AERPLOT Sample Run Instructions

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Overview

This AERPLOT Sample Run Instructions provides an overview of the steps involved in using AERPLOT in conjunction with Google Earth. This document assumes the user has reviewed the installation process outlined in the AERMOD Installation Guide.

The AERPLOT Sample Run Instructions instructs the user through a step-by-step overview of the download and setup process, including creating a working AERPLOT folder, downloading and extracting the AERPLOT data, confirming file naming conventions, modifying input file data, and executing the AERPLOT program to view the results.

By following the steps outlined in this document, users can expect to have a clear guide to utilizing AERPLOT for analyzing AERMOD data.

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1 Preparation

It is essential that the user has completed the steps outlined in the "AERMOD Sample Run Instructions". This example assumes the user has worked through that document and sample run.

Note: This example is presented for the Windows operating system. Additionally, to view the generated plot, it is assumed the user has already installed Google Earth or Google Earth Pro (available at https://www.google.com/earth/versions/#download-pro).

This AERPLOT example will utilize the most recent versions of AERPLOT (version 24142) and AERMOD (version 24142).

It is important to read these instructions closely. Due to the similarity in file names, such as aerplot.inp and aermod.inp, it is imperative to open the correct file for each step.

2 Creating an AERPLOT folder

Follow the steps below to create an AERPLOT folder:

> **Step 1.** Locate and open the AERMOD folder in the designated directory.
> **Step 2.** Open the SampleRun folder within the AERMOD folder.
> **Step 3.** Right-click inside the SampleRun folder and select New ❼ Folder from the context menu.
> **Step 4.** Name the newly created folder as "AERPLOT".

Verify that the contents of the Sample Run folder contain AERMAP, AERMET, AERMOD, and the newly created AERPLOT folder, as shown in Figure 1.
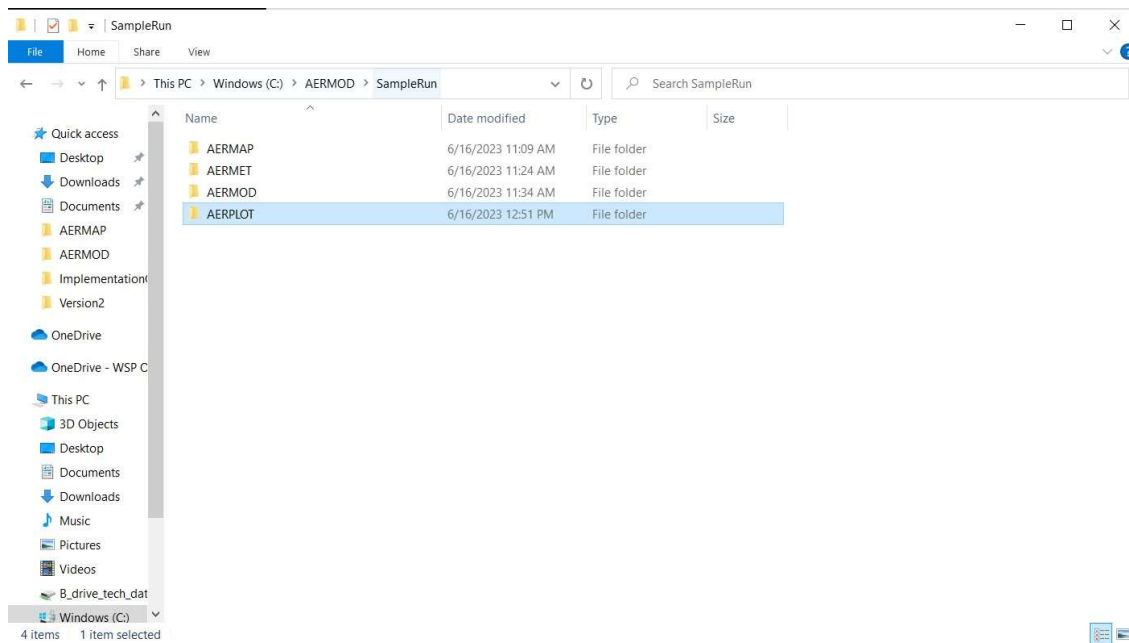
Figure 1: Contents of the Sample Run folder.

3 Downloading the AERPLOT ZIP File

The steps below will help the user download the AERPLOT ZIP file:

Step 1.   Open a web browser and navigate to EPA's SCRAM website (https://www.epa.gov/scram), then navigate to the AERMOD page by following the links: Air Quality Models ❼ Dispersion Modeling ❼ Preferred/Recommended Models ❼ AERMOD Modeling System.

Step 2.   Locate the section titled "Installation Guide (Sample Run)" and click on "AERPLOT Sample Run (ZIP)" to download the zip file.

Step 3.   Once the download is complete, open File Explorer and navigate to the "Downloads" tab.

Note: If a "CRDOWNLOAD" file was downloaded, please refer to Appendix "Help downloading ZIP file" for assistance.

4 Extracting the AERPLOT Download

After downloading the AERPLOT ZIP file, the next step is to extract (i.e., unzip) the contents into the appropriate AERPLOT folder.

Note: The process to unzip the file is very similar to unzipping the AERMOD ZIP file described in the AERMOD Sample Run Instructions with a slight difference in the "Extract All" location.

Follow the steps below to unzip the file into the AERPLOT folder:

Step 1. Open File Explorer and navigate to the "Downloads" tab.

Step 2. Right-click on the "Sample_AERPLOT_Run.zip" file.

Step 3. From the context menu, select "Extract All".

Step 4. Unless the destination of the SampleRun folder has changed, enter "C:\AERMOD\SampleRun\AERPLOT" in the destination field (see Figure 2).
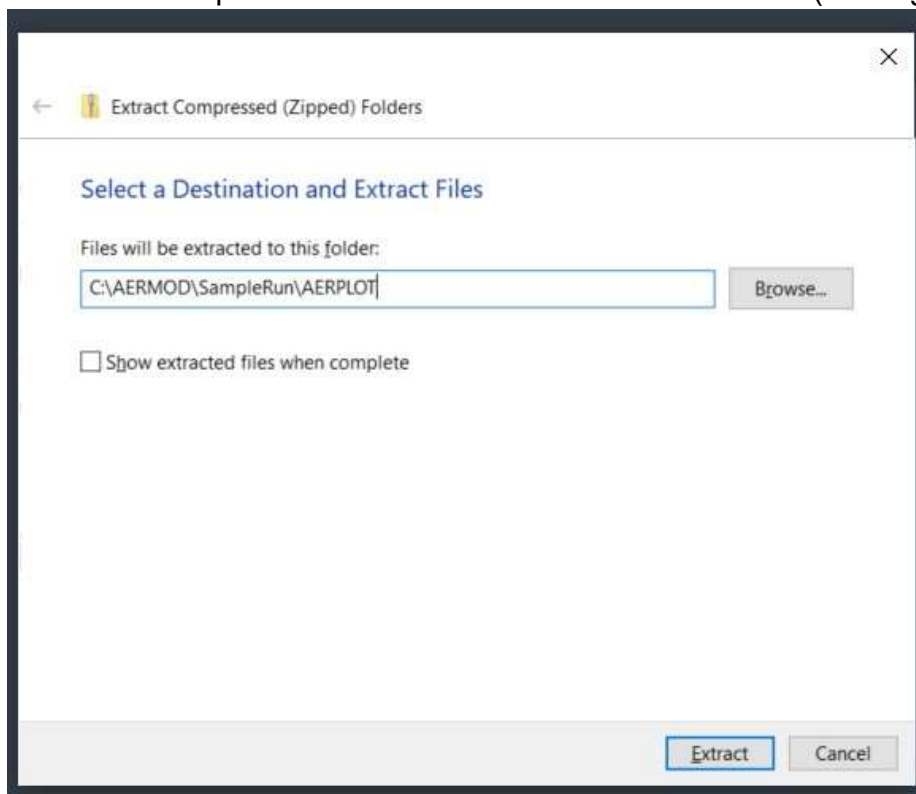

Figure 2:Selecting a location to unzip AERPLOT files.

Step 5. Verify that the AERPLOT folder now contains two files: aerplot.inp and aerplot.exe.

5 Confirming the PlotFileName

It is important to ensure the plot file name is correct in the file "aerplot.inp" for the scripts to run. The plot file was created by AERMOD during the Sample Run and contains

concentrations at spatial locations, which will be plotted by AERPLOT. This file has a .plt extension. The plot file will be input used by AERPLOT, thus the correct file name must be contained in the aerplot.inp file for AERPLOT to work.

Follow the steps below to confirm the plot file name:

Step 1.   In the SampleRun folder, open the AERPLOT subfolder.

Step 2.   Open the "aerplot.inp" file in a text editor, such as Notepad. If using a text editor program other than Notepad, ensure the program has a "find" feature.

     a.   To open aerplot.inp in Notepad, double-click on the "aerplot.inp" file in File Explorer.

Step 3.   Using "Ctrl + F" (or a different find feature), search for "PlotFileName". The results should resemble Figure 3.
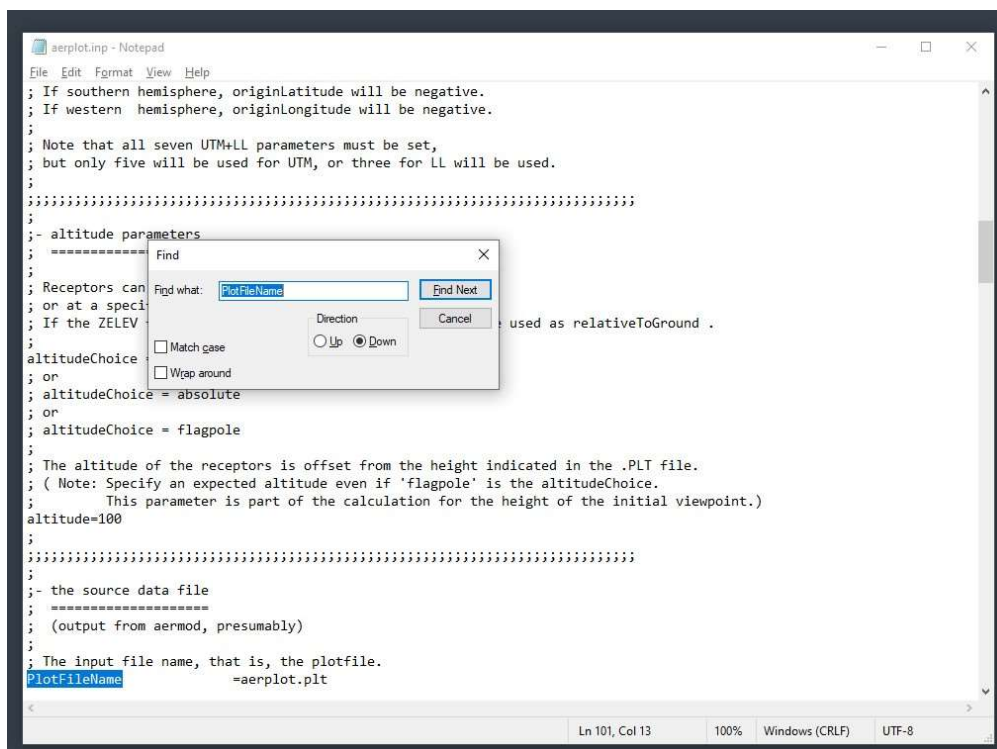

Figure 3: Using "Ctrl + F" to find PlotFileName

Step 4.   Confirm that the file contains the line: "PlotfileName   =aerplot.plt":

Step 5.   If the line does not match Figure 3, edit the line to match the correct format and have the correct .plt filename.

Step 6.   If the user does **not** wish to view the plot, they can disable it by finding the "sDisableEarthBrowser" line, using "ctrl + F", and setting it to:

sDisableEarthBrowser = true

Step 7. In the upper left-hand corner of Notepad, click "File" and then select "Save". Alternatively, use "Ctrl + S" to save the changes to "aerplot.inp".

Step 8. Close "aerplot.inp".

6 Incorporating Aerplot.plt to Aermod.inp

Once AERPLOT is downloaded, it is important to specify within the "aermod.inp" file the output file as "aermod.plt". To do this, the user must add a new line to the output "OU" pathway, as described below.

Step 1. Open the SampleRun folder and navigate to the AERMOD folder.

Step 2. Open "aermod.inp" file using a text editor (preferably Notepad). **Step 3.** Find the output pathway by using "Ctrl + F" to find "OU STARTING". This will direct to the output pathway section, which is the last section of the "aermod.inp" file.

Step 4. Add the following PLOTFILE line (highlighted below),

```
OU STARTING


   RECTABLE  allave first-second

   MAXTABLE  allave    400

   SUMMFILE  aermod.sum

   PLOTFILE  period   all       ..\aerplot\aerplot.plt


OU FINISHED
```

Step 5. Save the "aermod.inp" file (either "Ctrl + S" or File ❼ Save).

Step 6. Open Command Prompt and run AERMOD again by following the steps outlined in the AERMOD Sample Run Instructions (changing directory and then typing in AERMOD into the command prompt).

Step 7. Return to the AERPLOT folder in File Explorer and confirm that a new file called "aerplot.plt" is created.

The user can view the plot file (aerplot.plt) in a text editor. The plot file will contain a header with relevant information and tabular formatted data in columns separated by spaces.

7 Running AERPLOT and Google Earth

Follow the steps below to run AERPLOT and examine the results in Google Earth:

Step 1. After navigating to the SampleRun folder and executing AERMOD, change to the AERPLOT folder and run the program by typing in the following command:

```
aerplot
```

The terminal should display text output similar to Figure 4 below. Additionally, a new file named "SampleAERPLOTRun.kmz" should be created in the AERPLOT folder.

```
C:\AERMOD\SampleRun\AERPLOT>aerplot
aerplot, version 24142.
This program requires Windows.
(Do not run under Cygwin).
                          altitude: 100
                    altitudeChoice: relativeToGround
                     binningChoice: Log
             gradientBinningChoice: Log
                            MaxBin: data
                    gradientMaxBin: .5e-9
                            MinBin: 0.2e-7
                    gradientMinBin: .1e-11
        customBinningElevenThresholds: 1,2,3,4,5,6,7,8,9,10,11
        customGradBinElevenThresholds: 1,2,3,4,5,6,7,8,9,10,11
                      makeContours: false
                     makeGradients: false
                            origin: UTM
                           utmZone: 17
                           easting: 0
                          northing: 0
             inNorthernHemisphere: true
                    originLatitude: 0.0
                   originLongitude: -84.0
               OutputFileNameBase: SampleAERPLOTRun
                      PlotFileName: aerplot.plt
                   sIconSetChoice: redBlue
          NameDisplayedInGoogleEarth: Sample-AERPLOT-Run
                         IconScale: 0.70
  numberOfTimesToSmoothContourSurface: 1
                  numberOfGridCols: 400
                  numberOfGridRows: 400
                  contourExtension: 9999999
                 gradientExtension: 9999999
  provideEvenlySpacedInterpolatedGrid: false
          SourceDisplayInputFileName: ..\aermod\aermod.inp
                sDisableEarthBrowser: false

First Pass: Read and Eval

Second Pass: Output file: SampleAERPLOTRun.kmz

C:\AERMOD\SampleRun\AERPLOT>
```

Figure 4: Expected terminal window output when running AERPLOT.

Step 2.   If an Earth browser (such as Google Earth or Google Earth Pro) is available, after the AERPLOT run completes, the Earth browser will open and display the generated data points for examination (see Figure 5).
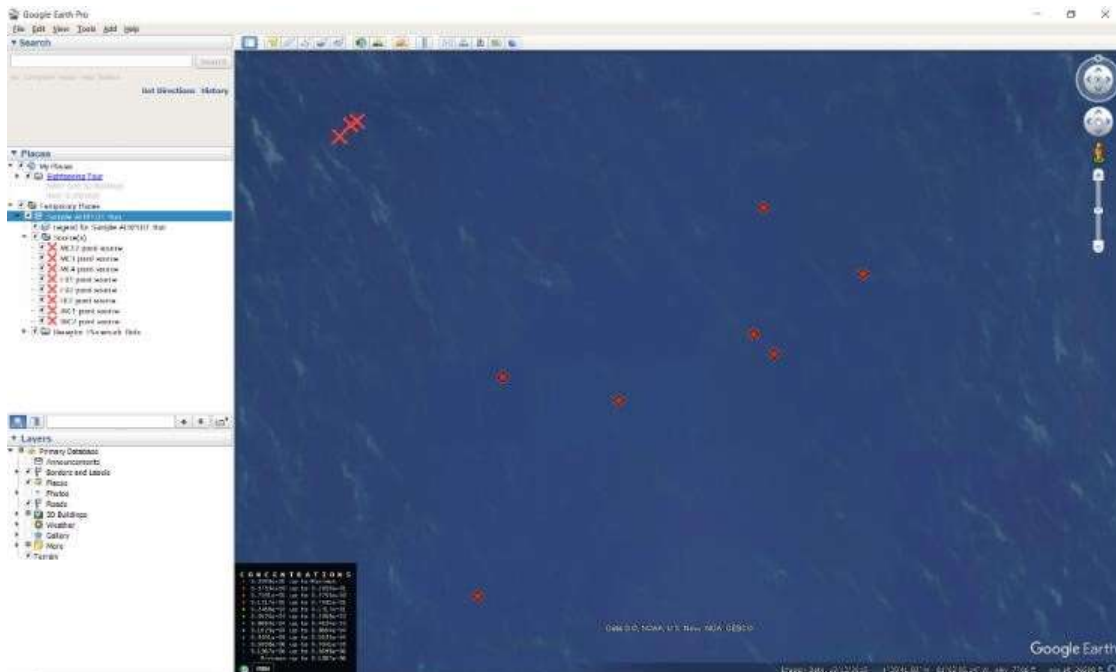
Figure 5: Displaying AERPLOT output in Google Earth.

Step 3.   In Google Earth, the panel to the upper-left contains controls that can toggle the visibility of different map elements. The user can adjust the visibility elements to become familiar with these tools.

Step 4.   Within the plot area, red dots represent the receptors calculated by AERMOD. The color scale used indicates the level of concentrations observed, and the upper-left panel and lower-left "legend" display the concentration ranges.

Step 5.   Select and click on a receptor dot. An "information balloon" will open, providing information about that receptor.
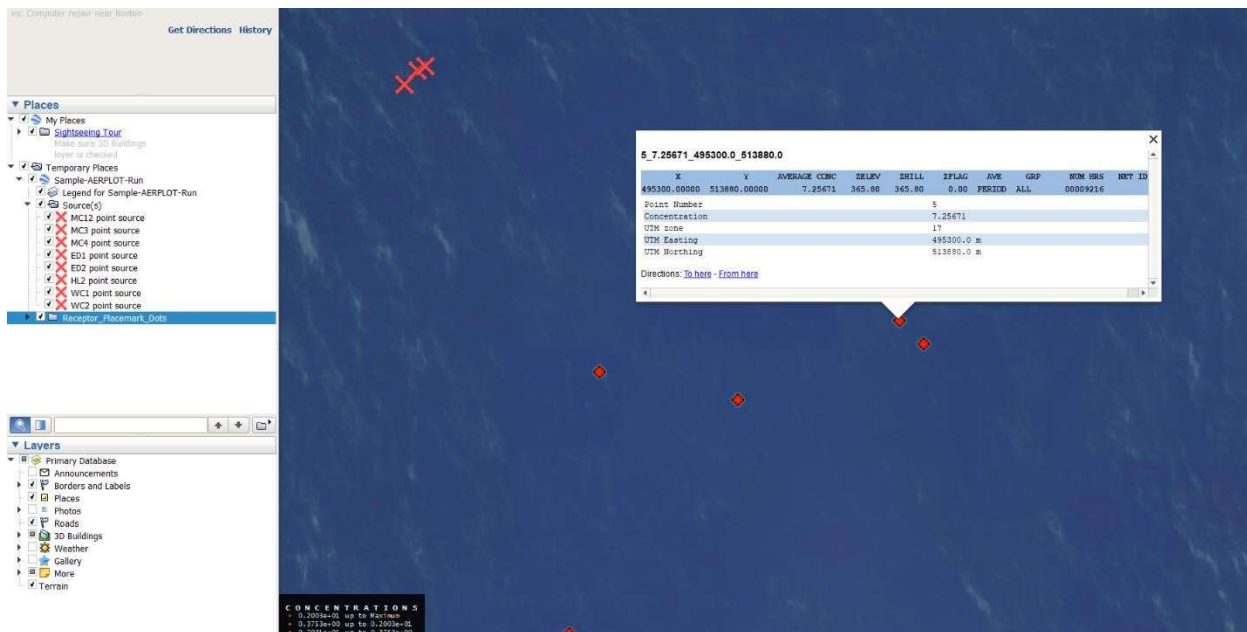
Figure 6: An information balloon in Google Earth that shows additional receptor information.

Step 6.   To exit Google Earth, use "Alt + F4", or select the "Exit" option from the File menu or click on the "X" button in the upper-right corner of the window. **Step 7.**   To exit the Command Prompt, enter the "exit" command, use "Alt + F4", or click on the "X" button in the upper-right corner of the window.

The user has now completed the AERPLOT Sample Run. By completing this document, a new user is familiar with the AERPLOT file structure, can run AERPLOT when given an .inp file, and can produce the correct output files: .plt from AERMOD, and .kmz from AERPLOT. The user is also familiar with the AERPLOT tools to easily navigate the data.

8 References

EPA, 2023: AERMOD Sample Run Instructions, EPA- 454/B-18-004. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711.

Appendix A. AERPLOT File Extensions

The table below is a list of the AERPLOT file types used in this Installation Guide. *Table 1: AERMOD File Extensions*

Extension	Meaning
*.plt	"plot file" of data to be plotted, output by AERMOD and read by AERPLOT
*.kmz	Compressed collection of XML data for earth browser, output by AERPLOT
*.exe	executable file
*.inp	input file

For more information on the specific files in the AERMOD SampleRun folder, see the file "ReadMeForFilesExplained.txt" in the AERMOD SampleRun folder.

Appendix B. Additional AERPLOT Resource

The link below is to a text document on the EPA website containing useful information

on installing and using AERPLOT including helpful settings and options:

gaftp.epa.gov/Air/aqmg/SCRAM/models/related/aerplot/aerplot_readme.txt

Appendix C. Issues with Downloading ZIP file

If the user encounters difficulties while downloading a ZIP file, it is essential to ensure the working computer has sufficient storage. If the computer has sufficient storage, the problem may be due to the browser's trust settings for the download.

Follow the steps below to address the download issues:

Step 1. Look for a pop-up message that may note something similar to "File.zip isn't commonly downloaded. Make sure you trust File.zip before you open it". Note: The name of the file will vary based off what the user is trying to download. Refer to Figure 7 for an example.
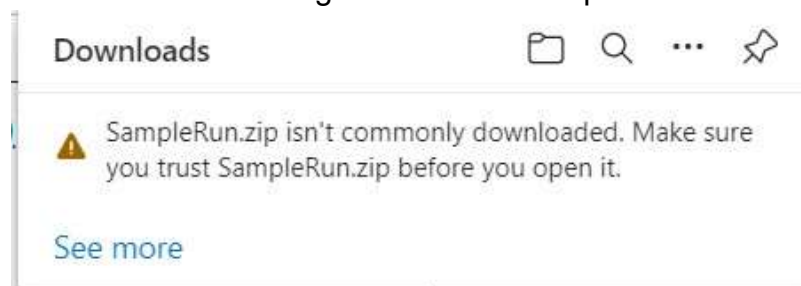

Figure 7: Example of a popup explaining potential error in downloading .zip file.

Step 2. Hover over the error message until the message is greyed out, and an icon with three horizontal bars appears on the side.

Step 3. Click the icon with three bars.

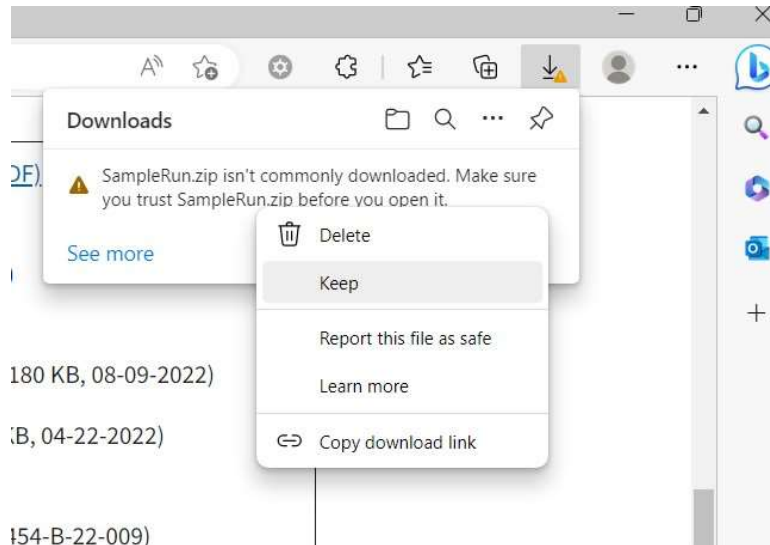**Step 4.** Select "Keep" from the options presented (refer to Figure 8).

Figure 8: Finding the keep option when downloading .zip file.

Step 5. The user will be prompted to "Make sure you trust the zip before you open it." Click the dropdown menu labeled, "Show more".

Step 6. Click the blue text, "Keep anyway" (refer to Figure 9).
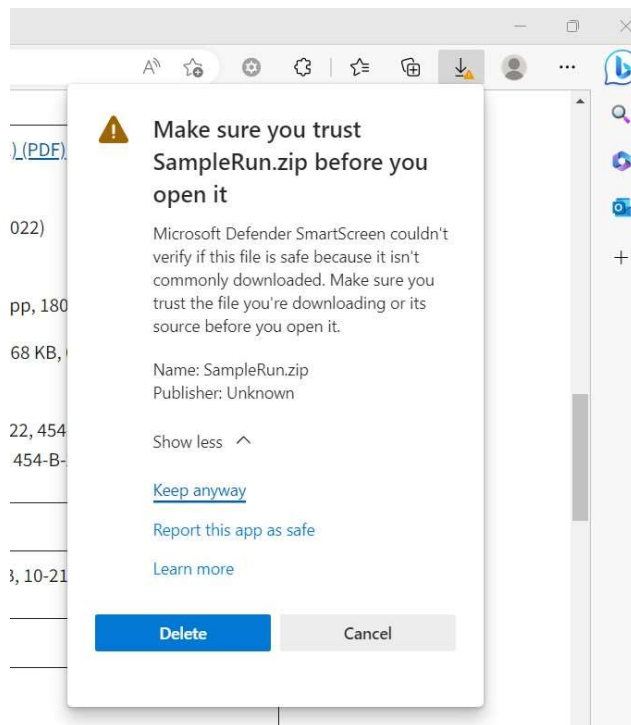

Figure 9: Keeping the .zip file.

After following these steps, the ZIP folder should be successfully downloaded and located in the "Downloads" folder. Repeat these steps if another ZIP file encounters the same issue.