Field Evaluation
Met One E-Sampler
From 7/14/2017 to 9/15/2017, two Met One E-Samplers were deployed in Rubidoux and were run side-by-side SCAQMD Federal Reference Method (FRM) instruments measuring the same pollutants.

**Met One E-Sampler (2 units tested):**
- Particle sensor (optical; non-FEM)
- Each unit measures PM$_{2.5}$ ($\mu$g/m$^3$), ambient air temperature (degree C), relative humidity (%), wind speed (m/s), and wind direction
- Unit cost: ~$5,500
- Time resolution: 5-min
- Units IDs:
  - W12
  - P22

**Met One BAM (reference method):**
- Beta-attenuation monitors (FEM PM$_{2.5}$)
- Measures PM$_{2.5}$ ($\mu$g/m$^3$)
- Unit cost: ~$20,000
- Time-resolution: 1-hr
Data validation & recovery

• Basic QA/QC procedures were used to validate the collected data (i.e. obvious outliers, negative values, and invalid data-points were eliminated from the data-set)
• Data recovery was near 100% for both units tested

Met One E-sampler; intra-model variability

• Relatively high measurement variation was observed between the two E-Samplers tested
Met One E-Sampler vs FEM BAM (PM$_{2.5}$ Mass; 1-hr mean)

- Met One E-Sampler PM$_{2.5}$ mass measurements show moderate correlations with the corresponding FEM BAM data ($0.55 < R^2 < 0.62$).
- The two sensor units tested seem to track well the diurnal PM$_{2.5}$ variations recorded by the FEM BAM instrument.
- Met One E-Samplers seem to underestimate the FEM measurement data.
Met One E-Sampler vs FEM BAM (PM$_{2.5}$ Mass; 24-hr mean)

- Met One E-Sampler PM$_{2.5}$ mass measurements correlate moderately with the corresponding FEM BAM data ($0.55 < R^2 < 0.61$).
- The two sensor units tracked well the day-to-day PM$_{2.5}$ variations recorded by the FEM BAM instrument.
- Met One E-Samplers seem to underestimate the FEM measurement data.
Discussion

• Overall, Met One E-Samplers were reliable with high data recovery (~100%)

• The two units tested showed relatively high intra-model variability for PM$_{2.5}$ mass concentration

• The Met One E-Samplers demonstrated moderate correlations ($R^2 > 0.55$) with the FEM instrument, while underestimated the FEM (BAM) measurement data

• It should be noted that no sensor calibration had been performed by SCAQMD Staff prior to the beginning of this field testing

• Laboratory chamber testing may be necessary to fully evaluate the performance of these sensors over different / more extreme environmental conditions

• All results are still preliminary