dB Foresight™

# User Guide

## For dB Foresight Software, Version 3.01
## Windows ® Version

**Included In This User Guide:**

The Quick Start Guide
Installation, Startup and Operation Instructions
The End User License Agreement
Warranty description
Refund policy
Functional Specifications
Noise Level Prediction Methodologies

User Guide Version: 3.01
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# Contents



  

  

dB Foresight Corporation, Calgary, Alberta, Canada, website: www.dbforesight.com.

## Acronyms

BMP – Bitmap File Format
CSV – Comma Separated Values
dB – Decibel
dBA – Decibel, A-weighted
EULA - End User License Agreement
ISO - International Organization for Standardization
JPEG – Joint Photographic Experts Group
KML – Keyhole Markup Language
MSI – Microsoft Installer
PNG – Portable Network Graphics
POR – Point Of Reception
PWYW - Pay What You Want
SPL – Sound Pressure Level
SWL – Sound Power Level
TGA – Truevision TGA (TARGA)
XDB – dB Foresight File Format

# 1 Licensing

## 1.1 License Definitions.

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"EULA" - End User License Agreement.

“YOU” – The "Licensee" or the organization (if any) on whose behalf YOU are taking the EULA.

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This license is a PWYW (Pay What You Want) agreement. You may download and try out the Software Product for free. But once you are satisfied with the product and intend to continue using it you must pay for it, for the amount you feel it is worth. The license will be valid until December 31, 2016. After December 31, 2016 dB Foresight Corporation reserves the right to either continue to extent the PWYW licenses or change the license type. The license renewal and payment instructions will be posted on the website www.dbforesight.com.

## 2 System Requirements

The following table lists preferred minimum system requires to run dB Foresight.

### 2.1 Standard System Requirements

| Component | Minimum Requirement |
|---|---|

| | |
|---|---|
| Computer and processor | PC, 2-gigahertz (GHz) processor, quad-core. It will run on a slower PC, but computation may take longer to run. |
| Memory | 1 gigabyte (GB) RAM or higher. |
| Hard disk | 5 gigabyte (GB) available disk space. The data files could require up to 50 MB per project. |
| Display | 1024 × 768 or higher resolution monitor. |
| Operating system | Windows XP:<br>Home/ Professional/ 64-bit Edition |
| | Windows Vista:<br>Home Basic/Home Premium / Business / Ultimate |
| | Windows 7:<br>Home Basic/Home Premium/Professional/Enterprise/ Ultimate |
| | Windows 10:<br>Running in Windows 7 compatibility mode. |
| Network Card / Internet Access | High speed internet access is preferred. This is required to view the noise plots on Google Earth. dB Foresight also requires internet access to verify the Product Verification Code. |

## 3 About dB Foresight

dB Foresight is a software application that predicts noise levels for outdoor industrial projects. It uses the computation methodologies as defined in the international standard ISO 9613-2. The noise level prediction plots and data can be used for permitting, regulatory applications or public consultations. For more information on noise level prediction calculation methodologies refer to section 10 Noise Level Prediction Methodologies.

One of dB Foresight's strengths is the ability to consider site elevation and topographic data. It computes barrier attenuation effects based on the both natural elevation contours and man-made barriers. This produces realistic, accurate noise level predictions for the assessment area. dB Foresight's simultaneous multiprocessing feature takes advantage of all the computer CPU cores to speed up the computations and reduce run time. The user interface is extremely intuitive and efficient.

The input data required includes the projects' geographic coordinates, project settings along with source, POR, barrier and plot settings. This data is entered and saved as dB Foresight project files.

The output files created by dB Foresight include predicted noise level contour line and filled contour plots in numerous file types. KML files are created which georeference the plot file images for viewing in Google Earth, ArcGIS, or most standard GIS applications. Complete noise level data files with latitude, longitude and SPL levels are also created.

The file types created are listed in the table below. Each file name contains the project name, file type and a unique 6 digit number which is the hour, minute and second (HHMMSS) it was created. The KML files georeference the plot files and require the complete path and file names. If you edit the plot file names or move them to another folder, then the file name references will need to be updated in Google Earth. Please refer to the 'Google Earth Settings' section of this user guide for details on updating the file name references in Google Earth.

### 3.1 dB Foresight 3 New Features

dB Foresight 3.01 has the following new features, and improvements:

- For insufficient memory allocation errors, version 3.01 now checks for sufficient memory allocation and gives the user a message to reduce project data points to save memory. Previously the software would freeze and give the error message on shut down.

dB Foresight 3.00 has the following new features, and improvements:

- Customized barriers: louvered or split barriers which are partial louvered and partial solid
- Increased component count: Sources-500, Barriers-500, Custom Barriers-500, PORs-500
- Increased resolution: up to 1000 divisions per axis
- Increased speed: restructured software to run up to 10 times faster or more depending on configuration
- Ability to include day and night time ambient SPLs for the PORs
- Improved POR SPL output data table, which includes the day and night time data
- Selectable current or previous data input: can be used to fine tune plotting for data already computed in a previous project, includes setting the previous project SPL data file
- More flexibility in the plot settings, including plot height, resolution and marker types
- New Cmet feature: this is a meteorological correction based on the site location and know conditions
- Simplified POR height is now the "Receiver (Map) Height", so that it can be set with one point
- Intermediate output data files for improved impact analysis and mitigation
- Ability to exclude barriers for selected sources (ex: if the barrier is the source enclosure).

### 3.2 File Types And Descriptions Table

| # | File Names And Folders Created By dB Foresight | Description |
|---|---|---|
| 1 | ProjectName_HHMMSS | Project folder |
| 2 | Data | Data folder |
| 2.1 | NoiseLevels_HHMMSS.csv* | The predicted noise sound pressure levels for each latitude and longitude in the project area. These levels do not include the cumulative project and ambient SPLs. * Used when "Previous Project" is set in the Project Panel. |
| 2.2 | POR_SPLs_HHMMSS.csv | The generated, day and night time ambient and cumulative SPLs at each POR. The POR coordinates. |
| 2.3 | ProjectData_HHMMSS.csv | A copy of all project settings from the project XDB file. |
| 2. a | Data/PORSPL | PORSPL folder |
| 2.a1 | PORSPLHHMMSS.csv | The SPL level at each POR point. The Project Settings information. |
| 2.b | Data/SiteSPL | SiteSPL folder |
| 2.b1 | SiteSPLHHMMSS.csv | The SPL values for the full project site. |
| 2.b2 | SiteSPLHeadersHHMMSS.csv | The SPL values for the full project site, with headers. |
| 2.c | Data/SPLPerSrc_FullGrid | SPLPerSrc_FullGrid folder |
| 2.c1 | FullGrid_HHMMSSSPLPerSrcNum_0.csv ... | The generated SPLs for the full site for each |

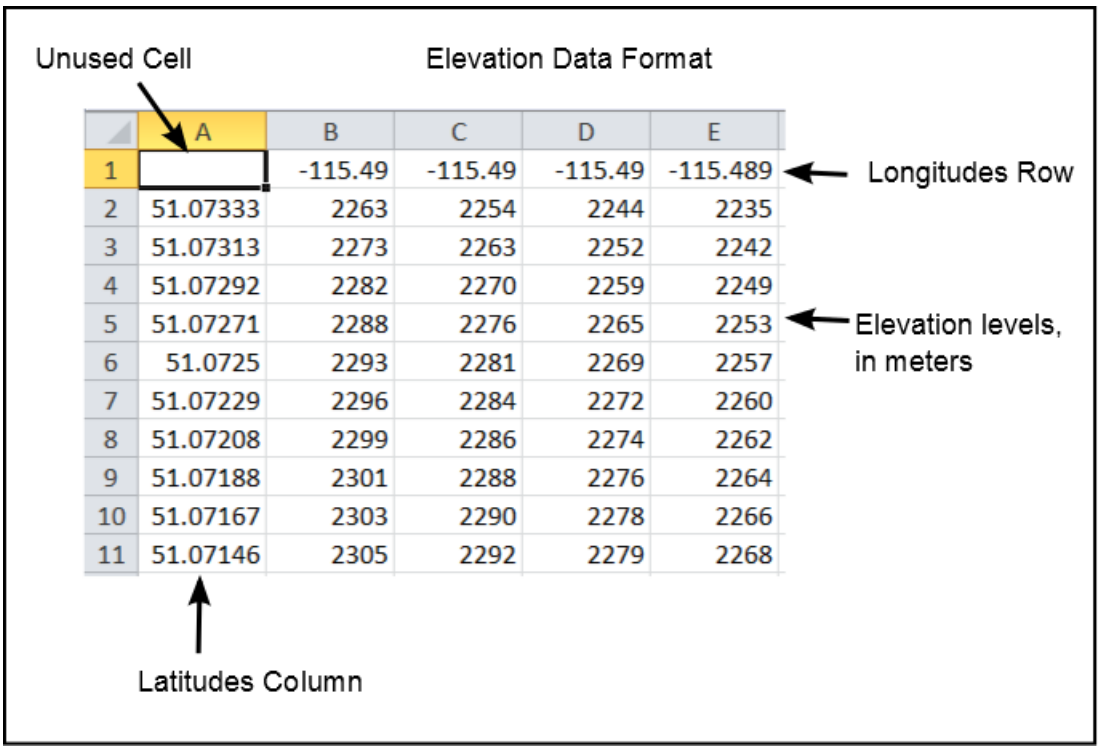
| | | |
|---|---|---|
| | | source. |
| 2.d | Data/SPLPerSrc_PORs | SPLPerSrc_PORs folder |
| 2.d1 | PORs_HHMMSSSPLPerSrcNum0.csv | The generated SPLs at each POR for each source. |
| 3 | Noise_ContourLines | Folder of plots for the predicted noise levels in the contour lines format. |
| 3.1 | NoiseContourLines_ HHMMSS.bmp | A BMP format of the noise contour lines plot. |
| 3.2 | NoiseContourLines_ HHMMSS.jpeg | A JPEG format of the noise contour lines plot. |
| 3.3 | NoiseContourLines_ HHMMSS.kml | A georeferenced KML format of the noise contour lines plot. This file can be opened in Google Earth, ArcGIS or most standard GIS applications. |
| 3.4 | NoiseContourLines_ HHMMSS.png | A PNG format of the noise contour lines plot. |
| 3.5 | NoiseContourLines_ HHMMSS.tga | A TGA format of the noise contour lines plot. |
| 3.6 | NoiseContourLinesLegend_ HHMMSS.png | A PNG format of the noise contour lines legend. |
| 3.7 | NoiseContourLinesLegend_ HHMMSS.tga | A TGA format of the noise contour lines legend. |
| 4 | Noise_FilledContours | Folder of plots for the predicted noise levels in the filled contours format. |
| 4.1 | NoiseFilledContours_ HHMMSS.bmp | A BMP format of the noise filled contours plot. |
| 4.2 | NoiseFilledContours_ HHMMSS.jpeg | A JPEG format of the noise filled contours plot. |
| 4.3 | NoiseFilledContours_ HHMMSS.kml | A georeferenced KML format of the noise filled contours plot. This file can be opened in Google Earth, ArcGIS or most standard GIS applications. |
| 4.4 | NoiseFilledContours_ HHMMSS.png | A PNG format of the noise filled contours plot. |
| 4.5 | NoiseFilledContours_ HHMMSS.tga | A TGA format of the noise filled contours plot. |
| 4.6 | NoiseFilledContoursLegend_ HHMMSS.png | A PNG format of the noise filled contours plot legend. |
| 4.7 | NoiseFilledContourssLegend_ HHMMSS.tga | A TGA format of the noise filled contours plot legend. |
| 5 | Placemarks | Placemarks Folder |
| 5.1 | Placemarks_ HHMMSS.kml | The georeferenced placemarks to view the source, POR and barrier names in Google Earth, ArcGIS or most standard GIS applications. |
| 5.2 | SrcStructurePlacemarks_ HHMMSS.kml | The georeferenced placemarks to view the source structure endpoints in Google Earth, ArcGIS or most standard GIS applications. These points are used to create and assess the affects the source structures would have on sound level attenuations. |

### 3.3 Elevations File Format

dB Foresight can accept elevation data to assess the noise level attenuation due to natural barriers and elevation changes. The format of the elevation data must be a CSV file in the following format.

Elevations File Format Table

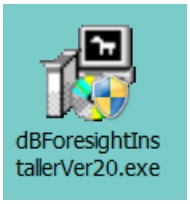



| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | | -115.49 | -115.49 | -115.49 | -115.489 |
| 2 | 51.07333 | 2263 | 2254 | 2244 | 2235 |
| 3 | 51.07313 | 2273 | 2263 | 2252 | 2242 |
| 4 | 51.07292 | 2282 | 2270 | 2259 | 2249 |
| 5 | 51.07271 | 2288 | 2276 | 2265 | 2253 |
| 6 | 51.0725 | 2293 | 2281 | 2269 | 2257 |
| 7 | 51.07229 | 2296 | 2284 | 2272 | 2260 |
| 8 | 51.07208 | 2299 | 2286 | 2274 | 2262 |
| 9 | 51.07188 | 2301 | 2288 | 2276 | 2264 |
| 10 | 51.07167 | 2303 | 2290 | 2278 | 2266 |
| 11 | 51.07146 | 2305 | 2292 | 2279 | 2268 |

The application Elevation Mapper creates the elevations in a file format accepted by dB Foresight. The Elevation Mapper software can be purchased and downloaded at www.elevationmapper.com.

## 4 Installation And Uninstallation Procedures

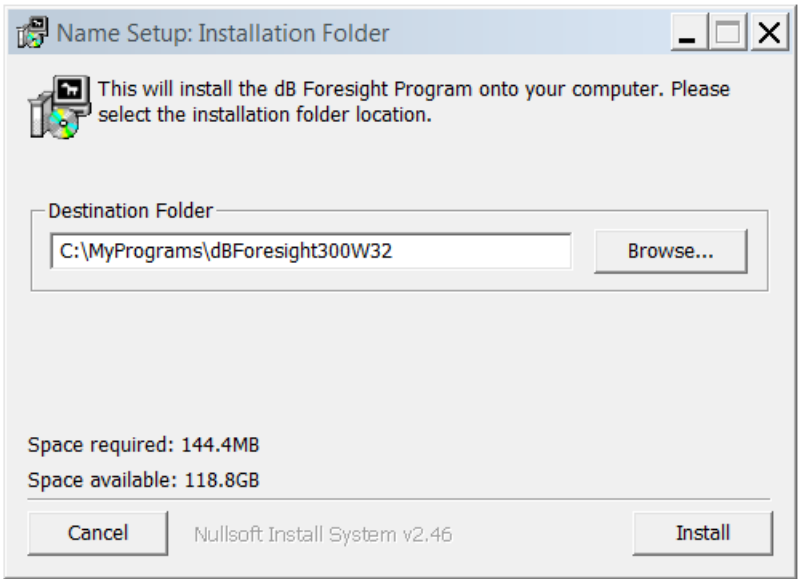
To install the dB Foresight download and double click on the ElevationMapperInstallerVer20.exe shortcut.



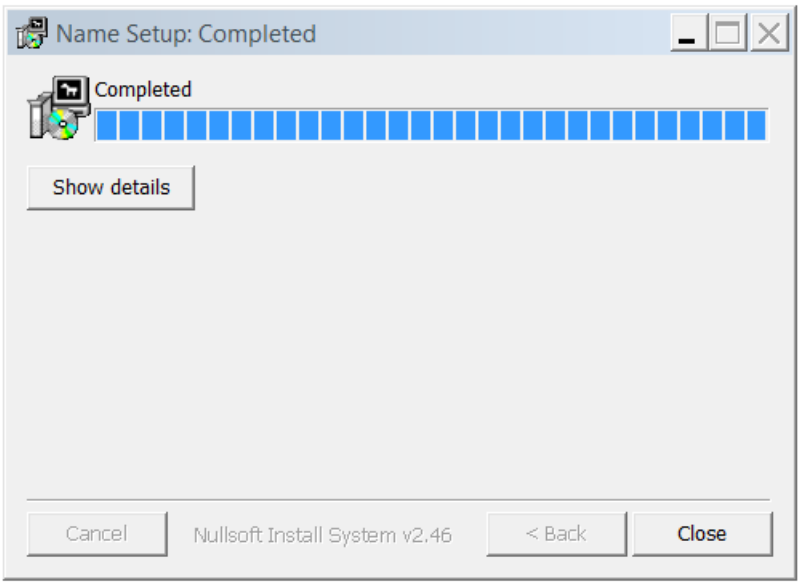

Note: the Installer version will be the released version which you have download.

This is a standard installer application which will automatically start up and guide you through the installation process. The installer will prompt you for the installation path, and suggest the preferred installation at C:\MyPrograms\ElevationMapper. If you select this path it will automatically create new folders, if required, and install the application at this selected location.



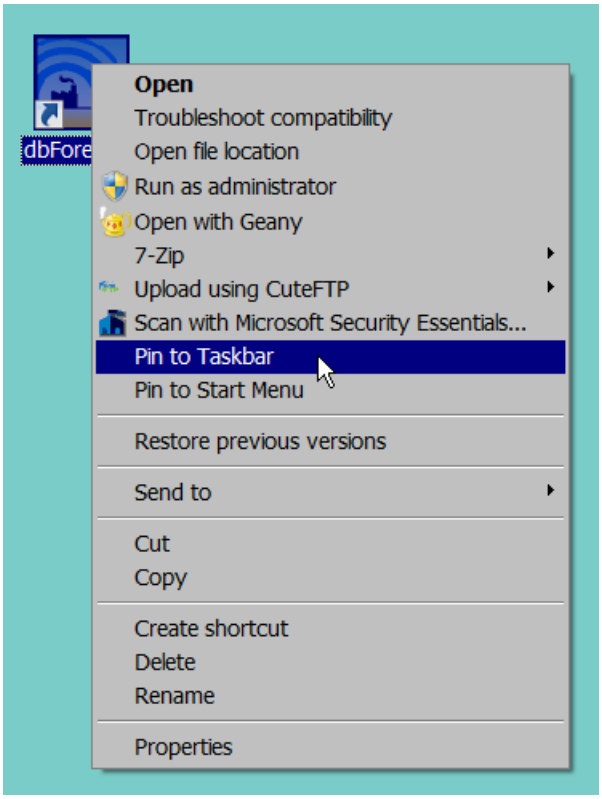

It is preferable NOT to install dB Foresight on either C:\Program Files or C:\Program Files(x86). These locations may require administrator privileges to run. If one of these paths is required, then see below on how to set dB Foresight to run in administrator mode.




After installation you will see a dB Foresight shortcut on your PC Desktop. You can start up the dB Foresight application by double clicking on this shortcut. To pin the short cut to your Taskbar or Start Menu , right click on the dB Foresight shortcut and select 'Pin to Taskbar' or 'Pin to Start Menu'.

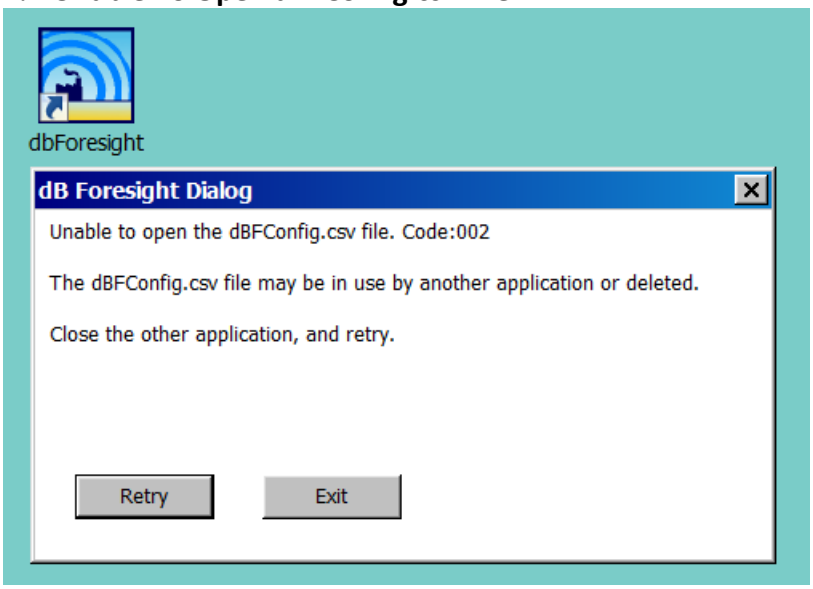
  

### 4.1 Pin to Taskbar or Start Menu




If you installed the application on the C:\Program Files(x86) or other folder locations that prevent write access, you may get the following error when you start the application.

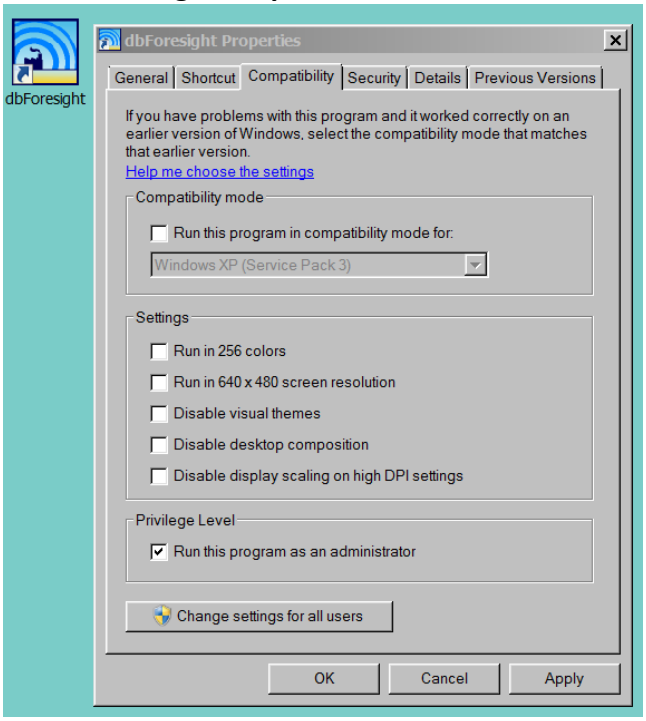
### 4.2 Unable To Open dBFConfig.csv File




If you get this error you can unlock the folder by setting the application to run in administrator mode. To do this, right click on the dB Foresight shortcut, select 'Properties', click the 'Compatibility' tab then select the box next to 'Run this program as an administrator', as per the following screenshot.

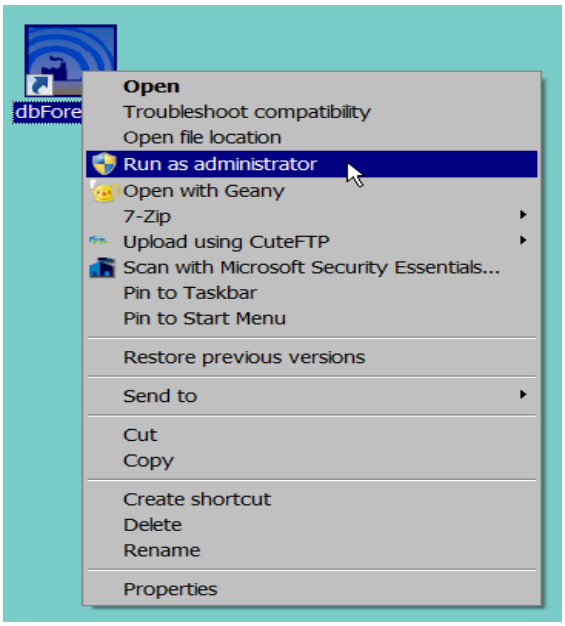
  

### 4.3 dB Foresight Properties




You can also right click on the dB Foresight shortcut and select 'Run As Administrator', though you will need to do this each time you start up the application, as per the following screenshot.

### 4.4 Run As Administrator



### 4.5 Uninstallation

To uninstall dB Foresight from your computer, simply use a file manager tool such as Windows Explorer to locate the folder where dB Foresight was installed. Delete the installed folder and all subfolder and files within that folder to remove the product from your computer. Delete any dB Foresight shortcuts you may have on your Desktop or other locations on your computer. Unpin any dB Foresight start icons that may be on the taskbar. Go to the Start menu and select “Remove from this list” for any dB Foresight start icons that may be in the Start Menu.

dB Foresight does not modify or store any information in the Windows Operating System registry, so there is nothing to remove from the registry.

## 5 Quick Start Guide

The project settings are located within the Project Panel. You can click in any cell and edit them for your site. The "Project Name" is used in the created filenames and KML references, so it must not contain any of the illegal filename characters as follows:

| | | | |
|---|---|---|---|
| # pound | < left angle bracket | $ dollar sign | + plus sign |
| % percent | > right angle bracket | ! exclamation point | ` backtick |
| & ampersand | * asterisk | ‘ single quotes | \| pipe |
| { left bracket | ? question mark | “ double quotes | = equal sign |
| } right bracket | / forward slash | : colon | ~ tilde |
| \ back slash | blank spaces | @ at sign | ^caret |
| ( left bracket | ) right bracket | [ left bracket | ] right bracket |

Also, keep these rules in mind.

- Don’t start or end your filename with a space, period, hyphen, or underline.
- Keep your filenames to a maximum of 30 characters.
- Project names are case sensitive.

The GPS coordinates for the site boundaries must be entered in decimal degrees. The resolution is the number of divisions per axis. This will correspond to the number of data points computed across your site. A resolution setting of 100 is a good starting point. The ground type is commonly ‘Mixed’ which is mostly vegetation with some hard ground such as pavement. The Include Cmet Effect should be set to ‘No’ unless you are aware of known conditions at the site area. If you have an elevation map then set the Include Elevation Effects to ‘Yes’. The Number of Elevation Levels can be set to 25 as a starting point.

The Output Data Folder setting is also located on the Project Information. To set where you want the map and data files located click on the ‘Browse” button which will open a folder selection menu. To save the project settings click the File>Save As menu and select a folder and file name to save the project. The project can be saved as either an XDB (dB Foresight Project) or CSV (Comma Separated Values) type of file.

If you have an Elevations File click the next 'Browse' button and select where the elevations file is located. The Elevations File must be in the format as described in section 4.2 Elevations File Format.

A standard setting for the Computation Setting in the Project Panel is to set it to "Current Project" and "Yes" for the other settings in this panel. If you just want to create the plot files and use SPL data previously calculated, then you set the setting to "Previous Project" and in the lower are of the Project Panel you select the location of the SPL file. This is the Data/SiteSPL/SiteSPLHHMMSS.csv file which would have been previously created with dB Foresight.

The remainder of the project settings are under the Settings menu. Ensure to set the 'Include' columns to 'Yes' for the items that you want included in the Run. Background cells will turn red if a value is out of range.

To create the maps and data files click the Run>Create Maps menu. The Status Panel will open up and show the results as the files are being created. Once complete it will indicate the paths for all the files created. You can then view the output BMP, PNG, JPEG or TGA maps with applications such as Microsoft Office or Inkscape. Double click on the KML files and they will open up in Google Earth (or your default GIS application) and you can view the georeferenced noise level plots there.

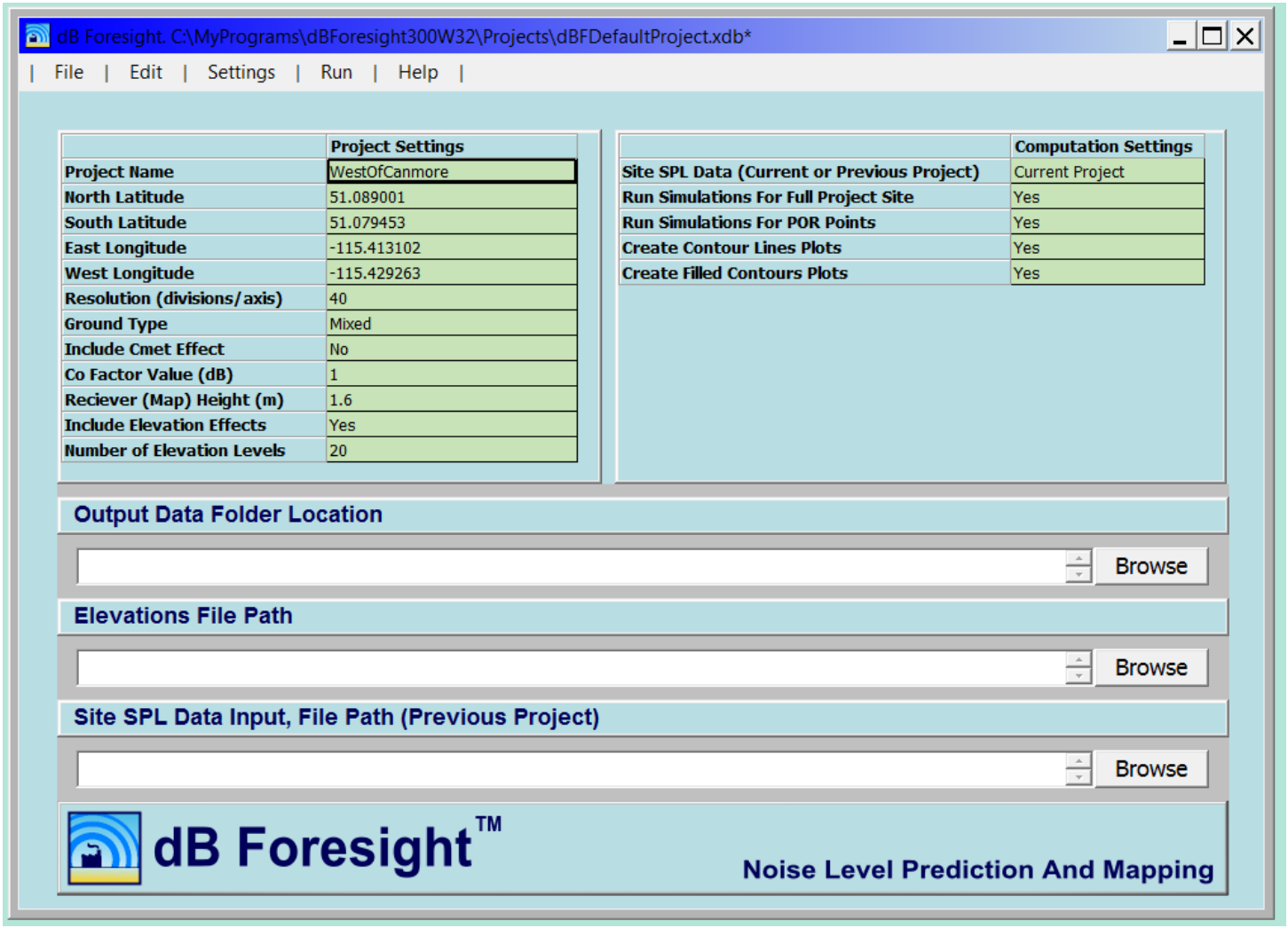
## 6 Operational Instructions

To install or uninstall dB Foresight follow the directions in section 4 Installation and Uninstallation Procedures. dB Foresight requires internet access to verify the Product Activation Code. Before you begin, ensure that you have internet access.

When you first start dB Foresight you will see project information for a default project. The start up window will open with the Project Panel. It will open maximized to your screen resolution. You can click the minimize button to get a smaller sized panel. The Project Panel is under the Settings menu. The Project Panel is shown below.

## 6.1 Project Panel



You can edit the Project Settings under the Settings>Project menu. The description and specifications for the Project Settings is described in the following table.

### 6.2 Project Settings and Specifications Table

| # | Project Setting | Setting Description and Specifications |
|---|---|---|
| 1 | Project Name | The "Project Name" is used in the created filenames and KML references, so it must not contain any of the illegal KML filename characters such: !@#$%^&*()+=[]{}\|'"/?<>~ \ / : < > or blanks, and must be no more than 30 characters in length. |
| 2 | North Latitude | The northern edge of the project site in decimal degrees, dd.dddddddd. The maximum latitude 90°. The minimum latitude is -90°. |
| 3 | South Latitude | The southern edge of the project site in decimal degrees, dd.dddddddd. The maximum latitude is 90°. The minimum latitude is -90°. |
| 4 | East Longitude | The eastern edge of the project site in decimal degrees, dd.dddddddd. The maximum longitude is 180°. The minimum longitude is -180°. |
| 5 | West Longitude | The western edge of the project site in decimal degrees, dd.dddddddd. The maximum longitude is -180°. The minimum longitude is -180°. |
| 6 | Resolution (divisions/axis) | The number of noise SPL points calculated along the north-south and east-west axis of the project site area. The total site SPL points computed is the number of divisions squared. The range of the setting is from 1 to 1,000, however computation run times will increase for higher resolution settings. If Included Elevation Effects is selected the Resolution should be set to approximately double the Number of Elevation Levels settings. This is explained more in section 9 below. |
| 7 | Ground Type | Select 'Porous', 'Mixed' or 'Hard' to enter they ground type for the project area. Porous ground is ground covered in grass, trees other vegetation or farm land. Hard ground includes paving, water, ice or concrete. Mixed ground is a combination of hard and porous ground, but it mostly porous. |
| 8 | Include Cmet Effect | Select 'Yes' or 'No' to determine if the Cmet Effect level is computed in all SPL points. The Cmet is a value that is based on known meteorological effects in an area, and are explained more in section 9 below. |
| 9 | Co Factor Value (dB) | This is the dB level of the CMet Effect that be used to all computed SPL points, if Include Cmet Effect is set to 'Yes'. |
| 10 | Receiver (Map) Height (m) | This is the height used for all POR points. |
| 11 | Include Elevation Effects | Select 'Yes' or 'No' to determine if the SPL computations include effects due to the site area topography. If set to yes, a valid Elevations File Path must be selected in the Elevation File Path window. |
| 12 | Number of Elevation Levels | If Include Elevation Effects is set to "Yes" this will determine the number of elevation levels used in determining the SPL attenuations due to the site area topography. The suggested setting is 15-30. The range of this setting is from 1 to 500. However, the higher the setting the longer the computation time will take. |
| 14 | Output Data Folder Location | Click on the "Browse" button to select or create the folder location. This is the working folder where all the files created from a run will be stored. |
| 15 | Elevations File Path | Click on the "Browse" button to select the elevations file path. This is the elevations file used in determining the SPL attenuations due to the site area |

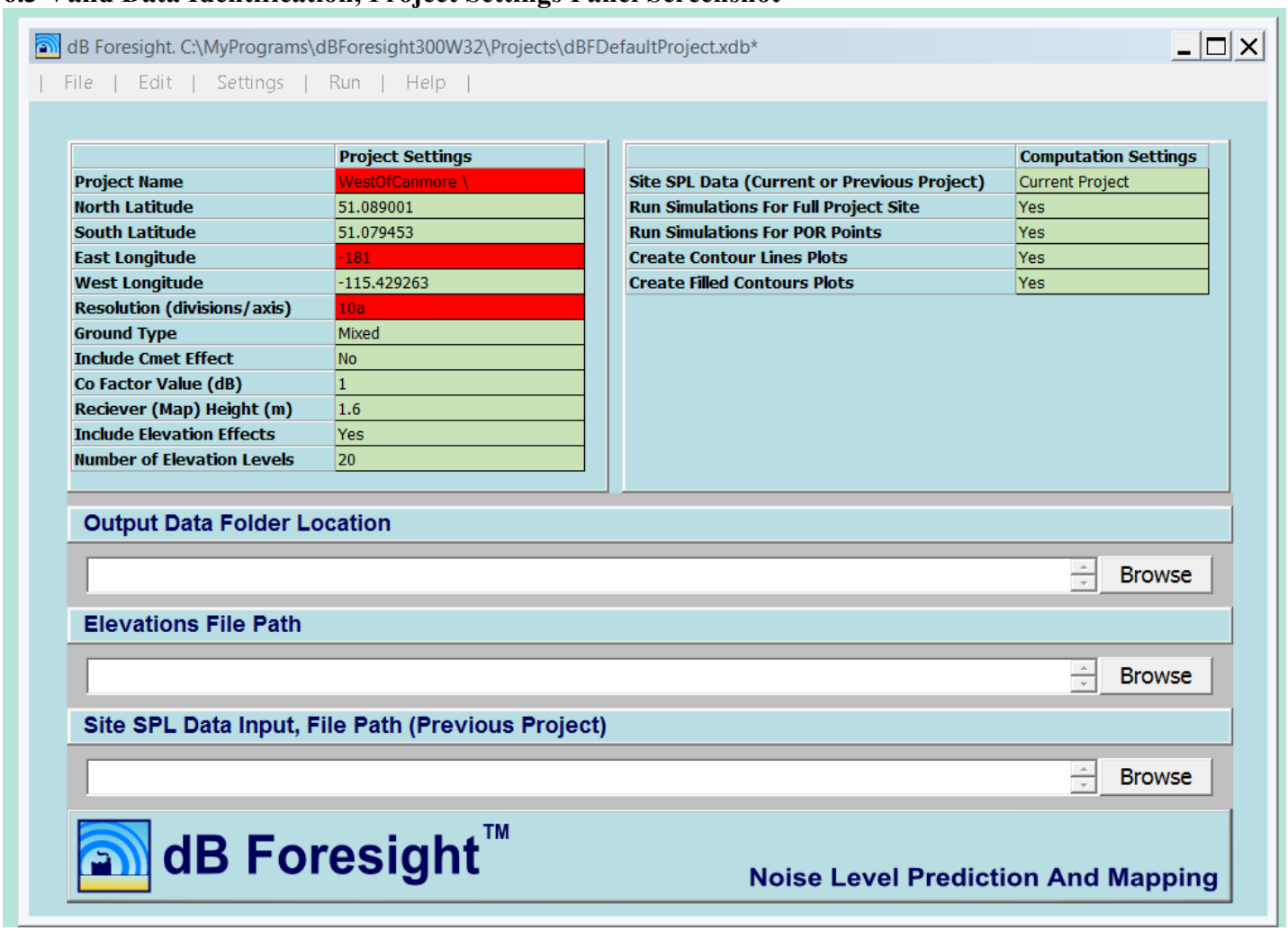
| | | |
|---|---|---|
| | | topography. The format of this file must be as described in section 4.1 of this document. |
| 16 | Site SPL Data Input, File Path (Previous Project) | This is the Data/SiteSPL/ SiteSPLHHMMSS.csv file to be used if "Previous Project" is selected. It will contain the SPL data previously computed, to be used to generate new plot files. This is meant for large projects that take considerable time to run, and the user wants to make adjustments to the Contour Lines and Filled Contour settings and replot them. |
| 17 | Site SPL Data (Current or Previous Project) | This is set to "Current Project" for standard computations, and to "Previous Project" if the Site SPL data was previously created. |
| 18 | Run Simulations For Full Project Site | This is set to "Yes" to run the computations for the full site based on the current project settings. |
| 19 | Run Simulations For POR Points | This is set to "Yes" to run the computations to determine the SPL levels at the PORs. |
| 20 | Create Contour Lines Plots | This is set to "Yes" to create all the contour line plots and files. |
| 21 | Create Filled Contours Plots | This is set to "Yes" to create all the filled contours plots and files. |

If the individual cells for the project setting is within specifications the cell background will be green. If the cell value is invalid, the cell background will be red. Further data checks will also be performed just prior to viewing the site location or creating the elevation maps. The maximum separation between the north and south latitudes or east and west longitudes is 0.24 degrees. This is about 27 kilometres (north to south) by 17 kilometres (east to west) at a latitude of 50 degrees.

Preliminary data checking is done as the Project Settings are updated. If the data is invalid the cell background will go red, as illustrated in the following screenshot.

### 6.3 Valid Data Identification, Project Settings Panel Screenshot




## 6.3.1 Project Settings Data Points Considerations

When setting up a project one consideration is number of data points required to run the computations. The more data points there are the longer it will take to run. Also when you Run Computations you may get an error that there is insufficient memory allocated to run your project. To reduce memory requirements and run time you can reduce the settings for one or more of the following:

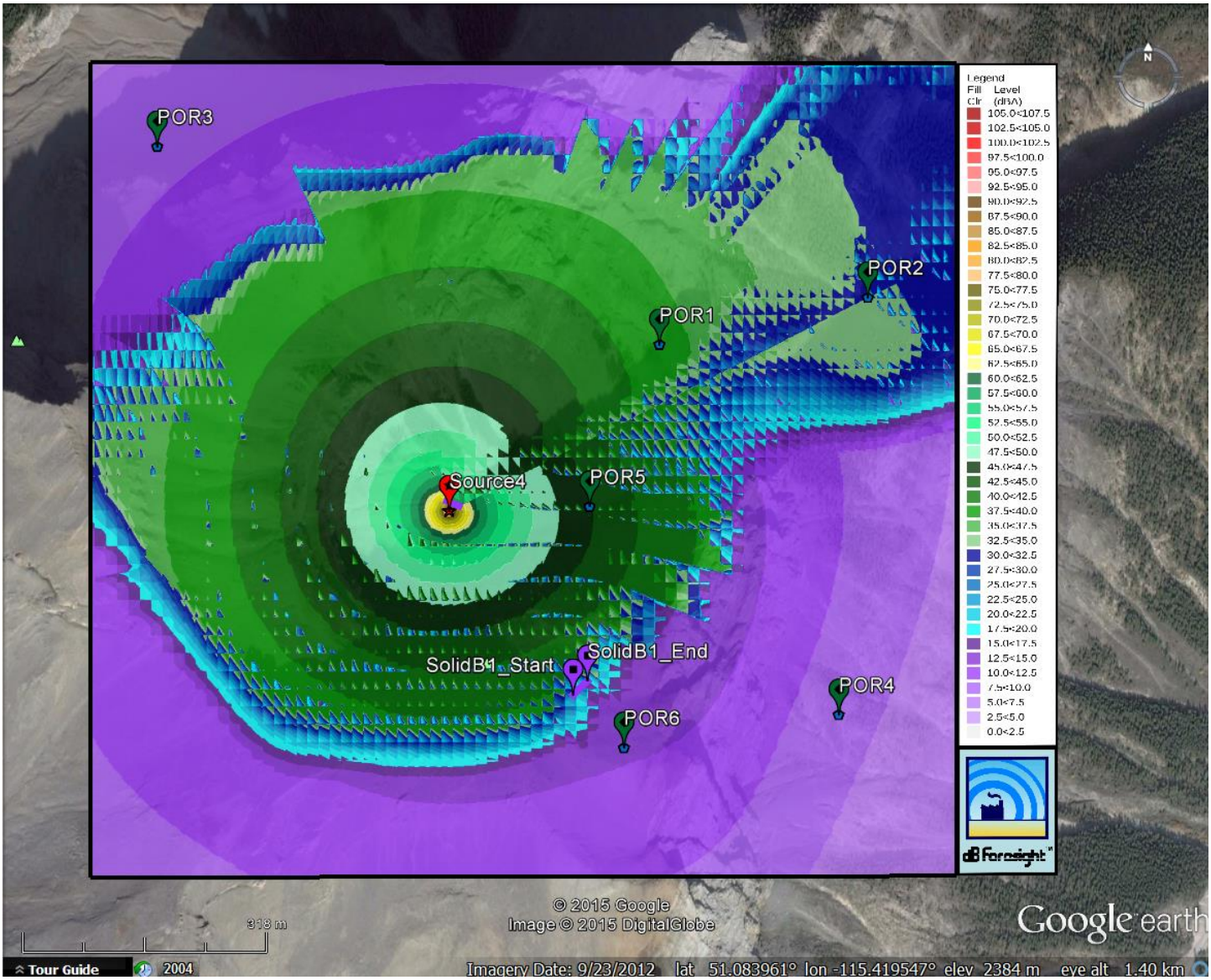
1. The number of elevation levels used when you created the elevations file. Try a maximum of 25 levels.
2. The number of data points in the elevations file, by deleting every other row and column, or more.
3. The number of elevations in the project information panel. Try a maximum of 25 levels.
4. The physical size of the project site. If possible, divide up a large site into smaller sites with a maximum length of 3 km.
5. The number of PORs selected in the POR settings panel.
6. If you are still having issues with long run times or a memory allocation error they you could consider reducing the number of mid-band frequency components in your sources. If some of the mid-band SWL levels for a given source are much lower than other mid-bands, then you could consider removing those mid-bands from the computations. Warning that this will reduce the accuracy of the results. If your resulting SPLs are close to permissible noise thresholds then you will want to keep all mid-bands in the computations to ensure they are as accurate as possible.

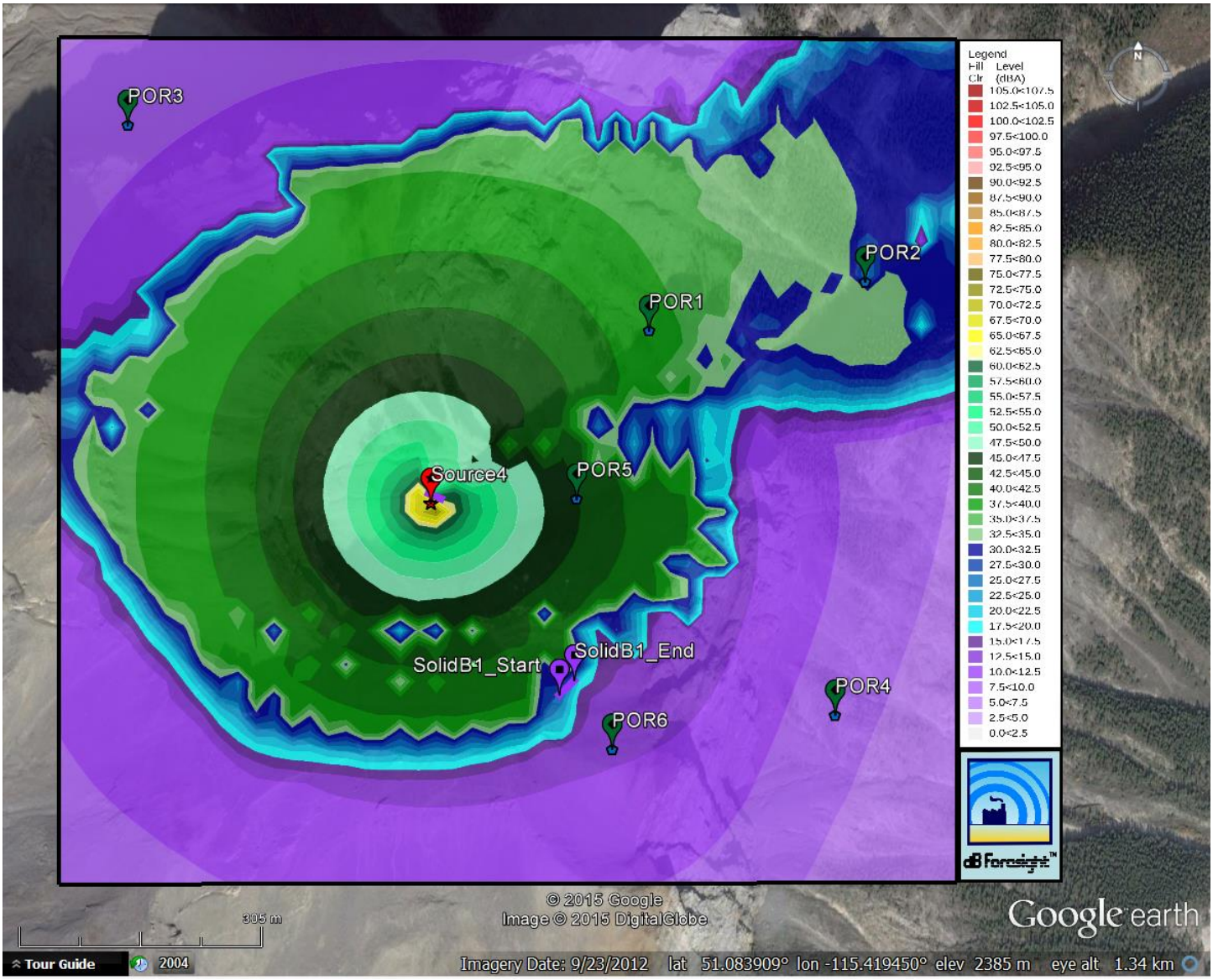
### 6.3.2 Project Settings Elevations And Resolution Considerations

When using elevations in your project you may need to consider reducing the Resolution setting in the Project Panel. dB Foresight creates contour lines from the elevations file and considers each line as a barrier. So between these types of barriers there would be a step up or down to the next barrier. If the resolution is too high this small step area could be considered as behind the barrier so may have a lower SPL level. Whereas actually the ground is more likely a gradual shift between elevation contours. To not show these small step areas try setting the number of elevation levels to 25 and use a resolution of about 60 as a starting point. These could be adjusted based on your project. Below is an example showing the same project with 25 elevation levels and a resolution of 1000 and of 60. You can see that there are the small anomalies when the resolution is 1000.

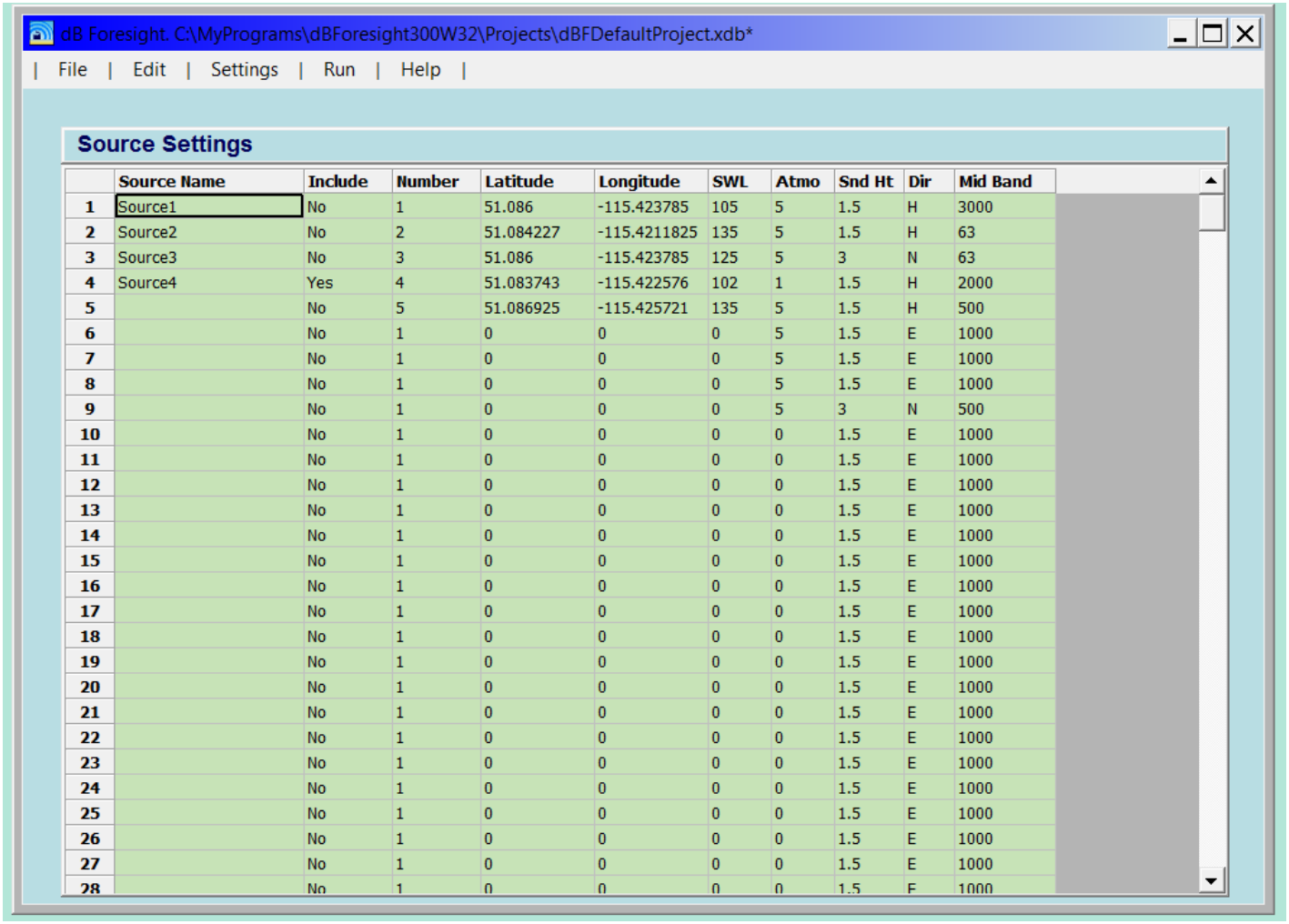
### 6.3.3 Resolution 1000 With 25 Elevation Levels



### 6.3.4 Resolution 60 With 25 Elevation Levels



## 6.4 Source Settings Panel




| | Source Name | Include | Number | Latitude | Longitude | SWL | Atmo | Snd Ht | Dir | Mid Band |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Source1 | No | 1 | 51.086 | -115.423785 | 105 | 5 | 1.5 | H | 3000 |
| 2 | Source2 | No | 2 | 51.084227 | -115.4211825 | 135 | 5 | 1.5 | H | 63 |
| 3 | Source3 | No | 3 | 51.086 | -115.423785 | 125 | 5 | 3 | N | 63 |
| 4 | Source4 | Yes | 4 | 51.083743 | -115.422576 | 102 | 1 | 1.5 | H | 2000 |
| 5 | | No | 5 | 51.086925 | -115.425721 | 135 | 5 | 1.5 | H | 500 |
| 6 | | No | 1 | 0 | 0 | 0 | 5 | 1.5 | E | 1000 |
| 7 | | No | 1 | 0 | 0 | 0 | 5 | 1.5 | E | 1000 |
| 8 | | No | 1 | 0 | 0 | 0 | 5 | 1.5 | E | 1000 |
| 9 | | No | 1 | 0 | 0 | 0 | 5 | 3 | N | 500 |
| 10 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 11 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 12 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 13 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 14 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 15 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 16 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 17 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 18 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 19 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 20 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 21 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 22 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 23 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 24 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 25 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 26 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 27 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 28 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |

You can edit the Source Settings under the Settings>Sources menu. The description and specifications for the Source Settings is described in the following table.

### 6.5 Source Settings and Specifications Table

| # | Source Setting | Setting Description and Specifications |
|---|---|---|
| 1 | Source Name | The "Source Name" is used in the KML plot files to identify the name of each source included. The name should be kept to less than 31 characters. |
| 2 | Include | Select 'Yes' or 'No' to indicate if the Source is included in the SPL calculations for the project. |
| 3 | Number | This is the source number, do not use 0. You can use decimal points such as 1.1, 1.2... 1.8 to identify that it is one source with multiple mid bands. The integer of this number is used in the barriers to exclude the barrier in the computations for the selected source. (Ex: for when the barrier is also the enclosure for the source.) |
| 4 | Latitude | The latitude of the location of the source in decimal degrees, dd.dddddddd. The maximum latitude is 90°. The minimum latitude is -90°. |
| 5 | Longitude | The longitude of the location of the source in decimal degrees, dd.dddddddd. The range of this setting is from 180 to -180 degrees. |
| 6 | SWL | This is the un-weighted octave-band Sound Power Level (SWL) of the Source in decibels (dB), produced by the Source relative to a reference sound power of one picowatt (1 pW). Ensure that you enter the Sound Power Level (SWL) and not the Sound Pressure Level (SPL). Ensure to use the un-weighted SWL, and not the A-weighted SWL for this entry. You must enter the SWL for each mid-band frequency that has noise levels. For example if you have noise levels at all eight mid-band frequencies, then you must create eight entries for that Source. Refer to the figure 6.3 Source Settings Panel. You will see that Source 5 is entered as Source 5.1, Source 5.2 ... Source 5.8 to account for the eight mid-band frequencies for that source. The data and plots that dB Foresight creates will be A-weighted SPL values. dB Foresight uses the A-weighting methodology as described by ISO-9613-2 which refers to the IEC-651 standard for A-weighting. |
| 7 | Atmo | The atmospheric attenuation coefficient in dB/km. The range of this setting is from 0 to 1000. See table 10.5 of this document for the setting levels based on other site parameters. |
| 8 | Snd Ht | The source's sound level height in metres. The range of this setting is from 0 to 1000. |
| 9 | Dir | The noise directivity of the source. The settings and descriptions for each setting are as follows:<br>H: Hemispherical - the sound radiates equally in all directions from the source<br>N: North - the sound radiation is dominant to the north of the source<br>S: South - the sound radiation is dominant to the south of the source<br>E: East - the sound radiation is dominant to the east of the source<br>W: West - the sound radiation is dominant to the west of the source |
| 10 | Mid Band | The nominal mid-band frequency in Hertz for the source. The range of this |

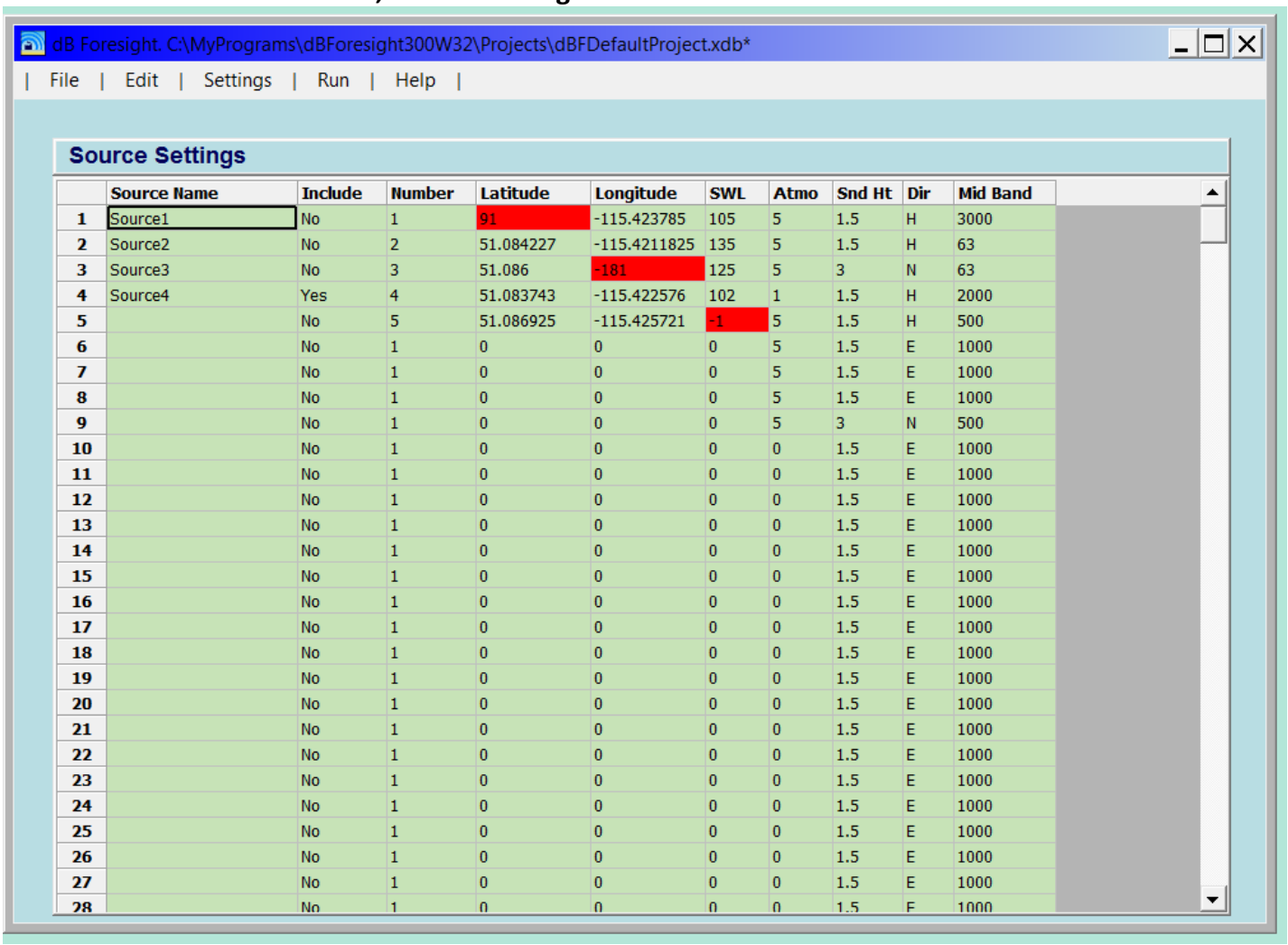
  

| | | |
|---|---|---|
| | | setting is from 1 to 20,000 Hz. |

If the individual cells for the source setting is within specifications the cell background will be green. If the cell value is invalid, the cell background will be red. Further data checks will also be performed just prior to running the SPL computations.

Preliminary data checking is done as the Source Settings are updated. If the data is invalid the cell background will turn red, as illustrated in the following screenshot.

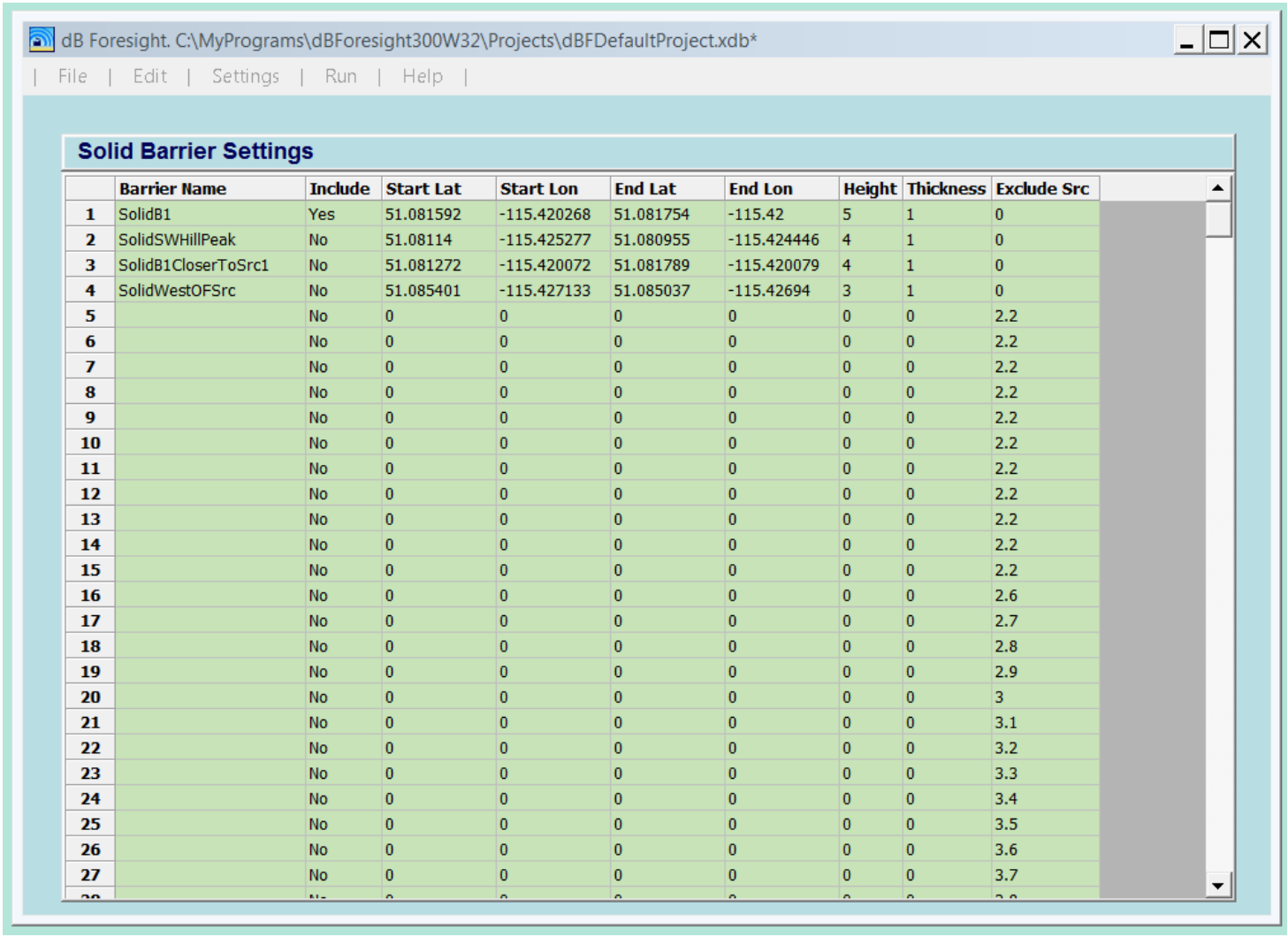
### 6.5.1 Valid Data Identification, Source Settings Panel Screenshot




| | Source Name | Include | Number | Latitude | Longitude | SWL | Atmo | Snd Ht | Dir | Mid Band |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Source1 | No | 1 | 91 | -115.423785 | 105 | 5 | 1.5 | H | 3000 |
| 2 | Source2 | No | 2 | 51.084227 | -115.4211825 | 135 | 5 | 1.5 | H | 63 |
| 3 | Source3 | No | 3 | 51.086 | -181 | 125 | 5 | 3 | N | 63 |
| 4 | Source4 | Yes | 4 | 51.083743 | -115.422576 | 102 | 1 | 1.5 | H | 2000 |
| 5 | | No | 5 | 51.086925 | -115.425721 | -1 | 5 | 1.5 | H | 500 |
| 6 | | No | 1 | 0 | 0 | 0 | 5 | 1.5 | E | 1000 |
| 7 | | No | 1 | 0 | 0 | 0 | 5 | 1.5 | E | 1000 |
| 8 | | No | 1 | 0 | 0 | 0 | 5 | 1.5 | E | 1000 |
| 9 | | No | 1 | 0 | 0 | 0 | 5 | 3 | N | 500 |
| 10 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 11 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 12 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 13 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 14 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 15 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 16 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 17 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 18 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 19 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 20 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 21 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 22 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 23 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 24 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 25 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 26 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 27 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |
| 28 | | No | 1 | 0 | 0 | 0 | 0 | 1.5 | E | 1000 |

## 6.6 Solid Barrier Settings Panel




| | Barrier Name | Include | Start Lat | Start Lon | End Lat | End Lon | Height | Thickness | Exclude Src |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SolidB1 | Yes | 51.081592 | -115.420268 | 51.081754 | -115.42 | 5 | 1 | 0 |
| 2 | SolidSWHillPeak | No | 51.08114 | -115.425277 | 51.080955 | -115.424446 | 4 | 1 | 0 |
| 3 | SolidB1CloserToSrc1 | No | 51.081272 | -115.420072 | 51.081789 | -115.420079 | 4 | 1 | 0 |
| 4 | SolidWestOFSrc | No | 51.085401 | -115.427133 | 51.085037 | -115.42694 | 3 | 1 | 0 |
| 5 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 |
| 6 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 |
| 7 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 |
| 8 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 |
| 9 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 |
| 10 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 |
| 11 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 |
| 12 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 |
| 13 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 |
| 14 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 |
| 15 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 |
| 16 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.6 |
| 17 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.7 |
| 18 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.8 |
| 19 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.9 |
| 20 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 21 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 3.1 |
| 22 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 3.2 |
| 23 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 3.3 |
| 24 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 3.4 |
| 25 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 3.5 |
| 26 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 3.6 |
| 27 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 3.7 |

You can edit the Barrier Settings under the Settings>Barriers menu. The description and specifications for the Barrier Settings is described in the following table.

### 6.7 Barrier Settings and Specifications Table

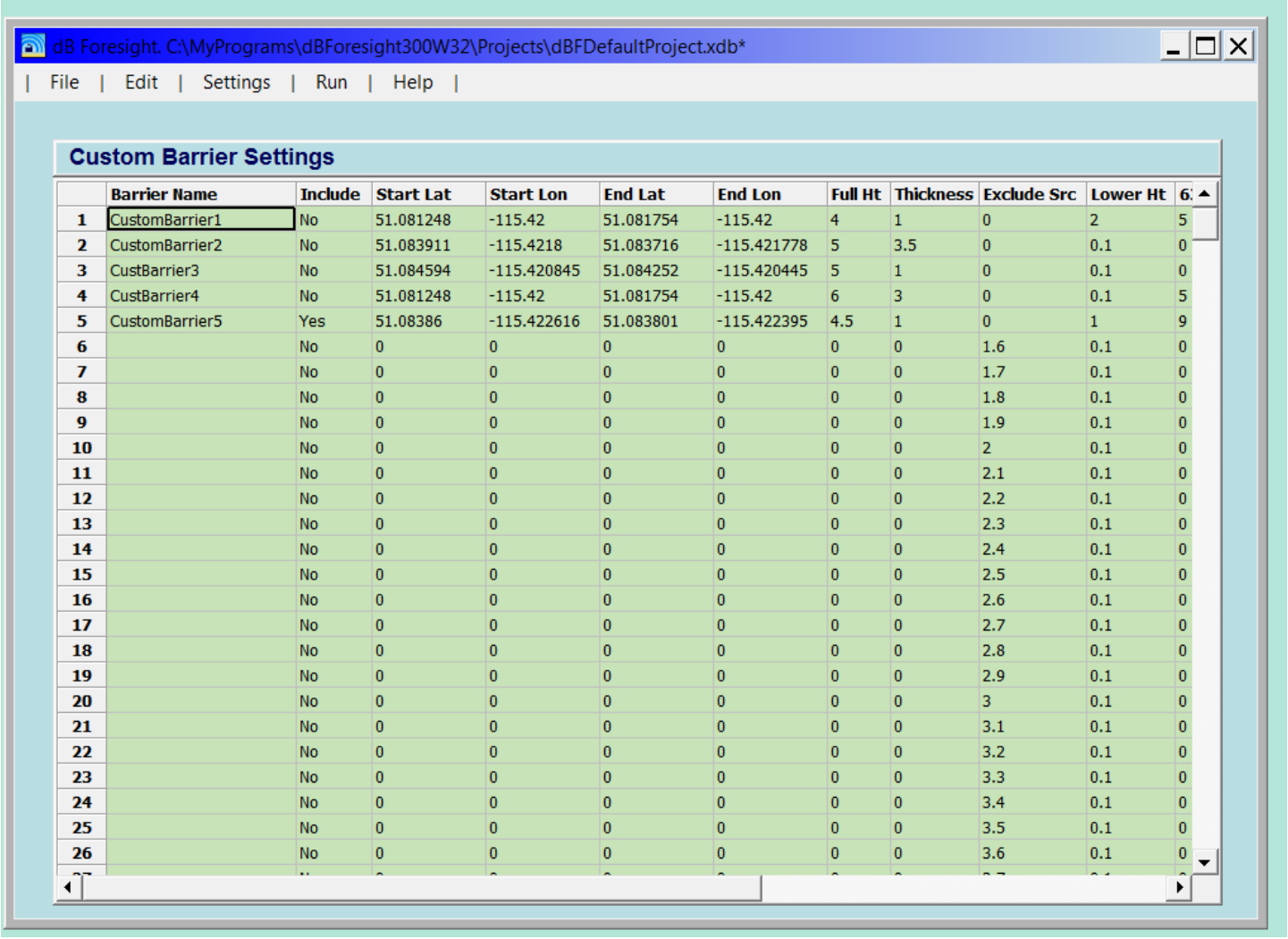
| # | Barrier Setting | Setting Description and Specifications |
|---|---|---|
| 1 | Barrier Name | The "Barrier Name" is used in the KML plot files to identify the name of each barrier included. The name should be kept to less than 31 characters. |
| 2 | Include | Select 'Yes' or 'No' to indicate if the Barrier is included in the SPL calculations for the project. |
| 3 | Start Lat | The latitude for the starting point of the barrier in decimal degrees, dd.dddddddd. The maximum latitude is 90°. The minimum latitude is -90°. |
| 4 | Start Lon | The longitude for the starting point of the barrier in decimal degrees, dd.dddddddd. The maximum latitude is 180°. The minimum latitude is -180°. |
| 5 | End Lat | The latitude for the end point of the barrier in decimal degrees, dd.dddddddd. The maximum latitude is 90°. The minimum latitude is -90°. |
| 6 | End Lon | The longitude for the end point of the barrier in decimal degrees, dd.dddddddd. The maximum latitude is 180°. The minimum latitude is -180°. |
| 7 | Height | The height of the barrier in metres. The range of this setting is from 1 to 100. |
| 8 | Thickness | The thickness of the barrier in metres. The range of this setting is from 1 to 100. Currently the barrier thickness is for user information only. If you do have a very thick barrier (>1m), it must be entered it as 2 barriers, for better attenuation accuracy. When a barrier is entered as a source, you need to enter one barrier for each side panel of the source. |
| 9 | Exclude Source | This source number which will excluded for the barrier in the computations for the selected source. (Ex: for when the barrier is also the enclosure for the source.) Set it to 0 to use for all sources. It will use the integer of the source number. For example if there is a source with 8 midbands with the source numbers 1.1, 1.2, 1.3...1.8, you can set the Exclude Source value to 1 to exclude all of these sources in the computations for this barrier. |

If the individual cells for the source setting is within specifications the cell background will be green. If the cell value is invalid, the cell background will be red. Further data checks will also be performed just prior to running the SPL computations.

Preliminary data checking is done as the Source Settings are updated. If the data is invalid the cell background will turn red.

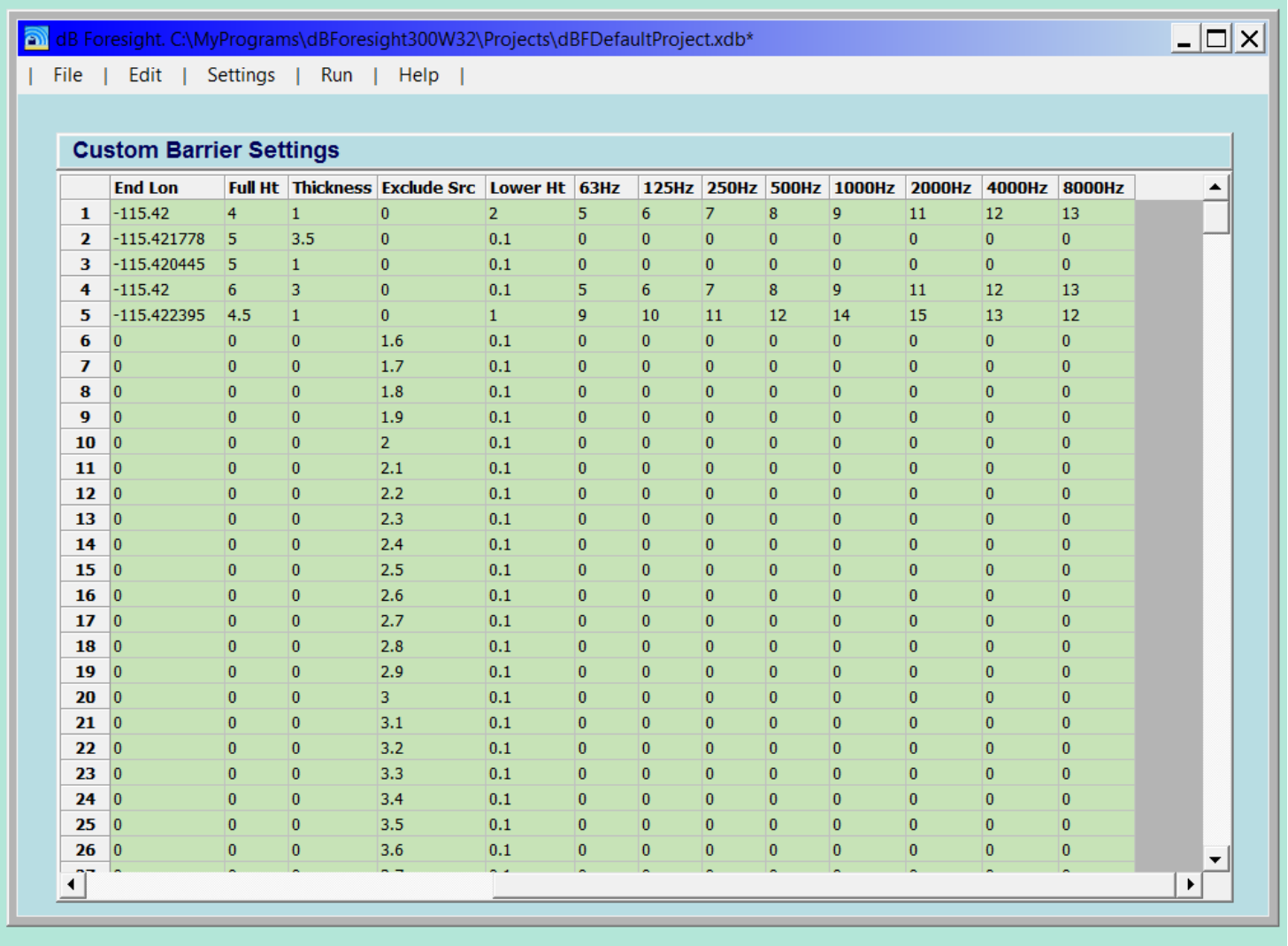
  

## 6.8 Custom Barrier Settings Panel




| | Barrier Name | Include | Start Lat | Start Lon | End Lat | End Lon | Full Ht | Thickness | Exclude Src | Lower Ht | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CustomBarrier1 | No | 51.081248 | -115.42 | 51.081754 | -115.42 | 4 | 1 | 0 | 2 | 5 |
| 2 | CustomBarrier2 | No | 51.083911 | -115.4218 | 51.083716 | -115.421778 | 5 | 3.5 | 0 | 0.1 | 0 |
| 3 | CustBarrier3 | No | 51.084594 | -115.420845 | 51.084252 | -115.420445 | 5 | 1 | 0 | 0.1 | 0 |
| 4 | CustBarrier4 | No | 51.081248 | -115.42 | 51.081754 | -115.42 | 6 | 3 | 0 | 0.1 | 5 |
| 5 | CustomBarrier5 | Yes | 51.08386 | -115.422616 | 51.083801 | -115.422395 | 4.5 | 1 | 0 | 1 | 9 |
| 6 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 1.6 | 0.1 | 0 |
| 7 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 1.7 | 0.1 | 0 |
| 8 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 1.8 | 0.1 | 0 |
| 9 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 1.9 | 0.1 | 0 |
| 10 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0.1 | 0 |
| 11 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.1 | 0.1 | 0 |
| 12 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 | 0.1 | 0 |
| 13 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.3 | 0.1 | 0 |
| 14 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.4 | 0.1 | 0 |
| 15 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.5 | 0.1 | 0 |
| 16 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.6 | 0.1 | 0 |
| 17 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.7 | 0.1 | 0 |
| 18 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.8 | 0.1 | 0 |
| 19 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 2.9 | 0.1 | 0 |
| 20 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0.1 | 0 |
| 21 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 3.1 | 0.1 | 0 |
| 22 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 3.2 | 0.1 | 0 |
| 23 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 3.3 | 0.1 | 0 |
| 24 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 3.4 | 0.1 | 0 |
| 25 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 3.5 | 0.1 | 0 |
| 26 | | No | 0 | 0 | 0 | 0 | 0 | 0 | 3.6 | 0.1 | 0 |




| | End Lon | Full Ht | Thickness | Exclude Src | Lower Ht | 63Hz | 125Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | 8000Hz |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | -115.42 | 4 | 1 | 0 | 2 | 5 | 6 | 7 | 8 | 9 | 11 | 12 | 13 |
| 2 | -115.421778 | 5 | 3.5 | 0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | -115.420445 | 5 | 1 | 0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | -115.42 | 6 | 3 | 0 | 0.1 | 5 | 6 | 7 | 8 | 9 | 11 | 12 | 13 |
| 5 | -115.422395 | 4.5 | 1 | 0 | 1 | 9 | 10 | 11 | 12 | 14 | 15 | 13 | 12 |
| 6 | 0 | 0 | 0 | 1.6 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 1.7 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 1.8 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 1.9 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 2 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | 0 | 0 | 0 | 2.1 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 0 | 0 | 0 | 2.2 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | 0 | 0 | 0 | 2.3 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 | 0 | 0 | 0 | 2.4 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | 0 | 0 | 0 | 2.5 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | 0 | 0 | 0 | 2.6 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17 | 0 | 0 | 0 | 2.7 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 | 0 | 0 | 0 | 2.8 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | 0 | 0 | 0 | 2.9 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | 0 | 0 | 0 | 3 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | 0 | 0 | 0 | 3.1 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | 0 | 0 | 0 | 3.2 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | 0 | 0 | 0 | 3.3 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | 0 | 0 | 0 | 3.4 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25 | 0 | 0 | 0 | 3.5 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 | 0 | 0 | 0 | 3.6 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### 6.9 Custom Barrier Settings and Specifications Table

| # | Barrier Setting | Setting Description and Specifications |
|---|---|---|
| 1 | Barrier Name | The "Barrier Name" is used in the KML plot files to identify the name of each barrier included. The name should be kept to less than 31 characters. |
| 2 | Include | Select ‘Yes’ or ‘No’ to indicate if the Barrier is included in the SPL calculations for the project. |
| 3 | Start Lat | The latitude for the starting point of the barrier in decimal degrees, dd.dddddddd. The maximum latitude is 90°. The minimum latitude is -90°. |
| 4 | Start Lon | The longitude for the starting point of the barrier in decimal degrees, dd.dddddddd. The maximum latitude is 180°. The minimum latitude is -180°. |
| 5 | End Lat | The latitude for the end point of the barrier in decimal degrees, dd.dddddddd. The maximum latitude is 90°. The minimum latitude is -90°. |
| 6 | End Lon | The longitude for the end point of the barrier in decimal degrees, dd.dddddddd. The maximum latitude is 180°. The minimum latitude is -180°. |
| 7 | Full Ht | The full height of the barrier in metres. The range of this setting is from 1 |

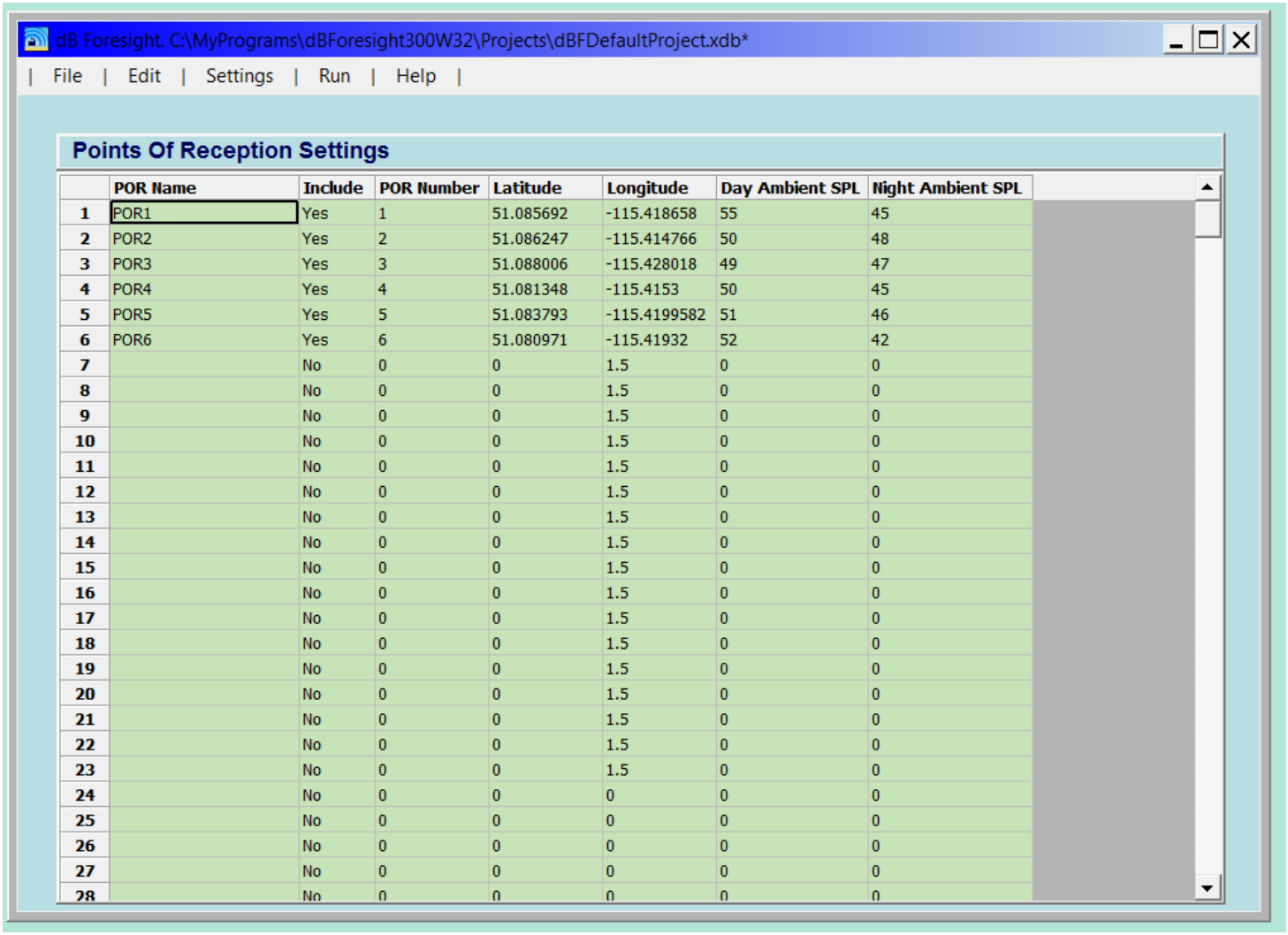
| | | |
|---|---|---|
| | | to 100. |
| 8 | Thickness | The thickness of the barrier in metres. The range of this setting is from 1 to 100. Currently the barrier thickness is for user information only. If you do have a very thick barrier (>1m), it must be entered it as 2 barriers, for better attenuation accuracy. When a barrier is entered as a source, you need to enter one barrier for each side panel of the source. |
| 9 | Exclude Source | This source number which will excluded for the barrier in the computations for the selected source. (Ex: for when the barrier is also the enclosure for the source.) Set it to 0 to use for all sources. It will use the integer of the source number. For example if there is a source with 8 midbands with the source numbers 1.1, 1.2, 1.3...1.8, you can set the Exclude Source value to 1 to exclude all of these sources in the computations for this barrier. |
| 10 | Lower Ht | The height of the lower area in metres, for split barriers that have a solid upper area and louvered lower area. |
| 11-18 | 63Hz...8000Hz | This are the mid bands for the attenuations in dB for the lower area. Put the known dB attenuation for each frequency here, or 0 if the bottom area is open. |

If the individual cells for the source setting is within specifications the cell background will be green. If the cell value is invalid, the cell background will be red. Further data checks will also be performed just prior to running the SPL computations.

Preliminary data checking is done as the Source Settings are updated. If the data is invalid the cell background will turn red.

## 6.10 POR Settings Panel




| | POR Name | Include | POR Number | Latitude | Longitude | Day Ambient SPL | Night Ambient SPL |
|---|---|---|---|---|---|---|---|
| 1 | POR1 | Yes | 1 | 51.085692 | -115.418658 | 55 | 45 |
| 2 | POR2 | Yes | 2 | 51.086247 | -115.414766 | 50 | 48 |
| 3 | POR3 | Yes | 3 | 51.088006 | -115.428018 | 49 | 47 |
| 4 | POR4 | Yes | 4 | 51.081348 | -115.4153 | 50 | 45 |
| 5 | POR5 | Yes | 5 | 51.083793 | -115.4199582 | 51 | 46 |
| 6 | POR6 | Yes | 6 | 51.080971 | -115.41932 | 52 | 42 |
| 7 | | No | 0 | 0 | 1.5 | 0 | 0 |
| 8 | | No | 0 | 0 | 1.5 | 0 | 0 |
| 9 | | No | 0 | 0 | 1.5 | 0 | 0 |
| 10 | | No | 0 | 0 | 1.5 | 0 | 0 |
| 11 | | No | 0 | 0 | 1.5 | 0 | 0 |
| 12 | | No | 0 | 0 | 1.5 | 0 | 0 |
| 13 | | No | 0 | 0 | 1.5 | 0 | 0 |
| 14 | | No | 0 | 0 | 1.5 | 0 | 0 |
| 15 | | No | 0 | 0 | 1.5 | 0 | 0 |
| 16 | | No | 0 | 0 | 1.5 | 0 | 0 |
| 17 | | No | 0 | 0 | 1.5 | 0 | 0 |
| 18 | | No | 0 | 0 | 1.5 | 0 | 0 |
| 19 | | No | 0 | 0 | 1.5 | 0 | 0 |
| 20 | | No | 0 | 0 | 1.5 | 0 | 0 |
| 21 | | No | 0 | 0 | 1.5 | 0 | 0 |
| 22 | | No | 0 | 0 | 1.5 | 0 | 0 |
| 23 | | No | 0 | 0 | 1.5 | 0 | 0 |
| 24 | | No | 0 | 0 | 0 | 0 | 0 |
| 25 | | No | 0 | 0 | 0 | 0 | 0 |
| 26 | | No | 0 | 0 | 0 | 0 | 0 |
| 27 | | No | 0 | 0 | 0 | 0 | 0 |
| 28 | | No | 0 | 0 | 0 | 0 | 0 |

You can edit the POR Settings under the Settings>PORs menu. The description and specifications for the POR Settings is described in the following table.

### 6.11 POR Settings and Specifications Table

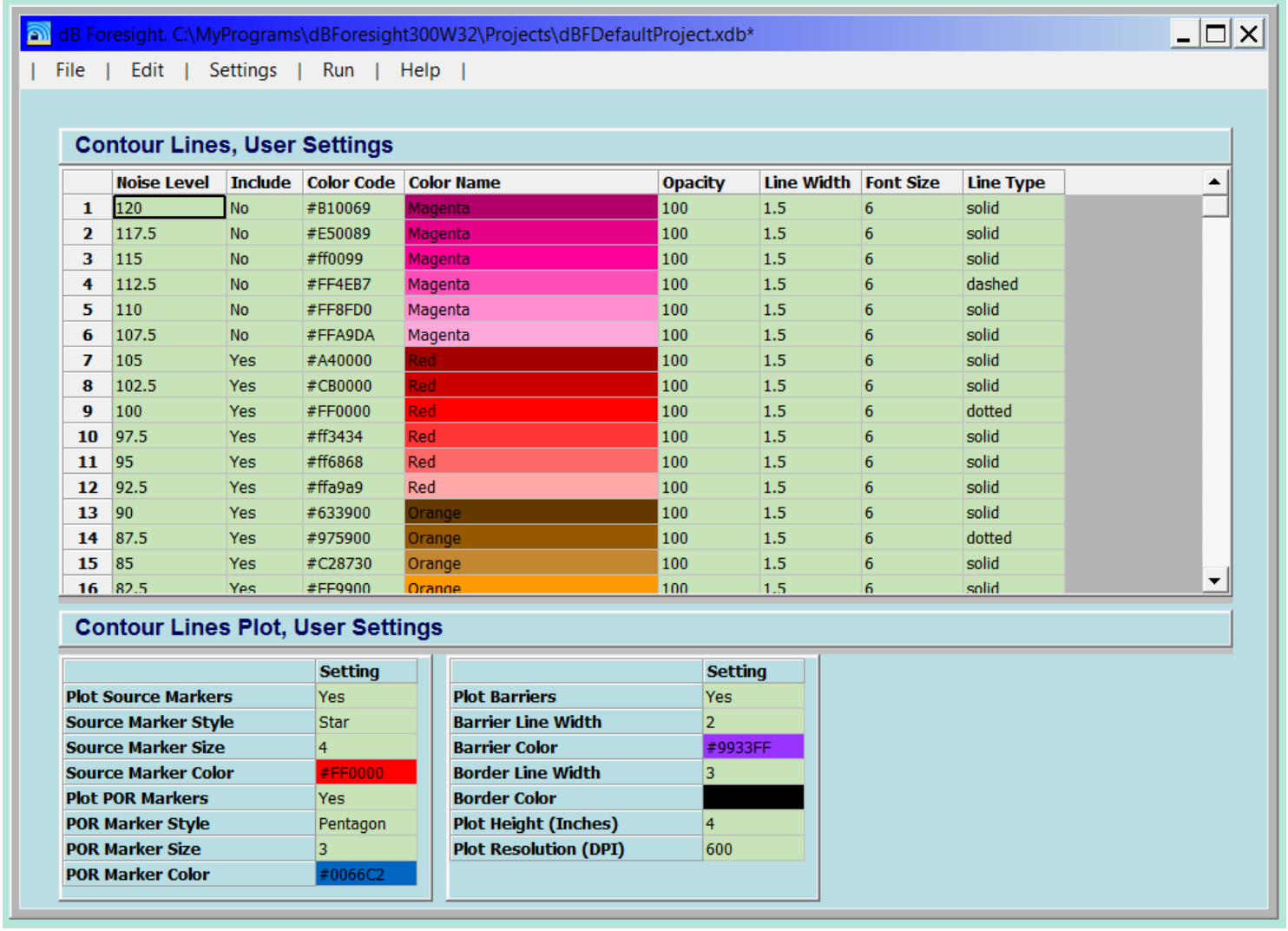
| # | POR Setting | Setting Description and Specifications |
|---|---|---|
| 1 | POR Name | The "POR Name" is used in the KML plot files to identify the name of each POR included. The name should be kept to less than 31 characters. |
| 2 | Include | Select 'Yes' or 'No' to indicate if the POR is included in the SPL calculations for the project. |
| 3 | POR Number | For user usage only, to identify any number for the POR. |
| 4 | Latitude | The latitude of the location of the POR in decimal degrees, dd.dddddddd. The maximum latitude is 90°. The minimum latitude is -90°. |
| 5 | Longitude | The longitude of the location of the POR in decimal degrees, dd.dddddddd. The maximum longitude is 180°. The minimum longitude is -180°. |
| 6 | Day Ambient SPL | The day time ambient SPL in dBA at the POR. This value will be added to the SPL at the POR, you can put it to -200 if not used. NOTE: this level is only added in the Data/POR_SPLs_HHMMSS.csv file for the ambient levels at the POR. It is not included in the plots or Noise Levels CSV data files. The range of this setting is from -200 to200. |
| 7 | Night Ambient SPL | The night time ambient SPL in dBA at the POR. This value will be added to the SPL at the POR, you can put it to -200 if not used. NOTE: this level is only added in the Data/POR_SPLs_HHMMSS.csv file for the ambient levels at the POR. It is not included in the plots or Noise Levels CSV data files. The range of this setting is from -200 to200. |

If the individual cells for the POR setting is within specifications the cell background will be green. If the cell value is invalid, the cell background will be red. Further data checks will also be performed just prior to running the SPL computations.

Preliminary data checking is done as the POR Settings are updated. If the data is invalid the cell background will turn red.

## 6.12 Contours Lines Settings Panel




| | Noise Level | Include | Color Code | Color Name | Opacity | Line Width | Font Size | Line Type |
|---|---|---|---|---|---|---|---|---|
| 1 | 120 | No | #B10069 | Magenta | 100 | 1.5 | 6 | solid |
| 2 | 117.5 | No | #E50089 | Magenta | 100 | 1.5 | 6 | solid |
| 3 | 115 | No | #ff0099 | Magenta | 100 | 1.5 | 6 | solid |
| 4 | 112.5 | No | #FF4EB7 | Magenta | 100 | 1.5 | 6 | dashed |
| 5 | 110 | No | #FF8FD0 | Magenta | 100 | 1.5 | 6 | solid |
| 6 | 107.5 | No | #FFA9DA | Magenta | 100 | 1.5 | 6 | solid |
| 7 | 105 | Yes | #A40000 | Red | 100 | 1.5 | 6 | solid |
| 8 | 102.5 | Yes | #CB0000 | Red | 100 | 1.5 | 6 | solid |
| 9 | 100 | Yes | #FF0000 | Red | 100 | 1.5 | 6 | dotted |
| 10 | 97.5 | Yes | #ff3434 | Red | 100 | 1.5 | 6 | solid |
| 11 | 95 | Yes | #ff6868 | Red | 100 | 1.5 | 6 | solid |
| 12 | 92.5 | Yes | #ffa9a9 | Red | 100 | 1.5 | 6 | solid |
| 13 | 90 | Yes | #633900 | Orange | 100 | 1.5 | 6 | solid |
| 14 | 87.5 | Yes | #975900 | Orange | 100 | 1.5 | 6 | dotted |
| 15 | 85 | Yes | #C28730 | Orange | 100 | 1.5 | 6 | solid |
| 16 | 82.5 | Yes | #FF9900 | Orange | 100 | 1.5 | 6 | solid |

| | Setting |
|---|---|
| Plot Source Markers | Yes |
| Source Marker Style | Star |
| Source Marker Size | 4 |
| Source Marker Color | #FF0000 |
| Plot POR Markers | Yes |
| POR Marker Style | Pentagon |
| POR Marker Size | 3 |
| POR Marker Color | #0066C2 |

| | Setting |
|---|---|
| Plot Barriers | Yes |
| Barrier Line Width | 2 |
| Barrier Color | #9933FF |
| Border Line Width | 3 |
| Border Color | |
| Plot Height (Inches) | 4 |
| Plot Resolution (DPI) | 600 |

You can edit the Contour Lines Settings under the Settings>Contour Lines menu. The description and specifications for the Contour Lines Settings is described in the following table.

### 6.13 POR Settings and Specifications Table

| # | Contour Lines, User Settings | Setting Description and Specifications |
|---|---|---|
| 1 | Noise Level | The noise level in dBA. The range of this setting is from -1000 to 1000. |
| 2 | Include | Select 'Yes' or 'No' to indicate if the noise level is included in the contour lines plot and in the contour lines legend. |
| 3 | Color Code | The hexadecimal notation (Hex) code for the color of the contour line in the plot and legend. The setting can be from a range of #000000 to #FFFFFF in hexadecimal notation.<br>The left two digits are for the red color value, from 00 to FF.<br>The middle two digits are for the green color value, from 00 to FF.<br>The right two digits are for the blue color value, from 00 to FF. |
| 4 | Color Name | The user can enter a color name for each color, for reference. The color name should be kept to under 31 characters. The background of the color name cell will be the color set by the color code. |
| 5 | Opacity | The opacity setting for the color as displayed on the contour line plot. The opacity allows transparency of the color so the background can show through it. The setting can be from 0 to 100. |
| 6 | Line Width | The width of the contour line in the contour line plots. The range of this setting is from 0 to 100. |
| 7 | Font Size | The size of the font for the noise level indicated on the contour lines plots. The range of this setting is from 0 to 100. |
| 8 | Line Type | The type of line used for the noise level indicated on the contour lines plots. The settings provided are solid, dashed, dotted or dashdot. |
| | **Contour Lines Plot, User Settings** | **Setting Description and Specifications** |
| 9 | Plot Source Markers | Select 'Yes' or 'No' to indicate if a marker for each 'Included' source should be shown on the contour line plots. |
| 10 | Source Marker Style | This is a pull down menu for the style of marker to plot for the source marker. You can select one of: Star, Circle, Diamond, Square, Pentagon, x, +, Diamon&X, Circle&+. |
| 11 | Source Marker Size | This is the size of the marker to be plotted, it is based on character height and the size will also depend on the Plot Resolution (DPI) settings. |
| 12 | Source Marker Color | Enter # then a 6 digit hex code for the color of the marker. You can copy the hex code from one of the settings in the upper panel.<br>The hexadecimal notation (Hex) code for the color of the source marker in the contour line plots. The setting can be from a range of #000000 to #FFFFFF in hexadecimal notation.<br>The left two digits are for the red color value, from 00 to FF.<br>The middle two digits are for the green color value, from 00 to FF. |
| 13 | Plot POR Markers | Select 'Yes' or 'No' to indicate if a marker for each 'Included' POR should be shown on the contour line plots. |

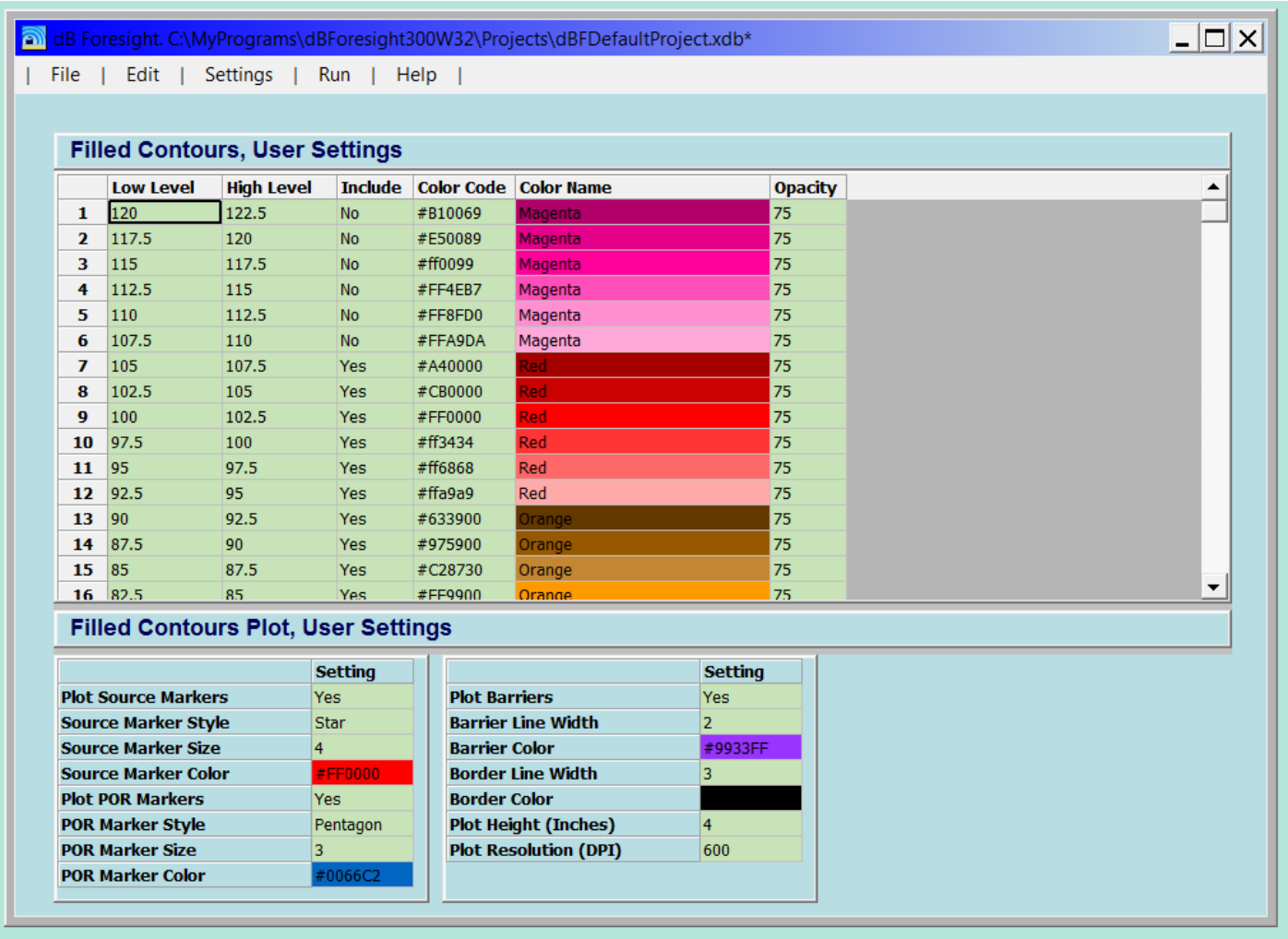
| | | |
|---|---|---|
| 14 | POR Marker Style | This is a pull down menu for the style of marker to plot for the POR marker. You can select one of: Star, Circle, Diamond, Square, Pentagon, x, +, Diamon&X, Circle&+. |
| 15 | POR Marker Size | This is the size of the marker to be plotted, it is based on character height and the size will also depend on the Plot Resolution (DPI) settings. |
| 16 | POR Marker Color | Enter # then a 6 digit hex code for the color of the marker. You can copy the hex code from one of the settings in the upper panel.<br>The hexadecimal notation (Hex) code for the color of the POR marker in the contour line plots. The setting can be from a range of #000000 to #FFFFFF in hexadecimal notation.<br>The left two digits are for the red color value, from 00 to FF.<br>The middle two digits are for the green color value, from 00 to FF. |
| 17 | Plot Barriers | Select 'Yes' or 'No' to indicate if each 'Included' Barrier should be shown on the contour line plots. |
| 18 | Barrier Line Width | The width of the barrier line as indicated on the contour line plots. The range of his setting is from 0 to 100. |
| 19 | Barrier Color | The hexadecimal notation (Hex) code for the color of the contour line in the plot and legend. The setting can be from a range of #000000 to #FFFFFF in hexadecimal notation.<br>The left two digits are for the red color value, from 00 to FF.<br>The middle two digits are for the green color value, from 00 to FF.<br>The right two digits are for the blue color value, from 00 to FF. |
| 20 | Border Line Width | The width of the border line as indicated on the contour line plots. The range of his setting is from 0 to 100. |
| 21 | Border Color | The hexadecimal notation (Hex) code for the color of the contour line in the plot and legend. The setting can be from a range of #000000 to #FFFFFF in hexadecimal notation.<br>The left two digits are for the red color value, from 00 to FF.<br>The middle two digits are for the green color value, from 00 to FF.<br>The right two digits are for the blue color value, from 00 to FF. |
| 22 | Plot Height (Inches) | This sets the plot height size in inches. The width will be set proportionally based on the site coordinates. |
| 23 | Plot Resolution (DPI) | This will set the plot resolution. |

If the individual cells for the Contour Lines setting is within specifications the cell background will be green. If the cell value is invalid, the cell background will be red. Further data checks will also be performed just prior to running the SPL computations.

Preliminary data checking is done as the Contour Lines Settings are updated. If the data is invalid the cell background will turn red.

## 6.14 Filled Contours Settings Panel




| | Low Level | High Level | Include | Color Code | Color Name | Opacity |
|---|---|---|---|---|---|---|
| 1 | 120 | 122.5 | No | #B10069 | Magenta | 75 |
| 2 | 117.5 | 120 | No | #E50089 | Magenta | 75 |
| 3 | 115 | 117.5 | No | #ff0099 | Magenta | 75 |
| 4 | 112.5 | 115 | No | #FF4EB7 | Magenta | 75 |
| 5 | 110 | 112.5 | No | #FF8FD0 | Magenta | 75 |
| 6 | 107.5 | 110 | No | #FFA9DA | Magenta | 75 |
| 7 | 105 | 107.5 | Yes | #A40000 | Red | 75 |
| 8 | 102.5 | 105 | Yes | #CB0000 | Red | 75 |
| 9 | 100 | 102.5 | Yes | #FF0000 | Red | 75 |
| 10 | 97.5 | 100 | Yes | #ff3434 | Red | 75 |
| 11 | 95 | 97.5 | Yes | #ff6868 | Red | 75 |
| 12 | 92.5 | 95 | Yes | #ffa9a9 | Red | 75 |
| 13 | 90 | 92.5 | Yes | #633900 | Orange | 75 |
| 14 | 87.5 | 90 | Yes | #975900 | Orange | 75 |
| 15 | 85 | 87.5 | Yes | #C28730 | Orange | 75 |
| 16 | 82.5 | 85 | Yes | #FF9900 | Orange | 75 |

| | Setting |
|---|---|
| Plot Source Markers | Yes |
| Source Marker Style | Star |
| Source Marker Size | 4 |
| Source Marker Color | #FF0000 |
| Plot POR Markers | Yes |
| POR Marker Style | Pentagon |
| POR Marker Size | 3 |
| POR Marker Color | #0066C2 |

| | Setting |
|---|---|
| Plot Barriers | Yes |
| Barrier Line Width | 2 |
| Barrier Color | #9933FF |
| Border Line Width | 3 |
| Border Color | |
| Plot Height (Inches) | 4 |
| Plot Resolution (DPI) | 600 |

The Filled Contours Settings can be selected under the Settings>Filled Contours menu. The description and specifications for the Filled Contours Settings is described in the following table.

## 6.15 Filled Contours Settings and Specifications Table

| # | Filled Contours, User Settings | Setting Description and Specifications |
|---|---|---|
| 1 | Low Level | The low noise level for the filled contour in dBA. The range of this setting is from -1000 to 1000. |
| 2 | High Level | The high noise level for the filled contour in dBA. The range of this setting is from -1000 to 1000. |
| 3 | Include | Select 'Yes' or 'No' to indicate if the noise level is included in the filled contours plot and in the filled contours legend. |
| 4 | Color Code | The hexadecimal notation (Hex) code for the color of the filled contour the plot and legend. The setting can be from a range of #000000 to #FFFFFF in hexadecimal notation.<br>The left two digits are for the red color value, from 00 to FF. |

| | | |
|---|---|---|
| | | The middle two digits are for the green color value, from 00 to FF.<br>The right two digits are for the blue color value, from 00 to FF. |
| 5 | Color Name | The user can enter a color name for each color, for reference. The color name should be kept to under 31 characters. The background of the color name cell will be the color set by the color code. |
| 6 | Opacity | The opacity setting for the color as displayed on the filled contours plot. The opacity allows transparency of the color so the background can show through it. The range of the setting is from 0 to 100. |
| | **Filled Contours Plot, User Settings** | **Setting Description and Specifications** |
| 7 | Plot Source Markers | Select 'Yes' or 'No' to indicate if a marker for each 'Included' source should be shown on the contour line plots. |
| 8 | Source Marker Style | This is a pull down menu for the style of marker to plot for the source marker. You can select one of: Star, Circle, Diamond, Square, Pentagon, x, +, Diamon&X, Circle&+. |
| 9 | Source Marker Size | This is the size of the marker to be plotted, it is based on character height and the size will also depend on the Plot Resolution (DPI) settings. |
| 10 | Source Marker Color | Enter # then a 6 digit hex code for the color of the marker. You can copy the hex code from one of the settings in the upper panel.<br>The hexadecimal notation (Hex) code for the color of the source marker in the contour line plots. The setting can be from a range of #000000 to #FFFFFF in hexadecimal notation.<br>The left two digits are for the red color value, from 00 to FF.<br>The middle two digits are for the green color value, from 00 to FF. |
| 11 | Plot POR Markers | Select 'Yes' or 'No' to indicate if a marker for each 'Included' POR should be shown on the contour line plots. |
| 12 | POR Marker Style | This is a pull down menu for the style of marker to plot for the POR marker. You can select one of: Star, Circle, Diamond, Square, Pentagon, x, +, Diamon&X, Circle&+. |
| 13 | POR Marker Size | This is the size of the marker to be plotted, it is based on character height and the size will also depend on the Plot Resolution (DPI) settings. |
| 14 | POR Marker Color | Enter # then a 6 digit hex code for the color of the marker. You can copy the hex code from one of the settings in the upper panel.<br>The hexadecimal notation (Hex) code for the color of the POR marker in the contour line plots. The setting can be from a range of #000000 to #FFFFFF in hexadecimal notation.<br>The left two digits are for the red color value, from 00 to FF.<br>The middle two digits are for the green color value, from 00 to FF. |
| 15 | Plot Barriers | Select 'Yes' or 'No' to indicate if each 'Included' Barrier should be shown on the contour line plots. |
| 16 | Barrier Line Width | The width of the barrier line as indicated on the contour line plots. The range of his setting is from 0 to 100. |
| 17 | Barrier Color | The hexadecimal notation (Hex) code for the color of the contour line in the plot and legend. The setting can be from a range of #000000 to #FFFFFF in hexadecimal notation.<br>The left two digits are for the red color value, from 00 to FF. |

| | | |
|---|---|---|
| | | The middle two digits are for the green color value, from 00 to FF.<br>The right two digits are for the blue color value, from 00 to FF. |
| 18 | Border Line Width | The width of the border line as indicated on the contour line plots. The range of his setting is from 0 to 100. |
| 19 | Border Color | The hexadecimal notation (Hex) code for the color of the contour line in the plot and legend. The setting can be from a range of #000000 to #FFFFFF in hexadecimal notation.<br>The left two digits are for the red color value, from 00 to FF.<br>The middle two digits are for the green color value, from 00 to FF.<br>The right two digits are for the blue color value, from 00 to FF. |
| 20 | Plot Height (Inches) | This sets the plot height size in inches. The width will be set proportionally based on the site coordinates. |
| 21 | Plot Resolution (DPI) | This will set the plot resolution. |

If the individual cells for the Filled Contours setting is within specifications the cell background will be green. If the cell value is invalid, the cell background will be red. Further data checks will also be performed just prior to running the SPL computations.

Preliminary data checking is done as the Contour Lines Settings are updated. If the data is invalid the cell background will turn red.

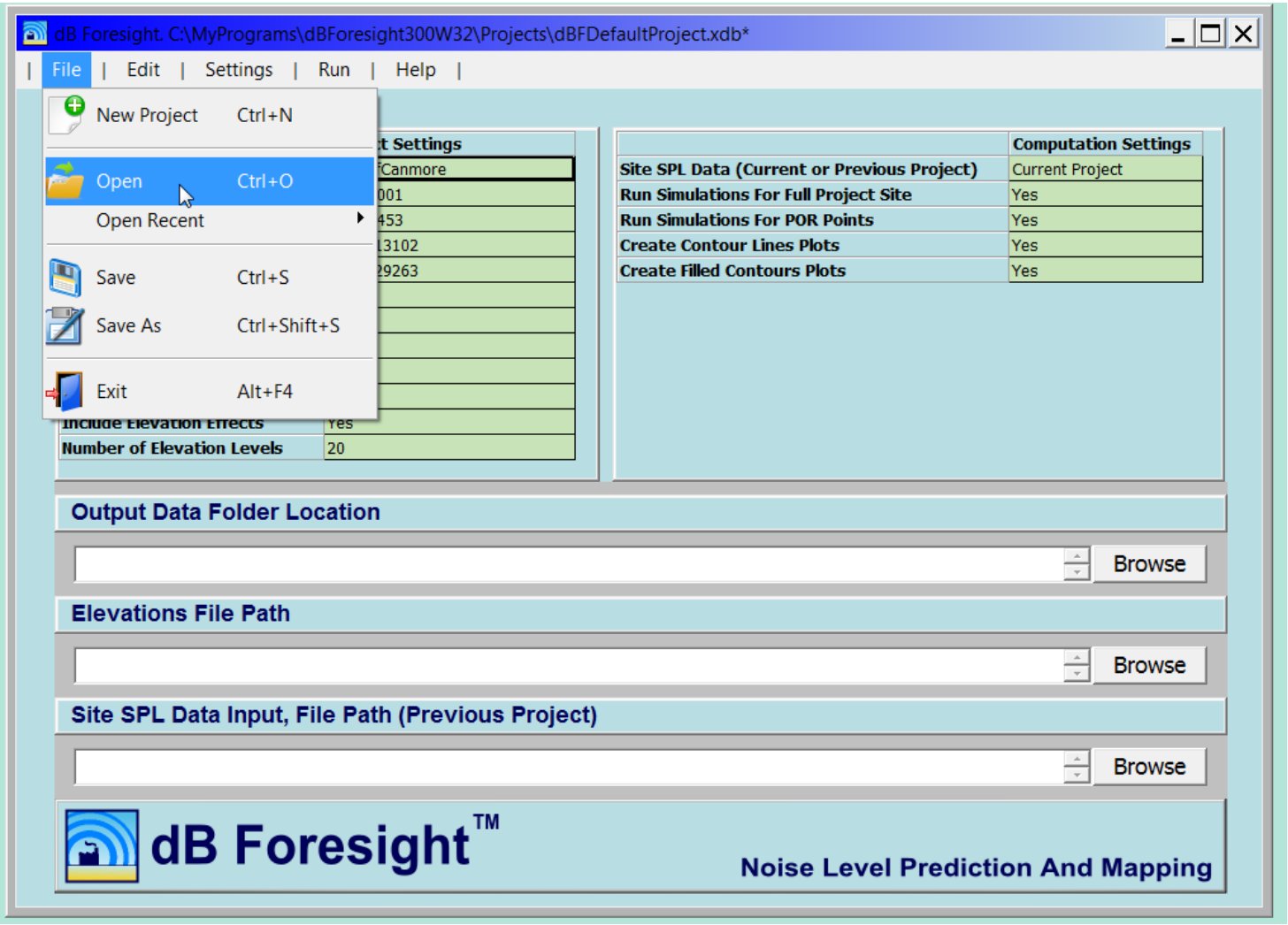
# 7 Menu Toolbar

## 7.1 File Menu

The File Menu is used for starting new projects, opening new or recent projects, saving or exiting dB Foresight.

### 7.1.1 File Menu Screenshot

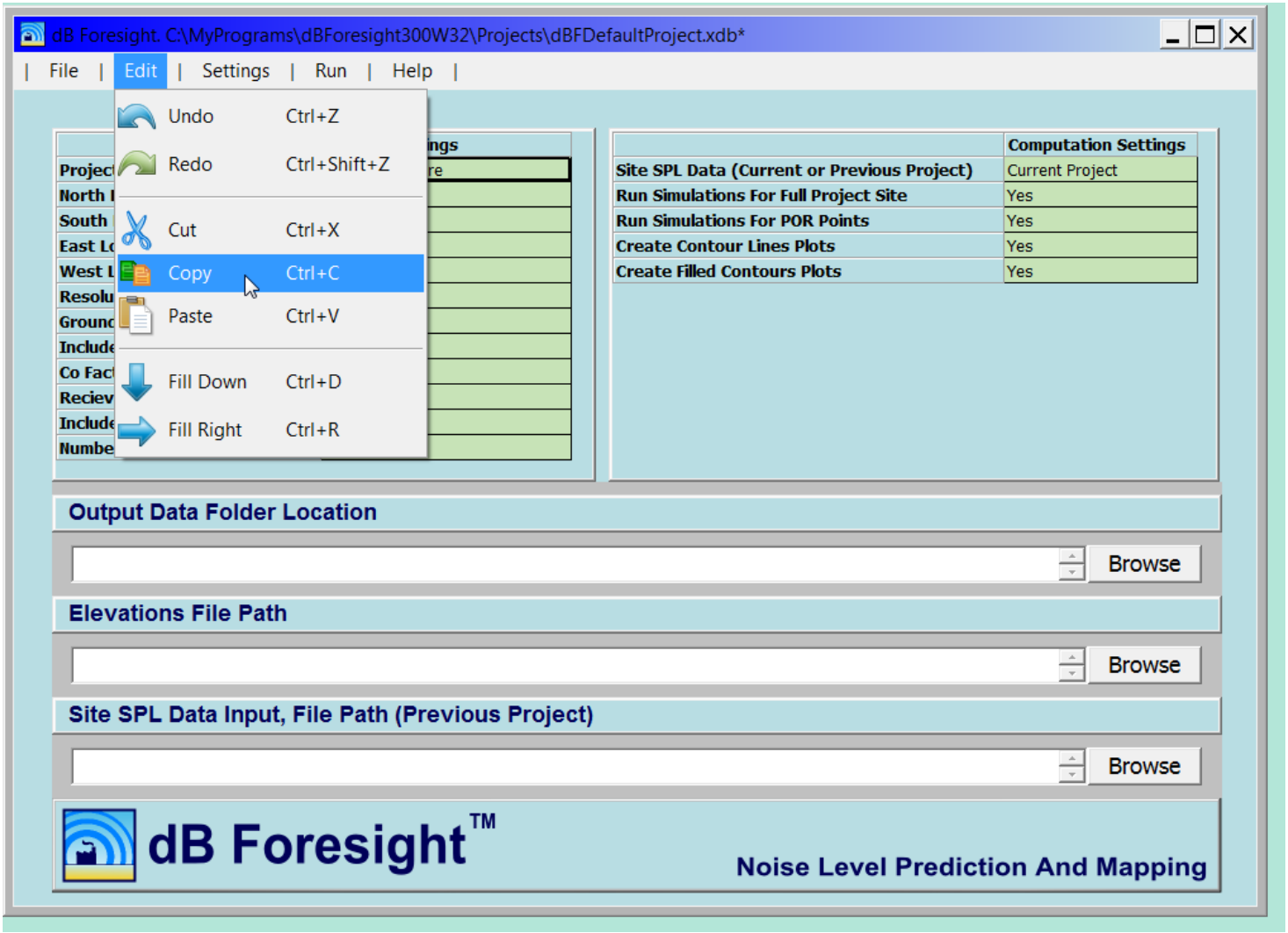



## 7.2 Edit Menu

To edit the project notes simply click into this window and enter your notes. This is meant for simple notes relating to your project. Not all of the 'Edit' features are available in this window.

### 7.2.1 Edit Menu Screenshot




## 7.3 Project Menu

### 7.3.1 Project Settings

The project settings can be edited with features similar to common spreadsheet applications such as Microsoft Excel or OpenOffice Calc. You can either use the predefined hotkeys or use the Edit menu and select the action required. The predefined hotkeys show up on the menus, just to the right of each features. You can use the computer clipboard to copy data from a spreadsheet directly into the Project Settings using Ctrl+C to copy and Ctrl+V to paste.

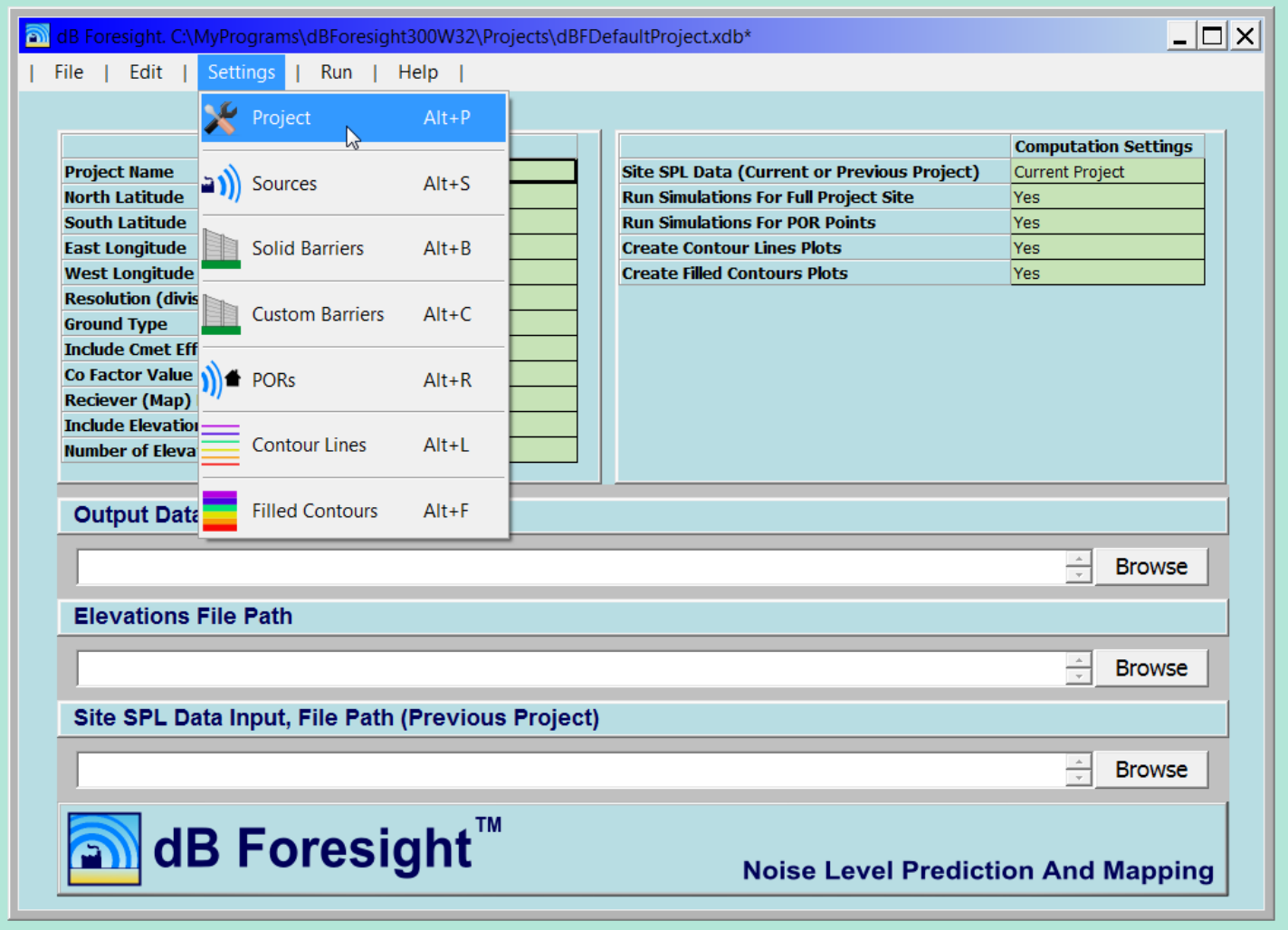
**IMPORTANT:** Note that to complete entering data into a cell you need to either press “Enter” or click on another cell. If you type data into a cell but do not complete entering the data, it will not be saved when you save the project file, and will not be processed if you run a ‘Create Maps’ process.

### 7.3.2 Output Data Folder Location

The Output Data Folder Location is the working folder where the files created will be stored. Click on the "Browse" button to select or create the folder location

### 7.3.3 Project Menu Screenshot



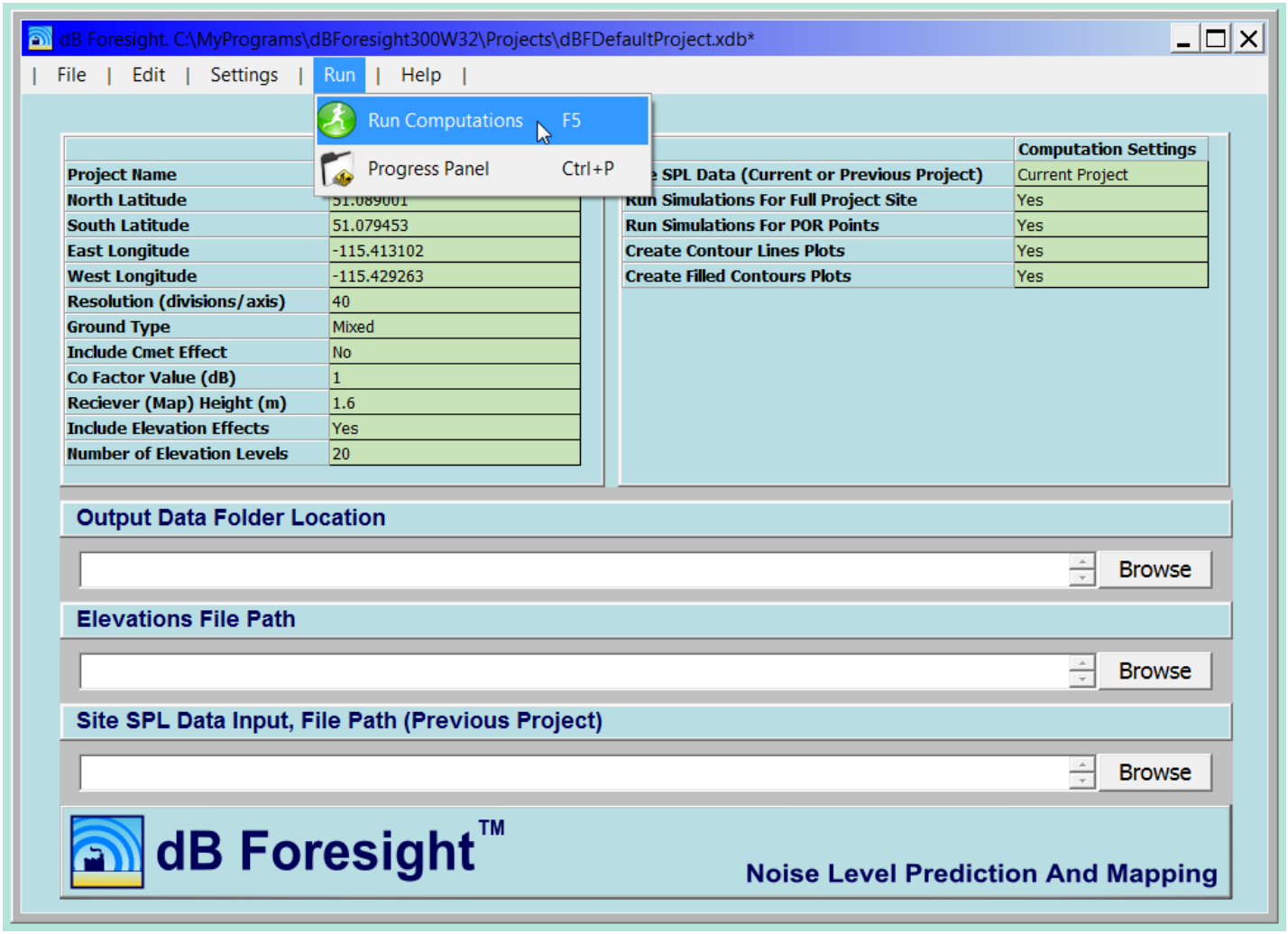

## 7.4 Run Menu

To create your noise impact assessment files select the Run>Run Computations menu. This will automatically take you to the Run>Progress Panel to display the status as the computations are running.

The Run process will first check if the Project Settings are all within specifications, and display a descriptive warning if they are invalid. As the files are being created the process status updates will be displayed in the Run>Status Panel. The computation process typically takes a few minutes, depending on the project settings. During the Run process most application features will not be available and will show as gray on the menus. Once this process is completed the output files can be accessed in the location identified for the Output Data Folder Location.

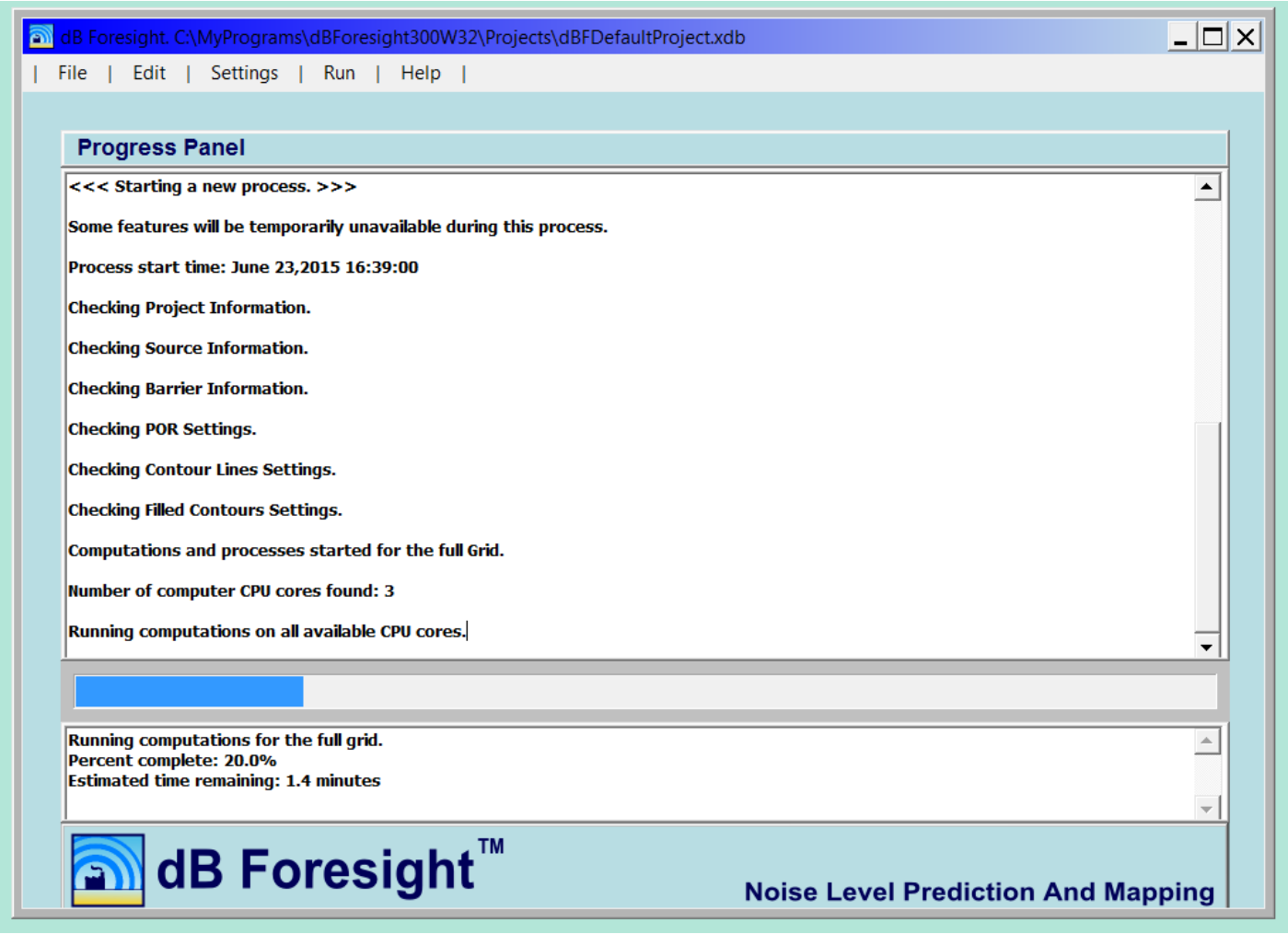
  

### 7.4.1 Run Menu Screenshot

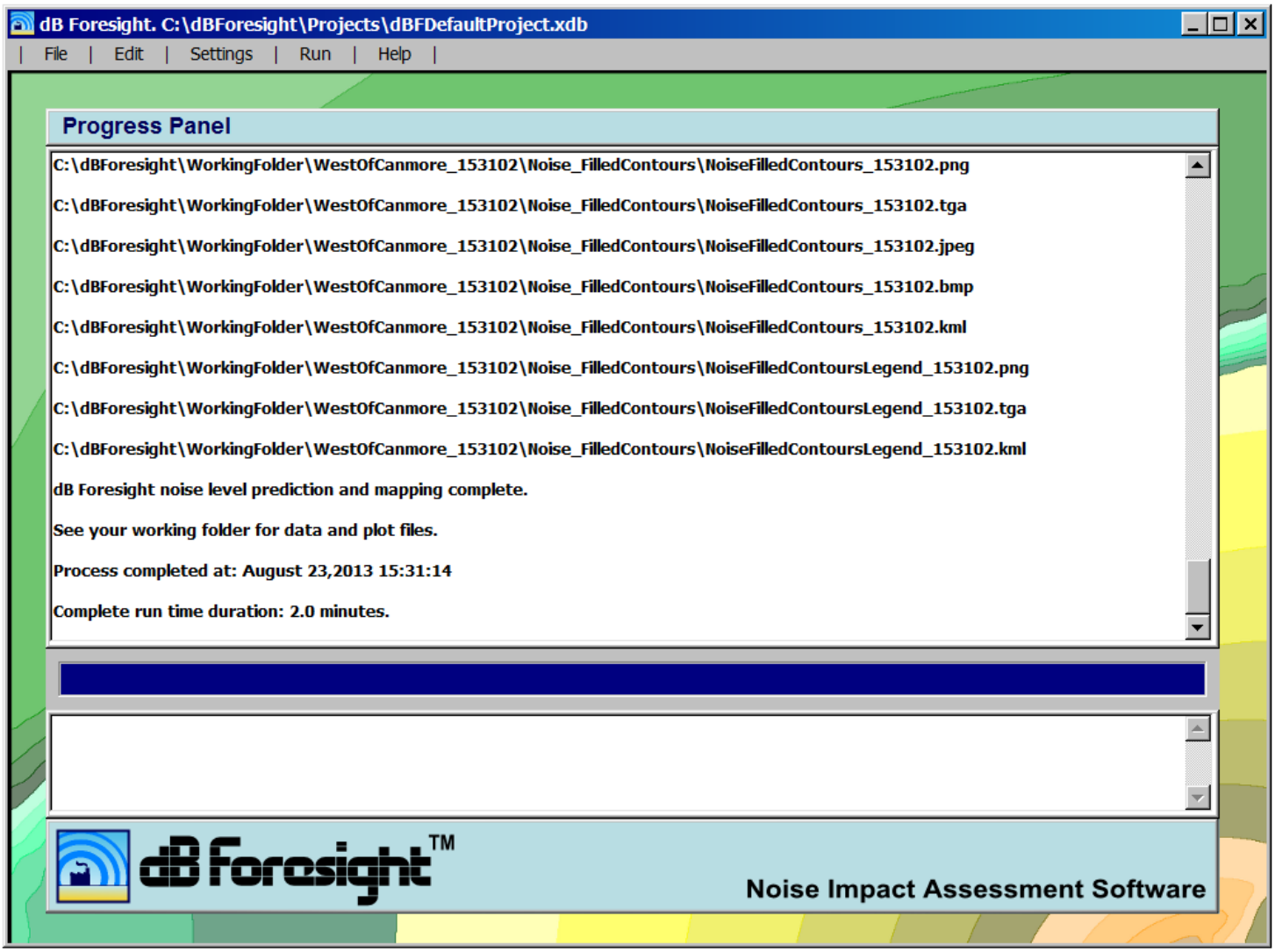


### 7.5 Map Creation Process, Progress Panel Screenshot



### 7.6 Map Creation Process, Progress Panel Screenshot



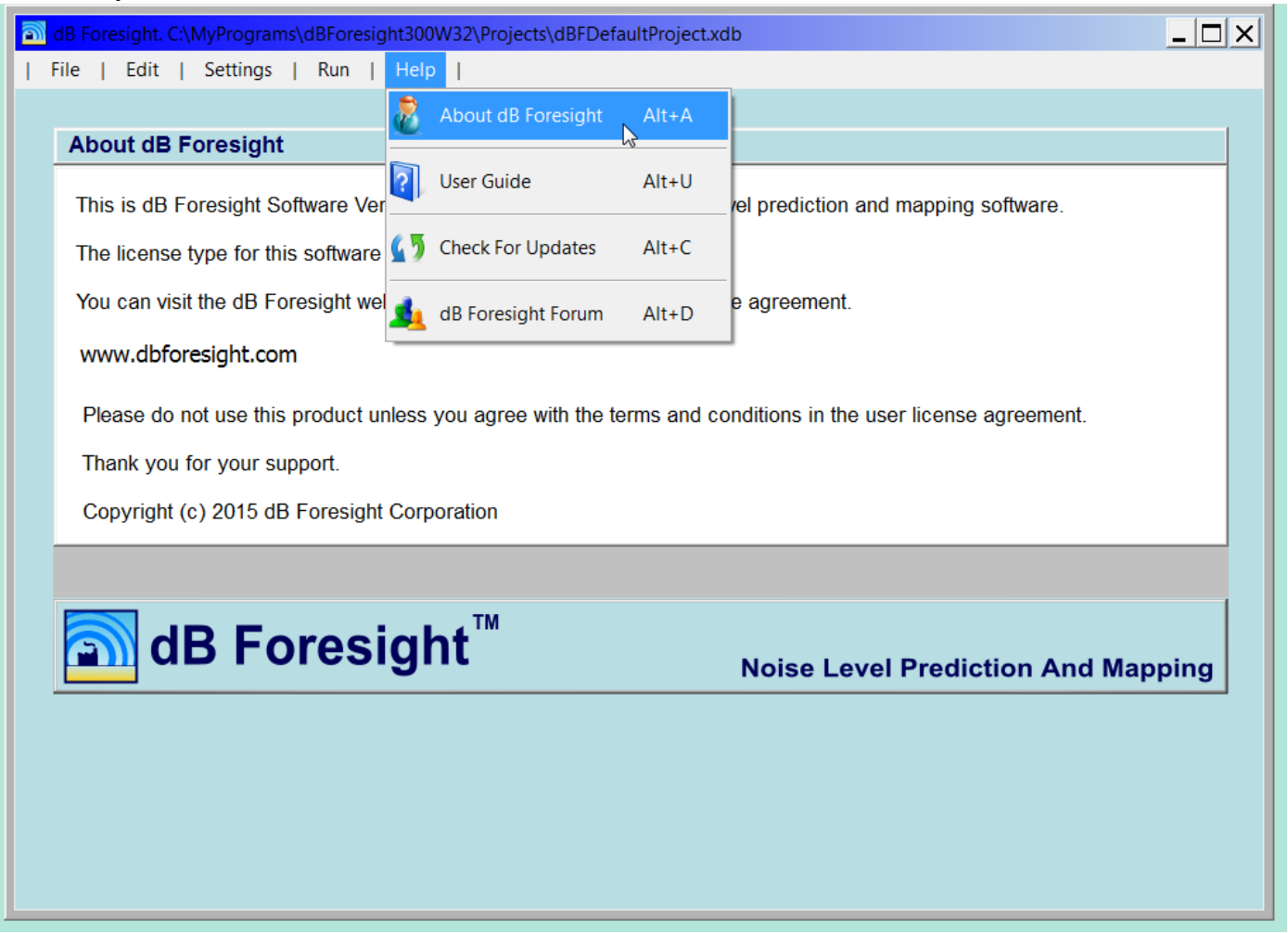

### 7.7 Help Menu

The help menu contains four sub menus which are:

- About dB Foresight
- User Guide
- Check For Updates
- Support Forum

### 7.7.1 Help, Menu Screenshot

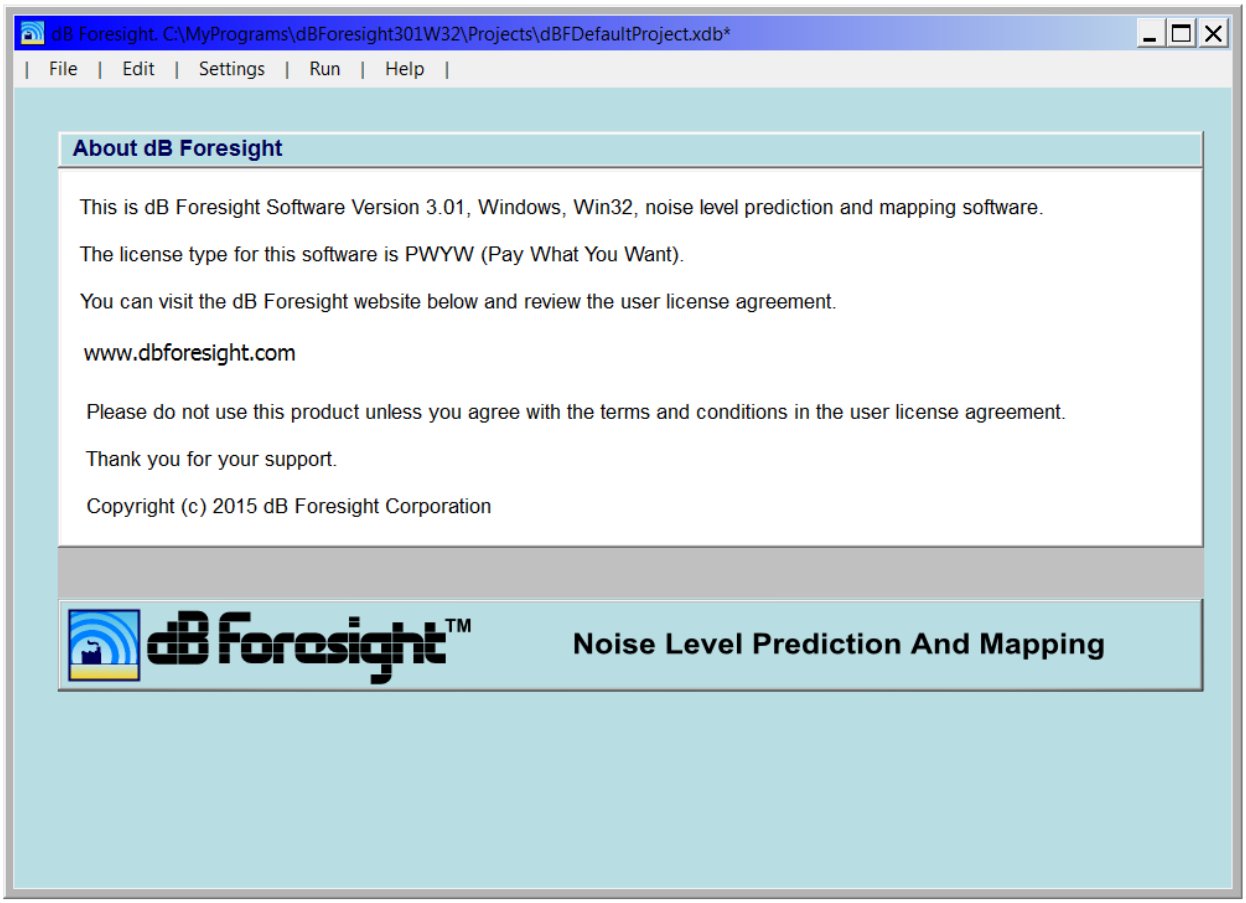



### 7.7.2 Help About dB Foresight Panel

The Help About Panel contains the Software Version and a link to dB Foresight where you can check for product upgrades or download the User Manual.

Please review any license changes periodically or check for upgrades at www.dbforesight.com.

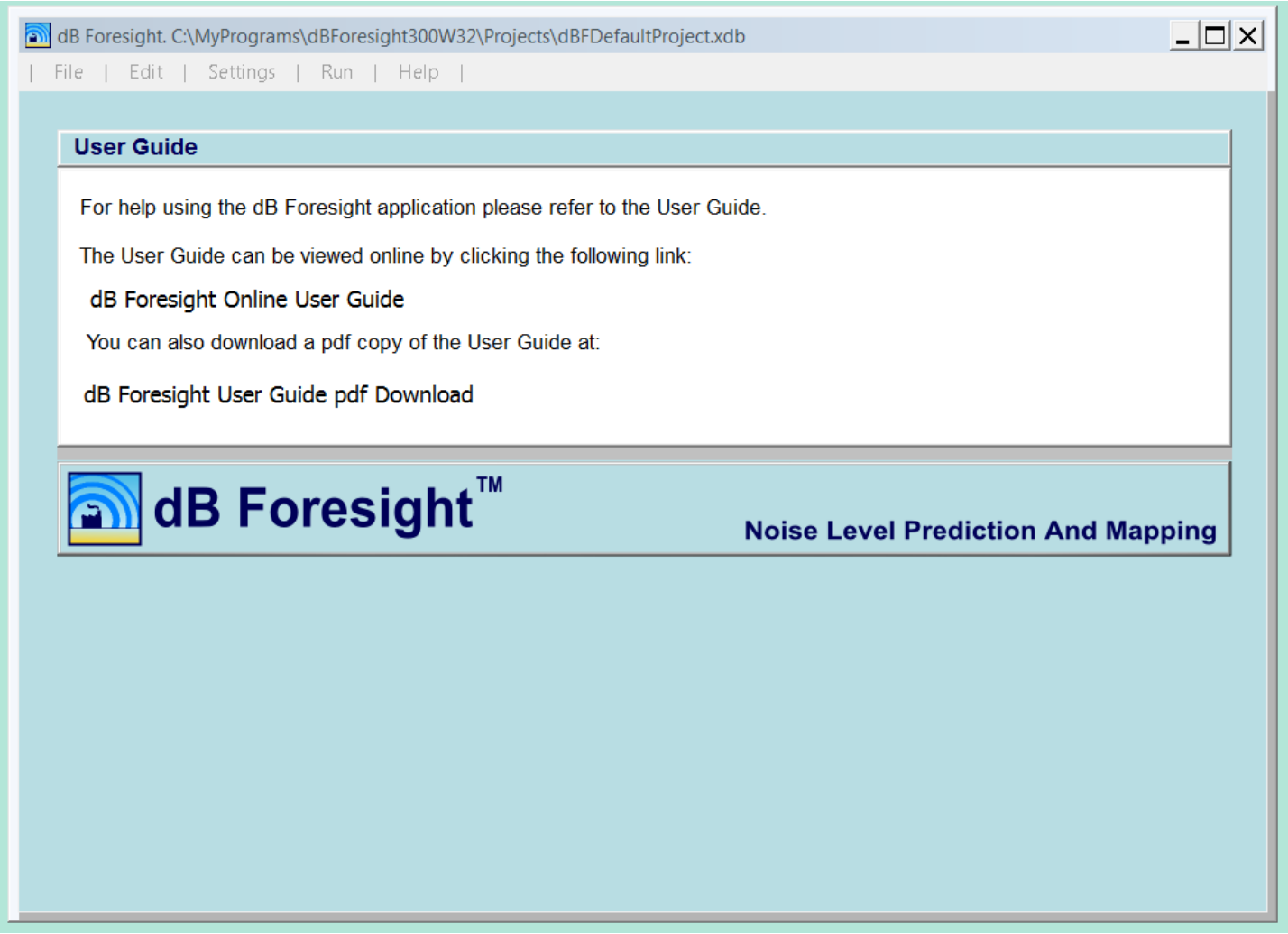
### 7.7.3 Help About dB Foresight Panel Screenshot




### 7.7.4 Help User Guide Panel

The Help User Guide Panel provides the links to either view the dB Foresight User Guide online or to download a pdf copy of the User Guide.

### 7.7.5 Help User Guide Panel




### 7.7.6 Help Check For Updates and Forum Menus

The Help Check For Updates panel will open a web browser and take you to the www.elevationmapper.com site to check for updates for your product.

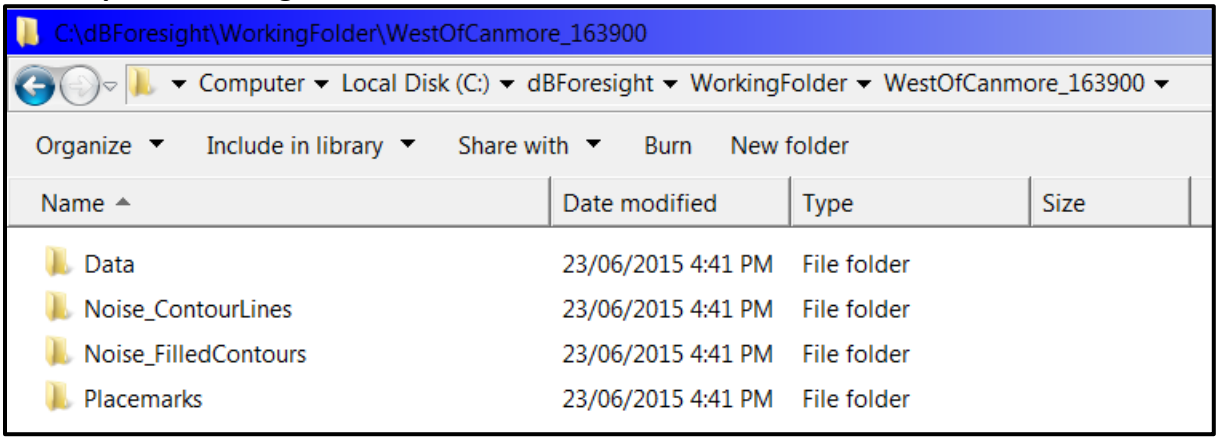
The Help dB Foresight Forum panel will open a web browser and take you to the dB Foresight Forum. You can sign into the Forum and view or add comments or questions related to the dB Foresight product.

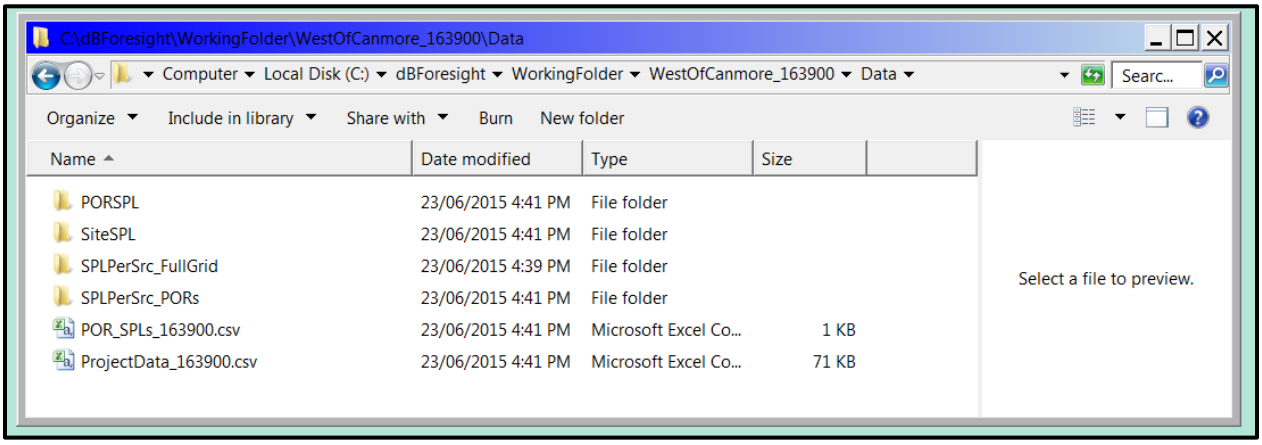
## 8 Viewing dB Foresight Created Files

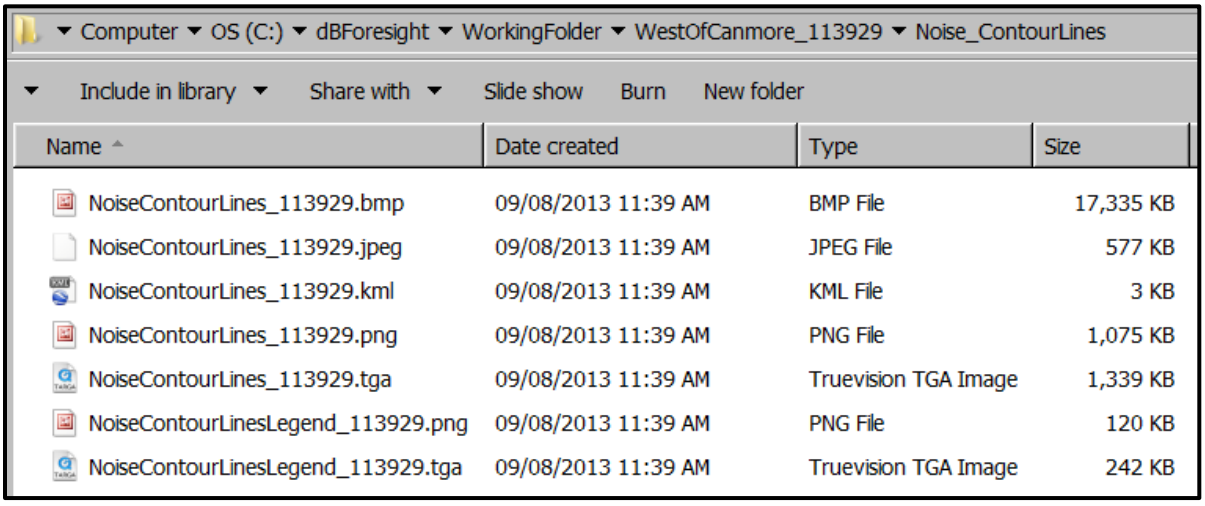
Once you have completed creating the map files you can go to the Output Data Folder Location to view the files. The following screenshot is the files from a typical project.

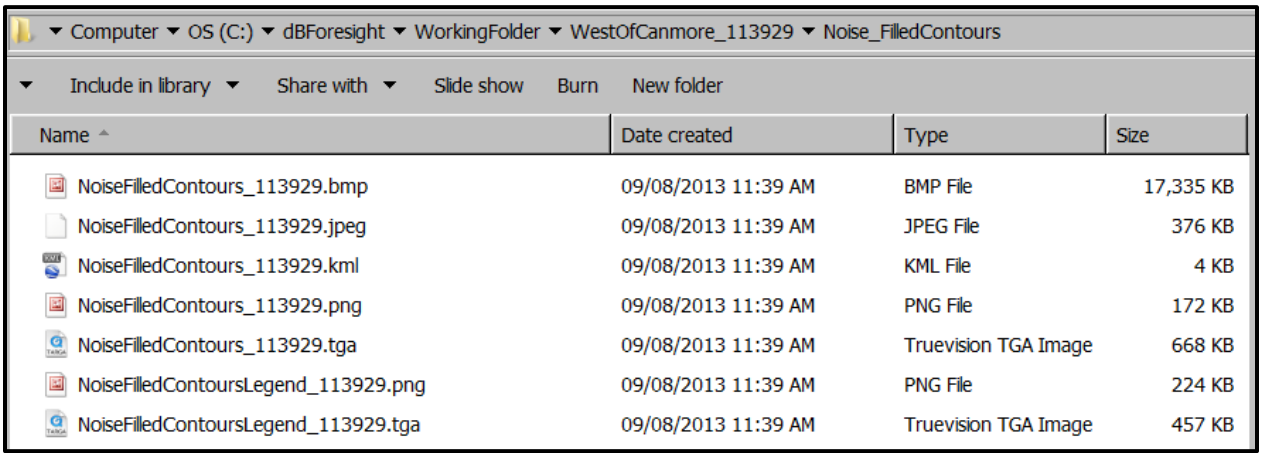
## 8.1 Output File Listings

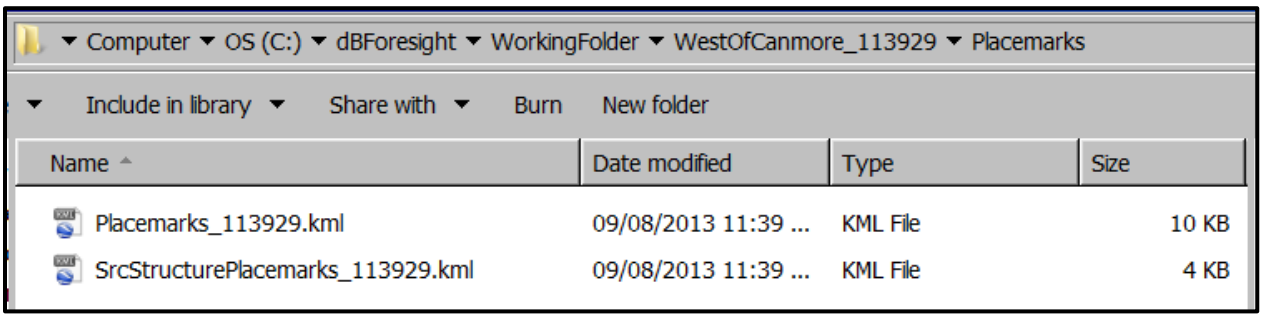




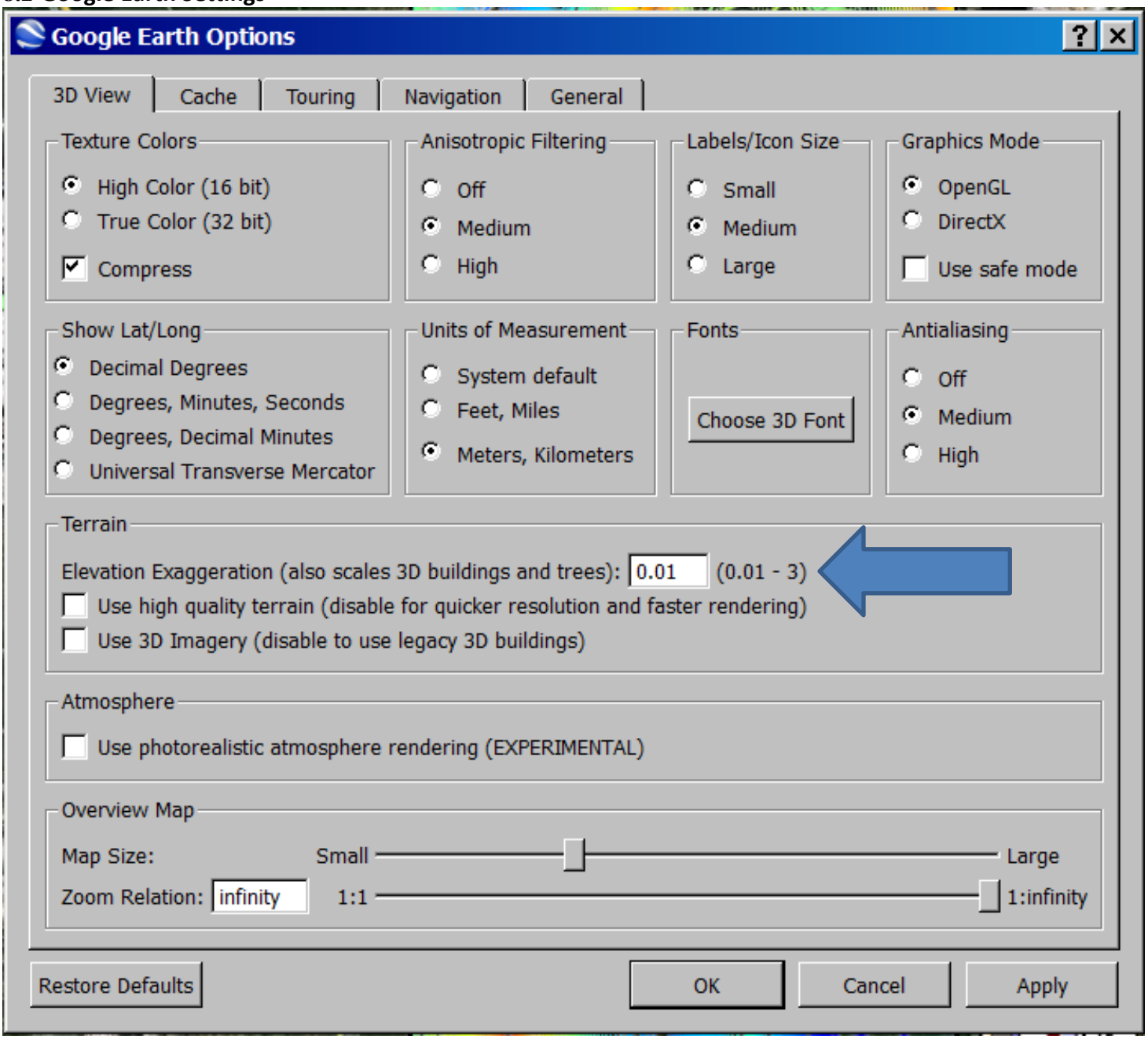




If you have Google Earth as your default GIS application, if you double click on either KML file it will automatically open in Google Earth. You should turn off the Google Earth setting called 3D View>Terrain>Elevation Exaggeration, or set it to the lowest value, as per the following screenshot. With Elevation Exaggeration feature turned off the contour borders will appear as straight lines, otherwise they will follow the terrain elevation levels.

Set Terrain>Elevation Exaggeration to lowest value to eliminate map distortion in Google Earth.

### 8.2 Google Earth Settings



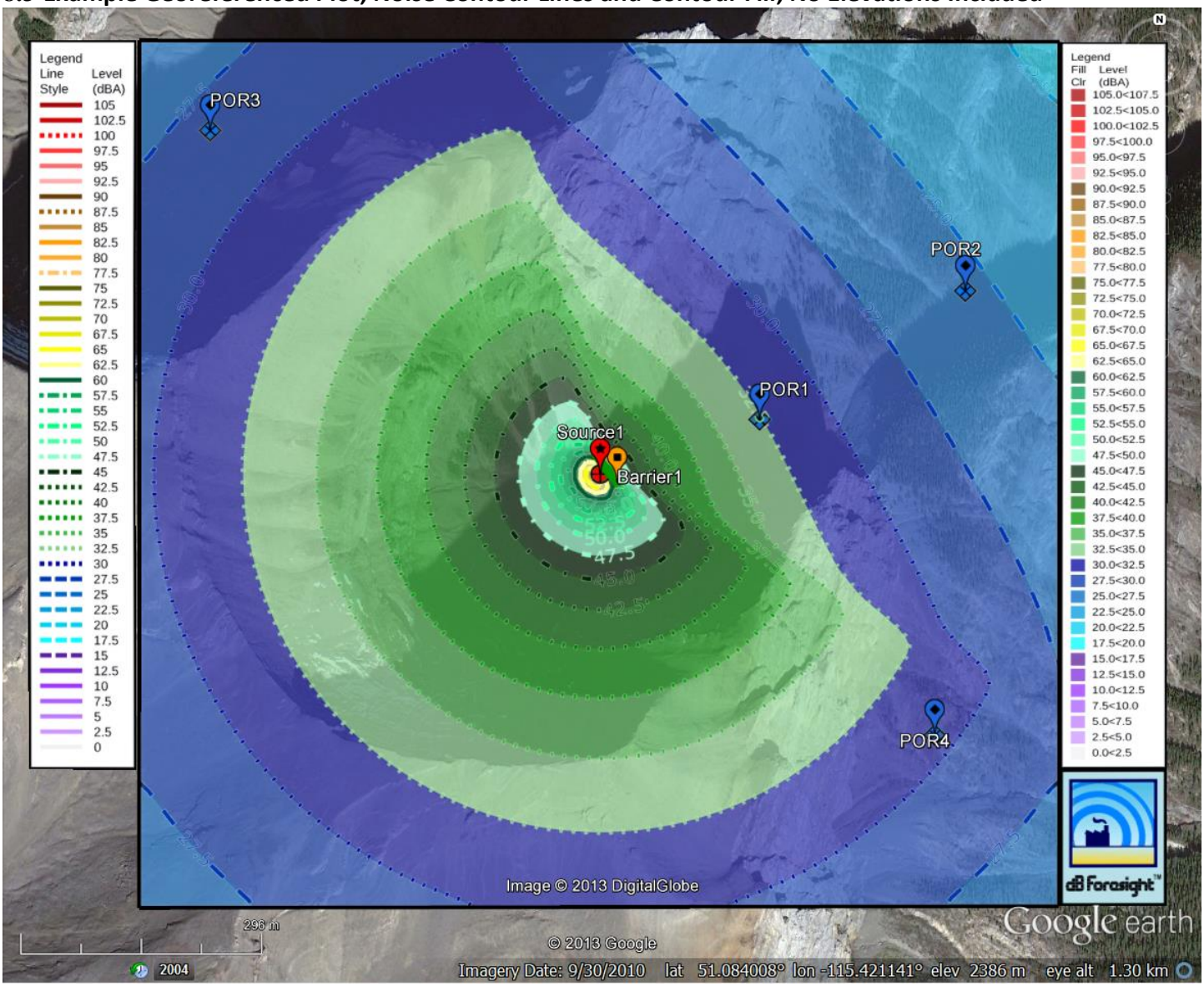

On opening the plot files the legend will be displayed. The legend can be moved or turned off within Google Earth. The frame around the plot can also be turned off within Google Earth.

If you edit your PNG file names or move them to a new file location, you will need to update the file location and name in Google Earth. To do this right click on the plot overlay under 'Places' in Google Earth. Next click the 'Browse' button to the right of the link and change the path of the PNG file to the new location.

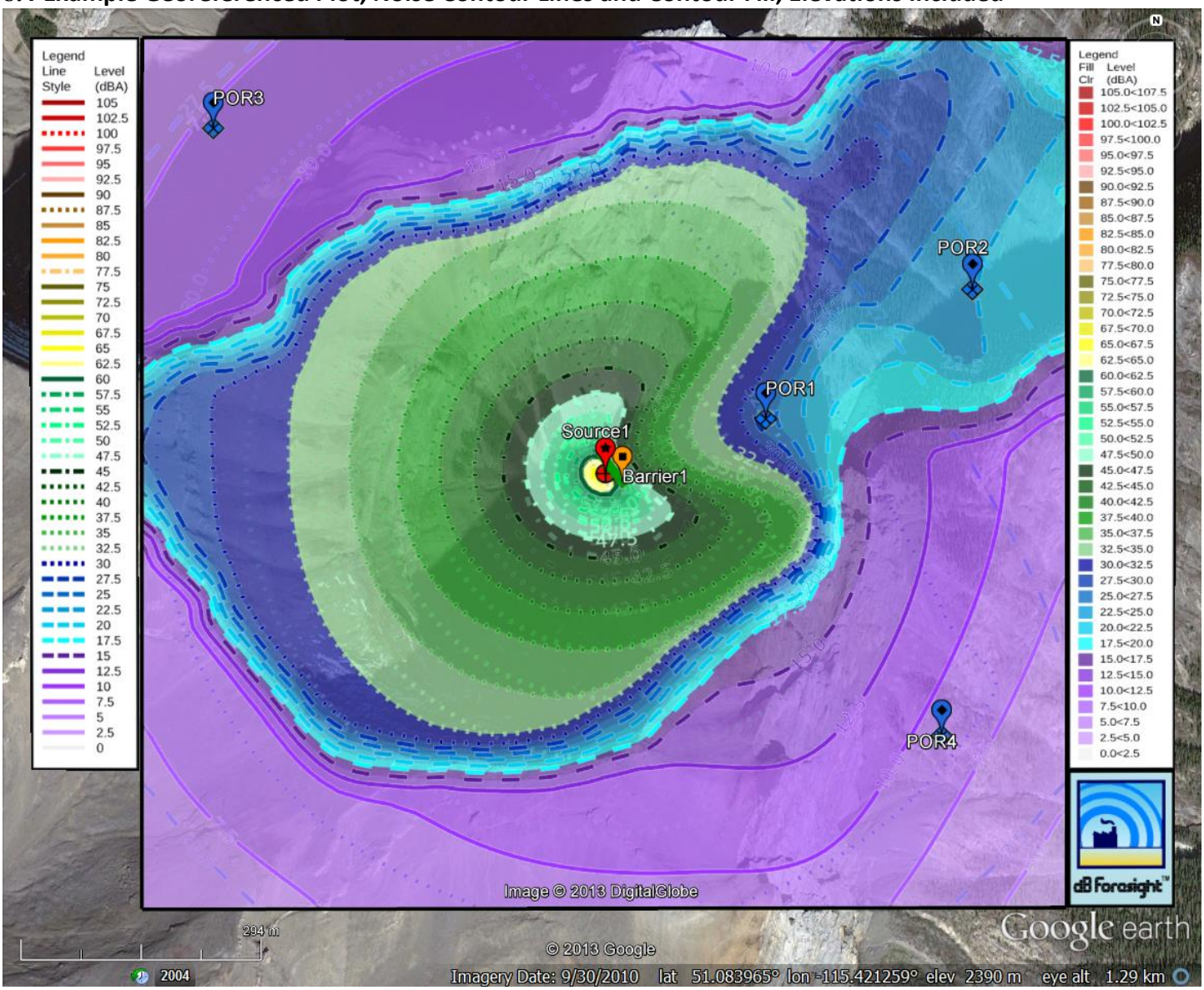
The following is a sample georeferenced noise filled contours and contour lines plot on Google Earth. This example shows the predicted noise levels without considering the noise level attenuation due to the natural topography in the site area. The noise attenuation due to one 4m tall man-made barrier is included.

### 8.3 Example Georeferenced Plot, Noise Contour Lines and Contour Fill, No Elevations Included




The following is a sample georeferenced noise filled contours and contour lines plot on Google Earth. This example shows the predicted noise levels considering the noise level attenuation due to the natural topography in the site area. The noise attenuation due to one 4m tall man-made barrier is also included.

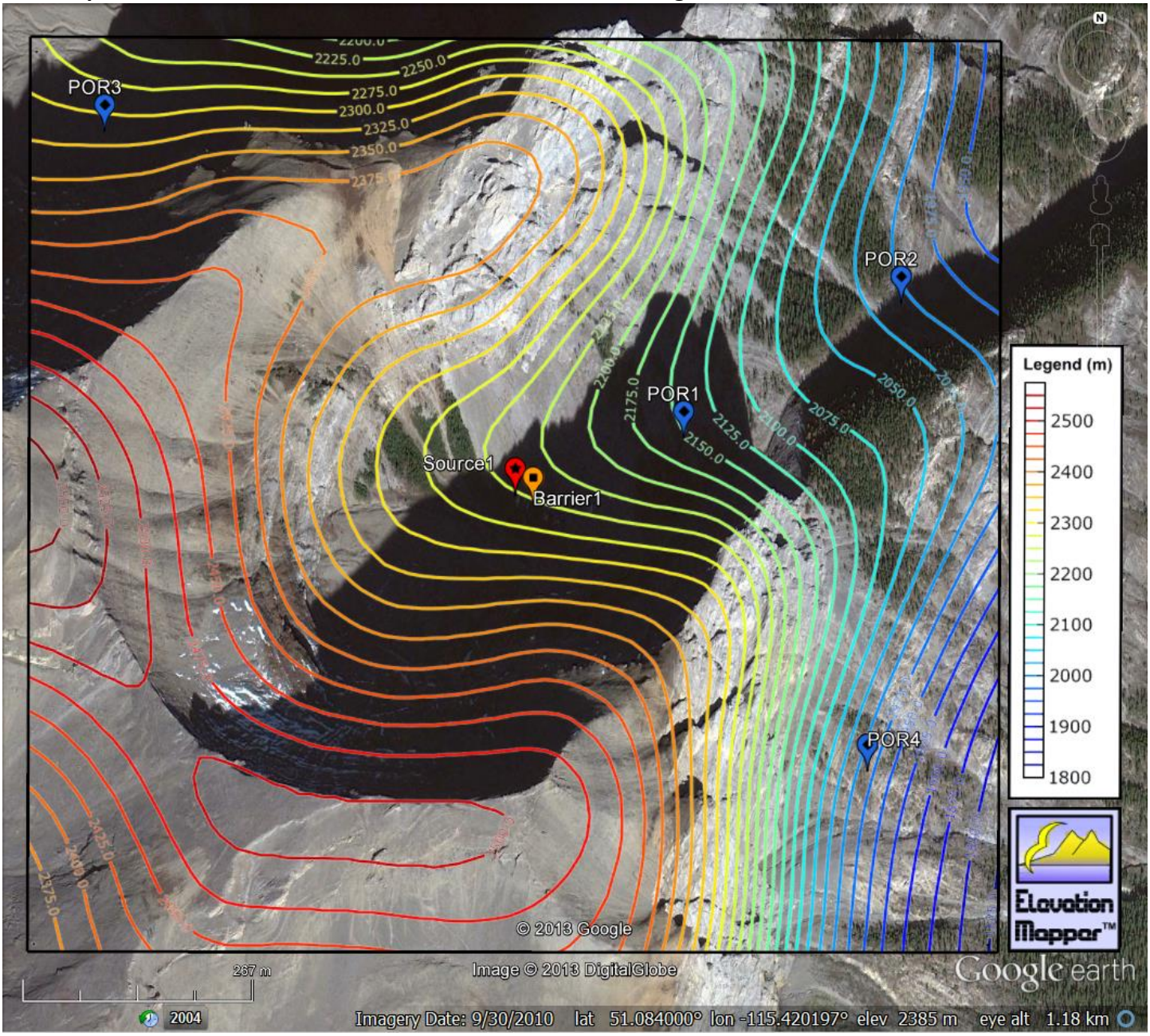
## 8.4 Example Georeferenced Plot, Noise Contour Lines and Contour Fill, Elevations Included




The following is the elevation contour lines plot for the site area in the previous example. The elevation contours were used to determine the noise level attenuation due to natural barriers and other effects. For this example the Source1 is in a valley which is closed off on the west end. The sound levels drop off considerably as you go move out of the valley on the other side of the ridges. The 4m tall man-made barrier attenuates the noise to the east of the source. However, for the higher elevation areas east of Source1 the man-made barrier has less attenuation. This is because the barrier is not in the path of a direct line of sight from Source1 to the reception area, so has minimal effect.

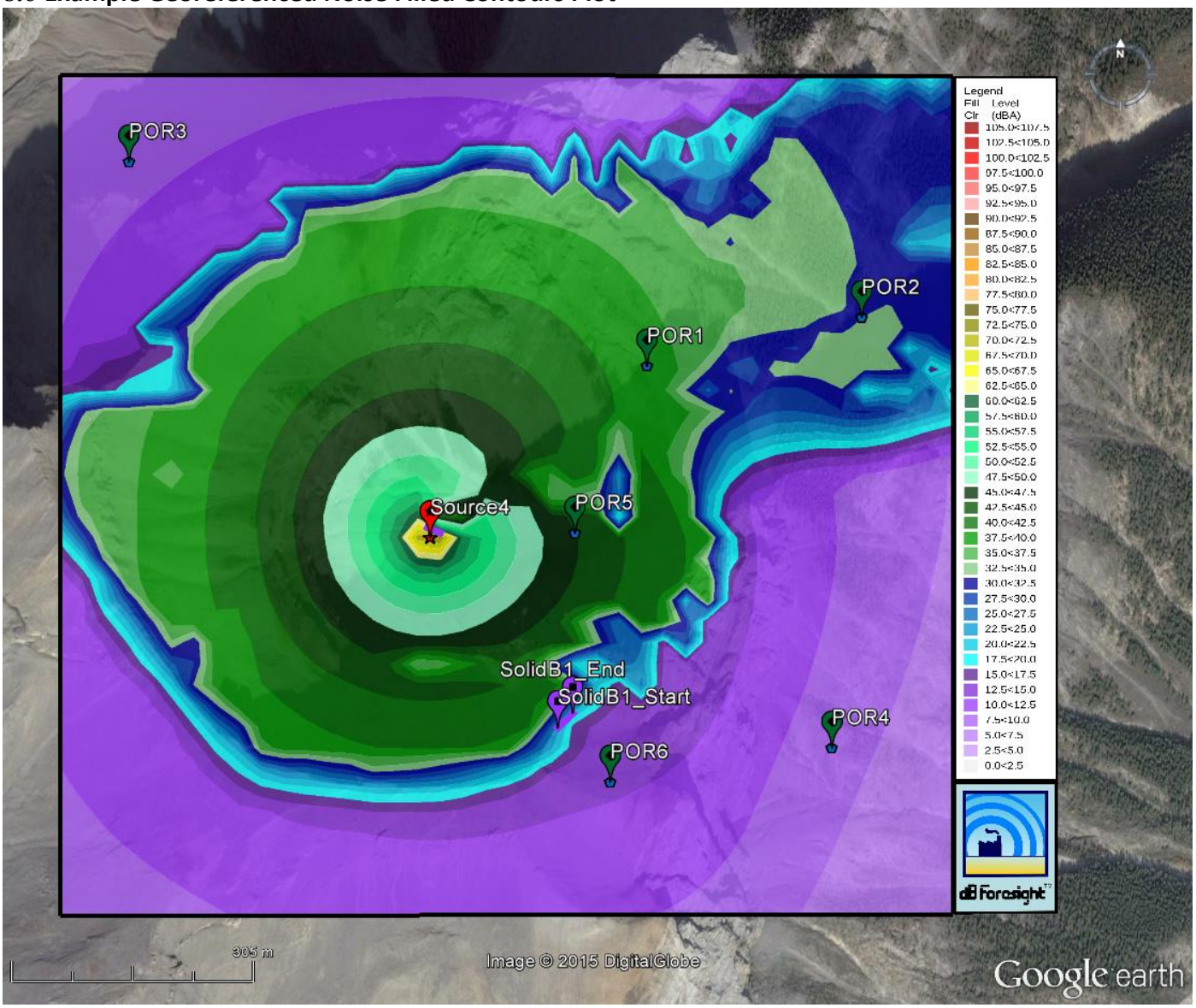
  

### 8.5 Sample Georeferenced Elevation Contour Lines Plot On Google Earth



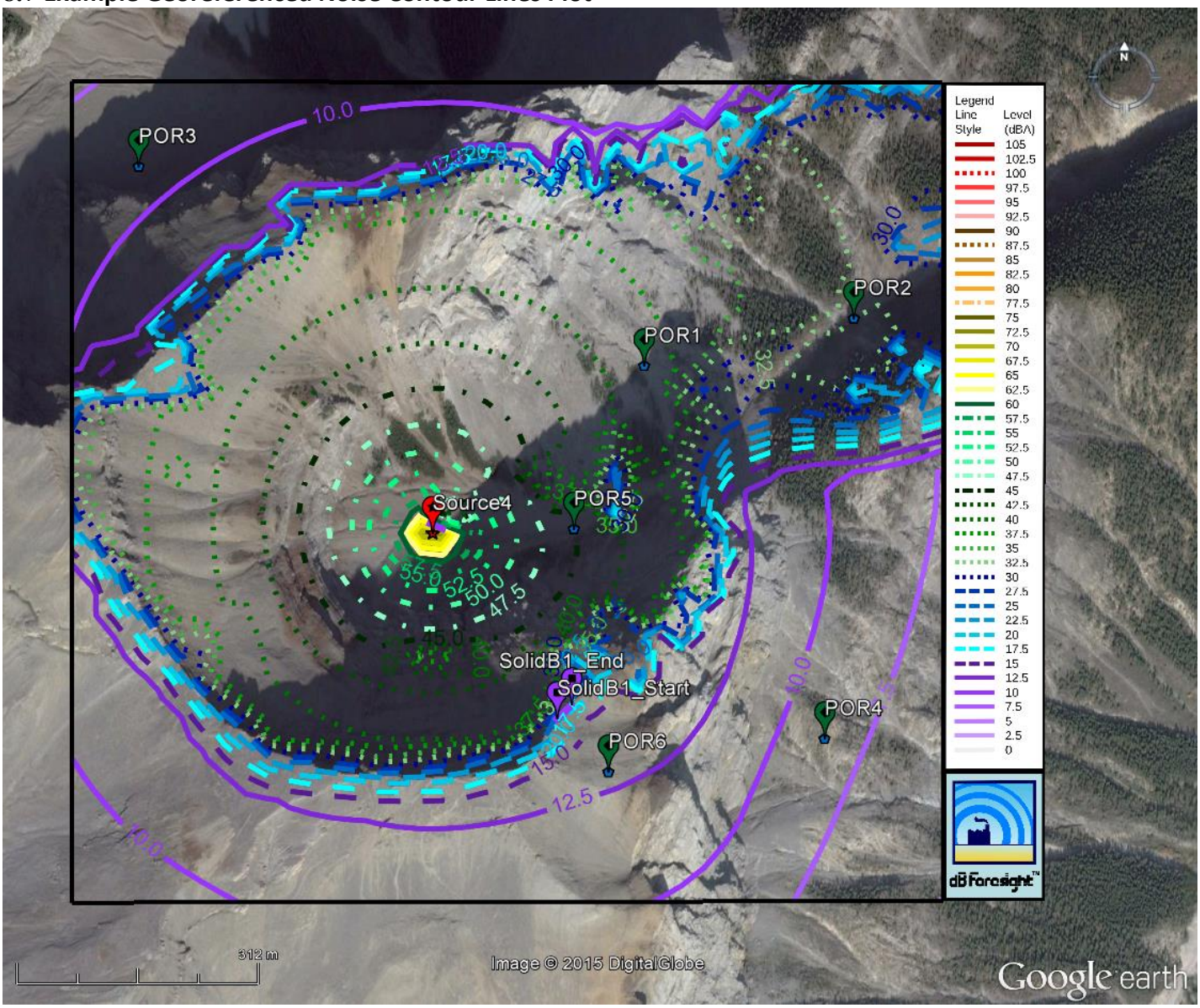
The following is a filled contours plot referenced on Google Earth.

### 8.6 Example Georeferenced Noise Filled Contours Plot



The following is a noise contour lines plot georeferenced on Google Earth.

### 8.7 Example Georeferenced Noise Contour Lines Plot



The NoiseLevels_HHMMSS.csv file will contain the latitudes along the left column and the longitudes along the top row, and the noise level (in dBA) in the remaining cells. These data files can be viewed in common spreadsheet applications such as Microsoft Excel or OpenOffice Calc. Surface charts or other charts can be created to view the plot. Note that Microsoft Excel has the following limitations on the amount of data it can handle. The Project Setting Resolution parameter can be reduced to produce less data points.

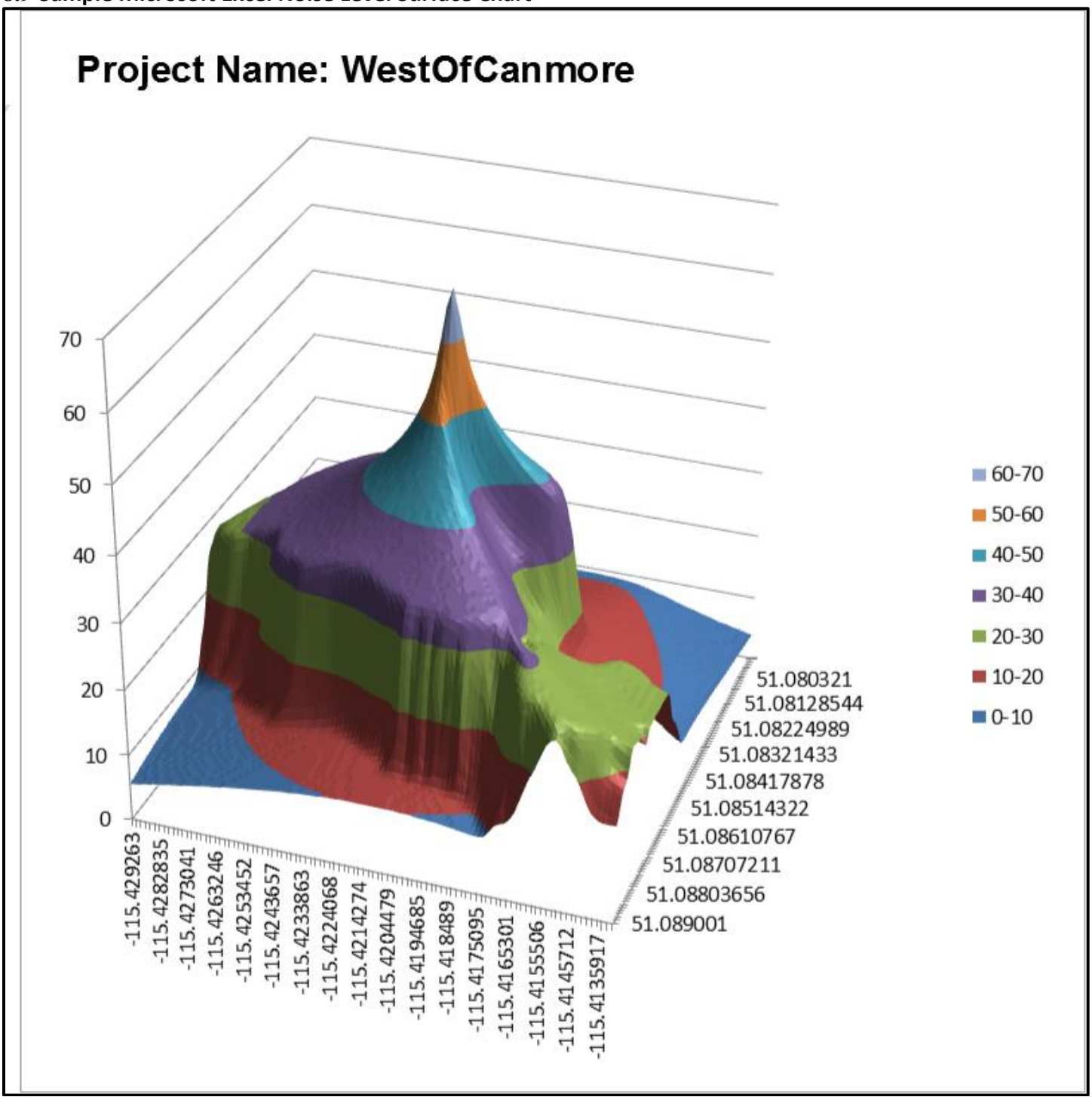
### 8.8 Microsoft Excel Charting Limitations

| **Microsoft Excel Charting Limitations** | **Limit** |
|---|---|
| Data series (data series: Related data points that are plotted in a chart. Each data series in a chart has a unique color or pattern and is represented in the chart legend. You can plot one or more data series in a chart. Pie charts have only one data series.) in one chart | 255 |
| Data points (data points: Individual values that are plotted in a chart. Related data points make up a data series. Data points are represented by bars, columns, lines, slices, dots, and other shapes. These shapes are called data markers.) in a data series for 2-D charts | 32,000 |
| Data points in a data series for 3-D charts | 4,000 |
| Data points for all data series in one chart | 256,000 |

The following noise level surface chart was created from the data from the dB Foresight.

### 8.9 Sample Microsoft Excel Noise Level Surface Chart



The following is an example of the OutputData_xxxxxx.csv from a project.

### 8.10 Sample Output Data Chart

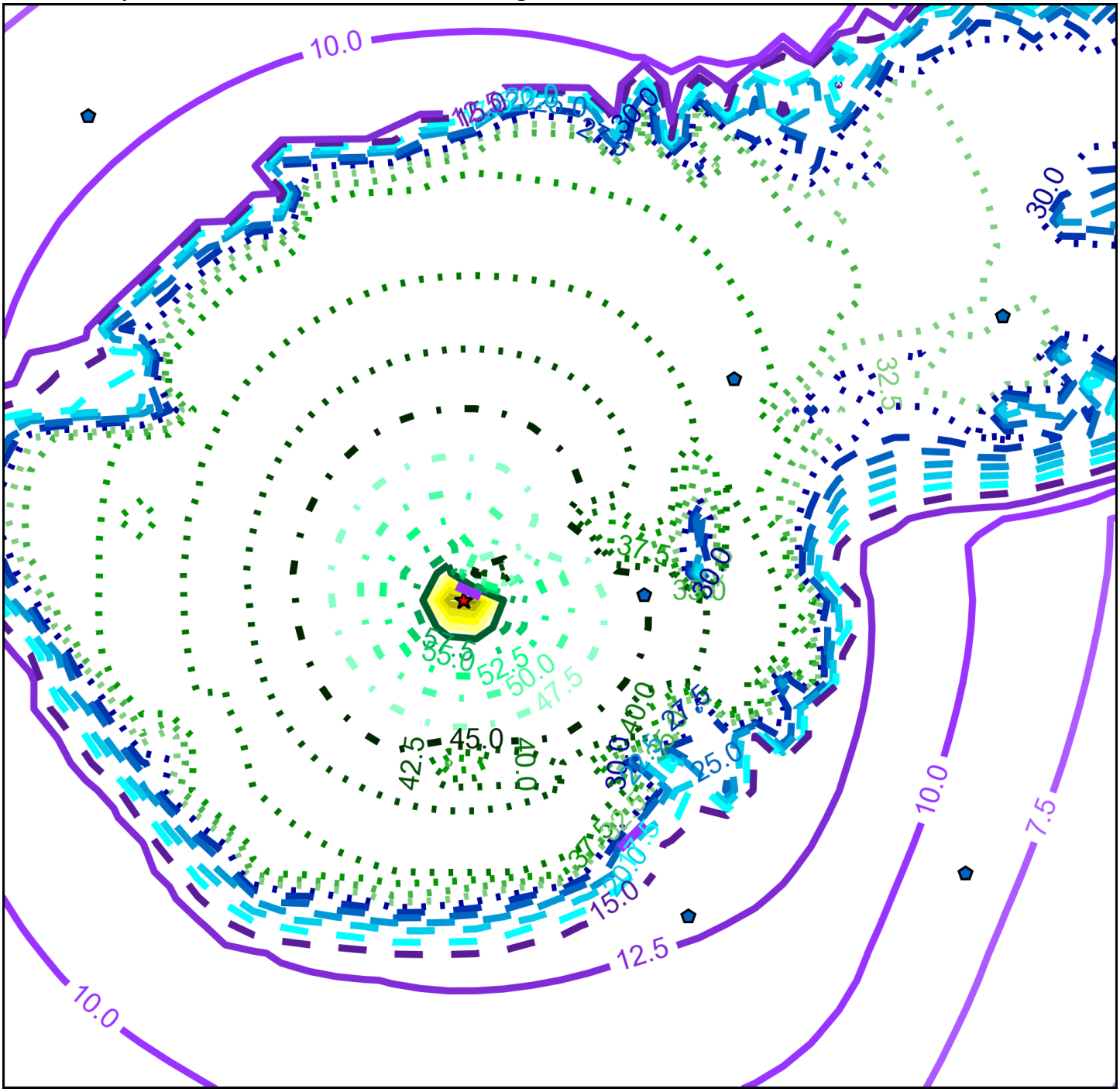
| POR Name | Latitude | Longitude | Day Ambient SPL (dBA) | Night Ambient SPL (dBA) | Generated SPL (dBA) | Predicted Day SPL (dBA) | Predicted Night SPL (dBA) |
|---|---|---|---|---|---|---|---|
| POR1 | 51.08569 | -115.418658 | 55 | 45 | 38.47 | 55.10 | 45.87 |
| POR2 | 51.08625 | -115.414766 | 50 | 48 | 31.88 | 50.07 | 48.10 |
| POR3 | 51.08801 | -115.428018 | 49 | 47 | 9.20 | 49.00 | 47.00 |
| POR4 | 51.08135 | -115.4153 | 50 | 45 | 8.55 | 50.00 | 45.00 |
| POR5 | 51.08379 | -115.419958 | 51 | 46 | 42.33 | 51.55 | 47.55 |
| POR6 | 51.08097 | -115.41932 | 52 | 42 | 12.90 | 52.00 | 42.01 |

### 8.11 Sample Plots And Legend

Following are samples of the plot files and legends that are created from the setting in the dB Foresight default project. These files are used in the KML files to georeference the plots for viewing in GIS applications such as Google Earth or ArcGIS.

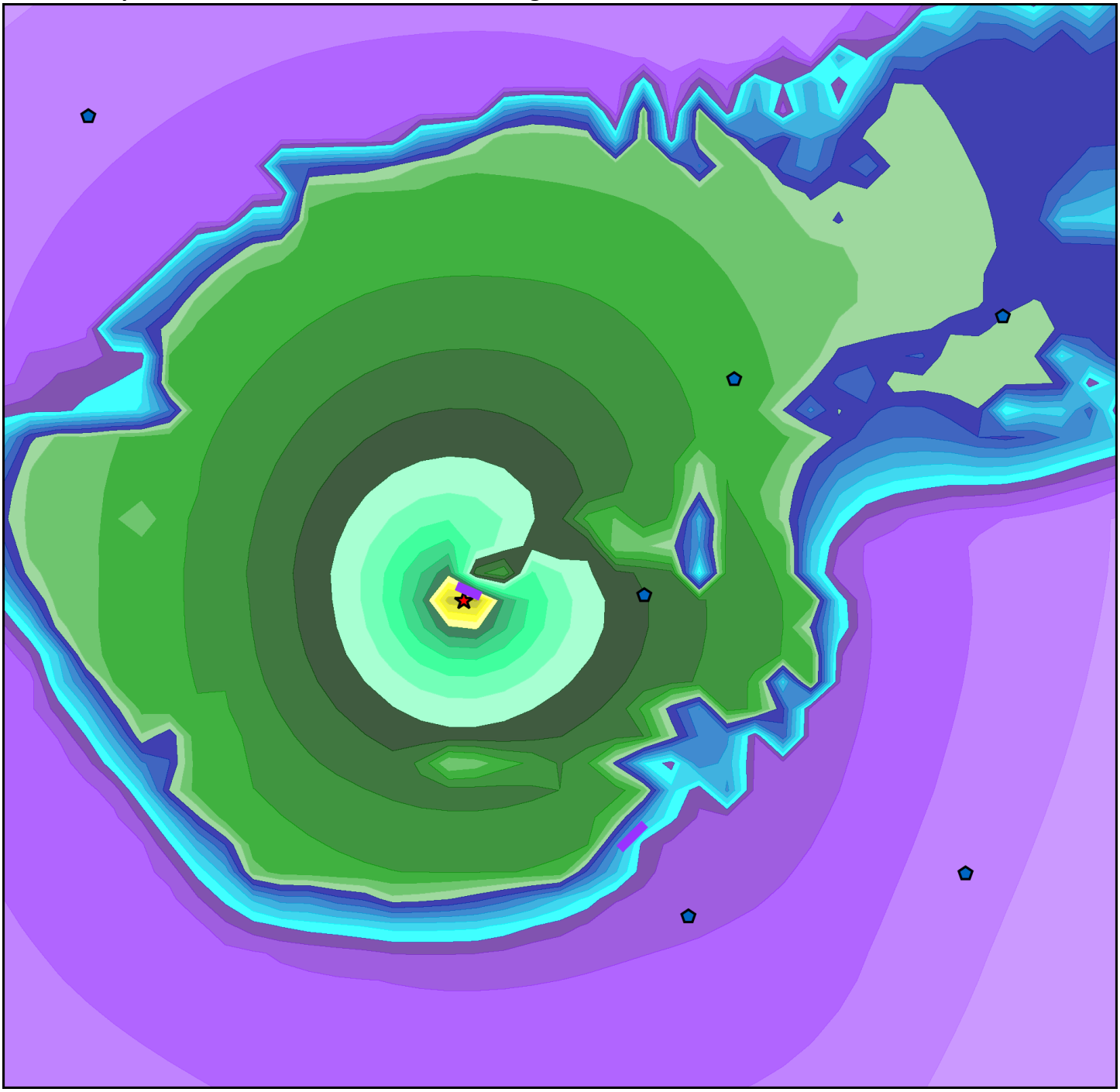
  

### 8.11.1 Sample Noise Contour Lines PNG File Image



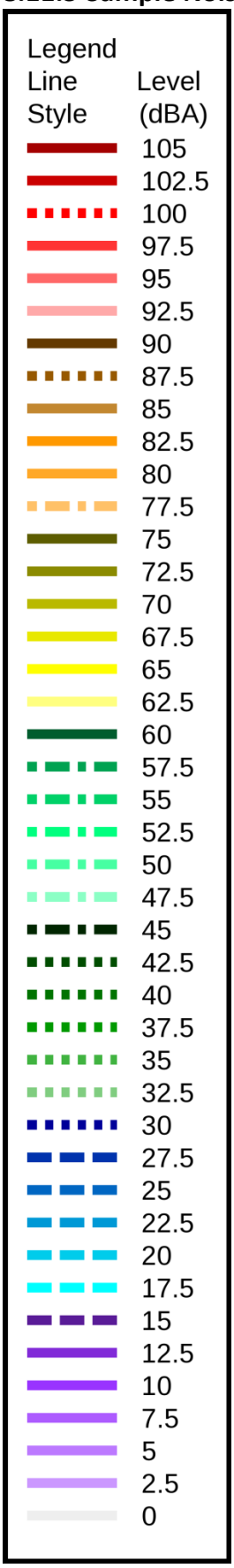

  

### 8.11.2 Sample Noise Filled Contours PNG File Image



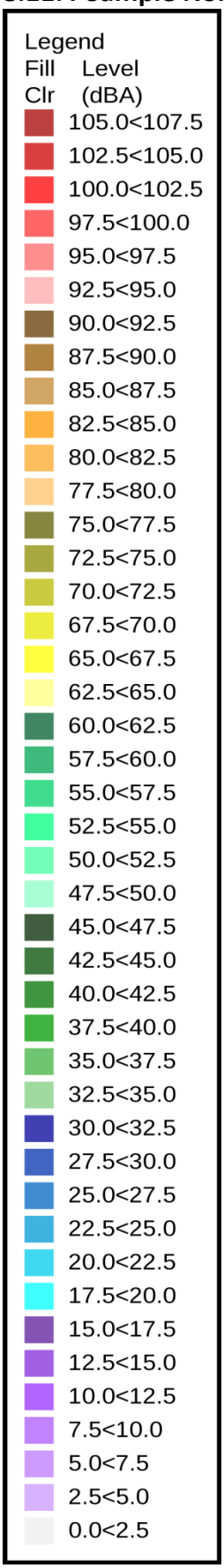
  

### 8.11.3 Sample Noise Contour Lines Legend



### 8.11.4 Sample Noise Filled Contours Legend



## 9 Noise Level Prediction Methodologies

The dB Foresight model of noise level prediction methodologies comply with the ISO standard 9613-2, and considers the following parameters for the sound level prediction analysis:

- GPS location of each sound source
- Ground type (porous, mixed or hard)
- Source elevations
- Source sound height
- Source directivity
- Source mid-band frequencies
- Physical size of the sources (if used as barriers)
- POR GPS locations
- POR height (noise map height)
- POR elevations
- POR ambient noise levels
- Geometric spreading
- Ground effects
- Attenuation due to man-make barriers or berms
- Attenuation due to natural barriers, berms or elevation effects
- Attenuation due to atmospheric conditions
- Cmet effects (includes downwind, thermal inversion or other know effects)
- Air temperature and relative humidity
- Atmospheric absorption
- Intermittency of the noise

dB Foresight creates and geo-references predicted noise level contour plots. The geo-referenced contour plots can be viewed directly on GIS tools such as Google Earth or ArcGIS. dB Foresight also creates data files containing the contributed and cumulative SPLs at each POR, along with other project information.

The ISO 9613 computation methodologies produce continuous A-weighted downwind sound pressure levels. The dBA rating accommodates the fact that the human ear is not equally sensitive to all frequency ranges, and emphasizes the middle frequency sounds. The user enters the un-weighted octave-band Sound Power Level (SWL) of the Source in decibels (dB), produced by the Source relative to a reference sound power of one picowatt (1 pW). The SWLs levels are entered for each mid-band frequency that has noise levels. For example if the Source has are noise levels at all eight mid-band frequencies, the user creates eight entries for that Source. Refer to the figure 6.3 Source Settings Panel. You will see that Source 5 is entered as Source5.1, Source5.2 ... Source5.8 to account for the eight mid-band frequencies for that source. The data and plots that dB Foresight creates will be A-weighted SPL values. dB Foresight uses the A-weighting methodology as described by ISO-9613-2 which refers to the IEC-651 standard for A-weighting.

## 9.1 Noise level Prediction Confidence

The published accuracy for the ISO 9613-2 standard is as follows:

| **Height, h** (h is the mean height of the source and receiver.) | **Distance, d** (d is the distance between the source and receiver.) | |
|---|---|---|
| | **0 < d < 100 m** | **100 m < d < 1,000 m** |
| 0 < h < 5 m | ± 3 dB | ± 3 dB |
| 5 m < h < 30 m | ± 1 dB | ± 3 dB |

Accuracy levels beyond 1,000 m are not published. As the distance increases, the associated accuracy in prediction will decrease. Environmental factors such as wind, temperature inversions, topography and ground cover all have increasing effects over larger distances. As such, for all receivers within approximately 1,000 m of the various noise sources, the prediction confidence is considered high, while for all receivers beyond 1,000 m, the prediction confidence is considered moderate. It is important to note that, the noise levels calculated in the model must meet the SPLs up to 1,500 m from the site. As the distance to the receiver increases, the actual noise levels are expected to be lower than that projected by the model. Therefore, the decreasing accuracy associated with model results beyond 1,000 m is not considered to be as significant.

## 9.2 Noise Impact Assessment Parameters

The following is the list of the parameters types that are required by the dB Foresight prediction tool to model the sound pressure level predictions.

- Project name
- GPS location of the assessment area (north and south latitudes, east and west longitudes)
- Plot resolution (divisions per axis)
- Ground Type (Porous, Mixed or Hard)
- Cmet Effect in dB (only if wind, thermal inversion or other conditions are common for the site area)
- Project elevation data input (if the elevation contours are significant for the site area)
- GPS location of each sound source
- SPL, sound height, frequency bands, and directivity of each source
- Physical dimensions of the sources (can be entered as a barrier, enter each panel as a barrier)
- Atmospheric absorption constant (based on the air temperature, relative humidity and midband frequency of the sources)
- GPS locations, height and thickness of each man-made barrier
- GPS locations, height and ambient SPL for each POR
- Plot line and fill settings

The following noise level prediction methodologies are included for illustration only. This information is provided to present the methodologies dB Foresight uses to predict noise levels. The methodologies are not meant to be complete or to be used independently for noise level prediction methodologies. The full extent of the methodologies are provided in the ISO standard 9613-2.

## 9.3 Geometric Divergence

A significant factor for attenuation of the noise level is from geometrical divergence. Geometrical divergence accounts for the spreading out of the sound source. Depending on the type of source, the geometrical divergence, and location, the divergence can be spherical, hemispherical or directional. The equation for attenuation due to spherical divergence is:

$A_{div} = 20 \times Log_{10}(d/d_0) - 10 \times Log_{10}(Q)$ dB

Where:
$A_{div}$ is the sound pressure level attenuation due to geometric divergence.
d is the distance from the source to receiver in metres.
$d_0$ is the reference distance (= 1m).
Q is the directivity as described below

### 9.3.1 Directivity

dB Foresight noise level predictions considers the directivity of each source. The user enters the directivity as H, N, S, E or W defined as:

H: Hemispherical (Q = 2)
N: North (Q = 4)
S: South (Q = 4)
E: East (Q = 4)
W: West (Q = 4)

Q is the directivity factor of the source as per the following table:

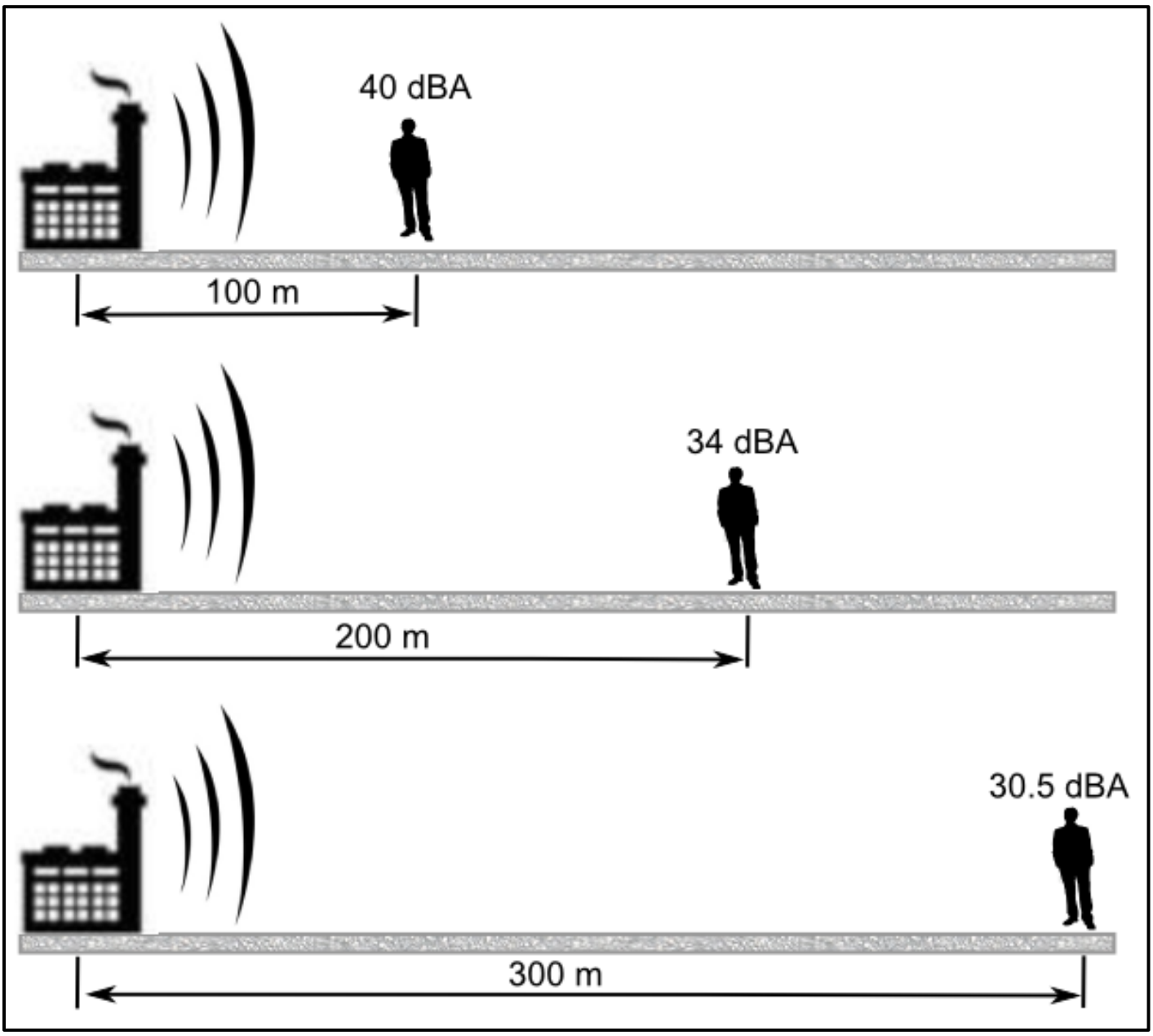
| Q | Radiation pattern | Examples |
|---|---|---|
| 1 | Spherical | Elevated sources, flares, aircraft |
| 2 | Hemispherical | Source near or on ground surface |
| 4 | ¼-spherical | Source on ground beside taller building |
| 8 | 1/8-spherical | In a corner of three surfaces |

### 9.3.2 Distance Effects

This effects of this is a doubling of the distance from a facility to the receiver results in a 6 dBA reduction in sound pressure level. For example, if the sound emitted from a single facility results in a noise level of 40 dBA, then the doubling of distance from the facility will result in a noise level of 34 dBA. Increasing the distance by the same amount again, amounts in a reduction to 30.5 dBA, as illustrated in Figure 10.3.3 below.

### 9.3.3 Distance Effect Illustration




### 9.4 Ground Effects

Ground attenuation is dependent on the type of ground surface, and is mainly the result of sound being reflected or absorbed by the ground surface. The ground types are divided into three main types defined as:

- Porous ground is ground covered in grass, trees other vegetation or farm land.
- Hard ground includes paving, water, ice or concrete.
- Mixed ground is a combination of hard and porous ground, but it mostly porous.

For porous ground type, or mixed ground type but mostly porous, the ground attenuation is calculated as follows:

$A_{gr} = 4.8 – (2 \times h_m / d) \times [ 17 + (300/d)] \geq 0$ dB

Where:

$A_{gr}$ is the sound pressure level attenuation due to ground effects.
$h_m$ is the mean height of the propagation path above the ground, in metres.
d is the distance from the source to receiver, in metres.
Under the following specific conditions:

- Only the A-weighted sound pressure level at the receiver position is of interest,
- The sound propagation occurs over porous ground or mixed ground, most of which is porous
- The sound is not a pure tone.

For a hard ground type, the ground attenuation is calculated as follows:

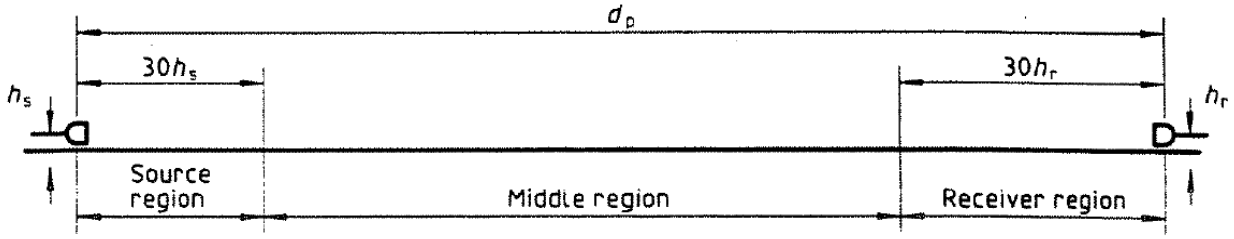
Agr = As + Ar + Am

Where:

$A_{gr}$ is the sound pressure level attenuation due to ground effects
As is the source region sound pressure level attenuation
Ar is the receptor region sound pressure level attenuation
Am is the middle region sound pressure level attenuation.

Where As, Ar and Am regions are defined in the following table:

### 9.4.1 Ground Attenuation Regions Table




Where:

$h_S$ is the height of the source above the ground, in metres

$h_r$ is the height of the receiver above the ground in metres

$d_p$ is the source-to-receiver distance projected onto the ground plane, in metres.

The expressions for each of these regions is defined in the following table:

### 9.4.2 Expressions Used For Hard Ground Type

| Nominal midband frequency Hz | $A_s$ or $A_r$ [1] dB | $A_m$ dB |
|---|---|---|
| 63 | $-1,5$ | $-3q$ [2] |
| 125 | $-1,5 + G \times a'(h)$ | $-3q(1 - G_m)$ |
| 250 | $-1,5 + G \times b'(h)$ | |
| 500 | $-1,5 + G \times c'(h)$ | |
| 1 000 | $-1,5 + G \times d(h)$ | |
| 2 000 | $-1,5(1 - G)$ | |
| 4 000 | $-1,5(1 - G)$ | |
| 8 000 | $-1,5(1 - G)$ | |

NOTES

$$a'(h) = 1,5 + 3,0 \times e^{-0,12(h-5)^2}\left(1 - e^{-d_p/50}\right) + 5,7 \times e^{-0,09h^2}\left(1 - e^{-2,8 \times 10^{-6} \times d_p^2}\right)$$

$$b'(h) = 1,5 + 8,6 \times e^{-0,09h^2}\left(1 - e^{-d_p/50}\right)$$

$$c'(h) = 1,5 + 14,0 \times e^{-0,46h^2}\left(1 - e^{-d_p/50}\right)$$

$$d'(h) = 1,5 + 5,0 \times e^{-0,9h^2}\left(1 - e^{-d_p/50}\right)$$

1) For calculating $A_s$, take $G = G_s$ and $h = h_s$. For calculating $A_r$, take $G = G_r$ and $h = h_r$. See 7.3.1 for values of $G$ for various ground surfaces.

2) $q = 0$ when $d_p \leq 30(h_s + h_r)$

$$q = 1 - \frac{30(h_s + h_r)}{d_p} \quad \text{when } d_p > 30(h_s + h_r)$$

where $d_p$ is the source-to-receiver distance, in metres, projected onto the ground planes.

## 9.5 Atmospheric Conditions

dB Foresight requires the user to enter the atmospheric attenuation coefficient which is based on the temperature, relative humidity and midband frequency. The lowest value of 0.1 considers winter or summer and high or low humidity conditions. This is also the most conservative (high side) approach to the noise impact assessment. Table 10.6 below lists the atmospheric absorption coefficients based on various atmospheric conditions.

### 9.6 ISO-9613-2 Atmospheric Attenuation Coefficients

| Temperature °C | Relative humidity % | Atmospheric attenuation coefficient $\alpha$, dB/km — Nominal midband frequency, Hz | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1 000 | 2 000 | 4 000 | 8 000 |
| 10 | 70 | 0,1 | 0,4 | 1,0 | 1,9 | 3,7 | 9,7 | 32,8 | 117 |
| 20 | 70 | 0,1 | 0,3 | 1,1 | 2,8 | 5,0 | 9,0 | 22,9 | 76,6 |
| 30 | 70 | 0,1 | 0,3 | 1,0 | 3,1 | 7,4 | 12,7 | 23,1 | 59,3 |
| 15 | 20 | 0,3 | 0,6 | 1,2 | 2,7 | 8,2 | 28,2 | 88,8 | 202 |
| 15 | 50 | 0,1 | 0,5 | 1,2 | 2,2 | 4,2 | 10,8 | 36,2 | 129 |
| 15 | 80 | 0,1 | 0,3 | 1,1 | 2,4 | 4,1 | 8,3 | 23,7 | 82,8 |

## 9.7 Meteorological Conditions

The engineering method for calculation attenuation of sound, specified in ISO 9613, considers common meteorological conditions favorable to propagation from the sources of sound emission, as described below. This is not to be confused with Cmet conditions. Cmet is an extra parameter that includes factors for the area such as downwind propagation, thermal inversions or other effects that are known for the area.

The equations for Cmet are as follows:

$$C_{met} = C_0 \left[1 - 10(h_s + h_r)/d_p\right] \quad \ldots (22)$$

if $d_p > 10(h_s + h_r)$

where

$h_s$ is the source height, in metres;

$h_r$ is the receiver height, in metres;

$d_p$ is the distance between the source and receiver projected to the horizontal ground plane, in metres;

$C_0$ is a factor, in decibels, which depends on local meteorological statistics for wind speed and direction, and temperature gradients.

Cmet = 0 if dp <= 10(hs+hr)

### 9.7.1 Downwind Propagation

When a wind is blowing there will always be a wind gradient. This is due to the layer of air next to the ground being stationary. A wind gradient can result in the sound waves propagating upwind being deflected upwards and those propagating downwind being deflected downwards. Therefore, a receiver upwind from the source may have a reduced noise level and a receiver downwind may have an increased noise level.

The ISO 9613 calculation methodology considers conditions with the wind direction within an angle of ± 45° of the direction connecting the center of the dominant sound source and the center of the specified receiver region, with the wind blowing from source to receiver, and wind speeds between approximately 1 m/s and 5 m/s, measured at a height of 3 m to 11 m above the ground.

The dB Foresight noise level prediction tool allows for consideration of more extreme downwind propagation conditions. To account for more extreme downwind conditions the user can include a dB factor in the settings.

### 9.7.2 Temperature Inversions

Usually, the air near the surface of the Earth is warmer than the air above it. Temperature inversions are conditions where the temperature increases with height. This occurs due to unique weather conditions, such

as a cold air mass moving over a warm one in winter, or clear nights with calm winds, just after sunset, when the ground level air cools faster than the air above it.

During a temperature inversion sound waves can be refracted downwards, and therefore may be heard over longer distances. The ISO 9613 calculation methodology considers propagation under a well-developed moderate ground-based temperature inversion, such as commonly occurs at night.

More extreme temperature inversion conditions over water surfaces may result in higher sound pressure levels. These more extreme conditions are not covered by the ISO 9613 propagation calculation methodology. However, the dB Foresight noise level prediction tool allows for consideration of more extreme temperature inversion conditions. To account for more extreme temperature inversions the user can include a dB factor in the settings.

### 9.8 Multiple Sources

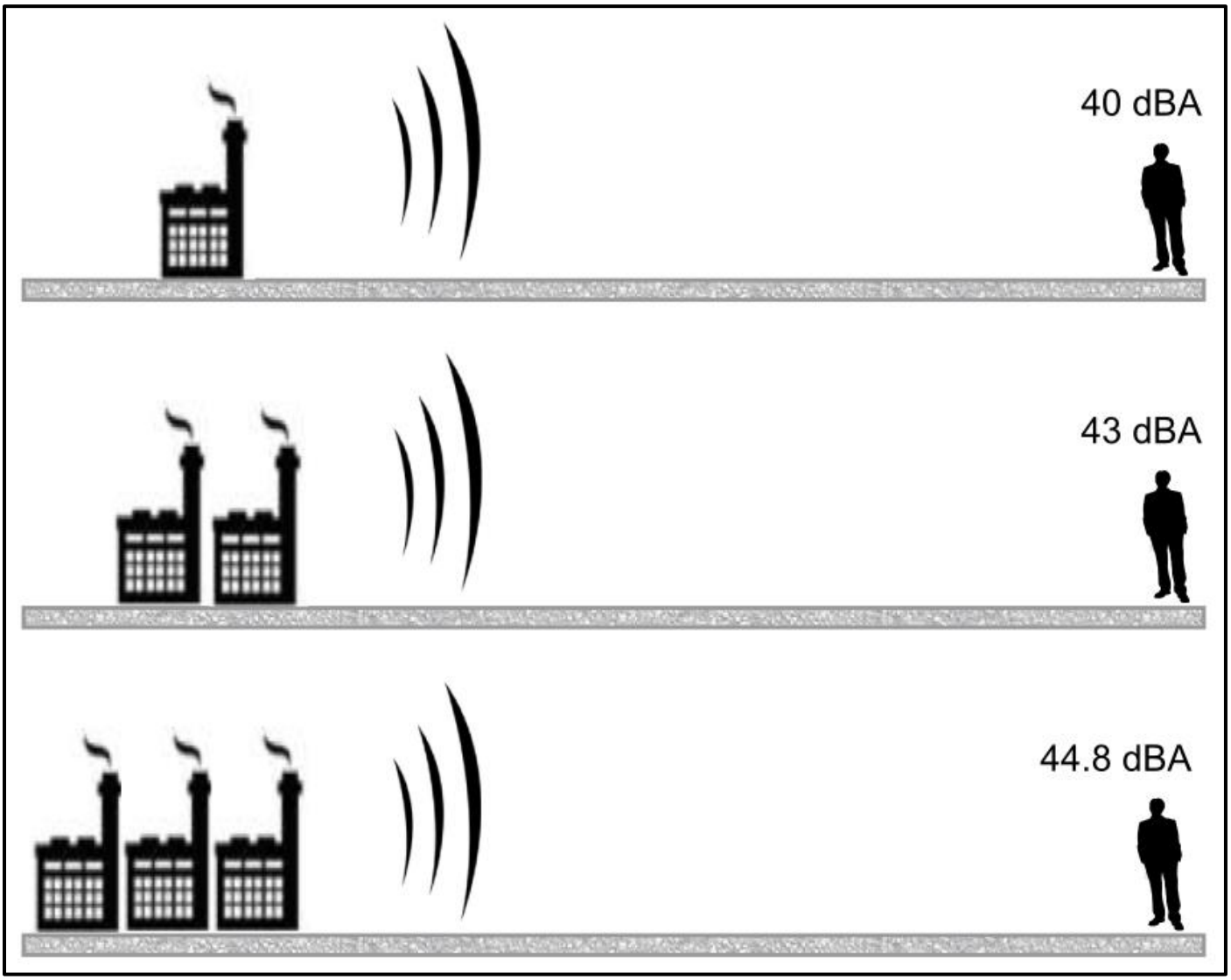
Since noise levels are measured on a logarithmic scale, the combined effect of multiple sources is calculated accordingly. The following formula is used to combine multiple sources:

$$dBA = 10 \times \log\left(10^{\frac{dBA_1}{10}} + 10^{\frac{dBA_2}{10}} + 10^{\frac{dBA_3}{10}} + \ldots + 10^{\frac{dBA_n}{10}}\right)$$

This has the effect of a doubling of the number of sources causing a 3dB increase in the noise level at the receiver. For example, if the sound emitted from a single facility results in a noise level of 40 dBA, then the emissions from two facilities with the same noise level will result in a noise level of 43 dBA. When a third facility is added, the noise level increases to 44.8 dBA. The effects of adding noise sources on ambient noise levels are illustrated in the figure below.

#### 9.8.1 Multiple Sources Effect On Noise Levels

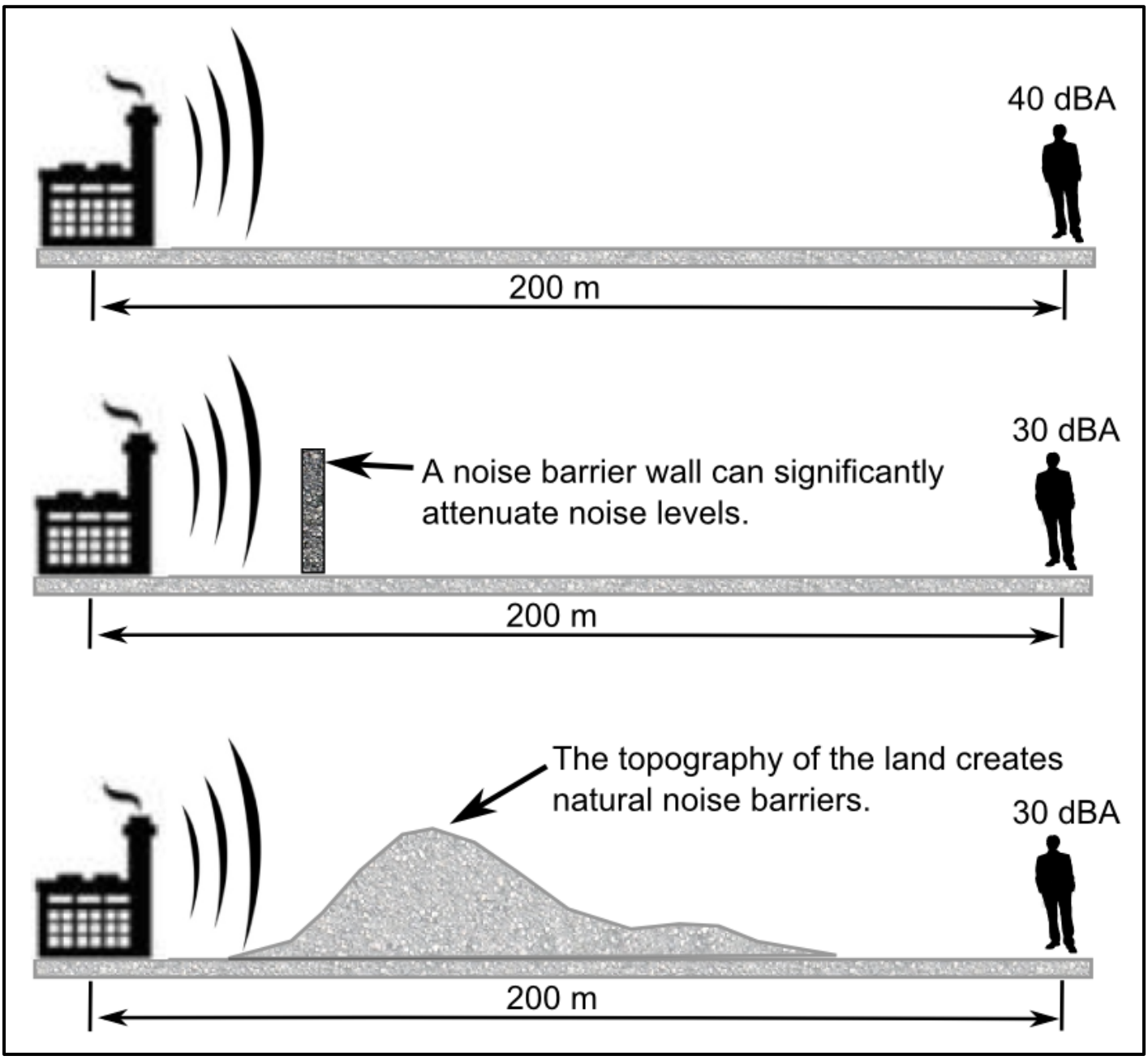



### 9.9 Noise Barriers

To attenuate noise levels natural or man made barriers can have a significant effect. A man made barrier can be a wall constructed from concrete or other solid material, or a berm of soil. The amount of attenuation for a barrier depends on its height, distance from the source and POR, thickness, and other factors. dB Foresight used the formulae provided by ISO 9613-2 to determine the attenuation due to natural or man made barriers. A natural barrier is considered due to the natural elevation contours of the land between the source and POR.

### 9.9.1 Effect Of Noise Barriers On Attenuation

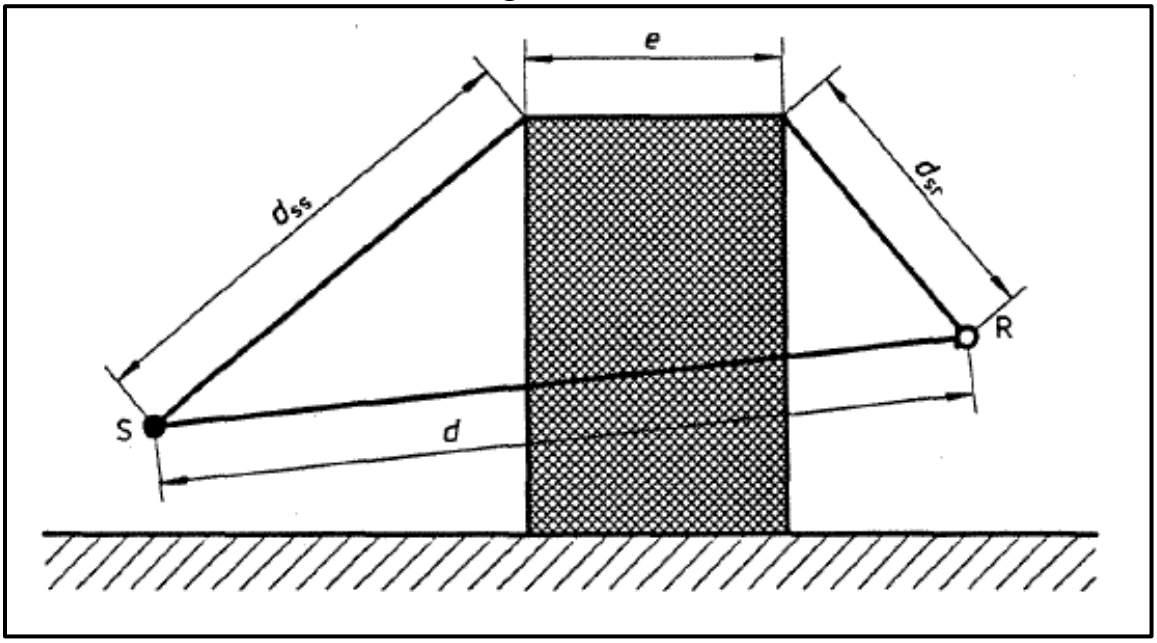



The noise attenuation calculations for the barrier effects consider many factors including:

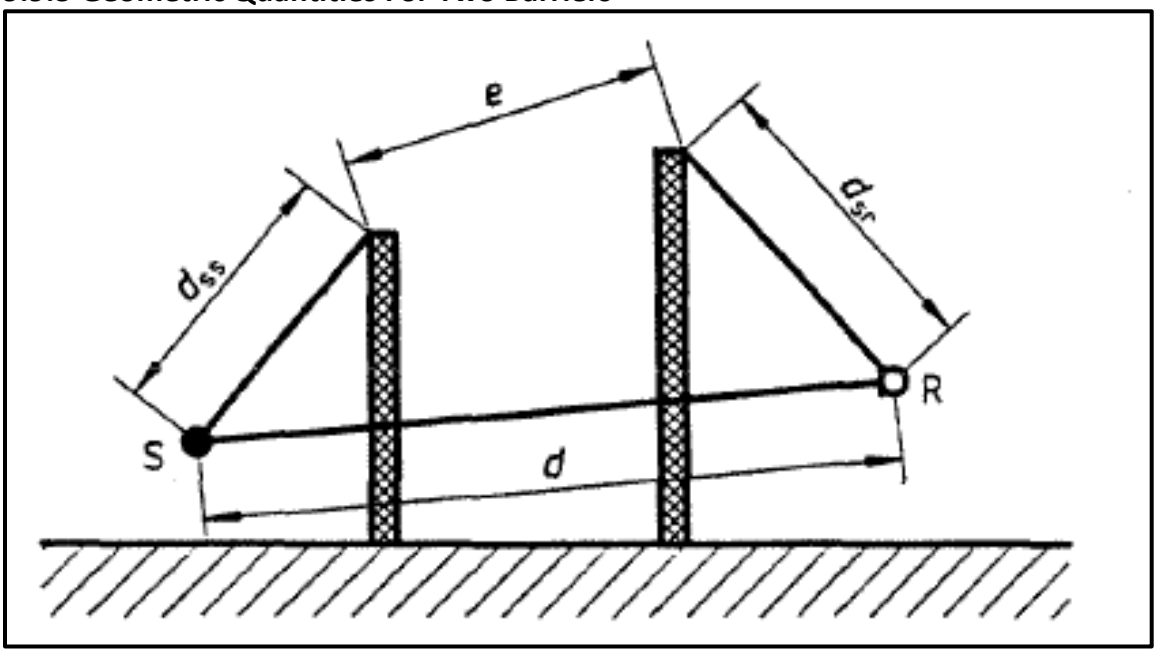
- The wavelength of the sound at the nominal mid-band frequency of the octave band
- Geometric values as indicated in the diagram below
- The difference between the sound path taken and a path directly from the source to the receiver
- The number of barriers in the path
- Whether the barrier top is above or below the line of sight between the source and receiver
- Correction factor for meteorological effects.

### 9.9.2 Geometric Quantities For a Single Barrier




### 9.9.3 Geometric Quantities For Two Barriers




The equations to calculation the attenuation due to barriers are included in ISO 9613. dB Foresight also considers the effects of the source structures on noise level attenuation. The user must enter the overall dimensions of the source, and they are considered in the barrier attenuation calculations. The expressions used for barrier attenuation (Abar) are as follows:

Abar = Dz – Agr >0

And for diffraction around a vertical edge:

Abar = Dz >0

Where:

Dz is the barrier attenuation for each octave band, equation (14);

Agr is the ground attenuation in the absence of the barrier.

The barrier attenuation Dz, in decibels, shall be calculated for this path by equation (14):

$Dz = 10 \log [ 3 + (C2/ \lambda) C3zKmet] dB$ … (14)

Where:

$C_2$ is equal to 20, and includes the effect of ground reflections; if in special cases ground reflections are taken into account separately by image sources, $C_2 = 40$;

$C_3$ is equal to 1 for single diffraction, and where
$C3 = [1 + (5 \lambda/d)2 ] / [(1/3) + (5 \lambda/e)2 ]$ … (15)
for double diffraction;

$\lambda$ is the wavelength of sound at the nominal midband frequency of the octave band, in metres;

z is the difference between the path lengths of diffracted and direct sound, as calculated by equations (16) and (17), in metres;

Kmet is the correction factor for meteorological effects, given by equation (18);

e is the distance between two diffraction edges in the case of double diffraction

For single diffraction, the path length difference z shall be calculated by equation (16):

$$Z = [(dss + dsr)^2 + a^2]^{1/2} - d \quad \ldots(16)$$

Where:

dss is the distance from the source to the (first) diffraction edge, in metres;

dsr is the distance from the (second) diffraction edge to the receiver, in metres;

a is the component distance parallel to the barrier edge between source and receiver, in metres.

If the line of sight between the source and receiver passes above the top of the edge of the barrier, z shall be given a negative sign.

For double diffraction, the path length difference z shall be calculated by:

$$Z = [(dss + dsr+e)^2 + a^2]^{1/2} - d \quad \ldots(17)$$

The correction factor Kmet for meteorological conditions in equation (14) shall be calculated using equation (18):

$Kmet = \exp [-(1/2000) \sqrt{dss\ dsr\ d/(2z)} ]$ for $z > 0$ dB … (18)

Kmet = 1 for z <=0

For lateral diffraction around obstacles, it shall be assumed that Kmet = 1

The barrier attenuation Dz, in any octave band, should not be taken to be greater than 20 dB in the case of single diffraction (i.e. thin barriers) and 25 dB in the case of double diffraction (i.e. thick barriers).

When Use Elevation Effects is selected, dB Foresight creates a contour map using the elevations, and each segment is converted into a barrier, and included in the barrier computations. If Included Elevation Effects is selected the Resolution should be set to approximately double the Number of Elevation Levels settings. If the Resolution is set too high, compared to the Number of Elevation Levels, false barriers could appear. This is because the actual elevations are more accurate than the contour lines, so if the elevation drops on one side

of a contour line, it would appear as a barrier in the computations. However, with some experimenting and adjusting of these settings, you will get very precise results.

For conditions where there are 2 or more barriers in a path, that are either man made or part of the elevation effects, as per ISO 9613, the two most relevant barriers are selected and the barrier attenuation is computed based on the double diffraction method described above.

For the custom barriers that are solid on the top portion and louvered or open on the bottom, as per ISO 9613, double diffraction is used with one path over the barrier and the other path through the bottom area.

## 10 Continuous Improvement

We at dB Foresight Corporation would like to continuously improve this product. If you have suggestions for improvement, comments or issues that you find with the product or associated documentation, please contact us through the Contact Us page at www.dbforesight.com.