MET ONE BAM ZERO BACKGROUND TEST

To meet EPA requirements for federal equivalency and for obtaining a site-specific background, all Met One PM2.5 BAM's must undergo a 48 – 72 consecutive hour zero background test when first deployed and annually thereafter. Each BAM has a programmable background value (BKGD) to compensate for site-specific characteristics such as grounding, inlet heater operation, shelter temperature characteristics, radon, or radio-frequency interference. This test should be performed during dry, stable weather when clean (not during wildfire smoke or other major particulate matter events) air is expected.

At the end of the completed 48 to 72-hour period, the data must be downloaded and statistically analyzed using the Zero Background Test spreadsheet template. After the new background value has been calculated and compared with the factory zero, the new background value is then inputted into the monitor. All subsequent stored concentration data is then corrected by the background value.

The 72-hour zero test should be performed when the BAM is installed in its permanent location and fully configured for sampling.

1) Identify the BX-302 Zero Filter Kit.

2) Perform a Zero Background Test. *For PM10 units, such as the E-BAM PLUS, the BKGD value may optionally be tested and adjusted for best accuracy, though it is not technically a requirement*. Complete this test by following these procedures:
   a. Remove the PM_{10} inlet and VSCC and install the Zero Filter onto the inlet sample downtube.

b. Navigate to the monitor Main Menu -> Setup -> Background-> or Calibrate -> Background.

c. Once you are in the Background submenu screen. Press the green bordered value box on the row labeled “Background” and the numerical entry keypad will be displayed.

d. Change or Reset the background value to 0.0000 on the monitor and press <OK>.

e. Regardless of the concentration units setting, the background is always entered in mg/m3.

f. Press the <X> icon in the upper right corner to return to the Setup Menu. Then select “Background” to ensure that the background value has been set to the desired value, i.e. 0.0000.

g. Navigate to the Main Menu and select "Operate" and press "Start" to put the monitor into sampling mode and allow the monitor to take measurements for 72 hours.

h. After 72 hours, put the monitor in stop mode and remove the Zero Filter and replace the PM_{10} inlet and VSCC

3) In the Operate Menu ->Transfer Data ->Download the 72 hours of stored Zero Data to a USB memory stick:

a. The Days field determines how many records you want to download. If you wish to change the number of days being copied, press the green bordered value box and the numerical entry keypad will be displayed. Enter the number of days between 001 and 999.

b. The FILES field determines whether you download all of the stored record types or only the user selected records. The USER files are ones which are used for all routine data collection purposes. The ALL option includes additional factory diagnostics files which are only used if data is being sent to Met One Instruments for factory support. The default setting is USER. If you need to change this field, press the green bordered value box and a list of the options available will be displayed. Tap the one you wish to use and it will be applied.

c. Locate the USB slot above the tape take up spool and insert a USB memory stick into it.

d. Press the grey COPY button to copy the selected data to the USB memory stick.

e. When the COPY COMPLETE message is displayed, remove the USB memory stick and close the front door of the BAM.

f. Copy and paste the Raw Data into the **TEMPLATE-BKGD_BAM1022** spreadsheet under ***Raw Data Input*** sheet. Complete the ***BKGD Audit*** sheet using you QC form. The TEMPLATE_BKGD_BAM1022 spreadsheet will calculate the new Zero Background value.

    i. Met One Instruments requires the Zero Background concentration to be inputted into the BAM monitor in mg/m3 and ***NOT ug/m3***. In this regard, the hourly (ConcHR) data is converted to mg/m^3 in the Zero Background Test spreadsheet which charts and calculates the Zero Background value.

g. Input the new Zero Background value into the monitor following Step 2 above (b – f), then navigate to the monitor Main Menu and select "Operate" and press "Start."

It is recommended that the new coefficient be audited for 24 hours prior to resuming normal data collection; especially if the BAM is close to failing the background test.