# EZY-NAV V1.2 USER MANUAL

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# 2 INSTALLATION

1. Ensure that you have administrator privileges on the computer on which you are installing Ezy-Nav before you attempt to install the program. Download the EZY-NAV software from this link: https://www.imdex.com/getmedia/9a219143-7332-419f-adb5-046e672a05b6/ezynav.zip
2. Follow the on screen prompts to complete the installation. If a serial number is requested for the install please use ***EZN-00G7-FF37*** after you put in your company name.
3. When the installation has completed run Ezy-Nav by double clicking on the Desktop icon "Ezy-Nav" or Clicking on "Start -> All Programs -> 2iC Australia -> Ezy-Nav –> Ezy-Nav".
4. The program will now require activation. See chapter "3 Activation" on page 5 for how to activate Ezy-Nav.

# 3 ACTIVATION

Activation of Ezy-Nav is a two stage process. After installation of the program you must first request an activation code from 2iC Australia using the function provided by the program and then when 2iC Australia responds with the activation key you will need to activate the program with it again using the function provided by the program. When you request an activation key a unique site code is generated that is combined with the serial number and your company name. This information is used by 2iC Australia to verify that payment has been received and to generate a unique activation key that will only activate the copy of Ezy-Nav from which you generated the request.

When Ezy-Nav runs for the first time or its activation has run out the screen below will be shown (*Figure 1: Ezy-Nav requires activation popup*). Click on the "Get Activation Key" to start the process of requesting an activation key. See section 3.1 "Get Activation Key*"* for instructions to complete the process. Payment must be received before an activation key will be issued to you. 2iC will respond to the request by sending you an activation key using the same medium by which you made the request. When you have received the activation key click on the "Enter Activation Key" button (*Figure 1: Ezy-Nav requires activation popup*) to start the process of activating the program with the key. See section *3.2 "Enter Activation Key"* for instructions on completing this process.

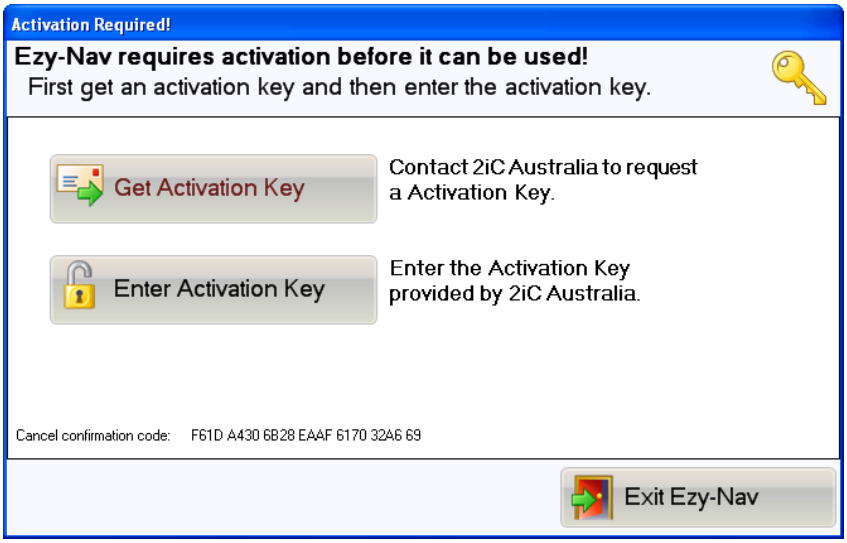


Figure 1: Ezy-Nav requires activation popup

## 3.1 GET ACTIVATION KEY

From the "Activation Required" popup (Figure 1: Ezy-Nav requires activation popup) click on the "Get Activation Key" button.

The program will now display a popup that prompts you for your identification details (Figure 2: Enter identification details popup). These will include your company name and the serial number of your copy of the program. If you have an installation CD then the serial number will be located on it. If you don't have an installation CD then the serial number will have been provided to you by some other means. Enter your

company name and serial number in the appropriate fields and click on the “Next” button when done. If you have activated the program before and the correct details are already in the fields then just click on “Next”.

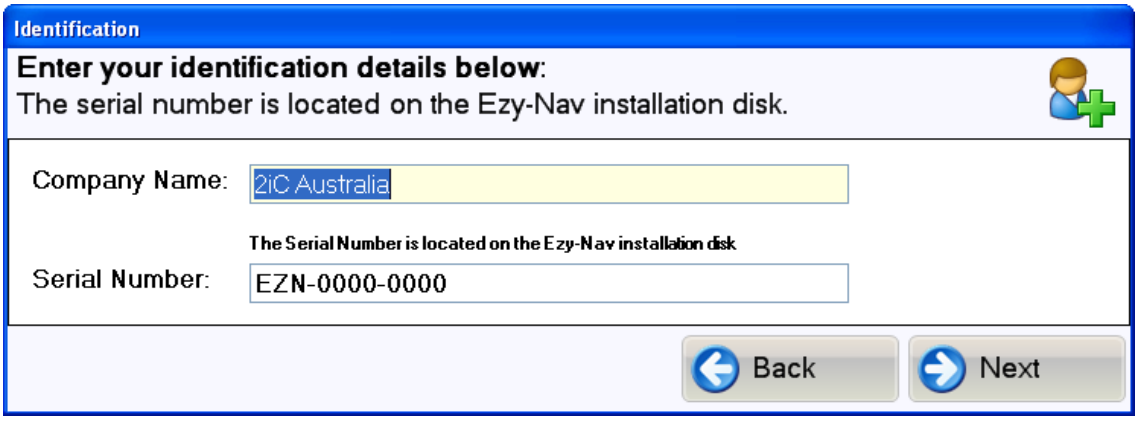


Figure 2: Enter identification details popup

A popup will now be displayed that requires you to select the method you would like to use to request an activation key (Figure 3: Select activation request method). The options are:

- Email: This method will automatically generate an email using your usual email program. To use this method you will have to be connected to the internet. This is the preferred method.
- Fax: This method will generate a document that you can print or save as a PDF. A fax number will be provided for where to send the fax.
- Phone: This method will provide you with the phone number to call in order to obtain an activation key from our operator. This service will only be available between 8:30am and 5:00pm Western Australia time.

Select the method you wish to use by clicking on the options text and clicking “Next” when done.

Depending on your selection see the following sections for instructions on completing the selected request:

- Email: 3.1.1 Email Request
- Fax: 3.1.2 Fax Request
- Phone: 3.1.3 Phone Request

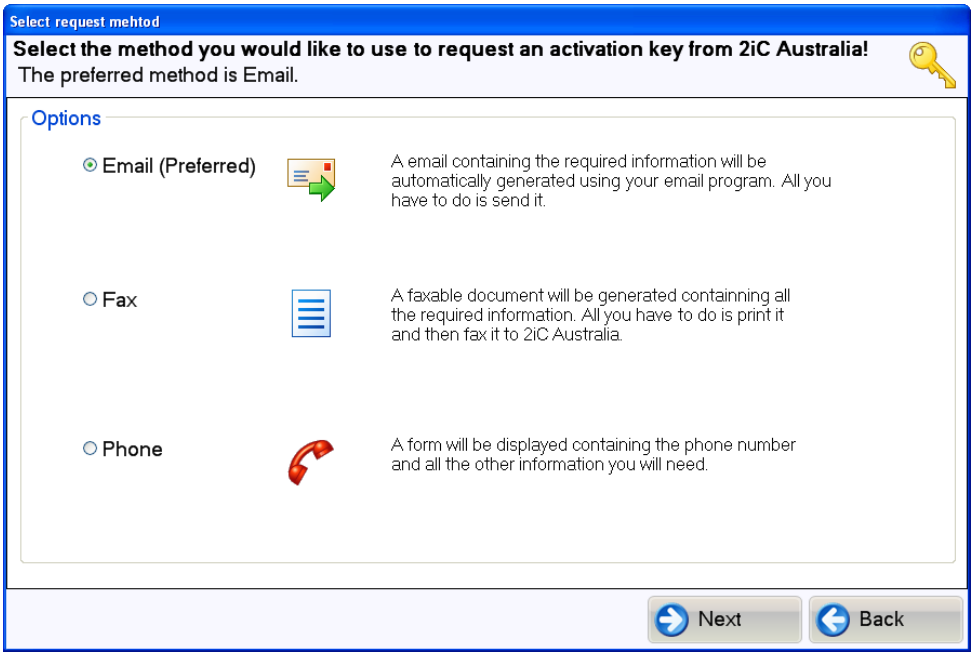


Figure 3: Select activation request method

### 3.1.1 EMAIL REQUEST

If you selected “Email” as the request method (see section 3.1 “Get Activation Key”) the program will automatically generate an email using your email program (Figure 4: Automatically generated email). This email contains all the required information. All you have to do is send this email as you would normally send an email (usually by clicking the “Send” button.

The program will also display the following popup screen (Figure 5: Email request popup). It contains the same information that is included in the email. If the email was not automatically generated you could manually copy the information into an email and send it. Click on the “Finished” button when the email has been sent. The activation key will be sent back to you via an email.

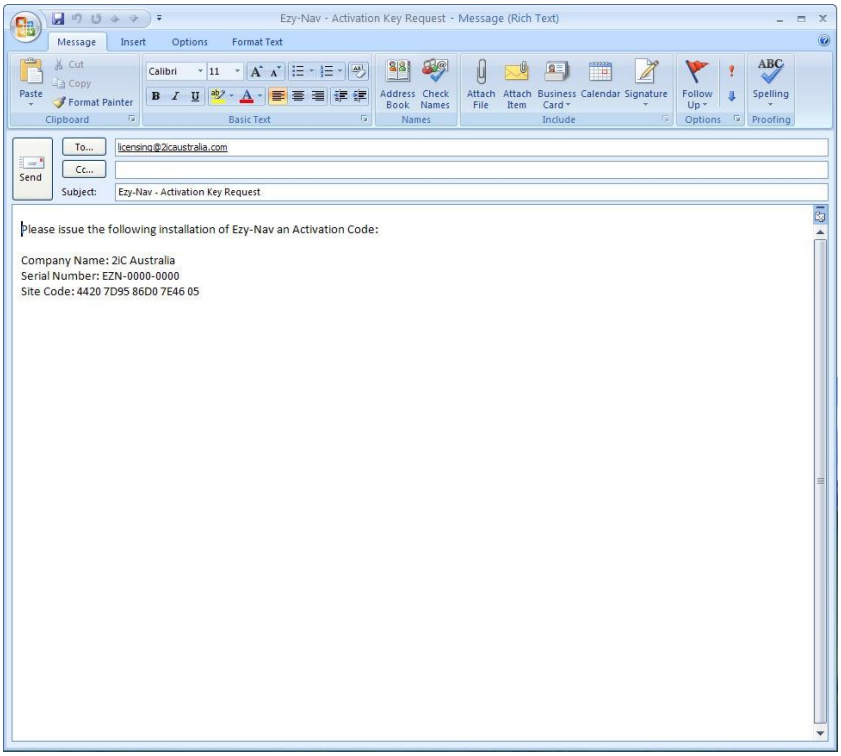


Figure 4: Automatically generated email

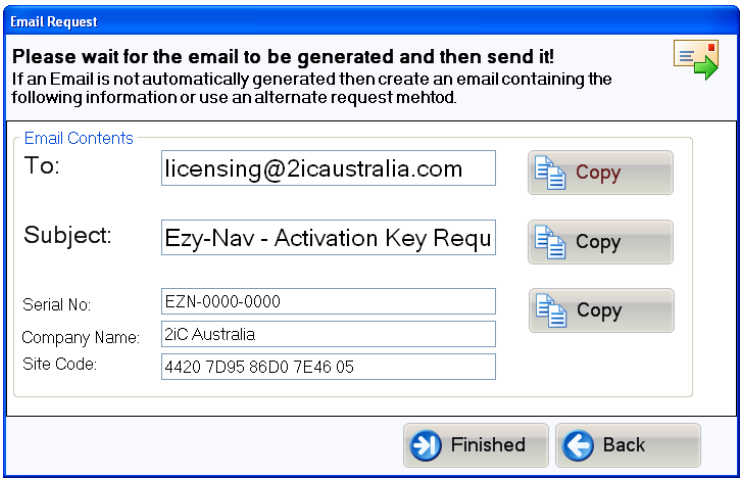


Figure 5: Email request popup

### 3.1.2 FAX REQUEST

If you selected “Fax” as the request method then (see section 3.1 “Get Activation Key”) the program will display a popup prompting for you to enter some identification details (Figure 6: User entered field’s popup). These will be included in the fax document that is generated. The field “From” is your name and will be used to address the fax that contains the activation details back to you. The field “Fax Number” is the fax number that the replying fax will be sent to.

Enter the required fields and click on the “Next” button when done.

The program will now display a preview of the generated fax along with the fax number to send it too (Figure 7: Fax request preview popup). You can either print the fax by clicking the “Print” button or save it to a PDF document by clicking the “Save PDF” button. See section 3.1.2.1 “Save PDF” for instructions on saving a PDF of the report and section 3.1.2.2 “Print” for instructions on printing the report.

When you have saved or printed the fax and sent it to the number provided click on the “Finish” button. The activation key will be sent back to you via a fax.

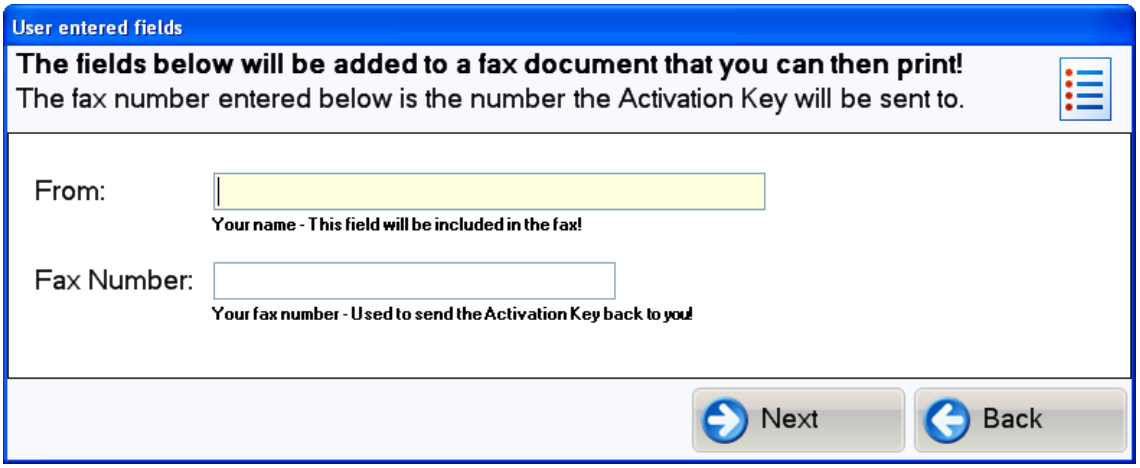


Figure 6: User entered field’s popup


Figure 7: Fax request preview popup

#### 3.1.2.1 SAVE PDF

If you clicked on the "Save PDF" button (see section 3.1.2 "Fax Request") a file saving popup will be displayed (Figure 8: Save PDF popup). Enter the filename you wish to save the file as in the "File Name" field and select the location you wish to save the file in using the file browser. Click on the "Save" button to save the file or "Cancel" to close the popup without saving a PDF.

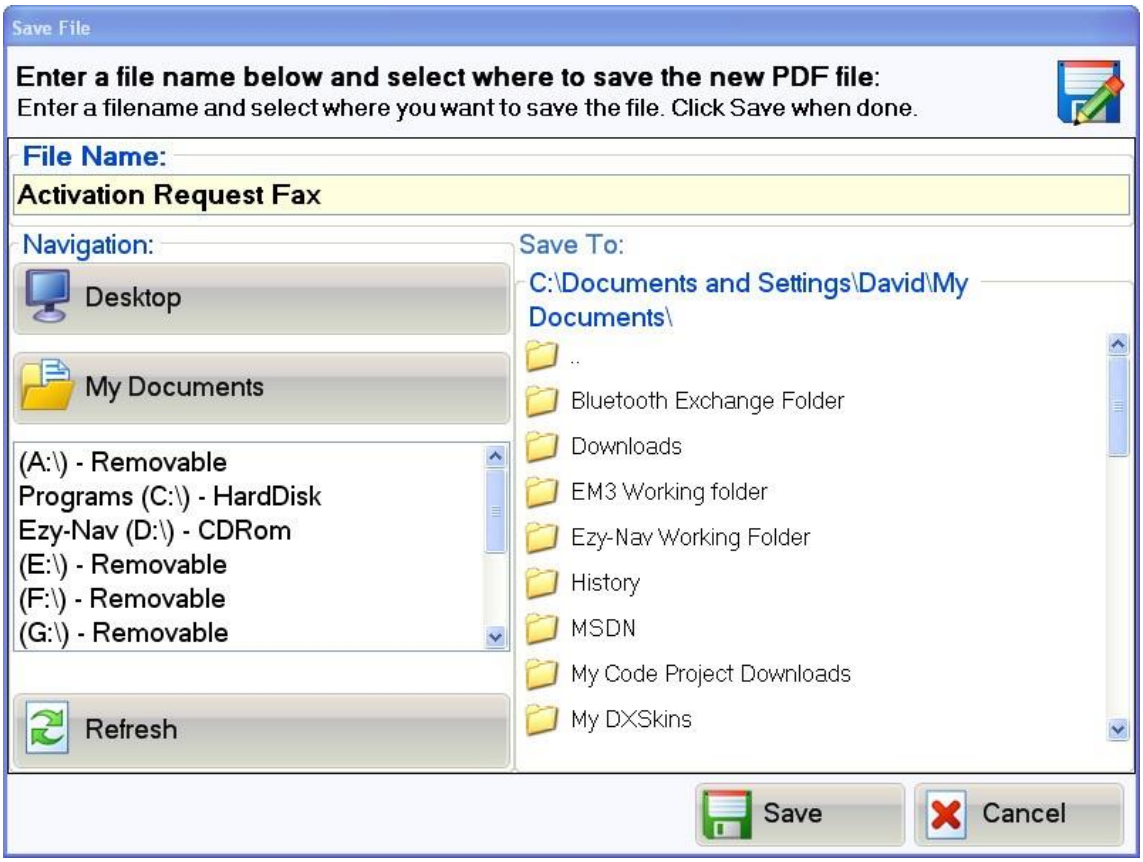


Figure 8: Save PDF popup

#### 3.1.2.2 PRINT

If you clicked on the "Print" button (see section 3.1.2 "Fax Request") then a standard print dialog will be displayed (Figure 9: Print popup). Use this dialog to select and configure the appropriate printer and click the "OK" button to print the fax to the selected printer. When the fax has been printed you can then send it to the fax number provided.

Note: If you have access to a Multi function centre or printer that can send a fax then you can print directly to the fax.

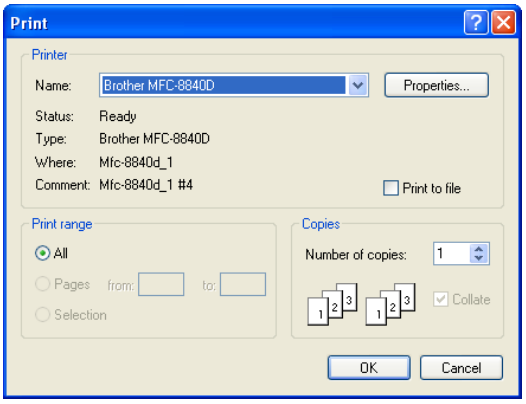


Figure 9: Print popup

### 3.1.3 PHONE REQUEST

If you selected “Phone” as the request method (see section 3.1.2 “Fax Request”) then a popup will be displayed that contains the information required to request an activation key over the phone(Figure 10: Phone request popup). Call the number provided, you will have to provide the operator with the “Identification” details and they will direct you through the activation procedure and provide the activation key at the appropriate step.

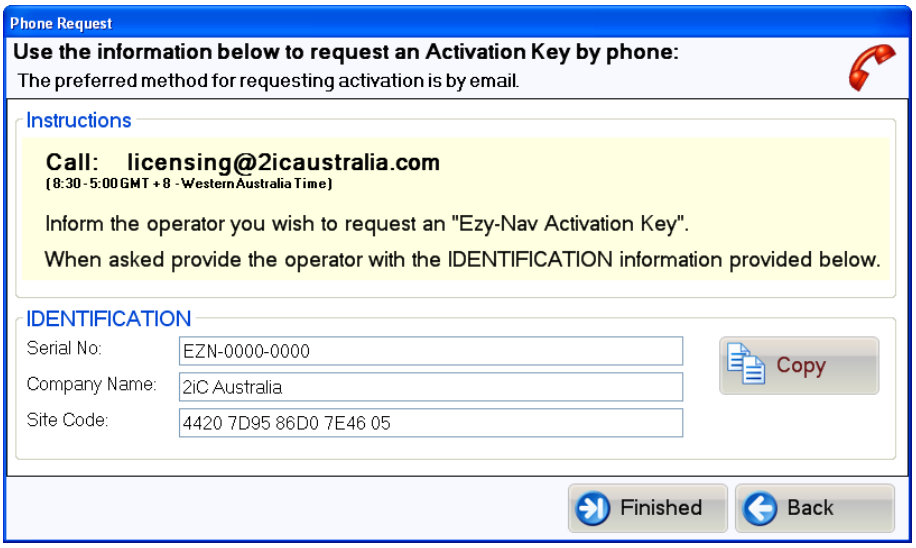


Figure 10: Phone request popup

## 3.2 ENTER ACTIVATION KEY

When you have received your activation key the next step is to activate the program using the key.

From the popup that appears when the program is not activated (Figure 1: Ezy-Nav requires activation popup) click the “Enter Activation Key” button.

The program will now display a popup requesting that you enter you identification details (Figure 11: Enter identification details popup). Confirm that the details entered are correct and click the “Next” button to continue.

A popup will now be displayed that shows the “Site Code” and a blank field under it for entering the “Activation Key” (Figure 12: Enter Activation Key popup). Ignore the “Site Code” field. Enter the “Activation Key” provided to you by 2iC Australia in the “Activation Key” field. You can type it in manually or if the “Activation Key” was emailed to you, you can select the key text in the from the email body right click and select copy. Return to “Ezy-Nav” and click on the “Paste Key” button to paste the copied key text into the “Activation Key” field.

When the “Activation Key” field has been entered click on the “Activate” button to attempt to activate the program with the entered key. If activation is successful the “Welcome” screen (Figure 13: Welcome screen) will be displayed otherwise an error popup will be displayed that explains what the problem is. See section 4 “Welcome” for instructions on using the welcome screen.

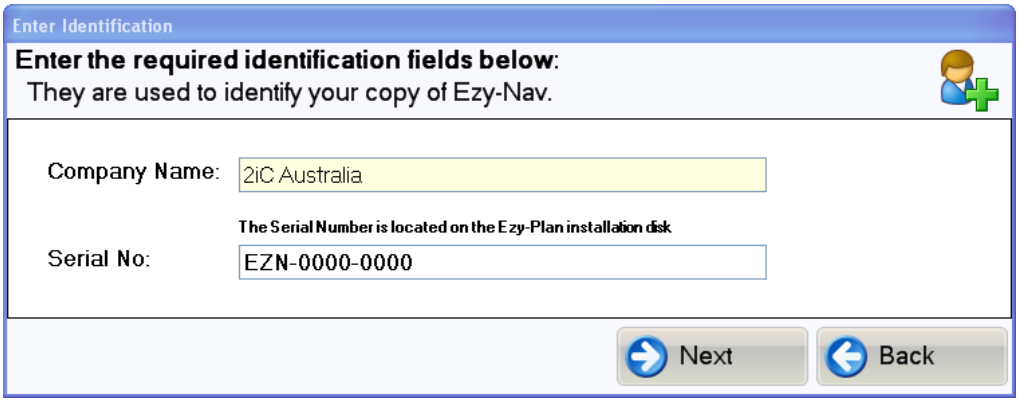


Figure 11: Enter identification details popup

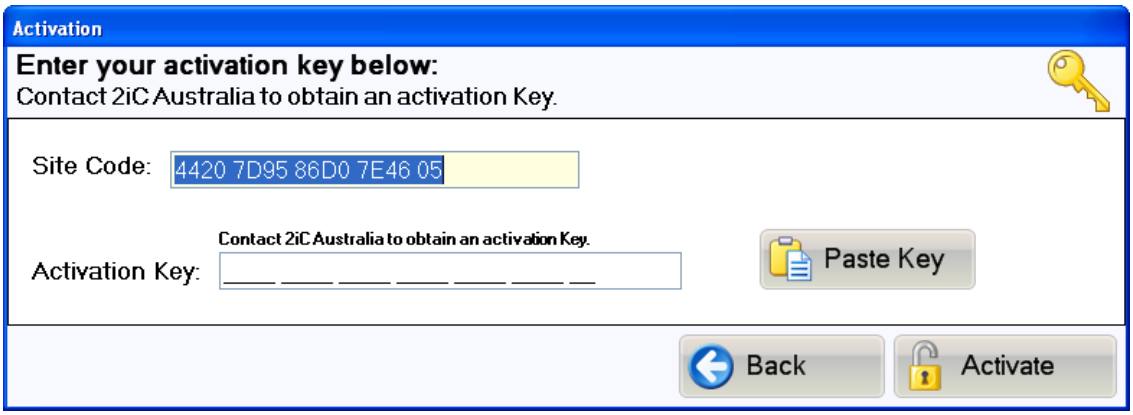


Figure 12: Enter Activation Key popup

# 4 WELCOME

The welcome screen (Figure 14: Welcome screen) is your starting point when you run the program. The buttons down the left hand side of the screen are the functions that you can start from here. Down the right hand side of the screen is a summary of the activation details for your installation of the program. The number of days or runs remaining is displayed under “Activation Status”. The functions that you can start from this screen are as follows:

- Open Existing File: Open an Ezy-Nav hole file that you have previously created. See section 6 “Open Hole File”.
- Open Previous File: This will open the Ezy-Nav hole file that you most recently had open.
- Create New File: This will start the procedure for creating a new Ezy-Nav hole file. See section 5 “Create New Hole File”.
- Hole Management: This will take you to the “Hole Management” screen for the currently open hole file. See section 7 “Hole Management”.
- Activation Management: This will display the Activation Management popup. This is where you can review the programs activation status, request top-up activation and enter top-up activation keys. See section 18 “Activation Management”.
- Close: This will terminate the program.

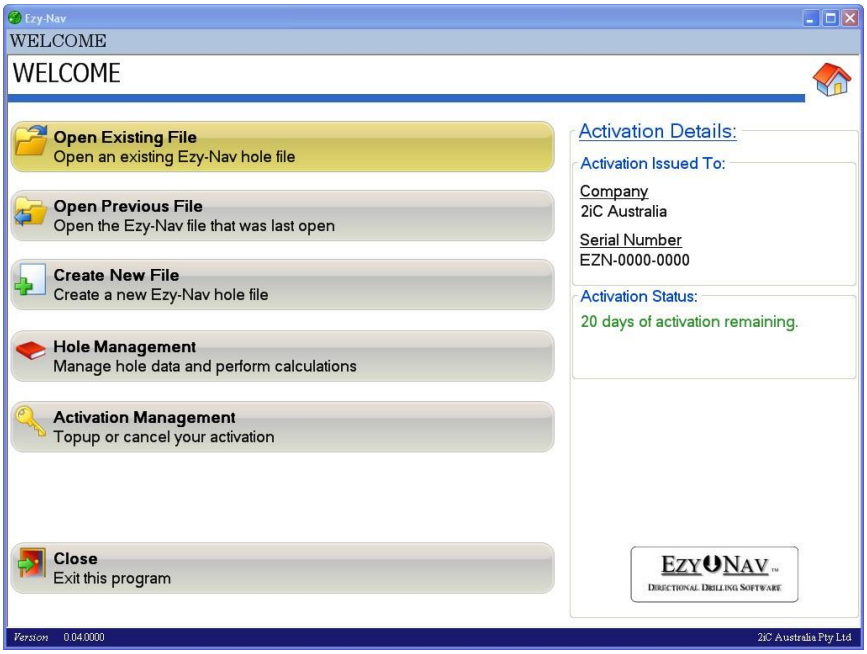


Figure 13: Welcome screen

# 5 CREATE NEW HOLE FILE

The Ezy-Nav hole files contain all the information that Ezy-Nav needs to store for a individual drill hole. The procedure for creating a new Ezy-Nav hole file is started by clicking on the “Create New File” button from the “Welcome” screen (see section 4 “Welcome”).

The procedure starts by displaying a screen requesting the user to enter the following fields (Figure 14: Create new hole - Enter details):

- HoleID: The unique identification code given to the drill hole. This field must be provided.
- RigID: The unique identification code given to the drill rig that is being used to drill the hole. This field must be provided.
- Location: The site that the hole is located. This field is optional.
- Area: The area within the site that the hole is located. This field is optional.
- Drilling Contractor: The company or person responsible for drilling the hole. This field is optional.
- Surveying Contractor: The company or person responsible for surveying the hole. They are the provider of the survey data used by Ezy-Nav. This field is optional.
- Client: If Ezy-Nav is being used on behalf of a client then there name can be entered here. This field is optional.

Click on the “Next” button to continue.

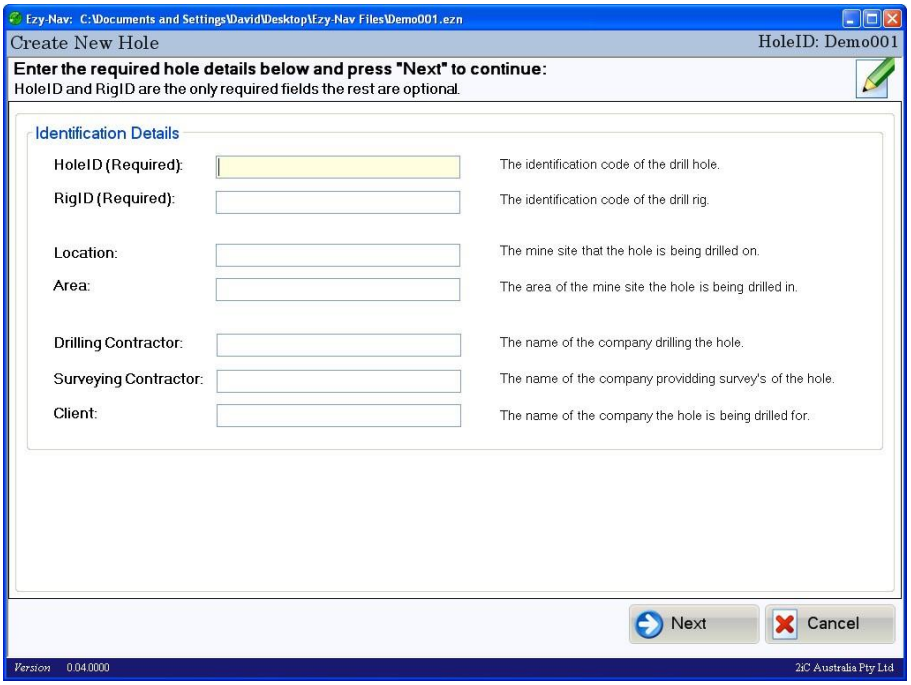


Figure 14: Create new hole - Enter details

A screen requesting the user to enter the Collar and target coordinates will be displayed (Figure 15: Create new hole - Enter Collar and Target). The “Collar Coordinates” require valid Northing and Easting coordinate values in meters. The “Target Coordinates” require valid Northing, Easting and TVD (True Vertical Depth) coordinate values in meters. All the fields must be completed. Click on the “Next” button to continue.

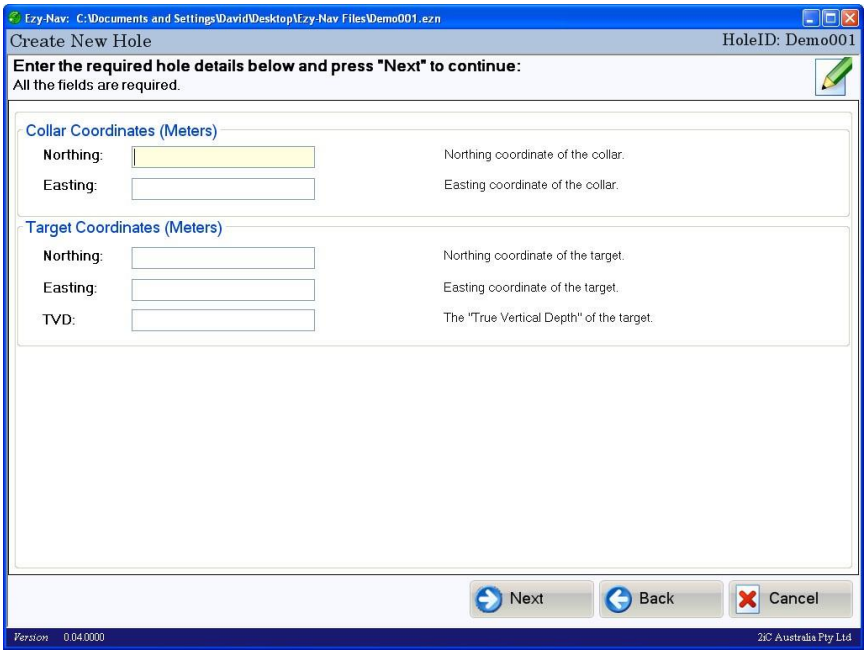


Figure 15: Create new hole - Enter Collar and Target

A screen for saving the new file will be displayed (Figure 16: Create new hole - Save hole file). The HoleID entered previously for the new hole will be displayed in the “File Name” field by default. You can change this value if you wish. Browse to the location you wish to save the file to and click on the “Save” button to save the file. If the save operation was successful the “Hole Management” screen will be displayed for the new hole file (see section 7 “Hole Management”). If the new hole was not successfully saved then an error message popup will display the error that occurred.

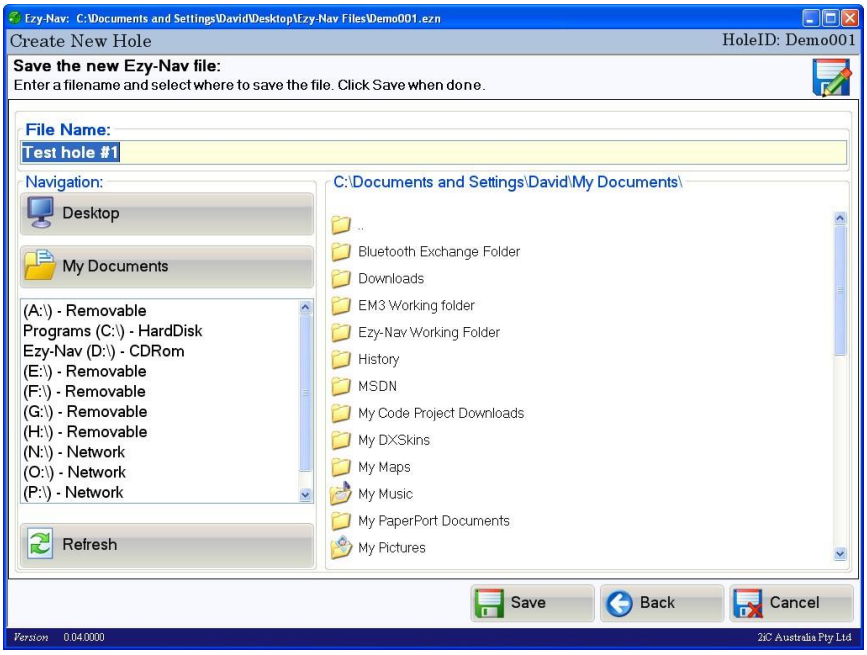


Figure 16: Create new hole - Save hole file

# 6 OPEN HOLE FILE

The procedure for opening the hole file is started by clicking on the “Open Existing File” button from the “Welcome” screen (see section 4 “Welcome”).

A screen will be displayed for browsing to and selecting the Ezy-Nav file you want to open (Figure 17: Open hole file). Ezy-Nav files will have the radar screen icon on the file extension “.ezn”. Browse to and select the Ezy-Nav file that you want to open and either double click on it or click the “Open” button to open the file. If the file is successfully opened then the “Hole Management” screen will be displayed for the opened hole file (see section 7 “Hole Management”). If the file is not opened then an error message popup will display the error that occurred.

The opened file’s name will be displayed on the right hand side of the header and the file path will be displayed in the window title for every screen in the program.

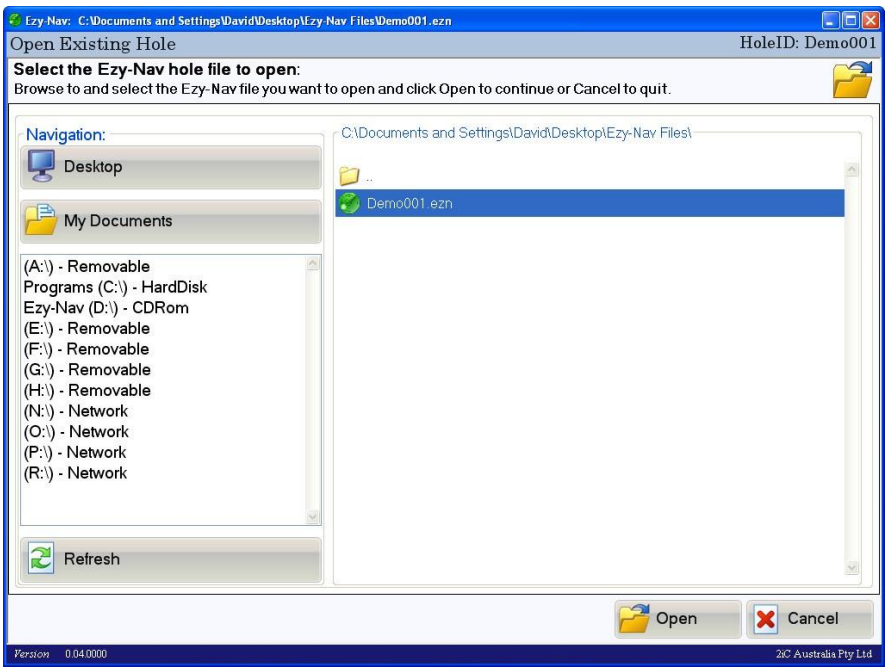


Figure 17: Open hole file

# 7 HOLE MANAGEMENT

The “Hole Management” screen displays the hole identification details, collar and target for the currently open hole file (Figure 18: Hole Management screen with mother hole plan). It also displays a chart showing the hole plan and any survey data that has been entered or imported for the hole. The buttons on the left of the screen when clicked will start the following functions:

- Back: Returns you to the “Welcome” screen. See section 4 “Welcome”.
- Edit Details: Starts the procedure for editing the hole, collar and target information. See section 11 “Edit Details”.
- Edit Survey Data: Shows the screen used for viewing, entering and modifying the survey data. See section 9 “Edit Survey Data”.
- Import Survey Data: Shows the screen used for importing survey data from a CSV file. See section 8 “Import Survey Data”.
- Hole Navigation: Displays the screen used for analysing the path of the hole and performing the navigation functions. See section 12 “Hole Navigation”.

When a daughter hole has been loaded the chart will display the daughter hole plan (Figure 19: Hole Management screen with daughter hole plan). The daughter hole plan displays the collar, target, sidetrack survey and straight path plan from the sidetrack survey to the target.

Click on the button to start the appropriate procedure.

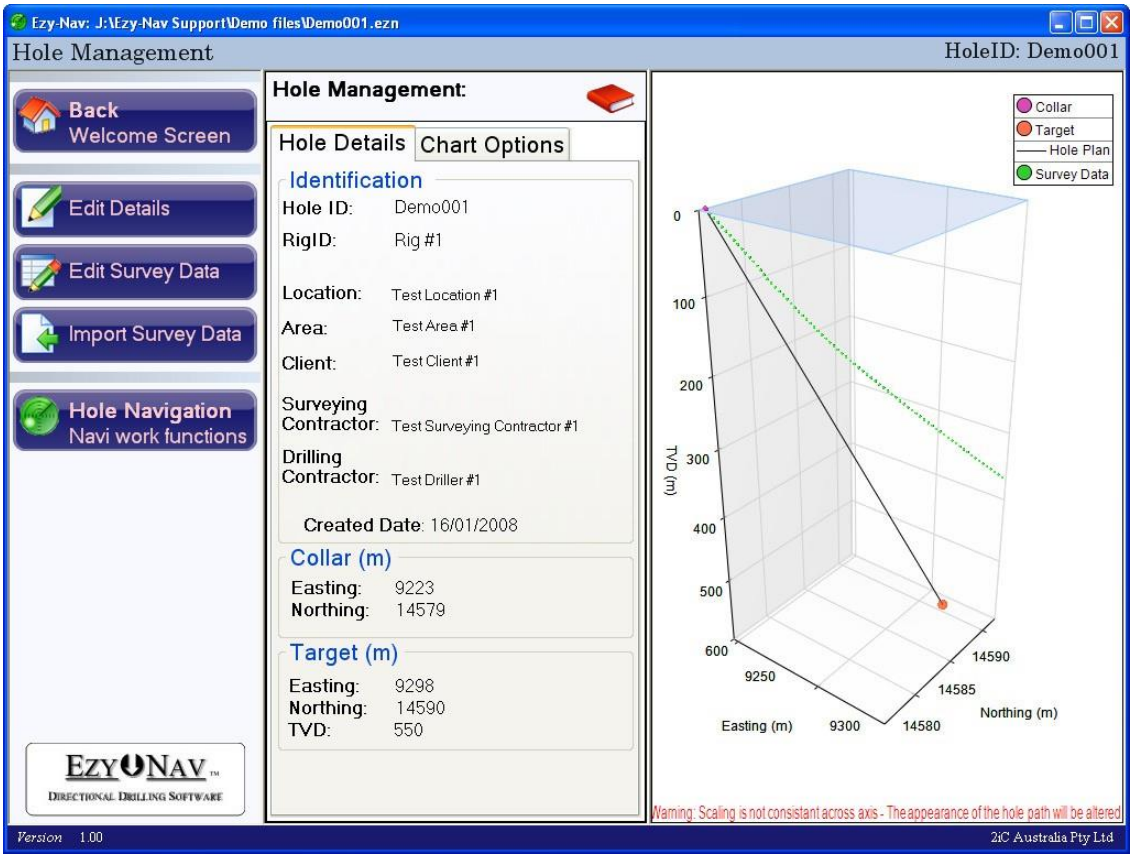


Figure 18: Hole Management screen with mother hole plan

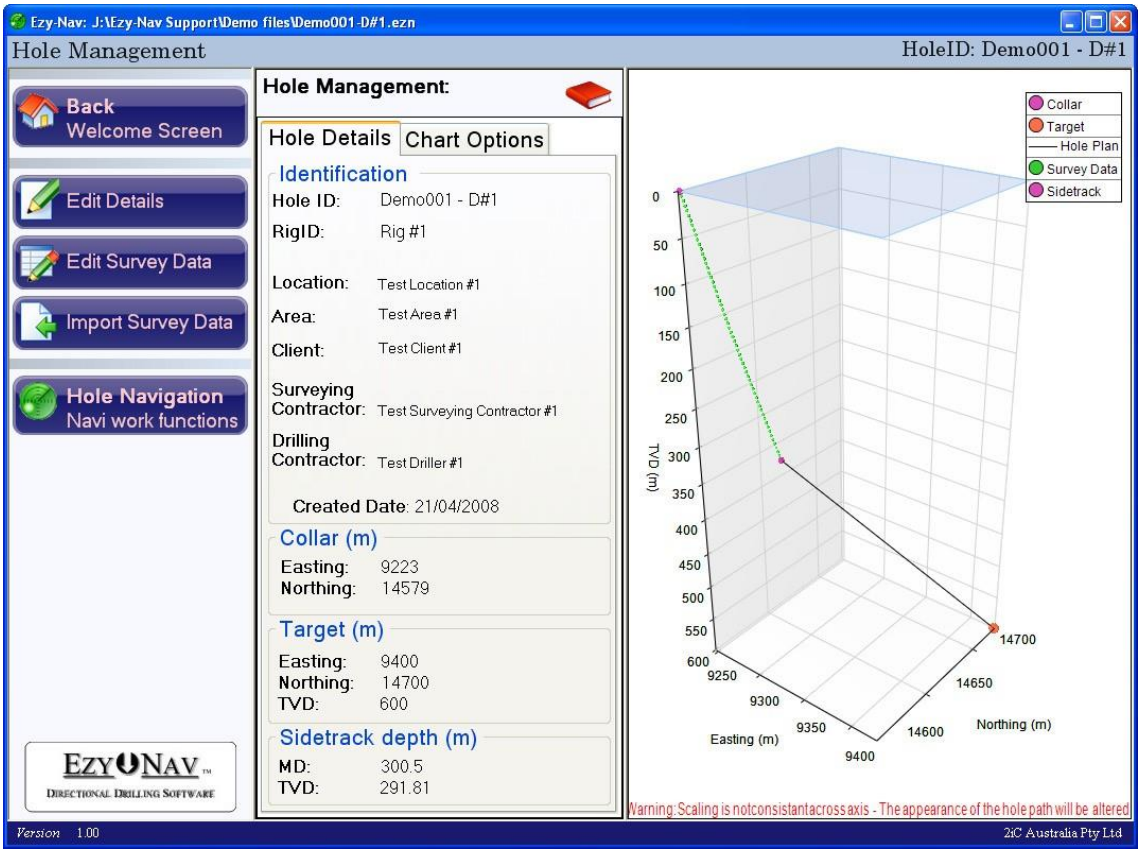


Figure 19: Hole Management screen with daughter hole plan

# 8 IMPORT SURVEY DATA

Survey data can be imported into the program from a Comma Separated Values (CSV) file. CSV is the file format that is typically used by bore hole surveyors' to provide the results of a bore hole survey to their client. The CSV file will contain the MD (Measured Depth), Dip (Inclination) and Azimuth (Direction). Ezy-Nav will import these values from the CSV file.

The survey data must conform to the requirements specified in section 10 "Survey Data Requirements".

To start the procedure for importing survey data click on the "Import Survey Data" button from the "Hole Management" screen (see section 7 "Hole Management").

## 8.1 SELECT CSV FILE

The "Import Survey Data" procedure starts by displaying a screen for browsing to and selecting the CSV file to import the survey data from (Figure 20: Import survey data - Select CSV file). Browse to the CSV file and either double click on it or click on the "Next" button to open the file and continue.

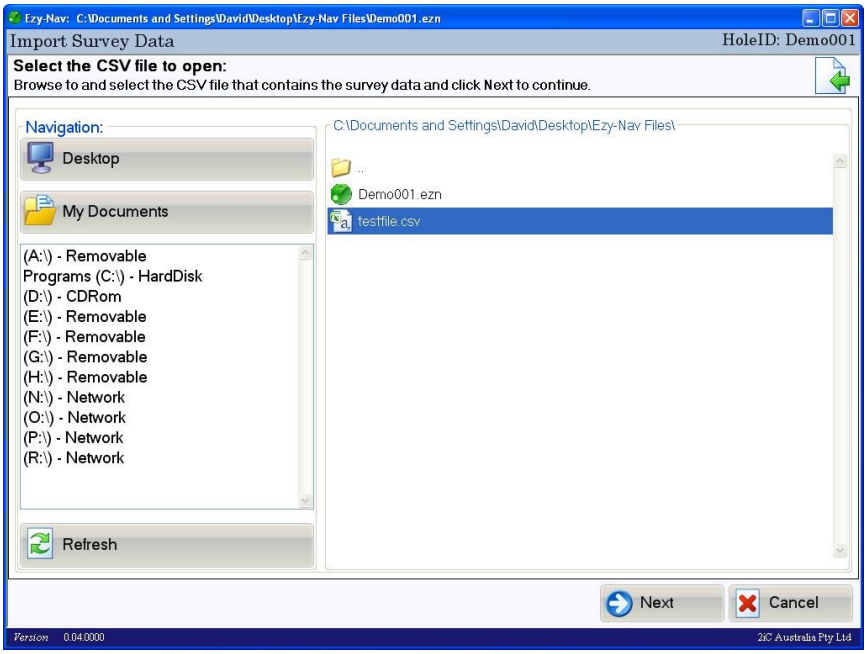


Figure 20: Import survey data - Select CSV file

The program will now display a screen for selecting the mapping to use when importing the survey data from the CSV file you have selected (Figure 21: Import survey data - Select import map). The screen displays a list of available maps under "Select Import Map" and the survey data from the CSV file under "CSV Data".

The import map tells the program which columns in the CSV file contain the MD, Dip and Azimuth values. The titles above each column indicate the field that will be imported from that column. The selected columns are also displayed in blue.

The standard map is selected by default. The standard import map takes the MD from column 1, Dip from column 2 and Azimuth from column 3. The other columns are not required and are ignored. The standard map

also removes the header text that is in the CSV. This is indicated by the red colour of the first row. If your CSV file does not match the format of the standard map then you will have to create a custom import map for the format of your CSV file. See section 8.1.1 “Add New Map” for instructions on creating a new map. Custom import maps can also be deleted, see section 8.1.2 “Delete Map” for instructions on deleting a map.

When you have selected the import map that matches the format of your CSV file then click the “Next” button. If the survey data is successfully imported it will be displayed. If an error occurs a popup will be displayed that details the error that occurred.

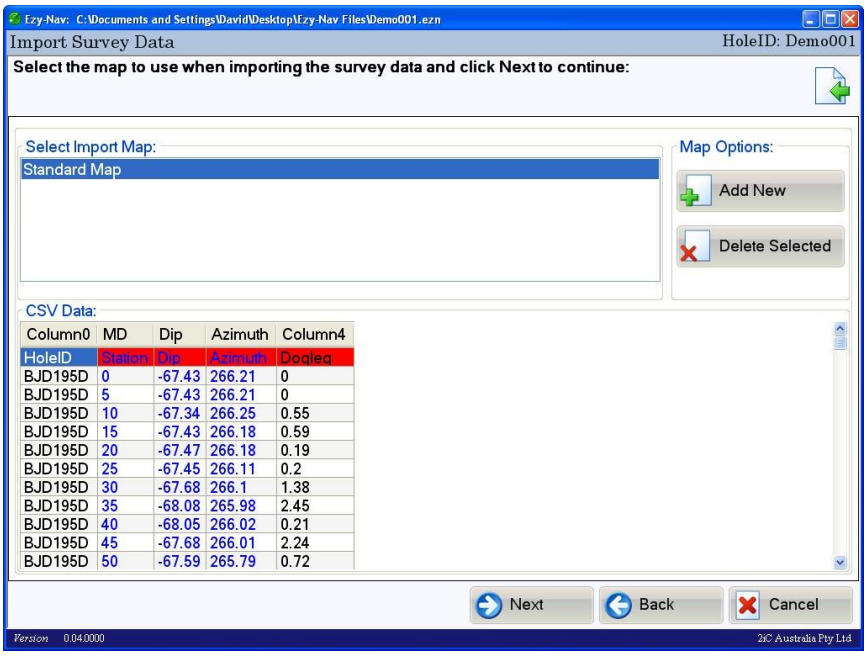


Figure 21: Import survey data - Select import map

The program will now show a screen that displays the survey data (Figure 22: Import survey data - Review and save). The table will display the MD, Dip and Azimuth values that were imported as well as the TVD, Northing, Easting and DL values which are calculated by the program. You can review the imported data make any necessary changes and click on the “Save” button when done. The program will now return to the “Hole Management” screen (see section 7 “Hole Management”). The imported survey data will be displayed on the 3D chart along with the hole plan.

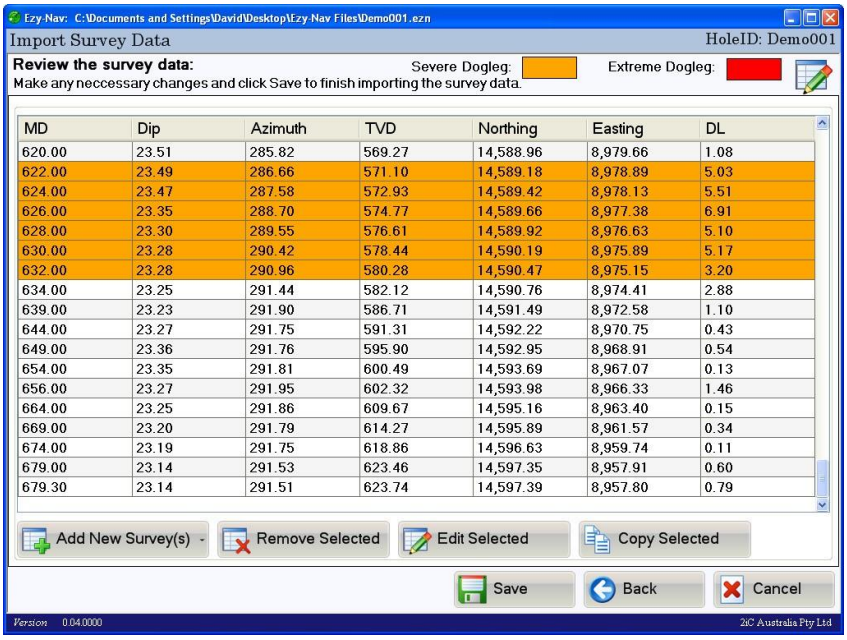


Figure 22: Import survey data - Review and save

### 8.1.1 ADD NEW MAP

To add a new import map click on the “Add New” button under “Map Options” on the “Select Map” screen (see section 8 “Import Survey Data”). The program will now display the screen for creating a new import map (Figure 23: Import survey data - Create new import map).

Firstly enter a name for the map under “Name”. This is the name that will be displayed in the list of maps on the map selection screen (Figure 21: Import survey data - Select import map). Secondly under “Mapping” is a list of the fields that Ezy-Nav requires. Under “Survey Data” is the data from the CSV file that the new map is being created for. Drag and drop each field from the list onto the column of the CSV file that contains the relevant data. Do this by first placing the mouse over the relevant field in the list and pressing and holding down the left mouse button. Now “drag” the field by moving the mouse (without releasing the button) down and over the column in the CSV that contains the matching data. Now release the left mouse button. This will “drop” the field onto the column. As you can see in “Figure 23: Import survey data - Create new import map” the MD field has already been dragged onto column 1.

Thirdly, if the CSV contains header text (text in the first row that identifies the contents of the column) it must be removed. To remove the header text, place a tick in the “CSV has header text” box by clicking on it. This will highlight the first row red to indicate that the row will not be imported. As you can see in “Figure 24: Import survey data - Import map created and ready to be saved” the header text will not be imported.

When you are done click the “Save” button to save the newly created import map to your import map list. The import map can now be selected from the “Select Import Map” list.

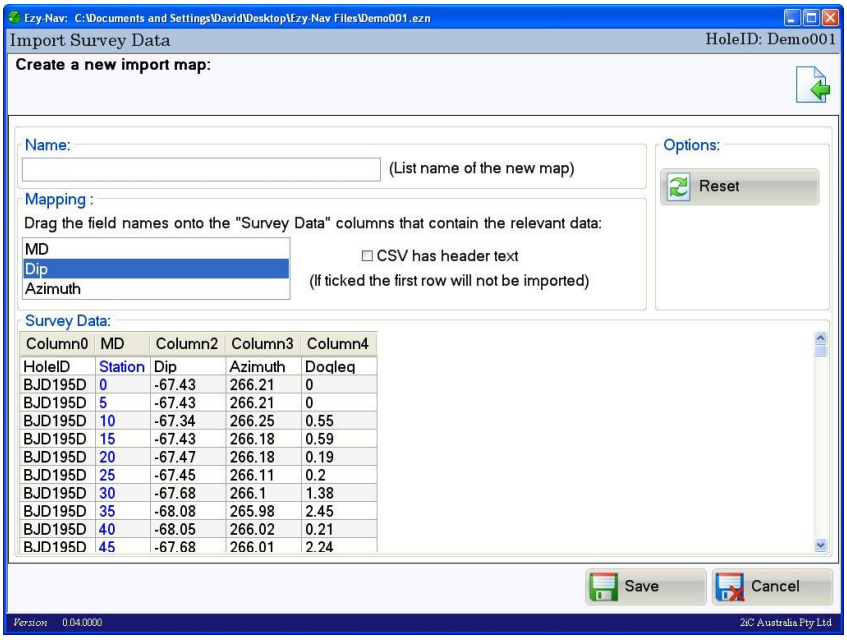


Figure 23: Import survey data - Create new import map

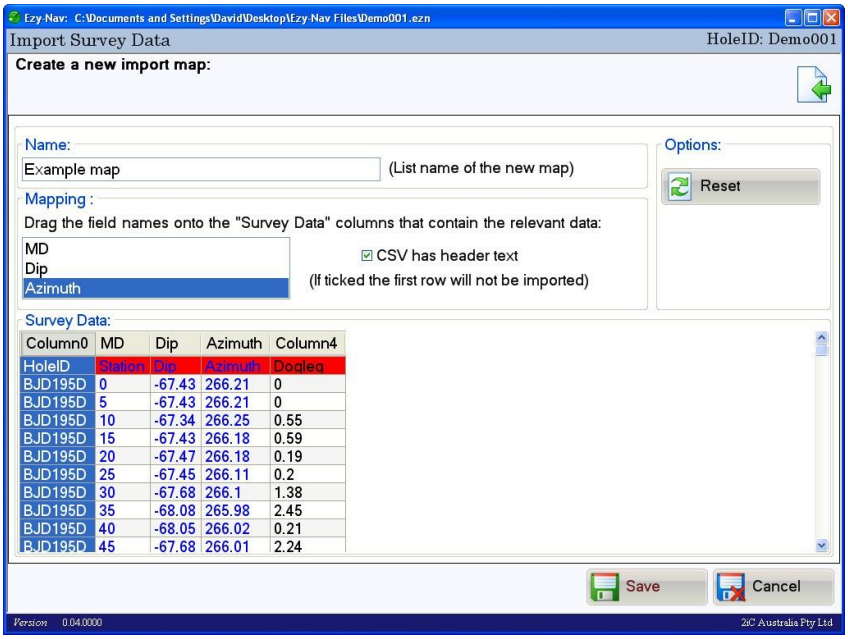


Figure 24: Import survey data - Import map created and ready to be saved

### 8.1.2 DELETE MAP

To delete an import map simply select the map from the list on the “Select Map” screen (Figure 21: Import survey data - Select import map) and click the “Delete Selected” button. This will permanently delete the map from the list and remember there is no undo function.

# 9 EDIT SURVEY DATA

The “Edit Survey Data” screen is where the survey data can be viewed, entered, and edited. To display the screen, click on the “Edit Survey Data” button from the “Hole Management” screen (see section 7 “Hole Management”).

The screen as seen in “Figure 26: Edit survey data screen before changes are made” will be displayed. The surveys are colour coded based on their dogleg values to make the identification of surveys with higher doglegs easier. The colour coding is general and is not to be used to determine what can and can’t be achieved by your equipment.

From the “Edit Survey Data” screen you can perform the following functions:

- Add New Survey(s): Add new surveys to the list. See section 9.1 “Add New”.
- Edit Selected: Edit the selected survey. See section 9.2 “Edit Selected”.
- Remove Selected: Delete the selected surveys from the list. See section 9.3 “Remove Selected”.
- Copy Selected: Copy the selected surveys to the clipboard. See section 9.4 “Copy Selected (copy to clipboard)”.

The survey data entered must conform to the requirements specified in section 10 “Survey Data Requirements”.

The above functions can be accessed by either clicking on the buttons at the bottom of the screen or by right clicking on the survey data table which will cause a popup menu to appear. The functions can be selected from this menu.

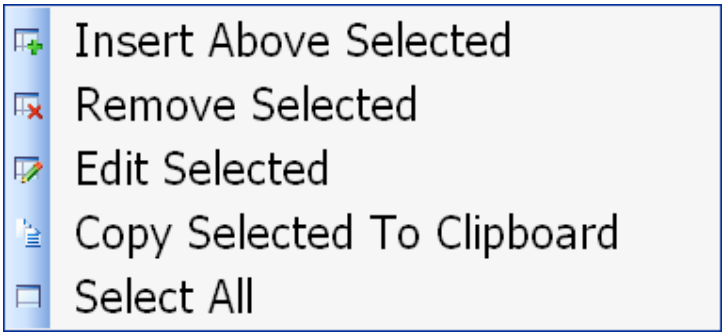


Figure 25: Survey data right click popup menu

The “Edit Survey Data” screen starts with just a “Cancel” button in the bottom right hand corner (Figure 26: Edit survey data screen before changes are made). After a modification is made to the data a “Save” button will appear (Figure 27: Edit survey data screen after changes are made). When you have made the changes to the survey data that you desire, click on the “Save” button to make the changes permanent. You can avoid saving the changes by clicking the “Cancel” button.

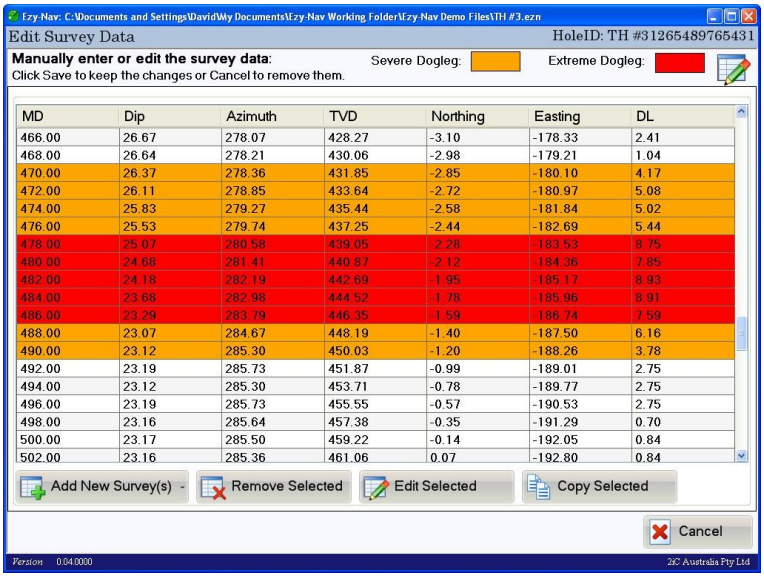


Figure 26: Edit survey data screen before changes are made

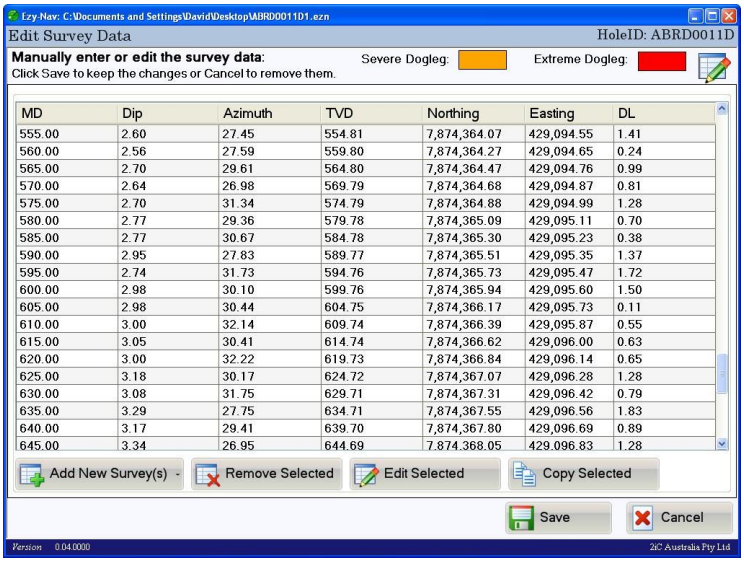


Figure 27: Edit survey data screen after changes are made

## 9.1 ADD NEW

To add a new survey click on the “Add New Survey(s)” button from the “Edit Survey Data” screen (see section 9 “Edit Survey Data”). The default action is to append new surveys to the end of the list. See section 9.1.1 “Append” for instructions on appending new surveys to the list.

You can also insert surveys above a selected survey by selecting the survey to insert above, clicking on the drop down part of the “Add New Survey(s)” button (Figure 28: Add New Survey button with dropdown split) and selecting “Insert Above Selected” from the popup menu that appears (Figure 29: Add New Survey dropdown menu). The drop down part of the button is on the right hand side of the button and is marked with a downward pointing arrow. See section 9.1.2 “Insert Above Selected” for instructions on inserting surveys.


Figure 28: Add New Survey button with dropdown split

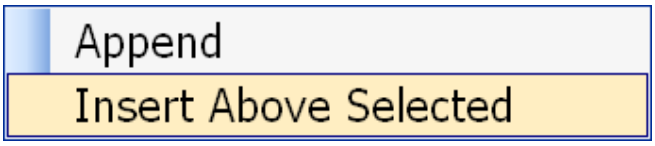


Figure 29: Add New Survey dropdown menu

### 9.1.1 APPEND

After clicking on the “Add New Survey(s)” button form the “Edit Survey Data” screen (see section 9 “Edit Survey Data”) a popup will appear for entering new surveys (Figure 30 Append new survey popup). Enter the fields for a survey. Click on the “Add and enter another” button to append the survey to the end of the list and clear the popup for entering another that will be appened to the end of the list below the survey just added. Click on the “Add and finish” button to add the new survey to the end of the list and close the popup. Click the “Cancel” button to close the popup without attempting to add a new survey.

Conditions:

- MD (Measured Depth) must be greater thatn the MD of the last survey in the list.
- Dip must be either 0 to -90 (mineral standard) or 0 to 90 (oil and gas standard).
- Azimuth must be a valid compass bearing (0-360).

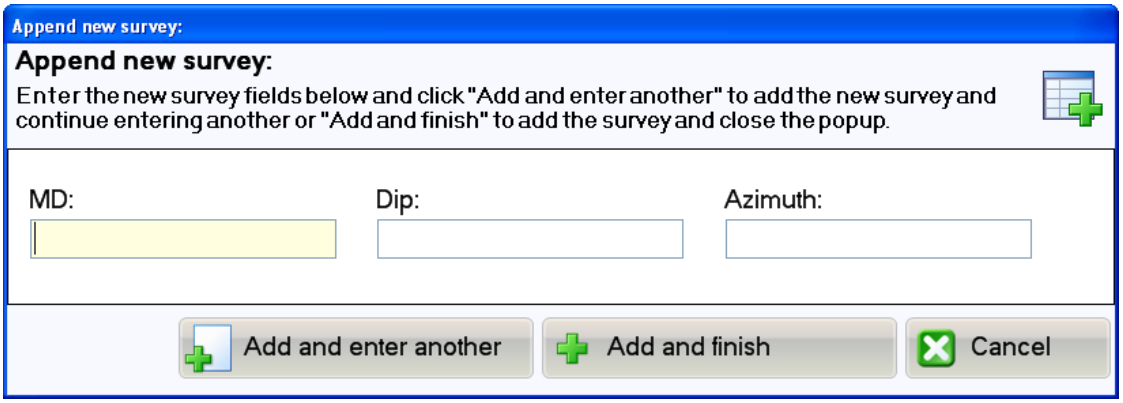


Figure 30 Append new survey popup

### 9.1.2 INSERT ABOVE SELECTED

After clicking on the “Insert Above Selected” button from the “Edit Survey Data” screen (see section 9 “Edit Survey Data”) a popup will appear for entering new surveys (Figure 31: Insert new survey popup). Enter the fields for the survey that is to be inserted above the selected survey.

Click on the “Add and enter another” button to insert the survey and clear the popup for entering another survey that will be inserted above the survey just inserted. Click on the “Add and finish” button to insert the new survey and close the popup. Click the “Cancel” button to close the popup without attempting to insert a new survey.

Conditions:

- MD (Measured Depth) must be greater thatn the MD of the last survey in the list.
- Dip must be either 0 to -90 (mineral standard) or 0 to 90 (oil and gas standard).
- Azimuth must be a valid compass bearing (0-360).

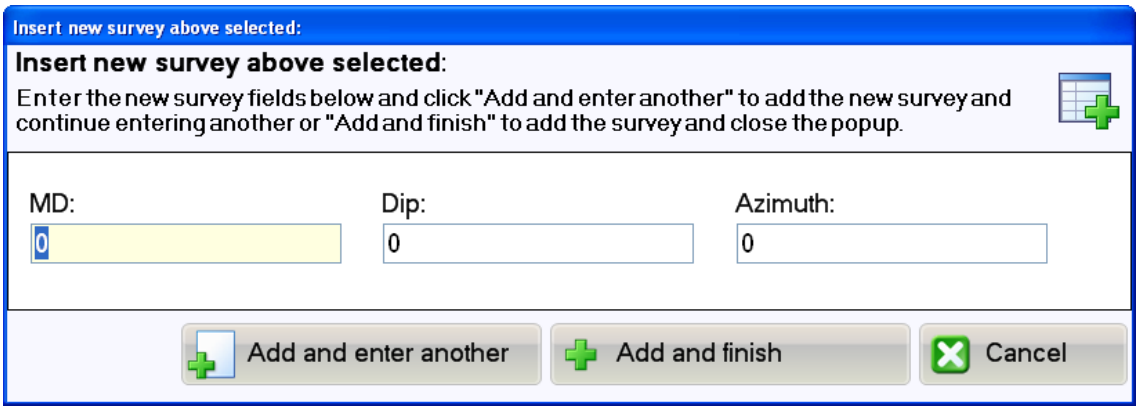


Figure 31: Insert new survey popup

## 9.2 EDIT SELECTED

A survey can be edited by first selecting it from the list of surveys on the “Edit Survey Data” screen (see section 9 “Edit Survey Data”). To select a survey left mouse click on it. Now click on the “Edit Selected” button. A popup will be displayed for editing the selected survey (Figure 32: Edit survey popup). Make the necessary changes to the fields and click he save button to save the changes made or the cancel button to cancel the changes made.

Conditions:

- MD (Measured Depth) must be greater thatn the MD of the last survey in the list.
- Dip must be either 0 to -90 (mineral standard) or 0 to 90 (oil and gas standard).
- Azimuth must be a valid compass bearing (0-360).

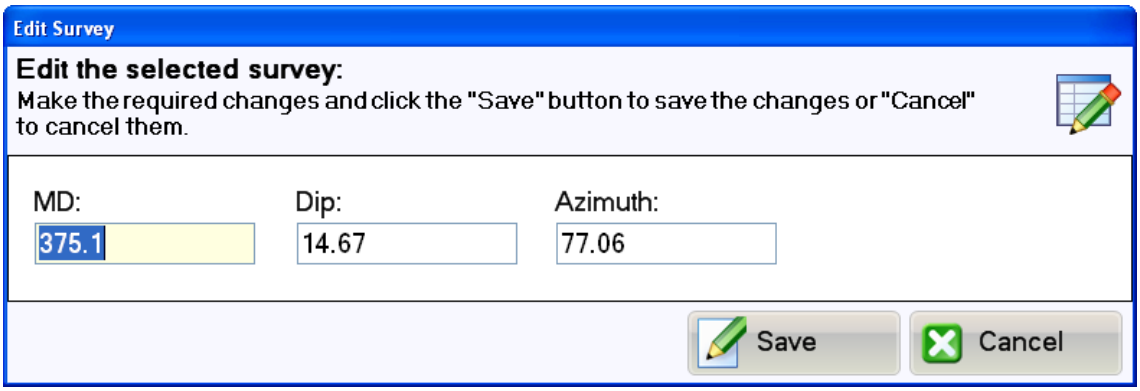


Figure 32: Edit survey popup

## 9.3 REMOVE SELECTED

From the "Edit Survey Data" screen (see section 9 "Edit Survey Data") select the surveys you wish to remove form the list by pressing and holding the left mouse button on the first survey you wish to remove and then dragging the mouse pointer over all the surveys you wish to remove. You will see the surveys being highlighted as you move over them (Figure 33: Edit survey data screen with a range of survey data selected). Release the left mouse button when you have selected all the surveys you want to remove. Now click on the "Remove Selected" button. A popup will appear requesting confirmation. Click "Yes" to remove the survey and "No" to cancel the action.

## 9.4 COPY SELECTED (COPY TO CLIPBOARD)

From the "Edit Survey Data" screen (see section 9 "Edit Survey Data") select the surveys you wish to copy to the clip board from the list of surveys. Do this by pressing and holding the left mouse button on the first survey you wish to copy and then dragging the mouse pointer over all the surveys you wish to remove. You will see the surveys being highlighted as you move over them (Figure 33: Edit survey data screen with a range of survey data selected). Release the left mouse button when you have selected all the surveys you want to copy. Now click on the "Copy Selected" button to copy the surveys to the clipboard.

The copied data can now be pasted into another document like a text document or excel spread sheet for example (Figure 34: Copied survey data pasted into a document).

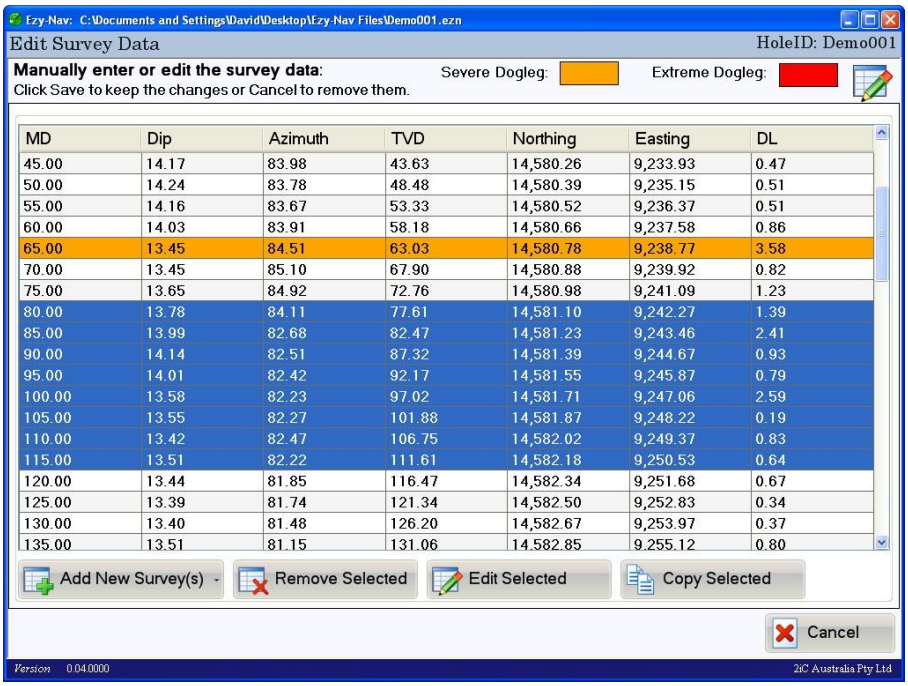


Figure 33: Edit survey data screen with a range of survey data selected

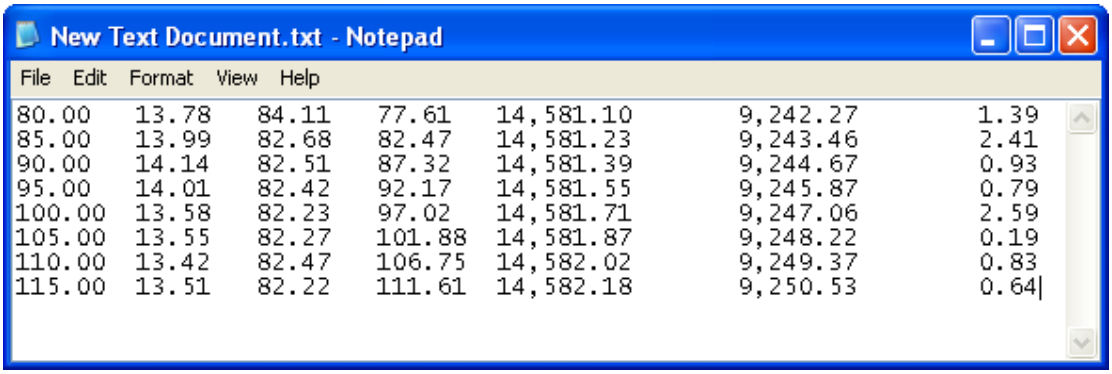


Figure 34: Copied survey data pasted into a document

# 10 SURVEY DATA REQUIREMENTS

The data must conform to the following requirements:

- The measured depth must start at 0 and increase.
- The dip can be in either the Oil and Gas standard or Mineral. The Oil and Gas standard measures dip positively from the vertical to horizontal so that a vertical hole would have a dip of 0 and a horizontal hole would have a dip of 90. The mineral standard measures dip negatively from the horizontal to vertical so that a horizontal hole would be 0 and a vertical hole would be -90. Ezy-Nav displays dip using the oil and gas standard so dip values in the mineral standard will be converted when they are imported.
- The Azimuth values must be relative to gird north. So if a magnetic tool has been used the azimuth values must be converted from magnetic north to grid north.

# 11 EDIT DETAILS

The hole details that are first entered when a Ezy-Nav hole file is created can also be edited at any time. To edit the hole details click on the “Edit Details” button from the “Hole Management” screen (see section 7 Hole Management).

The procedure starts by displaying a screen requesting the user to edit the following fields (Figure 35: Edit hole details - Edit Details screen):

- HoleID: The unique identification code given to the drill hole. This field must be provided.
- RigID: The unique identification code given to the drill rig that is being used to drill the hole. This field must be provided.
- Location: The site that the hole is located. This field is optional.
- Area: The area within the site that the hole is located. This field is optional.
- Drilling Contractor: The company or person responsible for drilling the hole. This field is optional.
- Surveying Contractor: The company or person responsible for surveying the hole. They are the provider of the survey data used by Ezy-Nav. This field is optional.
- Client: If Ezy-Nav is being used on behalf of a client then there name can be entered here. This field is optional.

When you have finished modifying the appropriate fields click on the “Next” button to continue.

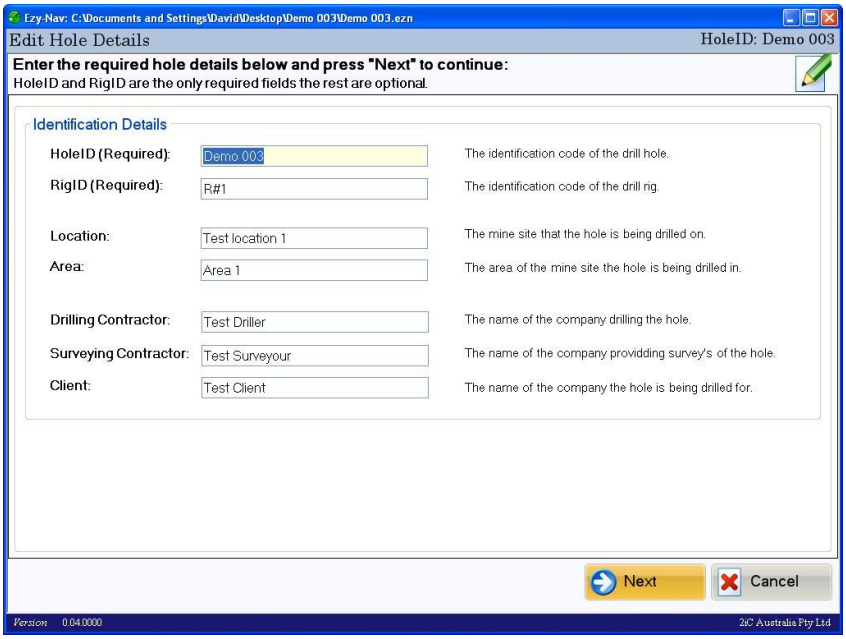


Figure 35: Edit hole details - Edit Details screen

Next a screen requesting the user to edit the Collar and target coordinates will be displayed (Figure 36: Edit hole details - Edit Collar and Target).

The “Collar Coordinates” require valid Northing and Easting coordinate values in metres. The “Target Coordinates” require valid Northing, Easting and TVD (True Vertical Depth) coordinate values in meters.

All the fields must be completed correctly. When all the necessary changes have been made click on the "Save" button to save the changes that have been made "Back" to return to the previous screen and review the fields on that screen or "Cancel" to leave the "Edit Details" procedure without saving the any of the changes you have made to the hole details.

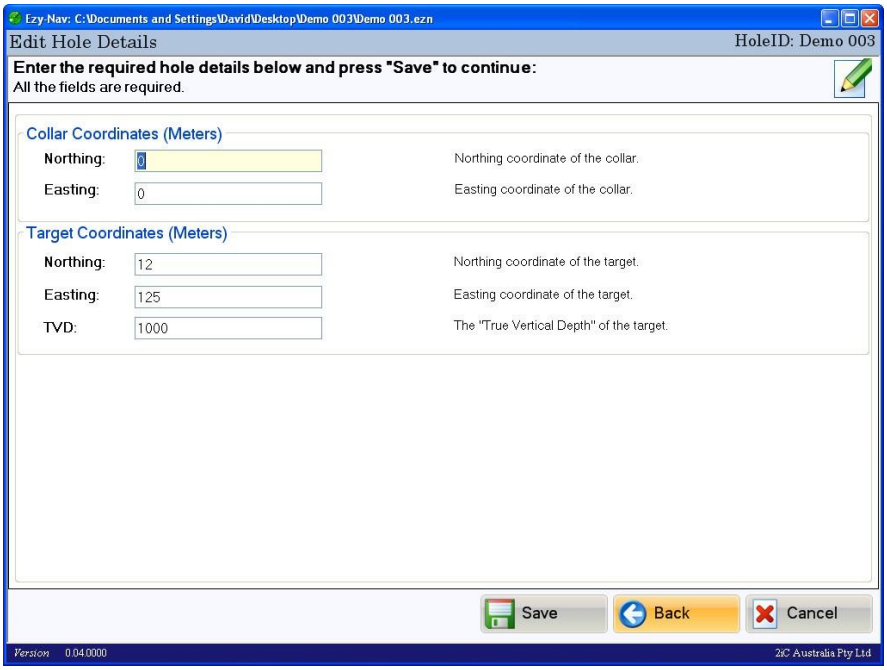


Figure 36: Edit hole details - Edit Collar and Target

# 12 HOLE NAVIGATION

The “Hole Navigation” screen (Figure 37: Hole Navigation screen – Hole above target) provides a summary of where the hole is and where it is heading. It is also the screen where you can start the various navigation functions for analysing, predicting and adjusting the drill hole’s path. There are two conditions the drill hole can be in terms of this screen. One is above the target TVD and the other is at or below the target TVD. The information displayed by this screen will differ depending on which of the two states the drill hole is in. See section 12.1 “Hole Above Target TVD” for a description of the information displayed when the hole is above the target TVD (True Vertical Depth) and section 12.2 “Hole At Or Below Target TVD” for a description of the information displayed when the hole is at or below the target TVD (True Vertical Depth).

If the hole being displayed is a daughter hole (the product of a sidetrack) then some additional information will be displayed by the screen. See section 12.3 “Daughter hole”.

This screen is also where you start the various hole navigation functions for analysing and correcting the holes path. See section 12.4 “Navigation Functions” for instructions on starting the available navigation functions.

The screen also provides access to “Advanced Results” information (see section 12.5 “Advanced Results”), a “Report” (see section 17 “Reports”) and the usual Chart options (see section 19 “Hole Chart”).

## 12.1 HOLE ABOVE TARGET TVD

When the TVD (True Vertical Depth) of the drill hole is above the TVD (True Vertical Depth) of the target the chart will display (see the chart on Figure 37: Hole Navigation screen – Hole above target):

- The “Collar” and “Target”.
- The straight path drilling plan from the collar to the target (“Hole Plan”).
- The “Survey Data”.
- A “Straight Path To Target TVD” (True Vertical Depth). The straight path to target TVD is a straight line that is projected from the end of the hole down to the depth of the target. It provides an indication of where the hole is heading.

The “Hole Status” tab will display the following information (see the “Hole Status” tab on Figure 37: Hole Navigation screen – Hole above target):

- The “Drill hole depth”: The MD (Measured Depth) and TVD (True Vertical Depth) of the end of the hole (last survey).
- The “End of hole distance from target”: The distance that the end of the hole (last survey) is from the target. HD stands for Horizontal Departure.
- The “Straight path to target TVD distance from target”: The distance that the end of the straight path to target TVD line is from the target.
- The “Minimum dogleg to target”: The minimum turn rate required to achieve the target.
- The “Target” and “Collar” coordinates.

## 12.2 HOLE AT OR BELOW TARGET TVD

When the TVD (True Vertical Depth) of the drill hole is at or below the TVD (True Vertical Depth) of the chart will display (see the chart on Figure 38: Hole Navigation screen - Hole past target):

- The “Collar” and “Target”.

- The straight path drilling plan from the collar to the target (“Hole Plan”).
- The “Survey Data”.
- A HD (Horizontal Departure) line between the survey at the target TVD and the target (“Distance From Target”).
- A “Straight path to target TVD” is not shown as the hole is already at or below the target.

The “Hole Status” tab will display the following information (see the “Hole Status” tab on Figure 38: Hole Navigation screen - Hole past target):

- The “Distance from target at target TVD”. This is the distance between the hole survey which is at the same TVD as the target and the target and informs you how far you were from the target when you passed it.
- The “Drill hole depth”: The MD (Measured Depth) and TVD (True Vertical Depth) of the end of the hole (last survey).
- The “End of hole distance from target”: The distance that the end of the hole (last survey) is from the target. HD stands for Horizontal Departure.
- The “Target” and “Collar” coordinates.

The “Minimum dogleg to target TVD distance from target” and the “Straight path to target TVD distance from target” are not shown as they are not relevant when the hole has already passed the target TVD.

## 12.3 DAUGHTER HOLE

When the hole is a daughter hole the “Hole Navigation” screen will display some additional information (Figure 39: Hole Navigation screen - Daughter hole plan). The Chart on the right of the screen will display the sidetrack survey (“Sidetrack”) and the straight path plan between the sidetrack survey and target. The “Hole Status” tab will show in addition to the other information the “Sidetrack Depth” at the top. Both the MD (Measured Depth) and TVD (True Vertical Depth) of the sidetrack survey are displayed.

## 12.4 NAVIGATION FUNCTIONS

The buttons down the left hand side of the “Hole Navigation” screen provide access to the programs Navigation functions. Click on the button for the navigation function you wish to start.

The available navigation functions are:

- Build To Target: Calculates a build to target for correcting the holes path back toward the target (see section 13 “Build To Target”).
- Trend Analysis: Analyses a user selected range of survey data and uses the trend (build and turn rates) to extrapolate the path of the hole (see section 14 “Trend Analysis”).
- Extrapolate: Enables the user to enter various parameters for predicting the future path of the hole (see section 15 “Extrapolate”).
- Sidetrack Hole: Creates a daughter hole off of the current hole (see section 16 “Sidetrack Hole”).


Figure 37: Hole Navigation screen – Hole above target

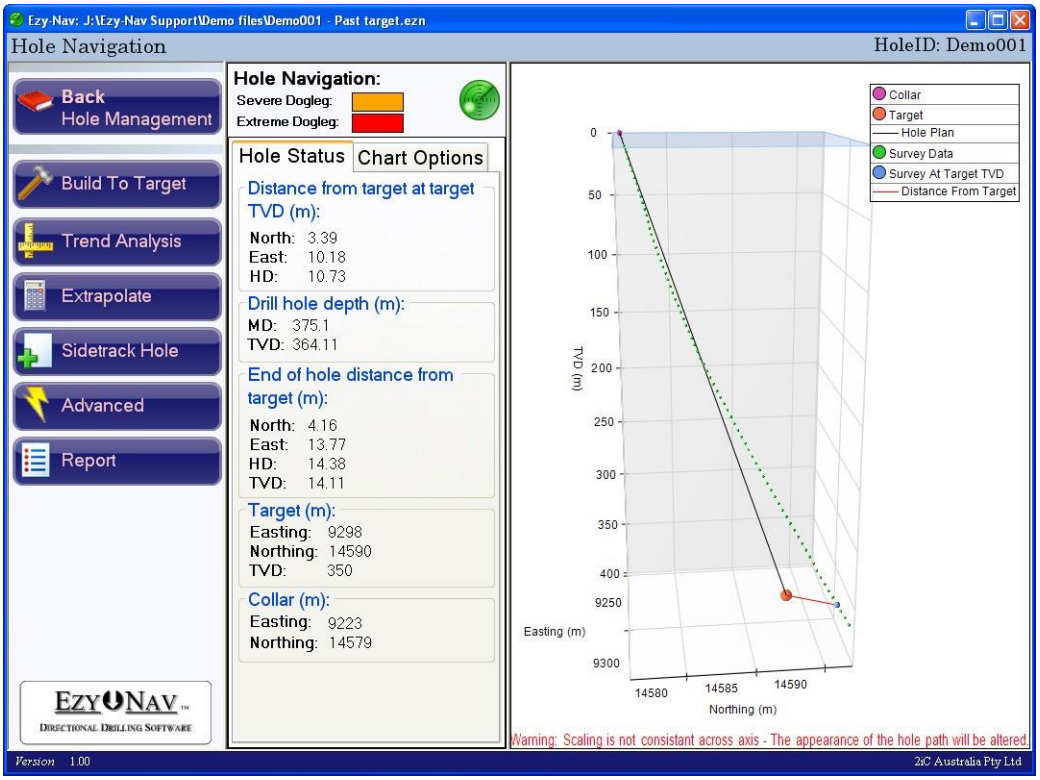


Figure 38: Hole Navigation screen - Hole past target


Figure 39: Hole Navigation screen - Daughter hole plan

## 12.5 ADVANCED RESULTS

The advanced popup displays the complete surveys for the end of the drill hole and the end of the “Straight path to target TVD”. Click on the close button to close the popup.

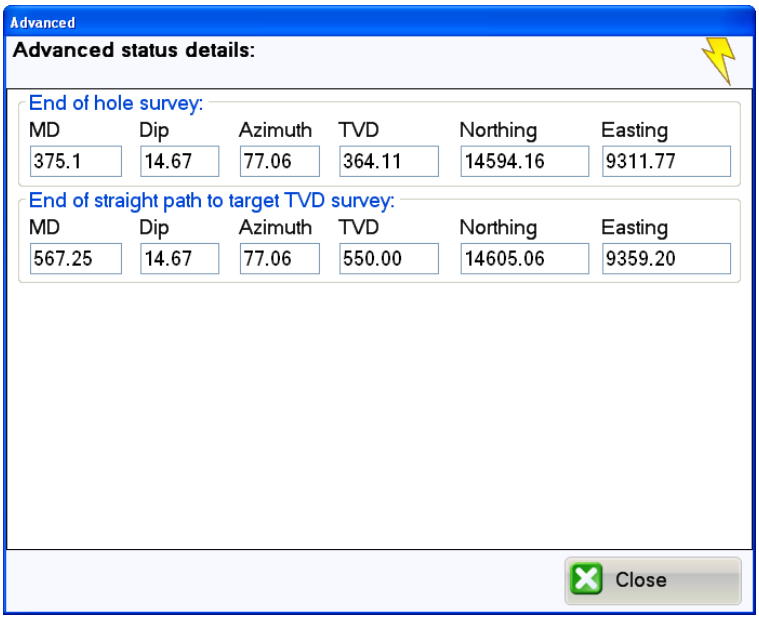


Figure 40: Hole Navigation - Advanced popup

# 13 BUILD TO TARGET

The “Build To Target” function calculates the DL (Dogleg) TFS (Tool Face Setting), Build Length and some other information required to correct the path of the drill hole back toward the target. To start this function click on the “Build To Target” button from the “Hole Navigation” screen (see section 12 “Hole Navigation”). This will start the build to target procedure. See section 13.1 "Select Dogleg” for instructions on using the first screen that is displayed.

## 13.1 SELECT DOGLEG

The first screen displays a summary list of your options down its left hand side on the “Select Dogleg” tab (Figure 41: Build to target - Select dogleg). The list displays the doglegs that can be used to achieve the target along with the corresponding Build Length (the distance that navigational drilling will be required) and Straight Length (the remaining distance between to be drilled conventionally after the build) for that dogleg.

The “Chart Options” tab can be selected for the chart options. See section 19 “Hole Chart” for instructions on using the chart options.

By default the dogleg is incremented by 0.5 starting at the minimum dogleg that can achieve the target. The size of the increments can be reduced by clicking on the drop down list labelled “Step Dogleg by” and selecting the desired increment size.

The rows are colour coded to make the identification of higher doglegs easier. The colour coding is general and is not to be used to determine what can and can’t be achieved by your equipment.

Select the dogleg that best suits your scenario. When you change the selected dogleg the chart will automatically be updated to display the new build scenario. The build is shown in blue and the straight path is shown in yellow. The “Straight path to target TVD” is in red and shows the original course of the hole from the end of the survey data.

When you have selected the dogleg you wish to use to create the build click on the “Next” button to view the drilling instructions for the build. See section 13.2 “Drilling Instructions” for instructions on using this screen.

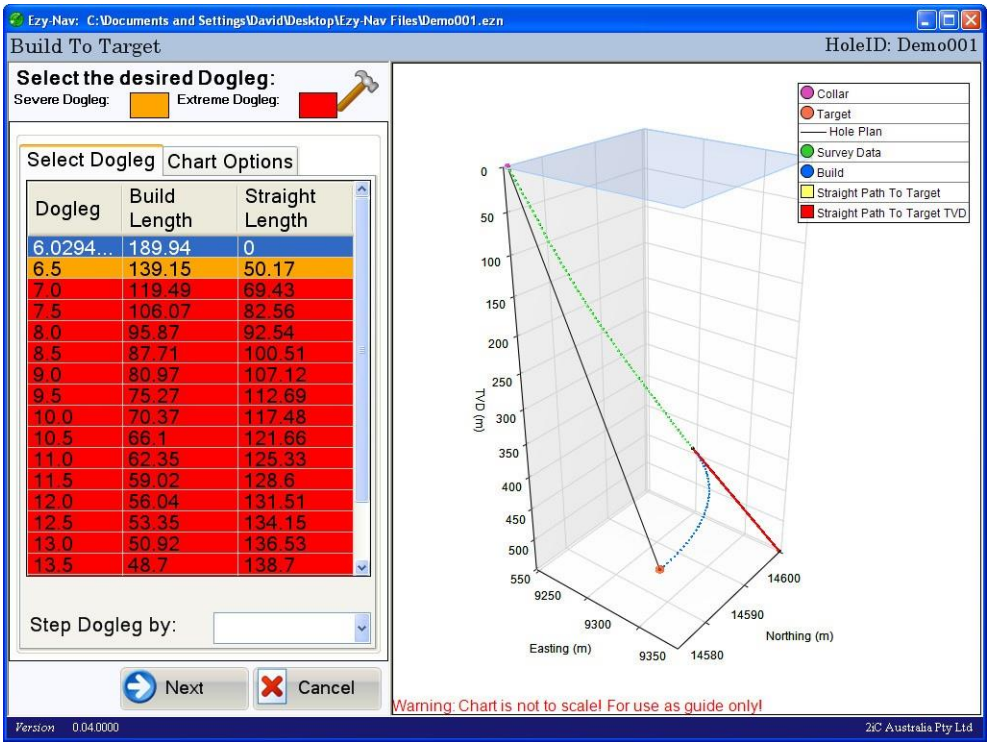


Figure 41: Build to target - Select dogleg

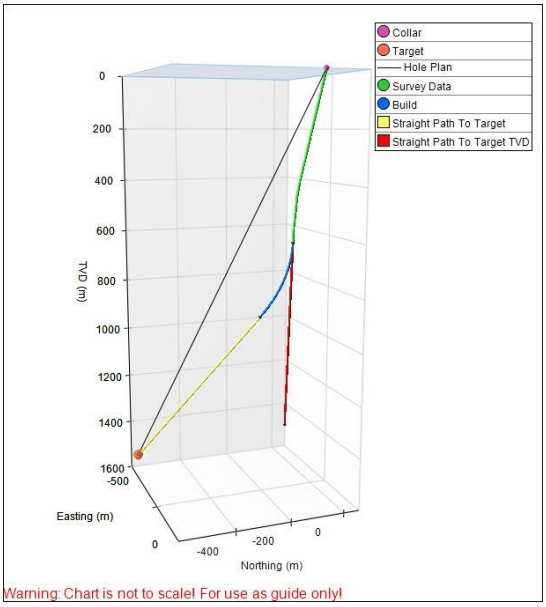


Figure 42: Build to target - Charted

## 13.2 DRILLING INSTRUCTIONS

The “Drilling Instructions” screen displays the information needed to achieve the build you selected from the “Select Dogleg” screen (section 13.1 “Select Dogleg”). The drilling instructions are displayed on the left hand

side of the screen on the “Build Results” tab (Figure 43: Build to target - Results). The chart options can be accessed by selecting the “Chart Options” tab. See section 19 “Hole Chart” for instructions on using the chart options.

The fields are:

- “Dogleg”: The dogleg (turn rate) the navigation tool is required to achieve for the build.
- “Toolface Setting”: The toolface setting to be set on the navigation tool and determines the direction the build will turn in.
- “Navi Distance”: The distance that the navigation tool will have to be run for (The build length).
- “Straight Distance”: The remaining drilling distance after the build that can be completed with normal drilling.
- “Navi Start MVD”: The MD (Measured Depth) at which to start the build.
- “Navi Stop MVD”: the MD (Measured Depth) at which to stop the build.

The Chart displays the selected build scenario.

The “Advanced” results can be displayed by clicking on the “Advanced” button (see section 13.2.1 Advanced Results).

A report containing the information displayed on this screen can be generated by clicking on the “Report” button. See section 17 "Reports” for instructions on generating reports.

Click the “Finish” button when you are done and want to end the function or back to return to the “Select Dogleg” screen (see section 13.1 “Select Dogleg”).

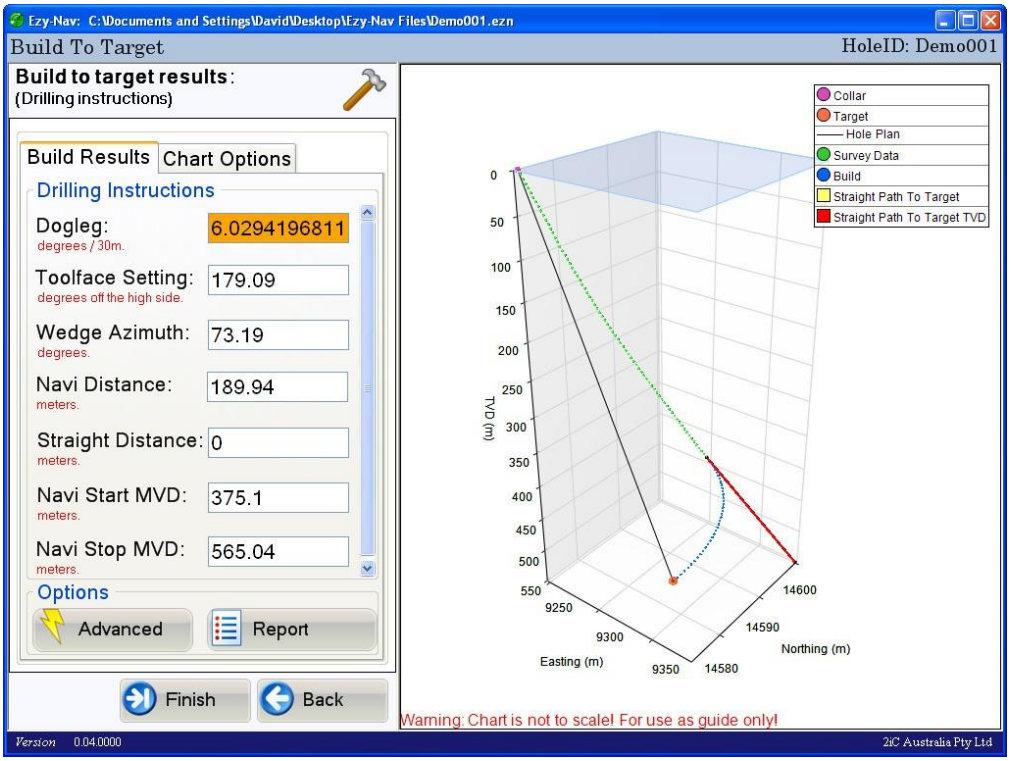


Figure 43: Build to target - Results

### 13.2.1 ADVANCED RESULTS

The “Advanced” result for the “Drilling Instructions” popup shows the following information (Figure 44: Build to target - Advanced):

- “Last real survey”: This is the survey at the end of the current (surveyed) drill hole.
- “End of build survey”: This is the survey at the end of the build.
- “End of hole survey”: This is the survey at the end of the straight path that follows the build. If the programs calculations are correct this survey will be at the target. If the minimum dogleg has been selected this survey will be at the end of the build as there is no straight path.
- “Calculated build surveys”: These are the surveys calculated along the length of the build and are used to chart the build.

Click on the “Close” button to close the popup.

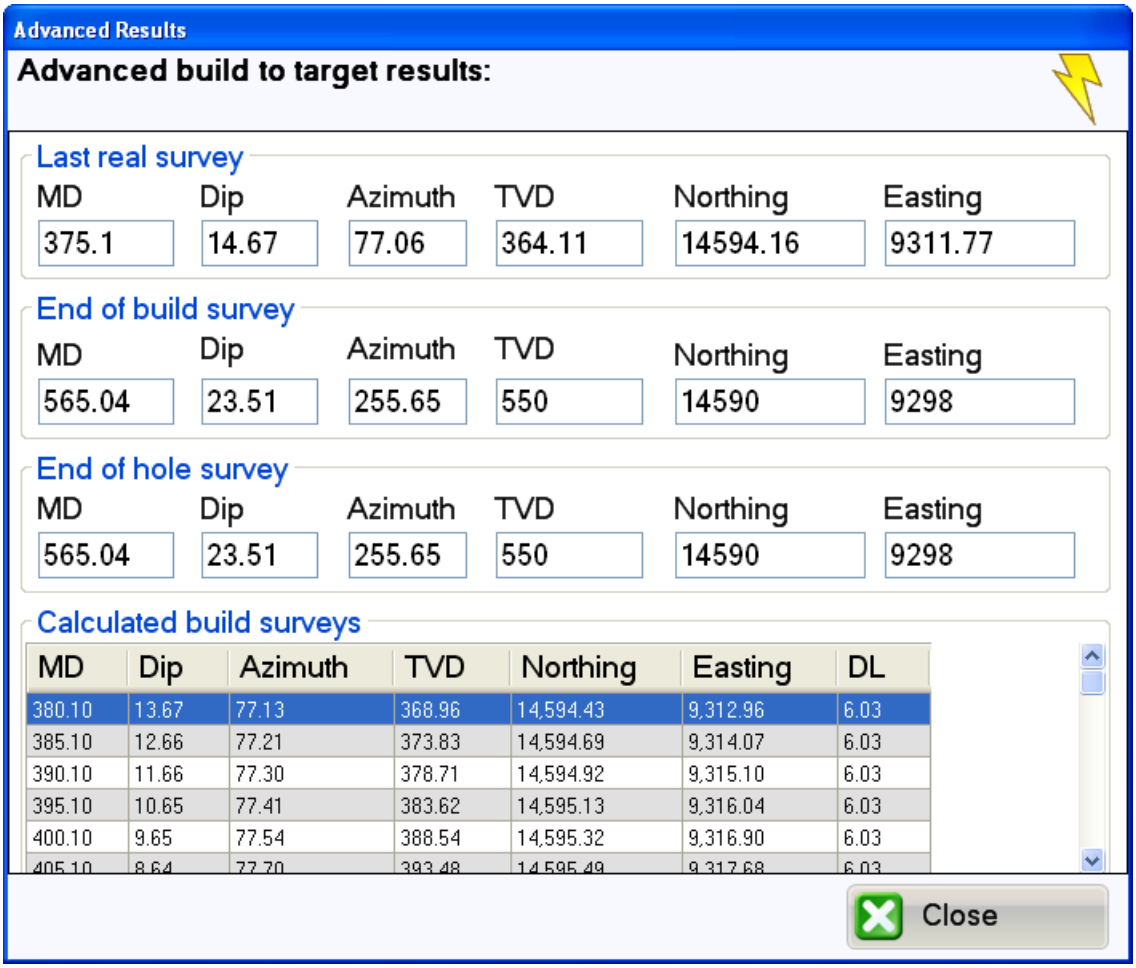


Figure 44: Build to target - Advanced

# 14 TREND ANALYSIS

The “Trend Analysis” procedure enables you to analyses the trend of a range of survey data and use the calculated trend (build and turn rates) of the selected surveys to extrapolate the future path of the drill hole from the end of the hole to the target TVD (True Vertical Depth).

To start the “Trend Analysis” procedure click on the “Trend Analysis” button from the “Hole Navigation” screen (see section 12 “Hole Navigation”).

The “Trend Analysis” procedure will now start. See section 14.1 “Select Range” for instructions on using the first screen that is displayed.

## 14.1 SELECT RANGE

This screen is where you select the range of survey data that you wish to analyse in order to calculate trend information. Figure 45: Trend Analysis - Select survey data.

Select the surveys to be included in the analysis. Do this by pressing and holding the left mouse button on the first survey you wish to analyse and then dragging the mouse pointer over all the surveys you wish to include in the analysis. You will see the surveys being highlighted as you mouse over them. Release the left mouse button when you have selected all the surveys you want analysed. As you select the surveys you will also be able to see them being highlighted on the chart in yellow.

The chart options can be accessed by selecting the “Chart Options” tab. See section 19 “Hole Chart” for instructions on using the chart options tab.

When you have selected all the surveys you wish to analyse click on the “Next” button to continue to the analysis “Results” screen. See section 14.2 “Results” for instructions on using the results screen.

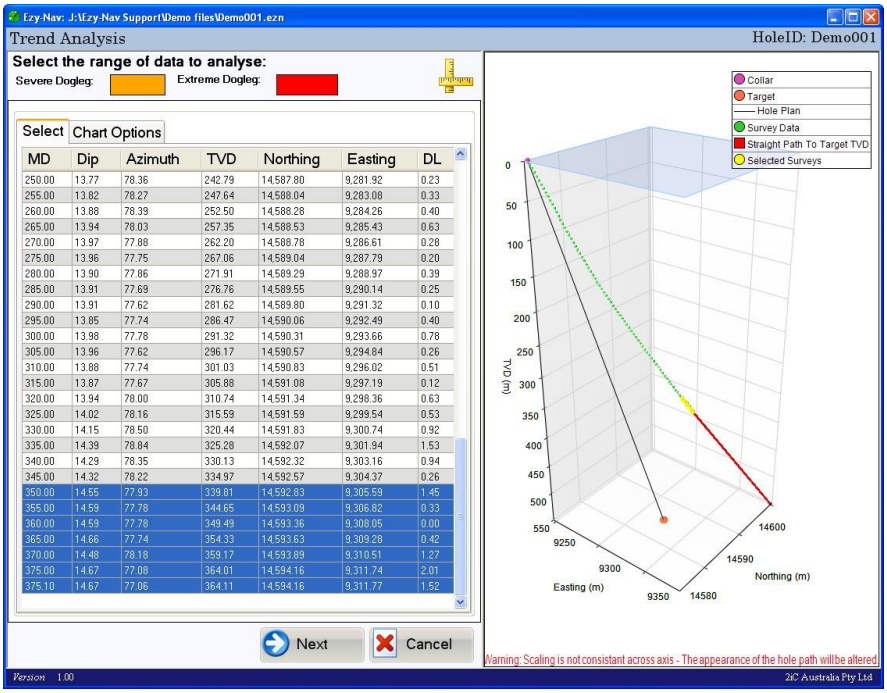


Figure 45: Trend Analysis - Select survey data

## 14.2 RESULTS

The “Results” screen (Figure 46: Trend Analysis – Results) displays the analysis results for the surveys that were selected from the “Select Range” screen (see section 14.1 “Select Range”). A summary of the analysis results is displayed on the left hand side of the screen on the “Results” tab. The summary includes:

- “Inclination”: Indicates whether the selected surveys are trending to build or drop and provides the rate.
- “Azimuth”: Indicates the direction that the selected surveys are turning in and provides the turn rate.
- “Toolface setting”: The resulting toolface setting from the combined build and turn of the selected surveys.
- “Dogleg severity”: The dogleg severity of the overall trend of the selected surveys.
- “Angle change”: The overall angle change of the selected surveys.
- “Extrapolated distance from target”: The distance that the extrapolated path is from the target at the target TVD. This would be the resulting distance form the target if the hole continued on with the same trend as the selected surveys.

The chart displays the survey data, selected surveys in yellow, straight path to target TVD in red and the extrapolated hole path in light blue. The chart options can be accessed by selecting the “Chart Options” tab. See section 19 “Hole Chart” for instructions on using the chart options tab.

If the trend of the selected surveys is high enough and there is sufficient TVD (True Vertical Depth) to the target then the hole path may loop back up toward the surface before reaching the target TVD. This means the path will never reach the target TVD. In this scenario the extrapolated path shown on the chart will be cut off before the dip of the path goes horizontal (Figure 47: Trend Analysis – Path cut-off before going horizontal).

If the survey data is already at or passed the target TVD (True Vertical Depth) an “Extrapolated” path is not displayed on the chart, an “Extrapolated distance from target” is not calculated and the “Advanced” results are not available. This is because when the hole has already reached the target an extrapolated path to the target cannot be calculated.

The “Advanced” results can be displayed by clicking on the “Advanced” button. See section 14.3 “Advanced Results”.

A report containing the information displayed on this screen can be generated by clicking on the “Report” button. See section 17 "Reports” for instructions on generating reports.

Click the “Finish” button when you are done or back to return to the “Range Selection” screen to select a different range of survey’s (see section 14.1 “Select Range”).

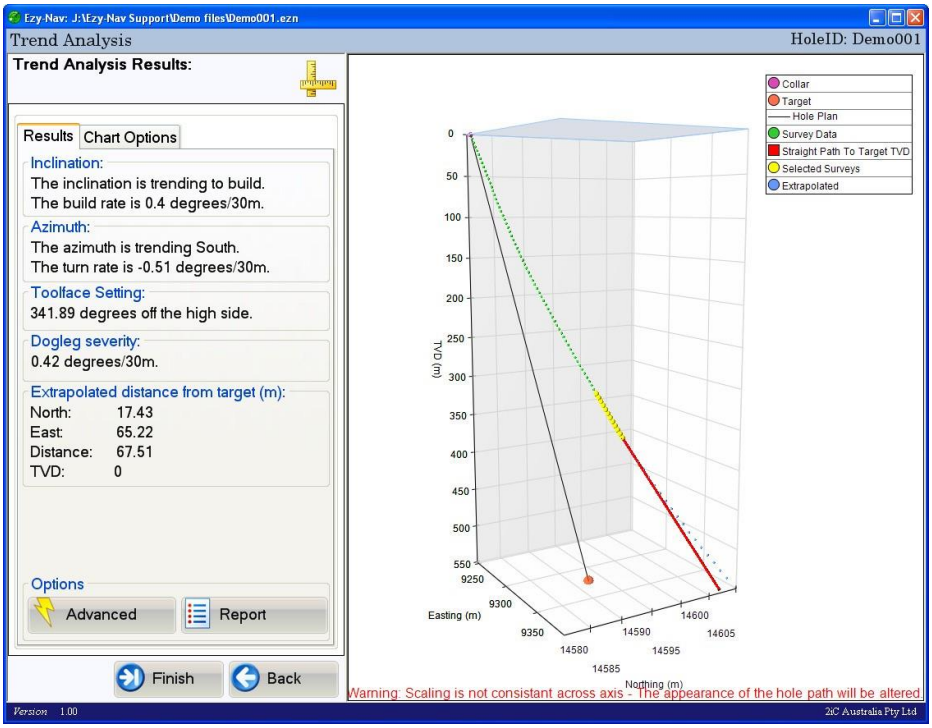


Figure 46: Trend Analysis – Results

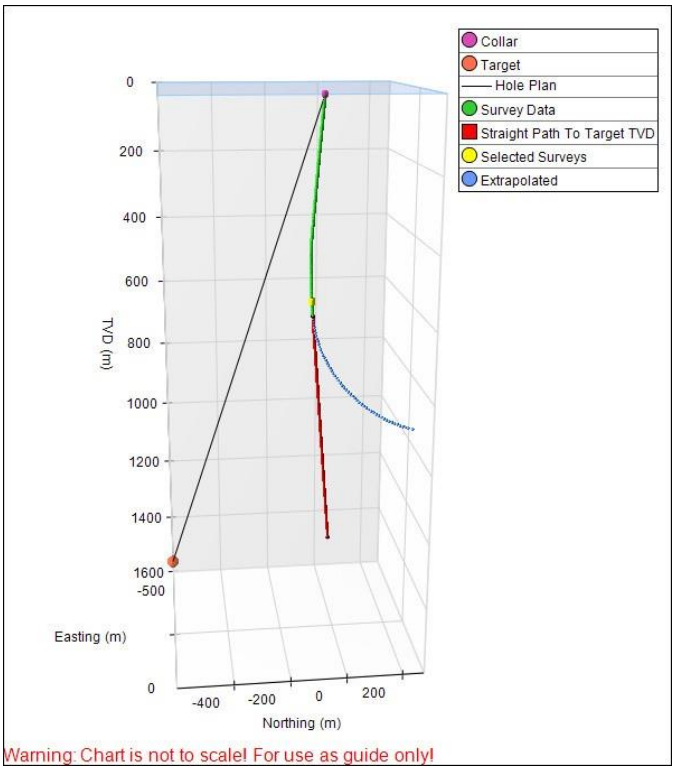


Figure 47: Trend Analysis – Path cut-off before going horizontal

## 14.3 ADVANCED RESULTS

The advanced results for the trend analysis contain the following fields (Figure 48: Trend Analysis - Advanced popup):

- "Start of extrapolation survey": The survey at which the extrapolation starts.
- "End of extrapolation survey": The survey at the end of the extrapolation.
- "Extrapolated survey data": The survey data used to chart the extrapolated path.

Click on the "Close" button to close the popup.

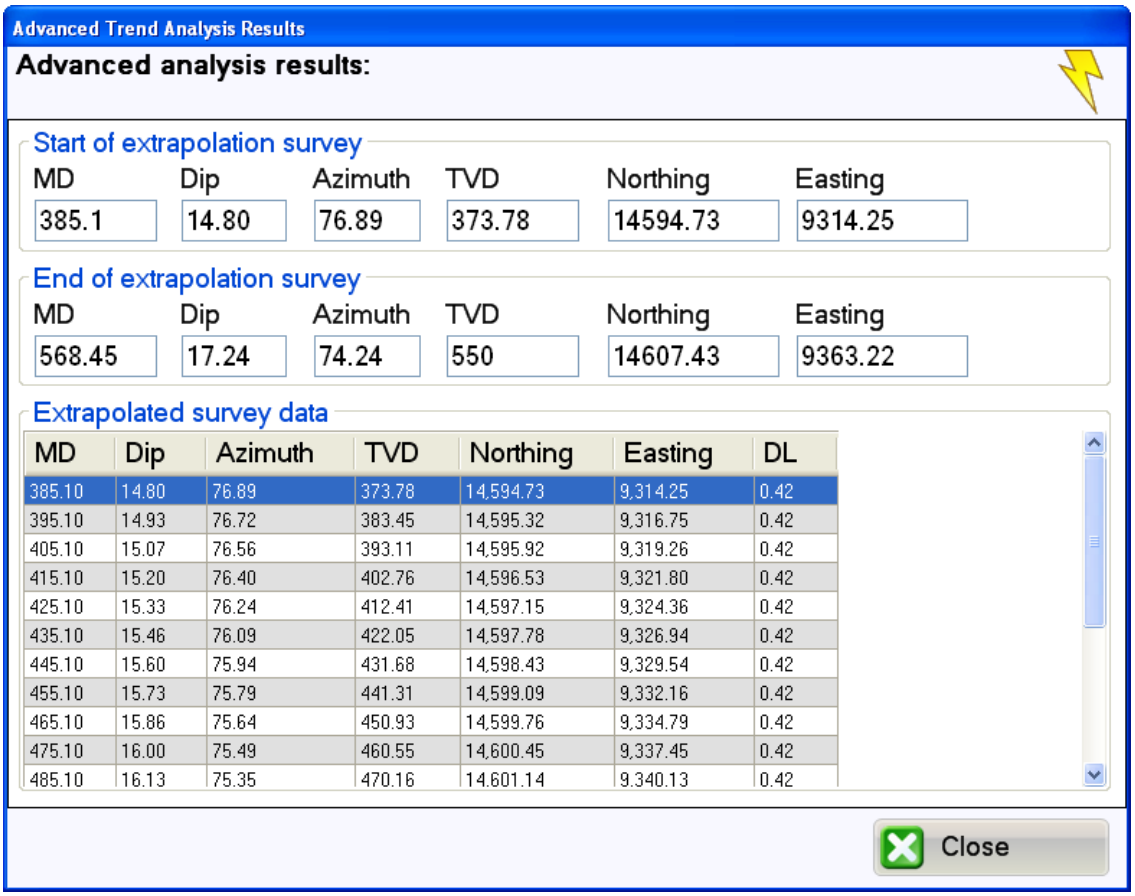


Figure 48: Trend Analysis - Advanced popup

# 15 EXTRAPOLATE

The extrapolate function enables the user to extrapolate the drill holes future path from the end of the hole using any combination of the following extrapolation methods:

- Extrapolate to MD: Specify the dogleg (turn rate), tool face setting and the MD to extrapolate to.
- Extrapolate to TVD: Specify the dogleg (turn rate), tool face setting and the TVD to extrapolate to.
- Extrapolate to Direction: Specify the dogleg, dip and direction (azimuth) to extrapolate to.
- Extrapolate to Dip: Specify the dogleg, tool face setting and dip to extrapolate to.

Ounce the extrapolated surveys have been entered the extrapolated path will be displayed on the chart and summary information regarding its resulting distance from the target provided.

To start the extrapolate procedure click on the “Extrapolate” button from the “Hole Navigation” screen (see section 12 “Hole Navigation”). The first screen displayed will by the “Append Extrapolated Surveys” screen. See section 15.1 "Append Extrapolated Surveys” for instructions on entering extrapolated surveys.

## 15.1 APPEND EXTRAPOLATED SURVEYS

The “Append Extrapolated Surveys” screen (Figure 49: Extrapolate - Append extrapolated surveys) enables you to select the type of extrapolation you wish to add to the end of the drill hole and enter the fields required for the selected extrapolation. Multiple extrapolations can be added onto the end of the previous extrapolations.

You can use the buttons at the bottom of the data grid to “Append”, “Remove Last Extrapolation” or “Clear All”. You can also access these functions by right clicking on the data grid, this action will cause a popup menu to appear from which you can select the desired function (Figure 53: Extrapolate - Extrapolated surveys popup menu).

The button at the bottom left of the screen has the word “Append” followed by a type of extrapolation. The default extrapolation type is “Extrapolate to MD” (Figure 50: Extrapolate - Append button with dropdown split). Clicking on the button will display the popup for creating the indicated type of extrapolation. The type of extrapolation started by this button can be changed by clicking on the drop down part of the button. The drop down part of the button is on the right hand side of the button and is marked with a down arrow (Figure 50: Extrapolate - Append button with dropdown split). When clicked a popup menu will appear that displays the available extrapolation methods (Figure 51: Extrapolate - Append dropdown menu). Click on the extrapolation method that you wish to append to the list. This action will display the popup for creating the selected extrapolation and also update the “Append” button to the selected extrapolation type.

See “Figure 52: Extrapolate - Append screen with two extrapolations added” for an example of the screen after two extrapolated surveys have been added.

The types of extrapolation that can be selected are:

- Extrapolate to MD: Specify the dogleg (turn rate), tool face setting and the MD to extrapolate to. See section 15.1.1 “Extrapolate To MD” for instructions.
- Extrapolate to TVD: Specify the dogleg (turn rate), tool face setting and the TVD to extrapolate to. See 15.1.2 section “Extrapolate To TVD” for instructions.
- Extrapolate to Direction: Specify the dogleg, dip and direction (azimuth) to extrapolate to. See 15.1.3 section “Extrapolate To Direction” for instructions.

- Extrapolate to Dip: Specify the dogleg, tool face setting and dip to extrapolate to. See section 15.1.4 “Extrapolate To Dip” for instructions.

You can also remove extrapolated surveys (see section 15.1.5 “Remove Last Extrapolation”) and clear all the added surveys (see section 15.1.6 “Clear All”).

Click the “Next” button when you have finished entering extrapolations to view a chart of the extrapolated path and have summary information about the extrapolated path displayed. See section 15.2 “Results”.

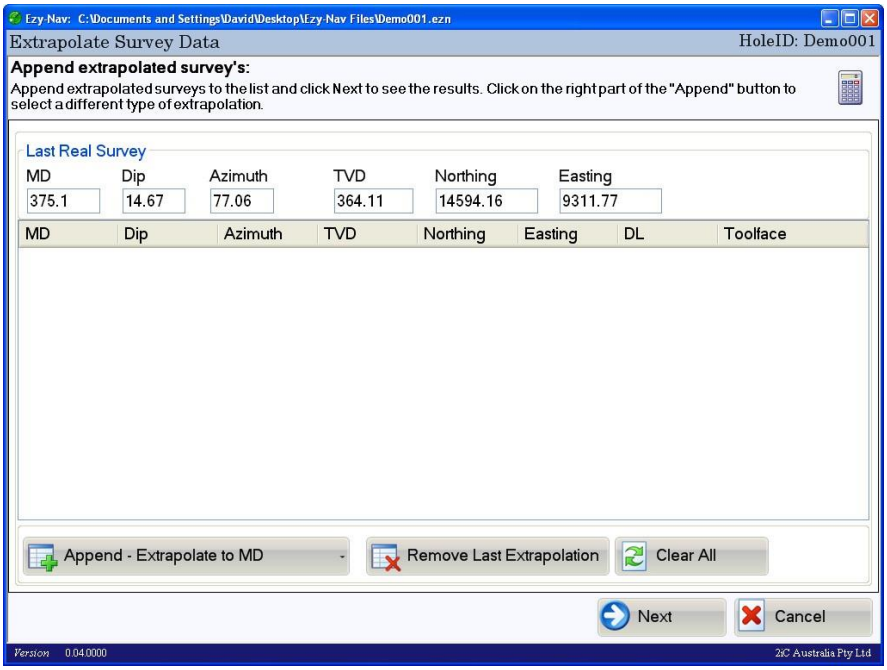


Figure 49: Extrapolate - Append extrapolated surveys


Figure 50: Extrapolate - Append button with dropdown split

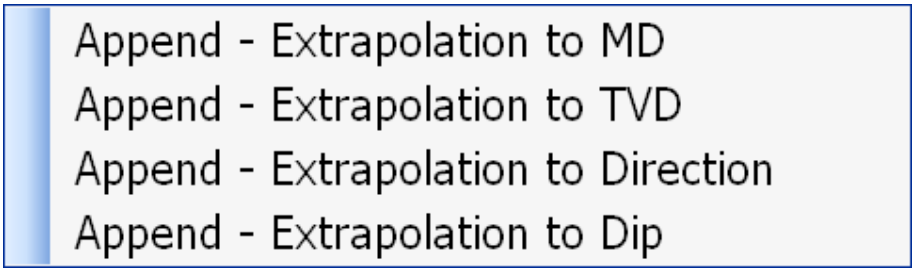


Figure 51: Extrapolate - Append dropdown menu

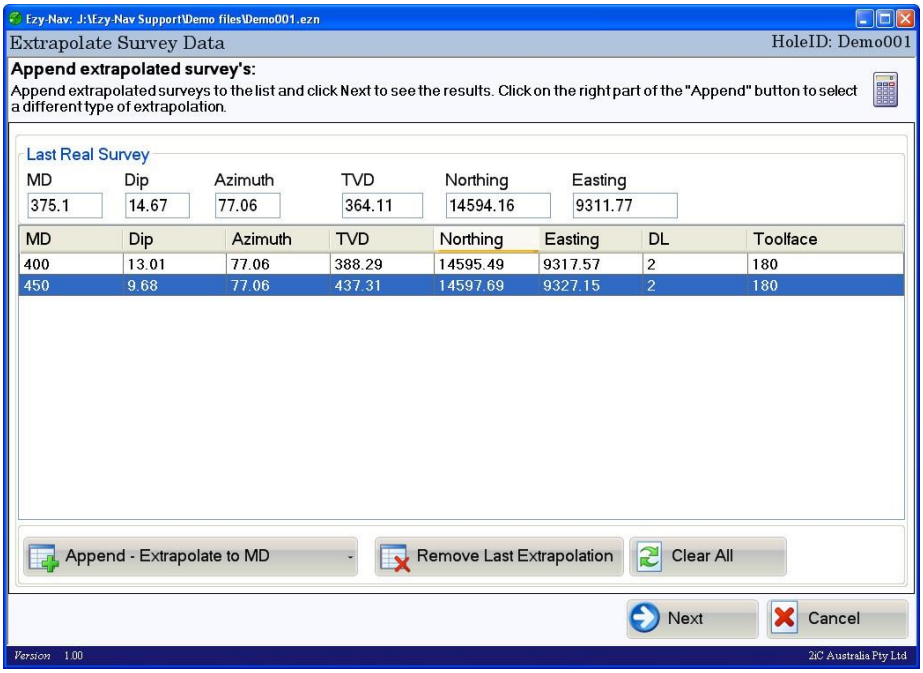


Figure 52: Extrapolate - Append screen with two extrapolations added

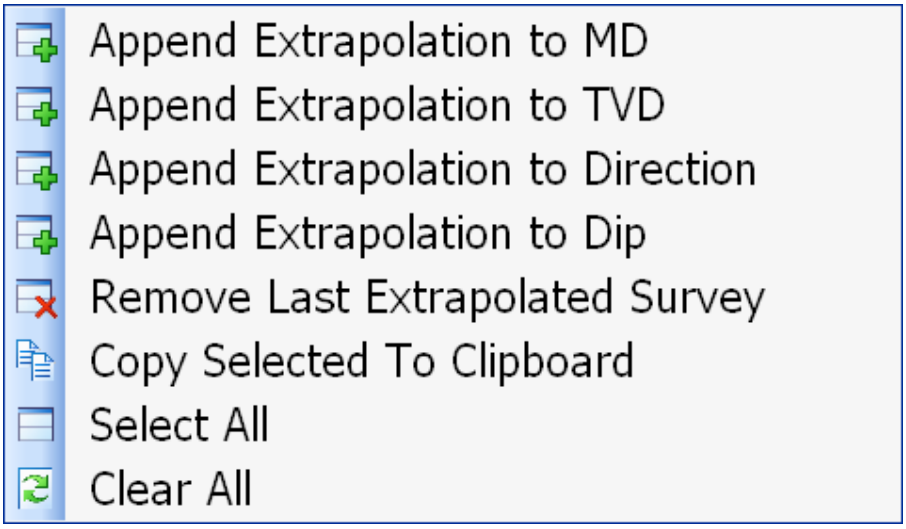


Figure 53: Extrapolate - Extrapolated surveys popup menu

### 15.1.1 EXTRAPOLATE TO MD

A extrapolate to MD (Measured Depth) enables you to specify a “Dogleg” (turn rate) and “Toolface setting” that are used to extrapolate the hole path from the previous survey to the specified MD.

When the “Extrapolate to MD” popup is displayed (Figure 54: Extrapolate - Append extrapolate to MD) enter the three required fields. Click on the “Add and enter another” button to append the extrapolation to the end of the list and clear the popup for entering another that will be appened to the end of the list below the extrapolation just added. Click on the “Add and finish” button to add the extrapolation to the end of the list and close the popup. Click the “Close” button to close the popup without attempting to add an extrapolation.

Field Conditions:

- Measured Depth: Must be greater than the MD of the previous survey and less than or equal to 24000 meters.
- Dogleg: Must be positive and less than or equal to 30.
- Toolface Setting: Must be between 0 and 360.

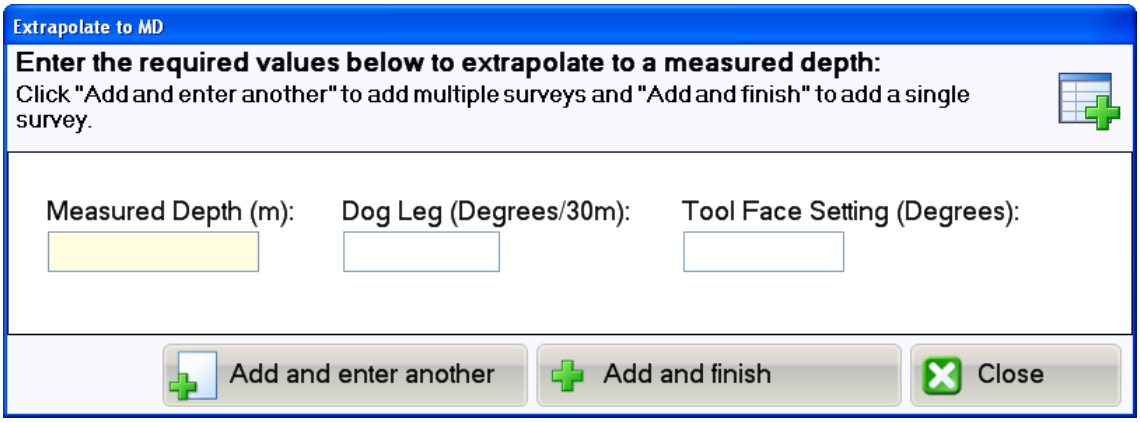


Figure 54: Extrapolate - Append extrapolate to MD

### 15.1.2 EXTRAPOLATE TO TVD

A extrapolate to TVD (True Vertical Depth) enables you to specify a “Dogleg” (turn rate) and “Toolface setting” that are used to extrapolate the hole path from the previous survey to the specified TVD.

When the “Extrapolate to TVD” popup is displayed (Figure 55: Extrapolate - Append extrapolate to TVD) enter the three fields. Click on the “Add and enter another” button to append the extrapolation to the end of the list and clear the popup for entering another that will be appened to the end of the list below the extrapolation just added. Click on the “Add and finish” button to add the extrapolation to the end of the list and close the popup. Click the “Close” button to close the popup without attempting to add an extrapolation.

Field Conditions:

- TVD (True Vertical Depth): Must be greater than the TVD of the previous survey.
- Dogleg: Must be positive and less than or equal to 30.
- Toolface Setting: Must be between 0 and 360.

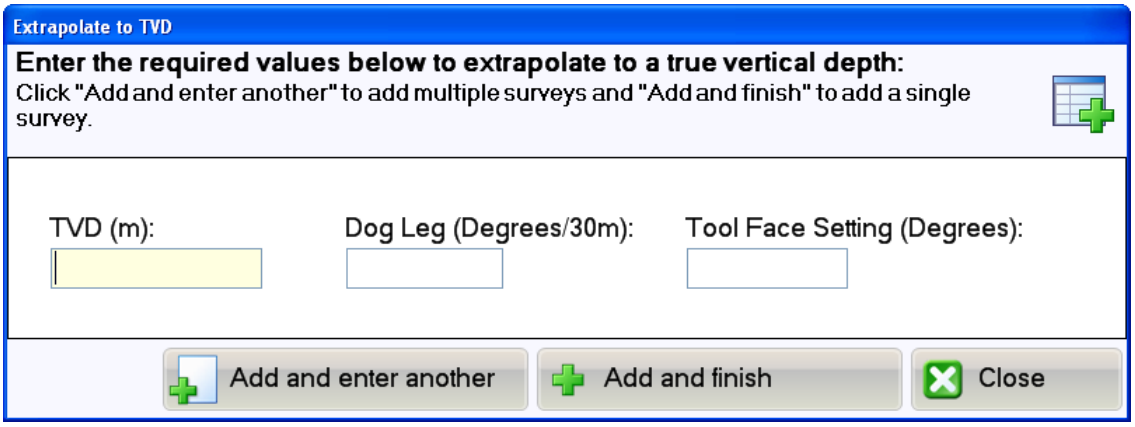


Figure 55: Extrapolate - Append extrapolate to TVD

### 15.1.3 EXTRAPOLATE TO DIRECTION

A extrapolate to Direction enables you to specify a Dogleg that is used to extrapolate the hole path from the previous survey to the specified Direction (Azimuth) and Dip.

When the “Extrapolate to Direction” popup is displayed (Figure 56: Extrapolate - Append extrapolate to Direction) enter the three required fields. Click on the “Add and enter another” button to append the extrapolation to the end of the list and clear the popup for entering another that will be appened to the end of the list below the extrapolation just added. Click on the “Add and finish” button to add the extrapolation to the end of the list and close the popup. Click the “Close” button to close the popup without attempting to add an extrapolation.

Field Conditions:

- Direction: Must be a valid compass bearing (0 to 360).
- Dip: Must be oil and gas standard (0 to 90) or mineral standard (0 to -90).
- Dogleg: Must be positive and less than or equal to 30.

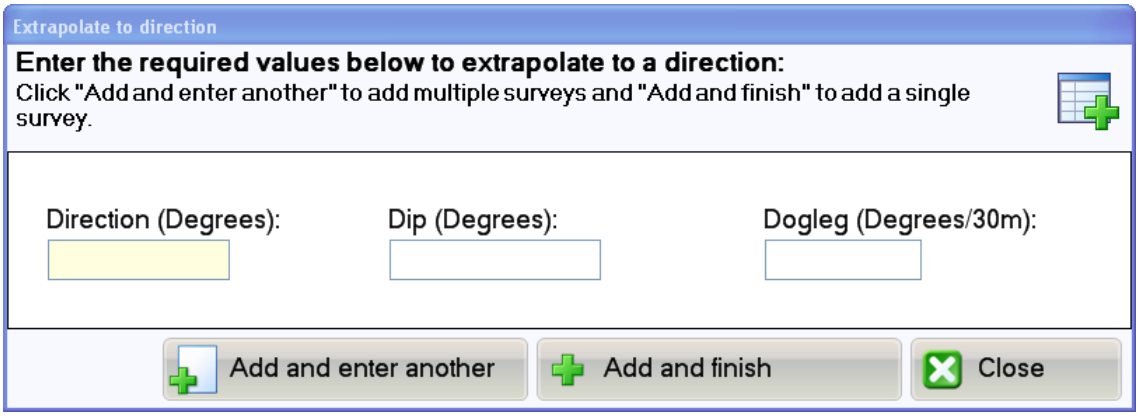


Figure 56: Extrapolate - Append extrapolate to Direction

### 15.1.4 EXTRAPOLATE TO DIP

A extrapolate to Dip enables you to specify a Dogleg and Toolface that is used to extrapolate the hole path from the previous survey to the specified Dip. It should be noted that not all toolface settings will be able to achieve the specified dip. When this is the case an error popup will notify you.

When the “Extrapolate to Dip” popup is displayed (Figure 57: Extrapolate - Append extrapolate to Dip) enter the three required fields. Click on the “Add and enter another” button to append the extrapolation to the end of the list and clear the popup for entering another that will be appened to the end of the list below the extrapolation just added. Click on the “Add and finish” button to add the extrapolation to the end of the list and close the popup. Click the “Close” button to close the popup without attempting to add an extrapolation.

Field Conditions:

- Dip: Must be oil and gas standard (0 to 90) or mineral standard (0 to -90).
- Dogleg: Must be positive and less than or equal to 30.
- Toolface Setting: Must be between 0 and 360.

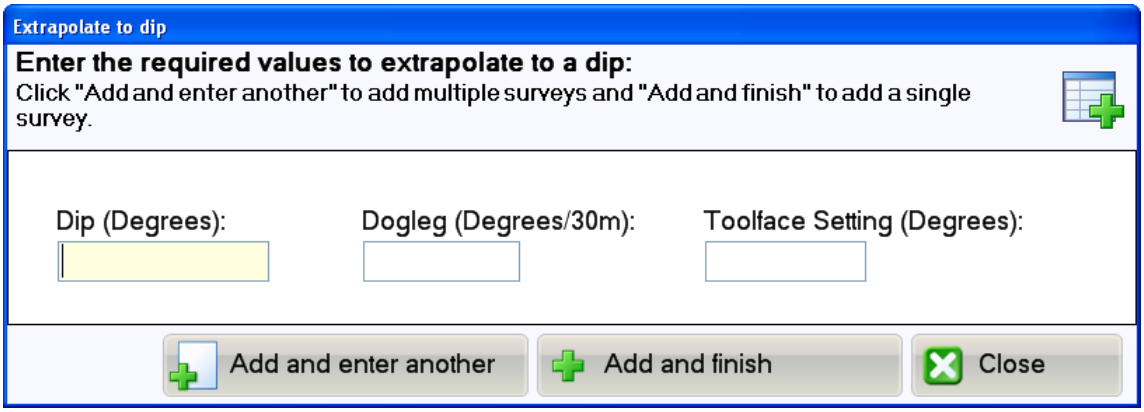


Figure 57: Extrapolate - Append extrapolate to Dip

### 15.1.5 REMOVE LAST EXTRAPOLATION

You can only remove the last extrapolation from the list. This is to maintain the integrity of the remaining extrapolations. To remove the last extrapolation click on the “Remove Last Extrapolation” button on the “Append Extrapolated Surveys” screen (Figure 52: Extrapolate - Append screen with two extrapolations added).

### 15.1.6 CLEAR ALL

This will clear the entire list of extrapolations. On the “Append Extrapolated Surveys” screen (Figure 52: Extrapolate - Append screen with two extrapolations added) click on the “Clear All” button.

## 15.2 RESULTS

The “Results” screen displays a chart of the extrapolated path on the right hand side of the screen. A summary of the extrapolations resulting distance from the target is displayed on the “Results” tab. The usual “Chart Options” are available on the “Chart Options” tab.

The extrapolated path can be in two states. It can be either above the target TVD (see section 15.2.1 “Above The Target TVD”) or at or below the target TVD (see section 15.2.2 “At Or Below The Target TVD”). The information displayed on the “Results” tab and the chart will be different for each these two states.

Click on the “Finish” button to end the “Extrapolate” function or “Back” to return to the “Append Extrapolated Surveys” screen (see section 15.1 “Append Extrapolated Surveys”).

### 15.2.1 ABOVE THE TARGET TVD

When the survey data is above the target the chart will display the “Straight path to target TVD” and the “Results” tab will display the “Extrapolated straight path distance from target” (Figure 58: Extrapolate – Results with hole above target TVD).

### 15.2.2 AT OR BELOW THE TARGET TVD

When the survey data is at or below the TVD of the target the chart will display a HD (Horizontal Departure Line) between the target and the survey that is at the targets TVD. The “Results” tab will display the “Extrapolated distance from target at target TVD” (Figure 59: Extrapolate - Results with hole past target TVD).

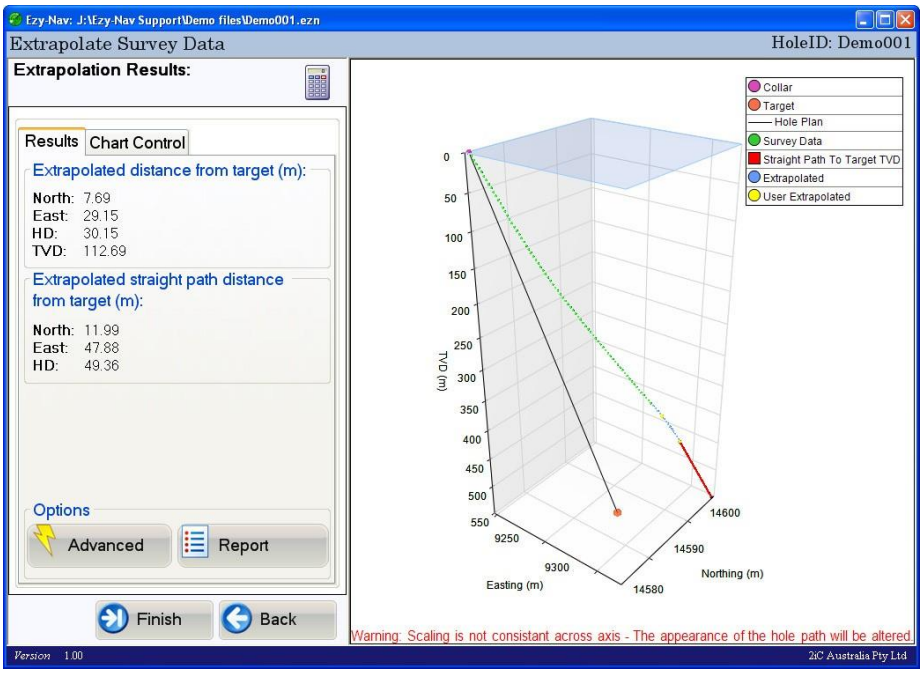


Figure 58: Extrapolate – Results with hole above target TVD

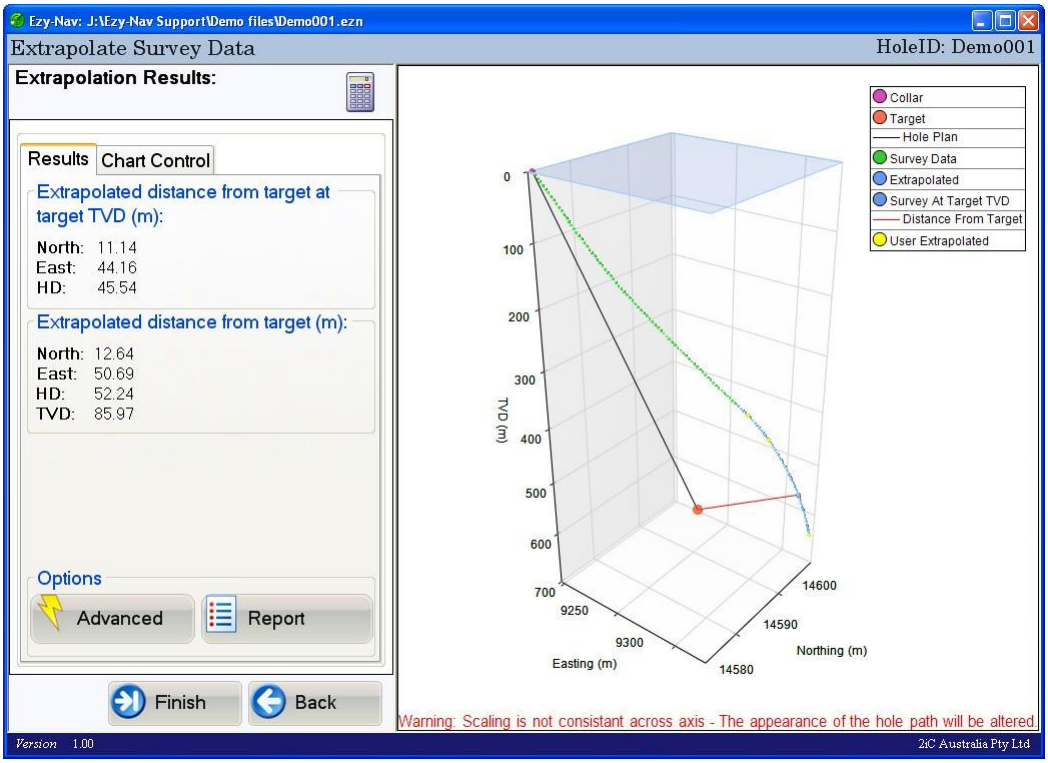


Figure 59: Extrapolate - Results with hole past target TVD

# 16 SIDETRACK HOLE

The sidetrack hole function is used to create a daughter hole that branches off from the currently loaded drill hole. The function will create a new Ezy-Nav hole file that contains the mother hole survey data down to the sidetrack MD (Measured Depth), a new target and hole details. This function can also be used to plan pull backs where you need to pull back up the hole and create a sidetrack toward the original target.

The function has two steps. The first is to “Enter Details” and the second is to “Save File”.

To start the function click on the “Sidetrack Hole” button on the “Hole Navigation” screen (see section 12 “Hole Navigation”). The function will start and display the “Enter Details” screen (see section 16.1 “Enter Details”).

## 16.1 ENTER DETAILS

The “Enter Details” screen (Figure 60: Sidetrack hole - Enter MD) enables you to enter all the data necessary to create a new daughter hole. The fields required for creating a sidetrack are: “Sidetrack depth”, “Target Coordinates”, “Minimum dogleg” and “Hole details”. When all the required fields have been entered click on the “Next” button to continue to the “Save File” screen (see section 16.2 “Save File”).

Sidetrack depth (Figure 61: Sidetrack hole - MD entered): On the “Sidetrack” tab start by entering the MD (Measured Depth) that you want to create the sidetrack at. The MD must exist along the length of the hole. If a survey exists at the entered MD “Found” will be displayed to indicate that a survey exists at the enterer MD. If no survey exists at the MD entered then the program will extrapolate a survey at the MD and display “Extrapolated” next to the field. If the entered MD is invalid then error text will be displayed next to the field. When a survey is found or extrapolated the “Calculated TVD” of the survey is displayed below the field.

Target coordinates (Figure 62: Sidetrack hole - Target entered): The original target coordinates are displayed by default. If you are planning a pull back you do not have to enter the target coordinates. If you are sidetracking toward a new target enter the coordinates of the new target. The fields are TVD (True Vertical Depth), Northing and Easting. When you enter each field if the value you have entered is valid “Accepted” will be displayed next to the field. If the value is not valid “Invalid” will be displayed.

The “Target status” is displayed under the fields and indicates whether the fields for the target are incomplete, invalid or complete. If the target coordinates are invalid the reason will be displayed.

Minimum dogleg (Figure 62: Sidetrack hole - Target entered): Ounce a valid “Sidetrack depth” and “Target coordinates” have been entered the program will calculate a minimum DL to target. The curve is displayed on the chart and the Minimum Dogleg is shown under “Minimum dogleg to target”. You can check this value to ensure that the target can be achieved from the specified Sidetrack point.

Hole details (Figure 63: Sidetrack hole - Update details): Enter the hole details for the new hole. The HoleID and RigID are brought across from the mother hole. The HoleID will have to be modified to the new ID but the RigID will most likely remain unchanged. The remaining fields are optional.

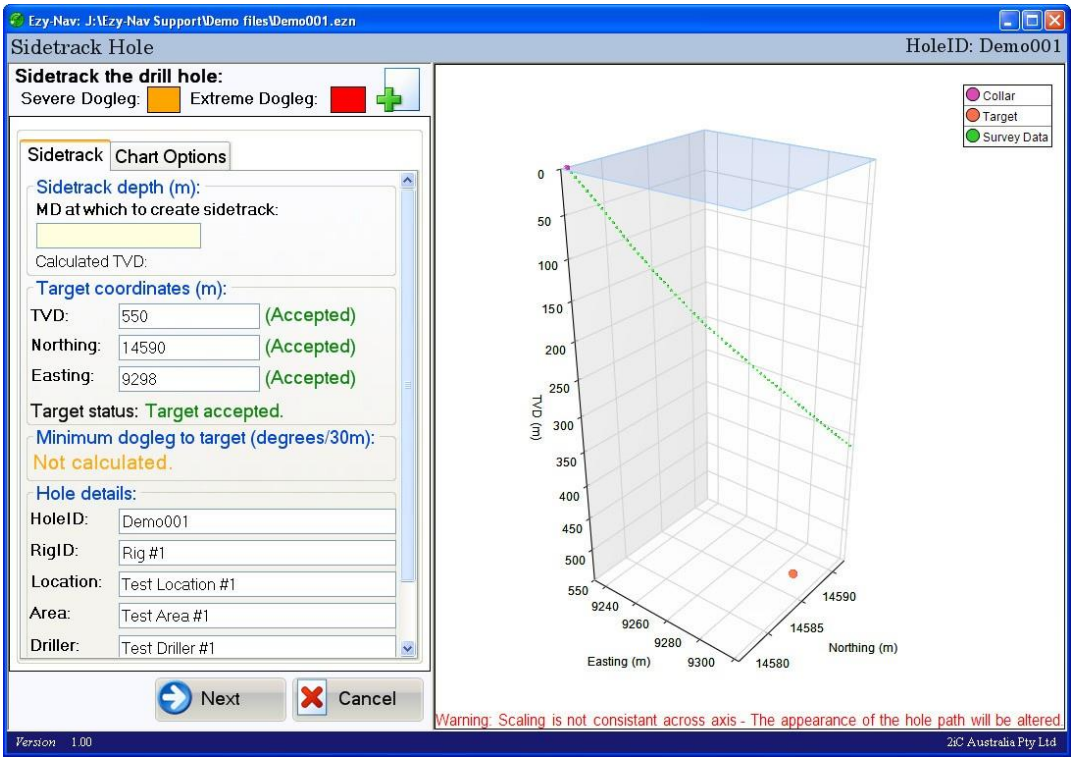


Figure 60: Sidetrack hole - Enter MD

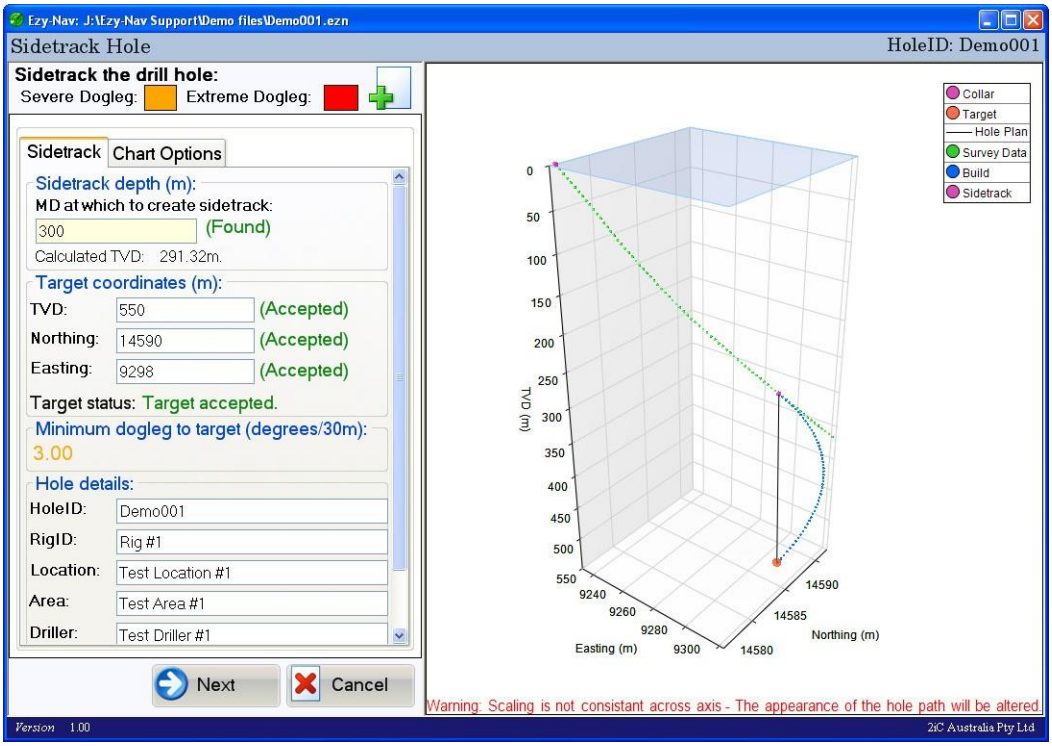


Figure 61: Sidetrack hole - MD entered

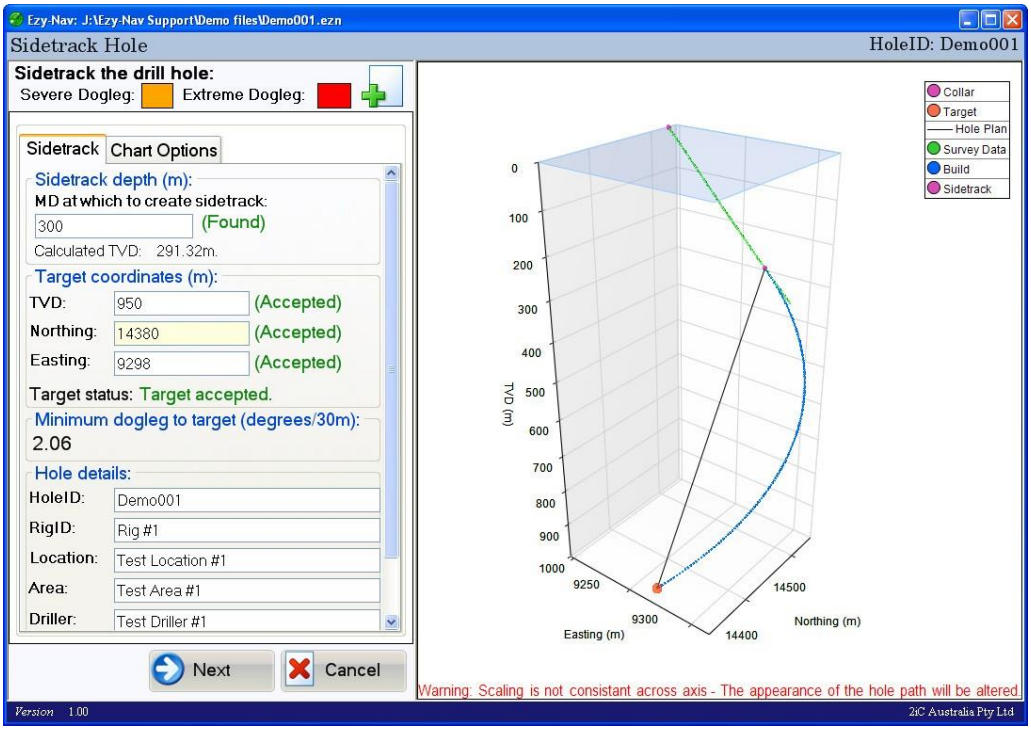


Figure 62: Sidetrack hole - Target entered

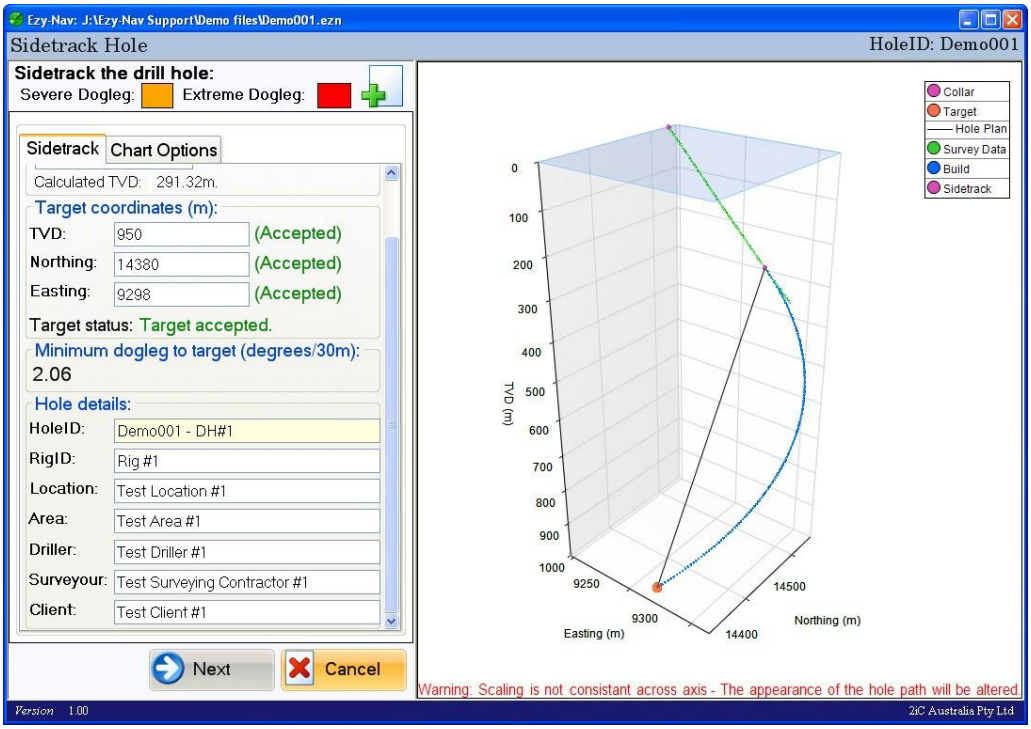


Figure 63: Sidetrack hole - Update details

## 16.2 SAVE FILE

The save file screen (Figure 64: Sidetrack hole - Save new hole file) will automatically display the HoleID field as the file name. Modify the file name if you want something else as the file name. Browse to the location that you want to save the file to and click the “Save” button to save the file to the location. The “Back” button will take you back to the “Entry Screen” (see section 16.1 “Enter Details”), the “Cancel” button will take you back to the “Hole Navigation” screen (see section 12 “Hole Navigation”) without saving a new daughter hole. Once the file has been successfully saved it will be opened and displayed by the “Hole Navigation” screen (see section 12 “Hole Navigation”) so that you can operate on it. The next step if you are creating a sidetrack hole would be to calculate a “Build to target” to get the drilling instructions for creating the sidetrack (see section 13 “Build To Target”).

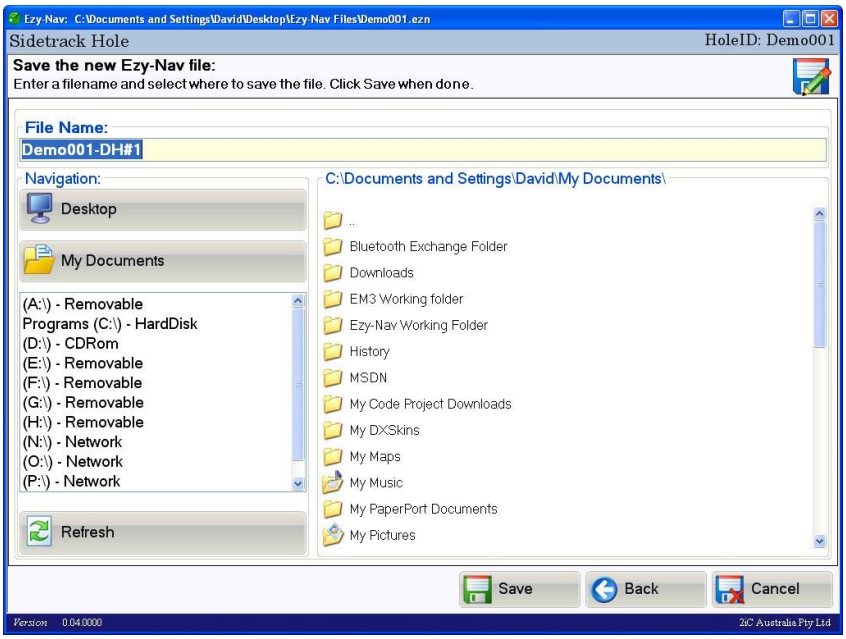


Figure 64: Sidetrack hole - Save new hole file

# 17 REPORTS

Reports can be generated by the following Ezy-Nav functions:

- “Hole Navigation” (see section 12 “Hole Navigation”)
- “Build To Target” (see section 13 “Build To Target”)
- “Trend Analysis” (see section 14 “Trend Analysis”)
- “Extrapolate” (see section 15 ”Extrapolate”)

The reports provide a permanent record of the program output and can be either printed or saved as a PDF document.

Every report contains the hole Identification information from the “Hole Management” screen and the “Hole Status” information from the “Hole Navigation” screen. The report will also contain the results of the specific function being reported, survey data and different views of the chart showing the results.

The chart is shown in the report with four views: Top profile, Easting profile, Northing profile and 3D.

For instructions on creating a report see section 17.1 “Create”.

## 17.1 CREATE

To create a report click on the “Report” button on the appropriate screen from one of the above listed program functions.

A popup will appear asking which components you would like included in the report (Figure 65: Report - Select components popup). The components listed will depend on which report you are generating. The common components are as follows:

- Survey Data: The complete survey of the hole.
- Charts: The chart views of the results.
- Tick the components that you want included and click on the “Next” button to continue.

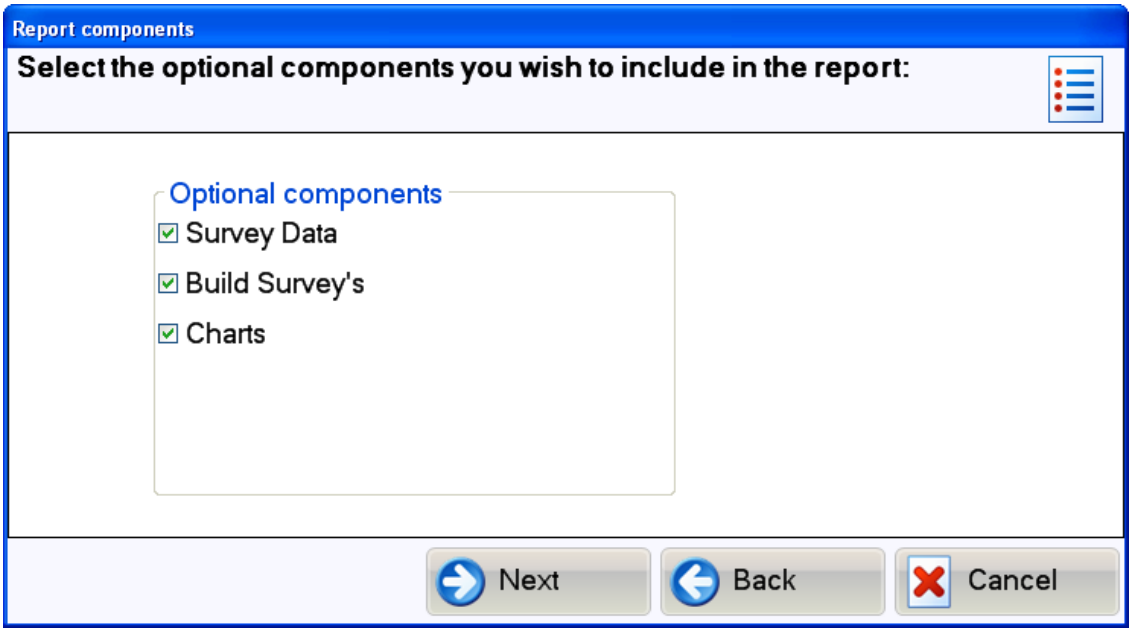


Figure 65: Report - Select components popup

The next popup requests the entry of two optional fields that if entered will be included in the report (Figure 66: Report - Enter user details popup). Click the “Next” button when you are done.

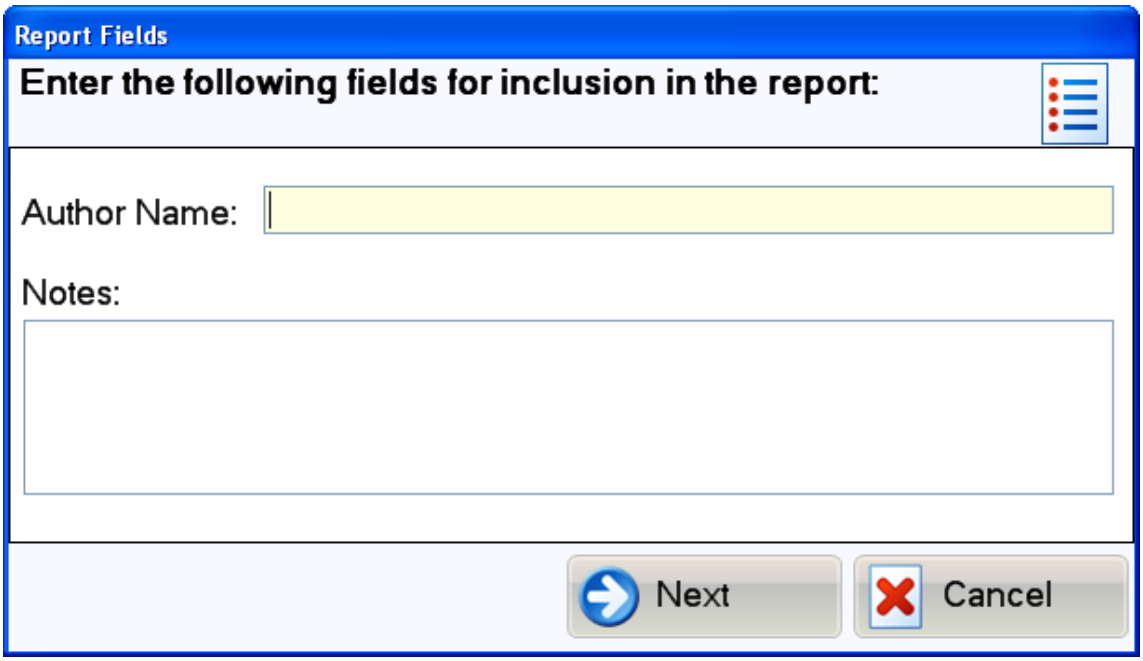


Figure 66: Report - Enter user details popup

A popup will now appear that displays the progress of the report generation process (Figure 67: Report - Progress indicator popup). You can cancel the generation by clicking the “Cancel” button.

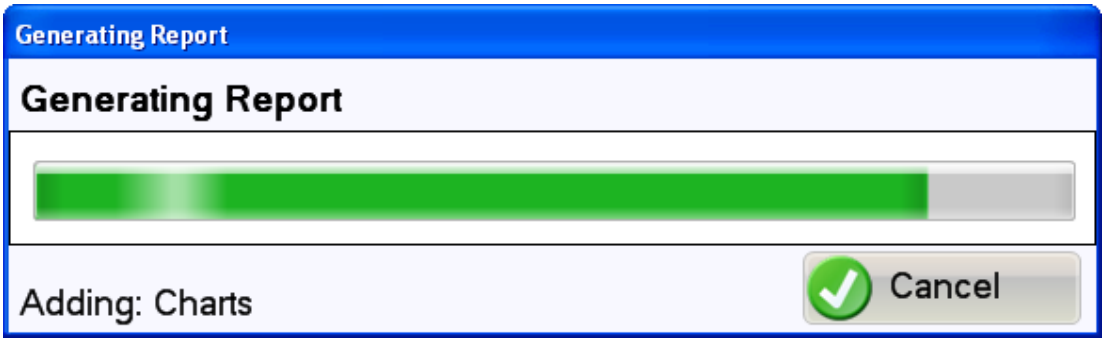


Figure 67: Report - Progress indicator popup

Ounce the report has been generated a “Preview” of the report will be displayed. See section 17.2 “Preview”.

## 17.2 PREVIEW

The report preview displays the report that has been generated and provides the means for printing or saving it (Figure 68: Report - Preview popup). Click on the “Close” button to close the preview popup. To print the report click on the “Print” button (see section 17.3 “Save PDF” for instructions). To save the report to a PDF document click on the “Save PDF” button (see section 17.4 “Print Report” for instructions).

You can use the scroll bar on the right hand side of the screen too review the entire report.

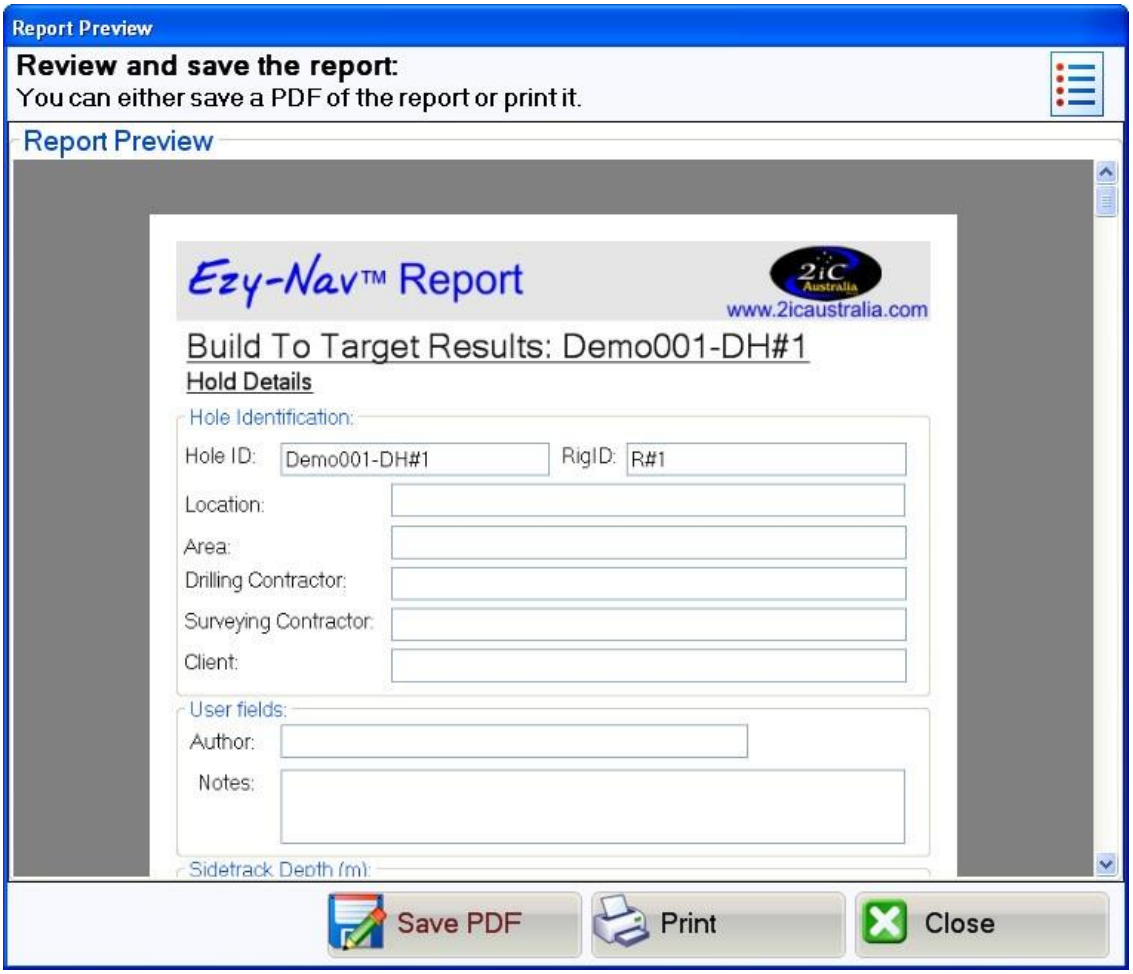


Figure 68: Report - Preview popup

## 17.3 SAVE PDF

After clicking on the “Save PDF” button on the “Report Preview” popup (see section 17.2 “Preview”) a popup for saving the file will appear (Figure 69: Report - Save PDF). Enter the filename of the new file and use the browser to browse to where you want to save the new file. To save the file click on the “Save” button. The “Cancel” button will close the popup without attempting to create a new file.

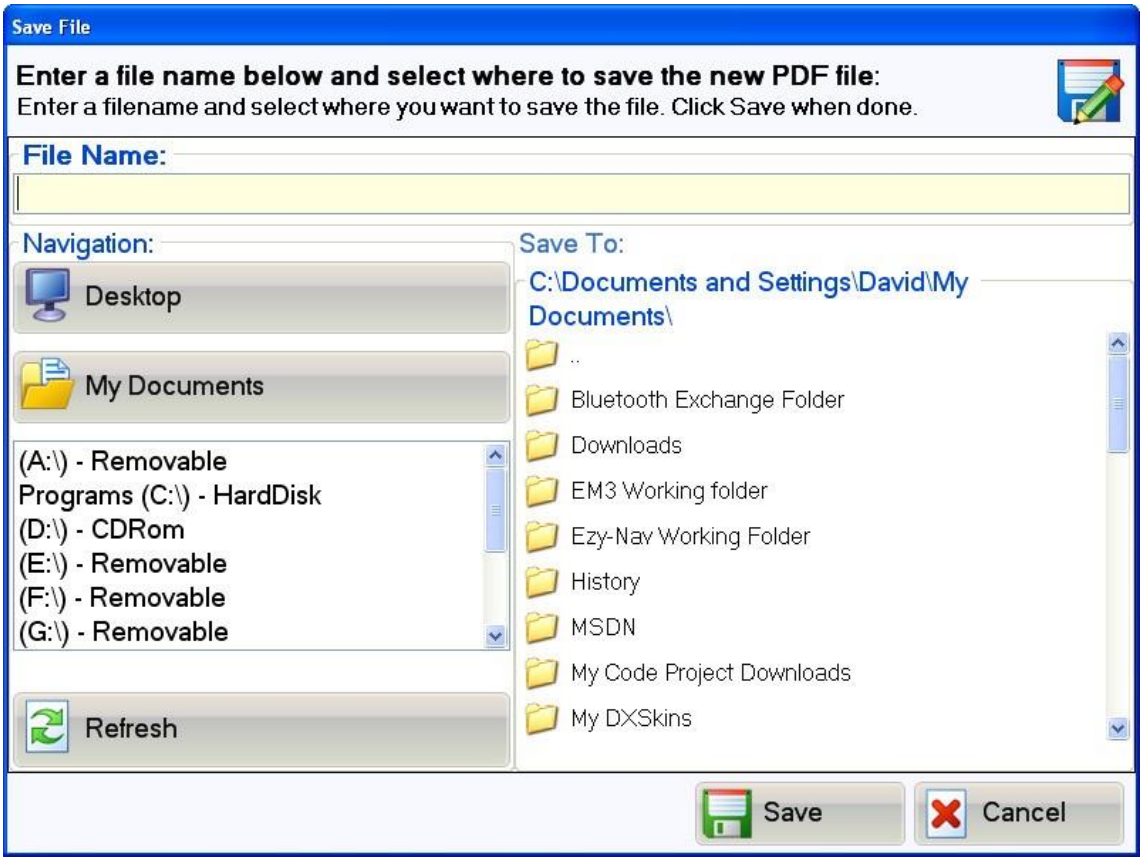


Figure 69: Report - Save PDF

## 17.4 PRINT REPORT

After clicking on the “Print” button on the “Report Preview” popup (see section 17.2 “Preview”) a standard print popup dialog will appear (Figure 70: Report - Print). Use this dialogue to select and configure your printer and click the “OK” button when done. The “Cancel” button will close the popup without printing the report.

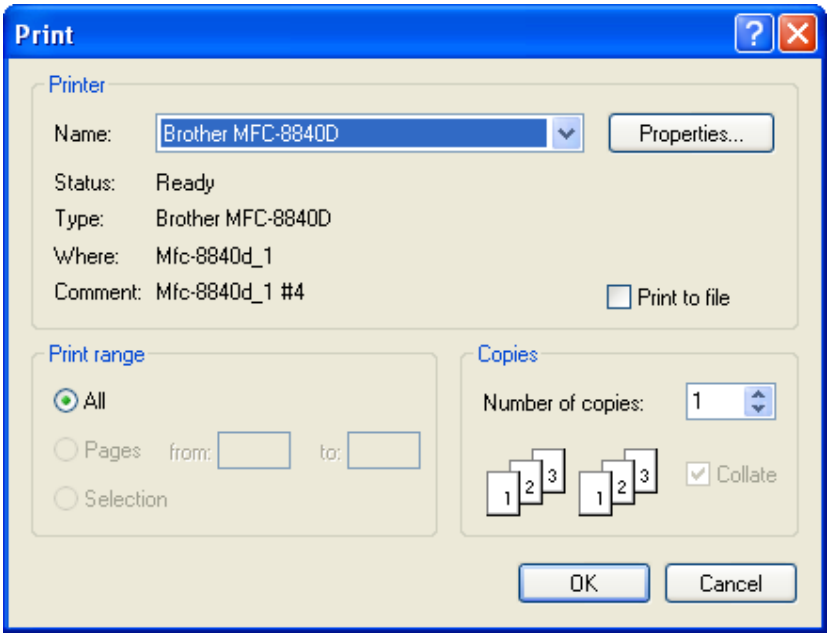


Figure 70: Report - Print

# 18 ACTIVATION MANAGEMENT

Activation management is where you can go to review, top-up and cancel your Ezy-Nav activation. To get to "Activation Management" click on the "Activation Management" button on the "Welcome" screen (see section 4 "Welcome"). A popup will appear that displays an "Activation Summary" and buttons to access the three available options (Figure 71: Activation Management popup). These are:

- "Get Topup Activation Key" (see section 18.1 "Get Topup Activation" for instructions)
- "Enter Topup Activation Key" (see section 18.2 "Enter Topup Activation Key" for instructions)
- "Cancel Activation" (see section 18.3 "Cancel Activation" for instructions)


Figure 71: Activation Management popup

## 18.1 GET TOPUP ACTIVATION

The "Get Activation" procedure will start. See section 3.1 "Get Activation Key" for instructions.

## 18.2 ENTER TOPUP ACTIVATION KEY

The "Enter Activation" procedure will start. See section 3.2 "Enter Activation Key" for instructions.

## 18.3 CANCEL ACTIVATION

This function is password protected and is for special cases only. To cancel the current activation you must first contact 2iC Australia to obtain the password. Remember that ounce the activation has been cancelled you will not be able to use Ezy-Nav again until you obtain a new activation key (see section 3 “Activation” for instructions).

The procedure will start by displaying a popup that requests the password (Figure 72: Enter activation cancellation password). Enter the password and click on the “OK” button to continue.

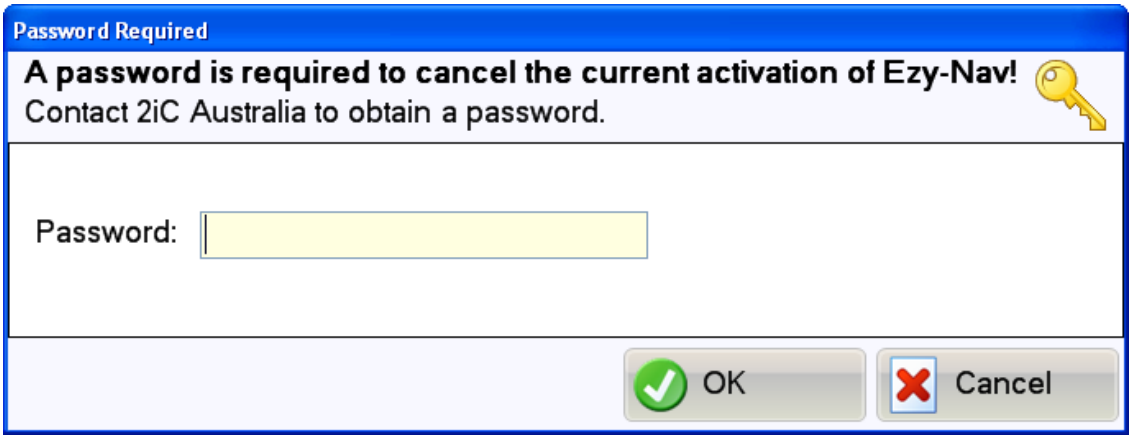


Figure 72: Enter activation cancellation password

The next popup will require you to confirm you identification details (Figure 73: Confirm identification popup). Ensure that the “Company Name” and “Serial No” fields are entered correctly. Click on the “Next” button to continue.

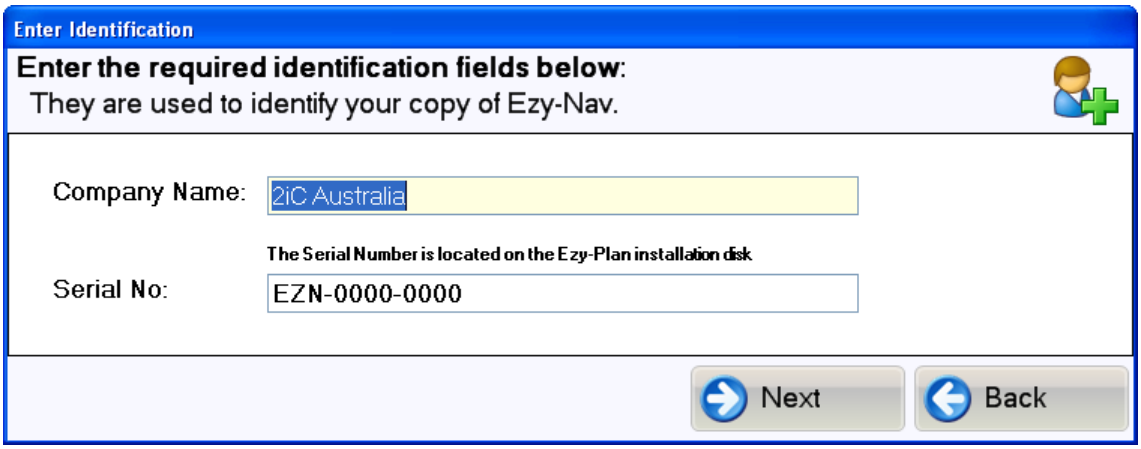


Figure 73: Confirm identification popup

The next popup will ask for confirmation that you want to cancel the current activation (Figure 74: Review current activation and confirm cancellation). Click on the “No” button to not cancel the activation and the “Yes

– Cancel Activation" button to continue to cancel the current activation of Ezy-Nav.

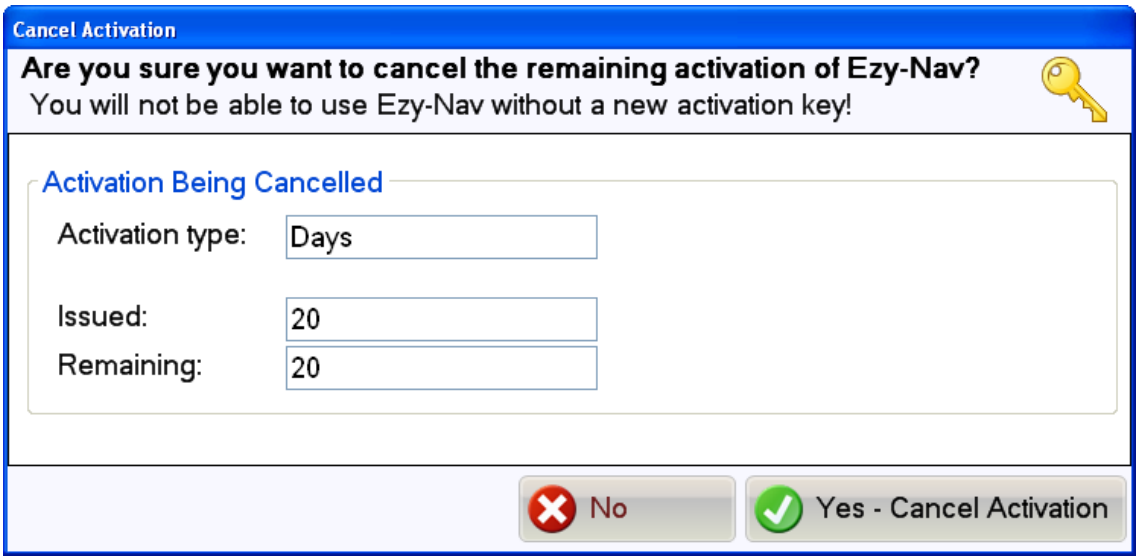


Figure 74: Review current activation and confirm cancellation

The next popup will require you to select the method you would like to use to notify 2iC Australia of the cancellation (Figure 75: Select notification method). 2iC Australia must be notified of the cancellation.

The available methods for notifying 2iC Australia are:

- Email Notification
- Fax Notification

The preferred notification method is "Email" but you are welcome to use whichever best suits you.

Select the notification method by clicking on the options text. Click on the "Next" button to generate the selected notification. See section 18.3.1 "Email Notification" if you selected "Email" or section 18.3.2 "Fax Notification" if you selected "Fax".

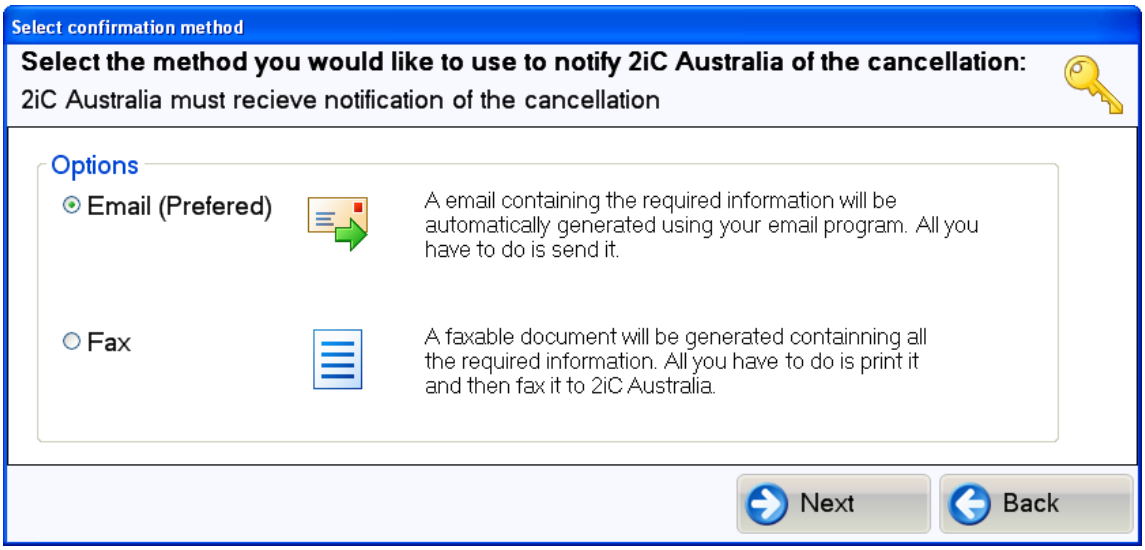


Figure 75: Select notification method

### 18.3.1 EMAIL NOTIFICATION

To use the “Email” method the computer must be connected to the internet and have an Email program setup. This method will use your email program to automatically generate an email with all the required information already entered (Figure 76: Automatically generated notification email). All you will have to do is click the “Send” button to send the email to us. A popup within Ezy-Nav will also appear that contains the information that is used to generate the email (Figure 77: Email notification popup). The information can be manual copied from this form and entered into an email manually if for some reason the email was not automatically generated. Click on the “Finish” button when the email has been successfully sent.

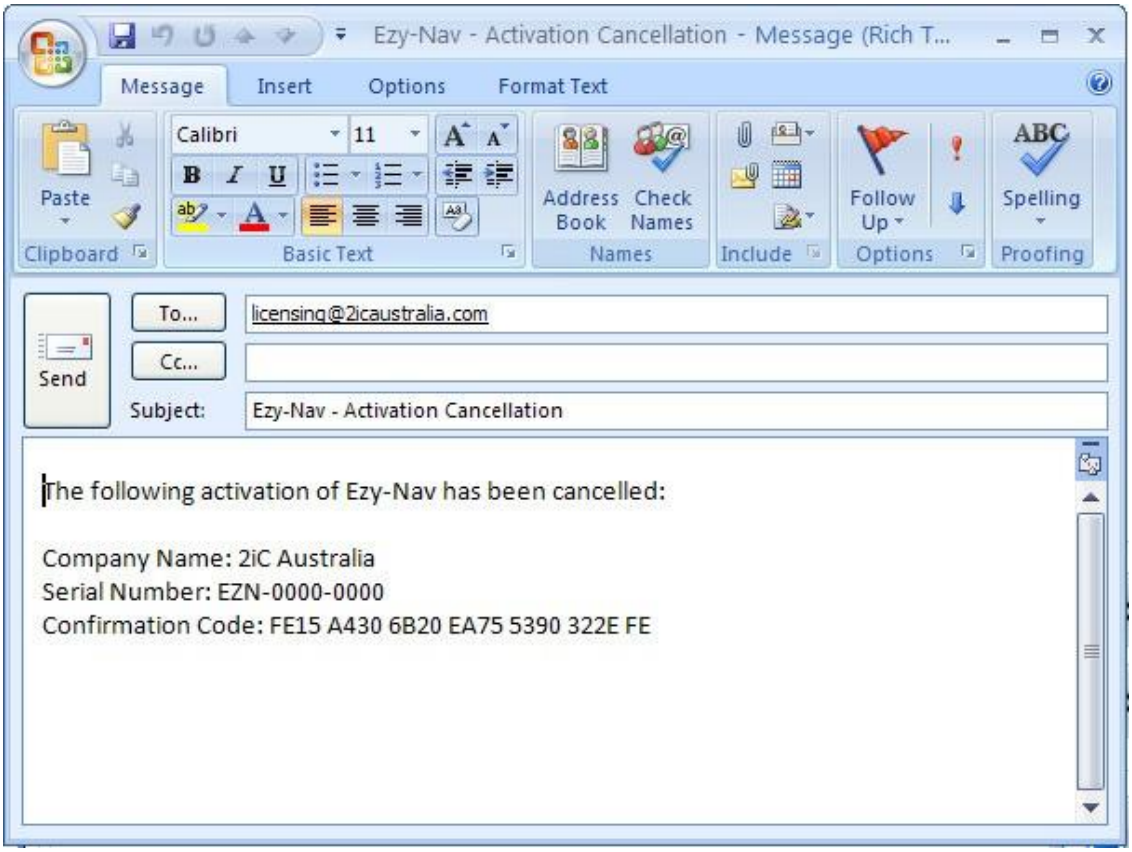


Figure 76: Automatically generated notification email

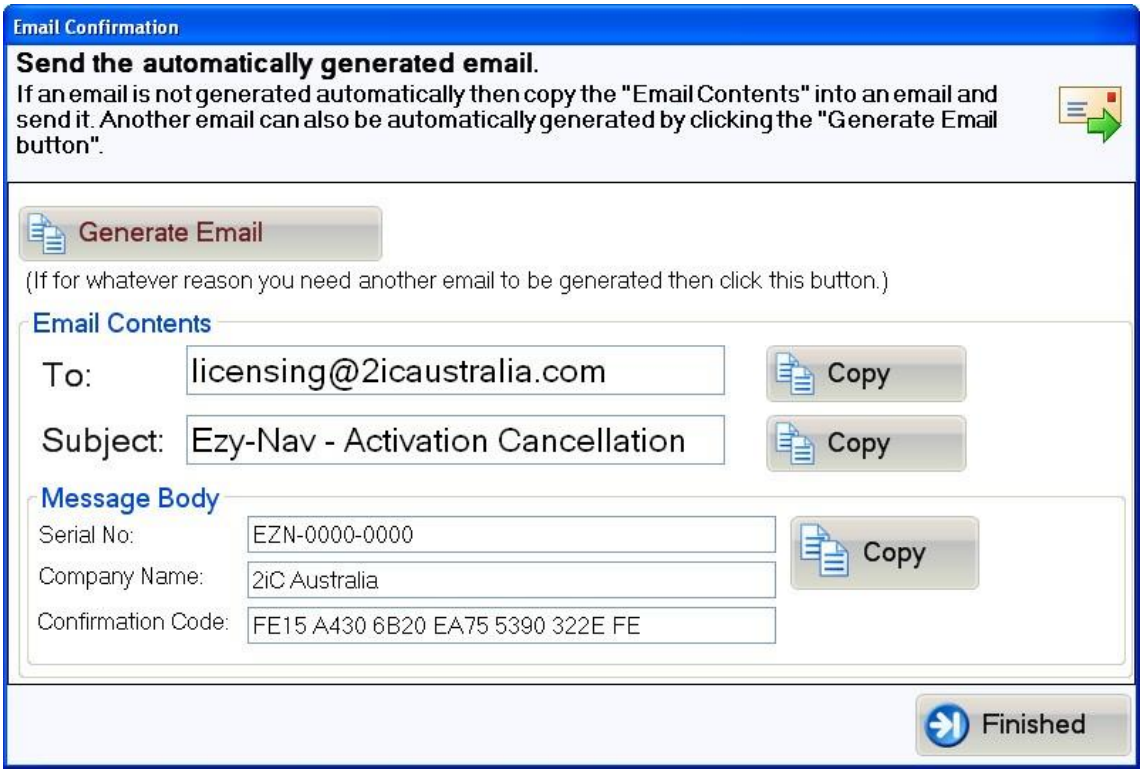


Figure 77: Email notification popup

Next a popup will appear that requests confirmation that the notification has been sent or at least the details saved (Figure 78: Notification sent confirmation). If you click the “Yes” button you will no longer be able to run the program. If you have not sent or copied the notification details then click on the “No” button and do so.

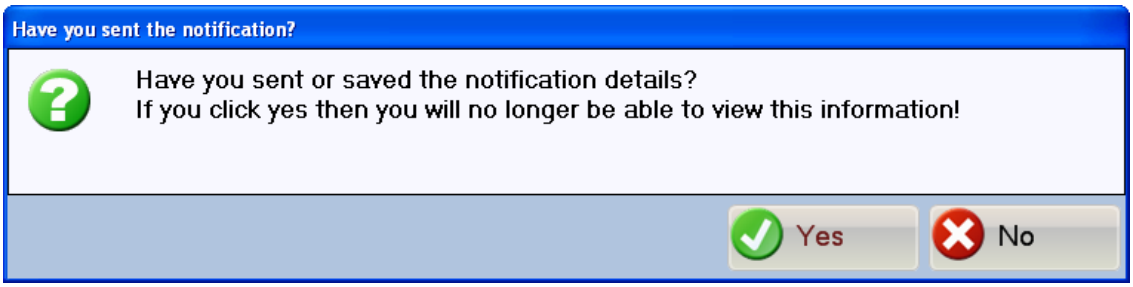


Figure 78: Notification sent confirmation

A popup will now appear that notifies you that the activation of Ezy-Nav has been cancelled and you will no longer be able to use Ezy-Nav (Figure 79: Activation cancelled popup). When you click on the “OK” button the program will terminate.

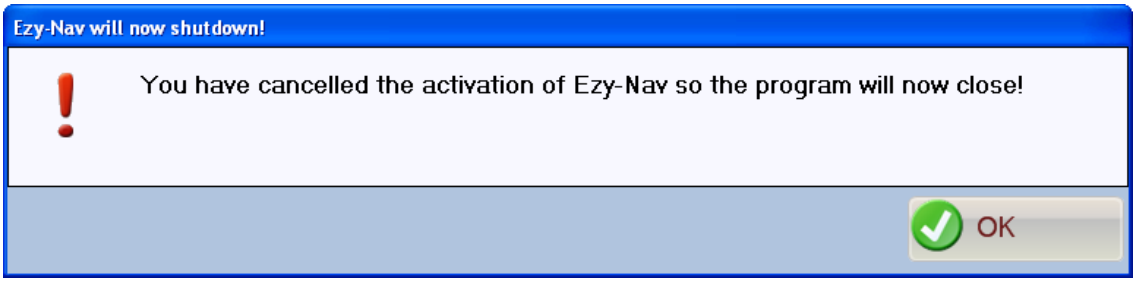


Figure 79: Activation cancelled popup

### 18.3.2 FAX NOTIFICATION

The fax notification will generate a faxable document that you can print or save as a PDF document.

A popup will appear that asks you to enter your name and your fax number (Figure 80: Enter user identification). These details are optional but we recommend that you enter them. Click on the "Next" button to continue.

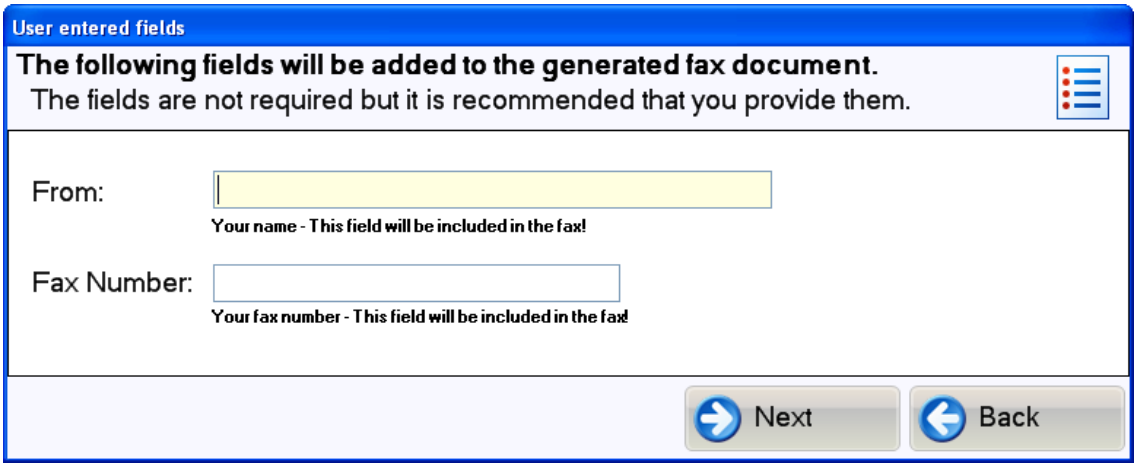


Figure 80: Enter user identification

The document will now be displayed in a preview popup (Figure 81: Fax preview). The preview popup also displays the "Number to send fax to". This is the number you must send the fax to. You can preview the entire document using the scroll bar on the right hand side of the popup. The preview popup also provides buttons for printing or saving the document, these are "Save PDF" (see section 18.3.2.1 "Save PDF") and "Print" (see section 18.3.2.2 "Print"). Ounce you have saved or printed the document click on the "Finished" button of this popup (Figure 81: Fax preview).


Figure 81: Fax preview

#### 18.3.2.1 SAVE PDF

If you click on the “Save PDF” button on the “Report Preview” popup a file saving popup will be displayed (Figure 82: Save PDF). Enter the filename you wish to save the file as in the “File Name” field and select the location you wish to save the file in using the file browser. Click on the “Save” button to attempt to save the file.

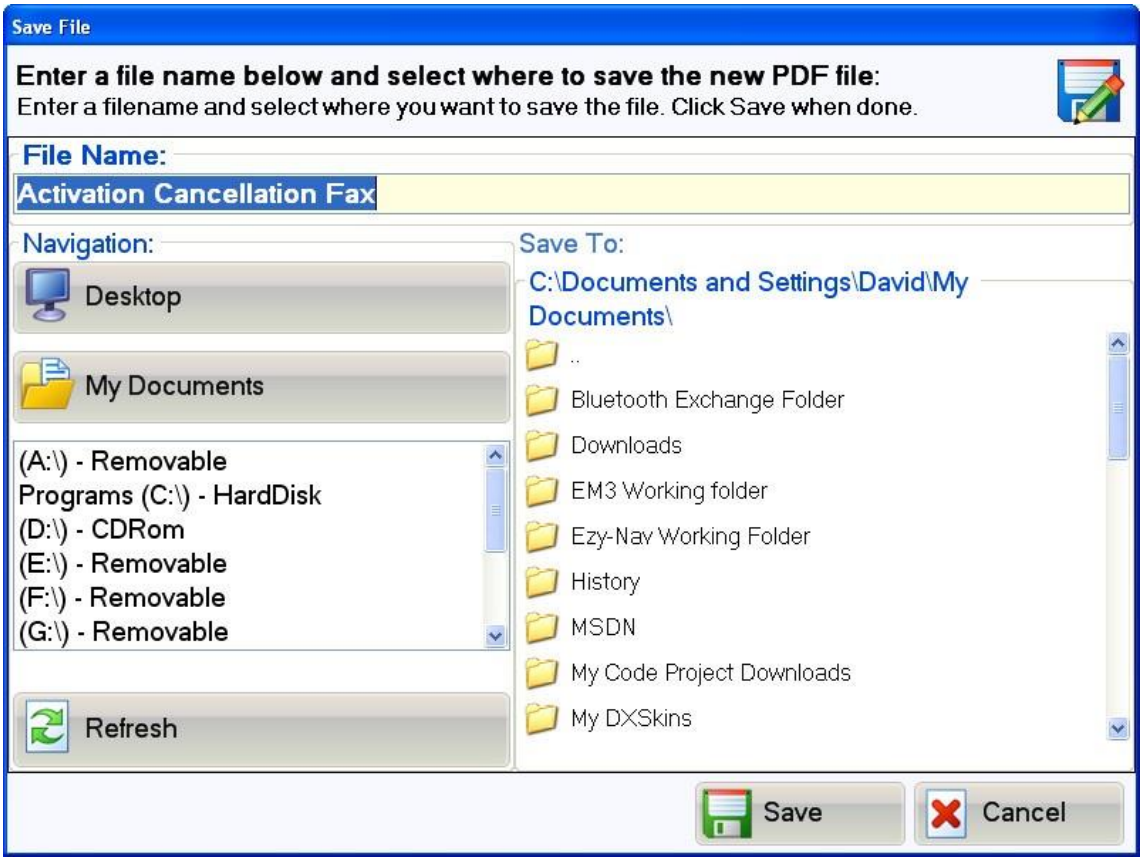


Figure 82: Save PDF

#### 18.3.2.2 PRINT

If you click on the “Print” button on the “Report Preview” popup then a standard print dialog will be displayed (Figure 83: Print). Use this dialog to select and configure the appropriate printer and click the “OK” button to print the fax to the selected printer. When the fax has been printed you can then send it to the fax number provided.

Note: If you have access to a Multi function centre or printer that can send a fax then you can print directly to the fax.

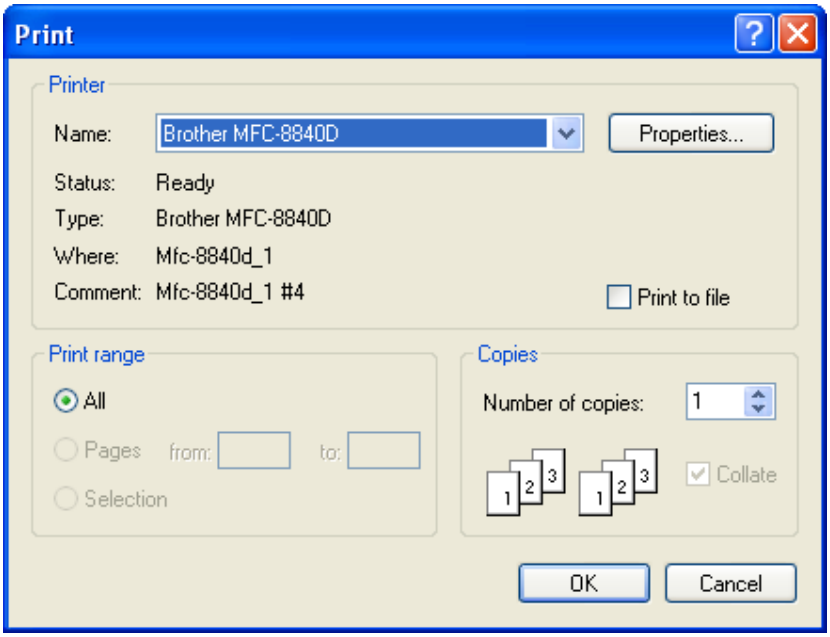


Figure 83: Print

# 19 HOLE CHART

Whenever a hole chart is displayed the chart can be manipulated in the following ways. The default method for manipulating the chart is to rotate it by pressing and holding down the left mouse button near the centre of the chart and moving the mouse in the direction you want to rotate the chart in. It is also possible to left click on the chart elements for example the surveys, straight lines, collars and targets to have the chart display the survey data relating to that element in a small popup on the chart (Figure 85: Chart showing the selected survey's data).

The view of the chart can be changed using a right click popup menu that enables you to change the charts view. The popup menu will appear when you right click on the chart area. See section 19.2 "Popup Menu" for further instructions.

Additional functionality can be accessed with the "Chart Options" tab (Figure 84: Hole Navigation with "Chart Options" tab selected). This tab will always be available when a chart is displayed by the program. To access the chart options click on the "Chart Options" tab. See section 19.1 "Chart Options" for further instructions.

Note: The user should be aware that the scaling of the charts is automatically adjusted to ensure that deviations from the intended course are visually obvious. To achieve this effect the scaling between the horizontal and vertical axis cannot be maintained at 1 to 1. This has the effect in many scenarios of stretching and exaggerating the horizontal departure of the holes path and also means that the holes original angles are not preserved. For example a section of the hole at 20 degrees dip may look more like 80 degrees in some scenarios.

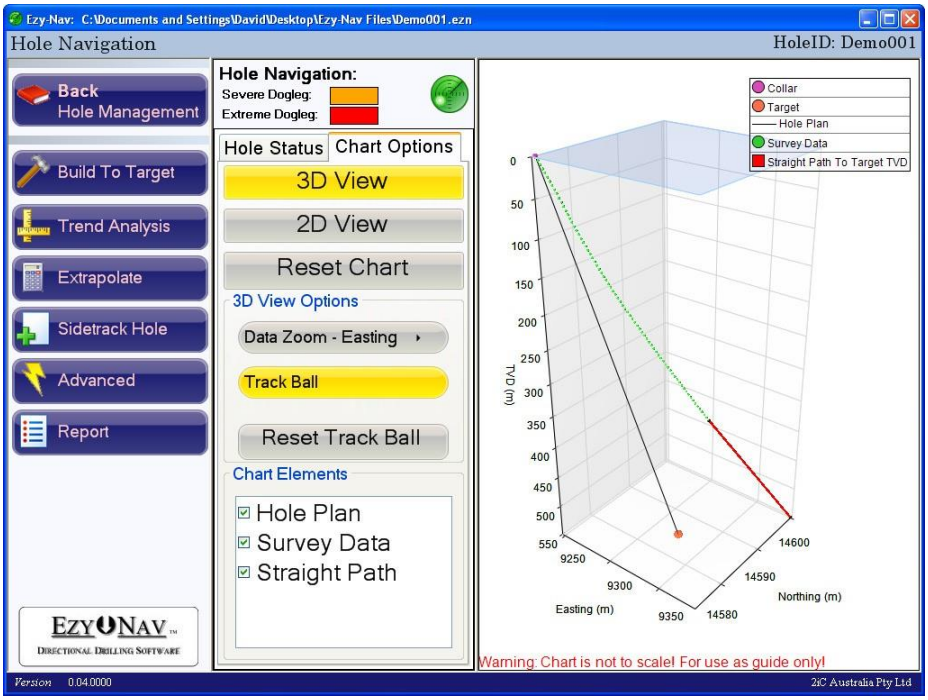


Figure 84: Hole Navigation with "Chart Options" tab selected

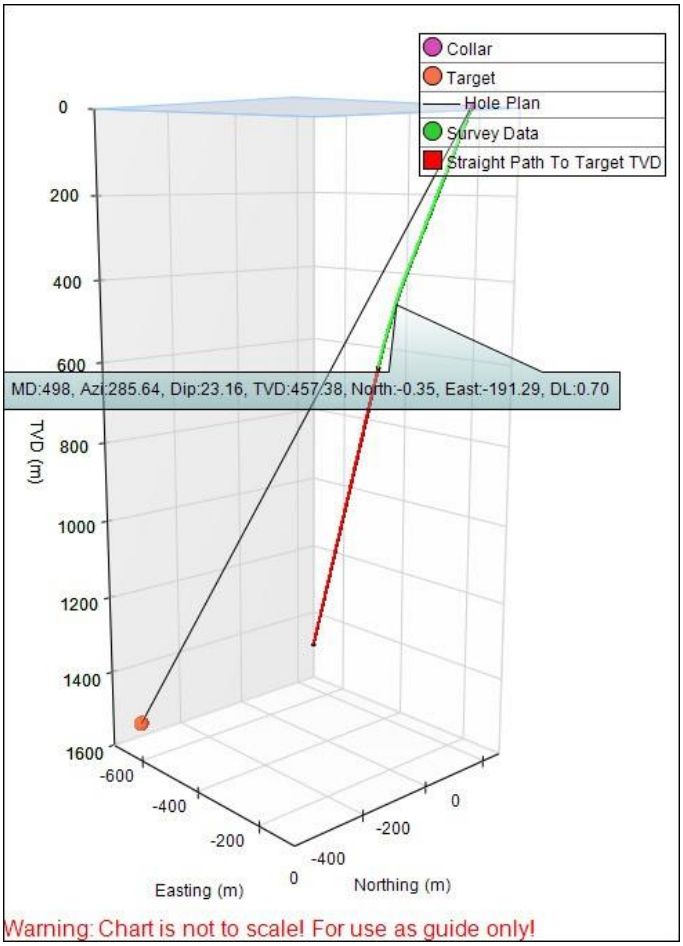


Figure 85: Chart showing the selected survey's data

## 19.1 CHART OPTIONS

The "Chart Options" tab provides access to all the chart functionality (Figure 86: Chart Options tab - 3D View selected). There are two modes that the chart can be set in. These are "3D View" (Figure 86: Chart Options tab - 3D View selected) and "2D View" (Figure 91: Chart Options tab - 2D View selected).

To place the chart in "3D View" click on the "3D View" button on the chart options tab (see section 19.1.1 "3D View" for instructions on using the 3D view mode). To place the chart in "2D View" mode click on the "2D View" button on the chart options tab (see section 19.1.2 "2D View" for instructions on using the 2D view mode).

Common to both modes is the ability to select and de-select chart elements. See "Chart Elements" on "Figure 86: Chart Options tab - 3D View selected" and "Figure 91: Chart Options tab - 2D View selected". When a chart element is de-selected it will be removed from the chart. To select or remove elements double click on their text under "Chart Elements".

The "Reset Chart" button can be clicked at any time to remove any changes you have made and return the chart to how it was originally displayed.

### 19.1.1 3D VIEW

See “Figure 86: Chart Options tab - 3D View selected” for an image of the “Chart Options” in “3D View” mode.

When the chart is in this state there are two functions available. These are:

- “Data Zoom”: See section 19.1.1.1 “Data Zoom” for instructions.
- “Track Ball”: See section 19.1.1.2 “Data Zoom” for instructions.

Click on the button for the function that you want to use under “3D View Options”.

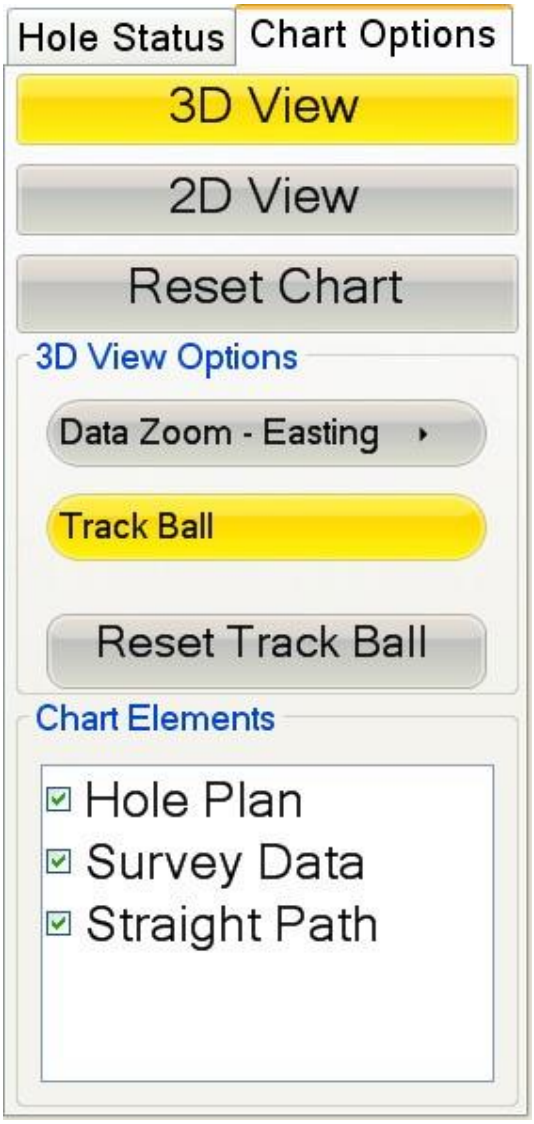


Figure 86: Chart Options tab - 3D View selected

#### 19.1.1.1 DATA ZOOM

The data zoom function is for zooming in on a particular range of chart data. The function works by enabling you to drag a range selector over the chart region you wish to zoom in on.

Select the “Data Zoom” function by clicking on the “Data Zoom” button on the “Chart Options” tab when it is in “3D View” mode (See section 19 “Hole Chart”).

To zoom in on a chart area press down and hold the left mouse button on the top left point of the chart area you want to zoom in on. Now move the mouse pointer across to the right and down to the point bottom right corner of the area you want to zoom in on. Release the mouse button and the chart will zoom in on the selected area. See “Figure 87: Data Zoom - Selecting area” for an image of the selection in progress.

The default axis that the range selector selects from is the “Easting” axis. This can be changed to the “Northing” axis by clicking on the right facing arrow on the right hand side of the “Data Zoom” button (Figure 86: Chart Options tab - 3D View selected). A popup menu will appear that enables you to select the axis that you want the data zoom to work on (Figure 89: Data Zoom - Axis selection popup menu). Click on the option that you want.

Click on the “Reset Data Zoom” button at any time to cancel any zooming you have already done and return the chart to its original view.

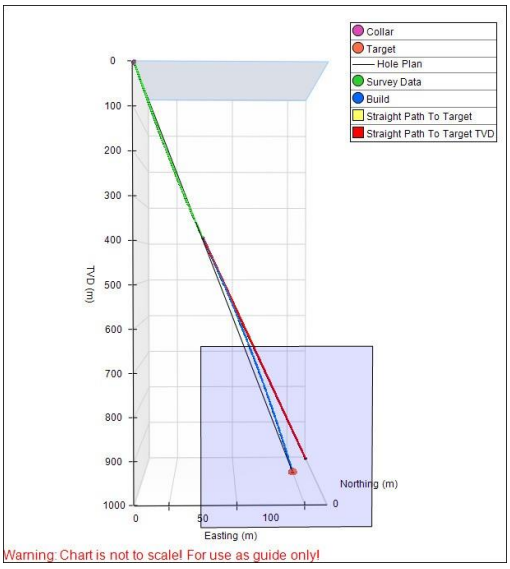


Figure 87: Data Zoom - Selecting area

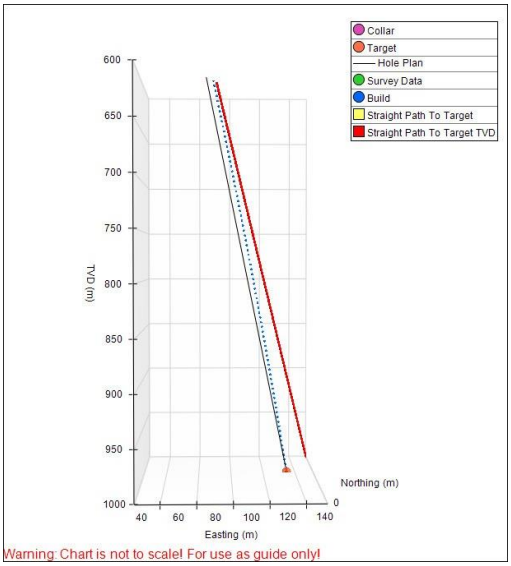


Figure 88: Data Zoom - Selected area displayed

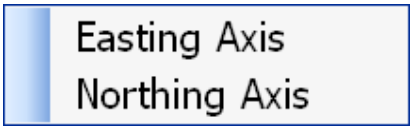


Figure 89: Data Zoom - Axis selection popup menu

### 19.1.1.2 TRACK BALL

The trackball function enables you to rotate the chart in any direction in order to view the chart from whatever angle you like.

To use the trackball function click on the “Track Ball” button under “3D View Options” on the “Chart Options” tab in “3D View” mode (Figure 86: Chart Options tab - 3D View selected). Then press and hold the left mouse button near the centre of the chart but away from any chart elements and move the mouse pointer in the direction you want to rotate the chart in. Release the mouse button when you are done.

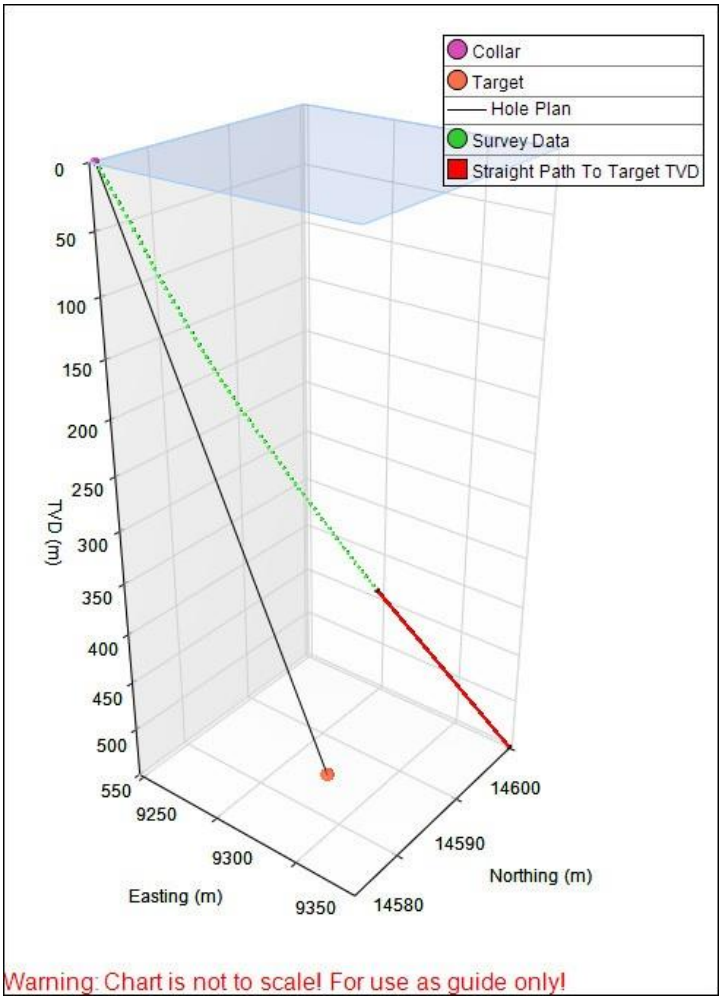


Figure 90: 3D View of the chart

### 19.1.2 2D VIEW

See “Figure 91: Chart Options tab - 2D View selected” for an image of the “Chart Options” tab in the “2D View” state.

When the chart is in this state there are three view options available. These are:

- “Easting Profile”: A 2D view of the Easting axis.
- “Northing Profile”: A 2D view of the Northing axis.
- “Top Profile”: A 2D view from the top.

To select any of these views click on the appropriate option text under “2D View Options”. The data zoom and trackball functions are not available when the chart is in “2D view” mode. See “Figure 92: 2D View of the chart (Easting)” for an example of a 2D view of the chart.

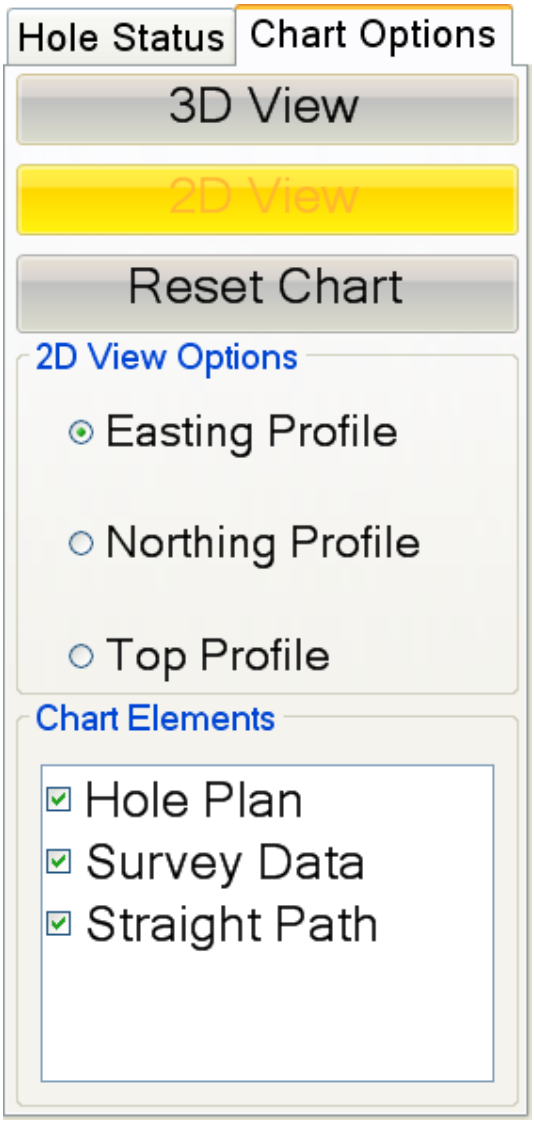


Figure 91: Chart Options tab - 2D View selected

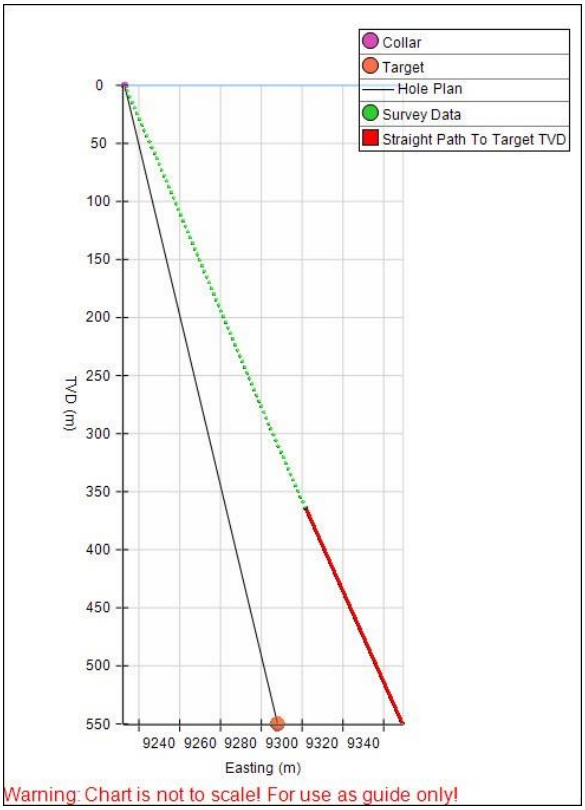


Figure 92: 2D View of the chart (Easting)

## 19.2 POPUP MENU

The right click popup menu for the charts enables you to change the view of the chart (Figure 93: Chart right click popup menu displayed). The options available are:

- 3D View – A perspective projection that enables you to look at the chart from any angle.
- Easting Profile - An orthogonal projection looking at the Easting axis of the chart.
- Northing Profile - An orthogonal projection looking at the Northing axis of the chart.
- Top profile – An orthogonal projection looking at the top of the chart.
- Reset Chart – Reset the chart back to its default state.

Select the desired view by left clicking on the view you want.

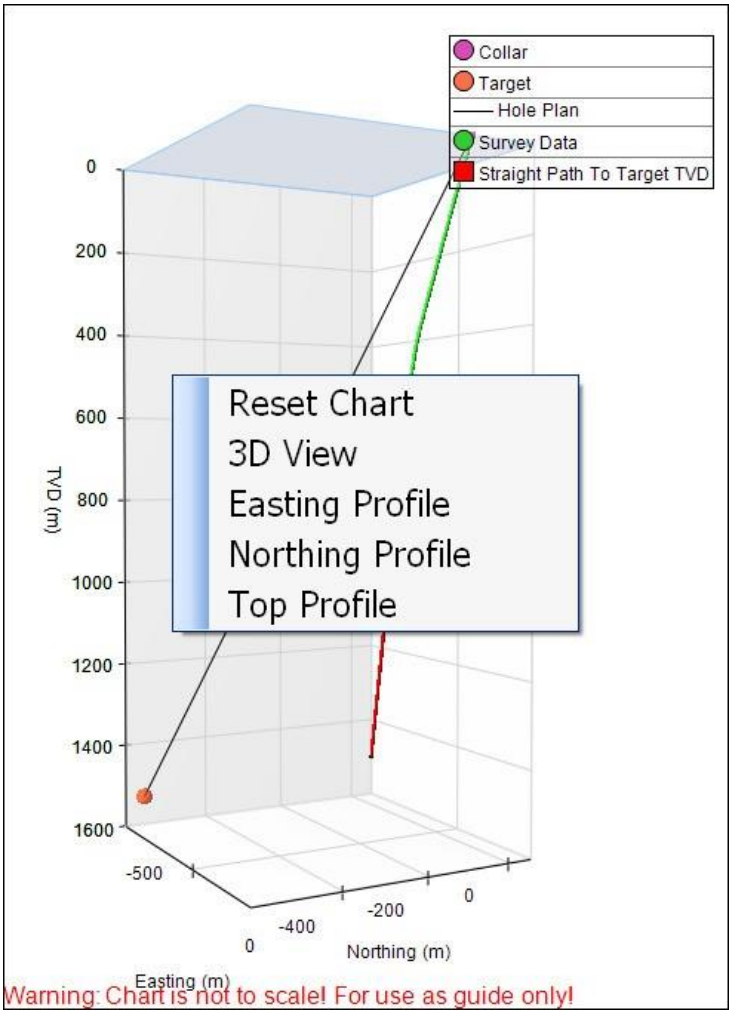


Figure 93: Chart right click popup menu displayed

# 20 2IC AUSTRALIA CONTACT DETAILS

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Office Email: admin@2icaustralia.com