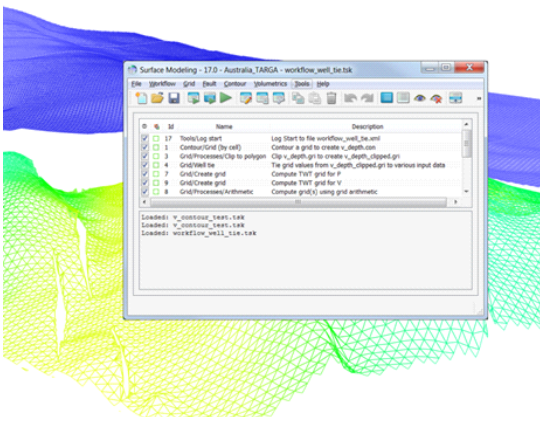
Petrosys Getting Started Guide

Version 17.0

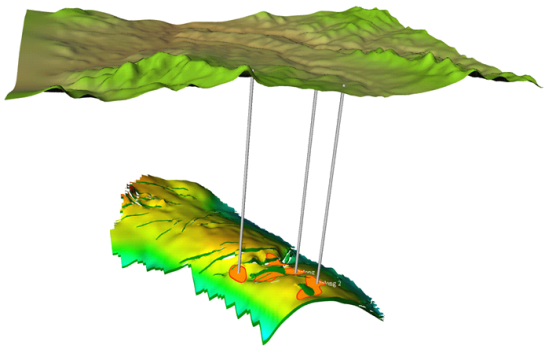


Petrosys mapping and data management helps you integrate geotechnical, engineering and GIS data to develop a better understanding of the subsurface for more effective management and exploitation of petroleum resources. With a strong focus on petroleum exploration and production, Petrosys ties into specialised data acquisition workflows and software applications based on wells, seismic, and remote sensing surveys.

The presentation quality map canvas is the natural space in which to collate spatial information. It provides rich rendering facilities tailored to the specific data types encountered in petroleum exploration and production with effortless and reliable correlation of international coordinate reference systems.



Petrosys surface modelling allows the consolidation of time, velocity and depth information to produce stable grids with excellent control over the balance between matching interpreted data and geological credibility. Workflows can be automated and rapidly re-run to allow a broad range of interpretations and volumetric estimates to be tested



To visually explore the subsurface model the 3D viewer will render much of the information in a 3D context, including the draping of maps on surfaces.

For Petrosys support call your local Petrosys office or send an email to support@petrosys.com.au. Our support email is monitored world wide around the clock.

Local office telephone numbers:

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Canada +1 403 537 5600

Europe +44 141 420 6555

Australia +61 8 8227 2799 (head office)

Malaysia +60 3 2772 7357

Welcome to Petrosys. This guide is intended to provide a quick introduction to the most commonly used features of Petrosys. It uses the demonstration data set supplied with the default installation of Petrosys.

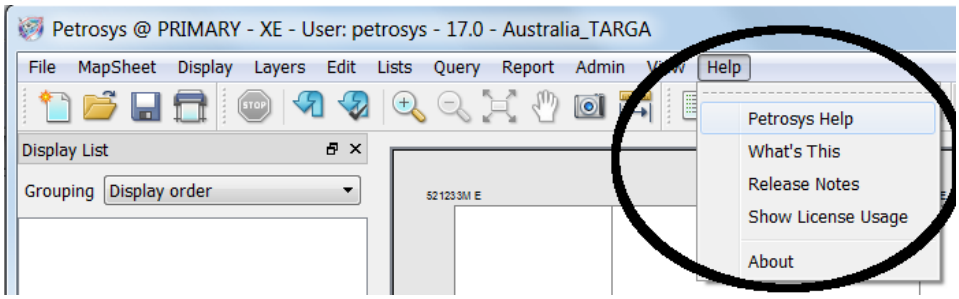
There are four main steps in getting started:

- The Petrosys launcher is the front menu from which you can select, create and add projects, and launch the mapping and other applications;
- The Mapping application is the map canvas in which you draw wells, seismic, grids, contours, GIS and other data
- The optional 3D visualization application displays wells, grids and maps in 3D
- The optional surface modeling is used to compute gridded surfaces, contours, volumes and to automate workflows.

Read the Online Help

This guide includes some direct links to topics in the online help. If you are reading a printed or PDF version of the getting started guide, then it is highly recommended that you switch to the online help version once you are up and running in Petrosys.

The online help is accessed from the Help options that are at the right of the various top level applications menus:



Petrosys Help — Opens the online help at the beginning

What's This — Changes the cursor to a question mark and lets you point at a Petrosys menu option or data panel field for which specific (context sensitive) help will be shown if available

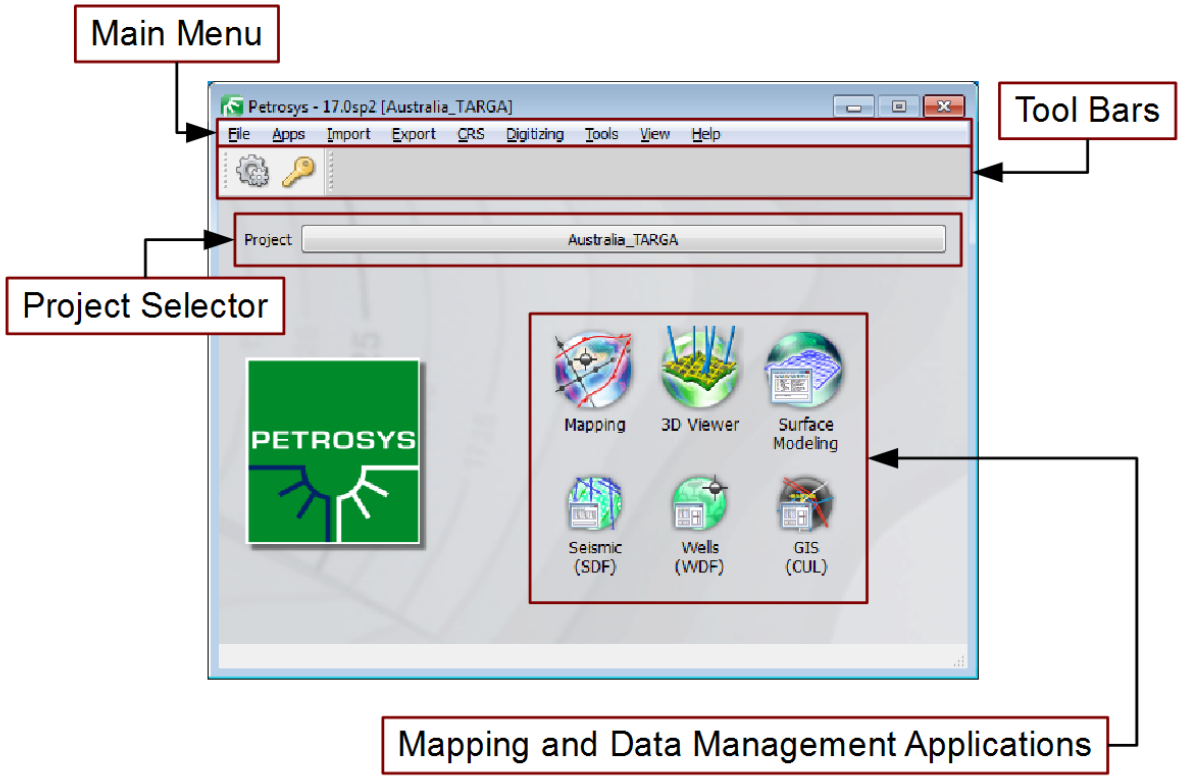
About — Provides information on the current version of Petrosys that you are using. You may be asked to provide this information when you make a support call.

Getting Started in the Petrosys Launcher

Launch Petrosys using the Petrosys icon on your desktop, or choose Petrosys/Petrosys Mapping from the start menu.

The Petrosys Launcher is divided into four main sections -

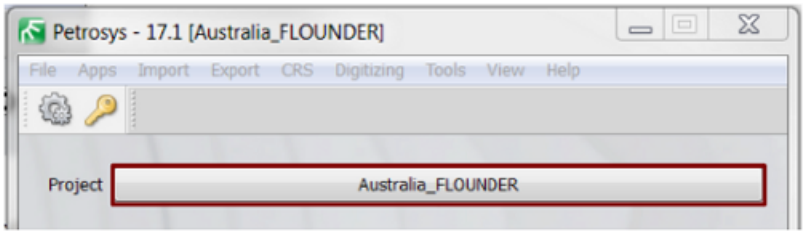
Menu Bar	Configuration, import and export options and detailed software functionality
Tool Bars	A customizable collection of shortcuts buttons to frequently used parts of the software
Project Selector	Launches the project selector, where projects can be created and manipulated
Mapping and Data Management Applications	The six main applications used for the management and display of data within the Petrosys application, the first three of which – Mapping, 3D Viewer and Surface Modeling – will be covered in this guide.



Everything you do in Petrosys is done within a “Project” - a local directory on your computer where all of the maps, surfaces and other pieces of interpretation data are stored. Projects also store configuration data, so any changes you make as a general user of the software within a particular project will be limited to that project.

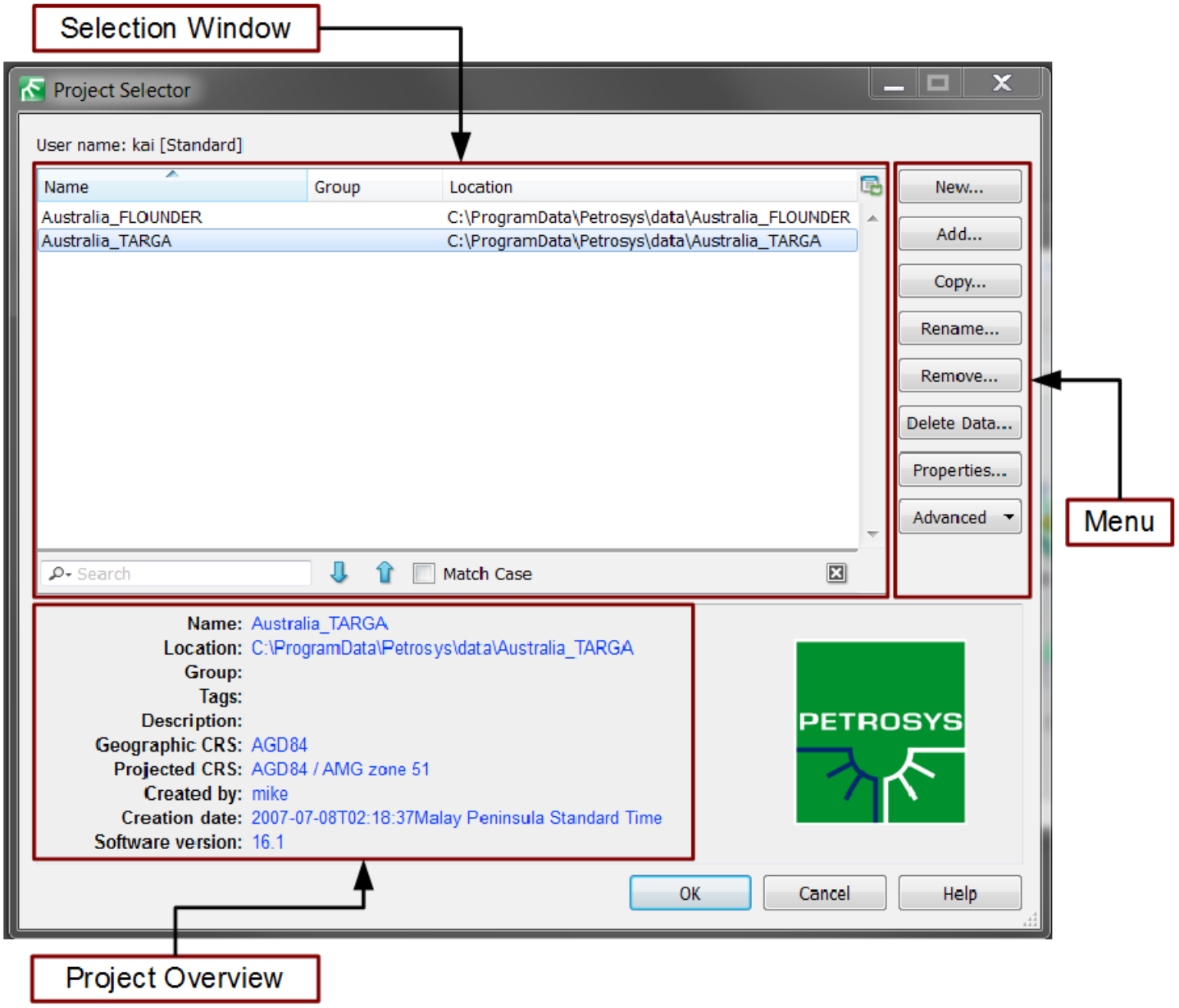
Projects are created, edited, and selected, and existing projects added and removed, using the “Project selector”.

Launch the Project Selector by clicking the field next to “Project” in the launcher.

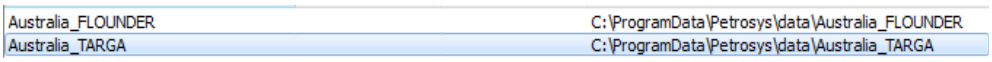


The Project Selector is divided into three main sections -

1. Project List – Displays all the active projects that you have access to
2. Menu – Contains options for managing the active projects
3. Project Overview – Is an overview of the project highlighted in the selection window



Highlight “Australia_TARGA” and select OK. This will close the project selector and make Australia_TARGA the active project.



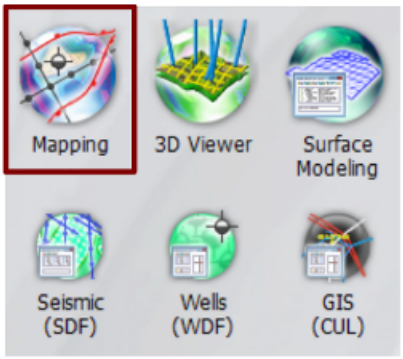
There are three main applications that will covered by this guide -

- Mapping
- 3D Viewer
- Surface Modeling

The vast majority of content creation is accomplished using these three applications. Other parts of the software are concerned primarily with data management, which will not be covered by this guide.

Applications are launched by clicking the relevant icon. The first section of this guide will deal with mapping.

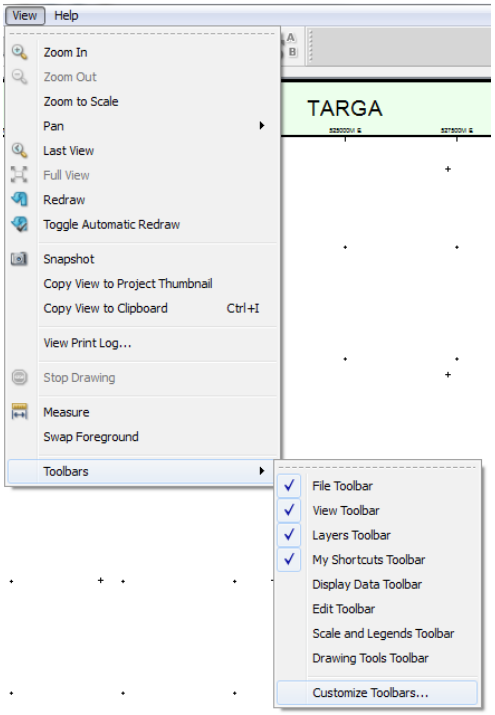
Launch the mapping application by clicking the “Mapping” icon in the launcher.



The map editor is divided into five main sections -

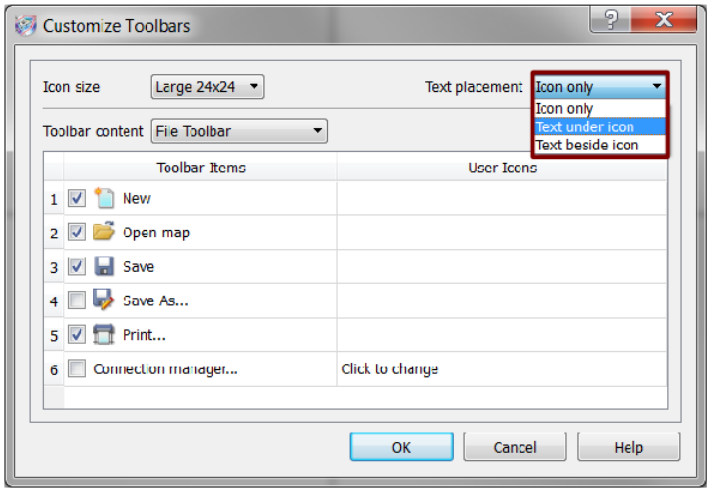
Main Menu	Contains most of the options relating to map editing
Toolbars	Are fully customisable collections of shortcuts to frequently used options in the main menu and other parts of the application
Display List	Is a hierarchical list of all the data displayed on the map. As there is no data currently displayed, it is empty
Map Canvas	Is a visual display of your map in which is comprised of both a map sheet and the data in the display list. As there is nothing currently in the display list, all of the currently visible elements belong to the map sheet – including the title block, the scale, and the ticks and crosses on the map itself. Map sheets and display lists are saved separately and work independently of one another, and are combined only when the final hard copy of the map is produced. This will all be covered in detail in this section of the guide.
Status Bar	Displays information relating to whatever is selected in the mapping window. The information currently displayed relates to the map sheet currently in use - "TARGA-REGIONAL".

Select View/Toolbars/Customize Toolbars...

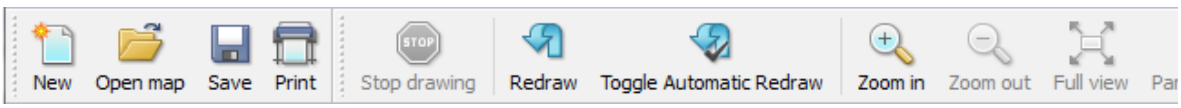


From this window, you can customize most of the toolbars available from both the main menu and quick menu.

Change Text placement, at the top right, from “Icon only” to “Text under icon”.

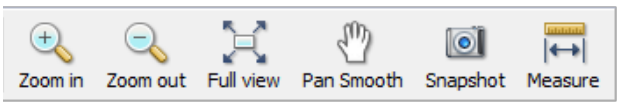


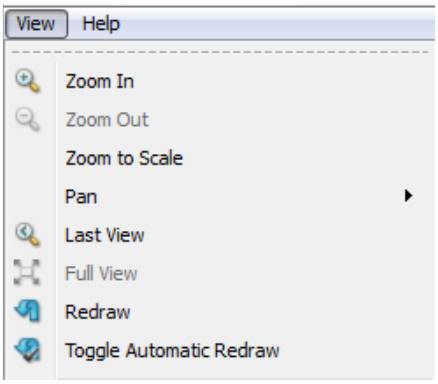
This will label the icons in the quick menu, which should make learning the software a little easier.



The simplest way of manipulating your view of the map canvas is by using the mouse wheel. Scrolling up zooms in, scrolling down zooms out, and holding the wheel down while moving the mouse pans the view in the desired direction.

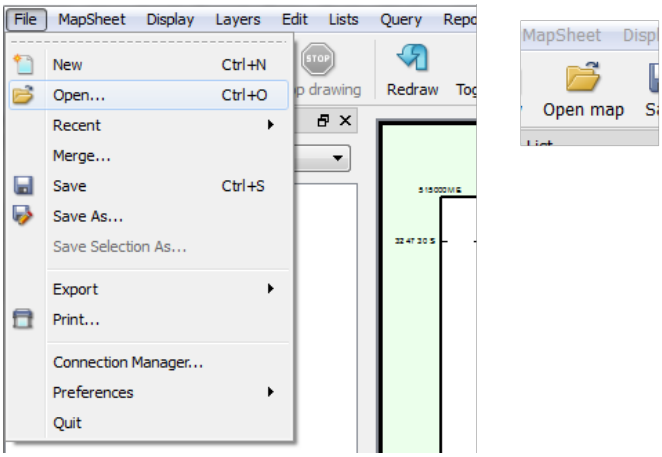
The view can be controlled with a little more accuracy using the “View” tools available from either the main menu or the quick menu.



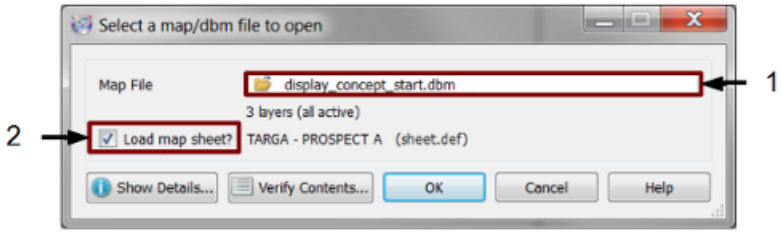


Once zoomed you can return to the original view either by using the mouse wheel, the zoom out icon, or by clicking the “Full View” button in the quick menu.

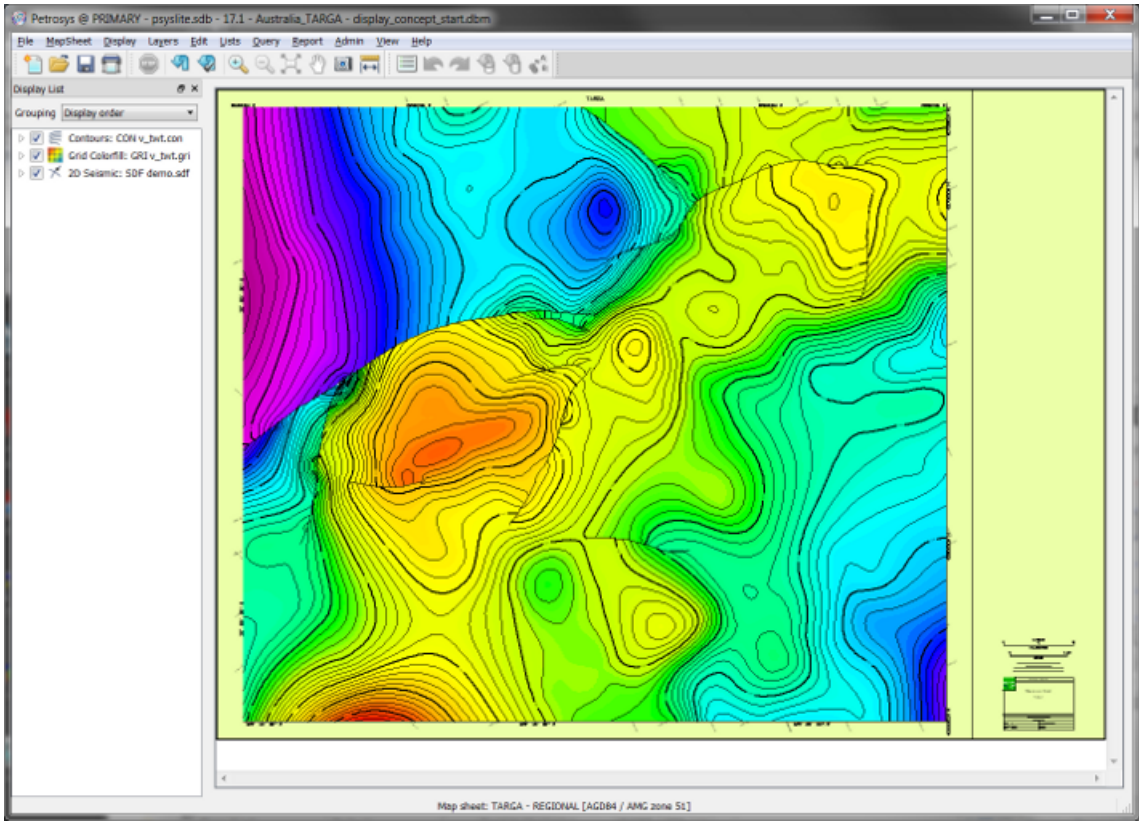
Select “File/Open” in the main menu or “Open Map” from the quick menu.



Click the file selection field next to “Map File” and browse to the file “display_concept_start.dbm”. Ensure that “Load map sheet” is turned on, and select OK.



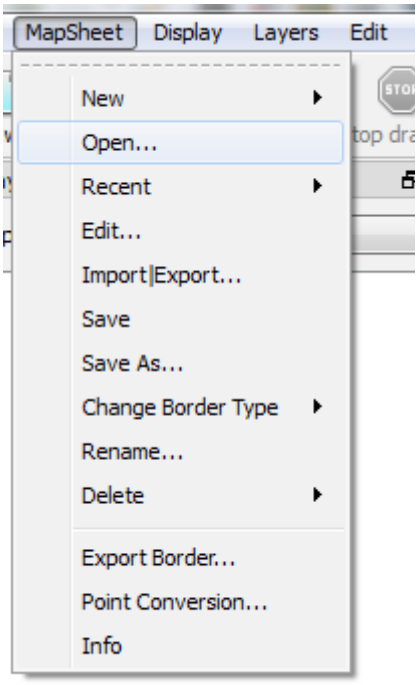
The Display List and the map canvas are now populated by various “layers” of data.



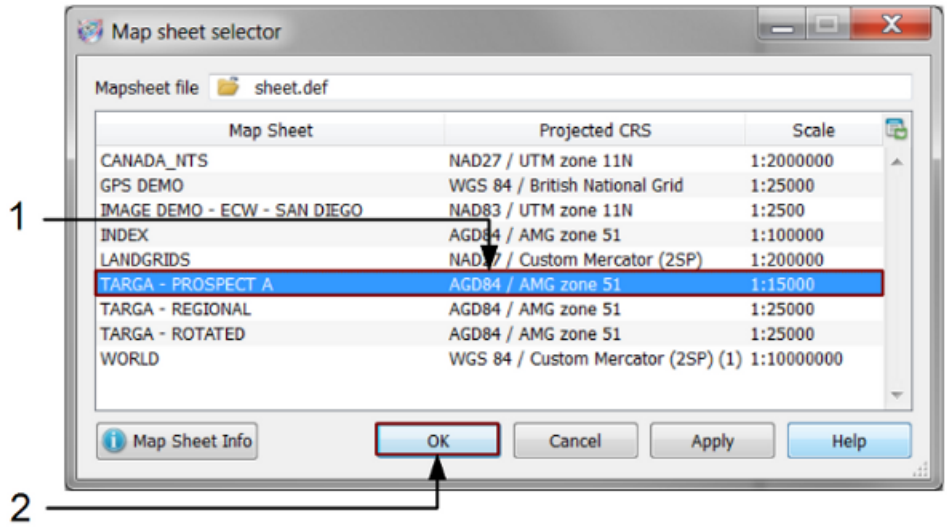
Maps are comprised of a Display list – saved as a .dbm file – and a map sheet.

Display lists – or dbm's – are independent of map sheets. Any dbm can be displayed on any map sheet so long as data stored in the dbm exists within the range of the map sheet.

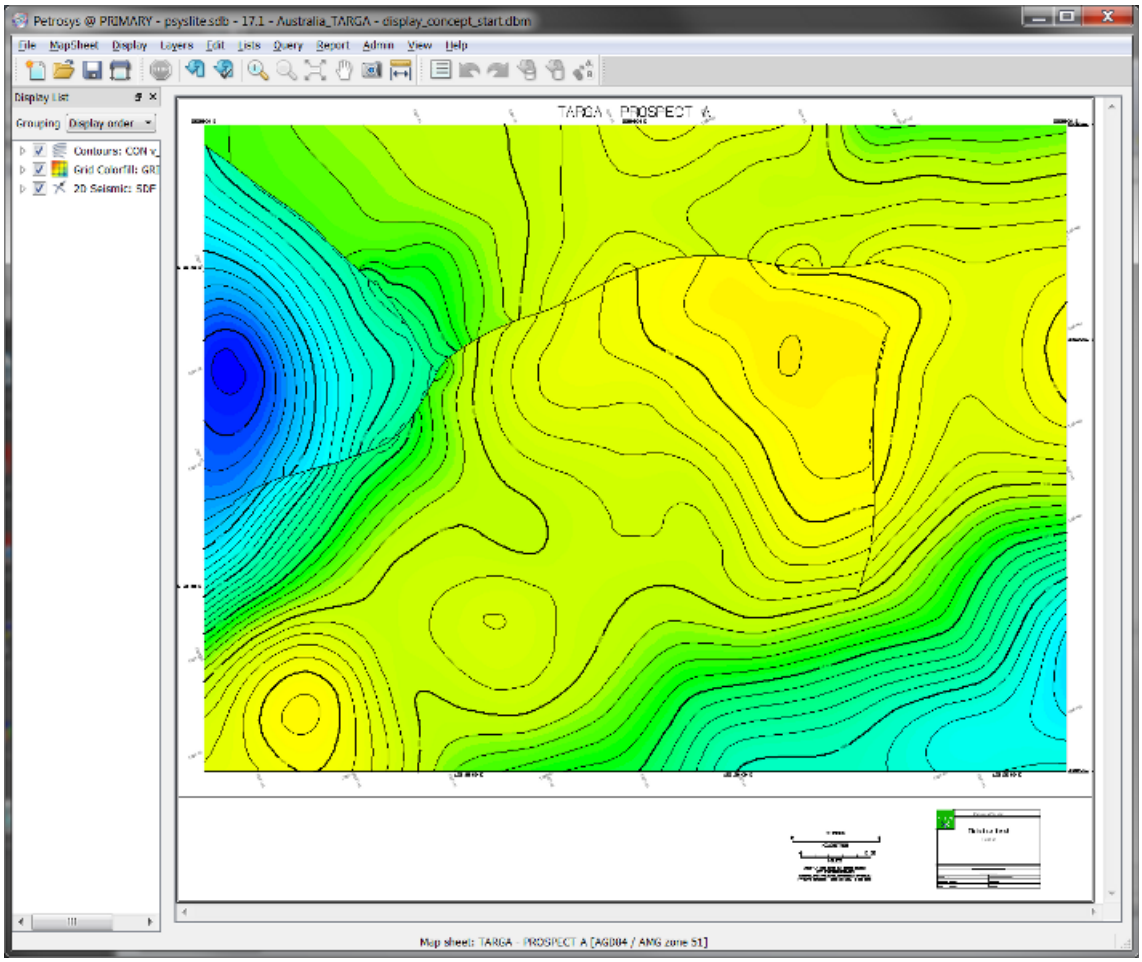
Select MapSheet/Open.



Change the active map sheet to “TARGA – Prospect A” by selecting it from the list and clicking OK.

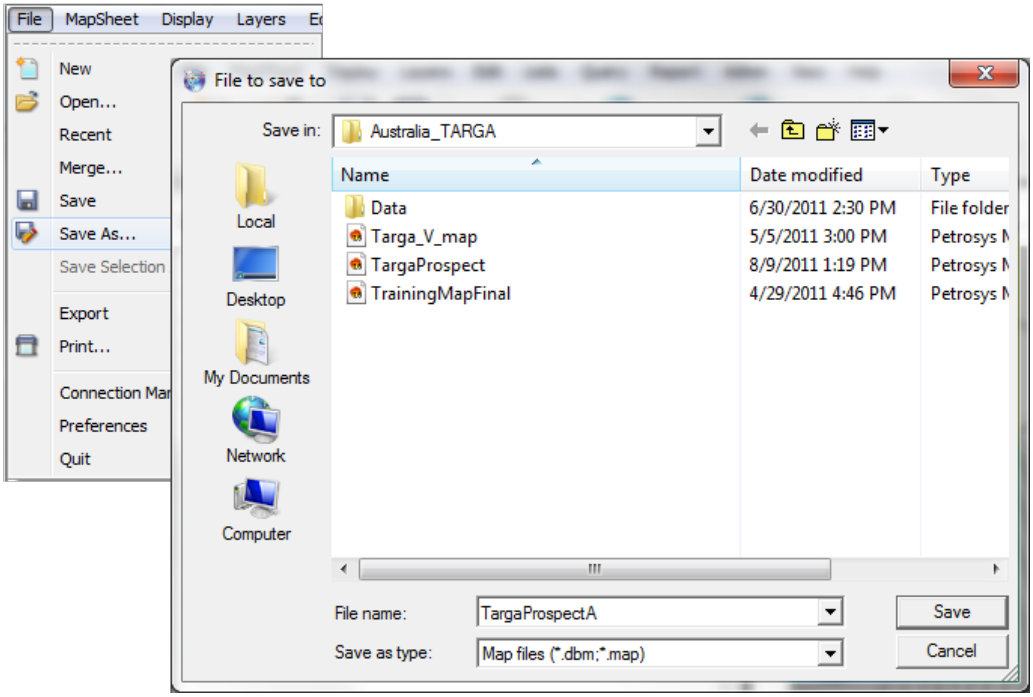


The map canvas will change to show the area in the top right of the data set, and with a different title block layout. The Display List will remain unchanged.

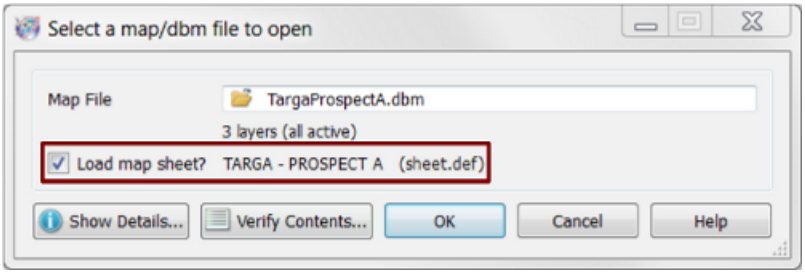


DBMs are independent of map sheets, but when a dbm is saved, it is associated with a particular map sheet, which can then be “loaded” using the “Load map sheet” menu option.

Select File/Save As from the main menu. Choose a name – something like “TargaProspectA.dbm” - and click OK.



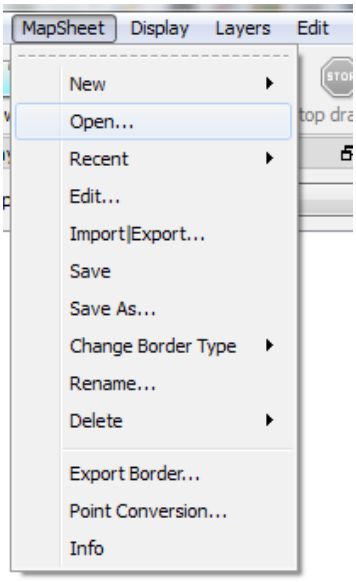
The map sheet associated with a .dbm file will always be the map sheet which was active when the .dbm file was saved. If you were to open this .dbm file in a subsequent session then the map sheet loaded by default will be the one active when the .dbm was saved:



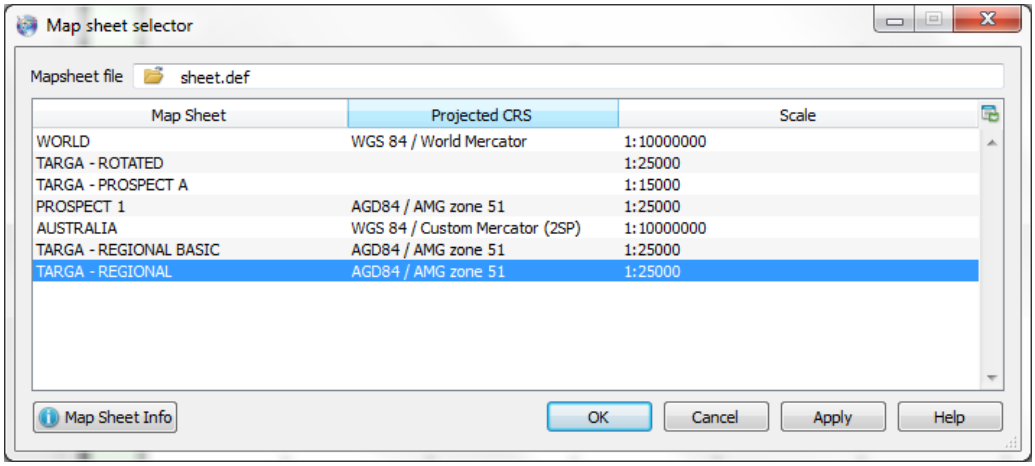
Map Creation – Choosing a Map Sheet

The first step in creating a new map is to choose or create a map sheet that is right for the data you'll be mapping. A map sheet contains graphical elements – a title, border, scale and title block – and geographical information; which includes the coordinate range, coordinate reference system and physical scale of the map.

Select MapSheet/Open.



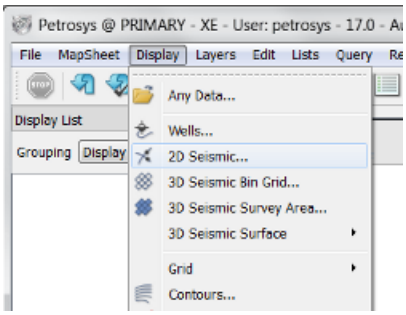
This window lists all of the map sheets available in the active project. From here you can change both the map sheet and sheet.def file – which is the file in which map sheets are saved. Specific information about a particular map sheet can be obtained by highlighting an item in the list and clicking “Map Sheet Info” in the bottom left hand corner of the window.



Ensure that the “TARGA – REGIONAL” map sheet is selected, and select OK.

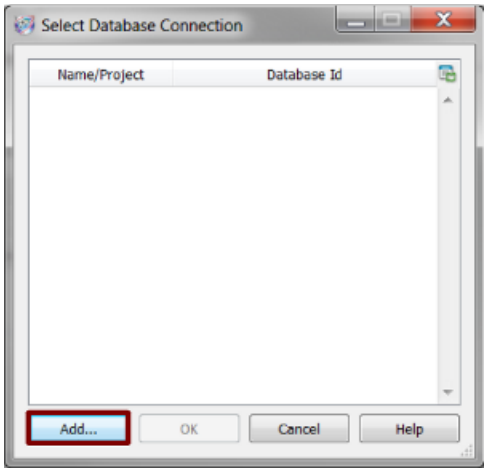
The most straightforward way of displaying data is using the “Display” menu.

Select Display/2D Seismic.

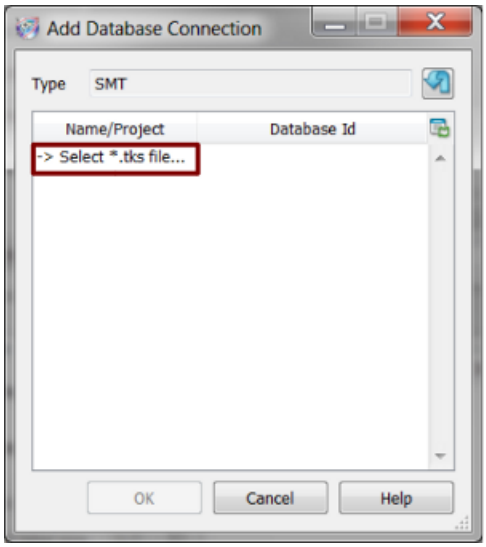


Under “Seismic lines data source” there are two items. The first controls the file format or database type the seismic data is being retrieved from. The second is the actual project or file containing the seismic lines. Change the format to “SMT”, then click the empty field on the right.

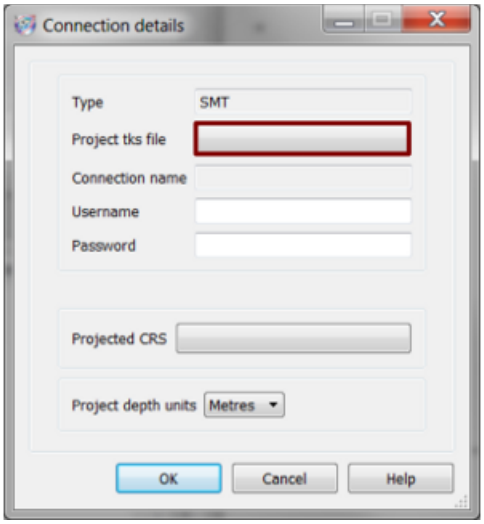
The new window will display the active database connections. This is empty, so we'll set up a new one by clicking “Add”.



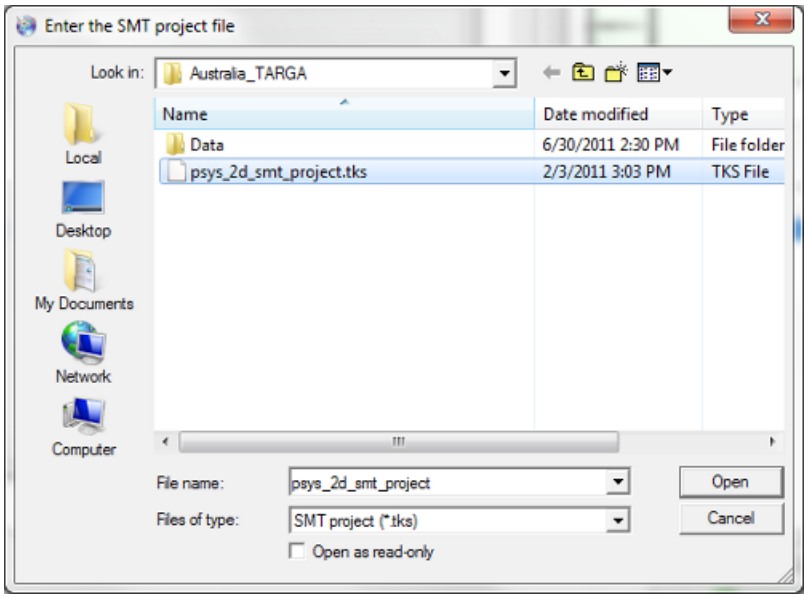
From the “Add Database Connection” window, double click “-> Select *.tks file”.



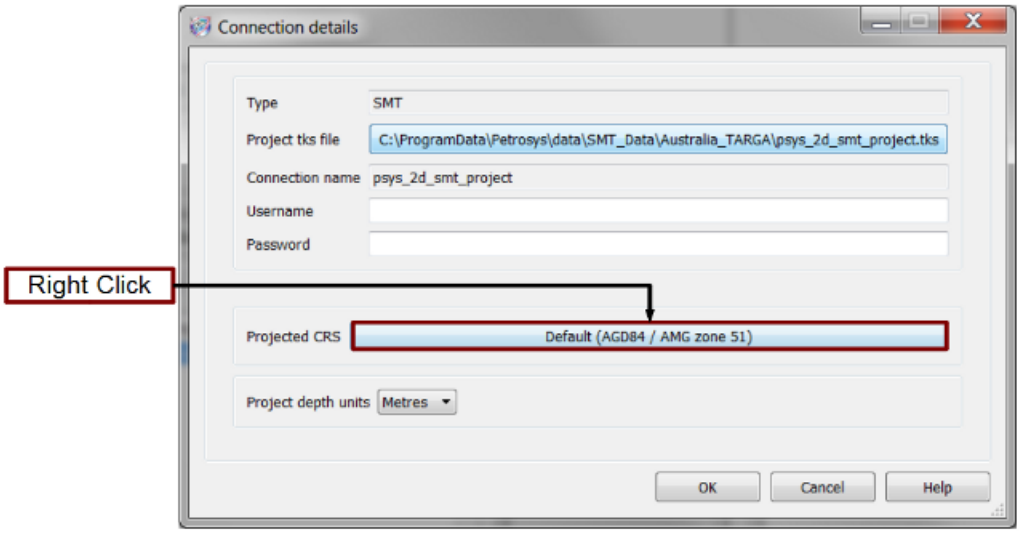
Click the empty field next to “Project tks file”.



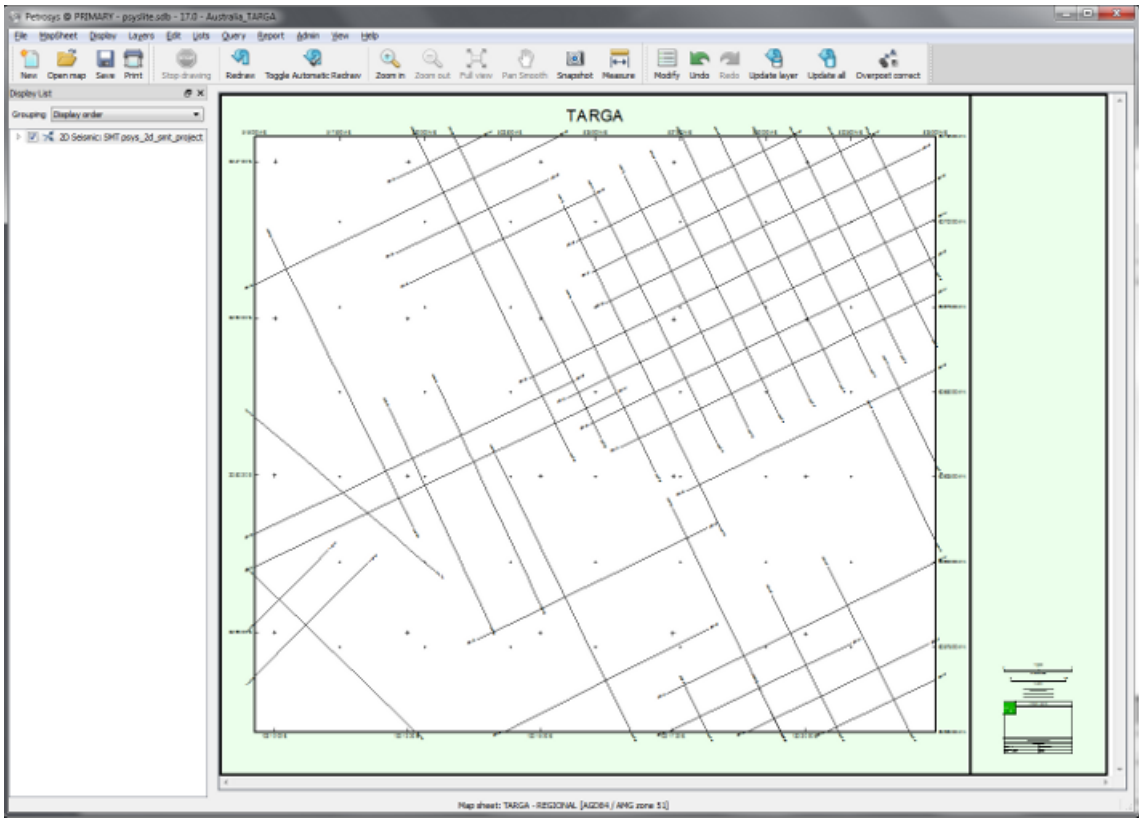
Browse to the file “psys_2d_smt_project.tks” and press OK.



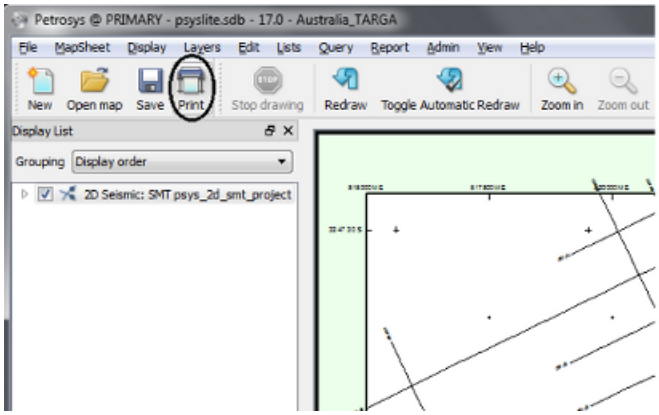
Now, right click the field next to “Projected CRS”. This will change the CRS used for the connection to the project default.

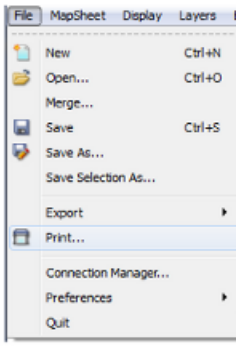


Press OK to confirm the changes and close the window, then again in the “Add Database Connection Window”. The “Select Database Connection” field should now be populated with the project you just set up. Ensure that this is selected, then press OK. Finally, select OK on the “Display 2D Seismic Lines” panel. The Lines from the SMT project should now be displayed on the map sheet in the view port.

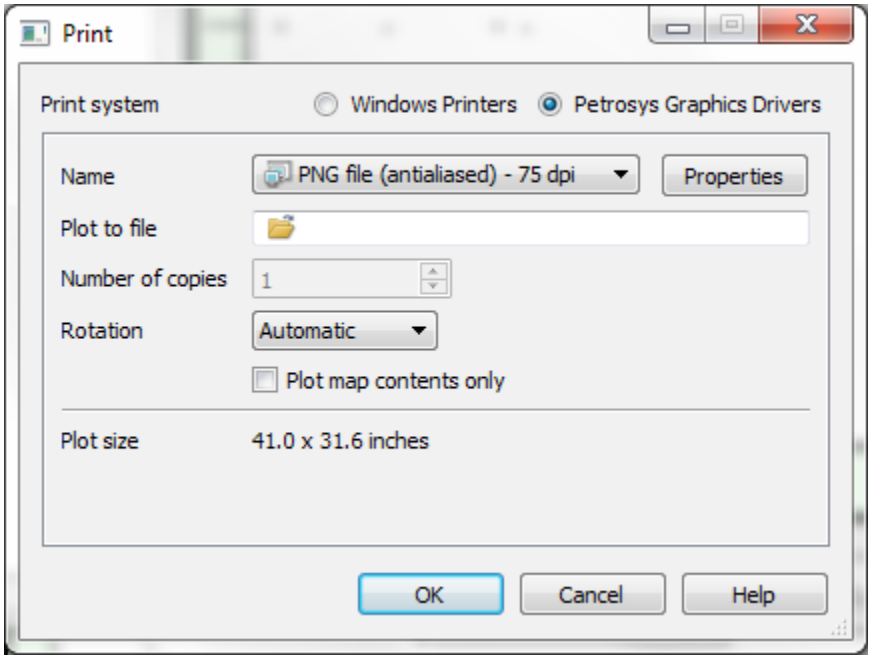

TARGA

Open the “Print” window using either the quick menu or by selecting “File/Print”.





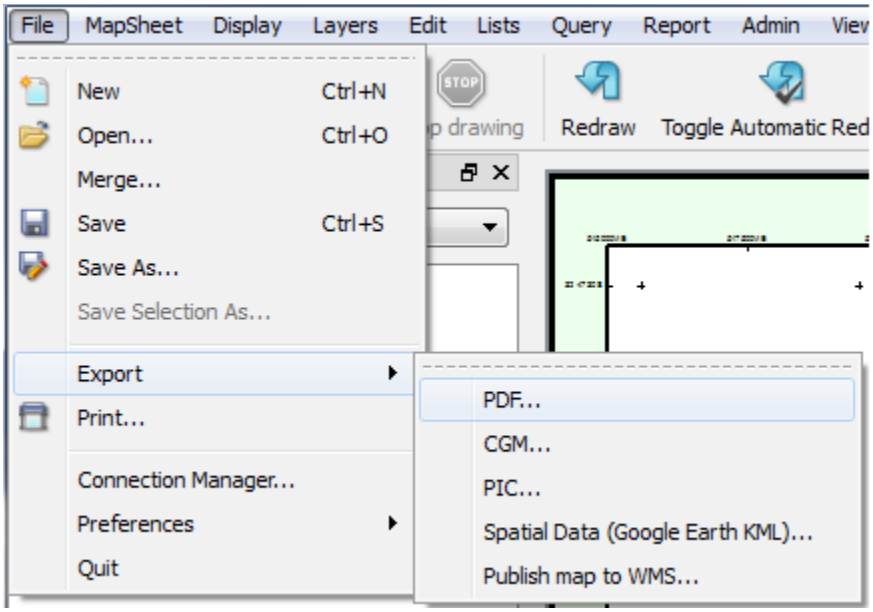
Both of these options will display the printer selection dialogue:



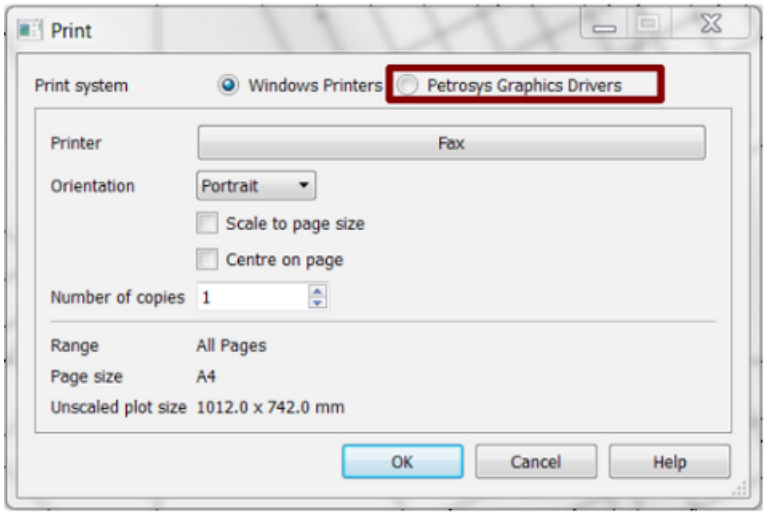
From the Print window a hard copy of a map can be produced using a supported printer or plotter or, by exporting the map as an image file using the “Petrosys Graphics Drivers” option.

The simplest way of creating a hard copy at this stage is to select one of your existing windows printer drivers and printing using that.

A third option is to export the map as a PDF, which can be done by selecting Flile/Export/PDF from the main menu.

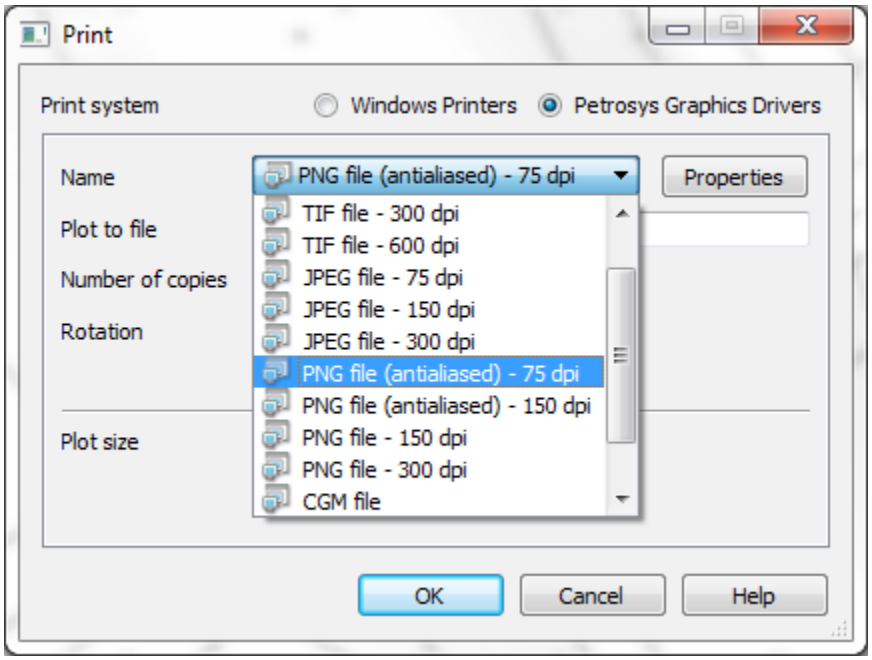


Open the Print window and select “Petrosys Graphics Drivers”

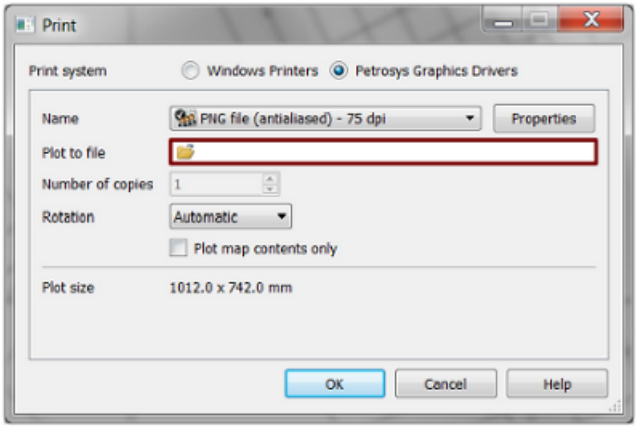


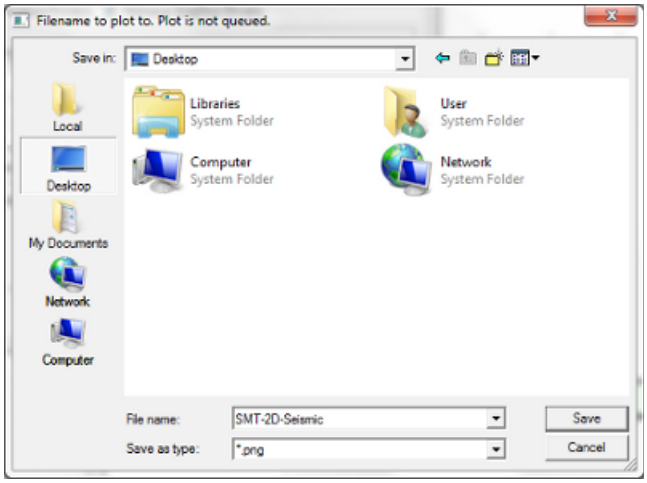
This panel will produce a hard copy of your map in the form of an image file.

First, choose the image format you want your map saved in from the “Name” field. A map can be saved as either a JPG, a TIFF or a PNG – with a range of detail options for each format. Other formats – DXF, CGM and DGN – are only used in very specific cases where the map is going to undergo further editing in other software packages. Note that these settings are site specific. If you are working from a fresh install of Petrosys, you should see something similar to what is shown below. If you see something different, it's likely you're using an out of date or different configuration file to what is shipped with the software. If this is the case, contact your site administrator or Petrosys support to obtain the relevant configuration file.



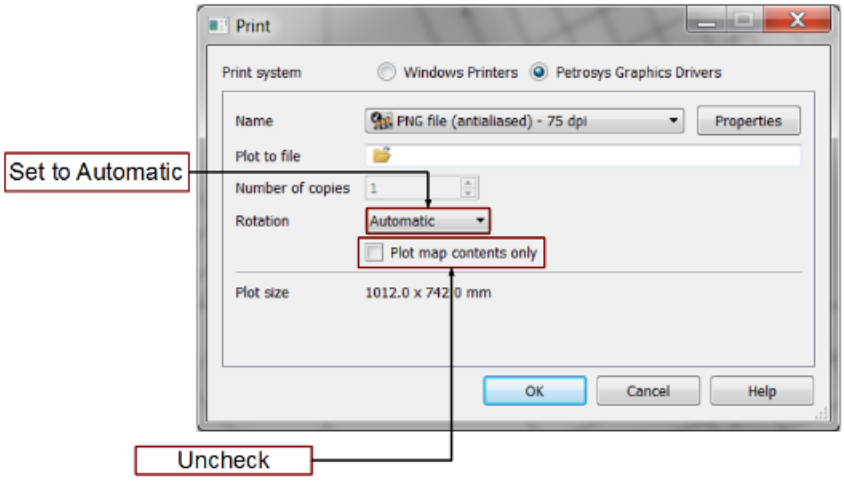
Use the file selector, launched using the icon in the empty field next to “Plot to File”, to define the file name of the output image. The output image will be saved into the active project by default, but can be exported elsewhere by using the file selector to browse to a different directory. Browse to the desktop of your computer and choose a name. In this instance “SMT-2D-Seismic” was used.





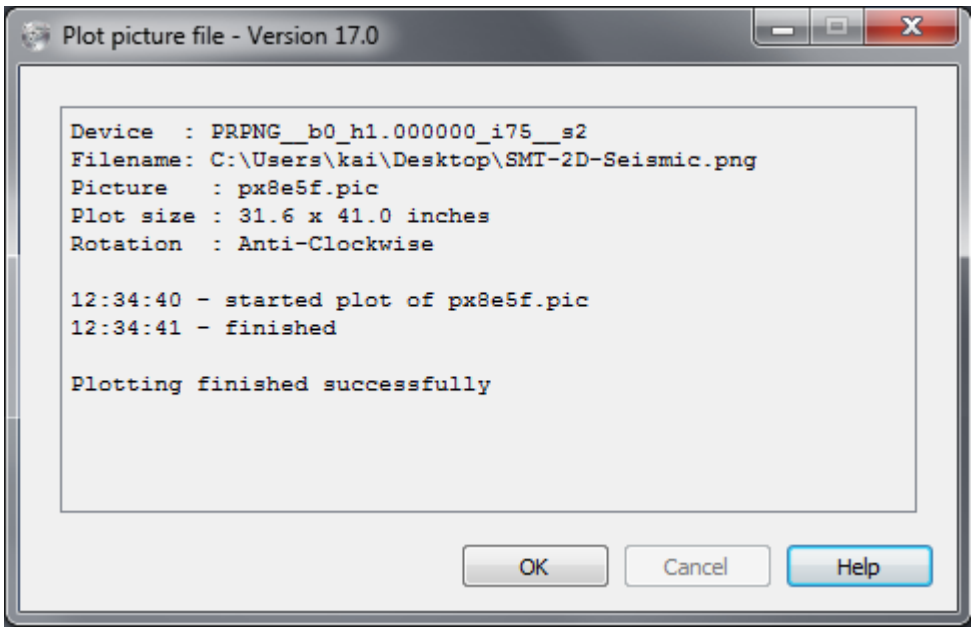
Leave “Rotation” set to “Automatic”. If this is changed, a rotated version of your map will be exported.

Also ensure that “Plot map contents only” is turned off. This option is used to plot only the items in the display list - excluding the map sheet. All of the

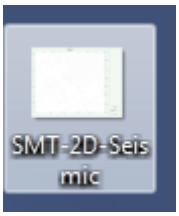


displayed items – the “map contents” - will be plotted according to the scale of the map sheet.

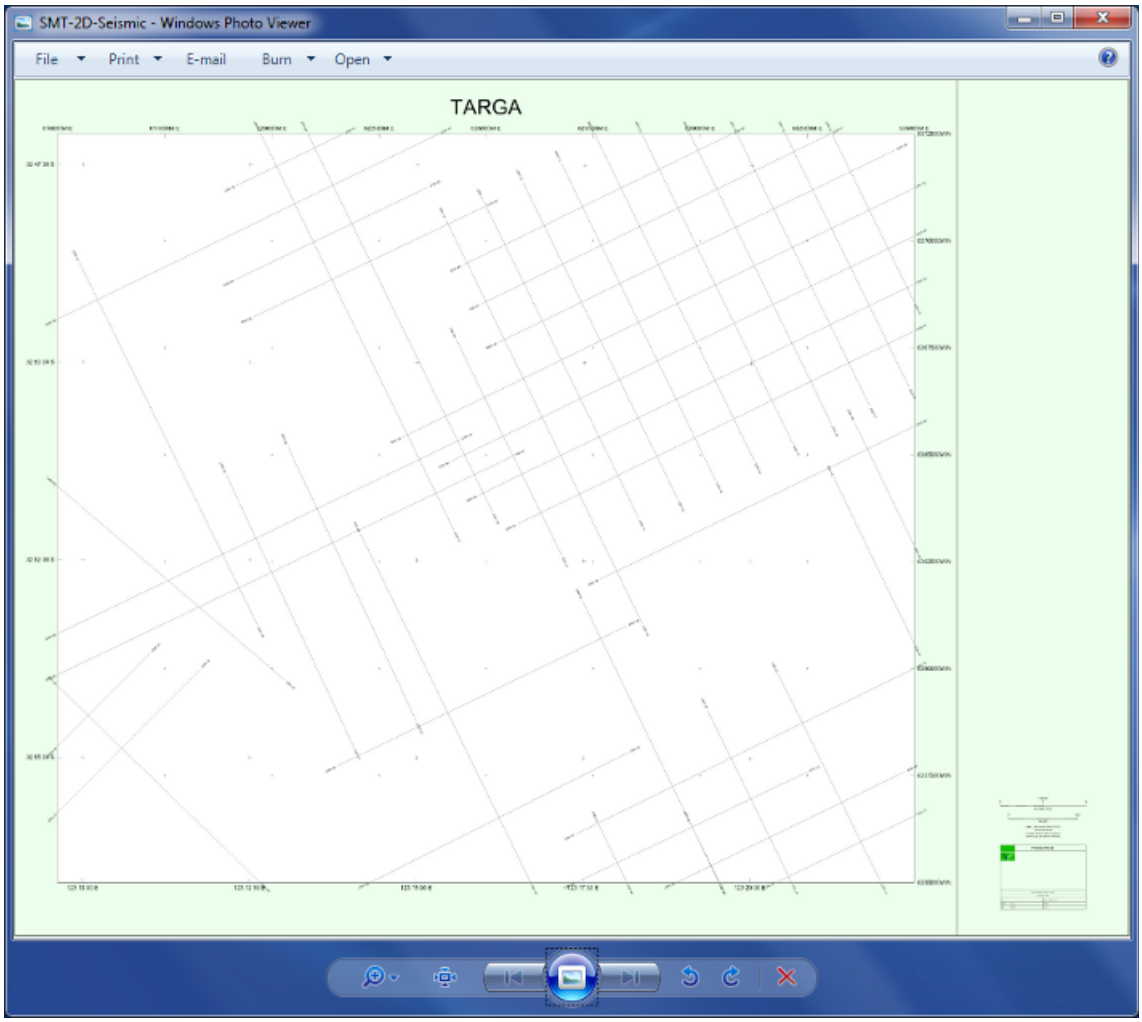
Finally, click OK. The map will be plotted to the image file you defined and a log will be displayed. Click OK to close this.



Open the image file by browsing to your computer's desktop and double clicking the file - “SMT-2D-Seismic.png”, or whatever it was called.



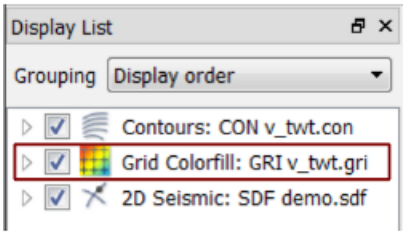
This image can now be used in any application that can open the file type it was plotted to – in this case, PNG.


SMT-2D-Seismic - Windows Photo Viewer
File
Print
E-mail
Burn
Open
TARGA

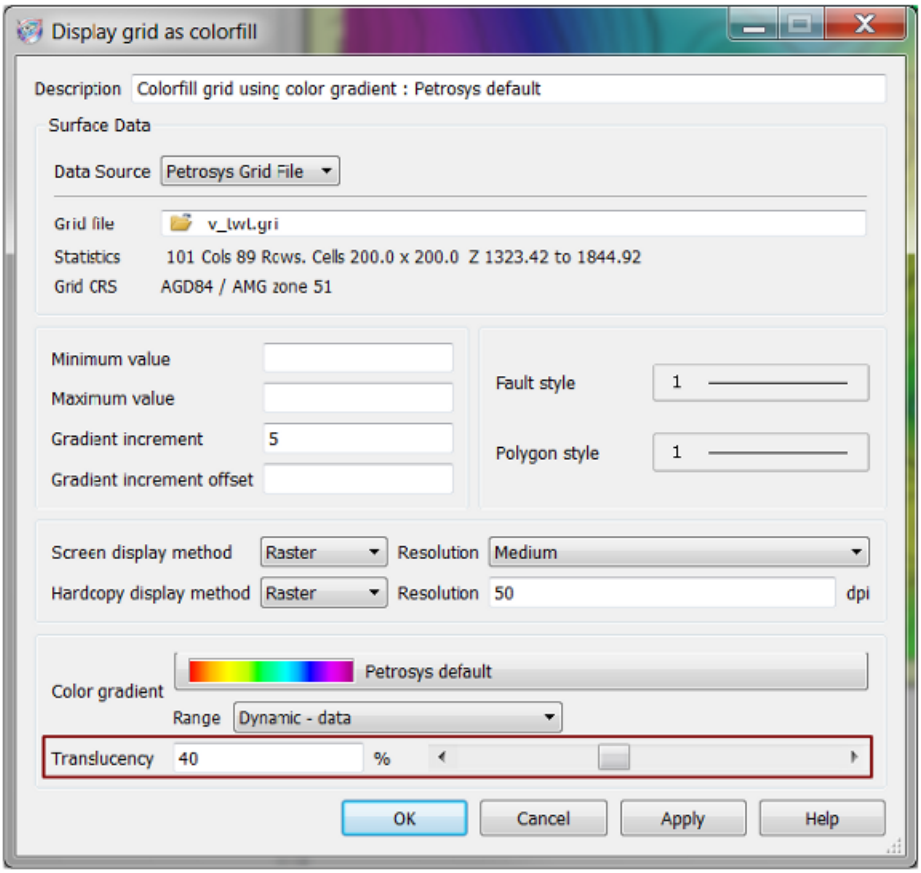
Load display_concept_start.dbm using either “File/Open” or “Open Map” from the quick menu.

Each of the items displayed on this map is listed in the display list.

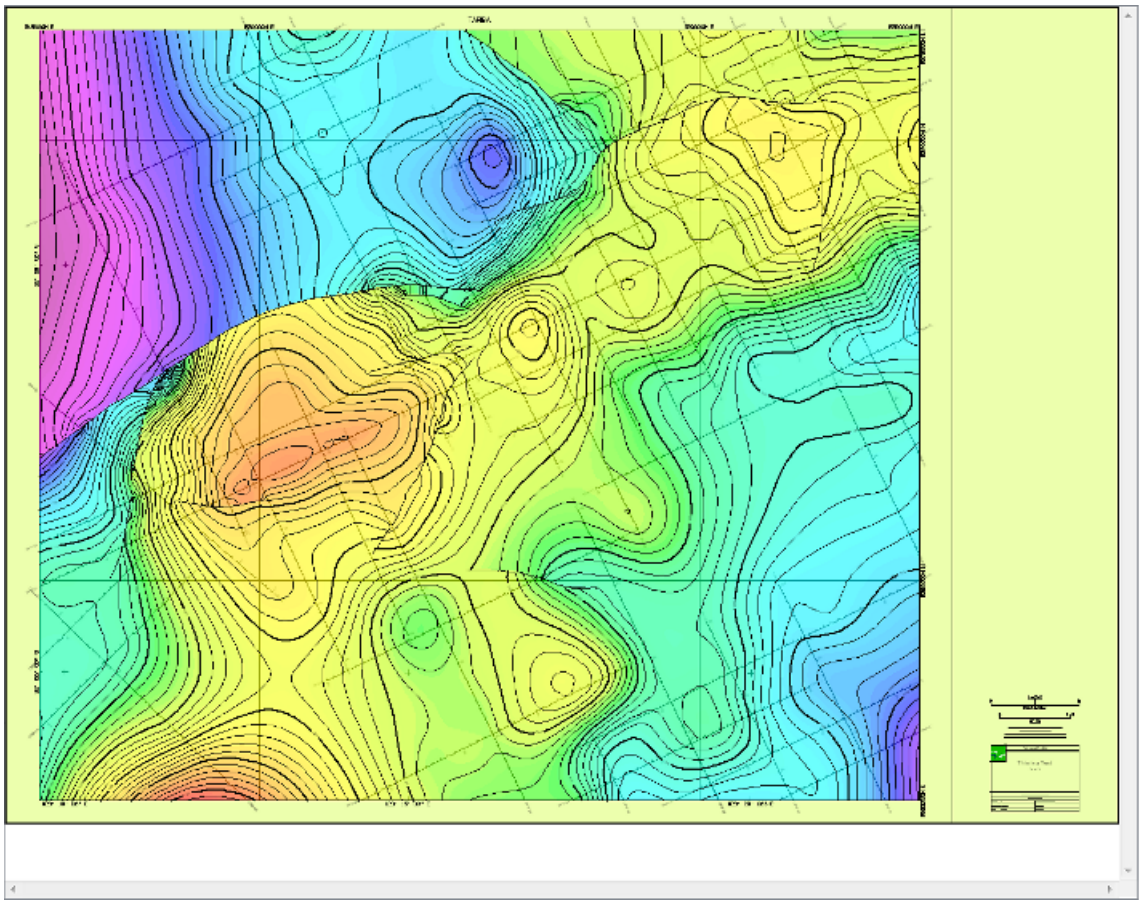
Double click the middle item in the list - “Grid Colorfill: v_twt.gri”.



Change the “translucency” slider at the bottom of the window to 40%, then click OK.

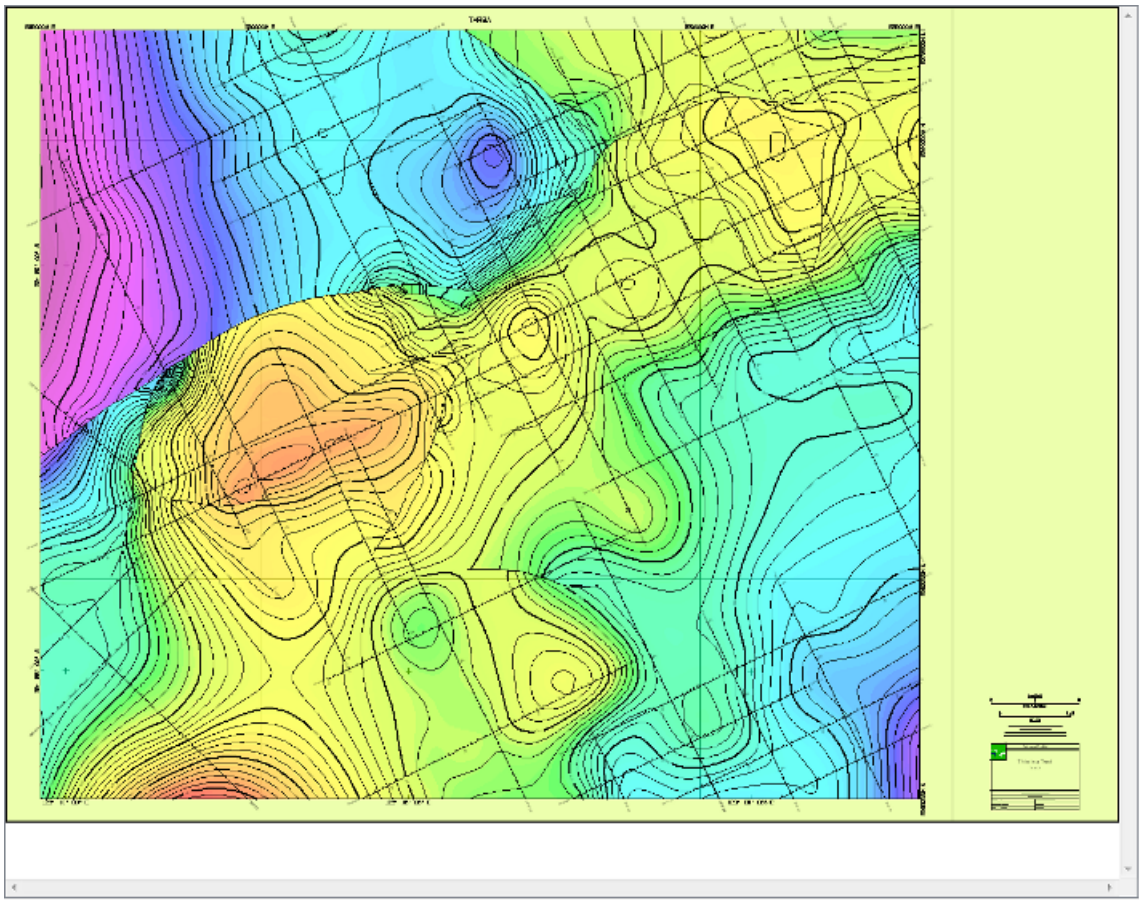


Items are displayed on the map as they are ordered in the list. Now the surface is translucent the seismic lines, displayed beneath the surface, are now visible.



Click and drag the surface to the bottom of the list, beneath the seismic lines.

The surface is now displayed beneath the other items, making everything in the display list visible.



Translucent grids are an easy way of demonstrating how layers are sequenced in the display list. Before embarking on a serious presentation project using a translucency you should ensure that the output is supported in your preferred publishing format: PDF in particular does not support translucency correctly.

There are many additional things you can do in the display list, including -

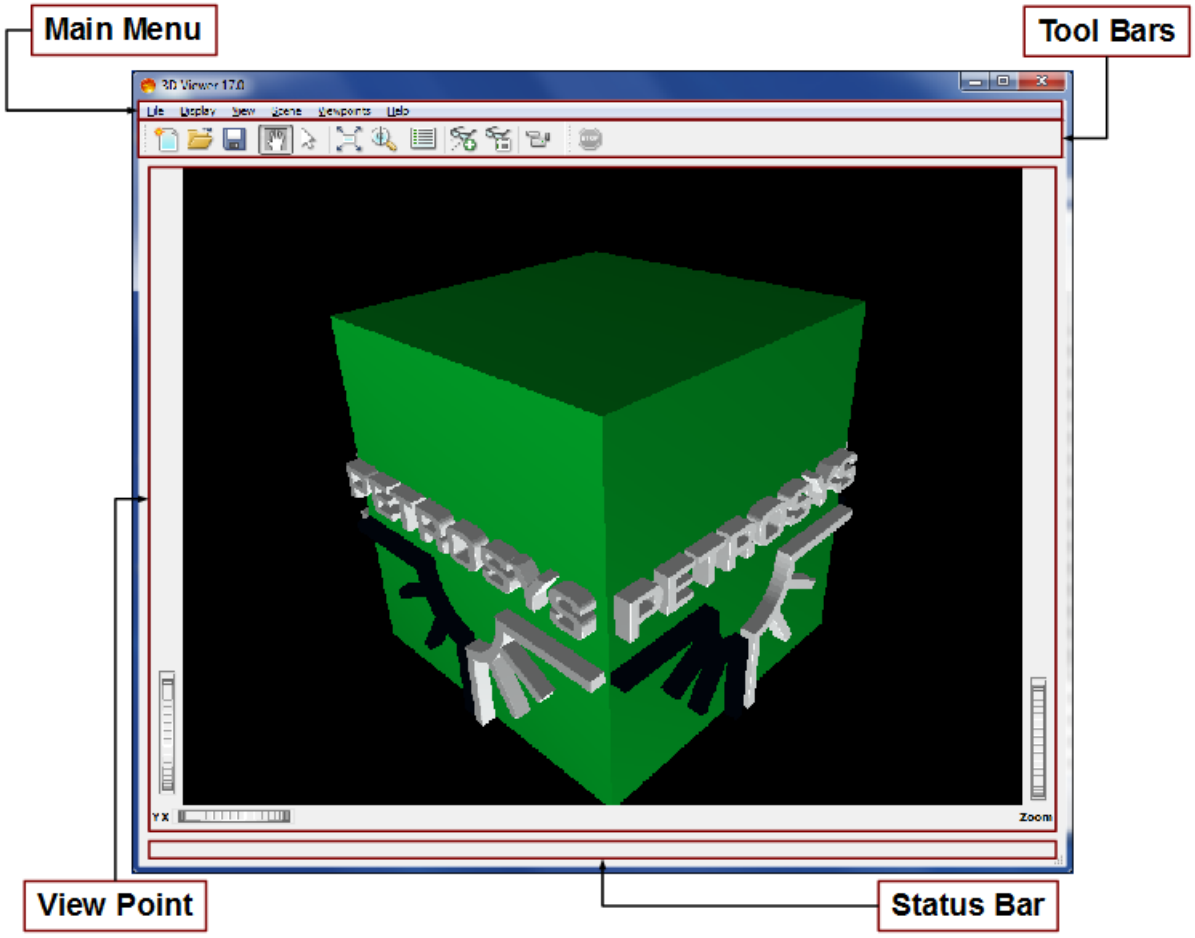
- Enabling/disabling the visibility of individual layers
- Enabling/disabling the ability to pick data on individual layers
- Creating groups of layers that can be manipulated together
- Displaying metadata about a particular layer
- Making bulk changes to the display style of selected layers
- Merging other display lists and displaying other .dbm files

Consult the Help option for more detailed information about any Petrosys function.

The 3D viewer is accessible from the launcher via the “3D viewer” icon.

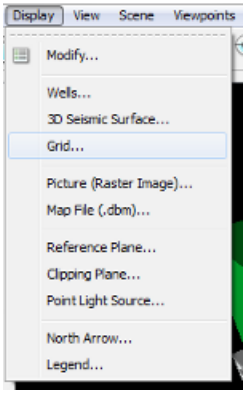
The 3D viewer is divided into three main sections -

Main Menu	Has access to all of the functions available in the viewer
Tool Bars	Shortcuts to the most frequently used functions in the viewer.
View Point	View of the data being displayed. By default, on opening the viewer, the Petrosys logo will be displayed.
Status Bar	Information relating to the piece of data selected in the view point.



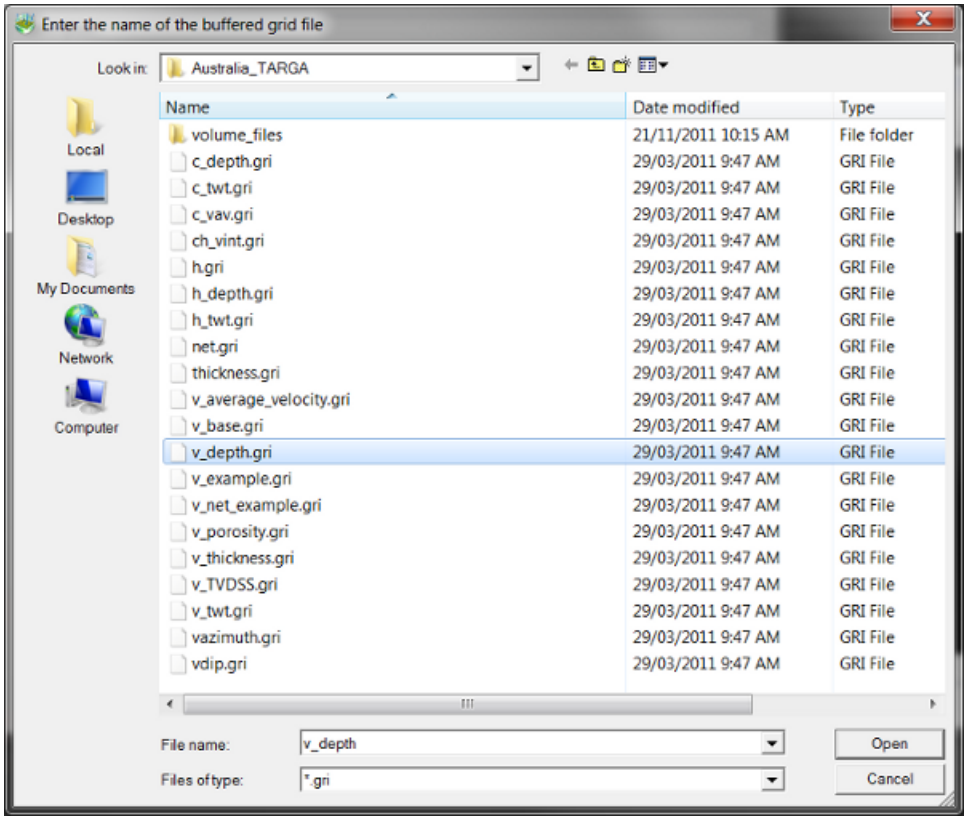
Unlike mapping, the 3d viewer does not make use of map sheets. The viewer is used purely for visualization, not for the production of maps, and hence while a display list is generated, as in mapping, a map sheet is not associated with that display list.

Click Display/Grid.

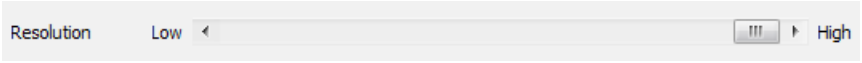


Ensure that “Data Source” is set to “Petrosys Grid File” then click the file selection icon next to “Grid File”.

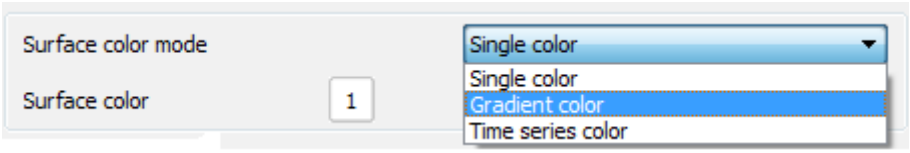
Select the file “v_depth.gri” then click OK to confirm the selection.



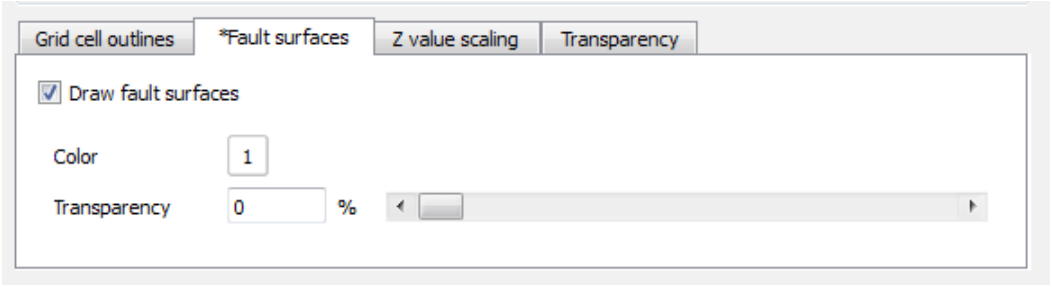
Set the resolution slider to the maximum setting.



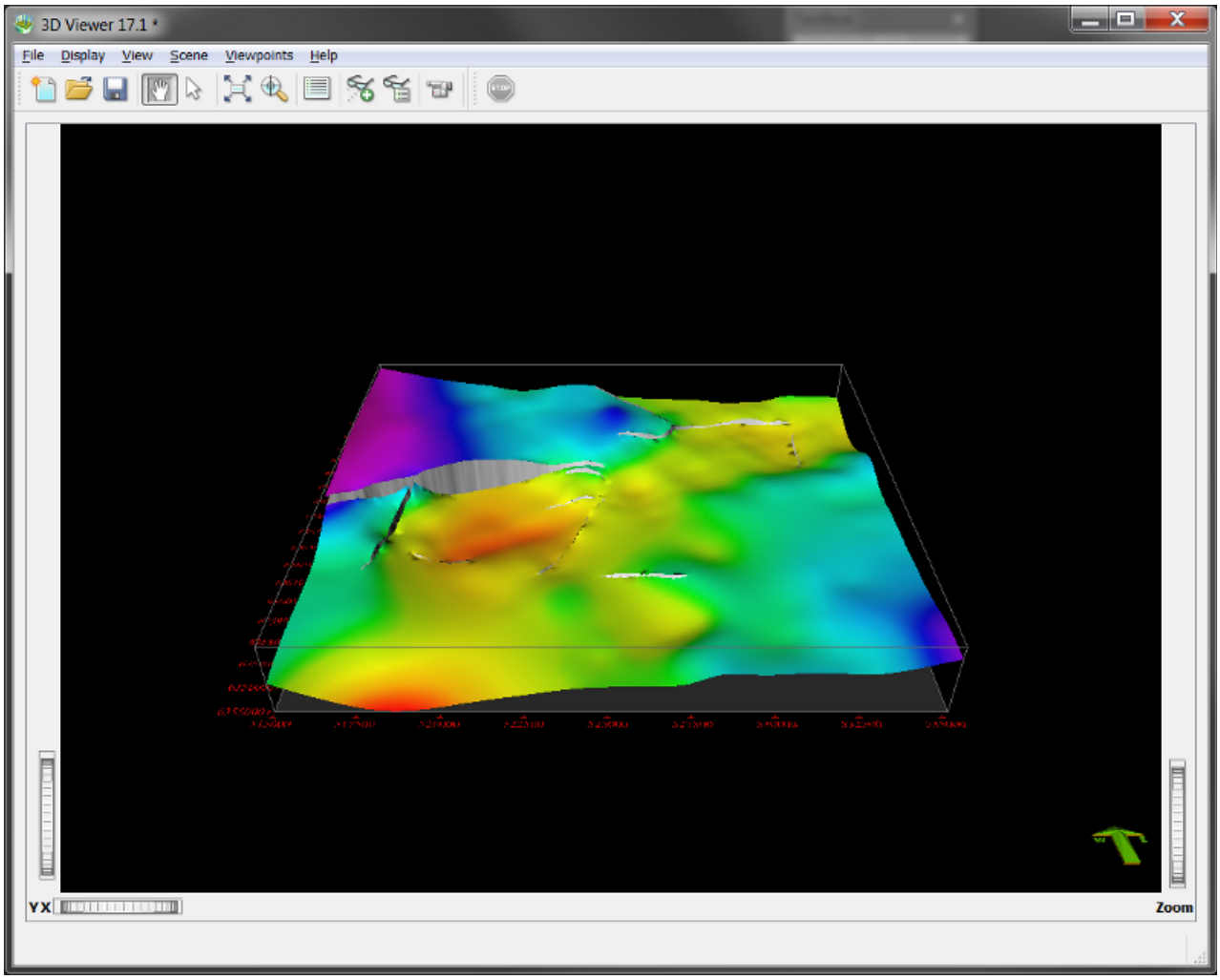
Change “Surface Color Mode” to “Gradient color”.



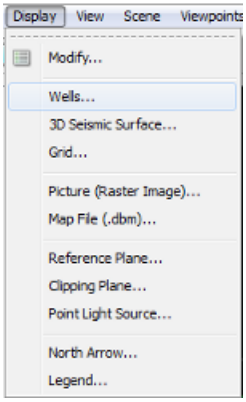
In the “Fault Surfaces” tab, turn the “Draw fault surfaces” option on. Choose a color for the fault surfaces that will stand out against the gradient – like white.



Click OK to confirm the display options. The grid will be displayed as a 3D surface in the view point.

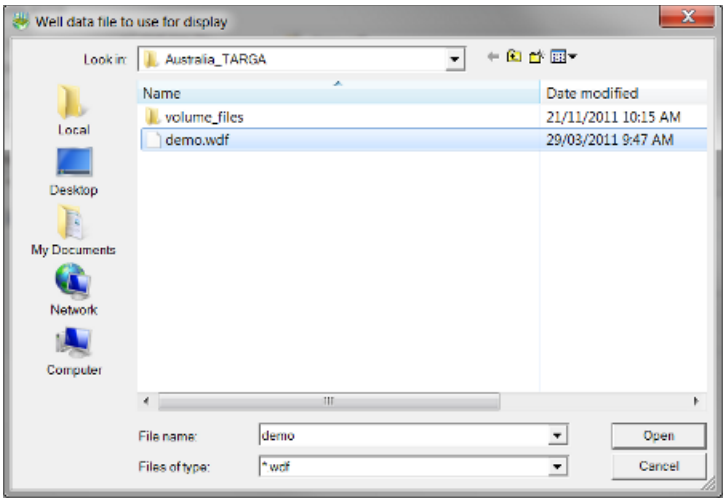

3D Viewer 17.1 *
File
Display
View
Scene
Viewpoints
Help
YX
Zoom

Click Display/Wells

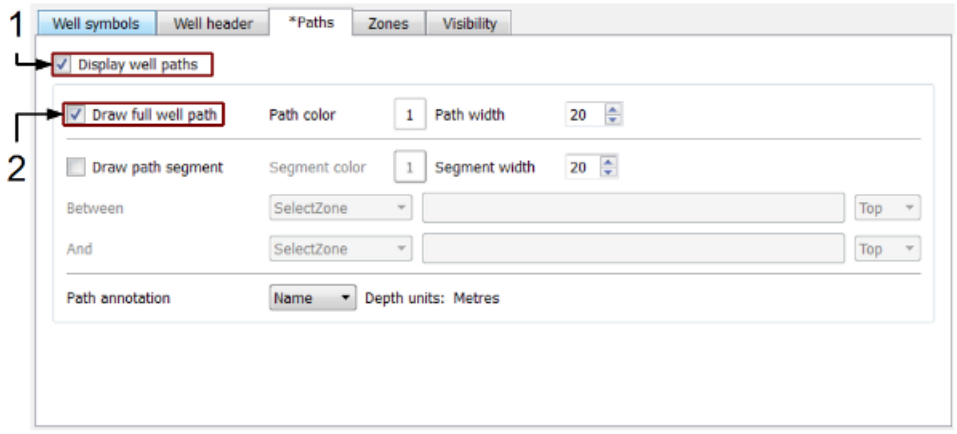


Ensure that “Data Source” is set to “WDF” then click the file selection icon next to “Well data file”

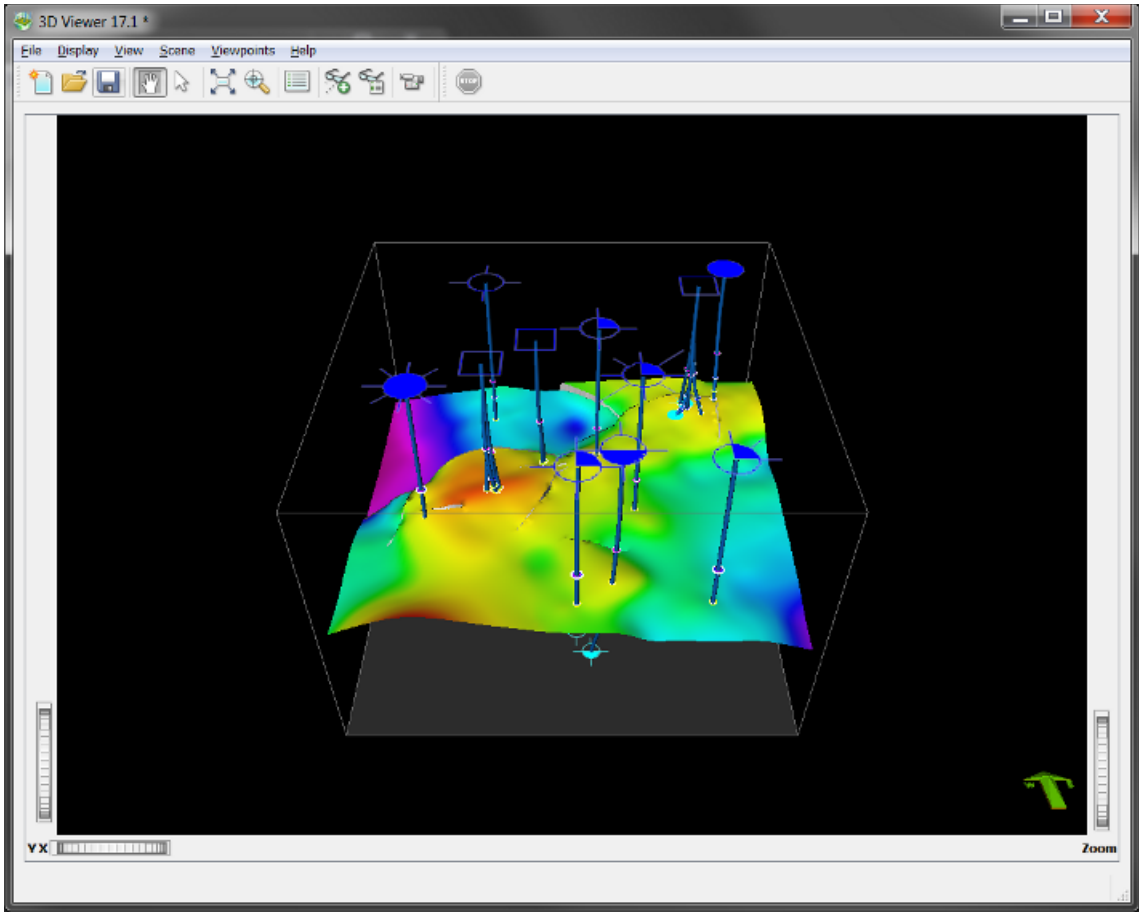
Select the file “demo.wdf” and click OK to confirm the selection.



Ensure that “Display path locations” and Draw full well path” are turned on under the “Paths” tab.

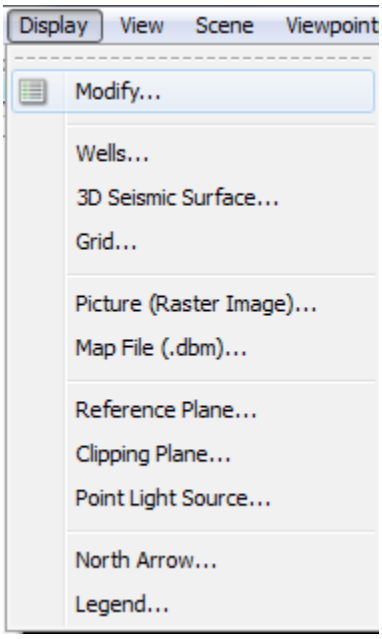


After clicking OK, the wells will be displayed as long cylinders representing the path of the hole associated with each well.

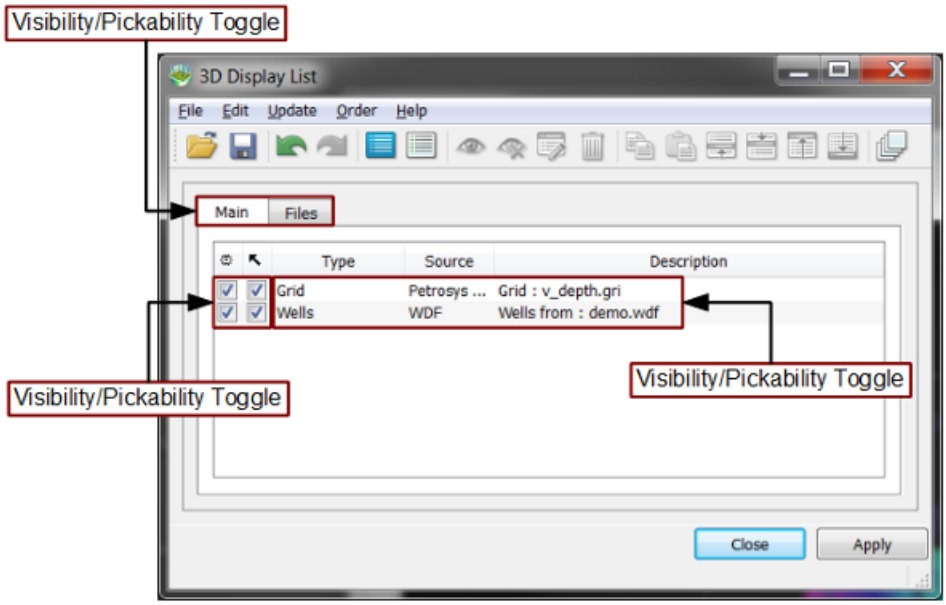


Data in the 3D viewer is managed in much the same way as in mapping – using a display list.

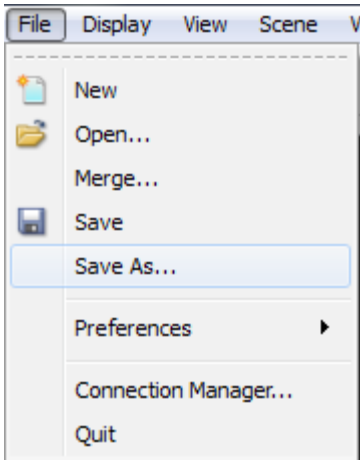
Click Display/Modify to open the display list.



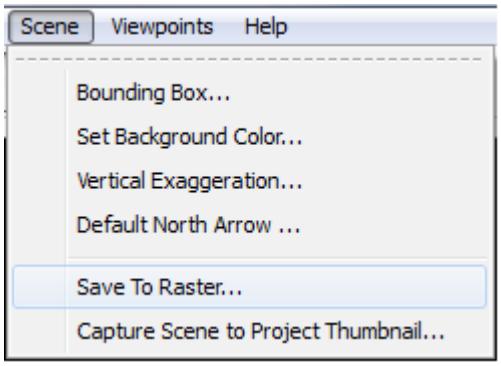
The display list works in the same way as in mapping. Double clicking any of the layers will bring up the display options for that layer. The two check boxes to the left control visibility and picking for the chosen layer. The File tab shows the files associated with each layer.



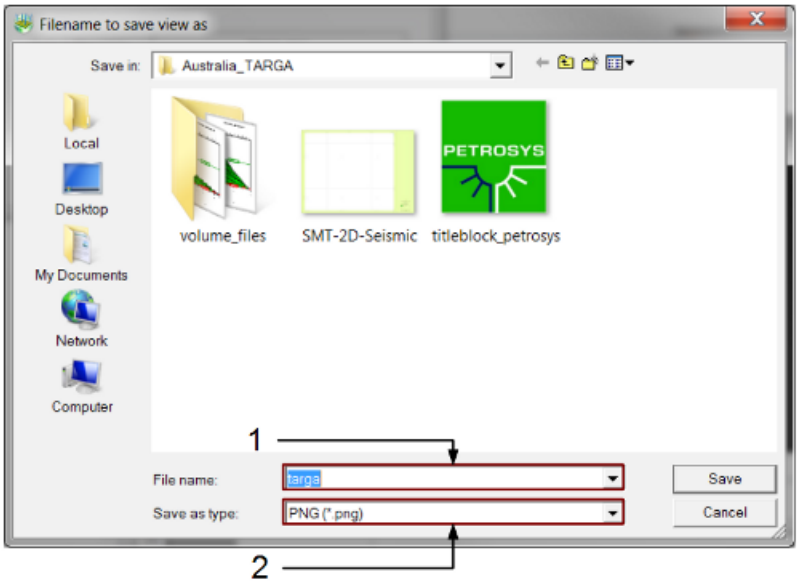
Save the display list using File/Save As. Display lists in 3D viewer are saved as .3dm files.


File
Display
View
Scene
New
Open...
Merge...
Save
Save As...
Preferences
Connection Manager...
Quit

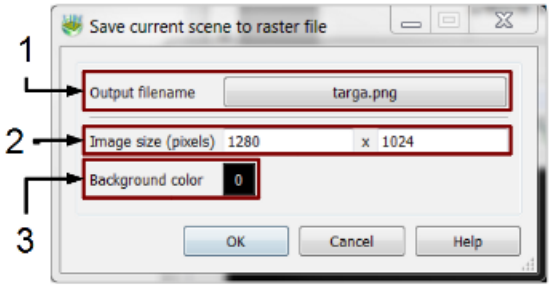
Click Scene/Save to Raster



Define a name and choose a file format from the drop down list – TIFF, JPEG or PNG are all good choices. Click “Save”.



Define an image size and Background color. The image size is the resolution of the exported image - ideally this should be something around the default of 1280x1024. The background color is the color of the empty space in the 3D viewer – which by default is black.

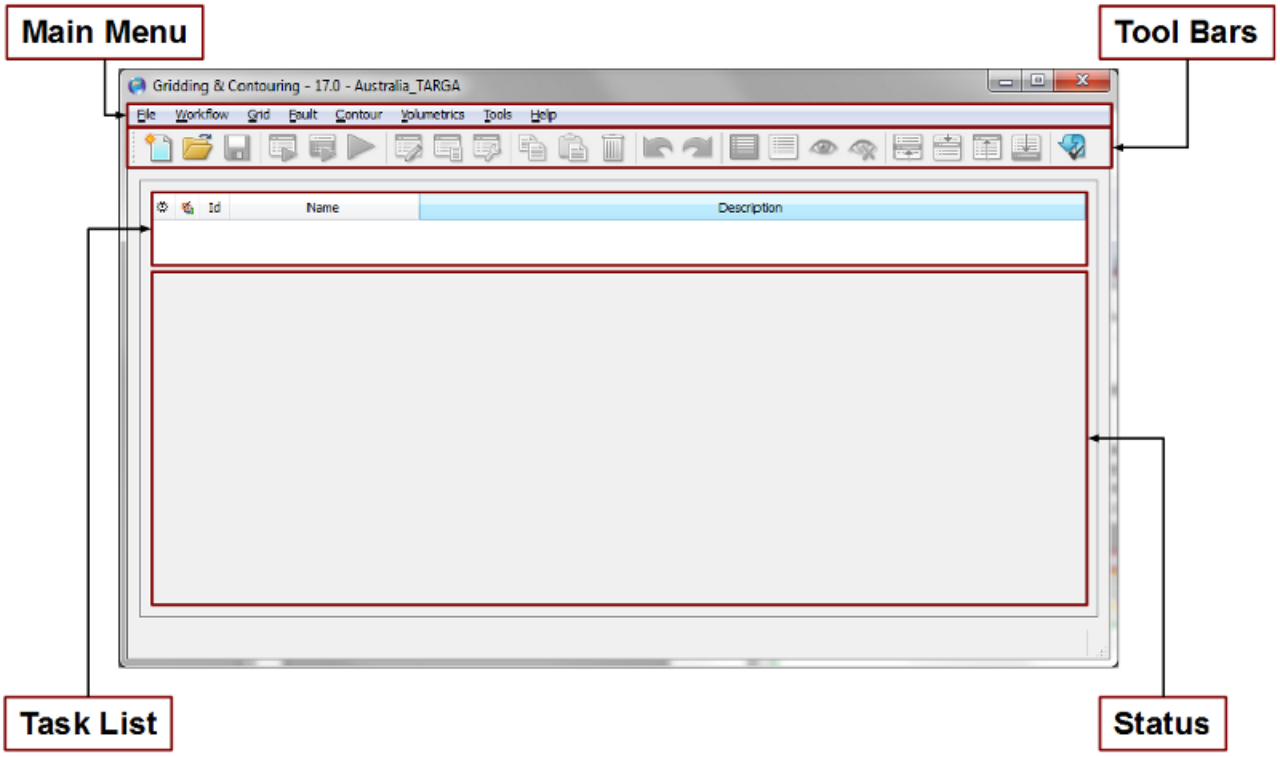


Click OK. The image will be saved to the project directory by default, or whatever directory was active when the file name was defined.

Surface modeling is the function in which you can compute and manipulate grids and surfaces, compute contours, and create workflows for repetitive geomodeling tasks. Launch surface modeling using the “Surface Modeling” icon in the launcher.

Surface modeling is divided into four main sections -

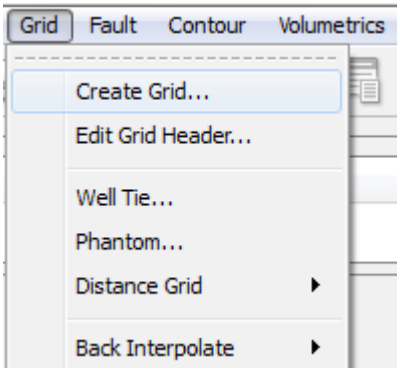
Main Menu	Contains access to all of the main functions within surface modeling.
Tool Bars	Shortcuts to frequently used options in gridding.
Task List	A list of the tasks in your open work flow.
Status	The status of the task being run. If a task is not being run, it will appear empty.



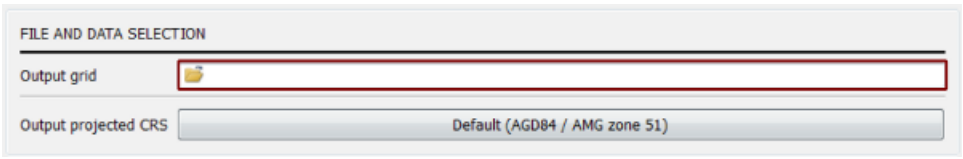
Gridding is primarily used to create interpretations - “Grids” - of seismic and well data. A grid is a set of values derived from the horizon data in either a seismic or a well file which is then displayed as a color gradient – as has been seen so far in this guide – or a raw set of values.

This section of the guide will walk you through the process of generating a grid from a seismic data set and an associated set of contours. This grid can be used in either mapping or the 3D viewer using the methods which have been demonstrated in previous sections.

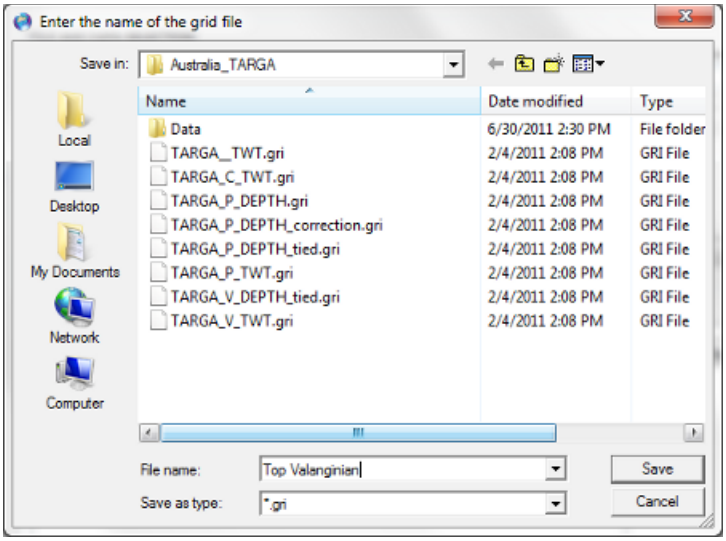
Click Grid/Create grid...



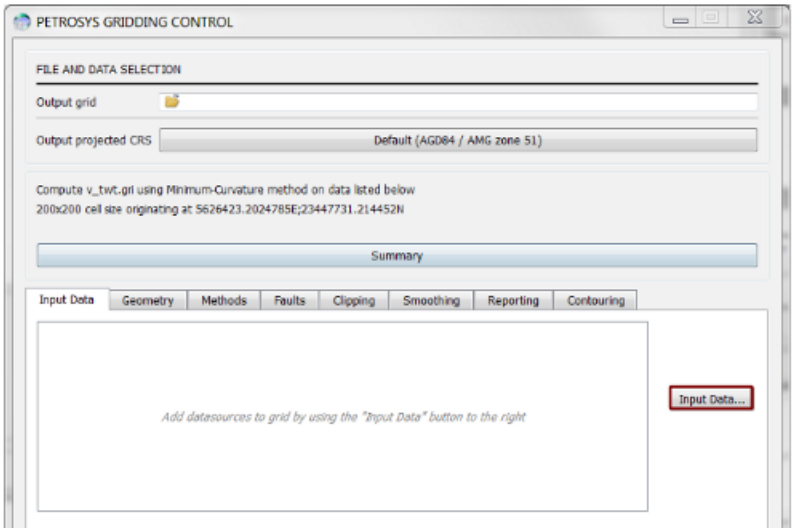
Under File and Data Selection, click the file selection field next to “Output grid”.



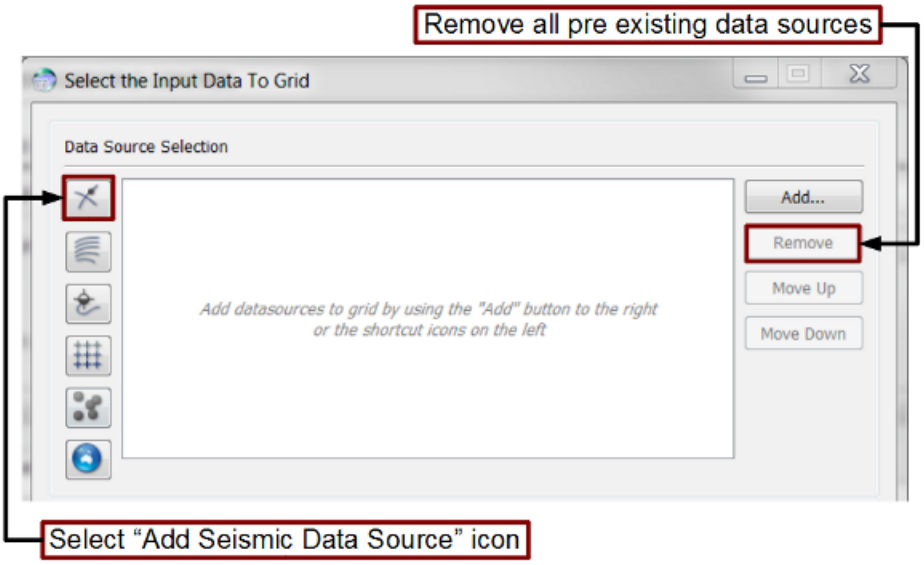
Use the file selector to enter a grid name. For this example the name “Top Valanginian” was used.



Click “Input Data...”



Use “Remove” to remove any data sources in the list, then click on the top left icon to add a new seismic data source.

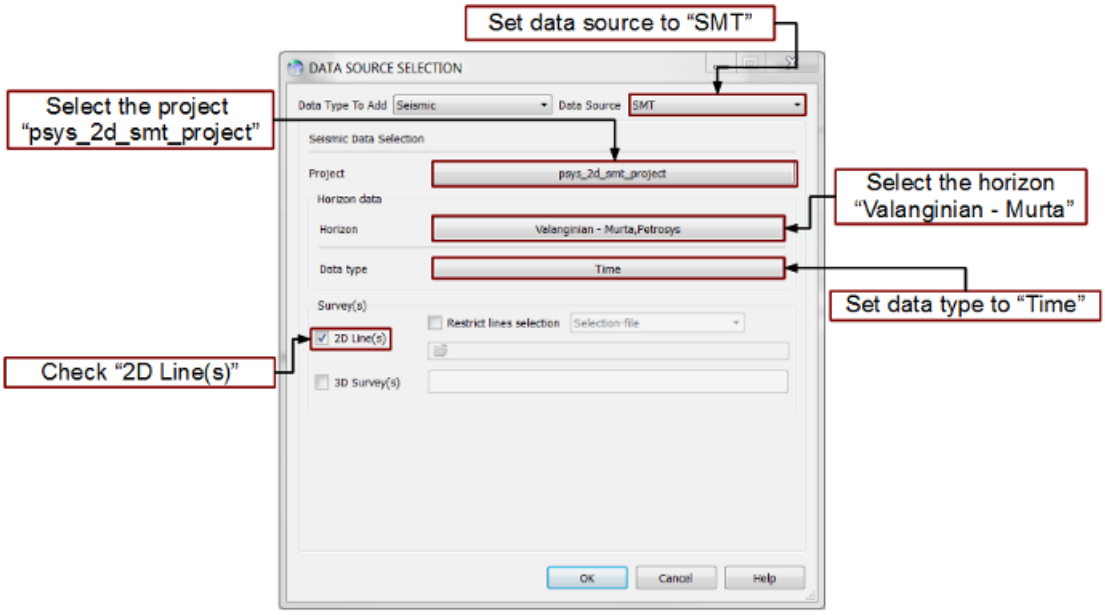


Ensure that the data source is set to “SMT”. Click the field next to “Project” and select “psys_2d_smt_project” - this is the same seismic data displayed earlier in mapping.

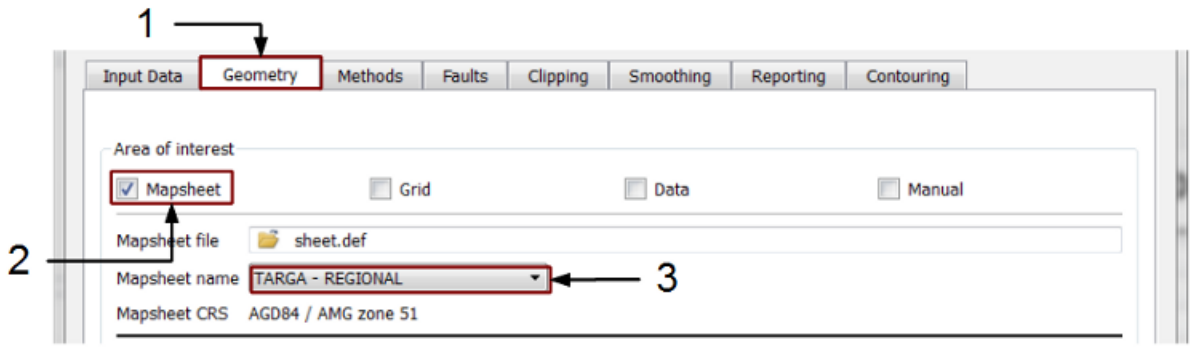
Click the field next to “Horizon” and select the “Valanginian – Murta,Petrosys” horizon.

Ensure the data type is set to “Time” and that under “Survey(s)” the box next to “2D Line(s) is checked.

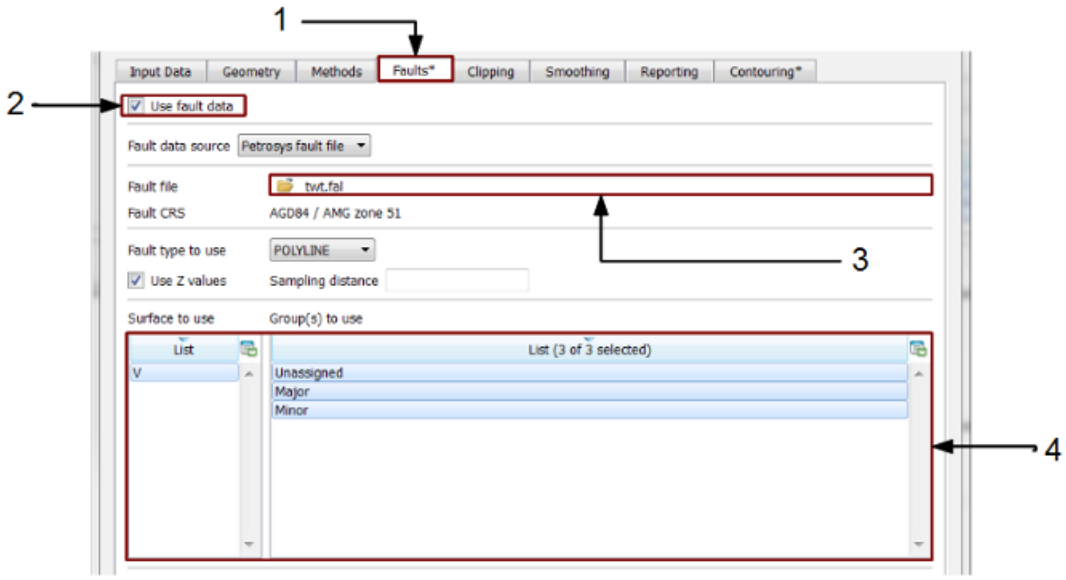
Click OK to confirm the data source selection, then again to return to the “Petrosys Gridding Control” window.



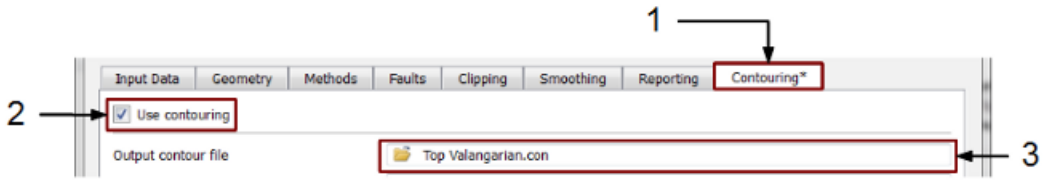
Under the “Geometry” tab, ensure that “Area of interest” is set to “Mapsheet” and that “Mapsheet name” is set to “TARGA-REGIONAL”.



Under the “Faults” tab ensure that “Use fault data” is checked. Set the “Fault file” to “twt.fal” using the file selector and ensure that all three groups are selected in the “Group(s) to use” list – multiple items can be selected from this field using the shit key + LMB click.

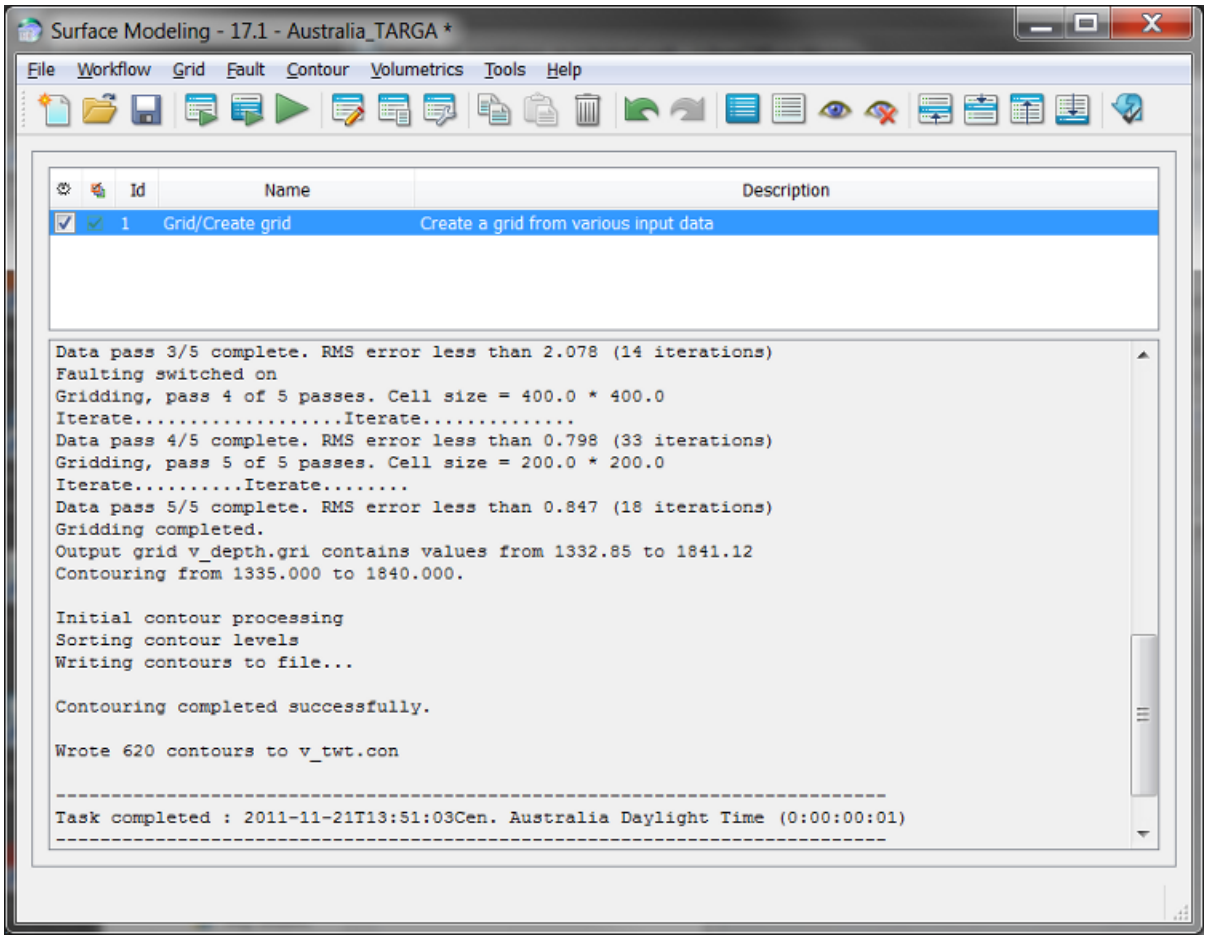


Finally, under the “Contouring” tab, check the box next to “Use contouring” and ensure that the “Output contour file” field is populated with an appropriate name. This should happen automatically.



Finally, click OK in Petrosys Gridding Control.

The task will run, and the status will be shown in the status window. If any errors are shown, the log in the status window can be used to help find out what went wrong.



This task will create two files in your project directory – a grid file, and an associated contour file.

Grids and contours can be displayed in mapping but, ensure that the space defined by the map sheet is the same as the area of interest selected during gridding.

In this case, because a map sheet was used to define this area of interest, as long as the same map sheet is used in mapping, both the grid and contours will appear correctly.

Useful Summary Topics

The online help contains a number of topics that are particularly useful to the first time user of Petrosys:

Topic	Summary of Content
Project Files	Lists the main file types that are used by Petrosys along with the file name suffixes commonly used with them.
Using Coordinate Reference Systems in Petrosys	An overview of how coordinate reference systems (CRS) are used in Petrosys.

Menu Options

File/File-Manager (Explorer)

Advanced users and systems administrators may wish to manage Petrosys files using operating systems features. All Petrosys project files may be stored within a single directory.

The easiest way of looking at the files in a Petrosys project directory is to use File/File-Manager (Explorer) from the Petrosys launcher.

See DATA MANAGEMENT for an introduction to the tools used to manage the various data stores within a project.

All the Petrosys files are discussed in detail under the separate help topics. This topic deals with data files, ie. the files that store the information that you are working on. See the help topic CONFIGURATION FILES for information on files that store information on how the application runs in your environment.

File Naming Conventions

Petrosys file names consist of a prefix separated from a suffix by a period (.). In Linux environments the suffix and prefix can be any length.

The prefix in a file name identifies the specific instance of the file, what data is actually contained within the file.

The suffix in file names is usually chosen according to a convention such that files of the same type have the same suffix. For example, a seismic data file has a .sdf suffix.

Case Sensitivity

In general Petrosys file names are case insensitive in Windows environments and case sensitive in Linux environments. File names should not rely on case sensitive differences for uniqueness.

Petrosys Standard File Name Suffixes

Data Files:

3d	3 dimensional coordinate file used in Fence Diagram displays.
3dm	Display list for 3D visualisation
cfc	Color flooded contour file
con	Contour file
cul	Culture file
dat	Used for a few specific files, such as wellinfomap.dat for well symbol matching
dbm	Map display list file - originally specific to dbMap
def	Map sheet definition file. Also used for 'scalebar.def' and 'projsys.def' files.
fal	Fault file
gri	Grid file
lgr	USA land grid data files
map	Map display list file
pal	Color gradient (palette) file, usually in a folder 'gradients'
ply	Polygon file
sdb	SQLite database, used for various things such as CRS definitions and default dbMap queries.
sdf	Seismic data file
sls	Line selection file
sty	Seismic line style file.
tsk	Task list for gridding, contouring and volumetrics
tzc	Well curve file (XYList file)
vps	Viewpoint save file for saving view points in 3D visualisation
wdf	Well data file
wsl	Well selection file
zmf	Zone mapping file to translate formation names between Petrosys and other applications

Input / Output Files:

asc	ASCII input or output data file
cgm	Graphics file in CGM format. Also used for user defined title blocks and well symbols.
dgn	Intergraph design file
dxf	Graphics file in Autocad DXF format
eps	Graphics file in encapsulated postscript format
hpg	Plot file in HPGL format
jpg	Graphics image file - JPEG format. (lossy, compressed, format)
ljt	Plot file in HP-PCL (Laserjet) format
pic	Picture (plot) file in Petrosys HMO format
png	Graphics image file - portable network graphics format. (lossless, compressed, format)

prn	Print file
txt	Text file
xml	XML file, used both for data transfer and various data stores.

Control Files:

plf	System list files (eg. current horizons, maps)
pnd	System file (these hold your previous responses)

See DEFAULTS FILES - PLF FILES and DEFAULTS FILES - PND FILES for more details on these two file types.

Software Files:

cfg	Petrosys systems configuration - only petrosys.cfg uses this.
cts	PACE initial job control file
erd	Error message library
lpo	DOS line printer options file
pif	Graphics font or pattern definition file
pnl	PACE dialogue source file
pnx	PACE dialogue binary file
xsl	XSL style file, generic, for reformatting and filtering of XML data
xsv	XSL style file specific to grid based volumetrics reports

Output and control files usually reside in the current working directory for the project. Software files are expected in a directory that is specified somewhere in your current PSPATH setting, and should not exist in your data directories. The system will behave in strange ways if software files exist in both data as well as a PSPATH directory.

Files that may be Deleted

Petrosys software generates a number of temporary file which are usually cleaned up at the end of a task, but which may accidentally be left on disk if the system is stopped abnormally.

Temporary files that can be deleted when there is no Petrosys task running in a directory include the upper and lower case versions of:

File name	Examples	Purpose
delete.*	delete.me	Various temporary files
*.tmp	ukooa.tmp grd9912.tmp	Temorary data file
pace*.bat	PACE34.BAT	Job control file - Windows batch file
pace*.sh	pace15a9.sh	Job control file - Linux shell script
*.pxt	pxdb03.pxt	Graphics buffering file
core	core	Linux or Unix core dump from a crash
stack_trace.txt stack_dump*.dmp	stack_trace.txt stack_dump_20080815_20.dmp	Windows memory dumps from a crash
spatial_properties*.dat	spatial_properties2.dat	Stores SQL queries associated with the annotations of database-related spatial layers, such as from ArcSDE or Oracle Spatial.

In the above a * is used as a wildcard, ie. any short simple text string could occur in place of the * symbol.

Under certain circumstances you may also delete files ending in .pnd . You may need to verify all defaults when using the system in a directory in

which you've done this.

Approximate File Sizes

See PROJECT MANAGEMENT - DISK SPACE for details on file sizes and project size.

File Permissions

Petrosys create all the files with the default permission as set by UNIX or Windows.

The default permission is controlled by the umask variable in the shell (see the UNIX help pages for details on umask). A umask of 0 means files get created with rw permission for everybody.

The normal unix default is to mark read-only for world and have rw for owner and group.

USING COORDINATE REFERENCE SYSTEMS IN PETROSYS

Coordinate reference systems (CRS) are the geometric framework in which points on our planet are described as polar (geographic) or rectangular coordinates. Understanding the coordinate reference systems that apply to data in your project area is extremely important!

This section provides an overview of the main CRS functionality provided within Petrosys. See COORDINATE REFERENCE SYSTEMS for a general overview of coordinate reference systems. The most important things to remember about a CRS are:

1. Geographic or latitude / longitude coordinates are specified in a 'geographic CRS' or GeogCRS. This includes the specification of a reference datum, which in turn is based on a 'spheroid' or 'ellipsoid' that is an approximation to the shape of the earth, and a geodetic datum which is one assumption of how that spheroid is located relative to the physical geoid which is the Earth. Some common geodetic datums are WGS84, NAD27, NAD83, GDA94, SIRGAS2000 and ED50.
2. Rectangular or east / north coordinates are specified in a 'projected CRS' or ProjCRS. A ProjCRS is a combination of a GeogCRS and a projection. A projection is one mathematical method for converting spherical (lat / long) to rectangular coordinates. A common projection type is UTM, a specific variant of this might be UTM17N, and an associated ProjCRS might be WGS84 – UTM17N.
3. Whilst it is relatively obvious when a projection is the wrong one – the data will usually be in a completely wrong location – errors in the reference datum of a GeogCRS are very common and may be hard to pick as they may only involve a shift of a few 100 metres.
4. There are usually several alternate ways of converting between any pair of GeogCRS, or 'datum transformations'. Petrosys supports the EPSG database of CRS data, from which such alternate versions may be selected. Different transformations are used for different purposes and in different areas based on the required accuracy, available computational speed, and acceptable approximation. You should be aware of what transformation is being used in areas where transformations are routinely applied. Different NAD27 to NAD83 transformations, for example, are used for data in the southern USA and Canada.
5. Any definition of data on the Earth's surface in rectangular coordinates will imply some form of approximation, and the impact of that approximation will change as the data are used in alternate CRS. You should be aware of what approximations apply in the CRS that are used in your projects. A common example of a CRS approximation is the variable scaling between real Earth measured distances and projected coordinate distances in UTM projections, depending on the distance from the central meridian of the UTM zone.

Petrosys is a very 'CRS aware' application. When you are in the Petrosys map canvas the current map sheet will define the CRS on the basis of which the current display is projected, All information displayed on the map will be automatically converted from the CRS of the data source to the CRS of the map sheet. This allows the display of data from an interpretation project in one ProjCRS to be overlaid with data or a regional map that is in an alternate ProjCRS.

Spatial output from Petrosys, such as grid and contour files, will include a full CRS specification.

Not all data sources are CRS aware. Files from older versions of applications, in particular, may not have a valid GeogCRS definition. To allow such files to be used with Petrosys, some Petrosys options have a field for specification of the data source CRS, and a 'project default CRS' is also provided for data sources without a CRS specification option.

The two most commonly used Petrosys CRS dialogues are:

Projected CRS selector	Dialogue for selecting a ProjCRS within a selection of GeogCRS, for example when editing a map sheet definition or specifying a ProjCRS for a data source.
Geographic CRS Configuration - Project	Dialogue for selecting the default GeogCRS transformations (datum conversions) to be used in a project.