

WinSurv 3D

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1. 01 Overview

1.1 Winsurv3D- An Overview

Winsurv3D allows you to take well planning and plotting to the next level by utilizing a 3D projection environment, customizable plotting and reports, as well as advanced geodetics positioning and a powerful database management system.

✔See your well plans and projections in three dimensions

You have the ability to render well plans in three dimensions. With a mouse or with a joystick, you can fly through a 3D space to view as well as edit well plans. Any changes to the project or target are made instantly in the 3D well planning interface so that problems can be immediately seen which would otherwise go unnoticed in traditional 2D well planning applications. 3D projections offer you this same advantage.

✔Manage projects and well plans with an intuitive database manager

If you have several projects all containing their own network of slots and curves, you can manage them in one screen through the Winsurv3D database manager. The manager allows you to edit job information and create multiple projects with maximum customizability on the fly.

✔Create professional customizable plots with ease

Using the Plot Maker, you can create company- or user-specific templates for any type of professional-grade plot. Once your personal parameters are set for the desired plot, importing well information to fill in the blanks is instantaneous, and creating your plots becomes one of the easiest and fastest things to do in Winsurv3D.

✔Create report templates to meet your exact specifications

As with plot templates, you can create reports that are specifically tailored to exactly what you want. Survey, target projection and least distance reports can be created quickly with the Report Designer, and reports can be exported as an ASCII file.

✔Utilize an up-to-date geodetics positioning system

By implementing the Blue Marble Geographics[®] calculation engine, your geodetics options are all-inclusive and allow you to specify all possible relevant geodetic parameters for your field. The Winsurv3D Magnetics allows you to generate extremely accurate coordinates by utilizing industry-standard cartographic calculation methods.

✔Create projections with a variety of powerful tools

You can quickly find the best way to reach your targets with a comprehensive list of projection tools. Projections can be made in the 2D or in a fully interactive three-dimensional interface. You can generate well

plans quickly and efficiently with ten specific projection tools and three projection profile tools, each designed to work with any set of parameters you have to work with.

✔ **Make targets (objects) with 3D detail through a comprehensive interface**

The Target Maker will help you construct your list of targets with a large number of parameters, including specific coordinates, shape, size and texture. Managing the targets is simple through the Database Manager, and can be easily edited inside the 3D well planning interface or in the Plot Maker.

✔ **Import and export a variety of file types**

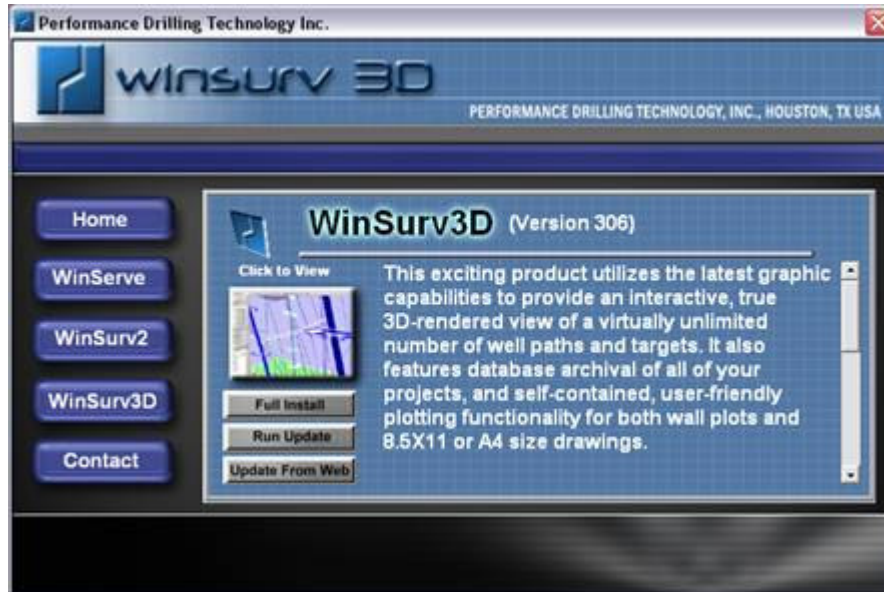
Export your projects as a WinServe Survey, MMS format, or Mauer Survey Files (.SDI). Import projects from WinServe or through other text files. Save plots as DXF, WMF, EMF files. Save your reports in ASCII format.

2. 02 Installation

2.1 Installing WinSurv2 and WinSurv3D

The process of installing WinSurv3D is twofold. First you must install WinSurv2 and WinSurv3D, and then the security [HASP Key](#) driver.

Step 1: **Insert the WinSurv CD** into your CD-ROM drive. If the autorun window does not pop up with this screen:



then open the CD's contents by right clicking on it in Windows Explorer and select the "Explore" option. Once inside the CD, select "AUTORUN" to run the installation program.

Step 2: **Click on Winsurv2** on the left, and then click "Full Install" in the box on the right. This should bring you to an installation prompt that looks like this:



Select the directory in which you would like to install WinSurv2 and then hit next. The installation process is automatic from this point.

Step 3: **To install WinSurv3D**, get back to the main WinSurv Installation screen, the blue window pictured above, and select WinSurv3D on the left. Click on the “Full Install” button to begin WinSurv3D installation.

Step 4: Choose the Destination Location at the Destination Directory Prompt. It is recommended to keep to default or as close as default as possible to avoid confusion unless user is familiar with program

Step 5: Choose Typical, Compact or Custom. It is highly recommended to choose Typical

Step 6: Select Program Folder

Step 7: The installer will begin copying files to your harddrive. After this process is finished, WinSurv3D is installed.

2.2 Installing the HASP Key

There are two parts to installing the HASP key: the security key driver installation and the device driver installation.

I. INSTALLING THE DEVICE DRIVER

Step 1: Windows will automatically detect a new device (Aladdin USB) and search for the driver. Tell Windows to AUTOMATICALLY search for the device driver. It should be found on your WinSurv CD. Once Windows finds the device driver on the CD, it will auto-install the driver and tell you when it is finished.

II. INSTALLING THE SECURITY KEY DRIVER

Step 1: On the desktop, after having installed Winserve2, there should be an icon named "HASP Installer." Click on this icon to open the installer. If there is no shortcut to the installer on your desktop, then go to the WinSurv2 directory (default: c:\Winsurv2) and click on the Haspinst.exe file, which has a key icon attached to it.

Step 2: In the **HASP SECURITY KEY DRIVER INSTALLATION PROGRAM** screen, select the top option, "Install HASP Driver" and click the bottom at the bottom labeled "Execute Hasp Configuration."



Step 3: Click on the next option, "Update Hasp Driver AND Maintain other settings," then click on the Execute button at the bottom. Do the same for the "Auto Detect Port Type" option. Disregard any prompts.

Step 4: Click done to close the installation program. Your HASP Key should be installed.

- ◆ Note: If the HASPINST installer is not working, open the HDD32.exe file to initiate the HASP manufacturer's installation program
- ◆ If your HASP key is plugged in and your computer says HASP NOT FOUND, then unplug and replug the key to reinitialize

2.3 Updating WinSurv3D

Updating WinSurv3D is a relatively simple process that requires an internet connection. The file that is required for download is usually around 6 megabytes. (For more on the website, see [WinSurv3D Website](http://www.winsurv.com))

UPDATING

1. Go to the WinSurv homepage, <http://www.winsurv.com>, and you should see a screen that looks like this:



2. Look for the “Support/Download” link at the bottom of the left-hand menu list. Click on it
3. The Support/Download screen will load. Look for the update file download link, which is the SEVENTH row down. The link itself will read “WinSurv3D Patch (Version xxx -...)” and go into a brief description of the most recent changes to the application.

you will want to copy them to either a CD via a CD burner or to a ZIP drive.

Support
If you have any problem with the downloads please [contact us](#) and we will sort out the problem.


PRODUCT PATCHES	Requirements
WinServe Survey Version 2005.01.27 (New MMS Export and DIMMS Export Requires download of TOOL TYPE.MDB, Added support for IGRF 2005.2010 Magnetics)	(Need User Name and Password)
ACCESS TOOL TYPE.MDB for 2005.01.01 and later (Copy this into your Winserve\Access directory)	(Need User Name and Password)
IGRF2005.2010 Magnetics File for Declination (Copy this into your Winserve\Access directory)	(Need User Name and Password. For use with Winserve 2005.01.01 and later; Also, Winsurv3D 306 and later)
World Wide Model 2005.2010 Magnetics File for Declination (Copy this into your Winserve\Access directory)	(Need User Name and Password. For use with Winserve 2005.01.01 and later; Also, Winsurv3D 306 and later)
Winsurv2 Executable + Patch - (Version 307 - Drillpost Update Added)	(Need User Name and Password)
Winsurv2 Executable Patch - (Version 308 Drillpost Update Added, Hydraulics Report Fix, Delete Days Glitch repaired)	(Need User Name and Password)
WinSurv3D Patch (Version 317a Glitch fixes for 317 - (Text box interface complete for Plotting... Ctrl-V paste will paste Excel Columns to Text box in importer, Grid North, True North and Improved Magnetics Report, GREAT NEW Paragraph Maker in Plot!)	(Need User Name and Password)
Winserve State Plane Database Includes all US states and territories	(Need User Name and Password)
TorqueandDrag DLL	(Need User Name and Password)
TorqueandDrag Executable Revision 21	(Need User Name and Password)
MISC.APIGID32.dll for Winsurv3D 292 - Save to Windows\System32 or Winnt\System32 directory directory.	
PRODUCT INSTALLS	Requirements
WinServe Office and WinServe Field Full Install	(Need User Name and Password)
WinSURV2 Full Install	(Need User Name and Password)
WinSURV COMPANION Full Install 09/13/2004 Unzip and Install	(Need User Name and Password)
WINSURV2.PDTMAST DATABASE	(Before saving, Use Winsurv2 to your current data, un on the HARD DRIVE using the BACKUP

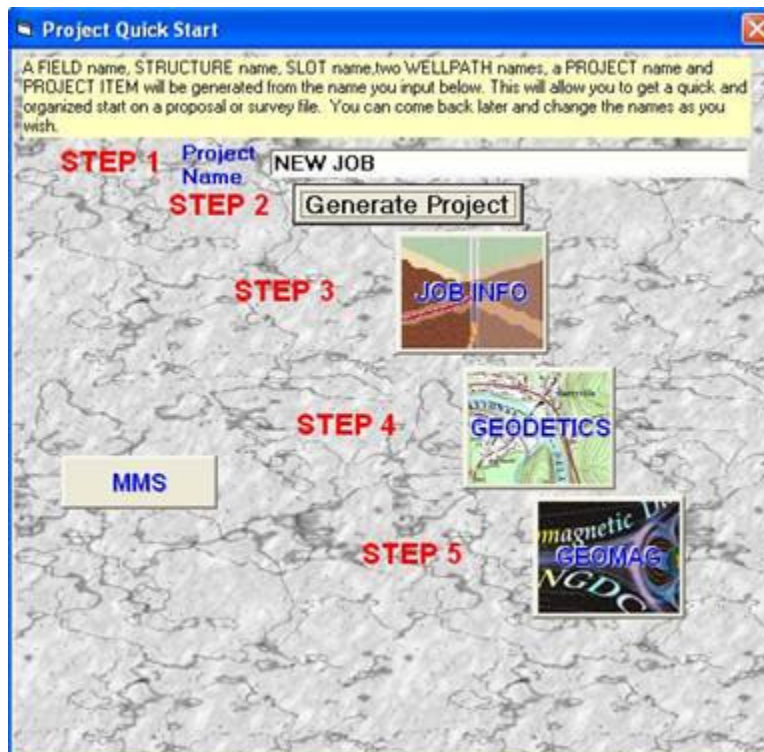
4. You will be prompted to type in a user name and password that should have. Type it in and begin downloading
5. Once you have the new survey3d.exe file, replace the old one. It is located in the WinSurv3D root directory. If you have not changed it from the default, it should be c:\WinSurv3D. Drop the new file in and start the program.

3. 03 Getting Started

3.1 Using Quickstart to Create a Project

You can use the Quickstart Wizard to get a jumpstart into your project.

1. Click the “Wizard” icon  at the upper left of the screen to create a new single well project and get to the planning action as quickly as possible (though as seen in the EXAMPLE Field, you can always “add on” later and enlarge the scope at any level).

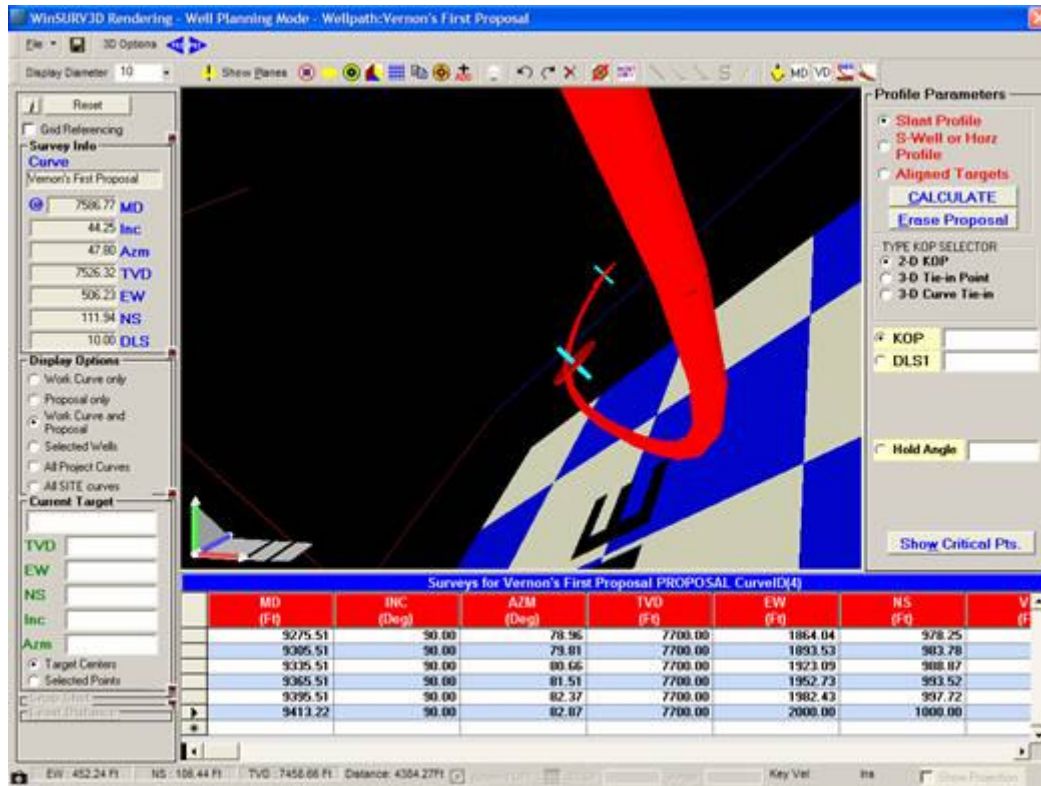


2. Type in a Project Name in the text box and press the GENERATE PROJECT button to activate the next steps. **NOTE:** WinSURV3D takes the name you enter for the Project and assigns it to all levels of the database tree.
 3. First you will be asked if the Project is measured in feet or meters. Click “Yes” for feet, “No” for meters. It is not necessary to complete Steps 3, 4 and 5 at this time (Job Info being least important), if you do not have all of the information. See note below for details.
- **NOTE:** Mineral Management Service- The “MMS” button will open the **MMS Block Locations** data in tabular form. This is specifically for projects in the Gulf of Mexico. There is more information on MMS at the website Drillpost.com

- **NOTE:** If you know your location, it is best to enter it in Step 4 – here’s why. Not only is the name you enter carried throughout the Project, but when you fill in geodetic coordinates to define the Field through the Job Wizard, those coordinates are also automatically assigned to the structure and slot (the Wizard starts from the assumption of a *single* well project). If you skip that step now, you will have to edit that location info later for all three levels. Plus, after entering coordinates in Step 4, the Magnetic calculation of Step 5 is automatically performed for that location, nothing for you to do except print it out.

3.2 Essentials of 3D Well Planning

Winsurv3D addresses a portion of the multi-faceted process of well planning with a 3D interface. There are several major tools to consider when utilizing the program in this capacity. (For a detailed breakdown of making three-dimensional well plans, jump to [3D Well Planning](#).)



Essentials of utilizing the 3D Well Planner in Winsurv3D

- Know the Point of View tools-** Using the keypad or the arrow keys with the mouse is the standard mode of flying around in the [3D planner](#), but it is ideal to have a joystick with twist action. Another key POV tool is the RESET button on the top left.
- Selecting targets-** Whichever target is selected is the one that the various projections will be solving for. Make sure the right targets are selected by left clicking on them.
- The right tools-** The three profile parameter tools at the top right of the screen are some of the most powerful tools in Winsurv3D. Depending on what parameters are available, the different tools are appropriate for different well-planning situations, but learning the function of each profile makes most jobs a breeze.
- Right clicking-** Depending on where the pointer is on the view screen, right-clicking will pull up a number of options. If on a target, a long list of target-related options will pop up. If on the well, a curve options will materialize, including least distance. If the floor or walls are selected when right-clicking, environmental options will show.

3.3 Runthrough- Making Plots

The [Plot Maker](#) in Winsurv3D is most effectively used with the templates available, but can just as easily be created from a clean slate. Even when using a template, it is necessary to learn the various individual tools to make a great plot. (For a detailed breakdown of making plots, see [Plot Maker](#).)

The Plot-making Process

1. **OPEN** the [Plot Maker](#) by selecting a slot or proposal in the [Survey Project Manager](#), and then clicking on the **PLOT** button at the bottom.
2. **SELECT THE SIZE** of the plot that you want to make from the four options at the top.



If you choose a size that auto-create info boxes, delete them before going to the next step.


3. **PLACE THE GRAPHS** by clicking on each of the three tools and drawing them onto the screen.



You can re-scale the graphs manually by selecting them and then right-clicking, then choosing Vertical Section Plot properties.

4. **OPEN THE TEXTER** and click on each info object that you want to place. To place them, click the ADD button in the [Texter](#). You can resize and relocate all objects once you have placed them.

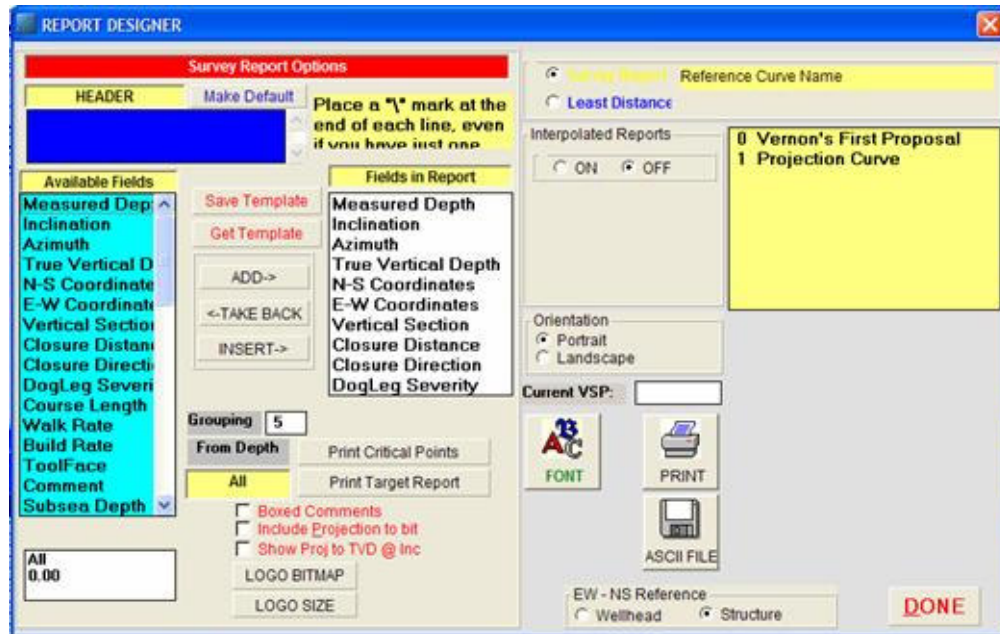


- The Survey List Generator tool creates a typically enormous information object and should be place last after all other objects have been arranged since moving it around locks all the other objects into place.
 - To customize the text boxes and set your personal default for colors, open the [Texter](#) and go Colors & FontsàText Colors and Colors & FontsàCaption Colors. Once your preferences have been selected, click Make Default in the [Texter](#) to save your changes.
5. **PLACE YOUR LOGO** by clicking on the logo tool at the bottom left of the main screen:  Simply select your logo from the module or load one from your file and arrange it on the plot.

6. **PRINT** the plot by clicking on the Print or Plot button on the right side of the main [Plot Maker](#) screen. Select the printer and click Print.

3.4 Runthrough- Making Reports

In order to make a report in Winsurv3D, you must be in the **Project Manager** screen. Once inside the Project Manager, click on the Reports button at the bottom of the screen. (For a detailed breakdown of the report maker, see [Report Designer](#).) Below is a brief synopsis of the process.



1. **CHOOSE REPORT:** Select the curve from the top right to make the report on. If you want a Least Distance Report, click on the Least Distance button and select the second curve in the blue box that will appear below.
2. **CUSTOMIZE:** Select all the fields that you want in your report. Use the ADD, INSERT and TAKE OUT buttons to toggle the fields.
3. **REFERENCE:** Select EW-NS Reference along the bottom of the Report Designer box.
4. **OPTIONS:** Choose your font by clicking on the large FONT button. Select company logo along the bottom of the dialogue box as well.
5. **OPTIONS:** Down the center right, choose whether or not you want interpolated reports, choose orientation and enter your current VSP. You do not have to enter a new VSP if one is already there.
6. **SAVE/LOAD:** To save this template, click on “Save Template” between the two fields lists on the left. You can also load templates with the “Get Template” button located in the same area.
7. **PRINT:** Hit the PRINT button at the bottom. It will bring up a print preview screen so that you can verify the appearance of your report. Toggle through the pages with the arrows on the top left. If it is satisfactory, click on the little printer icon at the top to print.

4. 04 Database Manager

4.1 What is the Database Manager?


Winsurv3D uses the Database Manager as the front end of the entire application. It is where you begin your project. You name your fields, projects, and slots here. You can also edit targets, curve information and surveys from this screen. Here is a general overview.

The Database Tree

On the left is a “tree” display of all data in the database associated with your well planning and drilling projects. It is subdivided into three tabs: Fields, Projects and Current Projects. (For more detailed information on the Database Tree, see [Database Manager Tree Structure](#).)

HOW IT WORKS: Information at each level of the tree corresponds to an info panel to the right of the tree on the screen. At the top center is shown the CURRENT PROJECT.

Continuing logically down the tree hierarchy, the next two corresponding panels contain SLOT INFORMATION (on the right) and WELLPATH INFORMATION (on the left). The slot name, grid and local coordinates, and possible lease line callouts are shown. For the wellpath, name, type of curve (e.g., Proposal or Survey), Vertical Section Plane and RKB elevation are given. The last panel at the bottom provides a list of surveys for the selected wellpath.

NOTE: For each of these info panels, notice the padlock icon . When the padlock is red, you are “locked out” and prevented from accessing any data; to EDIT any information in a particular panel, double-click the icon: the padlock and the background color of the panel turn green and blue-green, indicating that you are permitted to make changes. Double-click again to lock the data when you’re finished.



Example of the Slot Information panel UNLOCKED to allow editing

Current Project Box

In the center of the screen is a dual-purpose panel that typically displays a schematic diagram defining the ELEVATIONS associated with the selected Structure and Wellpath. Alternately, a summary of Target parameters will be displayed for a Target selected from the tree.

Inside the Current Project section of the screen is the **FIELD INFORMATION** panel, showing the name of the field and the geodetic coordinate system and units selected for it, as well as the North reference, grid convergence (CV) and specified horizontal datum

(e.g., MSL). The actual grid coordinates established for the field may be viewed or modified by clicking the Field Geodetics button.

Click “LAUNCH” to leave this screen and enter the main workspace to work on the selected Project. The program defaults to opening with the last Project that was launched.

The next lower panel contains **STRUCTURE INFORMATION**, including the name, elevation, grid reference coordinates, and which slot is currently designated as the reference slot. You can also access the [Structure Manager](#) by clicking the button. Use this to establish, view and edit your structure geometry.

The Graph Window

The upper right corner of the screen contains a multi-function view window. Across the top of the window are folder tabs to choose or indicate the function. Once a structure has been selected from the tree, a schematic of the slot arrangement or associated targets may be viewed. The plot option displays a plan view of the wellpaths in the project that are selected for plotting or display in the 3D interface through the **Curve Manager** (accessed in the [Plot Maker](#) module or in the [3D Well Planning Mode](#)).

As you tour around familiarizing yourself with the screen, clicking here and there, you may have noticed how these panels are either blank (only showing a label) or contain data. The panels only will contain information corresponding to the highest tree level that is selected in the tree view window. In other words, if you select (click and highlight) a field, only the Field Information panel is shown; select a wellpath, and its data and all panels above it in the hierarchy will be displayed. This organizing strategy helps you keep track of where you are at and quickly becomes second nature.

4.2 Database Manager Menu Icons

At the upper left of the screen, above the tree view window is a row of icons (float-over info boxes will help to remind you what each represents).



Quick start “Job Wizard”. Get your Project started quickly: WinSURV3D assigns the name you choose for the Project to all levels of the hierarchy (you can edit them later) so you can get to work on your wellplan more efficiently.



Project Selection Screen. A searchable list of all Projects in the database allows you to find the one you want easily and quickly (For more details, see below)



Ellipse Constants Table. A table giving you the choice of error calculation model and tool error coefficients (including user-specified) to assign to your survey data to obtain the most accurate assessment of BHL position uncertainty.



Job Information. Fill in a form with your job info to appear on plots and reports



Winserve1 Importer. Import a Winserve1 .SVY file of multiple curves and assign them to slots in your project. Bring all your old Winserve1 job files over to WinSURV3D!



Field Geodetics. Choose your geodetic coordinate system and input geodetic X, Y and Z's or Longitude and Latitude to define the location of your Field.



Magnetics. Use the WinSURV3D Magnetics Calculator to determine the magnetic declination, grid correction and other information for your location.



Structure Proposal Generator. A very powerful tool to plan a multi-well Structure utilizing user-determined well profiles, casing strings, lithology and torque & drag modeling within moments. Get a jump-start on a large project and then fine tune it – as opposed to a time-consuming well-by-well process.



DELETE! A simple concept with powerful effects. Because the delete function is accomplished on the data tree, the higher level up that you are the more data can be wiped out. But it is a two-step process, and there's a warning prompt as well. This is “carefully efficient” data elimination.

PROJECT SELECTION SCREEN

A Project may also be found quickly by clicking the ‘Project Query Search’ icon located just above the tree window. All Projects in the database are listed in spreadsheet form. Select one directly by clicking in the far left column to highlight the row; press GO TO PROJECT and it will be displayed as the current Project. Or, when your database

contains many Projects, use the search tools to ‘prune the tree’ and quickly find your Project.

Project Selection Screen

Project Name: contains EXAMPLE
 Company Name: =
 Service Company: >=
 Job Number: <= starts with contains
 Type Project: starts with
 Description: contains
 Field ID: =

Structures assigned to Project

Structure Name
EXAMPLE-Structure
STRUCTURE2
STRUCTURE3

Queried List -> You have 26 records

FieldID	Project Type	Project Name	Company Name	Job Number	Description	Date Initiated
139		EXAMPLE-Project				03/05/03 10:02
146		PDI EXAMPLE-Project				03/18/03 5:58:59
147	3 STRUCTURES	EXAMPLE-Project	OILCO-1			03/05/03 10:02

In the figure, several steps are illustrated simultaneously. The complete list of Projects has been narrowed down to those that ‘contain’ the word “EXAMPLE” after we clicked APPLY QUERY, and our EXAMPLE Project has been selected.

4.3 Database Tree Structure

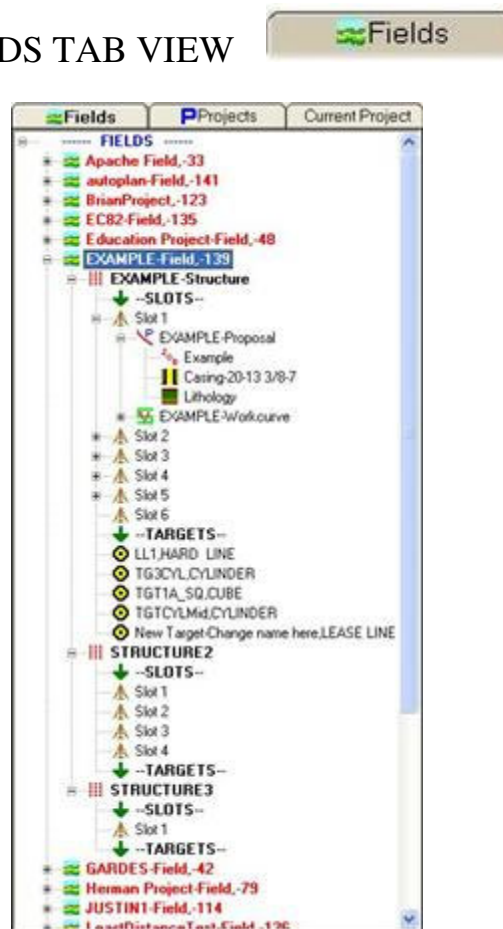
All data, for ALL jobs, is saved to a single database file (default: WinSURV3D.mdb - a Microsoft Access file). The data is organized and presented in a tree structure hierarchy, a concept much like several other well planning software packages.

Database Tree Tabs

Click directly on the folder tab to choose which mode to view the data.



FIELDS TAB VIEW

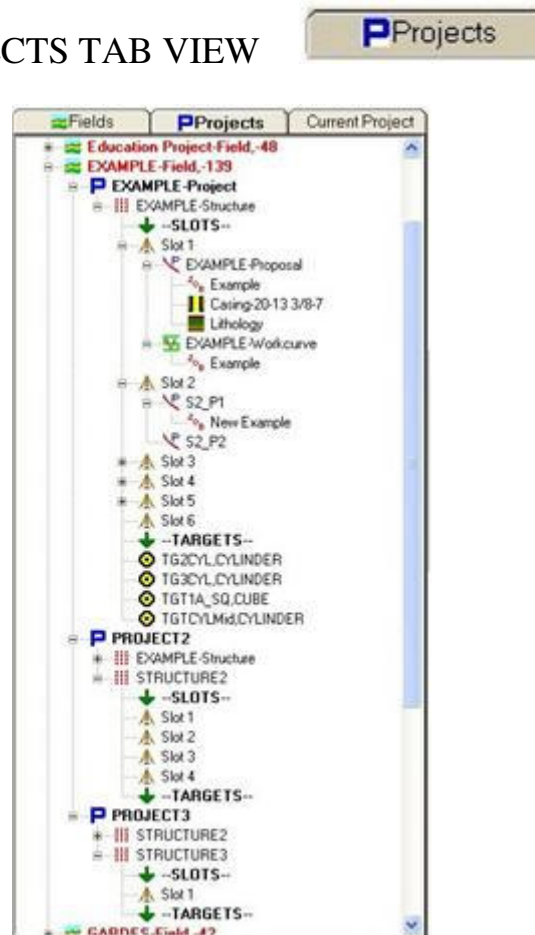


The FIELDS tab initially displays a list of all fields in the database; clicking on the blue - **FIELDS**- heading at the top of the window expands the view of the tree hierarchy from “top to bottom” for the entire list (i.e., Field→ Structure→ Slot→ Wellpath→ (Job / Casing / Lithology / Torque&Drag)). Click again to collapse the list.

With any individual Field that is expanded, click on its name (or the minus sign) to collapse that part of the tree. The figure on the left shows a partially expanded tree for the EXAMPLE Field.

The Fields display mode looks similar to the Projects display mode seen below, but only gives an overview of fields and structures.

PROJECTS TAB VIEW



The PROJECTS tab view option is nearly identical to the Fields view, with the only difference being the inclusion of Projects, now shown as the next level directly below Field in the tree.

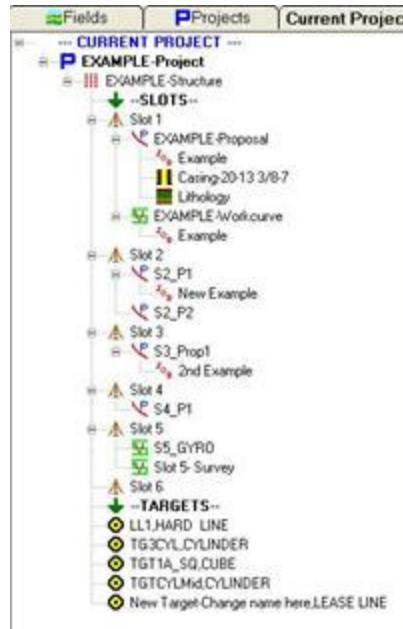
In the figure at the left, not seen is the blue - **FIELDS/PROJECTS-** heading. (NOTE: For all tree windows, different sections of the tree that may be undisplayed can be viewed by using the slider bar at the right). As in the case above, clicking on the heading will expand the entire tree; click again to collapse back to the list of Fields.

Notice the three Projects in the Example Field, and how the three Structures within that Field are assigned to those Projects. The EXAMPLE-Project consists of the single EXAMPLE-Structure; PROJECT2 includes two Structures, EXAMPLE and STRUCTURE2; PROJECT3 is defined by STRUCTURE2 and STRUCTURE3. This illustrates the point that **a Project may be composed of any combination of Structures found in a given Field**. Although the identical tree may appear under each Project, the data for a particular Structure is only written to the database once, and any modifications

to it will be in effect throughout all Projects in which that Structure appears. However, if you choose to edit a Project by deleting a particular Structure, only that single Project would be affected: the Structure data remains in the database, in the Field and any other Projects it is a part of.

CURRENT PROJECT TAB

Current Project



The CURRENT PROJECT tab option displays the currently selected project. When you open WinSURV3D, it is also the default view, showing the last project that had been “launched” into the **Project Manager** before you exited the program.

To select a different Project, go to the PROJECTS tab view and highlight the one you want by clicking it.

Now go back to the CURRENT PROJECT tab view to see the selected Project tree expanded.

The current Project name is also displayed in the text box at the top center of the screen.

DATABASE TREE ICONS

	Field
	Structure
	Slot
	Proposal wellpath
	Survey (Workcurve) wellpath
	Job Number
	Casing Profile
	Lithology Table
	Torque and Drag calculation file

HEIRARCHY: At the “top” of the tree is the FIELD level, followed by STRUCTURE, SLOT, and WELLPATH. Associated with the Wellpath may be a JOB NUMBER, CASING string, LITHOLOGY table, and TORQUE&DRAG calculation. Also associated at the Structure level are the TARGETS for your “project”.

The term PROJECT is a key organizing concept in the program. A Project is created and exists within an individual Field. The simplest way to understand the hierarchy is to visualize the case of an offshore drilling program. The FIELD may be a particular reservoir; there may be multiple platforms (Structures) drilling in that same field; each platform, or STRUCTURE, has the capacity to drill from a number of SLOTS in the template; and finally, there can be any number of Wellpaths associated with each Slot, whether a Proposal, a sidetrack, or Survey (“as drilled”, gyro, or offset wells for example).

The PROJECT exists as a subset of all wells in the Field, grouped as a selected number of Structures. One Project may be a single Structure; for another you may want to include the next closest structure for anti-collision purposes; a third may include several other structures, and so on. In other words, the *same* structure, or any combination of structures (within a single Field) can be part of any number of different Projects.

COLLAPSING AND EXPANDING: Any level of the tree may be expanded by clicking on the “plus sign” (“+”) to the left of that item. (Conversely, clicking on a “minus sign” (“-“) collapses the tree back up to that level). To whatever degree the complete tree has been expanded, you can collapse it again by clicking on the named level (or the minus sign): everything below that level will collapse from

view. If there is no plus sign next to the object, that means there isn't any data below that level associated with that object.

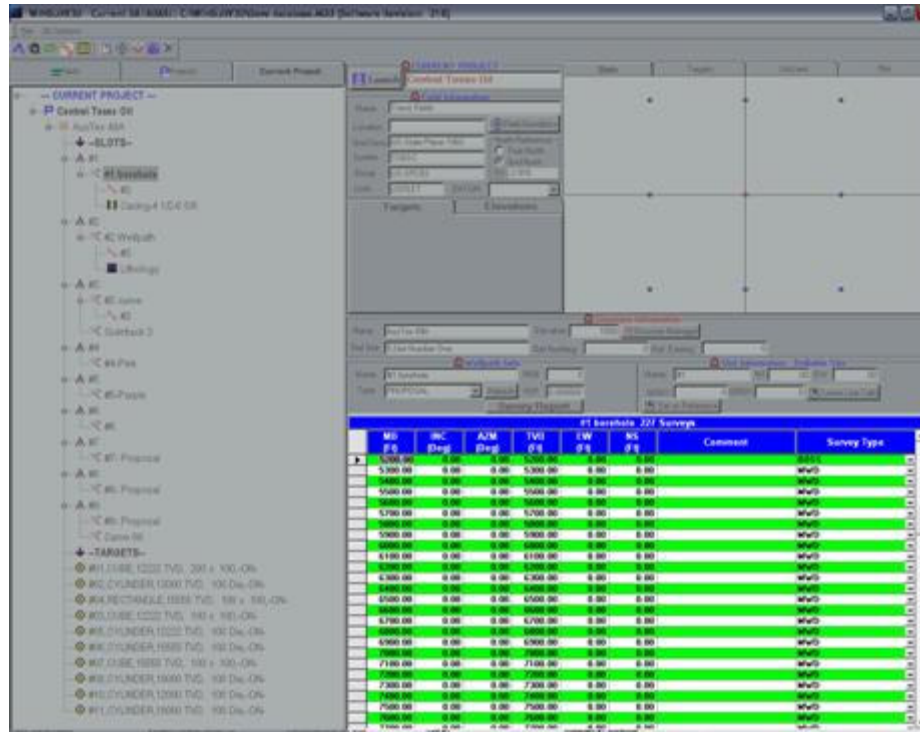
All objects, whether a Field, Structure, Wellpath, etc. have action menus associated with them that can be accessed by right-clicking on the item. The possible actions for each type of object is discussed in the [Database Right-click Menus](#) section.

4.4 Database Manager Surveys

Surveys in WinSurv3D are generated and tabulated automatically, and users can add surveys to a proposal individually. Survey lists of any given proposal are available in most modules of the program.

Survey List in Database Manager

By selecting any proposal in the database tree window on the left, the bottom right Survey Info field will be activated and relevant survey data will be displayed there.

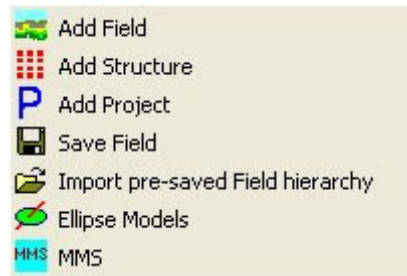


- The far right column in the survey list spreadsheet here is the Survey Type, where you can select from a couple dozen different types through the pull-down menu.
- Use the scrollbar on the right side of the list to view all the surveys.

4.5 Database Right-Click Menus

At each level of the [Database Manager](#)'s database tree hierarchy, action menus specific and relevant to that level may be accessed by right-clicking on the item. Here are these options for each level in turn.

Right-click on "FIELD"



Add Field- Add a new Field and build it 'manually' from scratch. The FIELD panel unlocks and you are prompted to name the new Field. (NOTE: It is generally preferable to use the quickstart [Job Wizard](#) to add a field).

Add Structure- STRUCTURE INFO panel unlocks to allow entry of a name, elevation, and grid reference coordinates. For larger than a 'single well' Structure, click [Structure Manager](#) to build it up

Add Project- Open [Add/Edit Project](#) form. Shows available Structures within the Field to select for the new Project

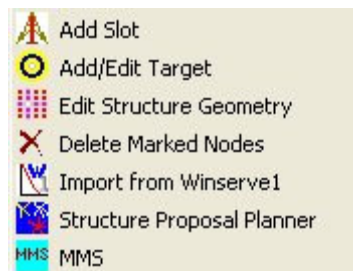
Save Field- Creates a copy of the entire Field hierarchy in the WinSURV3D>FIELDS folder on the hard drive. Useful to transfer data to another computer

Import pre saved Field hierarchy- Add a previously saved Field to your [WinSURV3D.mdb](#) database

Ellipse Models- Choose a 'global' error model and ellipse of uncertainty constants to apply throughout the field

MMS- View U.S. Minerals Management Service (MMS) offshore block locations for the Gulf of Mexico

Right-click on "STRUCTURE"



Add Slot- The SLOT INFO panel is unlocked to allow you to enter a name and local or grid coordinates, or lease line callouts

Add/Edit Target- Open [Target Editor](#)


Edit Structure Geometry- Open the [Structure Manager](#)

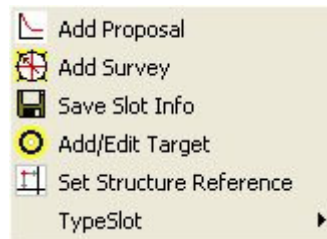
Delete Marked Nodes- Deletes all nodes that have been previously marked

Import from Winserve1- Display the **Winserve1 Importer** form to open a .SVY file and import a multiple set of curves and assign them to slots in the structure

Structure Proposal Planner- A powerful tool to ‘get a leg up’ on a large project by quickly generating a series of wellpaths

MMS- View U.S. Minerals Management Service (MMS) offshore block locations for the Gulf of Mexico

Right-click on “SLOT” 



Add Proposal- The WELLPATH INFO panel is unlocked. Name the Proposal and set the RKB value



Add Survey- The WELLPATH INFO panel is unlocked. Name the Survey and set the RKB value

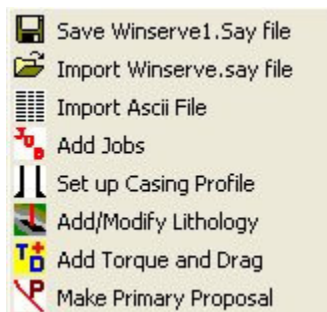
Save Slot Info- Saves the information of the currently selected slot into the main database

Add/Edit Target- Brings up the [Target Editor](#)

Set Structure Reference- Set the selected Slot as the reference slot (i.e., with “0,0” local coordinates) for the Structure.

TypeSlot- Label a “slot” site as DRILLABLE, REFERENCE ONLY, or NON-DRILLABLE. For organization and ‘bookkeeping’ help; solely for informational purposes.

Right-click on “PROPOSAL”  or **“SURVEY CURVE”** 



Save Winserve1.Say File- Save the wellpath survey data in a .SAY text file format to import to Winserve1

Import Winserve1.Say File- Import a single curve .SAY text file from Winserve1 and save the data in the selected wellpath

Import ASCII File- Import a single curve ASCII format text file from Winserve1 and save the data in the selected wellpath

Add Jobs- Open **Add/Edit Job** form to add a new job number and assign it to the wellpath

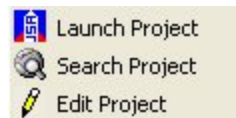
Set up Casing Profile- Open **Casing Profile** form to create or edit and assign a casing profile for the wellpath

Add/Modify Lithology- Open Wellpath Lithology form to create or edit a table of Lithology depths and descriptions and assign to the wellpath

Add Torque and Drag- Open **Torque and Drag** module to perform a T&D calculation and assign it to the wellpath

Make Primary Proposal- Tag the wellpath as the Primary Proposal for that Slot. This makes it the default proposal for plotting and rendering in the [3D Well Planner](#)

Right-click on “PROJECT” 



Launch Project- Go to the main workspace to work within the selected Project.

Search Project- Open the **Project Selection Screen** to find the Project to work on.

Edit Project- Open [Add/Edit Project](#) form.

Right-click on “TARGET”



Add/Edit Target- Open [Target Editor](#)

4.6 Job Information

The Job Information provides a means to keep track of the wells in terms of your company's internal job numbering system. This information will appear in the standard Survey Report Header and in the Header Info text box that may be placed on a plot.

All Jobs in the database are shown in a two level tree logically arranged so that Job Numbers are grouped beneath specific Company names.

However, the Job Number is the primary 'key' or index field for the database, and as such it cannot be duplicated identically. In other words, even under different Company names, you cannot use the same Job Number more than once.

Obviously this is not a problem generally, but may crop up when you're just practicing and tend to use the same 'dummy' name variables. If it happens you will see the following message (Error #3022):



Simply change the job number, and the problem is resolved.

4.7 The .MDB File

All data for every project is saved in one file, by default WINSURV3D.mdb. It is best left under that nomenclature until the user becomes familiar with the organizational theory of the program and gains practical experience with how it works.

When a full installation is done, WinSURV3D.mdb is assigned as the default database file (located in the WinSURV3D folder) and with no further action by the user, it will remain the default.

NOTE: Remember to rename your current WinSURV3D.mdb file before doing a full installation if you want to save your data; the WinSURV3D.mdb *will be overwritten*.

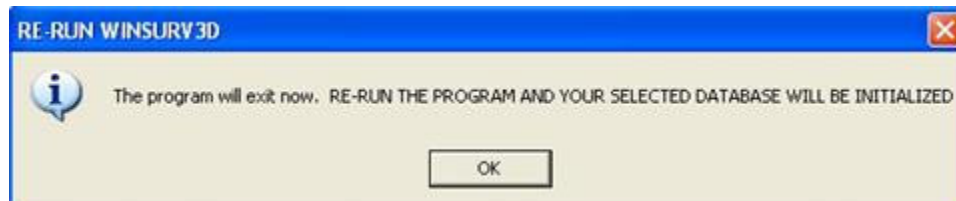
However, as your database grows, it may be desirable to limit the size of that file, both to speed up your computer's performance and to organize your data more efficiently. For instance, you may want to keep all Projects associated with an individual customer grouped together in one file, or have a training file for new users to practice without worrying about important data being compromised.

There are plus/minus considerations to be made with respect to having multiple database files. It is recommended that you stick with the default WinSURV3D.mdb until you feel comfortable enough or experience the need to create separate files.

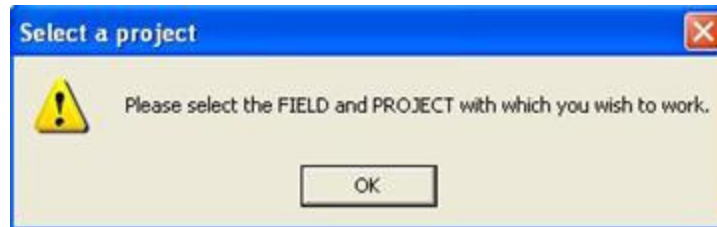
CREATING ALTERNATE DATABASES

To create an alternate file, select FILE→Create New Master Database from the menu at the upper left of the [Database Manager](#) screen. A Windows Explorer-type dialog box opens in the WinSURV3D directory and prompts you to name the file (type over the "NewNameHere.MDB"), and decide the location to save it. For example, you can create a folder called CustomerDB in the WinSURV3D directory, and keep a distinct "MDB" for each customer in that folder.


Once you name the file (the .mdb extension is added automatically), click "OPEN" to create the file and close the dialog box. The following message will appear:



Click OK to exit WinSURV3D. **Restart the program.** Since the program always opens to the last Project, it now does not know where to look because no data exists in the file you just created, and the following message will appear:



After you click OK, the program again looks for data that does not yet exist, and appears lost in 'hourglass' mode.

To get past that, you must initialize your new file, so here's the work-around trick: ignore the 'hourglass' and click on the [Job Wizard](#)  at the upper left of the screen. If you are ready to begin a new project – go for it! But if not, just type in a “dummy” name, click GENERATE, and close the Wizard; don't worry about the rest of the steps. After you have begun work on a “real” project, you can always delete this field later.

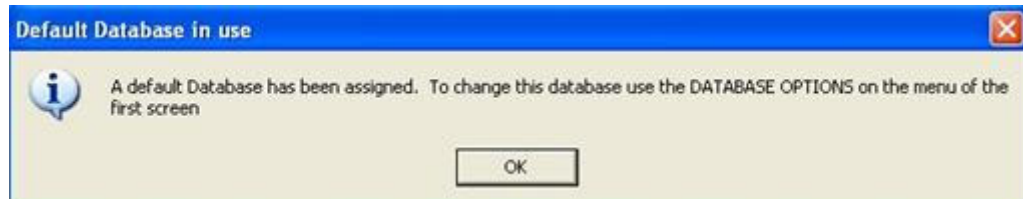
Visually confirm your filename and path at the top of the screen.

LOADING DATABASE .MDBs

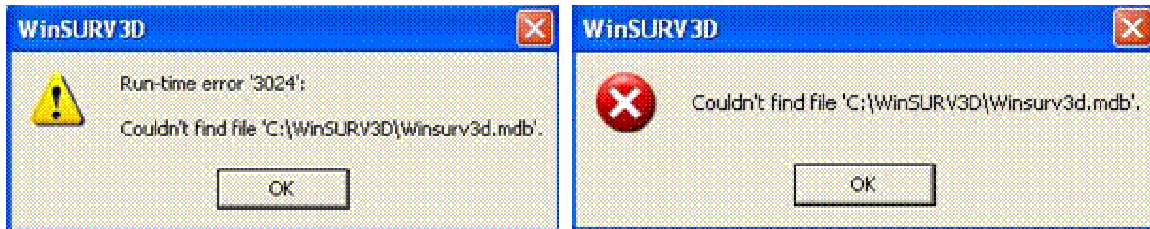
Once you know how to create and name your own distinct database files, here is how you can load a particular file to work on:

Select FILE→ Open Default Database from the menu bar. Find the file you want to use and 'OPEN' it. Once again you will see the same messages as above; the program will close, and you will have to select a project from the tree after you restart it.

NOTE: There is another message you may see. If you delete or change the name of your current default database file, the following message will appear:



The program reverts to the WinSURV3D.mdb file. However, say for example that you renamed that file to prevent it from being overwritten, but for some reason skipped doing the installation and went back to work. In that case, the following two messages will appear:



You will end up clicking through the second message 'OK' several times before getting tossed out of the program – and you will not get back in! Therefore, **always be sure that there is a WinSURV3D.mdb file in the WinSURV3D directory to avoid this situation.**

SPECIAL NOTE: Once you start manipulating files in this way, you may get curious and also notice a file called MASTERBLANKWINSURV3D.MDB. This is a very important file that contains the 'DNA', so to speak, of the database file format and table structure. The program mimics the form of this file in order to create a new master database – in other words, **don't delete it, rename it or mess with it in any way.**

The file COMPACT.MDB performs internal "housekeeping" and maintenance functions, and also should not be altered.

SAVE FIELD and IMPORT HIERARCHY

You may want to transfer data from one file to another. Just follow these simple steps:

1. Right-click on the field you want to transfer, choose SAVE FIELD from the menu. It may seem as if nothing happened, but the entire Field was copied and saved in the WinSURV3D→FIELDS folder and assigned a name automatically, with the following naming convention:

FIELD_YourChosenName-Field_X#.mdb

[where "X#" is the database internal indexing number (also appears on tree)]

Note that regardless from which database file you are saving the Field, it is always written to the WinSURV3D>FIELDS directory.

2. Open the default database where you want to import the Field.
3. Right-click on *any* Field on the tree, choose IMPORT PRE-SAVED FIELD HIERARCHY. The dialog box opens up to the WinSURV3D>FIELDS directory by default.
4. Open the "Field.mdb" file you want. It may not appear instantly on the tree; close and restart the program, click on the FIELDS tab view – it will be there now.

4.8 Tutorial: Using the Database Manager

Example: Create a new Project using the [Job Wizard](#) following the procedures described in [The .MDB File](#). You can name it and use any location you want, but this is the information to duplicate the “EXAMPLE” Project seen throughout the document.

1. Project NAME: EXAMPLE
Measure Units: FEET
2. Job Number: EXAMPLE
Company: My Company (Fill in the rest however you want)

Note that ‘Job Number’ is not automatically created by the [Job Wizard](#).

3. Geodetic Group: US State Plane 1927
System: Texas South
Datum: NAD 27 (default)
Linear Unit: USFEET (default)
Latitude: 27deg 0min 0sec
Longitude: -96deg (west) 0min 0sec (round-off may not show zeros)
4. Magnetics: If you have followed the steps in sequence, there is nothing required of you except to verify that the correct LAT/LONG has been carried through and the magnetic info calculated.
5. Close the Job Wizard and view your new project, which automatically is designated the CURRENT PROJECT. See how the name you chose has been assigned to each level of the tree hierarchy, and the Job Number assigned to the two wellpaths, a Proposal and a Survey (“Workcurve” in the terminology of WinSERVE1; “as drilled surveys”).

Select each level under the Project to see the relevant information. “Unlock” the Structure panel to enter an Elevation; unlock the Wellpath panel to enter an RKB elevation. Note that an RKB must be entered individually for each Wellpath.

ADDING SLOTS: There are two ways to add slots to a Structure. You can add slots ‘manually’, one by one, by selecting the Structure from the tree and choosing “Add Slot” from the right-click menu, and then filling in the data on the Slot info panel. Or, say you have a platform template that contains 6 slots, and you know the geometry of the template. There is a quicker way to add to our structure- see [Structure Manager](#) on how to create your platform.

4.9 Structure Manager (Platform Maker)

The Structure Manager allows you to quickly add “slots” to your Structure. Remember that the term “slots” merely refers to a place in the tree hierarchy, not strictly the familiar case of an offshore platform. A slot can be any drill site, or indeed simply a reference point in a conceptual “Structure” grouping.

For instance, consider a group of land wells in close proximity. Rather than define each as a “single well Structure” in a Field, it might be advantageous to model the group as a single Structure, with the “slots” defined by the surface offsets between the individual wellsites.

OPENING THE STRUCTURE MANAGER

To access the Structure Manager, you must first create the Structure, either through the [Job Wizard](#), or by selecting ADD STRUCTURE after right-clicking on the Field in the [Database Manager](#).

Open it by either action:

- Right click on the EXAMPLE Structure in the any tree view, and choose EDIT STRUCTURE GEOMETRY
- Select the Structure from the tree, unlock the Structure panel, then click the **Structure Manager** button.

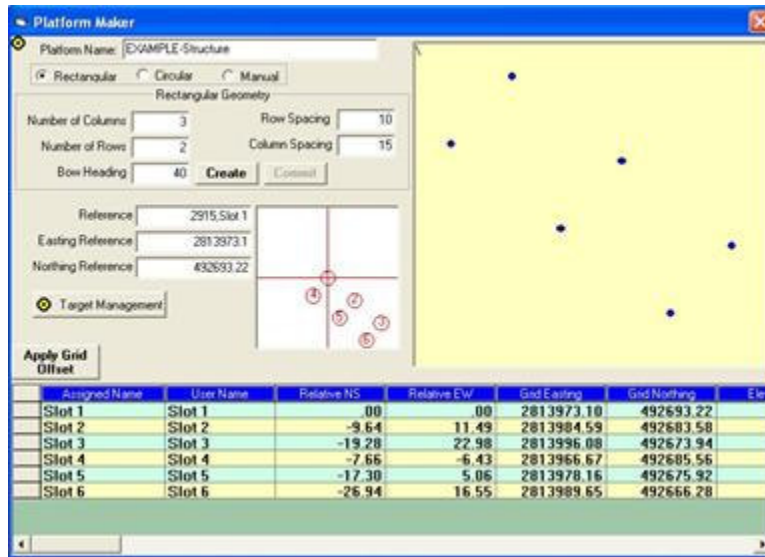
Structure Information				
Name	EXAMPLE-Structure	Elevation	100	Structure Manager
Ref Slot	2915.Slot 1	Ref Northing	492693.22	
		Ref Easting	2813973.1	

This is your structure information panel.

Here are several examples of how to use the Structure Manager. Follow these steps to duplicate the EXAMPLE Structure:

1. Open the **Structure Manager**.
2. Click the button for RECTANGULAR. Enter the geometry: 2 Rows, Row Spacing 10 ft; 3 Columns, Column Spacing 15 ft.; Bow Heading 40 degrees.
3. Click CREATE and view the schematic diagram of what the template looks like. Change the variables to see the effects and understand how it works, each time pressing CREATE. Return to the original settings described in Step 1.
4. When you are satisfied with the settings, click COMMIT. The template is generated and both local and geodetic coordinates are calculated for each slot.

NOTE: Even after you ‘Commit’, if you want to make a change to the geometry, just repeat the process.



DEFAULT SLOT NAME

“Slot 1” (the slot created by the [Job Wizard](#)) is the default reference slot, with local coordinates set to “0,0”. The geodetic reference coordinates for the Structure (and Slot 1) are those established when the Project was created through the [Job Wizard](#).

SLOT USER NAME

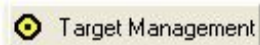
“User Name” for the slot (second column of the spreadsheet) is the name that will appear in the tree view and Slot Info panel.

EDITING INFORMATION

If you want to edit any information, close the **Platform Maker** and make the changes by unlocking the appropriate Slot Info panel. Alternatively, you can edit directly via the spreadsheet by double-clicking in the cell you want to change.

NOTE: If you edit the local coordinates, you **must** follow by clicking APPLY GRID OFFSET to update the grid coordinates. *This operation works in one direction only!* That is, if you alter the grid values, you may not see the local coordinates update immediately. However, when you close the Platform Maker and check the info panel for that slot the changes will be reflected.

Target Management



allows you to quickly set up generic targets for each slot.

4.10 Tutorial: Using Structure Manager

Example 1: Create STRUCTURE2 in the EXAMPLE Field.

1. Select FIELDS (or FIELDS/PROJECTS) tree view.
2. Right click on the EXAMPLE Field; choose “Add Structure.”
3. Select the new structure (“Put the new structure name here”) on the tree.
4. Enter the name STRUCTURE2 in the text box of the Structure panel that says, “Put the new structure name here” (the name can be modified in the Structure Manager later).
5. Enter an ELEVATION of 80 ft in the panel.
6. Go to STRUCTURE MANAGER and “Create & Commit” a six slot Rectangular template: 3 rows, 2 columns, row spacing 15 ft, column spacing 12 ft., 70 degree Bow Heading.
7. Note that the local and grid coordinates are initially the same (namely ‘local’) in the Slot spreadsheet.
8. Enter an EASTING REFERENCE = 2815000 and
9. NORTHING REFERENCE = 492500
10. Click the APPLY GRID OFFSET button and grid coordinates are calculated for the given local geometry, with the Structure Reference defaulting to Slot 1.

The screenshot shows the 'Platform Maker' window. The 'Platform Name' is 'STRUCTURE2'. The 'Rectangular Geometry' section is active, showing 'Number of Columns' as 2, 'Number of Rows' as 3, 'Row Spacing' as 15, and 'Column Spacing' as 12. The 'Bow Heading' is set to 200. The 'Reference' section shows 'Reference' as '2821 Slot 1', 'Easting Reference' as '2815000', and 'Northing Reference' as '492500'. The 'Apply Grid Offset' button is visible. A small diagram shows the slot layout. The 'Slot spreadsheet' at the bottom lists the following data:

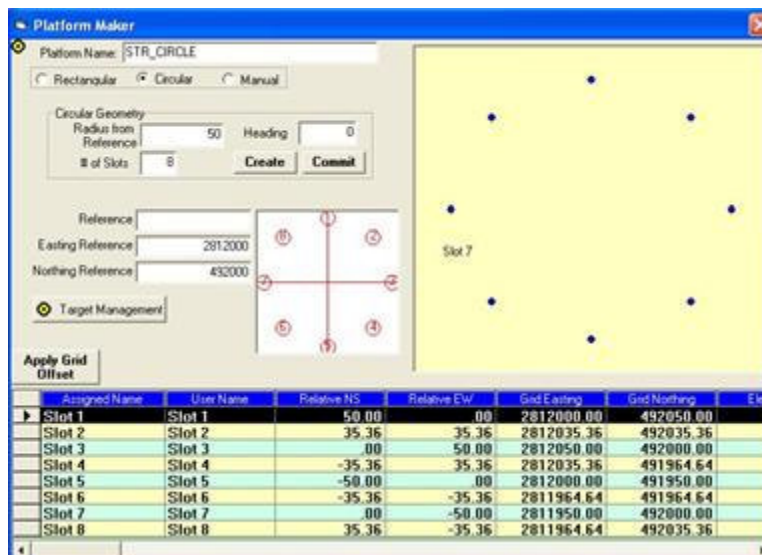
	Assigned Name	User Name	Relative NS	Relative EW	Grid Easting	Grid Northing	Elev
Slot 1	Slot 1		0.0	0.0	2815000.00	492500.00	
Slot 2	Slot 2		4.10	-11.28	2814988.72	492504.10	
Slot 3	Slot 3		14.10	5.13	2815005.13	492514.10	
Slot 4	Slot 4		18.20	-6.15	2814993.85	492518.20	
Slot 5	Slot 5		28.19	10.26	2815010.26	492528.19	
Slot 6	Slot 6		32.30	-1.02	2814998.98	492532.30	

STRUCTURE2 should end up looking as shown in the figure above.

Notice the conventions used for row, column, and bow heading. Slots are numbered in sequence by row; the bow heading is the angle described by a line passing through slots of the same column and successive rows, extended in the direction of Slot 1, and rotated clockwise from the north, or zero degree reference. Continue to “Create & Commit” to experiment with how the [Structure Manager](#) functions.

Example 2: Create a Structure with slots arranged in a circular pattern.

1. Right-click on the EXAMPLE Field in the tree; select ADD STRUCTURE.
2. Name the Structure STR_CIRCLE; Elevation = 0.
3. Go to the Structure Manager; select the CIRCULAR radio button
4. Set the Radius = 50 ft. and the number of Slots = 8, Heading = 0. “Create & Commit”. (Press Commit a second time to generate the larger schematic).
5. Enter Easting Ref = 2812000; Northing Ref = 492000. APPLY GRID OFFSET to update the grid coordinates.



NOTE: An important difference from the rectangular Platform Maker is that instead of the reference coordinates being associated with Slot 1 by default, they describe the center of the circle around which the slots are evenly spaced.

Example 3: Create STRUCTURE3 in the EXAMPLE Field. This time you will build the structure “slot by slot”. You want three Slots with the following names and local coordinates (N/S, E/W):

SLOT1_STR3, (0, 0); SLOT2_STR3, (20, -20); SLOT3_STR3. (-30, -15)

Follow steps 1 – 4 from Example 2 above, except with the name STRUCTURE3.

5. Enter an ELEVATION = 120 ft.
6. First go to the Structure Manager and set the EASTING REFERENCE = 2814700 and the NORTHING REFERENCE = 492600.
7. Select your new Structure on the tree; right-click and select ADD SLOT. The SLOT INFO panel “unlocks”; enter SLOT1_STR3 for the name. The default local coordinates are (0,0) and grid coordinates are equal to the Structure reference.
8. Repeat Step 7 to add the other 2 Slots. Notice that when you enter the local coordinates the grid coordinates are automatically calculated.
9. If you had not yet entered a Structure Reference (Step 6), the grid will match the local coordinates. You could then add the reference coordinates later in the Structure Manager, click APPLY GRID OFFSET and get the same result.
10. To illustrate editing the Structure Reference after the Structure has been created, change the EASTING REFERENCE = 2814600.
11. Go to the Structure Manager and enter the new reference.
12. Click APPLY GRID OFFSET and verify that the GRID EASTINGS for each Slot have been updated.
- 13.

Another way to build a Structure ‘by hand’ is to use the [Structure Manager](#) to create a temporary slot template for as many slots as you need, then edit the coordinates of each Slot with the actual well offsets.

Practice setting or editing the Structure Reference to understand how it works.

4.11 Add/Edit Project

Right-click on a Project in the [Database Manager](#) tree and choose EDIT PROJECT to open the form shown below.

- When opened from the Current Project tab view, you can only EDIT the current Project (not ADD a new one).
- Opening through the Project tab view is also for editing the selected Project.
- To ADD a Project, right-click on a FIELD in either Project or Field tab view, and choose ADD PROJECT.

GENERAL INFO

In either case, you can enter a name for the Project; denote a Start Date by clicking on the arrow and selecting the date from the calendar; indicate the Type Project (a useful index for searching a large Project list); denote the Operator; enter any comment you want to describe the Project.

AVAILABLE STRUCTURES displays all Structures in the Field. Simply check the ones you want to include in your Project (or uncheck those to “remove” – they are not deleted from the database, only not included in the Project).

4.12 Project Selection Screen

Right-click on a project in the [Database Manager](#) tree and choose SEARCH PROJECT to open the form shown below.

Project Selection Screen

Project Name: contains EXAMPLE
 Company Name: >
 Service Company: >=<
 Job Number: contains <>
 Type Project: starts with
 Description: contains
 Field ID: =

Structures assigned to Project

Structure Name
EXAMPLE-Structure
STRUCTURE2
STRUCTURE3

Queried List <> You have 26 records

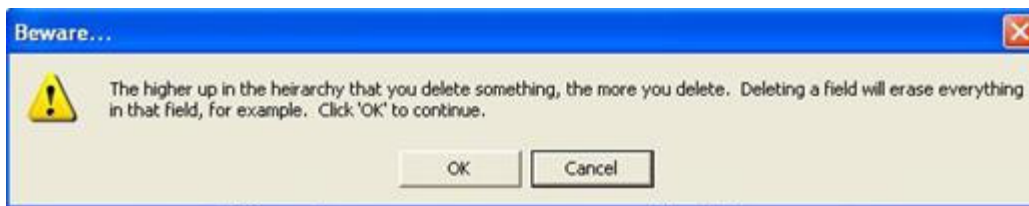
FieldID	Project Type	Project Name	Company Name	Job Number	Description	Date Initialed
139		EXAMPLE-Project				03/05/03 10:02
146		PDT EXAMPLE Proj				03/18/03 5:58:51
147	3 STRUCTURES	EXAMPLE Project	OILCO-1			03/05/03 10:02

- All projects in the database are listed in spreadsheet form. Select one directly by clicking in the far left column to highlight the row; press GO TO PROJECT and it will be displayed as the Current Project.
- Or, when your database contains many projects, use the search tools to ‘prune the tree’ and quickly find your project.
- Search with Boolean operators (‘contain’ is most useful) for a project NAME, or TYPE (if you are in the habit of including that tag). The other search criteria are remnants of an older interface and do not apply here.



4.13 Deleting Database Objects

As you manage your database of Projects, Fields, etc., there will be a need to delete items occasionally. The familiar Windows routine of selecting the object and hitting the DELETE key, or right-clicking and choosing “Delete” from a pop-up menu is too easy and leaves you vulnerable to a critical mistake. WinSURV3D handles the delete function in a unique, multi-step process to avoid such inadvertent and potentially catastrophic loss of data.

Virtually all delete operations are performed in one place – on the [Database Interface](#) screen, by means of the tree.



The WinSURV3D version of the well-known “Are you sure?” question.

- Click the DELETE icon  at the top of the screen to follow the process.
- The obvious difference this time are the “check boxes” that appear next to every object.
- To delete an item – *and ALL objects that are below that item in the tree hierarchy* – put a check in the box by clicking on it, then click the  icon a second time.
- The warning message shown above will appear. If you are sure that you want to delete all checked objects and their associated subgroup objects, click “OK.”
- The tree view will be refreshed without the deleted items.

NOTE: THERE IS NO “UNDO” AND NO “RECYCLE BIN” TO RECOVER DELETED DATA!

NOTE: Although a box appears next to the group headings “SLOTS” and “TARGETS,” checking that box will not remove all existing slots or targets – they must be individually checked to be deleted.

Deleting ALL Structures (indeed the entire ANOTHER Project) *does not affect the status of those structures in the other projects.* BUT modifying a structure (or any of its subcomponents) within a project *will* incorporate those changes throughout the field and any other projects which include

it. This holds true regardless of whether the editing or deletion is done through the Field, Projects or Current Project tab view, for the simple reason that the hierarchy is written *once* to the database and made accessible to all possible projects in the that field.

For this reason, it may be considered a “best practice” to perform these operations through the Field tab view, to remind yourself that the changes will be “global”. Similarly, rather than DELETE a structure from a project in this manner, it is better to right-click on the project and simply uncheck the unwanted structure on the [Add/Edit Project](#) form. (Of course, a project can only be deleted from the Project or Current Project tab view).

NOTE: If you DELETE a structure from the field tab view, that structure is gone – from **ALL** Projects in which it may have been included.

5. 05 Plots

5.1 How Do I Make a Plot?

All plots are made in the [Plot Maker](#), which can be accessed from the [Survey Project Manager](#) screen.

1. From the main [Database Manager](#) screen, select the projects or current projects tab above the database tree.
2. Select any component of the project that you want to make a plot of. The “Current Project” field should appear in the top middle of the screen with the “Launch” button in it.
3. Click on the “Launch” button to open the [Survey Project Manager](#) screen.
4. In the database tree on the left, select a slot, projection , or a job to open up the buttons on the bottom. The “Plot” button will open up. Click on it.
5. The [Plot Maker](#) is now open. You can begin creating, customizing and saving your plots from here.
 - ☐ Once in the [Plot Maker](#), you can choose anything to be plotted, not just the specific curve you may have selected to enable the “Plot” button.

5.2 The Plot Maker

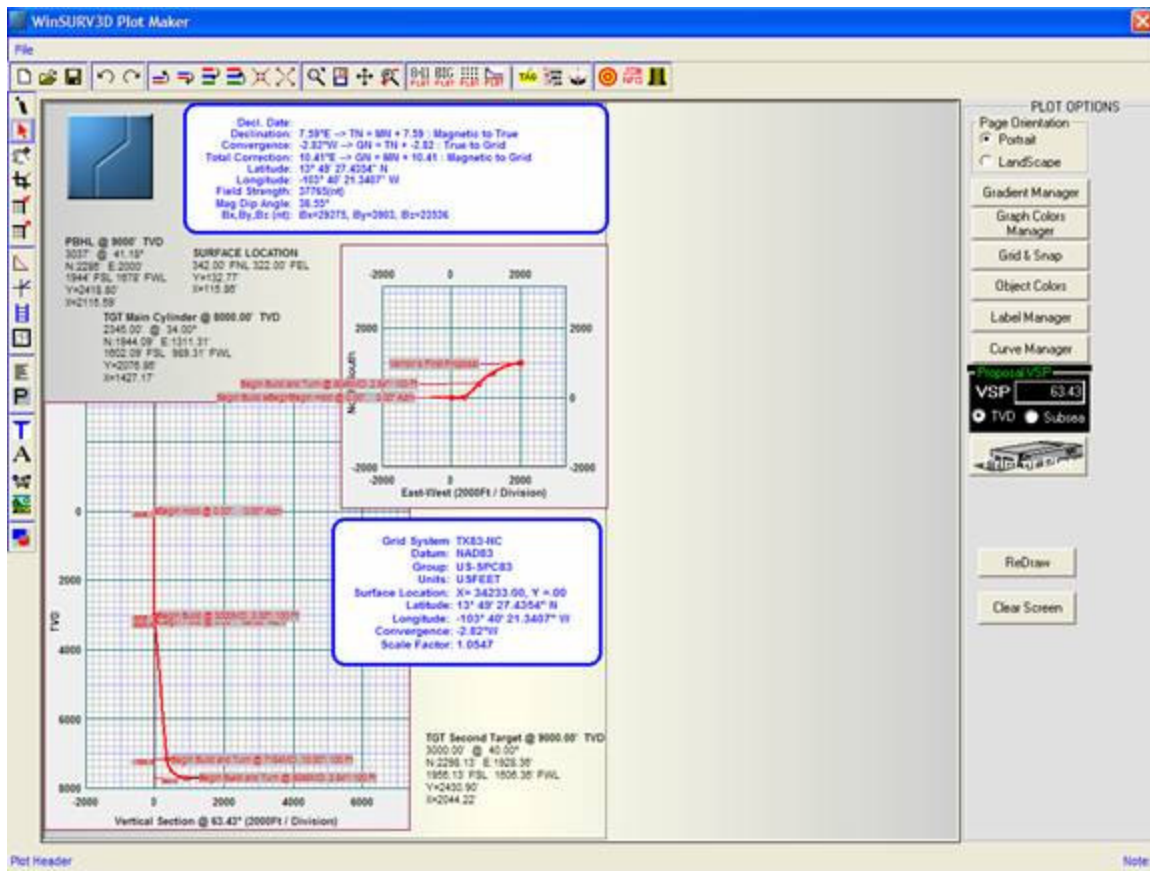
The **Plot Maker** allows you to customize your own plot templates to exact specifications. You can create multiple templates for different users and companies, or use pre-existing templates to get a quick start. All fields are customizable, from size and amount of data to font, color and backgrounds

With older programs, to generate a wall plot it was necessary to export the basic plot to a DXF file to be refined in a drawing program such as AutoCad or AutoCad Lite. While this was a workable solution for a power user of AutoCad, for many potential well planners it presented a formidable learning curve as well as an additional expense. Far more preferable and convenient would be a self-contained capability specifically designed to create directional plots, and nothing else.

WinSURV3D has that capability and includes various options to create functional and attractive graphics presentations quickly and efficiently.

OPENING THE PLOT MAKER

Open the WinSURV3D Plot Maker from the [Survey Project Manager](#) by clicking the PLOT icon at the bottom center of the screen. If the button is dimmed (inactive), that means you have not selected a curve yet. Click on a wellpath to select it and the button will become active (and you can see the surveys listed). The selected wellpath will be the default curve that will be plotted. (You can still open the **Plot Maker** even if the selected curve has no data).



Most of the available tools for generating and customizing the plot are accessed through familiar icon representations as shown below (Toolbar Icons).

Top Toolbar



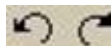
New Plot



Open an existing plot



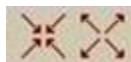
Save the current active plot



Undo / Redo



Layering tools. Move selected object to top, bottom, down one or up one layer. When objects are hidden behind other objects, use these tools to bring the desired objects to the top.



Grouping tool. Group and ungroup items. Grouping allows objects to be moved and resized as one, maintaining relative sizes. This is a very useful tool for customizing a plot.



Zoom Tools. A great set of tools for zooming in and editing the plot.



Default Plot Templates. WinSURV3D permits limited default templates to be defined for 8½ inch (A4), Wall size, Composite and Structure plots. This saves time, giving you a head start by having standard items you will usually include already on the plot. Currently it is recommended that you keep the templates simple, limited to information boxes, the plot frame and your standard logo. Arrange and size them on the template according to your conventional presentation. Do not include complex graphical objects (vertical section, horizontal or ladder plots) as part of the template; rather, add them after selecting the one you want to work on. For more information, see [Plot Templates](#).

NOTE: After a template is opened, you must click the REDRAW button to load the current project plot information.



Tag. Default Labels. Specify the criteria for labeling the curves.



Auto Comments. Apply Critical Point comments to the current proposal plot. Useful if you forgot to implement it when you created the original proposal, or have modified it since then.



Adjust Draw Mode for the Ellipses. Specify how overlapping ellipses will appear on the plot.



[Target Editor](#)

Add/Edit Job Information. Job needs to be chosen for the Header Box in [Texter](#)



Add/Edit Casing information

Grid Options and Cropping Tools



Info mode. Click to take the program out of Edit mode and display the plot as it will be printed. In this mode the name of the currently selected object is displayed in a text box at the lower left hand corner of the screen.



Edit Mode. This is a mode puts the program explicitly into edit mode, allowing selection, and also allowing a view of all the objects that are in the plot. It will display all of the grid lines that are created, regardless of whether they are selected for plotting. To view the grid lines that will be

plotted select the ‘i’ icon.



Move Graph tool. Hand Tool. Shift graph axes by simple drag and drop. When selected the program is put into a ‘move mode’ that remains active until another mode is selected. First select it, move the cursor over the graph, click the left mouse button down and drag it to the point more or less where you want it to be positioned. The graph will be redrawn with the axes shifted horizontally or vertically to the nearest inch. You can repeat this process without reselecting the Hand Icon, unlike the cropping exercise. Select Info or Edit mode to end ‘move’ mode.



Graph Resizer. Logically scales your grids. See [Graph Resizer](#)



Cropping tool. Used to crop Vertical and Horizontal Plot areas. The button must be clicked prior to each cropping exercise. Cropping works only from the top and from the right, not from the bottom or from the left. To adjust the position of the curves and comments within the plot, use the move graph tool



Crops plot graph to nearest lower whole inch grid



Expands plot graph to next larger whole inch grid

5.3 Objects Tools

The various components of a typical plot are each generated in a similar fashion, and are represented by what are known as targets “objects.” Think of an object as a type of container that may be “filled” with different kinds of data, which may be a vertical plot or reference information, for example.

Placing Objects

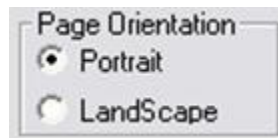
The most powerful feature of the [Plot Maker](#) is the ability to create and place complex objects wherever you desire.

This is done by selecting one of the icons described below (Plot, Information or Graphic Objects) and moving the cursor to a point on the workspace; now hold down the left mouse button and drag the cursor to create an ‘object box’ of the desired size; release the mouse button and the object will be drawn.

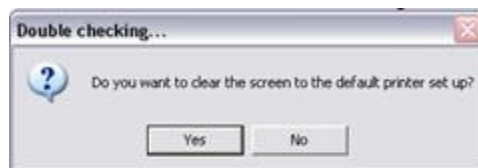
For vertical and horizontal plots the object drawn will have the same dimensions as the outlined box. Other objects, such as header information boxes, are drawn to a predefined size.

Page Orientation

Select your page orientation, Portrait or Landscape from the top right of the screen.



The default is Portrait. If you want Landscape, then select the Landscape option in the box. You will be prompted again about if you want to ERASE the current drawing, then you will see this prompt:



Click yes to switch to Landscape orientation.

NOTE: This step is currently required every time you want to load a template that is oriented opposite of what is currently displayed.

Plot Objects



Vertical Section Plot



Horizontal Plane Plot



Least Distance Ladder Plot

Information Objects (for all Information objects, see [The Texter](#))



[Texter](#)- Separate module for all text information objects



Critical Points Information Paragraph



Text. Add free-form text to the plot



Font. Choose font attributes for inserted text

Graphic Objects



Graphics. Place a captured 3D view on the plot



Frame. Draw a frame around the plot border



Logo. Place a logo on the plot



Rotate selected object. Used primarily to rotate text comments

CREATING THE PLOT

The first thing you need to decide is what size plot you want to work on. When you open the Plot Maker for the first time, the workspace area will be blank. Notice the vertical line that divides the page. The area to the left of the line is the active plot area. The plot area is proportioned according to the specified *paper size* of your current default printer.



INTERACTING WITH THE OBJECTS

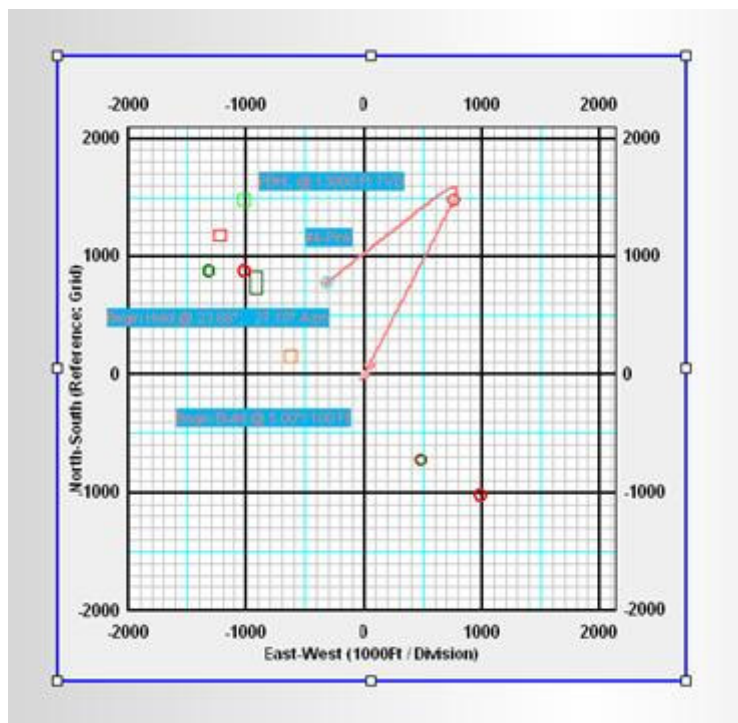
However, it is easy to resize any object: first select the object by clicking within the box so that white square “handles” appear in the corners and along the sides; then ‘grab’ a corner and drag to the desired size.

5.4 Graph Resizer


The logical scaling graph resizer works to “zoom in” on a desired portion of a well in a graph on your plot. It will automatically calculate a scale with friendly rounded numbers to resize your graph.



USING THE RESIZER TOOL

1. **Select your graph**  - A graph is selected when it has the eight handles on each corner and sides. The graph below is “selected.” To select a graph, click on the Edit Mode Tool on the left side of the screen, , and then click once or several distinct times on the graph. The handles should appear around the graph to signify that it is selected.



An object is “selected” when the box handles show up on each corner and sides.

NOTE: VIEW MODE TOGGLE- Depending on how many times you click on any object in the *Plot Maker*, the view mode will toggle. Double-clicking on a graph will select a single component of that graph, and may switch to a bare-bones grid view. If any other view modes are accidentally selected, reset the View Mode by clicking on the Edit Mode button just above the Hand Tool on the left side of the screen: . Then select the graph again by clicking on it once.

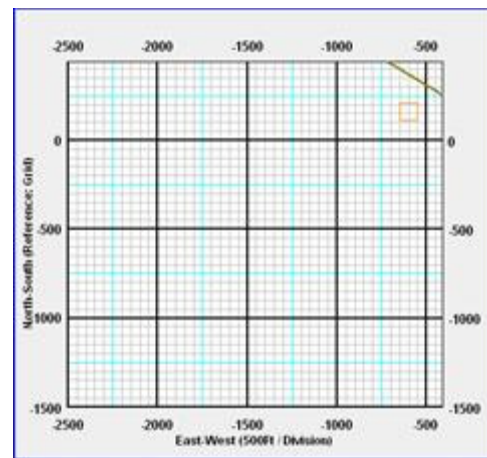
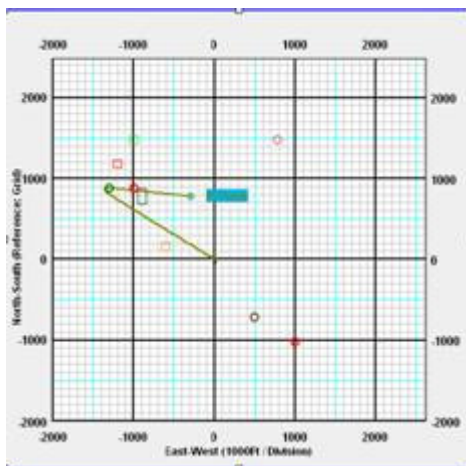
2. **Select the Resizer Tool**  - Once a graph is selected, click on the Resizer Tool  located on the left toolbar. This will change the appearance of the cursor



to the resize cursor, which looks just like the Resizer Tool icon except it is larger and has a red box frame behind it.

3. **Draw the Resize Box** – The resize cursor has a red box behind it that represents the area which will be enlarged on the graph. Bring the cursor over your graph and enlarge the red box by rolling the mouse wheel up. Roll the mouse button down to shrink the red box. It will automatically shape itself to the general orientation of the graph (either square or vertical rectangle).

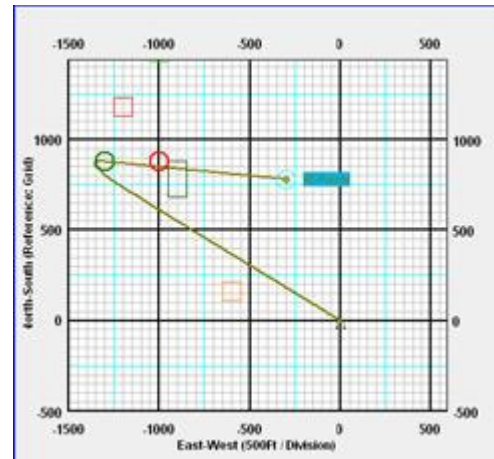
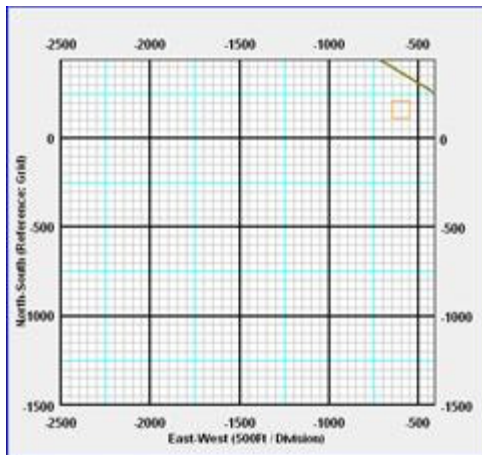
(NOTE: Be sure to roll up enough to where the box comes into view, as it will sometimes reset to its smallest size when you begin to resize it.)

To execute the zoom, position the red box over the portion of the curve you want enlarged, and click the right mouse button once. The graph will rescale itself to the dimensions of the red box, although your curve may not be centered. **Make the red box slightly smaller than the total area that you want enlarged.**




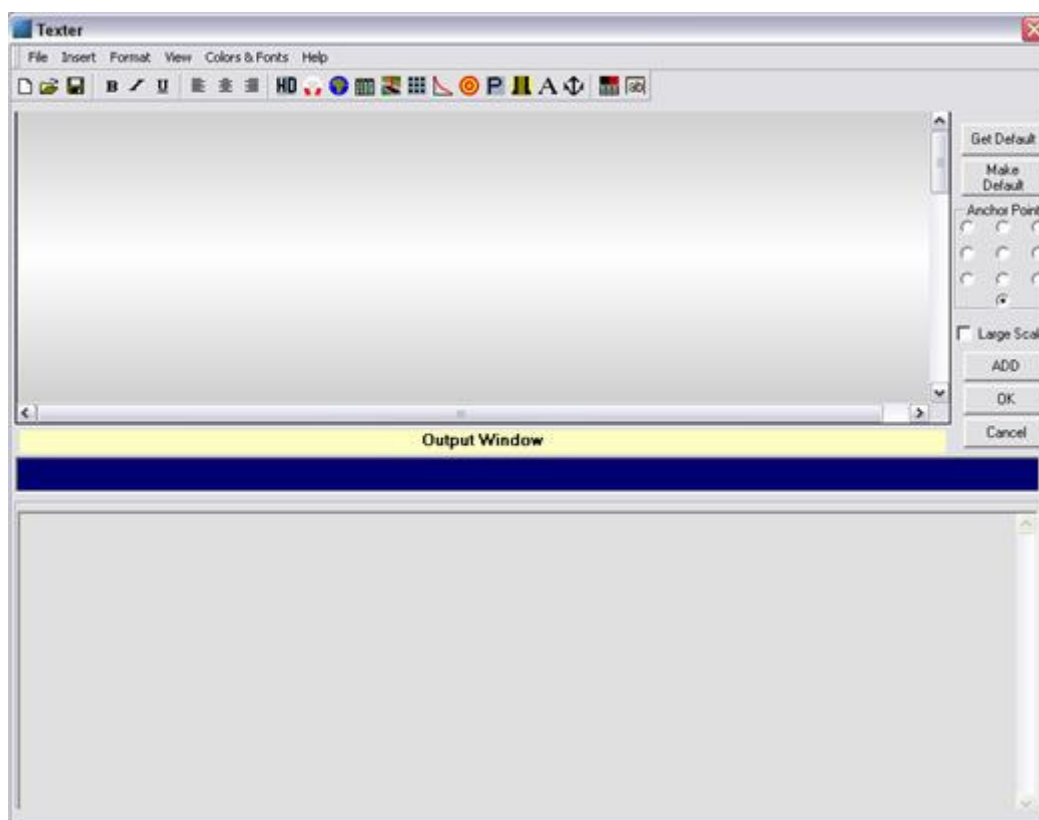
4. **Select the Hand Tool** -  To center the curve on your graph, make sure the graph is selected. (To select the graph, see Step 1) Then select the Hand Tool,  which will allow you to “slide” the graph around inside its outer edges to center the curve within. NOTE: The hand tool should automatically be selected after executing the resizer.
5. **Move the Graph View** – With the graph selected and the Hand Tool selected, left-click and hold on the visible portion of the curve and drag it to the center. You will not see a visual confirmation of what you have selected until you release the mouse button, but the curve will be placed where you release it. The screenshots below illustrate a Hand Tool adjustment where it was initiated in the upper right corner of the graph, dragged to and released in the center.

(NOTE: Once a move of the graph is made with the Hand Tool, a graph must be selected again and the Hand Tool again selected to make another adjustment)



5.5 The Texter

The *Texter* dialogue box is an integral part of the [Plot Maker](#), encompassing all the tools necessary for inserting information fields. To get to the Texter, click on the Texter icon  and this screen should appear (colors may vary depending on your default):



THE TWO TEXTER WINDOWS

The Texter is composed of two windows. The top window shows exactly what is to be added on the plot. The window below is a editing screen should you ever want to edit your data.

All data for any given information field is automatically filled in by the program, so the Texter is used to pull up info fields and place them. The bottom window's viewmode can be changed to either Grid or Text View by clicking on the options on the far right end of the toolbar or go to the View menu and select either Spreadsheet or Textbox.

.TXT File Options



Create a new text file








Open a text file in the Texter














Save current text to a .txt file. Can be edited with Notepad



Text Formatting

	Bold
	Italics
	Underline
	The three text justification tools: left, center and right
	Text color

Information Objects

	Make a Job Information Box
	Make a Magnetics Information Box
	Make a Geodetics Information Box
	Generate a Critical Points List
	Generate a Lithology List
	Generate a Slot List
	Generate a Survey List
	Generate a list of targets
	Critical Points Info Paragraph
	Add/Edit Casing information
	North Arrow. Corrections for Grid, True and Magnetic North

ViewMode Window Options

	Toggle bottom window to Grid/ Spreadsheet View
	Toggle bottom window to Text View

CUSTOMIZING YOUR INFO OBJECTS

All the information objects can be customized by color and gradient. There are two components to most of the information objects: the TEXT and the CAPTION/HEADER. Both are independently customizable.

TEXT COLORS

NOTE: There are two ways of accessing the Text Colors options array:

1. Go to the menu: Colors & Fonts → Text Colors

2. Double-click on the text box in the display window on top. If you want to change the header, you have to double-click or right-click on the sample header that separates the two windows or go Colors & Fonts→Caption Options

Fill style

Solid: Makes the background of the main text body a solid color that you select

Transparent: Make the background of the text transparent on the plot

Gradient: Creates a gradient effect with two customizable colors for the background

Text Forecolor: There are three ways to change the Text Forecolor, or color of the text:

1. Click on the Text Forecolor icon in the toolbar next to the text alignment tools
2. Double-click on the text box in the top window and select Text Forecolor
3. Colors & Fonts→Text Colors→Text Forecolor

Backcolor: Selects the background of the main text box. If gradient fill is chosen, then this color is one of two colors. The other would be the Text Gradient Color

Text Box Font: Selects the Text Box font. To change the Header font, see Caption Colors

Text Gradient Color: Selects the second gradient color. The first is the Backcolor.


CAPTION COLORS

All the options for the Caption Colors are identical to the Text Colors options. The “caption” refers to the header of the information object.

NOTE: There are two ways of accessing the Caption Colors options array:

1. Go to the menu: Colors & Fonts→Caption Colors
2. Right-click on the text box in the top window
3. Double-click on the sample header bar that separates the two windows in the Texter. All changes made to the header will be shown in this header bar

NOTE ON AUTO-FILLING

If the **Texter** does not create a job heading that has all the information filled out, you simply have to go into the main screen of the [Plot Maker](#) and click on the Job Info tool on top . Select your job here and then go back to the **Texter**. Now your information will automatically fill all fields.

ANCHOR POINT

You can anchor any info box that you create in the Texter to a certain part of your plot. To do this, just click on the sector of your plot that you want the currently displayed box to go...



and then click on the ADD button to place the box. The bottom button selected indicates that there is no anchor point, and this is the default.

LARGE SCALE

Click on the Large Scale box to make the info object that you are placing large in size. You can later scale the object down or make it even larger if you wish.

SETTING YOUR DEFAULT

It is easy to set a personal text schematic to default. Just select the various colors, fonts and alignments that you want, then click on the “Make Default” button. This will save whatever current schematic you have displayed as your default. To revert to this default if you have changed your schematic at all, just click the “Get Default” button and your saved preferences will automatically load.


5.6 Plot Maker Menus

The menu array at the top of the screen in the Plot Maker reflects all of the functions that can be found in the tool panels along the side and top of the screen and are textually self-explanatory.

5.7 Wellpath Lithology Profile

A Lithology table may be created and assigned to an individual wellpath by right-clicking on the wellpath and selecting ADD/MODIFY LITHOLOGY. The **Wellpath Lithology** Form shown below will pop up. Enter the descriptions, close the form and it will appear under the wellpath in the tree.

Wellpath Lithology				
Lithology for EXAMPLE-Proposal- SurveyID = 2823				
	Description	Name	Top	Bottom
✎	TOP SAND	SANDY TOP	800	888
	MIDDLE SAND	MID SAND	1400	1450
	DEEP LIMESTONE	DEEP LIME	3900	4000
*				

- A text table of the Lithology for the selected proposal wellpath may be included on the plot by clicking the Lithology icon at the left of the [Plot Maker](#) screen .


5.8 Casing Profiles

Casing Profiles may be created and attached to an individual wellpath by right-clicking on the wellpath and selecting SET UP CASING PROFILE. The **Casing Profile Form** shown below will pop up.

	Size	Weig	ID	OD	Top Depth	Set Depth	Comment
	20	94	19.124	21	0	200	SURFACE
	13 5/8	88	12.375	14.375	0	1000	INTERMEDIATE
	7	44	5.72	7.656	1000	2000	LINER
*							

1. Click on the arrow in the SIZE column and choose a casing size (with weight, ID and OD filled in automatically) from the look-up table. Enter the TOP DEPTH and SET DEPTH, and add a COMMENT if you want.

Notice that depths may be referenced to TVD, MD or SUBSEA by selecting the appropriate radio button at the upper right. A Proposal wellpath might be referenced by TVD for example, while a Survey wellpath may utilize actual measured set depths.

2. Enter the casing profile and close the form; it will now appear under the wellpath in the tree.
- If you are ready to plot your proposal and haven't entered a casing string yet, you can access the form directly from the *Plot Maker* by clicking the casing icon  at the top of the screen. This feature only applies to the Proposal wellpath selected in the main workspace prior to opening the Plot Maker.
 - For Survey wellpaths you must access the form through the tree and right-click menu.
 - 'Casing shoe' graphics will be placed on the plot for wellpaths with assigned profiles.

5.9 Plot Templates

Default Plot Templates

There are four plot templates that can be quickly loaded from the toolbar:

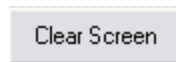


In the *Plot Maker* you will find these four default templates defined for 8½ inch (A4), Wall Size, Composite and Structure Plots. These can save time, giving you a head start by having standard items you will usually include already on the plot in the places you would usually place them. You can assign your own templates to these four buttons.

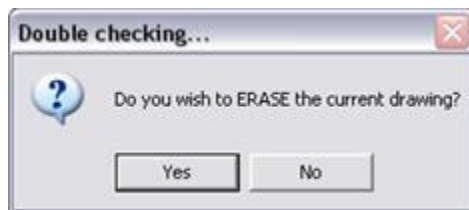
Make Your Own Plot Templates

The process of designing your own templates in the Plot Maker is simple. Follow these steps to see how, and design an unlimited number of personal plot templates that will have all the proposal information filled in automatically every time you load it.

1. Click the Clear Screen button on the right of the screen, thereby erasing whatever is there.

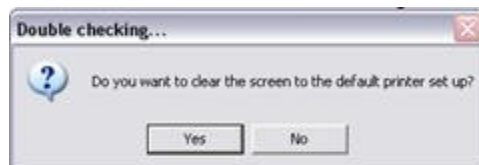


You will be prompted to confirm the screen purge.

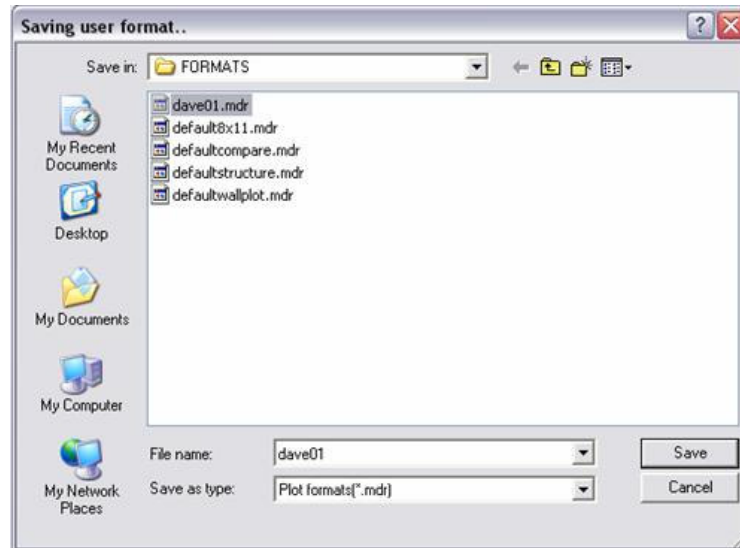


Click Yes.

Select your page orientation, Portrait or Landscape from the top right of the screen. The default is Portrait. If you want Landscape, then select the Landscape option in the box. You will be prompted again about if you want to ERASE the current drawing, then you will see this prompt:




Click yes to switch to Landscape orientation.



- **LOADING TEMPLATES:** Your templates can be loaded by going to File→New→From Template. When you open a template, all information from your currently selected proposal fills the fields automatically.
- **MISSING INFORMATION:** If the curve you are trying to plot does not have information that your template has boxes for (i.e. Casing Info, Lithology Info), then the Plot Maker will load your template with those spaces empty.
- **FILE FORMAT .MDR:** All templates are saved as .MDR (Meta Draw Resource). All plots and templates are saved in this format, therefore all plots can be used as templates in which new curve data can be substituted.

TIPS ON MAKING TEMPLATES

- **ASSIGN JOB INFO:** Make sure a job is associated with the curve you are trying to plot. This will save time when opening a template that has a header box. Job information can be assigned in the Plot Maker, but it is easier to assign the job to the curve in the [Database Manager](#) or [Survey Project Manager](#).
- **BRING IN COMMENTS:** When a graph's comments stick outside of its borders, it broadens the entire picture and is resized the next time you load. To avoid this unwanted resizing of graphs, before saving a template, do two things:
 - a) turn off all the comments through the tag editor 
 - b) and click ReDraw.
 Add curve comments AFTER a template is loaded.
- **AVOID LARGE OBJECTS:** Avoid putting the large objects into a template: Survey List and Critical Points Info Paragraph. Add these after a template is loaded.

5.10 Plot Printing

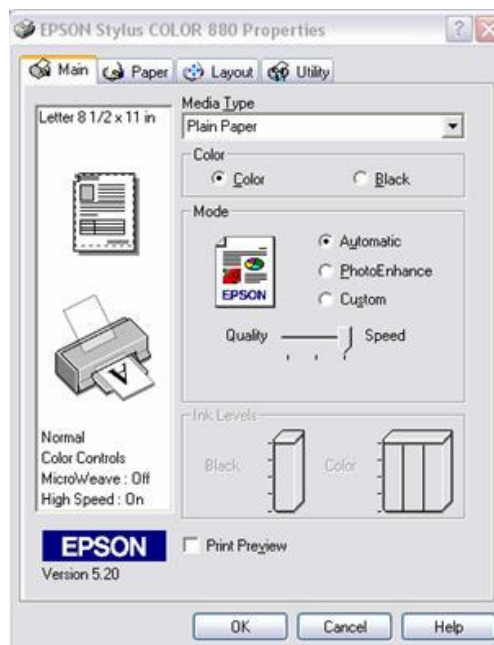
To print a plot, simply click the print button on the right side of the screen:



1. This will bring up the first of two printing prompts that will ask you to select your printer or plotter:



2. Once your printer is selected, click Print, and a printer-specific module will appear (Note: screenshot below differs from printer to printer.)




3. Select your printing parameters and then click OK. This will end the printing process, however you may have to close the Select Printer or Plotter prompt, as it may still be open.

6. 06 Targets

6.1 Opening the Target Editor


All targets are made with the [Target Editor](#), and there are several ways to access the editor. Once inside the editor, you can customize and manage your targets in great detail. Furthermore, the editor doubles as an “object editor” which can be used to model a variety of objects in your workspace.


Getting to the Target Editor:

- **Method 1:** In the [Database Manager](#), once you have a project open, right click on the word “-TARGETS-” in the database tree on the left and select “add/edit targets.” You may similarly right click on any targets you may already have made in this database to get to the “add/edit targets” option. 

- **Method 2:** In the [Survey Project Manager](#), without having to select any job or project, you can click on the large “Target” button at the bottom of the screen.



- **Method 3:** In the [3D Well Planning](#) mode or [3D Projections](#) mode, right click on any target and select the first option, which is “Edit Target.” If you do not have any targets yet, just click on the icon  at the top.

- **Method 4:** In the [Plot Maker](#) screen, click on the icon at the top 

- ☐ ☐ Note: In the [Target Editor](#), you will be able to edit and manage all targets, not just the specific target you may have selected to enter the Target Maker dialogue.
- Note: Another way of editing targets, although not as comprehensive, is to select a target in the [Database Manager](#) and unlock the Targets Info box that will appear in the dead center of the screen.

6.2 The Target Editor

The **Target Editor** will allow you to define all the parameters of your targets, including general information, shapes and coordinates. One distinct feature of WinSURV3D is that a broad definition of the term “target” is employed. The **Target Editor** allows for input of target objectives, target obstacles, lease line or hard line barriers and customized 3D objects that can be viewed in the 3D space. In other words, the ‘target’ editor encompasses more than the name implies, and can be used to model any object that you want to view in the 3D space.

Everyone in the industry is familiar with the concept of a schematic diagram. If, for example, you want to have a schematic representation of a BHA, you may put a picture of a bit in the diagram that is way out of proportion to its actual size. You do that so that you can see the bit and *where* it is, rather than how it *actually* looks.

That same schematic principle can be effectively employed with 3D modeling. For instance, say that you know that a fault lies at a certain depth, with a certain orientation and direction. Realistically, you are not interested in much more about the fault than the area you are going to be drilling through, or around, whichever the case may be.

With WinSURV3D, modeling the fault as a rectangular cube or ‘slab’ is very simple, and provides a very effective way of visualizing how it will relate to the well that you are planning and/or drilling.

Import Target List

Click on File (in the upper left corner) and go to Import Target List to bring in any target list to the **Target Editor**.

Target Visibility

The three target visibility options help you to define whether or not you want your targets to appear in the well planning interface. It does not affect the informational existence of the targets, only their graphical representation on the screen.

- **ALL Visible:** This makes all targets visible in the various interfaces where a target is graphically represented.
- **ALL Invisible:** This makes all targets that have any graphical representation NOT appear.
- **Default:** The default is that all targets are visible, but allows you to toggle visibility of individual targets.

General Target Data

The uppermost box in the Target Editor contains several groups of parameters. The first group is the reference for targets.

GENERAL TARGET DATA

Reference for Targets

☐ Field Reference
 ☒ Structure Reference
 ☐ Wellsite (Slot) Reference
 ☐ Target originally Referenced to True North

Description: TARGET #2
 Reference Description: 4.Vernon-User name
 Assigned Slot: [Green Button]

SHAPE: CYLINDER
 ☒ Visible
 EW Grid Ref: 34233
 NS Grid Ref: 0

Textures
 Target Color: 255
 Current Slot Easting:
 Current Slot Northing:

Point Target Shapes

Circle Diameter: 100
 Dip/Direction: 0
 Rotation: 0
 Dip / Inclination: 0
 Thickness: 5
 Direction Offset: 0
 Side A: 100
 Xoffset: 0
 Side B: 100
 Yoffset: 0

Coordinates

☐ Use Grid Coordinates
 ☒ Use LOCAL Coordinates (Reference to Structure)
 ☐ Use Lease Line Calls

Easting: 35433
 Local EW: 1200.00
 VS: 1389.24
 Northing: 700
 Local NS: 700.00
 @: 59.74 *

TARGET TVD: 7700
 ☐ Sub-Datum

- **Field Reference:** target is referenced to field geodetics parameters previously set
- **Structural Reference:** target is referenced by the structure to which it is associated
- **Wellsite (Slot) Reference:** target is referenced by its surface location
- **Target Originally Referenced to True North:** an on/off option that indicates that the local coordinates given for the target are referenced to True North
- The “**Description**” text field is simply where you type in an arbitrary name for the target.

- The “**Reference Description**” field is used to indicate your current wellsite reference. They remind you which Slot is the Structure Reference for the Structure associated with the Target; this is for information only and cannot be changed in the Target Editor.
- **Assigned Slot:** Used by the structural well planner when planning multiple wells with multiple slots simultaneously. The Assigned Slot indicates the optimal slot derived for any given user-defined projection. This slot number can be edited in the Structural Well planning module, found at the top of the Database Manager.
- **Shape:** This is a pull-down list of 14 shapes that define the target. Most of them are basic geometric shapes that are edited fully, but several shapes have limited parameters. See Special Shapes below.
- **Textures:** The image that is wrapped around the selected target.
- **Target color:** The color of the target. Defines the color of the texture selected.
- **EW Grid Ref:** Refers to the east-west coordinate based on the field grid that was previously defined for the project.
- **NS Grid Ref:** Refers to the north-south coordinate based on the field grid that was previously defined for the project.
- **Current Slot Easting:** Refers to the east-west coordinate based on a global grid system that is locally scaled.
- **Current Slot Northing:** Refers to the north-south coordinate based on a global grid system that is locally scaled.

Point Target Shapes

The middle box in the Target Editor contains all the text fields used for defining the orientation and dimensions of the target in 3D space. This applies to regular geometric shapes only. If you select a special shape (polygon, hard line or lease line), another set of parameter options appear. (See **Special Shapes** below.)

Point Target Shapes			
Circle Diameter:	100	Dip/Direction:	0
Rotation:	0	Dip / Inclination:	0
Thickness:	5	Direction Offset:	0
Side A:	100	Xoffset:	0
Side B:	100	Yoffset:	0

- **Circle Diameter:** refers to diameter of circular shaped targets
- **Rotation:** The position of a target having been turned along its long axis (0-360)
- **Thickness:** The vertical dimension of the target

- **Side A:** for rectangular targets, defines one of its two sides
- **Side B:** for rectangular targets, defines one of its two sides
- **Dip/Direction:** The direction that the target faces (0-360)
- **Dip/Inclination:** Number of degrees that the target is facing from 0
 - **Direction Offset:** how far off the target is shown as shifted along the plane of its direction. Negative values move it backwards.
- **XOffset:** how far off the target is shown on the X-axis from its defined location
- **YOffset:** how far off the target is shown on the Y-axis from its defined location

Coordinates

These fields at the bottom are used to define the absolute location of your targets, either by grid reference, local reference or lease line calls

Use Grid Coordinates

- **Easting:** The east-west coordinate based on the user-defined grid system
- **Northing:** The north-south coordinate based on the user-defined grid system

Note: A button labeled “GEO” appears when “Use Grid Coordinates” is selected. This button leads to the **Field Definition Form**, the geodetic tool used to calibrate geodetic grid positioning.

The screenshot shows a form titled "Coordinates" with three radio button options: "Use Grid Coordinates", "Use LOCAL Coordinates (Reference to Structure)" (which is selected), and "Use Lease Line Calls". Below these are input fields for "Easting:" (35433), "Local EW:" (1200.00), "Northing:" (700), "Local NS:" (700.00), "VS:" (1389.24), and "@:" (59.74). There is also a "DMS" button and a "Sub-Datum" checkbox. At the bottom, there is a "TARGET TVD" field with the value 7700.

Use Local Coordinates (Reference to Structure)

- **Local NS:** The north-south coordinate value referenced by the structure location
- **Local EW:** The east-west coordinate value referenced by the structure location
- **TARGET TVD:** Define the Total Vertical Depth of the target
- **VS/@:** Vertical Section—the physical distance along the Vertical Section Plane
- **Sub-Datum checkbox:** indicates whether the TVD is referenced to include RKB and elevation
- **DMS: Degrees/Minutes/Seconds-** describes the target in terms of degrees, minutes and seconds instead of decimal if using direction to define the target

Lease Line Calls

Use the given lease lines as references to define the location of targets.

- **FEL/-FWL:** Feet from East Line/ Feet from West Line
- **FNL/-FSL:** Feet from North Line/ Feet from South Line
 - **radio buttons:** indicate from which corner the target is referencing

Special Shapes

POLYGONS, LEASE LINES, HARD LINES and FAULTS: If you should choose your target's shape to be either polygon, lease line, hard line or fault, a different set of parameters comes up:

OR	X Point	Y Point	Direction	Distance	EASTING	NORTHING
	*	*				

- **Wall Thickness:** The dimensional value of the thinnest part of a plane
- **Wall Height:** The vertical dimensional value of a plane
 - **Central TVD:** refers to the TVD of a polygonal target, or the center of the plane representing the lease line, hard line or fault

Whether coordinates or direction and distance are given, this tool can calculate the values needed for target location.

- **Coordinates:** Select this option to define the target location by coordinates
 - **Direction-Distance:** When selected, the field appears to enter the DMS and a separate “calc” button appears
- **MMS: (see above)**
 - **Use Grid Coordinates/Use Local Coordinates:** Reference the target by the grid used for the project or local coordinates as provided

Special Shapes

FORMATIONS and PLANES

Point Target Shapes			
Circle Diameter:	100	Dip/Direction:	0
Rotation:	0	Dip / Inclination:	0
Thickness:	5	Direction Offset:	0
Side A:	100	Xoffset:	0
Side B:	100	Yoffset:	0

Generate Formation File

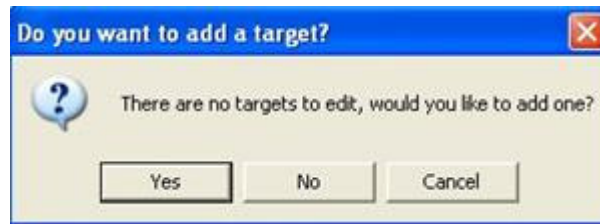
Formations will have no coordinate parameters to fill out. They will only have **General Target Data** and **Point Target Shapes** fields available.

Planes will have similar parameter limitations as the Formations options just mentioned, except a text field will be available to specify **RKBTVD**.

6.3 Creating a Target

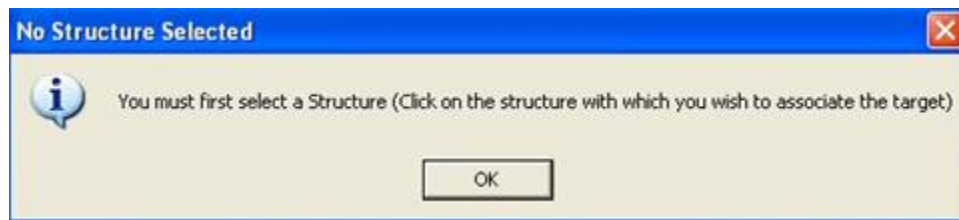
The first point to emphasize about targets is that they are associated with the structure level of the database hierarchy. This can be seen visually when you look at the tree and notice that targets are placed at the same level as slots, below the structure.

The first time you access the [Target Editor](#) to Add or Edit a target, the following message will appear:



In the case of a project with only one structure, clicking YES creates a 'blank' target and you are ready to proceed.

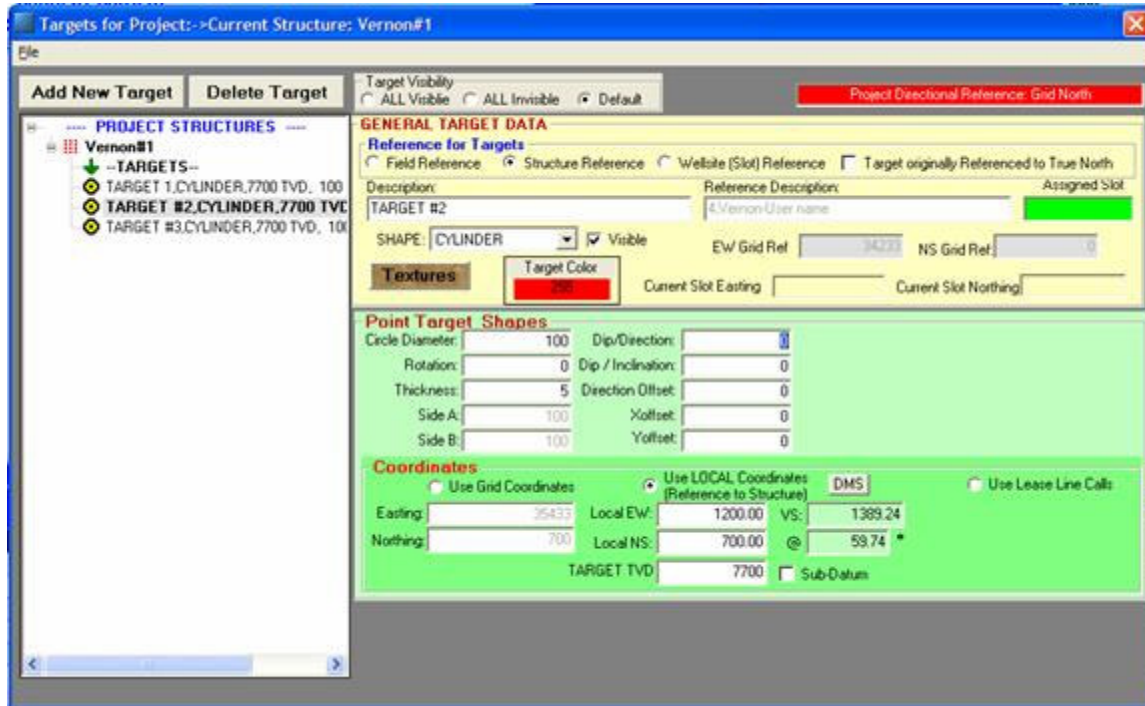
However, if a project contains more than one structure, the program needs to know to which of the structures your new target should be assigned, and reminds you with the following message:



Click OK; select the structure, and then click: **Add New Target**

A 'blank' target is created under the selected structure and you are ready to define the parameters, filling in the appropriate boxes depending on the type of target. Certain default values exist to speed the process, and non-relevant items are dimmed.

6.4 Managing Targets



In the [Target Editor](#) on the left is the database window used for managing targets.

Add Target: This will instantaneously add a target ready for its parameters to be filled.

See [Target Editor](#).

Delete Target: Select a target and click this to delete it.

ORGANIZATION: The topmost tier in the tree is the –PROJECT STRUCTURES– menu. This opens up into all the structures containing targets. Below each structure is the list of targets made within that structure.

SELECTING TARGETS: By either right-clicking or left clicking on any of these targets in the list, the relevant data pops up on the right-hand half of the Target Editor and can be directly edited from there.

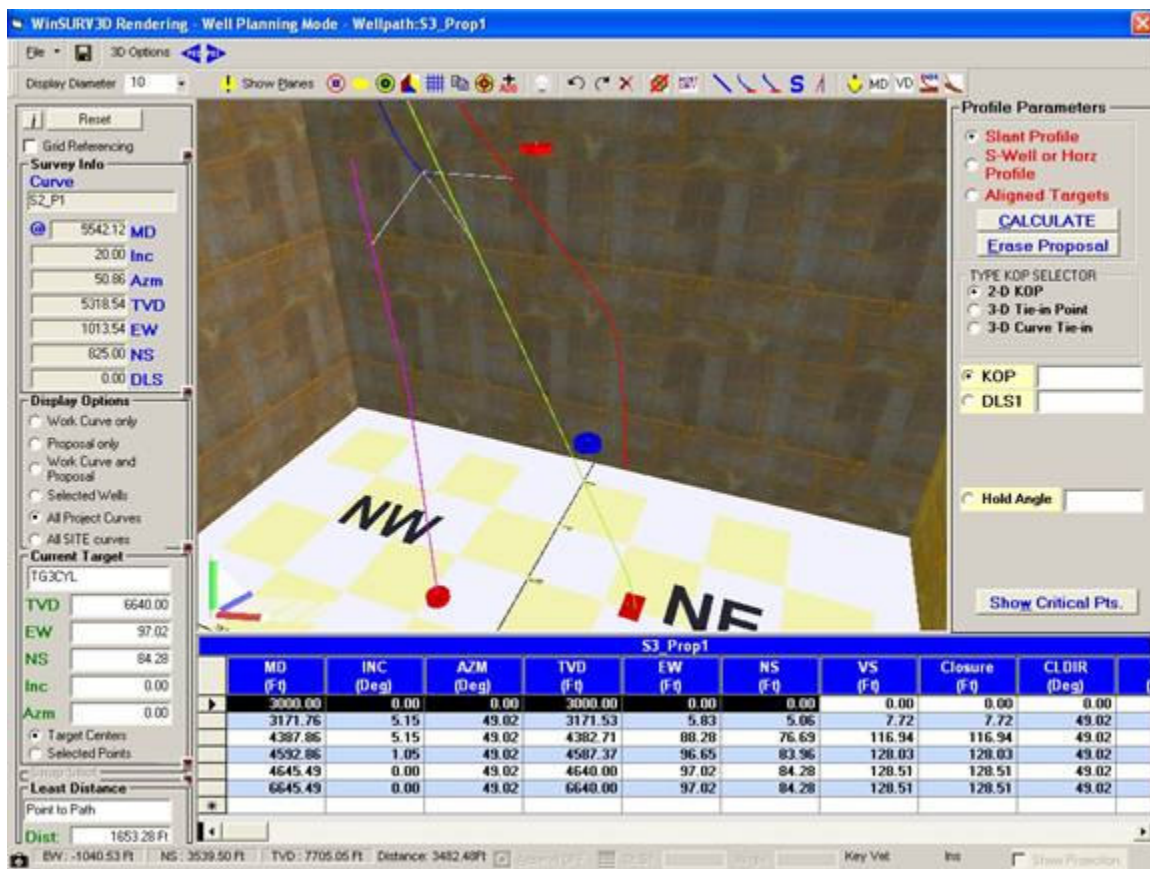
SAVING TARGETS: Changes are automatically saved when the [Target Editor](#) is closed. The two ways to close the editor are by clicking the close box on the top right or going File→Close.

7. 07 3D Well Planning

7.1 The 3D Well Planning Mode

The WinSury3D **Well Planning Mode** allows you to view *and edit* boreholes and targets in a three-dimensional environment. The 3D mode empowers you to successfully design virtually any style of well plan, including complex proposals incorporating vectored (or aligned) targets by means of sequential combinations of these various methods. Extensive data displays show survey info, target info, well information and critical points.

STARTING 3D Well Planning Mode- Once a proposal is selected in the **Project Manager** screen, the 3D button at the bottom will activate and allow you to enter either the 3D Well Planning Mode or the 3D Projection Mode. Click on the button to start.



3D Well Planning Mode main screen

3D Well Planning INTERFACE

Main Menu



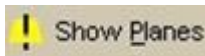
Save the current proposal to the database.



"Point Of Interest". Clicking on these arrows will advance the 3D Camera View along a path parallel to the selected curve in the 3D space.



Change the **display diameter** of each curve. If project is in feet then the diameters vary from 1 to 25. If in Meters, the diameters vary from .3 to 10. For feet, if the diameter is less than or equal to 2, the curves will be displayed in a wireline mode. For Meters, if the diameter is less than 1 the curves will be displayed in a wireline mode. The advantage to using wireline mode is that the curves can always been seen regardless of how far away you are.



Show Planes will toggle the orthogonal planes at each survey point along a wellpath.



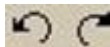
Place Cylinder of specified diameter around the selected proposal curve. When used in combination with the ellipses of uncertainty, it can provide a quick visualization to determine collision potential as you design your wellpath.



Select the properties of the **Ellipses** of uncertainty to be assigned to the curves.



This will show a **spreadsheet** of properties for each curve.

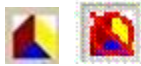


Undo last projection. **Redo** last projection

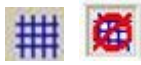


Delete entire (current Primary) Proposal

VIEW TOOLS- The display of walls and/or grid lines helps provide a sense of depth perspective.



Toggles **textured walls** which surround the 3D space



Toggles the **grid** which surrounds the 3D space



Adjust the overall **brightness** of the screen



Slot / Target switch mode



Add a **new proposal**, or sidetrack



Proposal History. This history button will show a dynamic spreadsheet that allows the user to adjust complex well profiles without redoing each component.



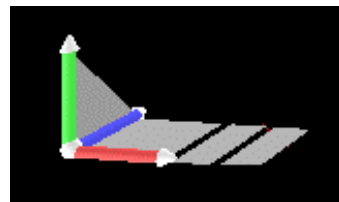
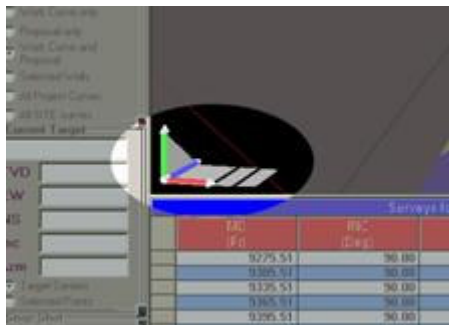
Target Editor. Add or Edit target locations, dimensions, shape, color and 3D texture.



Select a target for projection, without target editing capability.

NAVIGATION HANDLES

The navigation handles array at the bottom left corner of the 3D window is the primary tool for navigating through 3D space with a mouse.



To use the navigation handles, just left-click on any of the three colored bars, which represent three axes of space, hold and drag back and forth. To set your desired pivot point, right click on the target or well that you want to pivot on, and select “Set Camera Pivot Point.”

7.2 3D Projection Tools - Profiles

PROFILE PARAMETERS- Profiles are used to design standard well profiles. There are three profiles available at the top of the right panel in the **3D Well Planning Mode**: Slant, S-well or Horizontal, and Aligned Targets. Click the button for the desired profile, and the bottom of the panel changes to reflect the appropriate choice of parameters. Click the button for the parameter that you want to solve for, fill in the values to use for the remaining variables, and press Calculate.

TYPE KOP SELECTOR- These tools are only used when you are “starting from the top”. A simple well may be designed by merely calculating a profile to hit a target; more complex wellpaths can be achieved by adding sequences of projections together (or by continuing a profile by adding such projections).

SOLVE FOR SECTION- In the mid-panel are options for the type of kick off you are dealing with. A 2-D KOP is the simplest and most common: your profile begins from a point directly below the rig, the “0,0” coordinate case where the depth of KOP is the only concern. The 3-D Tie-In Point means you have a departure, perhaps some “drift” from the vertical, some section established – i.e., non-zero X, Y coordinates.

TYPE KOP SELECTOR (for 'Slant Profiles' and 'S-Well or Horizontal Profiles')

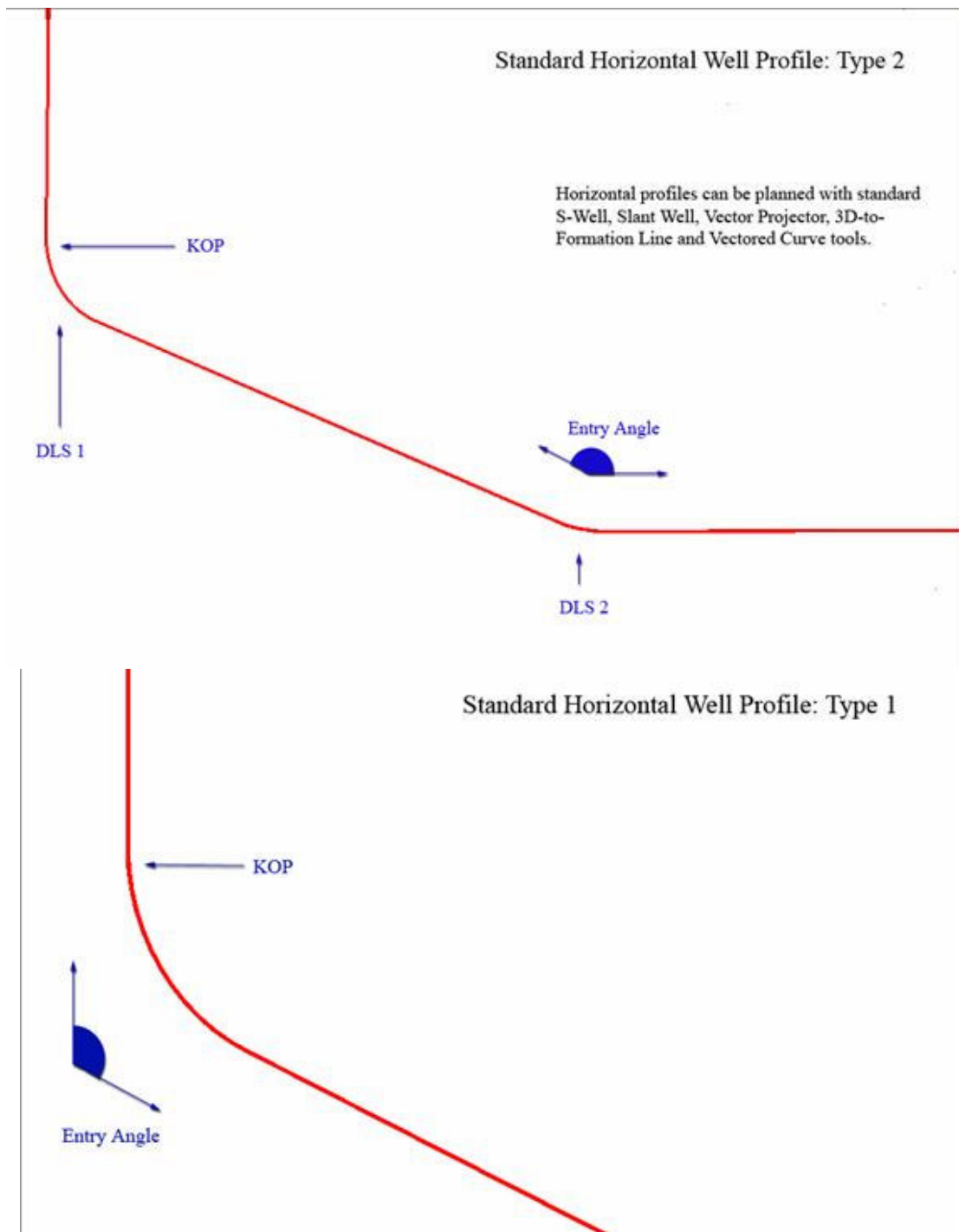
1. **2-D KOP -** The simplest of the tie-in types is the 2D KOP. This KOP always is centered at 0,0.
2. **3-D Tie-in Point-** This is really a 3D projection. If this button is selected then when the proposal is recalculated, the tie-in point at the first survey is NOT erased. It is recommend that instead of using this option, use the Slant well projection method.
3. **3-D Curve Tie-in-** This is useful for planning a slant well from an existing well path. This tie-in type requires you to select the well path from which you want to do a kickoff. Suppose a user wanted to find the perfect point from which to sidetrack from an existing well path to a target with a given DLS and a predetermined hold angle. The user will be required to select the well path from which they desire to side track by clicking on it in the 3D space. After that they will have to input a DLS and a Hold angle, and then press CALCULATE. If the program cannot find a solution, it will say so.

SLANT PROFILE

Selecting the Slant profile will expose a KOP, DLS and Hold angle input. Also activated is the TYPE KOP SELECTOR.

S-WELL or HORIZONTAL PROFILE

Selecting the S-Well or Horz Profile will activate a field for KOP, two DLS values, an entry angle and a Hold Angle, as well as Tangent and Post Hold. Select the field that you want solved for and enter your data into the unselected fields. The TYPE KOP SELECTOR is also activated with this profile.



ALIGNED TARGETS PROFILE

The aligned Targets profile has the inputs shown below. This profile method is designed to solve a very particular type of profile. Namely, the situation in which it is desired to

kick off a well and build out to a point in space where a constant inclination turn is executed so as to line the first target up with the second target. With this tool the user can specify the Tangent length and the 'Post Hold' length in addition to the Build DLS and the turn DLS.

The image shows two overlapping software windows. The 'Profile Alignment Parameters' window on the left contains input fields for 'DLS 1', 'DLS 2', 'INCL', and 'AZM', each with a yellow label. To the right of these are 'Tangent' and 'Post Hold' fields, also with yellow labels. A 'HIDE BOX' button is at the top right, and an 'Align to Next Target' button is at the bottom. The 'Profile Parameters' window on the right has radio buttons for 'Slant Profile', 'S-Well or Horz Profile', and 'Aligned Targets' (which is selected). Below these are 'CALCULATE' and 'Erase Proposal' buttons. A 'TYPE KOP SELECTOR' section includes radio buttons for '2-D KOP' (selected), '3-D Tie-in Point', and '3-D Curve Tie-in'. At the bottom is a 'KOP' label and an empty input field.

7.3 3D Projection Tools - Projections

What are the manual projections and how do they differ from profiles?

A 3D projection is any technique that can be used to project ahead from any point and orientation in space. Some projections require a target point, others do not. They are different from the Profile tools, because the Profile tools are not designed to be used from any point in space. Those tools must always begin at 0,0,0 (0 TVD, 0 EW and 0 NS).

PROJECTION TOOLS- The following icons represent various projection tools to specified targets. The buttons are dimmed and inactive until a target is selected. Further below is a detailed description of each.



Straight Line Projection to selected target



Minimum Curvature Projection



Slant Well Projection



S-Well Projection



S-Well Vector Projection. This allows the planner to create a 3D projection to a given inclination and azimuth at a target point. It is a powerful tool for planning wells to dipping formations. Automatically determines strike angle.



Classic "Ouija Board" Projection



Measured Depth Projection



True Vertical Depth Projection



"Needed Build Rate". Calculate the required build rate to reach a selected TVD or formation plane




Needed Build Rate to a Dipping Formation. Create a dipping formation target and plan a well to land on it at any inclination and direction in one step. Automatically determines strike angle.

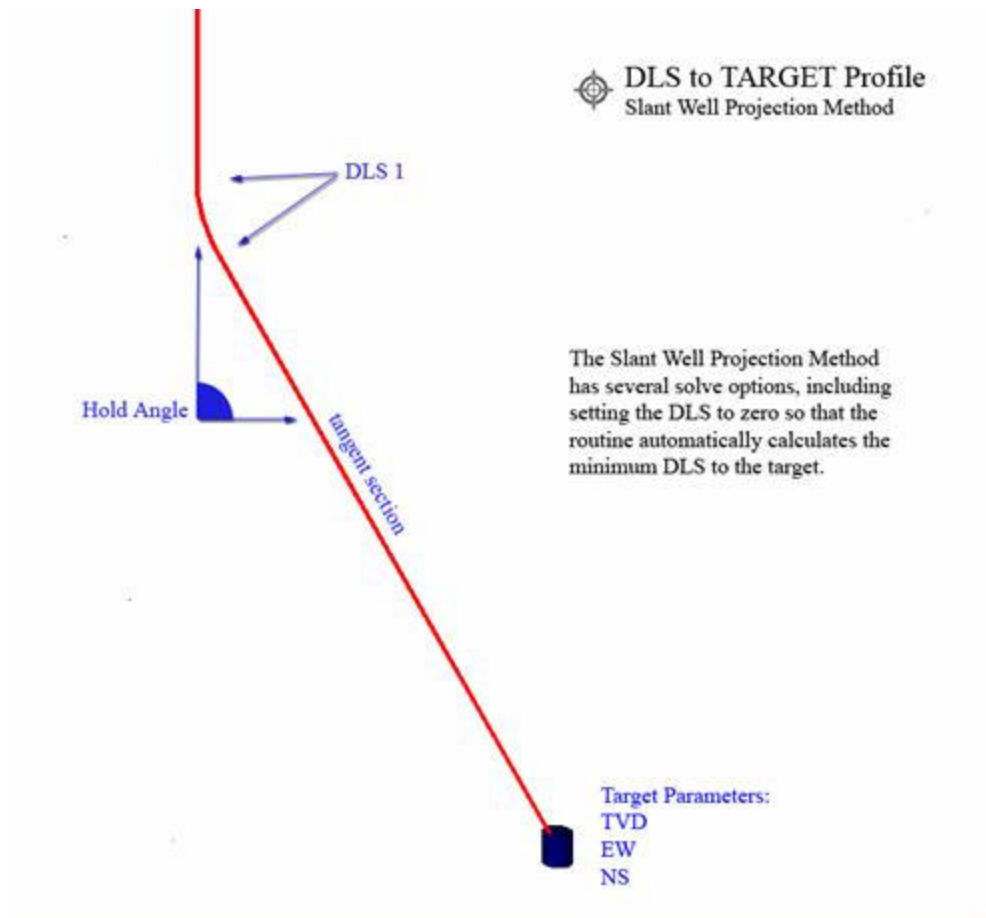



STRAIGHT LINE PROJECTION- Projects a straight line from the last point on the current proposal, using the last known inclination and azimuth as the basis for its trajectory. Straight line projections are often used in conjunction with the S-Well Vector Projection, which can reach the first of two targets at an angle that will require only a straight line to connect to the second.

 **MINIMUM CURVATURE PROJECTION-** This automatically calculates the minimum amount of curvature to connect to a target from the end of a current projection.

 **SLANT WELL PROJECTION-** The Slant well projection is also known as a DLS projection or a J-projection. It is a target-oriented projection. This is perhaps the most commonly used correction. It is made up of two parts. Part One is the build section. This parameter is measured in DLS units. The second section of this projection is the straightline-to-target projection.

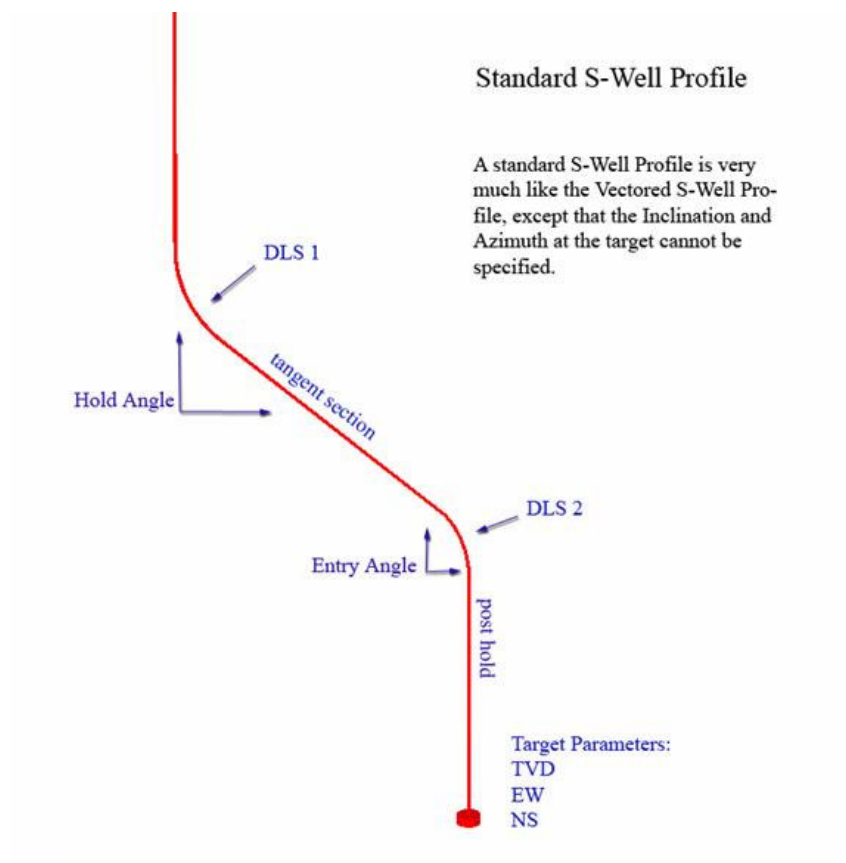
Depending upon the mode that is used, you can solve for the hold angle (the inclination of the tangent section), or you can solve for the DLS. If you input a DLS that is too low, i.e. you can't get there with such a low turn rate, the program will automatically solve for the minimum DLS. As such, you should always double check to see that the program is actually calculating what you expect.



 **S-WELL PROJECTION-** An extremely useful projection, which, like the Slant Well projection is a target-oriented projection. It is also a projection that

can begin from any point and orientation. In the simplest mode of usage, you input DLS1, DLS2 and entry angle, and solve for hold angle. The program will then calculate the length of the tangent. You can also input a Post Hold, which is to say the amount of distance you want to reach the entry angle before you get to the target.

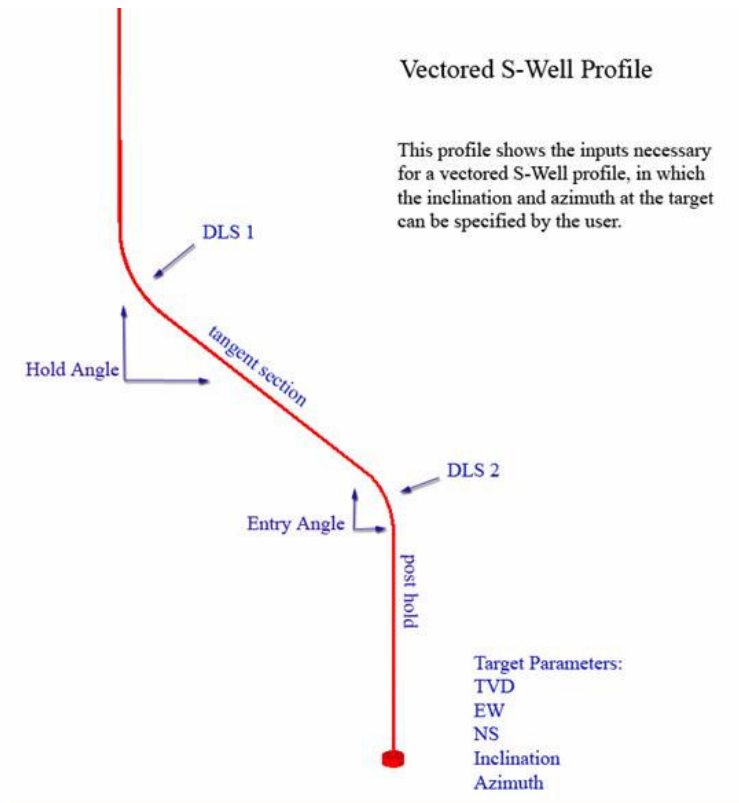
In this mode you solve for the Hold Angle by filling in the other fields.



S-WELL VECTOR PROJECTION- This is the most powerful target-oriented projection tool in the kit. It can be used in several ways: to project a path to get back on track, or it can be used to plan an approach to a specific landing point in a horizontal well. The dialog is designed to make it easy for the user to plan a path to Target 1 such that it is aligned with Target 2. Click [here](#) for an illustrated example.

The yellow arrows in the module allow for quickly selecting the appropriate target. The upper two yellow buttons are use for selecting the first target, and the second two for the second target. Each time a target is selected, the Inc @ Target and Azm @ Target are calculated. If you know what inclination and azimuth you want, just select the first target and input the desired Inc and Azm, along with the DLS1 and DLS2 values.

Enter your desired Inc and Azm @ Target as well as your two DLS values



Setting up to do a Vector Projection

Step 1

First choose the target you want to shoot at from the Target Selector box. When you choose the target you will see the Target Inc and Target Azm text boxes to the lower left reflect the values for that target. These are the values that you either entered or were calculated for you when you input your targets. If they are what you want to have at the target, leave them alone, but if you want to adjust them you can do that here.

Step 2

Now type in the desired values for the upper dog leg and the lower Dog leg under DLS1 and DLS2. These are the initial values that the program will attempt to use. If there is not a solution with this method then the one or both of the DLS's will be iterated depending upon the solve option you have selected in Step 3.

Step 3

There are four solve options. Really, there are five, the fifth being that the desired dog legs that you want to have render an immediate solution. The other options are variations on how the solver iterates the DLS's when searching for a solution. The four options are:

- LOCK DLS1 - This keeps the value of DLS1 at the value you input and iterates DLS2.

- LOCK DLS2 - This keeps the value of DLS2 at the value you input and iterates DLS1.
- MAKE = - This iterates DLS1 and DLS2 at the same time and makes them equal at all times.
- NO LOCKS- Lets the solver iterate the DLS that failed the last test and keep the other one the same.

Step 4

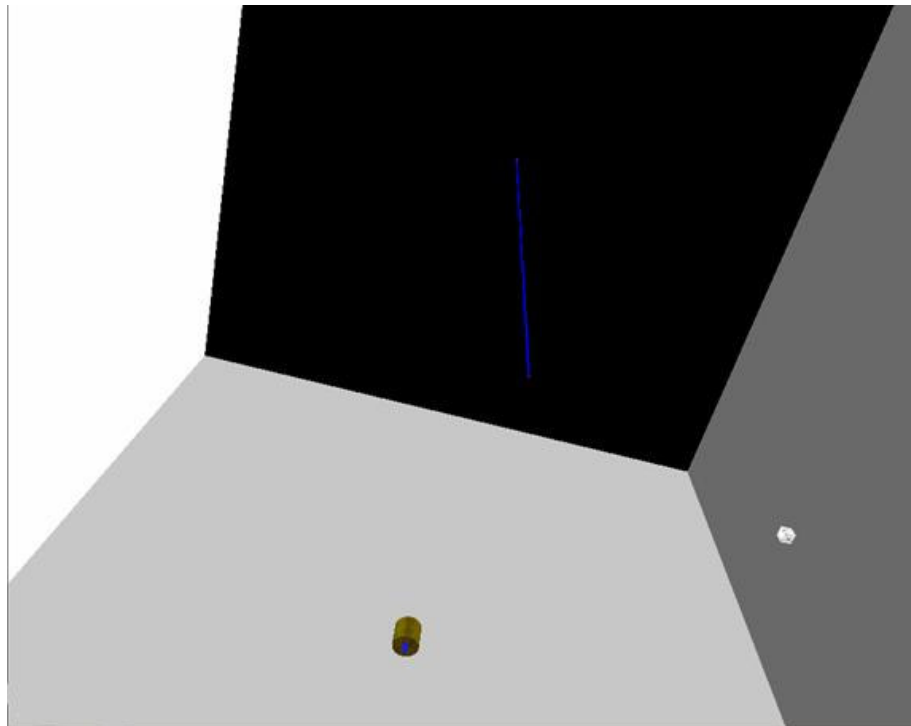
Check your bail out value. The bail out value defaults to 40. If you anticipate higher dog legs than 40 then change the bailout value. Coiled tubing directional drilling, for example, works with dog legs well in excess of 100.

Step 5

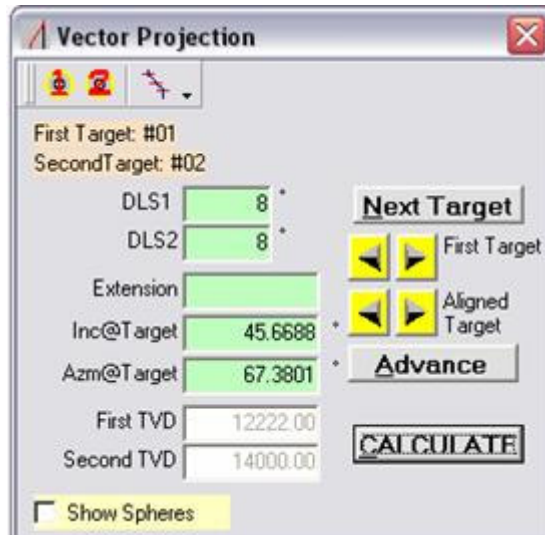
Press CALCULATE

NOTE: The vector projector does not give an absolutely optimum solution all of the time. It is a *powerful* tool, but it is not always the perfect tool.

Illustrated Example of a Vector Projection




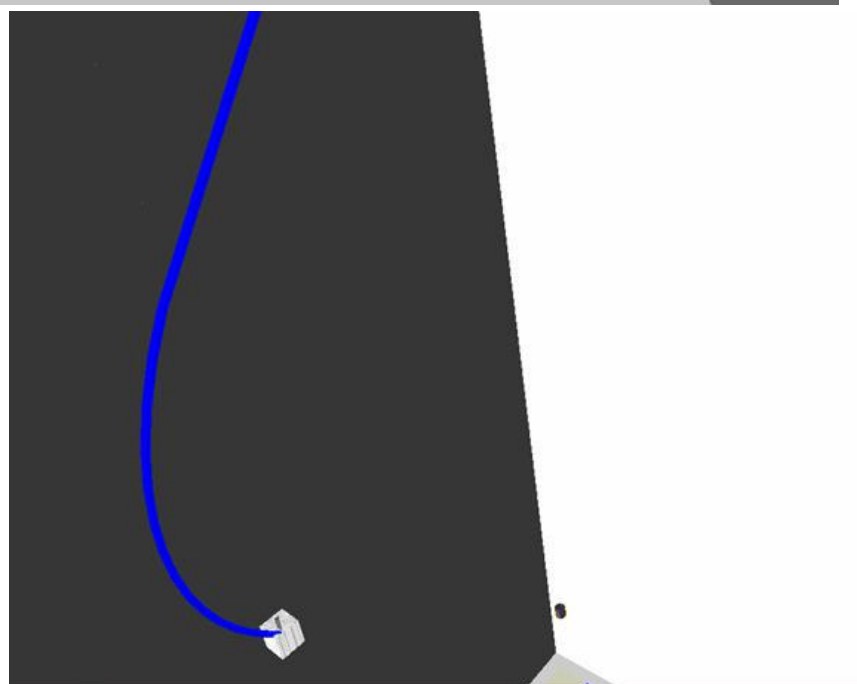
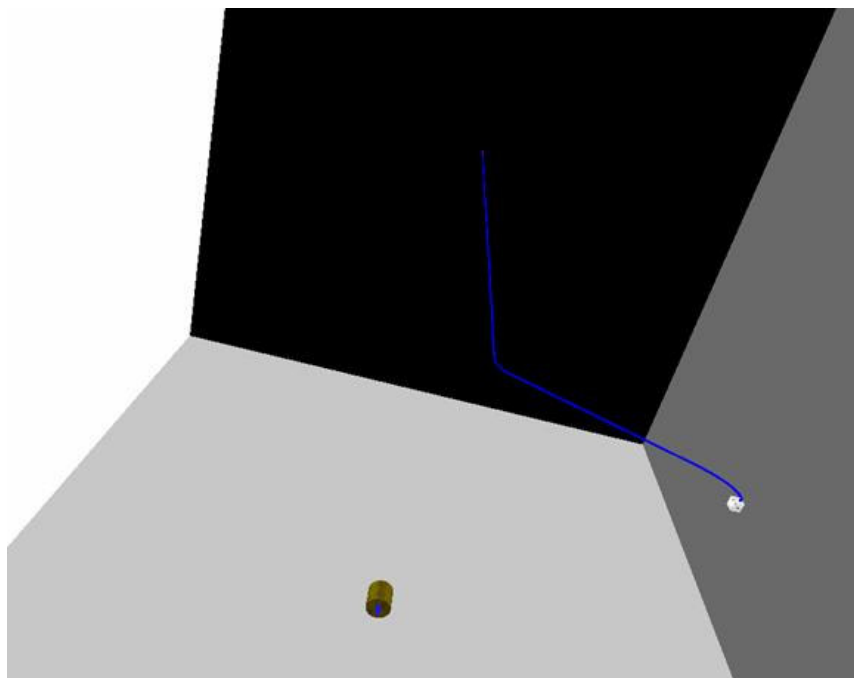
1) This view is from the bottom up of a well that has been drilled straight down to a depth of 9500 feet. There are two targets for it to hit. Target 1, the white box, and Target 2, the brown cylinder, are the desired targets.



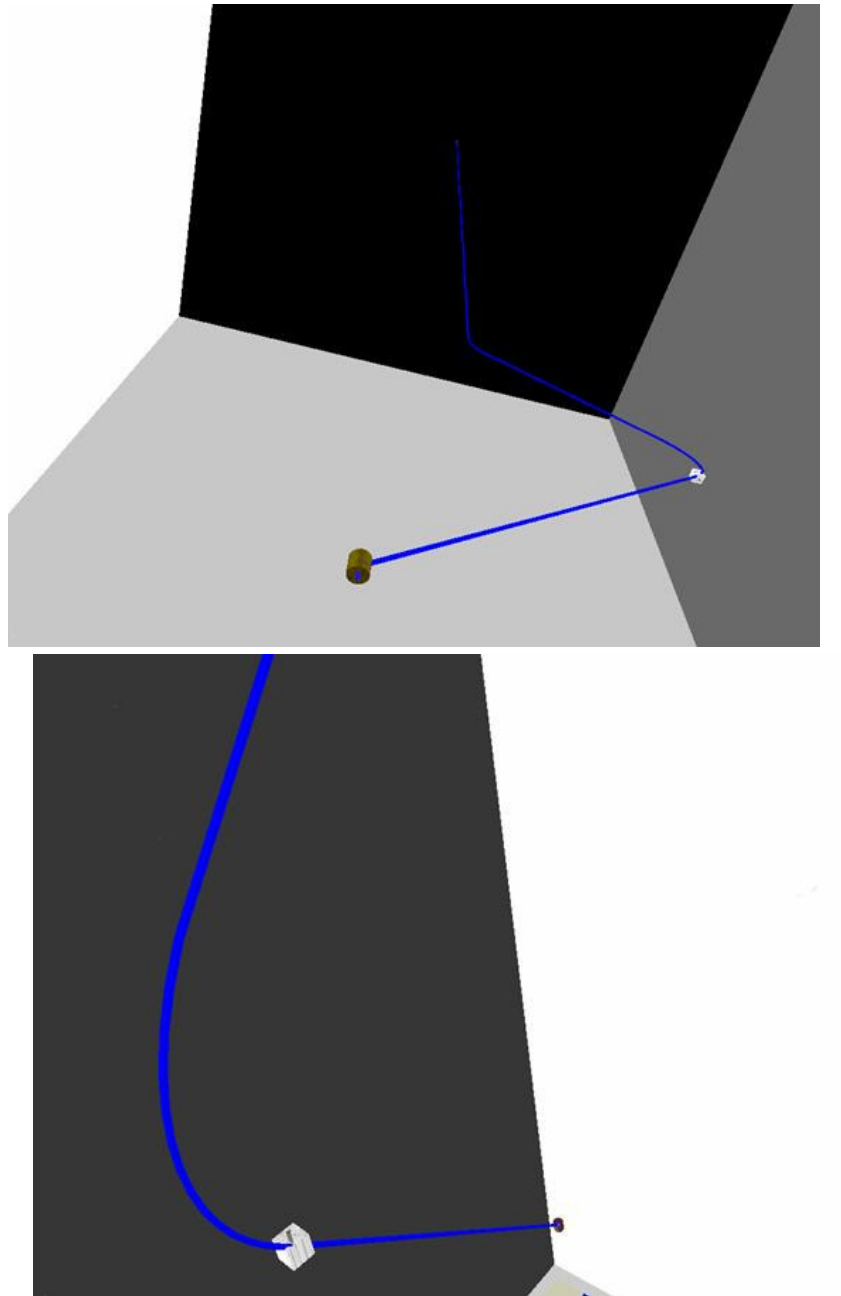
The image shows a software dialog box titled "Vector Projection". It contains several input fields and buttons. At the top, there are three small icons: a target, a sphere, and a vector. Below these, the text "First Target: #01" and "Second Target: #02" is displayed. The main section has input fields for "DLS1" (value 8), "DLS2" (value 8), "Extension" (empty), "Inc@Target" (value 45.6688), "Azm@Target" (value 67.3801), "First TVD" (value 12222.00), and "Second TVD" (value 14000.00). To the right of these fields are buttons: "Next Target", "First Target" (with a yellow arrow icon), "Aligned Target" (with a yellow arrow icon), "Advance", and a large "CALCULATE" button. At the bottom left, there is a checkbox labeled "Show Spheres".


Field	Value
First Target	#01
Second Target	#02
DLS1	8
DLS2	8
Extension	
Inc@Target	45.6688
Azm@Target	67.3801
First TVD	12222.00
Second TVD	14000.00


2) By clicking on the first target, the white box, and then clicking the Vector Projection tool icon, , this dialogue appears. We want to solve for Inclination and Azimuth at Target, knowing what DLS values we want to use, so we select our two targets with the yellow arrows and enter a DLS value of 8 for both Dog Leg Severity fields. Then we click CALCULATE.



3) The work of doing this S-Well is essentially over, as the curve has been calculated to line up **THROUGH** the first target to hit the second target with the DLS values that we input. But there is one more step.



4) To actually make the curve complete, we just click on Target 2, then click the straightline projection tool at the top of the screen  and a straight hold section will strike the anticipated target. The target is struck at an inclination of 45.67 and an azimuth of 67.38, as per the vector projection dialogue.


 **QUIJI BOARD PROJECTION-** Select a Solve Option and enter the parameters as required. This method is referred to as an 'open target' projection since rather

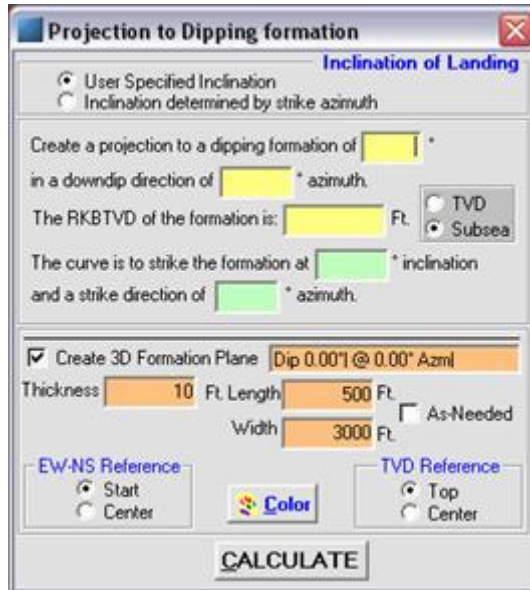
than specifying the target, you establish DLS and toolface orientation criteria and see where it takes you.

MD MEASURED DEPTH PROJECTION- Enter the TOTAL MD to project to and have the delta MD calculated, or enter an additional measured depth in the ADDED MD box and have the TOTAL MD calculated.


VD TRUE VERTICAL DEPTH PROJECTION- This works just like the measured depth, except that you are working with TVD instead MD. At the bottom of the Parameters Frame is a Pick List displaying the TVD's of all assigned targets by number. Select a target and the TVD will be displayed in the TOTAL TVD text box.

NEEDED BUILD RATE- Calculates the required build rate to reach a selected TVD or formation plane by using the Ouija Board Interface, as seen under “Ouija Board Projection.”

 **NEEDED BUILD RATE to a dipping formation-** The Projection to Dipping formation dialogue allows you to both create a 3D formation plane and a projection to reach it at a specified strike angle. This is an extremely useful tool for planning horizontal wells to dipping formations. It can automatically create the target object for you. It will also calculate the strike inclination



The dialog box is titled "Projection to Dipping formation". It contains the following fields and options:

- Inclination of Landing:**
 - ☒ User Specified Inclination
 - ☐ Inclination determined by strike azimuth
- Create a projection to a dipping formation of °
- in a downdip direction of ° azimuth.
- The RKBTV D of the formation is: Ft. ☐ TVD ☒ Subsea
- The curve is to strike the formation at ° inclination and a strike direction of ° azimuth.
- ☒ Create 3D Formation Plane Dip 0.00° @ 0.00° Azml
- Thickness: 10 Ft. Length: 500 Ft. ☐ As-Needed
- Width: 3000 Ft.
- EW-NS Reference:**
 - ☒ Start
 - ☐ Center
- Color:** 
- TVD Reference:**
 - ☒ Top
 - ☐ Center
- CALCULATE** button

FOOTER



The footer is mostly associated with displaying information, and will be discussed in more detail. Click the Camera icon to pop up a menu that allows the user to save the current 3D view that is displayed on the screen. The user can save as many snapshots as they want, and place them anywhere in the plot they create using the plot planner.

7.4 3D Well Planner Info Panels


LEFT INFO PANEL

COLLAPSABILITY- Shown directly below are the three default information panels visible to the left of the screen. Each panel may be collapsed or expanded by clicking on the arrow at the upper right corner of the panel.

Reset button will change the camera view to a “bird’s eye view” from just below the rig site

Grid Referencing shows the grid values instead of the wellsite-referenced values at the footer of the screen

Survey Info- This area dynamically displays the Curve name and the interpolated survey point data for the curve that the cursor is currently over in the 3D space. If the cursor is over an ellipse, then this box changes to display Ellipse information.

Display Options- Define a subset of Project wellpaths to display in the 3D space by clicking the appropriate radio button to choose which curves you want to see. Work Curve and Proposal refer to those curves as they are currently selected on the work screen. To select specific individual curves, click the Curve Properties icon  .

Current Target- Information for the currently selected target. By holding the mouse over the TVD box, either the TVD or the subsea depth will be displayed.

Target Centers- Displays information of the center of the target

Selected Points- Displays information on the selected point found within the target.





Shown below are the two remaining panels expanded to display a captured Snapshot of the 3D space, and Least Distance information.

Snap Shot- The last Snapshot taken (by clicking the Camera icon in the lower left corner) is shown as a thumbnail in this panel for your reference.

Least Distance. No information will be displayed in this panel until a least distance calculation is made. The information presented is dynamically updated as you move your cursor over the visual representations of LD in the 3D Space, showing the type of calculation, the Distance, and the interpolated survey points of the two wellpaths in question.

 **SNAP SHOTS:** Clicking on the snapshot camera brings up the options below:



-  **Copy Snap Shot-** Stores the frame inside the 3D view to the snapshot directory (default: c:\WinSURV3D\snapshots)
-  **Store SnapShot in Plot Queue-** Stores the frame inside the 3D view to the Plot Queue directory (default: c:\WinSURV3D\SNAPSHOTS\QUE)
-  **Attach to E-mail-** Allows the user to directly attach the current 3D image to an outgoing e-mail
-  **Empty Picture Queue-** Empties the directory of Plot Queue images (default: c:\WinSURV3D\SNAPSHOTS\QUE)

RIGHT PANEL

Most of the right panel in the [3D Well Planning Mode](#) is occupied by the [Profile Parameters](#) interface. For details, see [3D Projection Tools- Profiles](#).

ERASE PROPOSAL- A useful tool to clear out all of the data of your current proposal- used to get a fresh start on your proposed well.

SHOW CRITICAL POINTS- Pulls up a spreadsheet of all critical points in the proposal in the spreadsheet window at the bottom of the [3D Well Planning](#) screen

SHOW SURVEYS- This button is only displayed when Critical Points are being displayed in the Spreadsheet Window. Click on this button to display the Survey List of the currently selected curve.

APPLY TO CURVE- This button, like the Show Surveys button, only appears when Critical Points are displayed in the Spreadsheet Window. It is used to make changes to the 3D models if they have not automatically done so upon altering any projection parameters.

7.5 Spreadsheet Window

The window at the bottom of the 3D Well Planner can display a couple different bodies of information. The default is the Survey List for the proposal being displayed. Also can be shown is a Critical Points List. The spreadsheet fields act just like a standard spreadsheet application with regards to resizing and row/column selection.

NOTE: On resolutions less than 1280x1024, a large degree of horizontal scrolling may be necessary to view all fields in the spreadsheet window. Below is a screenshot of a typical 1024x768 screen. Notice that the bottom scroll bar (highlighted) is activated for a horizontally long spreadsheet.

TFA (Deg)	Walk Rate (Deg/100 Ft)	Build Rate (Deg/100 Ft)	OLS (Deg/100 Ft)	Comment	Survey Type
0.00	0.00	0.00	0.00		
0.00	0.00	0.00	0.00		
0.00	0.00	0.00	0.00		
0.00	0.00	0.00	0.00		
0.00	0.00	0.00	0.00		
0.00	0.00	0.00	0.00	PBHL @ 15555 Ft TVD	

SURVEY LIST (CURVE)- If you click on a well in the 3D window, its survey list will automatically appear in the Spreadsheet Window. If Critical Points are being displayed in the window, just click on the Show Surveys button that will appear in the bottom right.

MD (Ft)	INC (Deg)	AZM (Deg)	TVD (Ft)	EW (Ft)	NS (Ft)	VS (Ft)	Closure (Ft)	CLDIR (Deg)	TFA (Deg)	Walk Rate (Deg/100 Ft)	Build Rate (Deg/100 Ft)	OLS (Deg/100 Ft)	Comment
15339.30	16.78	95.71	15694.27	-438.23	833.62	833.62	941.97	332.28	0.00	0.00	0.00	0.00	
15439.30	16.78	95.71	15190.01	-409.50	830.95	830.95	926.37	333.77	0.00	0.00	0.00	0.00	
15539.30	16.78	95.71	15295.75	-380.77	828.00	828.00	911.43	335.31	0.00	0.00	0.00	0.00	
15639.30	16.78	95.71	15301.43	-352.05	825.20	825.20	897.16	336.90	0.00	0.00	0.00	0.00	
15739.30	16.78	95.71	15477.24	-323.32	822.33	822.33	883.61	338.54	0.00	0.00	0.00	0.00	
15820.52	16.78	95.71	15555.00	-299.99	820.00	820.00	873.15	339.91		0.00	0.00	0.00	

NOTE: To see a full explanation of all survey list fields, see [Survey Window](#).

CRITICAL POINTS LIST- To see this automatically generated list of critical points for any selected curve, click the Show Critical Points button on the far right of the screen. If the critical points are already being displayed at the bottom, you will not see this button, but rather a Show Surveys and Apply to Curve button.

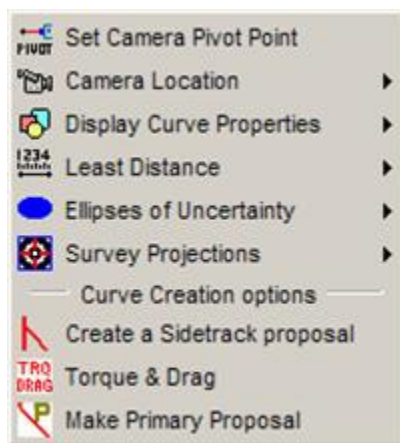
MD (Ft)	INC (Deg)	AZM (Deg)	TVD (Ft)	EW (Ft)	NS (Ft)	VS (Ft)	Comment
0.00	0.00	0.00	0.00	0.00	-20.00		Surface Location @ 0.00Ft Easting 120.00Ft Northing 10.00RKB Ft Sea Level Datum
158.15	7.91	304.00	157.65	-5.02	-13.89		Begin Hold @ 7.91", 304.00" Azm
11058.02	7.91	304.00	11747.05	-1342.26	888.21		Begin Build and Turn @ 11859MD 5.00"/100 Ft
12339.30	16.78	95.71	12222.00	-1300.00	900.00		Begin Hold @ 16.78", 95.71" Azm
15820.52	16.78	95.71	15555.00	-299.99	800.00		PBHL @ 15555 Ft TVD


7.6 3D Well Planner Right-Click Menus


3D Well Planning Mode RIGHT-CLICK MENU- Depending on where the pointer is on the view screen, right-clicking will pull up a number of options. If on a target, a long list of target-related options will pop up. If on the well, a curve options will materialize, including least distance. If the floor or walls are selected when right-clicking, environmental options will show.

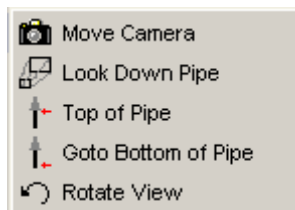
FOUR DIFFERENT 3D MODE ACTION MENUS:

1) Right-clicking on a WELL- Pulls up this menu, which has extensive submenus:



 **SET CAMERA PIVOT POINT-** Sets the point at which the camera pivots to this well when using the Navigation Handles

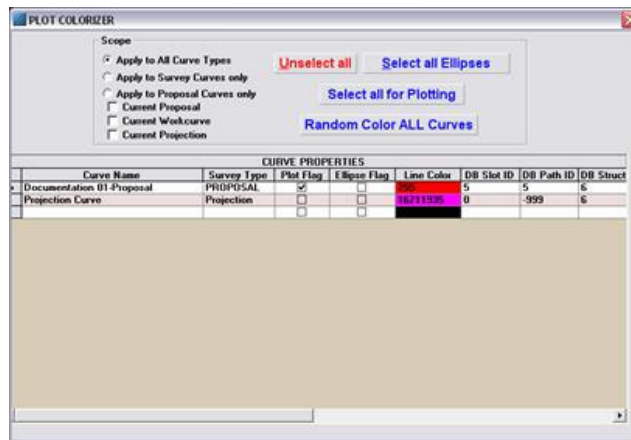
 **CAMERA LOCATION-** Control the point of view on the curve by using these various options:



 **DISPLAY CURVE PROPERTIES-** Modify the appearance of the curve inside the 3D space



Properties Dialogue- Opens the **Plot Colorizer**: Which is the main curve display properties module. NOTE: When making changes to your various curves, be sure to make sure they are selected in the spreadsheet window at the bottom by checking the Plot Flag button.

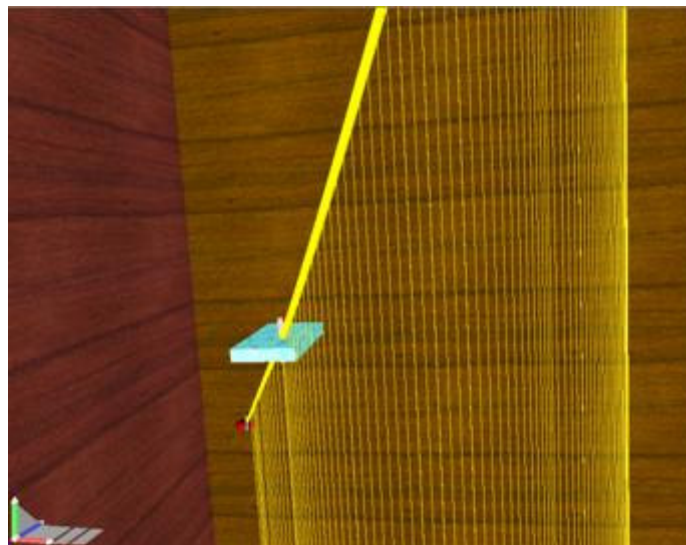


Change Color- Choose the color of your curve individually

Toggle Rotation- Turns on or off the rotation animation effect of the curve

Delete Object- Deletes the selected curve

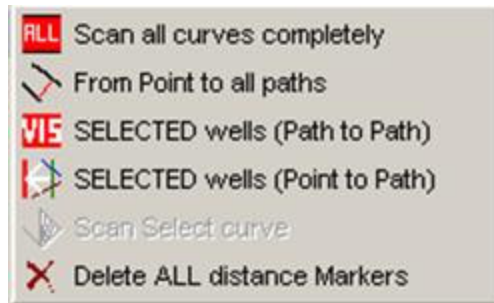
Drop Lines- Creates lines shooting from the curve to the floor to enhance 3-dimensional effect:



activate drop lines



LEAST DISTANCE- A powerful set of tools designed to indicate in various ways the least distances of curves:



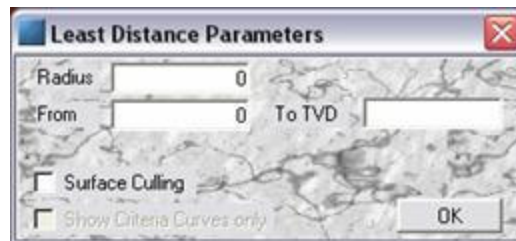
Scan all curves completely- set the parameters for your scan:

Radius- distance from the well to be scanned

From- the upper depth of the scanning spectrum

To TVD- the bottom depth of the space to be scanned

Surface Culling- Automatically removes inapplicable wells



From Point all paths- Scan for least distance from the point where you double-clicked and define the radius



SELECTED wells (Path to Path)- Looks for the closest point between any selected (visualized) wells



SELECTED wells (Point to Path)- Scans for all closest point between all selected (visualized) wells and the point at which you right-clicked

- **Scan Select curve**







Delete ALL distance Markers- removes all least distance markers that may have been placed by previous least distance scans




ELLIPSES OF UNCERTAINTY- A range of error that occurs when using standard locating methods. This range becomes greater as distances increase.



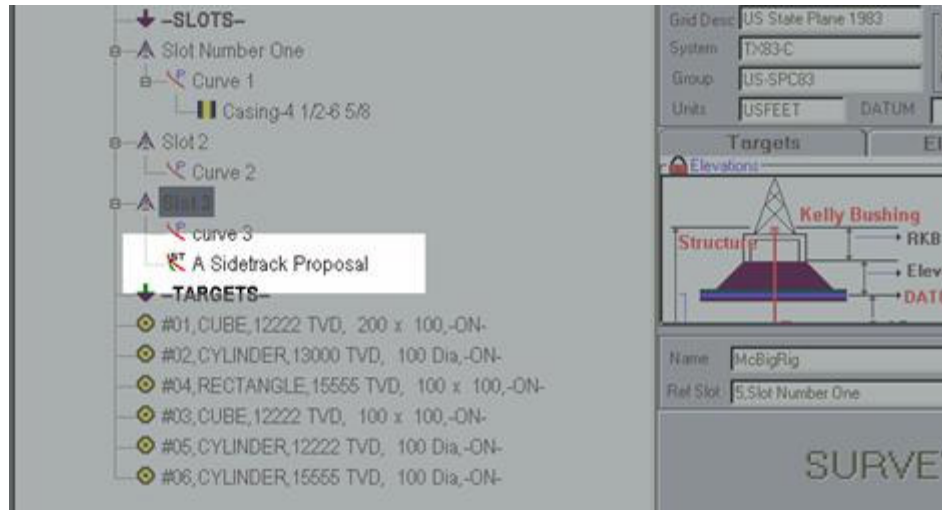
-  **Show End Ellipsoid-** Shows only the ellipsoid at the end of the well, relieves computational burden on the user's computer
-  **Show All Ellipsoids-** Shows an ellipsis of uncertainty at every survey point
-  **Show flat ellipses-** Displays all activated ellipses as 2D objects
- Draw Elliptical Cylinder-** Takes the edges of the ellipses and strings them together, creating a solid cylindrical range along the wellbore

 **SURVEY PROJECTIONS-** Shows a list of available projection curve tools.
(See [3D Projection Tools - Projections](#) for more details)

 **CREATE A SIDETRACK PROPOSAL-** When this option is selected, you will be prompted with a confirmation dialogue to confirm that you want to start a sidetrack, then a window appears for you to name your new sidetrack proposal, which takes the form of a new proposal under the slot in which you created it. (For another way to create Sidetrack proposals, see [Survey Project Manager Menus](#))



Once a sidetrack proposal has been created, you can access and edit it like any other proposal through the [Database Manager](#) and [3D Well Plan Mode](#).

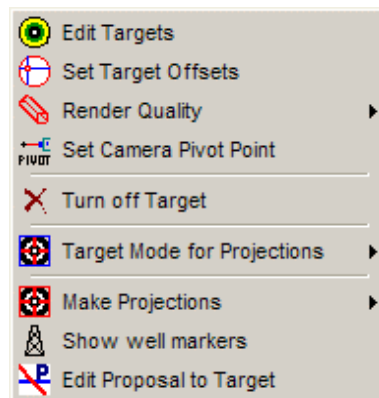


TORQUE AND DRAG- Opens the Torque and Drag application that installs with WinSurf3D. An explanation of this sub program is included in the Appendix



MAKE PRIMARY PROPOSAL- Switches the selected proposal curve to the one to be edited in the 3D mode without having to step back to the Project Manager and select it through the tree








2) Right clicking on a TARGET- Pulls up this menu:



EDIT TARGETS- Opens the [Target Editor](#), where all targets can be modified



SET TARGET OFFSETS- Opens the [Target Editor](#), where target offsets and all other parameters can be edited

-  **RENDER QUALITY**- Set the target's graphical rendering to either Wire Frame or Solid Shading
-  **SET CAMERA PIVOT POINT**- Sets the point at which the camera pivots to this target when using the Navigation Handles
-  **TURN OFF TARGET**- turns off the display of the target in the 3D space
-  **TARGET MODE FOR PROJECTIONS**- By default the center point of a target is the point that is used for projections. Users can select the point target mode and click on the point of the target they wish to hit. This method of selecting a target point is very inexact, as the 3D space does not allow for precise selection of a given point on a target, and you are likely to find that it is better to manually input a target point with the target editor.
-  **MAKE PROJECTIONS**- pulls up a list of projection tools. To make projections from selected target
-  **SHOW WELL MARKERS**- If a FAL_MARKERS.DAT file exists, will activate marker in 3D mode
-  **EDIT PROPOSAL TO TARGET**- If selected target is assigned to a slot, it will allow user to modify the proposal leading to the target

3) Right clicking on a **FLOOR**- Pulls up this menu:



FLOOR TYPE

Polar Floor- displays a radial, circular grid that emanates from the center of the floor

Grid Floor- the default setting, a standard square grid

Textured Floor- floor whose display properties are those of an image selected from a file

Default- the user-preferred default for floor type

DIVISION

Grid Lines- toggles whether or not to display grid lines on the floor

Quad Labels- toggles option to display large “NW,SW,NE,SE” letters in each grid

FLOOR COLOR SCHEME- Allows you to individually select colors for all various aspects of the floor

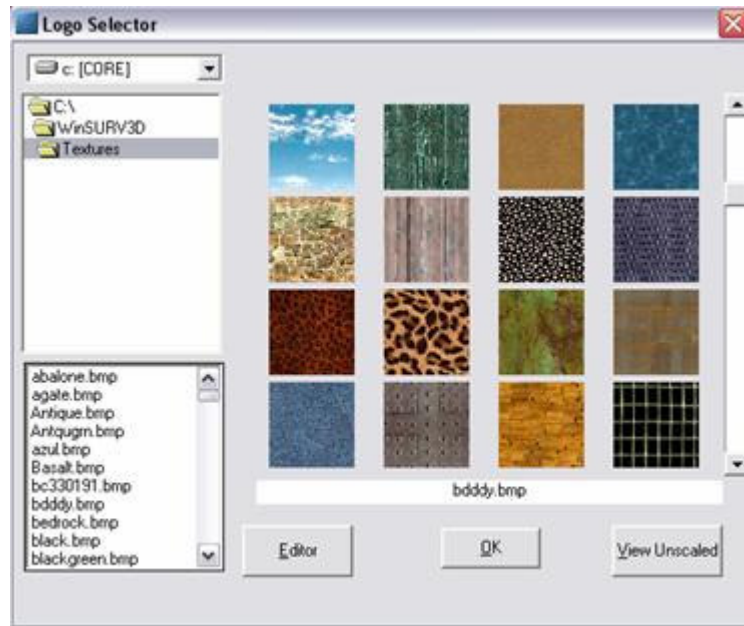
4) Right clicking on a **WALL-** Pulls up this menu:



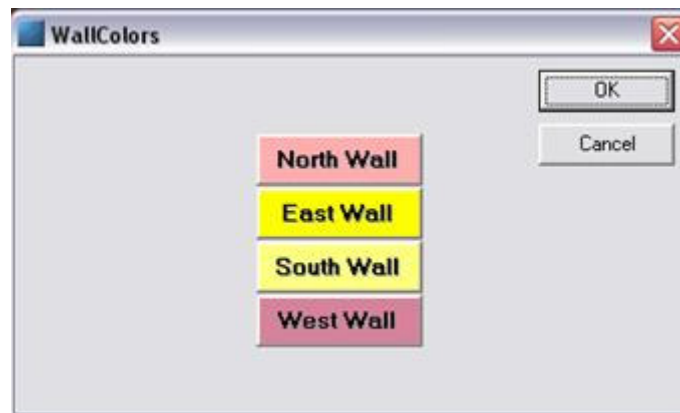
SET CAMERA PIVOT POINT- Sets the point at which the camera pivots to this wall when using the Navigation Handles



WALL TEXTURE- Select the wall texture for each of the four walls in the 3D space. Select the texture of your choice from the ones provided or pull up a bitmap of your own preference through this module:



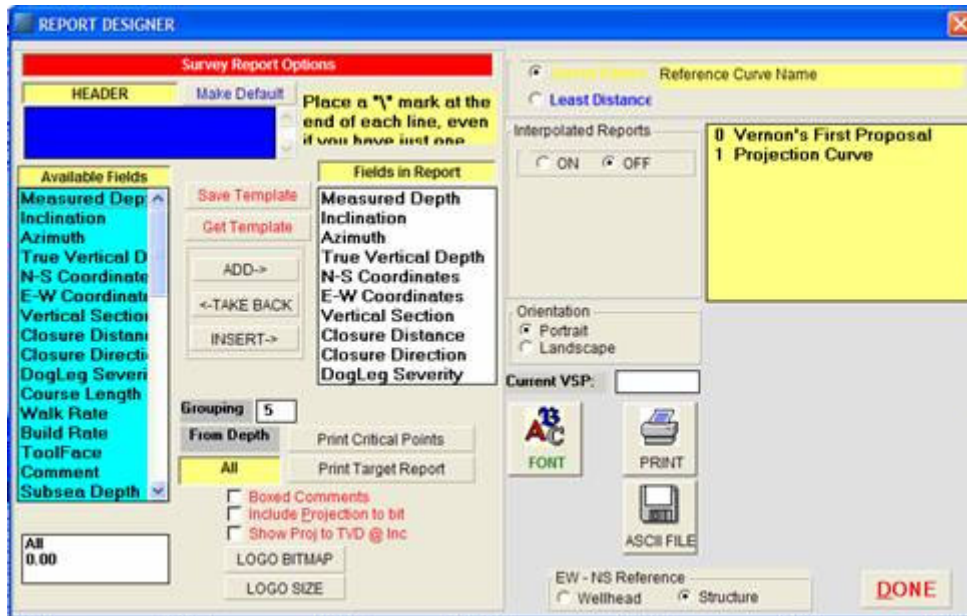
H WALL COLOR- Select the wall color for each of the four walls in the 3D space. Use this module:



8. 08 Reports

8.1 Report Designer

The Report Designer allows user chooses the information to present in a report. Once set up, the report design may be saved as a template, enabling the user to easily and quickly output different report configurations for different intended purposes and viewers (using a larger font for faxing, for example). A description of the report features and options follows. For printing options, see [Printing Reports](#).



TWO MAIN TYPES OF REPORTS:

Target Projection Report- The Target Projection Report presents a tabular summary of three types of projections to an array of nine points in and around the target.

Least Distance- Selecting the Least Distance option displays the screen seen below. WinSurv3D calculates the least distance between the workcurve and either another single curve or all survey curves loaded into the program, including an ellipse of uncertainty model if desired. The Least Distance Report provides the data for the selected pair of curves; in addition, a detailed ellipse report can be saved to file or printed.

HEADER COMMENT:

In addition to the job information presented in the header section, a header comment of up to four lines may be inserted at the top of the report, centered on the page, just below the header section. Remember to put a backslash <\> at the end of each line when typing comments. Click MAKE DEFAULT if you want this comment to appear on every report.

FIELDS:

Available Fields- There are 49 fields available to be printed in the Survey Report. To add an item to the bottom of the list of fields to be output, click on it to select it, then press ADD→. To insert an item in the list, select it, click on the Fields in Report item above which you want it to appear, then click INSERT→. Depending on the number selected, it may be necessary to experiment with the font size or print the report in landscape mode for an easily readable and well-organized report.

NOTE: Two Fields of special note are Up-Down and Left-Right, which are particularly useful in horizontal sections to know the location relative to a formation line.

Fields in Report-Displays the fields that will be printed in the survey report. Fields listed in descending order in the box are printed left to right across the columns of the page. To remove an item from the list to be printed, select it, then press ←TAKE BACK.

OTHER REPORT OPTIONS:

Boxed Comments- If this box is checked, a box will be placed around each survey with its associated comment in the report, thereby highlighting the comment.

Include Projection to Bit- If this box is checked, a projection made to the bit will be printed IF:

- ☐☐☐☐☐☐☐ The curve to be printed is the workcurve (as indicated by WORK# on the [Database Manager](#) screen)
- ☐☐☐☐☐☐☐ A Bit to Sensor distance is entered in the [Database Manager](#)

Show Proj to TVD @ Inc- Show Projection to Bit at TVD and Inclination is a special flag active only when printing a report of the workcurve. It is particularly useful for horizontal wells where it is critical to know what the needed build rate and landing point are projected to be. If this box is checked, all of that information will be printed at the end of the report, after the projection to the bit. If the projection to the bit is not selected then the projection is made from the last survey point.

Grouping- Grouping refers to the number of surveys that are printed before an empty line is inserted into the printout. This enhances the readability of the survey list.

From Depth- The measured depth from which the survey list will be printed.
The default is 'ALL', but any start depth may be specified by selecting it in the list box at the lower left of the screen.

Interpolated Reports- Click ON if you want to fill a gap in the survey list with interpolated surveys. The interpolation may be done by MD or TVD, with the user specifying the desired start and end depths and the station interval.

EW – NS Reference- Choose the reference to be the wellhead (normally) or slot location.

Logo Bitmap- Press this button to Select Bitmap to Use as Logo on the report.

Logo Size- Press this button to choose Bitmap Size to be printed. Magnification factors between 0.1 and 5 times may be specified.



Fonts ICON- Press this ICON to select the general font and font size for the report. Some experimentation is necessary to optimize the look of the report.



REPORT TEMPLATES:

Save Template- Once you have your report setup the way you want it, you may save it as a template with a .TMP extension. This is advantageous if you need to print or save the report in several different formats, eliminating the need to redo the setup for each type.

Get Template- If you have created templates for different report formats, press this button to retrieve the file with your preferred setups.

8.2 Printing Reports

Print Critical Points- Press this button to print a survey report including only the critical points of your proposal. The critical points must first be applied to the survey list on the Well Plan screen in order for this report to be available.

Print Target Report- Press this button to print the Target Projection Report for the currently selected target. A tabular summary of projections of the workcurve to the center and 8 other points on or around the target boundary, depending on the target shape, is printed.

The Target Report is available even if the workcurve is not the curve selected to print. A diagram of the target and 9 projection points is included. The three projection methods utilized are Protractor, Minimum DLS Curvature, and Slant Well with specified DLS.

The DLS is input in the Special Projection Parameters dialog box (press SETUP to access) or from the Graphical Projection Mode screen (press PROJECT button on MAIN SCREEN). The projected bit location will also be printed if BHL is selected on the MAIN SCREEN, as well as proximity data to the Comparison curve (which defaults to PLAN#).

Report to Print- Pull down menu to choose among Survey Report, BHL Report or Pipe Tally. See the appendix for sample reports.

Printer ICON- Press this ICON to display the Print dialog box and print the report. You may setup your printer here and choose Portrait or Landscape orientation for your report. Currently there is no Print Preview feature available in WinSERVE.



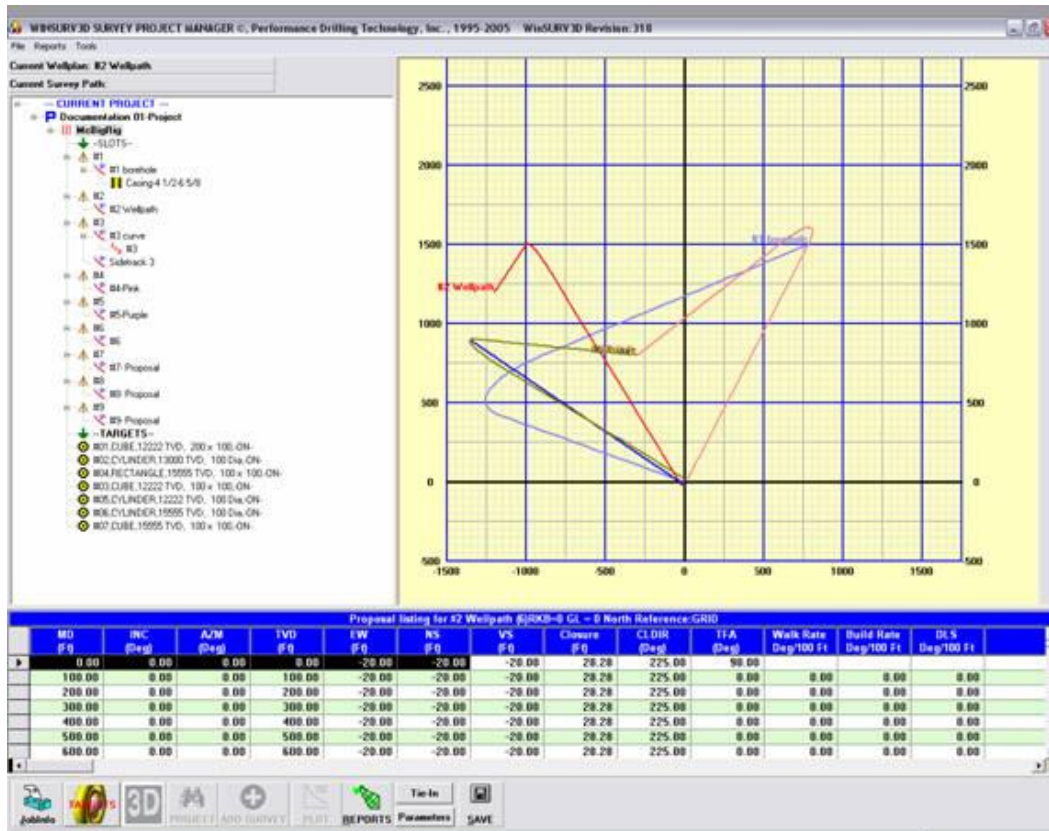
ASCII File- ICON Press this ICON to display the Save ASCII Text File dialog box to save the report as a text file. Your filename will automatically be given a .TXT extension. This is very useful if you need to create a survey file to export to another program. Setup the Fields in Report to include only Measured Depth, Inclination and Azimuth; press the ASCII File button and answer “no” to a full report to create a space delimited text file of raw survey data.



9. 09 Survey Project Manager

9.1 What is the Survey Project Manager?

The **Survey Project Manager** is one of the main modules in WinSurv3D. It is the “Launch” screen that is reached from the [Database Manager](#) and connects to all other modules. Inside the Survey Project Manager, you select the structure, slot and proposal that you want to work on directly and jump right in.



GETTING INTO THE SURVEY PROJECT MANAGER

1. In the first screen you encounter in WinSurv3D, the [Database Manager](#), find the database tree window on the left side of the screen.
2. Click on either the “Project” or the “Current Project” tab at the top of the database tree window. This will pull up any projects that can be worked with.
3. Open up the desired field and click on any object within that field. This will activate the Launch button for that entire project. Click launch to open the **Survey Project Manager**.

GETTING OUT OF THE SURVEY PROJECT MANAGER

- To get out of the Survey Project Manager and back to the main Database Manager screen, simply close the whole window with the standard Windows close button on the top right.
- OR, go File→Exit.

When exiting, you will be prompted to save the changes you have made to your project:



9.2 Survey Project Manager Toolbar



Most of the work in WinSurv3D is launched from the toolbar in [Survey Project Manager](#). The toolbar is found at the bottom of the [Survey Project Manager](#) screen, but not all tools are available all the time. A proposal has to be selected for some of these tool buttons to be activated.

Job Info



This button is always active in the toolbar, and opens up the **Add or Modify Job Information** dialogue.

A dialog box titled 'Add or Modify Job Information'. On the left is a tree view under 'COMPANIES' showing 'PDT' with a sub-entry 'Job #3'. On the right is a form with fields for 'Job Number' (value: #3), 'Company' (value: PDT), 'Lease/Well' (value: 425SA), 'Location' (value: Juneau), 'Rig Name' (value: Walden 49), 'State/Province' (value: AK), 'County/Parish' (value: Juneau), and 'Country' (value: USA). There are 'ADD', 'DELETE', and 'Refresh Tree' buttons. A green bar is next to the Job Number field. An 'OK' button is at the bottom right.

In this dialogue you are provided with the list of jobs under each company in your current database, and you can add, delete or modify the information for each one. The colored window on the top left indicates if your job number is in use. Green means available and red indicates unavailable.

Targets



This button is always active in the toolbar, and opens up the [Target Editor](#). All targets within a project can be edited, as well as added and deleted with the [Target Editor](#).

3D Well Planning Mode

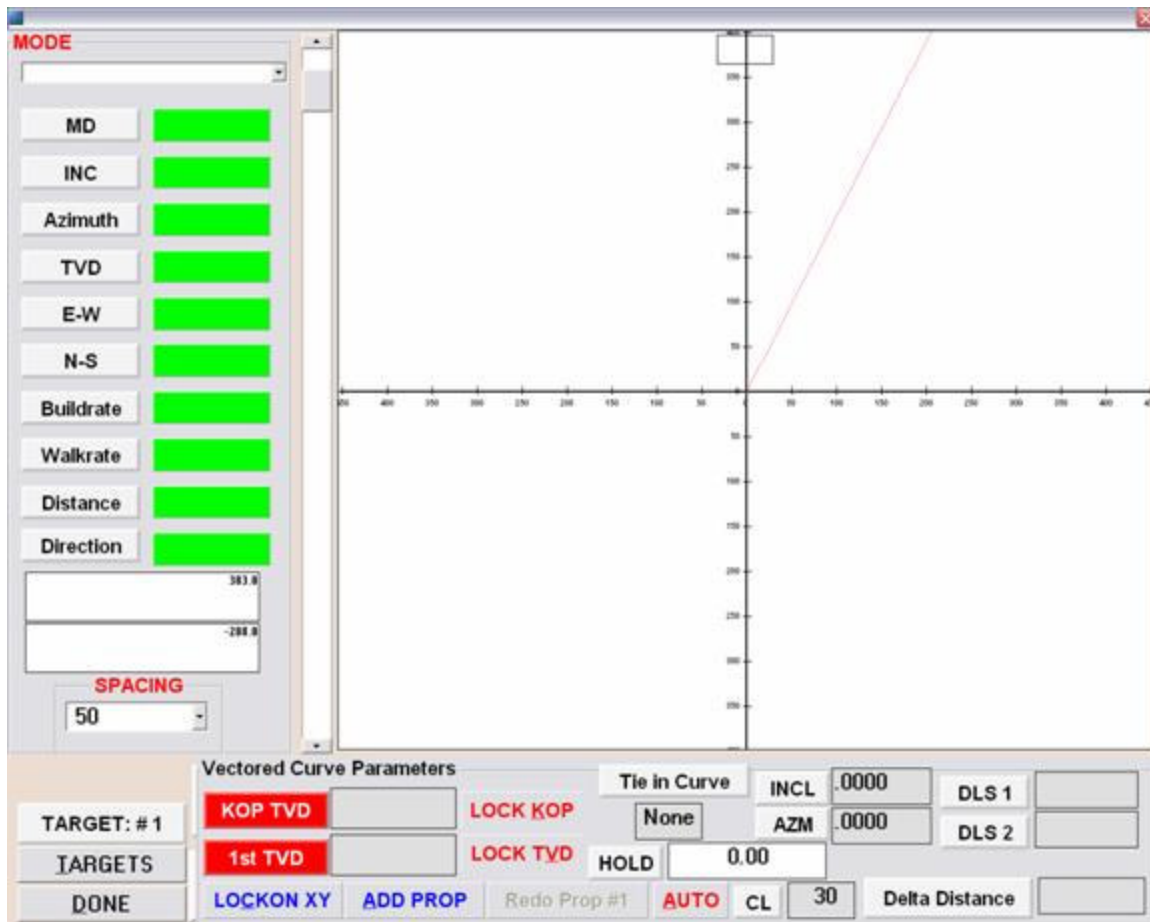


Once you do so, clicking on the 3D button launches the [3D Well Planning module](#), where you will be able to modify the selected curve in 3D space.

Graphic Projections



This button is only activated when you click on a specific slot or a specific proposal in the database window on the left of the screen. The “Binoculars” button opens a 2D Graphic Projections interface:



OVERVIEW:

The Graphical Projection mode allows the user to do complex projections by simply pointing and clicking with the mouse. Projections are made from the last survey of the projection

DISPLAY:

The screen is dominated by the graphical display area. This display is target-centric, with the axes centered at the currently selected target, indicated at the lower left corner. If this is not the target that you want to project to, click TARGET to make your selection from the List of Targets screen.

The size of the viewing area around the target is controlled by the vertical scroll bar to the left of the display area. Adjust the zoom factor by positioning the slider. This automatically determines the scale of the axes, shown in the SPACING box. NOTE: Remember that these are coordinates referenced from the target. If you zoom out enough you will see the endpoint of the workcurve indicated by a red cross-hairs symbol.

The large numeric text boxes at the lower left indicate the geographic coordinates of the mouse cursor referenced from the wellhead, duplicating the same information from the complete survey calculation data displayed along the left edge of the screen. As you

move the mouse around in the display area these values are continually updated, with the TVD held constant at the TVD of the selected target.

PROJECTION METHODS:

At the top left of the screen under MODE is a drop down menu of the available projection methods. The 'BUTTONS' options listed refer to the Projection Point buttons located at the lower right corner, and are redundant to the Mouse options (you will notice that the mode switches to 'Mouse' as soon as the mouse is moved from the drop down box).

In the descriptions below, *target point* refers to the end point of the projection, which is set by positioning the mouse anywhere in the display area and right-clicking. The first time, the selected projection will be made to the center of the selected target; you may subsequently position the target point wherever you choose, and the curve will be drawn per the parameters of the selected mode. Click on the Projection Point buttons to project to the Center, Left, Right, Top Center or Bottom Center of the selected target. A small red circle will be displayed on the target perimeter.

Protractor	Straight-line to the target point. This is a classical projection tool familiar to directional drillers using a string and protractor on a wall plot.
Your DLS	3-D Slant well to the target point. Specify the desired dogleg in the text box near the bottom of the screen. If the input DLS is too low, a minimum DLS projection will be made. If a projection at the specified DLS cannot reach the target point, '*****' are displayed in the survey data boxes. Zeros will typically be displayed for the Buildrate and Walkrate since a slant projection terminates as a straight line.
Build & Walk-Controls	Specify the desired Build and Walk Rates in the text boxes near the bottom of the screen.
Minimum DLS	3-D calculation of the minimum DLS to generate a curve of constant curvature to the target point. Similar to Your DLS except that it will never include a straight tangent section.
S-Well Vector Projector (Double Curve Profiler)	As a Profiler, this tool is limited to use in the Well Plan module

Vectored Curve-Advanced

Although this sophisticated method may be used to make projections, it is generally utilized as a well planning tool and as such it is discussed in detail in

3-D Vectored Curve to TARGET

Description of Projection

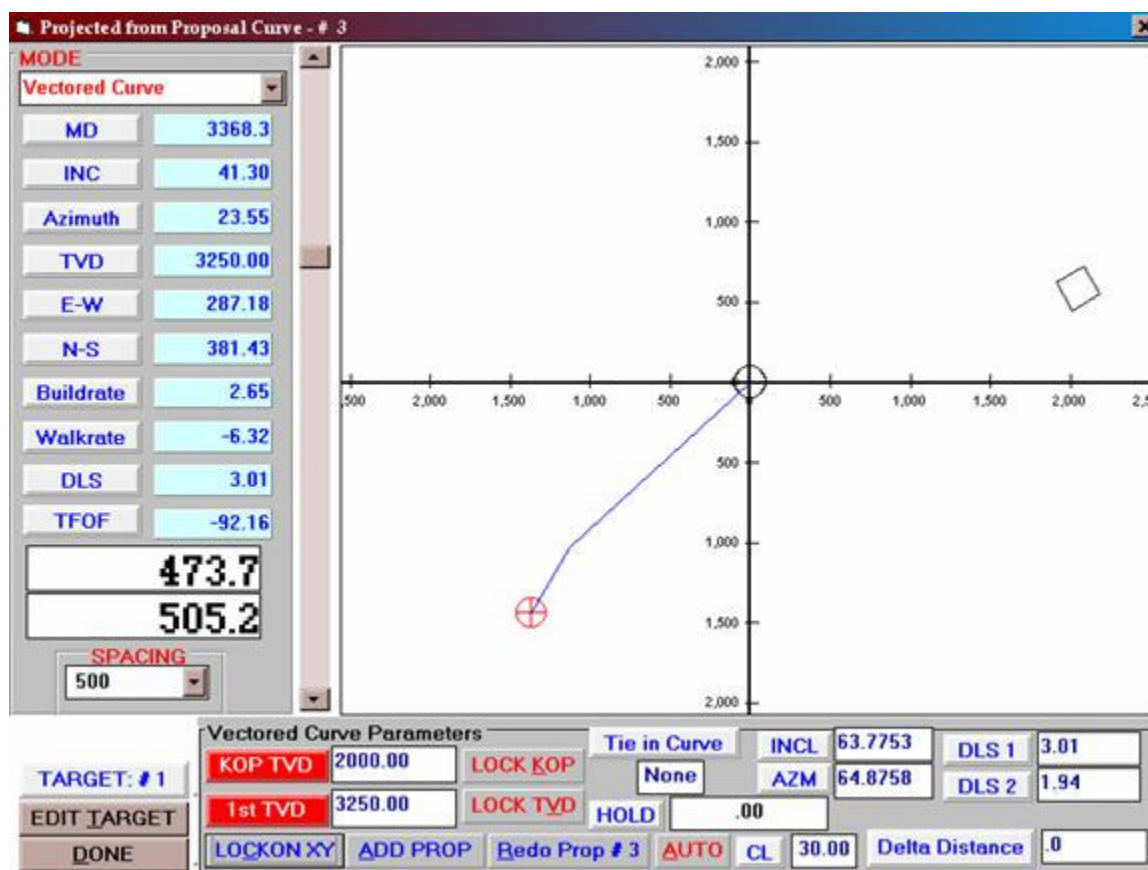
The Vectored Curve projection consists of two curves connected to one another without a tangent section. The dogleg of each curve can normally be adjusted so that they are equal by adjusting the **KOP** or the **TVD** of the target for the first curve. The advantage of this type of curve is that it can hit a given point at a given inclination and azimuth.

Where Used

This type of curve is used in winged lateral wells where landing points are restricted. It can also be used as one of the projection tools in building complex proposals.

Input Parameters

Primary Target Point, desired Inclination at target and desired Azimuth at target, Secondary Target point (**1st TVD**) and **KOP**. In all, there are 9 input parameters



Setting up to do the projection:

- Input the Primary Target in the Target list. Even though the size and shape of the target may not be important, it is a good idea to make the target a circle with a given diameter. That way you can see the target on the projection screen.
- Select your proposal curve on the main screen. The last survey in the proposal curve is used as the tie in point. This projection method allows you to specify a curve from which you can kick off. For example, if you wanted to pick a sidetrack KOP from an existing well you can enter the curve number for the tie in curve in the projection screen and the program will interpolate on that curve automatically.
- Select **3D Vectored Curve to TARGET** from the PROJECTIONS drop down list
- If the displayed Inclination and Azimuth at the target are not what you want, enter the inclination and azimuth. This could have been done when specifying the target.
- If you are going to be using a tie in curve to determine your **KOP** enter the tie in curve number under **TIE CURVE**.
- Adjust the size of the projection graphic by moving the vertical slider to the left of the graphic screen. Remember, this screen is target-centric. If you have specified a tie in point you should see a cross hair displayed over that point if your zoom is properly adjusted.
- If everything is setup up properly when you move the curser near the tie in point. Numbers all over the screen should be changing. If you are not in a solution convergence zone "**DLS2**" to the lower left will say "**OUT**". When you are in a solution convergence zone **DLS2** will show a number. The **DELTA Distance** is the distance between the Primary Target and the projected landing point at the primary target's TVD. You want this delta distance to be zero. Moving the mouse around trying to get the delta distance to be zero can be a tedious process. So, instead of wasting time trying to converge with the mouse an automatic function called **LOCKXY** will do it for you. Before you can use the **LOCKXY** function you must click on the graphic screen where **DLS2** does not say 'OUT'. When you click the graphic screen is temporarily disabled so that you can move off the screen to the **LOCKXY** button without changing any more values. When you press **LOCKXY** you will see two lines snap to the center of the graphic screen, your target. The **DLS1** and **DLS2** are the dog legs of the two respective curves. Invariably these number are different at this stage of the game. It is frequently the case that you want a solution that has the doglegs equal. There are

two ways to do this. The two LOCKDLS buttons will look for a solution varying either the KOP or the 1st TVD (Secondary Target TVD). This can take quite a few seconds, maybe even a minute depending upon your computer. In order to solve this problem there are three levels of iterations.

LOCKON XY

This button will find a solution for the given KOP and 1st TVD such that the landing point of the curve is at the center of the selected target at the desired inclination.

LOCK DLS with KOP

This button will find a solution for the given KOP and 1st TVD such that the landing point of the curve is at the desired target and inclination and azimuth AND the two Dog legs are equal. In order to do this the KOP is adjusted until there is a solution. (*IF THERE IS A SOLUTION*)

LOCK DLS with 1st TVD

This button will find a solution for the given KOP and 1st TVD such that the landing point of the curve is at the desired target and inclination and azimuth AND the two Dog legs are equal. In order to do this the 1st TVD is adjusted until there is a solution. (*IF THERE IS A SOLUTION*)

Sometimes it is desirable to solve for a specific Dog Leg. Let's say you want 18.00, not 18.31 for a dog leg. If you are *LOCKING* with the **1st TVD** button above and your dog leg comes out to be 18.31, for example, you could raise the KOP by a few feet and solve again. By manually adjusting the KOP you can converge on the desired dog leg of 18.

Using ARROW KEYS to adjust KOP and 1st TVD

There are times when the automatic methods just run away and do not render a solution, and there are times when you do not want to have the two dog legs equal. By entering the KOP or 1st TVD manually you can update the solution. To make this manual iteration easier and fast the arrow keys have been tied to the text boxes. It is easiest to explain by example.

- Place the cursor in either the KOP or 1st TVD box.
- Place your three middle fingers over the arrow keys on your keyboard.
- Press the up arrow - you should see the value in the text box increase by ten.
- Press the down arrow - you should see the value in the text box decrease by ten.
- Press the left arrow - The increment value has now been divided by ten, to 1.
- Now Press the up arrow again. You should see the value increase by one.
- Press the Right Arrow - The increment value has now been multiplied by 10.
- Press the Right Arrow again. - The increment value has now been set to 100.

By deft usage of these keys a user can manually and quickly converge on a solution. Sometimes it is easier to find a solution manually like this than it is to get the computer to solve.

ADD PROP

Then you are content with the curve you have and want to make it a proposal curve press this button. It will be immediately displayed. If you don't like the curve you see and want to generate another one you must press the **REDOPROP** button. (The straight lines you see on the graphic screen)

REDOPROP

Undoes the proposal you just added. If you didn't have proposal you just added it backs the tie in point to the first survey in the proposal list.

AUTO

This button attempts to automatically find a constant dogleg solution varying the 1st TVD method without you clicking in the convergence zone. It usually works.

Horizontal Projections

One of the trickiest types of projections to make in directional drilling is 'needed build rate to a dipping formation'. If the formation has a 0 degree dip then the calculation is straightforward and can be done easily on a calculator. When the TVD of the target does not stay constant, however, the problem is more difficult to solve. WinSERVE allows the user to do a projection to dip in two different methods. One method is a graphical method in which the user moves the mouse to point in the vertical section plane and can see how the Minimum DLS and the Inclination change. The other method is an option under the PROJECT button.

Setting up a horizontal dip projection requires several steps. Once done, however, each time a survey is entered this projection is automatically calculated and stored in curve 23. Furthermore, the entry point can be printed in a survey report or a BHL report as an option.

Vectored Curve Parameters									
KOP TVD	<input type="text"/>	LOCK KOP	Tie in Curve	<input type="text" value="None"/>	INCL	<input type="text" value=".0000"/>	DLS 1	<input type="text"/>	
1st TVD	<input type="text"/>	LOCK TVD	HOLD	<input type="text" value="0.00"/>	AZM	<input type="text" value=".0000"/>	DLS 2	<input type="text"/>	
LOCKON XY	ADD PROP	Redo Prop #1	AUTO	CL	<input type="text" value="30"/>	Delta Distance	<input type="text"/>		

Add Survey

To activate this button, select a proposal curve from the project tree in the window to the left. Once it is activated, click on it to open the Adding a Survey dialogue, where you can manually insert a survey into a proposal's survey list.

Adding a survey

200 OF 200

MEASURED DEPTH: 16127.22

INCLINATION: 6.17

AZIMUTH: 0.00

DONE

Directional Input Method
☒ Azimuth ☐ Quadrant

To add more than one survey at a time press the 'ENTER' key after each entry and the program will automatically loop to the next station.

COMMENT:

Survey Listing

	MD	Inclination	Azimuth
	0.00	0.00	0.00
	100.00	0.00	0.00
	200.00	0.00	0.00
	300.00	0.00	0.00
	400.00	0.00	0.00
	500.00	0.00	0.00
	600.00	0.00	0.00
	700.00	0.00	0.00

Default Tool Type: 0

All the major fields that define a survey can easily be filled out in this interface. Hit “Enter” to insert a survey and go to a new one. Click the Done button when you are finished.

Plot Maker



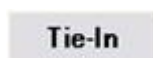
A slot or a proposal needs to be selected in the database screen on the left for this button to be activated. When you click on it, the comprehensive [Plot Maker](#) opens.

Report Designer

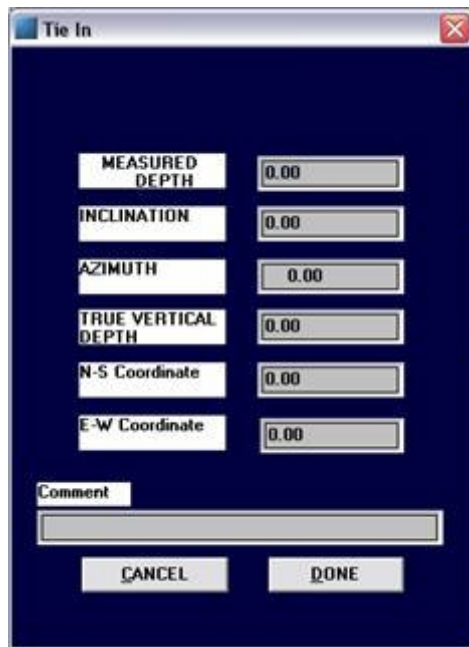


This button is always active in the toolbar, and opens up the [Report Designer](#) module.

Tie-in



The Tie-in button is always active in the toolbar. Clicking on it opens the Tie-In dialogue:



The 'Tie In' dialog box is a window with a dark blue background and a title bar that says 'Tie In'. It contains several input fields for survey data. The fields are arranged in two columns. The left column contains labels: 'MEASURED DEPTH', 'INCLINATION', 'AZIMUTH', 'TRUE VERTICAL DEPTH', 'N-S Coordinate', and 'E-W Coordinate'. The right column contains corresponding numerical input boxes, all of which currently display '0.00'. Below these fields is a 'Comment' label followed by a single-line text input box. At the bottom of the dialog are two buttons: 'CANCEL' and 'DONE'.

Field	Value
MEASURED DEPTH	0.00
INCLINATION	0.00
AZIMUTH	0.00
TRUE VERTICAL DEPTH	0.00
N-S Coordinate	0.00
E-W Coordinate	0.00

Comment:

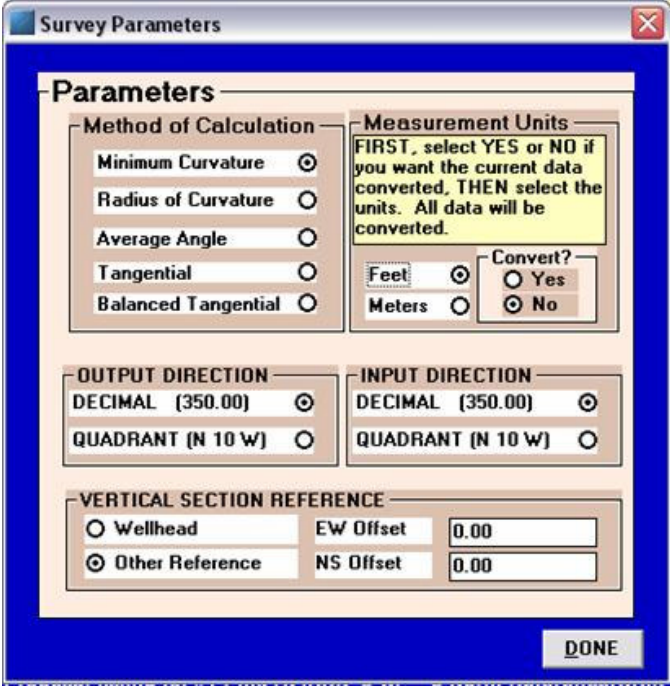
CANCEL DONE

Enter all information you want for your tie-in and click done when you are finished.

Parameters



This button is always activated in the toolbar. Click on it to open the Survey Parameters dialogue:



Survey Parameters

Parameters

Method of Calculation

Minimum Curvature ☒

Radius of Curvature ☐

Average Angle ☐

Tangential ☐

Balanced Tangential ☐

Measurement Units

FIRST, select YES or NO if you want the current data converted, THEN select the units. All data will be converted.

Feet ☒ Convert? ☐ Yes

Meters ☐ ☒ No

OUTPUT DIRECTION

DECIMAL (350.00) ☒

QUADRANT (N 10 W) ☐

INPUT DIRECTION

DECIMAL (350.00) ☒

QUADRANT (N 10 W) ☐

VERTICAL SECTION REFERENCE

☐ Wellhead EW Offset 0.00

☒ Other Reference NS Offset 0.00

DONE

This box will give you all the options to modify the measurement parameters of your surveys. Note the Measurement Units box conversion instructions. When you are done, click Done, and your parameters will be saved.

Save



This button is always activated in the toolbar. Click here to actively save all changes to your project to the database file (default WinSURV3D.mdb). You can also hit Ctrl+S to save. To toggle the auto-save option, go to the Options menu and select Auto-Save.

9.3 Survey Project Manager Menus

File

Save (Ctrl+S)

Saves all changes you have made to your currently opened project

EXPORT

WinServe Survey- Exports your currently selected survey list as a format usable in WinServe

MMS Format- Exports as Mineral Management Service survey format (US only)

Mauer Survey File (.SDI)- format can be used with the Mauer program D-Drag

IMPORT

WinServe Survey- Import a WinServe survey list for use in WinSurv3D

Other Text- Import a survey list from another text format

About

Copyright information

Exit

Closes the [Survey Project Manager](#) and prompts you to save your changes

Reports

Survey Report: Opens the [Report Designer](#)

Target Projection Report: Opens the standard Windows print setup to print report

Least Distance: Opens the [Report Designer](#) where you can add Least Distance to your reports

Tools

Interpolate

Interpolate between two survey points by MD or TVD. The interpolated point may be inserted into the survey list and labeled as such. The interpolated point may also be made a Tie-in point for a sidetrack well workcurve or proposal by selecting MAKE TIE IN. WinSERVE will prompt you to choose the curve in which to store the point. A text file with the extension .INT may also be created, or a previously created file loaded. This file saves all points that have been interpolated, and allows them all to be inserted at once if the file is loaded and executed by clicking EXECUTE TVD LIST.

MD TVD

Make Tie In INSERT DONE

Station #1	Interpolated	Station #2
MD 17010.07	MD 17010.07	MD 17110.07
Inc 1.40	Inc 1.40	Inc 1.40
Azm 315.00	Azm 315.00	Azm 315.00
TVD 16720.65	TVD 16720.65	TVD 16820.62
N-S 877.86	N-S 877.86	N-S 879.59
E-W -977.86	E-W -977.86	E-W -979.59
VS 1314.09	VS 1314.09	VS 1316.54
CL 1314.09	CL 1314.09	CL 1316.54
CLD 311.92	CLD 311.92	CLD 311.92
DLS 0.00	DLS 943418.60	DLS 0.00

MD 17010.07 Comment possible sidetrack point A16

Make List Execute TVD List

Well Site GeoDetics

Opens the [Field Definition Form](#)

Field Magnetics

Opens the [Magnetics](#) module

DLS-DIP Calculator

Opens the WinSurv3D DLS-Dip Calculator. Below is an explanation of its functions.

WinSERVE's DLS-DIP CALCULATOR TOOL

☒ Ft ☐ Meters

Build Rate [Blue field] [Erase icon]

Start Angle [Grey field] [Erase icon]

End Angle [Grey field] [Erase icon]

Click this to Erase all three

Displacement [Green field] [Erase icon]

Delta TVD [Cyan field] [Erase icon]

Delta MD [Light Blue field] [Erase icon]

DIP ANGLE [Red field]

Above DIP [Magenta field] [Erase icon]

Calculate

Input any Three of The White Inputs and the DIP ANGLE of the formation; (+) is DOWN, (-) is UP. Leave blank the white ones you want to calculate. Either Displacement or DELTA TVD or DELTA MD count as one of the Whites.

BR Needed Done

The DLS-DIP Calculator is used to solve for three variables which can be a number of different combinations of Build Rate, Start Angle, End Angle, Displacement, TVD and MD. If two of the top three fields are entered (Build Rate, Start Angle, and/or End Angle), then one of the bottom parameters (Displacement, Delta TVD and Delta MD). If all three of the top parameters are filled in, then only one of the bottom three parameters can be filled in. The calculate button will activate when enough parameters are filled in to make a calculation. The colorful icons to the right of each field will erase that field.

Convergence Corrector

The Convergence Correction dialogue allows for correcting all azimuths by the convergence. In actuality you can use any directional change you want, but the most common correction is the convergence, of the difference between true north and grid north.

NOTE: Be very careful with this tool as it can screw up surveys as quickly as it can fix them.

Convergence Correction

Grid Convergence [Text box: -2.9100]

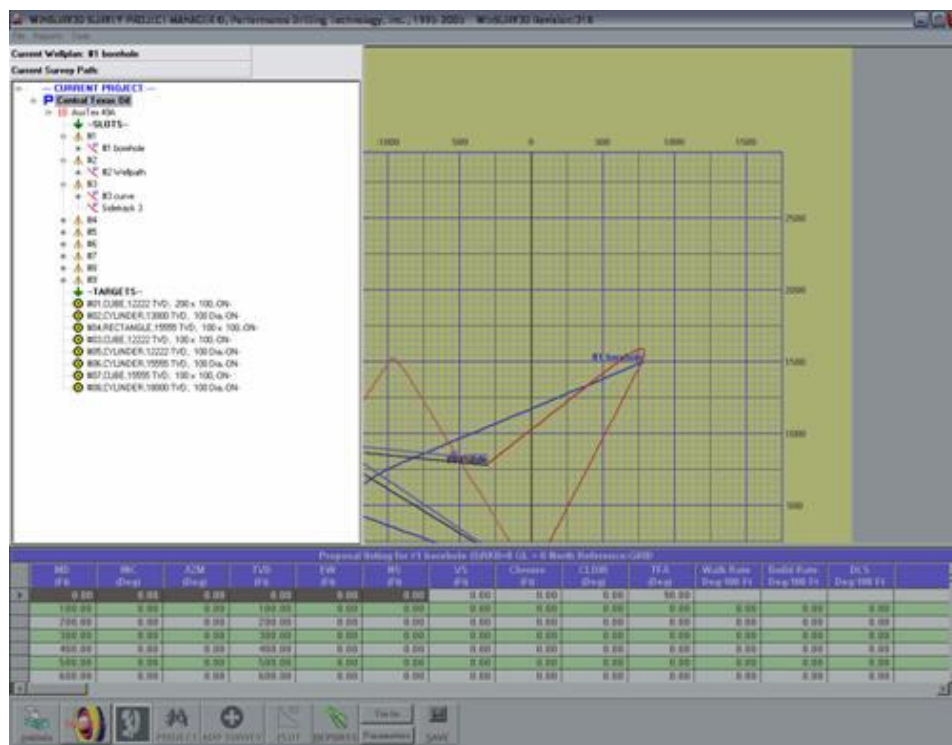
ADD TO ALL SURVEYS

SUBTRACT FROM ALL SURVEYS

Cancel OK










9.4 Survey Project Manager Tree Display

The tree display on the left in the Survey Project Manager screen is very similar to the tree display in the [Database Manager](#), except that it only displays ONE project at a time and does not have as many editing functions. Its purpose is to navigate easily within the selected project and launch into the other modules of the program.



DATABASE TREE ICONS

The table below shows the icons identifying the tree levels in order.

	Name of Current Project
	Structure
	Slot
	Proposal wellpath
	Survey (Workcurve) wellpath
	Job Number
	Casing Profile
	Lithology Table
	Torque and Drag calculation file


HEIRARCHY

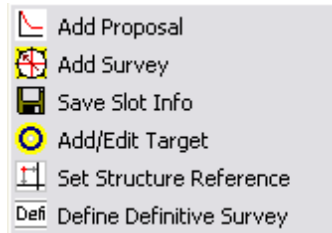
At the “top” of the tree is the -CURRENT PROJECT- heading, which encompasses the entire list. Under the main heading is PROJECT name, then STRUCTURE, and then SLOTS and TARGETS headings. Associated with the SLOTS may be a PROPOSAL, JOB number, CASING profile, LITHOLOGY table, and TORQUE&DRAG calculation. Under the TARGETS heading are all targets associated with that structure.

The PROJECT exists as a subset of all wells in the Field, grouped as a selected number of Structures. One Project may be a single Structure; for another you may want to include the next closest structure for anti-collision purposes; a third may include several other structures, and so on. In other words, the *same* structure, or any combination of structures (within a single Field) can be part of any number of different Projects.

COLLAPSING AND EXPANDING

Any level of the tree may be expanded and collapsed by clicking on the + and – signs to the left of that item. To whatever degree the complete tree has been expanded, you can collapse it again by clicking on the named level (or the minus sign): everything below that level will collapse from view. If there is no plus sign next to the object, that means there isn’t any data below that level associated with that object.

Right-click on “SLOT” 



Add Proposal- Opens a proposal wizard that prompts you for the name of your new well and its RKB. It then assigns it a default job number that you can change

Add Survey- Opens the Survey creation dialogue

Save Slot Info- Saves the information of the currently selected slot into the main database









Add/Edit Target- Brings up the **Target Editor**

Set Structure Reference- Set the selected Slot as the reference slot (i.e., with “0,0” local coordinates) for the Structure.

Define Definitive Survey- Opens the **Definitive Well Form**, which can be used to define the well path from the surface to the end of the well path. In the process of drilling a well it can be drilled in various sections. The first part could have been drilled down to say, 10000 feet and then a decision was made to plug it back to 8000 feet and drill in another direction. Then that was drilled to 11000 feet and then a decision was made to plug it back to 10000 feet and drill to 12000 feet in a different direction. So, we have 3 paths, but only one definitive well. To select that path all the user needs to do is define

which path is on the bottom and the program will calculate a path to bring it to the surface. There is only one path that will do that. That is the definitive path.

Right-click on “PROPOSAL” 

-  Save Winserve1.Say file
-  Import Winserve.say file
-  Import Ascii File
-  Add Jobs
-  Set up Casing Profile
-  Add/Modify Lithology
-  Add Torque and Drag
-  Make Primary Proposal

Save Winserve1.Say File- Save the wellpath survey data in a .SAY text file format to import to Winserve1

Import Winserve1.Say File- Import a single curve .SAY text file from Winserve1 and save the data in the selected wellpath

Import ASCII File- Import a single curve ASCII format text file from Winserve1 and save the data in the selected wellpath

Add Jobs- Opens **Add or Modify Job Information** form to add a new job number and assign it to the wellpath

Set up Casing Profile- Open **Casing Profile Form** to create or edit and assign a casing profile for the wellpath

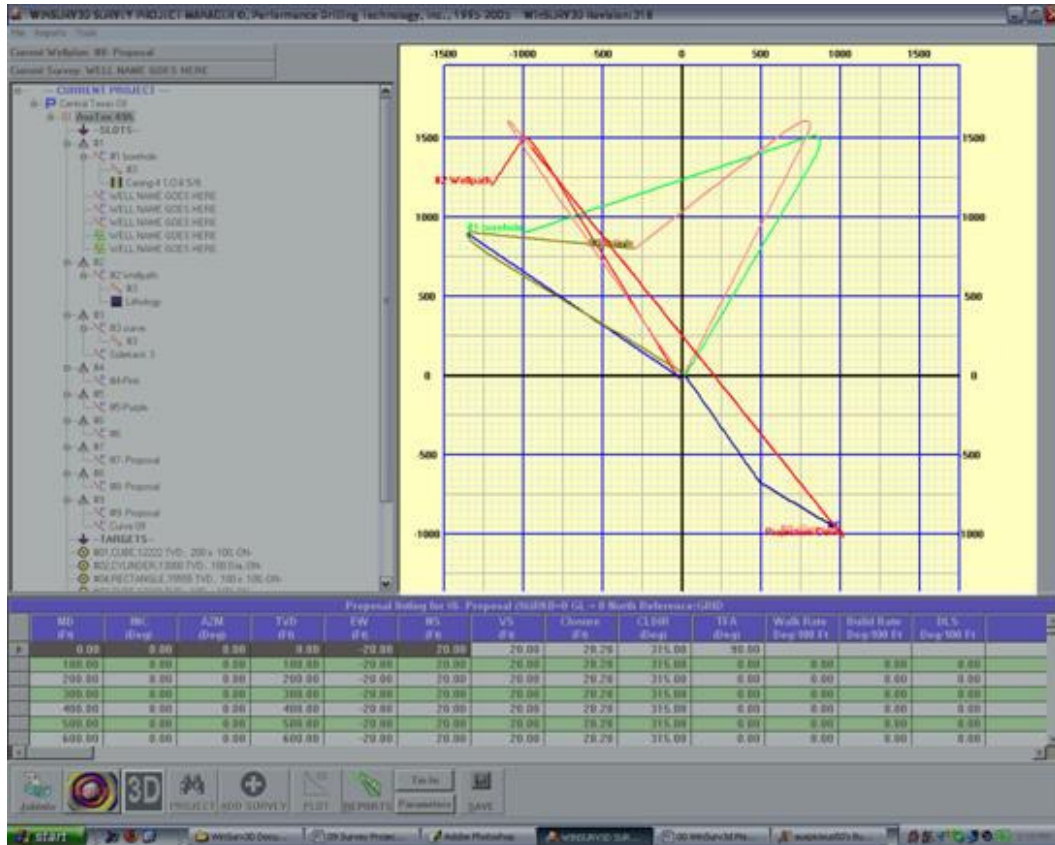
Add/Modify Lithology- Open **Wellpath Lithology Form** to create or edit a table of Lithology depths and descriptions and assign to the wellpath

Add Torque and Drag- Open **Torque and Drag** module to perform a T&D calculation and assign it to the wellpath

Make Primary Proposal- Tag the wellpath as the Primary Proposal for that Slot. This makes it the default proposal for plotting and rendering in the [3D Well Planner](#)

9.5 Survey Project Manager Graph Display

The graph display is a simple overview of your current project. It shows one or all of your proposals from the top-down in an auto-scaled graph.



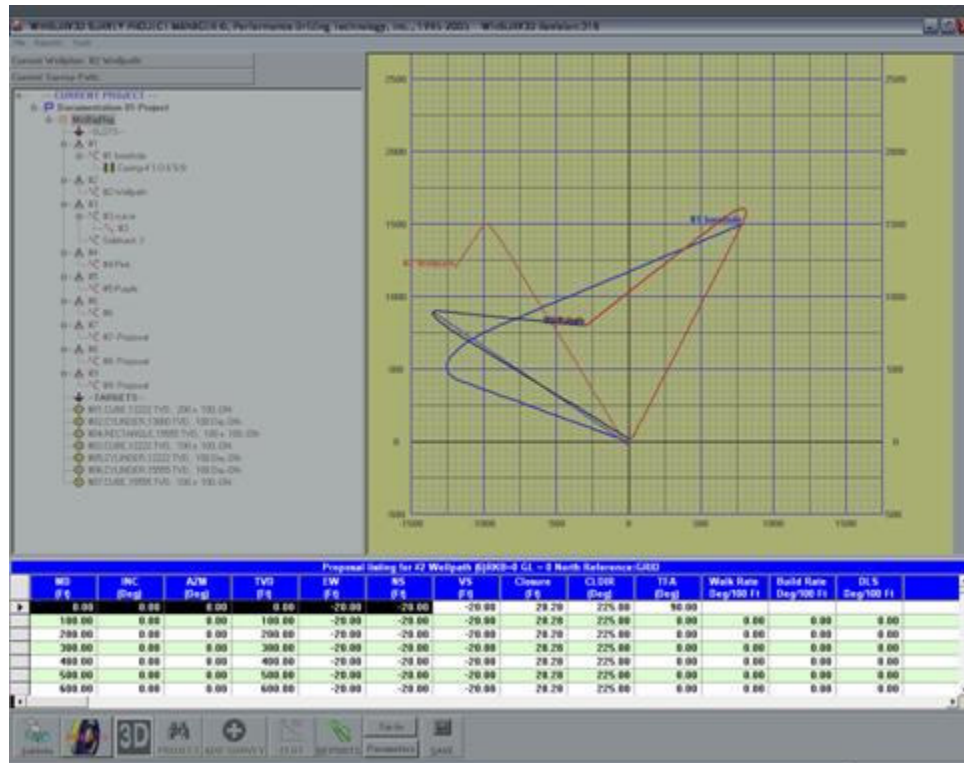
Using the graph display:

- Left-clicking on the graph makes a hand tool that allows you to drag it around for a full view
- Clicking on a Structure in the Tree Window will display all proposals associated with that structure
- Clicking on proposal curve in the Tree Window will display that single curve in the Graph Display

9.6 Survey Window

Survey List in Project Manager

Just as in the Database Manager, by selecting any proposal in the database tree window on the left, the bottom window will be activated and relevant survey data will be displayed there.



This listing is the most extensive in WinSurv3D. Using the scrollbars to navigate the myriad fields.

You can edit any field in any survey by simply clicking in the field and typing

SURVEY LIST FIELDS SUMMARY- All these fields define a survey in each column.

MD- Measured Depth

INC- Inclination

AZM- Azimuth

TVD- True Vertical Depth

EW- East West Coordinate (East is positive and West is negative)

NS- North-South coordinate (North is positive and South is negative)

VS- Vertical Section – The projection of a TVD,EW,NS coordinate on to a plane oriented perpendicular to the viewer. VS is a useful tool for displaying a 3D wellpath on a 2D page. If a well has a lot of turn VS is not very useful

Closure- $\text{=sqr (EW*EW + NS*NS)}$ or the distance from the surface location to the coordinated

CLDIR- = $\text{atan2}(\text{EW}, \text{NS})$ - or the Azimuth direction from the surface to the coordinate

TFA- Tool face Alignment, also often referred to as TFO –Tool Face Orientation. This is a mathematical calculation that roughly speaking, defines the angle of the steering wheel you would have to have to begin a turn to the next survey station. As you approach the next survey the values goes towards zero, always

Walk Rate- Turn rate per 100 feet or turn rate per 30 meters. Change in azimuth. Can be positive or negative

Build Rate- Build rate per 100 feet or Build rate per 30 meters. Change in inclination. Can be positive or negative

DLS- Dog-Leg Severity—A more useful method for calculating turn and build in a 3D space. It requires length, a beginning Inclination and Azimuth and an Ending Inclination and Azimuth

Comment- User's comment on survey

Survey Type- A mnemonic code used to define the survey tool used to measure the inclination and the azimuth. This is used to look up parameters that define the general accuracy of the measurement tool Those parameters are used in the uncertainty calculations

PHI- Angle of rotation of the ellipsoid of uncertainty

elAxEW- EW axis length of the ellipsoid of uncertainty

elAxNS- NS axis length of the ellipsoid of uncertainty

PHI Z - Angle of tilt of the ellipsoid of uncertainty

elCEW- EW coordinate of the center point of the ellipsoid of uncertainty

elCNS- NS coordinate of the center point of the ellipsoid of uncertainty

el-UP- Vertical height from the center point of the ellipsoid of uncertainty

el- DownLeg- the component of uncertainty of an ellipsoid in the direction the well is being drilled

Easting- EW coordinate in Grid coordinates. Value is generally positive and large, since it is a measurement of distance from distance references, such as the equator

Northing- NS coordinate in Grid coordinates. Value is generally positive and large, since is a measurement of distance from distance references , such as the equator



RIGHT-LEFT- Meters or feet to the left or right of a proposal. This is useful for easily explaining where one is in reference to a proposed path

Up-down- Same as above, but instead it is used for how may meters above or below one is

10. 10 Magnetics

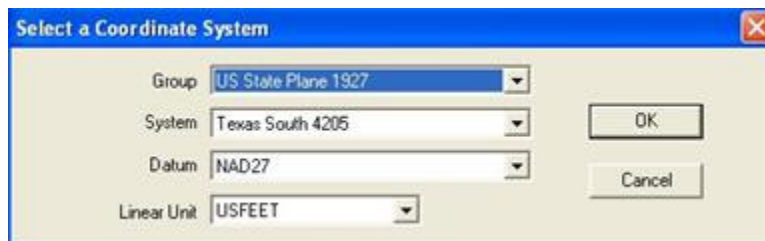
10.1 Field Geodetic Coordinate Definition Form

There are three ways to get to the **Field Definition Form**:


- Click the GEODETIC  icon at the upper left of the screen to open the Field Definition Form.
- Click on the GEODETICS button, Step 4 of the [Job Wizard](#)
- ☐ If you are adding a new Field manually, click on  Field Geodetics within the **Field Information** panel in the center of the [Database Manager](#).



STEP-BY-STEP: The first step in the form is to SET PRIMARY GEODETIC COORDINATE SYSTEM (click within the title box).




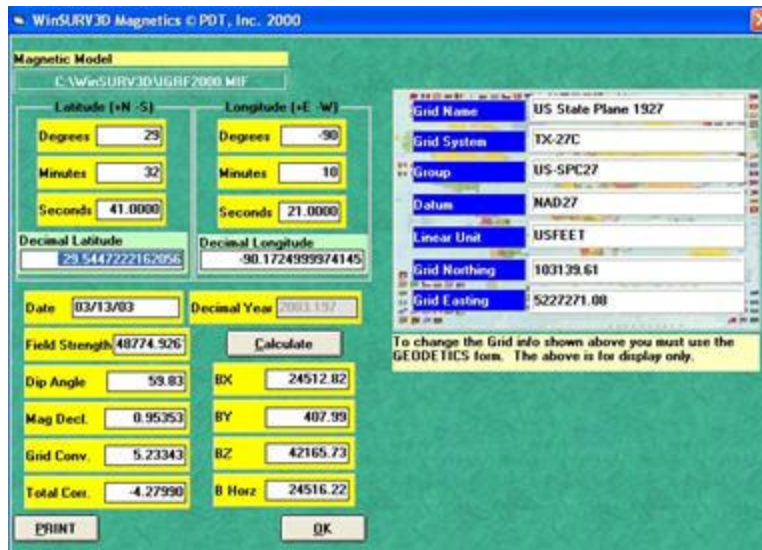
1. The dialog box shown above pops up. Working from the top, choose the GROUP from the pull-down list (click the arrow).
2. Then choose the SYSTEM (which is a linked list dependent on the Group). The DATUM and LINEAR UNIT defaults based on the Group choice are displayed. Get specific information from client company geologists or drilling engineers.

- (NOTE: be aware of the choice between **FEET** and **USFEET** for Linear Units, you will get different results for each).
3. Press OK.
 4. Next enter either X,Y,Z geodetic coordinates or Latitude and Longitude (check the appropriate radio button according to your preference). Whichever you enter, the other set of numbers will be calculated automatically. Lats and Longs are entered in Deg/Min/Sec format (TAB between the boxes) and then displayed in decimal form.
 5. Click the  to close the form and save your changes.

10.2 Magnetic Information

There are two ways to get to the **Magnetics** screen in WinSurv3D:


- Click the “magnet” icon  at the upper left of the screen to access the WinSURV3D **Magnetics** calculation independently.
- Or press the GEOMAG button, Step 5 of the [Job Wizard](#).



As mentioned above, as part of the **Job Wizard** the calculation of magnetic info is done automatically based on the field coordinate data entered. Confirm this by checking the Lat/Long values at the upper left.

The IGRF2000 MIF is used for the calculation, and the default date is the day you open the module. If you need to know the magnetic info for a different location or date, enter the numbers and press CALCULATE.

NOTE: When entering Lat/Long numbers, be sure to tab through all three Deg/Min/Sec to confirm the Decimal representation update, or you will not get a new calculation

- Press PRINT to pull up a print preview of a report, which includes a dynamic north arrow.
- Press OK or  to close the form and save your changes.

11. 11 WinSurv3D Online

11.1 Updating WinSurv3D

Updating WinSurv3D is a relatively simple process that requires an internet connection. The file that is required for download is usually right under 6 megabytes.

UPDATING

1. Go to the WinSurv homepage, <http://www.winsurv.com>, and you should see a screen that looks like this:



2. Look for the “Support/Download” link at the bottom of the left-hand menu list. Click on it
3. The Support/Download screen will load. Look for the update file download link, which is the SEVENTH row down. The link itself will read “WinSurv3D Patch (Version xxx -...” and go into a brief description of the most recent changes to the application.

you will want to copy them to either a CD via a CD burner or to a ZIP drive.

Support
If you have any problem with the downloads please [contact us](#) and we will sort out the problem.

PRODUCT PATCHES	Requirements
WinServe Survey Version 2005.01.27 (New MMS Export and DIMMS Export Requires download of TOOLTYPE.MDB, Added support for IGRF 2005.2010 Magnetics)	(Need User Name and Password)
ACCESS TOOLTYPE.MDB for 2005.01.01 and later (Copy this into your Winserve\Access directory)	(Need User Name and Password)
IGRF2005.2010 Magnetics File for Declination (Copy this into your Winserve\Access directory)	(Need User Name and Password. For use with Winserve 2005.01.01 and later; Also, Winsurv3D 306 and later)
World Wide Model 2005.2010 Magnetics File for Declination (Copy this into your Winserve\Access directory)	(Need User Name and Password. For use with Winserve 2005.01.01 and later; Also, Winsurv3D 306 and later)
Winsurv2 Executable + Patch - (Version 307 - Drillpost Update Added)	(Need User Name and Password)
Winsurv2 Executable Patch - (Version 308 Drillpost Update Added, Hydraulics Report Fix, Delete Days Glitch repaired)	(Need User Name and Password)
WinSurv3D Patch (Version 317a Glitch fixes for 317 - (Text box interface complete for Plotting... Ctrl-V paste will paste Excel Columns to Text box in importer, Grid North, True North and Improved Magnetics Report, GREAT NEW Paragraph Maker in Plot!)	(Need User Name and Password)
Winserve State Plane Database Includes all US states and territories	(Need User Name and Password)
TorqueandDrag DLL	(Need User Name and Password)
TorqueandDrag Executable Revision 21	(Need User Name and Password)
MISC.APIGID32.dll for Winsurv3D 292 - Save to Windows\System32 or Winnt\System32 directory directory.	
PRODUCT INSTALLS	Requirements
WinServe Office and WinServe Field Full Install	(Need User Name and Password)
WinSURV2 Full Install	(Need User Name and Password)
WinSURV COMPANION Full Install 09/13/2004 Unzip and Install	(Need User Name and Password)
WINSURV2.PDTMAST DATABASE	(Before saving, Use Winsurv2 to your current data, un on the HARD DRIVE using the BACKUP

4. You will be prompted to type in a user name and password that should have. Type it in and begin downloading
5. Once you have the new survey3d.exe file, replace the old one. It is located in the WinSurv3D root directory. If you have not changed it from the default, it should be c:\WinSurv3D. Drop the new file in and start the program.

11.2 WWW.WINSURV.COM

The WinSurv3D homepage (<http://www.winsurv.com>) contains all information about Performance Drilling Technologies products and consultation services.

DRILLPOST

One of the innovative new online services available through Performance Drilling Technologies is Drillpost. Drillpost offers an all-encompassing service to customers who wish to centralize to their job performance data and job related financial information on a server that is accessible from anywhere in the world via a secure connection on the internet. Customers' clients (the oil companies) are given administrative rights to their data so that they can upload and download data generated by Winserve or Winsurv3D. They can also grant limited access to the data for their customers so that the customers can keep track of the latest reports from the field.

For more information on the Drillpost service, see <http://www.winsurv.com/drillpost.htm>.